00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Bangor Twp

3) WATERCOURSE: Indian Town Drain

4) DOCUMENT TYPE: 100-yr Encroached

00BREAK00

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C      31
C     200          VS-1  200 FT. U.S. FROM MOUTH OF DRAIN
C    1820          VS-2  50 FT. D.S. FROM EUCLID RD. CULVERT
C    1870          BS-3  EUCLID RD. CULVERT
C    2430          VS-4  520 FT. U.S. FROM EUCLID RD.
C    3312          BS-5  BOY SCOUT RD. CULVERT
C    3388          VS-6  17 FT. U.S. FROM BOY SCOUT RD.
C    3405                DRIVEWAY CULVERT
C    3473                DRIVEWAY CULVERT
C    3549                DRIVEWAY CULVERT
C    3790          BS-7  DOUGLAS DR. CULVERT
C    4109                DRIVEWAY CULVERT
C    4131                DRIVEWAY CULVERT
C    4249                DRIVEWAY BRIDGE
C    4329                DRIVEWAY CULVERT
C    4520                DRIVEWAY BRIDGE
C    4570          VS-8  BETWEEN EAST BIRCH DR. @ GREGG DR.
C    4670                DRIVEWAY BRIDGE
C    4805                DRIVEWAY CULVERT
C    4870                DRIVEWAY CULVERT
C    4948                DRIVEWAY BRIDGE
C    5035                DRIVEWAY CULVERT
C    5190          VS-9  400 FT. U.S. W. BIRCH DR. AT BEND IN DRAIN
C    5412                DRIVEWAY CULVERT
C    5529          BS-10 340 FT U.S. FROM BEND
C    5599                DRIVEWAY CULVERT
C    7260          VS-11 90 FT. D.S. FROM TWOMILE RD. CULVERT
C    7349          BS-12 TWOMILE RD. CULVERT
C    8760          VS-13 50 FT. D.S. FROM LAURIA RD. CULVERT
C    8811          BS-14 LAURIA RD. CULVERT
C   11271          VS-15 50 FT D.S. FROM BEAVER RD.
C   11321          BS-16 BEAVER RD. CULVERT
T1  INDIAN TOWN DRAIN
T2  10 YEAR FLOOD
T3  BANGOR TWP. BAY CO.#5555-01
J1   -10      2                                                  581.9
J2                  -1
J3     1      4     27     28      3     10     26
NC   .07    .07   .035    0.3     .5
QT     4     80    105    115    140
X1   200     29   1000   1035    200    200    200
GR 585.6      0  585.6    100  585.3    200  585.1    300  585.1    400
GR 587.2    500  586.8    609  583.4    639  584.6    746  588.0    800
GR 587.6    900  584.8   1000  582.0   1005  580.6   1007  578.9   1013
GR 578.2   1021  579.5   1025  581.6   1030  585.5   1035  585.2   1100
GR 585.0   1200  585.2   1300  585.5   1400  585.3   1500  585.3   1600
GR 585.7   1700  585.8   1800  586.1   1900  586.2   2000
QT     4     65     85    100    120
X1  1820     28   1000   1030   1620   1620   1620
GR 584.8      0  585.0    100  585.9    200  586.5    318  586.5    400
GR 586.5    500  587.0    600  585.9    700  586.9    800  585.5    900
GR 585.3   1000  583.9   1005  582.1   1008  580.5   1011  580.4   1016
GR 580.9   1020  582.0   1023  585.5   1030  584.9   1100  585.1   1200
GR 584.7   1300  586.1   1400  585.1   1500  586.4   1600  586.7   1700
GR 586.9   1800  587.4   1900  587.5   2000
X1  1869     25    986    992     49     49     49
X3    10  580.6           600                         584.6  584.6
GR 585.8      0  585.9    100  586.0    200  586.2    300  586.4    400
GR 586.9    500  587.1    600  587.1    700  586.9    800  586.7    900
GR 586.7    974  580.6    986  579.2    987  578.6    989  579.2    991
GR 580.6    992  586.7   1004  587.0   1300  587.0   1400  586.7   1500
GR 586.8   1600  587.1   1700  587.4   1800  587.3   1900  587.4   2000
NC                 .030
X1  1870                          1      1      1
X2                         584.6  585.8
X3    10  580.6            600
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BT	25	0	585.8		100	585.9		200	586.0	
BT	300.0	586.2	0.0	400.0	586.4	0.0	500.0	586.9	0.0	600.0
BT	587.1	0.0	700.0	587.1	0.0	800.0	586.9	0.0	900.0	586.7
BT	0	974	586.7	586.7	986	586.7	580.6	986	586.7	582.6
BT	987	586.7	584.0	989	586.7	584.6	991	586.7	584.0	992
BT	586.7	582.6	992	586.7	580.6	1004	586.7	586.7	1300	587.0
BT		1400	587.0		1500	586.7		1600	586.8	
BT	1700	587.1		1800	587.4					
X1	1909				39	39	39			
X2				584.6	585.8		1			
X3	10	580.6		600						
NC			.035							
X1	1910				1	1	1			
X3	10	580.6		600				587.6	587.6	
X1	1935	28	1000	1030	25	25	25			
X3	10							585.3	585.5	
GR	584.8	0	585.0	100	585.9	200	586.5	318	586.5	400
GR	586.5	500	587.0	600	585.9	700	586.9	800	585.5	900
GR	585.3	1000	583.9	1005	582.1	1008	580.5	1011	580.4	1016
GR	580.9	1020	582.0	1023	585.5	1030	584.9	1100	585.1	1200
GR	584.7	1300	586.1	1400	585.1	1500	586.4	1600	586.7	1700
GR	586.9	1800	587.4	1900	587.5	2000				
X1	2430	26	1000	1024	495	495	495			
GR	585.0	0	585.7	100	587.1	200	586.4	284	585.9	400
GR	586.6	500	587.2	600	587.8	700	586.8	800	588.0	900
GR	583.0	1000	581.7	1002	580.7	1005	579.8	1012	581.1	1018
GR	583.0	1024	584.9	1100	584.9	1200	585.7	1300	586.5	1400
GR	586.0	1500	585.8	1600	586.1	1700	586.8	1800	587.7	1900
GR	587.7	2000								
X1	3264	18	680	700	834	834	834			
GR	586.3	0	586.6	100	586.7	200	586.1	300	586.9	400
GR	587.4	500	587.1	600	586.2	680	583.2	685	580.0	691
GR	580.0	695	587.5	700	588.5	800	587.1	900	586.7	1000
GR	586.6	1100	587.0	1200	586.7	1300				
X1	3312	28	978.75	983.25	48	48	48			
X3	10	580.0		969	585.9	993	585.9	583.5	583.5	
GR	586.0	0	586.1	300	586.5	400	586.3	500	586.1	600
GR	586.0	700	585.9	900	585.9	969	581.33	978.75	579.95	979.25
GR	579.48	979.75	579.23	980.25	579.08	981.00	579.23	981.75	579.48	982.25
GR	579.95	982.75	581.33	983.25	585.9	993	585.6	1000	586.4	1100
GR	586.7	1200	586.8	1300	586.2	1400	586.0	1500	585.9	1600
GR	585.8	1800	585.7	1900	585.6	2000				
SB		2.22	2.5		3.7		13.4		579.8	579.8
NC			.040							
X1	3371				59	59	59			
X2			1	583.5	585.9					
X3	10	580.0		400	586.5	1100	586.4	583.5	583.5	
BT	23	0.0	586.0	0.0	300.0	586.1	0.0	400.0	586.5	0.0
BT	500.0	586.3	0.0	600.0	586.1	0.0	700.0	586.0	0.0	900.0
BT	585.9	0	969	585.9	585.9	978.7	585.9	581.3	979.2	585.9
BT	582.7	979.7	585.9	583.1	980.2	585.9	583.4	981.0	585.9	583.5
BT	981.7	585.9	583.4	982.2	585.9	583.1	982.7	585.9	582.7	983.2
BT	585.9	581.3	993	585.9	585.9	1000	585.6		1100	586.4
BT		1200	586.7		1300	586.8		1400	586.2	
X1	3388	18	680	700	17	17	17			
X3				500		800				
GR	586.3	0	586.6	100	586.7	200	586.1	300	586.9	400
GR	587.4	500	587.1	600	586.2	680	583.2	685	582.6	691
GR	582.6	695	587.5	700	588.5	800	587.1	900	586.7	1000
GR	586.6	1100	587.0	1200	586.7	1300				
X1	3405	14	1006.3	1009.7	17	17	17			
X3	10	580.7		950		1150		583.1	583.1	
GR	587.0	0	586.5	400	586.0	800	585.3	990	580.8	1006.3
GR	580.0	1006.8	579.6	1008	580.0	1009.2	580.8	1009.7	585.3	1025
GR	585.3	1200	586.5	1400	587.0	1650	587.2	2000		
SB		1.76	2.5		2.67		7.11		580.4	580.4

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NC                .040
X1  3427                          22      22      22
X2                   1   583.1   585.3
X3    10   580.7            950            1150            583.1   583.1
BT    16       0   587.0              400   586.5              800   586.0
BT   990   585.3   585.3  1006.3   585.3   580.8  1006.3   585.3   581.9  1006.8
BT 585.3   582.7    1008   585.3   583.1  1009.2   585.3   582.7  1009.7   585.3
BT 581.9  1009.7   585.3   580.8    1025   585.3   585.3    1200   585.3
BT  1400   586.5            1650   587.0            2000   587.2
X1  3441      10     990    1025      14      14      14
X3                          950            1150
GR 587.0       0   586.5     400   586.0     800   584.9     990   580.5    1008
GR 584.9    1025   584.9    1200   586.5    1400   586.8    1650   587.2    2000
X1  3459                          18      18      18
X3                          900            1200
X1  3473      14  1006.3  1009.7      14      14      14
X3    10   580.8            900            1200            582.8   582.8
GR 587.0       0   586.5     400   586.0     800   585.5     990   580.5  1006.3
GR 579.7  1006.8   579.3    1008   579.7  1009.2   580.5  1009.7   585.5    1025
GR 585.5    1200   586.5    1400   587.0    1650   587.2    2000
SB           2.22     2.5            2.39             5.7            581.4   581.4
NC                .040
X1  3493                          20      20      20
X2                   1   582.8   585.5
X3    10   580.8            900            1200            582.8   582.8
BT    16       0   587.0              400   586.5              800   586.0
BT   990   585.5   585.5  1006.3   585.5   580.5  1006.3   585.5   581.6  1006.8
BT 585.5   582.4    1008   585.5   582.8  1009.2   585.5   582.4  1009.7   585.5
BT 581.6  1009.7   585.5   580.5    1025   585.5   585.5    1200   585.5
BT  1400   586.5            1650   587.0            2000   587.2
X1  3507      10     990    1025      14      14      14
X3          580.7            900            1200
GR 587.0       0   586.5     400   586.0     800   584.9     990   580.5    1008
GR 584.9    1025   584.9    1200   586.5    1400   586.8    1650   587.2    2000
X1  3533      10     990    1025      26      26      26
X3          580.7            800            1320
GR 587.1       0   586.6     400   586.1     800   585.0     990   579.9    1008
GR 585.0    1025   585.0    1200   586.6    1400   586.9    1650   587.3    2000
X1  3548      14    1006    1010      15      15      15
X3    10   580.7            800            1320            584.3   584.3
GR 587.1       0   586.6     400   586.1     800   585.4     990   581.7    1006
GR 580.6  1006.8   580.3    1008   580.6  1009.2   581.7    1010   585.4    1025
GR 585.4    1200   586.6    1400   587.1    1650   587.3    2000
NC                  .03
X1  3549                           1       1       1
X2                          584.3
X3    10   580.7            800            1320
BT    16       0   587.1              400   586.6              800   586.1
BT   990   585.4   585.4    1006   585.4   581.7    1006   585.4   582.9  1006.8
BT 585.4   584.0    1008   585.4   584.3  1009.2   585.4   584.0    1010   585.4
BT 582.9    1010   585.4   581.7    1025   585.4   585.4    1200   585.4
BT  1400   586.6            1650   587.1            2000   587.3
X1  3569                          20      20      20
X2                          584.3                    1
X3    10   580.7            800            1320
NC                .040
X1  3570                           1       1       1
X3    10   580.7            800            1320            584.3   584.3
X1  3580      10     990    1025      10      10      10
X3          580.7            800            1320
GR 587.1       0   586.6     400   586.1     800   585.0     990   580.5    1008
GR 585.0    1025   585.0    1200   586.6    1400   586.9    1650   587.3    2000
X1  3749      10     990    1025     169     169     169
X3          581.0            800            1300
GR 587.2       0   586.7     400   585.8     800   585.1     990   580.0    1008
GR 585.1    1025   585.1    1200   585.8    1400   586.9    1650   587.4    2000
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X1  3789      26   998.25 1001.75      40      40      40
X3     10   581.1              800            1300            583.7   583.7
GR 585.6       0   586.3      100   586.1     200   586.0     300   586.0     500
GR 585.7     700   585.7      800   585.9     900   585.9     988  581.99  998.25
GR581.86  998.38  581.47   998.77  580.90  999.34  580.24    1000  580.90 1000.67
GR581.47 1001.24  581.86  1001.61  581.99 1001.75   585.9    1012   584.6    1100
GR 584.9    1200   585.0     1300   585.7    1400   586.7    1500   585.2    1600
GR 585.6    1700
NC                   .03
X1  3790                          1       1       1
X2                          583.7   584.6
X3     10   581.1              800            1300            583.7   583.7
BT     26     0.0   585.6     0.0   100.0   586.3     0.0   200.0   586.1     0.0
BT  300.0   586.0     0.0   500.0   586.0     0.0   700.0   585.7     0.0   800.0
BT  585.7               900   585.9           988   585.9   585.9   998.2   585.9
BT  581.9   998.3   585.9   582.6   998.7   585.9   583.2   999.3   585.9   583.6
BT   1000   585.9   583.7  1000.6   585.9   583.6  1001.2   585.9   583.2  1001.6
BT  585.9   582.6  1001.7   585.9   581.9    1012   585.9   585.9    1100   584.6
BT          1200   584.9           1300   585.0           1400   585.7
BT   1500   586.7            1600   585.2           1700   585.6
X1  3823                         33      33      33
X2                          583.7   584.6               1
X3     10   581.1              800            1300
NC                   .040
X1  3824                          1       1       1
X3     10   581.1              800            1300            583.7   583.7
X1  3844      10     990    1025      20      20      20
X3          581.1              800            1300
GR 587.2       0   586.7     400   585.6     800   585.1     990     581    1008
GR 585.1    1025   585.1    1200   585.6    1400   586.9    1650   587.4    2000
X1  4095      10     990    1025     251     251     251
X3          581.1              750            1350
GR 587.6       0   585.8     200   585.5     800   585.5     990   580.4    1008
GR 585.5    1025   585.0    1200   585.8    1400   586.6    1650   587.8    2000
X1  4108      14  1006.3  1009.7      13      13      13
X3     10   581.1              750            1350            583.1   583.1
GR 587.6       0   585.8     200   585.5     800   585.5     990   580.8  1006.3
GR 580.0  1006.8   579.6    1008   580.0  1009.2   580.8  1009.7   585.5    1025
GR 585.0    1200   585.8    1400   586.6    1650   587.8    2000
NC                   .024
X1  4109                          1       1       1
X2                          583.1   585.0
X3     10   581.1              750            1350
BT     16       0   587.6       0     200   585.8       0     800   585.5       0
BT    990   585.5   585.5  1006.3   585.5   580.8  1006.3   585.5   581.9  1006.8
BT  585.5   582.7    1008   585.5   583.1  1009.2   585.5   582.7  1009.7   585.5
BT  581.9  1009.7   585.5   580.8    1025   585.5   585.5    1200   585.0
BT   1400   585.8            1650   586.6           2000   587.8
X1  4126                         17      17      17
X2                          583.1   585.0               1
X3     10   581.1              750            1350
X1  4130      14  1006.3  1009.7       4       4       4
X3     10   580.7              750            1350            583.1   583.1
GR 587.6       0   585.7     200   585.5     800   584.8     990   580.8  1006.3
GR 580.0  1006.8   579.6    1008   580.0  1009.2   580.8  1009.7   584.8    1025
GR 585.1    1200   585.8    1400   586.6    1650   587.8    2000
X1  4131                          1       1       1
X2                          583.1   584.8
X3          580.7              750            1350
BT     16       0   587.6       0     200   585.7       0     800   585.5       0
BT    990   584.8   584.8  1006.3   584.8   580.8  1006.3   584.8   581.9  1006.8
BT  584.8   582.7    1008   584.8   583.1  1009.2   584.8   582.7  1009.7   584.8
BT  581.9  1009.7   584.8   580.8    1025   584.8   584.8    1200   585.1
BT   1400   585.8            1650   586.6           2000   587.8
X1  4155                         24      24      24
X2                          583.1   584.8               1
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X3     10   580.7              750            1350
NC                   .040
X1   4156                                 1       1       1
X3     10   580.7              750            1350            583.1   583.1
X1   4166      10     990     1025       10      10      10
X3          580.7              750            1350
GR 587.6       0   585.8      200    585.5     800   585.5     990   580.4    1008
GR 585.5    1025   585.0     1200    585.8    1400   586.6    1650   587.8    2000
X1   4177      10     990     1025       11      11      11
X3          580.8              750            1350
GR 587.7       0   585.6      200    585.6     800   585.6     990   580.5    1008
GR 585.6    1025   585.1     1200    585.8    1400   586.6    1650   587.8    2000
X1   4248      16    1000     1018       71      71      71
X3     10                     750            1350            583.2   583.2
GR 587.7       0   585.5      200    585.5     800   584.5     990   584.5    1000
GR 583.2    1000   582.1     1003    581.5    1009   582.0    1013   583.5    1018
GR 584.9    1018   585.0     1025    585.1    1200   585.8    1400   586.6    1650
GR 587.8    2000
X1   4249                                 1       1       1
X3                             750            1350
BT     11       0   587.7        0      200   585.5       0     800   585.5       0
BT    990   584.5              1000    584.5   583.2    1018   584.9   583.5    1025
BT 585.0            1200    585.1        0    1400   585.8       0    1650   586.6
BT      0    2000   587.8        0
X1   4261                                12      12      12
X2                                                   1
X3                             750            1350
X1   4262      14    1000     1018        1       1       1
X3     10                     750            1350            583.2   583.2
GR 587.7       0   585.6      200    585.6     800   585.6     990   584.1    1000
GR 582.1    1003   581.5     1009    582.0    1013   584.9    1018   585.6    1025
GR 585.1    1200   585.8     1400    586.6    1650   587.8    2000
X1   4279      10     990     1025       17      17      17
X3          581.5              750            1350
GR 587.6       0   585.8      200    585.5     800   585.5     990   580.4    1008
GR 585.5    1025   585.0     1200    585.8    1400   586.6    1650   587.8    2000
X1   4313      10     990     1025       34      34      34
X3          581.5              750            1350
GR 587.6       0   585.8      200    585.5     800   585.5     990   580.4    1008
GR 585.5    1025   585.0     1200    585.8    1400   586.6    1650   587.8    2000
X1   4328      14    1006     1010       15      15      15
X3     10   581.5              750            1350            583.9   583.9
GR 587.8       0   585.4      200    585.4     800   585.3     990   581.3    1006
GR 580.2  1006.8   579.9     1008    580.2  1009.2   581.3    1010   585.3    1025
GR 585.1    1200   585.8     1400    586.6    1650   587.8    2000
NC                   .035
X1   4329                                 1       1       1
X2                             583.9   585.1
X3     10   581.5              750            1350
BT     16       0   587.8              200   585.4             800   585.4
BT    990   585.3   585.3     1006    585.3   581.3    1006   585.3   582.5  1006.8
BT 585.3    583.6    1008    585.3    583.9  1009.2   585.3   583.6    1010   585.3
BT 582.5    1010   585.3    581.3     1025   585.3   585.3    1200   585.1
BT   1400   585.8            1650    586.6           2000   587.8
X1   4394                                65      65      65
X2                             583.9   585.1                1
X3     10   581.5              750            1350
NC                   .040
X1   4395                                 1       1       1
X3     10   581.5              750            1350            583.9   583.9
X1   4405      10     990     1025       10      10      10
X3          581.5              750            1350
GR 587.6       0   585.4      200    585.5     800   585.7     990   580.6    1008
GR 585.7    1025   585.1     1200    585.8    1400   586.6    1650   587.8    2000
X1   4508      10     990     1025      103     103     103
X3          581.7              650            1250
```

GR	588.0	0	585.3	200	585.3	800	585.9	990	580.8	1008
GR	585.9	1025	585.2	1200	585.8	1400	586.6	1650	587.8	2000
X1	4519	16	1000	1022	11	11	11			
X3	10			650		1250		583.9	583.9	
GR	587.6	0	585.3	200	585.3	800	585.5	990	585.3	1000
GR	583.9	1000	582.2	1006	581.7	1011	582.3	1017	584.1	1022
GR	585.6	1022	585.6	1025	585.2	1200	585.8	1400	586.6	1650
GR	587.8	2000								
X1	4520				1	1	1			
X3				650		1250				
BT	11	0	587.6	0	200	585.3	0	800	585.3	0
BT	990	585.5	0	1000	585.3	583.9	1022	585.6	584.1	1025
BT	585.6	0	1200	585.2	0	1400	585.8		1650	586.6
BT	0	2000	587.8	0						
X1	4527				7	7	7			
X2							1			
X3				650		1250				
X1	4528				1	1	1			
X3	10			650		1250		583.9	583.9	
X1	4538	10	990	1025	10	10	10			
X3		581.7		650		1250				
GR	587.6	0	585.2	200	585.2	800	585.9	990	580.6	1008
GR	585.9	1025	585.2	1200	585.8	1400	586.6	1650	587.8	2000
X1	4570	26	978	1000	32	32	32			
X3				600		1200				
GR	585.2	0	585.2	100	585.0	200	584.9	300	585.0	400
GR	585.3	500	585.5	600	585.7	700	585.4	800	585.0	900
GR	585.4	978	582.2	984	581.7	990	582.5	995	585.7	1000
GR	586.6	1013	585.6	1100	585.6	1200	585.9	1300	585.8	1400
GR	586.3	1500	587.1	1600	587.0	1700	586.5	1800	586.0	1900
GR	586.5	2000								
X1	4655	10	990	1025	85	85	85			
X3		581.6		400		1025				
GR	585.6	0	585.0	300	585.2	800	585.6	990	580.7	1008
GR	586.4	1025	586.0	1200	586.4	1400	587.0	1650	588.3	2000
X1	4670	14	1000	1013	15	15	15			
X3	10			400		1025		584.8	584.8	
GR	585.6	0	585.0	300	585.2	800	586.2	990	583.5	1000
GR	582.1	1004	581.6	1006	582.2	1011	583.1	1013	586.2	1025
GR	586.0	1200	586.4	1400	587.0	1650	588.3	2000		
SB		1.5	2.5		7		33	1.58	581.6	581.6
X1	4691	14	1000	1013	21	21	21			
X2			1	583.5	585.0					
X3	10			400		1025		584.8	584.8	
BT	13	0	585.6	0	300	585.0	0	800	585.2	0
BT	990	586.2	586.2	1000	586.2	583.5	1000	586.2	584.9	1013
BT	586.0	584.8	1013	586.0	583.7	1025	586.0	586.0	1200	586.0
BT	0	1400	586.4	0	1650	587.9	0	2000	588.3	0
GR	585.6	0	585.0	300	585.2	800	586.2	990	583.3	1000
GR	582.8	1002	581.6	1007	582.5	1009	583.7	1013	586.0	1025
GR	586.0	1200	586.4	1400	587.9	1650	588.3	2000		
X1	4704	10	990	1025	13	13	13			
X3		581.6		400		1025				
GR	585.6	0	585.0	300	585.2	800	585.6	990	580.8	1008
GR	586.4	1025	586.1	1200	586.4	1400	587.0	1650	588.3	2000
X1	4744	10	990	1025	40	40	40			
X3		581.5		400		1025				
GR	585.6	0	585.0	300	585.2	800	585.6	990	580.8	1008
GR	586.4	1025	586.1	1200	586.4	1400	587.0	1650	588.3	2000
X1	4805	14	1006	1010	61	61	61			
X3	10	581.3		400		1025		583.8	583.8	
GR	585.6	0	585.0	300	585.2	800	586.9	990	581.2	1006
GR	580.1	1006.8	579.8	1008	580.1	1009.2	581.2	1010	586.9	1025
GR	586.1	1200	587.4	1400	587.0	1650	588.4	2000		
SB		1.92	2.5		2.86		8.2		580.9	580.9
NC			.040							

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X1  4832                                  27      27      27
X2                      1   583.8   585.0
X3    10   581.3            400            1025            583.8   583.8
BT    16       0   585.6            300   585.0             800   585.2
BT   990   586.9   586.9    1006   586.9   581.2    1006   586.9   582.4  1006.8
BT 586.9   583.5    1008   586.9   583.8  1009.2   586.9   583.5    1010   586.9
BT 582.4    1010   586.9   581.2    1025   586.9   586.9    1200   586.1
BT  1400   587.4            1650   587.0            2000   588.4
X1  4847      10     990    1025      15      15      15
X3         581.5            400            1025
GR 585.6       0   585.0     300   585.2     800   585.6     990   580.8    1008
GR 586.4    1025   586.1    1200   586.4    1400   587.0    1650   588.3    2000
X1  4869      16  1006.5  1009.5      22      22      22
X3    10   581.7            400            1025            583.7   583.7
GR 585.6       0   585.0     300   585.2     800   586.2     990   582.7  1006.5
GR 581.7  1006.5   581.0    1007   580.7    1008   581.0    1009   581.7  1009.5
GR 582.7  1009.5   586.2    1025   586.2    1200   586.4    1400   587.0    1650
GR 588.5    2000
NC                  .024
X1  4870                                   1       1       1
X2                          583.7   585.0
X3    10   581.7            400            1025
BT    14       0   585.6       0     300   585.0       0     800   585.2       0
BT   990   586.2   586.2  1006.5   586.3   582.7    1007   586.3   583.4    1008
BT 586.3   583.7    1009   586.3   583.4  1009.5   586.3   582.7    1025   586.2
BT 586.2    1200   586.2       0    1400   586.4       0    1650   587.0       0
BT  2000   588.5       0
X1  4888                                  18      18      18
X2                          583.7   585.0               1
X3    10   581.7            400            1025
NC                  .040
X1  4889                                   1       1       1
X3    10   581.7            400            1025            583.7   583.7
X1  4905      10     990    1025      16      16      16
X3         581.7            400            1025
GR 585.6       0   585.0     300   585.2     800   585.6     990   580.8    1008
GR 586.4    1025   586.1    1200   586.4    1400   587.0    1650   588.3    2000
X1  4947      13    1000  1010.5      42      42      42
X3    10                     400            1025            585.3   585.3
GR 585.6       0   585.0     300   585.2     800   586.6     990   582.3    1000
GR 581.8  1003.5   582.2    1007   583.8  1010.5   586.6    1025   586.6    1200
GR 586.4    1400   587.0    1650   588.3    2000
X1  4948                                   1       1       1
X2                          585.3   585.0
X3                             400            1025
BT    13       0   585.6       0     300   585.0             800   585.2
BT   990   586.6   586.6    1000   586.6   582.3    1000   586.6   585.3  1010.5
BT 586.6   585.3  1010.5   586.6   583.8    1025   586.6   586.6    1200   586.6
BT     0    1400   586.4       0    1650   587.0       0    2000   588.3       0
X1  4962                                  14      14      14
X2                          585.3   585.0               1
X3                             400            1025
X1  4963                                   1       1       1
X3    10                     400            1025            585.3   585.3
X1  4975      10     990    1025      12      12      12
X3         581.7            400            1025
GR 585.6       0   585.0     300   585.2     800   585.6     990   580.8    1008
GR 586.4    1025   586.1    1200   586.4    1400   587.0    1650   588.3    2000
X1  5034      16    1006    1010      59      59      59
X3    10   581.4            400            1025            585.0   585.0
GR 585.6       0   585.0     300   585.2     800   586.6     990   583.6    1006
GR 582.4    1006   581.3  1006.8   581.0    1008   581.3  1009.2   582.4    1010
GR 583.6    1010   586.6    1025   586.6    1200   586.4    1400   587.0    1650
GR 588.3    2000
NC                  .024
X1  5035                                   1       1       1
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X2                                585.0   585.0
X3     10   581.4                 400             1025
BT     14       0   585.6        0      300    585.0       0     800   585.2       0
BT    990   586.6   586.6     1006   586.6    583.6  1006.8   586.6   584.7    1008
BT  586.6     585  1009.2    586.6   584.7     1010   586.6   583.6    1025   586.6
BT  586.6    1200   586.1        0    1400    586.4       0    1650   587.0       0
BT   2000   588.3       0
X1   5059                                24      24      24
X2                                585.0   585.0               1
X3     10   581.4                 400             1025
NC                     .040
X1   5060                                 1       1       1
X3     10   581.4                 400             1025             585.0   585.0
X1   5075      10     990    1025      15      15      15
X3          581.4                 400             1025
GR  585.6       0   585.0     300   585.2     800   585.6     990   580.8    1008
GR  586.4    1025   586.1    1200   586.4    1400   587.0    1650   588.3    2000
X1   5190      26    1000    1017     115     115     115
X3                                400             1030
GR  584.7       0   584.4     100   583.8     200   584.9     300   584.9     400
GR  584.8     500   584.3     600   585.3     700   585.2     800   585.3     900
GR  585.9    1000   581.7    1004   581.6    1007   581.8    1011   585.9    1017
GR  586.5    1028   585.2    1100   586.8    1200   586.8    1300   586.8    1400
GR  586.9    1500   586.9    1600   587.1    1700   587.4    1800   589.2    1900
GR  587.6    2000
X1   5356      10     990    1025     166     166     166
X3          581.7                 400             1025
GR  588.8       0   585.8     400   585.4     800   585.4     990   581.5    1008
GR  585.9    1025   586.0    1200   586.6    1400   587.8    1650   589.0    2000
X1   5412      16  1006.5  1009.5      56      56      56
X3     10   581.8                 400             1025             584.3   584.3
GR  588.5       0   585.8     400   585.4     800   586.3     990   583.3  1006.5
GR  582.3  1006.5   581.6    1007   581.3    1008   581.6    1009   582.3  1009.5
GR  583.3  1009.5   586.3    1025   586.0    1200   586.6    1400   587.5    1650
GR  588.7    2000
SB          1.63     2.5                2.5                6.3                581.8   581.8
NC                     .04
X1   5431                                19      19      19
X2                       1   584.3   585.4
X3     10   581.8                 400             1025
BT     14       0   588.5        0      400    585.8       0     800   585.4       0
BT    990   586.3   586.3  1006.5   586.3    583.3    1007   586.3   584.0    1008
BT  586.3   584.3    1009   586.3   584.0   1009.5   586.3   583.3    1025   586.3
BT  586.3    1200   586.0        0    1400    586.6       0    1650   587.5       0
BT   2000   588.7       0
X1   5448      10     990    1025      17      17      17
X3     10   581.7                 400             1025
GR  588.8       0   585.8     400   585.4     800   585.4     990   581.5    1008
GR  585.9    1025   586.0    1200   586.6    1400   587.8    1650   589.0    2000
X1   5502      10     990    1025      54      54      54
X3                                400             1025
GR  588.7       0   585.8     400   585.4     800   585.4     990   581.3    1008
GR  585.9    1025   586.0    1200   586.6    1400   587.7    1650   588.9    2000
X1   5529      22  498.25  501.75      27      27      27
X3     10   581.1                   1             555             583.0   583.0
GR  585.8       0   584.8     100   585.4     200   586.2     300   585.8     400
GR  585.8   491.5  581.31  498.25  580.45  498.50  579.86   499.0  579.63  499.50
GR579.56     500  579.63   500.5  579.86   501.0  580.45   501.5  581.31  501.75
GR  585.8   508.5   586.5     600   586.5     700   587.4     782   587.0     800
GR  587.0     900   587.0    1000
SB          2.11     2.5                2.44                5.97                580.6   580.6
NC                     .045
X1   5548                                19      19      19
X2                       1   583.0   585.8
X3     10   581.1                   1             555             583.0   583.0
BT     20     0.0   585.8       0.0    100.0    584.8     0.0    200.0   585.4     0.0
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BT 300.0   586.2     0.0   400.0   585.8     0.0   498.2   585.8   581.3   498.5
BT 585.8   582.1   499.0   585.8   582.7   499.5   585.8   582.9   500.0   585.8
BT 583.0   500.5   585.8   582.9   501.0   585.8   582.7   501.5   585.8   582.1
BT 501.7   585.8   581.3   600.0   586.5     0.0   700.0   586.5     0.0     782
BT 587.4     0.0   800.0   587.0     0.0   900.0   587.0     0.0  1000.0   587.0
BT   0.0
X1  5556      10     990    1025       8       8       8
X3                         400            1025
GR 589.0       0   585.8     400   585.4     800   585.4     990   581.2    1008
GR 585.9    1025   586.0    1200   586.6    1400   588.5    1650   589.3    2000
X1  5599      14  1006.3  1009.7      43      43      43
X3    10   581.5              400            1025            583.4   583.4
GR 589.0       0   585.8     400   585.4     800   586.9     990   581.1  1006.3
GR 580.3  1006.8   579.9    1008   580.3  1009.2   581.1  1009.7   586.9    1025
GR 586.0    1200   586.6    1400   588.5    1650   589.2    2000
SB          2.17     2.5            2.32            5.39            581.1   581.1
NC                  .04
X1  5617                                 18      18      18
X2                     1   583.4   585.4
X3    10   581.5              400            1025            583.4   583.4
BT    16       0   589.0              400   585.8             800   585.4
BT   990   586.9   586.9  1006.3   586.9   581.1  1006.3   586.9   582.2  1006.8
BT 586.9   583.0    1008   586.9   583.4  1009.2   586.9   583.0  1009.7   586.9
BT 582.2  1009.7   586.9   581.1    1025   586.9   586.9    1200   586.0
BT  1400   586.6            1650   588.5            2000   589.2
X1  5633      10     990    1025      16      16      16
X3    10                     400            1025
GR 589.0       0   585.8     400   585.4     800   585.4     990   581.5    1008
GR 585.9    1025   586.0    1200   586.6    1400   588.5    1650   589.2    2000
X1  7260      25    1000    1024    1627    1627    1627
X3                         400            1025
GR 584.5       0   585.5     100   585.3     200   586.5     300   584.9     400
GR 584.9     500   586.3     600   586.1     700   585.1     800   585.9     900
GR 586.3    1000   583.9    1004   582.7    1012   583.0    1017   586.0    1024
GR 587.0    1100   587.3    1200   587.6    1300   587.6    1400   586.6    1500
GR 586.7    1600   587.2    1700   587.7    1800   588.7    1900   589.7    2000
X1  7309                                 49      49      49
X3                                     1025
X1  7349      30 1007.25 1010.75      40      40      40
X3    10   582.2                0            1021            584.3   584.3
GR 585.0       0   585.7     200   586.3     300   586.4     400   586.6     500
GR 586.6     600   586.4     700   586.4     800   586.6     900   586.8     997
GR582.57 1007.25  581.90 1007.38  581.33 1007.77  580.96 1008.34  580.82 1009.00
GR580.96 1009.67  581.33 1010.24  581.90 1010.61  582.57 1010.75  586.80    1021
GR 586.9    1100   587.3    1200   587.8    1300   587.6    1400   587.6    1500
GR 587.7    1600   588.0    1700   588.6    1800   589.5    1900   590.4    2000
SB          3.25     2.5            2.46            6.06            581.8   581.8
NC                  .045
X1  7388                                 39      39      39
X2                     1   584.3   585.0
X3    10   582.2                0            1021            584.3   584.3
BT    28     0.0   585.0     0.0   200.0   585.7     0.0   300.0   586.3     0.0
BT 400.0   586.4     0.0   500.0   586.6     0.0   600.0   586.6     0.0   700.0
BT 586.4     0.0   800.0   586.4     0.0   900.0   586.6     0.0  1007.2   586.8
BT 582.5  1007.3   586.8   583.2  1007.7   586.8   583.8  1008.3   586.8   584.1
BT1009.0   586.8   584.3  1009.6   586.8   584.1  1010.2   586.8   583.1  1010.6
BT 586.8   583.2  1010.7   586.8   582.5  1100.0   586.9     0.0  1200.0   587.3
BT   0.0  1300.0   587.8     0.0  1400.0   587.6     0.0  1500.0   587.6     0.0
BT1600.0   587.7     0.0  1700.0   588.0     0.0  1800.0   588.6     0.0  1900.0
BT 589.5     0.0  2000.0   590.4     0.0
X1  7398      11    1000    1018      10      10      10
X3                                     1025
GR 587.0       0   586.8     400   586.1     700   586.0    1000   583.8    1004
GR 582.2    1009   583.0    1014   586.9    1018   586.6    1300   588.4    1700
GR 600.0    2000
QT     4      55      70      80      95
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X1  8760      25    1000    1019    1362    1362    1362
X3                        400            1019
GR 584.7       0   585.5     100   586.0     200   584.7     300   584.9     400
GR 584.6     500   584.4     600   584.2     700   584.3     800   585.3     900
GR 586.0    1000   583.0    1004   582.2    1009   582.9    1014   586.9    1019
GR 586.0    1100   595.9    1200   586.3    1300   586.3    1400   586.1    1500
GR 587.2    1600   588.3    1700   587.8    1800   588.8    1900   587.6    2000
X1  8810      29   997.5  1002.5      50      50      50
X3    10   582.0             400            1019            585.4   585.4
GR 586.5       0   586.5     100   586.3     200   585.5     300   585.5     500
GR 585.4     600   585.4     800   585.7     900   585.7     990  582.90  997.50
GR581.95  997.69  581.13  998.23  580.60  999.04   580.4 1000.00  580.60 1000.95
GR581.13 1001.77  581.95  1002.3  582.90  1002.5   585.7    1010   586.4    1100
GR 586.5    1200   586.8    1300   587.0    1400   587.0    1500   587.3    1600
GR 588.0    1700   588.4    1800   588.6    1900   588.4    2000
NC   .09     .09     .03
X1  8811                          1       1       1
X3    10   582.0             400            1019
BT    27     0.0   586.5     0.0   100.0   586.5     0.0   200.0   586.3     0.0
BT 300.0   585.5     0.0   500.0   585.5     0.0   600.0   585.4     0.0   800.0
BT 585.4     0.0   900.0   585.7     0.0   997.5   585.7   582.9   997.6   585.7
BT 583.8   998.2   585.7   584.6   999.0   585.7   585.2  1000.0   585.7   585.4
BT1000.9   585.7   585.2  1001.7   585.7   584.6  1002.3   585.7   583.8  1002.5
BT 585.7   582.9  1100.0   586.4     0.0  1200.0   586.5     0.0  1300.0   586.8
BT   0.0  1400.0   587.0     0.0  1500.0   587.0     0.0  1600.0   587.3     0.0
BT1700.0   588.0     0.0  1800.0   588.4     0.0  1900.0   588.6     0.0  2000.0
BT 588.4     0.0
X1  8845                         34      34      34
X2                                        1
X3    10   582.0             400            1019
NC                  .045
X1  8846                          1       1       1
X3    10   582.0             400            1019            585.4   585.4
X1  8871      25    1000    1019      25      25      25
X3                        500            1019
GR 584.7       0   585.5     100   586.0     200   584.7     300   584.9     400
GR 584.6     500   584.4     600   584.2     700   584.3     800   585.3     900
GR 586.0    1000   583.0    1004   582.2    1009   582.9    1014   586.9    1019
GR 586.0    1100   585.9    1200   586.3    1300   586.3    1400   586.1    1500
GR 587.2    1600   588.3    1700   587.7    1800   588.7    1900   587.6    2000
QT     4      13      13      14      15
X1 11271      25    1000    1021    2400    2400    2400
X3                        500            1021
GR 586.0       0   587.6     100   587.3     176   585.7     300   586.4     400
GR 584.9     500   584.4     600   585.8     700   585.8     800   586.0     900
GR 585.6    1000   583.5    1008   582.7    1012   581.8    1015   582.8    1021
GR 583.7    1100   583.5    1200   583.5    1300   584.1    1400   584.0    1500
GR 583.6    1600   584.1    1700   583.7    1800   583.6    1900   584.5    2000
X1 11321      28     999    1001      50      50      50
X3    10   582.9             450            1010            583.9   583.9
GR 588.6       0   588.8     100   588.5     200   588.2     300   588.1     400
GR 587.7     500   587.7     600   587.8     700   587.9     800   588.2     900
GR 588.2     990  582.98     999  582.33  999.25  582.13  999.50  582.03  999.75
GR581.98    1000  582.03 1000.25  582.13 1000.50  582.33 1000.75  582.98    1001
GR 588.2    1010   588.4    1100   588.5    1200   588.4    1300   588.3    1700
GR 588.0    1800   587.9    1900   587.9    2000
SB            7.1     2.5            1.34            1.79            582.6   582.6
NC   .09     .09     .05
X1 11367                         46      46      46
X2                        1  583.9   587.7
X3          582.9             450            1010            583.9   583.9
BT    25     0.0   588.6     0.0   100.0   588.8     0.0   200.0   588.5     0.0
BT 300.0   588.2     0.0   400.0   588.1     0.0   500.0   587.7     0.0   600.0
BT 587.7     0.0   700.0   587.8     0.0   800.0   587.9     0.0   900.0   588.2
BT   0.0   999.0   588.2   582.9   999.2   588.2   583.6   999.5   588.2   583.8
BT 999.7   588.2   583.9  1000.0   588.2   583.9  1000.2   588.2   583.9  1000.5
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BT 588.2   583.8  1000.7   588.2   583.6  1001.0   588.2   582.9  1200.0   588.5
BT   0.0  1300.0   588.4     0.0  1700.0   588.3     0.0  1800.0   588.0     0.0
BT1900.0   587.9     0.0  2000.0   587.9     0.0
X1 11392      28     990    1010      25      25      25
X3    10   582.9
GR 588.6       0   588.8     100   588.5     200   588.2     300   588.1     400
GR 587.7     500   587.7     600   587.8     700   587.9     800   588.2     900
GR 588.2     990  582.98     999  582.33  999.25  582.13  999.50  582.03  999.75
GR581.98    1000  582.03 1000.25  582.13 1000.50  582.33 1000.75  582.98    1001
GR 588.2    1010   588.4    1100   588.5    1200   588.4    1300   588.3    1700
GR 588.0    1800   587.9    1900   587.9    2000
EJ
T1  INDIAN TOWN DRAIN
T2  50 YEAR FLOOD
T3  BANGOR TWP, BAY CO.
J1   -10       3                                                   581.9
J2     2              -1
T1  INDIAN TOWN DRAIN
T2  100 YEAR FLOOD
T3  BANGOR TWP, BAY CO.
J1   -10       4                                                   581.9
J2     3              -1
T1  INDIAN TOWN DRAIN
T2  500 YEAR FLOOD
T3  BANGOR TWP, BAY CO.
J1   -10       5                                                   581.9
J2    15              -1


ER
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HEC2 VERSION UPDATED JAN 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09
MODIFICATIONS 52,53,54,55,56,57,58
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T1  INDIAN TOWN DRAIN
T2  100 YEAR FLOOD
T3  BANGOR TWP. BAY CO.

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -10.       4.       -0.       -0. -0.000000     -0.00      -0.0      -0.    581.900   -0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     3.000    -0.000    -1.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000


CCHV=     .300 CEHV=     .500
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


                 VS-1  200 FT. U.S. FROM MOUTH OF DRAIN

   200.00      3.70    581.90      0.00    581.90    581.96       .06      0.00      0.00    584.80
      115.        0.      115.        0.        0.       60.        0.        0.        0.    585.50
     0.00      0.00      1.92      0.00      .070      .035      .070     0.000    578.20   1005.14
  .000694      200.      200.      200.         0         0         1      0.00     25.24   1030.38


                 VS-2  50 FT. D.S. FROM EUCLID RD. CULVERT

  1820.00      2.98    583.38      0.00      0.00    583.48       .09      1.50       .02    585.30
     100.        0.      100.        0.        0.       41.        0.        2.        1.    585.50
      .18      0.00      2.44      0.00      .070      .035      .070      .035    580.40   1005.86
  .001378     1620.     1620.     1620.         2         0         1      0.00     19.91   1025.77


3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS=     600.0    2000.0  TYPE=     1  TARGET=    -600.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      584.60 ELREA=      584.60

  1869.00      2.66    583.26      0.00      0.00    583.87       .61       .14       .26    580.60
     100.        0.      100.        0.        0.       16.        0.        2.        1.    580.60
      .19      0.00      6.25      0.00      .070      .035      .070      .035    580.60    986.00
  .008384       49.       49.       49.         2         0         1      0.00      6.00    997.25


NORMAL BRIDGE,NRD=25 MIN ELTRD=  585.80 MAX ELLC=  584.60

3470 ENCROACHMENT STATIONS=     600.0    2000.0  TYPE=     1  TARGET=    -600.000
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BS-3 EUCLID RD. CULVERT

1870.00	2.73	583.33	582.61	0.00	583.89	.56	.01	.01	580.60
100.	0.	92.	8.	0.	15.	5.	2.	1.	580.60
.19	0.00	6.27	1.52	.070	.030	.070	.035	580.60	980.63
.005997	1.	1.	1.	4	14	1	-11.00	16.73	997.37

NORMAL BRIDGE,NRD=25 MIN ELTRD= 585.80 MAX ELLC= 584.60

3470 ENCROACHMENT STATIONS= 600.0 2000.0 TYPE= 1 TARGET= -600.000

1909.00	3.05	583.65	0.00	0.00	584.12	.46	.20	.03	580.60
100.	0.	92.	8.	0.	16.	6.	2.	1.	580.60
.19	0.00	5.67	1.28	.070	.030	.070	.035	580.60	979.99
.004258	39.	39.	39.	2	0	1	-14.40	18.02	998.01

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

3470 ENCROACHMENT STATIONS= 600.0 2000.0 TYPE= 1 TARGET= -600.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 587.60 ELREA= 587.60

1910.00	3.06	583.66	0.00	0.00	584.12	.46	.00	.00	580.60
100.	0.	100.	0.	0.	18.	0.	2.	1.	580.60
.19	0.00	5.45	0.00	.070	.035	.070	.035	580.60	986.00
.005638	1.	1.	1.	0	0	1	0.00	6.00	998.02

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 585.30 ELREA= 585.50

1935.00	3.83	584.23	0.00	0.00	584.28	.04	.03	.13	585.30
100.	0.	100.	0.	0.	59.	0.	2.	1.	585.50
.19	0.00	1.69	0.00	.070	.035	.070	.035	580.40	1003.80
.000508	25.	25.	25.	2	0	1	0.00	23.67	1027.47

VS-4 520 FT. U.S. FROM EUCLID RD.

2430.00	4.59	584.39	0.00	0.00	584.41	.02	.12	.01	583.00
100.	4.	88.	8.	19.	80.	39.	3.	2.	583.00
.33	.20	1.10	.20	.070	.035	.070	.035	579.80	972.20
.000142	495.	495.	495.	3	0	1	0.00	107.39	1079.60

3264.00	4.60	584.60	0.00	0.00	584.68	.08	.24	.03	586.20
100.	0.	100.	0.	0.	45.	0.	5.	3.	587.50
.43	0.00	2.22	0.00	.070	.035	.070	.035	580.00	682.67
.000865	834.	834.	834.	2	0	1	0.00	15.40	698.07

3470 ENCROACHMENT STATIONS= 969.0 993.0 TYPE= 1 TARGET= 24.000
ELENCL= 585.90 ELENCR= 585.90

BS-5 BOY SCOUT RD. CULVERT

3312.00	4.61	584.61	0.00	0.00	584.77	.16	.06	.04	581.33
100.	13.	74.	13.	12.	20.	12.	5.	3.	581.33
.44	1.11	3.69	1.11	.070	.035	.070	.035	580.00	971.73
.001622	48.	48.	48.	1	0	1	0.00	18.53	990.27

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	-0.00	2.22	2.50	-0.00	3.70	-0.00	13.40	-0.00	579.80	579.80

3280 CROSS SECTION 3371.00 EXTENDED .31 FEET

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	ELLC	ELTRD	CLASS
586.53	584.59	0.00	17.	84.	13.	583.50	585.90	30.00

3470 ENCROACHMENT STATIONS= 400.0 1100.0 TYPE= 1 TARGET= 700.000
ELENCL= 586.50 ELENCR= 586.40

3371.00	5.91	585.91	0.00	0.00	585.97	.06	1.19	0.00	581.33
100.	19.	61.	20.	23.	26.	30.	5.	3.	581.33
.45	.82	2.34	.68	.070	.040	.070	.035	580.00	879.99
.000608	59.	59.	59.	2	0	7	0.00	158.76	1038.75

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	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= 500.0 800.0 TYPE= 1 TARGET= 300.000

VS-6 17 FT. U.S. FROM BOY SCOUT RD.

3388.00	3.31	585.91	0.00	0.00	585.99	.08	.02	.01	586.20
100.	0.	100.	0.	0.	43.	0.	5.	3.	587.50
.45	0.00	2.32	0.00	.070	.040	.070	.035	582.60	680.47
.001397	17.	17.	17.	1	0	1	0.00	17.92	698.39

3470 ENCROACHMENT STATIONS= 950.0 1150.0 TYPE= 1 TARGET= 200.000

DRIVEWAY CULVERT

3405.00	5.31	586.01	0.00	0.00	586.02	.01	.01	.02	580.80
100.	31.	26.	43.	74.	18.	134.	5.	3.	580.80
.46	.42	1.42	.32	.070	.040	.070	.035	580.70	950.00
.000159	17.	17.	17.	2	0	1	0.00	200.00	1150.00

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	-0.00	1.76	2.50	-0.00	2.67	-0.00	7.11	-0.00	580.40	580.40

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	ELLC	ELTRD	CLASS
591.42	585.72	0.00	95.	5.	7.	583.10	585.30	30.00

3470 ENCROACHMENT STATIONS= 950.0 1150.0 TYPE= 1 TARGET= 200.000

3427.00	5.32	586.02	0.00	0.00	586.03	.01	.00	0.00	580.80
100.	31.	25.	44.	75.	18.	136.	5.	3.	580.80
.47	.42	1.40	.32	.070	.040	.070	.035	580.70	950.00
.000155	22.	22.	22.	0	0	8	0.00	200.00	1150.00

3470 ENCROACHMENT STATIONS= 950.0 1150.0 TYPE= 1 TARGET= 200.000

3441.00	5.53	586.03	0.00	0.00	586.03	.00	.00	.00	584.90
100.	6.	70.	24.	41.	117.	141.	5.	3.	584.90
.48	.16	.60	.17	.070	.040	.070	.035	580.50	950.00
.000054	14.	14.	14.	0	0	1	0.00	200.00	1150.00

3470 ENCROACHMENT STATIONS= 900.0 1200.0 TYPE= 1 TARGET= 300.000

3459.00	5.53	586.03	0.00	0.00	586.03	.00	.00	.00	584.90
100.	10.	61.	29.	78.	117.	198.	5.	3.	584.90
.49	.12	.52	.15	.070	.040	.070	.035	580.50	900.00
.000041	18.	18.	18.	0	0	1	0.00	300.00	1200.00

3470 ENCROACHMENT STATIONS= 900.0 1200.0 TYPE= 1 TARGET= 300.000

DRIVEWAY CULVERT

3473.00	5.23	586.03	0.00	0.00	586.04	.01	.00	.00	580.80
100.	32.	26.	42.	84.	18.	137.	5.	3.	580.80
.50	.38	1.49	.30	.070	.040	.070	.035	580.80	900.00
.000176	14.	14.	14.	0	0	1	0.00	300.00	1200.00

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	-0.00	2.22	2.50	-0.00	2.39	-0.00	5.70	-0.00	581.40	581.40

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	ELLC	ELTRD	CLASS
596.64	586.64	0.00	96.	4.	6.	582.80	585.50	30.00

3470 ENCROACHMENT STATIONS= 900.0 1200.0 TYPE= 1 TARGET= 300.000

3493.00	5.23	586.03	0.00	0.00	586.04	.01	.01	0.00	580.80
100.	32.	26.	42.	85.	18.	138.	6.	4.	580.80
.50	.38	1.48	.30	.070	.040	.070	.035	580.80	900.00
.000175	20.	20.	20.	1	0	10	0.00	300.00	1200.00

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SECNO     DEPTH     C SEL     CRI S     SELK      EG        HV        HL        OLOSS     BAN. ELEV
Q         QLOB      QCH       QROB      ALOB      ACH       AROB      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=     900.0     1200.0  TYPE=     1  TARGET=     300.000
  3507.00     5.34   586.04     0.00      0.00   586.04      .00       .00       .00    584.90
     100.      10.      60.      30.       79.     113.     199.        6.        4.    584.90
      .52      .13      .53      .15      .070     .040     .070      .035    580.70    900.00
  .000043      14.      14.      14.         0        0        1      0.00    300.00   1200.00

3470 ENCROACHMENT STATIONS=     800.0     1320.0  TYPE=     1  TARGET=     520.000
  3533.00     5.34   586.04     0.00      0.00   586.05      .00       .00       .00    585.00
     100.       9.      59.      33.       94.     112.     250.        6.        4.    585.00
      .54      .09      .52      .13      .070     .040     .070      .035    580.70    810.14
  .000044      26.      26.      26.         0        0        1      0.00    509.85   1320.00

3470 ENCROACHMENT STATIONS=     800.0     1320.0  TYPE=     1  TARGET=     520.000
  3548.00     5.34   586.04     0.00      0.00   586.05      .01       .00       .00    581.70
     100.      27.      26.      47.       96.      21.     184.        6.        4.    581.70
      .54      .29     1.26      .25      .070     .040     .070      .035    580.70    815.76
  .000173      15.      15.      15.         0        0        1      0.00    491.22   1306.99

NORMAL BRIDGE.NRD=16 MIN ELTRD=  585.40 MAX ELLC=  585.40

3470 ENCROACHMENT STATIONS=     800.0     1320.0  TYPE=     1  TARGET=     520.000
                        DRIVEWAY CULVERT
  3549.00     5.34   586.04     0.00      0.00   586.05      .01       .00       .00    581.70
     100.      17.      18.      65.       66.      14.     165.        6.        4.    581.70
      .54      .25     1.32      .39      .070     .030     .070      .035    580.70    815.73
  .000641       1.       1.       1.         0        0        1    -54.95    491.27   1307.00

NORMAL BRIDGE.NRD=16 MIN ELTRD=  585.40 MAX ELLC=  585.40

3470 ENCROACHMENT STATIONS=     800.0     1320.0  TYPE=     1  TARGET=     520.000
  3569.00     5.36   586.06     0.00      0.00   586.06      .01       .01       .00    581.70
     100.      17.      18.      65.       68.      14.     168.        6.        4.    581.70
      .55      .25     1.29      .39      .070     .030     .070      .035    580.70    813.53
  .000616      20.      20.      20.         0        0        1    -54.95    494.83   1308.36

3470 ENCROACHMENT STATIONS=     800.0     1320.0  TYPE=     1  TARGET=     520.000
  3570.00     5.36   586.06     0.00      0.00   586.06      .01       .00       .00    581.70
     100.      27.      26.      47.       97.      21.     187.        6.        4.    581.70
      .55      .28     1.25      .25      .070     .040     .070      .035    580.70    813.36
  .000169       1.       1.       1.         0        0        1      0.00    495.11   1308.47

3470 ENCROACHMENT STATIONS=     800.0     1320.0  TYPE=     1  TARGET=     520.000
  3580.00     5.36   586.06     0.00      0.00   586.06      .00       .00       .00    585.00
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     100.       9.      58.      33.      96.     112.     254.       6.       4.    585.00
      .56      .09      .52      .13    .070     .040     .070     .035   580.70    807.82
  .000043      10.      10.      10.       0        0        1     0.00   512.18   1320.00

   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=     800.0    1300.0  TYPE=     1  TARGET=     500.000
  3749.00     5.07   586.07     0.00     0.00   586.07      .00      .01      .00    585.10
     100.      12.      54.      34.     118.     106.     250.       8.       6.    585.10
      .70      .10      .51      .13    .070     .040     .070     .035   581.00    800.00
  .000045     169.     169.     169.       0        0        1     0.00   500.00   1300.00

3280 CROSS SECTION   3789.00 EXTENDED       .47 FEET

3470 ENCROACHMENT STATIONS=     800.0    1300.0  TYPE=     1  TARGET=     500.000
  3789.00     4.97   586.07     0.00     0.00   586.07      .00      .00      .00    581.99
     100.      10.      14.      75.      65.      17.     339.       9.       7.    581.99
      .74      .16      .87      .22    .070     .040     .070     .035   581.10    800.00
  .000088      40.      40.      40.       0        0        1     0.00   500.00   1300.00

3280 CROSS SECTION   3790.00 EXTENDED       .47 FEET

NORMAL BRIDGE,NRD=26 MIN ELTRD=  584.60 MAX ELLC=  583.70

3470 ENCROACHMENT STATIONS=     800.0    1300.0  TYPE=     1  TARGET=     500.000

                 BS-7  DOUGLAS DR. CULVERT

  3790.00     4.97   586.07     0.00     0.00   586.08      .00      .00      .00    581.99
     100.       5.       4.      92.      46.       7.     319.       9.       7.    581.99
      .74      .10      .48      .29    .070     .030     .070     .035   581.10    800.00
  .000157       1.       1.       1.       0        0        1   -47.84   500.00   1300.00

3280 CROSS SECTION   3823.00 EXTENDED       .48 FEET

NORMAL BRIDGE,NRD=26 MIN ELTRD=  584.60 MAX ELLC=  583.70

3470 ENCROACHMENT STATIONS=     800.0    1300.0  TYPE=     1  TARGET=     500.000
  3823.00     4.98   586.08     0.00     0.00   586.08      .00      .01      .00    581.99
     100.       5.       4.      92.      47.       7.     320.       9.       7.    581.99
      .77      .10      .48      .29    .070     .030     .070     .035   581.10    800.00
  .000155      33.      33.      33.       0        0        1   -47.84   500.00   1300.00

3280 CROSS SECTION   3824.00 EXTENDED       .48 FEET

3470 ENCROACHMENT STATIONS=     800.0    1300.0  TYPE=     1  TARGET=     500.000
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3824.00      4.98    586.08      0.00      0.00    586.08       .00       .00       .00    581.99
   100.       10.       14.       75.       65.       17.      341.        9.        7.    581.99
    .77       .16       .87       .22      .070      .040      .070      .035    581.10    800.00
.000087        1.        1.        1.         0         0         1      0.00    500.00   1300.00


3470 ENCROACHMENT STATIONS=      800.0     1300.0  TYPE=      1  TARGET=      500.000
3844.00      4.98    586.08      0.00      0.00    586.08       .00       .00       .00    585.10
   100.       15.       51.       34.      139.      104.      257.        9.        7.    585.10
    .79       .11       .49       .13      .070      .040      .070      .035    581.10    800.00
.000042       20.       20.       20.         0         0         1      0.00    500.00   1300.00


 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=      750.0     1350.0  TYPE=      1  TARGET=      600.000
4095.00      4.99    586.09      0.00      0.00    586.09       .00       .01       .00    585.50
   100.       15.       50.       35.      143.       98.      268.       12.       11.    585.50
   1.01       .11       .51       .13      .070      .040      .070      .036    581.10    750.00
.000049      251.      251.      251.         0         0         1      0.00    600.00   1350.00


3470 ENCROACHMENT STATIONS=      750.0     1350.0  TYPE=      1  TARGET=      600.000
4108.00      4.99    586.09      0.00      0.00    586.09       .00       .00       .00    581.10
   100.       32.       15.       54.      188.       17.      311.       12.       11.    581.10
   1.03       .17       .86       .17      .070      .040      .070      .036    581.10    750.00
.000063       13.       13.       13.         0         0         1      0.00    600.00   1350.00


NORMAL BRIDGE•NRD=16 MIN ELTRD=  585.00 MAX ELLC=  583.10


3470 ENCROACHMENT STATIONS=      750.0     1350.0  TYPE=      1  TARGET=      600.000
                    DRIVEWAY CULVERT

4109.00      4.99    586.09      0.00      0.00    586.09       .00       .00       .00    581.10
   100.       29.        5.       67.      153.        7.      283.       12.       11.    581.10
   1.03       .19       .62       .24      .070      .024      .070      .036    581.10    750.00
.000157        1.        1.        1.         0         0         1    -73.04    600.00   1350.00


NORMAL BRIDGE•NRD=16 MIN ELTRD=  585.00 MAX ELLC=  583.10


3470 ENCROACHMENT STATIONS=      750.0     1350.0  TYPE=      1  TARGET=      600.000
4126.00      5.00    586.10      0.00      0.00    586.10       .00       .00       .00    581.10
   100.       29.        5.       67.      153.        7.      284.       12.       11.    581.10
   1.05       .19       .62       .23      .070      .024      .070      .035    581.10    750.00
.000156       17.       17.       17.         0         0         1    -73.04    600.00   1350.00


3470 ENCROACHMENT STATIONS=      750.0     1350.0  TYPE=      1  TARGET=      600.000
4130.00      5.40    586.10      0.00      0.00    586.10       .00       .00       .00    580.80
   100.       35.       18.       47.      264.       18.      362.       12.       11.    580.80
   1.05       .13      1.00       .13      .070      .024      .070      .035    580.70    750.00
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 .000028      4.      4.      4.       0       0       1    0.00   600.00  1350.00


NORMAL BRIDGE,NRD=16 MIN ELTRD=  584.80 MAX ELLC=  583.10

3470 ENCROACHMENT STATIONS=     750.0    1350.0  TYPE=     1  TARGET=     600.000
                        DRIVEWAY CULVERT

 4131.00     5.40   586.10     0.00     0.00   586.10     .00      .00      .00   580.80
    100.      35.       6.      59.     231.      11.    340.      12.      11.   580.80
    1.05      .15      .51      .17     .070     .024    .070     .035   580.70   750.00
 .000062       1.       1.       1.        0        0       1   -62.12   600.00  1350.00


NORMAL BRIDGE,NRD=16 MIN ELTRD=  584.80 MAX ELLC=  583.10

3470 ENCROACHMENT STATIONS=     750.0    1350.0  TYPE=     1  TARGET=     600.000
 4155.00     5.40   586.10     0.00     0.00   586.10     .00      .00      .00   580.80
    100.      35.       6.      59.     232.      11.    341.      13.      11.   580.80
    1.09      .15      .51      .17     .070     .024    .070     .035   580.70   750.00
 .000062      24.      24.      24.        0        0       1   -62.12   600.00  1350.00

   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=     750.0    1350.0  TYPE=     1  TARGET=     600.000
 4156.00     5.40   586.10     0.00     0.00   586.10     .00      .00      .00   580.80
    100.      38.      12.      51.     264.      18.    363.      13.      11.   580.80
    1.09      .14      .64      .14     .070     .040    .070     .035   580.70   750.00
 .000032       1.       1.       1.        0        0       1     0.00   600.00  1350.00


3470 ENCROACHMENT STATIONS=     750.0    1350.0  TYPE=     1  TARGET=     600.000
 4166.00     5.40   586.10     0.00     0.00   586.10     .00      .00      .00   585.50
    100.      14.      52.      33.     144.     105.    269.      13.      12.   585.50
    1.10      .10      .50      .12     .070     .040    .070     .035   580.70   750.00
 .000044      10.      10.      10.        0        0       1     0.00   600.00  1350.00


3470 ENCROACHMENT STATIONS=     750.0    1350.0  TYPE=     1  TARGET=     600.000
 4177.00     5.30   586.10     0.00     0.00   586.10     .00      .00      .00   585.60
    100.      12.      56.      32.     121.     102.    243.      13.      12.   585.60
    1.11      .10      .55      .13     .070     .040    .070     .035   580.80   750.00
 .000056      11.      11.      11.        0        0       1     0.00   600.00  1350.00


3470 ENCROACHMENT STATIONS=     750.0    1350.0  TYPE=     1  TARGET=     600.000
 4248.00     4.61   586.11     0.00     0.00   586.11     .00      .00      .00   584.50
    100.      32.      33.      35.     256.      70.    304.      14.      13.   584.90
    1.19      .13      .47      .11     .070     .040    .070     .035   581.50   750.00
 .000032      71.      71.      71.        0        0       1     0.00   600.00  1350.00
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NORMAL BRIDGE,NRD=11 MIN ELTRD=  584.50 MAX ELLC=  583.50

3470 ENCROACHMENT STATIONS=      750.0     1350.0  TYPE=      1  TARGET=      600.000
                        DRIVEWAY BRIDGE

  4249.00      4.61    586.11      0.00      0.00    586.11       .00       .00       .00    584.50
     100.       43.       11.       46.      256.       46.      304.       14.       13.    584.90
     1.19       .17       .24       .15      .070      .040      .070      .035    581.50    750.00
  .000056        1.        1.        1.         0         0         1    -24.30    600.00   1350.00


NORMAL BRIDGE,NRD=11 MIN ELTRD=  584.50 MAX ELLC=  583.50

3470 ENCROACHMENT STATIONS=      750.0     1350.0  TYPE=      1  TARGET=      600.000
  4261.00      4.61    586.11      0.00      0.00    586.11       .00       .00       .00    584.50
     100.       43.       11.       46.      257.       46.      305.       14.       13.    584.90
     1.21       .17       .24       .15      .070      .040      .070      .035    581.50    750.00
  .000056       12.       12.       12.         0         0         1    -24.30    600.00   1350.00


3470 ENCROACHMENT STATIONS=      750.0     1350.0  TYPE=      1  TARGET=      600.000
  4262.00      4.61    586.11      0.00      0.00    586.11       .00       .00       .00    584.10
     100.       16.       46.       37.      134.       66.      250.       14.       13.    584.90
     1.21       .12       .71       .15      .070      .040      .070      .035    581.50    750.00
  .000072        1.        1.        1.         0         0         1      0.00    600.00   1350.00


   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=      750.0     1350.0  TYPE=      1  TARGET=      600.000
  4279.00      4.61    586.11      0.00      0.00    586.11       .00       .00       .00    585.50
     100.       16.       46.       37.      145.       91.      271.       14.       13.    585.50
     1.23       .11       .51       .14      .070      .040      .070      .035    581.50    750.00
  .000054       17.       17.       17.         0         0         1      0.00    600.00   1350.00


3470 ENCROACHMENT STATIONS=      750.0     1350.0  TYPE=      1  TARGET=      600.000
  4313.00      4.61    586.11      0.00      0.00    586.11       .00       .00       .00    585.50
     100.       16.       46.       38.      146.       91.      272.       15.       14.    585.50
     1.26       .11       .51       .14      .070      .040      .070      .035    581.50    750.00
  .000054       34.       34.       34.         0         0         1      0.00    600.00   1350.00


3470 ENCROACHMENT STATIONS=      750.0     1350.0  TYPE=      1  TARGET=      600.000
  4328.00      4.61    586.11      0.00      0.00    586.11       .00       .00       .00    581.50
     100.       36.       14.       50.      223.       18.      312.       15.       14.    581.50
     1.28       .16       .76       .16      .070      .040      .070      .035    581.50    750.00
  .000054       15.       15.       15.         0         0         1      0.00    600.00   1350.00


NORMAL BRIDGE,NRD=16 MIN ELTRD=  585.10 MAX ELLC=  583.90
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3470 ENCROACHMENT STATIONS=      750.0     1350.0  TYPE=      1  TARGET=      600.000

                        DRIVEWAY CULVERT

  4329.00      4.61    586.11      0.00      0.00    586.11       .00       .00       .00    581.50
     100.       36.        4.       60.      193.       11.      291.       15.       14.    581.50
     1.28       .19       .42       .20      .070      .035      .070      .035    581.50    750.00
  .000112        1.        1.        1.         0         0         1    -59.12    600.00   1350.00


NORMAL BRIDGE,NRD=16 MIN ELTRD=  585.10 MAX ELLC=  583.90

3470 ENCROACHMENT STATIONS=      750.0     1350.0  TYPE=      1  TARGET=      600.000
  4394.00      4.62    586.12      0.00      0.00    586.12       .00       .01       .00    581.50
     100.       36.        4.       60.      194.       11.      293.       16.       15.    581.50
     1.37       .18       .41       .20      .070      .035      .070      .035    581.50    750.00
  .000110       65.       65.       65.         0         0         1    -59.12    600.00   1350.00


3470 ENCROACHMENT STATIONS=      750.0     1350.0  TYPE=      1  TARGET=      600.000
  4395.00      4.62    586.12      0.00      0.00    586.12       .00       .00       .00    581.50
     100.       36.       14.       50.      225.       18.      314.       16.       15.    581.50
     1.37       .16       .75       .16      .070      .040      .070      .035    581.50    750.00
  .000053        1.        1.        1.         0         0         1      0.00    600.00   1350.00


3470 ENCROACHMENT STATIONS=      750.0     1350.0  TYPE=      1  TARGET=      600.000
  4405.00      4.62    586.12      0.00      0.00    586.12       .00       .00       .00    585.70
     100.       15.       50.       35.      129.       88.      239.       16.       15.    585.70
     1.37       .12       .57       .15      .070      .040      .070      .035    581.50    750.00
  .000071       10.       10.       10.         0         0         1      0.00    600.00   1350.00

   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=      650.0     1250.0  TYPE=      1  TARGET=      600.000
  4508.00      4.43    586.13      0.00      0.00    586.13       .00       .01       .00    585.90
     100.       33.       47.       20.      223.       81.      143.       17.       16.    585.90
     1.46       .15       .57       .14      .070      .040      .070      .036    581.70    650.00
  .000080      103.      103.      103.         0         0         1      0.00    600.00   1250.00


3470 ENCROACHMENT STATIONS=      650.0     1250.0  TYPE=      1  TARGET=      600.000
  4519.00      4.43    586.13      0.00      0.00    586.13       .00       .00       .00    585.30
     100.       34.       44.       21.      268.       79.      171.       17.       16.    585.60
     1.47       .13       .56       .13      .070      .040      .070      .036    581.70    650.00
  .000051       11.       11.       11.         0         0         1      0.00    600.00   1250.00


NORMAL BRIDGE,NRD=11 MIN ELTRD=  585.20 MAX ELLC=  584.10

3470 ENCROACHMENT STATIONS=      650.0     1250.0  TYPE=      1  TARGET=      600.000
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DRIVE AT BRIDGE

4520.00	4.43	586.13	0.00	0.00	586.13	.00	.00	.00	585.30
100.	52.	15.	33.	268.	47.	171.	17.	16.	585.60
1.47	.20	.31	.19	.070	.040	.070	.036	581.70	650.00
.000120	1.	1.	1.	0	0	1	-31.90	600.00	1250.00

NORMAL BRIDGE,NRD=11 MIN ELTRD= 585.20 MAX ELLC= 584.10

3470 ENCROACHMENT STATIONS= 650.0 1250.0 TYPE= 1 TARGET= 600.000

4527.00	4.43	586.13	0.00	0.00	586.13	.00	.00	.00	585.30
100.	52.	15.	33.	269.	47.	171.	17.	17.	585.60
1.48	.20	.31	.19	.070	.040	.070	.036	581.70	650.00
.000120	7.	7.	7.	0	0	1	-31.90	600.00	1250.00

3470 ENCROACHMENT STATIONS= 650.0 1250.0 TYPE= 1 TARGET= 600.000

4528.00	4.43	586.13	0.00	0.00	586.13	.00	.00	.00	585.30
100.	34.	44.	21.	269.	79.	171.	17.	17.	585.60
1.48	.13	.56	.13	.070	.040	.070	.036	581.70	650.00
.000051	1.	1.	1.	0	0	1	0.00	600.00	1250.00

3470 ENCROACHMENT STATIONS= 650.0 1250.0 TYPE= 1 TARGET= 600.000

4538.00	4.43	586.13	0.00	0.00	586.13	.00	.00	.00	585.90
100.	37.	44.	19.	248.	81.	143.	17.	17.	585.90
1.49	.15	.54	.13	.070	.040	.070	.036	581.70	650.00
.000071	10.	10.	10.	0	0	1	0.00	600.00	1250.00

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 600.0 1200.0 TYPE= 1 TARGET= 600.000

VS-8 BETWEEN EAST BIRCH DR. @ GREGG DR.

4570.00	4.43	586.13	0.00	0.00	586.14	.00	.00	.00	585.40
100.	45.	48.	8.	276.	69.	66.	17.	17.	585.70
1.51	.16	.69	.12	.070	.040	.070	.036	581.70	600.00
.000082	32.	32.	32.	0	0	1	0.00	552.09	1200.00

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= 400.0 1025.0 TYPE= 1 TARGET= 625.000

4655.00	4.54	586.14	0.00	0.00	586.14	.00	.00	.00	585.60
100.	67.	33.	0.	545.	82.	0.	18.	18.	100000.00
1.62	.12	.40	0.00	.070	.040	.070	.036	581.60	400.00
.000037	85.	85.	85.	0	0	1	0.00	624.06	1024.06

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 400.0 1025.0 TYPE= 1 TARGET= 625.000

DRIVEWAY BRIDGE

4670.00	4.54	586.14	0.00	0.00	586.14	.00	.00	.00	583.50
100.	67.	30.	3.	502.	50.	18.	19.	19.	583.10
1.63	.13	.59	.18	.070	.040	.070	.036	581.60	400.00
.000044	15.	15.	15.	0	0	1	0.00	612.17	1024.75

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	-0.00	1.50	2.50	-0.00	7.00	-0.00	33.00	1.58	581.60	581.60

3265 DIVIDED FLOW

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	ELLC	ELTRD	CLASS
586.36	586.14	0.00	86.	14.	33.	583.50	585.00	30.00

3470 ENCROACHMENT STATIONS= 400.0 1025.0 TYPE= 1 TARGET= 625.000

4691.00	4.54	586.14	0.00	0.00	586.15	.00	.00	0.00	583.30
100.	71.	27.	3.	509.	46.	16.	19.	19.	583.70
1.66	.14	.58	.17	.070	.040	.070	.036	581.60	400.00
.000047	21.	21.	21.	0	0	6	0.00	614.59	1025.00

3470 ENCROACHMENT STATIONS= 400.0 1025.0 TYPE= 1 TARGET= 625.000

4704.00	4.55	586.15	0.00	0.00	586.15	.00	.00	.00	585.60
100.	68.	32.	0.	553.	82.	0.	19.	19.	100000.00
1.67	.12	.39	0.00	.070	.040	.070	.036	581.60	400.00
.000036	13.	13.	13.	0	0	1	0.00	624.10	1024.10

3470 ENCROACHMENT STATIONS= 400.0 1025.0 TYPE= 1 TARGET= 625.000

4744.00	4.65	586.15	0.00	0.00	586.15	.00	.00	.00	585.60
100.	67.	33.	0.	554.	84.	0.	20.	20.	100000.00
1.73	.12	.39	0.00	.070	.040	.070	.036	581.50	400.00
.000035	40.	40.	40.	0	0	1	0.00	624.13	1024.13

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 400.0 1025.0 TYPE= 1 TARGET= 625.000

DRIVEWAY CULVERT

4805.00	4.85	586.15	0.00	0.00	586.15	.00	.00	.00	581.30
100.	77.	15.	8.	496.	19.	32.	20.	20.	581.30
1.79	.16	.76	.26	.070	.040	.070	.036	581.30	400.00
.000051	61.	61.	61.	0	0	1	0.00	537.09	1022.99

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	-0.00	1.92	2.50	-0.00	2.86	-0.00	8.20	-0.00	580.90	580.90

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

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	ELLC	ELTRD	CLASS
590.58	585.75	0.00	97.	4.	8.	583.80	585.00	30.00

3470 ENCROACHMENT STATIONS= 400.0 1025.0 TYPE= 1 TARGET= 625.000

4832.00	4.85	586.15	0.00	0.00	586.16	.00	.00	0.00	581.30
100.	77.	15.	8.	499.	19.	32.	21.	21.	581.30
1.82	.15	.75	.26	.070	.040	.070	.036	581.30	400.00
.000050	27.	27.	27.	0	0	6	0.00	537.65	1023.00

3470 ENCROACHMENT STATIONS= 400.0 1025.0 TYPE= 1 TARGET= 625.000

4847.00	4.66	586.16	0.00	0.00	586.16	.00	.00	.00	585.60
100.	67.	33.	0.	558.	85.	0.	21.	21.	100000.00
1.84	.12	.39	0.00	.070	.040	.070	.036	581.50	400.00
.000034	15.	15.	15.	0	0	1	0.00	624.15	1024.15

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS= 400.0 1025.0 TYPE= 1 TARGET= 625.000

4869.00	4.46	586.16	0.00	0.00	586.16	.00	.00	.00	582.70
100.	86.	8.	6.	530.	13.	26.	21.	21.	582.70
1.88	.16	.56	.24	.070	.040	.070	.036	581.70	400.00
.000061	22.	22.	22.	0	0	1	0.00	616.44	1024.81

3265 DIVIDED FLOW

NORMAL BRIDGE,NRD=14 MIN ELTRD= 585.00 MAX ELLC= 583.70

3470 ENCROACHMENT STATIONS= 400.0 1025.0 TYPE= 1 TARGET= 625.000

DRIVEWAY CULVERT

4870.00	4.46	586.16	0.00	0.00	586.16	.00	.00	.00	582.70
100.	98.	2.	0.	502.	5.	0.	21.	21.	582.70
1.88	.19	.44	0.00	.070	.024	.070	.036	581.70	400.00
.000093	1.	1.	1.	0	0	1	-62.95	616.45	1024.81

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3265 DIVIDED FLOW

NORMAL BRIDGE,NRD=14 MIN ELTRD=  585.00 MAX ELLC=  583.70

3470 ENCROACHMENT STATIONS=      400.0     1025.0  TYPE=      1  TARGET=      625.000
  4888.00      4.46    586.16      0.00      0.00    586.16      .00       .00       .00    582.70
     100.       98.        2.        0.      503.        5.       0.       22.       21.    582.70
     1.90       .19       .44      0.00      .070      .024     .070      .036    581.70    400.00
  .000092       18.       18.       18.         0         0        1    -63.00    616.73   1024.82


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=      400.0     1025.0  TYPE=      1  TARGET=      625.000
  4889.00      4.46    586.16      0.00      0.00    586.16      .00       .00       .00    582.70
     100.       86.        7.        6.      531.       13.      26.       22.       21.    582.70
     1.90       .16       .56       .24      .070      .040     .070      .036    581.70    400.00
  .000061        1.        1.        1.         0         0        1      0.00    616.74   1024.82


3470 ENCROACHMENT STATIONS=      400.0     1025.0  TYPE=      1  TARGET=      625.000
  4905.00      4.46    586.16      0.00      0.00    586.16      .00       .00       .00    585.60
     100.       69.       31.        0.      560.       81.       0.       22.       22. 100000.00
     1.93       .12       .38      0.00      .070      .040     .070      .036    581.70    400.00
  .000035       16.       16.       16.         0         0        1      0.00    624.13   1024.13


3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=      400.0     1025.0  TYPE=      1  TARGET=      625.000
  4947.00      4.36    586.16      0.00      0.00    586.16      .00       .00       .00    582.30
     100.       73.       25.        2.      497.       40.      14.       22.       22.    583.80
     1.97       .15       .62       .16      .070      .040     .070      .036    581.80    400.00
  .000049       42.       42.       42.         0         0        1      0.00    562.24   1022.73


3265 DIVIDED FLOW

NORMAL BRIDGE,NRD=13 MIN ELTRD=  585.00 MAX ELLC=  585.30

3470 ENCROACHMENT STATIONS=      400.0     1025.0  TYPE=      1  TARGET=      625.000
                          DRIVEWAY BRIDGE
  4948.00      4.36    586.16      0.00      0.00    586.16      .00       .00       .00    582.30
     100.       89.       10.        1.      480.       26.       9.       22.       22.    583.80
     1.97       .19       .38       .16      .070      .040     .070      .036    581.80    400.00
  .000080        1.        1.        1.         0         0        1    -36.91    562.25   1022.73
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3265 DIVIDED FLOW

NORMAL BRIDGE.NRD=13 MIN ELTRD=  585.00 MAX ELLC=  585.30

3470 ENCROACHMENT STATIONS=     400.0    1025.0  TYPE=     1  TARGET=     625.000
  4962.00      4.36   586.16     0.00      0.00   586.16      .00       .00       .00   582.30
     100.       89.      10.       1.      480.      26.       9.       23.       22.   583.80
     1.99       .19      .38      .16      .070     .040     .070      .036   581.80   400.00
  .000080       14.      14.      14.         0        0        1    -36.94   562.38  1022.73

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=     400.0    1025.0  TYPE=     1  TARGET=     625.000
  4963.00      4.36   586.16     0.00      0.00   586.16      .00       .00       .00   582.30
     100.       73.      25.       2.      497.      40.      14.       23.       23.   583.80
     1.99       .15      .62      .16      .070     .040     .070      .036   581.80   400.00
  .000049        1.       1.       1.         0        0        1      0.00   562.39  1022.74

   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=     400.0    1025.0  TYPE=     1  TARGET=     625.000
  4975.00      4.46   586.16     0.00      0.00   586.16      .00       .00       .00   585.60
     100.       69.      31.       0.      563.      81.       0.       23.       23. 100000.00
     2.01       .12      .38     0.00      .070     .040     .070      .036   581.70   400.00
  .000035       12.      12.      12.         0        0        1      0.00   624.14  1024.14

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=     400.0    1025.0  TYPE=     1  TARGET=     625.000
  5034.00      4.77   586.17     0.00      0.00   586.17      .00       .00       .00   583.60
     100.       86.      10.       3.      499.      18.      16.       24.       23.   583.60
     2.08       .17      .56      .21      .070     .040     .070      .036   581.40   400.00
  .000069       59.      59.      59.         0        0        1      0.00   561.62  1022.83

3265 DIVIDED FLOW

NORMAL BRIDGE.NRD=14 MIN ELTRD=  585.00 MAX ELLC=  585.00

3470 ENCROACHMENT STATIONS=     400.0    1025.0  TYPE=     1  TARGET=     625.000

                        DRIVEWAY CULVERT

  5035.00      4.77   586.17     0.00      0.00   586.17      .00       .00       .00   583.60
     100.       93.       7.       0.      482.      12.       0.       24.       23.   583.60
     2.09       .19      .59     0.00      .070     .024     .070      .036   581.40   400.00
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 .000087      1.       1.       1.       0        0        1    -40.41    561.63  1022.83


3265 DIVIDED FLOW

NORMAL BRIDGE,NRD=14 MIN ELTRD=  585.00 MAX ELLC=  585.00

3470 ENCROACHMENT STATIONS=     400.0    1025.0  TYPE=     1  TARGET=     625.000
  5059.00     4.77   586.17     0.00     0.00   586.17      .00      .00      .00   583.60
     100.      93.       7.       0.     483.      12.       0.      24.      24.   583.60
     2.12      .19      .59     0.00     .070     .024     .070     .036   581.40   400.00
 .000086      24.      24.      24.        0        0        1   -40.46   561.90  1022.84


3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=     400.0    1025.0  TYPE=     1  TARGET=     625.000
  5060.00     4.77   586.17     0.00     0.00   586.17      .00      .00      .00   583.60
     100.      86.      10.       3.     500.      18.      16.      24.      24.   583.60
     2.12      .17      .56      .20     .070     .040     .070     .036   581.40   400.00
 .000068       1.       1.       1.        0        0        1     0.00   561.92  1022.84


3470 ENCROACHMENT STATIONS=     400.0    1025.0  TYPE=     1  TARGET=     625.000
  5075.00     4.77   586.17     0.00     0.00   586.17      .00      .00      .00   585.60
     100.      67.      33.       0.     566.      87.       0.      24.      24. 100000.00
     2.14      .12      .38     0.00     .070     .040     .070     .036   581.40   400.00
 .000032      15.      15.      15.        0        0        1     0.00   624.21  1024.21

   SECNO     DEPTH     CWSEL     CRIWS     WSELK      EG        HV        HL     OLOSS   BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      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    1030.0  TYPE=     1  TARGET=     630.000

                 VS-9  400 FT. U.S. W. BIRCH DR. AT BEND IN DRAIN

  5190.00     4.57   586.17     0.00     0.00   586.17      .00      .00      .00   585.90
     100.      80.      20.       0.     675.      55.       1.      26.      26.   585.90
     2.33      .12      .36      .03     .070     .040     .070     .036   581.60   400.00
 .000024     115.     115.     115.        0        0        1     0.00   622.04  1022.04


3470 ENCROACHMENT STATIONS=     400.0    1025.0  TYPE=     1  TARGET=     625.000
  5356.00     4.48   586.18     0.00     0.00   586.18      .00      .01      .00   585.40
     100.      51.      49.       0.     380.      88.       0.      28.      28. 100000.00
     2.46      .13      .56     0.00     .070     .040     .070     .036   581.70   400.00
 .000070     166.     166.     166.        0        0        1     0.00   625.00  1025.00


3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=     400.0    1025.0  TYPE=     1  TARGET=     625.000
```

DRIVEWAY CULVERT

5412.00	4.39	586.19	0.00	0.00	586.19	.00	.01	.00	583.30
100.	77.	14.	9.	320.	13.	21.	29.	29.	583.30
2.51	.24	1.06	.43	.070	.040	.070	.036	581.80	400.00
.000258	56.	56.	56.	0	0	1	0.00	598.89	1024.39

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	-0.00	1.63	2.50	-0.00	2.50	-0.00	6.30	-0.00	581.80	581.80

3265 DIVIDED FLOW

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	ELLC	ELTRD	CLASS
592.56	586.19	0.00	96.	4.	6.	584.30	585.40	30.00

3470 ENCROACHMENT STATIONS= 400.0 1025.0 TYPE= 1 TARGET= 625.000

5431.00	4.39	586.19	0.00	0.00	586.20	.00	.01	0.00	583.30
100.	78.	13.	9.	328.	13.	22.	29.	29.	583.30
2.52	.24	1.04	.42	.070	.040	.070	.036	581.80	400.00
.000244	19.	19.	19.	0	0	9	0.00	601.79	1024.46

3470 ENCROACHMENT STATIONS= 400.0 1025.0 TYPE= 1 TARGET= 625.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 585.40 ELREA= 100000.00

5448.00	4.50	586.20	0.00	0.00	586.20	.00	.00	.00	585.40
100.	52.	48.	0.	392.	88.	0.	29.	29.	100000.00
2.53	.13	.55	0.00	.070	.040	.070	.036	581.70	400.00
.000065	17.	17.	17.	0	0	1	0.00	625.00	1025.00

3470 ENCROACHMENT STATIONS= 400.0 1025.0 TYPE= 1 TARGET= 625.000

5502.00	4.90	586.20	0.00	0.00	586.20	.00	.00	.00	585.40
100.	49.	51.	0.	397.	96.	0.	30.	30.	100000.00
2.58	.12	.53	0.00	.070	.040	.070	.036	581.30	400.00
.000056	54.	54.	54.	0	0	1	0.00	625.00	1025.00

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= 1.0 555.0 TYPE= 1 TARGET= 554.000

BS-10 340 FT U.S. FROM BEND

5529.00	5.10	586.20	0.00	0.00	586.20	.01	.00	.00	581.31
100.	69.	22.	8.	316.	18.	28.	30.	30.	581.31

```
   2.60      .22     1.24      .30     .070     .040     .070     .036   581.10     1.00
 .000135    27.      27.       27.       1        0        1     0.00   554.00   555.00


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
    -0.00      2.11      2.50     -0.00      2.44     -0.00      5.97     -0.00    580.60    580.60

PRESSURE AND WEIR FLOW

  EGPRS     EGLWC      H3       QWEIR     QPR       BAREA     ELLC      ELTRD     CLASS

  595.39    585.73     0.00      96.       4.        6.      583.00    585.80     30.00


3470 ENCROACHMENT STATIONS=       1.0      555.0  TYPE=     1  TARGET=     554.000
  5548.00     5.11   586.21     0.00      0.00   586.21      .00       .01      0.00   581.31
     100.     71.      20.       9.      320.      18.      29.       30.       31.    581.31
     2.61     .22     1.12      .30      .070     .045     .070      .036   581.10     1.00
  .000138    19.      19.       19.        0        0        8      0.00   554.00   555.00


3470 ENCROACHMENT STATIONS=     400.0    1025.0  TYPE=     1  TARGET=     625.000
  5556.00     5.01   586.21     0.00      0.00   586.21      .00       .00       .00   585.40
     100.     51.      49.       0.      399.      98.       0.       30.       31. 100000.00
     2.62     .13      .50     0.00      .070     .045     .070      .036   581.20   400.00
  .000061     8.       8.       8.        0        0        1      0.00   625.00  1025.00


3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=     400.0    1025.0  TYPE=     1  TARGET=     625.000

                        DRIVEWAY CULVERT

  5599.00     4.71   586.21     0.00      0.00   586.22      .00       .00       .00   581.50
     100.     68.      18.       14.      323.      16.      32.       31.       31.    581.50
     2.65     .21     1.14      .44      .070     .045     .070      .036   581.50   400.00
  .000151    43.      43.       43.        0        0        1      0.00   534.46  1023.06


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
    -0.00      2.17      2.50     -0.00      2.32     -0.00      5.39     -0.00    581.10    581.10

3265 DIVIDED FLOW

PRESSURE AND WEIR FLOW

  EGPRS     EGLWC      H3       QWEIR     QPR       BAREA     ELLC      ELTRD     CLASS

  597.81    585.82     0.00      97.       3.        5.      583.40    585.40     30.00
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```
3470 ENCROACHMENT STATIONS=      400.0     1025.0  TYPE=      1  TARGET=      625.000
  5617.00      4.72    586.22      0.00      0.00    586.22       .01       .01      0.00    581.50
     100.       67.       20.       14.      327.       16.       32.       31.       32.    581.50
     2.66       .20      1.24       .43      .070      .040      .070      .036    581.50    400.00
  .000140       18.       18.       18.         0         0        10      0.00    535.54   1023.09
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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=      400.0     1025.0  TYPE=      1  TARGET=      625.000

OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA=      585.40 ELREA=   100000.00

  5633.00      4.73    586.23      0.00      0.00    586.23       .00       .00       .00    585.40
     100.       51.       49.        0.      408.       93.        0.       31.       32. 100000.00
     2.67       .13       .52      0.00      .070      .040      .070      .036    581.50    400.00
  .000056       16.       16.       16.         0         0         1      0.00    625.00   1025.00
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3470 ENCROACHMENT STATIONS=      400.0     1025.0  TYPE=      1  TARGET=      625.000

                VS-11 90 FT. D.S. FROM TWOMILE RD. CULVERT

  7260.00      3.63    586.33      0.00      0.00    586.33       .00       .10       .00    586.30
     100.       68.       32.        0.      406.       59.        0.       49.       55.    586.00
     4.24       .17       .54       .08      .070      .040      .070      .037    582.70    400.00
  .000069     1627.     1627.     1627.         2         0         1      0.00    625.00   1025.00
```

```
3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=          .0     1025.0  TYPE=      1  TARGET=     1024.999
  7309.00      3.63    586.33      0.00      0.00    586.33       .00       .00       .00    586.30
     100.       80.       20.        0.      742.       59.        0.       50.       56.    586.00
     4.32       .11       .34       .05      .070      .040      .070      .037    582.70       .00
  .000028       49.       49.       49.         0         0         1      0.00   1000.23   1025.00
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```
3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=          .0     1021.0  TYPE=      1  TARGET=     1020.999

                BS-12 TWOMILE RD. CULVERT

  7349.00      4.13    586.33      0.00      0.00    586.34       .01       .00       .00    582.57
     100.       74.       19.        8.      247.       14.       17.       50.       57.    582.57
     4.35       .30      1.29       .45      .070      .040      .070      .037    582.20       .00
  .000218       40.       40.       40.         0         0         1      0.00    353.80   1019.87
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SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
    -0.00      3.25      2.50     -0.00      2.46     -0.00      6.06     -0.00    581.80    581.80
```

3265 DIVIDED FLOW

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	ELLC	ELTRD	CLASS
600.07	585.94	0.00	97.	4.	6.	584.30	585.00	30.00

3470 ENCROACHMENT STATIONS= .0 1021.0 TYPE= 1 TARGET= 1020.999

7388.00	4.15	586.35	0.00	0.00	586.35	.00	.01	0.00	582.57
100.	76.	17.	8.	254.	14.	17.	50.	57.	582.57
4.37	.30	1.14	.45	.070	.045	.070	.037	582.20	.00
.000216	39.	39.	39.	0	0	9	0.00	371.74	1019.91

3470 ENCROACHMENT STATIONS= .0 1025.0 TYPE= 1 TARGET= 1024.999

7398.00	4.14	586.34	0.00	0.00	586.37	.03	.00	.01	586.00
100.	24.	76.	0.	101.	47.	0.	50.	57.	586.90
4.37	.24	1.61	0.00	.070	.045	.070	.037	582.20	595.31
.000744	10.	10.	10.	1	0	1	0.00	422.12	1017.43

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	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 1019.0 TYPE= 1 TARGET= 619.000

VS-13 50 FT. D.S. FROM LAURIA RD. CULVERT

8760.00	4.20	586.40	0.00	0.00	586.40	.00	.03	.01	586.00
80.	72.	8.	0.	1015.	54.	0.	69.	73.	100000.00
9.23	.07	.14	0.00	.070	.045	.070	.038	582.20	400.00
.000005	1362.	1362.	1362.	2	0	1	0.00	618.37	1018.37

3470 ENCROACHMENT STATIONS= 400.0 1019.0 TYPE= 1 TARGET= 619.000

8810.00	4.40	586.40	0.00	0.00	586.41	.00	.00	.00	582.90
80.	67.	10.	4.	556.	22.	22.	70.	74.	582.90
9.31	.12	.44	.17	.070	.045	.070	.038	582.00	400.00
.000034	50.	50.	50.	1	0	1	0.00	619.00	1019.00

NORMAL BRIDGE.NRD=27 MIN ELTRD= 585.40 MAX ELLC= 585.40

3470 ENCROACHMENT STATIONS= 400.0 1019.0 TYPE= 1 TARGET= 619.000

BS-14 LAURIA RD. CULVERT

8811.00	4.41	586.41	0.00	0.00	586.41	.00	.00	.00	582.90
80.	71.	7.	1.	545.	17.	11.	70.	74.	582.90
9.32	.13	.43	.10	.090	.030	.090	.038	582.00	400.00
.000071	1.	1.	1.	0	0	1	-26.28	619.00	1019.00

NORMAL BRIDGE.NRD=27 MIN ELTRD= 585.40 MAX ELLC= 585.40

3470 ENCROACHMENT STATIONS= 400.0 1019.0 TYPE= 1 TARGET= 619.000

8845.00	4.41	586.41	0.00	0.00	586.41	.00	.00	.00	582.90
80.	71.	7.	1.	546.	17.	11.	71.	75.	582.90
9.38	.13	.43	.10	.090	.030	.090	.038	582.00	400.00
.000070	34.	34.	34.	0	0	1	-26.28	619.00	1019.00

3470 ENCROACHMENT STATIONS= 400.0 1019.0 TYPE= 1 TARGET= 619.000

8846.00	4.41	586.41	0.00	0.00	586.41	.00	.00	.00	582.90
80.	65.	12.	4.	557.	22.	22.	71.	75.	582.90
9.38	.12	.54	.16	.090	.045	.090	.038	582.00	400.00
.000053	1.	1.	1.	0	0	1	0.00	619.00	1019.00

3470 ENCROACHMENT STATIONS= 500.0 1019.0 TYPE= 1 TARGET= 519.000

8871.00	4.21	586.41	0.00	0.00	586.41	.00	.00	.00	586.00
80.	69.	11.	0.	858.	54.	0.	71.	75.	100000.00
9.45	.08	.20	0.00	.090	.045	.090	.038	582.20	500.00
.000010	25.	25.	25.	0	0	1	0.00	518.39	1018.39

3280 CROSS SECTION 11271.00 EXTENDED 1.92 FEET

3470 ENCROACHMENT STATIONS= 500.0 1021.0 TYPE= 1 TARGET= 521.000

VS-15 50 FT D.S. FROM BEAVER RD.

11271.00	4.62	586.42	0.00	0.00	586.42	.00	.01	.00	585.60
14.	10.	4.	0.	487.	66.	0.	112.	104.	100000.00
28.78	.02	.07	0.00	.090	.045	.090	.040	581.80	500.00
.000001	2400.	2400.	2400.	2	0	1	0.00	521.00	1021.00

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= 450.0 1010.0 TYPE= 1 TARGET= 560.000

BS-16 BEAVER RD. CULVERT

11321.00	3.52	586.42	0.00	0.00	586.43	.01	.00	.01	582.98
14.	3.	8.	3.	10.	7.	10.	112.	104.	582.98
28.80	.31	1.09	.31	.090	.045	.090	.040	582.90	993.06
.000207	50.	50.	50.	0	0	1	0.00	13.88	1006.94

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	-0.00	7.10	2.50	-0.00	1.34	-0.00	1.79	-0.00	582.60	582.60

3265 DIVIDED FLOW

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	ELLC	ELTRD	CLASS
593.16	586.13	0.00	8.	6.	2.	583.90	587.70	30.00

3470 ENCROACHMENT STATIONS= 450.0 1010.0 TYPE= 1 TARGET= 560.000

11367.00	4.88	587.78	0.00	0.00	587.78	.00	1.35	0.00	582.98
14.	4.	6.	4.	32.	10.	20.	112.	104.	582.98
28.84	.13	.62	.20	.090	.050	.090	.040	582.90	479.90
.000053	46.	46.	46.	0	0	12	0.00	219.04	1009.28

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 588.20 ELREA= 588.20

11392.00	4.88	587.78	0.00	0.00	587.78	.00	.00	.00	588.20
14.	0.	14.	0.	0.	50.	0.	112.	104.	588.20
28.86	0.00	.28	0.00	.090	.050	.090	.040	582.90	990.72
.000029	25.	25.	25.	0	0	1	0.00	18.56	1009.28

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Bangor Twp

3) WATERCOURSE: Indian Town Drain

4) DOCUMENT TYPE: Report

00BREAK00

HYDRAULIC ANALYSIS

Introduction

The stream being studied is the Indian Town Drain in Bangor Township, Bay County, Michigan. The study limits are from its confluence with the Kawkawlin River to Beaver Road. The flows were computed by the SCS method and have been approved by the Michigan Department of Natural Resources

Method of Analysis

Water surface profiles were computed through use of the COE HEC-2 step-backwater computer program. Culverts and bridges which were under low flow conditions for all four flows were coded according to the "normal bridge" routine requirements. Those bridges which experienced pressure or weir flow for any of the four flows were coded according to the "special bridge" routine requirements. If the bridge losses were insignificant, the bridge or culvert was coded according to the "normal bridge" requirements.

The hydraulic model was developed for the 100-year flow. Valley sections upstream and downstream of culverts or bridges were located where full cross section flow would be developed out of the influence of the bridge constriction. The criteria for placement of these sections was that outlined on pages 18-21 in the HEC Training Document No. 6, Application of the HEC-2 Bridge Routines. If low flow or pressure flow was encountered

at a bridge or culvert, the downstream section was placed at a distance of about four times the bridge constriction and the upstream section was placed at a distance about equal to the bridge constriction. In the case of extensive weir flow where the bridge or culvert does not constrict the flow, the 4:1 and 1:1 ratios are not applicable.

Variables and Coefficients

The roughness factors (Manning's "n") were established by comparing photographs and field inspection with the photographs and descriptions found on pages 101 to 123 in Open-Channel Hydraulics, by Ven Te Chow. In general, the following range of values was used:

Description	Manning's "n"
1. Channel	
a. Muddy bottom	.03 - .04
b. Muddy bottom with light weeds	.04 - .055
2. Flood Plains	
a. Medium brush with scattered trees	.065 - .09
b. Medium to heavy brush	.08 - .10 low

0.08 — .16

The contraction and expansion coefficients used in the Indian Town Drain study were .3 and .5 respectively. These values were used throughout the study. References evaluated in selection of these values were the HEC-2 Users Manual, exhibit 2, page 2, and Open-Channel Hydraulics, Ven Te Chow, pages 311 and 468.

The orifice and weir coefficients used in the HEC-2 "special bridge" routine

were determined as outlined in the HEC-2 Users Manual, exhibit 2, pages 1 and 2, and Application of the HEC-2 Bridge Routines, pages 27-35.

Starting Point

Profile computations began at the Kawkawlin River by inputting the mean Saginaw Bay elevation as a known water surface elevation. The Kawkawlin River at the confluence of the Indian Town Drain will be approximately equal to the Saginaw Bay mean water surface elevation. In the final Flood Insurance Study Report, the 10-, 50-, 100- and 500-year Saginaw Bay flood elevations will be extended horizontally upstream until the corresponding Indian Town Drain profiles are intersected. The floodway and flood plain as delineated in this submittal are based on the calculated water surface profiles begun at the Kawkawlin River by inputting the mean bay elevation as a known water surface elevation. In the final Flood Insurance Study, the floodway will be based on the Indian Town Drain water surface profiles and the flood plain will reflect the influence of the Saginaw Bay.

Cross Section Location

Cross sections are located on the map as taken by field survey. However, the overbank portions of some cross sections had to be adjusted in the modeling process so that flow would be perpendicular to each cross section along its length. In the event of two cross sections intersecting, the downstream section was adjusted such that no part of this section extended past the upstream section.

why not used curved sections

Along Boy Scout Road, between section numbers 3388 F and 7260 K, are driveway culverts. The field work on these culverts consists of the top of driveway elevation, the invert elevation of the culvert, the silt elevation at the centerline of the culvert, and the culvert size. The left and right overbanks of these sections are an average section based on the overbank portions of full field sections in this area of the stream. The channel geometry of sections upstream and downstream of these culverts is based on valley sections taken in the same area of the stream. The culvert sections were not shown on the floodway map because the small distances between each culvert made it impossible to show clearly. Therefore, to avoid confusion between the map and the section number table, the culvert sections were left out of the table. In the computer printout, these sections were labeled "driveway culverts."

Floodway Determination

The location of the floodway encroachments was determined by encroaching the right and left overbanks of each cross section such that the water surface elevation increased a maximum of .1' above the natural water surface elevation. Alignment of the floodway was an important consideration in this particular stream.

Method 4?

Bangor Township
Bay County
Indian Town Drain
5555-01
TAB 3-30-76

Original Cross Section Location

Cross Section	SECNO	Location
A	200	200' u/s from Mouth of Drain
B	1820	50' d/s from Euclid Road
C	1870	d/s Face Euclid Road Culvert
D	2430	520' u/s from Euclid Road
E	3312	d/s Face Boy Scout Road Culvert
F	3388	u/s from Boy Scout Road
G	3790	d/s Face Douglas Drive Culvert
H	4570	Between E. Birch and Gregg Drive
I	5190	400' u/s W. Birch Drive (at bend in drain)
J	5529	340' u/s from Bend
K	7260	90' d/s from Twomile Road
L	7349	d/s Face Twomile Road Culvert
M	8760	50' d/s from Lauria Road
N	8811	d/s Face Lauria Road Culvert
O	11271	50' d/s Beaver Road
P	11321	d/s Face Beaver Road Culvert

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Bangor Twp

3) WATERCOURSE: Indian Town Drain

4) DOCUMENT TYPE: Summary

00BREAK00

SUMMARY PRINTOUT FOR MULTIPLE PROFILES

OR TWP, BAY CO.

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TOPWID	STENCL	STENCR	EG	HV	VCH
200.00	200.00	0.00	0.00	578.20	80.00	581.90	25.24	0.00	0.00	581.93	.03	1.34
200.00	200.00	0.00	0.00	578.20	105.00	581.90	25.24	0.00	0.00	581.95	.05	1.75
200.00	200.00	0.00	0.00	578.20	115.00	581.90	25.24	0.00	0.00	581.96	.06	1.92
200.00	200.00	0.00	0.00	578.20	140.00	581.90	25.24	0.00	0.00	581.98	.08	2.34
1820.00	1620.00	0.00	0.00	580.40	65.00	582.79	17.75	0.00	0.00	582.87	.07	2.18
1820.00	1620.00	0.00	0.00	580.40	85.00	583.18	19.17	0.00	0.00	583.27	.08	2.30
1820.00	1620.00	0.00	0.00	580.40	100.00	583.38	19.91	0.00	0.00	583.48	.09	2.44
1820.00	1620.00	0.00	0.00	580.40	120.00	583.73	21.16	0.00	0.00	583.83	.10	2.50
1869.00	49.00	0.00	0.00	580.60	65.00	582.77	6.00	600.00	2000.00	583.15	.39	5.00
1869.00	49.00	0.00	0.00	580.60	85.00	583.10	6.00	600.00	2000.00	583.60	.50	5.66
1869.00	49.00	0.00	0.00	580.60	100.00	583.26	6.00	600.00	2000.00	583.87	.61	6.25
1869.00	49.00	0.00	0.00	580.60	120.00	583.56	6.00	600.00	2000.00	584.27	.71	6.76
1870.00	1.00	585.80	584.60	580.60	65.00	582.84	14.83	600.00	2000.01	583.18	.33	4.84
1870.00	1.00	585.80	584.60	580.60	85.00	583.17	16.10	600.00	2000.01	583.62	.45	5.62
1870.00	1.00	585.80	584.60	580.60	100.00	583.33	16.73	600.00	2000.01	583.89	.56	6.27
1870.00	1.00	585.80	584.60	580.60	120.00	583.57	17.66	600.00	2000.01	584.28	.70	6.99
1909.00	39.00	585.80	584.60	580.60	65.00	583.06	15.68	600.00	2000.01	583.34	.29	4.47
1909.00	39.00	585.80	584.60	580.60	85.00	583.43	17.15	600.00	2000.01	583.81	.38	5.15
1909.00	39.00	585.80	584.60	580.60	100.00	583.65	18.02	600.00	2000.01	584.12	.46	5.67
1909.00	39.00	585.80	584.60	580.60	120.00	583.97	19.27	600.00	2000.01	584.53	.56	6.23
1910.00	1.00	0.00	0.00	580.60	65.00	583.06	6.00	600.00	2000.01	583.36	.30	4.40
1910.00	1.00	0.00	0.00	580.60	85.00	583.44	6.00	600.00	2000.01	583.82	.39	4.99
1910.00	1.00	0.00	0.00	580.60	100.00	583.66	6.00	600.00	2000.01	584.12	.46	5.45
1910.00	1.00	0.00	0.00	580.60	120.00	584.01	6.00	600.00	2000.01	584.54	.53	5.87
1935.00	25.00	0.00	0.00	580.40	65.00	583.43	20.07	0.00	0.00	583.47	.04	1.55
1935.00	25.00	0.00	0.00	580.40	85.00	583.91	21.88	0.00	0.00	583.96	.04	1.63
1935.00	25.00	0.00	0.00	580.40	100.00	584.23	23.67	0.00	0.00	584.28	.04	1.69
1935.00	25.00	0.00	0.00	580.40	120.00	584.67	26.13	0.00	0.00	584.72	.05	1.71
2430.00	495.00	0.00	0.00	579.80	65.00	583.60	59.99	0.00	0.00	583.62	.02	1.04
2430.00	495.00	0.00	0.00	579.80	85.00	584.07	88.48	0.00	0.00	584.09	.02	1.08
2430.00	495.00	0.00	0.00	579.80	100.00	584.39	107.39	0.00	0.00	584.41	.02	1.10
2430.00	495.00	0.00	0.00	579.80	120.00	584.82	133.04	0.00	0.00	584.83	.02	1.09
3264.00	834.00	0.00	0.00	580.00	65.00	583.85	13.66	0.00	0.00	583.91	.06	1.90
3264.00	834.00	0.00	0.00	580.00	85.00	584.30	14.71	0.00	0.00	584.37	.07	2.09
3264.00	834.00	0.00	0.00	580.00	100.00	584.60	15.40	0.00	0.00	584.68	.08	2.22
3264.00	834.00	0.00	0.00	580.00	120.00	584.99	16.32	0.00	0.00	585.08	.08	2.34
3312.00	48.00	0.00	0.00	580.00	65.00	583.87	15.36	969.00	993.00	583.99	.13	3.13
3312.00	48.00	0.00	0.00	580.00	85.00	584.32	17.27	969.00	993.00	584.46	.15	3.48
3312.00	48.00	0.00	0.00	580.00	100.00	584.61	18.53	969.00	993.00	584.77	.16	3.69
3312.00	48.00	0.00	0.00	580.00	120.00	585.00	20.21	969.00	993.00	585.18	.17	3.90

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	AX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	C SEL	TOP. ID	STENCL	STENCR	EG	HV	VCH
3371.00	59.00	585.90	583.50	580.00	65.00	584.62	18.52	400.00	1100.00	584.68	.06	2.32
3371.00	59.00	585.90	583.50	580.00	85.00	585.65	31.01	400.00	1100.00	585.70	.05	2.17
3371.00	59.00	585.90	583.50	580.00	100.00	585.91	158.76	400.00	1100.00	585.97	.06	2.34
3371.00	59.00	585.90	583.50	580.00	120.00	585.97	293.92	400.00	1100.00	586.05	.07	2.71
3388.00	17.00	0.00	0.00	582.60	65.00	584.61	14.39	500.00	800.00	584.74	.14	2.96
3388.00	17.00	0.00	0.00	582.60	85.00	585.66	17.23	500.00	800.00	585.73	.07	2.20
3388.00	17.00	0.00	0.00	582.60	100.00	585.91	17.92	500.00	800.00	585.99	.08	2.32
3388.00	17.00	0.00	0.00	582.60	120.00	585.97	18.06	500.00	800.00	586.09	.11	2.72
3405.00	17.00	0.00	0.00	580.70	65.00	584.76	31.22	950.00	1150.00	584.79	.03	1.98
3405.00	17.00	0.00	0.00	580.70	85.00	585.74	200.00	950.00	1150.00	585.76	.01	1.51
3405.00	17.00	0.00	0.00	580.70	100.00	586.01	200.00	950.00	1150.00	586.02	.01	1.42
3405.00	17.00	0.00	0.00	580.70	120.00	586.11	200.00	950.00	1150.00	586.13	.01	1.57
3427.00	22.00	585.30	583.10	580.70	65.00	585.42	195.90	950.00	1150.00	585.44	.01	1.49
3427.00	22.00	585.30	583.10	580.70	85.00	585.75	200.00	950.00	1150.00	585.76	.01	1.49
3427.00	22.00	585.30	583.10	580.70	100.00	586.02	200.00	950.00	1150.00	586.03	.01	1.40
3427.00	22.00	585.30	583.10	580.70	120.00	586.12	200.00	950.00	1150.00	586.13	.01	1.56
3441.00	14.00	0.00	0.00	580.50	65.00	585.44	200.00	950.00	1150.00	585.44	.00	.58
3441.00	14.00	0.00	0.00	580.50	85.00	585.76	200.00	950.00	1150.00	585.77	.00	.60
3441.00	14.00	0.00	0.00	580.50	100.00	586.03	200.00	950.00	1150.00	586.03	.00	.60
3441.00	14.00	0.00	0.00	580.50	120.00	586.13	200.00	950.00	1150.00	586.13	.01	.68
3459.00	18.00	0.00	0.00	580.50	65.00	585.44	300.00	900.00	1200.00	585.45	.00	.55
3459.00	18.00	0.00	0.00	580.50	85.00	585.76	300.00	900.00	1200.00	585.77	.00	.55
3459.00	18.00	0.00	0.00	580.50	100.00	586.03	300.00	900.00	1200.00	586.03	.00	.52
3459.00	18.00	0.00	0.00	580.50	120.00	586.13	300.00	900.00	1200.00	586.13	.00	.59
3473.00	14.00	0.00	0.00	580.80	65.00	585.44	34.60	900.00	1200.00	585.45	.02	1.58
3473.00	14.00	0.00	0.00	580.80	85.00	585.76	300.00	900.00	1200.00	585.77	.02	1.66
3473.00	14.00	0.00	0.00	580.80	100.00	586.03	300.00	900.00	1200.00	586.04	.01	1.49
3473.00	14.00	0.00	0.00	580.80	120.00	586.13	300.00	900.00	1200.00	586.14	.01	1.62
3493.00	20.00	585.50	582.80	580.80	65.00	585.67	278.65	900.00	1200.00	585.69	.01	1.37
3493.00	20.00	585.50	582.80	580.80	85.00	585.78	300.00	900.00	1200.00	585.80	.01	1.62
3493.00	20.00	585.50	582.80	580.80	100.00	586.03	300.00	900.00	1200.00	586.04	.01	1.48
3493.00	20.00	585.50	582.80	580.80	120.00	586.13	300.00	900.00	1200.00	586.14	.01	1.60
3507.00	14.00	0.00	0.00	580.70	65.00	585.69	300.00	900.00	1200.00	585.69	.00	.45
3507.00	14.00	0.00	0.00	580.70	85.00	585.80	300.00	900.00	1200.00	585.80	.00	.54
3507.00	14.00	0.00	0.00	580.70	100.00	586.04	300.00	900.00	1200.00	586.04	.00	.53
3507.00	14.00	0.00	0.00	580.70	120.00	586.14	300.00	900.00	1200.00	586.15	.00	.59
3533.00	26.00	0.00	0.00	580.70	65.00	585.69	414.26	800.00	1320.00	585.69	.00	.48
3533.00	26.00	0.00	0.00	580.70	85.00	585.80	446.61	800.00	1320.00	585.80	.00	.56
3533.00	26.00	0.00	0.00	580.70	100.00	586.04	509.85	800.00	1320.00	586.05	.00	.52
3533.00	26.00	0.00	0.00	580.70	120.00	586.15	520.00	800.00	1320.00	586.15	.00	.57

SECTION NUMBER	CHANNEL LENGTH	IN EL OF ROADWAY	MAX EL OF LOW CHORD	IN EL GROUND	DISCHARGE (CFS)	C SEL	TOP ID	STENCL	STENCR	EG	HV	CH
3548.00	15.00	0.00	0.00	580.70	65.00	585.69	335.59	800.00	1320.00	585.70	.01	1.29
3548.00	15.00	0.00	0.00	580.70	85.00	585.80	383.28	800.00	1320.00	585.81	.01	1.48
3548.00	15.00	0.00	0.00	580.70	100.00	586.04	491.22	800.00	1320.00	586.05	.01	1.26
3548.00	15.00	0.00	0.00	580.70	120.00	586.14	520.00	800.00	1320.00	586.15	.01	1.32
3549.00	1.00	585.40	585.40	580.70	65.00	585.67	333.18	800.00	1320.00	585.71	.03	2.20
3549.00	1.00	585.40	585.40	580.70	85.00	585.79	383.35	800.00	1320.00	585.81	.02	2.07
3549.00	1.00	585.40	585.40	580.70	100.00	586.04	491.27	800.00	1320.00	586.05	.01	1.32
3549.00	1.00	585.40	585.40	580.70	120.00	586.15	520.00	800.00	1320.00	586.15	.01	1.26
3569.00	20.00	585.40	585.40	580.70	65.00	585.72	346.73	800.00	1320.00	585.75	.03	2.01
3569.00	20.00	585.40	585.40	580.70	85.00	585.83	394.60	800.00	1320.00	585.85	.02	1.93
3569.00	20.00	585.40	585.40	580.70	100.00	586.06	494.83	800.00	1320.00	586.06	.01	1.29
3569.00	20.00	585.40	585.40	580.70	120.00	586.16	520.00	800.00	1320.00	586.16	.01	1.24
3570.00	1.00	0.00	0.00	580.70	65.00	585.74	361.04	800.00	1320.00	585.75	.01	1.20
3570.00	1.00	0.00	0.00	580.70	85.00	585.84	398.71	800.00	1320.00	585.85	.01	1.41
3570.00	1.00	0.00	0.00	580.70	100.00	586.06	495.11	800.00	1320.00	586.06	.01	1.25
3570.00	1.00	0.00	0.00	580.70	120.00	586.16	520.00	800.00	1320.00	586.16	.01	1.30
3580.00	10.00	0.00	0.00	580.70	65.00	585.75	434.51	800.00	1320.00	585.76	.00	.45
3580.00	10.00	0.00	0.00	580.70	85.00	585.85	461.55	800.00	1320.00	585.85	.00	.54
3580.00	10.00	0.00	0.00	580.70	100.00	586.06	512.18	800.00	1320.00	586.06	.00	.52
3580.00	10.00	0.00	0.00	580.70	120.00	586.16	520.00	800.00	1320.00	586.17	.00	.57
3749.00	169.00	0.00	0.00	581.00	65.00	585.76	490.79	800.00	1300.00	585.76	.00	.47
3749.00	169.00	0.00	0.00	581.00	85.00	585.86	500.00	800.00	1300.00	585.86	.00	.54
3749.00	169.00	0.00	0.00	581.00	100.00	586.07	500.00	800.00	1300.00	586.07	.00	.51
3749.00	169.00	0.00	0.00	581.00	120.00	586.17	500.00	800.00	1300.00	586.18	.00	.55
3789.00	40.00	0.00	0.00	581.10	65.00	585.76	336.18	800.00	1300.00	585.77	.00	.84
3789.00	40.00	0.00	0.00	581.10	85.00	585.86	395.16	800.00	1300.00	585.87	.00	.97
3789.00	40.00	0.00	0.00	581.10	100.00	586.07	500.00	800.00	1300.00	586.07	.00	.87
3789.00	40.00	0.00	0.00	581.10	120.00	586.18	500.00	800.00	1300.00	586.18	.00	.92
3790.00	1.00	584.60	583.70	581.10	65.00	585.76	336.21	800.00	1300.00	585.77	.00	.64
3790.00	1.00	584.60	583.70	581.10	85.00	585.86	395.21	800.00	1300.00	585.87	.00	.70
3790.00	1.00	584.60	583.70	581.10	100.00	586.07	500.00	800.00	1300.00	586.08	.00	.48
3790.00	1.00	584.60	583.70	581.10	120.00	586.18	500.00	800.00	1300.00	586.18	.00	.50
3823.00	33.00	584.60	583.70	581.10	65.00	585.77	338.84	800.00	1300.00	585.77	.00	.64
3823.00	33.00	584.60	583.70	581.10	85.00	585.87	398.43	800.00	1300.00	585.87	.00	.70
3823.00	33.00	584.60	583.70	581.10	100.00	586.08	500.00	800.00	1300.00	586.08	.00	.48
3823.00	33.00	584.60	583.70	581.10	120.00	586.18	500.00	800.00	1300.00	586.18	.00	.50
3824.00	1.00	0.00	0.00	581.10	65.00	585.77	338.95	800.00	1300.00	585.77	.00	.83
3824.00	1.00	0.00	0.00	581.10	85.00	585.87	398.56	800.00	1300.00	585.87	.00	.96
3824.00	1.00	0.00	0.00	581.10	100.00	586.08	500.00	800.00	1300.00	586.08	.00	.87
3824.00	1.00	0.00	0.00	581.10	120.00	586.18	500.00	800.00	1300.00	586.18	.00	.92

SECTION NUMBER	CHANNEL LENGTH	IN EL OF ROADWAY	AX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	C SEL	TOP ID	STENCL	STENCR	EG	HV	VCH
3844.00	20.00	0.00	0.00	581.10	65.00	585.77	500.00	800.00	1300.00	585.77	.00	.45
3844.00	20.00	0.00	0.00	581.10	85.00	585.87	500.00	800.00	1300.00	585.88	.00	.51
3844.00	20.00	0.00	0.00	581.10	100.00	586.08	500.00	800.00	1300.00	586.08	.00	.49
3844.00	20.00	0.00	0.00	581.10	120.00	586.18	500.00	800.00	1300.00	586.19	.00	.53
4095.00	251.00	0.00	0.00	581.10	65.00	585.78	600.00	750.00	1350.00	585.79	.00	.50
4095.00	251.00	0.00	0.00	581.10	85.00	585.89	600.00	750.00	1350.00	585.89	.00	.56
4095.00	251.00	0.00	0.00	581.10	100.00	586.09	600.00	750.00	1350.00	586.09	.00	.51
4095.00	251.00	0.00	0.00	581.10	120.00	586.20	600.00	750.00	1350.00	586.20	.00	.54
4108.00	13.00	0.00	0.00	581.10	65.00	585.78	600.00	750.00	1350.00	585.79	.00	.89
4108.00	13.00	0.00	0.00	581.10	85.00	585.89	600.00	750.00	1350.00	585.89	.00	.98
4108.00	13.00	0.00	0.00	581.10	100.00	586.09	600.00	750.00	1350.00	586.09	.00	.86
4108.00	13.00	0.00	0.00	581.10	120.00	586.20	600.00	750.00	1350.00	586.20	.00	.90
4109.00	1.00	585.00	583.10	581.10	65.00	585.79	600.00	750.00	1350.00	585.79	.00	.85
4109.00	1.00	585.00	583.10	581.10	85.00	585.89	600.00	750.00	1350.00	585.89	.00	.83
4109.00	1.00	585.00	583.10	581.10	100.00	586.09	600.00	750.00	1350.00	586.09	.00	.62
4109.00	1.00	585.00	583.10	581.10	120.00	586.20	600.00	750.00	1350.00	586.20	.00	.62
4126.00	17.00	585.00	583.10	581.10	65.00	585.79	600.00	750.00	1350.00	585.79	.00	.84
4126.00	17.00	585.00	583.10	581.10	85.00	585.90	600.00	750.00	1350.00	585.90	.00	.82
4126.00	17.00	585.00	583.10	581.10	100.00	586.10	600.00	750.00	1350.00	586.10	.00	.62
4126.00	17.00	585.00	583.10	581.10	120.00	586.20	600.00	750.00	1350.00	586.20	.00	.62
4130.00	4.00	0.00	0.00	580.70	65.00	585.79	600.00	750.00	1350.00	585.79	.00	.92
4130.00	4.00	0.00	0.00	580.70	85.00	585.90	600.00	750.00	1350.00	585.90	.00	1.06
4130.00	4.00	0.00	0.00	580.70	100.00	586.10	600.00	750.00	1350.00	586.10	.00	1.00
4130.00	4.00	0.00	0.00	580.70	120.00	586.20	600.00	750.00	1350.00	586.20	.00	1.07
4131.00	1.00	584.80	583.10	580.70	65.00	585.79	600.00	750.00	1350.00	585.80	.00	.55
4131.00	1.00	584.80	583.10	580.70	85.00	585.90	600.00	750.00	1350.00	585.90	.00	.60
4131.00	1.00	584.80	583.10	580.70	100.00	586.10	600.00	750.00	1350.00	586.10	.00	.51
4131.00	1.00	584.80	583.10	580.70	120.00	586.20	600.00	750.00	1350.00	586.20	.00	.53
4155.00	24.00	584.80	583.10	580.70	65.00	585.80	600.00	750.00	1350.00	585.80	.00	.55
4155.00	24.00	584.80	583.10	580.70	85.00	585.90	600.00	750.00	1350.00	585.90	.00	.59
4155.00	24.00	584.80	583.10	580.70	100.00	586.10	600.00	750.00	1350.00	586.10	.00	.51
4155.00	24.00	584.80	583.10	580.70	120.00	586.20	600.00	750.00	1350.00	586.21	.00	.53
4156.00	1.00	0.00	0.00	580.70	65.00	585.80	600.00	750.00	1350.00	585.80	.00	.61
4156.00	1.00	0.00	0.00	580.70	85.00	585.90	600.00	750.00	1350.00	585.90	.00	.69
4156.00	1.00	0.00	0.00	580.70	100.00	586.10	600.00	750.00	1350.00	586.10	.00	.64
4156.00	1.00	0.00	0.00	580.70	120.00	586.20	600.00	750.00	1350.00	586.21	.00	.69
4166.00	10.00	0.00	0.00	580.70	65.00	585.80	600.00	750.00	1350.00	585.80	.00	.47
4166.00	10.00	0.00	0.00	580.70	85.00	585.90	600.00	750.00	1350.00	585.90	.00	.54
4166.00	10.00	0.00	0.00	580.70	100.00	586.10	600.00	750.00	1350.00	586.10	.00	.50
4166.00	10.00	0.00	0.00	580.70	120.00	586.20	600.00	750.00	1350.00	586.21	.00	.53

SECTION NUMBER	CHANNEL LENGTH	IN EL OF ROADWAY	MAX EL OF LOW CHORD	IN EL GROUND	DISCHARGE (CFS)	CWSEL	TOP ID	STENCL	STENCR	EG	HV	VCH
4177.00	11.00	0.00	0.00	580.80	65.00	585.80	600.00	750.00	1350.00	585.80	.00	.53
4177.00	11.00	0.00	0.00	580.80	85.00	585.90	600.00	750.00	1350.00	585.91	.00	.61
4177.00	11.00	0.00	0.00	580.80	100.00	586.10	600.00	750.00	1350.00	586.10	.00	.55
4177.00	11.00	0.00	0.00	580.80	120.00	586.20	600.00	750.00	1350.00	586.21	.00	.59
4248.00	71.00	0.00	0.00	581.50	65.00	585.80	600.00	750.00	1350.00	585.80	.00	.44
4248.00	71.00	0.00	0.00	581.50	85.00	585.91	600.00	750.00	1350.00	585.91	.00	.50
4248.00	71.00	0.00	0.00	581.50	100.00	586.11	600.00	750.00	1350.00	586.11	.00	.47
4248.00	71.00	0.00	0.00	581.50	120.00	586.21	600.00	750.00	1350.00	586.21	.00	.50
4249.00	1.00	584.50	583.50	581.50	65.00	585.80	600.00	750.00	1350.00	585.80	.00	.25
4249.00	1.00	584.50	583.50	581.50	85.00	585.91	600.00	750.00	1350.00	585.91	.00	.27
4249.00	1.00	584.50	583.50	581.50	100.00	586.11	600.00	750.00	1350.00	586.11	.00	.24
4249.00	1.00	584.50	583.50	581.50	120.00	586.21	600.00	750.00	1350.00	586.21	.00	.25
4261.00	12.00	584.50	583.50	581.50	65.00	585.80	600.00	750.00	1350.00	585.80	.00	.25
4261.00	12.00	584.50	583.50	581.50	85.00	585.91	600.00	750.00	1350.00	585.91	.00	.27
4261.00	12.00	584.50	583.50	581.50	100.00	586.11	600.00	750.00	1350.00	586.11	.00	.24
4261.00	12.00	584.50	583.50	581.50	120.00	586.21	600.00	750.00	1350.00	586.21	.00	.25
4262.00	1.00	0.00	0.00	581.50	65.00	585.80	600.00	750.00	1350.00	585.81	.01	.72
4262.00	1.00	0.00	0.00	581.50	85.00	585.91	600.00	750.00	1350.00	585.91	.01	.80
4262.00	1.00	0.00	0.00	581.50	100.00	586.11	600.00	750.00	1350.00	586.11	.00	.71
4262.00	1.00	0.00	0.00	581.50	120.00	586.21	600.00	750.00	1350.00	586.21	.00	.74
4279.00	17.00	0.00	0.00	581.50	65.00	585.81	600.00	750.00	1350.00	585.81	.00	.50
4279.00	17.00	0.00	0.00	581.50	85.00	585.91	600.00	750.00	1350.00	585.92	.00	.56
4279.00	17.00	0.00	0.00	581.50	100.00	586.11	600.00	750.00	1350.00	586.11	.00	.51
4279.00	17.00	0.00	0.00	581.50	120.00	586.21	600.00	750.00	1350.00	586.22	.00	.54
4313.00	34.00	0.00	0.00	581.50	65.00	585.81	600.00	750.00	1350.00	585.81	.00	.50
4313.00	34.00	0.00	0.00	581.50	85.00	585.92	600.00	750.00	1350.00	585.92	.00	.56
4313.00	34.00	0.00	0.00	581.50	100.00	586.11	600.00	750.00	1350.00	586.11	.00	.51
4313.00	34.00	0.00	0.00	581.50	120.00	586.22	600.00	750.00	1350.00	586.22	.00	.54
4328.00	15.00	0.00	0.00	581.50	65.00	585.81	600.00	750.00	1350.00	585.81	.00	.77
4328.00	15.00	0.00	0.00	581.50	85.00	585.92	600.00	750.00	1350.00	585.92	.00	.85
4328.00	15.00	0.00	0.00	581.50	100.00	586.11	600.00	750.00	1350.00	586.11	.00	.76
4328.00	15.00	0.00	0.00	581.50	120.00	586.22	600.00	750.00	1350.00	586.22	.00	.79
4329.00	1.00	585.10	583.90	581.50	65.00	585.81	600.00	750.00	1350.00	585.81	.00	.52
4329.00	1.00	585.10	583.90	581.50	85.00	585.92	600.00	750.00	1350.00	585.92	.00	.52
4329.00	1.00	585.10	583.90	581.50	100.00	586.11	600.00	750.00	1350.00	586.11	.00	.42
4329.00	1.00	585.10	583.90	581.50	120.00	586.22	600.00	750.00	1350.00	586.22	.00	.42
4394.00	65.00	585.10	583.90	581.50	65.00	585.82	600.00	750.00	1350.00	585.83	.00	.51
4394.00	65.00	585.10	583.90	581.50	85.00	585.93	600.00	750.00	1350.00	585.93	.00	.51
4394.00	65.00	585.10	583.90	581.50	100.00	586.12	600.00	750.00	1350.00	586.12	.00	.41
4394.00	65.00	585.10	583.90	581.50	120.00	586.23	600.00	750.00	1350.00	586.23	.00	.42

SECTION NUMBER	CHANNEL LENGTH	IN EL OF ROADWAY	AX EL OF LOW CHORD	IN EL GROUND	DISCHARGE (CFS)	C SEL	TOP.ID	STENCL	STENCR	EG	HV	VCH
4395.00	1.00	0.00	0.00	581.50	65.00	585.82	600.00	750.00	1350.00	585.83	.00	.76
4395.00	1.00	0.00	0.00	581.50	85.00	585.93	600.00	750.00	1350.00	585.93	.00	.84
4395.00	1.00	0.00	0.00	581.50	100.00	586.12	600.00	750.00	1350.00	586.12	.00	.75
4395.00	1.00	0.00	0.00	581.50	120.00	586.22	600.00	750.00	1350.00	586.23	.00	.79
4405.00	10.00	0.00	0.00	581.50	65.00	585.82	600.00	750.00	1350.00	585.83	.00	.57
4405.00	10.00	0.00	0.00	581.50	85.00	585.93	600.00	750.00	1350.00	585.94	.00	.64
4405.00	10.00	0.00	0.00	581.50	100.00	586.12	600.00	750.00	1350.00	586.12	.00	.57
4405.00	10.00	0.00	0.00	581.50	120.00	586.23	600.00	750.00	1350.00	586.23	.00	.60
4508.00	103.00	0.00	0.00	581.70	65.00	585.83	557.53	650.00	1250.00	585.84	.00	.59
4508.00	103.00	0.00	0.00	581.70	85.00	585.94	600.00	650.00	1250.00	585.95	.00	.64
4508.00	103.00	0.00	0.00	581.70	100.00	586.13	600.00	650.00	1250.00	586.13	.00	.57
4508.00	103.00	0.00	0.00	581.70	120.00	586.23	600.00	650.00	1250.00	586.24	.00	.60
4519.00	11.00	0.00	0.00	581.70	65.00	585.84	600.00	650.00	1250.00	585.84	.00	.55
4519.00	11.00	0.00	0.00	581.70	85.00	585.94	600.00	650.00	1250.00	585.95	.00	.61
4519.00	11.00	0.00	0.00	581.70	100.00	586.13	600.00	650.00	1250.00	586.13	.00	.56
4519.00	11.00	0.00	0.00	581.70	120.00	586.23	600.00	650.00	1250.00	586.24	.00	.60
4520.00	1.00	585.20	584.10	581.70	65.00	585.84	600.00	650.00	1250.00	585.84	.00	.37
4520.00	1.00	585.20	584.10	581.70	85.00	585.95	600.00	650.00	1250.00	585.95	.00	.38
4520.00	1.00	585.20	584.10	581.70	100.00	586.13	600.00	650.00	1250.00	586.13	.00	.31
4520.00	1.00	585.20	584.10	581.70	120.00	586.24	600.00	650.00	1250.00	586.24	.00	.32
4527.00	7.00	585.20	584.10	581.70	65.00	585.84	600.00	650.00	1250.00	585.84	.00	.37
4527.00	7.00	585.20	584.10	581.70	85.00	585.95	600.00	650.00	1250.00	585.95	.00	.38
4527.00	7.00	585.20	584.10	581.70	100.00	586.13	600.00	650.00	1250.00	586.13	.00	.31
4527.00	7.00	585.20	584.10	581.70	120.00	586.24	600.00	650.00	1250.00	586.24	.00	.32
4528.00	1.00	0.00	0.00	581.70	65.00	585.84	600.00	650.00	1250.00	585.84	.00	.54
4528.00	1.00	0.00	0.00	581.70	85.00	585.95	600.00	650.00	1250.00	585.95	.00	.61
4528.00	1.00	0.00	0.00	581.70	100.00	586.13	600.00	650.00	1250.00	586.13	.00	.56
4528.00	1.00	0.00	0.00	581.70	120.00	586.24	600.00	650.00	1250.00	586.24	.00	.59
4538.00	10.00	0.00	0.00	581.70	65.00	585.84	565.59	650.00	1250.00	585.84	.00	.54
4538.00	10.00	0.00	0.00	581.70	85.00	585.95	600.00	650.00	1250.00	585.95	.00	.60
4538.00	10.00	0.00	0.00	581.70	100.00	586.13	600.00	650.00	1250.00	586.13	.00	.54
4538.00	10.00	0.00	0.00	581.70	120.00	586.24	600.00	650.00	1250.00	586.24	.00	.56
4570.00	32.00	0.00	0.00	581.70	65.00	585.84	522.62	600.00	1200.00	585.85	.00	.67
4570.00	32.00	0.00	0.00	581.70	85.00	585.95	533.43	600.00	1200.00	585.96	.01	.75
4570.00	32.00	0.00	0.00	581.70	100.00	586.13	552.09	600.00	1200.00	586.14	.00	.69
4570.00	32.00	0.00	0.00	581.70	120.00	586.24	562.87	600.00	1200.00	586.24	.00	.72
4655.00	85.00	0.00	0.00	581.60	65.00	585.85	623.03	400.00	1025.00	585.85	.00	.38
4655.00	85.00	0.00	0.00	581.60	85.00	585.96	623.41	400.00	1025.00	585.96	.00	.43
4655.00	85.00	0.00	0.00	581.60	100.00	586.14	624.06	400.00	1025.00	586.14	.00	.40
4655.00	85.00	0.00	0.00	581.60	120.00	586.25	624.44	400.00	1025.00	586.25	.00	.42

SECTIO NUMBER	CHANNEL LENGTH	IN EL OF ROADWAY	MAX EL OF LOW CHORD	IN EL GROUND	DISCHARGE (CFS)	CWSEL	TOPWID	SIE CL	SIENCR	EG	HV	VCH
4670.00	15.00	0.00	0.00	581.60	65.00	585.85	554.95	400.00	1025.00	585.85	.00	.55
4670.00	15.00	0.00	0.00	581.60	85.00	585.96	576.30	400.00	1025.00	585.96	.00	.63
4670.00	15.00	0.00	0.00	581.60	100.00	586.14	612.17	400.00	1025.00	586.14	.00	.59
4670.00	15.00	0.00	0.00	581.60	120.00	586.25	625.00	400.00	1025.00	586.25	.00	.63
4691.00	21.00	585.00	583.50	581.60	65.00	585.85	557.39	400.00	1025.00	585.85	.00	.55
4691.00	21.00	585.00	583.50	581.60	85.00	585.96	579.62	400.00	1025.00	585.97	.00	.61
4691.00	21.00	585.00	583.50	581.60	100.00	586.14	614.59	400.00	1025.00	586.15	.00	.58
4691.00	21.00	585.00	583.50	581.60	120.00	586.25	625.00	400.00	1025.00	586.25	.00	.61
4704.00	13.00	0.00	0.00	581.60	65.00	585.85	623.07	400.00	1025.00	585.86	.00	.38
4704.00	13.00	0.00	0.00	581.60	85.00	585.97	623.47	400.00	1025.00	585.97	.00	.42
4704.00	13.00	0.00	0.00	581.60	100.00	586.15	624.10	400.00	1025.00	586.15	.00	.39
4704.00	13.00	0.00	0.00	581.60	120.00	586.25	624.48	400.00	1025.00	586.25	.00	.42
4744.00	40.00	0.00	0.00	581.50	65.00	585.86	623.11	400.00	1025.00	585.86	.00	.37
4744.00	40.00	0.00	0.00	581.50	85.00	585.97	623.50	400.00	1025.00	585.97	.00	.42
4744.00	40.00	0.00	0.00	581.50	100.00	586.15	624.13	400.00	1025.00	586.15	.00	.39
4744.00	40.00	0.00	0.00	581.50	120.00	586.25	624.50	400.00	1025.00	586.25	.00	.42
4805.00	61.00	0.00	0.00	581.30	65.00	585.86	502.88	400.00	1025.00	585.86	.00	.72
4805.00	61.00	0.00	0.00	581.30	85.00	585.97	516.11	400.00	1025.00	585.97	.00	.80
4805.00	61.00	0.00	0.00	581.30	100.00	586.15	537.09	400.00	1025.00	586.15	.00	.76
4805.00	61.00	0.00	0.00	581.30	120.00	586.26	549.61	400.00	1025.00	586.26	.00	.81
4832.00	27.00	585.00	583.80	581.30	65.00	585.86	503.28	400.00	1025.00	585.86	.00	.71
4832.00	27.00	585.00	583.80	581.30	85.00	585.97	516.60	400.00	1025.00	585.98	.00	.80
4832.00	27.00	585.00	583.80	581.30	100.00	586.15	537.65	400.00	1025.00	586.16	.00	.75
4832.00	27.00	585.00	583.80	581.30	120.00	586.26	550.24	400.00	1025.00	586.26	.00	.80
4847.00	15.00	0.00	0.00	581.50	65.00	585.86	623.14	400.00	1025.00	585.86	.00	.37
4847.00	15.00	0.00	0.00	581.50	85.00	585.98	623.53	400.00	1025.00	585.98	.00	.41
4847.00	15.00	0.00	0.00	581.50	100.00	586.16	624.15	400.00	1025.00	586.16	.00	.39
4847.00	15.00	0.00	0.00	581.50	120.00	586.26	624.53	400.00	1025.00	586.26	.00	.41
4869.00	22.00	0.00	0.00	581.70	65.00	585.86	558.09	400.00	1025.00	585.86	.00	.57
4869.00	22.00	0.00	0.00	581.70	85.00	585.98	580.77	400.00	1025.00	585.98	.00	.62
4869.00	22.00	0.00	0.00	581.70	100.00	586.16	616.44	400.00	1025.00	586.16	.00	.56
4869.00	22.00	0.00	0.00	581.70	120.00	586.26	625.00	400.00	1025.00	586.26	.00	.58
4870.00	1.00	585.00	583.70	581.70	65.00	585.86	558.10	400.00	1025.00	585.86	.00	.51
4870.00	1.00	585.00	583.70	581.70	85.00	585.98	580.78	400.00	1025.00	585.98	.00	.52
4870.00	1.00	585.00	583.70	581.70	100.00	586.16	616.45	400.00	1025.00	586.16	.00	.44
4870.00	1.00	585.00	583.70	581.70	120.00	586.26	625.00	400.00	1025.00	586.26	.00	.44
4888.00	18.00	585.00	583.70	581.70	65.00	585.87	558.45	400.00	1025.00	585.87	.00	.50
4888.00	18.00	585.00	583.70	581.70	85.00	585.98	581.16	400.00	1025.00	585.98	.00	.52
4888.00	18.00	585.00	583.70	581.70	100.00	586.16	616.73	400.00	1025.00	586.16	.00	.44
4888.00	18.00	585.00	583.70	581.70	120.00	586.27	625.00	400.00	1025.00	586.27	.00	.44

SECTIO NUMBER	CHANNEL LENGTH	IN EL OF ROADWAY	MAX EL OF LOW CHORD	IN EL GROUND	DISCHARGE (CFS)	C SEL	TOP ID	STENCL	STE CR	EG	HV	VCH
4889.00	1.00	0.00	0.00	581.70	65.00	585.87	558.47	400.00	1025.00	585.87	.00	.57
4889.00	1.00	0.00	0.00	581.70	85.00	585.98	581.18	400.00	1025.00	585.98	.00	.62
4889.00	1.00	0.00	0.00	581.70	100.00	586.16	616.74	400.00	1025.00	586.16	.00	.56
4889.00	1.00	0.00	0.00	581.70	120.00	586.27	625.00	400.00	1025.00	586.27	.00	.58
4905.00	16.00	0.00	0.00	581.70	65.00	585.87	623.07	400.00	1025.00	585.87	.00	.37
4905.00	16.00	0.00	0.00	581.70	85.00	585.98	623.49	400.00	1025.00	585.98	.00	.41
4905.00	16.00	0.00	0.00	581.70	100.00	586.16	624.13	400.00	1025.00	586.16	.00	.38
4905.00	16.00	0.00	0.00	581.70	120.00	586.27	624.52	400.00	1025.00	586.27	.00	.41
4947.00	42.00	0.00	0.00	581.80	65.00	585.87	520.41	400.00	1025.00	585.87	.00	.58
4947.00	42.00	0.00	0.00	581.80	85.00	585.98	536.81	400.00	1025.00	585.98	.00	.65
4947.00	42.00	0.00	0.00	581.80	100.00	586.16	562.24	400.00	1025.00	586.16	.00	.62
4947.00	42.00	0.00	0.00	581.80	120.00	586.27	577.66	400.00	1025.00	586.27	.00	.66
4948.00	1.00	585.00	585.30	581.80	65.00	585.87	520.41	400.00	1025.00	585.87	.00	.40
4948.00	1.00	585.00	585.30	581.80	85.00	585.98	536.81	400.00	1025.00	585.98	.00	.43
4948.00	1.00	585.00	585.30	581.80	100.00	586.16	562.25	400.00	1025.00	586.16	.00	.38
4948.00	1.00	585.00	585.30	581.80	120.00	586.27	577.67	400.00	1025.00	586.27	.00	.39
4962.00	14.00	585.00	585.30	581.80	65.00	585.87	520.55	400.00	1025.00	585.87	.00	.40
4962.00	14.00	585.00	585.30	581.80	85.00	585.99	536.97	400.00	1025.00	585.99	.00	.43
4962.00	14.00	585.00	585.30	581.80	100.00	586.16	562.38	400.00	1025.00	586.16	.00	.38
4962.00	14.00	585.00	585.30	581.80	120.00	586.27	577.81	400.00	1025.00	586.27	.00	.39
4963.00	1.00	0.00	0.00	581.80	65.00	585.87	520.57	400.00	1025.00	585.87	.00	.58
4963.00	1.00	0.00	0.00	581.80	85.00	585.99	536.99	400.00	1025.00	585.99	.00	.65
4963.00	1.00	0.00	0.00	581.80	100.00	586.16	562.39	400.00	1025.00	586.16	.00	.62
4963.00	1.00	0.00	0.00	581.80	120.00	586.27	577.82	400.00	1025.00	586.27	.00	.66
4975.00	12.00	0.00	0.00	581.70	65.00	585.87	623.09	400.00	1025.00	585.87	.00	.37
4975.00	12.00	0.00	0.00	581.70	85.00	585.99	623.50	400.00	1025.00	585.99	.00	.41
4975.00	12.00	0.00	0.00	581.70	100.00	586.16	624.14	400.00	1025.00	586.16	.00	.38
4975.00	12.00	0.00	0.00	581.70	120.00	586.27	624.53	400.00	1025.00	586.27	.00	.41
5034.00	59.00	0.00	0.00	581.40	65.00	585.88	518.99	400.00	1025.00	585.88	.00	.58
5034.00	59.00	0.00	0.00	581.40	85.00	585.99	535.82	400.00	1025.00	585.99	.00	.62
5034.00	59.00	0.00	0.00	581.40	100.00	586.17	561.62	400.00	1025.00	586.17	.00	.56
5034.00	59.00	0.00	0.00	581.40	120.00	586.27	577.40	400.00	1025.00	586.28	.00	.59
5035.00	1.00	585.00	585.00	581.40	65.00	585.88	519.00	400.00	1025.00	585.88	.00	.65
5035.00	1.00	585.00	585.00	581.40	85.00	585.99	535.83	400.00	1025.00	585.99	.00	.68
5035.00	1.00	585.00	585.00	581.40	100.00	586.17	561.63	400.00	1025.00	586.17	.00	.59
5035.00	1.00	585.00	585.00	581.40	120.00	586.27	577.40	400.00	1025.00	586.28	.00	.61
5059.00	24.00	585.00	585.00	581.40	65.00	585.88	519.32	400.00	1025.00	585.88	.00	.65
5059.00	24.00	585.00	585.00	581.40	85.00	585.99	536.19	400.00	1025.00	585.99	.00	.68
5059.00	24.00	585.00	585.00	581.40	100.00	586.17	561.90	400.00	1025.00	586.17	.00	.59
5059.00	24.00	585.00	585.00	581.40	120.00	586.28	577.69	400.00	1025.00	586.28	.00	.60

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	C SEL	TOP ID	STENCL	STENCR	EG	HV	VCH
5060.00	1.00	0.00	0.00	581.40	65.00	585.88	519.33	400.00	1025.00	585.88	.00	.57
5060.00	1.00	0.00	0.00	581.40	85.00	585.99	536.20	400.00	1025.00	585.99	.00	.62
5060.00	1.00	0.00	0.00	581.40	100.00	586.17	561.92	400.00	1025.00	586.17	.00	.56
5060.00	1.00	0.00	0.00	581.40	120.00	586.28	577.70	400.00	1025.00	586.28	.00	.59
5075.00	15.00	0.00	0.00	581.40	65.00	585.88	623.22	400.00	1025.00	585.88	.00	.36
5075.00	15.00	0.00	0.00	581.40	85.00	585.99	623.62	400.00	1025.00	586.00	.00	.40
5075.00	15.00	0.00	0.00	581.40	100.00	586.17	624.21	400.00	1025.00	586.17	.00	.38
5075.00	15.00	0.00	0.00	581.40	120.00	586.28	624.58	400.00	1025.00	586.28	.00	.41
5190.00	115.00	0.00	0.00	581.60	65.00	585.88	614.32	400.00	1030.00	585.88	.00	.32
5190.00	115.00	0.00	0.00	581.60	85.00	586.00	618.85	400.00	1030.00	586.00	.00	.37
5190.00	115.00	0.00	0.00	581.60	100.00	586.17	622.04	400.00	1030.00	586.17	.00	.36
5190.00	115.00	0.00	0.00	581.60	120.00	586.28	624.03	400.00	1030.00	586.28	.00	.39
5356.00	166.00	0.00	0.00	581.70	65.00	585.89	624.95	400.00	1025.00	585.89	.00	.57
5356.00	166.00	0.00	0.00	581.70	85.00	586.00	625.00	400.00	1025.00	586.01	.00	.61
5356.00	166.00	0.00	0.00	581.70	100.00	586.18	625.00	400.00	1025.00	586.18	.00	.56
5356.00	166.00	0.00	0.00	581.70	120.00	586.29	625.00	400.00	1025.00	586.29	.00	.58
5412.00	56.00	0.00	0.00	581.80	65.00	585.89	534.44	400.00	1025.00	585.90	.01	1.39
5412.00	56.00	0.00	0.00	581.80	85.00	586.01	560.57	400.00	1025.00	586.02	.01	1.34
5412.00	56.00	0.00	0.00	581.80	100.00	586.19	598.89	400.00	1025.00	586.19	.00	1.06
5412.00	56.00	0.00	0.00	581.80	120.00	586.29	623.09	400.00	1025.00	586.30	.00	1.03
5431.00	19.00	585.40	584.30	581.80	65.00	585.90	537.47	400.00	1025.00	585.91	.01	1.34
5431.00	19.00	585.40	584.30	581.80	85.00	586.02	564.02	400.00	1025.00	586.03	.01	1.29
5431.00	19.00	585.40	584.30	581.80	100.00	586.19	601.79	400.00	1025.00	586.20	.00	1.04
5431.00	19.00	585.40	584.30	581.80	120.00	586.30	625.00	400.00	1025.00	586.30	.00	1.01
5448.00	17.00	0.00	0.00	581.70	65.00	585.91	625.00	400.00	1025.00	585.91	.00	.54
5448.00	17.00	0.00	0.00	581.70	85.00	586.03	625.00	400.00	1025.00	586.03	.00	.59
5448.00	17.00	0.00	0.00	581.70	100.00	586.20	625.00	400.00	1025.00	586.20	.00	.55
5448.00	17.00	0.00	0.00	581.70	120.00	586.30	625.00	400.00	1025.00	586.31	.00	.57
5502.00	54.00	0.00	0.00	581.30	65.00	585.91	625.00	400.00	1025.00	585.91	.00	.52
5502.00	54.00	0.00	0.00	581.30	85.00	586.03	625.00	400.00	1025.00	586.03	.00	.57
5502.00	54.00	0.00	0.00	581.30	100.00	586.20	625.00	400.00	1025.00	586.20	.00	.53
5502.00	54.00	0.00	0.00	581.30	120.00	586.31	625.00	400.00	1025.00	586.31	.00	.56
5529.00	27.00	0.00	0.00	581.10	65.00	585.91	415.87	1.00	555.00	585.92	.01	1.23
5529.00	27.00	0.00	0.00	581.10	85.00	586.03	478.58	1.00	555.00	586.04	.01	1.34
5529.00	27.00	0.00	0.00	581.10	100.00	586.20	554.00	1.00	555.00	586.20	.01	1.24
5529.00	27.00	0.00	0.00	581.10	120.00	586.31	554.00	1.00	555.00	586.31	.01	1.26
5548.00	19.00	585.80	583.00	581.10	65.00	585.92	419.97	1.00	555.00	585.92	.01	1.12
5548.00	19.00	585.80	583.00	581.10	85.00	586.04	480.73	1.00	555.00	586.04	.01	1.22
5548.00	19.00	585.80	583.00	581.10	100.00	586.21	554.00	1.00	555.00	586.21	.00	1.12
5548.00	19.00	585.80	583.00	581.10	120.00	586.32	554.00	1.00	555.00	586.32	.00	1.14

SECTION NUMBER	CHANNEL LENGTH	IN EL OF ROADWAY	AX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	C..SEL	TOP.ID.	STENCL	STENCR	EG	HV	VCH
5556.00	8.00	0.00	0.00	581.20	65.00	585.92	625.00	400.00	1025.00	585.93	.00	.49
5556.00	8.00	0.00	0.00	581.20	85.00	586.04	625.00	400.00	1025.00	586.05	.00	.53
5556.00	8.00	0.00	0.00	581.20	100.00	586.21	625.00	400.00	1025.00	586.21	.00	.50
5556.00	8.00	0.00	0.00	581.20	120.00	586.32	625.00	400.00	1025.00	586.32	.00	.52
5599.00	43.00	0.00	0.00	581.50	65.00	585.93	496.37	400.00	1025.00	585.93	.01	1.20
5599.00	43.00	0.00	0.00	581.50	85.00	586.05	512.40	400.00	1025.00	586.05	.01	1.27
5599.00	43.00	0.00	0.00	581.50	100.00	586.21	534.46	400.00	1025.00	586.22	.00	1.14
5599.00	43.00	0.00	0.00	581.50	120.00	586.32	549.06	400.00	1025.00	586.33	.00	1.16
5617.00	18.00	585.40	583.40	581.50	65.00	585.93	497.37	400.00	1025.00	585.94	.01	1.29
5617.00	18.00	585.40	583.40	581.50	85.00	586.05	513.53	400.00	1025.00	586.06	.01	1.37
5617.00	18.00	585.40	583.40	581.50	100.00	586.22	535.54	400.00	1025.00	586.22	.01	1.24
5617.00	18.00	585.40	583.40	581.50	120.00	586.33	550.16	400.00	1025.00	586.34	.01	1.27
5633.00	16.00	0.00	0.00	581.50	65.00	585.94	625.00	400.00	1025.00	585.94	.00	.51
5633.00	16.00	0.00	0.00	581.50	85.00	586.06	625.00	400.00	1025.00	586.06	.00	.56
5633.00	16.00	0.00	0.00	581.50	100.00	586.23	625.00	400.00	1025.00	586.23	.00	.52
5633.00	16.00	0.00	0.00	581.50	120.00	586.34	625.00	400.00	1025.00	586.34	.00	.55
7260.00	1627.00	0.00	0.00	582.70	65.00	586.04	436.81	400.00	1025.00	586.05	.00	.50
7260.00	1627.00	0.00	0.00	582.70	85.00	586.18	525.64	400.00	1025.00	586.18	.00	.56
7260.00	1627.00	0.00	0.00	582.70	100.00	586.33	625.00	400.00	1025.00	586.33	.00	.54
7260.00	1627.00	0.00	0.00	582.70	120.00	586.44	625.00	400.00	1025.00	586.44	.00	.57
7309.00	49.00	0.00	0.00	582.70	65.00	586.05	772.16	.00	1025.00	586.05	.00	.33
7309.00	49.00	0.00	0.00	582.70	85.00	586.18	882.36	.00	1025.00	586.18	.00	.35
7309.00	49.00	0.00	0.00	582.70	100.00	586.33	1000.23	.00	1025.00	586.33	.00	.34
7309.00	49.00	0.00	0.00	582.70	120.00	586.44	1016.85	.00	1025.00	586.45	.00	.36
7349.00	40.00	0.00	0.00	582.20	65.00	586.05	278.59	.00	1021.00	586.05	.01	1.23
7349.00	40.00	0.00	0.00	582.20	85.00	586.18	301.86	.00	1021.00	586.19	.01	1.33
7349.00	40.00	0.00	0.00	582.20	100.00	586.33	353.80	.00	1021.00	586.34	.01	1.29
7349.00	40.00	0.00	0.00	582.20	120.00	586.44	591.48	.00	1021.00	586.45	.01	1.33
7388.00	39.00	585.00	584.30	582.20	65.00	586.06	281.11	.00	1021.00	586.06	.01	1.10
7388.00	39.00	585.00	584.30	582.20	85.00	586.20	304.76	.00	1021.00	586.20	.01	1.18
7388.00	39.00	585.00	584.30	582.20	100.00	586.35	371.74	.00	1021.00	586.35	.00	1.14
7388.00	39.00	585.00	584.30	582.20	120.00	586.46	618.29	.00	1021.00	586.46	.00	1.17
7398.00	10.00	0.00	0.00	582.20	65.00	586.05	187.10	.00	1025.00	586.08	.04	1.54
7398.00	10.00	0.00	0.00	582.20	85.00	586.18	352.03	.00	1025.00	586.23	.04	1.77
7398.00	10.00	0.00	0.00	582.20	100.00	586.34	422.12	.00	1025.00	586.37	.03	1.61
7398.00	10.00	0.00	0.00	582.20	120.00	586.45	471.64	.00	1025.00	586.48	.03	1.58
8760.00	1362.00	0.00	0.00	582.20	55.00	586.12	618.02	400.00	1019.00	586.12	.00	.12
8760.00	1362.00	0.00	0.00	582.20	70.00	586.27	618.20	400.00	1019.00	586.27	.00	.14
8760.00	1362.00	0.00	0.00	582.20	80.00	586.40	618.37	400.00	1019.00	586.40	.00	.14
8760.00	1362.00	0.00	0.00	582.20	95.00	586.52	618.52	400.00	1019.00	586.52	.00	.15

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TOP WID	STENCL	STENCR	EG	HV	VCH
8810.00	50.00	0.00	0.00	582.00	55.00	586.12	619.00	400.00	1019.00	586.12	.00	.48
8810.00	50.00	0.00	0.00	582.00	70.00	586.27	619.00	400.00	1019.00	586.27	.00	.47
8810.00	50.00	0.00	0.00	582.00	80.00	586.40	619.00	400.00	1019.00	586.41	.00	.44
8810.00	50.00	0.00	0.00	582.00	95.00	586.52	619.00	400.00	1019.00	586.52	.00	.44
8811.00	1.00	585.40	585.40	582.00	55.00	586.12	619.00	400.00	1019.00	586.12	.00	.49
8811.00	1.00	585.40	585.40	582.00	70.00	586.27	619.00	400.00	1019.00	586.27	.00	.47
8811.00	1.00	585.40	585.40	582.00	80.00	586.41	619.00	400.00	1019.00	586.41	.00	.43
8811.00	1.00	585.40	585.40	582.00	95.00	586.52	619.00	400.00	1019.00	586.52	.00	.43
8845.00	34.00	585.40	585.40	582.00	55.00	586.12	619.00	400.00	1019.00	586.12	.00	.49
8845.00	34.00	585.40	585.40	582.00	70.00	586.27	619.00	400.00	1019.00	586.27	.00	.47
8845.00	34.00	585.40	585.40	582.00	80.00	586.41	619.00	400.00	1019.00	586.41	.00	.43
8845.00	34.00	585.40	585.40	582.00	95.00	586.52	619.00	400.00	1019.00	586.52	.00	.43
8846.00	1.00	0.00	0.00	582.00	55.00	586.12	619.00	400.00	1019.00	586.12	.00	.58
8846.00	1.00	0.00	0.00	582.00	70.00	586.27	619.00	400.00	1019.00	586.27	.00	.58
8846.00	1.00	0.00	0.00	582.00	80.00	586.41	619.00	400.00	1019.00	586.41	.00	.54
8846.00	1.00	0.00	0.00	582.00	95.00	586.52	619.00	400.00	1019.00	586.52	.00	.55
8871.00	25.00	0.00	0.00	582.20	55.00	586.12	518.04	500.00	1019.00	586.12	.00	.17
8871.00	25.00	0.00	0.00	582.20	70.00	586.27	518.23	500.00	1019.00	586.27	.00	.19
8871.00	25.00	0.00	0.00	582.20	80.00	586.41	518.39	500.00	1019.00	586.41	.00	.20
8871.00	25.00	0.00	0.00	582.20	95.00	586.52	518.54	500.00	1019.00	586.52	.00	.22
11271.00	2400.00	0.00	0.00	581.80	13.00	586.14	521.00	500.00	1021.00	586.14	.00	.08
11271.00	2400.00	0.00	0.00	581.80	13.00	586.29	521.00	500.00	1021.00	586.29	.00	.07
11271.00	2400.00	0.00	0.00	581.80	14.00	586.42	521.00	500.00	1021.00	586.42	.00	.07
11271.00	2400.00	0.00	0.00	581.80	15.00	586.54	521.00	500.00	1021.00	586.54	.00	.06
11321.00	50.00	0.00	0.00	582.90	13.00	586.13	12.89	450.00	1010.00	586.14	.01	1.15
11321.00	50.00	0.00	0.00	582.90	13.00	586.28	13.41	450.00	1010.00	586.29	.01	1.07
11321.00	50.00	0.00	0.00	582.90	14.00	586.42	13.88	450.00	1010.00	586.43	.01	1.09
11321.00	50.00	0.00	0.00	582.90	15.00	586.53	14.27	450.00	1010.00	586.55	.01	1.11
11367.00	46.00	587.70	583.90	582.90	13.00	587.77	206.38	450.00	1010.00	587.77	.00	.58
11367.00	46.00	587.70	583.90	582.90	13.00	587.77	209.02	450.00	1010.00	587.77	.00	.58
11367.00	46.00	587.70	583.90	582.90	14.00	587.78	219.04	450.00	1010.00	587.78	.00	.62
11367.00	46.00	587.70	583.90	582.90	15.00	587.78	228.04	450.00	1010.00	587.79	.00	.66
11392.00	25.00	0.00	0.00	582.90	13.00	587.77	18.53	0.00	0.00	587.77	.00	.26
11392.00	25.00	0.00	0.00	582.90	13.00	587.77	18.54	0.00	0.00	587.77	.00	.26
11392.00	25.00	0.00	0.00	582.90	14.00	587.78	18.56	0.00	0.00	587.78	.00	.28
11392.00	25.00	0.00	0.00	582.90	15.00	587.79	18.59	0.00	0.00	587.79	.00	.30

SECTION NUMBER	DISCHARGE CFS	CWSEL	CWSEL DIFF EACH Q	CWSEL DIFF EACH SECTION	CWSEL-WSELK	TOPWID	T.W. DIFF	LENGTH
200.000	80.000	581.900	0.000	0.000	0.000	25.242	0.000	200.000
200.000	105.000	581.900	0.000	0.000	0.000	25.242	0.000	200.000
200.000	115.000	581.900	0.000	0.000	0.000	25.242	0.000	200.000
200.000	140.000	581.900	0.000	0.000	0.000	25.242	0.000	200.000
1820.000	65.000	582.794	0.000	.894	0.000	17.745	0.000	1620.000
1820.000	85.000	583.184	.389	1.284	0.000	19.168	-1.422	1620.000
1820.000	100.000	583.385	.201	1.485	0.000	19.905	-2.160	1620.000
1820.000	120.000	583.730	.345	1.830	0.000	21.158	-3.412	1620.000
1869.000	65.000	582.766	0.000	-.028	0.000	6.000	0.000	49.000
1869.000	85.000	583.104	.337	-.080	0.000	6.000	0.000	49.000
1869.000	100.000	583.265	.161	-.120	0.000	6.000	0.000	49.000
1869.000	120.000	583.556	.291	-.174	0.000	6.000	0.000	49.000
1870.000	65.000	582.843	0.000	.076	0.000	14.826	0.000	1.000
1870.000	85.000	583.167	.325	.064	0.000	16.104	-1.277	1.000

1870.000	100.000	583.327	.160	.062	0.00	16.732	-1.905	1.000
1870.000	120.000	583.572	.245	.016	0.000	17.660	-2.834	1.000
1909.000	65.000	583.060	0.000	.217	0.000	15.676	0.000	39.000
1909.000	85.000	583.434	.374	.266	0.000	17.149	-1.473	39.000
1909.000	100.000	583.654	.221	.327	0.000	18.017	-2.341	39.000
1909.000	120.000	583.971	.317	.399	0.000	19.266	-3.590	39.000
1910.000	65.000	583.056	0.000	-.004	0.000	6.000	0.000	1.000
1910.000	85.000	583.435	.379	.002	0.000	6.000	0.000	1.000
1910.000	100.000	583.662	.227	.008	0.000	6.000	0.000	1.000
1910.000	120.000	584.010	.348	.039	0.000	6.000	0.000	1.000
1935.000	65.000	583.428	0.000	.372	0.000	20.071	0.000	25.000
1935.000	85.000	583.914	.486	.479	0.000	21.883	-1.812	25.000
1935.000	100.000	584.234	.320	.572	0.000	23.667	-3.596	25.000
1935.000	120.000	584.674	.441	.664	0.000	26.127	-6.056	25.000
2430.000	65.000	583.600	0.000	.172	0.000	59.995	0.000	495.000
2430.000	85.000	584.075	.475	.161	0.000	88.485	-28.490	495.000
2430.000	100.000	584.390	.315	.156	0.000	107.393	-47.398	495.000
2430.000	120.000	584.817	.428	.143	0.000	133.044	-73.049	495.000
3264.000	65.000	583.853	0.000	.253	0.000	13.657	0.000	834.000
3264.000	85.000	584.304	.451	.229	0.000	14.708	-1.051	834.000
3264.000	100.000	584.600	.297	.211	0.000	15.401	-1.744	834.000
3264.000	120.000	584.994	.393	.176	0.000	16.319	-2.662	834.000
3312.000	65.000	583.868	0.000	.015	0.000	15.362	0.000	48.000
3312.000	85.000	584.317	.449	.013	0.000	17.267	-1.905	48.000
3312.000	100.000	584.613	.296	.013	0.000	18.532	-3.170	48.000
3312.000	120.000	585.005	.392	.011	0.000	20.208	-4.846	48.000
3371.000	65.000	584.617	0.000	.749	0.000	18.525	0.000	59.000
3371.000	85.000	585.654	1.038	1.337	0.000	31.014	-12.490	59.000
3371.000	100.000	585.910	.256	1.297	0.000	158.764	-140.240	59.000
3371.000	120.000	585.974	.064	.969	0.000	293.916	-275.392	59.000
3388.000	65.000	584.607	0.000	-.010	0.000	14.393	0.000	17.000
3388.000	85.000	585.656	1.049	.001	0.000	17.234	-2.841	17.000
3388.000	100.000	585.911	.255	.001	0.000	17.922	-3.529	17.000
3388.000	120.000	585.972	.061	-.002	0.000	18.062	-3.669	17.000
3405.000	65.000	584.762	0.000	.155	0.000	31.222	0.000	17.000
3405.000	85.000	585.744	.982	.088	0.000	199.999	-168.777	17.000
3405.000	100.000	586.013	.269	.102	0.000	199.999	-168.777	17.000
3405.000	120.000	586.115	.101	.142	0.000	199.999	-168.777	17.000
3427.000	65.000	585.425	0.000	.663	0.000	195.896	0.000	22.000
3427.000	85.000	585.750	.325	.006	0.000	199.999	-4.103	22.000
3427.000	100.000	586.017	.268	.004	0.000	199.999	-4.103	22.000
3427.000	120.000	586.118	.100	.003	0.000	199.999	-4.103	22.000
3441.000	65.000	585.439	0.000	.015	0.000	199.999	0.000	14.000
3441.000	85.000	585.761	.322	.011	0.000	199.999	-.000	14.000
3441.000	100.000	586.025	.264	.008	0.000	199.999	-.000	14.000
3441.000	120.000	586.127	.102	.009	0.000	199.999	-.000	14.000
3459.000	65.000	585.441	0.000	.002	0.000	299.999	0.000	18.000
3459.000	85.000	585.764	.322	.002	0.000	299.999	-.000	18.000
3459.000	100.000	586.028	.264	.003	0.000	299.999	-.000	18.000
3459.000	120.000	586.130	.102	.003	0.000	299.999	-.000	18.000
3473.000	65.000	585.436	0.000	-.005	0.000	34.597	0.000	14.000
3473.000	85.000	585.759	.323	-.005	0.000	299.999	-265.402	14.000
3473.000	100.000	586.025	.266	-.003	0.000	299.999	-265.402	14.000

3473.000	120.000	586.127	.102	-.003	0.000	299.999	-265.[illegible]02	1[illegible].000
3493.000	65.000	585.675	0.000	.239	0.000	278.650	0.000	20.000
3493.000	85.000	585.780	.106	.022	0.000	299.999	-21.349	20.000
3493.000	100.000	586.031	.250	.006	0.000	299.999	-21.349	20.000
3493.000	120.000	586.132	.101	.005	0.000	299.999	-21.349	20.000
3507.000	65.000	585.688	0.000	.013	0.000	299.999	0.000	14.000
3507.000	85.000	585.797	.109	.017	0.000	299.999	-.000	14.000
3507.000	100.000	586.042	.245	.011	0.000	299.999	-.000	14.000
3507.000	120.000	586.144	.102	.012	0.000	299.999	-.000	14.000
3533.000	65.000	585.689	0.000	.001	0.000	414.259	0.000	26.000
3533.000	85.000	585.798	.109	.001	0.000	446.612	-32.353	26.000
3533.000	100.000	586.043	.245	.001	0.000	509.854	-95.595	26.000
3533.000	120.000	586.145	.102	.002	0.000	519.999	-105.740	26.000
3548.000	65.000	585.686	0.000	-.003	0.000	335.587	0.000	15.000
3548.000	85.000	585.795	.109	-.003	0.000	383.283	-47.696	15.000
3548.000	100.000	586.042	.247	-.001	0.000	491.223	-155.635	15.000
3548.000	120.000	586.145	.103	-.001	0.000	519.999	-184.412	15.000
3549.000	65.000	585.675	0.000	-.011	0.000	333.182	0.000	1.000
3549.000	85.000	585.790	.115	-.005	0.000	383.351	-50.168	1.000
3549.000	100.000	586.043	.253	.001	0.000	491.270	-158.088	1.000
3549.000	120.000	586.147	.104	.002	0.000	519.999	-186.817	1.000
3569.000	65.000	585.722	0.000	.047	0.000	346.729	0.000	20.000
3569.000	85.000	585.828	.106	.037	0.000	394.601	-47.871	20.000
3569.000	100.000	586.056	.228	.013	0.000	494.835	-148.105	20.000
3569.000	120.000	586.158	.103	.011	0.000	519.999	-173.270	20.000
3570.000	65.000	585.745	0.000	.023	0.000	361.036	0.000	1.000
3570.000	85.000	585.839	.094	.011	0.000	398.711	-37.675	1.000
3570.000	100.000	586.056	.217	-.000	0.000	495.110	-134.074	1.000
3570.000	120.000	586.158	.102	-.000	0.000	519.999	-158.963	1.000
3580.000	65.000	585.754	0.000	.009	0.000	434.509	0.000	10.000
3580.000	85.000	585.850	.096	.012	0.000	461.548	-27.040	10.000
3580.000	100.000	586.062	.212	.007	0.000	512.178	-77.669	10.000
3580.000	120.000	586.164	.102	.006	0.000	519.999	-85.490	10.000
3749.000	65.000	585.761	0.000	.007	0.000	490.791	0.000	169.000
3749.000	85.000	585.859	.099	.009	0.000	499.999	-9.208	169.000
3749.000	100.000	586.070	.211	.008	0.000	499.999	-9.208	169.000
3749.000	120.000	586.173	.103	.009	0.000	499.999	-9.208	169.000
3789.000	65.000	585.763	0.000	.002	0.000	336.177	0.000	40.000
3789.000	85.000	585.862	.099	.003	0.000	395.158	-58.981	40.000
3789.000	100.000	586.072	.210	.002	0.000	499.999	-163.822	40.000
3789.000	120.000	586.176	.103	.003	0.000	499.999	-163.822	40.000
3790.000	65.000	585.765	0.000	.002	0.000	336.214	0.000	1.000
3790.000	85.000	585.864	.100	.002	0.000	395.206	-58.992	1.000
3790.000	100.000	586.074	.209	.001	0.000	499.999	-163.785	1.000
3790.000	120.000	586.177	.103	.001	0.000	499.999	-163.785	1.000
3823.000	65.000	585.771	0.000	.006	0.000	338.843	0.000	33.000
3823.000	85.000	585.872	.101	.007	0.000	398.435	-59.591	33.000
3823.000	100.000	586.079	.207	.005	0.000	499.999	-161.156	33.000
3823.000	120.000	586.182	.103	.005	0.000	499.999	-161.156	33.000
3824.000	65.000	585.770	0.000	-.000	0.000	338.951	0.000	1.000
3824.000	85.000	585.871	.101	-.001	0.000	398.564	-59.613	1.000
3824.000	100.000	586.079	.207	-.000	0.000	499.999	-161.048	1.000
3824.000	120.000	586.182	.103	-.000	0.000	499.999	-161.048	1.000

3844.000	65.000	585.772	0.000	.002	0.000	499.999	0.000	20.000
3844.000	85.000	585.874	.101	.002	0.000	499.999	-.000	20.000
3844.000	100.000	586.080	.206	.002	0.000	499.999	-.000	20.000
3844.000	120.000	586.183	.103	.002	0.000	499.999	-.000	20.000
4095.000	65.000	585.784	0.000	.011	0.000	599.999	0.000	251.000
4095.000	85.000	585.888	.104	.014	0.000	599.999	-.000	251.000
4095.000	100.000	586.091	.204	.011	0.000	599.999	-.000	251.000
4095.000	120.000	586.196	.104	.012	0.000	599.999	-.000	251.000
4108.000	65.000	585.784	0.000	.001	0.000	599.999	0.000	13.000
4108.000	85.000	585.889	.105	.001	0.000	599.999	-.000	13.000
4108.000	100.000	586.092	.203	.001	0.000	599.999	-.000	13.000
4108.000	120.000	586.197	.105	.001	0.000	599.999	-.000	13.000
4109.000	65.000	585.786	0.000	.002	0.000	599.999	0.000	1.000
4109.000	85.000	585.891	.105	.002	0.000	599.999	-.000	1.000
4109.000	100.000	586.094	.203	.001	0.000	599.999	-.000	1.000
4109.000	120.000	586.198	.105	.001	0.000	599.999	-.000	1.000
4126.000	65.000	585.792	0.000	.006	0.000	599.999	0.000	17.000
4126.000	85.000	585.896	.104	.005	0.000	599.999	-.000	17.000
4126.000	100.000	586.096	.200	.003	0.000	599.999	-.000	17.000
4126.000	120.000	586.201	.104	.003	0.000	599.999	-.000	17.000
4130.000	65.000	585.791	0.000	-.001	0.000	599.999	0.000	4.000
4130.000	85.000	585.895	.104	-.001	0.000	599.999	-.000	4.000
4130.000	100.000	586.096	.200	-.001	0.000	599.999	-.000	4.000
4130.000	120.000	586.200	.104	-.001	0.000	599.999	-.000	4.000
4131.000	65.000	585.795	0.000	.003	0.000	599.999	0.000	1.000
4131.000	85.000	585.900	.105	.004	0.000	599.999	-.000	1.000
4131.000	100.000	586.099	.199	.003	0.000	599.999	-.000	1.000
4131.000	120.000	586.203	.105	.003	0.000	599.999	-.000	1.000
4155.000	65.000	585.797	0.000	.002	0.000	599.999	0.000	24.000
4155.000	85.000	585.902	.105	.002	0.000	599.999	-.000	24.000
4155.000	100.000	586.100	.198	.001	0.000	599.999	-.000	24.000
4155.000	120.000	586.205	.105	.002	0.000	599.999	-.000	24.000
4156.000	65.000	585.797	0.000	-.000	0.000	599.999	0.000	1.000
4156.000	85.000	585.902	.105	-.000	0.000	599.999	-.000	1.000
4156.000	100.000	586.100	.198	-.000	0.000	599.999	-.000	1.000
4156.000	120.000	586.205	.105	-.000	0.000	599.999	-.000	1.000
4166.000	65.000	585.796	0.000	-.000	0.000	599.999	0.000	10.000
4166.000	85.000	585.901	.105	-.000	0.000	599.999	-.000	10.000
4166.000	100.000	586.100	.199	-.000	0.000	599.999	-.000	10.000
4166.000	120.000	586.205	.105	-.000	0.000	599.999	-.000	10.000
4177.000	65.000	585.797	0.000	.000	0.000	599.999	0.000	11.000
4177.000	85.000	585.902	.105	.000	0.000	599.999	-.000	11.000
4177.000	100.000	586.100	.199	.000	0.000	599.999	-.000	11.000
4177.000	120.000	586.205	.105	.000	0.000	599.999	-.000	11.000
4248.000	65.000	585.802	0.000	.006	0.000	599.999	0.000	71.000
4248.000	85.000	585.908	.106	.007	0.000	599.999	-.000	71.000
4248.000	100.000	586.105	.197	.005	0.000	599.999	-.000	71.000
4248.000	120.000	586.210	.105	.005	0.000	599.999	-.000	71.000
4249.000	65.000	585.803	0.000	.001	0.000	599.999	0.000	1.000
4249.000	85.000	585.910	.106	.002	0.000	599.999	-.000	1.000
4249.000	100.000	586.106	.196	.001	0.000	599.999	-.000	1.000
4249.000	120.000	586.211	.105	.001	0.000	599.999	-.000	1.000

4261.000	65.000	585.804	0.000	.001	0.000	599.999	0.000	12.000
4261.000	85.000	585.911	.106	.001	0.000	599.999	-.000	12.000
4261.000	100.000	586.107	.196	.001	0.000	599.999	-.000	12.000
4261.000	120.000	586.212	.105	.001	0.000	599.999	-.000	12.000
4262.000	65.000	585.802	0.000	-.002	0.000	599.999	0.000	1.000
4262.000	85.000	585.908	.106	-.003	0.000	599.999	-.000	1.000
4262.000	100.000	586.105	.197	-.002	0.000	599.999	-.000	1.000
4262.000	120.000	586.210	.105	-.002	0.000	599.999	-.000	1.000
4279.000	65.000	585.807	0.000	.005	0.000	599.999	0.000	17.000
4279.000	85.000	585.913	.107	.005	0.000	599.999	-.000	17.000
4279.000	100.000	586.109	.195	.003	0.000	599.999	-.000	17.000
4279.000	120.000	586.214	.105	.003	0.000	599.999	-.000	17.000
4313.000	65.000	585.809	0.000	.002	0.000	599.999	0.000	34.000
4313.000	85.000	585.916	.107	.003	0.000	599.999	-.000	34.000
4313.000	100.000	586.110	.194	.002	0.000	599.999	-.000	34.000
4313.000	120.000	586.216	.105	.002	0.000	599.999	-.000	34.000
4328.000	65.000	585.810	0.000	.001	0.000	599.999	0.000	15.000
4328.000	85.000	585.918	.108	.002	0.000	599.999	-.000	15.000
4328.000	100.000	586.112	.194	.001	0.000	599.999	-.000	15.000
4328.000	120.000	586.217	.105	.001	0.000	599.999	-.000	15.000
4329.000	65.000	585.812	0.000	.002	0.000	599.999	0.000	1.000
4329.000	85.000	585.920	.108	.002	0.000	599.999	-.000	1.000
4329.000	100.000	586.113	.193	.001	0.000	599.999	-.000	1.000
4329.000	120.000	586.218	.105	.001	0.000	599.999	-.000	1.000
4394.000	65.000	585.825	0.000	.013	0.000	599.999	0.000	65.000
4394.000	85.000	585.932	.107	.012	0.000	599.999	-.000	65.000
4394.000	100.000	586.120	.188	.007	0.000	599.999	-.000	65.000
4394.000	120.000	586.225	.105	.007	0.000	599.999	-.000	65.000
4395.000	65.000	585.824	0.000	-.001	0.000	599.999	0.000	1.000
4395.000	85.000	585.931	.107	-.001	0.000	599.999	-.000	1.000
4395.000	100.000	586.120	.188	-.000	0.000	599.999	-.000	1.000
4395.000	120.000	586.225	.105	-.000	0.000	599.999	-.000	1.000
4405.000	65.000	585.824	0.000	-.000	0.000	599.999	0.000	10.000
4405.000	85.000	585.931	.107	.000	0.000	599.999	-.000	10.000
4405.000	100.000	586.120	.188	.000	0.000	599.999	-.000	10.000
4405.000	120.000	586.225	.105	.000	0.000	599.999	-.000	10.000
4508.000	65.000	585.834	0.000	.010	0.000	557.530	0.000	103.000
4508.000	85.000	585.943	.109	.011	0.000	599.999	-42.469	103.000
4508.000	100.000	586.128	.185	.008	0.000	599.999	-42.469	103.000
4508.000	120.000	586.233	.105	.008	0.000	599.999	-42.469	103.000
4519.000	65.000	585.835	0.000	.002	0.000	599.999	0.000	11.000
4519.000	85.000	585.944	.109	.002	0.000	599.999	-.000	11.000
4519.000	100.000	586.129	.185	.001	0.000	599.999	-.000	11.000
4519.000	120.000	586.234	.105	.001	0.000	599.999	-.000	11.000
4520.000	65.000	585.838	0.000	.003	0.000	599.999	0.000	1.000
4520.000	85.000	585.947	.109	.003	0.000	599.999	-.000	1.000
4520.000	100.000	586.131	.184	.002	0.000	599.999	-.000	1.000
4520.000	120.000	586.236	.105	.002	0.000	599.999	-.000	1.000
4527.000	65.000	585.840	0.000	.001	0.000	599.999	0.000	7.000
4527.000	85.000	585.949	.109	.001	0.000	599.999	-.000	7.000
4527.000	100.000	586.132	.183	.001	0.000	599.999	-.000	7.000
4527.000	120.000	586.237	.105	.001	0.000	599.999	-.000	7.000
4528.000	65.000	585.839	0.000	-.001	0.000	599.999	0.000	1.000

4528.000	85.000	585.948	.109	-.001	0.000	599.999	-.000	1.000
4528.000	100.000	586.131	.183	-.001	0.000	599.999	-.000	1.000
4528.000	120.000	586.236	.105	-.001	0.000	599.999	-.000	1.000
4538.000	65.000	585.839	0.000	.001	0.000	565.589	0.000	10.000
4538.000	85.000	585.949	.109	.001	0.000	599.999	-34.410	10.000
4538.000	100.000	586.132	.183	.001	0.000	599.999	-34.410	10.000
4538.000	120.000	586.237	.105	.001	0.000	599.999	-34.410	10.000
4570.000	65.000	585.841	0.000	.002	0.000	522.620	0.000	32.000
4570.000	85.000	585.951	.110	.002	0.000	533.427	-10.807	32.000
4570.000	100.000	586.134	.183	.002	0.000	552.086	-29.467	32.000
4570.000	120.000	586.239	.106	.002	0.000	562.873	-40.254	32.000
4655.000	65.000	585.851	0.000	.009	0.000	623.032	0.000	85.000
4655.000	85.000	585.962	.111	.011	0.000	623.414	-.382	85.000
4655.000	100.000	586.142	.180	.008	0.000	624.058	-1.026	85.000
4655.000	120.000	586.247	.106	.008	0.000	624.435	-1.404	85.000
4670.000	65.000	585.851	0.000	.000	0.000	554.948	0.000	15.000
4670.000	85.000	585.962	.111	.000	0.000	576.301	-21.353	15.000
4670.000	100.000	586.142	.180	.000	0.000	612.175	-57.227	15.000
4670.000	120.000	586.248	.106	.000	0.000	624.999	-70.051	15.000
4691.000	65.000	585.853	0.000	.002	0.000	557.387	0.000	21.000
4691.000	85.000	585.964	.112	.003	0.000	579.621	-22.234	21.000
4691.000	100.000	586.145	.180	.003	0.000	614.588	-57.201	21.000
4691.000	120.000	586.251	.106	.003	0.000	624.999	-67.612	21.000
4704.000	65.000	585.854	0.000	.002	0.000	623.069	0.000	13.000
4704.000	85.000	585.966	.112	.002	0.000	623.466	-.397	13.000
4704.000	100.000	586.146	.180	.001	0.000	624.102	-1.033	13.000
4704.000	120.000	586.252	.106	.001	0.000	624.479	-1.410	13.000
4744.000	65.000	585.856	0.000	.001	0.000	623.114	0.000	40.000
4744.000	85.000	585.968	.112	.002	0.000	623.504	-.390	40.000
4744.000	100.000	586.147	.180	.001	0.000	624.126	-1.012	40.000
4744.000	120.000	586.254	.106	.002	0.000	624.496	-1.382	40.000
4805.000	65.000	585.858	0.000	.002	0.000	502.883	0.000	61.000
4805.000	85.000	585.970	.113	.003	0.000	516.110	-13.227	61.000
4805.000	100.000	586.150	.179	.002	0.000	537.090	-34.207	61.000
4805.000	120.000	586.256	.107	.002	0.000	549.608	-46.725	61.000
4832.000	65.000	585.860	0.000	.003	0.000	503.282	0.000	27.000
4832.000	85.000	585.974	.113	.003	0.000	516.603	-13.321	27.000
4832.000	100.000	586.154	.180	.004	0.000	537.650	-34.368	27.000
4832.000	120.000	586.261	.107	.005	0.000	550.241	-46.959	27.000
4847.000	65.000	585.862	0.000	.002	0.000	623.136	0.000	15.000
4847.000	85.000	585.976	.114	.002	0.000	623.531	-.395	15.000
4847.000	100.000	586.155	.179	.002	0.000	624.153	-1.017	15.000
4847.000	120.000	586.263	.107	.002	0.000	624.525	-1.389	15.000
4869.000	65.000	585.863	0.000	.001	0.000	558.088	0.000	22.000
4869.000	85.000	585.977	.114	.001	0.000	580.771	-22.684	22.000
4869.000	100.000	586.156	.179	.001	0.000	616.440	-58.352	22.000
4869.000	120.000	586.264	.107	.001	0.000	624.999	-66.911	22.000
4870.000	65.000	585.864	0.000	.000	0.000	558.098	0.000	1.000
4870.000	85.000	585.978	.114	.000	0.000	580.783	-22.685	1.000
4870.000	100.000	586.157	.179	.000	0.000	616.450	-58.351	1.000
4870.000	120.000	586.264	.107	.000	0.000	624.999	-66.901	1.000
4888.000	65.000	585.866	0.000	.002	0.000	558.445	0.000	18.000
4888.000	85.000	585.980	.114	.002	0.000	581.158	-22.713	18.000

4888.000	100.000	586.158	.178	.002	0.000	616.726	-58.281	18.000
4888.000	120.000	586.266	.107	.002	0.000	624.999	-66.554	18.000
4889.000	65.000	585.866	0.000	-.000	0.000	558.470	0.000	1.000
4889.000	85.000	585.980	.114	-.000	0.000	581.184	-22.714	1.000
4889.000	100.000	586.158	.178	.000	0.000	616.744	-58.275	1.000
4889.000	120.000	586.266	.107	.000	0.000	624.999	-66.529	1.000
4905.000	65.000	585.867	0.000	.001	0.000	623.073	0.000	16.000
4905.000	85.000	585.981	.114	.001	0.000	623.486	-.413	16.000
4905.000	100.000	586.159	.178	.001	0.000	624.130	-1.057	16.000
4905.000	120.000	586.266	.107	.001	0.000	624.519	-1.446	16.000
4947.000	65.000	585.868	0.000	.001	0.000	520.406	0.000	42.000
4947.000	85.000	585.982	.114	.002	0.000	536.805	-16.399	42.000
4947.000	100.000	586.160	.178	.001	0.000	562.241	-41.835	42.000
4947.000	120.000	586.268	.108	.001	0.000	577.661	-57.254	42.000
4948.000	65.000	585.870	0.000	.002	0.000	520.412	0.000	1.000
4948.000	85.000	585.984	.115	.002	0.000	536.812	-16.400	1.000
4948.000	100.000	586.162	.178	.001	0.000	562.247	-41.835	1.000
4948.000	120.000	586.269	.108	.001	0.000	577.667	-57.255	1.000
4962.000	65.000	585.871	0.000	.001	0.000	520.553	0.000	14.000
4962.000	85.000	585.986	.115	.001	0.000	536.974	-16.421	14.000
4962.000	100.000	586.163	.177	.001	0.000	562.376	-41.823	14.000
4962.000	120.000	586.271	.108	.001	0.000	577.805	-57.252	14.000
4963.000	65.000	585.870	0.000	-.001	0.000	520.566	0.000	1.000
4963.000	85.000	585.985	.115	-.001	0.000	536.989	-16.423	1.000
4963.000	100.000	586.162	.177	-.000	0.000	562.388	-41.822	1.000
4963.000	120.000	586.270	.108	-.000	0.000	577.817	-57.251	1.000
4975.000	65.000	585.872	0.000	.002	0.000	623.088	0.000	12.000
4975.000	85.000	585.987	.115	.002	0.000	623.503	-.415	12.000
4975.000	100.000	586.164	.177	.002	0.000	624.144	-1.056	12.000
4975.000	120.000	586.272	.108	.002	0.000	624.534	-1.446	12.000
5034.000	65.000	585.875	0.000	.003	0.000	518.990	0.000	59.000
5034.000	85.000	585.990	.115	.003	0.000	535.823	-16.834	59.000
5034.000	100.000	586.167	.176	.003	0.000	561.623	-42.633	59.000
5034.000	120.000	586.275	.108	.003	0.000	577.396	-58.406	59.000
5035.000	65.000	585.875	0.000	.000	0.000	518.998	0.000	1.000
5035.000	85.000	585.991	.115	.000	0.000	535.833	-16.835	1.000
5035.000	100.000	586.167	.176	.000	0.000	561.630	-42.632	1.000
5035.000	120.000	586.275	.108	.000	0.000	577.404	-58.405	1.000
5059.000	65.000	585.878	0.000	.002	0.000	519.317	0.000	24.000
5059.000	85.000	585.993	.116	.003	0.000	536.186	-16.869	24.000
5059.000	100.000	586.169	.176	.002	0.000	561.903	-42.585	24.000
5059.000	120.000	586.277	.108	.002	0.000	577.688	-58.371	24.000
5060.000	65.000	585.878	0.000	.000	0.000	519.332	0.000	1.000
5060.000	85.000	585.993	.116	.000	0.000	536.203	-16.871	1.000
5060.000	100.000	586.169	.176	.000	0.000	561.915	-42.583	1.000
5060.000	120.000	586.277	.108	.000	0.000	577.701	-58.369	1.000
5075.000	65.000	585.879	0.000	.001	0.000	623.224	0.000	15.000
5075.000	85.000	585.994	.116	.001	0.000	623.617	-.393	15.000
5075.000	100.000	586.170	.175	.001	0.000	624.214	-.991	15.000
5075.000	120.000	586.278	.108	.001	0.000	624.582	-1.358	15.000
5190.000	65.000	585.882	0.000	.004	0.000	614.323	0.000	115.000
5190.000	85.000	585.999	.116	.004	0.000	618.846	-4.523	115.000
5190.000	100.000	586.173	.175	.004	0.000	622.041	-7.718	115.000

5190.000	120.000	586.282	.108	.004	0.000	624.031	-9.708	115.000
5356.000	65.000	585.887	0.000	.005	0.000	624.953	0.000	166.000
5356.000	85.000	586.005	.117	.006	0.000	624.999	-.046	166.000
5356.000	100.000	586.179	.174	.005	0.000	624.999	-.046	166.000
5356.000	120.000	586.288	.109	.006	0.000	624.999	-.046	166.000
5412.000	65.000	585.894	0.000	.007	0.000	534.439	0.000	56.000
5412.000	85.000	586.013	.119	.008	0.000	560.571	-26.132	56.000
5412.000	100.000	586.185	.172	.006	0.000	598.892	-64.453	56.000
5412.000	120.000	586.294	.109	.006	0.000	623.090	-88.651	56.000
5431.000	65.000	585.897	0.000	.003	0.000	537.466	0.000	19.000
5431.000	85.000	586.019	.122	.006	0.000	564.024	-26.558	19.000
5431.000	100.000	586.192	.173	.007	0.000	601.788	-64.323	19.000
5431.000	120.000	586.301	.109	.007	0.000	624.999	-87.533	19.000
5448.000	65.000	585.906	0.000	.009	0.000	624.999	0.000	17.000
5448.000	85.000	586.025	.119	.006	0.000	624.999	-.000	17.000
5448.000	100.000	586.195	.170	.003	0.000	624.999	-.000	17.000
5448.000	120.000	586.304	.109	.002	0.000	624.999	-.000	17.000
5502.000	65.000	585.910	0.000	.004	0.000	624.999	0.000	54.000
5502.000	85.000	586.030	.119	.004	0.000	624.999	-.000	54.000
5502.000	100.000	586.198	.169	.003	0.000	624.999	-.000	54.000
5502.000	120.000	586.307	.109	.003	0.000	624.999	-.000	54.000
5529.000	65.000	585.910	0.000	-.000	0.000	415.873	0.000	27.000
5529.000	85.000	586.030	.120	.000	0.000	478.578	-62.705	27.000
5529.000	100.000	586.199	.169	.000	0.000	553.999	-138.126	27.000
5529.000	120.000	586.308	.109	.001	0.000	553.999	-138.126	27.000
5548.000	65.000	585.917	0.000	.007	0.000	419.967	0.000	19.000
5548.000	85.000	586.037	.120	.007	0.000	480.732	-60.765	19.000
5548.000	100.000	586.207	.170	.008	0.000	553.999	-134.032	19.000
5548.000	120.000	586.317	.110	.009	0.000	553.999	-134.032	19.000
5556.000	65.000	585.923	0.000	.006	0.000	624.999	0.000	8.000
5556.000	85.000	586.043	.120	.006	0.000	624.999	-.000	8.000
5556.000	100.000	586.211	.168	.004	0.000	624.999	-.000	8.000
5556.000	120.000	586.321	.110	.004	0.000	624.999	-.000	8.000
5599.000	65.000	585.925	0.000	.002	0.000	496.369	0.000	43.000
5599.000	85.000	586.046	.121	.003	0.000	512.403	-16.034	43.000
5599.000	100.000	586.213	.168	.003	0.000	534.457	-38.088	43.000
5599.000	120.000	586.324	.110	.003	0.000	549.056	-52.687	43.000
5617.000	65.000	585.928	0.000	.003	0.000	497.370	0.000	18.000
5617.000	85.000	586.051	.122	.005	0.000	513.534	-16.164	18.000
5617.000	100.000	586.219	.169	.006	0.000	535.540	-38.171	18.000
5617.000	120.000	586.330	.111	.006	0.000	550.158	-52.789	18.000
5633.000	65.000	585.937	0.000	.009	0.000	624.999	0.000	16.000
5633.000	85.000	586.059	.122	.009	0.000	624.999	-.000	16.000
5633.000	100.000	586.225	.166	.006	0.000	624.999	-.000	16.000
5633.000	120.000	586.335	.110	.005	0.000	624.999	-.000	16.000
7260.000	65.000	586.044	0.000	.107	0.000	436.808	0.000	1627.000
7260.000	85.000	586.180	.135	.120	0.000	525.645	-88.837	1627.000
7260.000	100.000	586.327	.148	.102	0.000	624.999	-188.191	1627.000
7260.000	120.000	586.441	.114	.106	0.000	624.999	-188.191	1627.000
7309.000	65.000	586.048	0.000	.004	0.000	772.163	0.000	49.000
7309.000	85.000	586.184	.136	.004	0.000	882.356	-110.193	49.000
7309.000	100.000	586.331	.147	.004	0.000	1000.226	-228.063	49.000
7309.000	120.000	586.445	.114	.004	0.000	1016.852	-244.689	49.000

7349.000	65.000	586.047	0.000	-.001	0.000	278.594	0.000	40.000
7349.000	85.000	586.183	.136	-.001	0.000	301.861	-23.267	40.000
7349.000	100.000	586.330	.147	-.000	0.000	353.799	-75.206	40.000
7349.000	120.000	586.445	.114	-.000	0.000	591.483	-312.890	40.000
7388.000	65.000	586.059	0.000	.011	0.000	281.110	0.000	39.000
7388.000	85.000	586.197	.138	.013	0.000	304.764	-23.655	39.000
7388.000	100.000	586.345	.149	.015	0.000	371.740	-90.630	39.000
7388.000	120.000	586.459	.114	.015	0.000	618.293	-337.183	39.000
7398.000	65.000	586.047	0.000	-.012	0.000	187.101	0.000	10.000
7398.000	85.000	586.181	.134	-.015	0.000	352.035	-164.934	10.000
7398.000	100.000	586.336	.155	-.009	0.000	422.122	-235.021	10.000
7398.000	120.000	586.453	.117	-.007	0.000	471.642	-284.540	10.000
8760.000	55.000	586.118	0.000	.071	0.000	618.015	0.000	1362.000
8760.000	70.000	586.268	.150	.087	0.000	618.201	-.186	1362.000
8760.000	80.000	586.405	.137	.069	0.000	618.374	-.359	1362.000
8760.000	95.000	586.519	.114	.066	0.000	618.517	-.502	1362.000
8810.000	55.000	586.118	0.000	.000	0.000	618.999	0.000	50.000
8810.000	70.000	586.268	.151	.000	0.000	618.999	-.000	50.000
8810.000	80.000	586.405	.137	.000	0.000	618.999	-.000	50.000
8810.000	95.000	586.519	.114	.000	0.000	618.999	-.000	50.000
8811.000	55.000	586.118	0.000	.000	0.000	618.999	0.000	1.000
8811.000	70.000	586.268	.151	.000	0.000	618.999	-.000	1.000
8811.000	80.000	586.405	.137	.000	0.000	618.999	-.000	1.000
8811.000	95.000	586.519	.114	.000	0.000	618.999	-.000	1.000
8845.000	55.000	586.121	0.000	.004	0.000	618.999	0.000	34.000
8845.000	70.000	586.271	.150	.003	0.000	618.999	-.000	34.000
8845.000	80.000	586.408	.136	.002	0.000	618.999	-.000	34.000
8845.000	95.000	586.522	.114	.002	0.000	618.999	-.000	34.000
8846.000	55.000	586.121	0.000	-.000	0.000	618.999	0.000	1.000
8846.000	70.000	586.271	.150	-.000	0.000	618.999	-.000	1.000
8846.000	80.000	586.407	.136	-.000	0.000	618.999	-.000	1.000
8846.000	95.000	586.521	.114	-.000	0.000	618.999	-.000	1.000
8871.000	55.000	586.123	0.000	.002	0.000	518.037	0.000	25.000
8871.000	70.000	586.273	.150	.002	0.000	518.226	-.189	25.000
8871.000	80.000	586.409	.136	.001	0.000	518.393	-.357	25.000
8871.000	95.000	586.523	.114	.001	0.000	518.535	-.499	25.000
11271.000	13.000	586.137	0.000	.014	0.000	520.999	0.000	2400.000
11271.000	13.000	586.288	.151	.015	0.000	520.999	-.000	2400.000
11271.000	14.000	586.424	.136	.015	0.000	520.999	-.000	2400.000
11271.000	15.000	586.539	.116	.017	0.000	520.999	-.000	2400.000
11321.000	13.000	586.132	0.000	-.006	0.000	12.888	0.000	50.000
11321.000	13.000	586.283	.152	-.005	0.000	13.408	-.521	50.000
11321.000	14.000	586.419	.135	-.005	0.000	13.876	-.988	50.000
11321.000	15.000	586.534	.115	-.005	0.000	14.274	-1.387	50.000
11367.000	13.000	587.768	0.000	1.636	0.000	206.376	0.000	46.000
11367.000	13.000	587.770	.002	1.487	0.000	209.024	-2.647	46.000
11367.000	14.000	587.778	.008	1.359	0.000	219.037	-12.661	46.000
11367.000	15.000	587.784	.007	1.250	0.000	228.040	-21.664	46.000
11392.000	13.000	587.770	0.000	.003	0.000	18.531	0.000	25.000
11392.000	13.000	587.773	.002	.003	0.000	18.537	-.005	25.000
11392.000	14.000	587.781	.008	.003	0.000	18.564	-.033	25.000
11392.000	15.000	587.788	.007	.003	0.000	18.589	-.058	25.000

DATA FOR LAST CROSS SECTION

PROFILE	TYPE ENC	TARGET	TOP WIDTH AREA-ACRES	TOP WIDTH AREA-DIFF
1	0.000	0.000	94.012	0.000
2	0.000	0.000	99.688	5.676
3	0.000	0.000	104.058	10.045
4	0.000	0.000	105.969	11.956

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Frankenlust Twp

3) WATERCOURSE: Dutch Creek

4) DOCUMENT TYPE: 100-YR NATURAL

00BREAK00

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$$$$$$$$  $$$$$$$      $$      $$$$$$$$   $$$$$ $   $$     $$    $$$$$$
$$        $$    $$    $$$$        $$     $$    $    $$     $$   $$    $$
$$        $$    $$   $$  $$       $$     $$   $$$   $$     $$   $$    $$
$$$$$     $$    $$   $$    $$      $$     $$  $ $$   $$     $$    $$$$$$
$$        $$    $$   $$    $$      $$     $$ $$ $$   $$     $$   $$    $$
$$        $$$$$$$$   $$$$$$$$      $$     $$ $  $$   $$     $$   $$    $$
$$        $$  $$     $$    $$      $$     $$$   $$    $$  $$   $$    $$
$$        $$   $$    $$    $$  $$ $$       $    $$     $$$$    $$    $$
$$        $$    $$   $$    $$   $$$       $ $$$$$      $$     $$$$$$
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TOWNSHIP OF FRANKENLUST FIS

J&A FILE NO. 5555-21

DUTCH CREEK
10-50-100-500-YR. FLOWS
REVISED HEC-2
ADD .25' DUE TO DATUM DIFFERENCE !

RECEIVED
SEP 21 1977
WATER MANAGEMENT

494

9-19-77

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*****************************************
HEC2 VERSION UPDATED JAN 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09
MODIFICATIONS 52,53,54,55,56,57,58
*****************************************
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C
1          FRANKENLUST TWP. FIS 5555-21, PROJECT MANAGER: JAMES KREGER
T2       10 YEAR FLOW
T3       DUTCH CREEK

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.        2.        0.        0.  0.000000      0.00       0.0        0.   581.980     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      1.000    10.000    11.000    12.000    14.000     8.000     4.000     0.000     0.000     0.000
NC       .050      .050      .030      .300      .500     0.000     0.000     0.000     0.000     0.000
QT      4.000  2580.000  3430.000  3905.000  5015.000     0.000     0.000     0.000     0.000     0.000

X1   3199.000    50.000  1500.000  1647.000     0.000     0.000     0.000     0.000     0.000     0.000
X3     10.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
GR    585.500     0.000   585.400   100.000   585.700   200.000   585.600   300.000   585.500   400.000
GR    585.500   500.000   585.500   600.000   585.200   700.000   584.600   800.000   584.400   900.000
GR    584.300  1000.000   584.300  1100.000   583.700  1200.000   583.100  1300.000   583.200  1400.000
GR    587.200  1500.000   578.900  1500.000   576.200  1510.000   575.300  1520.000   575.200  1530.000
GR    575.100  1540.000   575.100  1546.500   575.100  1549.500   575.800  1560.000   575.100  1570.000
GR    574.800  1580.000   574.400  1590.000   573.600  1597.500   573.900  1600.500   574.900  1610.000
GR    575.100  1620.000   575.300  1630.000   576.400  1640.000   577.400  1647.000   587.000  1647.000
GR    585.100  1700.000   584.100  1800.000   584.200  1900.000   584.400  2000.000   584.500  2100.000
GR    584.700  2200.000   585.000  2300.000   585.800  2385.000   585.600  2400.000   585.000  2500.000
GR    585.400  2600.000   585.500  2700.000   585.200  2800.000   585.400  2900.000   585.300  3000.000
NC       .050      .050      .035     0.000     0.000     0.000     0.000     0.000     0.000     0.000

X1   3200.000    55.000  1500.000  1647.000     1.000     1.000     1.000     0.000     0.000     0.000
X3     10.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
BT     49.000     0.000   585.500     0.000   100.000   585.400     0.000   200.000   585.700     0.000
BT    300.000   585.600     0.000   400.000   585.500     0.000   500.000   585.500     0.000   600.000
BT    585.500     0.000   700.000   585.200     0.000   800.000   584.600     0.000   900.000   584.400
BT      0.000  1000.000   584.300     0.000  1100.000   584.300     0.000  1200.000   583.700     0.000
BT   1300.000   583.100     0.000  1400.000   583.200     0.000  1500.000   587.200   584.500  1510.000
BT    587.200   584.400  1520.000   587.200   584.400  1530.000   587.200   584.300  1540.000   587.100
BT    584.200  1546.500   587.100   584.200  1549.500   587.100   584.200  1560.000   587.100   584.200
BT   1570.000   587.100   584.200  1580.000   587.100   584.300  1590.000   587.100   584.300  1597.500
BT    587.100   584.300  1599.000   587.100   584.300  1600.500   587.100   584.300  1610.000   587.100
BT    584.300  1620.000   587.000   584.200  1630.000   587.000   584.200  1640.000   587.000   584.100
BT   1647.000   587.000   584.100  1700.000   585.100     0.000  1800.000   584.100     0.000  1900.000
BT    584.200     0.000  2000.000   584.400     0.000  2100.000   584.500     0.000  2200.000   584.700
BT      0.000  2300.000   585.000     0.000  2385.000   585.800     0.000  2400.000   585.600     0.000
BT   2500.000   585.000     0.000  2600.000   585.400     0.000  2700.000   585.500     0.000  2800.000
BT    585.200     0.000  2900.000   585.400     0.000  3000.000   585.300     0.000     0.000     0.000
GR    585.500     0.000   585.400   100.000   585.700   200.000   585.600   300.000   585.500   400.000
GR    585.500   500.000   585.500   600.000   585.200   700.000   584.600   800.000   584.400   900.000
GR    584.300  1000.000   584.300  1100.000   583.700  1200.000   583.100  1300.000   583.200  1400.000
GR    587.200  1500.000   578.900  1500.000   576.200  1510.000   575.300  1520.000   575.200  1530.000
GR    575.100  1540.000   575.100  1546.500   584.200  1546.500   584.200  1549.500   575.100  1549.500
GR    575.800  1560.000   575.100  1570.000   574.800  1580.000   574.100  1590.000   573.600  1597.500
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GR	584.300	1597.500	584.300	1599.000	584.300	1600.500	573.900	1600.500	574.900	1610.000
GR	575.100	1620.000	575.300	1630.000	576.400	1640.000	577.400	1647.000	587.000	1647.000
GR	585.100	1700.000	584.100	1800.000	584.200	1900.000	584.400	2000.000	584.500	2100.000
GR	584.700	2200.000	585.000	2300.000	585.800	2385.000	585.600	2400.000	585.000	2500.000
GR	585.400	2600.000	585.500	2700.000	585.200	2800.000	585.400	2900.000	585.300	3000.000
X1	3218.000	0.000	0.000	0.000	18.000	18.000	18.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	.050	.050	.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	3219.000	50.000	1500.000	1647.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	585.500	0.000	585.400	100.000	585.700	200.000	585.600	300.000	585.500	400.000
GR	585.500	500.000	585.500	600.000	585.200	700.000	584.600	800.000	584.400	900.000
GR	584.300	1000.000	584.300	1100.000	583.700	1200.000	583.100	1300.000	583.200	1400.000
GR	587.200	1500.000	578.900	1500.000	576.200	1510.000	575.300	1520.000	575.200	1530.000
GR	575.100	1540.000	575.100	1546.500	575.100	1549.500	575.800	1560.000	575.100	1570.000
GR	574.800	1580.000	574.400	1590.000	573.600	1597.500	573.900	1600.500	574.900	1610.000
GR	575.100	1620.000	575.300	1630.000	576.400	1640.000	577.400	1647.000	587.000	1647.000
GR	585.100	1700.000	584.100	1800.000	584.200	1900.000	584.400	2000.000	584.500	2100.000
GR	584.700	2200.000	585.000	2300.000	585.800	2385.000	585.600	2400.000	585.000	2500.000
GR	585.400	2600.000	585.500	2700.000	585.200	2800.000	585.400	2900.000	585.300	3000.000
X1	3318.000	46.000	1486.000	1800.000	99.000	99.000	99.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	583.200	0.000	583.100	100.000	582.900	200.000	583.200	300.000	583.000	400.000
GR	583.100	500.000	583.300	600.000	583.300	700.000	583.200	800.000	583.200	900.000
GR	583.400	1000.000	583.300	1100.000	583.400	1200.000	583.000	1300.000	582.400	1400.000
GR	582.500	1445.000	586.600	1486.000	580.400	1490.000	577.900	1505.000	577.000	1535.000
GR	576.500	1565.000	576.600	1570.000	576.400	1590.000	575.300	1615.000	574.800	1630.000
GR	574.400	1640.000	573.700	1665.000	574.400	1690.000	574.100	1700.000	574.400	1704.000
GR	576.400	1745.000	577.900	1765.000	579.800	1787.000	581.700	1800.000	586.700	1800.000
GR	586.600	1815.000	582.600	1822.000	580.700	1900.000	581.100	2000.000	581.900	2100.000
GR	582.400	2200.000	582.500	2300.000	582.700	2400.000	582.400	2500.000	582.400	2600.000
GR	586.200	2635.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	3718.000	46.000	1486.000	1886.000	400.000	400.000	400.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	1886.000	0.000	0.000	0.000	0.000
GR	583.200	0.000	583.100	100.000	582.900	200.000	583.200	300.000	583.000	400.000
GR	583.100	500.000	583.300	600.000	583.300	700.000	583.200	800.000	583.200	900.000
GR	583.400	1000.000	583.300	1100.000	583.400	1200.000	583.000	1300.000	582.400	1400.000
GR	582.500	1445.000	586.600	1486.000	581.500	1496.000	577.470	1534.000	576.570	1611.000
GR	576.070	1688.000	576.170	1701.000	575.970	1752.000	574.870	1816.000	574.370	1854.000
GR	573.970	1880.000	573.270	1944.000	573.970	2008.000	574.300	2034.000	574.600	2044.000
GR	576.600	2147.000	578.100	2198.000	580.000	2254.000	581.900	2286.000	586.700	2286.000
GR	586.600	2301.000	582.600	2308.000	580.700	2386.000	581.100	2486.000	581.900	2586.000
GR	582.400	2686.000	582.500	2786.000	582.700	2886.000	582.400	2986.000	582.400	3086.000
GR	586.200	3186.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	4018.000	46.000	1486.000	1800.000	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	0.000	0.000	0.000
GR	583.200	0.000	583.100	100.000	582.900	200.000	583.200	300.000	583.000	400.000
GR	583.100	500.000	583.300	600.000	583.300	700.000	583.200	800.000	583.200	900.000
GR	583.400	1000.000	583.300	1100.000	583.400	1200.000	583.000	1300.000	582.400	1400.000
GR	582.500	1445.000	586.600	1486.000	580.700	1490.000	578.200	1505.000	577.300	1535.000
GR	576.800	1565.000	576.900	1570.000	576.700	1590.000	575.600	1615.000	575.100	1630.000
GR	574.700	1640.000	574.000	1665.000	574.700	1690.000	574.400	1700.000	574.700	1704.000
GR	576.700	1745.000	578.200	1765.000	580.100	1787.000	582.000	1800.000	586.700	1800.000
GR	586.600	1815.000	582.600	1822.000	580.700	1900.000	581.100	2000.000	581.900	2100.000
GR	582.400	2200.000	582.500	2300.000	582.700	2400.000	582.400	2500.000	582.400	2600.000
GR	586.200	2635.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	4875.000	46.000	1486.000	1800.000	857.000	857.000	857.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1549.000	0.000	1737.000	0.000	0.000	0.000	0.000
GR	583.200	0.000	583.100	100.000	582.900	200.000	583.200	300.000	583.000	400.000

GR	583.100	500.000	583.300	600.000	583.300	700.000	583.200	800.000	583.200	900.000
GR	583.400	1000.000	583.300	1100.000	583.400	1200.000	583.000	1300.000	582.400	1400.000
GR	582.500	1445.000	586.600	1486.000	581.200	1490.000	578.700	1505.000	577.800	1535.000
GR	577.300	1565.000	577.400	1570.000	577.200	1590.000	576.100	1615.000	575.600	1630.000
GR	575.200	1640.000	574.500	1665.000	575.200	1690.000	574.900	1700.000	575.200	1704.000
GR	577.200	1745.000	578.700	1765.000	580.600	1787.000	582.500	1800.000	586.700	1800.000
GR	586.600	1815.000	582.600	1822.000	580.700	1900.000	581.100	2000.000	581.900	2100.000
GR	582.400	2200.000	582.500	2300.000	582.700	2400.000	582.400	2500.000	582.400	2600.000
GR	586.200	2635.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	4974.000	39.000	1500.000	1638.000	99.000	99.000	99.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	586.500	0.000	586.600	200.000	586.800	400.000	587.200	600.000	587.500	800.000
GR	587.600	1000.000	587.800	1200.000	587.900	1400.000	588.000	1500.000	577.700	1500.000
GR	576.600	1507.300	576.300	1509.200	575.400	1524.200	575.200	1526.000	574.800	1540.000
GR	574.800	1541.900	574.400	1555.400	574.500	1557.200	574.800	1566.000	574.900	1567.800
GR	576.200	1576.500	576.000	1580.000	574.800	1590.000	575.100	1600.000	576.600	1614.500
GR	576.700	1618.000	577.300	1628.000	577.400	1630.000	578.600	1638.000	588.000	1638.000
GR	588.000	1700.000	587.800	1900.000	587.800	2100.000	587.700	2300.000	587.700	2500.000
GR	587.800	2569.000	587.800	2700.000	587.100	2900.000	586.600	3100.000	0.000	0.000
X1	4975.000	53.000	1500.000	1638.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
BT	31.000	0.000	586.500	0.000	200.000	586.600	0.000	400.000	586.800	0.000
BT	600.000	587.200	0.000	800.000	587.500	0.000	1000.000	587.600	0.000	1200.000
BT	587.800	0.000	1400.000	587.900	0.000	1500.000	588.000	585.400	1507.300	588.000
BT	585.400	1509.200	588.000	585.400	1524.200	588.000	585.400	1526.000	588.000	585.400
BT	1540.000	588.000	585.400	1541.900	588.000	585.400	1555.400	588.000	585.400	1557.200
BT	588.000	585.400	1566.000	588.000	585.400	1567.800	588.000	585.400	1576.500	588.000
BT	585.400	1580.000	588.000	585.400	1580.000	588.000	582.500	1614.500	588.000	582.600
BT	1614.500	588.000	585.400	1618.000	588.000	585.400	1628.000	588.000	585.400	1630.000
BT	588.000	585.400	1638.000	588.000	585.400	1700.000	588.000	0.000	1900.000	587.800
BT	0.000	1900.000	587.800	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	586.500	0.000	586.600	200.000	586.800	400.000	587.200	600.000	587.500	800.000
GR	587.600	1000.000	587.800	1200.000	587.900	1400.000	588.000	1500.000	577.700	1500.000
GR	576.600	1507.300	585.400	1507.300	585.400	1509.200	576.300	1509.200	575.400	1524.200
GR	585.400	1524.200	585.400	1526.000	575.200	1526.000	574.800	1540.000	585.400	1540.000
GR	585.400	1541.900	574.800	1541.900	574.400	1555.400	585.400	1555.400	585.400	1557.200
GR	574.500	1557.200	574.800	1566.000	585.400	1566.000	585.400	1567.800	574.900	1567.800
GR	576.200	1576.500	585.400	1576.500	585.400	1580.000	576.000	1580.000	576.600	1614.500
GR	585.400	1614.500	585.400	1618.000	576.700	1618.000	577.300	1628.000	585.400	1628.000
GR	585.400	1630.000	577.400	1630.000	578.600	1638.000	588.000	1638.000	588.000	1700.000
GR	587.800	1900.000	587.800	2100.000	587.700	2300.000	587.700	2500.000	587.800	2569.000
GR	587.800	2700.000	587.100	2900.000	586.600	3100.000	0.000	0.000	0.000	0.000
X1	4985.000	0.000	0.000	0.000	10.000	10.000	10.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	.050	.050	.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	4986.000	39.000	1500.000	1638.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	586.500	0.000	586.600	200.000	586.800	400.000	587.200	600.000	587.500	800.000
GR	587.600	1000.000	587.800	1200.000	587.900	1400.000	588.000	1500.000	577.700	1500.000
GR	576.600	1507.300	576.300	1509.200	575.400	1524.200	575.200	1526.000	574.800	1540.000
GR	574.800	1541.900	574.400	1555.400	574.500	1557.200	574.800	1566.000	574.900	1567.800
GR	576.200	1576.500	576.000	1580.000	574.800	1590.000	575.100	1600.000	576.600	1614.500
GR	576.700	1618.000	577.300	1628.000	577.400	1630.000	578.600	1638.000	588.000	1638.000
GR	588.000	1700.000	587.800	1900.000	587.800	2100.000	587.700	2300.000	587.700	2500.000
GR	587.800	2569.000	587.800	2700.000	587.100	2900.000	586.600	3100.000	0.000	0.000
QT	4.000	2485.000	3305.000	3760.000	4835.000	0.000	0.000	0.000	0.000	0.000
X1	5135.000	46.000	1490.000	1800.000	100.000	200.000	149.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1431.000	0.000	1869.000	0.000	0.000	0.000	0.000
GR	583.200	0.000	583.100	100.000	582.900	200.000	583.200	300.000	583.000	400.000
GR	583.100	500.000	583.300	600.000	583.300	700.000	583.200	800.000	583.200	900.000

GR	583.400	1000.000	583.300	1100.000	583.400	1200.000	583.200	1245.000	586.600	1286.000
GR	583.000	1290.000	583.000	1300.000	582.400	1400.000	582.500	1445.000	581.200	1490.000
GR	578.800	1505.000	577.900	1535.000	577.400	1565.000	577.500	1570.000	577.300	1590.000
GR	576.200	1615.000	575.300	1630.000	575.300	1640.000	574.600	1665.000	575.300	1690.000
GR	575.000	1700.000	575.300	1704.000	577.300	1745.000	578.800	1765.000	580.700	1787.000
GR	582.500	1800.000	582.600	1822.000	580.700	1900.000	581.100	2000.000	581.900	2100.000
GR	582.400	2200.000	582.500	2300.000	582.700	2400.000	582.400	2500.000	582.400	2600.000
GR	586.200	2635.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	5885.000	51.000	1500.000	2266.000	750.000	750.000	750.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	582.000	0.000	581.700	100.000	582.900	200.000	578.900	300.000	578.600	400.000
GR	578.700	500.000	578.700	600.000	578.200	700.000	578.200	800.000	578.000	900.000
GR	578.500	1000.000	578.100	1100.000	578.100	1200.000	577.300	1300.000	578.000	1400.000
GR	577.000	1460.000	584.300	1480.000	585.000	1500.000	580.200	1510.000	576.300	1570.000
GR	576.300	1616.000	576.400	1684.000	576.300	1773.000	576.000	1844.000	575.900	1906.000
GR	576.200	1959.000	576.100	2021.000	576.400	2092.000	577.200	2163.000	576.800	2198.000
GR	576.900	2225.000	578.200	2255.000	586.000	2266.000	585.800	2274.000	581.900	2290.000
GR	581.400	2323.000	581.800	2423.000	581.800	2523.000	581.800	2623.000	581.900	2723.000
GR	582.000	2823.000	582.500	2923.000	582.400	3023.000	582.400	3123.000	582.400	3223.000
GR	582.700	3323.000	583.100	3423.000	583.200	3523.000	583.300	3623.000	583.600	3723.000
GR	583.700	3823.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
QT	4.000	2280.000	3035.000	3455.000	4445.000	0.000	0.000	0.000	0.000	0.000
X1	6900.000	51.000	1500.000	1951.000	1015.000	950.000	1015.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	582.000	0.000	581.700	100.000	582.900	200.000	578.900	300.000	578.600	400.000
GR	578.700	500.000	578.700	600.000	578.200	700.000	578.200	800.000	578.000	900.000
GR	578.500	1000.000	578.100	1100.000	578.100	1200.000	577.300	1300.000	578.000	1400.000
GR	577.000	1460.000	584.300	1480.000	585.000	1500.000	580.100	1510.000	577.900	1544.000
GR	577.900	1570.000	578.000	1610.000	577.900	1660.000	577.600	1700.000	577.500	1735.000
GR	577.800	1765.000	577.700	1800.000	578.000	1840.000	578.800	1880.000	578.400	1900.000
GR	578.500	1915.000	579.800	1932.000	586.000	1943.000	585.800	1951.000	581.900	1967.000
GR	581.400	2000.000	581.800	2100.000	581.800	2200.000	581.800	2300.000	581.900	2400.000
GR	582.000	2500.000	582.500	2600.000	582.400	2700.000	582.400	2800.000	582.400	2900.000
GR	582.700	3000.000	583.100	3100.000	583.200	3200.000	583.300	3300.000	583.600	3400.000
GR	583.700	3500.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	7700.000	48.000	1544.000	1943.000	825.000	700.000	800.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1050.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	582.000	0.000	581.700	100.000	582.900	200.000	579.300	300.000	579.000	400.000
GR	579.100	500.000	579.100	600.000	578.600	700.000	578.600	800.000	578.400	900.000
GR	578.900	1000.000	578.500	1100.000	578.500	1200.000	577.700	1300.000	578.400	1400.000
GR	577.400	1460.000	578.300	1544.000	578.200	1570.000	578.200	1580.000	578.200	1600.000
GR	577.900	1700.000	577.800	1735.000	578.100	1765.000	578.000	1800.000	578.300	1840.000
GR	579.100	1880.000	578.700	1900.000	578.800	1915.000	580.100	1932.000	585.900	1943.000
GR	585.700	1951.000	581.800	1967.000	581.300	2000.000	581.700	2100.000	581.700	2200.000
GR	581.700	2300.000	581.800	2400.000	581.900	2500.000	582.400	2600.000	582.300	2700.000
GR	582.300	2800.000	582.300	2900.000	582.600	3000.000	583.000	3100.000	583.100	3200.000
GR	583.200	3300.000	583.500	3400.000	583.600	3500.000	0.000	0.000	0.000	0.000
X1	8400.000	29.000	1620.000	2179.000	625.000	850.000	700.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1500.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	589.000	0.000	588.600	100.000	589.500	200.000	589.400	300.000	588.400	400.000
GR	587.800	500.000	587.500	600.000	587.000	700.000	587.200	800.000	588.400	834.000
GR	587.300	900.000	587.200	1000.000	586.900	1100.000	585.700	1200.000	584.100	1340.000
GR	582.500	1480.000	581.800	1620.000	580.800	1660.000	580.200	1723.000	579.400	1785.000
GR	578.900	1821.000	578.300	1883.000	577.900	1922.000	577.800	2000.000	577.400	2053.000
GR	578.400	2115.000	579.200	2160.000	586.000	2171.000	585.800	2179.000	0.000	0.000
QT	4.000	2200.000	2930.000	3330.000	4290.000	0.000	0.000	0.000	0.000	0.000
X1	9325.000	51.000	1500.000	2444.000	925.000	925.000	925.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1550.000	0.000	2300.000	0.000	0.000	0.000	0.000
GR	589.000	0.000	588.600	100.000	589.500	200.000	589.400	300.000	588.400	400.000
GR	587.800	500.000	587.500	600.000	587.000	700.000	587.200	800.000	588.400	834.000
GR	587.300	900.000	587.200	1000.000	586.900	1100.000	585.700	1200.000	584.100	1300.000

GR	582.500	1400.000	581.800	1500.000	580.900	1540.000	579.900	1603.000	579.300	1665.000
GR	578.800	1701.000	578.200	1763.000	577.800	1802.000	577.700	1880.000	577.300	1933.000
GR	578.300	1995.000	579.000	2040.000	579.000	2110.000	578.800	2158.000	578.900	2235.000
GR	578.800	2278.000	578.900	2340.000	579.500	2390.000	580.800	2443.000	581.800	2444.000
GR	582.400	2500.000	584.300	2600.000	584.600	2700.000	585.100	2800.000	585.100	2900.000
GR	584.900	3000.000	584.500	3100.000	583.500	3200.000	583.900	3300.000	583.700	3400.000
GR	583.300	3500.000	583.400	3600.000	583.800	3700.000	583.600	3800.000	583.600	3900.000
GR	583.400	4000.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	10125.000	0.000	0.000	0.000	725.000	1000.000	800.000	0.000	-.300	0.000
X3	10.000	0.000	0.000	0.000	0.000	1700.000	0.000	0.000	0.000	0.000
X1	10850.000	0.000	0.000	0.000	725.000	725.000	725.000	0.000	-.300	0.000
X3	10.000	0.000	0.000	1808.000	0.000	2136.000	0.000	0.000	0.000	0.000
QT	4.000	385.000	520.000	600.000	800.000	0.000	0.000	0.000	0.000	0.000
X1	11025.000	0.000	0.000	0.000	175.000	175.000	175.000	0.000	-.100	0.000
X3	10.000	0.000	0.000	1851.000	0.000	2093.000	0.000	0.000	0.000	0.000
X1	11200.000	0.000	0.000	0.000	175.000	175.000	175.000	0.000	-.100	0.000
X3	10.000	0.000	0.000	1895.000	0.000	2049.000	0.000	0.000	0.000	0.000
X1	11375.000	0.000	0.000	0.000	175.000	175.000	175.000	0.000	-.200	0.000
X3	10.000	0.000	0.000	1939.000	0.000	2005.000	0.000	0.000	0.000	0.000
X1	11425.000	0.000	0.000	0.000	50.000	50.000	50.000	0.000	-.210	0.000
X3	10.000	0.000	0.000	1952.000	0.000	1993.000	0.000	0.000	0.000	0.000
X1	11450.000	0.000	0.000	0.000	25.000	25.000	25.000	0.000	-.090	0.000
X3	10.000	0.000	0.000	1958.000	0.000	1986.000	0.000	0.000	0.000	0.000
X1	11474.000	39.000	1500.000	1515.500	24.000	24.000	24.000	0.000	0.000	0.000
GR	589.300	0.000	589.500	100.000	589.400	200.000	589.400	300.000	589.300	400.000
GR	588.800	500.000	588.300	600.000	587.800	700.000	587.700	800.000	587.700	900.000
GR	587.700	1000.000	587.400	1100.000	587.100	1200.000	587.000	1300.000	587.100	1400.000
GR	587.600	1500.000	578.400	1500.000	578.400	1501.000	576.400	1501.100	576.700	1508.000
GR	576.900	1514.400	578.400	1514.500	578.400	1515.500	587.700	1515.500	587.700	1600.000
GR	588.100	1700.000	588.200	1800.000	588.200	1900.000	588.200	2000.000	588.300	2100.000
GR	588.300	2200.000	588.400	2300.000	588.500	2400.000	588.600	2500.000	588.600	2600.000
GR	588.700	2700.000	588.700	2800.000	588.600	2900.000	588.500	3000.000	0.000	0.000
X1	11475.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
BT	37.000	0.000	589.300	0.000	100.000	589.500	0.000	200.000	589.400	0.000
BT	300.000	589.400	0.000	400.000	589.300	0.000	500.000	588.800	0.000	600.000
BT	588.300	0.000	700.000	587.800	0.000	800.000	587.700	0.000	900.000	587.700
BT	0.000	1000.000	587.700	0.000	1100.000	587.400	0.000	1200.000	587.100	0.000
BT	1300.000	587.000	0.000	1400.000	587.100	0.000	1500.000	587.600	584.400	1501.000
BT	587.600	584.400	1501.100	587.600	584.400	1508.000	587.700	584.400	1514.400	587.700
BT	584.400	1514.500	587.700	584.400	1515.500	587.700	584.400	1600.000	587.700	0.000
BT	1700.000	588.100	0.000	1800.000	588.200	0.000	1900.000	588.200	0.000	2000.000
BT	588.200	0.000	2100.000	588.300	0.000	2200.000	588.300	0.000	2300.000	588.400
BT	0.000	2400.000	588.500	0.000	2500.000	588.600	0.000	2600.000	588.600	0.000
BT	2700.000	588.700	0.000	2800.000	588.700	0.000	2900.000	588.600	0.000	3000.000
BT	588.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	11523.000	0.000	0.000	0.000	48.000	48.000	48.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X1	11524.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	11548.000	38.000	1500.000	1680.000	24.000	24.000	24.000	0.000	-2.000	0.000
X3	10.000	0.000	0.000	1557.000	0.000	1623.000	0.000	0.000	0.000	0.000
GR	585.700	0.000	588.900	40.000	589.600	100.000	589.100	200.000	589.600	300.000
GR	589.000	400.000	589.100	500.000	588.900	600.000	588.400	700.000	588.300	800.000
GR	587.800	900.000	587.400	1000.000	587.000	1100.000	588.800	1200.000	585.800	1300.000

GR	585.000	1400.000	582.200	1500.000	580.100	1520.000	579.600	1540.000	579.300	1560.000
GR	579.000	1580.000	579.000	1600.000	578.500	1620.000	578.700	1640.000	578.600	1660.000
GR	579.600	1675.000	584.400	1680.000	584.300	1700.000	585.200	1800.000	586.100	1900.000
GR	586.600	2000.000	588.000	2075.000	587.400	2100.000	587.300	2200.000	587.000	2300.000
GR	586.400	2400.000	585.800	2500.000	586.200	2527.000	0.000	0.000	0.000	0.000
X1	11573.000	0.000	0.000	0.000	25.000	25.000	25.000	0.000	.200	0.000
X3	10.000	0.000	0.000	1532.000	0.000	1648.000	0.000	0.000	0.000	0.000
QT	4.000	310.000	420.000	485.000	640.000	0.000	0.000	0.000	0.000	0.000
X1	11623.000	0.000	0.000	0.000	50.000	50.000	50.000	0.000	.300	0.000
X3	10.000	0.000	0.000	1482.000	0.000	1698.000	0.000	0.000	0.000	0.000
X1	11723.000	0.000	0.000	0.000	75.000	125.000	100.000	0.000	.600	0.000
X3	10.000	0.000	0.000	1458.000	0.000	1714.000	0.000	0.000	0.000	0.000
X1	11898.000	38.000	1500.000	1680.000	125.000	250.000	175.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	585.700	0.000	588.900	40.000	589.600	100.000	589.100	200.000	589.600	300.000
GR	589.000	400.000	589.100	500.000	588.900	600.000	588.400	700.000	588.300	800.000
GR	587.800	900.000	587.400	1000.000	587.000	1100.000	588.800	1200.000	585.800	1300.000
GR	585.000	1400.000	582.200	1500.000	580.100	1520.000	579.600	1540.000	579.300	1560.000
GR	579.000	1580.000	579.000	1600.000	578.500	1620.000	578.700	1640.000	578.600	1660.000
GR	579.600	1675.000	584.400	1680.000	584.300	1700.000	585.200	1800.000	586.100	1900.000
GR	586.600	2000.000	588.000	2075.000	587.400	2100.000	587.300	2200.000	587.000	2300.000
GR	586.400	2400.000	585.800	2500.000	586.200	2527.000	0.000	0.000	0.000	0.000
X1	12825.000	53.000	1500.000	1850.000	975.000	850.000	927.000	0.000	-.400	0.000
X3	10.000	0.000	0.000	0.000	0.000	1850.000	0.000	0.000	0.000	0.000
GR	588.800	0.000	588.700	100.000	588.000	200.000	587.300	300.000	587.200	400.000
GR	587.100	500.000	587.000	600.000	588.100	674.000	586.500	800.000	586.600	900.000
GR	586.400	1000.000	586.300	1100.000	586.200	1200.000	586.000	1300.000	585.500	1400.000
GR	582.900	1500.000	581.100	1511.000	580.200	1520.000	579.600	1540.000	579.500	1560.000
GR	579.600	1580.000	579.600	1600.000	579.700	1620.000	579.900	1640.000	579.900	1660.000
GR	580.000	1680.000	580.000	1700.000	579.900	1720.000	579.900	1740.000	580.000	1760.000
GR	580.000	1780.000	580.200	1800.000	580.700	1820.000	582.200	1845.000	582.800	1850.000
GR	583.400	1900.000	583.900	2000.000	584.100	2100.000	585.300	2200.000	586.200	2300.000
GR	586.500	2400.000	589.800	2449.000	587.300	2500.000	582.900	2540.000	586.100	2600.000
GR	591.300	2627.000	587.300	2700.000	586.300	2800.000	585.900	2900.000	587.100	3000.000
GR	586.900	3100.000	587.900	3200.000	588.500	3300.000	0.000	0.000	0.000	0.000
X1	13225.000	53.000	1500.000	1850.000	350.000	450.000	400.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	1750.000	0.000	0.000	0.000	0.000
GR	588.800	0.000	588.700	100.000	588.000	200.000	587.300	300.000	587.200	400.000
GR	587.100	500.000	587.000	600.000	588.100	674.000	586.500	800.000	586.600	900.000
GR	586.400	1000.000	586.300	1100.000	586.200	1200.000	586.000	1300.000	585.500	1400.000
GR	582.900	1500.000	581.100	1511.000	580.200	1520.000	579.600	1540.000	579.500	1560.000
GR	579.600	1580.000	579.600	1600.000	579.700	1620.000	579.900	1640.000	579.900	1660.000
GR	580.000	1680.000	580.000	1700.000	579.900	1720.000	579.900	1740.000	580.000	1760.000
GR	580.000	1780.000	580.200	1800.000	580.700	1820.000	582.200	1845.000	582.800	1850.000
GR	583.400	1900.000	583.900	2000.000	584.100	2100.000	585.300	2200.000	586.200	2300.000
GR	586.500	2400.000	589.800	2449.000	587.300	2500.000	582.900	2540.000	586.100	2600.000
GR	591.300	2627.000	587.300	2700.000	586.300	2800.000	585.900	2900.000	587.100	3000.000
GR	586.900	3100.000	587.900	3200.000	588.500	3300.000	0.000	0.000	0.000	0.000
X1	13723.000	0.000	0.000	0.000	498.000	498.000	498.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1563.000	0.000	1725.000	0.000	0.000	0.000	0.000
X1	13973.000	37.000	1500.000	1553.000	250.000	250.000	250.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1508.000	0.000	1545.000	0.000	0.000	0.000	0.000
GR	585.900	0.000	586.200	100.000	586.500	200.000	586.900	300.000	586.600	400.000
GR	586.900	500.000	587.300	600.000	587.200	700.000	587.300	800.000	587.400	900.000
GR	587.200	1000.000	587.300	1100.000	587.200	1200.000	586.400	1300.000	583.500	1400.000
GR	582.400	1500.000	581.000	1502.000	579.600	1516.000	579.500	1525.000	579.700	1535.000
GR	581.300	1549.000	583.200	1553.000	585.700	1600.000	587.400	1700.000	590.400	1751.000
GR	588.200	1787.000	590.500	1821.000	588.000	1900.000	583.700	1995.000	581.[illegible]00	200[illegible].000

GR	583.400	2600.000	583.000	2660.000	589.900	2675.000	590.400	2700.000	591.400	2800.000
GR	591.400	2900.000	593.400	2995.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	13998.000	0.000	0.000	0.000	25.000	25.000	25.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1515.000	0.000	1540.000	0.000	0.000	0.000	0.000
X1	14023.000	6.000	94.000	106.000	25.000	25.000	25.000	0.000	0.000	0.000
GR	600.000	0.000	600.000	94.000	579.500	94.000	579.500	106.000	600.000	106.000
GR	600.000	200.000	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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HEC2 VERSION UPDATED JAN 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09
MODIFICATIONS 52,53,54,55,56,57,58
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T1          FRANKENLUST TWP. FIS 5555-21, PROJECT MANAGER: JAMES KREGER
T2       100 YEAR FLOW
T3       DUTCH CREEK
J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
       0.       4.       0.        0.  0.000000      0.00       0.0       0.   581.980     0.000
J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE
     3.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
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CCHV=     .300 CEHV=     .500
    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA     LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      587.20 ELREA=      587.00

*  3199.00      8.38    581.98      0.00    581.98    582.23       .25      0.00      0.00    587.20
     3905.        0.      3905.       0.        0.      977.        0.       0.        0.     587.00
      0.00      0.00      4.00      0.00      .050      .030      .050     0.000    573.60   1500.00
   .000562        0.        0.        0.         0         0         1      0.00    147.00   1647.00
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* flow reversal in Saginaw River as result of a mean flood level in Saginaw Bay would cause the water level e confluence with Dutch Creek to be approx. equal to the Bay elevation

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 3265 DIVIDED FLOW

 NORMAL BRIDGE,NRD=49 MIN ELTRD=  583.10 MAX ELLC=  584.50

 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      587.20 ELREA=      587.00

                    BRIDGE SECTION A, EUCLID ROAD BRIDGE

                    147' WIDE OPENING, 2-3' PIERS, CONCRETE WINGWALLS

  3200.00      8.37    581.97      0.00      0.00    582.24       .27       .00       .01    587.20
     3905.        0.      3905.       0.        0.      930.        0.       0.        0.     587.00
      .00      0.00      4.20      0.00      .050      .035      .050      .018    573.60   1500.00
  .001089        1.        1.        1.         1         0         1      0.00    141.00   1647.00

 3265 DIVIDED FLOW

 NORMAL BRIDGE,NRD=49 MIN ELTRD=  583.10 MAX ELLC=  584.50

 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      587.20 ELREA=      587.00

  3218.00      8.39    581.99      0.00      0.00    582.26       .27       .02       .00    587.20
     3905.        0.      3905.       0.        0.      933.        0.       0.        0.     587.00
      .00      0.00      4.19      0.00      .050      .035      .050      .032    573.60   1500.00
  .001082       18.       18.       18.         0         0         1      0.00    141.00   1647.00

    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

 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      587.20 ELREA=      587.00

  3219.00      8.43    582.03      0.00      0.00    582.27       .24       .00       .01    587.20
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     3905.        0.     3905.        0.        0.      983.        0.        0.        0.    587.00
       .00      0.00      3.97     0.00      .050      .030      .050      .030    573.60   1500.00
   .000550        1.        1.       1.         2         0         1      0.00    147.00   1647.00


 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       586.60 ELREA=       586.70

  3318.00      8.58    582.28     0.00      0.00    582.35       .07       .03       .05    586.60
     3905.        0.     3905.        0.        0.     1854.        0.        4.        1.    586.70
       .01      0.00      2.11     0.00      .050      .030      .050      .030    573.70   1488.79
   .000169       99.       99.       99.         2         0         1      0.00    311.21   1800.00


 3470 ENCROACHMENT STATIONS=          .0    1886.0  TYPE=     1  TARGET=     1885.999
      LOB @ 1486 , ROB @ 1886  channel width @ 400 ft
 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       586.60 ELREA=    100000.00

  3718.00      8.46    582.37     0.00      0.00    582.41       .04       .05       .01    586.60
     3905.        0.     3905.        0.        0.     2393.        0.       23.        4. 100000.00
       .08      0.00      1.63     0.00      .050      .030      .050      .030    573.90   1494.30
   .000100      400.      400.      400.         2         0         1      0.00    391.70   1886.00


 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       586.60 ELREA=       586.70

  4018.00      8.39    582.39     0.00      0.00    582.47       .07       .04       .02    586.60
     3905.        0.     3905.        0.        0.     1798.        0.       38.        6.    586.70
       .12      0.00      2.17     0.00      .050      .030      .050      .030    574.00   1488.85
   .000187      300.      300.      300.         1         0         1      0.00    311.15   1800.00


 3470 ENCROACHMENT STATIONS=     1549.0     1737.0  TYPE=     1  TARGET=      188.000

 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=    100000.00 ELREA=    100000.00

          VALLEY SECTION B

  4875.00      8.07    582.57     0.00      0.00    582.72       .15       .21       .04100000.00
     3905.        0.     3905.        0.        0.     1242.        0.       67.       11. 100000.00
       .20      0.00      3.15     0.00      .050      .030      .050      .030    574.50   1549.00
   .000351      857.      857.      857.         2         0         1      0.00    188.00   1737.00


 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       588.00 ELREA=       588.00

  4974.00      8.15    582.55     0.00      0.00    582.82       .27       .04       .06    588.00
     3905.        0.     3905.        0.        0.      942.        0.       70.       12.    588.00
       .20      0.00      4.15     0.00      .050      .030      .050      .030    574.40   1500.00
   .000590       99.       99.       99.         2         0         1      0.00    138.00   1638.00


 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
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NORMAL BRIDGE,NRD=31 MIN ELTRD=  586.50 MAX ELLC=  585.40

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      588.00 ELREA=      588.00

                 BRIDGE SECTION C, PENN-CENTRAL RAILROAD BRIDGE

                 138' WIDE OPENING, 9 PIERS & 18.2' TOTAL WIDTH

  4975.00     8.10   582.50     0.00     0.00   582.88      .38      .00      .06   588.00
    3905.       0.    3905.       0.       0.     785.       0.      70.      12.    588.00
      .20     0.00     4.98     0.00     .050     .030     .050     .030   574.40  1500.00
 .002045       1.       1.       1.        2        0        1     0.00   119.80  1638.00

3265 DIVIDED FLOW

NORMAL BRIDGE,NRD=31 MIN ELTRD=  586.50 MAX ELLC=  585.40

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      588.00 ELREA=      588.00

  4985.00     8.12   582.52     0.00     0.00   582.90      .38      .02      .00   588.00
    3905.       0.    3905.       0.       0.     786.       0.      70.      12.    588.00
      .20     0.00     4.97     0.00     .050     .030     .050     .030   574.40  1500.00
 .002036      10.      10.      10.        0        0        1     -.18   119.80  1638.00

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      588.00 ELREA=      588.00

  4986.00     8.28   582.68     0.00     0.00   582.94      .26      .00      .04   588.00
    3905.       0.    3905.       0.       0.     960.       0.      70.      12.    588.00
      .20     0.00     4.07     0.00     .050     .030     .050     .030   574.40  1500.00
 .000556       1.       1.       1.        2        0        1     0.00   138.00  1638.00

3470 ENCROACHMENT STATIONS=    1431.0    1869.0  TYPE=      1  TARGET=     438.000
  5135.00     8.37   582.97     0.00     0.00   583.04      .07      .04      .06   581.20
    3760.      23.    3719.      19.      57.    1795.      54.      75.      13.    582.50
      .22      .40     2.07      .35     .050     .030     .050     .030   574.60  1431.00
 .000169     100.     149.     200.        2        0        1     0.00   438.00  1869.00

3280 CROSS SECTION   5885.00 EXTENDED      1.08 FEET

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      585.00 ELREA=      586.00

  5885.00     7.18   583.08     0.00     0.00   583.09      .01      .03      .02   585.00
    3760.       0.    3760.       0.       0.    4899.       0.     134.      23.    586.00
      .50     0.00      .77     0.00     .050     .030     .050     .030   575.90  1504.00
 .000020     750.     750.     750.        2        0        1     0.00   757.89  2261.88

3280 CROSS SECTION   6900.00 EXTENDED      1.11 FEET

   SECNO     DEPTH     C SEL     CRI S     SELK      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

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      585.00 ELREA=      585.80

          VALLEY SECTION D

  6900.00      5.61    583.11       0.00       0.00    583.15        .04        .04        .02    585.00
     3455.       0.      3455.       0.         0.     2144.         0.       216.        37.    585.80
       .67      0.00      1.61      0.00       .050      .030       .050       .030     577.50   1503.86
   .000127     1015.     1015.      950.          2         0          1       0.00     434.00   1937.87

3470 ENCROACHMENT STATIONS=     1050.0     3500.0  TYPE=      1  TARGET=   -1050.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      578.30 ELREA=      585.90

  7700.00      5.80    583.20       0.00       0.00    583.22        .01        .06        .01    578.30
     3455.     1530.     1925.        0.      2495.     1928.         0.       277.        49.    585.90
       .94       .61      1.00      0.00       .050      .030       .050       .030     577.40   1050.00
   .000049      825.      800.      700.          2         0          1       0.00     887.89   1937.89

3470 ENCROACHMENT STATIONS=     1500.0     2179.0  TYPE=      1  TARGET=   -1500.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      581.80 ELREA=   100000.00

  8400.00      5.84    583.24       0.00       0.00    583.28        .03        .05        .01    581.80
     3455.       49.     3406.       0.         137.     2364.         0.       330.        61. 100000.00
     1.07       .36      1.44      0.00       .050      .030       .050       .030     577.40   1500.00
   .000120      625.      700.      850.          2         0          1       0.00     666.54   2166.54

3470 ENCROACHMENT STATIONS=     1550.0     2300.0  TYPE=      1  TARGET=     750.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=   100000.00 ELREA=   100000.00

          VALLEY SECTION E

  9325.00      6.03    583.33       0.00       0.00    583.35        .01        .07        .01100000.00
     3330.       0.      3330.       0.         0.     3501.         0.       394.        76. 100000.00
     1.34      0.00       .95      0.00       .050      .030       .050       .030     577.30   1550.00
   .000048      925.      925.      925.          1         0          1       0.00     750.00   2300.00

3280 CROSS SECTION  10125.00 EXTENDED       .21 FEET

3470 ENCROACHMENT STATIONS=         .0     1700.0  TYPE=      1  TARGET=    1699.999

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      581.50 ELREA=   100000.00

 10125.00      6.31    583.31       0.00       0.00    583.59        .28        .11        .13    581.50
     3330.      249.     3081.       0.         185.      701.         0.       434.        86. 100000.00
     1.40      1.35      4.40      0.00       .050      .030       .050       .030     577.00   1330.52
   .001527      725.      800.     1000.          2         0          1       0.00     369.48   1700.00
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3280 CROSS SECTION  10850.00 EXTENDED      1.01 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=    1808.0    2136.0  TYPE=     1  TARGET=     328.000

 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=   100000.00 ELREA=   100000.00

  10850.00      7.11    583.81      0.00      0.00    583.85       .04       .18       .07100000.00
      3330.       0.      3330.      0.        0.     2034.       0.       458.       92. 100000.00
       1.52      0.00      1.64      0.00      .050      .030      .050      .030    576.70  1808.00
   .000101      725.      725.      725.        2         0         1      0.00    328.00  2136.00

OK

3280 CROSS SECTION  11025.00 EXTENDED      1.16 FEET

 3470 ENCROACHMENT STATIONS=    1851.0    2093.0  TYPE=     1  TARGET=     242.000

 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=   100000.00 ELREA=   100000.00

  11025.00      7.26    583.86      0.00      0.00    583.87       .00       .01       .01100000.00
       600.       0.       600.      0.        0.     1553.       0.       465.       93. 100000.00
       1.65      0.00       .39      0.00      .050      .030      .050      .030    576.60  1851.00
   .000005      175.      175.      175.        2         0         1      0.00    242.00  2093.00

3280 CROSS SECTION  11200.00 EXTENDED      1.27 FEET

 3470 ENCROACHMENT STATIONS=    1895.0    2049.0  TYPE=     1  TARGET=     154.000

 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=   100000.00 ELREA=   100000.00

  11200.00      7.36    583.86      0.00      0.00    583.87       .01       .00       .00100000.00
       600.       0.       600.      0.        0.     1023.       0.       471.       94. 100000.00
       1.73      0.00       .59      0.00      .050      .030      .050      .030    576.50  1895.00
   .000012      175.      175.      175.        0         0         1      0.00    154.00  2049.00

3280 CROSS SECTION  11375.00 EXTENDED      1.47 FEET

 3470 ENCROACHMENT STATIONS=    1939.0    2005.0  TYPE=     1  TARGET=      66.000

 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=   100000.00 ELREA=   100000.00

  11375.00      7.46    583.86      0.00      0.00    583.88       .03       .00       .01100000.00
       600.       0.       600.      0.        0.      458.       0.       474.       94. 100000.00
       1.77      0.00      1.31      0.00      .050      .030      .050      .030    576.40  1939.00
   .000068      175.      175.      175.        1         0         1      0.00     66.00  2005.00

3280 CROSS SECTION  11425.00 EXTENDED      1.65 FEET
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3470 ENCROACHMENT STATIONS=     1952.0     1993.0  TYPE=      1  TARGET=       41.000

OVERBANK AREA ASSUMED,NON-EFFECTIVE,ELLEA=   100000.00 ELREA=   100000.00

 11425.00      7.45    583.84      0.00      0.00    583.91       .07       .01       .02100000.00
     600.        0.      600.        0.        0.      292.        0.      474.       94. 100000.00
     1.77      0.00      2.06      0.00      .050      .030      .050      .030    576.40   1952.00
 .000187       50.       50.       50.         2         0         1      0.00     41.00   1993.00

3280 CROSS SECTION  11450.00 EXTENDED     1.71 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

3470 ENCROACHMENT STATIONS=     1958.0     1986.0  TYPE=      1  TARGET=       28.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=   100000.00 ELREA=   100000.00

 11450.00      7.41    583.81      0.00      0.00    583.95       .14       .01       .04100000.00
     600.        0.      600.        0.        0.      201.        0.      474.       94. 100000.00
     1.78      0.00      2.98      0.00      .050      .030      .050      .030    576.40   1958.00
 .000454       25.       25.       25.         2         0         1      0.00     28.00   1986.00

 11474.00      7.25    583.65      0.00      0.00    584.16       .51       .02       .19    587.60
     600.        0.      600.        0.        0.      105.        0.      474.       94.    587.70
     1.78      0.00      5.74      0.00      .050      .030      .050      .030    576.40   1500.00
 .002463       24.       24.       24.         2         0         1      0.00     15.50   1515.50

NORMAL BRIDGE,NRD=37 MIN ELTRD=  587.00 MAX ELLC=  584.40

                    BRIDGE SECTION F, M-84 BOX CULVERT

          15.5' WIDE BOX CULVERT, 48' IN LENGTH, CONCRETE PARALLEL WINGWALLS

 11475.00      7.25    583.65      0.00      0.00    584.16       .51       .00       .00    587.60
     600.        0.      600.        0.        0.      105.        0.      474.       94.    587.70
     1.78      0.00      5.74      0.00      .050      .030      .050      .030    576.40   1500.00
 .002462        1.        1.        1.         0         0         1      0.00     15.50   1515.50

NORMAL BRIDGE,NRD=37 MIN ELTRD=  587.00 MAX ELLC=  584.40

 11523.00      7.39    583.79      0.00      0.00    584.28       .49       .11       .01    587.60
     600.        0.      600.        0.        0.      107.        0.      474.       94.    587.70
     1.78      0.00      5.62      0.00      .050      .030      .050      .030    576.40   1500.00
 .002325       48.       48.       48.         2         0         1      0.00     15.50   1515.50

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      587.60 ELREA=      587.70

 11524.00      7.40    583.80      0.00      0.00    584.29       .49       .00       .00    587.60
     600.        0.      600.        0.        0.      107.        0.      474.       94.    587.70
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      1.78      0.00      5.62      0.00      .050      .030      .050      .030    576.40   1500.00
   .002323        1.        1.        1.         0         0         1      0.00     15.50   1515.50


 3470 ENCROACHMENT STATIONS=     1557.0     1623.0  TYPE=      1  TARGET=      66.000

 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=     99998.00 ELREA=     99998.00

 11548.00      7.91    584.41      0.00      0.00    584.43       .02       .00       .14  99998.00
     600.        0.      600.        0.        0.      491.        0.      475.       94.  99998.00
     1.78      0.00      1.22      0.00      .050      .030      .050      .030    576.50   1557.00
   .000055       24.       24.       24.         2         0         1      0.00     66.00   1623.00


    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=     1532.0     1648.0  TYPE=      1  TARGET=     116.000

 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=    100000.00 ELREA=    100000.00

 11573.00      7.73    584.43      0.00      0.00    584.44       .01       .00       .00100000.00
     600.        0.      600.        0.        0.      838.        0.      475.       95. 100000.00
     1.79      0.00       .72      0.00      .050      .030      .050      .030    576.70   1532.00
   .000017       25.       25.       25.         0         0         1      0.00    116.00   1648.00


 3470 ENCROACHMENT STATIONS=     1482.0     1698.0  TYPE=      1  TARGET=     216.000
 11623.00      7.44    584.44      0.00      0.00    584.44       .00       .00       .00    580.70
     485.       10.      472.        3.       63.     1181.       29.      476.       95.    582.90
     1.83       .16       .40       .09      .050      .030      .050      .030    577.00   1482.00
   .000005       50.       50.       50.         0         0         1      0.00    216.00   1698.00


 3470 ENCROACHMENT STATIONS=     1458.0     1714.0  TYPE=      1  TARGET=     256.000
 11723.00      6.84    584.44      0.00      0.00    584.44       .00       .00       .00    581.30
     485.       16.      466.        3.      107.     1073.       33.      479.       95.    583.50
     1.89       .15       .43       .08      .050      .030      .050      .030    577.60   1458.00
   .000007       75.      100.      125.         0         0         1      0.00    256.00   1714.00


          VALLEY SECTION G

 11898.00      5.94    584.44      0.00      0.00    584.44       .00       .00       .00    582.20
     485.       10.      475.        0.       90.      911.        3.      483.       96.    584.40
     1.99       .12       .52       .02      .050      .030      .050      .030    578.50   1419.94
   .000013      125.      175.      250.         0         0         1      0.00    295.80   1715.74


 3470 ENCROACHMENT STATIONS=         .0     1850.0  TYPE=      1  TARGET=    1849.999

 OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       582.50 ELREA=     99999.60

 12825.00      5.35    584.45      0.00      0.00    584.45       .00       .01       .00    582.50
     485.        4.      481.        0.       73.     1656.        0.      513.      104.  99999.60
     2.88       .06       .29      0.00      .050      .030      .050      .030    579.10   1424.96
   .000004      975.      927.      850.         0         0         1      0.00    425.03   1850.00
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3470 ENCROACHMENT STATIONS=        .0     1750.0  TYPE=      1  TARGET=     1749.999

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      582.90 ELREA=   100000.00


          VALLEY SECTION H

 13225.00      4.95    584.45      0.00      0.00    584.45       .00       .00       .00    582.90
     485.        4.      481.        0.       46.     1131.        0.      526.      107. 100000.00
      3.15       .08       .43      0.00      .050      .030      .050      .030    579.50   1440.22
  .000010      350.      400.      450.         0         0         1      0.00    309.78   1750.00


3470 ENCROACHMENT STATIONS=     1563.0     1725.0  TYPE=      1  TARGET=      162.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=   100000.00 ELREA=   100000.00

 13723.00      4.94    584.45      0.00      0.00    584.46       .01       .01       .00100000.00
     485.        0.      485.        0.        0.      753.        0.      537.      110. 100000.00
      3.36      0.00       .64      0.00      .050      .030      .050      .030    579.52   1563.00
  .000023      498.      498.      498.         0         0         1      0.00    162.00   1725.00


    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=     1508.0     1545.0  TYPE=      1  TARGET=       37.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=   100000.00 ELREA=   100000.00


          VALLEY SECTION I

 13973.00      4.91    584.41      0.00      0.00    584.54       .13       .02       .06100000.00
     485.        0.      485.        0.        0.      168.        0.      539.      111. 100000.00
      3.38      0.00      2.88      0.00      .050      .030      .050      .030    579.50   1508.00
  .000575      250.      250.      250.         2         0         1      0.00     37.00   1545.00


3470 ENCROACHMENT STATIONS=     1515.0     1540.0  TYPE=      1  TARGET=       25.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=   100000.00 ELREA=   100000.00

 13998.00      4.86    584.36      0.00      0.00    584.63       .26       .02       .07100000.00
     485.        0.      485.        0.        0.      118.        0.      540.      111. 100000.00
      3.39      0.00      4.13      0.00      .050      .030      .050      .030    579.50   1515.00
  .001317       25.       25.       25.         2         0         1      0.00     25.00   1540.00


3301 HV CHANGED MORE THAN HVINS

 14023.00      4.41    583.91      0.00      0.00    585.22      1.30       .07       .52    600.00
     485.        0.      485.        0.        0.       53.        0.      540.      111.    600.00
      3.39      0.00      9.15      0.00      .050      .030      .050      .030    579.50     94.00
  .009835       25.       25.       25.         3         0         1      0.00     12.00    106.00
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00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Frankenlust Twp

3) WATERCOURSE: Dutch Creek

4) DOCUMENT TYPE: Summary

00BREAK00

SUMMARY PRINTOUT FOR MULTIPLE PROFILES

DUTCH CREEK

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	HV	HL	OLOSS	QCH	DEPTH	TOPWID
3199.00	0.00	0.00	0.00	573.60	2580.00	581.98	.11	0.00	0.00	2580.00	8.38	147.00
3199.00	0.00	0.00	0.00	573.60	3430.00	581.98	.19	0.00	0.00	3430.00	8.38	147.00
3199.00	0.00	0.00	0.00	573.60	3905.00	581.98	.25	0.00	0.00	3905.00	8.38	147.00
3199.00	0.00	0.00	0.00	573.60	5015.00	581.98	.41	0.00	0.00	5015.00	8.38	147.00
3200.00	1.00	583.10	584.50	573.60	2580.00	581.97	.12	.00	.01	2580.00	8.37	141.00
3200.00	1.00	583.10	584.50	573.60	3430.00	581.97	.21	.00	.01	3430.00	8.37	141.00
3200.00	1.00	583.10	584.50	573.60	3905.00	581.97	.27	.00	.01	3905.00	8.37	141.00
3200.00	1.00	583.10	584.50	573.60	5015.00	581.96	.45	.00	.02	5015.00	8.36	141.00
3218.00	18.00	583.10	584.50	573.60	2580.00	581.98	.12	.01	.00	2580.00	8.38	141.00
3218.00	18.00	583.10	584.50	573.60	3430.00	581.99	.21	.02	.00	3430.00	8.39	141.00
3218.00	18.00	583.10	584.50	573.60	3905.00	581.99	.27	.02	.00	3905.00	8.39	141.00
3218.00	18.00	583.10	584.50	573.60	5015.00	582.00	.45	.03	.00	5015.00	8.40	141.00
3219.00	1.00	0.00	0.00	573.60	2580.00	582.00	.11	.00	.00	2580.00	8.40	147.00
3219.00	1.00	0.00	0.00	573.60	3430.00	582.01	.19	.00	.01	3430.00	8.41	147.00
3219.00	1.00	0.00	0.00	573.60	3905.00	582.03	.24	.00	.01	3905.00	8.43	147.00
3219.00	1.00	0.00	0.00	573.60	5015.00	582.06	.40	.00	.01	5015.00	8.46	147.00
3318.00	99.00	0.00	0.00	573.70	2580.00	582.11	.03	.01	.02	2580.00	8.41	311.10
3318.00	99.00	0.00	0.00	573.70	3430.00	582.21	.05	.02	.04	3430.00	8.51	311.17
3318.00	99.00	0.00	0.00	573.70	3905.00	582.28	.07	.03	.05	3905.00	8.58	311.21
3318.00	99.00	0.00	0.00	573.70	5015.00	582.49	.11	.04	.09	5015.00	8.79	311.35
3718.00	400.00	0.00	0.00	573.90	2580.00	582.15	.02	.02	.00	2580.00	8.25	391.28
3718.00	400.00	0.00	0.00	573.90	3430.00	582.28	.03	.04	.01	3430.00	8.38	391.53
3718.00	400.00	0.00	0.00	573.90	3905.00	582.37	.04	.05	.01	3905.00	8.46	391.70
3718.00	400.00	0.00	0.00	573.90	5015.00	582.62	.06	.07	.01	5015.00	8.71	392.19
4018.00	300.00	0.00	0.00	574.00	2580.00	582.16	.03	.02	.01	2580.00	8.16	311.00
4018.00	300.00	0.00	0.00	574.00	3430.00	582.30	.06	.03	.01	3430.00	8.30	311.09
4018.00	300.00	0.00	0.00	574.00	3905.00	582.39	.07	.04	.02	3905.00	8.39	311.15
4018.00	300.00	0.00	0.00	574.00	5015.00	582.65	.11	.06	.02	5015.00	8.65	311.32
4875.00	857.00	0.00	0.00	574.50	2580.00	582.25	.07	.11	.02	2580.00	7.75	188.00
4875.00	857.00	0.00	0.00	574.50	3430.00	582.44	.12	.17	.03	3430.00	7.94	188.00
4875.00	857.00	0.00	0.00	574.50	3905.00	582.57	.15	.21	.04	3905.00	8.07	188.00
4875.00	857.00	0.00	0.00	574.50	5015.00	582.90	.23	.31	.06	5015.00	8.40	188.00
4974.00	99.00	0.00	0.00	574.40	2580.00	582.25	.13	.02	.03	2580.00	7.85	138.00
4974.00	99.00	0.00	0.00	574.40	3430.00	582.43	.21	.04	.05	3430.00	8.03	138.00
4974.00	99.00	0.00	0.00	574.40	3905.00	582.55	.27	.04	.06	3905.00	8.15	138.00
4974.00	99.00	0.00	0.00	574.40	5015.00	582.87	.40	.06	.09	5015.00	8.47	138.00
4975.00	1.00	586.50	585.40	574.40	2580.00	582.22	.18	.00	.03	2580.00	7.82	119.80
4975.00	1.00	586.50	585.40	574.40	3430.00	582.39	.31	.00	.05	3430.00	7.99	119.80
4975.00	1.00	586.50	585.40	574.40	3905.00	582.50	.38	.00	.06	3905.00	8.10	119.80
4975.00	1.00	586.50	585.40	574.40	5015.00	582.78	.59	.00	.10	5015.00	8.38	119.80

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	HV	HL	OLOSS	QCH	DEPTH	TOPWID
4985.00	10.00	586.50	585.40	574.40	2580.00	582.23	.18	.01	.00	2580.00	7.83	119.80
4985.00	10.00	586.50	585.40	574.40	3430.00	582.41	.31	.02	.00	3430.00	8.01	119.80
4985.00	10.00	586.50	585.40	574.40	3905.00	582.52	.38	.02	.00	3905.00	8.12	119.80
4985.00	10.00	586.50	585.40	574.40	5015.00	582.82	.59	.04	.00	5015.00	8.42	119.80
4986.00	1.00	0.00	0.00	574.40	2580.00	582.31	.13	.00	.02	2580.00	7.91	138.00
4986.00	1.00	0.00	0.00	574.40	3430.00	582.54	.21	.00	.03	3430.00	8.14	138.00
4986.00	1.00	0.00	0.00	574.40	3905.00	582.68	.26	.00	.04	3905.00	8.28	138.00
4986.00	1.00	0.00	0.00	574.40	5015.00	583.10	.38	.00	.06	5015.00	8.70	138.00
5135.00	149.00	0.00	0.00	574.60	2485.00	582.45	.04	.02	.03	2479.08	7.85	352.78
5135.00	149.00	0.00	0.00	574.60	3305.00	582.77	.06	.04	.05	3279.29	8.17	438.00
5135.00	149.00	0.00	0.00	574.60	3760.00	582.97	.07	.04	.06	3718.60	8.37	438.00
5135.00	149.00	0.00	0.00	574.60	4835.00	583.53	.09	.05	.09	4735.65	8.93	438.00
5885.00	750.00	0.00	0.00	575.90	2485.00	582.51	.00	.02	.01	2485.00	6.61	755.88
5885.00	750.00	0.00	0.00	575.90	3305.00	582.86	.01	.03	.01	3305.00	6.96	757.11
5885.00	750.00	0.00	0.00	575.90	3760.00	583.08	.01	.03	.02	3760.00	7.18	757.89
5885.00	750.00	0.00	0.00	575.90	4835.00	583.67	.01	.04	.02	4835.00	7.77	759.93
6900.00	1015.00	0.00	0.00	577.50	2280.00	582.52	.02	.02	.01	2280.00	5.02	431.77
6900.00	1015.00	0.00	0.00	577.50	3035.00	582.88	.03	.04	.01	3035.00	5.38	433.14
6900.00	1015.00	0.00	0.00	577.50	3455.00	583.11	.04	.04	.02	3455.00	5.61	434.00
6900.00	1015.00	0.00	0.00	577.50	4445.00	583.70	.05	.05	.02	4445.00	6.20	436.25
7700.00	800.00	0.00	0.00	577.40	2280.00	582.58	.01	.04	.00	1267.30	5.18	886.71
7700.00	800.00	0.00	0.00	577.40	3035.00	582.97	.01	.05	.01	1689.51	5.57	887.44
7700.00	800.00	0.00	0.00	577.40	3455.00	583.20	.01	.06	.01	1924.89	5.80	887.89
7700.00	800.00	0.00	0.00	577.40	4445.00	583.81	.01	.07	.01	2480.89	6.41	889.04
8400.00	700.00	0.00	0.00	577.40	2280.00	582.61	.02	.04	.01	2268.69	5.21	665.53
8400.00	700.00	0.00	0.00	577.40	3035.00	583.00	.03	.05	.01	3002.93	5.60	666.15
8400.00	700.00	0.00	0.00	577.40	3455.00	583.24	.03	.05	.01	3406.05	5.84	666.54
8400.00	700.00	0.00	0.00	577.40	4445.00	583.86	.04	.05	.01	4342.61	6.46	667.53
9325.00	925.00	0.00	0.00	577.30	2200.00	582.68	.01	.05	.00	2200.00	5.38	750.00
9325.00	925.00	0.00	0.00	577.30	2930.00	583.09	.01	.06	.00	2930.00	5.79	750.00
9325.00	925.00	0.00	0.00	577.30	3330.00	583.33	.01	.07	.01	3330.00	6.03	750.00
9325.00	925.00	0.00	0.00	577.30	4290.00	583.96	.02	.07	.01	4290.00	6.66	750.00
10125.00	800.00	0.00	0.00	577.00	2200.00	582.66	.21	.08	.10	2118.33	5.66	328.69
10125.00	800.00	0.00	0.00	577.00	2930.00	583.07	.26	.10	.12	2752.11	6.07	354.17
10125.00	800.00	0.00	0.00	577.00	3330.00	583.31	.28	.11	.13	3081.05	6.31	369.48
10125.00	800.00	0.00	0.00	577.00	4290.00	583.93	.30	.12	.14	3818.94	6.93	408.26
10850.00	725.00	0.00	0.00	576.70	2200.00	583.03	.02	.13	.05	2200.00	6.33	328.00
10850.00	725.00	0.00	0.00	576.70	2930.00	583.53	.04	.17	.07	2930.00	6.83	328.00
10850.00	725.00	0.00	0.00	576.70	3330.00	583.81	.04	.18	.07	3330.00	7.11	328.00
10850.00	725.00	0.00	0.00	576.70	4290.00	584.46	.06	.21	.07	4290.00	7.76	328.00

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	HV	HL	OLOSS	QCH	DEPTH	TOPWID
11025.00	175.00	0.00	0.00	576.60	385.00	583.06	.00	.01	.01	385.00	6.46	242.00
11025.00	175.00	0.00	0.00	576.60	520.00	583.58	.00	.01	.01	520.00	6.98	242.00
11025.00	175.00	0.00	0.00	576.60	600.00	583.86	.00	.01	.01	600.00	7.26	242.00
11025.00	175.00	0.00	0.00	576.60	800.00	584.54	.00	.01	.02	800.00	7.94	242.00
11200.00	175.00	0.00	0.00	576.50	385.00	583.06	.00	.00	.00	385.00	6.56	154.00
11200.00	175.00	0.00	0.00	576.50	520.00	583.58	.00	.00	.00	520.00	7.08	154.00
11200.00	175.00	0.00	0.00	576.50	600.00	583.86	.01	.00	.00	600.00	7.36	154.00
11200.00	175.00	0.00	0.00	576.50	800.00	584.54	.01	.00	.00	800.00	8.04	154.00
11375.00	175.00	0.00	0.00	576.40	385.00	583.06	.01	.00	.01	385.00	6.66	66.00
11375.00	175.00	0.00	0.00	576.40	520.00	583.58	.02	.00	.01	520.00	7.18	66.00
11375.00	175.00	0.00	0.00	576.40	600.00	583.86	.03	.00	.01	600.00	7.46	66.00
11375.00	175.00	0.00	0.00	576.40	800.00	584.53	.04	.01	.02	800.00	8.13	66.00
11425.00	50.00	0.00	0.00	576.40	385.00	583.05	.03	.00	.01	385.00	6.66	41.00
11425.00	50.00	0.00	0.00	576.40	520.00	583.56	.05	.00	.02	520.00	7.17	41.00
11425.00	50.00	0.00	0.00	576.40	600.00	583.84	.07	.01	.02	600.00	7.45	41.00
11425.00	50.00	0.00	0.00	576.40	800.00	584.50	.10	.01	.03	800.00	8.11	41.00
11450.00	25.00	0.00	0.00	576.40	385.00	583.04	.07	.00	.02	385.00	6.64	28.00
11450.00	25.00	0.00	0.00	576.40	520.00	583.54	.11	.01	.03	520.00	7.14	28.00
11450.00	25.00	0.00	0.00	576.40	600.00	583.81	.14	.01	.04	600.00	7.41	28.00
11450.00	25.00	0.00	0.00	576.40	800.00	584.46	.21	.01	.05	800.00	8.05	28.00
11474.00	24.00	0.00	0.00	576.40	385.00	582.96	.26	.01	.10	385.00	6.56	15.50
11474.00	24.00	0.00	0.00	576.40	520.00	583.41	.41	.02	.15	520.00	7.01	15.50
11474.00	24.00	0.00	0.00	576.40	600.00	583.65	.51	.02	.19	600.00	7.25	15.50
11474.00	24.00	0.00	0.00	576.40	800.00	584.20	.78	.03	.28	800.00	7.80	15.50
11475.00	1.00	587.00	584.40	576.40	385.00	582.96	.26	.00	.00	385.00	6.56	15.50
11475.00	1.00	587.00	584.40	576.40	520.00	583.41	.41	.00	.00	520.00	7.01	15.50
11475.00	1.00	587.00	584.40	576.40	600.00	583.65	.51	.00	.00	600.00	7.25	15.50
11475.00	1.00	587.00	584.40	576.40	800.00	584.21	.78	.00	.00	800.00	7.81	15.50
11523.00	48.00	587.00	584.40	576.40	385.00	583.03	.26	.06	.00	385.00	6.63	15.50
11523.00	48.00	587.00	584.40	576.40	520.00	583.52	.40	.10	.00	520.00	7.12	15.50
11523.00	48.00	587.00	584.40	576.40	600.00	583.79	.49	.11	.01	600.00	7.39	15.50
11523.00	48.00	587.00	584.40	576.40	800.00	584.47	.74	.21	.01	800.00	8.07	15.50
11524.00	1.00	0.00	0.00	576.40	385.00	583.03	.26	.00	.00	385.00	6.63	15.50
11524.00	1.00	0.00	0.00	576.40	520.00	583.53	.40	.00	.00	520.00	7.13	15.50
11524.00	1.00	0.00	0.00	576.40	600.00	583.80	.49	.00	.00	600.00	7.40	15.50
11524.00	1.00	0.00	0.00	576.40	800.00	584.50	.72	.00	.01	800.00	8.10	15.50
11548.00	24.00	0.00	0.00	576.50	385.00	583.35	.01	.00	.07	385.00	6.85	66.00
11548.00	24.00	0.00	0.00	576.50	520.00	584.02	.02	.00	.11	520.00	7.52	66.00
11548.00	24.00	0.00	0.00	576.50	600.00	584.41	.02	.00	.14	600.00	7.91	66.00
11548.00	24.00	0.00	0.00	576.50	800.00	585.40	.03	.00	.21	800.00	8.90	66.00

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	HV	HL	OLOSS	QCH	DEPTH	TOPWID
11573.00	25.00	0.00	0.00	576.70	385.00	583.36	.00	.00	.00	385.00	6.66	116.00
11573.00	25.00	0.00	0.00	576.70	520.00	584.04	.01	.00	.00	520.00	7.34	116.00
11573.00	25.00	0.00	0.00	576.70	600.00	584.43	.01	.00	.00	600.00	7.73	116.00
11573.00	25.00	0.00	0.00	576.70	800.00	585.42	.01	.00	.01	800.00	8.72	116.00
11623.00	50.00	0.00	0.00	577.00	310.00	583.37	.00	.00	.00	304.95	6.37	216.00
11623.00	50.00	0.00	0.00	577.00	420.00	584.05	.00	.00	.00	410.52	7.05	216.00
11623.00	50.00	0.00	0.00	577.00	485.00	584.44	.00	.00	.00	472.36	7.44	216.00
11623.00	50.00	0.00	0.00	577.00	640.00	585.43	.00	.00	.00	618.12	8.43	216.00
11723.00	100.00	0.00	0.00	577.60	310.00	583.37	.00	.00	.00	304.14	5.77	221.86
11723.00	100.00	0.00	0.00	577.60	420.00	584.05	.00	.00	.00	407.01	6.45	256.00
11723.00	100.00	0.00	0.00	577.60	485.00	584.44	.00	.00	.00	466.34	6.84	256.00
11723.00	100.00	0.00	0.00	577.60	640.00	585.44	.00	.00	.00	603.79	7.84	256.00
11898.00	175.00	0.00	0.00	578.50	310.00	583.37	.00	.00	.00	308.25	4.87	220.71
11898.00	175.00	0.00	0.00	578.50	420.00	584.05	.00	.00	.00	413.81	5.55	245.80
11898.00	175.00	0.00	0.00	578.50	485.00	584.44	.00	.00	.00	474.60	5.94	295.80
11898.00	175.00	0.00	0.00	578.50	640.00	585.44	.00	.00	.00	604.07	6.94	480.50
12825.00	927.00	0.00	0.00	579.10	310.00	583.38	.00	.01	.00	309.48	4.28	383.77
12825.00	927.00	0.00	0.00	579.10	420.00	584.06	.00	.01	.00	417.53	4.96	410.06
12825.00	927.00	0.00	0.00	579.10	485.00	584.45	.00	.01	.00	480.53	5.35	425.03
12825.00	927.00	0.00	0.00	579.10	640.00	585.45	.00	.01	.00	626.29	6.35	518.73
13225.00	400.00	0.00	0.00	579.50	310.00	583.38	.00	.00	.00	309.84	3.88	268.51
13225.00	400.00	0.00	0.00	579.50	420.00	584.06	.00	.00	.00	418.27	4.56	294.80
13225.00	400.00	0.00	0.00	579.50	485.00	584.45	.00	.00	.00	481.29	4.95	309.78
13225.00	400.00	0.00	0.00	579.50	640.00	585.45	.00	.00	.00	627.01	5.95	347.95
13723.00	498.00	0.00	0.00	579.51	310.00	583.38	.00	.01	.00	310.00	3.87	162.00
13723.00	498.00	0.00	0.00	579.51	420.00	584.07	.01	.01	.00	420.00	4.55	162.00
13723.00	498.00	0.00	0.00	579.51	485.00	584.45	.01	.01	.00	485.00	4.94	162.00
13723.00	498.00	0.00	0.00	579.51	640.00	585.45	.01	.01	.00	640.00	5.94	162.00
13973.00	250.00	0.00	0.00	579.50	310.00	583.36	.09	.02	.04	310.00	3.86	37.00
13973.00	250.00	0.00	0.00	579.50	420.00	584.03	.11	.02	.05	420.00	4.53	37.00
13973.00	250.00	0.00	0.00	579.50	485.00	584.41	.13	.02	.06	485.00	4.91	37.00
13973.00	250.00	0.00	0.00	579.50	640.00	585.40	.15	.02	.07	640.00	5.90	37.00
13998.00	25.00	0.00	0.00	579.50	310.00	583.33	.18	.02	.04	310.00	3.83	25.00
13998.00	25.00	0.00	0.00	579.50	420.00	583.99	.23	.02	.06	420.00	4.49	25.00
13998.00	25.00	0.00	0.00	579.50	485.00	584.36	.26	.02	.07	485.00	4.86	25.00
13998.00	25.00	0.00	0.00	579.50	640.00	585.33	.32	.02	.08	640.00	5.83	25.00
14023.00	25.00	0.00	0.00	579.50	310.00	583.07	.81	.06	.32	310.00	3.57	12.00
14023.00	25.00	0.00	0.00	579.50	420.00	583.61	1.12	.07	.44	420.00	4.11	12.00
14023.00	25.00	0.00	0.00	579.50	485.00	583.91	1.30	.07	.52	485.00	4.41	12.00
14023.00	25.00	0.00	0.00	579.50	640.00	584.77	1.59	.07	.64	640.00	5.27	12.00

SECTION NUMBER	DISCHARGE CFS	CWSEL	CWSEL DIFF EACH Q	CWSEL DIFF EACH SECTION	CWSEL-WSELK	TOPWID	T.W. DIFF	LENGTH
3199.000	2580.000	581.980	0.000	0.000	0.000	147.000	0.000	0.000
3199.000	3430.000	581.980	0.000	0.000	0.000	147.000	0.000	0.000
3199.000	3905.000	581.980	0.000	0.000	0.000	147.000	0.000	0.000
3199.000	5015.000	581.980	0.000	0.000	0.000	147.000	0.000	0.000
3200.000	2580.000	581.975	0.000	-.005	0.000	141.000	0.000	1.000
3200.000	3430.000	581.971	-.004	-.009	0.000	141.000	0.000	1.000
3200.000	3905.000	581.968	-.003	-.012	0.000	141.000	0.000	1.000
3200.000	5015.000	581.959	-.009	-.021	0.000	141.000	0.000	1.000

3218.000	2580.000	581.984	0.000	.009	0.000	141.000	0.000	18.000
3218.000	3430.000	581.987	.003	.016	0.000	141.000	0.000	18.000
3218.000	3905.000	581.989	.002	.021	0.000	141.000	0.000	18.000
3218.000	5015.000	581.997	.008	.038	0.000	141.000	0.000	18.000
3219.000	2580.000	581.998	0.000	.015	0.000	147.000	0.000	1.000
3219.000	3430.000	582.014	.016	.027	0.000	147.000	0.000	1.000
3219.000	3905.000	582.026	.012	.036	0.000	147.000	0.000	1.000
3219.000	5015.000	582.063	.037	.066	0.000	147.000	0.000	1.000
3318.000	2580.000	582.110	0.000	.112	0.000	311.103	0.000	99.000
3318.000	3430.000	582.212	.102	.198	0.000	311.169	-.066	99.000
3318.000	3905.000	582.282	.070	.257	0.000	311.214	-.111	99.000
3318.000	5015.000	582.486	.204	.424	0.000	311.346	-.243	99.000
3718.000	2580.000	582.151	0.000	.041	0.000	391.276	0.000	400.000
3718.000	3430.000	582.281	.130	.069	0.000	391.530	-.254	400.000
3718.000	3905.000	582.369	.088	.087	0.000	391.703	-.427	400.000
3718.000	5015.000	582.617	.248	.131	0.000	392.190	-.914	400.000
4018.000	2580.000	582.163	0.000	.012	0.000	310.997	0.000	300.000
4018.000	3430.000	582.301	.137	.020	0.000	311.090	-.092	300.000
4018.000	3905.000	582.393	.092	.024	0.000	311.153	-.156	300.000
4018.000	5015.000	582.651	.258	.034	0.000	311.323	-.325	300.000
4875.000	2580.000	582.252	0.000	.088	0.000	187.999	0.000	857.000
4875.000	3430.000	582.443	.191	.143	0.000	187.999	-.000	857.000
4875.000	3905.000	582.567	.124	.174	0.000	187.999	-.000	857.000
4875.000	5015.000	582.897	.329	.246	0.000	187.999	-.000	857.000
4974.000	2580.000	582.248	0.000	-.004	0.000	138.000	0.000	99.000
4974.000	3430.000	582.434	.187	-.009	0.000	138.000	0.000	99.000
4974.000	3905.000	582.555	.120	-.012	0.000	138.000	0.000	99.000
4974.000	5015.000	582.873	.318	-.023	0.000	138.000	0.000	99.000
4975.000	2580.000	582.221	0.000	-.027	0.000	119.800	0.000	1.000
4975.000	3430.000	582.389	.168	-.046	0.000	119.800	0.000	1.000
4975.000	3905.000	582.497	.108	-.058	0.000	119.800	0.000	1.000
4975.000	5015.000	582.778	.281	-.095	0.000	119.800	0.000	1.000
4985.000	2580.000	582.231	0.000	.010	0.000	119.800	0.000	10.000
4985.000	3430.000	582.406	.175	.018	0.000	119.800	0.000	10.000
4985.000	3905.000	582.519	.113	.022	0.000	119.800	0.000	10.000
4985.000	5015.000	582.823	.303	.044	0.000	119.800	0.000	10.000
4986.000	2580.000	582.306	0.000	.075	0.000	138.000	0.000	1.000
4986.000	3430.000	582.536	.230	.129	0.000	138.000	0.000	1.000
4986.000	3905.000	582.684	.149	.165	0.000	138.000	0.000	1.000
4986.000	5015.000	583.099	.415	.277	0.000	138.000	0.000	1.000
5135.000	2485.000	582.447	0.000	.141	0.000	352.778	0.000	149.000
5135.000	3305.000	582.769	.322	.233	0.000	437.999	-85.221	149.000
5135.000	3760.000	582.975	.206	.291	0.000	437.999	-85.221	149.000
5135.000	4835.000	583.528	.553	.429	0.000	437.999	-85.221	149.000
5885.000	2485.000	582.507	0.000	.060	0.000	755.880	0.000	750.000
5885.000	3305.000	582.860	.353	.091	0.000	757.113	-1.233	750.000
5885.000	3760.000	583.082	.222	.107	0.000	757.889	-2.009	750.000
5885.000	4835.000	583.667	.585	.139	0.000	759.934	-4.054	750.000
6900.000	2280.000	582.523	0.000	.016	0.000	431.774	0.000	1015.000
6900.000	3035.000	582.882	.359	.022	0.000	433.145	-1.371	1015.000
6900.000	3455.000	583.107	.225	.025	0.000	434.002	-2.228	1015.000
6900.000	4445.000	583.696	.589	.029	0.000	436.250	-4.476	1015.000

7700.000	2280.000	582.584	0.000	.061	0.000	886.711	0.000	800.000
7700.000	3035.000	582.968	.384	.086	0.000	887.439	-.729	800.000
7700.000	3455.000	583.204	.236	.098	0.000	887.888	-1.177	800.000
7700.000	4445.000	583.814	.610	.118	0.000	889.044	-2.333	800.000
8400.000	2280.000	582.612	0.000	.029	0.000	665.531	0.000	700.000
8400.000	3035.000	583.005	.392	.037	0.000	666.155	-.624	700.000
8400.000	3455.000	583.244	.239	.040	0.000	666.542	-1.011	700.000
8400.000	4445.000	583.856	.612	.042	0.000	667.532	-2.001	700.000
9325.000	2200.000	582.676	0.000	.063	0.000	749.999	0.000	925.000
9325.000	2930.000	583.088	.412	.083	0.000	749.999	-.000	925.000
9325.000	3330.000	583.334	.247	.090	0.000	749.999	-.000	925.000
9325.000	4290.000	583.956	.622	.100	0.000	749.999	-.000	925.000
10125.000	2200.000	582.659	0.000	-.017	0.000	328.686	0.000	800.000
10125.000	2930.000	583.066	.408	-.021	0.000	354.165	-25.479	800.000
10125.000	3330.000	583.312	.245	-.023	0.000	369.481	-40.795	800.000
10125.000	4290.000	583.932	.620	-.024	0.000	408.259	-79.573	800.000
10850.000	2200.000	583.030	0.000	.371	0.000	327.999	0.000	725.000
10850.000	2930.000	583.530	.501	.464	0.000	327.999	-.000	725.000
10850.000	3330.000	583.806	.275	.494	0.000	327.999	-.000	725.000
10850.000	4290.000	584.457	.651	.525	0.000	327.999	-.000	725.000
11025.000	385.000	583.064	0.000	.034	0.000	241.999	0.000	175.000
11025.000	520.000	583.581	.516	.050	0.000	241.999	-.000	175.000
11025.000	600.000	583.865	.284	.059	0.000	241.999	-.000	175.000
11025.000	800.000	584.536	.671	.079	0.000	241.999	-.000	175.000
11200.000	385.000	583.064	0.000	.000	0.000	153.999	0.000	175.000
11200.000	520.000	583.581	.516	-.000	0.000	153.999	-.000	175.000
11200.000	600.000	583.864	.284	-.000	0.000	153.999	-.000	175.000
11200.000	800.000	584.535	.671	-.000	0.000	153.999	-.000	175.000
11375.000	385.000	583.061	0.000	-.003	0.000	65.999	0.000	175.000
11375.000	520.000	583.576	.514	-.005	0.000	65.999	-.000	175.000
11375.000	600.000	583.858	.282	-.006	0.000	65.999	-.000	175.000
11375.000	800.000	584.525	.667	-.010	0.000	65.999	-.000	175.000
11425.000	385.000	583.055	0.000	-.007	0.000	40.999	0.000	50.000
11425.000	520.000	583.564	.510	-.011	0.000	40.999	-.000	50.000
11425.000	600.000	583.844	.279	-.014	0.000	40.999	-.000	50.000
11425.000	800.000	584.503	.659	-.022	0.000	40.999	-.000	50.000
11450.000	385.000	583.040	0.000	-.015	0.000	27.999	0.000	25.000
11450.000	520.000	583.541	.501	-.023	0.000	27.999	-.000	25.000
11450.000	600.000	583.815	.274	-.029	0.000	27.999	-.000	25.000
11450.000	800.000	584.458	.644	-.045	0.000	27.999	-.000	25.000
11474.000	385.000	582.957	0.000	-.083	0.000	15.500	0.000	24.000
11474.000	520.000	583.408	.451	-.133	0.000	15.500	0.000	24.000
11474.000	600.000	583.649	.241	-.165	0.000	15.500	0.000	24.000
11474.000	800.000	584.203	.554	-.255	0.000	15.500	0.000	24.000
11475.000	385.000	582.958	0.000	.001	0.000	15.500	0.000	1.000
11475.000	520.000	583.411	.452	.002	0.000	15.500	0.000	1.000
11475.000	600.000	583.652	.242	.003	0.000	15.500	0.000	1.000
11475.000	800.000	584.207	.555	.004	0.000	15.500	0.000	1.000
11523.000	385.000	583.030	0.000	.072	0.000	15.500	0.000	48.000
11523.000	520.000	583.523	.493	.113	0.000	15.500	0.000	48.000
11523.000	600.000	583.794	.271	.142	0.000	15.500	0.000	48.000
11523.000	800.000	584.471	.677	.264	0.000	15.500	0.000	48.000
11524.000	385.000	583.032	0.000	.001	0.000	15.500	0.000	1.000

11524.000	520.000	583.526	.494	.002	0.000	15.500	0.000	1.000
11524.000	600.000	583.797	.271	.003	0.000	15.500	0.000	1.000
11524.000	800.000	584.500	.704	.029	0.000	15.500	0.000	1.000
11548.000	385.000	583.350	0.000	.318	0.000	65.999	0.000	24.000
11548.000	520.000	584.024	.674	.498	0.000	65.999	-.000	24.000
11548.000	600.000	584.408	.384	.611	0.000	65.999	-.000	24.000
11548.000	800.000	585.396	.988	.895	0.000	65.999	-.000	24.000
11573.000	385.000	583.361	0.000	.011	0.000	115.999	0.000	25.000
11573.000	520.000	584.041	.679	.017	0.000	115.999	-.000	25.000
11573.000	600.000	584.428	.387	.020	0.000	115.999	-.000	25.000
11573.000	800.000	585.424	.996	.028	0.000	115.999	-.000	25.000
11623.000	310.000	583.366	0.000	.004	0.000	215.999	0.000	50.000
11623.000	420.000	584.047	.681	.006	0.000	215.999	-.000	50.000
11623.000	485.000	584.436	.389	.008	0.000	215.999	-.000	50.000
11623.000	640.000	585.435	.999	.011	0.000	215.999	-.000	50.000
11723.000	310.000	583.366	0.000	.000	0.000	221.863	0.000	100.000
11723.000	420.000	584.047	.682	.000	0.000	255.999	-34.136	100.000
11723.000	485.000	584.436	.389	.000	0.000	255.999	-34.136	100.000
11723.000	640.000	585.435	.999	.000	0.000	255.999	-34.136	100.000
11898.000	310.000	583.367	0.000	.001	0.000	220.706	0.000	175.000
11898.000	420.000	584.048	.682	.001	0.000	245.798	-25.092	175.000
11898.000	485.000	584.437	.389	.001	0.000	295.802	-75.096	175.000
11898.000	640.000	585.436	.999	.001	0.000	480.496	-259.790	175.000
12825.000	310.000	583.376	0.000	.009	0.000	383.769	0.000	927.000
12825.000	420.000	584.058	.683	.010	0.000	410.057	-26.288	927.000
12825.000	485.000	584.447	.389	.010	0.000	425.035	-41.266	927.000
12825.000	640.000	585.446	.999	.010	0.000	518.730	-134.962	927.000
13225.000	310.000	583.377	0.000	.002	0.000	268.508	0.000	400.000
13225.000	420.000	584.060	.683	.002	0.000	294.804	-26.296	400.000
13225.000	485.000	584.449	.389	.002	0.000	309.783	-41.275	400.000
13225.000	640.000	585.447	.998	.001	0.000	347.951	-79.443	400.000
13723.000	310.000	583.384	0.000	.006	0.000	161.999	0.000	498.000
13723.000	420.000	584.066	.682	.006	0.000	161.999	-.000	498.000
13723.000	485.000	584.455	.389	.006	0.000	161.999	-.000	498.000
13723.000	640.000	585.452	.997	.004	0.000	161.999	-.000	498.000
13973.000	310.000	583.357	0.000	-.027	0.000	36.999	0.000	250.000
13973.000	420.000	584.027	.671	-.038	0.000	36.999	-.000	250.000
13973.000	485.000	584.410	.382	-.045	0.000	36.999	-.000	250.000
13973.000	640.000	585.395	.985	-.057	0.000	36.999	-.000	250.000
13998.000	310.000	583.331	0.000	-.026	0.000	24.999	0.000	25.000
13998.000	420.000	583.988	.657	-.039	0.000	24.999	-.000	25.000
13998.000	485.000	584.363	.375	-.047	0.000	24.999	-.000	25.000
13998.000	640.000	585.333	.970	-.062	0.000	24.999	-.000	25.000
14023.000	310.000	583.073	0.000	-.258	0.000	12.000	0.000	25.000
14023.000	420.000	583.611	.538	-.377	0.000	12.000	0.000	25.000
14023.000	485.000	583.915	.304	-.448	0.000	12.000	0.000	25.000
14023.000	640.000	584.767	.852	-.565	0.000	12.000	0.000	25.000

DATA FOR LAST CROSS SECTION

PROFILE	TYPE ENC	TARGET	TOP WIDTH AREA-ACRES	TOP WIDTH AREA-DIFF
1	0.000	0.000	106.807	0.000
2	0.000	0.000	109.343	2.536
3	0.000	0.000	110.654	3.847

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     4        0.000        0.000      115.561        8.754

HEC2 VERSION UPDATED JAN 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09
MODIFICATIONS 52,53,54,55,56,57,58
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00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Frankenlust Twp

3) WATERCOURSE: Frankenlust Drain

4) DOCUMENT TYPE: 100-YR NATURAL

00BREAK00

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$$$$$$$$  $$$$$$$      $$      $$$$$$$$   $$$$$ $   $$$$$$$$        $$
$$        $$    $$    $$$$        $$     $$    $        $$         $$$
$$        $$    $$   $$  $$       $$     $$   $$$       $$        $$$$
$$$$$     $$    $$   $$    $$      $$     $$  $ $$       $$       $$ $$
$$        $$    $$   $$    $$      $$     $$ $$ $$       $$      $$  $$
$$        $$$$$$$$   $$$$$$$$      $$     $$ $  $$       $$      $$$$$$$$
$$        $$   $$    $$    $$      $$     $$$   $$       $$         $$
$$        $$   $$    $$    $$  $$ $$       $    $$   $$ $$         $$
$$        $$    $$   $$    $$   $$$       $ $$$$$    $$$          $$
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TOWNSHIP OF FRANKENLUST FIS

J&A FILE NO. 5555-21

FRANKENLUST DRAIN
10-50-100-500-YR. FLOWS
REVISED HEC-2
ADD .25' DUE TO DATUM DIFFERENCE

4.13

SEP 15 '77

9-19-77

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*****************************************
HEC2 VERSION UPDATED JAN 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09
MODIFICATIONS 52,53,54,55,56,57,58
*****************************************


C
1          FRANKENLUST TWP. FIS 5555-21, PROJECT MANAGER: JAMES KREGER
T2          10 YEAR FLOW
T3          FRANKENLUST DRAIN

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      0.       2.        0.        0.  0.000000     0.00       0.0       0.   585.850    0.000

J2  NPROF     IPLOT     PREVS     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     1.000    10.000    11.000    12.000    14.000     8.000     4.000     0.000     0.000     0.000
NC      .040      .040      .035      .300      .500     0.000     0.000     0.000     0.000     0.000
QT    4.000   700.000   930.000  1060.000  1365.000     0.000     0.000     0.000     0.000     0.000

X1     0.000    36.000  1470.000  1500.000     0.000     0.000     0.000     0.000     0.000     0.000
X3    10.000     0.000     0.000  1207.000     0.000  1762.000     0.000     0.000     0.000     0.000
GR   591.300     0.000   591.100   100.000   590.600   200.000   590.600   300.000   589.800   400.000
GR   591.100   500.000   590.000   600.000   587.700   700.000   588.400   800.000   589.000   900.000
GR   589.700  1000.000   588.000  1100.000   587.900  1200.000   584.100  1300.000   583.300  1400.000
GR   583.000  1470.000   581.000  1478.000   579.600  1482.000   578.900  1486.000   580.100  1496.000
GR   583.900  1500.000   583.200  1600.000   585.100  1700.000   584.500  1800.000   583.300  1900.000
GR   583.600  2000.000   582.300  2100.000   586.200  2200.000   586.900  2300.000   586.800  2400.000
GR   586.400  2500.000   586.500  2600.000   588.600  2700.000   586.600  2800.000   586.300  2900.000
GR   586.500  3000.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

X1   150.000    36.000  1470.000  1500.000   150.000   150.000   150.000     0.000     0.000     0.000
X3    10.000     0.000     0.000  1245.000     0.000  1725.000     0.000     0.000     0.000     0.000
GR   591.300     0.000   591.100   100.000   590.600   200.000   590.600   300.000   589.800   400.000
GR   591.100   500.000   590.000   600.000   587.700   700.000   588.400   800.000   589.000   900.000
GR   589.700  1000.000   588.000  1100.000   587.900  1200.000   584.100  1300.000   583.300  1400.000
GR   583.000  1470.000   581.000  1478.000   579.600  1482.000   578.900  1486.000   580.100  1496.000
GR   583.900  1500.000   583.200  1600.000   585.100  1700.000   584.500  1800.000   583.300  1900.000
GR   583.600  2000.000   582.300  2100.000   586.200  2200.000   586.900  2300.000   586.800  2400.000
GR   586.400  2500.000   586.500  2600.000   588.600  2700.000   586.600  2800.000   586.300  2900.000
GR   586.500  3000.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

X1   400.000     0.000     0.000     0.000   250.000   250.000   250.000     0.000      .300     0.000
X3    10.000     0.000     0.000  1308.000     0.000  1663.000     0.000     0.000     0.000     0.000

X1   650.000     0.000     0.000     0.000   250.000   250.000   250.000     0.000      .300     0.000
X3    10.000     0.000     0.000  1370.000     0.000  1600.000     0.000     0.000     0.000     0.000

X1   900.000     0.000     0.000     0.000   250.000   250.000   250.000     0.000      .400     0.000
X3    10.000     0.000     0.000  1433.000     0.000  1538.000     0.000     0.000     0.000     0.000
NC      .040      .040      .035      .300     1.000     0.000     0.000     0.000     0.000     0.000

X1  1050.000     0.000     0.000     0.000   150.000   150.000   150.000     0.000      .200     0.000
X3    10.000     0.000     0.000  1470.000     0.000  1500.000     0.000     0.000     0.000     0.000

X1  1075.000    40.000  1500.000  1517.000    25.000    25.000    25.000     0.000     0.000     0.000
X3     0.000     0.000     0.000  1500.000     0.000  1517.000     0.000     0.000     0.000     0.000
GR   594.000     0.000   593.800   100.000   593.600   200.000   593.400   300.000   593.500   400.000
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GR	593.400	500.000	593.000	600.000	592.600	700.000	592.200	800.000	592.000	900.000
GR	591.300	1000.000	590.900	1100.000	591.000	1200.000	589.000	1300.000	585.000	1400.000
GR	582.800	1500.000	581.000	1501.500	580.500	1503.500	581.000	1505.500	582.800	1507.000
GR	582.400	1510.000	580.600	1511.500	580.100	1513.500	580.600	1515.500	582.400	1517.000
GR	585.000	1600.000	589.000	1700.000	591.400	1800.000	591.700	1900.000	591.800	2000.000
GR	591.700	2100.000	591.600	2200.000	591.400	2300.000	591.100	2400.000	590.700	2500.000
GR	590.400	2600.000	590.300	2700.000	590.100	2800.000	589.800	2900.000	589.600	3000.000
SB	0.000	1.720	2.500	0.000	17.000	0.000	77.000	0.000	580.700	580.100
X1	1115.000	42.000	1500.000	1517.000	40.000	40.000	40.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	588.000	590.400	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1260.000	0.000	1713.000	0.000	587.500	587.500	0.000
BT	34.000	0.000	594.000	0.000	100.000	593.800	0.000	200.000	593.600	0.000
BT	300.000	593.400	0.000	400.000	593.500	0.000	500.000	593.400	0.000	600.000
BT	593.000	0.000	700.000	592.600	0.000	800.000	592.200	0.000	900.000	592.000
BT	0.000	1000.000	591.300	0.000	1100.000	590.900	0.000	1200.000	591.000	0.000
BT	1300.000	590.800	0.000	1400.000	590.300	0.000	1500.000	590.400	583.300	1500.000
BT	590.400	585.700	1501.500	590.400	587.500	1503.500	590.400	588.000	1505.500	590.400
BT	587.500	1507.000	590.400	585.700	1507.000	590.400	583.300	1510.000	590.400	583.000
BT	1510.000	590.400	585.400	1511.500	590.400	587.200	1513.500	590.400	587.700	1515.500
BT	590.400	587.200	1517.000	590.400	585.400	1517.000	590.400	583.000	1600.000	590.400
BT	0.000	1700.000	590.800	0.000	1800.000	591.400	0.000	1900.000	591.700	0.000
BT	2000.000	591.800	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	594.000	0.000	593.800	100.000	593.600	200.000	593.400	300.000	593.500	400.000
GR	593.400	500.000	593.000	600.000	592.600	700.000	592.200	800.000	592.000	900.000
GR	591.300	1000.000	590.900	1100.000	591.000	1200.000	589.000	1300.000	585.000	1400.000
GR	583.300	1500.000	581.500	1501.500	581.000	1503.500	581.500	1505.500	583.300	1507.000
GR	590.400	1507.000	590.400	1510.000	583.000	1510.000	581.200	1511.500	580.700	1513.500
GR	581.200	1515.500	583.000	1517.000	585.000	1600.000	589.000	1700.000	591.400	1800.000
GR	591.700	1900.000	591.800	2000.000	591.700	2100.000	591.600	2200.000	591.400	2300.000
GR	591.100	2400.000	590.700	2500.000	590.400	2600.000	590.300	2700.000	590.100	2800.000
GR	589.800	2900.000	589.600	3000.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	.060	.060	.050	.300	.500	0.000	0.000	0.000	0.000	0.000
X1	1215.000	39.000	1463.000	1500.000	100.000	100.000	100.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1200.000	0.000	1670.000	0.000	0.000	0.000	0.000
GR	592.100	0.000	591.900	100.000	591.800	200.000	591.600	300.000	591.700	400.000
GR	591.500	500.000	591.600	600.000	591.700	700.000	590.900	800.000	591.400	900.000
GR	589.700	1000.000	590.200	1100.000	591.400	1200.000	589.900	1300.000	587.700	1400.000
GR	587.600	1463.000	580.800	1473.000	580.500	1479.000	579.900	1485.000	580.600	1490.000
GR	588.000	1500.000	586.900	1504.000	585.100	1600.000	585.300	1660.000	590.400	1670.000
GR	590.500	1700.000	591.000	1800.000	591.400	1900.000	590.300	2000.000	589.500	2100.000
GR	588.600	2200.000	589.200	2300.000	588.800	2400.000	589.100	2500.000	588.600	2600.000
GR	588.400	2700.000	588.000	2800.000	587.700	2900.000	587.200	3000.000	0.000	0.000
X1	3250.000	35.000	1459.000	1500.000	2035.000	2035.000	2035.000	0.000	0.000	0.000
GR	594.500	0.000	594.200	100.000	593.900	200.000	593.800	300.000	593.800	400.000
GR	593.600	500.000	593.400	600.000	592.500	700.000	592.800	800.000	592.900	900.000
GR	593.300	1000.000	594.700	1100.000	594.700	1200.000	593.000	1300.000	591.400	1400.000
GR	591.400	1459.000	582.900	1478.000	582.200	1483.000	583.100	1488.000	589.300	1500.000
GR	593.400	1500.000	594.500	1709.000	595.300	1800.000	595.000	1900.000	594.900	2000.000
GR	595.100	2100.000	595.100	2200.000	595.300	2300.000	595.500	2400.000	595.300	2500.000
GR	595.300	2600.000	595.200	2700.000	595.300	2800.000	595.300	2900.000	596.400	3000.000
QT	4.000	610.000	815.000	830.000	1210.000	0.000	0.000	0.000	0.000	0.000
X1	5299.000	12.000	200.000	216.500	2049.000	2049.000	2049.000	0.000	0.000	0.000
GR	594.600	0.000	593.000	100.000	593.800	200.000	587.100	200.000	586.100	205.000
GR	585.000	210.000	584.000	215.000	588.000	215.000	588.300	216.500	593.800	216.500
GR	595.300	300.000	596.500	363.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	5300.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
BT	9.000	0.000	594.600	0.000	100.000	593.800	0.000	200.000	593.800	592.800
BT	205.000	593.800	592.800	210.000	593.800	592.800	215.000	593.800	592.800	216.500
BT	593.800	592.800	300.000	595.300	0.000	363.000	596.500	0.000	0.000	0.000
X1	5315.000	0.000	0.000	0.000	15.000	15.000	15.000	0.000	0.000	0.000

X1	5316.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X1	5550.000	21.000	1500.000	1540.000	150.000	300.000	234.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1100.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	599.200	0.000	598.400	200.000	598.200	400.000	596.400	600.000	596.400	800.000
GR	594.500	1000.000	594.700	1200.000	591.700	1400.000	592.900	1500.000	586.500	1518.000
GR	585.400	1523.000	587.100	1528.000	593.900	1540.000	595.100	1600.000	596.500	1800.000
GR	597.600	2000.000	597.100	2200.000	596.500	2400.000	597.100	2600.000	598.300	2800.000
GR	596.400	3000.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	6549.000	14.000	300.000	316.000	1300.000	900.000	999.000	0.000	0.000	0.000
GR	597.600	0.000	597.200	100.000	594.400	200.000	593.900	257.000	596.400	300.000
GR	588.400	300.000	588.600	306.000	588.000	309.000	588.500	312.000	589.000	316.000
GR	596.400	316.000	595.600	340.000	597.800	395.000	597.900	500.000	0.000	0.000
X1	6550.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
BT	12.000	0.000	597.600	0.000	100.000	597.200	0.000	200.000	594.400	0.000
BT	257.000	593.900	0.000	300.000	596.400	594.700	306.000	596.400	594.700	309.000
BT	596.400	594.700	312.000	596.400	594.700	316.000	596.400	594.700	340.000	595.600
BT	0.000	395.000	597.800	0.000	500.000	597.900	0.000	0.000	0.000	0.000
X1	6564.000	0.000	0.000	0.000	14.000	14.000	14.000	0.000	0.000	0.000
X1	6565.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X1	7500.000	21.000	1500.000	1533.000	850.000	950.000	935.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1000.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	596.800	0.000	596.600	200.000	596.800	400.000	597.000	600.000	597.000	800.000
GR	596.600	1000.000	595.600	1200.000	595.200	1400.000	595.700	1500.000	590.300	1512.000
GR	589.400	1521.000	590.100	1525.000	595.000	1533.000	596.000	1600.000	598.300	1800.000
GR	599.600	2000.000	600.000	2200.000	599.300	2400.000	598.000	2600.000	598.400	2800.000
GR	598.300	3000.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	8725.000	0.000	0.000	0.000	1350.000	1100.000	1225.000	0.000	1.200	0.000
X3	10.000	0.000	0.000	1445.000	0.000	1587.000	0.000	0.000	0.000	0.000
X1	8825.000	17.000	400.000	416.000	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	597.400	597.400	0.000
GR	602.000	0.000	600.600	100.000	599.300	200.000	598.200	300.000	598.600	370.000
GR	599.100	390.000	593.000	400.000	593.200	403.000	591.500	406.000	590.700	410.000
GR	591.200	413.000	592.000	416.000	599.300	426.000	597.400	480.000	597.700	500.000
GR	599.500	600.000	600.600	707.000	0.000	0.000	0.000	0.000	0.000	0.000
SB	.900	1.460	2.500	0.000	16.000	.005	106.000	0.000	590.700	590.700
X1	8841.000	0.000	0.000	0.000	16.000	16.000	16.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	597.400	597.400	0.000
BT	13.000	0.000	602.000	0.000	100.000	600.600	0.000	200.000	599.300	0.000
BT	300.000	598.200	0.000	370.000	598.600	0.000	400.000	599.400	593.000	400.000
BT	599.400	598.300	416.000	599.600	598.500	416.000	599.600	592.000	480.000	597.400
BT	0.000	500.000	597.700	0.000	600.000	599.500	0.000	707.000	600.600	0.000
X1	9550.000	33.000	1300.000	1336.000	709.000	709.000	709.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	1367.000	0.000	0.000	0.000	0.000
GR	606.000	0.000	605.600	100.000	604.900	200.000	604.300	300.000	604.000	400.000
GR	603.900	500.000	603.600	600.000	603.800	700.000	603.900	800.000	603.900	900.000
GR	603.600	1000.000	602.900	1100.000	602.700	1200.000	598.600	1300.000	593.600	1314.000
GR	592.400	1325.000	599.000	1336.000	598.500	1400.000	601.300	1478.000	601.000	1500.000
GR	601.100	1600.000	601.500	1700.000	602.200	1800.000	602.100	1900.000	602.100	2000.000
GR	601.500	2100.000	601.300	2200.000	601.800	2300.000	602.000	2400.000	601.200	2500.000
GR	602.000	2600.000	600.900	2700.000	600.300	2800.000	0.000	0.000	0.000	0.000
X1	9600.000	25.000	1192.000	1208.000	50.000	50.000	50.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	599.900	599.900	0.000
GR	606.200	0.000	606.000	100.000	605.600	200.000	605.300	300.000	605.000	400.000

GR	604.800	500.000	604.500	600.000	603.900	700.000	603.500	800.000	603.100	900.000
GR	602.900	1000.000	602.200	1100.000	601.800	1150.000	594.300	1192.000	594.000	1195.000
GR	592.300	1197.000	592.200	1200.000	593.200	1203.000	594.300	1208.000	601.500	1250.000
GR	601.400	1300.000	601.400	1400.000	601.300	1500.000	601.000	1600.000	601.000	1700.000
SB	0.000	1.500	2.500	0.000	16.000	0.000	106.000	0.000	592.200	592.200
X1	9624.000	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	599.900	601.000	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	1300.000	0.000	601.000	601.000	0.000
BT	22.000	0.000	606.200	0.000	100.000	606.000	0.000	200.000	605.600	0.000
BT	300.000	605.300	0.000	400.000	605.000	0.000	500.000	604.800	0.000	600.000
BT	604.500	0.000	700.000	603.900	0.000	800.000	603.500	0.000	900.000	603.100
BT	0.000	1000.000	602.900	0.000	1100.000	602.200	0.000	1192.000	601.500	594.300
BT	1192.000	601.500	599.900	1208.000	601.500	599.900	1208.000	601.500	594.300	1250.000
BT	601.500	0.000	1300.000	601.400	0.000	1400.000	601.400	0.000	1500.000	601.300
BT	0.000	1600.000	601.000	0.000	1700.000	601.000	0.000	0.000	0.000	0.000
X1	9724.000	22.000	1500.000	1527.000	100.000	100.000	100.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	1527.000	0.000	0.000	0.000	0.000
GR	604.000	0.000	605.300	200.000	605.200	250.000	606.500	400.000	606.400	600.000
GR	605.000	800.000	603.300	1000.000	602.900	1200.000	600.600	1400.000	600.400	1500.000
GR	594.000	1508.000	592.400	1512.000	593.900	1517.000	601.100	1527.000	603.300	1600.000
GR	603.900	1800.000	603.900	2000.000	603.400	2200.000	602.500	2400.000	602.700	2600.000
GR	602.300	2800.000	603.300	3000.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	11284.000	16.000	492.000	509.000	1560.000	1560.000	1560.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	800.000	0.000	603.000	603.000	0.000
GR	604.300	0.000	604.100	100.000	603.900	200.000	603.100	300.000	602.300	400.000
GR	603.000	475.000	596.500	492.000	595.300	496.000	595.100	500.000	595.600	509.000
GR	603.300	525.000	603.800	600.000	603.900	700.000	604.000	800.000	604.000	900.000
GR	603.700	1000.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SB	0.000	2.000	2.500	0.000	17.000	0.000	117.000	0.000	595.100	595.100
X1	11300.000	0.000	0.000	0.000	16.000	16.000	16.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	602.300	603.200	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	800.000	0.000	603.600	603.600	0.000
BT	16.000	0.000	604.300	0.000	100.000	604.100	0.000	200.000	603.900	0.000
BT	300.000	603.100	0.000	400.000	602.300	0.000	475.000	603.000	0.000	492.000
BT	603.200	596.500	492.000	603.200	602.300	509.000	603.200	602.300	509.000	603.200
BT	595.600	525.000	603.300	0.000	600.000	603.800	0.000	700.000	603.900	0.000
BT	800.000	604.000	0.000	900.000	604.000	0.000	1000.000	603.700	0.000	0.000
X1	11400.000	22.000	1500.000	1527.000	150.000	400.000	100.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1200.000	0.000	1200.000	0.000	0.000	0.000	0.000
GR	604.000	0.000	605.300	200.000	605.200	250.000	606.500	400.000	606.400	600.000
GR	605.000	800.000	603.300	1000.000	602.900	1200.000	600.600	1400.000	600.400	1500.000
GR	596.400	1508.000	594.800	1512.000	596.300	1517.000	601.100	1527.000	603.300	1600.000
GR	603.900	1800.000	603.900	2000.000	603.400	2200.000	602.500	2400.000	602.700	2600.000
GR	602.300	2800.000	603.300	3000.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	12643.000	17.000	491.500	508.000	1243.000	1243.000	1243.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	850.000	0.000	603.500	603.500	0.000
GR	606.300	0.000	605.800	100.000	605.500	200.000	605.300	300.000	604.600	400.000
GR	604.300	485.000	599.500	491.500	598.100	497.000	597.100	500.000	597.900	503.000
GR	598.300	508.000	604.300	515.000	603.600	600.000	604.300	700.000	604.100	800.000
GR	604.900	900.000	604.700	1000.000	0.000	0.000	0.000	0.000	0.000	0.000
SB	0.000	1.970	2.500	0.000	16.500	0.000	89.000	0.000	597.100	597.100
X1	12657.000	0.000	0.000	0.000	14.000	14.000	14.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	603.500	603.600	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	850.000	0.000	603.600	603.600	0.000
BT	14.000	0.000	606.300	0.000	100.000	605.800	0.000	200.000	605.500	0.000
BT	300.000	605.300	0.000	400.000	604.600	0.000	491.500	604.300	599.500	491.500
BT	604.300	603.500	508.000	604.300	603.500	508.000	604.300	598.300	600.000	603.600
BT	0.000	700.000	604.300	0.000	800.000	604.100	0.000	900.000	604.900	0.000
BT	1000.000	604.700	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	13175.000	21.000	1500.000	1529.000	518.000	518.000	518.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1383.000	0.000	1698.000	0.000	0.000	0.000	0.000
GR	609.300	0.000	608.800	200.000	608.900	400.000	608.600	600.000	608.800	800.000
GR	606.600	1000.000	604.900	1200.000	604.500	1400.000	603.500	1500.000	598.400	1513.000
GR	597.700	1516.000	598.400	1520.000	602.900	1529.000	602.800	1600.000	604.800	1800.000
GR	605.100	2000.000	605.200	2200.000	604.700	2400.000	605.100	2600.000	604.600	2800.000
GR	604.700	3000.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	13875.000	6.000	93.000	107.000	700.000	700.000	700.000	0.000	0.000	0.000
GR	610.000	0.000	610.000	93.000	598.500	93.000	598.500	107.000	610.000	107.000
GR	610.000	200.000	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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HEC2 VERSION UPDATED JAN 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09
MODIFICATIONS 52,53,54,55,56,57,58
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T1          FRANKENLUST TWP. FIS 5555-21, PROJECT MANAGER: JAMES KREGER
T2          100 YEAR FLOW
T3          FRANKENLUST DRAIN

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.        4.        0.        0.  0.000000      0.0       0.0       0.   588.043     0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     3.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
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CCHV=     .300 CEHV=     .500
3280 CROSS SECTION       0.00 EXTENDED       1.54 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=     1207.0     1762.0  TYPE=      1  TARGET=     555.000
*   0.00      9.14    588.04      0.00    588.04    588.05       .00      0.00      0.00    583.00
   1060.      437.      165.      458.      979.      224.     1033.        0.        0.    583.90
    0.00       .45       .73       .44      .040      .035      .040     0.000    578.90   1207.00
 .000022        0.        0.        0         0         0         1      0.00    555.00   1762.00

3280 CROSS SECTION     150.00 EXTENDED       1.55 FEET

3470 ENCROACHMENT STATIONS=     1245.0     1725.0  TYPE=      1  TARGET=     480.000
                 VALLEY SECTION A
  150.00      9.15    588.05      0.00      0.00    588.05       .00       .00       .00    583.00
   1060.      455.      172.      432.      937.      224.      915.        7.        2.    583.90
     .08       .49       .77       .47      .040      .035      .040      .035    578.90   1245.00
 .000025      150.      150.      150.         0         0         1      0.00    480.00   1725.00

3280 CROSS SECTION     400.00 EXTENDED       1.25 FEET

3470 ENCROACHMENT STATIONS=     1308.0     1663.0  TYPE=      1  TARGET=     355.000
  400.00      8.85    588.05      0.00      0.00    588.06       .01       .01       .00    583.30
   1060.      442.      209.      410.      698.      215.      669.       18.        4.    584.20
     .18       .63       .97       .61      .040      .035      .040      .035    579.20   1308.00
 .000041      250.      250.      250.         0         0         1      0.00    355.00   1663.00

3280 CROSS SECTION     650.00 EXTENDED        .96 FEET

3470 ENCROACHMENT STATIONS=     1370.0     1600.0  TYPE=      1  TARGET=     230.000
  650.00      8.56    588.06      0.00      0.00    588.08       .02       .02       .01    583.60
   1060.      405.      299.      356.      423.      207.      391.       25.        6.    584.50
     .24       .96      1.45       .91      .040      .035      .040      .035    579.50   1370.00
 .000097      250.      250.      250.         0         0         1      0.00    230.00   1600.00

3280 CROSS SECTION     900.00 EXTENDED        .58 FEET

3470 ENCROACHMENT STATIONS=     1433.0     1538.0  TYPE=      1  TARGET=     105.000
  900.00      8.17    588.07      0.00      0.00    588.16       .09       .04       .04    584.00
   1060.      283.      564.      212.      148.      195.      126.       30.        7.    584.90
     .27      1.91      2.89      1.69      .040      .035      .040      .035    579.90   1433.00
 000419       250       250       250         0         0         1      0.00    105.00   1538.00
```

st W.S. = (588.04 - 588.03)
0.01 ft higher
than initial submittal

```
CCHV=     .300 CEHV=    1.000
3280 CROSS SECTION    1050.00 EXTENDED        .49 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=     1470.0     1500.0  TYPE=      1  TARGET=       30.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       584.20 ELREA=    100000.00

  1050.00       8.09     588.19       0.00       0.00     588.66        .47        .12        .38     584.20
     1060.         0.     1060.         0.         0.       192.         0.        31.         7. 100000.00
      .28       0.00       5.51       0.00       .040       .035       .040       .035     580.10    1470.00
  .002018       150.       150.       150.          2          0          1       0.00      30.00    1500.00

3301 HV CHANGED MORE THAN HVINS
```

ELLC @ 588.0 < 588.28 ⇒ TW 0.28 ft above low chord

```
3470 ENCROACHMENT STATIONS=     1500.0     1517.0  TYPE=      1  TARGET=       17.000
* 1075.00       8.18     588.28       0.00       0.00     589.52       1.25        .09        .78     582.80
     1060.         0.     1060.         0.         0.       118.         0.        31.         7. 100000.00
      .28       0.00       8.96       0.00       .040       .035       .040       .035     580.10    1500.00
  .007792        25.        25.        25.          2          0          1       0.00      17.00    1517.00
```

765

expansion loss

* if flow was allowed into overbanks ⇒ less shock loss ⇒ lower TW than 588.28 ⇒ closer to 588.19 @ 1050

```
SPECIAL BRIDGE

SB   XK        XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
      0.00       1.72       2.50       0.00      17.00       0.00      77.00       0.00     580.70     580.10

3280 CROSS SECTION    1115.00 EXTENDED        1.31 FEET

3301 HV CHANGED MORE THAN HVINS

PRESSURE AND WEIR FLOW

  EGPRS      EGLWC      H3         QWEIR      QPR        BAREA      ELLC       ELTRD      CLASS
  593.34     588.89     0.00       297.       765.       77.        588.00     590.40     30.00

3470 ENCROACHMENT STATIONS=     1260.0     1713.0  TYPE=      1  TARGET=      453.000

                BRIDGE SECTION B, DELTA ROAD CULVERT

                2-7" DIA. RCP.
```

by 0.52

```
  1115.00      10.21     590.91       0.00       0.00     590.91        .00       1.39       0.00     583.30
     1060.       531.       56.       473.      1128.       132.       988.        32.         7.     583.00
      .30        .47        .42        .48       .040       .035       .040       .035     580.70    1260.00
  000017         40         40         40          0          0          1       0.00     453.00    1713.00
```

765

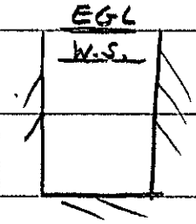
Delta Rd @ 115

let 765 cfs in channel @ 1115 (output shows 56 cfs)

EGL

W.S.

EGL @ 590.91



$V = Q/A = \frac{765}{132} = 5.79$ fps

$\frac{V^2}{2g} = .52$

$W.S. = EGL - \frac{V^2}{2g} = 590.91 - .52$

$= 590.39$

```
CCHV=    .300 CEHV=    .500
3280 CROSS SECTION    1215.00 EXTENDED       3.71 FEET

3470 ENCROACHMENT STATIONS=     1200.  1670.0  TYPE=     1  TARGET=     470.000

                    VALLEY SECTION C

 1215.00     11.01    590.91      0.00      0.00    590.92       .01       .00       .00    587.60
    1060.      181.      317.      562.      450.      312.      858.       36.        8.    588.00
      .34       .40      1.02       .65      .060      .050      .060      .036    579.90   1232.74
 .000079      100.      100.      100.         2         0         1      0.00    437.26   1670.00

                    VALLEY SECTION D

 3250.00      9.02    591.22      0.00      0.00    591.57       .35       .48       .17    591.40
    1060.        0.      1060.       0.        0.      224.        0.       80.       19.    593.40
      .46      0.00      4.74      0.00      .060      .050      .060      .045    582.20   1459.40
 .003075     2035.     2035.     2035.         2         0         1      0.00     40.60   1500.00

3280 CROSS SECTION    5299.00 EXTENDED        .64 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

 5299.00     11.24    595.24      0.00      0.00    595.31       .07      3.66       .08    593.80
     830.      370.      423.       37.      329.      156.       58.       98.       27.    593.80
      .76      1.12      2.71       .65      .060      .050      .060      .047    584.00      0.00
 .001050     2049.     2049.     2049.         4         0         1      0.00    296.84    296.84

3280 CROSS SECTION    5300.00 EXTENDED        .65 FEET

NORMAL BRIDGE,NRD= 9 MIN ELTRD=  593.80 MAX ELLC=  592.80

                    BRIDGE SECTION E, DRIVEWAY BRIDGE #1

                    16.5" WIDE BRIDGE, WITH WOODEN DECK

 5300.00     11.24    595.24      0.00      0.00    595.31       .07       .00       .00    593.80
     830.      394.      372.       63.      249.      140.       58.       98.       27.    593.80
      .76      1.58      2.67      1.09      .060      .050      .060      .047    584.00      0.00
 .002974        1.        1.        1.         0         0         1    -96.50    296.95    296.95

3280 CROSS SECTION    5315.00 EXTENDED        .68 FEET

 5315.00     11.27    595.27      0.00      0.00    595.34       .06       .02       .00    593.80
     830.      374.      417.       39.      335.      157.       61.       98.       28.    593.80
      .76      1.12      2.66       .64      .060      .050      .060      .047    584.00      0.00
 .001009        15        15        15         0         0         1      0.00    298.63    298.63
```

⇒ W.S. high by ~ .52 ft for distance 100' upstream @ 1215

consider reasonable

should have shock loss

3280 CROSS SECTION 5316.00 EXTENDED .68 FEET

5316.00	11.28	595.28	0.00	0.00	595.34	.06	.00	.00	593.80
830.	374.	417.	39.	335.	157.	61.	98.	28.	593.80
.76	1.12	2.66	.64	.060	.050	.060	.047	584.00	0.00
.001006	1.	1.	1.	0	0	1	0.00	298.74	298.74

3470 ENCROACHMENT STATIONS= 1100.0 3000.0 TYPE= 1 TARGET= -1100.000

VALLEY SECTION F

5550.00	10.01	595.41	0.00	0.00	595.42	.01	.07	.02	592.90
830.	485.	328.	17.	829.	255.	61.	101.	29.	593.90
.83	.59	1.29	.28	.060	.050	.060	.047	585.40	1100.00
.000176	150.	234.	300.	2	0	1	0.00	544.12	1644.12

3265 DIVIDED FLOW

6549.00	7.85	595.85	0.00	0.00	596.06	.21	.54	.10	596.40
830.	303.	527.	1.	167.	118.	2.	121.	39.	596.40
.92	1.81	4.46	.38	.060	.050	.060	.047	588.00	148.14
.003704	1300.	999.	900.	2	0	1	0.00	172.29	346.30

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

NORMAL BRIDGE,NRD=12 MIN ELTRD= 593.90 MAX ELLC= 594.70

BRIDGE SECTION G. DRIVEWAY BRIDGE #2

16" WIDE BRIDGE. WITH WOODEN DECK

6550.00	7.92	595.92	0.00	0.00	596.08	.16	.00	.01	596.40
830.	433.	395.	2.	177.	100.	3.	121.	39.	596.40
.92	2.44	3.97	.59	.060	.050	.060	.047	588.00	145.69
.006476	1.	1.	1.	2	0	1	-19.53	179.69	348.01

3265 DIVIDED FLOW

6564.00	7.97	595.97	0.00	0.00	596.16	.18	.06	.01	596.40
830.	327.	501.	2.	187.	120.	4.	121.	39.	596.40
.92	1.75	4.18	.47	.060	.050	.060	.047	588.00	143.47
.003204	14.	14.	14.	1	0	1	0.00	186.40	349.57

3265 DIVIDED FLO

```
 6565.00      7.98    595.98      0.00      0.00    596.16       .18       .00       .00    596.40
    830.      328.      501.        2.      187.      120.        4.      121.       39.    596.40
     .92      1.75      4.17       .47      .060      .050      .060      .047    588.00    143.30
 .003187        1.        1.        1.         0         0         1      0.00    186.92    349.69

3470 ENCROACHMENT STATIONS=     1000.0     3000.0  TYPE=      1  TARGET=    -1000.000

                    VALLEY SECTION H

 7500.00      7.64    597.04      0.00      0.00    597.06       .02       .86       .05    595.70
    830.      411.      330.       89.      637.      178.      151.      134.       48.    595.00
    1.14       .65      1.85       .59      .060      .050      .060      .047    589.40   1000.00
 .000452      850.      935.      950.         4         0         1      0.00    690.80   1690.80

3470 ENCROACHMENT STATIONS=     1445.0     1587.0  TYPE=      1  TARGET=     142.000
 8725.00      7.40    598.00      0.00      0.00    598.17       .18      1.03       .08    596.90
    830.       86.      640.      104.       68.      170.       75.      153.       60.    596.20
    1.25      1.27      3.76      1.38      .060      .050      .060      .048    590.60   1445.00
 .001989     1350.     1225.     1100.         3         0         1      0.00    142.00   1587.00

3265 DIVIDED FLOW

 8825.00      7.38    598.08      0.00      0.00    598.66       .58       .29       .20    593.00
    830.       59.      674.       97.       21.      101.       47.      153.       61.    592.00
    1.25      2.81      6.67      2.07      .060      .050      .060      .048    590.70    391.66
 .004570     100.      100.      100.         2         0         1      0.00     93.49    521.37

SPECIAL BRIDGE

SB   XK        XKOR      COEQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
      .90      1.46      2.50      0.00     16.00       .01    106.00      0.00    590.70    590.70

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

PRESSURE AND WEIR FLOW

  EGPRS     EGLWC     H3        QWEIR     QPR       BAREA     ELLC      ELTRD     CLASS

   598.78    598.66       .00      245.      587.      106.    598.50    597.40     30.00

                    BRIDGE SECTION I, DRIVEWAY BRIDGE #3

                    16" WIDE BRIDGE, WITH WOODEN DECK

 8841.00      7.58    598.28      0.00      0.00    598.78       .50       .12      0.00    593.00
    830       61        657       112        24       104        62       153        61     592.00
```

```
      1.25      2.58      6.31      1.82      .060      .050      .060      .048    590.70    292.98
  .003929       16.       16.       16.         2         0         0      0.00    130.78    532.07

3280 CROSS SECTION    9550.00 EXTENDED        .18 FEET

3470 ENCROACHMENT STATIONS=        .0    1367.0   TYPE=     1   TARGET=    1366.999

                    VALLEY SECTION J

   9550.00      8.08    600.48      0.00      0.00    600.66       .18      1.78       .10    598.60
      830.       43.       717.       70.       43.      196.       50.      157.       63.    599.00
      1.31       .99      3.66      1.41      .060      .050      .060      .048    592.40   1254.25
  .001747      709.       709.      709.         3         0         1      0.00    112.75   1367.00

   9600.00      8.42    600.62      0.00      0.00    600.74       .13       .07       .02    594.30
      830.      198.       426.      206.      112.      118.      116.      158.       63.    594.30
      1.32      1.77      3.63      1.77      .060      .050      .060      .048    592.20   1156.62
  .001124       50.        50.       50.         0         0         1      0.00     88.23   1244.85

SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.00      1.50      2.50      0.00     16.00      0.00    106.00      0.00    592.20    592.20

3265 DIVIDED FLOW

3280 CROSS SECTION    9624.00 EXTENDED        .43 FEET

PRESSURE AND WEIR FLOW

  EGPRS     EGLWC       H3      QWEIR       QPR      BAREA      ELLC     ELTRD     CLASS
  602.04    601.39     0.00       177.      659.       106.    599.90    601.00     30.00

3470 ENCROACHMENT STATIONS=        .0    1300.0   TYPE=     1   TARGET=    1299.999

                    BRIDGE SECTION K, AMELITH ROAD BRIDGE

                    16" WIDE CONCRETE BOX CULVERT

   9624.00      9.23    601.43      0.00      0.00    601.52       .09       .77      0.00    594.30
      830.      213.       396.      222.      142.      131.      148.      158.       63.    594.30
      1.32      1.49      3.03      1.49      .060      .050      .060      .048    592.20   1152.08
  .000683       24.        24.       24.         2         0         2      0.00    112.03   1300.00

3470 ENCROACHMENT STATIONS=        .0    1527.0   TYPE=     1   TARGET=    1526.999

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      600.40 ELREA=   100000.00

   9724.00      9.07    601.47      0.00      0.00    601.73       .26       .13       .09    600.40
      830.      155.       675.       0.      129.      148.        0.      159.       63. 100000.00
      1.33      1.20      4.54      0.00      .060      .050      .060      .048    592.40   1324.68
```

```
.003080      100.     100.     100.       2        0        1     0.00   202.32  1527.00

3280 CROSS SECTION  11284.00 EXTENDED        .05 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=          .0      800.0  TYPE=      1  TARGET=     799.999
 11284.00      8.65   603.75      0.00      0.00   603.85       .10      2.07       .05    596.50
     830.      250.     463.      118.      282.     141.       84.      173.       74.    595.60
    1.52       .89     3.28      1.40      .060     .050      .060      .048    595.10    218.75
 .000733     1560.    1560.     1560.         2        0         1      0.00    373.74    592.50

ELTRD @ 603.2 < 603.75 ⇒ TW over road

SPECIAL BRIDGE

SB   XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.00      2.00      2.50      0.00     17.00      0.00    117.00      0.00    595.10    595.10

3280 CROSS SECTION  11300.00 EXTENDED        .11 FEET

PRESSURE AND WEIR FLOW

  EGPRS     EGLWC     H3        Q*EIR     QPR       BAREA     ELLC      ELTRD     CLASS

  605.31    603.85    0.00      575.      261.      117.      602.30    603.20    30.00

3470 ENCROACHMENT STATIONS=          .0      800.0  TYPE=      1  TARGET=     799.999
                 BRIDGE SECTION L, KLOHA ROAD BRIDGE

                 17" WIDE BOX CULVERT

 11300.00      8.71   603.81      0.00      0.00   603.90       .09       .05      0.00    596.50
     830.      258.     454.      118.      297.     142.       89.      173.       74.    595.60
    1.52       .87     3.19      1.33      .060     .050      .060      .048    595.10    211.75
 .000690       16.      16.       16.         2        0         4      0.00    394.26    606.01

3280 CROSS SECTION  11400.00 EXTENDED        .66 FEET

3470 ENCROACHMENT STATIONS=     1200.0     1800.0  TYPE=      1  TARGET=     600.000
                 VALLEY SECTION M

 11400.00      9.16   603.96      0.00      0.00   603.98       .01       .05       .02    600.40
     830.      525.     229.       76.      788.     173.      201.      176.       76.    601.10
    1.57       .67     1.33       .38      .060     .050      .060      .048    594.80   1200.00
 .000189      150.     100.      400.         0        0         1      0.00    600.00   1800.00
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```
3470 ENCROACHMENT STATIONS=          .0      850.0  TYPE=      1  TARGET=      849.999
 12643.00      7.26    604.36    602.42      0.00    604.86       .50       .64       .25    599.50
     830.       40.      653.      136.       17.      103.      118.      196.       90.    598.30
     1.64      2.44      6.36      1.16      .060      .050      .060      .048    597.10    467.68
  .004143     1243.     1243.     1243.         4        11         1      0.00    364.96    832.64


SPECIAL BRIDGE

SB   XK          XKOR        COFQ        RDLEN       BWC         BWP         BAREA       SS          ELCHU       ELCHD
      0.00        1.97        2.50        0.00       16.50        0.00       89.00       0.00      597.10      597.10

6870 D.S. ENERGY OF  604.86 HIGHER THAN COMPUTED ENERGY OF  604.75
PRESSURE AND WEIR FLOW

  EGPRS       EGLWC       H3          QWEIR       QPR         BAREA       ELLC        ELTRD       CLASS

   607.02      604.86      0.00        517.        317.        89.       603.50      603.60      30.00


3470 ENCROACHMENT STATIONS=          .0      850.0  TYPE=      1  TARGET=      849.999

                    BRIDGE SECTION N, DRIVEWAY BRIDGE #4

                    16.5" WIDE BRIDGE, WITH WOODEN DECK

 12657.00      7.25    604.35      0.00      0.00    604.86       .51      0.00      0.00    599.50
     830.       40.      656.      134.       16.      103.      115.      196.       90.    598.30
     1.64      2.47      6.39      1.16      .060      .050      .060      .048    597.10    470.05
  .004194       14.       14.       14.         4         0         1      0.00    361.55    831.60


3280 CROSS SECTION  13175.00 EXTENDED       .84 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


3470 ENCROACHMENT STATIONS=     1383.0     1698.0  TYPE=      1  TARGET=      315.000

                    VALLEY SECTION O

 13175.00      7.84    605.54      0.00      0.00    605.57       .03       .56       .14    603.50
     830.      122.      300.      409.      171.      156.      411.      202.       94.    602.90
     1.75       .71      1.92       .99      .060      .050      .060      .048    597.70   1383.00
  .000487      518.      518.      518.         3         0         1      0.00    315.00   1698.00


3301 HV CHANGED MORE THAN HVINS

 13875.00      7.52    606.02      0.00      0.00    606.99       .96       .95       .47    610.00
     830.        0.      830.        0.        0.      105.        0.      209.       97.    610.00
     1.78      0.00      7.88      0.00      .060      .050      .060      .048    598.50     93.00
  .012630      700.      700.      700.         3         0         1      0.00     14.00    107.00
```

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Frankenlust Twp

3) WATERCOURSE: Frankenlust Drain

4) DOCUMENT TYPE: Summary

00BREAK00

SUMMARY PRINTOUT FOR MULTIPLE PROFILES

FRANKENLUST DRAIN

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	HV	HL	OLOSS	QCH	DEPTH	TOPWID
0.00	0.00	0.00	0.00	578.90	700.00	585.85	.01	0.00	0.00	184.84	6.95	508.05
0.00	0.00	0.00	0.00	578.90	930.00	587.19	.01	0.00	0.00	169.45	8.29	543.21
0.00	0.00	0.00	0.00	578.90	1060.00	588.04	.00	0.00	0.00	164.62	9.14	555.00
0.00	0.00	0.00	0.00	578.90	1365.00	589.07	.00	0.00	0.00	183.56	10.16	555.00
150.00	150.00	0.00	0.00	578.90	700.00	585.86	.01	.01	.00	187.51	6.96	471.41
150.00	150.00	0.00	0.00	578.90	930.00	587.19	.01	.01	.00	175.12	8.29	480.00
150.00	150.00	0.00	0.00	578.90	1060.00	588.05	.00	.00	.00	172.36	9.15	480.00
150.00	150.00	0.00	0.00	578.90	1365.00	589.07	.00	.00	.00	195.26	10.17	480.00
400.00	250.00	0.00	0.00	579.20	700.00	585.89	.02	.03	.00	216.46	6.69	355.00
400.00	250.00	0.00	0.00	579.20	930.00	587.20	.01	.01	.00	208.72	8.00	355.00
400.00	250.00	0.00	0.00	579.20	1060.00	588.05	.01	.01	.00	208.73	8.85	355.00
400.00	250.00	0.00	0.00	579.20	1365.00	589.07	.01	.01	.00	239.86	9.87	355.00
650.00	250.00	0.00	0.00	579.50	700.00	585.93	.04	.05	.01	295.21	6.43	230.00
650.00	250.00	0.00	0.00	579.50	930.00	587.22	.02	.02	.01	295.50	7.72	230.00
650.00	250.00	0.00	0.00	579.50	1060.00	588.06	.02	.02	.01	299.09	8.56	230.00
650.00	250.00	0.00	0.00	579.50	1365.00	589.08	.02	.01	.01	347.12	9.58	230.00
900.00	250.00	0.00	0.00	579.90	700.00	586.01	.17	.14	.06	492.82	6.11	105.00
900.00	250.00	0.00	0.00	579.90	930.00	587.24	.11	.07	.05	541.27	7.34	105.00
900.00	250.00	0.00	0.00	579.90	1060.00	588.07	.09	.04	.04	564.26	8.17	105.00
900.00	250.00	0.00	0.00	579.90	1365.00	589.08	.10	.04	.04	670.56	9.18	105.00
1050.00	150.00	0.00	0.00	580.10	700.00	586.25	.42	.25	.26	700.00	6.15	30.00
1050.00	150.00	0.00	0.00	580.10	930.00	587.40	.47	.16	.36	930.00	7.30	30.00
1050.00	150.00	0.00	0.00	580.10	1060.00	588.19	.47	.12	.38	1060.00	8.09	30.00
1050.00	150.00	0.00	0.00	580.10	1365.00	589.19	.58	.11	.49	1365.00	9.09	30.00
1075.00	25.00	0.00	0.00	580.10	700.00	586.36	1.04	.11	.62	700.00	6.26	17.00
1075.00	25.00	0.00	0.00	580.10	930.00	587.50	1.22	.10	.75	930.00	7.40	17.00
1075.00	25.00	0.00	0.00	580.10	1060.00	588.28	1.25	.09	.78	1060.00	8.18	17.00
1075.00	25.00	0.00	0.00	580.10	1365.00	589.29	1.58	.10	.99	1365.00	9.19	17.00
1115.00	40.00	590.40	588.00	580.70	700.00	588.56	.00	1.17	0.00	60.19	7.86	375.25
1115.00	40.00	590.40	588.00	580.70	930.00	590.65	.00	1.94	0.00	50.25	9.95	453.00
1115.00	40.00	590.40	588.00	580.70	1060.00	590.91	.00	1.39	0.00	55.88	10.21	453.00
1115.00	40.00	590.40	588.00	580.70	1365.00	591.19	.01	.33	0.00	70.15	10.49	453.00
1215.00	100.00	0.00	0.00	579.90	700.00	588.56	.02	.01	.01	319.34	8.66	305.55
1215.00	100.00	0.00	0.00	579.90	930.00	590.65	.01	.00	.00	289.50	10.75	420.04
1215.00	100.00	0.00	0.00	579.90	1060.00	590.91	.01	.00	.00	317.07	11.01	437.26
1215.00	100.00	0.00	0.00	579.90	1365.00	591.19	.01	.00	.00	391.48	11.29	456.22
3250.00	2035.00	0.00	0.00	582.20	700.00	589.63	.29	1.21	.14	700.00	7.43	37.05
3250.00	2035.00	0.00	0.00	582.20	930.00	590.95	.30	.44	.14	930.00	8.75	39.99
3250.00	2035.00	0.00	0.00	582.20	1060.00	591.22	.35	.48	.17	1060.00	9.02	40.60
3250.00	2035.00	0.00	0.00	582.20	1365.00	591.60	.50	.65	.24	1357.92	9.40	112.75

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	HV	HL	OLOSS	QCH	DEPTH	TOPWID
5299.00	2049.00	0.00	0.00	584.00	610.00	594.45	.11	4.59	.05	444.57	10.45	244.41
5299.00	2049.00	0.00	0.00	584.00	815.00	595.04	.09	3.82	.06	454.30	11.04	285.75
5299.00	2049.00	0.00	0.00	584.00	830.00	595.24	.07	3.66	.08	422.94	11.24	296.84
5299.00	2049.00	0.00	0.00	584.00	1210.00	595.94	.06	3.77	.13	458.57	11.94	333.39
5300.00	1.00	593.80	592.80	584.00	610.00	594.42	.18	.00	.04	479.85	10.42	240.09
5300.00	1.00	593.80	592.80	584.00	815.00	595.04	.09	.00	.00	418.41	11.04	285.86
5300.00	1.00	593.80	592.80	584.00	830.00	595.24	.07	.00	.00	372.50	11.24	296.95
5300.00	1.00	593.80	592.80	584.00	1210.00	595.95	.06	.00	.00	355.26	11.95	333.83
5315.00	15.00	0.00	0.00	584.00	610.00	594.57	.10	.04	.03	423.17	10.57	258.12
5315.00	15.00	0.00	0.00	584.00	815.00	595.09	.08	.03	.00	445.62	11.09	288.10
5315.00	15.00	0.00	0.00	584.00	830.00	595.27	.06	.02	.00	416.96	11.27	298.63
5315.00	15.00	0.00	0.00	584.00	1210.00	595.97	.06	.02	.00	453.01	11.97	335.03
5316.00	1.00	0.00	0.00	584.00	610.00	594.58	.10	.00	.00	422.42	10.58	258.61
5316.00	1.00	0.00	0.00	584.00	815.00	595.09	.08	.00	.00	445.09	11.09	288.25
5316.00	1.00	0.00	0.00	584.00	830.00	595.28	.06	.00	.00	416.59	11.28	298.74
5316.00	1.00	0.00	0.00	584.00	1210.00	595.97	.06	.00	.00	452.74	11.97	335.11
5550.00	234.00	0.00	0.00	585.40	610.00	594.77	.01	.09	.02	295.88	9.37	483.30
5550.00	234.00	0.00	0.00	585.40	815.00	595.25	.02	.08	.02	337.72	9.85	521.75
5550.00	234.00	0.00	0.00	585.40	830.00	595.41	.01	.07	.02	327.65	10.01	544.12
5550.00	234.00	0.00	0.00	585.40	1210.00	596.09	.01	.07	.01	392.82	10.69	642.01
6549.00	999.00	0.00	0.00	588.00	610.00	595.25	.24	.60	.11	476.78	7.25	126.92
6549.00	999.00	0.00	0.00	588.00	815.00	595.76	.23	.61	.11	534.50	7.76	162.49
6549.00	999.00	0.00	0.00	588.00	830.00	595.85	.21	.54	.10	526.55	7.85	172.29
6549.00	999.00	0.00	0.00	588.00	1210.00	596.57	.19	.56	.09	581.98	8.57	241.52
6550.00	1.00	593.90	594.70	588.00	610.00	595.31	.20	.01	.01	415.19	7.31	129.55
6550.00	1.00	593.90	594.70	588.00	815.00	595.83	.18	.01	.02	409.47	7.83	170.24
6550.00	1.00	593.90	594.70	588.00	830.00	595.92	.16	.00	.01	395.06	7.92	179.69
6550.00	1.00	593.90	594.70	588.00	1210.00	596.64	.13	.00	.02	327.79	8.64	246.19
6564.00	14.00	0.00	0.00	588.00	610.00	595.37	.21	.07	.00	458.24	7.37	133.19
6564.00	14.00	0.00	0.00	588.00	815.00	595.89	.20	.07	.01	510.04	7.89	176.26
6564.00	14.00	0.00	0.00	588.00	830.00	595.97	.18	.06	.01	501.48	7.97	186.40
6564.00	14.00	0.00	0.00	588.00	1210.00	596.68	.16	.06	.02	555.35	8.68	248.73
6565.00	1.00	0.00	0.00	588.00	610.00	595.37	.21	.00	.00	457.45	7.37	133.47
6565.00	1.00	0.00	0.00	588.00	815.00	595.89	.20	.00	.00	509.06	7.89	176.82
6565.00	1.00	0.00	0.00	588.00	830.00	595.98	.18	.00	.00	500.56	7.98	186.92
6565.00	1.00	0.00	0.00	588.00	1210.00	596.69	.16	.00	.00	554.38	8.69	249.00
7500.00	935.00	0.00	0.00	589.40	610.00	596.61	.03	1.01	.05	316.88	7.21	653.74
7500.00	935.00	0.00	0.00	589.40	815.00	597.01	.03	.89	.05	330.81	7.61	687.62
7500.00	935.00	0.00	0.00	589.40	830.00	597.04	.02	.86	.05	329.83	7.64	690.80
7500.00	935.00	0.00	0.00	589.40	1210.00	597.61	.02	.74	.04	359.97	8.21	740.50

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	HV	HL	OLOSS	QCH	DEPTH	TOPWID
8725.00	1225.00	0.00	0.00	590.60	610.00	597.64	.14	1.08	.05	509.03	7.04	142.00
8725.00	1225.00	0.00	0.00	590.60	815.00	597.98	.17	1.05	.07	630.41	7.38	142.00
8725.00	1225.00	0.00	0.00	590.60	830.00	598.00	.18	1.03	.08	639.99	7.40	142.00
8725.00	1225.00	0.00	0.00	590.60	1210.00	598.50	.24	1.00	.11	841.85	7.90	142.00
8825.00	100.00	0.00	0.00	590.70	610.00	597.74	.38	.22	.12	511.16	7.04	63.81
8825.00	100.00	0.00	0.00	590.70	815.00	598.07	.56	.28	.20	662.69	7.37	92.15
8825.00	100.00	0.00	0.00	590.70	830.00	598.08	.58	.29	.20	673.67	7.38	93.49
8825.00	100.00	0.00	0.00	590.70	1210.00	598.60	.80	.38	.28	897.36	7.90	244.12
8841.00	16.00	597.40	598.50	590.70	610.00	597.76	.38	.02	0.00	510.69	7.06	64.95
8841.00	16.00	597.40	598.50	590.70	815.00	598.26	.49	.12	0.00	646.87	7.56	123.39
8841.00	16.00	597.40	598.50	590.70	830.00	598.28	.50	.12	0.00	656.74	7.58	130.78
8841.00	16.00	597.40	598.50	590.70	1210.00	598.63	.77	0.00	0.00	888.29	7.93	252.31
9550.00	709.00	0.00	0.00	592.40	610.00	599.71	.17	1.68	.06	574.83	7.31	94.08
9550.00	709.00	0.00	0.00	592.40	815.00	600.43	.18	1.77	.09	708.16	8.03	111.69
9550.00	709.00	0.00	0.00	592.40	830.00	600.48	.18	1.78	.10	717.45	8.08	112.75
9550.00	709.00	0.00	0.00	592.40	1210.00	601.43	.21	2.07	.17	931.81	9.03	136.05
9600.00	50.00	0.00	0.00	592.20	610.00	599.66	.55	.14	.19	610.00	7.46	16.00
9600.00	50.00	0.00	0.00	592.20	815.00	600.57	.13	.07	.02	420.36	8.37	87.71
9600.00	50.00	0.00	0.00	592.20	830.00	600.62	.13	.07	.02	426.25	8.42	88.23
9600.00	50.00	0.00	0.00	592.20	1210.00	601.59	.13	.07	.02	533.18	9.39	548.85
9624.00	24.00	601.00	599.90	592.20	610.00	599.92	.51	.22	0.00	610.00	7.72	16.00
9624.00	24.00	601.00	599.90	592.20	815.00	601.40	.08	.78	0.00	389.65	9.20	97.13
9624.00	24.00	601.00	599.90	592.20	830.00	601.43	.09	.77	0.00	395.64	9.23	112.03
9624.00	24.00	601.00	599.90	592.20	1210.00	601.85	.14	.26	0.00	547.26	9.65	155.76
9724.00	100.00	0.00	0.00	592.40	610.00	600.52	.38	.43	.04	609.10	8.12	85.93
9724.00	100.00	0.00	0.00	592.40	815.00	601.43	.27	.13	.09	669.91	9.03	199.14
9724.00	100.00	0.00	0.00	592.40	830.00	601.47	.26	.13	.09	674.53	9.07	202.32
9724.00	100.00	0.00	0.00	592.40	1210.00	601.95	.30	.18	.08	836.96	9.55	245.20
11284.00	1560.00	0.00	0.00	595.10	610.00	603.16	.11	2.28	.08	404.63	8.06	230.96
11284.00	1560.00	0.00	0.00	595.10	815.00	603.71	.10	2.07	.05	459.02	8.61	364.97
11284.00	1560.00	0.00	0.00	595.10	830.00	603.75	.10	2.07	.05	462.54	8.65	373.74
11284.00	1560.00	0.00	0.00	595.10	1210.00	604.37	.08	2.13	.07	513.65	9.27	800.00
11300.00	16.00	603.20	602.30	595.10	610.00	603.07	.34	.15	0.00	610.00	7.97	17.00
11300.00	16.00	603.20	602.30	595.10	815.00	603.78	.09	.06	0.00	449.94	8.68	381.42
11300.00	16.00	603.20	602.30	595.10	830.00	603.81	.09	.05	0.00	453.84	8.71	394.26
11300.00	16.00	603.20	602.30	595.10	1210.00	604.37	.08	0.00	0.00	513.93	9.27	800.00
11400.00	100.00	0.00	0.00	594.80	610.00	603.55	.01	.05	.10	193.09	8.75	483.75
11400.00	100.00	0.00	0.00	594.80	815.00	603.94	.01	.05	.02	226.78	9.14	600.00
11400.00	100.00	0.00	0.00	594.80	830.00	603.96	.01	.05	.02	228.69	9.16	600.00
11400.00	100.00	0.00	0.00	594.80	1210.00	604.52	.01	.06	.02	278.60	9.72	600.00

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	HV	HL	OLOSS	QCH	DEPTH	TOPWID
12643.00	1243.00	0.00	0.00	597.10	610.00	603.91	.43	.56	.21	531.80	6.81	109.79
12643.00	1243.00	0.00	0.00	597.10	815.00	604.32	.51	.64	.25	651.29	7.22	351.34
12643.00	1243.00	0.00	0.00	597.10	830.00	604.36	.50	.64	.25	653.38	7.26	364.96
12643.00	1243.00	0.00	0.00	597.10	1210.00	605.04	.26	.64	.12	629.19	7.94	512.92
12657.00	14.00	603.60	603.50	597.10	610.00	604.10	.37	.13	0.00	517.75	7.00	162.54
12657.00	14.00	603.60	603.50	597.10	815.00	604.32	.52	0.00	0.00	653.96	7.22	347.50
12657.00	14.00	603.60	603.50	597.10	830.00	604.35	.51	0.00	0.00	655.90	7.25	361.55
12657.00	14.00	603.60	603.50	597.10	1210.00	605.05	.25	0.00	0.00	623.42	7.95	514.95
13175.00	518.00	0.00	0.00	597.70	610.00	605.06	.03	.52	.10	258.63	7.36	315.00
13175.00	518.00	0.00	0.00	597.70	815.00	605.51	.03	.56	.15	296.21	7.81	315.00
13175.00	518.00	0.00	0.00	597.70	830.00	605.54	.03	.56	.14	299.67	7.84	315.00
13175.00	518.00	0.00	0.00	597.70	1210.00	605.93	.04	.61	.06	392.01	8.23	315.00
13875.00	700.00	0.00	0.00	598.50	610.00	605.67	.57	.88	.27	610.00	7.17	14.00
13875.00	700.00	0.00	0.00	598.50	815.00	606.00	.94	.94	.45	815.00	7.50	14.00
13875.00	700.00	0.00	0.00	598.50	830.00	606.02	.96	.95	.47	830.00	7.52	14.00
13875.00	700.00	0.00	0.00	598.50	1210.00	606.37	1.87	1.36	.91	1210.00	7.87	14.00

SECTION NUMBER	DISCHARGE CFS	CWSEL	CWSEL DIFF EACH Q	CWSEL DIFF EACH SECTION	CWSEL-WSELK	TOPWID	T.W. DIFF	LENGTH
0.000	700.000	585.850	0.000	0.000	0.000	508.052	0.000	0.000
0.000	930.000	587.186	1.336	0.000	0.000	543.210	-35.158	0.000
0.000	1060.000	588.043	.857	0.000	0.000	554.999	-46.947	0.000
0.000	1365.000	589.065	1.022	0.000	0.000	554.999	-46.947	0.000
150.000	700.000	585.863	0.000	.013	0.000	471.408	0.000	150.000
150.000	930.000	587.191	1.328	.005	0.000	479.999	-8.591	150.000
150.000	1060.000	588.046	.855	.003	0.000	479.999	-8.591	150.000
150.000	1365.000	589.068	1.021	.003	0.000	479.999	-8.591	150.000
400.000	700.000	585.889	0.000	.026	0.000	354.999	0.000	250.000
400.000	930.000	587.201	1.312	.010	0.000	354.999	-.000	250.000
400.000	1060.000	588.052	.851	.006	0.000	354.999	-.000	250.000
400.000	1365.000	589.072	1.020	.005	0.000	354.999	-.000	250.000
650.000	700.000	585.931	0.000	.041	0.000	229.999	0.000	250.000
650.000	930.000	587.217	1.287	.016	0.000	229.999	-.000	250.000
650.000	1060.000	588.062	.845	.010	0.000	229.999	-.000	250.000
650.000	1365.000	589.079	1.017	.007	0.000	229.999	-.000	250.000
900.000	700.000	586.006	0.000	.075	0.000	104.999	0.000	250.000
900.000	930.000	587.238	1.232	.021	0.000	104.999	-.000	250.000
900.000	1060.000	588.069	.831	.007	0.000	104.999	-.000	250.000
900.000	1365.000	589.078	1.009	-.001	0.000	104.999	-.000	250.000
1050.000	700.000	586.252	0.000	.246	0.000	29.999	0.000	150.000
1050.000	930.000	587.397	1.145	.159	0.000	29.999	-.000	150.000
1050.000	1060.000	588.188	.791	.119	0.000	29.999	-.000	150.000
1050.000	1365.000	589.189	1.001	.111	0.000	29.999	-.000	150.000
1075.000	700.000	586.358	0.000	.106	0.000	16.999	0.000	25.000
1075.000	930.000	587.495	1.138	.098	0.000	16.999	-.000	25.000
1075.000	1060.000	588.276	.781	.089	0.000	16.999	-.000	25.000
1075.000	1365.000	589.287	1.011	.098	0.000	16.999	-.000	25.000
1115.000	700.000	588.560	0.000	2.202	0.000	375.249	0.000	40.000
1115.000	930.000	590.650	2.090	3.155	0.000	452.999	-77.750	40.000
1115.000	1060.000	590.908	.258	2.632	0.000	452.999	-77.750	40.000
1115.000	1365.000	591.192	.284	1.905	0.000	452.999	-77.750	40.000

1215.000	700.000	588.561	0.000	.001	0.000	305.551	0.000	100.000
1215.000	930.000	590.651	2.089	.000	0.000	420.041	-114.490	100.000
1215.000	1060.000	590.909	.258	.001	0.000	437.259	-131.709	100.000
1215.000	1365.000	591.193	.284	.001	0.000	456.216	-150.665	100.000
3250.000	700.000	589.634	0.000	1.073	0.000	37.052	0.000	2035.000
3250.000	930.000	590.947	1.313	.297	0.000	39.989	-2.937	2035.000
3250.000	1060.000	591.219	.272	.310	0.000	40.596	-3.544	2035.000
3250.000	1365.000	591.605	.386	.411	0.000	112.745	-75.693	2035.000
5299.000	610.000	594.455	0.000	4.821	0.000	244.408	0.000	2049.000
5299.000	815.000	595.040	.585	4.092	0.000	285.752	-41.344	2049.000
5299.000	830.000	595.243	.203	4.024	0.000	296.840	-52.432	2049.000
5299.000	1210.000	595.944	.701	4.339	0.000	333.394	-88.987	2049.000
5300.000	610.000	594.423	0.000	-.032	0.000	240.085	0.000	1.000
5300.000	815.000	595.037	.615	-.003	0.000	285.863	-45.778	1.000
5300.000	830.000	595.243	.206	.000	0.000	296.954	-56.869	1.000
5300.000	1210.000	595.951	.707	.007	0.000	333.828	-93.742	1.000
5315.000	610.000	594.575	0.000	.152	0.000	258.122	0.000	15.000
5315.000	815.000	595.087	.512	.049	0.000	288.102	-29.980	15.000
5315.000	830.000	595.274	.187	.031	0.000	298.634	-40.512	15.000
5315.000	1210.000	595.970	.696	.019	0.000	335.029	-76.906	15.000
5316.000	610.000	594.577	0.000	.002	0.000	258.612	0.000	1.000
5316.000	815.000	595.088	.511	.002	0.000	288.249	-29.638	1.000
5316.000	830.000	595.275	.187	.001	0.000	298.745	-40.133	1.000
5316.000	1210.000	595.971	.696	.001	0.000	335.108	-76.496	1.000
5550.000	610.000	594.766	0.000	.189	0.000	483.299	0.000	234.000
5550.000	815.000	595.252	.486	.164	0.000	521.751	-38.452	234.000
5550.000	830.000	595.409	.157	.134	0.000	544.123	-60.824	234.000
5550.000	1210.000	596.094	.685	.123	0.000	642.012	-158.713	234.000
6549.000	610.000	595.251	0.000	.485	0.000	126.924	0.000	999.000
6549.000	815.000	595.758	.507	.506	0.000	162.492	-35.568	999.000
6549.000	830.000	595.850	.092	.441	0.000	172.286	-45.362	999.000
6549.000	1210.000	596.566	.715	.471	0.000	241.522	-114.598	999.000
6550.000	610.000	595.306	0.000	.054	0.000	129.551	0.000	1.000
6550.000	815.000	595.832	.526	.074	0.000	170.235	-40.684	1.000
6550.000	830.000	595.920	.088	.070	0.000	179.690	-50.139	1.000
6550.000	1210.000	596.643	.723	.077	0.000	246.192	-116.642	1.000
6564.000	610.000	595.368	0.000	.063	0.000	133.194	0.000	14.000
6564.000	815.000	595.889	.520	.057	0.000	176.259	-43.065	14.000
6564.000	830.000	595.973	.084	.053	0.000	186.399	-53.206	14.000
6564.000	1210.000	596.685	.712	.042	0.000	248.728	-115.534	14.000
6565.000	610.000	595.373	0.000	.005	0.000	133.465	0.000	1.000
6565.000	815.000	595.894	.520	.005	0.000	176.817	-43.352	1.000
6565.000	830.000	595.978	.084	.005	0.000	186.922	-53.456	1.000
6565.000	1210.000	596.689	.711	.004	0.000	249.000	-115.534	1.000
7500.000	610.000	596.611	0.000	1.237	0.000	653.735	0.000	935.000
7500.000	815.000	597.008	.397	1.114	0.000	687.618	-33.883	935.000
7500.000	830.000	597.038	.030	1.060	0.000	690.804	-37.069	935.000
7500.000	1210.000	597.614	.577	.925	0.000	740.502	-86.767	935.000
8725.000	610.000	597.642	0.000	1.032	0.000	141.999	0.000	1225.000
8725.000	815.000	597.982	.340	.974	0.000	141.999	-.000	1225.000
8725.000	830.000	597.997	.015	.959	0.000	141.999	-.000	1225.000
8725.000	1210.000	598.503	.506	.889	0.000	141.999	-.000	1225.000
8825.000	610.000	597.737	0.000	.094	0.000	63.814	0.000	100.000

8825.000	815.000	598.069	.332	.087	0.000	92.147	-28.333	100.000
8825.000	830.000	598.085	.015	.088	0.000	93.492	-29.678	100.000
8825.000	1210.000	598.598	.514	.095	0.000	244.116	-180.302	100.000
8841.000	610.000	597.756	0.000	.019	0.000	64.948	0.000	16.000
8841.000	815.000	598.257	.501	.188	0.000	123.386	-58.438	16.000
8841.000	830.000	598.275	.019	.191	0.000	130.781	-65.833	16.000
8841.000	1210.000	598.630	.355	.032	0.000	252.309	-187.361	16.000
9550.000	610.000	599.712	0.000	1.956	0.000	94.082	0.000	709.000
9550.000	815.000	600.432	.720	2.175	0.000	111.690	-17.608	709.000
9550.000	830.000	600.476	.044	2.200	0.000	112.753	-18.671	709.000
9550.000	1210.000	601.429	.953	2.799	0.000	136.049	-41.967	709.000
9600.000	610.000	599.661	0.000	-.051	0.000	16.000	0.000	50.000
9600.000	815.000	600.573	.912	.141	0.000	87.714	-71.714	50.000
9600.000	830.000	600.616	.043	.140	0.000	88.234	-72.234	50.000
9600.000	1210.000	601.594	.978	.165	0.000	548.848	-532.848	50.000
9624.000	610.000	599.923	0.000	.262	0.000	16.000	0.000	24.000
9624.000	815.000	601.396	1.473	.823	0.000	97.128	-81.128	24.000
9624.000	830.000	601.429	.033	.813	0.000	112.026	-96.026	24.000
9624.000	1210.000	601.846	.417	.252	0.000	155.758	-139.758	24.000
9724.000	610.000	600.520	0.000	.597	0.000	85.927	0.000	100.000
9724.000	815.000	601.429	.910	.034	0.000	199.139	-113.212	100.000
9724.000	830.000	601.466	.037	.037	0.000	202.324	-116.397	100.000
9724.000	1210.000	601.951	.435	.105	0.000	245.204	-159.277	100.000
11284.000	610.000	603.158	0.000	2.639	0.000	230.962	0.000	1560.000
11284.000	815.000	603.714	.555	2.284	0.000	364.972	-134.010	1560.000
11284.000	830.000	603.746	.032	2.280	0.000	373.743	-142.781	1560.000
11284.000	1210.000	604.367	.622	2.416	0.000	799.998	-569.036	1560.000
11300.000	610.000	603.065	0.000	-.093	0.000	17.000	0.000	16.000
11300.000	815.000	603.778	.713	.064	0.000	381.419	-364.419	16.000
11300.000	830.000	603.806	.028	.060	0.000	394.262	-377.262	16.000
11300.000	1210.000	604.367	.561	-.000	0.000	799.998	-782.998	16.000
11400.000	610.000	603.551	0.000	.486	0.000	483.752	0.000	100.000
11400.000	815.000	603.936	.384	.158	0.000	599.999	-116.247	100.000
11400.000	830.000	603.964	.029	.158	0.000	599.999	-116.247	100.000
11400.000	1210.000	604.518	.554	.151	0.000	599.999	-116.247	100.000
12643.000	610.000	603.905	0.000	.354	0.000	109.787	0.000	1243.000
12643.000	815.000	604.325	.419	.389	0.000	351.342	-241.555	1243.000
12643.000	830.000	604.358	.033	.393	0.000	364.964	-255.177	1243.000
12643.000	1210.000	605.040	.682	.522	0.000	512.920	-403.134	1243.000
12657.000	610.000	604.099	0.000	.194	0.000	162.537	0.000	14.000
12657.000	815.000	604.317	.218	-.008	0.000	347.505	-184.968	14.000
12657.000	830.000	604.350	.034	-.007	0.000	361.551	-199.014	14.000
12657.000	1210.000	605.048	.697	.008	0.000	514.948	-352.411	14.000
13175.000	610.000	605.062	0.000	.962	0.000	314.999	0.000	518.000
13175.000	815.000	605.514	.452	1.197	0.000	314.999	-.000	518.000
13175.000	830.000	605.536	.022	1.185	0.000	314.999	-.000	518.000
13175.000	1210.000	605.928	.393	.881	0.000	314.999	-.000	518.000
13875.000	610.000	605.670	0.000	.609	0.000	14.000	0.000	700.000
13875.000	815.000	606.001	.331	.487	0.000	14.000	0.000	700.000
13875.000	830.000	606.021	.020	.485	0.000	14.000	0.000	700.000
13875.000	1210.000	606.373	.352	.444	0.000	14.000	0.000	700.000

DATA FOR LAST CROSS SECTION

PROFILE	TYPE ENC	TARGET	TOP WIDTH	TOP WIDTH

			AREA-ACRES	AREA-DIFF
1	0.000	0.000	75.214	0.000
2	0.000	0.000	94.931	19.717
3	0.000	0.000	96.965	21.751
4	0.000	0.000	120.665	45.452

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Frankenlust Twp.

3) WATERCOURSE: Klauss Drain

4) DOCUMENT TYPE: 100-YR NATURAL

00BREAK00

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$$$$$$$$  $$$$$$$      $$     $$$$$$$$   $$$$$ $  $$    $$  $$    $$
$$        $$    $$    $$$$       $$     $$    $   $$    $$  $$    $$
$$        $$    $$   $$  $$      $$     $$   $$$  $$    $$  $$    $$
$$$$$     $$    $$  $$    $$     $$     $$  $ $$  $$    $$  $$    $$
$$        $$    $$  $$    $$     $$     $$ $$ $$  $$    $$  $$ $$ $$
$$        $$$$$$$   $$$$$$$$     $$     $$ $  $$  $$    $$  $$$$$$$$
$$        $$  $$    $$    $$     $$     $$$   $$   $$  $$   $$$  $$$
$$        $$   $$   $$    $$  $$ $$      $    $$    $$$$    $$    $$
$$        $$    $$  $$    $$   $$$      $ $$$$$      $$     $      $
FRAJOVW  JANDA              11/04/77  13.21.25  7600   JO
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DUE COPY

TOWNSHIP OF FRANKENMUST FIS
KLAUSS DRAIN
10-50-100-500 YR. FLOWS

— WITH ADDITIONAL
BRIDGE AT STATION
2000.
(ADD .25' TO ALL EQUATIONS
TO CONVERT TO N.G.V.D.) !

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*********************************************
HEC2 VERSION UPDATED JAN 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09
MODIFICATIONS 52,53,54,55,56,57,58
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C
1          FRANKENLUST TWP. FIS 5555-21, PROJECT MANAGER: JAMES KREGER
T2          10 YEAR FLOW
T3          KLAUSS DRAIN

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.        2.        0.        0.  0.000000      0.00       0.0        0.   591.236     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     1.000    10.000    11.000    12.000    14.000     8.000     4.000     0.000     0.000     0.000
NC      .080      .080      .050      .300      .500     0.000     0.000     0.000     0.000     0.000
QT     4.000   615.000   820.000   940.000  1230.000     0.000     0.000     0.000     0.000     0.000

X1     0.000    29.000   632.000   670.000     0.000     0.000     0.000     0.000     0.000     0.000
X3    10.000     0.000     0.000   170.000     0.000   850.000     0.000     0.000     0.000     0.000
GR   591.200     0.000   592.400    70.000   596.600   170.000   596.200   270.000   595.200   370.000
GR   594.400   470.000   592.800   570.000   591.800   632.000   580.500   653.000   580.400   655.000
GR   581.000   658.000   582.700   659.000   582.900   666.000   589.300   670.000   590.300   770.000
GR   591.500   870.000   592.600   970.000   594.100  1070.000   594.600  1170.000   594.700  1270.000
GR   594.500  1370.000   594.200  1470.000   593.800  1570.000   595.300  1670.000   596.200  1770.000
GR   594.300  1870.000   595.300  1970.000   595.900  2070.000   596.300  2170.000     0.000     0.000

X1   800.000    29.000   632.000   670.000   800.000   800.000   800.000     0.000     0.000     0.000
X3    10.000     0.000     0.000   170.000     0.000   750.000     0.000     0.000     0.000     0.000
GR   591.200     0.000   592.400    70.000   596.600   170.000   596.200   270.000   595.200   370.000
GR   594.400   470.000   592.800   570.000   591.800   632.000   583.600   653.000   583.500   655.000
GR   584.100   658.000   585.800   659.000   586.000   666.000   589.300   670.000   590.300   770.000
GR   591.500   870.000   592.600   970.000   594.100  1070.000   594.600  1170.000   594.700  1270.000
GR   594.500  1370.000   594.200  1470.000   593.800  1570.000   595.300  1670.000   596.200  1770.000
GR   594.300  1870.000   595.300  1970.000   595.900  2070.000   596.300  2170.000     0.000     0.000

X1  1950.000    35.000  1500.000  1558.000  1150.000  1150.000  1150.000     0.000    -2.200     0.000
X3    10.000     0.000     0.000  1505.000     0.000  1553.000     0.000     0.000     0.000     0.000
GR   600.400     0.000   600.900   100.000   600.700   200.000   600.800   300.000   600.100   400.000
GR   599.400   500.000   598.500   600.000   598.200   700.000   598.100   800.000   597.700   900.000
GR   597.500  1000.000   597.000  1100.000   596.400  1200.000   595.500  1300.000   595.800  1400.000
GR   595.600  1500.000   586.400  1519.000   587.600  1523.000   588.200  1535.000   596.300  1558.000
GR   594.000  1600.000   592.700  1700.000   593.900  1800.000   596.100  1900.000   596.500  2000.000
GR   596.000  2100.000   595.900  2200.000   596.200  2300.000   596.100  2400.000   595.900  2500.000
GR   596.000  2600.000   596.100  2700.000   595.500  2800.000   594.300  2900.000   592.200  3000.000

X1  1999.000    18.000   300.000   323.000    49.000    49.000    49.000     0.000     0.000     0.000
X3    10.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
GR   596.400     0.000   594.900   100.000   594.500   200.000   596.300   298.000   596.300   300.000
GR   589.100   300.500   588.500   307.000   587.500   311.000   585.500   314.000   584.900   316.000
GR   584.200   319.500   586.500   320.000   586.600   322.000   596.100   323.000   596.100   327.000
GR   593.300   400.000   594.000   500.000   594.600   600.000     0.000     0.000     0.000     0.000
NC     0.000     0.000      .020     0.000     0.000     0.000     0.000     0.000     0.000     0.000

X1  2000.000     0.000     0.000     0.000     1.000     1.000     1.000     0.000     0.000     0.000
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[illegible]	10.000	0.000	[illegible]	0.000	0.000	[illegible]	[illegible]	0.000	0.000	[illegible]
BT	10.000	0.000	596.400	0.000	100.000	594.900	0.000	200.000	594.500	0.000
BT	298.000	596.300	0.000	300.000	596.300	593.800	323.000	596.100	594.200	327.000
BT	596.100	0.000	400.000	593.300	0.000	500.000	594.000	0.000	600.000	594.600
BT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	2013.000	0.000	0.000	0.000	13.000	13.000	13.000	0.000	0.000	0.000
X2	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	.080	.080	.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	2014.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	2350.000	35.000	1500.000	1558.000	336.000	336.000	336.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	600.400	0.000	600.900	100.000	600.700	200.000	600.800	300.000	600.100	400.000
GR	599.400	500.000	598.500	600.000	598.200	700.000	598.100	800.000	597.700	900.000
GR	597.500	1000.000	597.000	1100.000	596.400	1200.000	595.500	1300.000	595.800	1400.000
GR	595.600	1500.000	586.400	1519.000	587.600	1523.000	588.200	1535.000	596.300	1558.000
GR	594.000	1600.000	592.700	1700.000	593.900	1800.000	596.100	1900.000	596.500	2000.000
GR	596.000	2100.000	595.900	2200.000	596.200	2300.000	596.100	2400.000	595.900	2500.000
GR	596.000	2600.000	596.100	2700.000	595.500	2800.000	594.300	2900.000	592.200	3000.000
X1	2550.000	0.000	0.000	0.000	200.000	200.000	200.000	0.000	-.100	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	2750.000	0.000	0.000	0.000	200.000	200.000	200.000	0.000	-.100	0.000
X3	10.000	0.000	0.000	1414.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	3000.000	20.000	391.700	408.300	250.000	250.000	250.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	596.500	596.500	0.000
GR	596.400	0.000	596.900	100.000	597.300	200.000	597.600	300.000	592.300	350.000
GR	588.400	391.700	587.400	392.000	586.900	393.500	586.200	396.000	586.000	398.500
GR	586.000	401.500	586.200	404.000	586.900	406.500	587.400	408.000	588.400	408.300
GR	592.300	450.000	598.300	500.000	597.800	600.000	597.500	700.000	596.000	800.000
SB	0.000	2.270	2.500	0.000	10.100	0.000	131.000	0.000	586.000	586.000
X1	3090.000	0.000	0.000	0.000	90.000	90.000	90.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	596.000	598.200	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	598.200	598.200	0.000
BT	12.000	300.000	597.600	0.000	391.700	598.200	588.400	392.000	598.200	589.900
BT	393.500	598.200	592.900	396.000	598.200	594.900	398.500	598.200	596.000	401.500
BT	598.200	596.000	404.000	598.200	594.900	406.500	598.200	592.900	408.000	598.200
BT	589.900	408.300	598.200	588.400	500.000	598.300	0.000	0.000	0.000	0.000
NC	.040	.040	.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	3138.000	35.000	1500.000	1616.000	48.000	48.000	48.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1500.000	0.000	1616.000	0.000	0.000	0.000	0.000
GR	598.000	0.000	597.100	100.000	596.700	200.000	596.100	300.000	596.000	400.000
GR	595.400	500.000	595.600	600.000	595.600	700.000	595.600	800.000	595.600	900.000
GR	596.600	1000.000	597.100	1100.000	597.700	1200.000	598.100	1300.000	597.700	1400.000
GR	598.000	1500.000	588.000	1557.000	586.800	1558.000	586.600	1561.000	588.200	1563.000
GR	597.900	1616.000	597.200	1700.000	596.400	1800.000	596.200	1900.000	596.200	2000.000
GR	596.400	2100.000	596.000	2200.000	596.200	2300.000	596.300	2400.000	596.200	2500.000
GR	596.400	2600.000	596.800	2700.000	597.500	2800.000	598.300	2900.000	598.200	3000.000
X1	3168.000	35.000	1500.000	1616.000	30.000	30.000	30.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1500.000	0.000	1616.000	0.000	0.000	0.000	0.000
GR	598.000	0.000	597.100	100.000	596.700	200.000	596.100	300.000	596.000	400.000
GR	595.400	500.000	595.600	600.000	595.600	700.000	595.600	800.000	595.600	900.000
GR	596.600	1000.000	597.100	1100.000	597.700	1200.000	598.100	1300.000	597.700	1400.000
GR	598.000	1500.000	588.300	1557.000	587.100	1558.000	586.900	1561.000	588.500	1563.000
GR	597.900	1616.000	597.200	1700.000	596.400	1800.000	596.200	1900.000	596.200	2000.000
GR	596.400	2100.000	596.000	2200.000	596.200	2300.000	596.300	2400.000	596.200	2500.000
GR	596.400	2600.000	596.800	2700.000	597.500	2800.000	598.300	2900.000	598.200	3000.000

X1	3200.000	35.000	1500.000	1616.000	32.000	32.000	32.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1500.000	0.000	1616.000	0.000	0.000	0.000	0.000
GR	598.000	0.000	597.100	100.000	596.700	200.000	596.100	300.000	596.000	400.000
GR	595.400	500.000	595.600	600.000	595.600	700.000	595.600	800.000	595.600	900.000
GR	596.600	1000.000	597.100	1100.000	597.700	1200.000	598.100	1300.000	597.700	1400.000
GR	598.000	1500.000	588.700	1557.000	587.500	1558.000	587.300	1561.000	588.900	1563.000
GR	597.900	1616.000	597.200	1700.000	596.400	1800.000	596.200	1900.000	596.200	2000.000
GR	596.400	2100.000	596.000	2200.000	596.200	2300.000	596.300	2400.000	596.200	2500.000
GR	596.400	2600.000	596.800	2700.000	597.500	2800.000	598.300	2900.000	598.200	3000.000
X1	3400.000	0.000	0.000	0.000	200.000	200.000	200.000	0.000	.100	0.000
X3	10.000	0.000	0.000	1500.000	0.000	1616.000	0.000	0.000	0.000	0.000
X1	3600.000	0.000	0.000	0.000	200.000	200.000	200.000	0.000	.100	0.000
X3	10.000	0.000	0.000	1500.000	0.000	1616.000	0.000	0.000	0.000	0.000
X1	3860.000	0.000	0.000	0.000	260.000	260.000	260.000	0.000	.100	0.000
X3	10.000	0.000	0.000	1500.000	0.000	1616.000	0.000	0.000	0.000	0.000
X1	3900.000	0.000	0.000	0.000	40.000	40.000	40.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1500.000	0.000	1616.000	0.000	0.000	0.000	0.000
X1	3919.000	28.000	541.700	558.300	19.000	19.000	19.000	0.000	0.000	0.000
X3	0.000	0.000	0.000	0.000	0.000	610.000	0.000	0.000	0.000	0.000
GR	601.300	0.000	600.600	50.000	599.700	150.000	598.500	250.000	598.300	350.000
GR	598.700	450.000	598.700	490.000	590.000	541.700	589.000	542.000	588.700	543.500
GR	587.800	546.000	587.600	548.500	587.600	550.000	587.600	551.500	587.800	554.000
GR	588.700	556.500	589.000	558.000	590.000	558.300	598.100	610.000	597.700	650.000
GR	598.000	750.000	598.600	850.000	598.600	950.000	599.200	1050.000	599.400	1150.000
GR	599.500	1250.000	599.000	1350.000	598.900	1450.000	0.000	0.000	0.000	0.000
SB	0.000	2.220	2.500	0.000	16.700	0.000	131.000	0.000	587.900	587.600
X1	4000.000	28.000	541.700	558.300	81.000	81.000	81.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	597.600	598.700	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	414.000	0.000	686.000	0.000	598.700	598.700	0.000
BT	13.000	490.000	598.700	0.000	541.700	598.700	590.300	542.000	598.700	591.800
BT	543.500	598.700	594.800	546.000	598.700	596.800	548.500	598.700	597.900	550.000
BT	598.700	597.900	551.500	598.700	597.900	554.000	598.700	596.800	556.500	598.700
BT	594.800	558.000	598.700	591.800	558.300	598.700	590.300	610.000	598.100	0.000
GR	601.300	0.000	600.600	50.000	599.700	150.000	598.500	250.000	598.300	350.000
GR	598.700	450.000	598.700	490.000	590.300	541.700	589.300	542.000	588.800	543.500
GR	588.100	546.000	587.900	548.500	587.900	550.000	587.900	551.500	588.100	554.000
GR	588.800	556.500	589.300	558.000	590.300	558.300	598.100	610.000	597.700	650.000
GR	598.000	750.000	598.600	850.000	598.600	950.000	599.200	1050.000	599.400	1150.000
GR	599.500	1250.000	599.000	1350.000	598.900	1450.000	0.000	0.000	0.000	0.000
X1	4509.000	31.000	265.700	282.300	509.000	509.000	509.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	875.000	0.000	598.100	598.100	0.000
GR	601.000	0.000	599.800	74.000	599.600	174.000	599.400	225.000	590.600	265.700
GR	589.600	266.000	589.100	267.500	588.400	270.000	588.200	272.500	588.100	274.000
GR	588.200	275.500	588.400	278.000	589.100	280.500	589.600	282.000	590.600	282.300
GR	598.400	322.000	597.400	374.000	596.100	474.000	596.700	574.000	597.500	674.000
GR	598.200	774.000	599.000	874.000	599.700	974.000	600.100	1074.000	600.300	1174.000
GR	600.000	1274.000	598.900	1374.000	598.800	1474.000	598.400	1574.000	598.100	1674.000
GR	598.000	1774.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SB	0.000	2.220	2.500	0.000	16.700	0.000	131.000	0.000	588.100	588.100
X1	4590.000	0.000	0.000	0.000	81.000	81.000	81.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	598.100	599.200	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	145.000	0.000	875.000	0.000	599.200	599.200	0.000
BT	11.000	265.700	599.200	590.600	266.000	599.200	592.100	267.500	599.200	595.100
BT	270.000	599.200	597.100	272.500	599.200	598.200	274.000	599.200	598.200	275.500
BT	599.200	598.200	278.000	599.200	597.100	280.500	599.200	595.100	282.000	599.200
BT	592.100	282.300	599.200	590.600	0.000	0.000	0.000	0.000	0.000	0.000
NC	.080	.080	.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000

X1	4700.000	35.000	1500.000	1590.000	150.000	1.000	110.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1275.000	0.000	2100.000	0.000	0.000	0.000	0.000
GR	604.100	0.000	604.100	100.000	604.300	200.000	603.800	300.000	604.100	400.000
GR	602.900	500.000	605.000	600.000	602.700	700.000	601.700	800.000	601.300	900.000
GR	601.700	1000.000	599.600	1100.000	599.400	1200.000	599.200	1300.000	599.000	1400.000
GR	597.600	1500.000	592.300	1534.000	590.400	1535.000	589.200	1542.000	589.800	1548.000
GR	597.200	1590.000	597.900	1700.000	596.700	1800.000	597.500	1900.000	598.200	2000.000
GR	599.000	2100.000	599.700	2200.000	600.100	2300.000	600.300	2400.000	600.000	2500.000
GR	598.900	2600.000	598.800	2700.000	598.400	2800.000	598.100	2900.000	598.000	3000.000
X1	6550.000	41.000	1500.000	1544.000	1850.000	1850.000	1850.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1490.000	0.000	1554.000	0.000	0.000	0.000	0.000
GR	605.100	0.000	605.300	100.000	605.400	200.000	605.300	300.000	605.200	400.000
GR	604.700	500.000	604.600	600.000	604.100	700.000	602.800	800.000	602.600	900.000
GR	604.300	975.000	603.500	1000.000	602.200	1100.000	602.100	1200.000	602.000	1300.000
GR	600.600	1400.000	599.400	1500.000	594.600	1507.000	595.700	1516.000	596.400	1522.000
GR	593.900	1528.000	593.600	1531.000	594.000	1534.000	599.600	1544.000	599.400	1600.000
GR	600.400	1655.000	603.800	1664.000	604.200	1700.000	602.900	1800.000	604.000	1900.000
GR	603.900	2000.000	604.200	2100.000	604.100	2200.000	604.100	2300.000	603.800	2400.000
GR	603.800	2500.000	603.000	2600.000	602.300	2700.000	602.500	2800.000	602.400	2900.000
GR	602.400	3000.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	6583.000	0.000	0.000	0.000	33.000	33.000	33.000	0.000	-.800	0.000
X3	10.000	0.000	0.000	1498.000	0.000	1546.000	0.000	0.000	0.000	0.000
X1	6616.000	0.000	0.000	0.000	33.000	33.000	33.000	0.000	-.800	0.000
X3	10.000	0.000	0.000	1507.000	0.000	1538.000	0.000	0.000	0.000	0.000
X1	6630.000	0.000	0.000	0.000	14.000	14.000	14.000	0.000	-.300	0.000
X3	10.000	0.000	0.000	1510.000	0.000	1534.000	0.000	0.000	0.000	0.000
X1	6643.000	0.000	0.000	0.000	13.000	13.000	13.000	0.000	-.300	0.000
X3	10.000	0.000	0.000	1513.000	0.000	1531.000	0.000	0.000	0.000	0.000
X1	6650.000	42.000	1492.900	1507.100	7.000	7.000	7.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	601.500	601.500	0.000
GR	608.300	0.000	608.400	100.000	608.600	200.000	608.600	300.000	608.000	400.000
GR	607.600	500.000	607.600	600.000	607.100	700.000	606.400	800.000	605.500	900.000
GR	605.300	1000.000	605.200	1100.000	605.000	1123.000	604.300	1200.000	603.900	1300.000
GR	603.800	1400.000	603.700	1475.000	593.600	1492.900	592.000	1493.600	591.600	1496.000
GR	591.200	1499.200	591.200	1500.000	591.200	1500.800	591.600	1504.000	592.000	1506.400
GR	593.600	1507.100	603.800	1525.000	603.900	1600.000	604.300	1700.000	604.500	1800.000
GR	604.700	1900.000	605.300	2000.000	605.600	2100.000	605.600	2200.000	605.500	2300.000
GR	605.500	2400.000	605.300	2500.000	605.200	2600.000	605.000	2700.000	604.600	2800.000
GR	604.100	2900.000	603.400	3000.000	0.000	0.000	0.000	0.000	0.000	0.000
SB	0.000	2.040	2.500	0.000	8.900	0.000	101.000	0.000	591.600	591.200
X1	6695.000	42.000	1492.900	1507.100	45.000	45.000	45.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	600.500	603.700	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	0.000	0.000	0.000	0.000	603.700	603.700	0.000
BT	11.000	1475.000	603.700	0.000	1492.900	603.700	594.000	1493.600	603.700	596.400
BT	1496.000	603.700	599.600	1499.200	603.700	600.500	1500.000	603.700	600.500	1500.800
BT	603.700	600.500	1504.000	603.700	599.600	1506.400	603.700	596.400	1507.100	603.700
BT	594.000	1525.000	603.800	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GR	608.300	0.000	608.400	100.000	608.600	200.000	608.600	300.000	608.000	400.000
GR	607.600	500.000	607.600	600.000	607.100	700.000	606.400	800.000	605.500	900.000
GR	605.300	1000.000	605.200	1100.000	605.000	1123.000	604.300	1200.000	603.900	1300.000
GR	603.800	1400.000	603.700	1475.000	594.000	1492.900	592.400	1493.600	592.000	1496.000
GR	591.600	1499.200	591.600	1500.000	591.600	1500.800	592.000	1504.000	592.400	1506.400
GR	594.000	1507.100	603.800	1525.000	603.900	1600.000	604.300	1700.000	604.500	1800.000
GR	604.700	1900.000	605.300	2000.000	605.600	2100.000	605.600	2200.000	605.500	2300.000
GR	605.500	2400.000	605.300	2500.000	605.200	2600.000	605.000	2700.000	604.600	2800.000
GR	604.100	2900.000	603.400	3000.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	6706.000	41.000	1500.000	1544.000	11.000	11.000	11.000	0.000	0.000	0.000

X3	10.000	.000	.000	15[illegible]	[illegible]	154.000	0.[illegible]	0.00	[illegible]	[illegible]
GR	605.100	0.000	605.300	100.000	605.400	200.000	605.300	300.000	605.200	400.000
GR	604.700	500.000	604.600	600.000	604.100	700.000	602.800	800.000	602.600	900.000
GR	604.300	975.000	603.500	1000.000	602.200	1100.000	602.100	1200.000	602.000	1300.000
GR	600.600	1400.000	599.400	1500.000	592.700	1507.000	593.800	1516.000	594.500	1522.000
GR	592.000	1528.000	591.700	1531.000	592.100	1534.000	599.600	1544.000	599.400	1600.000
GR	600.400	1655.000	603.800	1664.000	604.200	1700.000	602.900	1800.000	604.000	1900.000
GR	603.900	2000.000	604.200	2100.000	604.100	2200.000	604.100	2300.000	603.800	2400.000
GR	603.800	2500.000	603.000	2600.000	602.300	2700.000	602.500	2800.000	602.400	2900.000
GR	602.400	3000.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	6746.000	0.000	0.000	0.000	40.000	40.000	40.000	0.000	.100	0.000
X3	10.000	0.000	0.000	1464.000	0.000	1580.000	0.000	0.000	0.000	0.000
X1	6796.000	0.000	0.000	0.000	50.000	50.000	50.000	0.000	.300	0.000
X3	10.000	0.000	0.000	1465.000	0.000	1579.000	0.000	0.000	0.000	0.000
X1	6996.000	0.000	0.000	0.000	200.000	200.000	200.000	0.000	.900	0.000
X3	10.000	0.000	0.000	1480.000	0.000	1566.000	0.000	0.000	0.000	0.000
X1	7096.000	0.000	0.000	0.000	100.000	100.000	100.000	0.000	.500	0.000
X3	10.000	0.000	0.000	1489.000	0.000	1555.000	0.000	0.000	0.000	0.000
X1	7146.000	0.000	0.000	0.000	50.000	50.000	50.000	0.000	.200	0.000
X3	10.000	0.000	0.000	1501.000	0.000	1542.000	0.000	0.000	0.000	0.000
X1	7200.000	6.000	93.000	107.000	54.000	54.000	54.000	0.000	0.000	0.000
GR	610.000	0.000	610.000	93.000	594.000	93.000	594.000	107.000	610.000	107.000
GR	610.000	200.000	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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HEC2 VERSION UPDATED JAN 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09
MODIFICATIONS 52,53,54,55,56,57,58
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T1          FRANKENLUST TWP. FIS 5555-21, PROJECT MANAGER: JAMES KREGER
T2          100 YEAR FLOW
T3       KLAUSS DRAIN

J1   ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
        0.       4.        0.        0.  0.000000      0.00       0.0       0.   592.537    0.000

J2   NPROF     IPLOT     PRFVS     XSECV     XSECH      FN       ALLDC     IBW      CHNIM     ITRACE
     3.000     0.000    -1.000     0.000     0.000     0.000     0.000    0.000     0.000     0.000
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CCHV=     .300 CEHV=     .500
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

3470 ENCROACHMENT STATIONS=     170.0     850.0  TYPE=     1  TARGET=     680.000
     0.00     12.14    592.54     0.00    592.54    592.59      .05      0.00      0.00    591.80
     940.      3.       650.     287.      17.       298.     414.       0.        0.      589.30
     0.00      .20      2.18      .69      .080      .050     .080     0.000    580.40    586.31
  .000436      0.        0.       0.        0         0        1       0.00     263.69    850.00

3470 ENCROACHMENT STATIONS=     170.0     750.0  TYPE=     1  TARGET=     580.000
                VALLEY SECTION A
   800.00      9.48    592.98     0.00      0.00    593.06     .08       .46       .01    591.80
     940.      17.      622.     301.      43.       236.     262.       12.       4.      589.30
      .10      .39      2.63     1.15      .080      .050     .080      .050    583.50    558.67
  .000780     800.      800.     800.        2         0        1       0.00     191.33    750.00

3280 CROSS SECTION   1950.00 EXTENDED      1.77 FEET

3470 ENCROACHMENT STATIONS=    1505.0    1553.0  TYPE=     1  TARGET=      48.000
OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=    99997.80 ELREA=    99997.80
  1950.00      9.77    593.97     0.00      0.00    594.12     .14      1.02      .03 99997.80
     940.      0.       940.      0.        0.       312.      0.       23.       7.   99997.80
      .21     0.00      3.01     0.00      .080      .050     .080      .050    584.20   1505.00
  .001029    1150.     1150.    1150.        2         0        1       0.00      48.00  1553.00

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      596.30 ELREA=      596.10
  1999.00      9.65    593.85     0.00      0.00    594.45     .61      .10       .23    596.30
     940.      0.       940.      0.        0.       150.      0.       23.       7.     596.10
      .21     0.00      6.25     0.00      .080      .050     .080      .050    584.20    300.17
  .006643      49.       49.      49.        2         0        1       0.00      22.59    322.76

NORMAL BRIDGE,NRD=10 MIN ELTRD=  593.30 MAX ELLC=  594.20

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      596.30 ELREA=      596.10
                EXTRA BRIDGE SECTION
  2000.00      9.65    593.85     0.00      0.00    594.45     .61      .00       .00    596.30
     940.      0.       940.      0.        0.       150.      0.       23.       7.     596.10
      .21     0.00      6.25     0.00      .080      .020     .080      .050    584.20    300.17
  .001077       1.        1.       1.        0         0        1      -.14      22.59    322.76
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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

NORMAL BRIDGE,NRD=10 MIN ELTRD=  593.30 MAX ELLC=  594.20

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      596.30 ELREA=      596.10

  2013.00      9.66    593.86      0.00      0.00    594.47       .60       .01       .00    596.30
     940.        0.      940.        0.        0.     151.        0.       23.        7.    596.10
      .21      0.00      6.24      0.00      .080      .020      .080      .050    584.20    300.17
 .001072       13.       13.       13.         2         0         1      -.19     22.60    322.76

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      596.30 ELREA=      596.10

  2014.00      9.67    593.87      0.00      0.00    594.47       .60       .00       .00    596.30
     940.        0.      940.        0.        0.     151.        0.       23.        7.    596.10
      .21      0.00      6.23      0.00      .080      .050      .080      .050    584.20    300.17
 .006587        1.        1.        1.         0         0         1      0.00     22.60    322.76

3280 CROSS SECTION   2350.00 EXTENDED      3.18 FEET

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      595.60 ELREA=      596.30

                VALLEY SECTION 8

  2350.00      8.98    595.38      0.00      0.00    595.56       .18       .96       .13    595.60
     940.        0.      940.        0.        0.     280.        0.       25.        8.    596.30
      .24      0.00      3.36      0.00      .080      .050      .080      .050    586.40   1500.45
 .001582      336.      336.      336.         2         0         1      0.00     54.94   1555.39

3280 CROSS SECTION   2550.00 EXTENDED      3.60 FEET

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      595.50 ELREA=      596.20

  2550.00      9.40    595.70      0.00      0.00    595.85       .15       .28       .01    595.50
     940.        5.      935.        0.       30.     303.        0.       26.        8.    596.20
      .26      .17      3.08      0.00      .080      .050      .080      .050    586.30   1266.64
 .001246      200.      200.      200.         2         0         1      0.00    289.94   1556.58

3280 CROSS SECTION   2750.00 EXTENDED      3.95 FEET

3470 ENCROACHMENT STATIONS=    1414.0    3000.0  TYPE=     1  TARGET=   -1414.000
OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      595.40 ELREA=      596.10

  2750.00      9.75    595.95      0.00      0.00    596.08       .13       .22       .01    595.40
     940.       14.      926.        0.       40.     323.        0.       28.        9.    596.10
```

.28	.35	2.86	.00	.08	[illegible]	.080	.50	586.2	[illegible]
.001011	200.	200.	200.	2	0	1	0.00	143.58	1557.58

3280 CROSS SECTION 3000.00 EXTENDED .17 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

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 596.50 ELREA= 596.50

3000.00	10.17	596.17	0.00	0.00	596.70	.53	.42	.20	588.40
940.	0.	940.	0.	0.	161.	0.	29.	10.	588.40
.29	0.00	5.84	0.00	.080	.050	.080	.050	586.00	391.70
.003425	250.	250.	250.	2	0	1	0.00	16.60	408.30

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	2.27	2.50	0.00	10.10	0.00	131.00	0.00	586.00	586.00

3280 CROSS SECTION 3090.00 EXTENDED 1.59 FEET

PRESSURE FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	ELLC	ELTRD	CLASS
597.99	596.70	0.00	0.	940.	131.	596.00	598.20	10.00

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 598.20 ELREA= 598.20

BRIDGE SECTION C, DELTA COLLEGE ENTRANCE ROAD BRIDGE

16'7"X10'1" MULTIPLATE PIPE ARCH

3090.00	11.59	597.59	0.00	0.00	597.99	.40	1.29	0.00	588.40
940.	0.	940.	0.	0.	184.	0.	30.	10.	588.40
.30	0.00	5.10	0.00	.080	.050	.080	.050	586.00	391.70
.002335	90.	90.	90.	2	0	1	0.00	16.60	408.30

3470 ENCROACHMENT STATIONS= 1500.0 1616.0 TYPE= 1 TARGET= 116.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 598.00 ELREA= 100000.00

3138.00	11.48	598.08	0.00	0.00	598.12	.04	.02	.11	598.00
940.	0.	940.	0.	0.	622.	0.	30.	10.	100000.00
.30	0.00	1.51	0.00	.040	.035	.040	.049	586.60	1500.00
.000140	48.	48.	48.	2	0	1	0.00	116.00	1616.00

3470 ENCROACHMENT STATIONS= 1500.0 1616.0 TYPE= 1 TARGET= 116.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 598.00 ELREA= 100000.00

3168.00	11.18	598.08	0.00	0.00	598.12	.04	.00	.00	598.00
940.	0.	940.	0.	0.	604.	0.	31.	10.	100000.00
.31	0.00	1.56	0.00	.040	.035	.040	.049	586.90	1500.00
.000154	30.	30.	30.	2	0	1	0.00	116.00	1616.00

3470 ENCROACHMENT STATIONS= 1500.0 1616.0 TYPE= 1 TARGET= 116.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 598.00 ELREA= 100000.00

VALLEY SECTION D

3200.00	10.79	598.09	0.00	0.00	598.13	.04	.01	.00	598.00
940.	0.	940.	0.	0.	581.	0.	31.	10.	100000.00
.32	0.00	1.62	0.00	.040	.035	.040	.049	587.30	1500.00
.000176	32.	32.	32.	0	0	1	0.00	116.00	1616.00

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= 1500.0 1616.0 TYPE= 1 TARGET= 116.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 598.10 ELREA= 100000.00

3400.00	10.72	598.12	0.00	0.00	598.16	.04	.04	.00	598.10
940.	0.	940.	0.	0.	573.	0.	34.	11.	100000.00
.35	0.00	1.64	0.00	.040	.035	.040	.048	587.40	1500.00
.000183	200.	200.	200.	0	0	1	0.00	116.00	1616.00

3470 ENCROACHMENT STATIONS= 1500.0 1616.0 TYPE= 1 TARGET= 116.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 598.20 ELREA= 100000.00

3600.00	10.66	598.16	0.00	0.00	598.20	.04	.04	.00	598.20
940.	0.	940.	0.	0.	565.	0.	36.	11.	100000.00
.38	0.00	1.66	0.00	.040	.035	.040	.048	587.50	1500.26
.000191	200.	200.	200.	0	0	1	0.00	115.74	1616.00

3470 ENCROACHMENT STATIONS= 1500.0 1616.0 TYPE= 1 TARGET= 116.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 598.30 ELREA= 100000.00

3860.00	10.61	598.21	0.00	0.00	598.25	.04	.05	.00	598.30
940.	0.	940.	0.	0.	559.	0.	40.	12.	100000.00
.43	0.00	1.68	0.00	.040	.035	.040	.047	587.60	1500.58
.000197	260.	260.	260.	0	0	1	0.00	115.42	1616.00

3470 ENCROACHMENT STATIONS= 1500.0 1616.0 TYPE= 1 TARGET= 116.000

OVERBANK AREA ASSUMED NON EFFECTIVE ELLEN= 598.3 ELREA= 10. 00.

3900.00	10.62	598.22	0.00	0.00	598.26	.04	.01	.00	598.30
940.	0.	940.	0.	0.	560.	0.	40.	12.	100000.00
.43	0.00	1.68	0.00	.040	.035	.040	.047	587.60	1500.53
.000196	40.	40.	40.	0	0	1	0.00	115.47	1616.00

3470 ENCROACHMENT STATIONS= .0 610.0 TYPE= 1 TARGET= 609.999

3919.00	10.62	598.22	0.00	0.00	598.27	.06	.00	.01	590.00
940.	253.	413.	274.	201.	168.	215.	40.	12.	590.00
.44	1.26	2.46	1.27	.040	.035	.040	.046	587.60	492.87
.000178	19.	19.	19.	0	0	1	0.00	117.13	610.00

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	2.22	2.50	0.00	16.70	0.00	131.00	0.00	587.90	587.60

3280 CROSS SECTION 4000.00 EXTENDED .39 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

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	ELLC	ELTRD	CLASS
599.99	599.00	0.00	199.	743.	131.	597.60	598.70	30.00

3470 ENCROACHMENT STATIONS= 414.0 686.0 TYPE= 1 TARGET= 272.000

BRIDGE SECTION E, PARKING LOT DRIVEWAY CULVERT #1

16'7"X10'1" MULTIPLATE PIPE ARCH

4000.00	11.39	599.29	0.00	0.00	599.32	.03	1.05	0.00	590.30
940.	265.	343.	332.	296.	181.	375.	42.	12.	590.30
.45	.90	1.89	.88	.040	.035	.040	.046	587.90	414.00
.000095	81.	81.	81.	2	0	2	0.00	272.00	686.00

3280 CROSS SECTION 4509.00 EXTENDED 1.36 FEET

3470 ENCROACHMENT STATIONS= .0 875.0 TYPE= 1 TARGET= 874.999

4509.00	11.25	599.35	0.00	0.00	599.36	.01	.03	.01	590.60
940.	116.	228.	596.	177.	178.	1278.	56.	18.	590.60
.66	.66	1.28	.47	.040	.035	.040	.045	588.10	225.19
.000045	509.	509.	509.	1	0	1	0.00	649.80	875.00

SPECIAL BRIDGE

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
0.00	2.22	2.50	0.00	16.70	0.00	131.00	0.00	588.10	588.10

3280 CROSS SECTION 4590.00 EXTENDED 2.82 FEET

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	ELLC	ELTRD	CLASS
601.13	599.36	0.00	85.	854.	131.	598.10	599.20	30.00

3470 ENCROACHMENT STATIONS= 145.0 875.0 TYPE= 1 TARGET= 730.000

BRIDGE SECTION F, PARKING LOT DRIVEWAY CULVERT #2

4590.00	12.71	600.81	0.00	0.00	600.82	.00	1.46	0.00	590.60
940.	113.	147.	680.	338.	202.	2143.	60.	19.	590.60
.72	.33	.73	.32	.040	.035	.040	.045	588.10	145.00
.000012	81.	81.	81.	0	0	3	0.00	730.00	875.00

3280 CROSS SECTION 4700.00 EXTENDED 2.82 FEET

3470 ENCROACHMENT STATIONS= 1275.0 2100.0 TYPE= 1 TARGET= 825.000

VALLEY SECTION G

4700.00	11.62	600.82	0.00	0.00	600.82	.00	.00	.00	597.60
940.	88.	451.	401.	464.	662.	1603.	63.	20.	597.20
.75	.19	.68	.25	.080	.050	.080	.045	589.20	1275.00
.000038	150.	110.	1.	0	0	1	0.00	825.00	2100.00

3470 ENCROACHMENT STATIONS= 1490.0 1554.0 TYPE= 1 TARGET= 64.000

VALLEY SECTION H

6550.00	7.32	600.92	0.00	0.00	601.16	.24	.22	.12	599.40
940.	17.	909.	14.	15.	227.	13.	126.	39.	599.60
.88	1.13	4.00	1.07	.080	.050	.080	.047	593.60	1490.00
.002256	1850.	1850.	1850.	2	0	1	0.00	64.00	1554.00

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= 1498.0 1546.0 TYPE= 1 TARGET= 48.000

6583.00	8.25	601.05	0.00	0.00	601.23	.18	.06	.02	598.60
940.	6.	929.	5.	5.	268.	5.	126.	39.	598.80
.88	1.24	3.46	1.17	.080	.050	.080	.047	592.80	1498.00
.001355	33.	33.	33.	2	0	1	0.00	48.00	1546.00

3280 CROSS SECTION 6616.00 EXTENDED .27 FEET

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3470 ENCROACHMENT STATIONS=    1507.0    1538.0  TYPE=     1  TARGET=      31.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=   100000.00 ELREA=   100000.00

  6616.00      9.07   601.07      0.00      0.00   601.32       .25       .05       .03100000.00
     940.        0.     940.        0.        0.     236.        0.      127.        39. 100000.00
      .89      0.00     3.98      0.00      .080     .050      .080      .047    592.00  1507.00
  .002069       33.      33.       33.         2        0         1      0.00     31.00  1538.00

3280 CROSS SECTION   6630.00 EXTENDED       .54 FEET


3470 ENCROACHMENT STATIONS=    1510.0    1534.0  TYPE=     1  TARGET=      24.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=   100000.00 ELREA=   100000.00

  6630.00      9.34   601.04      0.00      0.00   601.43       .39       .04       .07100000.00
     940.        0.     940.        0.        0.     189.        0.      127.        39. 100000.00
      .89      0.00     4.98      0.00      .080     .050      .080      .047    591.70  1510.00
  .003733       14.      14.       14.         2        0         1      0.00     24.00  1534.00

3280 CROSS SECTION   6643.00 EXTENDED       .76 FEET


3470 ENCROACHMENT STATIONS=    1513.0    1531.0  TYPE=     1  TARGET=      18.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=   100000.00 ELREA=   100000.00

  6643.00      9.56   600.96      0.00      0.00   601.64       .68       .07       .15100000.00
     940.        0.     940.        0.        0.     142.        0.      127.        39. 100000.00
      .89      0.00     6.62      0.00      .080     .050      .080      .047    591.40  1513.00
  .007970       13.      13.       13.         2        0         1      0.00     18.00  1531.00


OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      601.50 ELREA=      601.50

  6650.00      9.76   600.96      0.00      0.00   601.74       .79       .05       .05    593.60
     940.        0.     940.        0.        0.     132.        0.      127.        39.    593.60
      .89      0.00     7.11      0.00      .080     .050      .080      .047    591.20  1492.90
  .005777        7.       7.        7.         2        0         1      0.00     14.20  1520.01


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.00      2.04      2.50      0.00      8.90      0.00    101.00      0.00    591.60    591.20

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


PRESSURE FLOW


   EGPRS     EGLWC     H3        QWEIR     QPR       BAREA     ELLC      ELTRD     CLASS
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603.70    602.14      0.00        0.      940.      101.    600.50    603.70     10.00

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      603.70 ELREA=      603.70

                BRIDGE SECTION I, DELTA ROAD CULVERT

                14'3"X8'11" MULTIPLATE PIPE ARCH

  6695.00    11.55   603.15      0.00      0.00   603.70      .55      1.96      0.00   594.00
     940.       0.     940.       0.        0.     158.       0.      127.       39.    594.00
      .89     0.00     5.96      0.00      .080     .050     .080      .047    591.60  1492.90
  .003538      45.      45.      45.         2        0        1      0.00     14.20  1523.81

3280 CROSS SECTION   6706.00 EXTENDED      1.35 FEET

3470 ENCROACHMENT STATIONS=    1504.0    1540.0  TYPE=     1  TARGET=      36.000
OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=   100000.00 ELREA=   100000.00

  6706.00    12.05   603.75      0.00      0.00   603.85      .10       .01       .14100000.00
     940.       0.     940.       0.        0.     372.       0.      127.       39. 100000.00
      .89     0.00     2.53      0.00      .080     .050     .080      .047    591.70  1504.00
  .000562      11.      11.      11.         2        0        1      0.00     36.00  1540.00

3280 CROSS SECTION   6746.00 EXTENDED      1.33 FEET

3470 ENCROACHMENT STATIONS=    1464.0    1580.0  TYPE=     1  TARGET=     116.000
  6746.00    12.04   603.84      0.00      0.00   603.88      .04       .01       .02   599.50
     940.     101.     735.     104.       148.     418.     151.      127.       39.    599.70
      .90      .68     1.76      .69      .080     .050     .080      .047    591.80  1464.00
  .000204      40.      40.      40.         0        0        1      0.00    116.00  1580.00

3280 CROSS SECTION   6796.00 EXTENDED      1.05 FEET

3470 ENCROACHMENT STATIONS=    1465.0    1579.0  TYPE=     1  TARGET=     114.000
  6796.00    11.75   603.85      0.00      0.00   603.89      .04       .01       .00   599.80
     940.      94.     749.      97.       134.     406.     137.      128.       39.    600.00
      .91      .70     1.85      .71      .080     .050     .080      .047    592.10  1465.00
  .000235      50.      50.      50.         0        0        1      0.00    114.00  1579.00

3280 CROSS SECTION   6996.00 EXTENDED       .19 FEET

3470 ENCROACHMENT STATIONS=    1480.0    1566.0  TYPE=     1  TARGET=      86.000
  6996.00    10.89   603.89      0.00      0.00   603.97      .07       .06       .01   600.70
     940.      49.     839.      52.        61.     368.      67.      131.       40.    600.90
      .93      .79     2.28      .79      .080     .050     .080      .047    593.00  1480.00
  .000408     200.     200.     200.         0        0        1      0.00     86.00  1566.00
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SECNO     DEPTH     CWSEL     CRIWS     SELK      EG        HV        HL        VLOSS     BANK ELEV
Q         QLOB      QCH       QROB      ALOB      ACH       AROB      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=    1489.0    1555.0  TYPE=     1  TARGET=      66.000
  7096.00    10.43   603.93      0.00      0.00    604.03       .10       .05       .01    601.20
     940.      25.     892.       23.       29.      348.       28.      132.       40.    601.40
      .94      .84     2.57       .82      .080      .050      .080      .047    593.50   1489.00
  .000559     100.     100.      100.         0         0         1      0.00     66.00   1555.00

3470 ENCROACHMENT STATIONS=    1501.0    1542.0  TYPE=     1  TARGET=      41.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=   100000.00 ELREA=   100000.00

  7146.00    10.25   603.95      0.00      0.00    604.07       .13       .03       .01100000.00
     940.       0.     940.       0.        0.      331.        0.      132.       40. 100000.00
      .95     0.00     2.84      0.00      .080      .050      .080      .047    593.70   1501.00
  .000801      50.      50.       50.         0         0         1      0.00     41.00   1542.00

3301 HV CHANGED MORE THAN HVINS

  7200.00     9.74   603.74      0.00      0.00    604.48       .74       .10       .31    610.00
     940.       0.     940.       0.        0.      136.        0.      133.       40.    610.00
      .95     0.00     6.89      0.00      .080      .050      .080      .047    594.00     93.00
  .008261      54.      54.       54.         2         0         1      0.00     14.00    107.00
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00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Frankenlust Twp.

3) WATERCOURSE: Klauss Drain

4) DOCUMENT TYPE: Summary

00BREAK00

SUMMARY PRINTOUT FOR MULTIPLE PROFILES

KLAUSS DRAIN

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	HV	HL	OLOSS	QCH	DEPTH	TOPWID
0.00	0.00	0.00	0.00	580.40	615.00	591.24	.06	0.00	0.00	529.19	10.84	214.95
0.00	0.00	0.00	0.00	580.40	820.00	592.26	.05	0.00	0.00	592.71	11.86	246.58
0.00	0.00	0.00	0.00	580.40	940.00	592.54	.05	0.00	0.00	649.54	12.14	263.69
0.00	0.00	0.00	0.00	580.40	1230.00	593.04	.06	0.00	0.00	783.40	12.64	295.00
800.00	800.00	0.00	0.00	583.50	615.00	591.76	.07	.53	.01	466.03	8.26	117.90
800.00	800.00	0.00	0.00	583.50	820.00	592.68	.07	.43	.01	561.69	9.18	172.71
800.00	800.00	0.00	0.00	583.50	940.00	592.98	.08	.46	.01	622.32	9.48	191.33
800.00	800.00	0.00	0.00	583.50	1230.00	593.55	.09	.53	.01	760.83	10.05	227.00
1950.00	1150.00	0.00	0.00	584.20	615.00	592.75	.09	1.00	.01	615.00	8.55	48.00
1950.00	1150.00	0.00	0.00	584.20	820.00	593.61	.12	.96	.02	820.00	9.41	48.00
1950.00	1150.00	0.00	0.00	584.20	940.00	593.97	.14	1.02	.03	940.00	9.77	48.00
1950.00	1150.00	0.00	0.00	584.20	1230.00	594.70	.20	1.20	.05	1230.00	10.50	48.00
1999.00	49.00	0.00	0.00	584.20	615.00	592.69	.38	.08	.14	615.00	8.49	22.39
1999.00	49.00	0.00	0.00	584.20	820.00	593.51	.51	.09	.20	820.00	9.31	22.53
1999.00	49.00	0.00	0.00	584.20	940.00	593.85	.61	.10	.23	940.00	9.65	22.59
1999.00	49.00	0.00	0.00	584.20	1230.00	594.50	.86	.13	.33	1230.00	10.30	22.71
2000.00	1.00	593.30	594.20	584.20	615.00	592.69	.38	.00	.00	615.00	8.49	22.39
2000.00	1.00	593.30	594.20	584.20	820.00	593.52	.51	.00	.00	820.00	9.32	22.53
2000.00	1.00	593.30	594.20	584.20	940.00	593.85	.61	.00	.00	940.00	9.65	22.59
2000.00	1.00	593.30	594.20	584.20	1230.00	594.44	.99	.00	.06	1230.00	10.24	22.70
2013.00	13.00	593.30	594.20	584.20	615.00	592.70	.38	.01	.00	615.00	8.50	22.39
2013.00	13.00	593.30	594.20	584.20	820.00	593.53	.51	.01	.00	820.00	9.33	22.54
2013.00	13.00	593.30	594.20	584.20	940.00	593.86	.60	.01	.00	940.00	9.66	22.60
2013.00	13.00	593.30	594.20	584.20	1230.00	594.48	.99	.04	.00	1230.00	10.28	22.70
2014.00	1.00	0.00	0.00	584.20	615.00	592.70	.38	.00	.00	615.00	8.50	22.39
2014.00	1.00	0.00	0.00	584.20	820.00	593.53	.51	.00	.00	820.00	9.33	22.54
2014.00	1.00	0.00	0.00	584.20	940.00	593.87	.60	.00	.00	940.00	9.67	22.60
2014.00	1.00	0.00	0.00	584.20	1230.00	594.72	.81	.00	.05	1230.00	10.52	22.75
2350.00	336.00	0.00	0.00	586.40	615.00	593.89	.14	.88	.07	615.00	7.49	47.60
2350.00	336.00	0.00	0.00	586.40	820.00	594.90	.16	.91	.10	820.00	8.50	52.55
2350.00	336.00	0.00	0.00	586.40	940.00	595.38	.18	.96	.13	940.00	8.98	54.94
2350.00	336.00	0.00	0.00	586.40	1230.00	596.37	.01	.23	0.00	474.03	9.97	1740.26
2550.00	200.00	0.00	0.00	586.30	615.00	594.20	.12	.28	.01	615.00	7.90	49.64
2550.00	200.00	0.00	0.00	586.30	820.00	595.21	.14	.28	.01	820.00	8.91	54.59
2550.00	200.00	0.00	0.00	586.30	940.00	595.70	.15	.28	.01	934.87	9.40	289.94
2550.00	200.00	0.00	0.00	586.30	1230.00	596.42	.01	.04	.00	445.35	10.12	1820.12
2750.00	200.00	0.00	0.00	586.20	615.00	594.45	.10	.23	.00	615.00	8.25	51.34
2750.00	200.00	0.00	0.00	586.20	820.00	595.46	.12	.23	.01	819.95	9.26	85.29
2750.00	200.00	0.00	0.00	586.20	940.00	595.95	.13	.22	.01	925.84	9.75	143.58
2750.00	200.00	0.00	0.00	586.20	1230.00	596.46	.01	.04	.00	432.77	10.26	1586.00

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	HV	HL	OLOSS	QCH	DEPTH	TOPWID
3000.00	250.00	0.00	0.00	586.00	615.00	594.71	.31	.37	.11	615.00	8.71	16.60
3000.00	250.00	0.00	0.00	586.00	820.00	595.71	.44	.41	.16	820.00	9.71	16.60
3000.00	250.00	0.00	0.00	586.00	940.00	596.17	.53	.42	.20	940.00	10.17	16.60
3000.00	250.00	0.00	0.00	586.00	1230.00	596.50	.06	.06	.02	453.10	10.50	230.19
3090.00	90.00	598.20	596.00	586.00	615.00	594.98	.39	.31	.04	615.00	8.98	16.60
3090.00	90.00	598.20	596.00	586.00	820.00	596.73	.36	.94	0.00	820.00	10.73	16.60
3090.00	90.00	598.20	596.00	586.00	940.00	597.59	.40	1.29	0.00	940.00	11.59	16.60
3090.00	90.00	598.20	596.00	586.00	1230.00	598.63	.01	2.09	0.00	310.79	12.63	800.00
3138.00	48.00	0.00	0.00	586.60	615.00	595.47	.05	.04	.10	615.00	8.87	88.25
3138.00	48.00	0.00	0.00	586.60	820.00	597.17	.04	.02	.10	820.00	10.57	107.24
3138.00	48.00	0.00	0.00	586.60	940.00	598.08	.04	.02	.11	940.00	11.48	116.00
3138.00	48.00	0.00	0.00	586.60	1230.00	598.62	.05	.01	.02	1230.00	12.02	116.00
3168.00	30.00	0.00	0.00	586.90	615.00	595.47	.05	.01	.00	615.00	8.57	87.45
3168.00	30.00	0.00	0.00	586.90	820.00	597.17	.04	.01	.00	820.00	10.27	107.02
3168.00	30.00	0.00	0.00	586.90	940.00	598.08	.04	.00	.00	940.00	11.18	116.00
3168.00	30.00	0.00	0.00	586.90	1230.00	598.63	.05	.01	.00	1230.00	11.73	116.00
3200.00	32.00	0.00	0.00	587.30	615.00	595.48	.06	.01	.00	615.00	8.18	86.32
3200.00	32.00	0.00	0.00	587.30	820.00	597.18	.05	.01	.00	820.00	9.88	106.69
3200.00	32.00	0.00	0.00	587.30	940.00	598.09	.04	.01	.00	940.00	10.79	116.00
3200.00	32.00	0.00	0.00	587.30	1230.00	598.63	.06	.01	.00	1230.00	11.33	116.00
3400.00	200.00	0.00	0.00	587.40	615.00	595.56	.06	.08	.00	615.00	8.16	85.97
3400.00	200.00	0.00	0.00	587.40	820.00	597.22	.05	.05	.00	820.00	9.82	106.00
3400.00	200.00	0.00	0.00	587.40	940.00	598.12	.04	.04	.00	940.00	10.72	116.00
3400.00	200.00	0.00	0.00	587.40	1230.00	598.67	.06	.04	.00	1230.00	11.27	116.00
3600.00	200.00	0.00	0.00	587.50	615.00	595.64	.06	.08	.00	615.00	8.14	85.71
3600.00	200.00	0.00	0.00	587.50	820.00	597.27	.05	.05	.00	820.00	9.77	105.35
3600.00	200.00	0.00	0.00	587.50	940.00	598.16	.04	.04	.00	940.00	10.66	115.74
3600.00	200.00	0.00	0.00	587.50	1230.00	598.72	.06	.05	.00	1230.00	11.22	116.00
3860.00	260.00	0.00	0.00	587.60	615.00	595.74	.06	.11	.00	615.00	8.14	85.77
3860.00	260.00	0.00	0.00	587.60	820.00	597.33	.05	.06	.00	820.00	9.73	104.90
3860.00	260.00	0.00	0.00	587.60	940.00	598.21	.04	.05	.00	940.00	10.61	115.42
3860.00	260.00	0.00	0.00	587.60	1230.00	598.78	.06	.06	.00	1230.00	11.18	116.00
3900.00	40.00	0.00	0.00	587.60	615.00	595.76	.06	.02	.00	615.00	8.16	85.96
3900.00	40.00	0.00	0.00	587.60	820.00	597.34	.05	.01	.00	820.00	9.74	105.02
3900.00	40.00	0.00	0.00	587.60	940.00	598.22	.04	.01	.00	940.00	10.62	115.47
3900.00	40.00	0.00	0.00	587.60	1230.00	598.79	.06	.01	.00	1230.00	11.19	116.00
3919.00	19.00	0.00	0.00	587.60	615.00	595.76	.08	.01	.01	344.79	8.16	87.58
3919.00	19.00	0.00	0.00	587.60	820.00	597.34	.06	.00	.01	391.58	9.74	107.09
3919.00	19.00	0.00	0.00	587.60	940.00	598.22	.06	.00	.01	412.96	10.62	117.13
3919.00	19.00	0.00	0.00	587.60	1230.00	598.79	.07	.00	.00	499.70	11.19	384.06

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	HV	HL	OLOSS	QCH	DEPTH	TOPWID
4000.00	81.00	598.70	597.60	587.90	615.00	595.61	.49	.06	.21	615.00	7.71	16.60
4000.00	81.00	598.70	597.60	587.90	820.00	598.31	.38	1.29	0.00	820.00	10.41	16.60
4000.00	81.00	598.70	597.60	587.90	940.00	599.29	.03	1.05	0.00	343.33	11.39	272.00
4000.00	81.00	598.70	597.60	587.90	1230.00	599.90	.03	1.08	0.00	401.21	12.00	272.00
4509.00	509.00	0.00	0.00	588.10	615.00	596.75	.33	.93	.05	615.00	8.65	16.60
4509.00	509.00	0.00	0.00	588.10	820.00	598.87	.01	.08	.11	237.40	10.77	629.97
4509.00	509.00	0.00	0.00	588.10	940.00	599.35	.01	.03	.01	228.00	11.25	649.80
4509.00	509.00	0.00	0.00	588.10	1230.00	599.96	.01	.03	.01	243.13	11.86	811.62
4590.00	81.00	599.20	598.10	588.10	615.00	596.84	.41	.13	.04	615.00	8.74	16.60
4590.00	81.00	599.20	598.10	588.10	820.00	600.10	.00	1.22	0.00	155.98	12.00	730.00
4590.00	81.00	599.20	598.10	588.10	940.00	600.81	.00	1.46	0.00	146.70	12.71	730.00
4590.00	81.00	599.20	598.10	588.10	1230.00	602.10	.00	2.13	0.00	145.54	14.00	730.00
4700.00	110.00	0.00	0.00	589.20	615.00	597.43	.04	.11	.11	602.45	8.23	277.67
4700.00	110.00	0.00	0.00	589.20	820.00	600.10	.01	.00	.00	453.34	10.90	825.00
4700.00	110.00	0.00	0.00	589.20	940.00	600.82	.00	.00	.00	451.33	11.62	825.00
4700.00	110.00	0.00	0.00	589.20	1230.00	602.10	.00	.00	.00	487.74	12.90	825.00
6550.00	1850.00	0.00	0.00	593.60	615.00	599.34	.24	2.00	.10	615.00	5.74	43.46
6550.00	1850.00	0.00	0.00	593.60	820.00	600.28	.25	.31	.12	807.53	6.68	64.00
6550.00	1850.00	0.00	0.00	593.60	940.00	600.92	.24	.22	.12	909.18	7.32	64.00
6550.00	1850.00	0.00	0.00	593.60	1230.00	602.13	.25	.15	.12	1152.05	8.53	64.00
6583.00	33.00	0.00	0.00	592.80	615.00	599.53	.14	.07	.03	612.88	6.73	48.00
6583.00	33.00	0.00	0.00	592.80	820.00	600.45	.17	.06	.02	812.80	7.65	48.00
6583.00	33.00	0.00	0.00	592.80	940.00	601.05	.18	.06	.02	928.68	8.25	48.00
6583.00	33.00	0.00	0.00	592.80	1230.00	602.22	.22	.05	.01	1208.43	9.42	48.00
6616.00	33.00	0.00	0.00	592.00	615.00	599.57	.16	.05	.01	615.00	7.57	31.00
6616.00	33.00	0.00	0.00	592.00	820.00	600.48	.22	.06	.02	820.00	8.48	31.00
6616.00	33.00	0.00	0.00	592.00	940.00	601.07	.25	.05	.03	940.00	9.07	31.00
6616.00	33.00	0.00	0.00	592.00	1230.00	602.22	.32	.06	.05	1230.00	10.22	31.00
6630.00	14.00	0.00	0.00	591.70	615.00	599.56	.25	.03	.04	615.00	7.86	24.00
6630.00	14.00	0.00	0.00	591.70	820.00	600.46	.34	.04	.06	820.00	8.76	24.00
6630.00	14.00	0.00	0.00	591.70	940.00	601.04	.39	.04	.07	940.00	9.34	24.00
6630.00	14.00	0.00	0.00	591.70	1230.00	602.17	.50	.04	.09	1230.00	10.47	24.00
6643.00	13.00	0.00	0.00	591.40	615.00	599.52	.44	.05	.09	615.00	8.12	18.00
6643.00	13.00	0.00	0.00	591.40	820.00	600.39	.60	.06	.13	820.00	8.99	18.00
6643.00	13.00	0.00	0.00	591.40	940.00	600.96	.68	.07	.15	940.00	9.56	18.00
6643.00	13.00	0.00	0.00	591.40	1230.00	602.06	.90	.08	.20	1230.00	10.66	18.00
6650.00	7.00	0.00	0.00	591.20	615.00	599.54	.47	.03	.02	615.00	8.34	14.20
6650.00	7.00	0.00	0.00	591.20	820.00	600.40	.68	.04	.04	820.00	9.20	14.20
6650.00	7.00	0.00	0.00	591.20	940.00	600.96	.79	.05	.05	940.00	9.76	14.20
6650.00	7.00	0.00	0.00	591.20	1230.00	602.70	.43	.03	.14	929.55	11.50	46.31

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	HV	HL	OLOSS	QCH	DEPTH	TOPWID
6695.00	45.00	603.70	600.50	591.60	615.00	599.72	.64	.27	.09	615.00	8.12	14.20
6695.00	45.00	603.70	600.50	591.60	820.00	601.96	.53	1.41	0.00	820.00	10.36	14.20
6695.00	45.00	603.70	600.50	591.60	940.00	603.15	.55	1.96	0.00	940.00	11.55	14.20
6695.00	45.00	603.70	600.50	591.60	1230.00	605.42	.05	2.34	0.00	498.33	13.82	1656.01
6706.00	11.00	0.00	0.00	591.70	615.00	600.45	.09	.02	.16	615.00	8.75	36.00
6706.00	11.00	0.00	0.00	591.70	820.00	602.53	.10	.01	.13	820.00	10.83	36.00
6706.00	11.00	0.00	0.00	591.70	940.00	603.75	.10	.01	.14	940.00	12.05	36.00
6706.00	11.00	0.00	0.00	591.70	1230.00	605.38	.13	.00	.04	1230.00	13.68	36.00
6746.00	40.00	0.00	0.00	591.80	615.00	600.50	.07	.03	.01	591.92	8.70	116.00
6746.00	40.00	0.00	0.00	591.80	820.00	602.61	.05	.02	.02	684.79	10.81	116.00
6746.00	40.00	0.00	0.00	591.80	940.00	603.84	.04	.01	.02	734.58	12.04	116.00
6746.00	40.00	0.00	0.00	591.80	1230.00	605.51	.04	.01	.03	894.42	13.71	116.00
6796.00	50.00	0.00	0.00	592.10	615.00	600.53	.08	.03	.01	602.10	8.43	114.00
6796.00	50.00	0.00	0.00	592.10	820.00	602.62	.05	.02	.00	699.71	10.52	114.00
6796.00	50.00	0.00	0.00	592.10	940.00	603.85	.04	.01	.00	749.26	11.75	114.00
6796.00	50.00	0.00	0.00	592.10	1230.00	605.51	.04	.01	.00	910.81	13.41	114.00
6996.00	200.00	0.00	0.00	593.00	615.00	600.68	.11	.17	.02	615.00	7.68	43.69
6996.00	200.00	0.00	0.00	593.00	820.00	602.69	.09	.09	.02	767.87	9.69	86.00
6996.00	200.00	0.00	0.00	593.00	940.00	603.89	.07	.06	.01	838.80	10.89	86.00
6996.00	200.00	0.00	0.00	593.00	1230.00	605.55	.07	.05	.02	1038.75	12.55	86.00
7096.00	100.00	0.00	0.00	593.50	615.00	600.79	.13	.12	.01	615.00	7.29	42.76
7096.00	100.00	0.00	0.00	593.50	820.00	602.75	.11	.07	.01	799.72	9.25	66.00
7096.00	100.00	0.00	0.00	593.50	940.00	603.93	.10	.05	.01	892.40	10.43	66.00
7096.00	100.00	0.00	0.00	593.50	1230.00	605.57	.10	.04	.01	1130.23	12.07	66.00
7146.00	50.00	0.00	0.00	593.70	615.00	600.86	.14	.07	.00	615.00	7.16	41.00
7146.00	50.00	0.00	0.00	593.70	820.00	602.78	.13	.04	.01	820.00	9.08	41.00
7146.00	50.00	0.00	0.00	593.70	940.00	603.95	.13	.03	.01	940.00	10.25	41.00
7146.00	50.00	0.00	0.00	593.70	1230.00	605.58	.15	.03	.02	1230.00	11.88	41.00
7200.00	54.00	0.00	0.00	594.00	615.00	600.76	.66	.16	.26	615.00	6.76	14.00
7200.00	54.00	0.00	0.00	594.00	820.00	602.60	.72	.12	.29	820.00	8.60	14.00
7200.00	54.00	0.00	0.00	594.00	940.00	603.74	.74	.10	.31	940.00	9.74	14.00
7200.00	54.00	0.00	0.00	594.00	1230.00	605.29	.94	.10	.40	1230.00	11.29	14.00

SECTION NUMBER	DISCHARGE CFS	CWSEL	CWSEL DIFF EACH Q	CWSEL DIFF EACH SECTION	CWSEL-WSELK	TOPWID	T.W. DIFF	LENGTH
0.000	615.000	591.236	0.000	0.000	0.000	214.951	0.000	0.000
0.000	820.000	592.261	1.025	0.000	0.000	246.581	-31.630	0.000
0.000	940.000	592.537	.276	0.000	0.000	263.693	-48.742	0.000
0.000	1230.000	593.040	.503	0.000	0.000	294.999	-80.048	0.000
800.000	615.000	591.761	0.000	.525	0.000	117.898	0.000	800.000
800.000	820.000	592.682	.922	.421	0.000	172.710	-54.812	800.000
800.000	940.000	592.981	.299	.444	0.000	191.329	-73.431	800.000
800.000	1230.000	593.552	.571	.512	0.000	227.002	-109.104	800.000
1950.000	615.000	592.748	0.000	.988	0.000	47.999	0.000	1150.000
1950.000	820.000	593.615	.867	.932	0.000	47.999	-.000	1150.000
1950.000	940.000	593.975	.360	.993	0.000	47.999	-.000	1150.000
1950.000	1230.000	594.703	.728	1.151	0.000	47.999	-.000	1150.000
1999.000	615.000	592.686	0.000	-.062	0.000	22.390	0.000	49.000
1999.000	820.000	593.513	.826	-.102	0.000	22.534	-.144	49.000
1999.000	940.000	593.846	.333	-.129	0.000	22.592	-.203	49.000
1999.000	1230.000	594.502	.656	-.201	0.000	22.707	-.317	49.000

2000.000	615.000	592.688	0.000	.002	0.000	22.390	0.000	1.000
2000.000	820.000	593.515	.827	.003	0.000	22.535	-.144	1.000
2000.000	940.000	593.848	.333	.002	0.000	22.593	-.203	1.000
2000.000	1230.000	594.442	.594	-.060	0.000	22.696	-.306	1.000
2013.000	615.000	592.700	0.000	.012	0.000	22.392	0.000	13.000
2013.000	820.000	593.530	.830	.015	0.000	22.537	-.145	13.000
2013.000	940.000	593.865	.335	.017	0.000	22.596	-.203	13.000
2013.000	1230.000	594.484	.620	.042	0.000	22.704	-.312	13.000
2014.000	615.000	592.702	0.000	.002	0.000	22.392	0.000	1.000
2014.000	820.000	593.532	.830	.002	0.000	22.537	-.145	1.000
2014.000	940.000	593.869	.337	.004	0.000	22.596	-.203	1.000
2014.000	1230.000	594.722	.853	.238	0.000	22.746	-.353	1.000
2350.000	615.000	593.885	0.000	1.183	0.000	47.596	0.000	336.000
2350.000	820.000	594.896	1.011	1.364	0.000	52.555	-4.959	336.000
2350.000	940.000	595.383	.487	1.513	0.000	54.942	-7.345	336.000
2350.000	1230.000	596.374	.991	1.651	0.000	1740.262	-1692.666	336.000
2550.000	615.000	594.201	0.000	.316	0.000	49.642	0.000	200.000
2550.000	820.000	595.208	1.007	.312	0.000	54.585	-4.943	200.000
2550.000	940.000	595.699	.491	.317	0.000	289.943	-240.301	200.000
2550.000	1230.000	596.420	.720	.046	0.000	1820.116	-1770.473	200.000
2750.000	615.000	594.448	0.000	.247	0.000	51.341	0.000	200.000
2750.000	820.000	595.458	1.011	.250	0.000	85.293	-33.951	200.000
2750.000	940.000	595.951	.492	.251	0.000	143.576	-92.235	200.000
2750.000	1230.000	596.457	.506	.037	0.000	1586.001	-1534.659	200.000
3000.000	615.000	594.711	0.000	.263	0.000	16.600	0.000	250.000
3000.000	820.000	595.707	.996	.249	0.000	16.600	0.000	250.000
3000.000	940.000	596.173	.466	.223	0.000	16.600	0.000	250.000
3000.000	1230.000	596.498	.325	.041	0.000	230.189	-213.589	250.000
3090.000	615.000	594.982	0.000	.271	0.000	16.600	0.000	90.000
3090.000	820.000	596.728	1.746	1.021	0.000	16.600	0.000	90.000
3090.000	940.000	597.585	.857	1.412	0.000	16.600	0.000	90.000
3090.000	1230.000	598.633	1.048	2.135	0.000	800.001	-783.401	90.000
3138.000	615.000	595.465	0.000	.484	0.000	88.252	0.000	48.000
3138.000	820.000	597.167	1.701	.438	0.000	107.245	-18.993	48.000
3138.000	940.000	598.080	.914	.495	0.000	115.999	-27.747	48.000
3138.000	1230.000	598.621	.541	-.012	0.000	115.999	-27.747	48.000
3168.000	615.000	595.472	0.000	.006	0.000	87.453	0.000	30.000
3168.000	820.000	597.171	1.699	.004	0.000	107.015	-19.563	30.000
3168.000	940.000	598.084	.913	.003	0.000	115.999	-28.546	30.000
3168.000	1230.000	598.625	.541	.004	0.000	115.999	-28.546	30.000
3200.000	615.000	595.479	0.000	.007	0.000	86.319	0.000	32.000
3200.000	820.000	597.175	1.696	.005	0.000	106.694	-20.375	32.000
3200.000	940.000	598.087	.912	.004	0.000	115.999	-29.680	32.000
3200.000	1230.000	598.630	.542	.005	0.000	115.999	-29.680	32.000
3400.000	615.000	595.558	0.000	.078	0.000	85.967	0.000	200.000
3400.000	820.000	597.221	1.663	.046	0.000	105.999	-20.032	200.000
3400.000	940.000	598.123	.902	.035	0.000	115.999	-30.032	200.000
3400.000	1230.000	598.673	.550	.043	0.000	115.999	-30.032	200.000
3600.000	615.000	595.638	0.000	.080	0.000	85.712	0.000	200.000
3600.000	820.000	597.268	1.631	.047	0.000	105.353	-19.641	200.000
3600.000	940.000	598.160	.891	.037	0.000	115.737	-30.024	200.000
3600.000	1230.000	598.718	.558	.045	0.000	115.999	-30.287	200.000

3860.000	820.000	597.332	1.589	.063	0.000	104.898	-19.133	260.000
3860.000	940.000	598.209	.878	.050	0.000	115.422	-29.656	260.000
3860.000	1230.000	598.778	.569	.060	0.000	115.999	-30.234	260.000
3900.000	615.000	595.760	0.000	.017	0.000	85.960	0.000	40.000
3900.000	820.000	597.342	1.582	.010	0.000	105.016	-19.057	40.000
3900.000	940.000	598.217	.875	.008	0.000	115.469	-29.510	40.000
3900.000	1230.000	598.788	.570	.010	0.000	115.999	-30.039	40.000
3919.000	615.000	595.758	0.000	-.001	0.000	87.581	0.000	19.000
3919.000	820.000	597.340	1.581	-.002	0.000	107.089	-19.508	19.000
3919.000	940.000	598.215	.876	-.002	0.000	117.131	-29.550	19.000
3919.000	1230.000	598.788	.573	.000	0.000	384.059	-296.479	19.000
4000.000	615.000	595.609	0.000	-.149	0.000	16.600	0.000	81.000
4000.000	820.000	598.306	2.698	.967	0.000	16.600	0.000	81.000
4000.000	940.000	599.295	.989	1.080	0.000	271.999	-255.399	81.000
4000.000	1230.000	599.899	.604	1.111	0.000	271.999	-255.399	81.000
4509.000	615.000	596.755	0.000	1.146	0.000	16.600	0.000	509.000
4509.000	820.000	598.868	2.113	.561	0.000	629.971	-613.371	509.000
4509.000	940.000	599.352	.484	.057	0.000	649.804	-633.204	509.000
4509.000	1230.000	599.963	.611	.064	0.000	811.619	-795.019	509.000
4590.000	615.000	596.845	0.000	.090	0.000	16.600	0.000	81.000
4590.000	820.000	600.098	3.253	1.231	0.000	729.999	-713.399	81.000
4590.000	940.000	600.815	.717	1.463	0.000	729.999	-713.399	81.000
4590.000	1230.000	602.098	1.284	2.135	0.000	729.999	-713.399	81.000
4700.000	615.000	597.430	0.000	.585	0.000	277.674	0.000	110.000
4700.000	820.000	600.099	2.669	.001	0.000	824.999	-547.325	110.000
4700.000	940.000	600.815	.716	.000	0.000	824.999	-547.325	110.000
4700.000	1230.000	602.099	1.284	.000	0.000	824.999	-547.325	110.000
6550.000	615.000	599.336	0.000	1.906	0.000	43.457	0.000	1850.000
6550.000	820.000	600.284	.948	.185	0.000	63.999	-20.542	1850.000
6550.000	940.000	600.918	.634	.102	0.000	63.999	-20.542	1850.000
6550.000	1230.000	602.130	1.213	.031	0.000	63.999	-20.542	1850.000
6583.000	615.000	599.528	0.000	.192	0.000	47.999	0.000	33.000
6583.000	820.000	600.449	.921	.165	0.000	47.999	-.000	33.000
6583.000	940.000	601.048	.599	.131	0.000	47.999	-.000	33.000
6583.000	1230.000	602.217	1.168	.086	0.000	47.999	-.000	33.000
6616.000	615.000	599.572	0.000	.043	0.000	30.999	0.000	33.000
6616.000	820.000	600.482	.911	.033	0.000	30.999	-.000	33.000
6616.000	940.000	601.072	.590	.024	0.000	30.999	-.000	33.000
6616.000	1230.000	602.223	1.151	.006	0.000	30.999	-.000	33.000
6630.000	615.000	599.558	0.000	-.013	0.000	23.999	0.000	14.000
6630.000	820.000	600.457	.899	-.025	0.000	23.999	-.000	14.000
6630.000	940.000	601.041	.583	-.032	0.000	23.999	-.000	14.000
6630.000	1230.000	602.174	1.133	-.049	0.000	23.999	-.000	14.000
6643.000	615.000	599.517	0.000	-.041	0.000	17.999	0.000	13.000
6643.000	820.000	600.392	.874	-.066	0.000	17.999	-.000	13.000
6643.000	940.000	600.961	.569	-.080	0.000	17.999	-.000	13.000
6643.000	1230.000	602.057	1.096	-.117	0.000	17.999	-.000	13.000
6650.000	615.000	599.536	0.000	.018	0.000	14.200	0.000	7.000
6650.000	820.000	600.398	.862	.006	0.000	14.200	0.000	7.000
6650.000	940.000	600.956	.558	-.005	0.000	14.200	0.000	7.000
6650.000	1230.000	602.696	1.740	.639	0.000	46.306	-32.106	7.000
6695.000	615.000	599.721	0.000	.185	0.000	14.200	0.000	45.000

6695.000	820.000	603.139	2.238	1.561	0.000	14.200	0.	45.000
6695.000	940.000	603.147	1.189	2.191	0.000	14.200	0.000	45.000
6695.000	1230.000	605.417	2.270	2.721	0.000	1656.013	-1641.813	45.000
6706.000	615.000	600.451	0.000	.730	0.000	35.999	0.000	11.000
6706.000	820.000	602.531	2.081	.573	0.000	35.999	-.000	11.000
6706.000	940.000	603.749	1.218	.602	0.000	35.999	-.000	11.000
6706.000	1230.000	605.381	1.632	-.036	0.000	35.999	-.000	11.000
6746.000	615.000	600.503	0.000	.053	0.000	115.999	0.000	40.000
6746.000	820.000	602.613	2.110	.082	0.000	115.999	-.000	40.000
6746.000	940.000	603.840	1.227	.091	0.000	115.999	-.000	40.000
6746.000	1230.000	605.506	1.666	.125	0.000	115.999	-.000	40.000
6796.000	615.000	600.529	0.000	.025	0.000	113.999	0.000	50.000
6796.000	820.000	602.625	2.096	.012	0.000	113.999	-.000	50.000
6796.000	940.000	603.849	1.224	.009	0.000	113.999	-.000	50.000
6796.000	1230.000	605.513	1.664	.007	0.000	113.999	-.000	50.000
6996.000	615.000	600.680	0.000	.152	0.000	43.687	0.000	200.000
6996.000	820.000	602.693	2.013	.068	0.000	85.999	-42.312	200.000
6996.000	940.000	603.895	1.202	.046	0.000	85.999	-42.312	200.000
6996.000	1230.000	605.549	1.654	.036	0.000	85.999	-42.312	200.000
7096.000	615.000	600.792	0.000	.112	0.000	42.764	0.000	100.000
7096.000	820.000	602.747	1.955	.054	0.000	65.999	-23.235	100.000
7096.000	940.000	603.930	1.183	.035	0.000	65.999	-23.235	100.000
7096.000	1230.000	605.574	1.644	.025	0.000	65.999	-23.235	100.000
7146.000	615.000	600.859	0.000	.066	0.000	40.999	0.000	50.000
7146.000	820.000	602.780	1.922	.033	0.000	40.999	-.000	50.000
7146.000	940.000	603.949	1.169	.019	0.000	40.999	-.000	50.000
7146.000	1230.000	605.583	1.633	.008	0.000	40.999	-.000	50.000
7200.000	615.000	600.763	0.000	-.096	0.000	14.000	0.000	54.000
7200.000	820.000	602.604	1.841	-.177	0.000	14.000	0.000	54.000
7200.000	940.000	603.744	1.140	-.205	0.000	14.000	0.000	54.000
7200.000	1230.000	605.292	1.548	-.291	0.000	14.000	0.000	54.000

DATA FOR LAST CROSS SECTION

PROFILE	TYPE ENC	TARGET	TOP WIDTH AREA-ACRES	TOP WIDTH AREA-DIFF
1	0.000	0.000	15.973	0.000
2	0.000	0.000	35.778	19.805
3	0.000	0.000	39.807	23.834
4	0.000	0.000	70.294	54.321

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Frankenlust

3) WATERCOURSE:

4) DOCUMENT TYPE: Report

00BREAK00

RECEIVED
APR 27 1977
WATER MANAGEMENT

TOWNSHIP OF FRANKENLUST FIS
HYDRAULIC ANALYSIS
DUTCH CREEK
SQUACONNING CREEK
FRANKENLUST DRAIN
KLAUSS DRAIN

J&A FILE NO. 5555-21-1

JOHNSON & ANDERSON, INC.
Consulting Engineers
2300 Dixie Highway, P. O. Box 1166
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TABLE OF CONTENTS

Letter of Transmittal

Introduction

Method of Analysis

Unusual Situations

Synthetic Cross Sections

Starting Point

Variables and Coefficients

Appendix A - SECNO Tables

Appendix B - Calculations for "XKOR"

Appendix C - Bridge Data and Field Sketches

Appendix D - Bridge Hand Calculations and Squaconning Creek Island Problem

HYDRAULIC ANALYSIS

Introduction

The streams being studied are Dutch Creek, Squaconning Creek, Frankenlust Drain and the Klauss Drain in Frankenlust Township, Bay County, Michigan.

* Because of the effect of the Saginaw River at its confluence, the study limits of Dutch Creek were from Euclid Road to the north township boundary at Hotchkiss Road. The Squaconning Creek was studied from its confluence with Dutch Creek to the north township boundary at Hotchkiss Road.

The study limits of Frankenlust Drain and the Klauss Drain were from their confluences with Squaconning Creek to Mackinaw Road.

Cross sections were obtained by field surveys in October, 1975.

Flows having recurrence intervals of 10-, 50-, 100-, and 500-years were computed by the SCS Method and have been approved by the Michigan Department of Natural Resources.

The project manager for this study was James Kreger.

Method of Analysis

Water-surface profiles were computed through use of the Corps of Engineers' HEC-2 step-backwater computer program. Culverts which were under low flow conditions for all four flows were coded according to the "normal bridge" routine requirements. For those culverts which experienced pressure or weir

* flow reversal in Saginaw River as result of mean flood level in Saginaw Bay would cause the water level @ confluence of Dutch Creek to be approx. equal to the Bay elevation V&A letter dated 9/14/77

flow for any of the four flows, the "special bridge" routine and hand calculations were used to determine the upstream water-surface elevations.

The hydraulic model was developed for the 100-year flow. Valley sections upstream and downstream of culverts were located where full cross-section flow would be developed out of the influence of bridge constrictions. The criteria for placement of these sections was that outlined on pages 18-21 of the Hydrologic Engineering Center Training Document No. 6, Application of the HEC-2 Bridge Routines. Accordingly, the downstream sections were placed at a distance of about four times the average length of the side constriction caused by the bridge abutments. The upstream sections were placed at a distance about equal to the bridge constriction. If additional sections were found necessary within this distance of if the actual field-surveyed cross section fell within this distance, the intermediate sections were encroached as appropriate.

Unusual Situations

1. The Squaconning Creek at M-84 experiences weir flow in the right overbank, while the bridge in the main channel is at pressure flow. The weir flow occurs for a width of approximately 250' with the natural floodway being limited on the north side by ground and the south side by homes.

   Since this situation depicts an island problem for the 100-year and 500-year flows, the profile of each channel was determined as outlined in Open-Channel Hydraulics by Ven Te Chow, pages 320 and 321. The results of the analysis indicate 290 cfs for the 100-year flood and 960 cfs for

the 500-year flood flowing on the south side of the island (Channel 1), with 2455 cfs and 2595 cfs for the 100-year and 500-year floods flowing in the main channel (Channel 2).

Computations and graphs used in this determination, as well as profiles of the south side of the island at M-84 are included with this submittal.

2. A number of small driveway culverts and footbridges under high submergence were coded using the "normal bridge" routine.

3. The "normal bridge" routine was found to be inappropriate for the 500-year flow through the Delta College entrance road culvert on Squaconning Creek. Hand calculations were done for this flow and the computed headwater elevation was inputted with an X5 card.

Synthetic Cross Sections

Synthetic cross sections utilized in the hydraulic analysis were developed in two ways: repetition of field-surveyed cross sections with appropriate invert adjustments, and interpolation of field-surveyed cross sections using the Johnson & Anderson, Inc., AVSEC computer program. The AVSEC program develops an average cross section by averaging the overbanks and channel of two known cross sections. All cross sections and their origins are listed in the SECNO Table (Appendix A).

Since inverts are known only at field sections, a straight line is assumed between these known points with the inverts of synthetic cross sections adjusted accordingly.

Should provided reason why the mean flood level of the bay was used over a stage from the river.

Starting Point

The starting elevations used in Profile Computations for Dutch Creek were begun at the approximate mean flood elevation of Saginaw Bay.

Flow reversal of Saginaw River J&A 9/14/77 letter

M.L. 580.52 IGLD
+1.46
M.L. 581.98 USGS

The time of concentration for each tributary is approximately equal to that of the main stream at each tributary's confluence. Therefore, the starting water-surface elevations chosen for Squaconning Creek, Frankenlust Drain, and Klauss Drain were the elevations determined by flows of corresponding frequency in each of their receiving waters.

Variables and Coefficients

The roughness factors (Manning's "n") were established by comparing photographs and information obtained during field inspections with photographs and descriptions found on pages 101 to 123 in Open-Channel Hydraulics by Ven Te Chow, as well as with photographs and descriptions found in the Geological Survey Water-Supply Paper 1849, Roughness Characteristics of Natural Channels. In general, the following range of values was used:

Description	Manning's "n"
1. Channel	
a. Sand bottom with light brush	0.030 - 0.035
b. Sand bottom with medium brush or debris	0.045 - 0.050
c. Sand bottom with heavy brush or debris	0.050 - 0.065

Description	Manning's "n"
2. Flood Plains	
a. Grass	0.035
b. Light to medium woods, brush	0.040 - 0.060
c. Cultivated areas	0.06
d. Medium to heavy woods, dense brush	0.065 - 0.09

This range was considered for springtime conditions.

The contraction and expansion coefficients used were 0.30 and 0.50, respectively except at Delta Road on the Frankenlust Drain, where the sharpness of transition warranted a coefficient of expansion of 1.0. References used in the selection of these values were the HEC-2 Users Manual, Exhibit 2, page 2, and Open-Channel Hydraulics, Ven Te Chow, pages 311 and 468.

The loss coefficients used in the HEC-2 "special bridge" routine were determined as outlined in Exhibit 2 of the HEC-2 Users Manual. Calculations are included in Appendix B.

Dutch Creek

Cross Section	SECNO	Location & Origin
	3199	1' d/s of Euclid Road Bridge, cross section A repeated, no piers or bridge table
A	3200	d/s face Euclid Road Bridge, field bridge section 4
	3218	u/s face Euclid Road Bridge, cross section A and bridge table repeated
	3219	1' u/s of Euclid Road Bridge, cross section A repeated, no piers or bridge table
	3318	100' u/s of Euclid Road Bridge, cross section B repeated
	3718	500' u/s of Euclid Road Bridge, manufactured from USGS map and cross section B
	4018	800' u/s of Euclid Road Bridge, cross section B repeated
B	4875	100' d/s of Penn-Central Railroad Bridge, field valley section 5
	4974	1' d/s of Penn-Central Railroad Bridge, cross section C repeated, no piers or bridge table
C	4975	d/s face Penn-Central Railroad Bridge, field bridge section 6
	4985	u/s face Penn-Central Railroad Bridge, cross section A and bridge table repeated
	4986	1' u/s of Penn-Central Railroad Bridge, cross section C repeated, no piers or bridge table
	5135	150' u/s of Penn-Central Railroad Bridge, manufactured from USGS map and cross section B
	5885	900' u/s of Penn-Central Railroad Bridge, manufactured from USGS map and cross section D
D	6900	1915' u/s of Penn Central Railroad Bridge, field valley section 7
	7700	800' u/s of cross section D, manufactured from USGS map and cross section D

Cross Section	SECNO	Location & Origin
	8400	925' d/s of cross section E, manufactured from USGS map and cross section E
E	9325	At Two Mile Road extended, field valley section 8
	10125	725' d/s of confluence with Squaconning Creek, cross section E repeated
	10850	At confluence with Squaconning Creek, cross section E repeated
	11025	450' d/s of M-85 culvert, cross section E repeated
	11200	275' d/s of M-84 culvert, cross section E repeated
	11375	100' d/s of M-84 culvert, cross section E repeated
	11425	50' d/s of M-84 culvert, cross section E repeated
	11450	25' d/s of M-84 culvert, cross section E repeated
	11474	1' d/s of M-84 culvert, cross section F repeated, no bridge table
F	11475	d/s face M-84 culvert, field bridge section 9
	11523	u/s face M-84 culvert, cross section F, bridge table repeated
	11524	1' u/s of M-84 culvert, cross section F repeated, no bridge table
	11548	25' u/s of M-84 culvert, cross section G repeated
	11573	50' u/s of M-84 culvert, cross section G repeated
	11623	100' u/s of M-84 culvert, cross section G repeated

Cross Section	SECNO	Location & Origin
	11723	200' u/s of M-84 culvert, cross section G repeated
G	11898	375' u/s of M-84 culvert, field valley section 10
	12825	1277' u/s of M-84 culvert, cross section H repeated
H	13225	798' d/s of Hotchkiss Road, field valley seciton 11
	13723	300' d/s of Hotchkiss Road, cross section H repeated
I	13973	50' d/s of Hotchkiss Road, field valley section 12
	13998	25' d/s of Hotchkiss Road, cross section I repeated
	14023	d/s face Hotchkiss Road, manufactured section

Squaconning Creek

Cross Section	SECNO	
	0	At confluence with Dutch Creek, cross section A repeated
	400	400' u/s of confluence with Dutch Creek, cross section A repeated
A	550	75' d/s of Ziegler Street bridge, field valley section 1
	585	40' d/s of Ziegler Street bridge, cross section A repeated
	624	1' d/s of Ziegler Street bridge, cross section B repeated, no piers or bridge table
B	625	d/s face Ziegler Street bridge, field bridge section 2
	665	u/s face Ziegler Street bridge, cross section B and bridge table repeated
	666	1' u/s of Ziegler Street bridge, cross section B repeated, no piers or bridge table
	668	3' u/s of Ziegler Street bridge, cross section C repeated
	671	6' u/s of Ziegler Street bridge, cross section C repeated
	696	31' u/s of Ziegler Street bridge, cross section C repeated
	756	91' u/s of Zielger Street bridge, cross section C repeated
	801	136' u/s of Ziegler Street bridge, cross section C repeated
	1016	351' u/s of Ziegler Street bridge, cross section C repeated

Cross Section	SECNO	Location
	1451	424' d/s of cross section C, cross section C repeated
C	1875	900' d/s of northbound I-75 bridge, field valley section 3
	2400	375' d/s of northbound I-75 bridge, cross section C repeated
	2775	d/s face northbound I-75 bridge, cross section D repeated, no piers or bridge table
D	2860	u/s face northbound I-75 bridge, field bridge section 4
E	3025	165' u/s of northbound I-75 bridge, field valley section 5
	3170	d/s face southbound I-75 bridge, cross section F repeated, no piers or bridge table
F	3231	u/s face southbound I-75 bridge, field bridge section 6
G	3650	419' u/s of southbound I-75 bridge, field valley section 7
	3950	650' d/s of M-84 bridge, cross section G repeated
	4250	350' d/s of M-84 bridge, cross section G repeated
	4400	200' d/s of M-84 bridge, cross section G repeated
H	4550	50' d/s of M-84 bridge, field valley section 8
	4660	d/s face M-84 bridge, cross section I repeated, no piers or bridge table
I	4647	u/s face M-84 bridge, field bridge section 9
	4662	15' u/s of M-84 bridge, cross section J repeated
	4697	50' u/s of M-84 bridge, cross section J repeated
	4772	125' u/s of M-84 bridge, cross section J repeated
	4847	200' u/s of M-84 bridge, cross section J repeated

Cross Section	SECNO	Location
	5347	700' u/s of M-84 bridge, cross section J repeated
	5847	1200' u/s of M-84 bridge, cross section J repeated
	6300	1653' u/s of M-84 bridge, cross section J repeated
J	6350	1703' u/s of M-84 bridge, field valley section 10
K	8350	250' d/s of confluence with Frankenlust Drain, field valley section 11
	8600	At confluence with Frankenlust Drain, cross section K repeated
	8699	1' d/s of footbridge #1, cross section L repeated, no bridge table
L	8700	d/s face footbridge #1, 100' u/s of confluence with Frankenlust Drain, field bridge section 11-A
	8707	u/s face footbridge #1, cross section L and bridge table repeated
	8708	1' u/s of footbridge #1, cross section L repeated, no bridge table
	9474	1' d/s of footbridge #2, cross section M repeated, no bridge table
M	9475	d/s face footbridge #2, 375' d/s of Bay Valley Road, field bridge section 11-B
	9482	u/s face footbridge #2, cross section M and bridge table repeated
	9483	1' u/s of footbridge #2, cross section M repeated no bridge table
N	9800	50' d/s of Bay Valley Road, field valley section 12
	9850	d/s face Bay Valley Road, cross section O repeated, no bridge table
O	9867	u/s face Bay Valley Road, field bridge section 13
P	10750	883' u/s of Bay Valley Road, field valley section 14
	10999	1' d/s of Golf Cart bridge #1, cross section Q repeated, no bridge table

Cross Section	SECNO	Location
Q	11000	d/s face Golf Cart bridge #1, 1133' u/s of Bay Valley Road, field bridge section 14-A
	11007	u/s face Golf Cart bridge #1, cross section Q and bridge table repeated
	11008	1' u/s of Golf Cart bridge #1, cross section Q repeated, no bridge table
	11299	1' d/s of Golf Cart bridge #2, cross section R repeated, no bridge table
R	11300	d/s face Golf Cart bridge #2, 450' d/s of covered bridge, field bridge section 14-B
	11307	u/s face Golf Cart bridge #2, cross section R and bridge table repeated
	11308	1' u/s of Golf Cart bridge #2, cross section R repeated, no bridge table
	11408	101' u/s of Golf Cart bridge #2, cross section S repeated
	11508	201' u/s of Golf Cart bridge #2, cross section S repeated
	11608	142' d/s of covered bridge, cross section S repeated
S	11700	50' d/s of covered bridge, field valley section 15
	11715	35' d/s of covered bridge, cross section S repeated
	11730	20' d/s of covered bridge, cross section S repeated
	11749	1' d/s of covered bridge, cross section T repeated, no bridge table
T	11750	d/s face covered bridge, field bridge section 15-A
	11763	u/s face covered bridge, cross section T and bridge table repeated
	11764	1' u/s of covered bridge, cross section T repeated, no bridge table

Cross Section	SECNO	Location
	11813	50' u/s of covered bridge, cross section U repeated
	12100	337' u/s of covered bridge, cross section U repeated
	12700	1000' d/s of Four Mile Road bridge, cross section U repeated
	13075	625' d/s of Four Mile Road bridge, cross section U repeated
U	13600	100' d/s of Four Mile Road bridge, field valley section 16
	13700	d/s face Four Mile Road bridge, cross section V repeated, no bridge table
V	13736	u/s face Four Mile Road bridge, field bridge section 17
W	14100	364' u/s of Four Mile Road bridge, field valley section 18
	14506	770' u/s of Four Mile Road bridge, AVSEC between cross sections W and X
	14912	913' d/s of Delta College entrance road bridge, AVSEC between cross sections W and X
	15318	507' d/s of Delta College entrance road bridge, AVSEC between cross sections W and X
X	15725	100' d/s of Delta College entrance road bridge, field valley section 19
	15758	67' d/s of Delta College entrance road bridge, cross section X repeated
	15791	34' d/s of Delta College entrance road bridge, cross section X repeated
	15808	17' d/s of Delta College entrance road bridge, cross section X repeated
	15824	1' d/s of Delta College entrance road bridge, cross section Y repeated, no bridge table
Y	15825	d/s face Delta College entrance road bridge, field bridge section 20

Cross Section	SECNO	Location
	15875	u/s face Delta College entrance road bridge, cross section Y and bridge table repeated
	15876	1' u/s of Delta College entrance road bridge, cross section Y repeated, no bridge table
	15881	6' u/s of Delta College entrance road bridge, cross section Z repeated
	15901	26' u/s of Delta College entrance road bridge, cross section Z repeated
Z	17450	1575' u/s of Delta College entrance road bridge, field valley section 21
AA	19800	200' d/s of Hotchkiss Road bridge, field valley section 22
	20000	d/s face Hotchkiss Road, manufactured section

Frankenlust Drain

Cross Section	SECNO	Location
	0	At confluence with Squaconning Creek, cross section A repeated
A	150	150' u/s of confluence with Squaconning Creek, field valley section 1
	400	250' u/s of cross section A, cross section A repeated
	650	500' u/s of cross section A, cross section A repeated
	900	175' d/s of Delta Road bridge, cross section A repeated
	1050	25' d/s of Delta Road bridge, cross section A repeated
	1075	d/s face Delta Road bridge, cross section B repeated, no bridge table
B	1115	u/s face Delta Road bridge, field bridge section 2
C	1215	100' u/s of Delta Road bridge, field valley section 3
D	3250	2135' u/s of Delta Road bridge, field valley section 4
	5299	1' d/s of driveway bridge #1, cross section E repeated, no bridge table
E	5300	d/s face driveway bridge #1, 2050' u/s of cross section D, field bridge section 5A
	5315	u/s face driveway bridge #1, cross section E and bridge table repeated
	5316	1' u/s of driveway bridge #1, cross section E repeated, no bridge table
F	5550	235' u/s of driveway bridge #1, field valley section 5

Cross Section	SECNO	Location
	6549	1' d/s of driveway bridge #2, cross section G repeated, no bridge table
G	6550	d/s face driveway bridge #2, field bridge section 5B
	6564	u/s face driveway bridge #2, cross section G and bridge table repeated
	6565	1' u/s of driveway bridge #2, cross section G repeated, no bridge table
H	7500	2100 d/s of Amelith Road bridge, field valley section 6
	8725	100' d/s of driveway bridge #3, cross section H repeated
	8825	d/s face driveway bridge #3, cross section I repeated, no bridge table
I	8841	u/s face driveway bridge #3, field bridge section 6A
J	9550	50' d/s of Amelith Road bridge, field valley section 7
	9600	d/s face Amelith Road bridge, cross section J repeated, no bridge table
K	9624	u/s face Amelith Road bridge, field bridge section 8
	9724	100' u/s of Amelith Road, cross section L repeated
	11284	d/s face Kloha Road bridge, cross section K repeated, no bridge table
L	11300	u/s face Kloha Road bridge, field bridge section 9
M	11400	100' u/s of Kloha Road, field valley section 10
	12643	d/s face driveway bridge #4, cross section M repeated, no bridge table
N	12657	u/s face driveway bridge #4, field bridge section 11
O	13175	518' u/s of driveway bridge #4, field valley section 12
	13875	d/s face Mackinaw Road culvert, manufactured section

Klauss Drain

Cross Section	SECNO	Location
	0	At confluence with Squaconning Creek, cross section A repeated
A	800	800' u/s of confluence with Squaconning Creek, field valley section 1
B	2350	650' d/s of Delta College entrance road bridge, field valley section 2
	2550	450' d/s of Delta College entrance road bridge, cross section B repeated
	2750	250' d/s of Delta College entrance road brige, cross section B repeated
	3000	d/s face Delta College entrance road bridge, cross section C repeated, no bridge table
C	3090	u/s face Delta College entrance road bridge, field bridge section 4
	3138	48' u/s of Delta College entrance road bridge, cross section D repeated
	3168	78' u/s of Delta College entrance road bridge, cross section D repeated
D	3200	110' u/s of Delta College entrance road bridge, field valley section 5
	3400	310' u/s of Delta College entrance road bridge, cross section D repeated
	3600	319' d/s of parking lot driveway culvert #1, cross section D repeated
	3860	59' d/s of parking lot driveway culvert #1, cross section D repeated
	3900	19' d/s of parking lot driveway culvert #1, cross section D repeated
	3919	d/s face parking lot driveway culvert #1, cross section E repeated, no bridge table

Cross Section	SECNO	Location
E	4000	u/s face parking lot driveway culvert #1, field bridge section 5A
	4509	d/s face parking lot driveway culvert #2 cross section F repeated, no bridge table
F	4590	u/s face parking lot driveway culvert #2, field bridge section 5B
G	4700	110' u/s of parking lot driveway culvert #2, field field valley section 6
H	6550	100' d/s of Delta Road, field valley section 7
	6583	67' d/s of Delta Road, cross section H repeated
	6616	34' d/s of Delta Road, cross section H repeated
	6630	20' d/s of Delta Road, cross section H repeated
	6643	7' d/s of Delta Road, cross section H repeated
	6650	d/s face Delta Road culvert, cross section I repeated, no bridge table
I	6695	u/s face Delta Road culvert, field bridge section 8
	6706	11' u/s of Delta Road, cross section H repeated
	6746	51' u/s of Delta Road, cross section H repeated
	6796	101' u/s of Delta Road, cross section H repeated
	6996	204' d/s of Mackinaw Road, cross section H repeated
	7096	104' d/s of Mackinaw Road, cross section H repeated
	7146	54' d/s of Mackinaw Road, cross section H repeated
	7200	d/s face Mackinaw Road bridge, manufactured section

JOHNSON & ANDERSON, INC.
CONSULTING ENGINEERS

BY RSM DATE 2-18-77 JOB DESCRIPTION FRANKENMUTH TWP. FIS SHEET ____ OF ____
SUBJECT DUTCH CREEK BRIDGE SECTION 9. JOB NO. 5555-21

M-84 BOX CULVERT

15.5' x 7.9' BOX CULVERT

AREA = 123 FT²

$R = A/P = 123/47 = 2.62$

"n" = 0.02

XKOR = ENTRANCE LOSS + EXIT LOSS + FRICTION LOSS

ASSUME:

ENTRANCE LOSS = 0.7

EXIT LOSS = 1.0

$$K_F = \frac{29.1\, n^2\, L}{R^{4/3}} = \frac{29.1\,(.02)^2\, 48}{(2.62)^{4/3}}$$

$$= \frac{0.56}{3.61} = 0.16$$

$XKOR_{TOTAL} = 1.86$

JOHNSON & ANDERSON, INC.
CONSULTING ENGINEERS

BY RSM DATE 2-28-77 JOB DESCRIPTION FRANKENLUST TWP. F15 SHEET ____ OF ____
SUBJECT SQUACONNING CREEK JOB NO. 5555-21

B.S. #4 - NORTH BOUND I-75

$A = 596\ ft^2,\ P = 195'$

$R = A/P = 596/195 = 3.06$ ✓

$L = 85'$

"n" = .030

ASSUME:

EXIT LOSS = 1.0

ENTRANCE LOSS = 0.5

$$K_F = \frac{29.1\, n^2 L}{R^{4/3}} = \frac{29.1\,(.03)^2(85)}{3.06^{4/3}}$$

$$= \frac{2.23}{4.44} = 0.5$$

$XKOR_{TOTAL} = 1.0 + 0.5 + 0.5 = 2.0$

$L = 99.5 + (16.8)(2) = 133.1$
due to skew

$\therefore\ XK\phi R = 2.29$

$$H = \left[\left(\frac{2805}{596}\right)^2 / 64.4\right](2.29)$$

$H = 0.787'$

SOUTH BOUND I-75

$A = 702\ ft^2 \quad P = 195'$

$R = A/P = 702/195 = 3.6$

$L = 61'$

"n" = 0.03

ASSUME:

EXIT LOSS = 1.0

ENTRANCE LOSS = 0.5

$$K_F = \frac{29.1\ n^2 L}{R^{4/3}} = \frac{29.1(.03)^2(61)}{(3.6)^{4/3}}$$

$$= \frac{1.60}{5.5} = 0.29$$

$$\Sigma K\,OR_{TOTAL} = 1.0 + 0.5 + 0.29$$

$$= \underline{\underline{1.79}}$$

$L = 78 + (16.8)(2)$

$L = 111.6'$

$\Sigma K\,OR = 2.03$

$$H = \left[\left(\frac{2805}{702}\right)^2 / 64.4\right](2.03) = 0.503\ ft.$$

JOHNSON & ANDERSON, INC.
CONSULTING ENGINEERS

BY RSM DATE 3-2-77 JOB DESCRIPTION FRANKLIN CST TWP FIS SHEET ____ OF ____
SUBJECT M-84 Box Culvert, XKOR Determination JOB NO. 5555.21
SQUAKAWING CREEK

M-84 Box Culvert B.S. #9

$A = 342 \quad P = 115$

$R = A/P = 342/115 = 2.97$

$L = 47'$

"n" = 0.030

ASSUME:

EXIT LOSS = 1.0

ENTRANCE LOSS = 0.5

$$K_F = \frac{29.1\, n^2 L}{R^{4/3}} = \frac{29.1\,(.03)^2\, 47}{(2.97)^{4/3}}$$

$$= \frac{1.23}{4.27} = 0.29$$

$$XKOR_{TOTAL} = 1 + 0.5 + .29 = 1.79$$

JOHNSON & ANDERSON, INC.
CONSULTING ENGINEERS

BY RJM DATE 3-3-77 JOB DESCRIPTION FRANKLIN TWP. FIS SHEET ____ OF ____
SUBJECT SQUAGONNING CREEK. JOB NO. 5555-21

B.S. #13 - ROSS ROAD BRIDGE

$A = 162\ ft^2 \quad P = 76\ ft$

$R = A/P = 162/76 = 2.13$

$L = 17'$

"n" = 0.02

Same as B.S. Valley Road Bridge

ASSUME:

EXIT LOSS = 1.0

ENTRANCE LOSS = 0.4

$$K_F = \frac{29.1\, n^2 L}{R^{4/3}}$$

$$= \frac{29.1\,(.02)^2\,17}{2.13^{4/3}} = 0.07$$

$$= \frac{0.198}{2.74}$$

ΣK_{OR} TOTAL = 1.0 + 0.4 + 0.07 = 1.47

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CONSULTING ENGINEERS

BY RSH DATE 3-10-77 JOB DESCRIPTION FRANKLINVILLE TWP. F15 SHEET ___ OF ___
SUBJECT SQUAGONING CREEK JOB NO. 5555-21

FOUR MILE ROAD BRIDGE B.S. #17

2-13'5" x 8'5" MULTIPLATE PIPE ARCH

$AREA_{TOTAL} = 178\ FT^2$ $P = 70.7$ 89 each

$R = A/P = 178/70.7 = 2.52$ 2.48

$L = 36'$

$n = 0.0311$

ASSUME:

EXIT LOSS = 1.0

ENTRANCE LOSS = 0.6

may be could be around 0.7

$$K_F = \frac{29.1\, n^2 L}{R^{4/3}} = \frac{29.1\,(.0311)^2\, 36}{2.52^{4/3}}$$ 2.48

$$= \frac{1.013}{3.43} = 0.30$$

$\Sigma K_{OR} = 1.0 + 0.6 + 0.3 = 1.9$

JOHNSON & ANDERSON, INC.
CONSULTING ENGINEERS

BY RSM DATE 3-17-77 JOB DESCRIPTION FRANKLINVILLE TWP. F/S SHEET ____ OF ____
SUBJECT FRANKLINVILLE DRAIN B.S. #2 JOB NO. 5555-21

DELTA ROAD CULVERT

2-7' DIA. RCP

L = 40'

Ke = 0.5

"n" = 0.02 Pipe 0.013

38.49 cfs

A = 77 Ft² TOTAL 38/PIPE R = 1.75

ASSUME:

EXIT LOSS = 1.0

ENTRANCE LOSS = 0.5

$$K_F = \frac{29.1 n^2 L}{R^{4/3}} = \frac{29.1 (.02)^2 40}{1.75^{4/3}} = \frac{.466}{2.11}$$

$$= 0.22$$

$$\Sigma KOR_{TOTAL} = 1 + 0.5 + 0.22$$

$$= \underline{\underline{1.72}}$$

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BY RSM DATE 3-30-77 JOB DESCRIPTION FRANKENLUST TWP. F15 SHEET ____ OF ____
SUBJECT FRANKENLUST DRAIN B.S. #6A JOB NO. 5955-21

DRIVEWAY BRIDGE #3

16' WIDE BOX CULVERT

ENTRANCE DESIGN: CONCRETE WINGWALLS

$A = 106\ ft^2 \quad P = 46'$

$L = 16'$

$R = A/P = 106/46 = 2.30$

"n" = 0.02

ASSUME:

EXIT LOSS = 1.0

ENTRANCE LOSS = 0.4

$$K_F = \frac{29.1 n^2 L}{R^{4/3}} = \frac{29.1 (.02)^2 (16)}{(2.3)^{4/3}}$$

$$= \frac{0.186}{3.04} = 0.06$$

$\Sigma K_{OR} = 1.0 + 0.4 + 0.06$

$= 1.46$

1'-16' x 3' = 19.7

19.7

JOHNSON & ANDERSON, INC.
CONSULTING ENGINEERS

BY RSM DATE 3-23-77 JOB DESCRIPTION FRANKENLUST TWP. FIS SHEET ____ OF ____
SUBJECT FRANKENLUST DRAIN B.S. #8 JOB NO. 5555-21

AMELITH ROAD BRIDGE

16' WIDE CONCRETE BOX CULVERT

$L = 24'$

ENTRANCE DESIGN = CONCRETE WINGWALLS

$A = 106\ ft^2 \quad P = 50'$

$R = A/P = 106/50 = 2.12$

"n" = 0.02

ASSUME:

EXIT LOSS = 1.0

Poor effect bridge

ENTRANCE LOSS = 0.4

$$K_F = \frac{29.1\, n^2 L}{R^{4/3}} = \frac{29.1\,(.02)^2\, 24}{(2.12)^{4/3}}$$

$$= \frac{0.279}{2.72} = 0.10$$

$$XKOR_{TOTAL} = 1.0 + 0.4 + 0.1$$

$$= \underline{\underline{1.5}}$$

KLOHA ROAD

17' WIDE BOX CULVERT

ENTRANCE DESIGN: CONCRETE WINGWALLS

$A = 117\ FT^2 \quad P = 50'$

$R = A/P = 117/50 = 2.34$

$L = 16'$

"n" = 0.02

ASSUME:

EXIT LOSS = 1.0

ENTRANCE LOSS = 0.4

$$K_F = \frac{29.1 n^2 L}{R^{4/3}} = \frac{29.1 (.02)^2 16}{(2.34)^{4/3}} = \frac{0.186}{3.11} = 0.06$$

$$\Sigma K_{OR\ TOTAL} = 1.0 + 0.4 + 0.06$$

$$= \underline{\underline{1.46}}$$

JOHNSON & ANDERSON, INC.
CONSULTING ENGINEERS

BY RSM DATE 4-4-77 JOB DESCRIPTION FRANKENLUST TWP. FIS SHEET ____ OF ____
SUBJECT FRANKENLUST DRAIN B.S. #11 JOB NO. 5555-21

DRIVEWAY BRIDGE #4

16.5' WIDE BRIDGE OPENING

$L = 14'$

$A = 89 \text{ FT}^2$ W.P. = 45

$R = A/P = 89/45 = 1.98$

"n" = 0.02

ASSUME:

EXIT LOSS = 1.0

ENTRANCE LOSS = 0.9

$$K_f = \frac{29.1 n^2 L}{R^{4/3}} = \frac{29.1(.02)^2 14}{1.98^{4/3}}$$

$$= \frac{0.163}{2.49} = 0.065$$

$$\Sigma K_{OR\,TOTAL} = 1.0 + 0.9 + 0.07$$

$$= \underline{\underline{1.97}}$$

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BY RSM DATE 3-21-77 JOB DESCRIPTION FRANKENLUST TWP. F15 SHEET ____ OF ____
SUBJECT KLAUSS DRAIN B.S. #4 JOB NO. 5555-27

DELTA COLLEGE ENTRANCE ROAD CULVERT

16'7" X 10'11" MULTIPLATE PIPE ARCH

$A = 131\ FE^2 \quad P = 43.2'$

$R = A/P = 3.03$

ENTRANCE DESIGN: PROJECTING FROM HEADWALL

$L = 90'$

"n" = 0.031

ASSUME:

EXIT LOSS = 1.0

ENTRANCE LOSS = 0.7

$$K_F = \frac{29.1 n^2 L}{R^{4/3}} = \frac{29.1(.031)^2 90}{(3.03)^{4/3}} = \frac{2.52}{4.38}$$

$$= 0.57$$

$$\Sigma K\ OR_{TOTAL} = 1.0 + 0.7 + 0.57$$

$$= \underline{\underline{2.27}}$$

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BY RSM DATE 3-22-77 JOB DESCRIPTION FRANKENMUTH TWP. FIS SHEET ____ OF ____
SUBJECT KLAUSS DRAIN B.S. #5-A JOB NO. 5555-21

PARKING LOT CULVERT #1

16'7" x 10'1" MULTIPLATE PIPE ARCH

A = 131' P = 43.2

R = A/P = 3.03

ENTRANCE DESIGN: PROJECTING FROM HEADWALL

L = 81'

"n" = 0.031

ASSUME:

EXIT LOSS = 1.0

ENTRANCE LOSS = 0.7

$$K_F = \frac{29.1 n^2 L}{R^{4/3}} = \frac{29.1(.031)^2 81}{3.03^{4/3}}$$

$$= \frac{2.27}{438} = 0.52$$

$$\Sigma K_{OR\,TOTAL} = 1.0 + 0.7 + 0.52$$

$$= \underline{\underline{2.22}}$$

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BY RSM DATE 3-22-77 JOB DESCRIPTION FRANKLINVIST TWA FIS SHEET ____ OF ____
SUBJECT KLAUSS DRAW B.S. #5-B JOB NO. 5555-21

PARKING LOT CULVERT #2

16'7" X 10'1" MULTIPLATE PIPE ARCH

$A = 131\ ft^2$ $P = 43.2'$

$R = A/P = 3.03$

ENTRANCE DESIGN: PROJECTING FROM HEADWALL

$L = 81'$

"n" = 0.031

ASSUME:

EXIT LOSS = 1.0

ENTRANCE LOSS = 0.7

$$K_F = \frac{29.1 n^2 L}{R^{4/3}} = \frac{29.1(.031)^2\ 81}{(3.03)^{4/3}}$$

$$= \frac{2.27}{4.38} = 0.52$$

$$\Sigma K_{OL\,TOTAL} = 1.0 + 0.7 + 0.52$$

$$= \underline{\underline{2.22}}$$

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BY RSM DATE 3-22-77 JOB DESCRIPTION FRANKENLUST TWP. SHEET ____ OF ____
SUBJECT KLAUSS DRAIN B.S. #8 JOB NO. 5555-21

DELTA ROAD CULVERT

14'3" x 8'11" MULTIPLATE PIPE ARCH

$A = 101\ FT^2$ W.P. = 37.7

$R = A/P = 101/37.7 = 2.68$

"n" = 0.031 ENTRANCE DESIGN: PROJECTING FROM HEADWALL

$L = 45'$

ASSUME:

EXIT LOSS = 1.0

ENTRANCE LOSS = 0.7

$$K_F = \frac{29.1\, n^2 L}{R^{4/3}} = \frac{29.1\,(.031)^2\,(45)}{2.68^{4/3}}$$

$$= \frac{1.26}{3.72} = 0.34$$

$$XKOR_{TOTAL} = 1.0 + 0.7 + 0.34$$

$$= \underline{\underline{2.04}}$$

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HYDRAULIC STRUCTURAL DATA

DUTCH CREEK
SECNO 3200

11-3-75

Code No. 21-01-B.S.#4

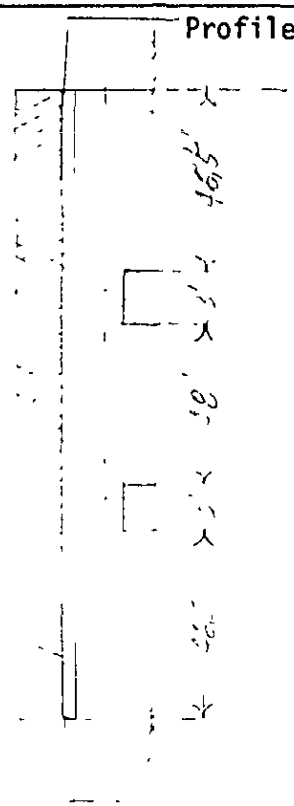
Job Name: FRANKENMUTH TWP FIS			By: L.T. SLADE JDent
Date: 20 OCT. 75	Feature: BRIDGE ON FIRCLID RD		Water Course: DUTCH CREEK
Remarks:			

	US	US Face	R	L	DS.	DS Face
	E-17	E-18	E-19	E-20	E-21	E-22

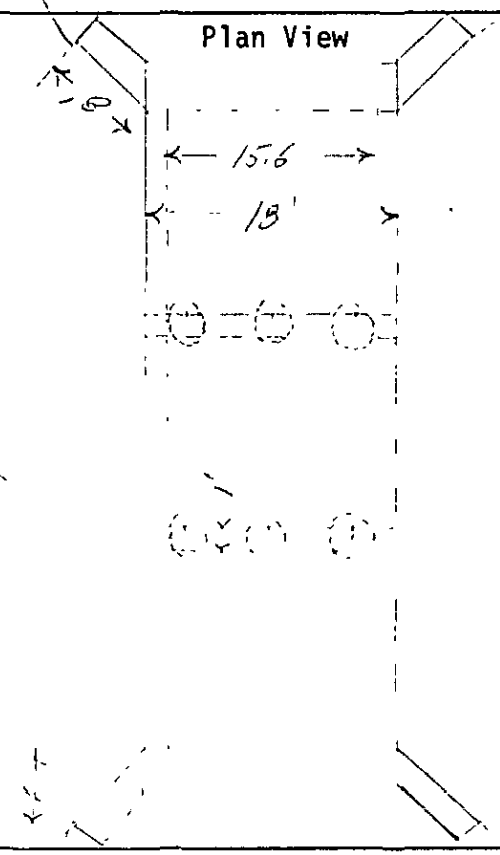
Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation: 581.1	Length:	Width of Deck:	Skew:

FIELD SKETCH

Profile View



Plan View



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HYDRAULIC STRUCTURAL DATA

DUTCH CREEK
SECNO 4975

Code No. 21-01-B5

Job Name: FRANKENLUST TWP. FIS		By: L. SLADE
Date: 10- -75	Feature: PENN CENTRAL RAILROAD BRIDGE	Water Course: DUTCH CREEK
Remarks:		

PICTURES E-16 (U.S.) F-1 (U.S. Face) F-2 (D.S.) F-5 (D.S. Face) F-6 (R) F-7 (L)

Width of Piers: 6- , 2-3.5'	Pier Shape:	No. of Piers: 8	Area:
Water Elevation: 581.5	Length: 138'	Width of Deck: 10'	Skew:

FIELD SKETCH

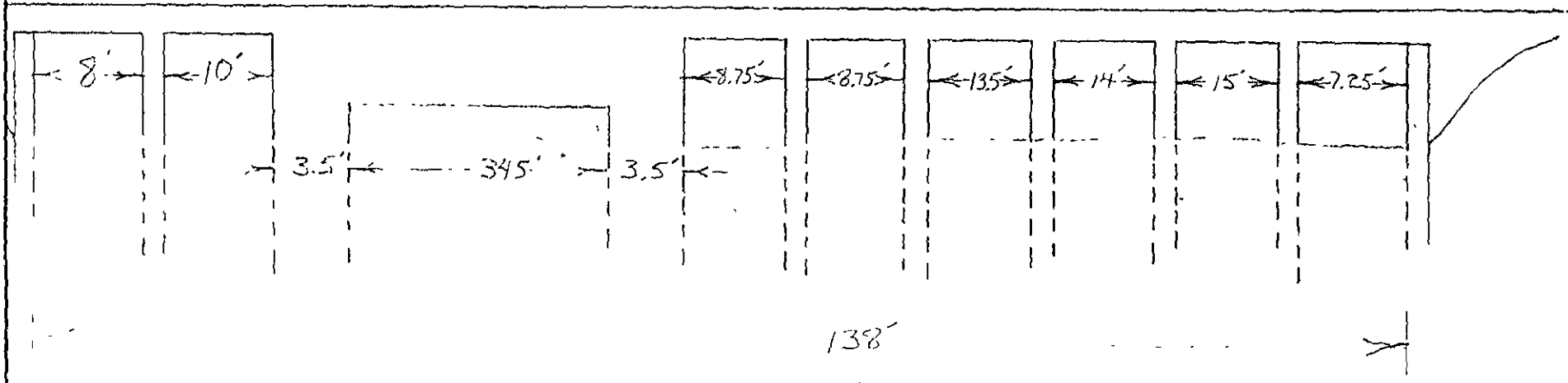
Profile View

~~UPSTREAM~~ FACE
DOWNSTREAM

RIGHT BANK

Plan View

LEFT BANK

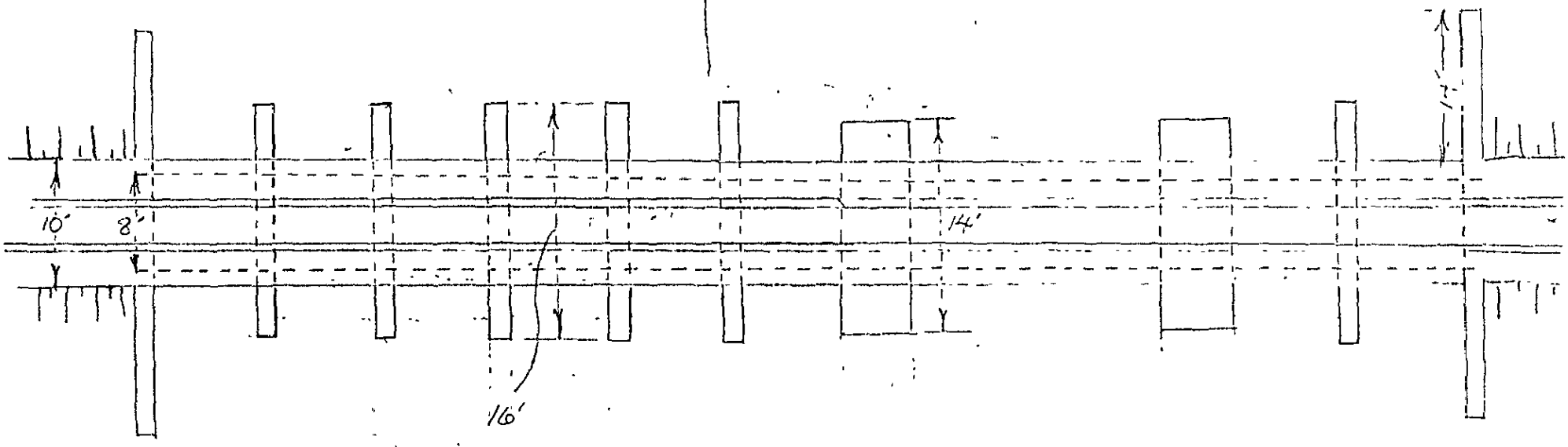


138.00
-126.75
11.25

$\frac{11.25}{6} = 1.88'$ / pier } WIDTH

DUTCH CREEK
S[illegible]0 4975

DUTCH
CREEK



16

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HYDRAULIC STRUCTURAL DATA

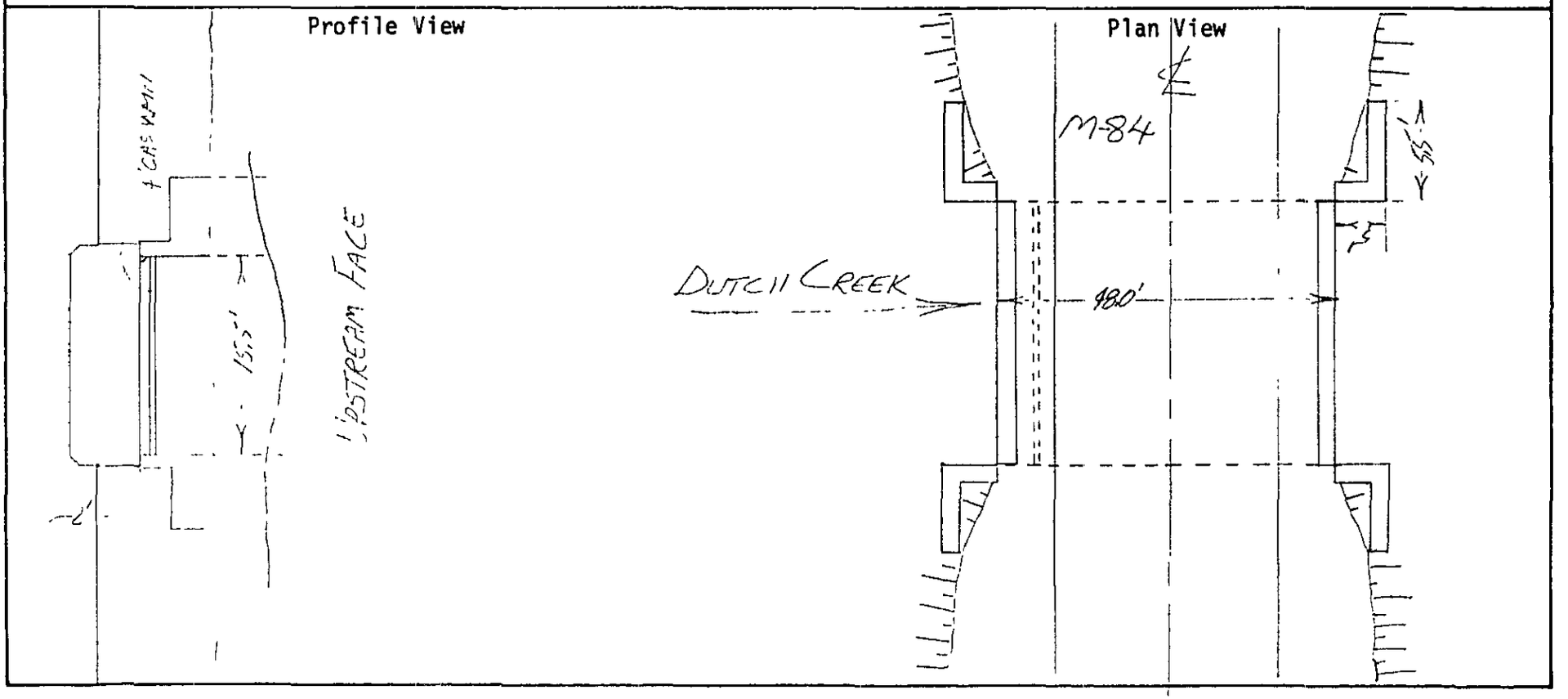
DUTCH CREEK
SECTO 11475

rec'd 11-3-75

Code No. 21-01-B5-#9

Job Name: FRANKENLUST TWP. FIS			By: L. T. SCHADE
Date: 28 OCT, 75	Feature: M84 BOX CULVERT		Water Course: DUTCH CREEK
Remarks:			
PICTURES: U.S. E-2	U.S. Face E-3	R E-4	L E-5	D.S. E-6	D.S. Face E-7
Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation: 580.5	Length:	Width of Deck:	Skew:

FIELD SKETCH



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HYDRAULIC STRUCTURAL DATA

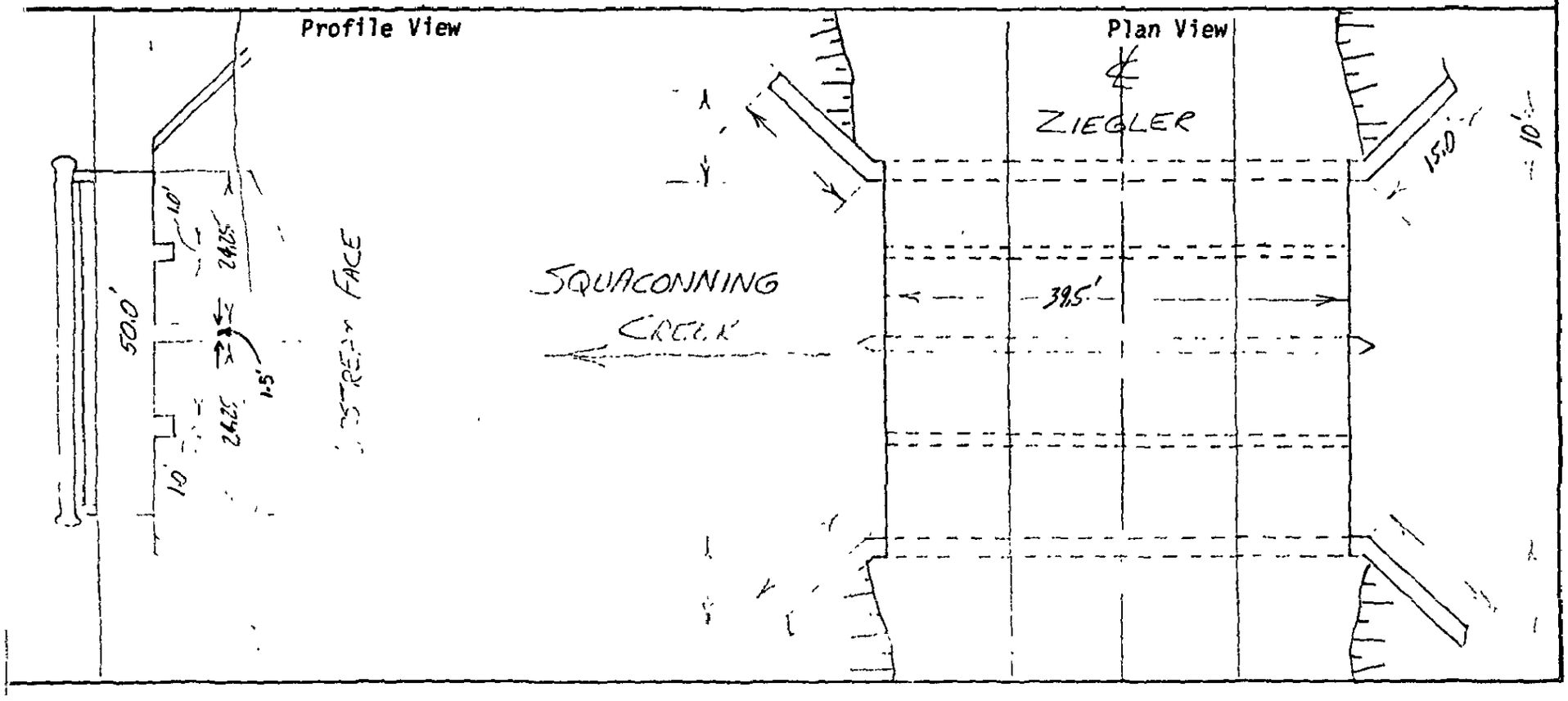
SQUACONNING CREEK
SECTO 625
Code No. 21-02-[illegible] 2

Job Name: FRANKENMUTH [illegible]		By: L. T. SLADE [illegible]
Date: 27 OCT. 75	Feature: ZIEGLER ST. BRIDGE	Water Course: SQUACONNING CREEK
Remarks:		

Pier Number	US FACE	US	DS	DS FACE	RIGHT	LEFT
	D-13	D-18	D-14	D-19	D-21	D-22

Width of Piers:	Pier Shape: POINTED	No. of Piers:	Area:
Water Elevation: 580.5	Length:	Width of Deck:	Skew:

FIELD SKETCH



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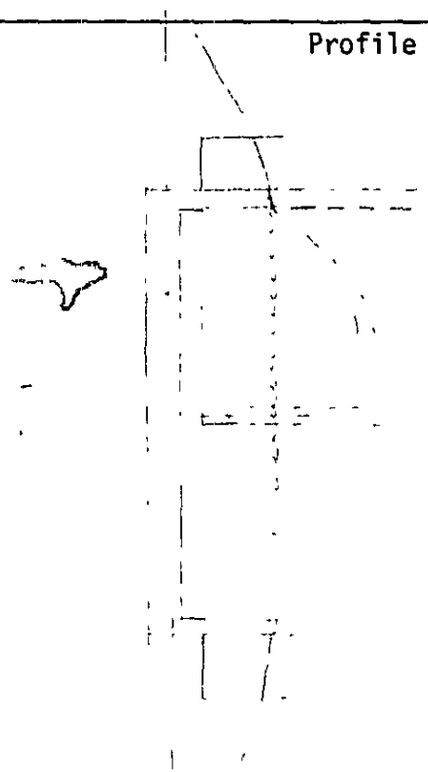
HYDRAULIC STRUCTURAL DATA

SQUACONNING CREEK
SECNO 2860
Code No. 21-02-B.S #4

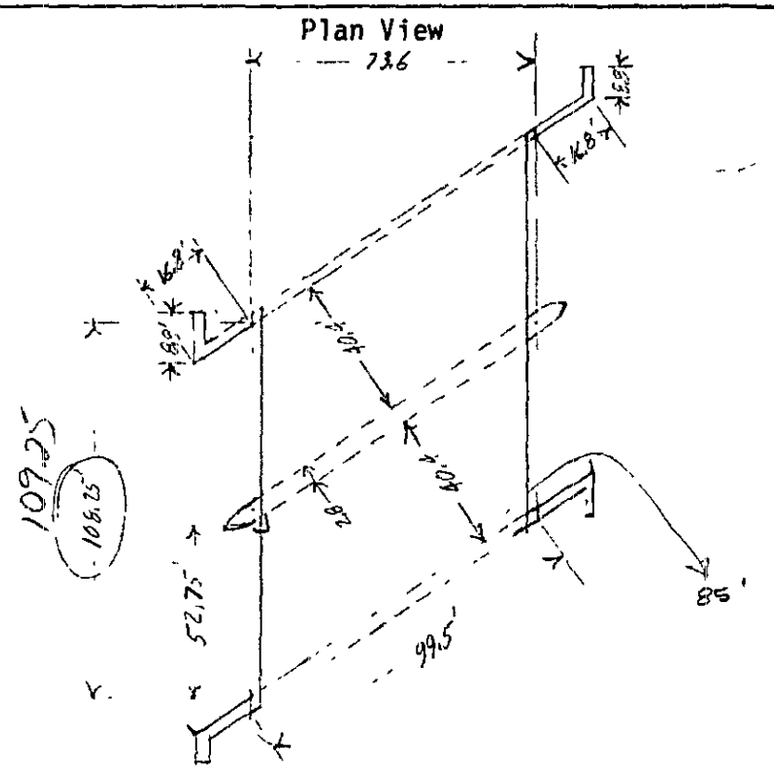
Job Name: FRANKENMUTH TWP FCS NORTH			By: L.T. SLAME
Date: 28 OCT. 75	Feature: ~~SOUTH~~ I-75 BOUND BRIDGE		Water Course: SQUACONNING CREEK
Remarks:			
Photos: US. Face D-3; US. D-4; DS. D-5; DS Face D-6; R D-11; L D-12			
Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation: 580.2	Length:	Width of Deck:	Skew:

FIELD SKETCH

Profile View



Plan View



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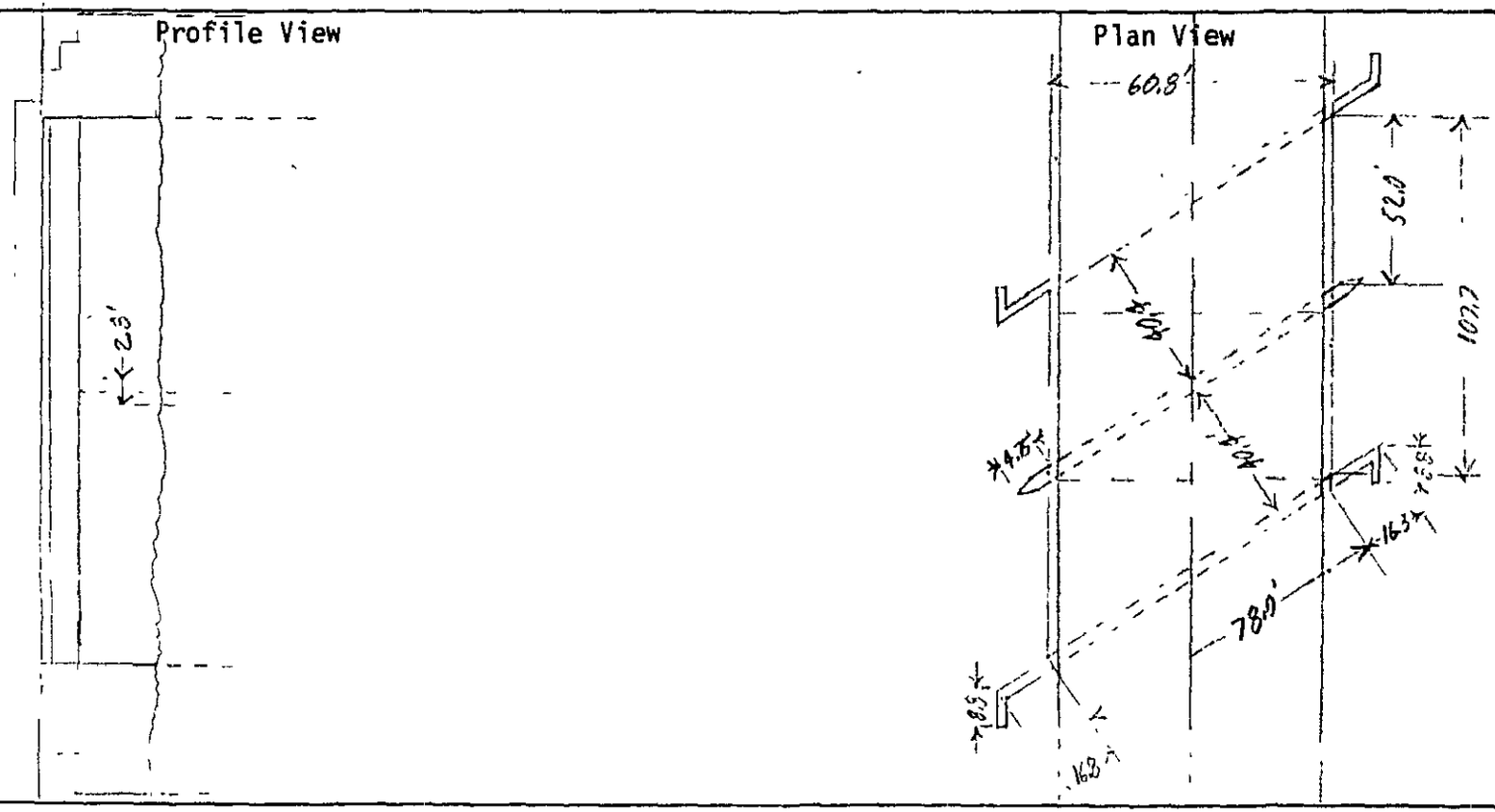
HYDRAULIC STRUCTURAL DATA

SQUACONNING CREEK
SEAD 3231
Code No. 21-02-BS #6

Job Name: FRANKENLUST TWP FIS			By: L.T. SLADE
Date: 23 OCT. 75	Feature: SOUTH BOUND I-75		Water Course: SQUACONNING CREEK
Remarks:			
Photos U.S. Face D-1	U.S. D-2	D.S. D-3	D.S. Face D-4 R D-7 L D-8
Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation: 586.5	Length:	Width of Deck:	Skew:

FIELD SKETCH



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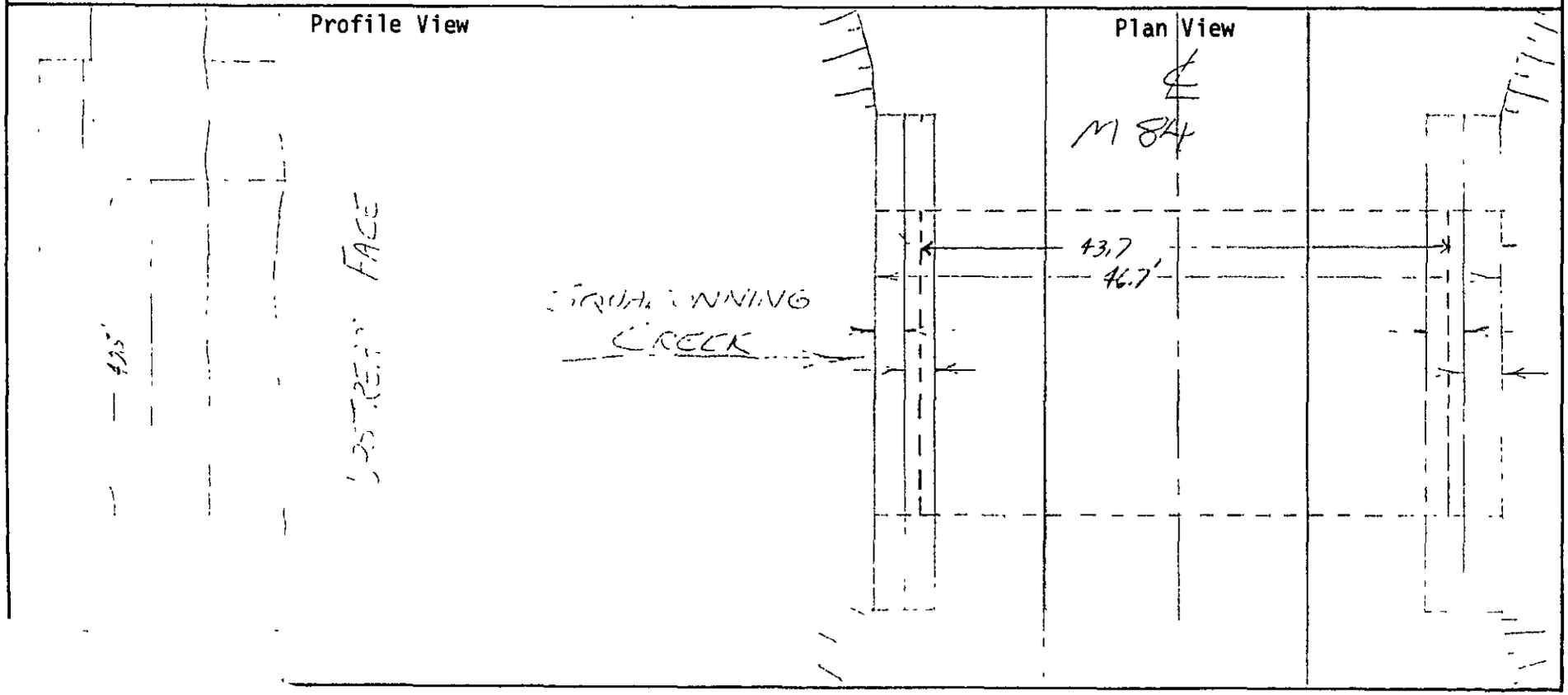
HYDRAULIC STRUCTURAL DATA

SQUACONNING CREEK
SECNO 4647

Code No. 21-02-85#9

Job Name: FRANKENLUST TWP. FIS		By: L. T. SLADE / Dan T.	
Date: 22 OCT 75	Feature: M-84 BRIDGE	Water Course: SQUACONNING CREEK	
Remarks:			
PICTURES: US, US.F., DS., DSF., RB, LB C-27, 28, 29, 30, 31, 32			
Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation: 581.1	Length:	Width of Deck:	Skew:

FIELD SKETCH



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HYDRAULIC STRUCTURAL DATA

SQUACONNING CREEK
SEWO 8700

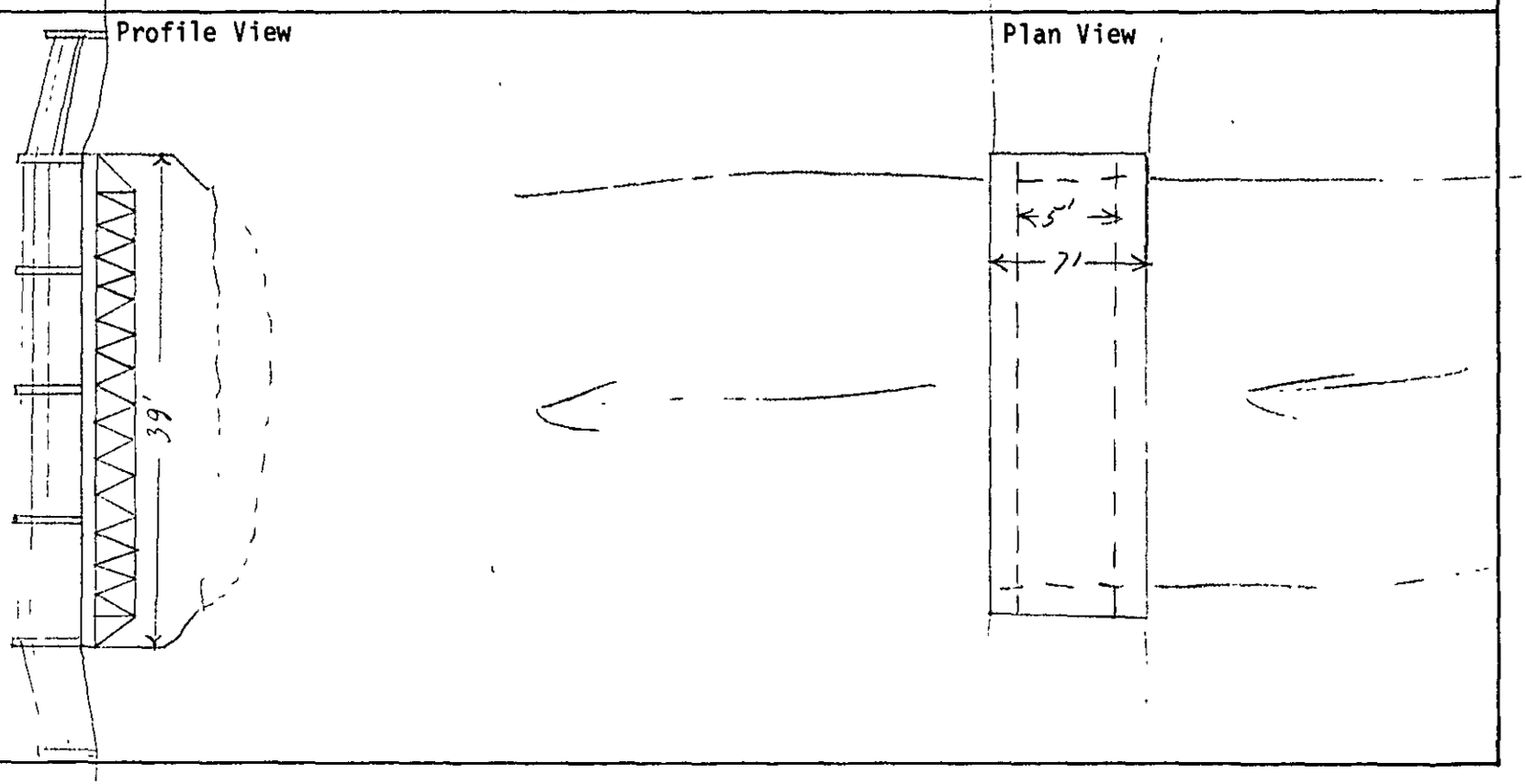
Code No. 21-02-185 II 11-A

Job Name: FRANKENLUST TWP FTS.		By: L.T. SLADE
Date: 17 OCT 75	Feature: 100'± U.S. FROM FRANKENLUST DRAIN	Water Course: SQUACONNING CREEK
Remarks:		

PHOTOS – U.S. C-13, U.S. FACE C-14, D.S. C-15, D.S. FACE C-16, RIGHT C-17, LEFT C-18

Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation: 581.9	Length:	Width of Deck:	Skew:

FIELD SKETCH



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HYDRAULIC STRUCTURAL DATA

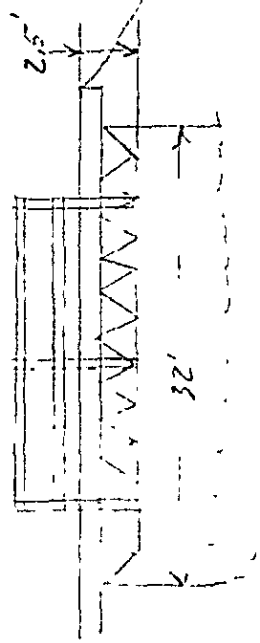
SQUACONNING CREEK
SEAD 9475

Code No. BS #11-B

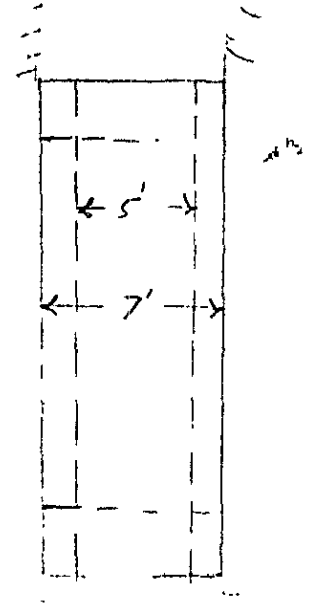
Job Name: FRANKENLUST TWP F.I.S.			By: L.T. SCADE JR.
Date: 17 OCT. 75	Feature: Foot Bridge		Water Course: SQUACONNING CREEK
Remarks: 100' + DOWNSTREAM BALDWIN RD. (BEECE ROAD)			
Photos: US. C-7	US-Face C-8	DS. C-9	DS-Face C-10	R. C-11	L. C-12
Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation: 581.6	Length:	Width of Deck:	Skew:

FIELD SKETCH

Profile View



Plan View



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HYDRAULIC STRUCTURAL DATA

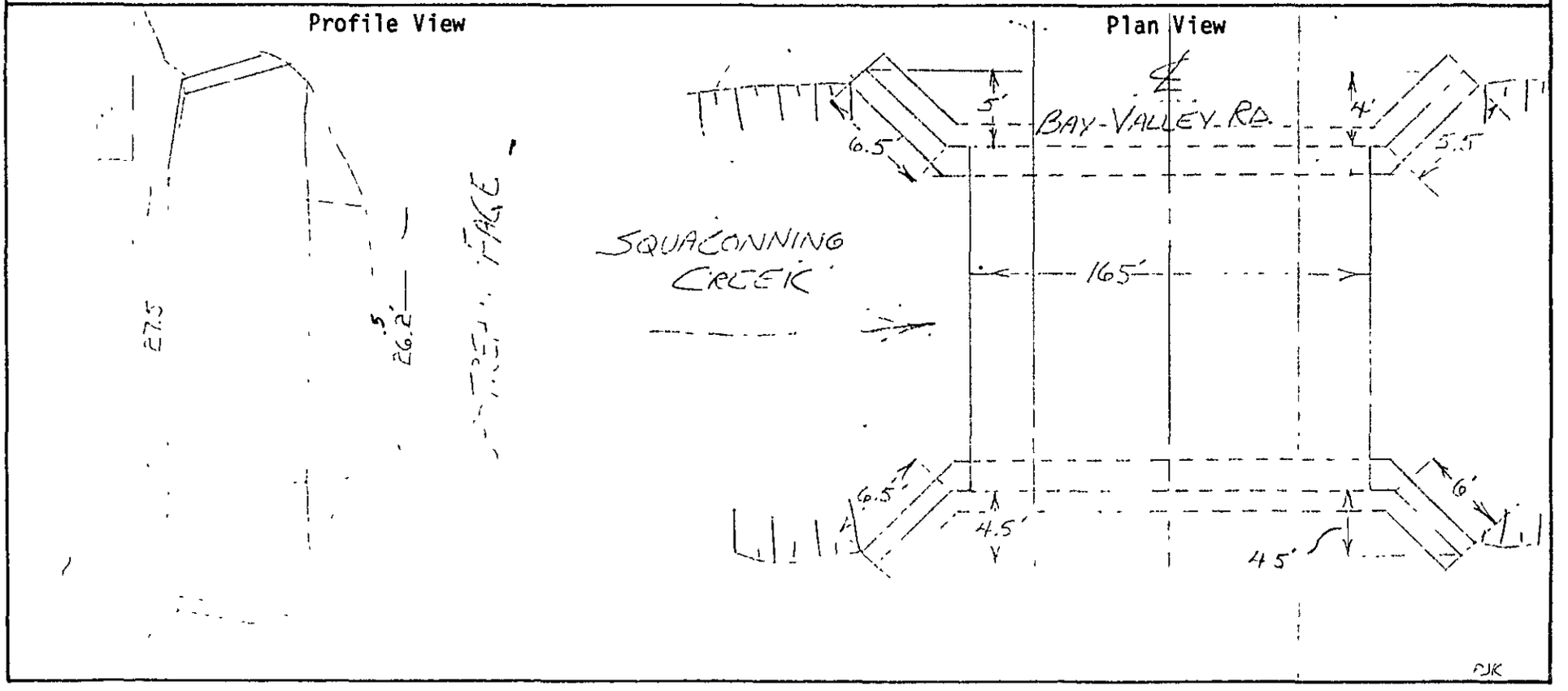
SQUACONNING CREEK
SECNO 9867
Code No. 21-02-B5#13

Job Name: FRANKENMUTH TOUR FIS		By: L. T. SCHADE
Date: 16 OCT, 75	Feature: BAY VALLEY RD. BRIDGE	Water Course: SQUACONNING CREEK
Remarks:		

PICTURES: U.S. B-36, U.S. FACE B-37, U.S. C-1, DS FACE C-2, RIGHT C-3, LEFT C-4

Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation: 581.6'	Length:	Width of Deck:	Skew:

FIELD SKETCH



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HYDRAULIC STRUCTURAL DATA

SQUACONNING CREEK
SEAD 11000

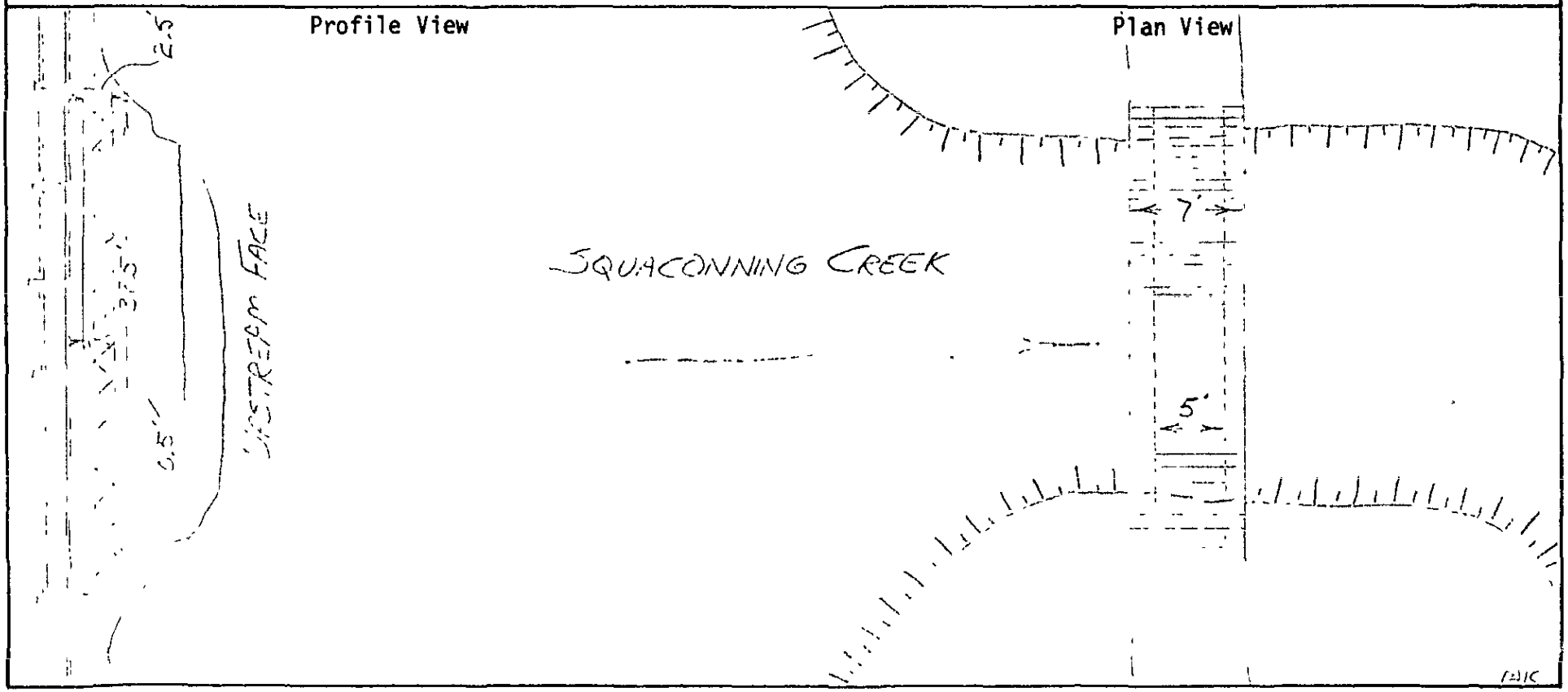
Code No. 21-OE-BS #14A

Job Name: FRANKENLUST TWP. FIS		By: L. SLADE
Date: 10-16-75	Feature: GOLF CART BRIDGE	Water Course: SQUACONNING CREEK
Remarks:		

PICTURES:	U.S.	U.S FACE	D.S.	D.S. FACE	RIGHT	LEFT
	B-30	B-31	B-32	B-33	B-34	B-35

Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation: 581.2	Length:	Width of Deck:	Skew:

FIELD SKETCH



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HYDRAULIC STRUCTURAL DATA

SQUACONNING CREEK
SECNO 11300

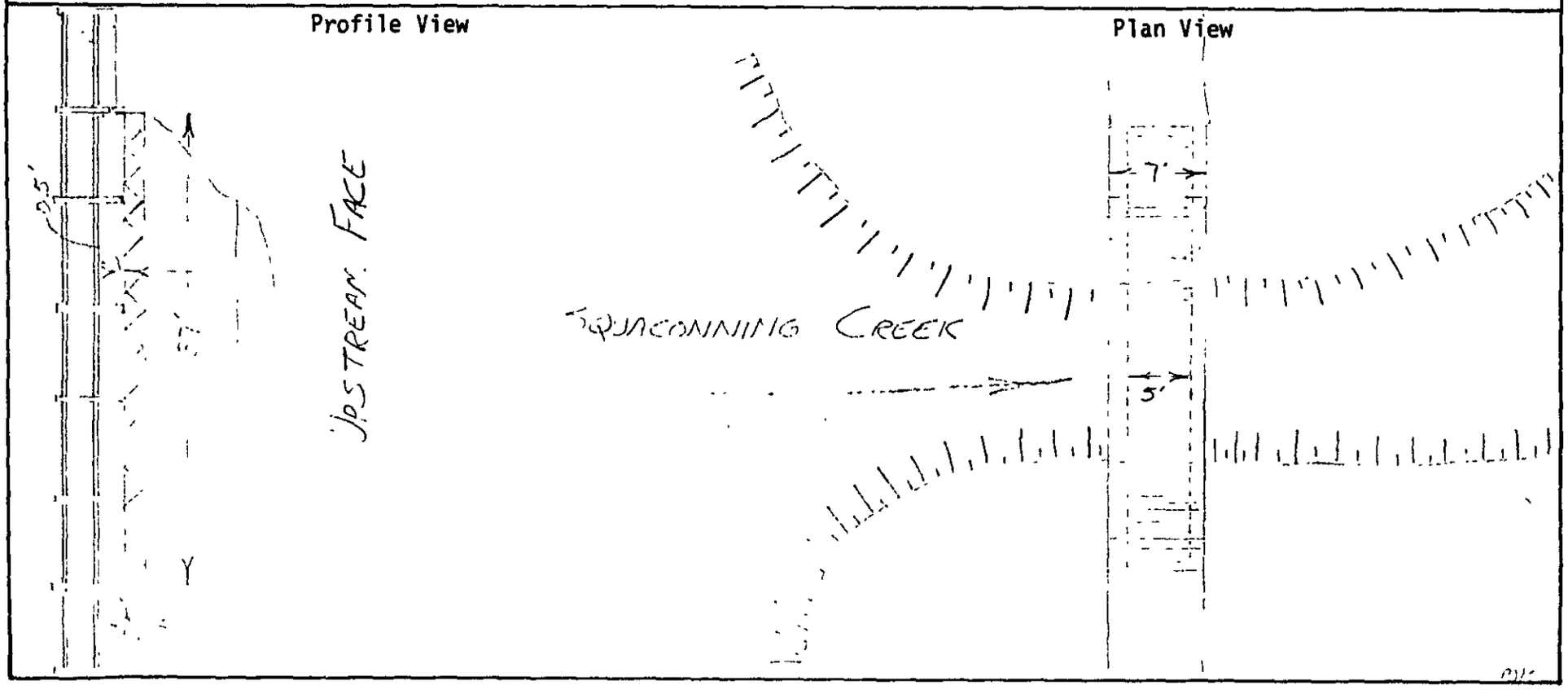
Code No. 21-02-B5 #14

Job Name: FRANKENLUST TWP. FIS		By: L. SLADE
Date: 10-16-75	Feature: GOLF CART BRIDGE	Water Course: SQUACONNING CREEK
Remarks:		

PICTURES: U.S. B-24; U.S. FACE B-25; D.S. B-26; D.S. FACE B-27; RIGHT B-28; LEFT B-29

Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation: 581.2	Length:	Width of Deck:	Skew:

FIELD SKETCH



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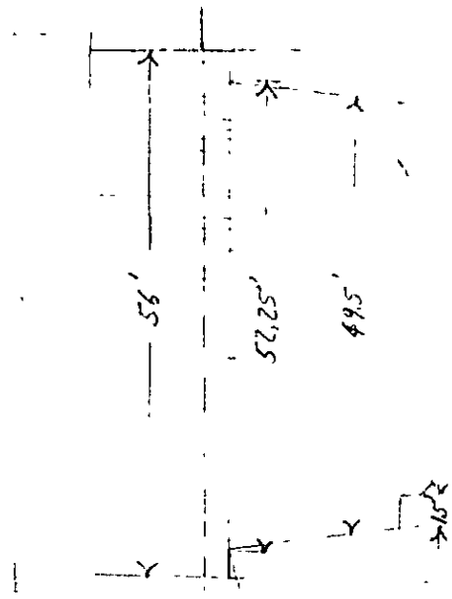
HYDRAULIC STRUCTURAL DATA

SQUACONNING CREEK
SECRD 11700
Code No. 21 - 02 - B.S. #1

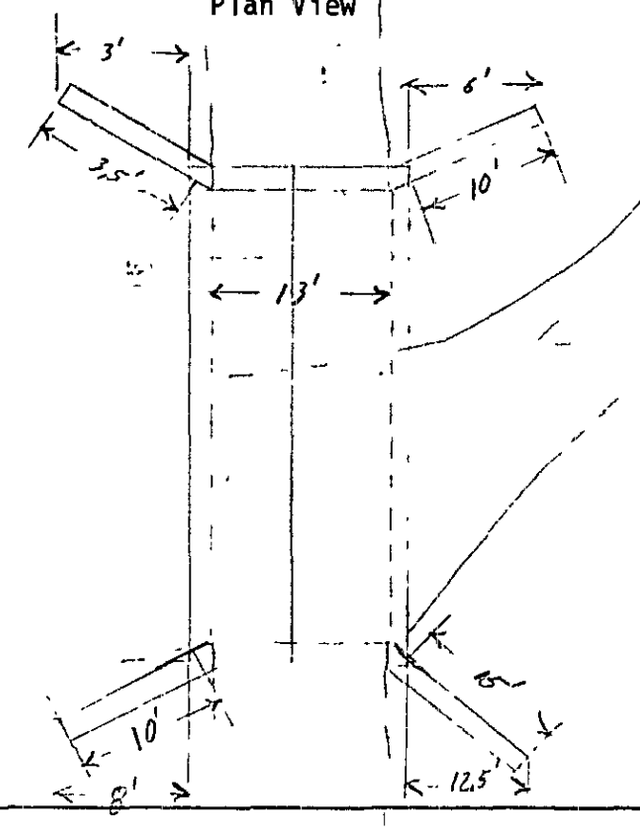
Job Name: FRANKENLUST TWP FTS.			By: L. T. SLADE
Date: 15 OCT. 25	Feature: ON E-W 1/4 LINE SECTION #2		Water Course: SQUACONNING CREEK
Remarks: COVERED BRIDGE BUILT IN 1922, ALL WOOD CONSTRUCTION			
U.S. B-9	U.S. FACE B-10	D.S. B-11	D.S. FACE B-12	RIGHT B-13	LEFT B-14
Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation: 580.7	Length:	Width of Deck:	Skew:

FIELD SKETCH

Profile View



Plan View



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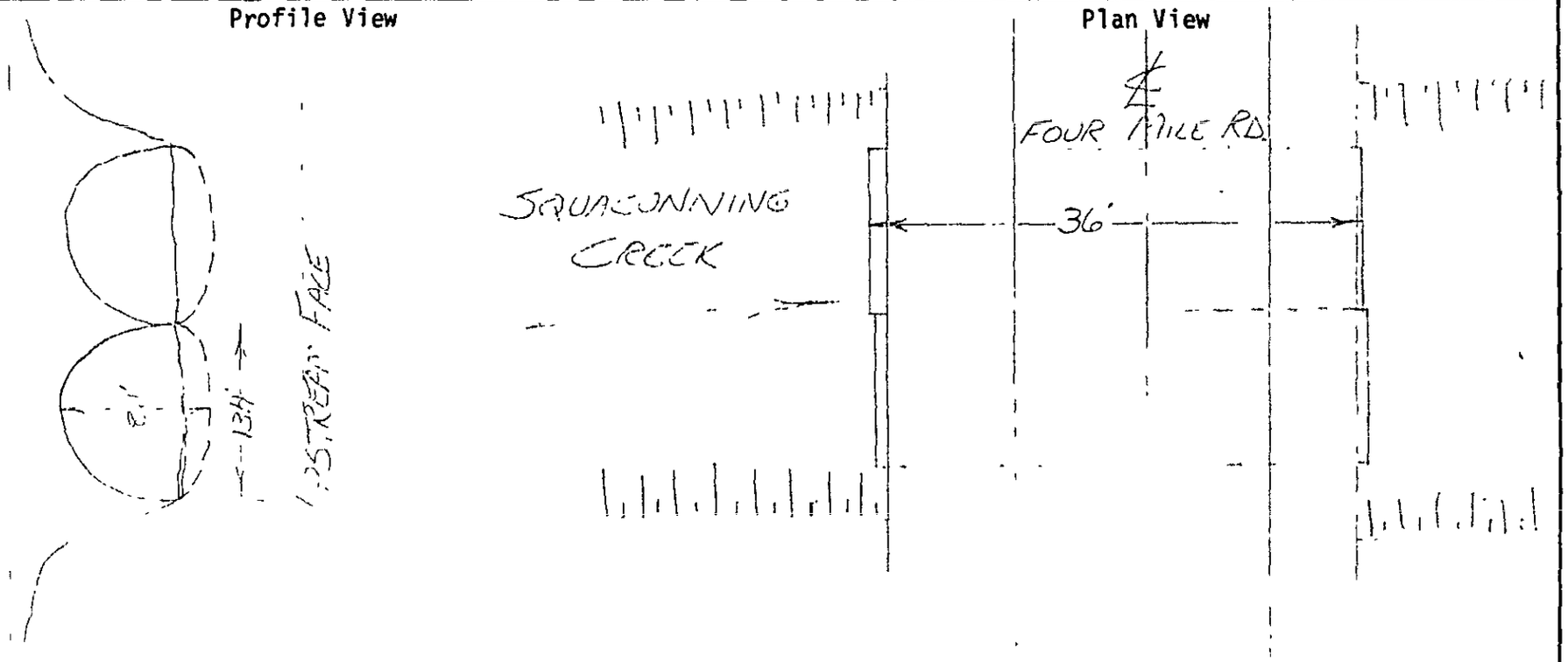
HYDRAULIC STRUCTURAL DATA

SQUACONNING CREEK
SEC NO 13736
Code No. 21-02 BS# 17

Job Name: FRANKENLUST TWP. F.I.S.		By: G. Norberg	
Date: Oct 14 1975	Feature: FOUR MILE RD.	Water Course: SQUACONNING CREEK	
Remarks:			
PICTURES: US B1, US Face B2, DS B3, DS Face B4, Right B5, Left B6			
Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation: 582.6	Length: 36' MULTIPLATE	Width of Deck:	Skew:

FIELD SKETCH



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HYDRAULIC STRUCTURAL DATA

SQUACONNING CREEK
SEAD 5825

Code No. 21-02-B5#20

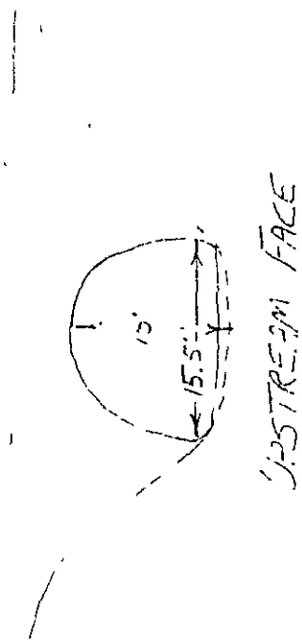
Job Name: FRANKENLUST TWP. F.I.S.		By: DJ Kane
Date:	Feature: DELTA COLLEGE ENTRANCE RD. CULV.	Water Course: SQUACONNING CREEK
Remarks:		

FIGURES	US A-23	USFACE A-24	DS A-25	DS FACE A-26	RIGHT A-27	LEFT A-28

Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation:	Length: MULTIPLATE	Width of Deck:	Skew:

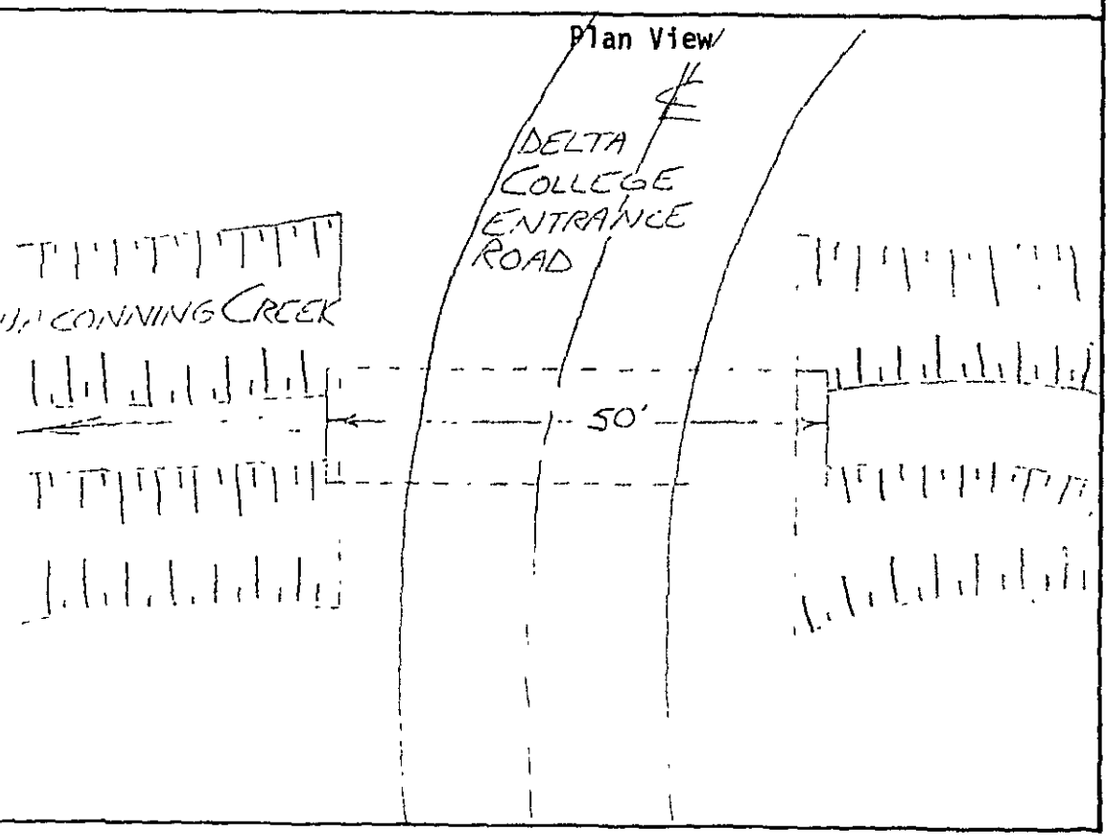
FIELD SKETCH

Profile View



ASSUME 15'6" x 9'5"

Plan View



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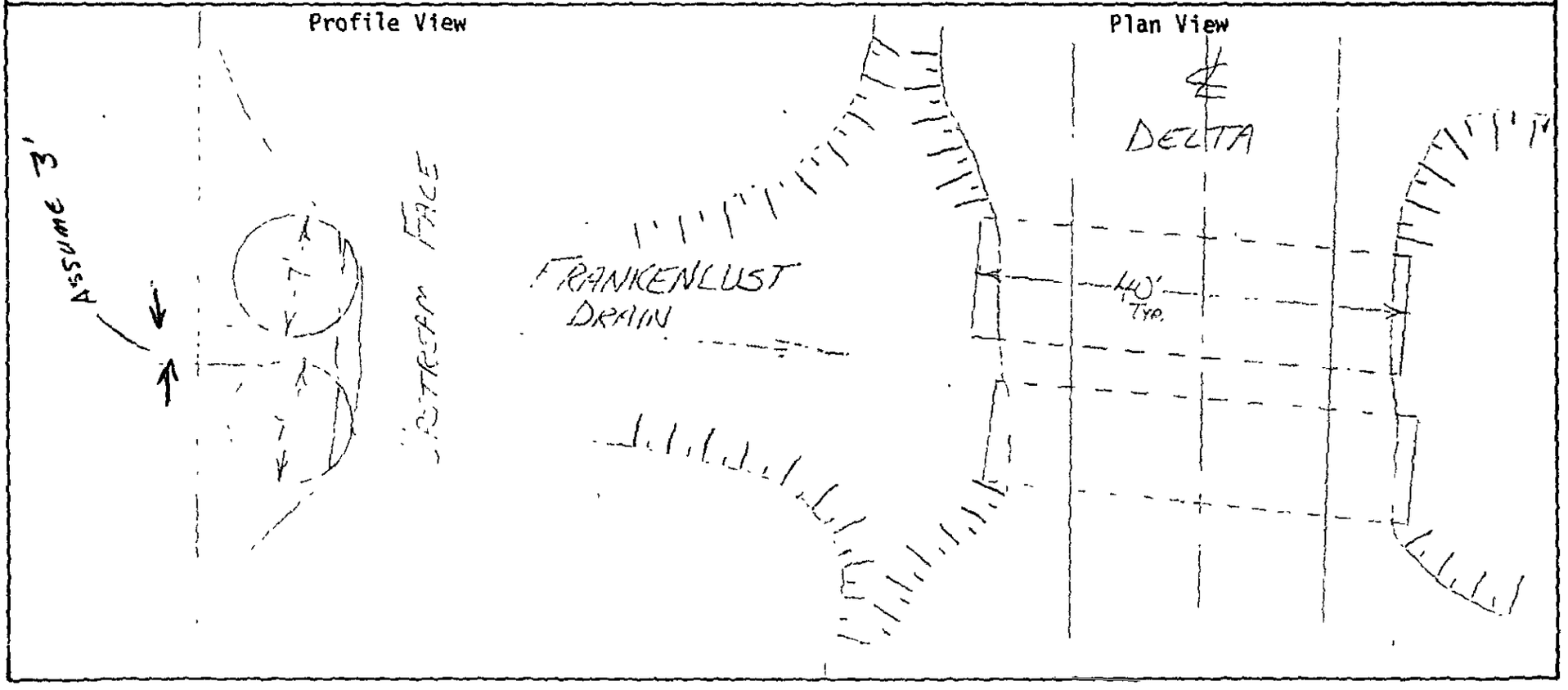
HYDRAULIC STRUCTURAL DATA

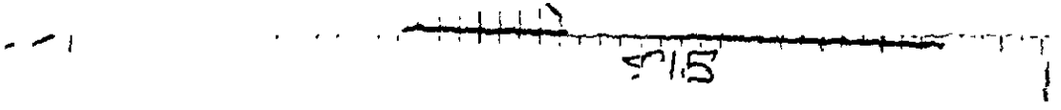
FRANKENLUST DRAIN
SCALE 1"=5'

Code No. 21-04-B5 #2

Job Name: FRANKENLUST DRAIN			By: L. SLADE
Date: 10-7-75	Feature: DELTA BRIDGE		Water Course: FRANKENLUST DRAIN
Remarks:			
PICTURES: U.S. FACE 2-3	U.S. 2-4	D.S. 2-5	D.S. FACE 2-6 RIGHT 2-7 LEFT 2-8
Width of Piers:	Pier Shape:	No. of Piers: 0	Area:
Water Elevation: 581.2	Length: 40' x 84" RCP (2)	Width of Deck:	Skew:

FIELD SKETCH





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HYDRAULIC STRUCTURAL DATA

FRANKENLUST DRAIN
SECN 5300

Code No. 21-04-B5 #5A

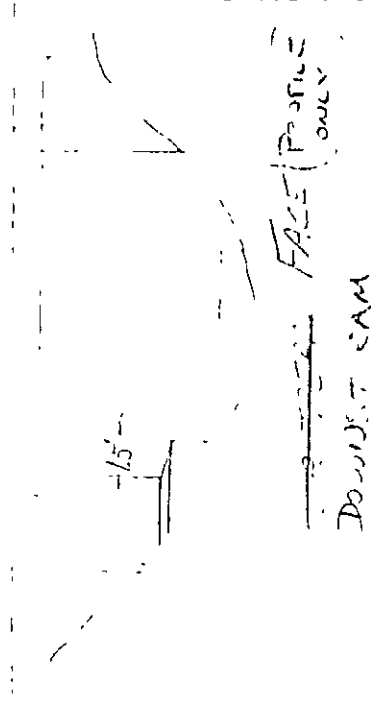
Job Name: FRANKENLUST TWP. F-5		By: L. SLADE
Date: 10-7-75	Feature: DRIVEWAY BRIDGE	Water Course: FRANKENLUST DRAIN
Remarks: 200± DOWNSTREAM V5 #5		

PICTURES:	U.S. Y-30	U.S. FACE Y-31	D.S. Y-32	D.S. FACE Y-33	RIGHT Y-34	LEFT Y-35

Width of Piers:	Pier Shape:	No. of Piers: 0	Area:
Water Elevation:	Length:	Width of Deck:	Skew: 3'

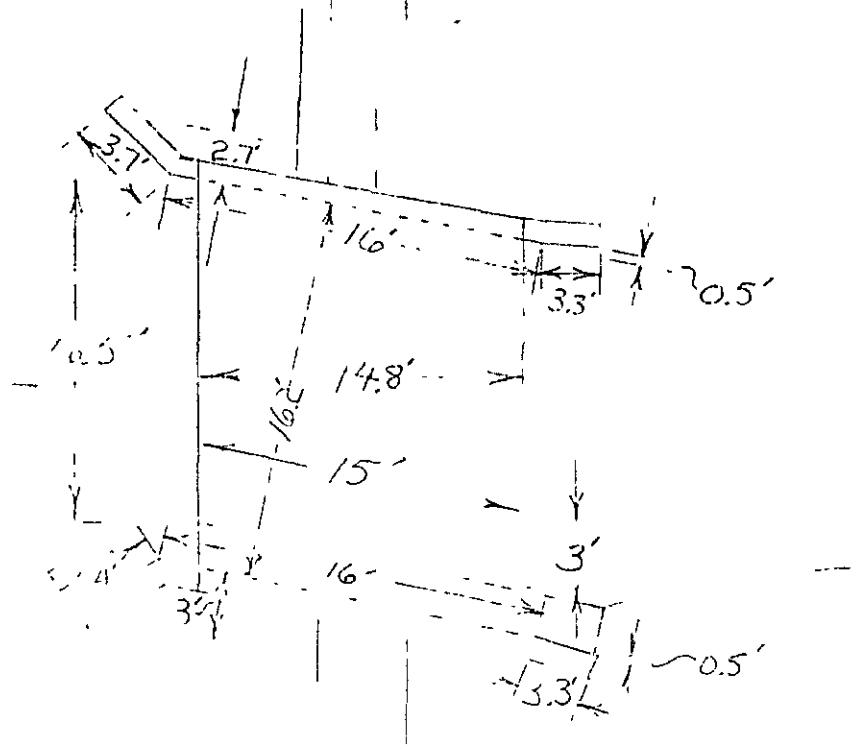
FIELD SKETCH

Profile View



FRANKENLUST DRAIN

Plan View



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HYDRAULIC STRUCTURAL DATA

FRANKENLUST DRAIN
SEC. 6550

Code No. 21-04-25#58

Job Name: FRANKENLUST TWP F.1.5		By: L. SLADE
Date: 10-31-75	Feature:	Water Course: FRANKENLUST DRAIN
Remarks:		

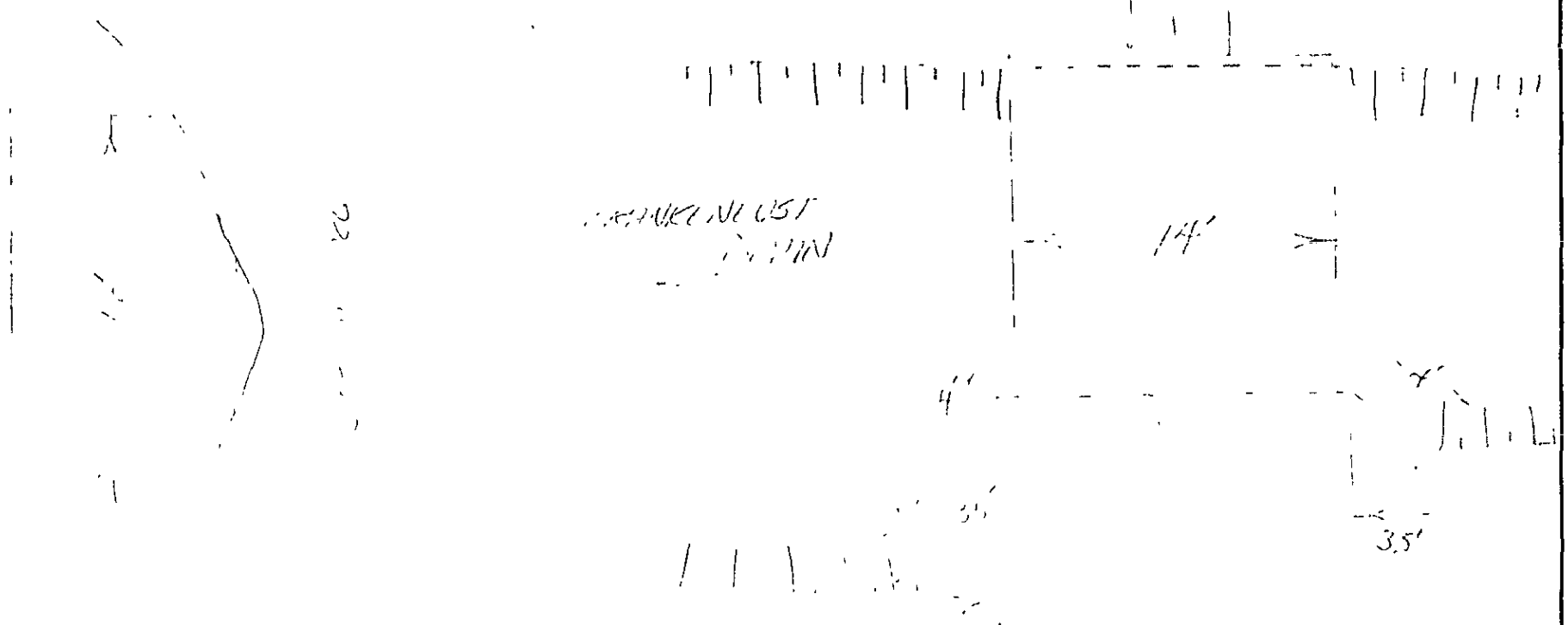
PICTURES:	U.S. F-22	U.S. FACE F-23	D.S. F-24	D.S. FACE F-25	RIGHT F-26	LEFT F-27

Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation:	Length:	Width of Deck:	Skew:

FIELD SKETCH

Profile View

Plan View



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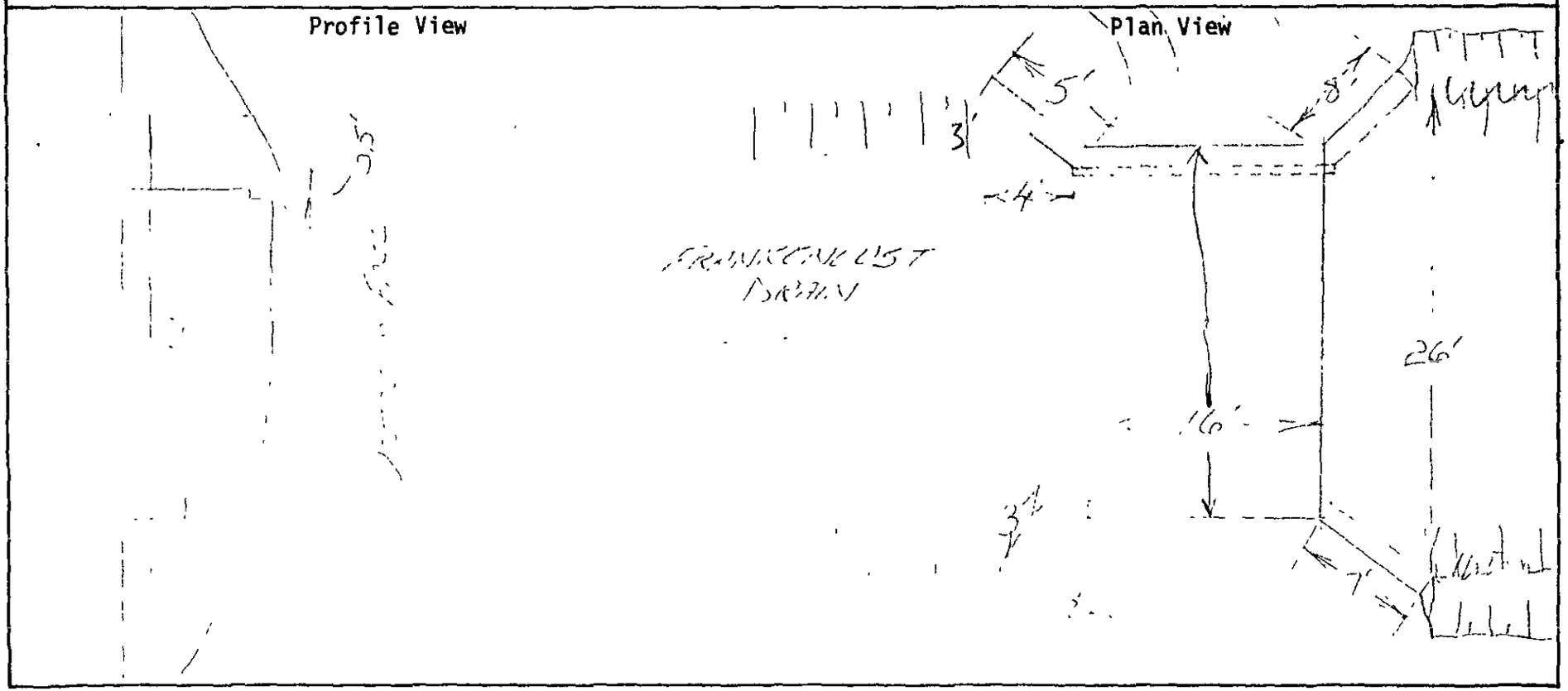
HYDRAULIC STRUCTURAL DATA

FRANKENLUST DRAIN
SEALD 8841

Code No. 01-04 185 #6

Job Name: FRANKENLUST TWP FT.		By: L SLADE	
Date: 10-31-75	Feature: FARM BRIDGE	Water Course: FRANKENLUST DRAIN	
Remarks:			
PICTURES: U.S. F-16	U.S. FACE F-17	D.S. F-18	D.S. FACE F-19 RIGHT F-20 LEFT F-21
Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation: 591.2	Length: 16'	Width of Deck: 16'	Skew:

FIELD SKETCH



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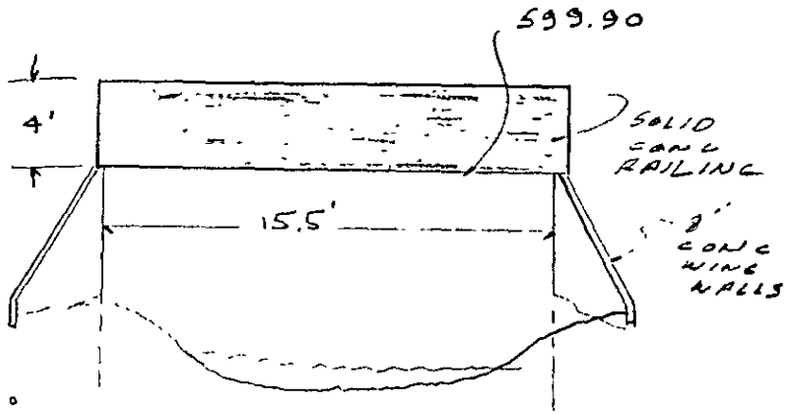
HYDRAULIC STRUCTURAL DATA

FRANKENLUST DRAIN #8
SEAD 9624
Code No. 5555-21.04.04

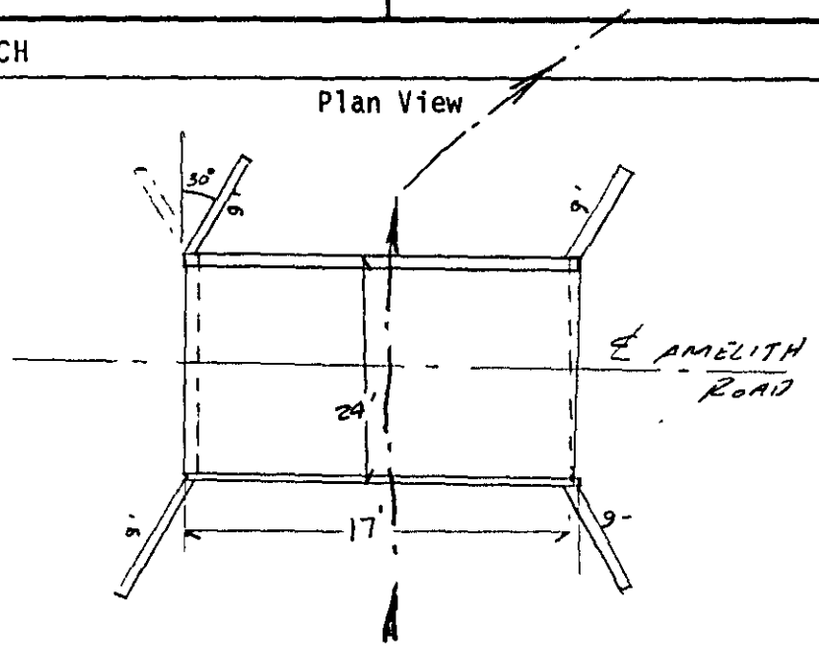
Job Name: FRANKENLUST TWP F/S			By: JOE KAPELCZAK V. RICK D. NETT
Date: 10-03-75	Feature: ~~[illegible]~~ AMELITH ROAD BRIDGE		Water Course: FRANKENLUST DRAIN
Remarks:			
PHOTO LOG ROLL /	21 L / 22 R / 23 UP / 24 D / 25 UP F / 26 D.F. /		
Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation: 592.7	Length:	Width of Deck:	Skew:

FIELD SKETCH

Profile View



Plan View



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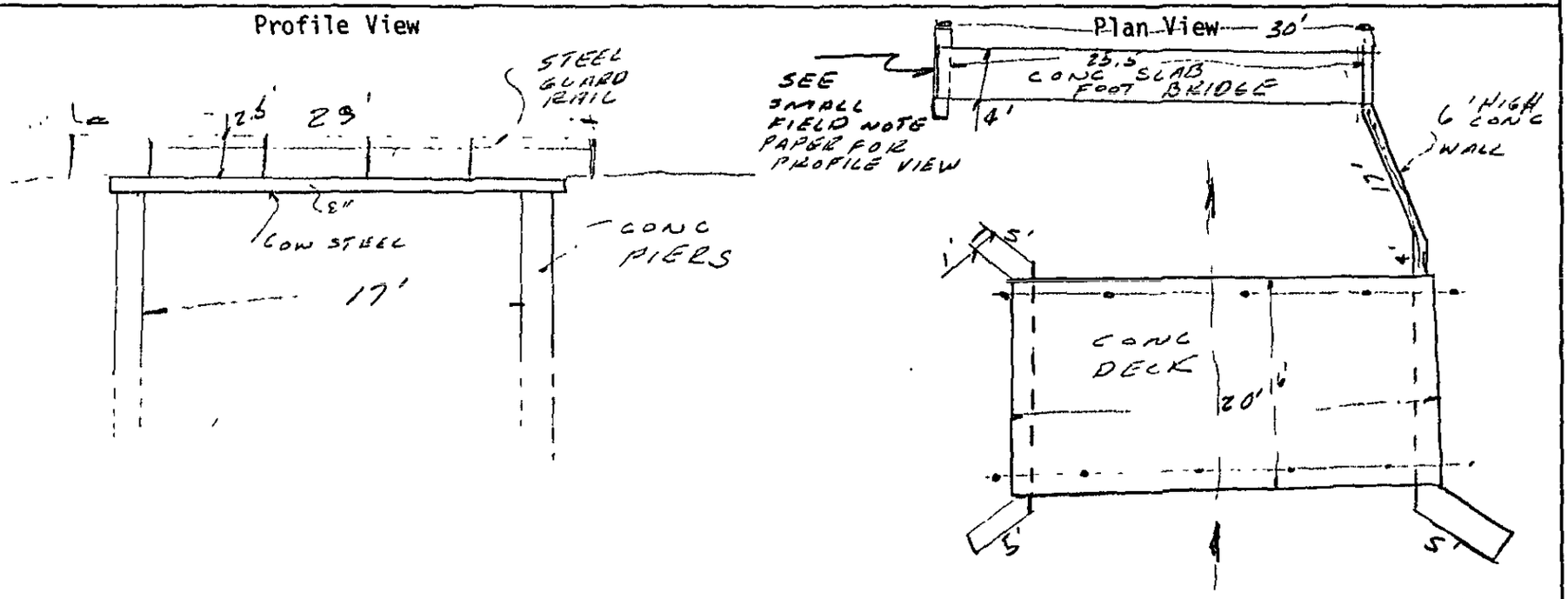
HYDRAULIC STRUCTURAL DATA BS #9

FRANKENLUST DRAIN
SEND 11300

Code No. 5555 21

Job Name: FRANKENLUST TWP FIS			By: J. KAPELCZAK V. RICK D. NETT
Date: 10-03-75	Feature: KLOHA ROAD BRIDGE		Water Course: FRANKENLUST DRAIN
Remarks: CONC BRIDGE DECK W/ CONC WING WALLS & ABUTMENTS			
PHOTO LOG ROLL 1	15 R / 16 L / UP 17 / 18 DOWN / UP 19 F / 20 D.F. /		
Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation: 5952	Length:	Width of Deck:	Skew:

FIELD SKETCH



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HYDRAULIC STRUCTURAL DATA

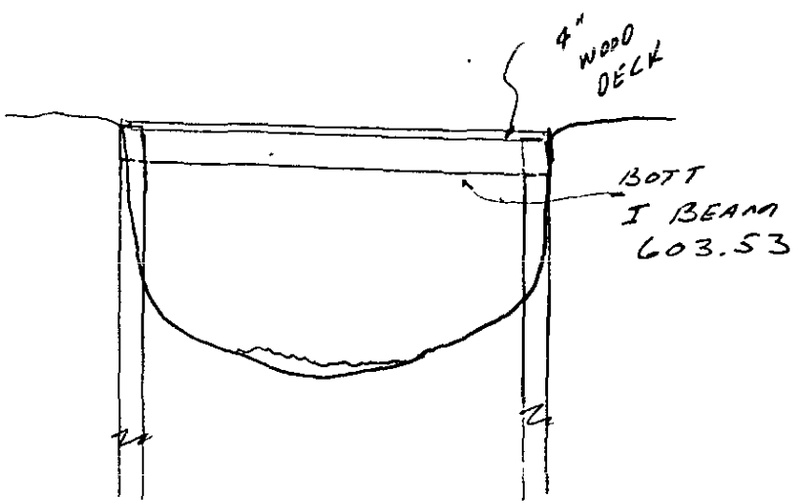
BS #11
FRANKENLUST DRAIN
SBHO 12657

Code No. 5555-21

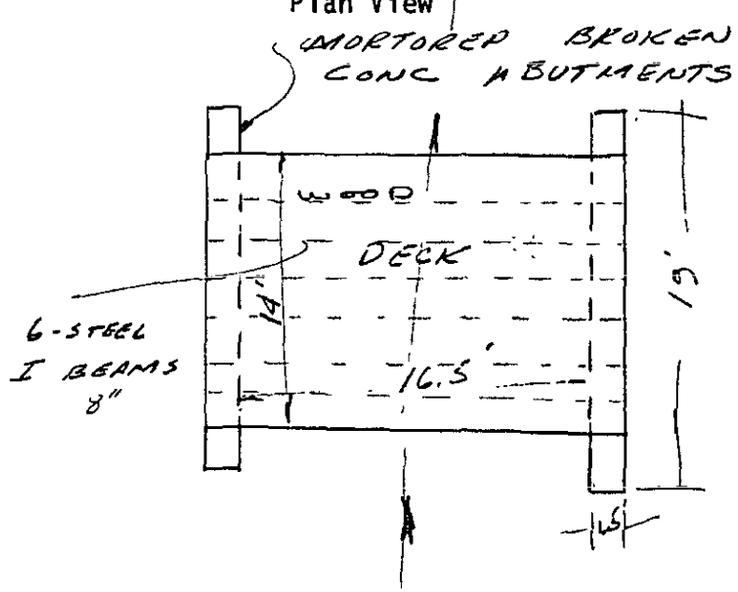
Job Name: FRANKENLUST TWP F/S			By: J. KAPELCZAK - V. RICK - D. NETT
Date: 10-02-75	Feature: WOOD DECK W/ STEEL SUPORTS		Water Course: FRANKENLUST DR.
Remarks:			
PHOTO LOG ROLL 1 / 5 L. / 6 R. / 7 UP / 8 D. / 9 UP.F. / 10 D.F. /			
Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation: 597.8	Length:	Width of Deck:	Skew: NONE

FIELD SKETCH

Profile View



Plan View



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HYDRAULIC STRUCTURAL DATA

KLAUSS DRAIN
SEND 3090

Code No. 21-03-BS#4

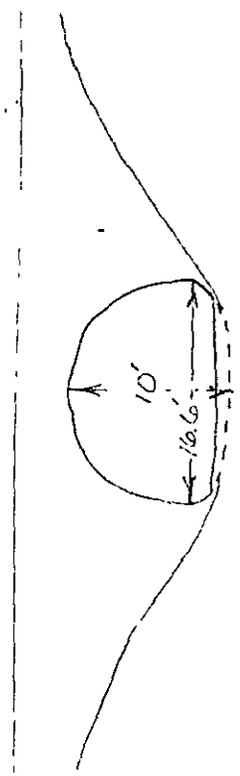
Job Name: FRANKENLUST TWP FIS		By: L. SLADE / DenTi
Date: 10-9-75	Feature: DRIVEWAY CULV.	Water Course: KLAUSS DRAIN
Remarks:		

PICTURES: U.S. FACE A-5 | U.S. A-6 | D.S. A-7 | D.S. FACE A-8 | RIGHT A-9R | LEFT A-10

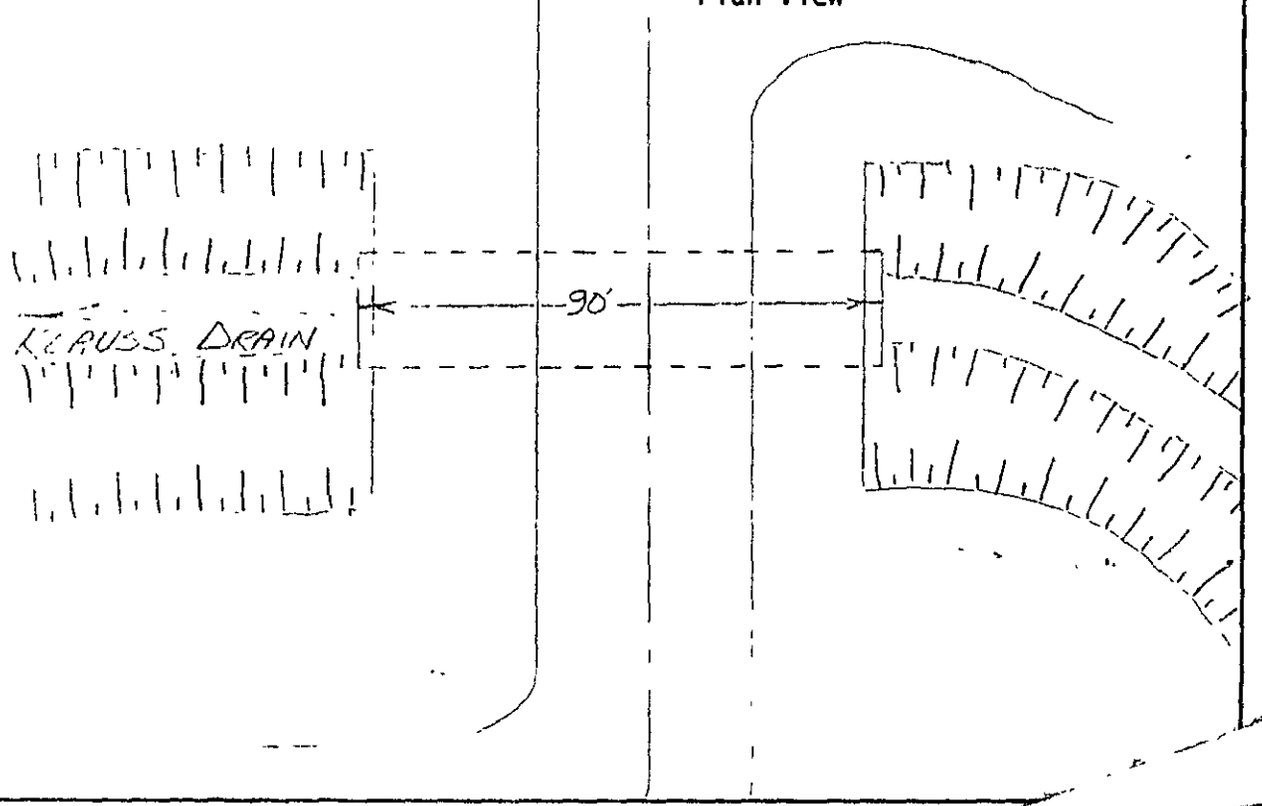
Width of Piers:	~~Pier~~ Shape: 16.6" X 10'	No. of Piers:	Area:
Water Elevation: 588.0	Length: 90' MULTIPLATE	Width of Deck:	Skew:

FIELD SKETCH

Profile View



Plan View



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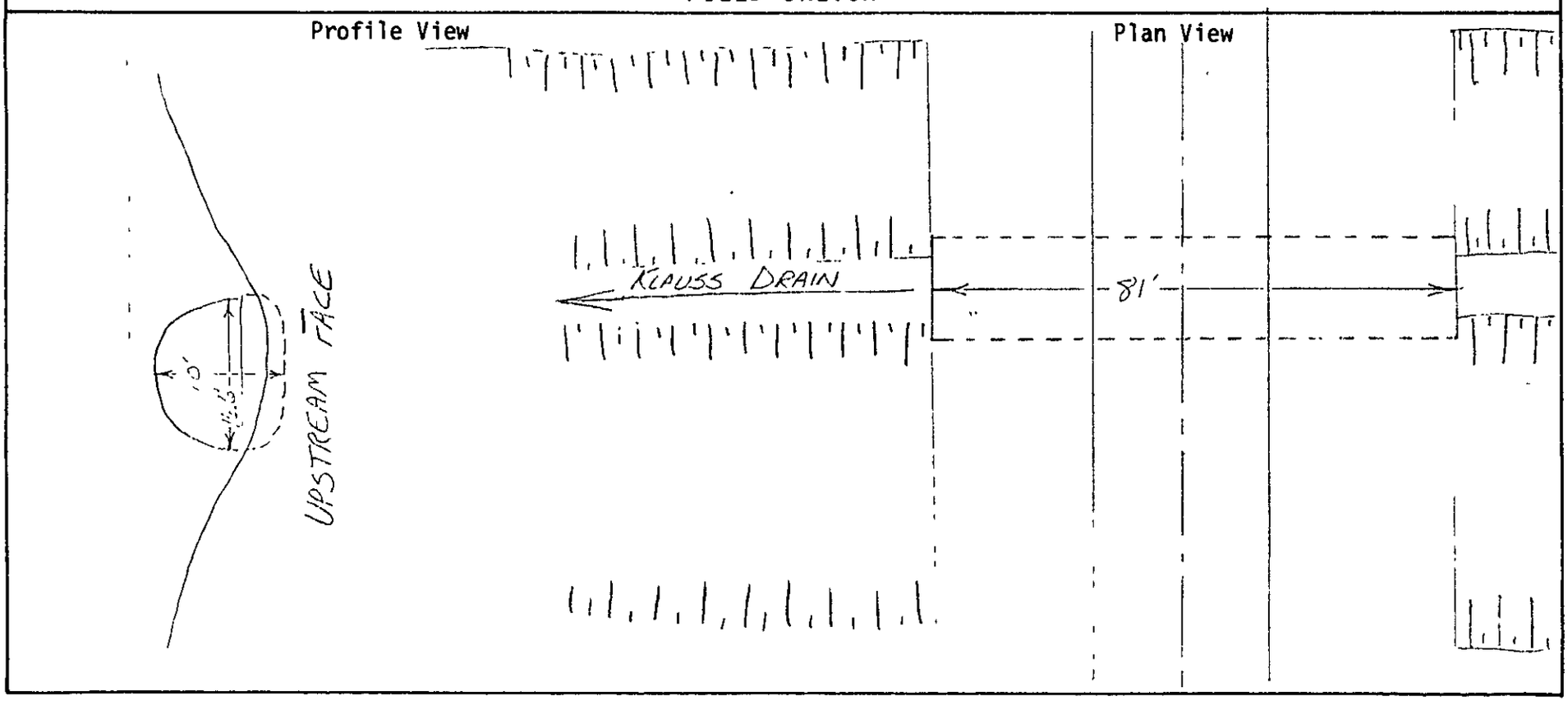
HYDRAULIC STRUCTURAL DATA

KLAUSS DRAIN
SCND 4000

Code No. 21-03-BS#5

Job Name: FRANKENLUST TWP FIS			By: L. SLADE
Date: 10-9-75	Feature: DRIVEWAY CULV.		Water Course: KLAUSS DRAIN
Remarks: 590' DOWNSTREAM FROM BS#5B			
PICTURES: U.S. 2-32	U.S FACE 2-33	D.S. 2-34	D.S. FACE 2-35
RIGHT 2-36	LEFT 2-37		
Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation: 589.1	Length:	Width of Deck:	Skew:

FIELD SKETCH



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HYDRAULIC STRUCTURAL DATA

KLAUSS DRAIN
SECND 4590

Code No. 21-03-BS#5

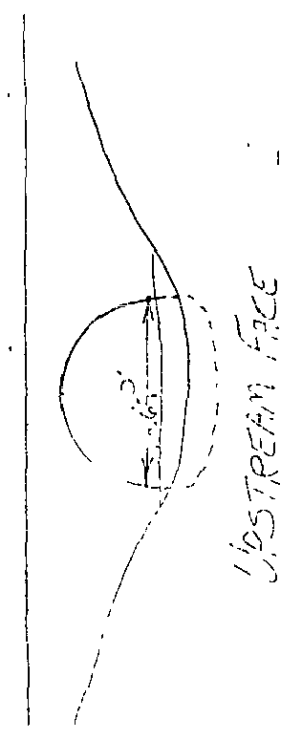
Job Name: FRANKENLUST FIS		By: L. SLADE / DEPT.
Date: 10-9-75	Feature: DRIVEWAY CULV.	Water Course: KLAUSS DRAIN
Remarks: 150' DOWNSTREAM OF VS#6		

PICTURES: U.S. FACE 2-26, U.S. 2-27, D.S 2-28, D.S FACE 2-29, RIGHT 2-30, LEFT 2-31

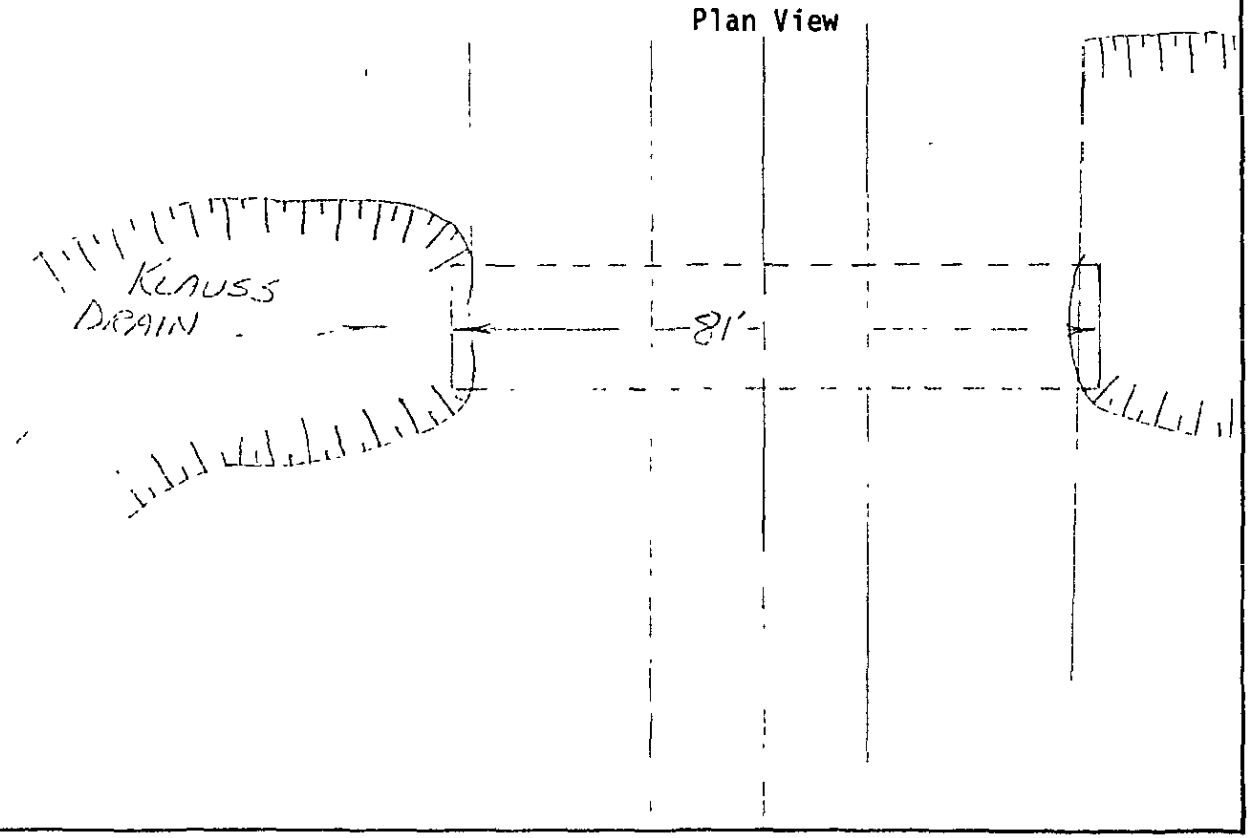
Width of Piers:	Pier Shape: 16.6'	No. of Piers:	Area:
Water Elevation: 589.5	Length: 81' MULTIPLATE	Width of Deck:	Skew:

FIELD SKETCH

Profile View



Plan View



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HYDRAULIC STRUCTURAL DATA

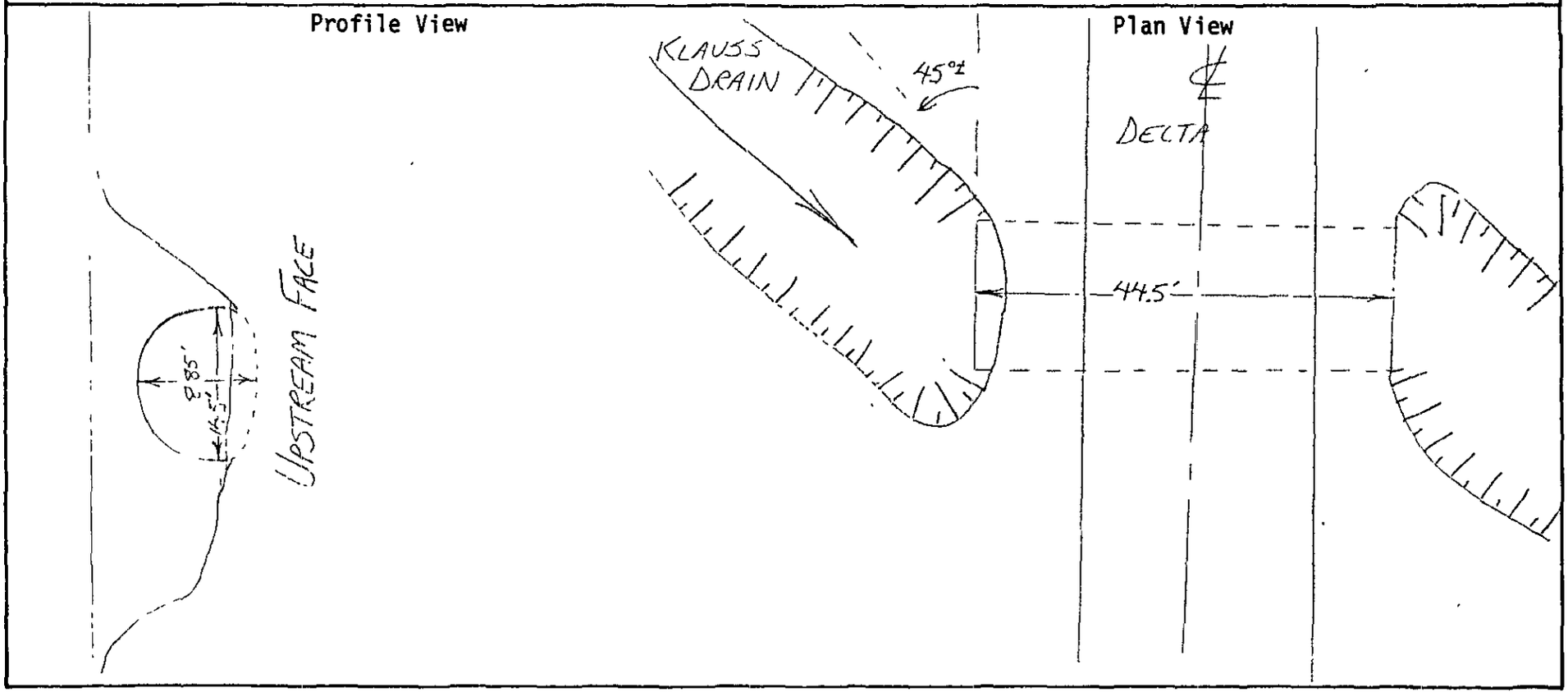
KLAUSS DRAIN
SECNO 6695
Code No. 21-03-B5 #8

Job Name: FRANKENLUST DRAIN FIS		By: L. SLADE
Date: 10-8-75	Feature: DELTA CULV.	Water Course: KLAUSS DRAIN
Remarks:		

PICTURES: U.S. 2-13 | U.S. FACE 2-14 | D.S. 2-15 | D.S. FACE 2-16 | RIGHT 2-17 | LEFT 2-18

Width of Piers:	Pier Shape:	No. of Piers:	Area:
Water Elevation: 594.7	Length:	Width of Deck:	Skew:

FIELD SKETCH



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CONSULTING ENGINEERS

BY RSM DATE 4-19-77 JOB DESCRIPTION FRANKENLUST TWP. FIS SHEET 1 OF 7
SUBJECT SQUACONNING CREEK AT M-84 JOB NO. 5555-21

ISLAND PROBLEM AT M-84

CHANNEL 1 REACH LENGTH = 1353'

CHANNEL 2 REACH LENGTH = 2050'

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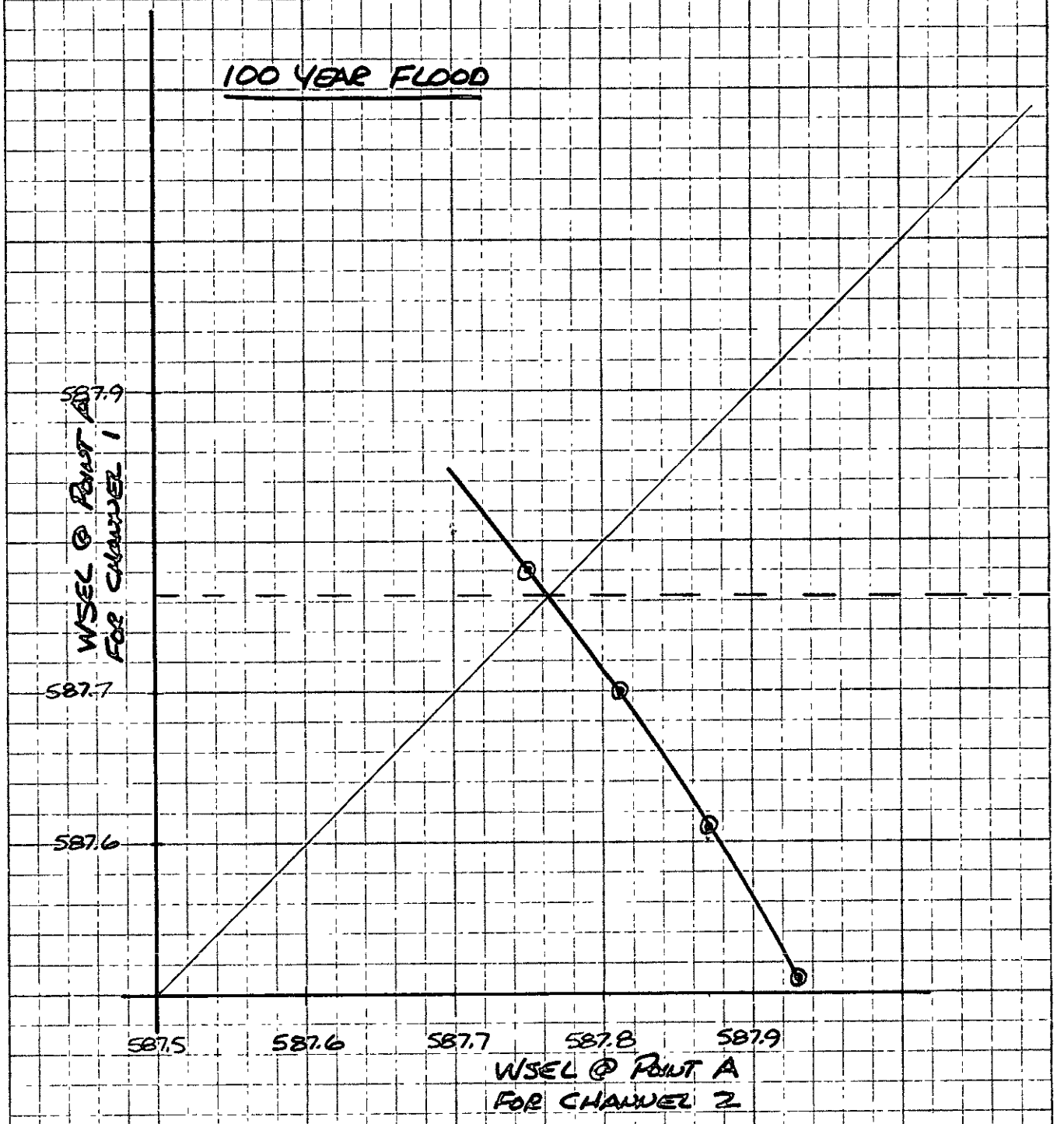
BY RSM DATE 4-19-77 JOB DESCRIPTION FRANKENLUST TWP. FIS SHEET 2 OF 7
SUBJECT SQUACONNING CREEK AT M-84. JOB NO. 5555-21



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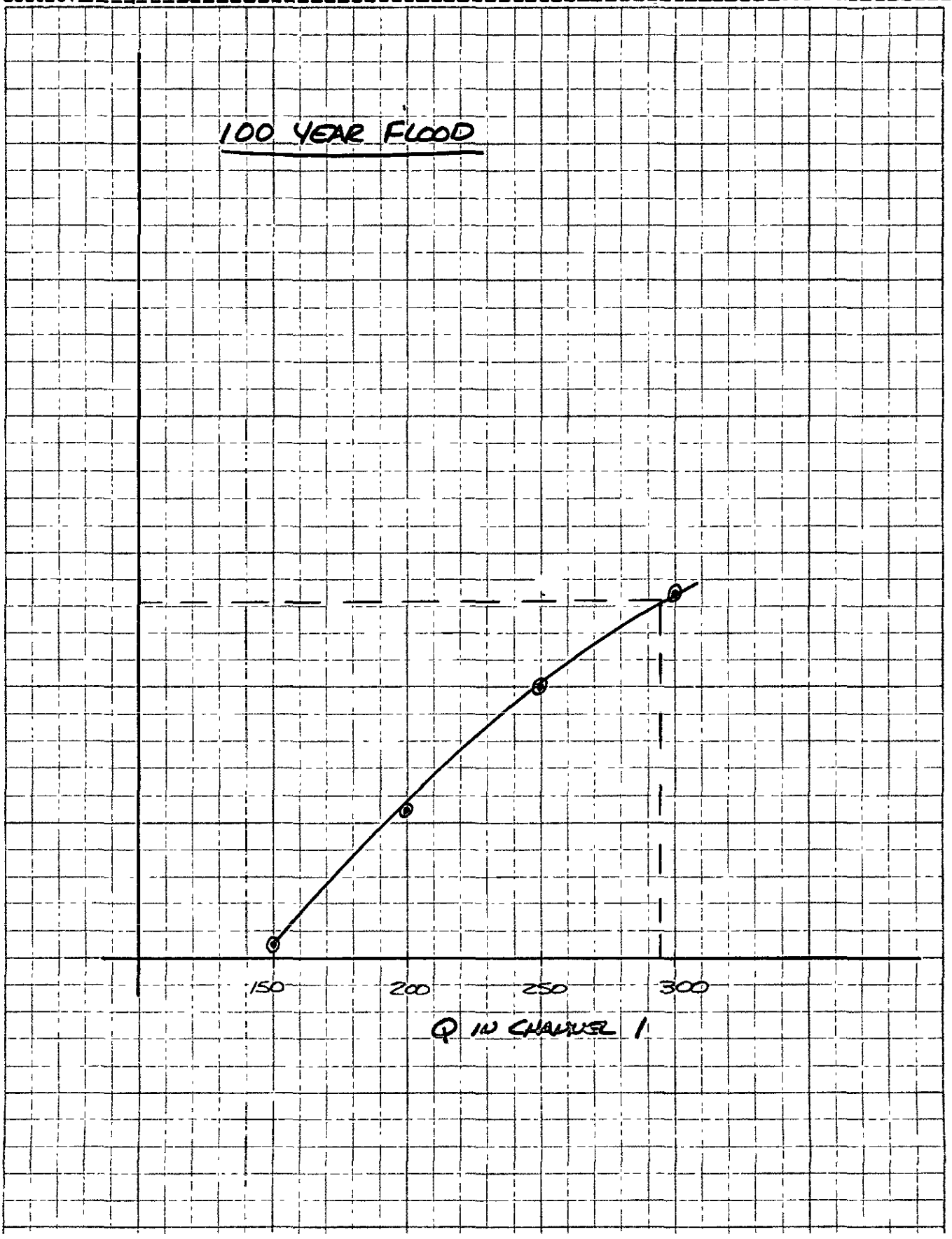
BY RSM DATE 4-19-77 JOB DESCRIPTION FRANKENLUST TWP. F15 SHEET 3 OF 7
SUBJECT SQUACONNING CREEK AT M-84 JOB NO. 5555-21



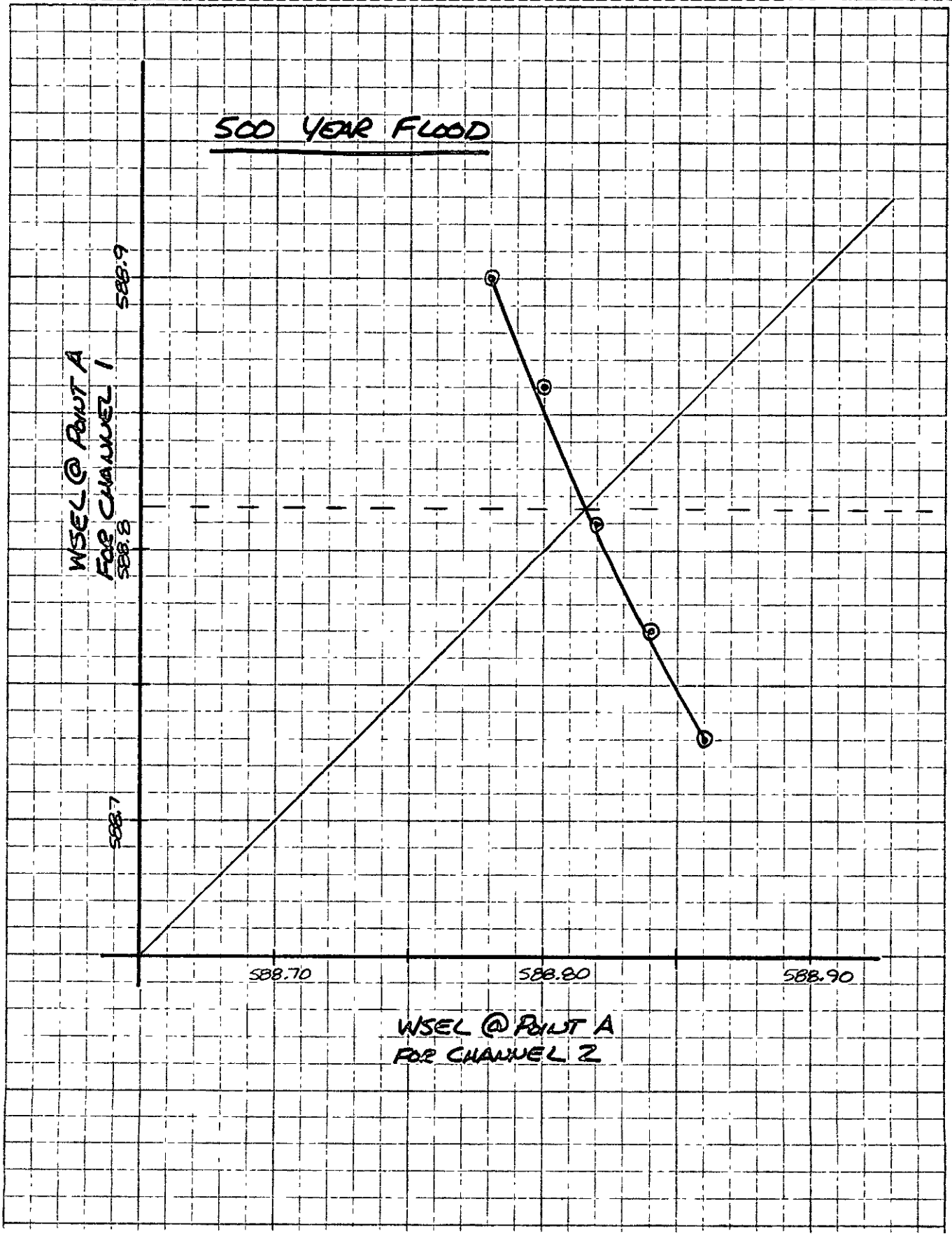
100 YR.

Q IN CHANNEL 1	WSEL @ A CHANNEL 1 (SECNO 1353)
150	587.51
200	587.61
250	587.70
300	587.78
290 (FINAL)	587.76 ✓

Q IN CHANNEL 2	WSEL @ A CHANNEL 2 (SECNO 6300)
2595	587.93
2545	587.87
2495	587.81
2445	587.75
2455 (FINAL)	587.76 ✓

JOHNSON & ANDERSON, INC.
CONSULTING ENGINEERS

BY RSM DATE 4-20-77 JOB DESCRIPTION FRANKENMUTH TWP. FIS SHEET 5 OF 7
SUBJECT SQUAGOWING CREEK AT M-84 JOB NO. 5955-21



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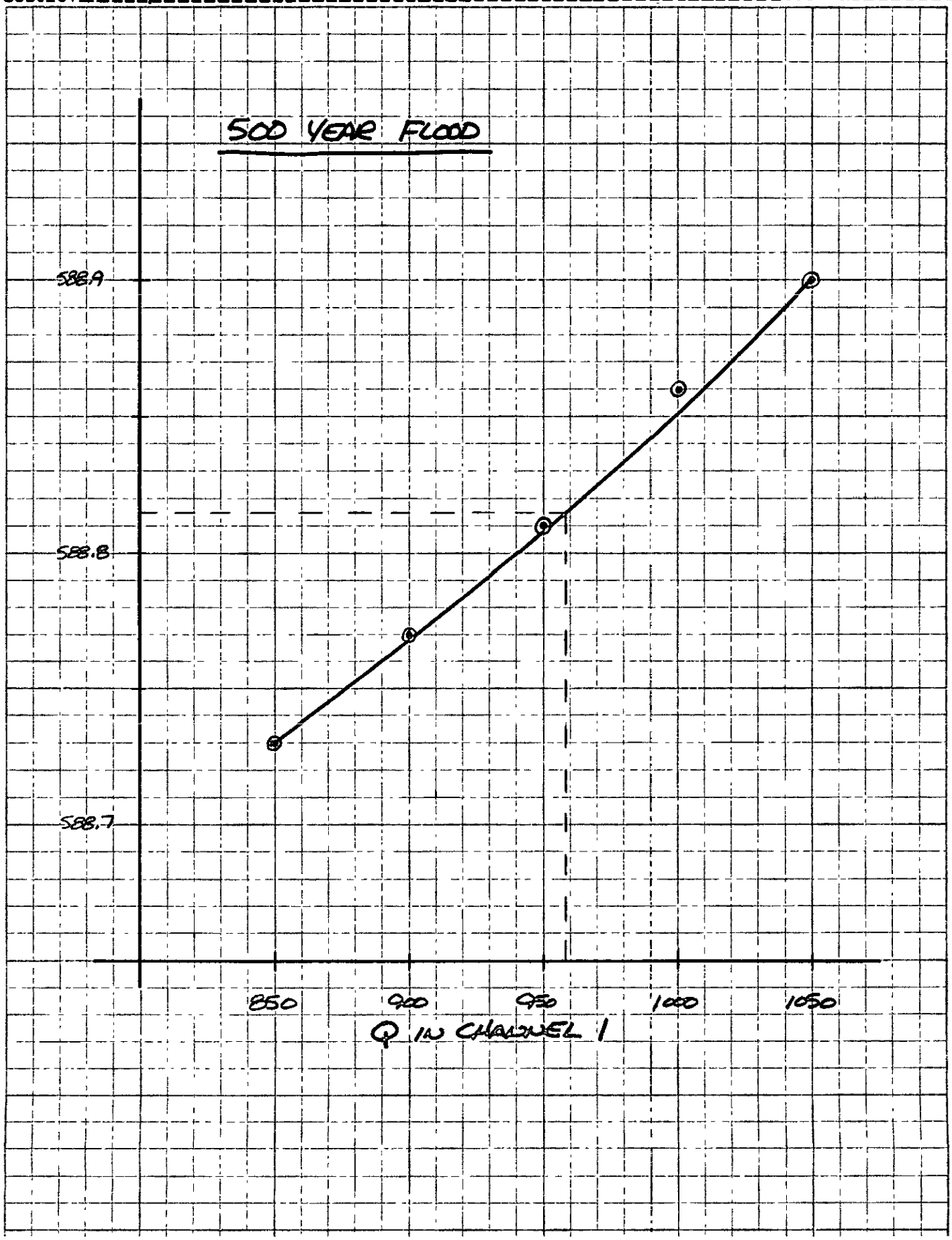
BY RSM DATE 4-20-77 JOB DESCRIPTION FRANKENLUST TWP. FIS SHEET 6 OF 7
SUBJECT SQUACOWING CREEK AT M-84 JOB NO. 5555-21



500 YR.

Q IN CHANNEL 1	WSEL @ A IN CHANNEL 1 (SEND 1353)
850	588.73
900	588.77
950	588.81
1000	588.86
1050	588.90
960 (FINAL)	588.82 ✓

Q IN CHANNEL 2	WSEL @ A IN CHANNEL 2 (SEND 6300)
2705	588.86
2655	588.84
2605	588.82
2555	588.80
2505	588.78
2595 (FINAL)	588.82 ✓

JOB NAME: FRANKENLUST TWP. FIS | JOB NO. 5555 | 21

WATERCOURSE: SQUACONNING CREEK | CULVERT LOCATION: DELTA COLLEGE EXT. ROAD

CULVERT DESCRIPTION: 15'6" X 9'5" | BY RSN | DATE 3-16-77

MULTIPLATE ARCH PIPE

n = .031 | Q_{10} = | TW_{10} =

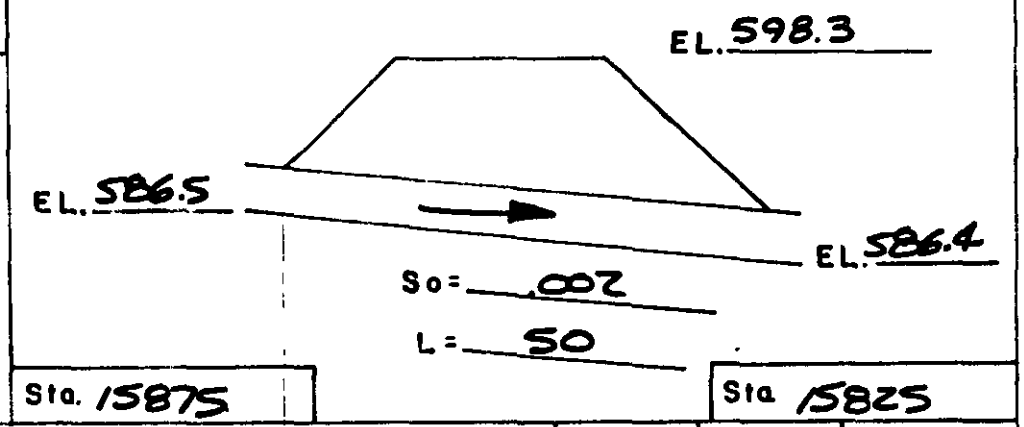
A = 113 | Q_{50} = | TW_{50} =

R = 2.83 | Q_{100} = | TW_{100} =

Ke = 0.5 | Q_{500} = 1050 | TW_{500} = 8.49

D = 9.5'

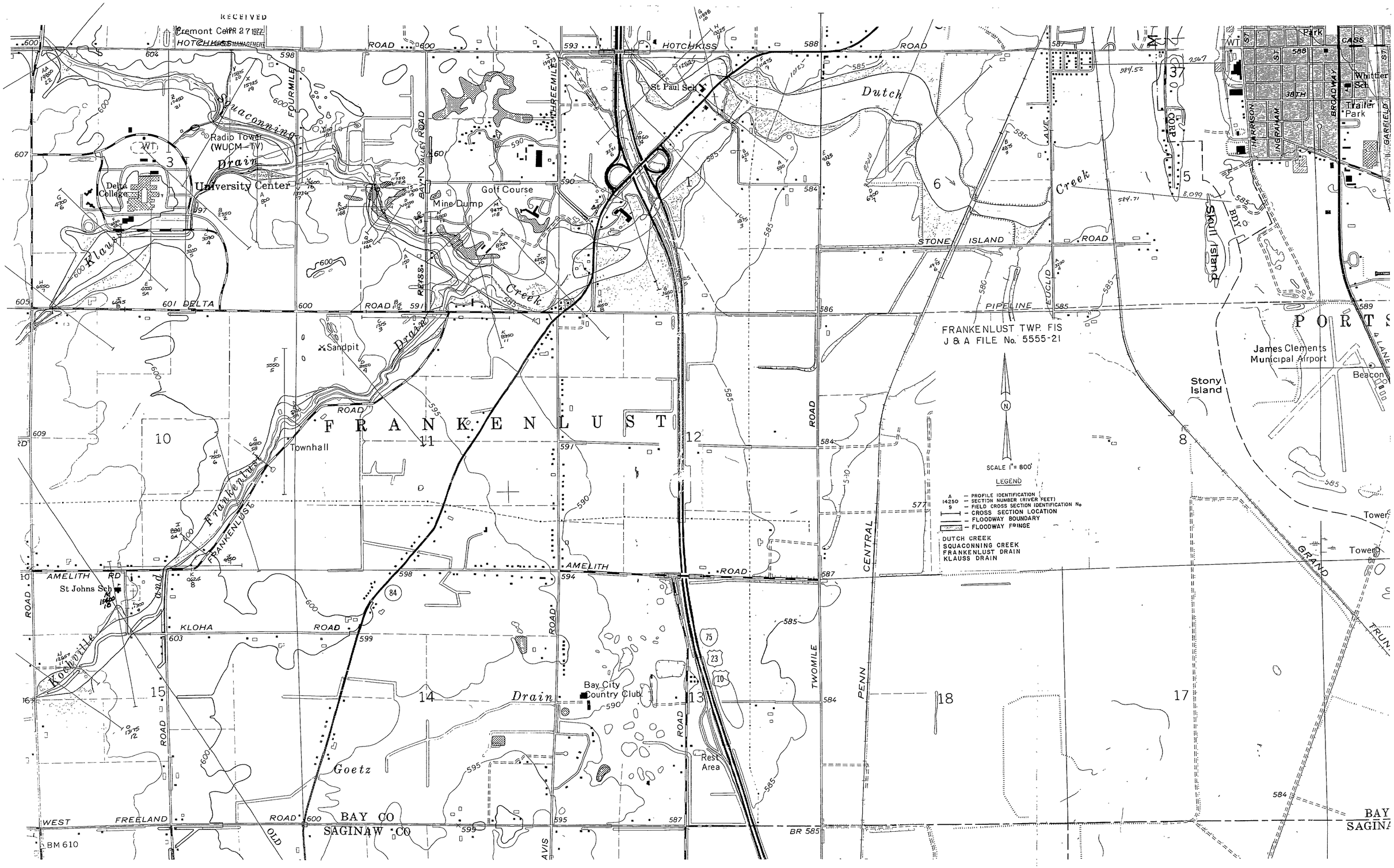
LSo = 0.1



Q	HEADWATER ANALYSIS									FINAL HW EGL	FINAL HW ELEV. EGL.	FINAL HW ELEV.
	INLET CONT.		OUTLET CONT. HW = H + ho − LSo					HEC-2				
	$\frac{HW}{D}$	HW	H	dc	$\frac{dc+D}{2}$	ho	HW	$D+(1+Ke)\frac{V^2}{2g}$	HW			
1050	1.02	9.69	3.3	5.75	7.63	8.49	11.69	11.51	9.53	11.69	598.19	597.52

CALCULATIONS AND COMMENTS

$R = A/P = 113/40 = 2.83$ $\quad Q = VA = V = \frac{Q}{A} = \frac{1050}{113} = 9.29$


RECEIVED
APR 27 1972
Fremont Corp
HOTCHKISS
ROAD
Saucaonning
Drain
Radio Tower
(WUCM-TV)
Delta College
University Center
Klauss
Creek
Golf Course
Mine Dump
BAY VALLEY ROAD
FOURMILE
FREEMILES
St Paul Sch
Dutch
Creek
STONE ISLAND ROAD
PIPELINE
EUCLID
Skull Island
Park
CASS
Whittier Sch
Trailer Park
BROADWAY
GARFIELD
HARRISON
INGRAHAM
38TH
ST
CORP
DELTA
Sandpit
Drain
Townhall
F R A N K E N L U S T
Frankenlust
FRANKENLUST
Kochville
AMELITH RD
St Johns Sch
KLOHA
ROAD
Bay City
Country Club
Drain
Goetz
Rest
Area
WEST
FREELAND
BAY CO
SAGINAW CO
OLD
AVIS
TWOMILE
PENN
CENTRAL
FRANKENLUST TWP. FIS
J & A FILE No. 5555-21
SCALE 1" = 800'
LEGEND
A — PROFILE IDENTIFICATION
14250 — SECTION NUMBER (RIVER FEET)
9 — FIELD CROSS SECTION IDENTIFICATION No
— CROSS SECTION LOCATION
— FLOODWAY BOUNDARY
— FLOODWAY FRINGE
DUTCH CREEK
SQUACONNING CREEK
FRANKENLUST DRAIN
KLAUSS DRAIN
James Clements
Municipal Airport
Beacon
Stony
Island
Tower
Tower
GRAND
TRUN
BAY
SAGINA
BM 610

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Frankenlust Twp

3) WATERCOURSE: Squaconning Creek - Secondary

4) DOCUMENT TYPE: 100- + 500-Year Flows

00BREAK00

```
$$$$$$$$  $$$$$$$      $$     $$$$$$$$   $$$$$ $  $$$$$$$$   $$$$$$
$$        $$    $$    $$$$       $$     $$    $      $$     $$    $$
$$        $$    $$   $$  $$      $$     $$   $$$      $$           $$
$$$$$     $$    $$  $$    $$     $$     $$  $ $$      $$        $$$$
$$        $$    $$  $$    $$     $$     $$ $$ $$      $$        $$
$$        $$$$$$$   $$$$$$$$     $$     $$ $  $$      $$        $$
$$        $$  $$    $$    $$     $$     $$$   $$      $$        $$
$$        $$   $$   $$    $$  $$ $$      $    $$   $$ $$        $$
$$        $$    $$  $$    $$   $$$      $ $$$$$    $$$        $$$$$$$$
```

TOWNSHIP OF FRANKENLUST FIS

J&A FILE NO. 5555-21

SQUACONNING CREEK
(SECONDARY CHANNEL)
100-500-YR. FLOWS
REVISED HEC-2
ADD .25' DUE TO DATUM DIFFERENCE !

1.58

SEP 15 '77

9-19-77

```
*****************************************
HEC2 VERSION UPDATED JAN 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09
MODIFICATIONS 52,53,54,55,56,57,58
*****************************************


T1      FRANKENLUST TWP. FIS J&A FILE NO. 5555-21
T2      ISLAND FLOW PROBLEM AT M-84, SOUTH CHANNEL
T3      SQUACONNING CREEK

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.        2.        0.        0.  0.00000     0.00      0.0       0.   586.312    0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000

NC      .060      .060      .030      .300      .500     0.000     0.000     0.000     0.000     0.000
QT     4.000  2745.000  3555.000  3555.000  3555.000     0.000     0.000     0.000     0.000     0.000

X1     0.000    45.000  1500.000  1750.000     0.000     0.000     0.000     0.000     -.100     0.000
X3    10.000     0.000     0.000  1475.000     0.000  2375.000     0.000     0.000     0.000     0.000
GR   587.500     0.000   586.900   100.000   586.800   200.000   586.600   300.000   586.600   400.000
GR   586.400   500.000   585.700   600.000   585.600   700.000   586.300   800.000   590.000   873.000
GR   588.600   900.000   588.000  1000.000   587.300  1100.000   585.700  1200.000   584.300  1300.000
GR   583.600  1400.000   582.900  1500.000   581.200  1505.000   580.600  1520.000   580.700  1540.000
GR   580.300  1560.000   579.900  1580.000   579.600  1600.000   579.000  1620.000   578.700  1640.000
GR   578.500  1660.000   578.200  1680.000   577.900  1700.000   578.600  1720.000   580.700  1735.000
GR   582.100  1750.000   583.700  1800.000   584.200  1900.000   585.100  2000.000   585.700  2100.000
GR   585.000  2200.000   584.700  2300.000   584.700  2400.000   584.100  2500.000   584.200  2600.000
GR   585.300  2700.000   585.800  2800.000   585.700  2900.000   585.800  3000.000   585.800  3100.000
NC      .060      .060      .060     0.000     0.000     0.000     0.000     0.000     0.000     0.000
QT     4.000   290.000   960.000   960.000  1050.000     0.000     0.000     0.000     0.000     0.000

X1   450.000    45.000  2175.000  2450.000   450.000   450.000   450.000     0.000      .200     0.000
X3    10.000     0.000     0.000  2175.000     0.000  2450.000     0.000     0.000     0.000     0.000
GR   587.500     0.000   586.900   100.000   586.800   200.000   586.600   300.000   586.600   400.000
GR   586.400   500.000   585.700   600.000   585.600   700.000   586.300   800.000   590.000   873.000
GR   588.600   900.000   588.000  1000.000   587.300  1100.000   585.700  1200.000   584.300  1300.000
GR   583.600  1400.000   582.900  1500.000   580.700  1505.000   580.100  1520.000   580.200  1540.000
GR   579.800  1560.000   579.400  1580.000   579.100  1600.000   578.500  1620.000   578.200  1640.000
GR   578.000  1660.000   577.700  1680.000   577.400  1700.000   578.100  1720.000   580.200  1735.000
GR   582.100  1750.000   583.700  1800.000   600.000  1800.000   600.000  2175.000   585.200  2175.000
GR   585.000  2200.000   584.700  2300.000   584.700  2400.000   584.100  2500.000   584.200  2600.000
GR   585.300  2700.000   585.800  2800.000   585.700  2900.000   585.800  3000.000   585.800  3100.000

X1   675.000     0.000     0.000     0.000   225.000   225.000   225.000     0.000     0.000     0.000
X3    10.000     0.000     0.000  2175.000     0.000  2425.000     0.000     0.000     0.000     0.000

X1   900.000    35.000  2094.000  2344.000   225.000   225.000   225.000     0.000     0.000     0.000
X3    10.000     0.000     0.000  2094.000     0.000  2344.000     0.000     0.000     0.000     0.000
GR   589.100     0.000   588.300    36.000   581.800    64.000   581.900   316.000   585.400   326.000
GR   588.000   364.000   587.900   464.000   587.500   564.000   588.600   664.000   587.600   764.000
GR   589.500   864.000   588.000   964.000   587.000  1064.000   585.800  1164.000   583.400  1239.000
GR   581.400  1264.000   580.400  1284.000   580.500  1304.000   580.500  1324.000   580.000  1344.000
GR   579.000  1364.000   577.700  1384.000   577.500  1404.000   577.800  1425.000   578.700  1444.000
GR   600.000  1444.000   600.000  2094.000   585.100  2094.000   585.300  2164.000   586.300  2264.000
GR   585.100  2364.000   585.200  2464.000   585.800  2564.000   585.500  2664.000   586.200  2764.000

X1   950.000    34.000  1600.000  1850.000    50.000    50.000    50.000     0.000     0.000     0.000
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X3	10.000	0.000	0.000	1600.000	0.000	1850.000	0.000	0.000	0.000	0.000
GR	593.800	0.000	591.500	100.000	589.900	200.000	588.900	300.000	588.400	400.000
GR	588.300	500.000	588.600	600.000	588.800	700.000	588.900	800.000	587.900	884.000
GR	581.600	891.000	578.700	900.000	577.300	908.000	576.300	916.000	575.800	924.000
GR	576.300	932.000	576.700	940.500	581.100	953.000	582.000	1000.000	584.200	1129.000
GR	585.000	1200.000	585.000	1250.000	585.000	1300.000	585.000	1400.000	585.000	1500.000
GR	585.000	1600.000	585.000	1700.000	585.000	1800.000	585.000	1900.000	585.000	2000.000
GR	585.000	2100.000	585.000	2200.000	585.000	2300.000	585.000	2400.000	0.000	0.000
SB	0.000	10.000	2.500	0.000	.100	0.000	.100	0.000	575.800	575.800
X1	997.000	0.000	0.000	0.000	47.000	47.000	47.000	0.000	0.000	0.000
X2	0.000	0.000	1.000	0.000	586.900	0.000	0.000	0.000	0.000	0.000
X3	10.000	0.000	0.000	1600.000	0.000	1850.000	0.000	0.000	0.000	0.000
BT	4.000	1600.000	587.700	0.000	1700.000	587.200	0.000	1800.000	586.900	0.000
BT	1850.000	586.900	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	.040	.065	.065	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	1050.000	44.000	2445.000	2695.000	53.000	53.000	53.000	0.000	-1.900	0.000
X3	10.000	0.000	0.000	2445.000	0.000	2695.000	0.000	0.000	0.000	0.000
GR	590.800	0.000	589.800	100.000	589.900	200.000	588.800	300.000	586.200	335.000
GR	586.200	485.000	590.100	500.000	588.500	600.000	588.500	700.000	589.000	800.000
GR	589.900	900.000	589.000	1000.000	589.000	1100.000	588.800	1200.000	587.500	1300.000
GR	587.000	1400.000	585.500	1500.000	582.300	1600.000	581.500	1620.000	581.000	1640.000
GR	580.100	1660.000	578.000	1680.000	578.100	1700.000	580.000	1720.000	580.000	1726.000
GR	582.600	1727.000	584.100	1740.000	581.500	1745.000	581.100	1800.000	583.700	1840.000
GR	583.700	1900.000	583.900	1920.000	600.000	1920.000	600.000	2136.000	600.000	2200.000
GR	600.000	2445.000	586.500	2445.000	586.200	2500.000	585.300	2600.000	585.000	2700.000
GR	584.400	2800.000	585.300	2900.000	585.300	3000.000	585.400	3100.000	0.000	0.000
X1	1180.000	44.000	2610.000	2835.000	130.000	130.000	130.000	0.000	-1.300	0.000
X3	10.000	0.000	0.000	2610.000	0.000	2835.000	0.000	0.000	0.000	0.000
GR	590.800	0.000	589.800	100.000	589.900	200.000	588.800	300.000	586.200	335.000
GR	586.200	485.000	590.100	500.000	588.500	600.000	588.500	700.000	589.000	800.000
GR	589.900	900.000	589.000	1000.000	589.000	1100.000	588.800	1200.000	587.500	1300.000
GR	587.000	1400.000	585.500	1500.000	582.300	1600.000	581.500	1620.000	581.000	1640.000
GR	580.100	1660.000	578.000	1680.000	578.100	1700.000	580.000	1720.000	580.000	1726.000
GR	582.600	1727.000	584.100	1740.000	581.500	1745.000	581.100	1800.000	583.700	1840.000
GR	583.700	1900.000	584.700	2000.000	585.800	2100.000	586.200	2110.000	600.000	2110.000
GR	600.000	2300.000	600.000	2400.000	600.000	2610.000	585.300	2610.000	585.000	2700.000
GR	584.400	2800.000	585.300	2900.000	585.300	3000.000	585.400	3100.000	0.000	0.000
X1	1310.000	44.000	2000.000	2250.000	130.000	130.000	130.000	0.000	-.600	0.000
X3	10.000	0.000	0.000	2000.000	0.000	2250.000	0.000	0.000	0.000	0.000
GR	590.800	0.000	589.800	100.000	589.900	200.000	588.800	300.000	586.200	335.000
GR	586.200	485.000	590.100	500.000	588.500	600.000	588.500	700.000	589.000	800.000
GR	589.900	900.000	589.000	1000.000	589.000	1100.000	588.800	1200.000	587.500	1300.000
GR	587.000	1400.000	585.500	1500.000	582.300	1600.000	581.500	1620.000	581.000	1640.000
GR	580.100	1660.000	578.000	1680.000	578.100	1700.000	580.000	1720.000	580.000	1726.000
GR	582.600	1727.000	584.100	1740.000	581.500	1745.000	581.100	1800.000	600.000	1800.000
GR	600.000	2000.000	583.700	2000.000	584.800	2100.000	586.100	2136.000	584.700	2200.000
GR	584.800	2300.000	586.700	2400.000	586.200	2500.000	585.300	2600.000	585.000	2700.000
GR	584.400	2800.000	585.300	2900.000	585.300	3000.000	585.400	3100.000	0.000	0.000
QT	4.000	2745.000	3555.000	3555.000	3555.000	0.000	0.000	0.000	0.000	0.000
NC	.040	.065	.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	1353.000	44.000	1500.000	1727.000	43.000	43.000	43.000	0.000	-.400	0.000
X3	10.000	0.000	0.000	950.000	0.000	2000.000	0.000	0.000	0.000	0.000
GR	590.800	0.000	589.800	100.000	589.900	200.000	588.800	300.000	586.200	335.000
GR	586.200	485.000	590.100	500.000	588.500	600.000	588.500	700.000	589.000	800.000
GR	589.900	900.000	589.000	1000.000	589.000	1100.000	588.800	1200.000	587.500	1300.000
GR	587.000	1400.000	585.500	1500.000	582.300	1600.000	581.500	1620.000	581.000	1640.000
GR	580.100	1660.000	578.000	1680.000	578.100	1700.000	580.000	1720.000	580.000	1726.000
GR	582.600	1727.000	584.100	1740.000	581.500	1745.000	581.100	1800.000	583.700	1840.000
GR	583.700	1900.000	584.700	2000.000	585.800	2100.000	587.100	2136.000	585.700	2200.000
GR	585.800	2300.000	586.700	2400.000	586.200	2500.000	585.300	2600.000	585.000	2700.000
GR	584.400	2800.000	585.300	2900.000	585.300	3000.000	585.400	3100.000	0.000	0.000

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EJ      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000      0.000

CCHV=    .300 CEHV=    .500
3280 CROSS SECTION      0.00 EXTENDED       .51 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=    1475.0    2375.0  TYPE=     1  TARGET=     900.000
      0.00      8.51    586.31      0.00    586.31    586.34       .03      0.00      0.00    582.80
     2745.       37.     2377.      330.       86.     1716.     1090.        0.        0.    582.00
      0.00       .44      1.39       .30      .060      .030      .060     0.000    577.80   1475.00
   .000060        0.        0.        0.         0         0         1      0.00    900.00   2375.00

3280 CROSS SECTION    450.00 EXTENDED       .57 FEET

3470 ENCROACHMENT STATIONS=    2175.0    2450.0  TYPE=     1  TARGET=     275.000
OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      600.20 ELREA=   100000.20

    450.00      1.77    586.37      0.00      0.00    586.37       .01       .03       .01    600.20
     290.        0.      290.        0.        0.      385.        0.       17.        6. 100000.20
      .17       0.00       .75      0.00      .060      .060      .060      .060    584.60   2175.00
   .000596      450.      450.      450.         2         0         1      0.00    275.00   2450.00

3280 CROSS SECTION    675.00 EXTENDED       .70 FEET

3470 ENCROACHMENT STATIONS=    2175.0    2425.0  TYPE=     1  TARGET=     250.000
OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      600.20 ELREA=   100000.00

    675.00      1.75    586.50      0.00      0.00    586.51       .01       .13       .00    600.20
     290.        0.      290.        0.        0.      376.        0.       19.        7. 100000.00
      .25       0.00       .77      0.00      .060      .060      .060      .060    584.75   2175.00
   .000572      225.      225.      225.         2         0         1      0.00    250.00   2425.00

3280 CROSS SECTION    900.00 EXTENDED       .50 FEET

3470 ENCROACHMENT STATIONS=    2094.0    2344.0  TYPE=     1  TARGET=     250.000
OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      600.00 ELREA=   100000.00

    900.00      1.60    586.70      0.00      0.00    586.72       .02       .21       .00    600.00
     290.        0.      290.        0.        0.      266.        0.       21.        9. 100000.00
      .30       0.00      1.09      0.00      .060      .060      .060      .060    585.10   2094.00
   .001811      225.      225.      225.         2         0         1      0.00    250.00   2344.00

3280 CROSS SECTION    950.00 EXTENDED      1.76 FEET
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3470 ENCROACHMENT STATIONS= 1600.0 1850.0 TYPE= 1 TARGET= 250.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 585.00 ELREA= 100000.00

950.00	1.75	586.75	0.00	0.00	586.76	.01	.03	.00	585.00
290.	0.	290.	0.	0.	439.	0.	21.	9.	100000.00
.33	0.00	.66	0.00	.060	.060	.060	.060	585.00	1600.00
.000342	50.	50.	50.	1	0	1	0.00	250.00	1850.00

SPECIAL BRIDGE

SB	XK	XKOR	COEQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	10.00	2.50	0.00	.10	0.00	.10	0.00	575.80	575.80

3280 CROSS SECTION 997.00 EXTENDED 2.76 FEET

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	ELLC	ELTRD	CLASS

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306487.37    586.02      0.00      290.        0.        0.      0.00    586.90     30.00

3470 ENCROACHMENT STATIONS=     1600.0     1850.0  TYPE=      1  TARGET=      250.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      585.00 ELREA=   100000.00

   997.00      2.75   587.75      0.00      0.00   587.76       .00      1.00      0.00    585.00
    290.        0.     290.        0.        0.     689.        0.       22.        9. 100000.00
     .36       0.00     .42       0.00      .060     .060      .060      .060    585.00   1600.00
 .000077       47.      47.       47.        0         0        19      0.00    250.00   1850.00

3280 CROSS SECTION   1050.00 EXTENDED      2.37 FEET

3470 ENCROACHMENT STATIONS=     2445.0     2695.0  TYPE=      1  TARGET=      250.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      598.10 ELREA=    99998.10

  1050.00      4.64   587.76      0.00      0.00   587.76       .00       .00       .00    598.10
    290.        0.     290.        0.        0.    1003.        0.       23.       10.  99998.10
     .41       0.00     .29       0.00      .040     .065      .065      .060    583.12   2445.00
 .000026       53.      53.       53.        0         0         1      0.00    250.00   2695.00

3280 CROSS SECTION   1180.00 EXTENDED      2.37 FEET

3470 ENCROACHMENT STATIONS=     2610.0     2835.0  TYPE=      1  TARGET=      225.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      598.70 ELREA=    99998.70

  1180.00      4.66   587.76      0.00      0.00   587.76       .00       .00       .00    598.70
    290.        0.     290.        0.        0.     947.        0.       26.       10.  99998.70
     .53       0.00     .31       0.00      .040     .065      .065      .060    583.10   2610.00
 .000028      130.     130.      130.         1         0         1      0.00    225.00   2835.00

3280 CROSS SECTION   1310.00 EXTENDED      2.37 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=     2000.0     2250.0  TYPE=      1  TARGET=      250.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      599.40 ELREA=    99999.40

  1310.00      4.67   587.77      0.00      0.00   587.77       .00       .00       .00    599.40
    290.        0.     290.        0.        0.     890.        0.       28.       11.  99999.40
     .64       0.00     .33       0.00      .040     .065      .065      .061    583.10   2000.00
 .000039      130.     130.      130.         0         0         1      0.00    250.00   2250.00

3280 CROSS SECTION   1353.00 EXTENDED      2.37 FEET
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3470 ENCROACHMENT STATIONS=      950.0     2000.0  TYPE=      1  TARGET=     1050.000
  1353.00     10.16    587.76      0.00      0.00    587.78       .02       .00       .01    585.10
    2745.      111.     1919.      715.      300.     1465.     1362.       30.       11.    582.20
      .65       .37      1.31       .53      .040      .030      .065      .060    577.60   1248.74
  .000059       43.       43.       43.         1         0         1      0.00    751.26   2000.00
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*****************************************
HEC2 VERSION UPDATED JAN 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09
MODIFICATIONS 52,53,54,55,56,57,58
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T1       FRANKENLUST TWP. FIS J&A FILE NO. 5555-21
T2       ISLAND FLOW PROBLEM AT M-84. SOUTH CHANNEL
T3       SQUACONNING CREEK
J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
       0.        3.        0.        0.  0.000000     0.00      0.0       0.   588.259    0.000
J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE
     15.000     0.000    -1.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
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CCHV=     .300 CEHV=     .500
3280 CROSS SECTION       0.00 EXTENDED       2.46 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=     1475.0     2375.0  TYPE=      1  TARGET=      900.000
      0.00     10.46    588.26      0.00    588.26    588.28       .02      0.00      0.00    582.80
    3555.        59.     2690.      806.      134.     2202.     2307.        0.        0.    582.00
      0.00       .44      1.22       .35      .060      .030      .060     0.000    577.80   1475.00
  .000034        0.        0.        0.         0         0         1      0.00    900.00   2375.00

3280 CROSS SECTION     450.00 EXTENDED       2.47 FEET

3470 ENCROACHMENT STATIONS=     2175.0     2450.0  TYPE=      1  TARGET=      275.000
OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       600.20 ELREA=    100000.20

    450.00      3.68    588.28      0.00      0.00    588.30       .02       .02       .00    600.20
      960.        0.      960.        0.        0.      910.        0.       29.        6. 100000.20
       .12      0.00      1.05      0.00      .060      .060      .060      .060    584.60   2175.00
  .000379      450.      450.      450.         0         0         1      0.00    275.00   2450.00

3280 CROSS SECTION     675.00 EXTENDED       2.57 FEET

3470 ENCROACHMENT STATIONS=     2175.0     2425.0  TYPE=      1  TARGET=      250.000
OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       600.20 ELREA=    100000.00

    675.00      3.62    588.37      0.00      0.00    588.39       .02       .09       .00    600.20
      960.        0.      960.        0.        0.      844.        0.       33.        7. 100000.00
       .17      0.00      1.14      0.00      .060      .060      .060      .060    584.75   2175.00
  .000430      225.      225.      225.         2         0         1      0.00    250.00   2425.00

3280 CROSS SECTION     900.00 EXTENDED       2.29 FEET

3470 ENCROACHMENT STATIONS=     2094.0     2344.0  TYPE=      1  TARGET=      250.000
OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       600.00 ELREA=    100000.00

    900.00      3.39    588.49      0.00      0.00    588.52       .03       .13       .00    600.00
      960.        0.      960.        0.        0.      713.        0.       37.        9. 100000.00
       .22      0.00      1.35      0.00      .060      .060      .060      .060    585.10   2094.00
  .000755      225.      225.      225.         2         0         1      0.00    250.00   2344.00

3280 CROSS SECTION     950.00 EXTENDED       3.52 FEET
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SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

3470 ENCROACHMENT STATIONS=     1600.0     1850.0  TYPE=      1  TARGET=      250.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       585.00 ELREA=    100000.00

    950.00      3.53    588.53      0.00      0.00    588.55       .02       .03       .00    585.00
      960.        0.      960.        0.        0.     880.        0.       38.        9. 100000.00
       .23      0.00      1.09      0.00      .060      .060      .060      .060    585.00   1600.00
   .000375       50.       50.       50.         0         0         1      0.00    250.00   1850.00


SPECIAL BRIDGE

SB   XK        XKOR      COEQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
      0.00     10.00      2.50      0.00       .10      0.00       .10      0.00    575.80    575.80

3280 CROSS SECTION     997.00 EXTENDED      3.78 FEET


PRESSURE AND WEIR FLOW

  EGPRS     EGLWC     H3        QWEIR     QPR       BAREA     ELLC      ELTRD     CLASS

*********   586.23     0.00      960.        0.        0.      0.00    586.90     30.00


3470 ENCROACHMENT STATIONS=     1600.0     1850.0  TYPE=      1  TARGET=      250.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       585.00 ELREA=    100000.00

    997.00      3.77    588.77      0.00      0.00    588.79       .02       .24      0.00    585.00
      960.        0.      960.        0.        0.     944.        0.       39.        9. 100000.00
       .25      0.00      1.02      0.00      .060      .060      .060      .060    585.00   1600.00
   .000298       47.       47.       47.         1         0        18      0.00    250.00   1850.00


3280 CROSS SECTION    1050.00 EXTENDED      3.40 FEET


3470 ENCROACHMENT STATIONS=     2445.0     2695.0  TYPE=      1  TARGET=      250.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       598.10 ELREA=     99998.10

   1050.00      5.67    588.79      0.00      0.00    588.80       .01       .01       .00    598.10
      960.        0.      960.        0.        0.    1260.        0.       40.       10.  99998.10
       .26      0.00       .76      0.00      .040      .065      .065      .060    583.12   2445.00
   .000135       53.       53.       53.         0         0         1      0.00    250.00   2695.00


3280 CROSS SECTION    1180.00 EXTENDED      3.42 FEET


3470 ENCROACHMENT STATIONS=     2610.0     2835.0  TYPE=      1  TARGET=      225.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       598.70 ELREA=     99998.70
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1180.00      5.71    588.81      0.00      0.00    588.82       .01       .02       .00    598.70
   960.        0.      960.        0.        0.     1183.        0.       44.       10.  99998.70
    .31      0.00       .81      0.00      .040      .065      .065      .060    583.10   2610.00
 .000146     130.      130.      130.         1         0         1      0.00    225.00   2835.00

3280 CROSS SECTION    1310.00 EXTENDED       3.43 FEET

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

3470 ENCROACHMENT STATIONS=     2000.0    2250.0  TYPE=      1  TARGET=     250.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      599.40 ELREA=    99999.40

 1310.00      5.73    588.83      0.00      0.00    588.84       .01       .02       .00    599.40
   960.        0.      960.        0.        0.     1155.        0.       48.       11.  99999.40
    .35      0.00       .83      0.00      .040      .065      .065      .061    583.10   2000.00
 .000181     130.      130.      130.         0         0         1      0.00    250.00   2250.00

3280 CROSS SECTION    1353.00 EXTENDED       3.43 FEET

3470 ENCROACHMENT STATIONS=      950.0     2000.0  TYPE=      1  TARGET=    1050.000
 1353.00     11.23    588.83      0.00      0.00    588.85       .02       .00       .00    585.10
    3555.      288.     2341.      926.      665.     1708.     1654.       50.       12.    582.20
     .36       .43      1.37       .56      .040      .030      .065      .060    577.60    974.11
 .000053       43.       43.       43.         1         0         1      0.00   1025.89   2000.00
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SUMMARY PRINTOUT FOR MULTIPLE PROFILES

SQUACONNING CREEK

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	CRIWS	EG	TOPWID	10K*S	TIME	VOL
0.00	0.00	0.00	0.00	577.80	2745.00	586.31	0.00	586.34	900.00	.60	0.00	0.00
0.00	0.00	0.00	0.00	577.80	3555.00	588.26	0.00	588.28	900.00	.34	0.00	0.00
450.00	450.00	0.00	0.00	584.60	290.00	586.37	0.00	586.37	275.00	5.96	.17	16.92
450.00	450.00	0.00	0.00	584.60	960.00	588.28	0.00	588.30	275.00	3.79	.12	28.69
675.00	225.00	0.00	0.00	584.75	290.00	586.50	0.00	586.51	250.00	5.72	.25	18.89
675.00	225.00	0.00	0.00	584.75	960.00	588.37	0.00	588.39	250.00	4.30	.17	33.22
900.00	225.00	0.00	0.00	585.10	290.00	586.70	0.00	586.72	250.00	18.11	.30	20.55
900.00	225.00	0.00	0.00	585.10	960.00	588.49	0.00	588.52	250.00	7.55	.22	37.24
950.00	50.00	0.00	0.00	585.00	290.00	586.75	0.00	586.76	250.00	3.42	.33	20.95
950.00	50.00	0.00	0.00	585.00	960.00	588.53	0.00	588.55	250.00	3.75	.23	38.16
997.00	47.00	586.90	0.00	585.00	290.00	587.75	0.00	587.76	250.00	.77	.36	21.56
997.00	47.00	586.90	0.00	585.00	960.00	588.77	0.00	588.79	250.00	2.98	.25	39.14
1050.00	53.00	0.00	0.00	583.11	290.00	587.76	0.00	587.76	250.00	.26	.41	22.59
1050.00	53.00	0.00	0.00	583.11	960.00	588.79	0.00	588.80	250.00	1.35	.26	40.48
1180.00	130.00	0.00	0.00	583.10	290.00	587.76	0.00	587.76	225.00	.28	.53	25.50
1180.00	130.00	0.00	0.00	583.10	960.00	588.81	0.00	588.82	225.00	1.46	.31	44.13
1310.00	130.00	0.00	0.00	583.10	290.00	587.77	0.00	587.77	250.00	.39	.64	28.24
1310.00	130.00	0.00	0.00	583.10	960.00	588.83	0.00	588.84	250.00	1.81	.35	47.62
1353.00	43.00	0.00	0.00	577.60	2745.00	587.76	0.00	587.78	751.26	.59	.65	30.23
1353.00	43.00	0.00	0.00	577.60	3555.00	588.83	0.00	588.85	1025.89	.53	.36	50.17

SECTION NUMBER	DISCHARGE CFS	CWSEL	CWSEL DIFF EACH-0	CWSEL DIFF EACH SECTION	CWSEL-WSELK	TOPWID	T.W. DIFF	LENGTH
0.000	2745.000	586.312	0.000	0.000	0.000	899.999	0.000	0.000
0.000	3555.000	588.259	1.947	0.000	0.000	899.999	-.000	0.000
450.000	290.000	586.365	0.000	.053	0.000	274.999	0.000	450.000
450.000	960.000	588.281	1.915	.022	0.000	274.999	-.000	450.000
675.000	290.000	586.496	0.000	.131	0.000	249.999	0.000	225.000
675.000	960.000	588.370	1.874	.089	0.000	249.999	-.000	225.000
900.000	290.000	586.703	0.000	.206	0.000	249.999	0.000	225.000
900.000	960.000	588.492	1.789	.122	0.000	249.999	-.000	225.000
950.000	290.000	586.751	0.000	.048	0.000	249.999	0.000	50.000
950.000	960.000	588.530	1.779	.038	0.000	249.999	-.000	50.000
997.000	290.000	587.754	0.000	1.003	0.000	249.999	0.000	47.000
997.000	960.000	588.770	1.015	.239	0.000	249.999	-.000	47.000
1050.000	290.000	587.759	0.000	.004	0.000	249.999	0.000	53.000
1050.000	960.000	588.789	1.031	.019	0.000	249.999	-.000	53.000
1180.000	290.000	587.762	0.000	.003	0.000	224.999	0.000	130.000
1180.000	960.000	588.807	1.045	.018	0.000	224.999	-.000	130.000

1310.000	290.000	587.766	0.000	.004	0.000	249.999	0.000	130.000
1310.000	960.000	588.828	1.062	.021	0.000	249.999	-.000	130.000
1353.000	2745.000	587.759	0.000	-.007	0.000	751.261	0.000	43.000
1353.000	3555.000	588.825	1.066	-.002	0.000	1025.891	-274.630	43.000

DATA FOR LAST CROSS SECTION

PROFILE	TYPE ENC	TARGET	TOP WIDTH AREA-ACRES	TOP WIDTH AREA-DIFF
1	0.000	1050.000	11.489	0.000
2	0.000	1050.000	11.625	.136

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Frankenlust Twp

3) WATERCOURSE: Squaconning Creek - Island

4) DOCUMENT TYPE: 100-YEAR & 500-YEAR SOUTH CHANNEL

00BREAK00

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$$$$$$$$  $$$$$$$      $$     $$$$$$$$   $$$$$ $   $$$$$$   $$$$$$$$
$$        $$    $$    $$$$       $$     $$     $   $$    $$     $$
$$        $$    $$  $$   $$      $$     $$    $$$  $$    $$     $$
$$$$$     $$    $$  $$    $$      $$     $$   $ $$  $$    $$     $$
$$        $$    $$  $$    $$      $$     $$ $$ $$  $$    $$     $$
$$        $$$$$$$   $$$$$$$$      $$     $$ $  $$   $$$$$$$     $$
$$        $$   $$   $$    $$      $$     $$$   $$        $$     $$
$$        $$   $$   $$    $$  $$ $$      $    $$  $$    $$     $$
$$        $$    $$  $$    $$   $$$      $ $$$$$    $$$$$$   $$$$$$$$
FRAJ09I  JANDA              04/21/77  09.02.25  7600   JO
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TOWNSHIP OF FRANKENLUST FIS

J&A FILE NO. 5555-21

SQUACONNING CREEK

ISLAND PROBLEM AT M-84

SOUTH CHANNEL, 100 & 500 YR.

HEC-2 OUTPUT

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*****************************************
HEC2 VERSION UPDATED JAN 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09
MODIFICATIONS 52,53,54,55,56,57,58
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T1      FRANKENLUST TWP. FIS J&A FILE NO. 5555-21
T2      ISLAND FLOW PROBLEM AT M-84, SOUTH CHANNEL
T3      SQUACONNING CREEK

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
      -0.       2.       -0.       -0. -0.000000     -0.00      -0.0      -0.    586.279   -0.000

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

NC      .060      .060      .030      .300      .500     -0.000     -0.000     -0.000     -0.000     -0.000
QT     4.000  2745.000  3555.000  3555.000  3555.000     -0.000     -0.000     -0.000     -0.000     -0.000

X1     0.000    45.000  1500.000  1750.000    -0.000     -0.000     -0.000     -0.000     -.100     -0.000
X3    10.000    -0.000    -0.000  1475.000    -0.000  2375.000     -0.000     -0.000     -0.000     -0.000
GR   587.500     0.000   586.900   100.000   586.800   200.000    586.600    300.000    586.600    400.000
GR   586.400   500.000   585.700   600.000   585.600   700.000    586.300    800.000    590.000    873.000
GR   588.600   900.000   588.000  1000.000   587.300  1100.000    585.700   1200.000    584.300   1300.000
GR   583.600  1400.000   582.900  1500.000   581.200  1505.000    580.600   1520.000    580.700   1540.000
GR   580.300  1560.000   579.900  1580.000   579.600  1600.000    579.000   1620.000    578.700   1640.000
GR   578.500  1660.000   578.200  1680.000   577.900  1700.000    578.600   1720.000    580.700   1735.000
GR   582.100  1750.000   583.700  1800.000   584.200  1900.000    585.100   2000.000    585.700   2100.000
GR   585.000  2200.000   584.700  2300.000   584.700  2400.000    584.100   2500.000    584.200   2600.000
GR   585.300  2700.000   585.800  2800.000   585.700  2900.000    585.800   3000.000    585.800   3100.000
NC      .060      .060      .060     -0.000     -0.000     -0.000     -0.000     -0.000     -0.000     -0.000
QT     4.000   290.000   960.000   960.000  1050.000     -0.000     -0.000     -0.000     -0.000     -0.000

X1   450.000    45.000  2175.000  2450.000   450.000   450.000    450.000     -0.000      .200     -0.000
X3    10.000    -0.000    -0.000  2175.000    -0.000  2450.000     -0.000     -0.000     -0.000     -0.000
GR   587.500     0.000   586.900   100.000   586.800   200.000    586.600    300.000    586.600    400.000
GR   586.400   500.000   585.700   600.000   585.600   700.000    586.300    800.000    590.000    873.000
GR   588.600   900.000   588.000  1000.000   587.300  1100.000    585.700   1200.000    584.300   1300.000
GR   583.600  1400.000   582.900  1500.000   580.700  1505.000    580.100   1520.000    580.200   1540.000
GR   579.800  1560.000   579.400  1580.000   579.100  1600.000    578.500   1620.000    578.200   1640.000
GR   578.000  1660.000   577.700  1680.000   577.400  1700.000    578.100   1720.000    580.200   1735.000
GR   582.100  1750.000   583.700  1800.000   600.000  1800.000    600.000   2175.000    585.200   2175.000
GR   585.000  2200.000   584.700  2300.000   584.700  2400.000    584.100   2500.000    584.200   2600.000
GR   585.300  2700.000   585.800  2800.000   585.700  2900.000    585.800   3000.000    585.800   3100.000

X1   675.000    -0.000    -0.000    -0.000   225.000   225.000    225.000     -0.000     -0.000     -0.000
X3    10.000    -0.000    -0.000  2175.000    -0.000  2425.000     -0.000     -0.000     -0.000     -0.000

X1   900.000    35.000  2094.000  2344.000   225.000   225.000    225.000     -0.000     -0.000     -0.000
X3    10.000    -0.000    -0.000  2094.000    -0.000  2344.000     -0.000     -0.000     -0.000     -0.000
GR   589.100     0.000   588.300    36.000   581.800    64.000    581.900    316.000    585.400    326.000
GR   588.000   364.000   587.900   464.000   587.500   564.000    588.600    664.000    587.600    764.000
GR   589.500   864.000   588.000   964.000   587.000  1064.000    585.800   1164.000    583.400   1239.000
GR   581.400  1264.000   580.400  1284.000   580.500  1304.000    580.500   1324.000    580.000   1344.000
GR   579.000  1364.000   577.700  1384.000   577.500  1404.000    577.800   1425.000    578.700   1444.000
GR   600.000  1444.000   600.000  2094.000   585.100  2094.000    585.300   2164.000    586.300   2264.000
GR   585.100  2364.000   585.200  2464.000   585.800  2564.000    585.500   2664.000    586.200   2764.000

X1   950.000    34.000  1600.000  1850.000    50.000    50.000     50.000     -0.000     -0.000     -0.000
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X3	10.000	-0.000	-0.000	1600.000	-0.000	1850.000	-0.000	-0.000	-0.000	-0.000
GR	593.800	0.000	591.500	100.000	589.900	200.000	588.900	300.000	588.400	400.000
GR	588.300	500.000	588.600	600.000	588.800	700.000	588.900	800.000	587.900	884.000
GR	581.600	891.000	578.700	900.000	577.300	908.000	576.300	916.000	575.800	924.000
GR	576.300	932.000	576.700	940.500	581.100	953.000	582.000	1000.000	584.200	1129.000
GR	585.000	1200.000	585.000	1250.000	585.000	1300.000	585.000	1400.000	585.000	1500.000
GR	585.000	1600.000	585.000	1700.000	585.000	1800.000	585.000	1900.000	585.000	2000.000
GR	585.000	2100.000	585.000	2200.000	585.000	2300.000	585.000	2400.000	-0.000	-0.000
SB	-0.000	10.000	2.500	-0.000	.100	-0.000	.100	-0.000	575.800	575.800
X1	997.000	-0.000	-0.000	-0.000	47.000	47.000	47.000	-0.000	-0.000	-0.000
X2	-0.000	-0.000	1.000	-0.000	586.900	-0.000	-0.000	-0.000	-0.000	-0.000
X3	10.000	-0.000	-0.000	1600.000	-0.000	1850.000	-0.000	-0.000	-0.000	-0.000
BT	4.000	1600.000	587.700	0.000	1700.000	587.200	0.000	1800.000	586.900	0.000
BT	1850.000	586.900	0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
NC	.040	.065	.065	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
X1	1050.000	44.000	2445.000	2695.000	53.000	53.000	53.000	-0.000	-1.900	-0.000
X3	10.000	-0.000	-0.000	2445.000	-0.000	2695.000	-0.000	-0.000	-0.000	-0.000
GR	590.800	0.000	589.800	100.000	589.900	200.000	588.800	300.000	586.200	335.000
GR	586.200	485.000	590.100	500.000	588.500	600.000	588.500	700.000	589.000	800.000
GR	589.900	900.000	589.000	1000.000	589.000	1100.000	588.800	1200.000	587.500	1300.000
GR	587.000	1400.000	585.500	1500.000	582.300	1600.000	581.500	1620.000	581.000	1640.000
GR	580.100	1660.000	578.000	1680.000	578.100	1700.000	580.000	1720.000	580.000	1726.000
GR	582.600	1727.000	584.100	1740.000	581.500	1745.000	581.100	1800.000	583.700	1840.000
GR	583.700	1900.000	583.900	1920.000	600.000	1920.000	600.000	2136.000	600.000	2200.000
GR	600.000	2445.000	586.500	2445.000	586.200	2500.000	585.300	2600.000	585.000	2700.000
GR	584.400	2800.000	585.300	2900.000	585.300	3000.000	585.400	3100.000	-0.000	-0.000
X1	1180.000	44.000	2610.000	2835.000	130.000	130.000	130.000	-0.000	-1.300	-0.000
X3	10.000	-0.000	-0.000	2610.000	-0.000	2835.000	-0.000	-0.000	-0.000	-0.000
GR	590.800	0.000	589.800	100.000	589.900	200.000	588.800	300.000	586.200	335.000
GR	586.200	485.000	590.100	500.000	588.500	600.000	588.500	700.000	589.000	800.000
GR	589.900	900.000	589.000	1000.000	589.000	1100.000	588.800	1200.000	587.500	1300.000
GR	587.000	1400.000	585.500	1500.000	582.300	1600.000	581.500	1620.000	581.000	1640.000
GR	580.100	1660.000	578.000	1680.000	578.100	1700.000	580.000	1720.000	580.000	1726.000
GR	582.600	1727.000	584.100	1740.000	581.500	1745.000	581.100	1800.000	583.700	1840.000
GR	583.700	1900.000	584.700	2000.000	585.800	2100.000	586.200	2110.000	600.000	2110.000
GR	600.000	2300.000	600.000	2400.000	600.000	2610.000	585.300	2610.000	585.000	2700.000
GR	584.400	2800.000	585.300	2900.000	585.300	3000.000	585.400	3100.000	-0.000	-0.000
X1	1310.000	44.000	2000.000	2250.000	130.000	130.000	130.000	-0.000	-.600	-0.000
X3	10.000	-0.000	-0.000	2000.000	-0.000	2250.000	-0.000	-0.000	-0.000	-0.000
GR	590.800	0.000	589.800	100.000	589.900	200.000	588.800	300.000	586.200	335.000
GR	586.200	485.000	590.100	500.000	588.500	600.000	588.500	700.000	589.000	800.000
GR	589.900	900.000	589.000	1000.000	589.000	1100.000	588.800	1200.000	587.500	1300.000
GR	587.000	1400.000	585.500	1500.000	582.300	1600.000	581.500	1620.000	581.000	1640.000
GR	580.100	1660.000	578.000	1680.000	578.100	1700.000	580.000	1720.000	580.000	1726.000
GR	582.600	1727.000	584.100	1740.000	581.500	1745.000	581.100	1800.000	600.000	1800.000
GR	600.000	2000.000	583.700	2000.000	584.800	2100.000	586.100	2136.000	584.700	2200.000
GR	584.800	2300.000	586.700	2400.000	586.200	2500.000	585.300	2600.000	585.000	2700.000
GR	584.400	2800.000	585.300	2900.000	585.300	3000.000	585.400	3100.000	-0.000	-0.000
QT	4.000	2745.000	3555.000	3555.000	3555.000	-0.000	-0.000	-0.000	-0.000	-0.000
NC	.040	.065	.030	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
X1	1353.000	44.000	1500.000	1727.000	43.000	43.000	43.000	-0.000	-.400	-0.000
X3	10.000	-0.000	-0.000	950.000	-0.000	2000.000	-0.000	-0.000	-0.000	-0.000
GR	590.800	0.000	589.800	100.000	589.900	200.000	588.800	300.000	586.200	335.000
GR	586.200	485.000	590.100	500.000	588.500	600.000	588.500	700.000	589.000	800.000
GR	589.900	900.000	589.000	1000.000	589.000	1100.000	588.800	1200.000	587.500	1300.000
GR	587.000	1400.000	585.500	1500.000	582.300	1600.000	581.500	1620.000	581.000	1640.000
GR	580.100	1660.000	578.000	1680.000	578.100	1700.000	580.000	1720.000	580.000	1726.000
GR	582.600	1727.000	584.100	1740.000	581.500	1745.000	581.100	1800.000	583.700	1840.000
GR	583.700	1900.000	584.700	2000.000	585.800	2100.000	587.100	2136.000	585.700	2200.000
GR	585.800	2300.000	586.700	2400.000	586.200	2500.000	585.300	2600.000	585.000	2700.000
GR	584.400	2800.000	585.300	2900.000	585.300	3000.000	585.400	3100.000	-0.000	-0.000

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EJ      -0.000      -0.000      -0.000      -0.000      -0.000      -0.000      -0.000      -0.000      -0.000      -0.000

CCHV=     .300 CEHV=     .500
3280 CROSS SECTION       0.00 EXTENDED        .48 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=     1475.0     2375.0  TYPE=      1  TARGET=      900.000
      0.00      8.48    586.28      0.00    586.28    586.31       .03      0.00      0.00    582.80
     2745.       37.     2384.      324.      85.     1707.     1069.        0.        0.    582.00
      0.00       .44      1.40       .30      .060      .030      .060     0.000    577.80   1475.00
   .000061       -0.       -0.       -0.         0         0         1      0.00    900.00   2375.00

3280 CROSS SECTION     450.00 EXTENDED        .53 FEET

3470 ENCROACHMENT STATIONS=     2175.0     2450.0  TYPE=      1  TARGET=      275.000
OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      600.20 ELREA=   100000.20

    450.00      1.73    586.33      0.00      0.00    586.34       .01       .03       .01    600.20
     290.        0.      290.        0.        0.      377.        0.       17.        6. 100000.20
       .16      0.00       .77      0.00      .060      .060      .060      .060    584.60   2175.00
   .000644      450.      450.      450.         2         0         1      0.00    275.00   2450.00

3280 CROSS SECTION     675.00 EXTENDED        .67 FEET

3470 ENCROACHMENT STATIONS=     2175.0     2425.0  TYPE=      1  TARGET=      250.000
OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      600.20 ELREA=   100000.00

    675.00      1.72    586.47      0.00      0.00    586.48       .01       .14       .00    600.20
     290.        0.      290.        0.        0.      370.        0.       19.        7. 100000.00
       .24      0.00       .78      0.00      .060      .060      .060      .060    584.75   2175.00
   .000602      225.      225.      225.         2         0         1      0.00    250.00   2425.00

3280 CROSS SECTION     900.00 EXTENDED        .49 FEET

3470 ENCROACHMENT STATIONS=     2094.0     2344.0  TYPE=      1  TARGET=      250.000
OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      600.00 ELREA=   100000.00

    900.00      1.59    586.69      0.00      0.00    586.71       .02       .22       .00    600.00
     290.        0.      290.        0.        0.      263.        0.       20.        9. 100000.00
       .30      0.00      1.10      0.00      .060      .060      .060      .060    585.10   2094.00
   .001888      225.      225.      225.         2         0         1      0.00    250.00   2344.00

3280 CROSS SECTION     950.00 EXTENDED       1.75 FEET
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Sta 3950

channel is ready. ROB flow. The LOB and ROB was redefined. n value same as 4400

SECNO	DEPTH	CWSEL	CRIWS	SELK	EG	HV	HL	VLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	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= 1600.0 1850.0 TYPE= 1 TARGET= 250.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 585.00 ELREA= 100000.00

950.00	1.74	586.74	0.00	0.00	586.75	.01	.03	.00	585.00
290.	0.	290.	0.	0.	436.	0.	21.	9.	100000.00
.32	0.00	.66	0.00	.060	.060	.060	.060	585.00	1600.00
.000349	50.	50.	50.	1	0	1	0.00	250.00	1850.00

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	-0.00	10.00	2.50	-0.00	.10	-0.00	.10	-0.00	575.80	575.80

3280 CROSS SECTION 997.00 EXTENDED 2.76 FEET

PRESSURE AND WEIR FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	ELLC	ELTRD	CLASS

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306487.36    586.02      0.00      290.        0.        0.     -0.00    586.90     30.00


3470 ENCROACHMENT STATIONS=    1600.0    1850.0  TYPE=     1  TARGET=     250.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      585.00 ELREA=   100000.00

   997.00     2.75   587.75      0.00      0.00   587.76       .00      1.01      0.00   585.00
      290.       0.     290.       0.        0.     689.        0.       21.        9. 100000.00
      .35     0.00      .42      0.00      .060     .060      .060      .060    585.00  1600.00
  .000077      47.      47.       47.         0        0        19      0.00    250.00  1850.00


3280 CROSS SECTION   1050.00 EXTENDED      2.37 FEET


3470 ENCROACHMENT STATIONS=    2445.0    2695.0  TYPE=     1  TARGET=     250.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      598.10 ELREA=    99998.10

  1050.00     4.64   587.76      0.00      0.00   587.76       .00       .00       .00   598.10
      290.       0.     290.       0.        0.    1003.        0.       22.       10.  99998.10
      .40     0.00      .29      0.00      .040     .065      .065      .060    583.12  2445.00
  .000026      53.      53.       53.         0        0         1      0.00    250.00  2695.00


3280 CROSS SECTION   1180.00 EXTENDED      2.37 FEET


3470 ENCROACHMENT STATIONS=    2610.0    2835.0  TYPE=     1  TARGET=     225.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      598.70 ELREA=    99998.70

  1180.00     4.66   587.76      0.00      0.00   587.76       .00       .00       .00   598.70
      290.       0.     290.       0.        0.     947.        0.       25.       10.  99998.70
      .52     0.00      .31      0.00      .040     .065      .065      .060    583.10  2610.00
  .000028     130.     130.      130.         1        0         1      0.00    225.00  2835.00


3280 CROSS SECTION   1310.00 EXTENDED      2.37 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=    2000.0    2250.0  TYPE=     1  TARGET=     250.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      599.40 ELREA=    99999.40

  1310.00     4.67   587.77      0.00      0.00   587.77       .00       .00       .00   599.40
      290.       0.     290.       0.        0.     890.        0.       28.       11.  99999.40
      .63     0.00      .33      0.00      .040     .065      .065      .061    583.10  2000.00
  .000039     130.     130.      130.         0        0         1      0.00    250.00  2250.00


3280 CROSS SECTION   1353.00 EXTENDED      2.37 FEET
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4647

≈ 4697

≈ 4847

3470 ENCROACHMENT STATIONS=			950.0	2000.0	TYPE=	1	TARGET=	1050.000	
1353.00	10.16	587.76	0.00	0.00	587.78	.02	.00	.01	585.10
2745.	111.	1919.	715.	300.	1465.	1362.	30.	11.	582.20
.64	.37	1.31	.52	.040	.030	.065	.060	577.60	1248.73
.000059	43.	43.	43.	1	0	1	0.00	751.26	2000.00

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*****************************************
HEC2 VERSION UPDATED JAN 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09
MODIFICATIONS 52,53,54,55,56,57,58
*****************************************


T1      FRANKENLUST TWP. FIS J&A FILE NO. 5555-21
T2      ISLAND FLOW PROBLEM AT M-84, SOUTH CHANNEL
T3      SQUACONNING CREEK

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
       -0.       3.       -0.       -0. -0.000000     -0.00      -0.0       -0.   588.238   -0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE
     15.000   -0.000    -1.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000
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CCHV=     .300 CEHV=     .500
3280 CROSS SECTION       0.00 EXTENDED       2.44 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      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

3470 ENCROACHMENT STATIONS=     1475.0     2375.0  TYPE=      1  TARGET=      900.000
     0.00     10.44    588.24      0.00    588.24    588.26       .02      0.00      0.00    582.80
    3555.       59.     2694.      802.      134.     2197.     2294.        0.        0.    582.00
     0.00       .44      1.23       .35      .060      .030      .060     0.000    577.80   1475.00
  .000034       -0.       -0.       -0.         0         0         1      0.00    900.00   2375.00

3280 CROSS SECTION     450.00 EXTENDED       2.45 FEET

3470 ENCROACHMENT STATIONS=     2175.0     2450.0  TYPE=      1  TARGET=      275.000
OVERBANK AREA ASSUMED NON-EFFECTIVE·ELLEA=      600.20 ELREA=   100000.20

   450.00      3.66    588.26      0.00      0.00    588.28       .02       .02       .00    600.20
     960.        0.      960.        0.        0.      905.        0.       29.        6. 100000.20
      .12      0.00      1.06      0.00      .060      .060      .060      .060    584.60   2175.00
  .000387      450.      450.      450.         0         0         1      0.00    275.00   2450.00

3280 CROSS SECTION     675.00 EXTENDED       2.55 FEET

3470 ENCROACHMENT STATIONS=     2175.0     2425.0  TYPE=      1  TARGET=      250.000
OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      600.20 ELREA=   100000.00

   675.00      3.60    588.35      0.00      0.00    588.37       .02       .09       .00    600.20
     960.        0.      960.        0.        0.      840.        0.       33.        7. 100000.00
      .17      0.00      1.14      0.00      .060      .060      .060      .060    584.75   2175.00
  .000439      225.      225.      225.         2         0         1      0.00    250.00   2425.00

3280 CROSS SECTION     900.00 EXTENDED       2.28 FEET

3470 ENCROACHMENT STATIONS=     2094.0     2344.0  TYPE=      1  TARGET=      250.000
OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      600.00 ELREA=   100000.00

   900.00      3.38    588.48      0.00      0.00    588.50       .03       .13       .00    600.00
     960.        0.      960.        0.        0.      709.        0.       37.        9. 100000.00
      .22      0.00      1.35      0.00      .060      .060      .060      .060    585.10   2094.00
  .000770      225.      225.      225.         2         0         1      0.00    250.00   2344.00

3280 CROSS SECTION     950.00 EXTENDED       3.51 FEET
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SECNO     DEPTH     C SEL     CRIT S    SELK      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=    1600.0    1850.0  TYPE=     1  TARGET=     250.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      585.00 ELREA=   100000.00

   950.00      3.51    588.51      0.00      0.00    588.53       .02       .03       .00    585.00
     960.        0.      960.        0.        0.     876.        0.       38.        9. 100000.00
      .23      0.00      1.10      0.00      .060      .060      .060      .060    585.00   1600.00
  .000381       50.       50.       50.         0         0         1      0.00    250.00   1850.00


SPECIAL BRIDGE

SB  XK        XKOR      COFQ     RDLEN      BWC      BWP      BAREA      SS       ELCHU     ELCHD
    -0.00     10.00      2.50     -0.00      .10     -0.00      .10     -0.00     575.80    575.80

3280 CROSS SECTION    997.00 EXTENDED      3.77 FEET

PRESSURE AND WEIR FLOW

  EGPRS     EGLWC       H3      QWEIR       QPR      BAREA      ELLC     ELTRD     CLASS

*********   586.23     0.00       959.        0.        0.     -0.00    586.90     30.00


3470 ENCROACHMENT STATIONS=    1600.0    1850.0  TYPE=     1  TARGET=     250.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      585.00 ELREA=   100000.00

   997.00      3.76    588.76      0.00      0.00    588.77       .02       .24       0.00    585.00
     960.        0.      960.        0.        0.     942.        0.       39.        9. 100000.00
      .24      0.00      1.02      0.00      .060      .060      .060      .060    585.00   1600.00
  .000301       47.       47.       47.         1         0        18      0.00    250.00   1850.00


3280 CROSS SECTION   1050.00 EXTENDED      3.38 FEET


3470 ENCROACHMENT STATIONS=    2445.0    2695.0  TYPE=     1  TARGET=     250.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      598.10 ELREA=    99998.10

  1050.00      5.66    588.78      0.00      0.00    588.79       .01       .01       .00    598.10
     960.        0.      960.        0.        0.    1257.        0.       40.       10.  99998.10
      .26      0.00       .76      0.00      .040      .065      .065      .060    583.12   2445.00
  .000136       53.       53.       53.         0         0         1      0.00    250.00   2695.00


3280 CROSS SECTION   1180.00 EXTENDED      3.40 FEET


3470 ENCROACHMENT STATIONS=    2610.0    2835.0  TYPE=     1  TARGET=     225.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      598.70 ELREA=    99998.70
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1180.00      5.70    588.80      0.00      0.00    588.81       .01       .02       .00    598.70
   960.        0.      960.        0.        0.     1180.        0.       44.       10.  99998.70
    .31      0.00       .81      0.00      .040      .065      .065      .060    583.10   2610.00
 .000147     130.      130.      130.         1         0         1      0.00    225.00   2835.00

3280 CROSS SECTION   1310.00 EXTENDED      3.42 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=    2000.0    2250.0  TYPE=     1  TARGET=     250.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      599.40 ELREA=    99999.40

1310.00      5.72    588.82      0.00      0.00    588.83       .01       .02       .00    599.40
   960.        0.      960.        0.        0.     1153.        0.       47.       11.  99999.40
    .35      0.00       .83      0.00      .040      .065      .065      .061    583.10   2000.00
 .000183     130.      130.      130.         0         0         1      0.00    250.00   2250.00

3280 CROSS SECTION   1353.00 EXTENDED      3.42 FEET

3470 ENCROACHMENT STATIONS=     950.0    2000.0  TYPE=     1  TARGET=    1050.000
1353.00     11.21    588.81      0.00      0.00    588.83       .02       .00       .01    585.10
  3555.       287.     2342.      926.      659.     1705.      1650.       50.       12.    582.20
    .36       .44      1.37       .56      .040      .030      .065      .060    577.60    975.36
 .000053      43.       43.       43.         1         0         1      0.00   1024.64   2000.00
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SUMMARY PRINTOUT FOR MULTIPLE PROFILES

SQUACONNING CREEK

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	CRIWS	EG	TOPWID	10K*S	TIME	VOL
0.00	0.00	0.00	0.00	577.80	2745.00	586.28	0.00	586.31	900.00	.61	0.00	0.00
0.00	0.00	0.00	0.00	577.80	3555.00	588.24	0.00	588.26	900.00	.34	0.00	0.00
450.00	450.00	0.00	0.00	584.60	290.00	586.33	0.00	586.34	275.00	6.44	.16	16.73
450.00	450.00	0.00	0.00	584.60	960.00	588.26	0.00	588.28	275.00	3.87	.12	28.56
675.00	225.00	0.00	0.00	584.75	290.00	586.47	0.00	586.48	250.00	6.02	.24	18.65
675.00	225.00	0.00	0.00	584.75	960.00	588.35	0.00	588.37	250.00	4.39	.17	33.06
900.00	225.00	0.00	0.00	585.10	290.00	586.69	0.00	586.71	250.00	18.88	.30	20.29
900.00	225.00	0.00	0.00	585.10	960.00	588.48	0.00	588.50	250.00	7.70	.22	37.06
950.00	50.00	0.00	0.00	585.00	290.00	586.74	0.00	586.75	250.00	3.49	.32	20.69
950.00	50.00	0.00	0.00	585.00	960.00	588.51	0.00	588.53	250.00	3.81	.23	37.97
997.00	47.00	586.90	0.00	585.00	290.00	587.75	0.00	587.76	250.00	.77	.35	21.30
997.00	47.00	586.90	0.00	585.00	960.00	588.76	0.00	588.77	250.00	3.01	.24	38.96
1050.00	53.00	0.00	0.00	583.11	290.00	587.76	0.00	587.76	250.00	.26	.40	22.33
1050.00	53.00	0.00	0.00	583.11	960.00	588.78	0.00	588.79	250.00	1.36	.26	40.29
1180.00	130.00	0.00	0.00	583.10	290.00	587.76	0.00	587.76	225.00	.28	.52	25.24
1180.00	130.00	0.00	0.00	583.10	960.00	588.80	0.00	588.81	225.00	1.47	.31	43.93
1310.00	130.00	0.00	0.00	583.10	290.00	587.77	0.00	587.77	250.00	.39	.63	27.98
1310.00	130.00	0.00	0.00	583.10	960.00	588.82	0.00	588.83	250.00	1.83	.35	47.41
1353.00	43.00	0.00	0.00	577.60	2745.00	587.76	0.00	587.78	751.26	.59	.64	29.96
1353.00	43.00	0.00	0.00	577.60	3555.00	588.81	0.00	588.83	1024.64	.53	.36	49.96

SECTION NUMBER	DISCHARGE CFS	CWSEL	CWSEL DIFF EACH Q	CWSEL DIFF EACH SECTION	CWSEL-WSELK	TOPWID	T.W. DIFF	LENGTH
0.000	2745.000	586.279	0.000	0.000	0.000	899.999	0.000	-0.000
0.000	3555.000	588.238	1.959	0.000	0.000	899.999	-.000	-0.000
450.000	290.000	586.333	0.000	.054	0.000	274.999	0.000	450.000
450.000	960.000	588.260	1.927	.022	0.000	274.999	-.000	450.000
675.000	290.000	586.473	0.000	.140	0.000	249.999	0.000	225.000
675.000	960.000	588.351	1.878	.091	0.000	249.999	-.000	225.000
900.000	290.000	586.690	0.000	.217	0.000	249.999	0.000	225.000
900.000	960.000	588.475	1.786	.124	0.000	249.999	-.000	225.000
950.000	290.000	586.739	0.000	.050	0.000	249.999	0.000	50.000
950.000	960.000	588.514	1.775	.039	0.000	249.999	-.000	50.000
997.000	290.000	587.754	0.000	1.015	0.000	249.999	0.000	47.000
997.000	960.000	588.758	1.004	.244	0.000	249.999	-.000	47.000
1050.000	290.000	587.759	0.000	.004	0.000	249.999	0.000	53.000
1050.000	960.000	588.777	1.019	.020	0.000	249.999	-.000	53.000
1180.000	290.000	587.762	0.000	.003	0.000	224.999	0.000	130.000
1180.000	960.000	588.795	1.033	.018	0.000	224.999	-.000	130.000

1310.000	290.000	587.766	0.000	.004	0.000	249.999	0.000	130.000
1310.000	960.000	588.816	1.050	.021	0.000	249.999	-.000	130.000
1353.000	2745.000	587.759	0.000	-.007	0.000	751.264	0.000	43.000
1353.000	3555.000	588.814	1.055	-.002	0.000	1024.641	-273.377	43.000

DATA FOR LAST CROSS SECTION

PROFILE	TYPE ENC	TARGET	TOP WIDTH AREA-ACRES	TOP WIDTH AREA-DIFF
1	0.000	1050.000	11.489	0.000
2	0.000	1050.000	11.624	.135

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Frankenlust Twp

3) WATERCOURSE: Squaconning Creek

4) DOCUMENT TYPE: Summary

00BREAK00

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$$$$$$$$  $$$$$$$      $$      $$$$$$$$   $$$$$ $  $$$$$$$$  $$$$$$$$
$$        $$    $$    $$$$        $$     $$    $   $$        $$
$$        $$    $$   $$  $$       $$     $$   $$$  $$        $$
$$$$$     $$    $$  $$    $$      $$     $$  $ $$  $$$$$$$    $$
$$        $$    $$  $$    $$      $$     $$ $$ $$        $$   $$
$$        $$$$$$$   $$$$$$$$      $$     $$ $  $$        $$   $$
$$        $$  $$    $$    $$      $$     $$$   $$        $$   $$
$$        $$   $$   $$    $$  $$ $$       $    $$  $$    $$   $$
$$        $$    $$  $$    $$   $$$       $ $$$$$    $$$$$$  $$$$$$$$
FRAJ05I   JANDA             09/14/77  14.56.53  7600    J0
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TOWNSHIP OF FRANKENLUST FIS

J&A FILE NO. 5555-21

SQUACONNING CREEK
10-50-100-500-YR. FLOWS
REVISED HEC-2
ADD .25' DUE TO DATUM DIFFERENCE !

9.56

SEP 14 '77

9-19-77

SUMMARY PRINTOUT FOR MULTIPLE PROFILES

SQUACONNING CREEK

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	HV	HL	OLOSS	QCH	DEPTH	TOPWID
0.00	0.00	0.00	0.00	576.70	1855.00	583.03	.03	0.00	0.00	1855.00	6.33	348.52
0.00	0.00	0.00	0.00	576.70	2460.00	583.53	.05	0.00	0.00	2460.00	6.83	354.30
0.00	0.00	0.00	0.00	576.70	2805.00	583.81	.05	0.00	0.00	2804.94	7.11	361.56
0.00	0.00	0.00	0.00	576.70	3620.00	584.46	.06	0.00	0.00	3616.40	7.76	391.73
400.00	400.00	0.00	0.00	576.00	1855.00	583.08	.09	.08	.03	1855.00	7.08	151.33
400.00	400.00	0.00	0.00	576.00	2460.00	583.59	.13	.10	.04	2459.56	7.59	161.46
400.00	400.00	0.00	0.00	576.00	2805.00	583.86	.15	.11	.05	2803.06	7.86	162.00
400.00	400.00	0.00	0.00	576.00	3620.00	584.51	.20	.12	.07	3610.81	8.51	162.00
550.00	150.00	0.00	0.00	575.80	1855.00	583.09	.18	.05	.05	1855.00	7.29	88.00
550.00	150.00	0.00	0.00	575.30	2460.00	583.59	.27	.07	.07	2460.00	7.79	88.00
550.00	150.00	0.00	0.00	575.80	2805.00	583.86	.32	.08	.09	2805.00	8.06	88.00
550.00	150.00	0.00	0.00	575.80	3620.00	584.48	.45	.10	.13	3620.00	8.68	88.00
585.00	35.00	0.00	0.00	575.30	1855.00	583.08	.23	.02	.03	1855.00	7.78	70.00
585.00	35.00	0.00	0.00	575.30	2460.00	583.57	.36	.03	.04	2460.00	8.27	70.00
585.00	35.00	0.00	0.00	575.30	2805.00	583.83	.43	.03	.06	2805.00	8.53	70.00
585.00	35.00	0.00	0.00	575.30	3620.00	584.43	.62	.04	.08	3620.00	9.13	70.00
624.00	39.00	0.00	0.00	574.80	1855.00	582.99	.49	.03	.13	1855.00	8.19	50.00
624.00	39.00	0.00	0.00	574.80	2460.00	583.42	.76	.05	.20	2460.00	8.62	50.00
624.00	39.00	0.00	0.00	574.80	2805.00	583.64	.92	.06	.25	2805.00	8.84	50.00
624.00	39.00	0.00	0.00	574.80	3620.00	584.14	1.34	.08	.36	3620.00	9.34	50.00
625.00	1.00	585.90	586.10	574.80	1855.00	582.98	.51	.00	.01	1855.00	8.18	49.20
625.00	1.00	585.90	586.10	574.80	2460.00	583.40	.80	.00	.02	2460.00	8.60	49.24
625.00	1.00	585.90	586.10	574.80	2805.00	583.62	.98	.00	.03	2805.00	8.82	49.26
625.00	1.00	585.90	586.10	574.80	3620.00	584.11	1.42	.00	.04	3620.00	9.31	49.31
665.00	40.00	585.90	586.10	574.80	1855.00	583.07	.50	.08	.00	1855.00	8.27	49.21
665.00	40.00	585.90	586.10	574.80	2460.00	583.55	.76	.11	.01	2460.00	8.75	49.26
665.00	40.00	585.90	586.10	574.80	2805.00	583.82	.92	.13	.02	2805.00	9.02	49.28
665.00	40.00	585.90	586.10	574.80	3620.00	584.44	1.31	.18	.03	3620.00	9.64	49.34
666.00	1.00	0.00	0.00	574.80	1855.00	583.11	.47	.00	.01	1855.00	8.31	50.00
666.00	1.00	0.00	0.00	574.80	2460.00	583.62	.71	.00	.02	2460.00	8.82	50.00
666.00	1.00	0.00	0.00	574.80	2805.00	583.90	.86	.00	.02	2805.00	9.10	50.00
666.00	1.00	0.00	0.00	574.80	3620.00	584.57	1.21	.00	.03	3620.00	9.77	50.00
668.00	2.00	0.00	0.00	574.80	1855.00	583.40	.25	.00	.07	1855.00	8.60	54.00
668.00	2.00	0.00	0.00	574.80	2460.00	584.06	.38	.00	.10	2460.00	9.26	54.00
668.00	2.00	0.00	0.00	574.80	2805.00	584.43	.45	.00	.12	2805.00	9.63	54.00
668.00	2.00	0.00	0.00	574.80	3620.00	585.32	.63	.00	.17	3620.00	10.52	54.00
671.00	3.00	0.00	0.00	574.80	1855.00	583.47	.20	.00	.02	1855.00	8.67	60.00
671.00	3.00	0.00	0.00	574.80	2460.00	584.16	.30	.00	.02	2460.00	9.36	60.00
671.00	3.00	0.00	0.00	574.80	2805.00	584.56	.36	.00	.03	2805.00	9.76	60.00
671.00	3.00	0.00	0.00	574.80	3620.00	585.50	.50	.00	.04	3620.00	10.70	60.00

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	HV	HL	OLOSS	QCH	DEPTH	TOPWID
696.00	25.00	0.00	0.00	574.90	1855.00	583.65	.06	.00	.04	1855.00	8.75	110.00
696.00	25.00	0.00	0.00	574.90	2460.00	584.45	.09	.01	.06	2460.00	9.55	110.00
696.00	25.00	0.00	0.00	574.90	2805.00	584.90	.10	.01	.08	2805.00	10.00	110.00
696.00	25.00	0.00	0.00	574.90	3620.00	585.97	.14	.01	.11	3620.00	11.07	110.00
756.00	60.00	0.00	0.00	575.00	1855.00	583.70	.02	.00	.01	1855.00	8.70	182.00
756.00	60.00	0.00	0.00	575.00	2460.00	584.52	.03	.00	.02	2460.00	9.52	182.00
756.00	60.00	0.00	0.00	575.00	2805.00	584.99	.04	.01	.02	2805.00	9.99	182.00
756.00	60.00	0.00	0.00	575.00	3620.00	586.09	.05	.01	.03	3620.00	11.09	182.00
801.00	45.00	0.00	0.00	575.10	1855.00	583.71	.02	.00	.00	1855.00	8.61	223.65
801.00	45.00	0.00	0.00	575.10	2460.00	584.53	.03	.00	.00	2460.00	9.43	224.30
801.00	45.00	0.00	0.00	575.10	2805.00	585.00	.03	.00	.00	2805.00	9.90	224.68
801.00	45.00	0.00	0.00	575.10	3620.00	586.11	.04	.00	.00	3620.00	11.01	225.00
1016.00	215.00	0.00	0.00	575.60	1855.00	583.72	.01	.01	.00	1833.83	8.12	323.27
1016.00	215.00	0.00	0.00	575.60	2460.00	584.55	.02	.01	.00	2424.74	8.95	323.92
1016.00	215.00	0.00	0.00	575.60	2805.00	585.02	.02	.01	.00	2760.58	9.42	324.30
1016.00	215.00	0.00	0.00	575.60	3620.00	586.14	.03	.01	.00	3551.22	10.54	325.00
1451.00	435.00	0.00	0.00	576.80	1855.00	583.73	.04	.02	.01	1849.97	6.93	249.11
1451.00	435.00	0.00	0.00	576.80	2460.00	584.56	.05	.02	.02	2437.94	7.76	288.51
1451.00	435.00	0.00	0.00	576.80	2805.00	585.03	.06	.02	.02	2764.25	8.23	338.54
1451.00	435.00	0.00	0.00	576.80	3620.00	586.14	.07	.03	.02	3477.51	9.34	1234.88
1875.00	424.00	0.00	0.00	578.00	1855.00	583.79	.03	.04	.00	1849.54	5.79	349.64
1875.00	424.00	0.00	0.00	578.00	2460.00	584.63	.04	.04	.01	2437.00	6.63	374.23
1875.00	424.00	0.00	0.00	578.00	2805.00	585.10	.04	.04	.01	2766.01	7.10	375.01
1875.00	424.00	0.00	0.00	578.00	3620.00	586.22	.04	.04	.01	3528.96	8.22	558.28
2400.00	525.00	0.00	0.00	577.10	1855.00	583.83	.03	.04	.00	1855.00	6.73	225.00
2400.00	525.00	0.00	0.00	577.10	2460.00	584.67	.04	.05	.00	2460.00	7.57	225.00
2400.00	525.00	0.00	0.00	577.10	2805.00	585.14	.04	.05	.00	2805.00	8.04	225.00
2400.00	525.00	0.00	0.00	577.10	3620.00	586.26	.05	.05	.00	3620.00	9.16	225.00
2775.00	375.00	0.00	0.00	576.50	1855.00	583.80	.20	.05	.09	1855.00	7.30	83.60
2775.00	375.00	0.00	0.00	576.50	2460.00	584.61	.28	.06	.12	2460.00	8.11	83.60
2775.00	375.00	0.00	0.00	576.50	2805.00	585.07	.32	.07	.14	2805.00	8.57	83.60
2775.00	375.00	0.00	0.00	576.50	3620.00	586.24	.21	.06	.08	2898.69	9.74	303.16
2860.00	85.00	588.80	585.20	576.50	1855.00	583.84	.22	.05	.01	1855.00	7.34	80.80
2860.00	85.00	588.80	585.20	576.50	2460.00	584.66	.30	.06	.01	2460.00	8.16	80.80
2860.00	85.00	588.80	585.20	576.50	2805.00	585.45	.31	.37	0.00	2805.00	8.95	83.60
2860.00	85.00	588.80	585.20	576.50	3620.00	587.04	.35	.94	0.00	3620.00	10.54	83.60
3025.00	165.00	0.00	0.00	577.70	1855.00	584.09	.07	.05	.05	1855.00	6.39	156.00
3025.00	165.00	0.00	0.00	577.70	2460.00	584.99	.09	.06	.06	2460.00	7.29	156.00
3025.00	165.00	0.00	0.00	577.70	2805.00	585.79	.09	.05	.07	2805.00	8.09	156.00
3025.00	165.00	0.00	0.00	577.70	3620.00	587.41	.10	.05	.08	3620.00	9.71	156.00

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	HV	HL	OLOSS	QCH	DEPTH	TOPWID
3170.00	145.00	0.00	0.00	576.40	1855.00	584.08	.15	.03	.04	1855.00	7.68	83.60
3170.00	145.00	0.00	0.00	576.40	2460.00	584.97	.21	.04	.06	2460.00	8.57	83.60
3170.00	145.00	0.00	0.00	576.40	2805.00	585.76	.22	.04	.07	2805.00	9.36	83.60
3170.00	145.00	0.00	0.00	576.40	3620.00	587.43	.11	.02	.00	2640.24	11.03	303.31
3231.00	61.00	588.10	585.60	576.40	1855.00	584.09	.16	.02	.01	1855.00	7.69	80.80
3231.00	61.00	588.10	585.60	576.40	2460.00	584.99	.22	.02	.01	2460.00	8.59	80.80
3231.00	61.00	588.10	585.60	576.40	2805.00	585.97	.23	.22	0.00	2805.00	9.57	83.60
3231.00	61.00	588.10	585.60	576.40	3620.00	587.90	.25	.62	0.00	3620.00	11.50	83.60
3650.00	419.00	0.00	0.00	577.90	1810.00	584.34	.03	.08	.04	1751.40	6.44	515.24
3650.00	419.00	0.00	0.00	577.90	2405.00	585.31	.03	.08	.06	2220.77	7.41	634.62
3650.00	419.00	0.00	0.00	577.90	2745.00	586.29	.03	.06	.06	2391.18	8.39	750.00
3650.00	419.00	0.00	0.00	577.90	3555.00	588.25	.02	.04	.07	2783.08	10.35	750.00
3950.00	300.00	0.00	0.00	577.80	1810.00	584.37	.03	.03	.00	1763.14	6.57	454.99
3950.00	300.00	0.00	0.00	577.80	2405.00	585.34	.03	.03	.00	2240.97	7.54	818.31
3950.00	300.00	0.00	0.00	577.80	2745.00	586.31	.03	.02	.00	2377.38	8.51	900.00
3950.00	300.00	0.00	0.00	577.80	3555.00	588.26	.02	.01	.00	2690.11	10.46	900.00
4250.00	300.00	0.00	0.00	577.60	1810.00	584.40	.05	.04	.01	1810.00	6.80	216.00
4250.00	300.00	0.00	0.00	577.60	2405.00	585.36	.06	.04	.01	2405.00	7.76	216.00
4250.00	300.00	0.00	0.00	577.60	2455.00	586.33	.05	.02	.01	2455.00	8.73	216.00
4250.00	300.00	0.00	0.00	577.60	2595.00	588.26	.03	.01	.01	2595.00	10.66	216.00
4400.00	150.00	0.00	0.00	577.60	1810.00	584.40	.15	.05	.05	1810.00	6.80	141.00
4400.00	150.00	0.00	0.00	577.60	2405.00	585.34	.18	.04	.06	2405.00	7.74	141.00
4400.00	150.00	0.00	0.00	577.60	2455.00	586.31	.13	.03	.04	2455.00	8.71	141.00
4400.00	150.00	0.00	0.00	577.60	2595.00	588.25	.08	.01	.03	2595.00	10.65	141.00
4550.00	150.00	0.00	0.00	577.50	1810.00	584.44	.27	.10	.06	1810.00	6.94	66.00
4550.00	150.00	0.00	0.00	577.50	2405.00	585.35	.36	.10	.09	2405.00	7.85	66.00
4550.00	150.00	0.00	0.00	577.50	2455.00	586.29	.30	.07	.09	2455.00	8.79	66.00
4550.00	150.00	0.00	0.00	577.50	2595.00	588.22	.22	.03	.07	2595.00	10.72	66.00
4600.00	50.00	0.00	0.00	575.80	1810.00	584.35	.53	.05	.13	1810.00	8.55	40.50
4600.00	50.00	0.00	0.00	575.80	2405.00	585.22	.75	.06	.19	2405.00	9.42	40.50
4600.00	50.00	0.00	0.00	575.80	2455.00	586.17	.63	.04	.17	2455.00	10.37	40.50
4600.00	50.00	0.00	0.00	575.80	2595.00	588.11	.49	.03	.13	2595.00	12.31	40.50
4647.00	47.00	588.70	585.20	575.80	1810.00	584.43	.52	.06	.00	1810.00	8.63	40.50
4647.00	47.00	588.70	585.20	575.80	2405.00	585.96	.64	.62	0.00	2405.00	10.16	40.50
4647.00	47.00	588.70	585.20	575.80	2455.00	587.07	.53	.80	0.00	2455.00	11.27	40.50
4647.00	47.00	588.70	585.20	575.80	2595.00	588.18	.48	.07	0.00	2595.00	12.38	40.50
4662.00	15.00	0.00	0.00	575.80	1810.00	584.86	.19	.01	.10	1810.00	9.06	62.00
4662.00	15.00	0.00	0.00	575.80	2405.00	586.48	.24	.01	.12	2405.00	10.68	62.00
4662.00	15.00	0.00	0.00	575.80	2455.00	587.50	.20	.01	.10	2455.00	11.70	62.00
4662.00	15.00	0.00	0.00	575.80	2595.00	588.57	.19	.01	.09	2595.00	12.77	62.00

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	HV	HL	OLOSS	QCH	DEPTH	TOPWID
4697.00	35.00	0.00	0.00	575.90	1810.00	585.05	.06	.01	.04	1810.00	9.15	140.00
4697.00	35.00	0.00	0.00	575.90	2405.00	586.72	.06	.01	.05	2405.00	10.82	140.00
4697.00	35.00	0.00	0.00	575.90	2455.00	587.70	.05	.01	.05	2455.00	11.80	140.00
4697.00	35.00	0.00	0.00	575.90	2595.00	588.76	.05	.00	.04	2595.00	12.86	140.00
4772.00	75.00	0.00	0.00	576.00	1810.00	585.09	.02	.01	.01	1810.00	9.09	240.00
4772.00	75.00	0.00	0.00	576.00	2405.00	586.77	.03	.01	.01	2405.00	10.77	240.00
4772.00	75.00	0.00	0.00	576.00	2455.00	587.75	.02	.00	.01	2455.00	11.75	240.00
4772.00	75.00	0.00	0.00	576.00	2595.00	588.80	.02	.00	.01	2595.00	12.80	240.00
4847.00	75.00	0.00	0.00	576.10	1810.00	585.11	.02	.00	.00	1810.00	9.01	340.00
4847.00	75.00	0.00	0.00	576.10	2405.00	586.79	.02	.00	.00	2405.00	10.69	340.00
4847.00	75.00	0.00	0.00	576.10	2455.00	587.76	.01	.00	.00	2455.00	11.66	340.00
4847.00	75.00	0.00	0.00	576.10	2595.00	588.81	.01	.00	.00	2595.00	12.71	340.00
5347.00	500.00	0.00	0.00	576.70	1810.00	585.14	.01	.03	.00	1804.99	8.44	672.17
5347.00	500.00	0.00	0.00	576.70	2405.00	586.81	.01	.01	.00	2343.39	10.11	750.00
5347.00	500.00	0.00	0.00	576.70	2455.00	587.78	.01	.01	.00	2355.40	11.08	750.00
5347.00	500.00	0.00	0.00	576.70	2595.00	588.82	.00	.01	.00	2455.34	12.12	750.00
5847.00	500.00	0.00	0.00	577.40	1810.00	585.17	.03	.04	.01	1809.73	7.77	317.65
5847.00	500.00	0.00	0.00	577.40	2405.00	586.82	.03	.02	.01	2362.02	9.42	400.00
5847.00	500.00	0.00	0.00	577.40	2455.00	587.78	.02	.01	.01	2364.49	10.38	400.00
5847.00	500.00	0.00	0.00	577.40	2595.00	588.82	.02	.01	.01	2451.68	11.42	400.00
6000.00	153.00	0.00	0.00	577.60	1810.00	585.20	.03	.02	.00	1411.25	7.60	506.64
6000.00	153.00	0.00	0.00	577.60	2405.00	586.84	.02	.01	.00	1760.51	9.24	646.56
6000.00	153.00	0.00	0.00	577.60	2745.00	587.79	.02	.01	.00	1916.77	10.19	752.61
6000.00	153.00	0.00	0.00	577.60	3555.00	588.83	.02	.01	.00	2344.37	11.23	850.00
6350.00	350.00	0.00	0.00	578.00	1810.00	585.26	.04	.07	.00	1447.11	7.26	442.35
6350.00	350.00	0.00	0.00	578.00	2405.00	586.87	.03	.03	.00	1839.10	8.87	450.00
6350.00	350.00	0.00	0.00	578.00	2745.00	587.81	.03	.02	.00	2066.68	9.81	450.00
6350.00	350.00	0.00	0.00	578.00	3555.00	588.84	.03	.02	.01	2641.61	10.84	450.00
8350.00	2000.00	0.00	0.00	576.30	1810.00	585.80	.09	.56	.02	1149.90	9.50	547.08
8350.00	2000.00	0.00	0.00	576.30	2405.00	587.16	.06	.31	.01	1176.50	10.86	598.47
8350.00	2000.00	0.00	0.00	576.30	2745.00	588.03	.04	.22	.01	1169.09	11.73	634.45
8350.00	2000.00	0.00	0.00	576.30	3555.00	589.05	.04	.21	.00	1308.49	12.75	696.48
8600.00	250.00	0.00	0.00	577.70	1810.00	585.85	.30	.15	.11	1532.82	8.15	261.15
8600.00	250.00	0.00	0.00	577.70	2405.00	587.19	.21	.10	.08	1676.64	9.49	371.97
8600.00	250.00	0.00	0.00	577.70	2745.00	588.04	.15	.07	.06	1678.54	10.34	402.04
8600.00	250.00	0.00	0.00	577.70	3555.00	589.06	.14	.06	.05	1883.40	11.36	444.61
8699.00	99.00	0.00	0.00	578.30	1150.00	586.24	.03	.04	.08	479.61	7.94	334.25
8699.00	99.00	0.00	0.00	578.30	1530.00	587.45	.02	.03	.05	510.41	9.15	359.41
8699.00	99.00	0.00	0.00	578.30	1750.00	588.23	.02	.02	.04	521.82	9.93	375.76
8699.00	99.00	0.00	0.00	578.30	2275.00	589.23	.02	.02	.03	601.34	10.93	398.16

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	HV	HL	OLOSS	QCH	DEPTH	TOPWID
8700.00	1.00	583.20	584.90	578.30	1150.00	586.25	.03	.00	.00	283.94	7.95	334.26
8700.00	1.00	583.20	584.90	578.30	1530.00	587.45	.02	.00	.00	203.21	9.15	359.42
8700.00	1.00	583.20	584.90	578.30	1750.00	588.23	.02	.00	.00	191.45	9.93	375.77
8700.00	1.00	583.20	584.90	578.30	2275.00	589.23	.02	.00	.00	227.45	10.93	398.17
8707.00	7.00	583.20	584.90	578.30	1150.00	586.25	.03	.00	.00	283.73	7.95	334.30
8707.00	7.00	583.20	584.90	578.30	1530.00	587.45	.02	.00	.00	203.16	9.15	359.44
8707.00	7.00	583.20	584.90	578.30	1750.00	588.23	.02	.00	.00	191.43	9.93	375.79
8707.00	7.00	583.20	584.90	578.30	2275.00	589.23	.02	.00	.00	227.43	10.93	398.18
8708.00	1.00	0.00	0.00	578.30	1150.00	586.25	.03	.00	.00	479.35	7.95	334.30
8708.00	1.00	0.00	0.00	578.30	1530.00	587.45	.02	.00	.00	510.27	9.15	359.45
8708.00	1.00	0.00	0.00	578.30	1750.00	588.24	.02	.00	.00	521.73	9.94	375.79
8708.00	1.00	0.00	0.00	578.30	2275.00	589.24	.02	.00	.00	601.26	10.94	398.18
9474.00	766.00	0.00	0.00	578.20	1150.00	586.42	.09	.20	.03	685.14	8.22	261.18
9474.00	766.00	0.00	0.00	578.20	1530.00	587.56	.06	.13	.02	696.65	9.36	318.55
9474.00	766.00	0.00	0.00	578.20	1750.00	588.32	.05	.09	.01	682.37	10.12	325.00
9474.00	766.00	0.00	0.00	578.20	2275.00	589.31	.04	.08	.01	749.61	11.11	325.00
9475.00	1.00	583.90	584.60	578.20	1150.00	586.43	.08	.00	.00	457.83	8.23	261.20
9475.00	1.00	583.90	584.60	578.20	1530.00	587.57	.05	.00	.00	312.79	9.37	318.56
9475.00	1.00	583.90	584.60	578.20	1750.00	588.32	.04	.00	.00	298.20	10.12	325.00
9475.00	1.00	583.90	584.60	578.20	2275.00	589.31	.04	.00	.00	323.81	11.11	325.00
9482.00	7.00	583.90	584.60	578.20	1150.00	586.44	.07	.01	.00	455.06	8.24	261.78
9482.00	7.00	583.90	584.60	578.20	1530.00	587.58	.05	.00	.00	312.53	9.38	318.72
9482.00	7.00	583.90	584.60	578.20	1750.00	588.33	.04	.00	.00	298.07	10.13	325.00
9482.00	7.00	583.90	584.60	578.20	2275.00	589.31	.04	.00	.00	323.73	11.11	325.00
9483.00	1.00	0.00	0.00	578.20	1150.00	586.44	.09	.00	.01	682.86	8.24	261.83
9483.00	1.00	0.00	0.00	578.20	1530.00	587.57	.06	.00	.00	696.04	9.37	318.75
9483.00	1.00	0.00	0.00	578.20	1750.00	588.32	.05	.00	.00	682.02	10.12	325.00
9483.00	1.00	0.00	0.00	578.20	2275.00	589.31	.04	.00	.00	749.37	11.11	325.00
9800.00	317.00	0.00	0.00	577.20	1150.00	586.55	.19	.16	.05	1041.40	9.35	131.27
9800.00	317.00	0.00	0.00	577.20	1530.00	587.63	.18	.12	.06	1248.48	10.43	178.65
9800.00	317.00	0.00	0.00	577.20	1750.00	588.36	.16	.09	.05	1295.59	11.16	278.45
9800.00	317.00	0.00	0.00	577.20	2275.00	589.35	.13	.08	.04	1413.08	12.15	364.38
9850.00	50.00	0.00	0.00	577.20	1150.00	586.45	.49	.05	.15	1150.00	9.25	27.50
9850.00	50.00	0.00	0.00	577.20	1530.00	587.44	.67	.05	.24	1530.00	10.24	27.50
9850.00	50.00	0.00	0.00	577.20	1750.00	588.38	.18	.03	.01	1067.67	11.18	245.05
9850.00	50.00	0.00	0.00	577.20	2275.00	589.36	.15	.02	.01	1126.90	12.16	328.91
9867.00	17.00	587.20	585.20	577.20	1150.00	587.40	.16	.63	0.00	848.35	10.20	165.90
9867.00	17.00	587.20	585.20	577.20	1530.00	588.40	.14	.42	0.00	929.55	11.20	246.74
9867.00	17.00	587.20	585.20	577.20	1750.00	588.97	.12	.52	0.00	947.51	11.77	292.74
9867.00	17.00	587.20	585.20	577.20	2275.00	589.67	.11	.28	0.00	1047.60	12.47	360.68

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	HV	HL	OLOSS	QCH	DEPTH	TOPWID
10750.00	883.00	0.00	0.00	579.00	1135.00	587.89	.07	.37	.03	742.19	8.89	196.62
10750.00	883.00	0.00	0.00	579.00	1515.00	588.80	.07	.32	.02	870.41	9.80	222.43
10750.00	883.00	0.00	0.00	579.00	1735.00	589.32	.07	.29	.01	933.43	10.32	237.11
10750.00	883.00	0.00	0.00	579.00	2280.00	590.01	.09	.31	.01	1130.46	11.01	257.01
10999.00	249.00	0.00	0.00	578.20	1135.00	587.99	.03	.05	.01	556.89	9.79	278.46
10999.00	249.00	0.00	0.00	578.20	1515.00	588.90	.03	.05	.01	635.56	10.70	311.21
10999.00	249.00	0.00	0.00	578.20	1735.00	589.41	.03	.04	.01	674.25	11.21	329.37
10999.00	249.00	0.00	0.00	578.20	2280.00	590.12	.04	.05	.01	803.48	11.92	354.98
11000.00	1.00	584.50	584.90	578.20	1135.00	587.99	.03	.00	.00	246.32	9.79	278.47
11000.00	1.00	584.50	584.90	578.20	1515.00	588.90	.03	.00	.00	277.15	10.70	311.22
11000.00	1.00	584.50	584.90	578.20	1735.00	589.41	.03	.00	.00	293.60	11.21	329.37
11000.00	1.00	584.50	584.90	578.20	2280.00	590.12	.04	.00	.00	350.55	11.92	354.99
11007.00	7.00	584.50	584.90	578.20	1135.00	588.00	.03	.00	.00	246.23	9.80	278.53
11007.00	7.00	584.50	584.90	578.20	1515.00	588.91	.03	.00	.00	277.08	10.71	311.27
11007.00	7.00	584.50	584.90	578.20	1735.00	589.41	.03	.00	.00	293.54	11.21	329.42
11007.00	7.00	584.50	584.90	578.20	2280.00	590.12	.04	.00	.00	350.49	11.92	355.04
11008.00	1.00	0.00	0.00	578.20	1135.00	587.99	.03	.00	.00	556.64	9.79	278.55
11008.00	1.00	0.00	0.00	578.20	1515.00	588.91	.03	.00	.00	635.37	10.71	311.28
11008.00	1.00	0.00	0.00	578.20	1735.00	589.41	.03	.00	.00	674.08	11.21	329.43
11008.00	1.00	0.00	0.00	578.20	2280.00	590.12	.04	.00	.00	803.29	11.92	355.05
11299.00	291.00	0.00	0.00	578.60	1135.00	588.00	.19	.09	.08	988.23	9.40	187.58
11299.00	291.00	0.00	0.00	578.60	1515.00	588.92	.16	.08	.07	1102.89	10.32	265.18
11299.00	291.00	0.00	0.00	578.60	1735.00	589.43	.14	.07	.05	1129.50	10.83	276.00
11299.00	291.00	0.00	0.00	578.60	2280.00	590.15	.14	.07	.05	1279.09	11.55	276.00
11300.00	1.00	586.30	585.00	578.60	1135.00	587.98	.23	.00	.02	719.89	9.38	187.09
11300.00	1.00	586.30	585.00	578.60	1515.00	588.95	.14	.00	.01	643.83	10.35	268.61
11300.00	1.00	586.30	585.00	578.60	1735.00	589.46	.11	.00	.01	608.15	10.86	276.00
11300.00	1.00	586.30	585.00	578.60	2280.00	590.18	.12	.00	.01	642.36	11.58	276.00
11307.00	7.00	586.30	585.00	578.60	1135.00	588.05	.22	.04	.00	703.11	9.45	190.38
11307.00	7.00	586.30	585.00	578.60	1515.00	588.97	.14	.02	.00	640.94	10.37	269.89
11307.00	7.00	586.30	585.00	578.60	1735.00	589.48	.11	.01	.00	606.46	10.88	276.00
11307.00	7.00	586.30	585.00	578.60	2280.00	590.19	.12	.01	.00	641.25	11.59	276.00
11308.00	1.00	0.00	0.00	578.60	1135.00	588.09	.18	.00	.01	972.08	9.49	193.40
11308.00	1.00	0.00	0.00	578.60	1515.00	588.96	.16	.00	.01	1092.33	10.36	270.18
11308.00	1.00	0.00	0.00	578.60	1735.00	589.46	.14	.00	.01	1118.37	10.86	276.00
11308.00	1.00	0.00	0.00	578.60	2280.00	590.18	.14	.00	.01	1268.44	11.58	276.00
11408.00	100.00	0.00	0.00	578.70	1135.00	588.31	.04	.03	.04	875.38	9.61	222.00
11408.00	100.00	0.00	0.00	578.70	1515.00	589.14	.04	.03	.03	1095.64	10.44	222.00
11408.00	100.00	0.00	0.00	578.70	1735.00	589.61	.05	.03	.03	1211.91	10.91	222.00
11408.00	100.00	0.00	0.00	578.70	2280.00	590.31	.06	.03	.02	1520.47	11.61	222.00

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	HV	HL	OLOSS	QCH	DEPTH	TOPWID
11508.00	100.00	0.00	0.00	578.90	1135.00	588.33	.04	.02	.00	926.53	9.43	172.00
11508.00	100.00	0.00	0.00	578.90	1515.00	589.16	.06	.02	.01	1177.63	10.26	172.00
11508.00	100.00	0.00	0.00	578.90	1735.00	589.63	.06	.02	.01	1315.37	10.73	172.00
11508.00	100.00	0.00	0.00	578.90	2280.00	590.33	.08	.03	.01	1669.36	11.43	172.00
11608.00	100.00	0.00	0.00	579.00	1135.00	588.34	.05	.02	.01	1000.01	9.34	122.00
11608.00	100.00	0.00	0.00	579.00	1515.00	589.17	.07	.03	.01	1297.68	10.17	122.00
11608.00	100.00	0.00	0.00	579.00	1735.00	589.64	.08	.03	.01	1464.33	10.64	122.00
11608.00	100.00	0.00	0.00	579.00	2280.00	590.35	.12	.04	.02	1885.06	11.35	122.00
11700.00	92.00	0.00	0.00	579.10	1135.00	588.36	.07	.03	.01	1102.29	9.26	76.00
11700.00	92.00	0.00	0.00	579.10	1515.00	589.19	.10	.03	.01	1463.11	10.09	76.00
11700.00	92.00	0.00	0.00	579.10	1735.00	589.66	.12	.03	.02	1670.66	10.56	76.00
11700.00	92.00	0.00	0.00	579.10	2280.00	590.36	.18	.04	.03	2186.61	11.26	76.00
11715.00	15.00	0.00	0.00	579.10	1135.00	588.36	.08	.00	.00	1122.07	9.26	69.00
11715.00	15.00	0.00	0.00	579.10	1515.00	589.19	.11	.01	.00	1495.26	10.09	69.00
11715.00	15.00	0.00	0.00	579.10	1735.00	589.66	.13	.01	.00	1710.95	10.56	69.00
11715.00	15.00	0.00	0.00	579.10	2280.00	590.37	.19	.01	.01	2245.76	11.27	69.00
11730.00	15.00	0.00	0.00	579.10	1135.00	588.36	.09	.01	.01	1135.00	9.26	61.00
11730.00	15.00	0.00	0.00	579.10	1515.00	589.19	.13	.01	.01	1515.00	10.09	61.00
11730.00	15.00	0.00	0.00	579.10	1735.00	589.66	.15	.01	.01	1735.00	10.56	61.00
11730.00	15.00	0.00	0.00	579.10	2280.00	590.36	.22	.01	.02	2280.00	11.26	61.00
11749.00	19.00	0.00	0.00	579.20	1135.00	588.34	.15	.01	.03	1135.00	9.14	49.64
11749.00	19.00	0.00	0.00	579.20	1515.00	589.16	.22	.01	.05	1515.00	9.96	50.37
11749.00	19.00	0.00	0.00	579.20	1735.00	589.62	.26	.02	.05	1735.00	10.42	50.78
11749.00	19.00	0.00	0.00	579.20	2280.00	590.30	.38	.02	.08	2280.00	11.10	51.40
11750.00	1.00	589.60	592.10	579.20	1135.00	588.34	.15	.00	.00	1135.00	9.14	49.64
11750.00	1.00	589.60	592.10	579.20	1515.00	589.16	.22	.00	.00	1515.00	9.96	50.37
11750.00	1.00	589.60	592.10	579.20	1735.00	589.62	.26	.00	.00	1735.00	10.42	50.79
11750.00	1.00	589.60	592.10	579.20	2280.00	590.30	.38	.00	.00	2280.00	11.10	51.40
11763.00	13.00	589.60	592.10	579.20	1135.00	588.35	.15	.01	.00	1135.00	9.15	49.65
11763.00	13.00	589.60	592.10	579.20	1515.00	589.17	.22	.01	.00	1515.00	9.97	50.38
11763.00	13.00	589.60	592.10	579.20	1735.00	589.64	.26	.02	.00	1735.00	10.44	50.80
11763.00	13.00	589.60	592.10	579.20	2280.00	590.33	.38	.02	.00	2280.00	11.13	51.42
11764.00	1.00	0.00	0.00	579.20	1135.00	588.35	.15	.00	.00	1135.00	9.15	49.65
11764.00	1.00	0.00	0.00	579.20	1515.00	589.17	.22	.00	.00	1515.00	9.97	50.38
11764.00	1.00	0.00	0.00	579.20	1735.00	589.64	.26	.00	.00	1735.00	10.44	50.80
11764.00	1.00	0.00	0.00	579.20	2280.00	590.33	.38	.00	.00	2280.00	11.13	51.42
11813.00	49.00	0.00	0.00	579.30	1135.00	588.40	.16	.05	.00	1101.33	9.10	150.00
11813.00	49.00	0.00	0.00	579.30	1515.00	589.28	.18	.05	.01	1378.48	9.98	150.00
11813.00	49.00	0.00	0.00	579.30	1735.00	589.78	.19	.06	.02	1518.54	10.48	150.00
11813.00	49.00	0.00	0.00	579.30	2280.00	590.59	.23	.07	.04	1881.51	11.29	150.00

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	HV	HL	OLOSS	QCH	DEPTH	TOPWID
12100.00	287.00	0.00	0.00	579.60	1135.00	588.70	.15	.29	.00	1084.65	9.10	259.37
12100.00	287.00	0.00	0.00	579.60	1515.00	589.61	.14	.28	.01	1273.78	10.01	334.68
12100.00	287.00	0.00	0.00	579.60	1735.00	590.12	.13	.26	.02	1333.07	10.52	364.42
12100.00	287.00	0.00	0.00	579.60	2280.00	590.99	.12	.25	.03	1507.32	11.39	414.97
12700.00	600.00	0.00	0.00	580.20	1135.00	589.31	.15	.61	.00	1082.98	9.11	260.95
12700.00	600.00	0.00	0.00	580.20	1515.00	590.17	.15	.57	.00	1281.78	9.97	332.59
12700.00	600.00	0.00	0.00	580.20	1735.00	590.63	.14	.51	.00	1354.85	10.43	359.09
12700.00	600.00	0.00	0.00	580.20	2280.00	591.46	.13	.48	.01	1540.53	11.26	407.44
13075.00	375.00	0.00	0.00	580.60	1135.00	589.68	.15	.37	.00	1086.80	9.08	255.49
13075.00	375.00	0.00	0.00	580.60	1515.00	590.51	.15	.35	.00	1294.22	9.91	329.33
13075.00	375.00	0.00	0.00	580.60	1735.00	590.94	.15	.32	.00	1375.54	10.34	354.11
13075.00	375.00	0.00	0.00	580.60	2280.00	591.75	.14	.29	.01	1570.06	11.15	400.95
13600.00	525.00	0.00	0.00	581.20	1135.00	590.22	.16	.55	.00	1093.10	9.02	243.65
13600.00	525.00	0.00	0.00	581.20	1515.00	591.04	.16	.53	.00	1309.23	9.84	323.47
13600.00	525.00	0.00	0.00	581.20	1735.00	591.44	.16	.51	.01	1399.91	10.24	348.33
13600.00	525.00	0.00	0.00	581.20	2280.00	592.23	.15	.48	.01	1603.75	11.03	393.76
13700.00	100.00	0.00	0.00	580.40	1135.00	590.31	.19	.11	.02	947.17	9.91	261.72
13700.00	100.00	0.00	0.00	580.40	1515.00	591.13	.19	.11	.01	1092.27	10.73	332.48
13700.00	100.00	0.00	0.00	580.40	1735.00	591.53	.18	.10	.01	1148.41	11.13	356.06
13700.00	100.00	0.00	0.00	580.40	2280.00	592.32	.17	.10	.01	1275.99	11.92	402.50
13736.00	36.00	591.50	589.30	580.40	1135.00	591.24	.27	1.00	0.00	1135.00	10.84	26.80
13736.00	36.00	591.50	589.30	580.40	1515.00	592.26	.08	1.02	0.00	858.06	11.86	399.12
13736.00	36.00	591.50	589.30	580.40	1735.00	592.54	.08	.91	0.00	927.40	12.14	415.60
13736.00	36.00	591.50	589.30	580.40	2280.00	593.04	.10	.65	0.00	1098.28	12.64	457.14
14100.00	364.00	0.00	0.00	582.40	520.00	591.89	.03	.35	.07	381.46	9.49	190.65
14100.00	364.00	0.00	0.00	582.40	700.00	592.48	.04	.17	.01	471.53	10.08	212.88
14100.00	364.00	0.00	0.00	582.40	800.00	592.77	.04	.18	.01	518.74	10.37	223.25
14100.00	364.00	0.00	0.00	582.40	1050.00	593.32	.05	.21	.02	633.00	10.92	243.98
14506.00	406.00	0.00	0.00	583.30	520.00	592.09	.05	.20	.01	440.32	8.79	180.02
14506.00	406.00	0.00	0.00	583.30	700.00	592.70	.05	.22	.01	537.32	9.40	216.60
14506.00	406.00	0.00	0.00	583.30	800.00	592.99	.06	.23	.01	582.39	9.69	238.92
14506.00	406.00	0.00	0.00	583.30	1050.00	593.57	.06	.25	.01	692.72	10.27	280.06
14912.00	406.00	0.00	0.00	584.20	520.00	592.36	.06	.28	.01	474.28	8.16	166.47
14912.00	406.00	0.00	0.00	584.20	700.00	592.98	.07	.30	.01	579.81	8.78	236.59
14912.00	406.00	0.00	0.00	584.20	800.00	593.28	.07	.30	.01	626.94	9.08	261.20
14912.00	406.00	0.00	0.00	584.20	1050.00	593.87	.07	.31	.01	727.68	9.67	422.22
15318.00	406.00	0.00	0.00	585.10	520.00	592.68	.07	.33	.00	464.28	7.58	190.12
15318.00	406.00	0.00	0.00	585.10	700.00	593.32	.07	.34	.00	559.67	8.22	220.77
15318.00	406.00	0.00	0.00	585.10	800.00	593.62	.07	.34	.00	604.25	8.52	239.10
15318.00	406.00	0.00	0.00	585.10	1050.00	594.22	.07	.35	.00	707.53	9.12	277.17

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	HV	HL	OLOSS	QCH	DEPTH	TOPWID
15725.00	407.00	0.00	0.00	586.00	520.00	593.12	.12	.47	.03	510.95	7.12	65.00
15725.00	407.00	0.00	0.00	586.00	700.00	593.78	.15	.50	.04	668.28	7.78	65.00
15725.00	407.00	0.00	0.00	586.00	800.00	594.08	.17	.51	.05	753.29	8.08	65.00
15725.00	407.00	0.00	0.00	586.00	1050.00	594.69	.23	.55	.08	962.47	8.69	65.00
15758.00	33.00	0.00	0.00	586.10	520.00	593.18	.12	.06	.00	515.29	7.08	48.00
15758.00	33.00	0.00	0.00	586.10	700.00	593.83	.17	.06	.01	685.50	7.73	48.00
15758.00	33.00	0.00	0.00	586.10	800.00	594.14	.19	.07	.01	778.99	8.04	48.00
15758.00	33.00	0.00	0.00	586.10	1050.00	594.75	.27	.08	.02	1011.16	8.65	48.00
15791.00	33.00	0.00	0.00	586.10	520.00	593.23	.14	.06	.01	520.00	7.13	32.00
15791.00	33.00	0.00	0.00	586.10	700.00	593.89	.20	.07	.01	700.00	7.79	32.00
15791.00	33.00	0.00	0.00	586.10	800.00	594.20	.23	.08	.02	800.00	8.10	32.00
15791.00	33.00	0.00	0.00	586.10	1050.00	594.82	.33	.10	.03	1050.00	8.72	32.00
15808.00	17.00	0.00	0.00	586.20	520.00	593.24	.21	.04	.04	520.00	7.04	24.00
15808.00	17.00	0.00	0.00	586.20	700.00	593.89	.31	.06	.06	700.00	7.69	24.00
15808.00	17.00	0.00	0.00	586.20	800.00	594.20	.37	.06	.07	800.00	8.00	24.00
15808.00	17.00	0.00	0.00	586.20	1050.00	594.81	.53	.09	.10	1050.00	8.61	24.00
15824.00	16.00	0.00	0.00	586.40	520.00	593.19	.46	.08	.12	520.00	6.79	15.20
15824.00	16.00	0.00	0.00	586.40	700.00	593.82	.69	.11	.19	700.00	7.42	15.20
15824.00	16.00	0.00	0.00	586.40	800.00	594.10	.83	.13	.23	800.00	7.70	15.20
15824.00	16.00	0.00	0.00	586.40	1050.00	594.64	1.23	.18	.35	1050.00	8.24	15.20
15825.00	1.00	598.30	595.90	586.40	520.00	593.17	.52	.00	.03	520.00	6.77	15.20
15825.00	1.00	598.30	595.90	586.40	700.00	593.75	.82	.01	.07	700.00	7.35	15.20
15825.00	1.00	598.30	595.90	586.40	800.00	594.01	1.02	.01	.10	800.00	7.61	15.20
15825.00	1.00	598.30	595.90	586.40	1050.00	594.46	1.61	.01	.19	1050.00	8.06	15.20
15875.00	50.00	598.30	596.00	586.50	520.00	593.34	.51	.16	.00	520.00	6.84	15.20
15875.00	50.00	598.30	596.00	586.50	700.00	594.06	.79	.26	.01	700.00	7.56	15.20
15875.00	50.00	598.30	596.00	586.50	800.00	594.40	.96	.32	.02	800.00	7.90	15.20
15875.00	50.00	598.30	596.00	586.50	1050.00	595.16	1.46	.51	.04	1050.00	8.66	15.20
15876.00	1.00	0.00	0.00	586.50	520.00	593.44	.44	.01	.02	520.00	6.94	15.20
15876.00	1.00	0.00	0.00	586.50	700.00	594.29	.62	.01	.05	700.00	7.79	15.20
15876.00	1.00	0.00	0.00	586.50	800.00	594.73	.72	.01	.07	800.00	8.23	15.20
15876.00	1.00	0.00	0.00	586.50	1050.00	597.52	.67	.01	.24	1050.00	11.02	15.20
15881.00	5.00	0.00	0.00	586.50	520.00	593.79	.18	.03	.08	520.00	7.29	25.00
15881.00	5.00	0.00	0.00	586.50	700.00	594.81	.25	.03	.11	700.00	8.31	25.00
15881.00	5.00	0.00	0.00	586.50	800.00	595.33	.28	.03	.13	800.00	8.83	25.00
15881.00	5.00	0.00	0.00	586.50	1050.00	598.08	.26	.03	.12	1050.00	11.58	25.00
15901.00	20.00	0.00	0.00	586.50	520.00	593.94	.11	.05	.02	520.00	7.44	41.98
15901.00	20.00	0.00	0.00	586.50	700.00	595.01	.13	.05	.03	700.00	8.51	46.32
15901.00	20.00	0.00	0.00	586.50	800.00	595.57	.14	.05	.04	800.00	9.07	48.57
15901.00	20.00	0.00	0.00	586.50	1050.00	598.32	.10	.03	.05	1049.59	11.82	61.90

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	HV	HL	OLOSS	QCH	DEPTH	TOPWID
17450.00	1549.00	0.00	0.00	589.30	520.00	596.71	.09	2.74	.01	520.00	7.41	50.79
17450.00	1549.00	0.00	0.00	589.30	700.00	597.76	.10	2.71	.01	700.00	8.46	56.50
17450.00	1549.00	0.00	0.00	589.30	800.00	598.25	.10	2.64	.01	788.85	8.95	221.03
17450.00	1549.00	0.00	0.00	589.30	1050.00	599.61	.04	1.22	.02	741.75	10.31	660.00
19800.00	2350.00	0.00	0.00	590.50	520.00	599.63	.06	2.88	.01	451.19	9.13	130.00
19800.00	2350.00	0.00	0.00	590.50	700.00	600.49	.06	2.68	.01	539.88	9.99	130.00
19800.00	2350.00	0.00	0.00	590.50	800.00	600.90	.06	2.59	.01	587.65	10.40	130.00
19800.00	2350.00	0.00	0.00	590.50	1050.00	601.45	.08	1.85	.02	726.45	10.95	130.00
20000.00	200.00	0.00	0.00	590.60	520.00	599.80	.06	.16	.00	520.00	9.20	30.00
20000.00	200.00	0.00	0.00	590.60	700.00	600.66	.08	.18	.01	700.00	10.06	30.00
20000.00	200.00	0.00	0.00	590.60	800.00	601.07	.10	.19	.02	800.00	10.47	30.00
20000.00	200.00	0.00	0.00	590.60	1050.00	601.66	.16	.25	.04	1050.00	11.06	30.00

SECTION NUMBER	DISCHARGE CFS	CWSEL	CWSEL DIFF EACH Q	CWSEL DIFF EACH SECTION	CWSEL-WSELK	TOPWID	T.W. DIFF	LENGTH
0.000	1855.000	583.030	0.000	0.000	0.000	348.522	0.000	0.000
0.000	2460.000	583.530	.500	0.000	0.000	354.302	-5.780	0.000
0.000	2805.000	583.806	.276	0.000	0.000	361.558	-13.036	0.000
0.000	3620.000	584.457	.651	0.000	0.000	391.731	-43.209	0.000
400.000	1855.000	583.084	0.000	.054	0.000	151.331	0.000	400.000
400.000	2460.000	583.588	.504	.058	0.000	161.465	-10.134	400.000
400.000	2805.000	583.864	.275	.058	0.000	161.999	-10.668	400.000
400.000	3620.000	584.506	.642	.049	0.000	161.999	-10.668	400.000
550.000	1855.000	583.090	0.000	.006	0.000	87.999	0.000	150.000
550.000	2460.000	583.586	.496	-.002	0.000	87.999	-.000	150.000
550.000	2805.000	583.855	.269	-.009	0.000	87.999	-.000	150.000
550.000	3620.000	584.475	.620	-.030	0.000	87.999	-.000	150.000
585.000	1855.000	583.081	0.000	-.009	0.000	69.999	0.000	35.000
585.000	2460.000	583.568	.487	-.019	0.000	69.999	-.000	35.000
585.000	2805.000	583.830	.262	-.025	0.000	69.999	-.000	35.000
585.000	3620.000	584.431	.601	-.044	0.000	69.999	-.000	35.000
624.000	1855.000	582.987	0.000	-.094	0.000	50.000	0.000	39.000
624.000	2460.000	583.416	.429	-.151	0.000	50.000	0.000	39.000
624.000	2805.000	583.641	.225	-.189	0.000	50.000	0.000	39.000
624.000	3620.000	584.143	.502	-.287	0.000	50.000	0.000	39.000
625.000	1855.000	582.976	0.000	-.012	0.000	49.203	0.000	1.000
625.000	2460.000	583.397	.421	-.019	0.000	49.242	-.040	1.000
625.000	2805.000	583.617	.220	-.024	0.000	49.263	-.061	1.000
625.000	3620.000	584.107	.490	-.037	0.000	49.310	-.107	1.000
665.000	1855.000	583.070	0.000	.094	0.000	49.211	0.000	40.000
665.000	2460.000	583.554	.484	.157	0.000	49.257	-.046	40.000
665.000	2805.000	583.817	.263	.200	0.000	49.282	-.071	40.000
665.000	3620.000	584.435	.618	.328	0.000	49.341	-.130	40.000
666.000	1855.000	583.112	0.000	.042	0.000	50.000	0.000	1.000
666.000	2460.000	583.623	.511	.069	0.000	50.000	0.000	1.000
666.000	2805.000	583.904	.281	.087	0.000	50.000	0.000	1.000
666.000	3620.000	584.571	.667	.136	0.000	50.000	0.000	1.000
668.000	1855.000	583.400	0.000	.288	0.000	53.999	0.000	2.000
668.000	2460.000	584.061	.662	.439	0.000	53.999	-.000	2.000
668.000	2805.000	584.434	.373	.531	0.000	53.999	-.000	2.000
668.000	3620.000	585.323	.889	.752	0.000	53.999	-.000	2.000

671.000	1855.000	583.466	0.000	.067	0.000	59.999	0.000	3.000
671.000	2460.000	584.165	.699	.104	0.000	59.999	-.000	3.000
671.000	2805.000	584.560	.395	.126	0.000	59.999	-.000	3.000
671.000	3620.000	585.503	.943	.180	0.000	59.999	-.000	3.000
696.000	1855.000	583.653	0.000	.187	0.000	109.999	0.000	25.000
696.000	2460.000	584.447	.794	.282	0.000	109.999	-.000	25.000
696.000	2805.000	584.899	.452	.339	0.000	109.999	-.000	25.000
696.000	3620.000	585.975	1.076	.472	0.000	109.999	-.000	25.000
756.000	1855.000	583.703	0.000	.050	0.000	181.999	0.000	60.000
756.000	2460.000	584.521	.818	.073	0.000	181.999	-.000	60.000
756.000	2805.000	584.986	.465	.087	0.000	181.999	-.000	60.000
756.000	3620.000	586.092	1.107	.118	0.000	181.999	-.000	60.000
801.000	1855.000	583.712	0.000	.009	0.000	223.654	0.000	45.000
801.000	2460.000	584.534	.822	.014	0.000	224.305	-.650	45.000
801.000	2805.000	585.002	.468	.016	0.000	224.679	-1.024	45.000
801.000	3620.000	586.114	1.112	.022	0.000	224.999	-1.345	45.000
1016.000	1855.000	583.724	0.000	.013	0.000	323.268	0.000	215.000
1016.000	2460.000	584.552	.827	.018	0.000	323.922	-.654	215.000
1016.000	2805.000	585.022	.470	.020	0.000	324.296	-1.028	215.000
1016.000	3620.000	586.140	1.118	.026	0.000	324.999	-1.731	215.000
1451.000	1855.000	583.730	0.000	.005	0.000	249.107	0.000	435.000
1451.000	2460.000	584.556	.827	.005	0.000	288.506	-39.399	435.000
1451.000	2805.000	585.026	.470	.004	0.000	338.545	-89.438	435.000
1451.000	3620.000	586.143	1.117	.003	0.000	1234.883	-985.775	435.000
1875.000	1855.000	583.787	0.000	.057	0.000	349.641	0.000	424.000
1875.000	2460.000	584.626	.839	.069	0.000	374.234	-24.593	424.000
1875.000	2805.000	585.100	.475	.074	0.000	375.007	-25.366	424.000
1875.000	3620.000	586.221	1.121	.078	0.000	558.281	-208.641	424.000
2400.000	1855.000	583.830	0.000	.043	0.000	224.999	0.000	525.000
2400.000	2460.000	584.670	.840	.044	0.000	224.999	-.000	525.000
2400.000	2805.000	585.144	.474	.044	0.000	224.999	-.000	525.000
2400.000	3620.000	586.262	1.118	.041	0.000	224.999	-.000	525.000
2775.000	1855.000	583.795	0.000	-.034	0.000	83.600	0.000	375.000
2775.000	2460.000	584.612	.816	-.058	0.000	83.600	0.000	375.000
2775.000	2805.000	585.072	.460	-.072	0.000	83.600	0.000	375.000
2775.000	3620.000	586.245	1.173	-.018	0.000	303.158	-219.558	375.000
2860.000	1855.000	583.836	0.000	.041	0.000	80.800	0.000	85.000
2860.000	2460.000	584.659	.823	.048	0.000	80.800	0.000	85.000
2860.000	2805.000	585.448	.788	.376	0.000	83.600	-2.800	85.000
2860.000	3620.000	587.037	1.589	.792	0.000	83.600	-2.800	85.000
3025.000	1855.000	584.085	0.000	.249	0.000	155.999	0.000	165.000
3025.000	2460.000	584.991	.906	.332	0.000	155.999	-.000	165.000
3025.000	2805.000	585.788	.797	.341	0.000	155.999	-.000	165.000
3025.000	3620.000	587.411	1.623	.374	0.000	155.999	-.000	165.000
3170.000	1855.000	584.078	0.000	-.007	0.000	83.600	0.000	145.000
3170.000	2460.000	584.971	.892	-.021	0.000	83.600	0.000	145.000
3170.000	2805.000	585.758	.788	-.030	0.000	83.600	0.000	145.000
3170.000	3620.000	587.431	1.673	.021	0.000	303.313	-219.713	145.000
3231.000	1855.000	584.093	0.000	.015	0.000	80.800	0.000	61.000
3231.000	2460.000	584.988	.895	.017	0.000	80.800	0.000	61.000
3231.000	2805.000	585.975	.987	.217	0.000	83.600	-2.800	61.000
3231.000	3620.000	587.904	1.930	.473	0.000	83.600	-2.800	61.000
3650.000	1810.000	584.337	0.000	.244	0.000	515.241	0.000	419.000

3650.000	2405.000	585.308	.971	.320	0.000	634.624	-119.383	419.000
3650.000	2745.000	586.292	.984	.317	0.000	749.999	-234.758	419.000
3650.000	3555.000	588.246	1.954	.341	0.000	749.999	-234.758	419.000
3950.000	1810.000	584.370	0.000	.033	0.000	454.991	0.000	300.000
3950.000	2405.000	585.336	.966	.028	0.000	818.311	-363.320	300.000
3950.000	2745.000	586.312	.976	.021	0.000	899.999	-445.008	300.000
3950.000	3555.000	588.259	1.947	.014	0.000	899.999	-445.008	300.000
4250.000	1810.000	584.399	0.000	.029	0.000	215.999	0.000	300.000
4250.000	2405.000	585.358	.959	.022	0.000	215.999	-.000	300.000
4250.000	2455.000	586.325	.967	.013	0.000	215.999	-.000	300.000
4250.000	2595.000	588.265	1.939	.005	0.000	215.999	-.000	300.000
4400.000	1810.000	584.395	0.000	-.004	0.000	140.999	0.000	150.000
4400.000	2405.000	585.344	.948	-.014	0.000	140.999	-.000	150.000
4400.000	2455.000	586.310	.966	-.015	0.000	140.999	-.000	150.000
4400.000	2595.000	588.251	1.941	-.014	0.000	140.999	-.000	150.000
4550.000	1810.000	584.437	0.000	.042	0.000	66.000	0.000	150.000
4550.000	2405.000	585.353	.915	.009	0.000	66.000	-.000	150.000
4550.000	2455.000	586.291	.939	-.019	0.000	66.000	-.000	150.000
4550.000	2595.000	588.215	1.924	-.036	0.000	66.000	-.000	150.000
4600.000	1810.000	584.355	0.000	-.082	0.000	40.499	0.000	50.000
4600.000	2405.000	585.218	.863	-.135	0.000	40.499	-.000	50.000
4600.000	2455.000	586.168	.950	-.123	0.000	40.499	-.000	50.000
4600.000	2595.000	588.110	1.942	-.106	0.000	40.499	-.000	50.000
4647.000	1810.000	584.430	0.000	.075	0.000	40.499	0.000	47.000
4647.000	2405.000	585.957	1.526	.739	0.000	40.499	-.000	47.000
4647.000	2455.000	587.072	1.116	.904	0.000	40.499	-.000	47.000
4647.000	2595.000	588.181	1.109	.072	0.000	40.499	-.000	47.000
4662.000	1810.000	584.859	0.000	.429	0.000	61.999	0.000	15.000
4662.000	2405.000	586.482	1.623	.526	0.000	61.999	-.000	15.000
4662.000	2455.000	587.500	1.018	.428	0.000	61.999	-.000	15.000
4662.000	2595.000	588.567	1.067	.386	0.000	61.999	-.000	15.000
4697.000	1810.000	585.047	0.000	.187	0.000	139.999	0.000	35.000
4697.000	2405.000	586.718	1.671	.235	0.000	139.999	-.000	35.000
4697.000	2455.000	587.703	.985	.203	0.000	139.999	-.000	35.000
4697.000	2595.000	588.756	1.053	.189	0.000	139.999	-.000	35.000
4772.000	1810.000	585.094	0.000	.047	0.000	239.999	0.000	75.000
4772.000	2405.000	586.772	1.678	.054	0.000	239.999	-.000	75.000
4772.000	2455.000	587.748	.976	.045	0.000	239.999	-.000	75.000
4772.000	2595.000	588.797	1.049	.041	0.000	239.999	-.000	75.000
4847.000	1810.000	585.108	0.000	.014	0.000	339.999	0.000	75.000
4847.000	2405.000	586.787	1.679	.015	0.000	339.999	-.000	75.000
4847.000	2455.000	587.760	.974	.013	0.000	339.999	-.000	75.000
4847.000	2595.000	588.808	1.048	.011	0.000	339.999	-.000	75.000
5347.000	1810.000	585.139	0.000	.031	0.000	672.172	0.000	500.000
5347.000	2405.000	586.811	1.672	.024	0.000	749.999	-77.827	500.000
5347.000	2455.000	587.778	.967	.018	0.000	749.999	-77.827	500.000
5347.000	2595.000	588.823	1.044	.015	0.000	749.999	-77.827	500.000
5847.000	1810.000	585.172	0.000	.033	0.000	317.650	0.000	500.000
5847.000	2405.000	586.823	1.651	.011	0.000	399.999	-82.349	500.000
5847.000	2455.000	587.783	.961	.005	0.000	399.999	-82.349	500.000
5847.000	2595.000	588.825	1.041	.002	0.000	399.999	-82.349	500.000
6000.000	1810.000	585.200	0.000	.027	0.000	506.639	0.000	153.000
6000.000	2405.000	586.842	1.643	.020	0.000	646.555	-139.916	153.000

6000.000	2745.000	587.793	.951	.010	0.000	752.608	-245.969	153.000
6000.000	3555.000	588.829	1.036	.004	0.000	849.999	-343.360	153.000
6350.000	1810.000	585.261	0.000	.061	0.000	442.355	0.000	350.000
6350.000	2405.000	586.870	1.610	.028	0.000	449.999	-7.644	350.000
6350.000	2745.000	587.812	.941	.019	0.000	449.999	-7.644	350.000
6350.000	3555.000	588.844	1.032	.015	0.000	449.999	-7.644	350.000
8350.000	1810.000	585.801	0.000	.541	0.000	547.075	0.000	2000.000
8350.000	2405.000	587.163	1.362	.293	0.000	598.473	-51.398	2000.000
8350.000	2745.000	588.027	.864	.215	0.000	634.454	-87.379	2000.000
8350.000	3555.000	589.051	1.024	.207	0.000	696.480	-149.405	2000.000
8600.000	1810.000	585.850	0.000	.049	0.000	261.153	0.000	250.000
8600.000	2405.000	587.186	1.335	.022	0.000	371.966	-110.813	250.000
8600.000	2745.000	588.043	.857	.016	0.000	402.039	-140.886	250.000
8600.000	3555.000	589.065	1.022	.014	0.000	444.614	-183.462	250.000
8699.000	1150.000	586.243	0.000	.393	0.000	334.250	0.000	99.000
8699.000	1530.000	587.452	1.208	.266	0.000	359.411	-25.161	99.000
8699.000	1750.000	588.234	.782	.191	0.000	375.765	-41.515	99.000
8699.000	2275.000	589.233	.999	.169	0.000	398.160	-63.910	99.000
8700.000	1150.000	586.250	0.000	.006	0.000	334.264	0.000	1.000
8700.000	1530.000	587.452	1.202	-.000	0.000	359.420	-25.156	1.000
8700.000	1750.000	588.234	.782	-.000	0.000	375.772	-41.508	1.000
8700.000	2275.000	589.233	.999	-.001	0.000	398.166	-63.903	1.000
8707.000	1150.000	586.252	0.000	.002	0.000	334.298	0.000	7.000
8707.000	1530.000	587.453	1.201	.001	0.000	359.442	-25.145	7.000
8707.000	1750.000	588.235	.782	.001	0.000	375.789	-41.492	7.000
8707.000	2275.000	589.234	.999	.001	0.000	398.182	-63.884	7.000
8708.000	1150.000	586.250	0.000	-.002	0.000	334.304	0.000	1.000
8708.000	1530.000	587.454	1.204	.001	0.000	359.446	-25.143	1.000
8708.000	1750.000	588.236	.783	.002	0.000	375.793	-41.489	1.000
8708.000	2275.000	589.235	.999	.002	0.000	398.185	-63.881	1.000
9474.000	1150.000	586.415	0.000	.166	0.000	261.182	0.000	766.000
9474.000	1530.000	587.561	1.146	.108	0.000	318.549	-57.367	766.000
9474.000	1750.000	588.317	.756	.081	0.000	324.999	-63.817	766.000
9474.000	2275.000	589.308	.991	.073	0.000	324.999	-63.817	766.000
9475.000	1150.000	586.434	0.000	.018	0.000	261.197	0.000	1.000
9475.000	1530.000	587.571	1.138	.010	0.000	318.558	-57.362	1.000
9475.000	1750.000	588.324	.752	.006	0.000	324.999	-63.802	1.000
9475.000	2275.000	589.312	.989	.004	0.000	324.999	-63.802	1.000
9482.000	1150.000	586.442	0.000	.009	0.000	261.776	0.000	7.000
9482.000	1530.000	587.576	1.134	.005	0.000	318.721	-56.945	7.000
9482.000	1750.000	588.326	.750	.003	0.000	324.999	-63.223	7.000
9482.000	2275.000	589.314	.988	.002	0.000	324.999	-63.223	7.000
9483.000	1150.000	586.436	0.000	-.006	0.000	261.830	0.000	1.000
9483.000	1530.000	587.573	1.137	-.003	0.000	318.754	-56.924	1.000
9483.000	1750.000	588.324	.752	-.002	0.000	324.999	-63.169	1.000
9483.000	2275.000	589.313	.989	-.001	0.000	324.999	-63.169	1.000
9800.000	1150.000	586.550	0.000	.113	0.000	131.267	0.000	317.000
9800.000	1530.000	587.631	1.082	.058	0.000	178.653	-47.386	317.000
9800.000	1750.000	588.361	.730	.037	0.000	278.452	-147.184	317.000
9800.000	2275.000	589.347	.986	.034	0.000	364.378	-233.110	317.000
9850.000	1150.000	586.448	0.000	-.102	0.000	27.500	0.000	50.000
9850.000	1530.000	587.436	.988	-.195	0.000	27.500	0.000	50.000
9850.000	1750.000	588.376	.940	.015	0.000	245.047	-217.547	50.000

9850.000	2275.000	589.363	.987	.016	0.000	328.906	-301.406	50.000
9867.000	1150.000	587.400	0.000	.952	0.000	165.899	0.000	17.000
9867.000	1530.000	588.397	.998	.961	0.000	246.735	-80.836	17.000
9867.000	1750.000	588.965	.568	.589	0.000	292.739	-126.840	17.000
9867.000	2275.000	589.670	.705	.307	0.000	360.679	-194.780	17.000
10750.000	1135.000	587.888	0.000	.488	0.000	196.621	0.000	883.000
10750.000	1515.000	588.804	.916	.407	0.000	222.435	-25.814	883.000
10750.000	1735.000	589.315	.511	.350	0.000	237.110	-40.489	883.000
10750.000	2280.000	590.013	.698	.343	0.000	257.010	-60.389	883.000
10999.000	1135.000	587.990	0.000	.103	0.000	278.461	0.000	249.000
10999.000	1515.000	588.902	.912	.098	0.000	311.208	-32.748	249.000
10999.000	1735.000	589.409	.507	.094	0.000	329.368	-50.907	249.000
10999.000	2280.000	590.122	.713	.109	0.000	354.982	-76.522	249.000
11000.000	1135.000	587.993	0.000	.002	0.000	278.469	0.000	1.000
11000.000	1515.000	588.903	.910	.001	0.000	311.216	-32.747	1.000
11000.000	1735.000	589.409	.506	.001	0.000	329.375	-50.906	1.000
11000.000	2280.000	590.122	.713	.000	0.000	354.990	-76.521	1.000
11007.000	1135.000	587.995	0.000	.003	0.000	278.534	0.000	7.000
11007.000	1515.000	588.905	.910	.002	0.000	311.268	-32.734	7.000
11007.000	1735.000	589.411	.506	.002	0.000	329.422	-50.888	7.000
11007.000	2280.000	590.124	.713	.002	0.000	355.040	-76.506	7.000
11008.000	1135.000	587.995	0.000	-.001	0.000	278.547	0.000	1.000
11008.000	1515.000	588.905	.910	-.000	0.000	311.278	-32.731	1.000
11008.000	1735.000	589.411	.506	.000	0.000	329.431	-50.884	1.000
11008.000	2280.000	590.124	.713	.000	0.000	355.049	-76.502	1.000
11299.000	1135.000	588.001	0.000	.006	0.000	187.576	0.000	291.000
11299.000	1515.000	588.916	.914	.011	0.000	265.182	-77.606	291.000
11299.000	1735.000	589.426	.511	.015	0.000	275.999	-88.423	291.000
11299.000	2280.000	590.147	.721	.023	0.000	275.999	-88.423	291.000
11300.000	1135.000	587.984	0.000	-.017	0.000	187.092	0.000	1.000
11300.000	1515.000	588.946	.962	.031	0.000	268.610	-81.518	1.000
11300.000	1735.000	589.462	.516	.036	0.000	275.999	-88.907	1.000
11300.000	2280.000	590.183	.721	.035	0.000	275.999	-88.907	1.000
11307.000	1135.000	588.046	0.000	.061	0.000	190.379	0.000	7.000
11307.000	1515.000	588.967	.921	.021	0.000	269.891	-79.511	7.000
11307.000	1735.000	589.475	.508	.013	0.000	275.999	-85.620	7.000
11307.000	2280.000	590.193	.717	.010	0.000	275.999	-85.620	7.000
11308.000	1135.000	588.094	0.000	.048	0.000	193.402	0.000	1.000
11308.000	1515.000	588.959	.865	-.008	0.000	270.184	-76.782	1.000
11308.000	1735.000	589.465	.506	-.010	0.000	275.999	-82.597	1.000
11308.000	2280.000	590.182	.717	-.011	0.000	275.999	-82.597	1.000
11408.000	1135.000	588.313	0.000	.219	0.000	221.999	0.000	100.000
11408.000	1515.000	589.141	.828	.182	0.000	221.999	-.000	100.000
11408.000	1735.000	589.612	.471	.147	0.000	221.999	-.000	100.000
11408.000	2280.000	590.315	.703	.133	0.000	221.999	-.000	100.000
11508.000	1135.000	588.327	0.000	.015	0.000	171.999	0.000	100.000
11508.000	1515.000	589.156	.829	.015	0.000	171.999	-.000	100.000
11508.000	1735.000	589.627	.471	.015	0.000	171.999	-.000	100.000
11508.000	2280.000	590.332	.705	.017	0.000	171.999	-.000	100.000
11608.000	1135.000	588.344	0.000	.017	0.000	121.999	0.000	100.000
11608.000	1515.000	589.173	.829	.017	0.000	121.999	-.000	100.000
11608.000	1735.000	589.644	.470	.017	0.000	121.999	-.000	100.000
11608.000	2280.000	590.350	.707	.018	0.000	121.999	-.000	100.000

11700.000	1135.000	588.361	0.000	.017	0.000	75.999	0.000	92.000
11700.000	1515.000	589.189	.828	.016	0.000	75.999	-.000	92.000
11700.000	1735.000	589.658	.469	.015	0.000	75.999	-.000	92.000
11700.000	2280.000	590.364	.705	.013	0.000	75.999	-.000	92.000
11715.000	1135.000	588.364	0.000	.003	0.000	68.999	0.000	15.000
11715.000	1515.000	589.192	.828	.003	0.000	68.999	-.000	15.000
11715.000	1735.000	589.661	.469	.002	0.000	68.999	-.000	15.000
11715.000	2280.000	590.366	.705	.002	0.000	68.999	-.000	15.000
11730.000	1135.000	588.364	0.000	.000	0.000	60.999	0.000	15.000
11730.000	1515.000	589.191	.827	-.001	0.000	60.999	-.000	15.000
11730.000	1735.000	589.658	.468	-.002	0.000	60.999	-.000	15.000
11730.000	2280.000	590.361	.702	-.005	0.000	60.999	-.000	15.000
11749.000	1135.000	588.341	0.000	-.023	0.000	49.637	0.000	19.000
11749.000	1515.000	589.158	.816	-.033	0.000	50.370	-.733	19.000
11749.000	1735.000	589.619	.462	-.039	0.000	50.785	-1.148	19.000
11749.000	2280.000	590.303	.683	-.058	0.000	51.398	-1.762	19.000
11750.000	1135.000	588.342	0.000	.001	0.000	49.637	0.000	1.000
11750.000	1515.000	589.159	.817	.001	0.000	50.371	-.733	1.000
11750.000	1735.000	589.621	.462	.001	0.000	50.785	-1.148	1.000
11750.000	2280.000	590.305	.684	.002	0.000	51.399	-1.762	1.000
11763.000	1135.000	588.353	0.000	.011	0.000	49.647	0.000	13.000
11763.000	1515.000	589.174	.820	.015	0.000	50.383	-.736	13.000
11763.000	1735.000	589.637	.464	.017	0.000	50.799	-1.152	13.000
11763.000	2280.000	590.328	.691	.023	0.000	51.418	-1.771	13.000
11764.000	1135.000	588.354	0.000	.001	0.000	49.648	0.000	1.000
11764.000	1515.000	589.175	.821	.001	0.000	50.384	-.736	1.000
11764.000	1735.000	589.639	.464	.001	0.000	50.800	-1.153	1.000
11764.000	2280.000	590.330	.691	.002	0.000	51.420	-1.772	1.000
11813.000	1135.000	588.397	0.000	.043	0.000	149.999	0.000	49.000
11813.000	1515.000	589.276	.879	.101	0.000	149.999	-.000	49.000
11813.000	1735.000	589.784	.507	.145	0.000	149.999	-.000	49.000
11813.000	2280.000	590.594	.810	.264	0.000	149.999	-.000	49.000
12100.000	1135.000	588.697	0.000	.300	0.000	259.371	0.000	287.000
12100.000	1515.000	589.605	.909	.329	0.000	334.681	-75.310	287.000
12100.000	1735.000	590.119	.513	.335	0.000	364.418	-105.047	287.000
12100.000	2280.000	590.991	.873	.397	0.000	414.973	-155.602	287.000
12700.000	1135.000	589.306	0.000	.609	0.000	260.954	0.000	600.000
12700.000	1515.000	590.169	.863	.564	0.000	332.586	-71.632	600.000
12700.000	1735.000	590.627	.457	.508	0.000	359.090	-98.136	600.000
12700.000	2280.000	591.461	.835	.470	0.000	407.443	-146.489	600.000
13075.000	1135.000	589.677	0.000	.371	0.000	255.485	0.000	375.000
13075.000	1515.000	590.513	.837	.344	0.000	329.334	-73.849	375.000
13075.000	1735.000	590.941	.428	.314	0.000	354.110	-98.625	375.000
13075.000	2280.000	591.749	.809	.288	0.000	400.952	-145.467	375.000
13600.000	1135.000	590.222	0.000	.546	0.000	243.651	0.000	525.000
13600.000	1515.000	591.040	.818	.527	0.000	323.465	-79.815	525.000
13600.000	1735.000	591.441	.401	.500	0.000	348.330	-104.679	525.000
13600.000	2280.000	592.225	.784	.476	0.000	393.763	-150.112	525.000
13700.000	1135.000	590.312	0.000	.090	0.000	261.722	0.000	100.000
13700.000	1515.000	591.133	.821	.093	0.000	332.484	-70.762	100.000
13700.000	1735.000	591.532	.399	.091	0.000	356.058	-94.335	100.000
13700.000	2280.000	592.317	.784	.091	0.000	402.496	-140.773	100.000

13736.000	1135.000	591.236	0.000	.924	0.000	26.800	0.000	36.000
13736.000	1515.000	592.261	1.024	1.127	0.000	399.124	-372.324	36.000
13736.000	1735.000	592.537	.277	1.005	0.000	415.604	-388.804	36.000
13736.000	2280.000	593.040	.503	.724	0.000	457.136	-430.336	36.000
14100.000	520.000	591.894	0.000	.657	0.000	190.650	0.000	364.000
14100.000	700.000	592.484	.590	.223	0.000	212.882	-22.232	364.000
14100.000	800.000	592.774	.290	.237	0.000	223.253	-32.603	364.000
14100.000	1050.000	593.321	.546	.280	0.000	243.982	-53.332	364.000
14506.000	520.000	592.087	0.000	.193	0.000	180.025	0.000	406.000
14506.000	700.000	592.696	.609	.212	0.000	216.597	-36.572	406.000
14506.000	800.000	592.994	.298	.219	0.000	238.919	-58.894	406.000
14506.000	1050.000	593.567	.573	.246	0.000	280.059	-100.034	406.000
14912.000	520.000	592.357	0.000	.270	0.000	166.466	0.000	406.000
14912.000	700.000	592.983	.627	.288	0.000	236.587	-70.120	406.000
14912.000	800.000	593.283	.299	.289	0.000	261.196	-94.730	406.000
14912.000	1050.000	593.872	.590	.306	0.000	422.220	-255.754	406.000
15318.000	520.000	592.683	0.000	.326	0.000	190.116	0.000	406.000
15318.000	700.000	593.324	.641	.340	0.000	220.771	-30.656	406.000
15318.000	800.000	593.624	.300	.341	0.000	239.102	-48.986	406.000
15318.000	1050.000	594.218	.595	.346	0.000	277.166	-87.051	406.000
15725.000	520.000	593.123	0.000	.441	0.000	64.999	0.000	407.000
15725.000	700.000	593.778	.654	.454	0.000	64.999	-.000	407.000
15725.000	800.000	594.080	.303	.456	0.000	64.999	-.000	407.000
15725.000	1050.000	594.692	.611	.473	0.000	64.999	-.000	407.000
15758.000	520.000	593.176	0.000	.053	0.000	47.999	0.000	33.000
15758.000	700.000	593.834	.658	.057	0.000	47.999	-.000	33.000
15758.000	800.000	594.139	.304	.059	0.000	47.999	-.000	33.000
15758.000	1050.000	594.755	.616	.063	0.000	47.999	-.000	33.000
15791.000	520.000	593.230	0.000	.054	0.000	31.999	0.000	33.000
15791.000	700.000	593.894	.664	.060	0.000	31.999	-.000	33.000
15791.000	800.000	594.201	.307	.062	0.000	31.999	-.000	33.000
15791.000	1050.000	594.824	.623	.069	0.000	31.999	-.000	33.000
15808.000	520.000	593.236	0.000	.006	0.000	23.999	0.000	17.000
15808.000	700.000	593.895	.659	.001	0.000	23.999	-.000	17.000
15808.000	800.000	594.198	.303	-.003	0.000	23.999	-.000	17.000
15808.000	1050.000	594.810	.612	-.015	0.000	23.999	-.000	17.000
15824.000	520.000	593.194	0.000	-.043	0.000	15.200	0.000	16.000
15824.000	700.000	593.816	.623	-.079	0.000	15.200	0.000	16.000
15824.000	800.000	594.096	.280	-.102	0.000	15.200	0.000	16.000
15824.000	1050.000	594.636	.540	-.174	0.000	15.200	0.000	16.000
15825.000	520.000	593.168	0.000	-.025	0.000	15.200	0.000	1.000
15825.000	700.000	593.754	.586	-.062	0.000	15.200	0.000	1.000
15825.000	800.000	594.008	.253	-.088	0.000	15.200	0.000	1.000
15825.000	1050.000	594.462	.454	-.174	0.000	15.200	0.000	1.000
15875.000	520.000	593.342	0.000	.174	0.000	15.200	0.000	50.000
15875.000	700.000	594.060	.718	.306	0.000	15.200	0.000	50.000
15875.000	800.000	594.399	.339	.392	0.000	15.200	0.000	50.000
15875.000	1050.000	595.163	.764	.701	0.000	15.200	0.000	50.000
15876.000	520.000	593.440	0.000	.098	0.000	15.200	0.000	1.000
15876.000	700.000	594.293	.853	.232	0.000	15.200	0.000	1.000
15876.000	800.000	594.729	.436	.330	0.000	15.200	0.000	1.000
15876.000	1050.000	597.520	2.791	2.357	0.000	15.200	0.000	1.000
15881.000	520.000	593.792	0.000	.352	0.000	24.999	0.000	5.000

15881.000	700.000	594.805	1.014	.512	0.000	24.999	-.000	5.000
15881.000	800.000	595.333	.527	.604	0.000	24.999	-.000	5.000
15881.000	1050.000	598.078	2.745	.558	0.000	24.999	-.000	5.000
15901.000	520.000	593.935	0.000	.144	0.000	41.977	0.000	20.000
15901.000	700.000	595.007	1.072	.202	0.000	46.324	-4.347	20.000
15901.000	800.000	595.567	.560	.234	0.000	48.574	-6.597	20.000
15901.000	1050.000	598.316	2.749	.238	0.000	61.899	-19.923	20.000
17450.000	520.000	596.714	0.000	2.778	0.000	50.794	0.000	1549.000
17450.000	700.000	597.762	1.048	2.755	0.000	56.504	-5.710	1549.000
17450.000	800.000	598.250	.488	2.684	0.000	221.035	-170.240	1549.000
17450.000	1050.000	599.612	1.361	1.296	0.000	659.999	-609.205	1549.000
19800.000	520.000	599.626	0.000	2.913	0.000	129.999	0.000	2350.000
19800.000	700.000	600.494	.868	2.732	0.000	129.999	-.000	2350.000
19800.000	800.000	600.896	.402	2.646	0.000	129.999	-.000	2350.000
19800.000	1050.000	601.447	.551	1.835	0.000	129.999	-.000	2350.000
20000.000	520.000	599.795	0.000	.169	0.000	30.000	0.000	200.000
20000.000	700.000	600.664	.868	.170	0.000	30.000	0.000	200.000
20000.000	800.000	601.069	.405	.173	0.000	30.000	0.000	200.000
20000.000	1050.000	601.660	.591	.213	0.000	30.000	0.000	200.000

DATA FOR LAST CROSS SECTION

PROFILE	TYPE ENC	TARGET	TOP WIDTH AREA-ACRES	TOP WIDTH AREA-DIFF
1	0.000	0.000	109.686	0.000
2	0.000	0.000	127.360	17.675
3	0.000	0.000	141.562	31.877
4	0.000	0.000	182.257	72.571

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Fraser Township

3) WATERCOURSE: Saginaw Bay Wave Runup

4) DOCUMENT TYPE: Report

00BREAK00

TECHNICAL LETTER REPORT ON FRASER TOWNSHIP, MICHIGAN

RECEIVED

JAN 07 1991

NATURAL RESOURCES
LAND & WATER MGMT.

Prepared by the U.S. Army Corps of Engineers
for the Federal Emergency Management Agency

Detroit, Michigan
December 1990

TECHNICAL LETTER REPORT ON
FRASER TOWNSHIP, MICHIGAN

TABLE OF CONTENTS

Title	Page
TABLE OF CONTENTS	i
LIST OF FIGURES	ii
LIST OF TABLES	ii
1.0 INTRODUCTION	1
1.1 PURPOSE OF STUDY	1
1.2 AUTHORITY AND ACKNOWLEDGMENTS	1
1.3 COORDINATION	1
2.0 AREA STUDIED	3
2.1 COMMUNITY DESCRIPTION	3
2.2 PRINCIPAL FLOOD PROBLEMS	3
3.0 ENGINEERING METHODS	5
4.0 AE-ZONE AND VE-ZONE DELINEATIONS	6
5.0 CONCLUSIONS	9
6.0 GLOSSARY	11
7.0 REFERENCES	13

TECHNICAL LETTER REPORT ON
FRASER TOWNSHIP, MICHIGAN

LIST OF FIGURES

Number	Title	Page
1.	FRASER TOWNSHIP LOCATION MAP	4
2.	FRASER TOWNSHIP AE & VE-ZONE DELINEATIONS ON A BEACH SYSTEM (PROFILE F-1)	7
3.	FRASER TOWNSHIP AE & VE-ZONE DELINEATIONS ON A BEACH SYSTEM (PROFILE F-2)	8

LIST OF TABLES

Number	Title	Page
1.	SHORELINE PROFILES, FRASER TOWNSHIP, MICHIGAN	2
2.	WAVE RUNUP ELEVATIONS	10

Appendix	Title
A	FIS PROFILES AND COMPUTATIONS

TECHNICAL LETTER REPORT ON
FRASER TOWNSHIP, MICHIGAN

1.0 INTRODUCTION

1.1 Purpose of Study

This report describes the application of the procedures developed in the 1989 "Great Lakes Wave Runup Methodology Study" to flood levels on Saginaw Bay, specifically in Fraser Township, Michigan.

1.2 Authority and Acknowledgments

The "Great Lakes Wave Runup Methodology Study" was prepared in 1989 by the U.S. Army Corps of Engineers (COE) for the Federal Emergency Management Agency (FEMA), for application to future coastal Flood Insurance Studies (FIS) and/or restudies of communities bordering the Great Lakes. The work was conducted under Inter-Agency Work Agreement, EMW-89-E-3218, Project Order No. 1, between the COE and FEMA. The 100-year and 500-year flood levels from the September 1989 "Flood Levels Report for Saginaw Bay" were used in combination with the maximum wave runup elevations to update the previous study in Fraser Township on Saginaw Bay. TABLE 1 lists profile locations and the 100- and 500-year "base" flood levels at two locations along the Fraser Township shoreline. The two profiles were plotted from data obtained from a June 1990 survey.

1.3 Coordination

The "Flood Levels Report For Saginaw Bay", along with examples of the application of the methodology from the 1989 "Great Lakes Wave Runup Methodology Study", were presented to FEMA on 1 March 1990. The procedures outlined in the above

SHORELINE PROFILES
FRASER TOWNSHIP, MICHIGAN

	Profile Location	100-year Flood Level	500-year Flood Level
1.	Fraser-1	585.7	586.7
2.	Fraaer-2	585.7	586.7

NOTE: All elevations are in FT, NGVD and were obtained from the September 1989 "Saginaw Bay Flood Levels Report."

TABLE 1

references were approved at this meeting for application to all Saginaw Bay FIS sites, including Fraser Township.

2.0 AREA STUDIED

2.1 Community Description

Fraser Township, Michigan, shown on FIGURE 1, is located in Bay County along approximately 7 miles of shoreline on Saginaw Bay. There are no major populated communities located along the Fraser Township shoreline. The developed shoreline consists of small seasonal and year-round residential homes.

The entire Fraser Township shoreline on Saginaw Bay is exposed from the northeast to a Lake Huron/Saginaw Bay fetch of about 150 miles. Bathymetry in Saginaw Bay along the Fraser Township shoreline varies from 30-foot depths offshore to less than five feet deep near shore. Ordinary fluctuations of water levels along this shoreline are subject to change due to wind. A northeast storm can push water into the bay and raise the water level along Fraser Township 3 to 4 feet. Accordingly, a storm from the southwest can lower water levels sufficiently to cause large vessels to ground in the shipping channels. The lowest seasonal bay stages usually prevail during the winter months and the highest during the summer months. During the past 13 years, fluctuations of monthly mean water levels on Saginaw Bay, as measured at the Essexville, Michigan water level gage, have ranged from a minimum of 578.14 to a maximum of 581.9 feet NGVD.

2.2 Principal Flood Problems

Short-term Saginaw Bay water level fluctuations are most

FRASER TOWNSHIP LOCATION MAP

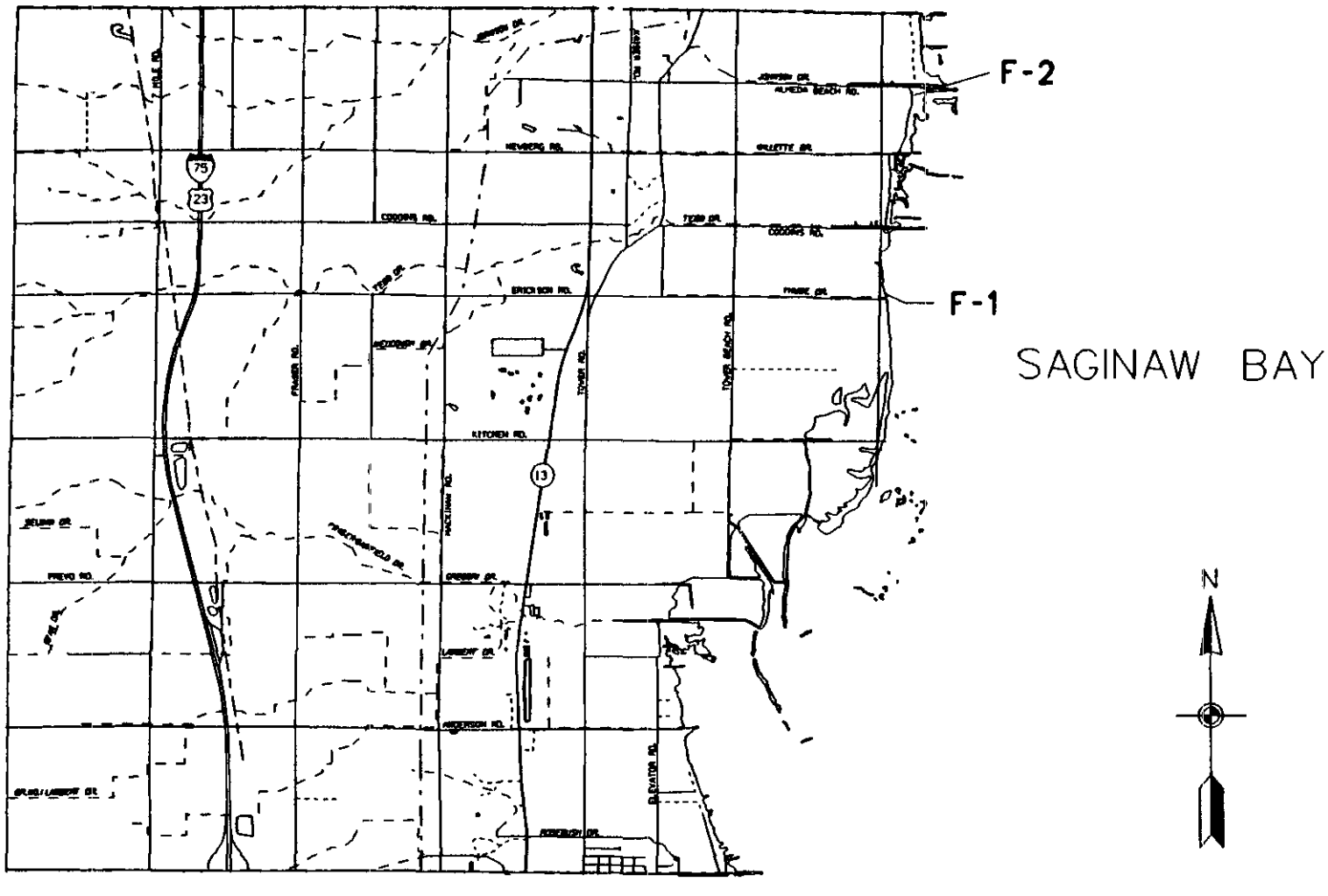


Figure 1

often due to variations in wind and barometric pressure. Occasionally, a surge of considerable proportions takes place within a few hours, due to strong and persistent northeasterly winds.

When lake levels are high and storms occur from the northeast, the Fraser Township shoreline properties are usually subjected to extreme conditions. Along the Fraser Township shoreline, substantial flooding has occurred because of the flat topography along the reaches on Saginaw Bay.

3.0 ENGINEERING METHODS

The flood levels established in the U.S. Army Corps of Engineer's September 1989 "Flood Levels Report for Saginaw Bay" and the procedures developed in the 1989 "Great Lakes Wave Runup Methodology Study" were used to analyze the flooding potential at the two Fraser Township FIS sites shown on FIGURE 1. The hydraulic analyses presented herein involved the determination of the wave runup components and maximum wave runup elevations for selected sites.

Input data used for flood calculations include site specific design wave, water depth at the toe of the structure, and wave period. Additional data such as nearshore profiles, high water marks, and existing conditions, bathymetry and topography, were also analyzed to determine the maximum wave runup elevation at each site. This technical letter report presents the wave runup application procedures for each of the two FIS sites located in

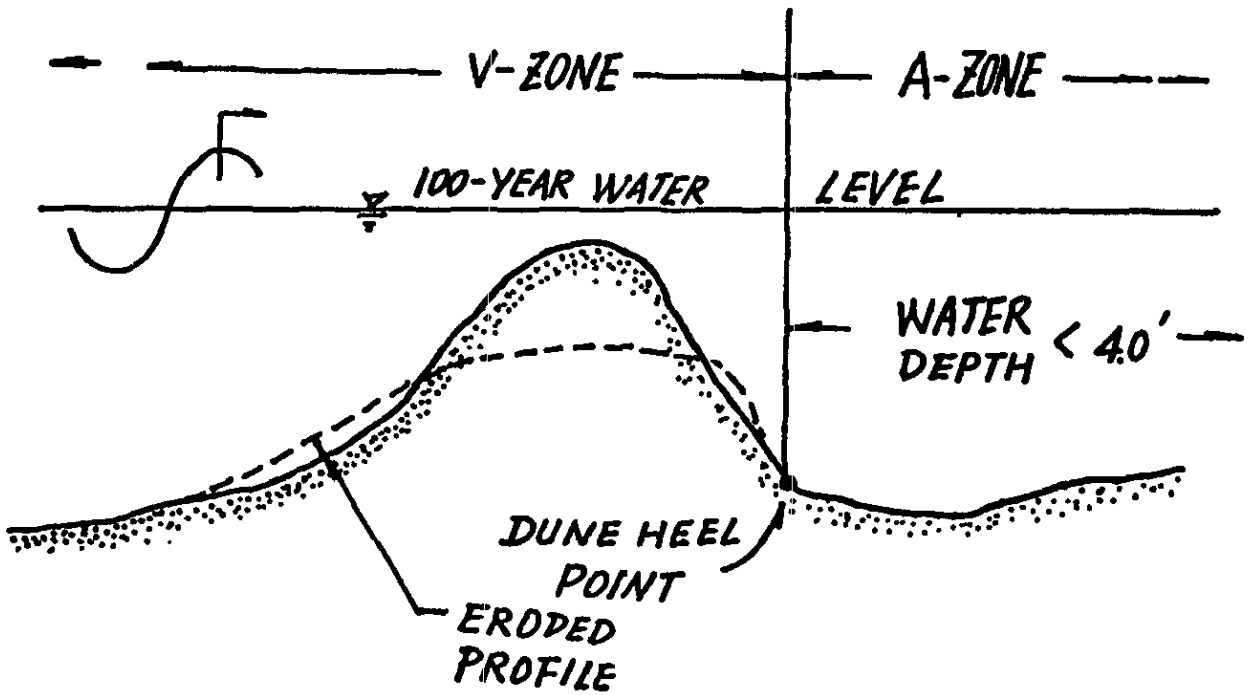
Fraser Township. Representative profiles for each site are included in APPENDIX A.

4.0 "AE"-Zone and "VE"-Zone Delineations

The "VE"-Zone defined in FEMA's 1990 "Guidelines For Great Lakes Wave Runup Computation And Mapping" is the flood insurance rate zone that corresponds to the 100-year coastal flood plains that have additional hazards associated with storm waves. An "AE"-Zone is the flood insurance rate zone that corresponds to the 100-year flood plains that are determined in the FIS using the detailed methods.

Two flood condition as defined by FEMA, most closely represent the FIS sites in Fraser Township. The first condition has the low-dune flooded by the 100-year flood level. The largest 100-year water depth for the flooded area on the landward side of the low-dune heel point is less than 4 feet. The V/A demarcation line is fixed at the low-bluff/dune heel point. This mapping is considered representative of the conditions depicted by profiles Fraser-1 and Fraser-2 as shown on FIGURES 2 and 3. The second type of condition involves a beach that is flooded or breached. In this case, the V/A demarcation line is fixed at the point where the 100-year flood level is equal to 4 feet on the lakeward side of the beach. In general, the A/X demarcation line is fixed at the Saginaw Bay 100-year flood limit, at areas of shallow 100-year flooding with depths less than one foot deep and at the 500-year flood limit. Limited areas of coastal dunes were delineated based on the wave runup elevations.

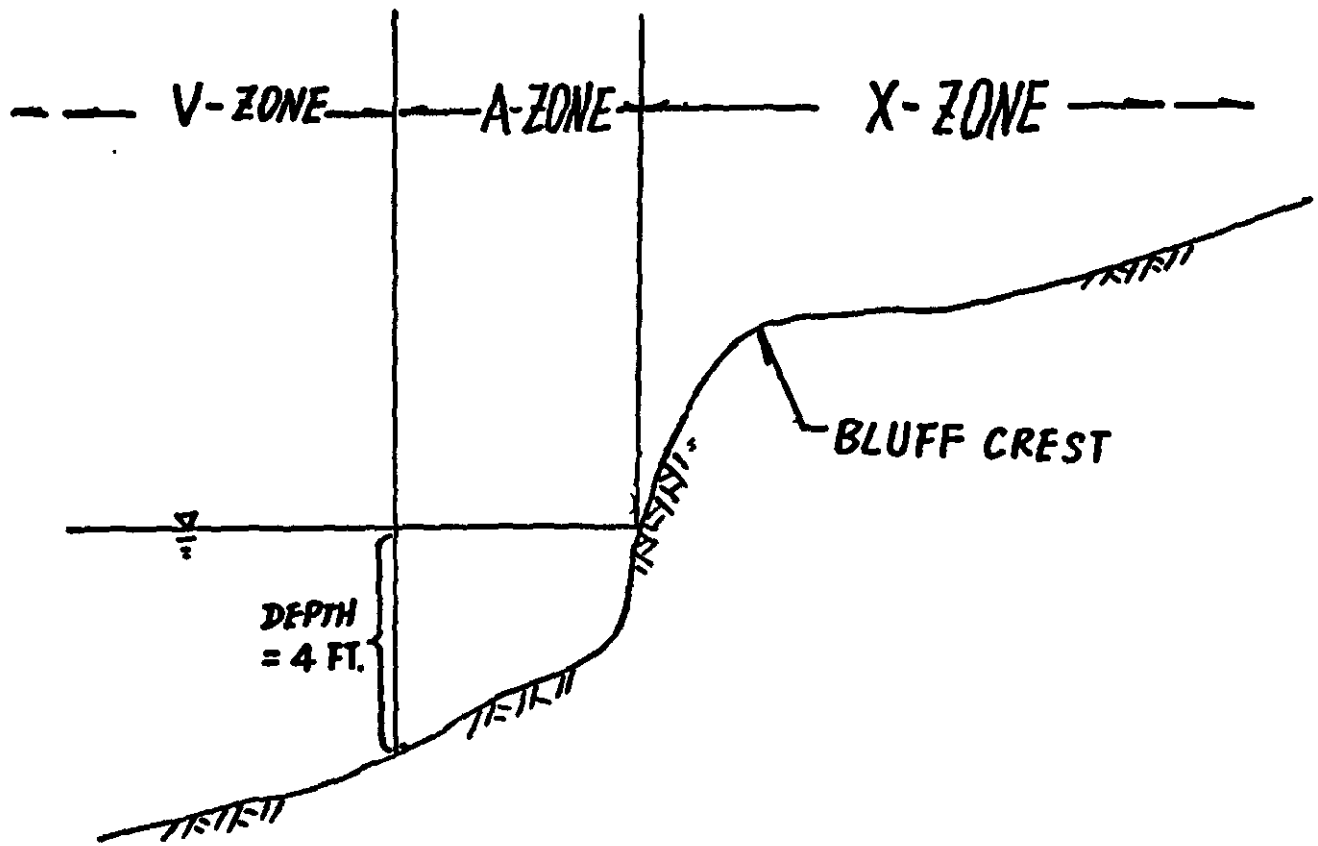
FRASER TOWNSHIP A & V ZONE DELINEATIONS ON A BEACH SYSTEM



Fraser-1

FIGURE 2

FRASER TOWNSHIP A & V ZONE DELINEATIONS ON A BEACH SYSTEM



Fraser-2

FIGURE 3

The "AE" and "VE"-Zones for these sites have been delineated according to FEMA's 1990 "Flood Insurance Study Guidelines and Specifications for Study Contractors" and are shown on the attached work maps.

The formal submittal of the Fraser Township study will include original mylar copies showing sufficient detail for submittal to FEMA's technical review contractor.

5.0 CONCLUSIONS

For each of the Fraser Township sites where the 100-year flood levels inundate shoreline property, the inundated area will experience a minimal water depth landward of the shoreline protection. This water depth will generate a negligible wave across the property. Therefore, the 100-year Saginaw Bay flood level was used to delineate the landward limit of the flood profiles at each site. Coastal dunes were delineated using wave runup.

Accordingly, where structures are not protected against flooding, the 100-year "AE" and "VE" Zones, based on wave runup elevations, will be delineated on the work maps in the final FIS for the site. Landward of the shoreline protection the delineation is based on the 100-year Saginaw Bay flood levels. TABLE 2 lists the 100-year computed wave runup components and the associated wave runup elevations for the two sites.

In conclusion, it is recommended that the delineated 100-year flood profiles for the two Fraser Township sites included herein be used by FEMA for updating the Fraser FIS.

TABLE 2

WAVE RUNUP ELEVATIONS

Fraser Township FIS Sites	100-year Computed Wave Runup(ft.)	100-year Wave Runup Elevation (ft., NGVD)
1. Fraser-1	2.0	587.7
2. Fraser-2	2.0	587.7

6.0 GLOSSARY

Annual Maximum Instantaneous Water Level: The highest water level that was recorded during a year by a gage with a sampling frequency of an hour or less.

AE-Zone: The flood insurance rate zone that corresponds to the 100-year flood plains that are determined in the Flood Insurance Study by detailed methods.

AO-Zone: The flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet.

Beach: The zone of sedimentary material that extends landward from the low water line to the place where there is a marked change in material or form, or to the line of permanent vegetation.

Bluff: A high, steep bank composed of erodible materials.

Floodplain: The area adjoining a river, stream, watercourse, ocean, lake or other body of standing water that has been or may be covered by floodwater.

National Geodetic Vertical Datum of 1929 (NGVD): The nationwide reference datum for land elevations throughout the United States. It was established by the National Geodetic Survey in 1929.

Runup: The rush of water up a beach or structure from the breaking of a wave. Also, the vertical height of uprush above the still-water level.

Still-water level: The elevation that the water surface would assume if all wave action were absent.

Storm-water level: The rise above the normal water level on the open-coast, due to wind stress on the water surface.

VE-Zone: The flood insurance rate zone that corresponds to the areas of 100-year coastal flood plains that have additional hazards associated with storm waves.

Wave-height: The vertical distance between the wave crest and the preceding trough.

Wave setup: The superelevation of the water surface over normal surge elevation due to the onshore mass transport of the water by wave action alone.

Wind setup: The vertical rise in the still-water level on the leeward side of a body of water caused by wind stresses on the surface of the water.

X-Zone: The flood insurance rate zone that corresponds to areas outside the 500-year flood plain, areas within the 500-year flood plain, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from 100-year flood by levees.

7.0 REFERENCES

1. U.S. Army Corps of Engineers, Coastal Engineering Research Center, Vicksburg, MS, "Shore Protection Manual," Volumes I & II, 1984.

2. U.S. Army Corps of Engineers, Detroit District, "Phase I, Revised Report on Great Lakes Open-Coast Flood Levels," April 1988.

3. U.S. Army Corps of Engineers, Detroit District, "Phase II, Revised Report on Great Lakes Open-Coast Flood Levels," April 1988.

4. U.S. Army Corps of Engineers, Detroit District, "Appendices, Revised Report on Great Lakes Open-Coast Flood Levels," April 1988.

5. U.S. Army Corps of Engineers, Coordinating Committee on Great Lakes Basin Hydraulic and Hydrologic Data, "History of Water Level Gauges, Upper Great Lakes and the St. Clair - Detroit Rivers," January 1978.

6. U.S. Army Corps of Engineers, North Central Division, "Great Lakes Region Inventory Report National Shoreline Study," August 1978.

7. U.S. Army Corps of Engineers, Detroit District, "Flood Levels Report - Saginaw Bay," September 1989.

8. U.S. Army Corps of Engineers, Detroit District, "Flood Levels Report - Anchor Bay," September 1989.

9. Great Lakes Environmental Research Laboratory, Ann Arbor, Michigan, SCHWAB, D.J., and LYNN, E.W., "Great Lakes Storm Surge Planning Program," 1987.

10. U.S. Army Corps of Engineers, Detroit District, "Phase II Report on Great Lakes Flood Levels - Little Bay De Noc," August 1981.

11. U.S. Army Corps of Engineers, Detroit District, "Phase II Report on Great Lakes Flood Levels - Big Bay De Noc," July 1981. April 1988.

12. FEMA Great Lakes "A" Zone and "V" Zone Delineation.

SYNOPSIS

APPENDIX A outlines the procedures necessary to calculate the wave runup component and the maximum wave runup elevation associated with the 100-year flood level. These data, with the information provided from the profile surveys will enable the user to delineate the 100-year "AE" and "VE"-Zone profiles according to FEMA's 1990 "Flood Insurance Study Guidelines and Specifications for Study Contractors". The following list shows the two Fraser Township sites and the 100-year wave runup flood profiles. Samples of these computations are included in APPENDIX A.

Fraser Township FIS Sites	100-year Computed Wave Runup(ft.)	100-year Wave Runup Elevation (ft., NGVD)
1. Fraser-1	2.0	587.7
2. Fraser-2	2.0	587.7

DEFINITION OF TERMS

SYMBOL	DEFINITIONS
a	Wave transmission coefficient
b	Wave transmission coefficient
d	Relative depth (ft.)
ξ	Surf parameter
ϵ	Significant wave steepness
f'	Frequency (sec.)
g	Gravitational constant (ft./sec^2)
H_i	Incident wave height (ft.)
H_o'	Unrefracted deepwater wave height (ft.)
H_{mo}	Zero-moment wave height (ft.)
H_s	Average height of the 1/3 highest waves (ft.)
k	Dimensionless wave number
L_m	Wavelength (ft.)
L_o	Deepwater wavelength (ft.)
θ	Structure slope (degrees)
R	Wave runup (ft.)
T'	Wave period (sec.)
T_m	Spectral peak period (sec.)
α	Spectral parameter

FIS PROFILE
FRASER - 1

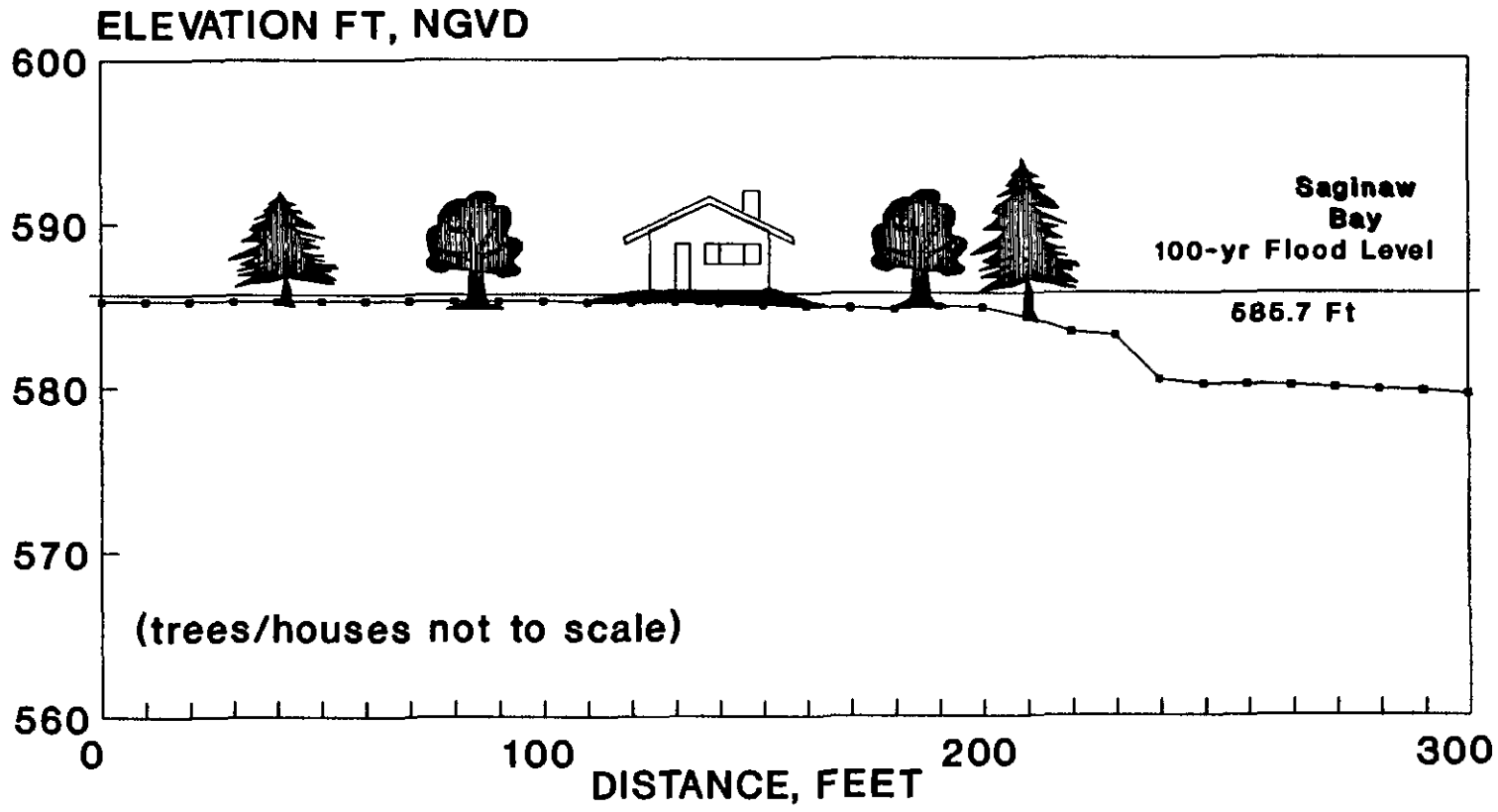


FIGURE F-1

RUNUP COMPUTATION

WAVE RUNUP AT FRASER TOWNSHIP, FRASER-1

```
                runup on:  beach
        100-year flood: 585.7 feet
    water depth       :  26.0 feet                 significant wave computation
  100-year wave period T:  11.5
                     T':   5.7
                      L: 332.48
100-yr deep water wave H:  24.9 feet
                      K:   2.0
                  alpha:   0.0110
                    Hmo:  15.6
                  d bar:   0.0061
                epsilon:   0.0117
                 Hs/Hmo:   1.000
       Hs in deep water:  15.6                 (significant wave)
            beach slope:   0.02000  (tan 30H:1V = 0.03333)
             beach zeta:   0.132                   wave runup computation
            beach runup:   2.0
         runup elevation: 587.7 feet
```

NOTE: ALL ELEVATIONS ABOVE ARE IN FEET ABOVE NGVD

FIS PROFILE
FRASER - 2

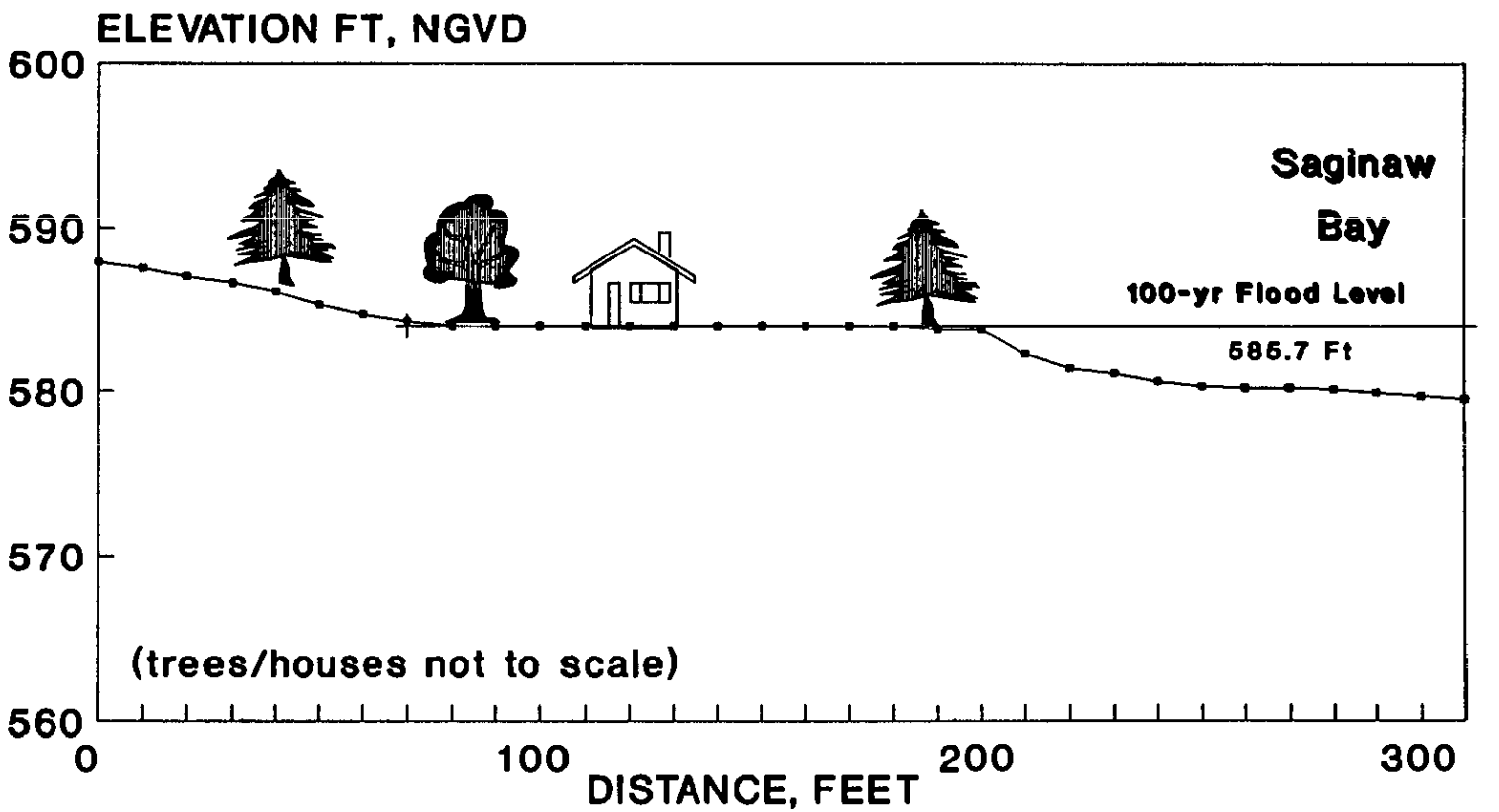


FIGURE F-2

RUNUP COMPUTATION
WAVE RUNUP FASER TOWNSHIP

runup on:	revetment
100-year flood:	585.7
water depth at toe:	2.6
100-year wave period T:	11.4
T':	1.8
L:	104.23
100-yr deep water wave H:	24.9
K:	6.4
alpha:	0.0194
Hmo:	1.6
d bar:	0.0006
epsilon:	0.0038
Hs/Hmo:	1.000
H at structure:	1.6
tan(theta):	0.50000
revetment (Greek ltr) xi:	10.2
revetment runup:	3.1
runup elevation:	588.8

B:\>NOTE: ALL ELEVATIONS ABOVE ARE IN FEET ABOVE NGVD

Enclosed for your information are revised wave runup elevations for the Saginaw Bay Flood Insurance Studies submitted to your office in February 1991, for 8 communities. Since approval by FEMA of the Great Lakes wave runup methodology, the Detroit District has employed this methodology in a number of other projects within the District. During this time, it had become apparent to District personnel that certain improprieties existed in the results obtained from these wave runup calculations. Consequently, the District conducted a review of these calculations and discovered that a minor error existed in the program's equations. Subsequent to this review, all runup elevations for the study sites were re-computed. Attached for your use is a summary of the original and revised runup elevations at each site. Although any change in runup elevation will result in a corresponding change to the Base Flood Elevation (BFE), the impacts on the flood zone delineation are minimal, except for Alpena.

RECEIVED

JAN 17 1992

NATURAL RESOURCES
LAND & WATER MGMT.

SAGINAW BAY FIS
WAVE RUNUP INFORMATION
7 January 1992

LOCATION	INITIAL RUNUP	REVISED RUNUP	CHANGE	BASE FLOOD ELEVATION INITIAL	BASE FLOOD ELEVATION REVISED	STRUCTURE TYPE
Pinconning 4	-	-	-	585.5	585.5	open coast
Pinconning 5	-	-	-	585.5	585.5	open coast
Pinconning 6	-	-	-	585.5	585.5	open coast
Pinconning 7	-	-	-	585.5	585.5	open coast
Pinconning 8	-	-	-	585.5	585.5	open coast
Pinconning 9	-	-	-	585.5	585.5	open coast
Sims 1 (P-1,4)	2.9	2.4	0.5	587.7	587.2	beach
Sims 2 (P-1)	3.3	2.8	0.5	588.1	587.6	beach
Sims 3 (P-2)	2.6	2.2	0.4	587.4	587.0	beach
Sims 4 (P-3)	2.6	2.2	0.4	587.4	587.0	beach
Sims 5	2.6	-	-	587.4	-	vert. struc.
Tawas City 1 (P-1,2)	3.9	3.3	0.6	587.9	587.3	beach
Tawas City 2	2.6	-	-	586.6	-	vert. struc.
Tawas City 3 (P-1)	3.9	3.3	0.6	587.9	587.3	beach
Tawas City 4 (P-1,2)	3.9	3.3	0.6	587.9	587.3	beach
East Tawas 1 (P-1)	0.6	0.5	0.1	584.6	584.5	beach
East Tawas 2	4.8	2.8	2.0	588.8	586.8	revetment
Fraser 2 (new)	-	3.1	3.1	585.7 (open coast)	588.8	revetment

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Fraser Twp

3) WATERCOURSE:

4) DOCUMENT TYPE: Report

00BREAK00

HYDRAULIC ANALYSIS

Introduction

The stream being studied is the Tebo Drain in Fraser Township, Bay County, Michigan. The study limits are from the outlet to the Saginaw Bay to the M-13 expressway bridge. The flows were computed by the SCS method and have been approved by the Michigan Department of Natural Resources.

Method of Analysis

Water surface profiles were computed through use of the COE HEC-2 step-backwater computer program. Bridges which were under low flow conditions for all four flows were coded according to the "normal bridge" routine requirements. Those bridges which experienced pressure or weir flow for any of the four flows were coded according to the "special bridge" routine requirements. Bridges that were submerged were coded according to the "normal bridge" requirements.

The hydraulic model was developed for the 100-year flow. Valley sections upstream and downstream of culverts or bridges were located where full cross section flow would be developed out of the influence of the bridge constriction. The criteria for placement of these sections was that outlined on pages 18-21 in the HEC Training Document No. 6, Application of the HEC-2 Bridge Routines. If low flow or pressure flow was encountered at a bridge, the downstream section was placed at a distance of four times the bridge constriction and the upstream section was placed at a distance equal to the bridge

constriction. If these distances became too large, the upstream and downstream sections were placed at a reasonable distance and then encroached according to the 1:1 contraction and 4:1 expansion ratios respectively. If additional sections were found necessary within this distance or if the actual field-surveyed cross section fell within this distance, the intermediate sections were encroached as appropriate. In the case of extensive weir flow where the bridge does not constrict the flow, the 1:1 and 4:1 ratios are not applicable.

Variables and Coefficients

The roughness factors (Manning's "n") were established by comparing photographs and field inspection with the photographs and descriptions found on pages 101 to 123 in Open-Channel Hydraulics, by Ven Te Chow. In general, the following range of values was used:

Description	Manning's "n"
1. Channel	
a. Muddy bottom	.03 - .04
b. Sand bottom mixed with gravel - grass growth on banks	.03 - .035
2. Flood Plains	
a. Medium brush with scattered trees	.065 - .09
b. Cultivated fields with small row crops	.045 - .06

The contraction and expansion coefficients used in the Tebo Drain study were .3 and .5 respectively. These values were used throughout the study. References evaluated in selection of these values were the HEC-2 Users

Manual, exhibit 2, page 2, and Open-Channel Hydraulics, Ven Te Chow, pages 311 and 468.

The orifice and weir coefficients used in the HEC-2 "special bridge" routine were determined as outlined in the HEC-2 Users Manual, exhibit 2, pages 1 and 2, and Application of the HEC-2 Bridge Routines, pages 27-35.

Starting Point

Profile computations began at the Saginaw Bay by inputting the mean elevation as a known water surface elevation. In the final Flood Insurance Study Report, the 10-, 50-, 100- and 500-year Saginaw Bay flood elevations will be extended horizontally upstream until the corresponding Tebo Drain profiles are intersected. The floodway and flood plain as delineated in this submittal are based on the calculated water surface profiles begun at the Saginaw Bay by inputting the mean bay elevation as a known water surface elevation. In the final Flood Insurance Study, the floodway will be based on the Tebo Drain water surface profiles and the flood plain will reflect the influence of the Saginaw Bay.

Cross Section Location

Cross sections are located on the map as taken by field survey. However, the overbank portions of some cross sections had to be adjusted in the modeling process so that flow would be perpendicular to each cross section along its length. In the event of two cross sections intersecting, the downstream section was adjusted such that no part of this section extended past the upstream section. Why not make them parallel? They should never cross!

Floodway Determination

Section N is encroached to follow the 4:1 expansion of flow coming out of the bridge at Section O. From Section N to Section F, the flow is contained in the channel without encroaching. The flow leaves the channel downstream of Section F, therefore, Section D and E are encroached to follow the 4:1 expansion ratio. The floodway expands out to the left end of Sections B and C and then contracts to follow the 1:1 contraction ratio. The high ground downstream of Section B forces the water back into the channel. The flow then stays in the channel for the rest of the length to Saginaw Bay. Sections B and C could not be encroached significantly without raising the water surface more than .1'. Coggins Road is high enough in elevation to retain the water in the left overbank of all cross sections.

Tebo Drain
Fraser Township
Bay County

Cross Section Location

Cross Section	SECNO	Location
A	40	At DNR public access
B	2850	A N.S. 1/4 line, Section 12
C	3563	Farmhouse bridge
D	5353	100' d/s Tower Beach Road
E	5453	Tower Beach Road double box culvert
F	7686	50' d/s Detroit & Mackinac RR
G	7736	Detroit & Mackinac RR bridge
H	8177	50' d/s Old State Road bridge
I	8227	Old State Road bridge
J	9954	20' d/s Kaiser Road bridge
K	10016	Kaiser Road bridge
L	10097	Penn Central RR bridge
M	10312	200' u/s Penn Central RR
N	11295	50' d/s M-13 bridge
O	11424	M-13 expressway bridge

100-year

WATERCOURSE: Tebo Drain
/TOWNSHIP: Fraser
COUNTY: Bay

STATION	LOCATION	CWSEL	EG	Q
40	DNR Public Access @ Saginaw Bay	581.9	582.42	1040
340	340' u/s of confluence	582.86	583.19	1040
640	640' u/s of confluence	583.37	583.69	1040
1770	1770' u/s of confluence	585.03	585.32	1040
2850	2850' u/s of confluence	585.71	585.73	1040
3513	50' d/s of Farm House Br.	585.82	585.88	1040
3562	1' d/s of Farm House Br.	585.83	585.90	1040
3563	d/s face of Farm House Br.	585.83	585.90	1040
3587	u/s face of Farm House Br.	585.85	585.92	1040
3588	1' u/s of Farm House Br.	585.85	585.92	1040
3608	21' u/s of Farm House Br.	585.87	585.93	1040
4507	920' u/s of Farm House Br.	586.21	586.26	1040
5353	100' d/s of Tower Beach Road	586.61	586.68	1040
5452	1' d/s of Tower Beach Road	586.64	586.75	1040
5453	d/s face of Tower Beach Road	586.61	586.78	1040
5493	u/s face of Tower Beach Road	586.71	586.84	1040
5494	1' u/s of Tower Beach Road	586.75	586.85	1040
5504	11' u/s of Tower Beach Road	586.80	586.87	1040
6230	737' u/s of Tower Beach Road	587.06	587.17	1040
6960	776' d/s of Detroit & Mackinaw RR	587.64	588.02	1040
7686	50' d/s of Detroit & Mackinaw RR	589.46	589.96	1040
7711	25' d/s of Detroit & Mackinaw RR	589.51	590.08	1040
7735	1' d/s of Detroit & Mackinaw RR	589.36	590.43	1040
7736	d/s face of Detroit & Mackinaw RR	589.27	590.53	1040
7746	U/S face of Detroit & Mackinaw RR	589.51	590.65	1040
7747	1' u/s of Detroit & Mackinaw RR	589.84	590.73	1040
7757	11' u/s of Detroit & Mackinaw RR	590.51	590.91	1040
8177	50' d/s of Old State Road	591.22	591.64	1040
8226	1' d/s of Old State Road	591.25	591.75	1040
8227	d/s face of Old State Road	591.33	591.77	1040
8250	u/s face of Old State Road	591.37	591.80	1040
8251	1' u/s of Old State Road	591.34	591.83	1040
8275	25' u/s of Old State Road	591.59	591.91	1040
9115	865' u/s of Old State Road	592.42	592.71	1040
9954	20' d/s of Kaiser Road	593.19	593.43	1040
9974	d/s face of Kaiser Road	593.08	593.58	1040
10016	u/s face of Kaiser Road	593.67	594.10	1040
10041	25' u/s of Kaiser Road	594.01	594.19	1040
10071	55' u/s of Kaiser Road	593.98	594.25	1040
10096	1' d/s of Penn Central RR	593.68	594.62	1040
10097	d/s face of Penn Central RR	593.64	594.66	1040
10112	u/s face of Penn central RR	593.74	594.73	1040
10113	1' u/s of Penn Central RR	593.88	594.76	1040
10135	23' u/s of Penn Central RR	594.47	594.93	1040
10312	200' u/s of Penn Central RR	595.02	595.23	1040
11295	50' d/s of M-13	595.92	596.07	1040
11344	d/s face of M-13	595.82	596.21	1040
11424	u/s face of M-13	596.25	596.57	1040
11449	25' u/s of M-13	596.43	596.65	1040

HYDRAULIC ANALYSIS

Introduction

The stream being studied is the Rosebush Drain in Fraser Township, Bay County, Michigan. The study limits are from the Saginaw Bay to 800' upstream of the M-13 expressway. The flows were computed by the SCS method and have been approved by the Michigan Department of Natural Resources.

Method of Analysis

Water surface profiles were computed through use of the COE HEC-2 step-backwater computer program. Culverts and bridges which were under low flow conditions for all four flows were coded according to the "normal bridge" routine requirements. Those bridges which experienced pressure or weir flow for any of the four flows were coded according to the "special bridge" routine requirements. Bridges or culverts that were submerged were coded according to the "normal bridge" requirements.

The hydraulic model was developed for the 100-year flow. Valley sections upstream and downstream of culverts or bridges were located where full cross section flow would be developed out of the influence of the bridge constriction. The criteria for placement of these sections was that outlined on pages 18-21 in the HEC Training Document No. 6, Application of the HEC-2 Bridge Routines. If low flow or pressure flow was encountered at a bridge or culvert, the downstream section was placed at a distance of four times the bridge constriction and the upstream section was placed at a

distance equal to the bridge constriction. If these distances became too large, the upstream and downstream sections were placed at a reasonable distance and then encroached according to the 1:1 contraction and 4:1 expansion ratios respectively. If additional sections were found necessary within this distance or if the actual field-surveyed cross section fell within this distance, the intermediate sections were encroached as appropriate. In the case of extensive weir flow where the bridge does not constrict the flow, the 1:1 and 4:1 ratios are not applicable.

Variables and Coefficients

The roughness factors (Manning's "n") were established by comparing photographs and field inspection with the photographs and descriptions found on pages 101 to 123 in Open-Channel Hydraulics, by Ven Te Cow. In general, the following range of values was used:

Description	Manning's "n"
1. Channel	
a. Muddy bottom	.03 - .04
b. Muddy bottom with weed growth	.04 - .05
c. Weed-clogged channel with some small trees on banks	.05 - .07
2. Flood Plains	
a. Medium brush with scattered small trees	.06 - .09
b. Medium to heavy brush with scattered trees and houses	.10 - .12

The contraction and expansion coefficients used in the Rosebush Drain study were .3 and .5 respectively. These values were used throughout the study. References evaluated in selection of these values were the HEC-2 Users

Manual, exhibit 2, page 2, and Open-Channel Hydraulics, Ven Te Chow, pages 311 and 468.

The orifice and weir coefficients used in the HEC-2 "special bridge" routine were determined as outlined in the HEC-2 Users Manual, exhibit 2, pages 1 and 2, and Application of the HEC-2 Bridge Routines, pages 27-35.

Starting Point

Profile computations began at the Saginaw Bay by inputting the mean bay elevation as a known water surface elevation. In the final Flood Insurance Study Report, the 10-, 50-, 100- and 500-year Saginaw Bay flood elevations will be extended horizontally upstream until the corresponding Rosebush Drain profiles are intersected. The floodway and flood plain as delineated in this submittal are based on the calculated water surface profiles begun at the Saginaw Bay by inputting the mean bay elevation as a known water surface elevation. In the final Flood Insurance Study, the floodway will be based on the Rosebush Drain water surface profiles and the flood plain will reflect the influence of the Saginaw Bay.

Cross Section Location

Cross sections are located on the map as taken by field survey. However, the overbank portions of some cross sections had to be adjusted in the modeling process so that flow would be perpendicular to each cross section along its length. In the event of two cross sections intersecting, the downstream section was adjusted such that no part of this section extended

Poor layout

why is not the sections bent to run parallel? 4.

past the upstream section.

Along Linwood Road, between section numbers 500 and 2106, are driveway culverts. The field work on these culverts consists of the top of driveway elevation, the invert elevation of the culvert, the silt elevation at the centerline of the culvert, and the culvert size. The left and right overbanks of these sections are an average section based on the overbank portions of full field sections in this area of the stream. The channel geometry of sections upstream and downstream of these culverts is based on valley sections taken in the same area of the stream. The culvert sections were not shown on the floodway map because the small distances between each culvert made it impossible to show clearly. Therefore, to avoid confusion between the map and the section number table, the culvert sections were left out of the table. In the computer printout, these sections were labeled "driveway culverts."

Floodway Determination

The location of the floodway encroachments were determined by encroaching the right and left overbanks of each cross section such that the water surface elevation increased a maximum of .1' above the natural water surface elevation.

? confusing /167 statute

Type 1 encr used why not

Correct but this is not equal encroachment

see comparison on summary printout, natural floodway, 100-yr profile

Method of encroachment on both sides

Cross Section Location

Cross Section	SECNO	Location
A	500	At entrance to drain
B	653	60' d/s Detroit & Mackinac RR
C	712	Detroit & Mackinac RR Bridge
D	769	Detroit & Mackinac RR spur line
E	988	300' u/s Detroit & Mackinac RR
F	2056	50' d/s Linwood Road Bridge
G	2107	Linwood Road Bridge
H	2376	Detroit & Mackinac RR spur line
I	3710	50' d/s Elevator Road Bridge
J	3802	Elevator Road Bridge
K	4162	50' d/s Penn Central RR Culvert
L	4245	Penn Central RR Culvert
M	6364	50' d/s Tower Road Bridge
N	6447	Tower Road Bridge
O	8417	100' d/s M-13 Bridge
P	8518	M-13 Expressway Bridge
Q	9300	800'± u/s M-13 Expressway Bridge

100-year

WATERCOURSE: Rosebush Drain

TOWNSHIP: Fraser

COUNTY: Bay

STATION	LOCATION	CWSEL	EG	Q
500	Confluence of Saginaw Bay	581.90	581.99	100
550	50' u/s of confluence	581.99	582.07	100
573	1' d/s of Driveway Culvert	581.93	582.21	100
574	d/s face of Driveway Culvert	581.92	582.22	100
594	u/s face of Driveway Culvert	581.96	582.31	100
595	1' u/s of Driveway Culvert	582.00	582.32	100
605	22' d/s of Driveway Culvert	582.34	582.41	100
627	d/s face of Driveway Culvert	582.15	582.69	100
653	u/s face of Driveway Culvert	583.43	583.71	100
663	25' d/s of Detroit Mackinaw RR	583.76	583.80	100
688	d/s face of Detroit Mackinaw RR	583.75	583.85	100
712	u/s face of Detroit Mackinaw RR	584.26	584.34	100
730	d/s face of railroad spur	584.33	584.37	100
769	u/s face of railroad spur	584.76	584.79	100
778	d/s face of Driveway Culvert	584.77	584.79	100
802	u/s face of Driveway Culvert	584.77	584.79	100
812	10' u/s of Driveway Culvert	584.79	584.80	100
988	300' u/s of Detroit Mackinaw RR	584.81	584.81	100
1005	1' d/s of Driveway Culvert	584.80	584.82	100
1006	d/s face of Driveway Culvert	584.81	584.83	100
1026	u/s face of Driveway Culvert	584.83	584.84	100
1037	181' d/s of Driveway Culvert	584.85	584.86	100
1217	1' d/s of Driveway Culvert	584.86	584.86	100
1218	d/s face of Driveway Culvert	584.86	584.86	100
1236	u/s face of Driveway Culvert	584.86	584.86	100
1237	1' u/s of Driveway Culvert	584.86	584.86	100
1247	11' u/s of Driveway Culvert	584.86	584.86	100
1324	21' d/s of Driveway Culvert	584.86	584.86	100
1344	1' d/s of Driveway Culvert	584.86	584.86	100
1345	d/s face of Driveway Culvert	584.86	584.86	100
1375	u/s face of Driveway Culvert	584.86	584.86	100
1376	1' u/s of Driveway Culvert	584.86	584.86	100
1386	11' u/s of Driveway Culvert	584.86	584.86	100
1554	26' d/s of Driveway Culvert	584.87	584.87	100
1579	1' d/s of Driveway Culvert	584.87	584.87	100
1580	d/s face of Driveway Culvert	584.87	584.87	100
1604	u/s face of Driveway Culvert	584.87	584.87	100
1605	1' u/s of Driveway Culvert	584.87	584.87	100
1615	11' u/s of Driveway Culvert	584.87	584.87	100
1966	26' d/s of Driveway Culvert	584.88	584.88	100
1991	1' d/s of Driveway Culvert	584.88	584.88	100
1992	d/s face of Driveway Culvert	584.88	584.88	100
2012	u/s face of Driveway Culvert	584.88	584.88	100
2013	1' u/s of Driveway Culvert	584.88	584.88	100
2023	11' u/s of Driveway Culvert	584.88	584.88	100
2056	50' d/s of Linwood Road	584.88	584.88	100
2071	1' d/s of Driveway Culvert	584.88	584.88	100
2072	d/s face of Driveway Culvert	584.88	584.88	100
2094	u/s face of Driveway Culvert	584.88	584.88	100
2095	1' u/s of Driveway Culvert	584.88	584.88	100

100-year

WATERCOURSE: Rosebush Drain

TOWNSHIP: Fraser

COUNTY: Bay

STATION	LOCATION	CWSEL	EG	Q
2106	1' d/s of Linwood Road	584.88	584.88	100
2107	d/s face of Linwood Road	584.88	584.88	100
2133	u/s face of Linwood Road	584.89	584.89	100
2134	1' u/s of Linwood Road	584.88	584.89	100
2144	11' u/s of Linwood Road	584.89	584.89	100
2308	50' d/s of Detroit Mackinaw Spur	584.88	584.92	100
2358	d/s face of Detroit Mackinaw Spur	584.87	584.99	100
2376	u/s face of Detroit Mackinaw Spur	585.26	585.36	100
2386	10' u/s of Detroit Mackinaw Spur	585.36	585.39	100
3710	50' d/s of Elevator Road	585.71	585.73	100
3760	d/s face of Elevator Road	585.63	585.87	100
3802	u/s face of Elevator Road	586.20	586.39	100
3812	10' u/s of Elevator Road	586.42	586.45	100
4162	50' d/s of Penn Central	586.52	586.53	100
4212	d/s face of Penn Central	586.40	586.68	100
4245	u/s face of Penn Central	587.21	587.42	100
4255	10' u/s of Penn Central	587.43	587.48	100
5310	1065' u/s of Penn Central	587.51	587.51	100
6364	50' d/s of Tower Road	587.52	587.54	85
6414	d/s face of Tower Road	587.54	587.57	85
6447	u/s face of Tower Road	587.60	587.63	85
6457	10' u/s of Tower Road	587.62	587.64	85
6784	337' u/s of Tower Road	587.86	587.90	85
7110	663' u/s of Tower Road	588.57	588.66	85
7437	990' u/s of Tower Road	589.86	589.96	85
7763	1316' u/s of Tower Road	591.12	591.21	85
8090	1643' u/s of Tower Road	592.36	592.45	85
8417	100' d/s of M-13	593.12	593.13	11
8450	66' d/s of M-13	593.13	593.14	11
8483	33' d/s of M-13	593.15	593.17	11
8517	1' d/s of M-13	593.20	593.25	11
8518	d/s face of M-13	593.20	593.26	11
8628	u/s face of M-13	593.44	593.48	11
8629	1' u/s of M-13	593.44	593.49	11
8645	16' u/s of M-13	593.50	593.52	11
9300	800' u/s of M-13	597.24	597.34	11

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Fraser Twp

3) WATERCOURSE: Rosebush Drain

4) DOCUMENT TYPE: 100-YR ENCROACHED

00BREAK00

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$$$$$$$$$   $$$$$$$$   $$$$$$   $$$$$$   $$$$$$$$$   $$$$$$$$$   $$      $$   FJ03BPU
$$$$$$$$$   $$$$$$$$   $$$$$$   $$$$$$   $$$$$$$$$   $$$$$$$$$   $$      $$   FJ03BPU
$$          $$     $$  $$   $$  $$   $$  $$      $$  $$      $$  $$      $$   FJ03BPU
$$          $$     $$  $$   $$  $$   $$  $$      $$  $$      $$  $$      $$   FJ03BPU
$$$$$$$     $$     $$  $$       $$$     $$$$$$$$$   $$$$$$$$$   $$      $$   FJ03BPU
$$$$$$$     $$     $$  $$       $$$     $$$$$$$$$   $$$$$$$$$   $$      $$   FJ03BPU
$$          $$     $$  $$           $$  $$      $$  $$          $$      $$   FJ03BPU
$$          $$     $$  $$           $$  $$      $$  $$          $$      $$   FJ03BPU
$$      $$  $$     $$  $$   $$      $$  $$      $$  $$          $$      $$   FJ03BPU
$$      $$  $$     $$  $$   $$      $$  $$      $$  $$          $$      $$   FJ03BPU
$$      $$$$$$$    $$$$$$   $$$$$$  $$  $$$$$$$$$   $$          $$$$$$$$$   FJ03BPU
$$      $$$$$$$    $$$$$$   $$$$$$  $$  $$$$$$$$$   $$          $$$$$$$$$   FJ03BPU
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SEP 22 '73

ROSEBUSH DRAIN
FLOODWAY (100-YR)

revised 9/28/76

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C
C     38
C    500          VS-1
C    574                DRIVEWAY CULVERT - 20FT. OF 72"  CMP WITH ENDS PROJEC-
C    574                TING FROM FILL
C    627          BS-2  60FT. D.S. DETROIT @ MACKINAC R.R. - 24FT. OF 60"  CMP
C    627                WITH ENDS FLUSH WITH HEADWALL
C    688          BS-3  DETROIT @ MACKINAW R.R. BRIDGE
C    730          BS-4  DETROIT @ MACKINAC R.R. SPUR LINE BRIDGE - 36FT. OF
C    730                48"  CMP WITH ENDS PROJECTING FROM FILL, AND TWO 37 FT
C    730                LENGTHS OF 36"  C.I. PIPE WITH ENDS PROJECTING FROM
C    730                FILL
C    778                DRIVEWAY CULVERT - 22FT. OF 66"  CMP WITH ENDS PROJEC-
C    778                TING FROM HEADWALL
C    988          VS-5  U.S. FROM DETROIT @ MACKINAW R.R.
C   1006                DRIVEWAY CULVERT - 20FT. OF 60"  CMP WITH ENDS PROJEC-
C   1006                TING FROM FILL
C   1218                DRIVEWAY CULVERT - 18FT. OF 54"  CMP WITH ENDS FLUSH
C   1218                WITH HEADWALL
C   1345                DRIVEWAY CULVERT - 30FT. OF 60"  CMP WITH ENDS PROJEC-
C   1345                TING FROM FILL
C   1580                DRIVEWAY CULVERT - 24FT. OF 66"  CMP WITH ENDS PROJEC-
C   1580                TING FROM FILL
C   1992                DRIVEWAY CULVERT - 20FT. OF 60"  CMP WITH ENDS PROJEC-
C   1992                TING FROM FILL
C   2056          VS-6  D.S. FROM LINWOOD ROAD BRIDGE
C   2072                DRIVEWAY CULVERT
C   2107          BS-7  LINWOOD ROAD BRIDGE
C   2358          BS-8  DETROIT @ MACKINAW R.R. SPUR LINE
C   3710          VS-9  D.S. FROM ELEVATOR ROAD BRIDGE
C   3760          BS-10 ELEVATOR ROAD CULVERT - 40FT. OF 60"  RCP WITH SQUARE
C   3760                ENDS FLUSH WITH HEADWALL
C   4162          VS-11 D.S. FROM PENN CENTRAL R.R. CULVERT
C   4212          BS-12 PENN CENTRAL R.R. CULVERT - 31FT. OF 60"  C.I. PIPE,
C   4212                WITH SQUARE ENDS PROJECTING FROM FILL
C   6364          VS-13 D.S. FROM TOWER ROAD BRIDGE
C   6414          BS-14 TOWER ROAD BRIDGE
C   8417          VS-15 D.S. FROM M-13 BRIDGE
C   8518          BS-16 M-13 BRIDGE
C   9300          VS-17 U.S. FROM M-13 BRIDGE
T1  ROSEBUSH DRAIN
T2  100 YEAR FLOOD
T3  FRASER TWP, BAY CO
J1    -10     4                                                  581.9
J2     -1            -1
J3      1     4     27     28      3     10     26
NC    .09   .09   .035     .3     .5
QT      4    75     95    100    115
X1    500    27   1000   1028    500    500    500
X3     10                900  585.5   1100  585.9
GR 583.9     0  584.1    100  585.2    200  585.4    300  585.3    400
GR 586.1   500  585.3    600  584.8    700  584.5    800  585.5    900
GR 584.7  1000  581.2   1004  580.1   1008  579.2   1016  579.9   1021
GR 581.5  1026  584.9   1028  585.9   1100  585.0   1200  585.0   1300
GR 585.6  1400  585.3   1500  584.8   1600  584.3   1700  584.5   1800
GR 585.1  1900  584.8   2000
X1    550    27   1000   1028     50     50     50
X3     10                900  585.5   1100  585.9  586.1  585.9
GR 583.9     0  584.1    100  585.2    200  585.4    300  585.3    400
GR 586.1   500  585.3    600  584.8    700  584.5    800  585.5    900
GR 584.7  1000  581.2   1004  580.1   1008  579.0   1016  579.9   1021
GR 581.5  1026  584.9   1028  585.9   1100  585.0   1200  585.0   1300
GR 585.6  1400  585.3   1500  584.8   1600  584.3   1700  584.5   1800
GR 585.1  1900  584.8   2000
```

X1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			
X3	10	577.9						584.7	585.2	
GR	585.6	0	585.3	100	585.5	200	585.4	300	585.2	400
GR	585.1	500	584.6	600	584.3	700	584.2	800	584.7	990
GR	578.6	1000	577.2	1001	576.6	1003	577.2	1005	578.6	1006
GR	585.2	1016	585.2	1200	585.2	1300	585.5	1400	585.4	1500
GR	585.0	1600	584.6	1700	584.7	1800	585.0	1900	585.5	2000
NC	.09	.09	.03							
X1	574				1	1	1			
X2				582.6	585.0					
X3	10	577.9						584.7	585.2	
BT	27	0	585.6	0	100	585.3	0	200	585.5	0
BT	300	585.4	0	400	585.2	0	500	585.1	0	600
BT	584.6	0	700	584.3	0	800	584.2	0	990	584.7
BT	584.7	1000	584.9	578.6	1000	584.9	580.6	1001	584.9	582.0
BT	1003	585.0	582.6	1005	585.0	582.0	1006	585.0	580.6	1006
BT	585.0	578.6	1016	585.2	585.2	1200	585.2	0	1300	585.2
BT	0	1400	585.5	0	1500	585.4	0	1600	585.0	0
BT	1700	584.6	0	1800	584.7	0	1900	585.0	0	2000
BT	585.5	0								
X1	594				20	20	20			
X2				582.6	585.0		1			
X3	10	578.3						584.7	585.2	
NC	.09	.09	.035							
X1	595				1	1	1			
X3	10	578.3						584.7	585.2	
X1	605	25	990	1016	10	10	10			
X3	10	578.4								
GR	585.6	0	585.3	100	585.5	200	585.4	300	585.2	400
GR	585.1	500	584.6	600	584.3	700	584.2	800	584.7	990
GR	578.6	1000	577.2	1001	576.6	1003	577.2	1005	578.6	1006
GR	585.2	1016	585.2	1200	585.2	1300	585.5	1400	585.4	1500
GR	585.0	1600	584.6	1700	584.7	1800	585.0	1900	585.5	2000
X1	627	31	997.5	1002.5	22	22	22			
X3	10	578.7						584.4	584.4	
GR	585.5	0	587.0	100	585.6	200	584.6	300	584.5	400
GR	584.5	500	583.9	600	583.8	700	583.9	800	584.4	900
GR	585.0	972	584.4	986	579.7	997.5	578.7	997.6	577.9	998.2
GR	577.4	999	577.2	1000	577.4	1000.9	577.9	1001.7	578.8	1002.3
GR	579.7	1002.5	584.4	1014	585.2	1100	585.5	1200	585.7	1400
GR	585.5	1500	585.3	1600	585.1	1700	585.1	1800	585.4	1900
GR	585.4	2000								
SB		2.18	2.7		3.83		14.73		578.7	578.7
X1	653				26	26	26			
X2			1	582.2	584.4					
X3	10	578.7						584.4	584.4	
BT	11	986	584.4		997.5	584.4	579.7	997.6	584.4	580.6
BT	998.2	584.4	581.4	999.0	584.4	582.0	1000.0	584.4	582.2	1000.9
BT	584.4	582.0	1001.7	584.4	581.4	1002.3	584.4	580.6	1002.5	584.4
BT	579.7	1014	584.4							
X1	663	31	986	1014	10	10	10			
X3	10	578.8						584.4	584.4	
GR	585.5	0	587.0	100	585.6	200	584.6	300	584.5	400
GR	584.5	500	583.9	600	583.8	700	583.9	800	584.4	900
GR	585.0	972	584.4	986	579.7	997.5	578.7	997.6	577.9	998.2
GR	577.4	999	577.2	1000	577.4	1000.9	577.9	1001.7	578.8	1002.3
GR	579.7	1002.5	584.4	1014	585.2	1100	585.5	1200	585.7	1400
GR	585.5	1500	585.3	1600	585.1	1700	585.1	1800	585.4	1900
GR	585.4	2000								
X1	688	27	1000	1009	25	25	25			
X3	10									
GR	585.0	0	585.0	100	584.9	200	584.7	300	584.6	400
GR	584.6	500	584.7	600	584.8	700	584.8	800	584.8	900
GR	584.9	990.5	584.9	1000	579.8	1000	579.3	1004.5	579.1	1009
GR	584.9	1009	584.9	1018.5	584.8	1100	585.0	1200	585.0	1300
GR	585.2	1400	585.2	1500	585.1	1600	585.1	1700	585.1	1800

SB		2.04	2.7		9		23		579.1	579.1
X1	712				24	24	24			
X2			1	581.9	584.9					
X3	10									
BT	4	1000	584.9	581.9	1000	584.9	581.9	1009	584.9	581.9
BT	1009	584.9	581.9							
NC	.1	.1	.035							
X1	730	28	493	507	18	18	18			
X3	10	579.5		488		512		584.2	584.2	
GR	585.1	0	585.0	100	584.4	200	583.8	300	583.7	400
GR	584.4	488.0	580.0	493.0	579.3	493.5	579.0	494.5	579.3	495.5
GR	580.0	496.0	580.8	498.0	579.8	498.2	579.3	498.6	579.0	499.1
GR	578.8	500.0	579.0	500.9	579.3	501.4	579.8	501.8	580.8	502.0
GR	579.9	504.0	579.2	504.5	578.9	505.5	579.2	506.5	579.9	507.0
GR	584.4	512	584.6	600	584.8	700				
SB		2.3	3.0		6.6		23		579.7	579.5
X1	769				39	39	39			
X2			1	582.7	584.4					
X3	10	579.7		488		512		584.2	584.2	
BT	24	488	584.4	0	493	584.4	580.0	493	584.4	581.0
BT	493.5	584.4	581.7	494.5	584.4	582.0	495.5	584.4	581.7	496
BT	584.4	581.0	496	584.4	580.0	498	584.4	580.8	498.2	584.4
BT	581.8	498.6	584.4	582.3	500	584.4	582.8	500.9	584.4	582.6
BT	501.4	584.4	582.3	501.8	584.4	581.8	502	584.4	580.8	504
BT	584.4	579.9	504	584.4	580.9	504.5	584.4	581.6	505.5	584.4
BT	581.9	506.5	584.4	581.6	507	584.4	580.9	507	584.4	579.9
BT	512	584.4	0							
X1	778	15	500	505.4	9	9	9			
X3		579.5		300		514				
GR	585.1	0	585.0	100	584.4	200	583.8	300	583.7	400
GR	584.4	490	580.2	500	578.7	500.9	578.3	502.7	578.7	504.5
GR	580.2	505.4	584.4	514	584.6	600	584.8	700	585.1	800
SB		2.05	3.0		5.5		20		579.5	579.5
X1	802				24	24	24			
X2			1	583.7	584.4					
X3		579.5		300		514				
BT	11	300	583.8		400	583.7		490	584.4	584.4
BT	500	584.4	580.2	500	584.4	581.8	500.9	584.4	583.3	502.7
BT	584.4	583.7	504.5	584.4	583.3	505.4	584.4	581.8	505.4	584.4
BT	580.2	514	584.4	584.4						
X1	812	15	490	514	10	10	10			
X3	10	579.5		300		514				
GR	585.1	0	585.0	100	584.4	200	583.8	300	583.7	400
GR	584.4	490	580.2	500	578.7	500.9	578.3	502.7	578.7	504.5
GR	580.2	505.4	584.4	514	584.6	600	584.8	700	585.1	800
NC	.11	.11	.035							
X1	988	16	1000	1024	176	176	176			
X3				815		1024				
GR	585.0	0	583.4	775	584.7	815	583.4	850	583.2	900
GR	584.5	958	584.2	990	583.9	1000	580.9	1003	579.8	1009
GR	579.9	1015	580.9	1021	583.3	1024	583.3	1100	582.4	1124
GR	585.0	2150								
X1	1005	18	1000	1005	17	17	17			
X3	10	578.6		815		1014		584.2	583.3	
GR	585.0	0	583.4	775	585.0	815	583.4	850	583.2	900
GR	584.5	958	584.2	990	578.6	1000	578.0	1000.4	577.2	1001.2
GR	576.9	1002.5	577.2	1003.8	578.0	1004.6	578.6	1005	583.3	1014
GR	583.3	1100	582.4	1124	585.0	2150				
NC	.11	.11	.03							
X1	1006				1	1	1			
X2				581.9	583.7					
X3	10	578.6		815		1014		584.2	583.3	
BT	20	0	585.0	0	775	583.4	0	815	585.0	0
BT	850	583.4	0	900	583.2	0	958	584.5	0	990
BT	584.2	0	1000	583.7	578.6	1000	583.7	580.2	1000.4	583.7

BT	1004.6	583.7	580.8	1005	583.7	580.2	1005	583.7	578.6	1014
BT	583.3	0	1100	583.3	0	1124	582.4	0	2150	585.0
BT	0									
X1	1026				20	20	20			
X2				581.9	583.7		1			
X3	10	578.6		815		1014		584.2	583.3	
NC	.11	.11	.035							
X1	1027				1	1	1			
X3	10	578.6		815		1014		584.2	583.3	
X1	1037	18	990	1014	10	10	10			
X3		578.6		815		1014				
GR	585.0	0	583.4	775	585.0	815	583.4	850	583.2	900
GR	584.5	958	584.2	990	578.6	1000	578.0	1000.4	577.2	1001.2
GR	576.9	1002.5	577.2	1003.8	578.0	1004.6	578.6	1005	583.3	1014
GR	583.3	1100	582.4	1124	585.0	2150				
X1	1198	21	990	1014	161	161	161			
X3		579.7		660		1014				
GR	584.0	0	582.4	600	585.4	660	583.1	700	592.3	717
GR	582.3	800	582.4	900	584.5	958	584.3	990	580.4	1000
GR	579.4	1000.7	578.6	1001.8	578.6	1002.8	579.4	1003.9	580.4	1004.6
GR	584.3	1014	583.7	1100	583.3	1200	582.9	1211	582.1	1213
GR	584.0	2000								
X1	1217	21	1000	1004.6	19	19	19			
X3	10	579.7		660		1014		583.2	583.2	
GR	584.0	0	582.4	600	585.4	660	583.1	700	582.3	717
GR	582.3	800	582.4	900	584.5	958	584.3	990	580.4	1000
GR	579.4	1000.7	578.6	1001.8	578.6	1002.8	579.4	1003.9	580.4	1004.6
GR	584.3	1014	583.7	1100	583.3	1200	582.9	1211	582.1	1213
GR	584.0	2000								
NC	.11	.11	.03							
X1	1218				1	1	1			
X2				583.2	584.3					
X3	10	579.7		660		1014		583.2	583.2	
BT	23	0	584.0	0	600	582.4	0	660	585.4	0
BT	700	583.1	0	717	582.3	0	800	582.3	0	900
BT	582.4	0	958	584.5	0	990	584.3	584.3	1000	584.3
BT	580.4	1000	584.3	581.4	1000.7	584.3	582.5	1001.8	594.3	583.2
BT	1002.8	584.3	583.2	1003.9	584.3	582.5	1004.6	584.3	581.4	1004.6
BT	584.3	580.4	1014	584.3	584.3	1100	583.7	0	1200	583.3
BT	0	1211	582.9	0	1213	582.1	0	2000	584.0	0
X1	1236				18	18	18			
X2				583.2	584.3		1			
X3	10	579.7		660		1014		583.2	583.2	
NC	.11	.11	.035							
X1	1237				1	1	1			
X3	10	579.7		660		1014		583.2	583.2	
X1	1247	21	990	1014	10	10	10			
X3		580.1		660		1014				
GR	584.0	0	582.4	600	585.4	660	583.1	700	582.3	717
GR	582.3	800	582.4	900	584.5	958	584.3	990	580.4	1000
GR	579.4	1000.7	578.6	1001.8	578.6	1002.8	579.4	1003.9	580.4	1004.6
GR	584.3	1014	583.7	1100	583.3	1200	582.9	1211	582.1	1213
GR	584.0	2000								
X1	1324	22	993	1013	77	77	77			
X3		579.2		660		1013				
GR	584.0	0	582.4	600	585.5	660	583.1	700	582.3	717
GR	582.3	800	582.4	900	584.7	988	584.4	993	579.5	1000
GR	578.9	1000.4	578.1	1001.2	577.8	1002.5	578.1	1003.8	578.9	1004.6
GR	579.5	1005	584.4	1013	583.7	1100	583.3	1200	582.9	1211
GR	582.1	1213	584.0	2000						
X1	1344	22	1000	1005	20	20	20			
X3	10	579.2		660		1013		582.8	582.8	
GR	584.0	0	582.4	600	585.5	660	583.1	700	582.3	717
GR	582.3	800	582.4	900	584.7	988	584.4	993	579.5	1000
GR	578.9	1000.4	578.1	1001.2	577.8	1002.5	578.1	1003.8	578.9	1004.6

GR	582.1	1213	584.0	2000						
NC	.11	.11	.03							
X1	1345				1	1	1			
X2				582.8	584.4					
X3	10	579.2		660		1013		582.8	582.8	
BT	24	0	584.0	0	600	582.4	0	660	585.5	0
BT	700	583.1	0	717	582.3	0	800	582.3	0	900
BT	582.4	0	988	584.7	0	993	584.4	584.4	1000	584.4
BT	579.5	1000	584.4	581.1	1000.4	584.4	581.7	1001.2	584.4	582.5
BT	1002.5	584.4	582.8	1003.8	584.4	582.5	1004.6	584.4	581.7	1005
BT	584.4	581.1	1005	584.4	579.5	1013	584.4	0	1100	583.7
BT	0	1200	583.3	0	1211	582.9	0	1213	582.1	0
BT	2000	584.0	0							
X1	1375				30	30	30			
X2				582.8	584.4		1			
X3	10	579.2		660		1013		582.8	582.8	
NC	.11	.11	.035							
X1	1376	0	0	0	1	1	1			
X3	10	579.2		660		1013		582.8	582.8	
X1	1386	22	993	1013	10	10	10			
X3		579.2		660		1013				
GR	584.0	0	582.4	600	585.5	660	583.1	700	582.3	717
GR	582.3	800	582.4	900	584.7	988	584.4	993	579.5	1000
GR	578.9	1000.4	578.1	1001.2	577.8	1002.5	578.1	1003.8	578.9	1004.6
GR	579.5	1005	584.4	1013	583.7	1100	583.3	1200	582.9	1211
GR	582.1	1213	584.0	2000						
X1	1554	19	993	1013	168	168	168			
X3		579.8		660		1013				
GR	584.0	0	582.4	600	585.1	660	583.1	700	582.3	717
GR	582.3	800	582.4	900	584.2	993	580.3	1000	578.8	1000.9
GR	578.4	1002.7	578.8	1004.5	580.3	1005.4	584.2	1013	583.7	1100
GR	583.3	1200	582.9	1211	582.1	1213	584.0	2000		
X1	1579	19	1000	1005.4	25	25	25			
X3	10	579.8		660		1013		583.8	583.8	
GR	584.0	0	582.4	600	585.1	660	583.1	700	582.3	717
GR	582.3	800	582.4	900	584.2	993	580.3	1000	578.8	1000.9
GR	578.4	1002.7	578.8	1004.5	580.3	1005.4	584.2	1013	583.7	1100
GR	583.3	1200	582.9	1211	582.1	1213	584.0	2000		
NC	.11	.11	.03							
X1	1580				1	1	1			
X2				583.8	584.2					
X3	10	579.8		660		1013		583.8	583.8	
BT	21	0	584.0	0	600	582.4	0	660	585.1	0
BT	700	583.1	0	717	582.3	0	800	582.3	0	900
BT	582.4	0	993	584.2	584.2	1000	584.2	580.3	1000	584.2
BT	581.9	1000.9	584.2	583.4	1002.7	584.2	583.8	1004.5	584.2	583.4
BT	1005.4	584.2	581.9	1005.4	584.2	580.3	1013	584.2	584.2	1100
BT	583.7	0	1200	583.3	0	1211	582.9	0	1213	582.1
BT	0	2000	584.0	0						
X1	1604				24	24	24			
X2				583.8	584.2		1			
X3	10	579.8		660		1013		583.8	583.8	
NC	.11	.11	.035							
X1	1605				1	1	1			
X3	10	579.8		660		1013		583.8	583.8	
X1	1615	19	993	1013	10	10	10			
X3		579.8		660		1013				
GR	584.0	0	582.4	600	585.1	660	583.1	700	582.3	717
GR	582.3	800	582.4	900	584.2	993	580.3	1000	578.8	1000.9
GR	578.4	1002.7	578.8	1004.5	580.3	1005.4	584.2	1013	583.7	1100
GR	583.3	1200	582.9	1211	582.1	1213	584.0	2000		
X1	1966	21	993	1011	351	351	351			
X3		580.2		660		1011				
GR	584.0	0	582.4	600	584.8	660	583.1	700	582.3	717
GR	582.3	800	582.4	900	584.3	993	580.8	1000	580.2	1000.4

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GR 584.3    1011   583.7    1100   583.3    1200   582.9    1211   582.1    1213
GR 584.0    2000
X1  1991      21    1000     1005      25      25      25
X3    10   580.2             660            1011           584.1   584.1
GR 584.0       0   582.4     600   584.8     660   583.1     700   582.3     717
GR 582.3     800   582.4     900   584.3     993   580.8    1000   580.2  1000.4
GR 579.4  1001.2   579.1  1002.5   579.4  1003.8   580.2  1004.6   580.8    1005
GR 584.3    1011   583.7    1100   583.3    1200   582.9    1211   582.1    1213
GR 584.0    2000
NC   .11     .11     .03
X1  1992                          1       1       1
X2                         584.1   584.3
X3    10   580.2             660            1011           584.1   584.1
BT    23       0   584.0       0     600   582.4       0     660   584.8       0
BT   700   583.1       0     717   582.3       0     800   582.3       0     900
BT 582.4       0     993   584.3   584.3    1000   584.3   580.8    1000   584.3
BT 582.4  1000.4   584.3   583.0  1001.2   584.3   583.8  1002.5   584.3   584.1
BT1003.8   584.3   583.8  1004.6   584.3   583.0    1005   584.3   582.4    1005
BT 584.3   580.8    1011   584.3   584.3    1100   583.7       0    1200   583.3
BT     0    1211   582.9       0    1213   582.1       0    2000   584.0       0
X1  2012                         20      20      20
X2                         584.1   584.3               1
X3    10   580.2             660            1011           584.1   584.1
NC   .11     .11    .035
X1  2013                          1       1       1
X3    10   580.2             660            1011           584.1   584.1
X1  2023      21     993    1011      10      10      10
X3         580.2             660            1011
GR 584.0       0   582.4     600   584.8     660   583.1     700   582.3     717
GR 582.3     800   582.4     900   584.3     993   580.8    1000   580.2  1000.4
GR 579.4  1001.2   579.1  1002.5   579.4  1003.8   580.2  1004.6   580.8    1005
GR 584.3    1011   583.7    1100   583.3    1200   582.9    1211   582.1    1213
GR 584.0    2000
X1  2056      18    1000    1018      33      33      33
X3                         660            1018
GR 584.0       0   582.4     600   585.1     660   583.1     700   582.3     717
GR 582.3     800   582.4     900   584.7     988   584.3    1000   581.7    1004
GR 580.5    1008   581.5    1014   583.9    1018   583.7    1100   583.3    1200
GR 582.9    1211   582.1    1213   584.0    2000
X1  2071      17     998    1006      15      15      15
X3    10                         660            1018           583.5   583.5
GR 584.0       0   582.4     600   585.1     660   583.1     700   582.3     717
GR 582.3     800   582.4     900   584.5     998   581.2     998   580.8    1002
GR 581.6    1006   584.5    1006   583.7    1100   583.3    1200   582.9    1211
GR 582.1    1213   584.0    2000
NC   .11     .11     .03
X1  2072      17     998    1006       1       1       1
X2                         583.6   584.5
X3    10                         660            1018           583.6   583.6
BT    15       0   584.0       0     600   582.4       0     660   585.1       0
BT   700   583.1       0     717   582.3       0     800   582.3       0     900
BT 582.4       0     998   584.5   583.5    1002   584.5   583.6    1006   584.5
BT 583.6    1100   583.7       0    1200   583.3       0    1211   582.9       0
BT  1213   582.1       0    2000   584.0       0
GR 584.0       0   582.4     600   585.1     660   583.1     700   582.3     717
GR 582.3     800   582.4     900   584.5     998   581.2     998   580.8    1002
GR 581.6    1006   584.5    1006   583.7    1100   583.3    1200   582.9    1211
GR 582.1    1213   584.0    2000
X1  2094                         22      22      22
X2                         583.6   584.5               1
X3    10   581.1             660            1018           583.6   583.6
X1  2095                          1       1       1
X3    10   581.1             660            1018           583.6   583.6
X1  2106      18    1000    1008      11      11      11
X3                         570
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GR	582.4	800	584.8	900	586.1	995	581.3	1000	581.1	1004
GR	581.4	1008	586.1	1013	586.3	1100	587.2	1200	587.7	1300
GR	587.4	1400	587.5	1500	587.6	1600				
NC	.11	.12	.03							
X1	2107	20	1000	1008	1	1	1			
X3				570						
BT	13	570	585.1	0	630	582.4	0	700	582.4	0
BT	800	582.4	0	900	584.8	0	995	586.1	0	1000
BT	586.3	581.3	1000	586.3	584.2	1008	586.3	584.2	1008	586.3
BT	581.4	1013	586.1	0	1100	586.3	0	1200	587.2	0
GR	584.0	0	582.4	510	585.1	570	582.4	630	582.4	700
GR	582.4	800	584.8	900	586.1	995	586.1	1000	581.3	1000
GR	581.1	1004	581.4	1008	586.1	1008	586.1	1013	586.3	1100
GR	587.2	1200	587.7	1300	587.4	1400	587.5	1500	587.6	1600
X1	2133				26	26	26			
X2							1			
X3				570						
NC	.11	.12	.035							
X1	2134	18	1000	1008	1	1	1			
X3				570						
GR	584.0	0	582.4	510	585.1	570	582.4	630	582.4	700
GR	582.4	800	584.8	900	586.1	995	581.3	1000	581.1	1004
GR	581.4	1008	586.1	1013	586.3	1100	587.2	1200	587.7	1300
GR	587.4	1400	587.5	1500	587.6	1600				
NC	.1	.12	.035							
X1	2144	18	995	1013	10	10	10			
X3				570						
GR	584.0	0	582.4	510	585.1	570	582.4	630	582.4	700
GR	582.4	800	584.8	900	586.1	995	581.3	1000	581.1	1004
GR	581.4	1008	586.1	1013	586.3	1100	587.2	1200	587.7	1300
GR	587.4	1400	587.5	1500	587.6	1600				
X1	2308	24	996	1014	164	164	164			
X3	10									
GR	585.2	0	585.3	100	585.4	200	585.5	300	585.4	400
GR	585.1	500	584.8	600	584.7	700	584.9	800	584.9	900
GR	585.3	996	579.8	1000	579.8	1003	579.8	1007	585.3	1014
GR	585.5	1100	585.4	1200	585.8	1300	586.3	1400	586.4	1500
GR	586.6	1600	586.6	1700	587.0	1800	587.2	1900		
NC	.1	.1	.035							
X1	2358	24	1000	1007	50	50	50			
X3	10			1000		1007		585.3	585.3	
GR	585.2	0	585.3	100	585.4	200	585.5	300	585.4	400
GR	585.1	500	584.8	600	584.7	700	584.9	800	584.9	900
GR	585.3	996	579.8	1000	579.8	1003	579.8	1007	585.3	1014
GR	585.5	1100	585.4	1200	585.8	1300	586.3	1400	586.4	1500
GR	586.6	1600	586.6	1700	587.0	1800	587.2	1900		
SB		1.68	2.7		7		23		579.8	579.8
X1	2376				18	18	18			
X2			1	583.2	585.3					
X3	10			1000		1007		585.3	585.3	
BT	4	1000	585.3	579.8	1000	585.3	583.2	1007	585.3	583.2
BT	1007	585.3	579.8							
X1	2386	24	996	1014	10	10	10			
X3				996		1014				
GR	585.2	0	585.3	100	585.4	200	585.5	300	585.4	400
GR	585.1	500	584.8	600	584.7	700	584.9	800	584.9	900
GR	585.3	996	579.8	1000	579.8	1003	579.8	1007	585.3	1014
GR	585.5	1100	585.4	1200	585.8	1300	586.3	1400	586.4	1500
GR	586.6	1600	586.6	1700	587.0	1800	587.2	1900		
NC	.09	.09	.04							
X1	3710	25	1000	1024	1324	1324	1324			
X3				900	587.2	1300	587.1	587.2	587.1	
GR	586.5	0	588.3	100	588.1	200	588.4	300	588.6	400
GR	589.6	500	589.7	600	587.8	700	587.8	800	587.2	900
GR	584.8	1000	581.3	1007	580.8	1012	581.6	1016	585.2	1024

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GR 586.2    1600    586.6    1700    587.0    1800    587.2    1900    587.3    2000
NC   .09     .09     .04
X1  3760      31   997.5  1002.5      50       50       50
X3    10   580.3                                          586.8   586.8
GR 586.8       0   587.3     100   587.8      200    588.4      300   589.0     400
GR 589.0     500   588.9     600   588.6      700    587.9      800   586.8     900
GR 586.8     988   582.3   997.5  581.35   997.60   580.53   998.20    580.0  999.00
GR 579.8    1000   580.0  1000.90 580.53  1001.70   581.35   1002.3   582.3  1002.5
GR 586.5    1012   586.5    1100   586.5     1200    586.9     1300   586.7    1400
GR 586.8    1500   587.0    1600   587.2     1700    587.1     1800   587.3    1900
GR 587.5    2000
SB     0    1.98     3.0       0     5.0        0       20        0   580.3   580.3
X1  3802                                 42       42       42
X2                    1   584.8   586.8
X3    10   580.3                                          586.8   586.8
BT    30     0.0   586.8     0.0   100.0    587.3      0.0    200.0   587.8     0.0
BT 300.0   588.4     0.0   400.0   589.0      0.0    500.0    589.0     0.0   600.0
BT 588.9     0.0   700.0   588.6     0.0    800.0    587.9      0.0   900.0   586.8
BT   0.0   988.0   586.8     0.0   997.5    586.8    582.3    997.6   586.8   583.2
BT 998.2   586.8   584.0   999.0   586.8    584.6   1000.0    586.8   584.8  1000.9
BT 586.8   584.6  1001.7   586.8   584.0   1002.3    586.8    583.2  1002.5   586.8
BT 582.3  1012.0   586.5     0.0  1100.0    586.5      0.0   1200.0   586.5     0.0
BT1300.0   586.9     0.0  1400.0   586.7      0.0   1500.0    586.8     0.0  1600.0
BT 587.0     0.0  1700.0   587.2     0.0   1800.0    587.1      0.0  2000.0   587.5
BT   0.0
NC   .15     .05    .040      .3      .5
X1  3812      31     988    1012      10       10       10
X3                           988              1012
GR 586.8       0   587.3     100   587.8      200    588.4      300   589.0     400
GR 589.0     500   588.9     600   588.6      700    587.9      800   586.8     900
GR 586.8     988   582.3   997.5  581.35   997.60   580.53   998.20    580.3  999.00
GR 580.3    1000   580.3  1000.90 580.53  1001.70   581.35   1002.3   582.3  1002.5
GR 586.5    1012   586.5    1100   586.5     1200    586.9     1300   586.7    1400
GR 586.8    1500   587.0    1600   587.2     1700    587.1     1800   587.3    1900
GR 587.5    2000
NC   .12     .07     .04
X1  4162      25    1000    1018     350      350      350
X3                           989              1029
GR 583.2       0   583.2     100   583.6      200    583.7      300   583.8     400
GR 584.0     500   584.1     600   583.6      700    583.7      800   583.8     900
GR 584.6    1000   581.4    1006   580.8     1009    581.4     1015   583.9    1018
GR 584.6    1100   584.2    1200   584.2     1300    584.3     1400   584.9    1500
GR 586.0    1600   585.4    1700   586.7     1800    586.4     1900   586.2    2000
NC   .09     .09    .045
X1  4212      31   997.5  1002.5      50       50       50
X3    10   581.5                                          587.4   587.4
GR 586.8       0   586.9     100   587.0      200    587.0      300   587.2     400
GR 587.3     500   587.5     600   587.4      700    587.5      800   587.4     900
GR 587.4     991   583.3   997.5   582.4    997.6    581.5    998.2   581.0     999
GR 580.8    1000   581.0  1000.9   581.5   1001.7    582.4   1002.3   583.3  1002.5
GR 587.4    1009   587.6    1100   587.7     1200    587.7     1300   588.0    1400
GR 588.0    1500   588.1    1600   587.9     1700    587.7     1800   587.6    1900
GR 587.6    2000
SB     0    2.11     3.0       0     5.0        0       18        0   581.5   581.5
X1  4245                                 33       33       33
X2                    1   585.8   588.5
X3    10   581.5            997.5            1002.5            587.4   587.4
BT    30     0.0   586.8     0.0   100.0    586.9      0.0    200.0   587.0     0.0
BT 300.0   587.0     0.0   400.0   587.2      0.0    500.0    587.3     0.0   600.0
BT 587.5     0.0   700.0   587.4     0.0    800.0    587.5      0.0   900.0   587.4
BT   0.0   991.0   587.4     0.0   997.5    587.4    583.3    997.6   587.4   584.2
BT 998.2   587.4   585.0   999.0   587.4    585.6   1000.0    587.4   585.8  1000.9
BT 587.4   585.6  1001.7   587.4   585.0   1002.3    587.4    584.2  1002.5   587.4
BT 583.3  1009.0   587.4     0.0  1100.0    587.6      0.0   1200.0   587.7     0.0
BT1300.0   587.7     0.0  1400.0   588.0      0.0   1500.0    588.0     0.0  1600.0
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BT		2000	587.6							
X1	4255	31	991	1009	10	10	10			
X3				991		1009				
GR	586.8	0	586.9	100	587.0	200	587.0	300	587.2	400
GR	587.3	500	587.5	600	587.4	700	587.5	800	587.4	900
GR	587.4	991	583.3	997.5	582.4	997.6	581.5	998.2	581.5	999
GR	581.5	1000	581.5	1000.9	581.5	1001.7	582.4	1002.3	583.3	1002.5
GR	587.4	1009	587.6	1100	587.7	1200	587.7	1300	588.0	1400
GR	588.0	1500	588.1	1600	587.9	1700	587.7	1800	587.6	1900
GR	587.6	2000								
X1	5310	15	997	1018	1055	1055	1055			
X3	10			700		1300		585.9	585.1	
GR	585.6	0	585.6	100	585.8	300	585.6	500	585.6	700
GR	584.7	900	585.9	997	581.6	1009	581.9	1013	585.1	1018
GR	585.6	1100	585.2	1300	586.3	1500	586.6	1700	588.0	2000
QT	4	50	70	85	1000					
NC	.07	.07	.06							
X1	6364	25	1000	1021	1054	1054	1054			
X3				990		1030				
GR	587.7	0	588.3	100	589.0	200	587.6	300	586.6	400
GR	587.3	500	587.7	600	587.6	700	587.2	800	586.1	900
GR	587.2	1000	582.7	1008	582.2	1011	582.5	1015	586.3	1021
GR	586.5	1100	586.5	1200	586.3	1300	587.3	1400	587.7	1500
GR	587.3	1600	588.1	1700	588.0	1800	586.9	1900	587.3	2000
X1	6414	26	1000	1012	50	50	50			
X3	10							588.4	588.4	
GR	588.1	0	588.6	100	588.8	200	588.0	300	587.5	400
GR	587.5	500	587.9	600	587.8	700	587.3	800	587.5	900
GR	588.4	995	583.9	1000	582.4	1003	582.5	1007	583.3	1012
GR	588.4	1017	587.8	1100	587.7	1200	587.7	1300	588.1	1400
GR	588.1	1500	588.3	1600	588.3	1700	588.1	1800	588.3	1900
GR	588.4	2000								
SB	0	2.2	3.0	0	12	0	50	0	582.4	582.4
X1	6447				33	33	33			
X2			1	587.0	588.0					
X3	10							588.4	588.4	
BT	26	0	588.1	0	100	588.6	0	200	588.8	0
BT	300	588.0	0	400	587.5	0	500	587.5	0	600
BT	587.9	0	700	587.8	0	800	587.3	0	900	587.5
BT	0	995	588.4	0	1000	588.4	583.9	1000	588.4	587.0
BT	1012	588.4	587.0	1012	588.4	583.3	1017	588.4	0	1100
BT	587.8	0	1200	587.7	0	1300	587.7	0	1400	588.1
BT	0	1500	588.1	0	1600	588.3	0	1700	588.3	0
BT	1800	588.1	0	1900	588.3	0	2000	588.4	0	
X1	6457	26	995	1017	10	10	10			
X3	10							588.4	588.4	
GR	588.1	0	588.6	100	588.8	200	588.0	300	587.5	400
GR	587.5	500	587.9	600	587.8	700	587.3	800	587.5	900
GR	588.4	995	583.9	1000	582.4	1003	582.5	1007	583.3	1012
GR	588.4	1017	587.8	1100	587.7	1200	587.7	1300	588.1	1400
GR	588.1	1500	588.3	1600	588.3	1700	588.1	1800	588.3	1900
GR	588.4	2000								
X1	6784	24	1000	1024	327	327	327			
GR	589.4	0	589.8	100	590.1	200	589.4	300	589.2	400
GR	589.3	500	589.7	600	589.6	700	589.2	800	589.5	900
GR	589.3	1000	584.3	1008	583.8	1012	584.2	1016	589.6	1024
GR	589.5	1100	589.4	1200	589.5	1300	589.6	1400	589.8	1500
GR	589.8	1600	589.9	1700	589.7	1800	589.8	1900		
X1	7110	24	1000	1026	326	326	326			
GR	590.7	0	591.0	100	591.3	200	590.7	300	590.9	400
GR	591.1	500	591.4	600	591.3	700	591.0	800	591.5	900
GR	591.1	1000	586.1	1010	585.0	1013	585.1	1016	591.6	1026
GR	591.2	1100	591.0	1200	591.2	1300	591.1	1400	591.4	1500
GR	591.2	1600	591.4	1700	591.3	1800	591.3	1900		
X1	7437	24	1000	1028	327	327	327			

GR	592.9	500	593.2	600	593.1	700	592.9	800	593.5	900
GR	592.9	1000	587.2	1011	586.3	1014	586.5	1017	593.7	1028
GR	592.9	1100	592.6	1200	593.0	1300	592.7	1400	593.1	1500
GR	592.7	1600	592.8	1700	592.9	1800	592.8	1900		
X1	7763	24	1000	1030	326	326	326			
GR	593.2	0	593.4	100	593.8	200	593.4	300	594.2	400
GR	594.7	500	594.9	600	594.9	700	594.8	800	595.4	900
GR	594.7	1000	588.3	1012	587.6	1015	587.8	1018	595.8	1030
GR	594.5	1100	594.2	1200	594.8	1300	594.2	1400	594.8	1500
GR	594.2	1600	594.2	1700	594.4	1800	594.3	1900		
X1	8090	24	1000	1032	327	327	327			
GR	594.5	0	594.6	100	595.1	200	594.8	300	595.9	400
GR	596.6	500	596.7	600	596.7	700	596.7	800	597.4	900
GR	596.6	1000	589.4	1013	589.0	1016	589.1	1019	597.9	1032
GR	596.2	1100	595.9	1200	596.6	1300	595.7	1400	596.5	1500
GR	595.7	1600	595.9	1700	596.0	1800	595.8	1900		
QT	4	5	8	11	15					
NC	.09	.09	.06							
X1	8417	28	1000	1034	327	327	327			
X3	10							598.4	599.9	
GR	595.8	0	595.8	100	596.3	200	596.1	300	597.6	400
GR	598.4	500	598.5	600	598.4	700	598.5	800	599.4	900
GR	598.4	1000	590.5	1015	590.3	1017	590.4	1019	599.9	1034
GR	599.3	1059	599.7	1067	598.1	1085	597.9	1100	597.9	1100
GR	597.5	1200	598.3	1300	597.2	1400	598.1	1500	597.1	1600
GR	597.5	1700	597.6	1800	597.3	1900				
X1	8450	24	1000	1034	33	33	33			
GR	599.2	0	599.2	100	599.5	200	599.4	300	600.4	400
GR	600.9	500	601.0	600	600.9	700	601.0	800	601.6	900
GR	600.9	1000	590.9	1013	590.7	1015	590.9	1017	601.9	1034
GR	600.6	1100	600.3	1200	600.8	1300	600.1	1400	600.7	1500
GR	600.0	1600	600.3	1700	600.4	1800	600.2	1900		
X1	8483	24	1000	1034	33	33	33			
GR	602.5	0	602.5	100	602.7	200	602.6	300	603.1	400
GR	603.4	500	603.4	600	603.4	700	603.4	800	603.7	900
GR	603.4	1000	591.2	1010	591.2	1012	591.4	1014	603.9	1034
GR	603.3	1100	603.1	1200	603.4	1300	603.0	1400	603.3	1500
GR	603.0	1600	603.1	1700	603.1	1800	603.0	1900		
NC	.12	.12	.06							
X1	8517	8	200	204	34	34	34			
X3	10							605.9	605.9	
GR	605.6	0	605.9	100	605.9	185	591.6	200	591.9	204
GR	605.9	219	606.0	300	605.9	400				
NC	.11	.12	.035							
X1	8518	8	200	204	1	1	1			
BT	6	0	605.9	0	100	605.9	0	200	605.9	595.4
BT	204	605.9	595.4	300	606.0	0	400	605.9	0	
GR	605.9	0	605.9	100	605.9	200	591.6	200	591.9	204
GR	605.9	204	606.0	300	605.9	400				
X1	8628				110	110	110			
X2				595.4	605.9		1			
NC	.12	.12	.06							
X1	8629	8	200	204	1	1	1			
X3	10							605.9	605.9	
GR	605.6	0	605.9	100	605.9	185	591.6	200	591.9	204
GR	605.9	219	606.0	300	605.9	400				
X1	8645	8	191	211	15	15	15			
GR	605.6	0	605.9	100	605.9	191	591.6	200	591.9	204
GR	605.9	211	606.0	300	605.9	400				
X1	9300	17	782	800	655	655	655			
X3	10							599.3	599.1	
GR	605.0	0	598.9	400	598.0	500	598.3	600	598.9	700
GR	599.3	782	597.1	787	596.5	792	597.0	796	599.1	800
GR	598.6	900	598.3	1000	599.4	1100	597.5	1200	597.8	1300
GR	597.5	1400	605.0	1600						

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*****************************************
HEC2 VERSION UPDATED JAN 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09
MODIFICATIONS 52,53,54,55,56,57,58
*****************************************



C
1  ROSEBUSH DRAIN
T2  100 YEAR FLOOD
T3  FRASER TWP, BAY CO

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -10.       4.       -0.       -0. -0.000000     -0.00     -0.0      -0.    581.900   -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

CCHV=     .300 CEHV=     .500
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


3470 ENCROACHMENT STATIONS=     900.0    1100.0  TYPE=     1  TARGET=     200.000
 ELENCL=    585.50  ELENCR=    585.90

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      584.70 ELREA=      584.90

                    VS-1

   500.00      2.70   581.90      0.00   581.90   581.99      .09      0.00      0.00   584.70
     100.        0.     100.        0.       0.       41.       0.        0.        0.   584.90
     0.00      0.00     2.43      0.00     .090     .035     .090     0.000    579.20  1003.20
  .001608      500.     500.      500.        0        0        1      0.00     23.04  1026.24


3470 ENCROACHMENT STATIONS=     900.0    1100.0  TYPE=     1  TARGET=     200.000
 ELENCL=    585.50  ELENCR=    585.90

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      586.10 ELREA=      585.90

   550.00      2.99   581.99      0.00     0.00   582.07      .08      .07       .00   584.70
     100.        0.     100.        0.       0.       44.       0.        0.        0.   584.90
      .01      0.00     2.26      0.00     .090     .035     .090     .034    579.00  1003.11
  .001275       50.      50.       50.        0        0        1      0.00     23.17  1026.28


OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      584.70 ELREA=      585.20

   573.00      4.03   581.93      0.00     0.00   582.21      .28      .04       .10   578.60
     100.        0.     100.        0.       0.       23.       0.        0.        0.   578.60
      .01      0.00     4.26      0.00     .090     .035     .090     .034    577.90  1000.00
```

NORMAL BRIDGE,NRD=27 MIN ELTRD= 585.00 MAX ELLC= 582.60

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLFA= 584.70 ELREA= 585.20

DRIVEWAY CULVERT - 20FT. OF 72" CMP WITH ENDS PROJEC-

TING FROM FILL

574.00	4.02	581.92	0.00	0.00	582.22	.30	.00	.01	578.60
100.	0.	100.	0.	0.	23.	0.	0.	0.	578.60
.01	0.00	4.38	0.00	.090	.030	.090	.034	577.90	1000.00
.002734	1.	1.	1.	0	0	1	-4.03	6.00	1011.05

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

NORMAL BRIDGE,NRD=27 MIN ELTRD= 585.00 MAX ELLC= 582.60

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 584.70 ELREA= 585.20

594.00	3.66	581.96	0.00	0.00	582.31	.35	.06	.03	578.60
100.	0.	100.	0.	0.	21.	0.	0.	0.	578.60
.01	0.00	4.77	0.00	.090	.030	.090	.033	578.30	1000.00
.003381	20.	20.	20.	2	0	1	-4.13	6.00	1011.09

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 584.70 ELREA= 585.20

595.00	3.70	582.00	0.00	0.00	582.32	.32	.00	.01	578.60
100.	0.	100.	0.	0.	22.	0.	0.	0.	578.60
.01	0.00	4.57	0.00	.090	.035	.090	.032	578.30	1000.00
.003473	1.	1.	1.	2	0	1	0.00	6.00	1011.15

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 584.70 ELREA= 585.20

605.00	3.94	582.34	0.00	0.00	582.41	.07	.02	.07	584.70
100.	0.	100.	0.	0.	46.	0.	0.	0.	585.20
.01	0.00	2.20	0.00	.090	.035	.090	.032	578.40	993.87
.000896	10.	10.	10.	2	0	1	0.00	17.80	1011.67

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 584.40 ELREA= 584.40

BS-2 60FT. D.S. DETROIT @ MACKINAC R.R. - 24FT. OF 60" CMP

WITH ENDS FLUSH WITH HEADWALL

```
   100.      0.     100.      0.      0.     17.      0.      0.      0.   579.70
    .01    0.00    5.85    0.00    .090   .035    .090    .032  578.70   997.50
.008182     22.     22.     22.       2      0       1    0.00    5.00  1008.51

SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
    -0.00     2.18      2.70      -0.00     3.83      -0.00     14.73     -0.00     578.70    578.70

PRESSURE FLOW

  EGPRS     EGLWC     H3        QWEIR     QPR       BAREA     ELLC      ELTRD     CLASS

  583.71    582.69    0.00        0.      100.       15.     582.20    584.40    10.00


OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      584.40 ELREA=      584.40

  653.00     4.73   583.43      0.00      0.00   583.71       .28      1.03      0.00   579.70
   100.       0.     100.       0.        0.      23.        0.        0.        0.    579.70
    .01     0.00     4.26      0.00      .090     .035      .090      .033    578.70   997.50
.003382      26.      26.       26.         2        0         1      0.00      5.00  1011.64

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


OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      584.40 ELREA=      584.40

  663.00     4.96   583.76      0.00      0.00   583.80       .04       .01       .07   584.40
   100.       0.     100.       0.        0.      65.        0.        0.        0.    584.40
    .01     0.00     1.54      0.00      .090     .035      .090      .033    578.80   987.56
.000427      10.      10.       10.         2        0         1      0.00     24.87  1012.44


OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      584.90 ELREA=      584.90

                    BS-3  DETROIT @ MACKINAW R.R. BRIDGE

  688.00     4.65   583.75      0.00      0.00   583.85       .10       .02       .03   584.90
   100.       0.     100.       0.        0.      39.        0.        0.        0.    584.90
    .02     0.00     2.54      0.00      .090     .035      .090      .033    579.10  1000.00
.001229      25.      25.       25.         2        0         1      0.00      9.00  1009.00


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
    -0.00     2.04      2.70      -0.00     9.00      -0.00     23.00     -0.00     579.10    579.10

PRESSURE FLOW

  EGPRS     EGLWC     H3        QWEIR     QPR       BAREA     ELLC      ELTRD     CLASS
```

```
584.34    583.85    0.00    0.    100.    23.    581.90    584.90    10.00

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      584.90 ELREA=      584.90

  712.00    5.16   584.26    0.00    0.00   584.34     .08     .50    0.00   584.90
    100.      0.     100.      0.      0.     44.      0.      0.      0.   584.90
     .02    0.00     2.27    0.00    .090     .035    .090    .033  579.10  1000.00
 .000913     24.      24.     24.       2        0       1    0.00    9.00  1009.00

3470 ENCROACHMENT STATIONS=      488.0      512.0  TYPE=      1  TARGET=      24.000

                    BS-4  DETROIT @ MACKINAC R.R. SPUR LINE BRIDGE - 36FT. OF

                          48"  CMP WITH ENDS PROJECTING FROM FILL, AND TWO 37 FT

                          LENGTHS OF 36"  C.I. PIPE WITH ENDS PROJECTING FROM

                          FILL

  730.00    4.83   584.33    0.00    0.00   584.37     .03     .01     .01   580.00
    100.      3.       94.      3.     11.     63.     11.      0.      0.   579.90
     .02     .30     1.48     .30    .100     .035    .100    .033  579.50   488.08
 .000208     18.      18.     18.       2        0       1    0.00   23.85   511.93

SPECIAL BRIDGE

SB   XK      XKOR     COFQ     RDLEN    BWC      BWP      BAREA    SS       ELCHU    ELCHD
     -0.00    2.30     3.00     -0.00    6.60     -0.00    23.00    -0.00    579.70   579.50

PRESSURE AND WEIR FLOW

  EGPRS    EGLWC    H3       QWEIR    QPR      ELBRD    ELTRD    CLASS
  585.01   584.57   0.00     17.      82.      23.      582.70   584.40   30.00

3470 ENCROACHMENT STATIONS=      488.0      512.0  TYPE=      1  TARGET=      24.000
  769.00    5.26   584.76    0.00    0.00   584.79     .03     .42    0.00   580.00
    100.      4.       93.      4.     13.     68.     13.      0.      0.   579.90
     .03     .29     1.37     .29    .100     .035    .100    .033  579.50   488.00
 .000155     39.      39.     39.       2        0       2    0.00   24.00   512.00

  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=      300.0      514.0  TYPE=      1  TARGET=      214.000

                    DRIVEWAY CULVERT - 22FT. OF 66"  CMP WITH ENDS PROJEC-
```

B.S.4 Det. & Mac RR spur line

check on pressure flow

$K = 2.3,\ C = 1/\sqrt{K} = 1/\sqrt{2.3} = 0.659$

$Q = CA\sqrt{2gH} = .0659(23)(8.025)H^{1/2}$

$Q = 121.7H^{1/2}$

$TW = 584.33$

$HW = 584.79$

$H = (584.79 - 584.33) = 0.46$

$Q = 121.7(.678) = 82.5$ cfs

D/S

U/S

consider reasonable

TING FROM HEADWALL

? in a ft ?

```
  778.00      5.27    584.77      0.00      0.00    584.79       .02       .00       .00    580.20
   100.       43.      49.        8.       190.      28.        21.        0.        0.     580.20
    .03       .23      1.77      .37       .100      .035      .100      .033    579.50    300.00
 .000218      9.       9.        9.        0         0         1        0.00    214.00    514.00
```

SPECIAL BRIDGE

```
SB   XK       XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     -0.00     2.05      3.00     -0.00      5.50     -0.00     20.00     -0.00    579.50    579.50
```

6870 D.S. ENERGY OF 584.79 HIGHER THAN COMPUTED ENERGY OF 584.79
PRESSURE AND WEIR FLOW

```
  EGPRS     EGLWC     H3        QWEIR     QPR       BAREA     ELLC      ELTRD     CLASS
  585.56    584.79    0.00      85.       15.       20.       583.70    584.40    30.00
```

high submergence

```
3470 ENCROACHMENT STATIONS=     300.0     514.0  TYPE=     1  TARGET=     214.000
  802.00      5.27    584.77      0.00      0.00    584.79       .02       0.00      0.00    580.20
   100.       43.      49.        8.       193.      28.        21.        0.        0.     580.20
    .04       .23      1.75      .37       .100      .035      .100      .033    579.50    300.00
 .000213      24.      24.       24.        1         0         7        0.00    214.00    514.00
```

```
3470 ENCROACHMENT STATIONS=     300.0     514.0  TYPE=     1  TARGET=     214.000
OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      584.40 ELREA=   100000.00
  812.00      5.29    584.79      0.00      0.00    584.80       .01       .00       .00    584.40
   100.       27.      73.        0.       169.      74.        0.        1.        0.  100000.00
    .05       .16      .98      0.00       .100      .035      .100      .033    579.50    300.00
 .000137      10.      10.       10.        0         0         1        0.00    214.00    514.00
```

```
3470 ENCROACHMENT STATIONS=     815.0    1024.0  TYPE=     1  TARGET=     209.000
```

VS-5 U.S. FROM DETROIT @ MACKINAW R.R.

```
  988.00      5.01    584.81      0.00      0.00    584.81       .01       .02       .00    583.90
   100.       21.      79.        0.       180.      98.        0.        2.        1.  100000.00
    .12       .12      .80      0.00       .110      .035      .110      .034    579.80    815.00
 .000066      176.     176.      176.       0         0         1        0.00    209.00   1024.00
```

```
3470 ENCROACHMENT STATIONS=     815.0    1014.0  TYPE=     1  TARGET=     199.000
 1005.00      6.20    584.80      0.00      0.00    584.82       .02       .00       .01    578.60
   100.       38.      50.       12.       201.      31.        35.        2.        1.     578.60
    .12       .19      1.62      .35       .110      .035      .110      .034    578.60    819.23
 .000127      17.      17.       17.        1         0         1        0.00    194.77   1014.00
```

NORMAL BRIDGE,NRD=20 MIN ELTRD= 583.70 MAX ELLC= 581.90

```
DRIVEWAY CULVERT - 20FT. OF 60"  CMP WITH ENDS PROJEC-

TING FROM FILL

 1006.00      6.21   584.81      0.00      0.00   584.83       .01       .00       .00    578.60
    100.        62.      28.       10.      176.      19.       19.        2.        1.    578.60
     .13       .35     1.46       .52      .110     .030      .110      .034    578.60    819.23
 .000633        1.       1.        1.         0        0         1    -53.20    194.77   1014.00

  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

NORMAL BRIDGE,NRD=20 MIN ELTRD=  583.70 MAX ELLC=  581.90

3470 ENCROACHMENT STATIONS=      815.0     1014.0  TYPE=      1  TARGET=     199.000
 1026.00      6.23   584.83      0.00      0.00   584.84       .01       .01       .00    578.60
    100.        63.      28.       10.      178.      19.       19.        2.        1.    578.60
     .13       .35     1.44       .51      .110     .030      .110      .033    578.60    818.92
 .000613       20.      20.       20.         1        0         1    -53.20    195.07   1014.00

3470 ENCROACHMENT STATIONS=      815.0     1014.0  TYPE=      1  TARGET=     199.000
 1027.00      6.22   584.82      0.00      0.00   584.84       .02       .00       .00    578.60
    100.        38.      50.       12.      204.      31.       35.        2.        1.    578.60
     .13       .19     1.60       .34      .110     .035      .110      .033    578.60    818.91
 .000124        1.       1.        1.         0        0         1      0.00    195.09   1014.00

3470 ENCROACHMENT STATIONS=      815.0     1014.0  TYPE=      1  TARGET=     199.000
 1037.00      6.24   584.84      0.00      0.00   584.85       .01       .00       .00    584.20
    100.        20.      80.        0.      171.     100.        0.        2.        1. 100000.00
     .14       .12      .80      0.00      .110     .035      .110      .033    578.60    618.67
 .000064       10.      10.       10.         1        0         1      0.00    195.33   1014.00

3280 CROSS SECTION   1198.00 EXTENDED        .85 FEET

3470 ENCROACHMENT STATIONS=      660.0     1014.0  TYPE=      1  TARGET=     354.000
 1198.00      5.15   584.85      0.00      0.00   584.86       .00       .01       .00    584.30
    100.        71.      29.        0.      620.      72.        0.        4.        2. 100000.00
     .36       .11      .41      0.00      .110     .035      .110      .034    579.70    669.61
 .000025      161.     161.      161.         0        0         1      0.00    344.39   1014.00

3280 CROSS SECTION   1217.00 EXTENDED        .85 FEET

3470 ENCROACHMENT STATIONS=      660.0     1014.0  TYPE=      1  TARGET=     354.000
 1217.00      5.16   584.86      0.00      0.00   584.86       .00       .00       .00    580.40
    100.        82.      15.        3.      645.      23.       23.        4.        3.    580.40
     .39       .13      .64       .13      .110     .035      .110      .034    579.70    669.60
 .000031       19.      19.       19.         0        0         1      0.00    344.40   1014.00
```

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3280 CROSS SECTION    1218.00 EXTENDED        .85 FEET

NORMAL BRIDGE.NRD=23 MIN ELTRD=  584.30 MAX ELLC=  583.20

3470 ENCROACHMENT STATIONS=      660.0     1014.0  TYPE=      1  TARGET=      354.000
                          DRIVEWAY CULVERT - 18FT. OF 54"  CMP WITH ENDS FLUSH

                          WITH HEADWALL
  1218.00      5.16   584.86      0.00      0.00   584.86       .00       .00       .00    580.40
     100.       94.       5.        1.      625.      15.       10.        4.        3.    580.40
     .39       .15       .34       .09      .110     .030      .110      .034    579.70    669.60
 .000044        1.        1.        1.         0        0         1    -41.06    344.40   1014.00

3280 CROSS SECTION    1236.00 EXTENDED        .85 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

NORMAL BRIDGE.NRD=23 MIN ELTRD=  584.30 MAX ELLC=  583.20

3470 ENCROACHMENT STATIONS=      660.0     1014.0  TYPE=      1  TARGET=      354.000
  1236.00      5.16   584.86      0.00      0.00   584.86       .00       .00       .00    580.40
     100.       94.       5.        1.      626.      15.       10.        4.        3.    580.40
     .42       .15       .34       .09      .110     .030      .110      .033    579.70    669.58
 .000044       18.       18.       18.         0        0         1    -41.06    344.41   1014.00

3280 CROSS SECTION    1237.00 EXTENDED        .85 FEET

3470 ENCROACHMENT STATIONS=      660.0     1014.0  TYPE=      1  TARGET=      354.000
  1237.00      5.16   584.86      0.00      0.00   584.86       .00       .00       .00    580.40
     100.       82.       15.       3.      645.      23.       23.        4.        3.    580.40
     .42       .13       .64       .13      .110     .035      .110      .033    579.70    669.58
 .000031        1.        1.        1.         0        0         1      0.00    344.42   1014.00

3280 CROSS SECTION    1247.00 EXTENDED        .85 FEET

3470 ENCROACHMENT STATIONS=      660.0     1014.0  TYPE=      1  TARGET=      354.000
  1247.00      4.76   584.86      0.00      0.00   584.86       .00       .00       .00    584.30
     100.       71.       29.       0.      620.      70.        0.        4.        3. 100000.00
     .43       .11       .41      0.00      .110     .035      .110      .033    580.10    669.58
 .000025       10.       10.       10.         0        0         1      0.00    344.42   1014.00

3280 CROSS SECTION    1324.00 EXTENDED        .85 FEET
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3470 ENCROACHMENT STATIONS=      660.0     1013.0  TYPE=      1  TARGET=      353.000
  1324.00      5.66    584.86      0.00      0.00    584.86       .00       .00       .00    584.40
     100.       70.       30.        0.      640.       72.        0.        6.        3. 100000.00
      .54       .11       .43      0.00      .110      .035      .110      .033    579.20    670.81
  .000023       77.       77.       77.         0         0         1      0.00    342.19   1013.00

3280 CROSS SECTION    1344.00 EXTENDED        .85 FEET

3470 ENCROACHMENT STATIONS=      660.0     1013.0  TYPE=      1  TARGET=      353.000
  1344.00      5.66    584.86      0.00      0.00    584.86       .00       .00       .00    579.50
     100.       78.       19.        3.      661.       28.       23.        6.        4.    579.50
      .56       .12       .68       .13      .110      .035      .110      .033    579.20    670.80
  .000027       20.       20.       20.         0         0         1      0.00    342.20   1013.00

3280 CROSS SECTION    1345.00 EXTENDED        .85 FEET

NORMAL BRIDGE,NRD=24 MIN ELTRD=  584.40 MAX ELLC=  582.80

3470 ENCROACHMENT STATIONS=      660.0     1013.0  TYPE=      1  TARGET=      353.000
                         DRIVEWAY CULVERT - 30FT. OF 60"  CMP WITH ENDS PROJEC-

                         TING FROM FILL

  1345.00      5.66    584.86      0.00      0.00    584.86       .00       .00       .00    579.50
     100.       93.        6.        1.      643.       17.       10.        6.        4.    579.50
      .57       .14       .34       .09      .110      .030      .110      .033    579.20    670.80
  .000041        1.        1.        1.         0         0         1    -41.30    342.20   1013.00

3280 CROSS SECTION    1375.00 EXTENDED        .85 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      XNP       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR    ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

NORMAL BRIDGE,NRD=24 MIN ELTRD=  584.40 MAX ELLC=  582.80

3470 ENCROACHMENT STATIONS=      660.0     1013.0  TYPE=      1  TARGET=      353.000
  1375.00      5.66    584.86      0.00      0.00    584.86       .00       .00       .00    579.50
     100.       93.        6.        1.      644.       17.       10.        6.        4.    579.50
      .62       .14       .34       .09      .110      .030      .110      .033    579.20    670.78
  .000041       30.       30.       30.         0         0         1    -41.30    342.22   1013.00

3280 CROSS SECTION    1376.00 EXTENDED        .85 FEET

3470 ENCROACHMENT STATIONS=      660.0     1013.0  TYPE=      1  TARGET=      353.000
  1376.00      5.66    584.86      0.00      0.00    584.86       .00       .00       .00    579.50
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      .62      .12      .68      .13     .110     .035     .110     .033   579.20   670.78
  .000027       1.       1.       1.        0        0        1     0.00   342.22  1013.00

3280 CROSS SECTION   1386.00 EXTENDED       .85 FEET

3470 ENCROACHMENT STATIONS=      660.0     1013.0  TYPE=      1  TARGET=      353.000
  1386.00     5.66   584.86     0.00     0.00   584.86      .00      .00      .00   584.40
     100.      70.      30.       0.     641.      72.       0.       7.       4. 100000.00
      .63      .11      .42     0.00     .110     .035     .110     .033   579.20   670.78
  .000023      10.      10.      10.        0        0        1     0.00   342.22  1013.00

3280 CROSS SECTION   1554.00 EXTENDED       .86 FEET

3470 ENCROACHMENT STATIONS=      660.0     1013.0  TYPE=      1  TARGET=      353.000
  1554.00     5.07   584.87     0.00     0.00   584.87      .00      .00      .00   584.20
     100.      74.      26.       0.     675.      65.       0.       9.       5. 100000.00
      .88      .11      .41     0.00     .110     .035     .110     .033   579.80   664.85
  .000023     168.     168.     168.        0        0        1     0.00   348.15  1013.00

3280 CROSS SECTION   1579.00 EXTENDED       .86 FEET

3470 ENCROACHMENT STATIONS=      660.0     1013.0  TYPE=      1  TARGET=      353.000
  1579.00     5.07   584.87     0.00     0.00   584.87      .00      .00      .00   580.30
     100.      81.      16.       2.     694.      27.      20.      10.       5.   580.30
      .92      .12      .61      .12     .110     .035     .110     .033   579.80   664.84
  .000026      25.      25.      25.        0        0        1     0.00   348.16  1013.00

3280 CROSS SECTION   1580.00 EXTENDED       .86 FEET

NORMAL BRIDGE,NRD=21 MIN ELTRD=  584.20 MAX ELLC=  583.80

3470 ENCROACHMENT STATIONS=      660.0     1013.0  TYPE=      1  TARGET=      353.000
                        DRIVEWAY CULVERT - 24FT. OF 66"  CMP WITH ENDS PROJEC-

                        TING FROM FILL

  1580.00     5.07   584.87     0.00     0.00   584.87      .00      .00      .00   580.30
     100.      92.       7.       1.     680.      21.      11.      10.       5.   580.30
      .92      .13      .35      .10     .110     .030     .110     .033   579.80   664.84
  .000035       1.       1.       1.        0        0        1   -28.06   348.16  1013.00

3280 CROSS SECTION   1604.00 EXTENDED       .86 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
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NORMAL BRIDGE,NRD=21 MIN ELTRD=  584.20 MAX ELLC=  583.80

3470 ENCROACHMENT STATIONS=      660.0     1013.0  TYPE=      1  TARGET=      353.000
  1604.00      5.07   584.87      0.00      0.00   584.87      .00       .00       .00    580.30
     100.       92.       7.        1.      680.      21.      11.       10.        6.    580.30
      .96       .13      .35       .10      .110     .030     .110      .033    579.80    664.82
  .000035       24.      24.       24.         0        0        1    -28.06    348.18   1013.00

3280 CROSS SECTION   1605.00 EXTENDED        .86 FEET

3470 ENCROACHMENT STATIONS=      660.0     1013.0  TYPE=      1  TARGET=      353.000
  1605.00      5.07   584.87      0.00      0.00   584.87      .00       .00       .00    580.30
     100.       81.      16.        2.      694.      27.      20.       10.        6.    580.30
      .97       .12      .61       .12      .110     .035     .110      .033    579.80    664.82
  .000026        1.       1.        1.         0        0        1      0.00    348.18   1013.00

3280 CROSS SECTION   1615.00 EXTENDED        .86 FEET

3470 ENCROACHMENT STATIONS=      660.0     1013.0  TYPE=      1  TARGET=      353.000
  1615.00      5.07   584.87      0.00      0.00   584.87      .00       .00       .00    584.20
     100.       74.      26.        0.      676.      65.       0.       10.        6. 100000.00
      .98       .11      .41      0.00      .110     .035     .110      .033    579.80    664.82
  .000023       10.      10.       10.         0        0        1      0.00    348.18   1013.00

3280 CROSS SECTION   1966.00 EXTENDED        .87 FEET

3470 ENCROACHMENT STATIONS=      660.0     1011.0  TYPE=      1  TARGET=      351.000
  1966.00      4.68   584.88      0.00      0.00   584.88      .00       .01       .00    584.30
     100.       79.      21.        0.      680.      53.       0.       16.        8. 100000.00
     1.53       .12      .40      0.00      .110     .035     .110      .034    580.20    660.00
  .000026      351.     351.      351.         0        0        1      0.00    351.00   1011.00

3280 CROSS SECTION   1991.00 EXTENDED        .87 FEET

3470 ENCROACHMENT STATIONS=      660.0     1011.0  TYPE=      1  TARGET=      351.000
  1991.00      4.68   584.88      0.00      0.00   584.88      .00       .00       .00    580.80
     100.       85.      13.        2.      696.      23.      14.       17.        9.    580.80
     1.57       .12      .58       .11      .110     .035     .110      .034    580.20    660.00
  .000029       25.      25.       25.         0        0        1      0.00    351.00   1011.00

3280 CROSS SECTION   1992.00 EXTENDED        .87 FEET

NORMAL BRIDGE,NRD=23 MIN ELTRD=  584.30 MAX ELLC=  584.10

3470 ENCROACHMENT STATIONS=      660.0     1011.0  TYPE=      1  TARGET=      351.000
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                    TING FROM FILL

  1992.00      4.68    584.88      0.00      0.00    584.88       .00       .00       .00    580.80
     100.       93.        6.        1.      686.       19.        8.       17.        9.    580.80
     1.57       .14       .34       .09      .110      .030      .110      .034    580.20    660.00
  .000035        1.        1.        1.         1         0         1    -21.90    351.00   1011.00

3280 CROSS SECTION    2012.00 EXTENDED        .87 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

NORMAL BRIDGE,NRO=23 MIN ELTRD=  584.30 MAX ELLC=  584.10

3470 ENCROACHMENT STATIONS=      660.0     1011.0  TYPE=      1  TARGET=      351.000
  2012.00      4.68    584.88      0.00      0.00    584.88       .00       .00       .00    580.80
     100.       93.        6.        1.      686.       19.        8.       17.        9.    580.80
     1.61       .14       .34       .09      .110      .030      .110      .034    580.20    660.00
  .000035       20.       20.       20.         0         0         1    -21.90    351.00   1011.00

3280 CROSS SECTION    2013.00 EXTENDED        .87 FEET

3470 ENCROACHMENT STATIONS=      660.0     1011.0  TYPE=      1  TARGET=      351.000
  2013.00      4.68    584.88      0.00      0.00    584.88       .00       .00       .00    580.80
     100.       85.       13.        2.      698.       23.       14.       17.        9.    580.80
     1.61       .12       .58       .11      .110      .035      .110      .034    580.20    660.00
  .000028        1.        1.        1.         0         0         1      0.00    351.00   1011.00

3280 CROSS SECTION    2023.00 EXTENDED        .87 FEET

3470 ENCROACHMENT STATIONS=      660.0     1011.0  TYPE=      1  TARGET=      351.000
  2023.00      4.68    584.88      0.00      0.00    584.88       .00       .00       .00    584.30
     100.       79.       21.        0.      682.       53.        0.       17.        9. 100000.00
     1.63       .12       .40      0.00      .110      .035      .110      .034    580.20    660.00
  .000025       10.       10.       10.         0         0         1      0.00    351.00   1011.00

3280 CROSS SECTION    2056.00 EXTENDED        .88 FEET

3470 ENCROACHMENT STATIONS=      660.0     1018.0  TYPE=      1  TARGET=      358.000

                 VS-6  D.S. FROM LINWOOD ROAD BRIDGE

  2056.00      4.38    584.88      0.00      0.00    584.88       .00       .00       .00    584.30
     100.       77.       23.        0.      656.       55.        0.       18.        9. 100000.00
     1.68       .12       .42      0.00      .110      .035      .110      .034    580.50    664.49
  .000027       33.       33.       33.         0         0         1      0.00    353.51   1018.00
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3470 ENCROACHMENT STATIONS=      660.0     1018.0  TYPE=      1  TARGET=      358.000
  2071.00      4.08    584.88      0.00      0.00    584.88       .00       .00       .00    584.50
     100.       88.       12.        0.      675.       30.        5.       18.        9.    584.50
     1.70       .13       .40       .04      .110      .035      .110      .034    580.80    664.48
 .000033       15.       15.       15.         0         0         1      0.00    353.52   1018.00

3280 CROSS SECTION    2072.00 EXTENDED        .88 FEET


NORMAL BRIDGE.NRD=15 MIN ELTRD=  584.50 MAX ELLC=  583.60

3470 ENCROACHMENT STATIONS=      660.0     1018.0  TYPE=      1  TARGET=      358.000

                        DRIVEWAY CULVERT

  2072.00      4.08    584.88      0.00      0.00    584.88       .00       .00       .00    584.50
     100.       94.        6.        0.      675.       23.        5.       18.        9.    584.50
     1.70       .14       .25       .05      .110      .030      .110      .034    580.80    664.48
 .000037        1.        1.        1.         0         0         1     -7.40    353.52   1018.00

3280 CROSS SECTION    2094.00 EXTENDED        .88 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

NORMAL BRIDGE.NRD=15 MIN ELTRD=  584.50 MAX ELLC=  583.60

3470 ENCROACHMENT STATIONS=      660.0     1018.0  TYPE=      1  TARGET=      358.000
  2094.00      4.08    584.88      0.00      0.00    584.88       .00       .00       .00    584.50
     100.       95.        5.        0.      675.       22.        5.       18.       10.    584.50
     1.75       .14       .24       .05      .110      .030      .110      .033    580.80    664.47
 .000038       22.       22.       22.         0         0         1     -7.40    353.53   1018.00

3280 CROSS SECTION    2095.00 EXTENDED        .88 FEET


3470 ENCROACHMENT STATIONS=      660.0     1018.0  TYPE=      1  TARGET=      358.000
  2095.00      4.08    584.88      0.00      0.00    584.88       .00       .00       .00    584.50
     100.       87.       13.        0.      675.       29.        5.       18.       10.    584.50
     1.75       .13       .45       .04      .110      .030      .110      .033    580.80    664.47
 .000032        1.        1.        1.         0         0         1      0.00    353.53   1018.00


3265 DIVIDED FLOW


3470 ENCROACHMENT STATIONS=      570.0     1600.0  TYPE=      1  TARGET=     -570.000
  2106.00      3.78    584.88      0.00      0.00    584.88       .00       .00       .00    581.30
     100.       79.       20.        1.      624.       29.        6.       19.       10.    581.40
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.000034      11.      11.      11.       0        0        1     0.00   346.11  1011.70

3265 DIVIDED FLOW

NORMAL BRIDGE.NRD=13 MIN ELTRD=  582.40 MAX ELLC=  584.20

3470 ENCROACHMENT STATIONS=      570.0     1600.0  TYPE=      1  TARGET=     -570.000

                 BS-7  LINWOOD ROAD BRIDGE

 2107.00      3.78   584.88     0.00     0.00   584.88      .00      .00      .00   586.10
    100.       92.       8.       0.      617.      24.       0.      19.      10.   586.10
    1.76       .15      .34     0.00     .110     .030     .120     .033   581.10   574.95
 .000046        1.       1.       1.        0        0        1    -5.42   338.68  1008.00

3265 DIVIDED FLOW

NORMAL BRIDGE.NRD=13 MIN ELTRD=  582.40 MAX ELLC=  584.20

3470 ENCROACHMENT STATIONS=      570.0     1600.0  TYPE=      1  TARGET=     -570.000
 2133.00      3.79   584.89     0.00     0.00   584.89      .00      .00      .00   586.10
    100.       92.       8.       0.      618.      24.       0.      19.      10.   586.10
    1.81       .15      .34     0.00     .110     .030     .120     .033   581.10   574.93
 .000046       26.      26.      26.        0        0        1    -5.43   338.78  1008.00

3265 DIVIDED FLOW

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

3470 ENCROACHMENT STATIONS=      570.0     1600.0  TYPE=      1  TARGET=     -570.000
 2134.00      3.78   584.88     0.00     0.00   584.89      .00      .00      .00   581.30
    100.       82.      18.       1.      624.      29.       6.      19.      10.   581.40
    1.81       .13      .60      .09     .110     .035     .120     .033   581.10   574.93
 .000036        1.       1.       1.        0        0        1     0.00   346.22  1011.70

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=      570.0     1600.0  TYPE=      1  TARGET=     -570.000
 2144.00      3.79   584.89     0.00     0.00   584.89      .00      .00      .00   586.10
    100.       83.      17.       0.      618.      42.       0.      19.      10.   586.10
    1.82       .13      .41     0.00     .100     .035     .120     .033   581.10   574.92
 .000031       10.      10.      10.        0        0        1     0.00   346.26  1011.70

OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA=      585.30 ELREA=      585.30
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   100.      0.     100.      0.      0.     61.      0.     21.     11.    585.30
  1.85     0.00     1.63     0.00    .100    .035    .120    .033  579.80    996.30
.000363    164.     164.     164.       0       0       1    0.00   17.17   1013.47

3470 ENCROACHMENT STATIONS=     1000.0     1007.0  TYPE=      1  TARGET=        7.000
OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA=       585.30 ELREA=       585.30

                    BS-8  DETROIT & MACKINAW R.R. SPUR LINE
 2358.00     5.07   584.87     0.00     0.00   584.99     .12     .03     .04   579.80
   100.      0.     100.      0.      0.     35.      0.     21.     11. 100000.00
  1.86     0.00     2.82     0.00    .100    .035    .100    .033  579.80   1000.00
.001669     50.      50.      50.       2       0       1    0.00    7.00   1007.00

SPECIAL BRIDGE
SB   XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
    -0.00      1.68      2.70     -0.00      7.00     -0.00     23.00     -0.00     579.80    579.80
PRESSURE AND WEIR FLOW
  EGPRS     EGLWC     H3        QWEIR     QPR       BAREA     ELLC      ELTRD     CLASS
  585.36    584.99    0.00      0.        100.      23.       583.20    585.30    30.00

3470 ENCROACHMENT STATIONS=     1000.0     1007.0  TYPE=      1  TARGET=        7.000
OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA=       585.30 ELREA=       585.30
 2376.00     5.46   585.26     0.00     0.00   585.36     .11     .37     0.00   579.80
   100.      0.     100.      0.      0.     38.      0.     21.     11. 100000.00
  1.86     0.00     2.62     0.00    .100    .035    .100    .033  579.80   1000.00
.001385     18.      18.      18.       2       0       2    0.00    7.00   1007.00

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

3470 ENCROACHMENT STATIONS=      996.0     1014.0  TYPE=      1  TARGET=       18.000
 2386.00     5.56   585.36     0.00     0.00   585.39     .03     .01     .02   585.30
   100.      0.     100.      0.      0.     70.      0.     21.     11. 100000.00
  1.86     0.00     1.43     0.00    .100    .035    .100    .033  579.80    996.00
.000256     10.      10.      10.       2       0       1    0.00   18.00   1014.00

3470 ENCROACHMENT STATIONS=      900.0     1300.0  TYPE=      1  TARGET=      400.000
 ELENCL=     587.20  ELENCR=     587.10
                    VS-9  D.S. FROM ELEVATOR ROAD BRIDGE
 3710.00     4.91   585.71     0.00     0.00   585.73     .02     .33     .00   584.80
```

B.S. 8, Det & Mac RR spur line

check on pressure flow

$K = 1.68$; $C = 1/\sqrt{K} = 1/\sqrt{1.68} = .77$

$Q = CA\sqrt{2gH} = .77(23)(8.025)H^{1/2}$

$Q = 142.4H^{1/2}$

$TW = 584.87$

$HW = 585.36$

$H = (585.36 - 584.87) = .49$

$Q = 142.4(.7) = 99.68$ cfs

2.17	.15	1.23	.10	.090	.040	.090	.036	580.80	962.36
.000247	1324.	1324.	1324.	2	0	1	0.00	116.28	1078.64

OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA= 586.80 ELREA= 586.80

BS-10 ELEVATOR ROAD CULVERT - 40FT. OF 60" RCP WITH SQUARE

ENDS FLUSH WITH HEADWALL

3760.00	5.33	585.63	0.00	0.00	585.87	.24	.03	.11	582.30
100.	0.	100.	0.	0.	25.	0.	23.	13.	582.30
2.17	0.00	3.97	0.00	.090	.040	.090	.036	580.30	997.50
.003697	50.	50.	50.	2	0	1	0.00	5.00	1010.02

$Q = 111.98H^{1/2}$; $H = (586.42 - 585.63) = 0.79$; $Q = 111.98(.88) = 99.4$ cfs

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.98	3.00	0.00	5.00	0.00	20.00	0.00	580.30	580.30

PRESSURE FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	ELLC	ELTRD	CLASS
586.39	585.87	0.00	0.	100.	20.	584.80	586.80	10.00

OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA= 586.80 ELREA= 586.80

3802.00	5.90	586.20	0.00	0.00	586.39	.20	.52	0.00	582.30
100.	0.	100.	0.	0.	28.	0.	23.	13.	582.30
2.18	0.00	3.56	0.00	.090	.040	.090	.036	580.30	997.50
.002768	42.	42.	42.	2	0	1	0.00	5.00	1011.32

CCHV= .300 CEHV= .500

3470 ENCROACHMENT STATIONS= 988.0 1012.0 TYPE= 1 TARGET= 24.000

3812.00	6.12	586.42	0.00	0.00	586.45	.04	.01	.05	586.80
100.	0.	100.	0.	0.	66.	0.	23.	13.	100000.00
2.18	0.00	1.51	0.00	.150	.040	.050	.036	580.30	988.81
.000507	10.	10.	10.	2	0	1	0.00	23.01	1011.81

3280 CROSS SECTION 4162.00 EXTENDED .32 FEET

3470 ENCROACHMENT STATIONS= 989.0 1029.0 TYPE= 1 TARGET= 40.000

VS-11 D.S. FROM PENN CENTRAL R.R. CULVERT

4162.00	5.72	586.52	0.00	0.00	586.53	.01	.07	.01	584.60
100.	4.	83.	12.	22.	81.	28.	24.	13.	583.90
2.29	.21	1.02	.43	.120	.040	.070	.037	580.80	989.00
.000115	350.	350.	350.	2	0	1	0.00	40.00	1029.00

Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	BANK ELEV LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 587.40 ELREA= 587.40

BS-12 PENN CENTRAL R.R. CULVERT - 31FT. OF 60" C.I. PIPE,

WITH SQUARE ENDS PROJECTING FROM FILL

4212.00	4.90	586.40	0.00	0.00	586.68	.28	.02	.13	583.30
100.	0.	100.	0.	0.	24.	0.	24.	13.	583.30
2.29	0.00	4.24	0.00	.090	.045	.090	.037	581.50	997.50
.005675	50.	50.	50.	2	0	1	0.00	5.00	1007.42

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	2.11	3.00	0.00	5.00	0.00	18.00	0.00	581.50	581.50

3280 CROSS SECTION 4245.00 EXTENDED .41 FEET

PRESSURE FLOW

$Q = 99.44 H^{1/2}$; $H = (587.43 - 586.4) = 1.03$; $Q = 99.44(1.01) = 100.9$ cfs

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	ELLC	ELTRD	CLASS
587.42	586.68	0.00	0.	100.	18.	585.80	588.50	10.00

3470 ENCROACHMENT STATIONS= 997.5 1002.5 TYPE= 1 TARGET= 5.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 587.40 ELREA= 587.40

4245.00	5.71	587.21	0.00	0.00	587.42	.20	.73	0.00	583.30
100.	0.	100.	0.	0.	28.	0.	24.	13.	100000.00
2.29	0.00	3.62	0.00	.090	.045	.090	.037	581.50	997.50
.005481	33.	33.	33.	2	0	1	0.00	5.00	1002.50

3470 ENCROACHMENT STATIONS= 991.0 1009.0 TYPE= 1 TARGET= 18.000

4255.00	5.93	587.43	0.00	0.00	587.48	.05	.02	.05	587.40
100.	0.	100.	0.	0.	56.	0.	24.	13.	100000.00
2.29	0.00	1.79	0.00	.090	.045	.090	.037	581.50	991.00
.000902	10.	10.	10.	2	0	1	0.00	18.00	1009.00

3470 ENCROACHMENT STATIONS= 700.0 1300.0 TYPE= 1 TARGET= 600.000

5310.00	5.91	587.51	0.00	0.00	587.51	.00	.02	.01	585.90
100.	46.	17.	38.	688.	88.	600.	42.	20.	585.10
5.73	.07	.19	.06	.090	.045	.090	.038	581.60	700.00
.000005	1055.	1055.	1055.	3	0	1	0.00	600.00	1300.00

3280 CROSS SECTION 6364.00 EXTENDED .22 FEET

3470 ENCROACHMENT STATIONS= 990.0 1030.0 TYPE= 1 TARGET= 40.000

VS-13 D.S. FROM TOWER ROAD BRIDGE

6364.00	5.32	587.52	0.00	0.00	587.54	.02	.02	.01	587.20
85.	1.	79.	5.	4.	75.	11.	59.	28.	586.30
6.02	.22	1.05	.47	.070	.060	.070	.042	582.20	990.00
.000378	1054.	1054.	1054.	2	0	1	0.00	40.00	1030.00

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

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 588.40 ELREA= 588.40

BS-14 TOWER ROAD BRIDGE

6414.00	5.14	587.54	0.00	0.00	587.57	.03	.02	.01	583.90
85.	0.	85.	0.	0.	57.	0.	60.	28.	583.30
6.03	0.00	1.50	0.00	.070	.060	.070	.042	582.40	1000.00
.000625	50.	50.	50.	0	0	1	0.00	12.00	1016.15

SPECIAL BRIDGE $Q = 270.52 H^{1/2}$; $H = (587.62 - 587.54) = .08$; $Q = 270.52(.282) = 76.5$ cfs

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	2.20	3.00	0.00	12.00	0.00	50.00	0.00	582.40	582.40

PRESSURE FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	AREA		ELTRD	CLASS
587.63	587.57	0.00	0.	85.	50.	587.00	583.00	10.00

consider reasonable

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 588.40 ELREA= 588.40

6447.00	5.20	587.60	0.00	0.00	587.63	.03	.06	0.00	583.90
85.	0.	85.	0.	0.	57.	0.	60.	28.	583.30
6.04	0.00	1.48	0.00	.070	.060	.070	.043	582.40	1000.00
.000599	33.	33.	33.	2	0	1	0.00	12.00	1016.22

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 588.40 ELREA= 588.40

6457.00	5.22	587.62	0.00	0.00	587.64	.02	.01	.00	588.40
85.	0.	85.	0.	0.	74.	0.	60.	28.	588.40
6.04	0.00	1.14	0.00	.070	.060	.070	.043	582.40	995.87
.000470	10.	10.	10.	1	0	1	0.00	20.36	1016.23

6784.00	4.06	587.86	0.00	0.00	587.90	.04	.25	.01	589.30
85.	0.	85.	0.	0.	51.	0.	60.	28.	589.60
6.09	0.00	1.67	0.00	.070	.060	.070	.043	583.80	1002.30

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7110.00      3.57    588.57      0.00      0.00    588.66       .09       .73       .02    591.10
   85.         0.       85.       0.        0.       35.        0.       60.       29.    591.60
  6.13      0.00      2.43      0.00      .070      .060      .070      .044    585.00   1005.06
.004001      326.     326.      326.         2         0         1      0.00     16.27   1021.34

7437.00      3.56    589.86      0.00      0.00    589.96       .09      1.29       .00    592.90
   85.         0.       85.       0.        0.       35.        0.       61.       29.    593.70
  6.17      0.00      2.42      0.00      .070      .060      .070      .045    586.30   1005.86
.003911      327.     327.      327.         2         0         1      0.00     16.27   1022.14

 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

7763.00      3.52    591.12      0.00      0.00    591.21       .09      1.25       .00    594.70
   85.         0.       85.       0.        0.       36.        0.       61.       29.    595.80
  6.21      0.00      2.39      0.00      .070      .060      .070      .046    587.60   1006.70
.003768      326.     326.      326.         1         0         1      0.00     16.29   1022.99

8090.00      3.36    592.36      0.00      0.00    592.45       .09      1.25       .00    596.60
   85.         0.       85.       0.        0.       35.        0.       61.       29.    597.90
  6.24      0.00      2.41      0.00      .070      .060      .070      .046    589.00   1007.64
.003849      327.     327.      327.         1         0         1      0.00     16.18   1023.83

OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLFA=      598.40 ELREA=      599.90

                    VS-15 D.S. FROM M-13 BRIDGE

8417.00      2.82    593.12      0.00      0.00    593.13       .00       .65       .03    598.40
   11.         0.       11.       0.        0.       23.        0.       61.       29.    599.90
  6.44      0.00       .47      0.00      .090      .060      .090      .047    590.30   1010.03
.000196      327.     327.      327.         2         0         1      0.00     13.27   1023.29

8450.00      2.43    593.13      0.00      0.00    593.14       .01       .01       .00    600.90
   11.         0.       11.       0.        0.       16.        0.       61.       29.    601.90
  6.45      0.00       .67      0.00      .090      .060      .090      .047    590.70   1010.10
.000470       33.      33.       33.         2         0         1      0.00     10.35   1020.45

8483.00      1.95    593.15      0.00      0.00    593.17       .01       .02       .00    603.40
   11.         0.       11.       0.        0.       12.        0.       61.       29.    603.90
  6.46      0.00       .95      0.00      .090      .060      .090      .047    591.20   1008.41
.001188       33.      33.       33.         0         0         1      0.00      8.38   1016.79

OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLFA=      605.90 ELREA=      605.90

8517.00      1.60    593.20      0.00      0.00    593.25       .06       .07       .02    591.60
   11.         0.       11.       0.        0.        6.        0.       61.       29.    591.90
  6.47      0.00      1.90      0.00      .120      .060      .120      .047    591.60    200.00
.003836       34.      34.       34.         2         0         1      0.00      4.00    205.39
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NORMAL BRIDGE,NRD= 6 MIN ELTRD= 605.90 MAX ELLC= 595.40

BS-16 M-13 BRIDGE

8518.00	1.60	593.20	0.00	0.00	593.26	.06	.00	.00	605.90
11.	0.	11.	0.	0.	6.	0.	61.	29.	605.90
6.47	0.00	1.90	0.00	.110	.035	.120	.047	591.60	200.00
.002518	1.	1.	1.	0	0	1	0.00	4.00	204.00

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

NORMAL BRIDGE,NRD= 6 MIN ELTRD= 605.90 MAX ELLC= 595.40

8628.00	1.84	593.44	0.00	0.00	593.48	.04	.22	.00	605.90
11.	0.	11.	0.	0.	7.	0.	61.	29.	605.90
6.48	0.00	1.63	0.00	.110	.035	.120	.047	591.60	200.00
.001649	110.	110.	110.	2	0	1	0.00	4.00	204.00

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 605.90 ELREA= 605.90

8629.00	1.84	593.44	0.00	0.00	593.49	.04	.00	.00	591.60
11.	0.	11.	0.	0.	7.	0.	61.	29.	591.90
6.48	0.00	1.62	0.00	.120	.060	.120	.047	591.60	200.00
.002333	1.	1.	1.	0	0	1	0.00	4.00	205.65

8645.00	1.90	593.50	0.00	0.00	593.52	.02	.03	.00	605.90
11.	0.	11.	0.	0.	9.	0.	61.	29.	605.90
6.49	0.00	1.25	0.00	.120	.060	.120	.047	591.60	198.80
.002279	15.	15.	15.	2	0	1	0.00	6.00	204.80

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 599.30 ELREA= 599.10

VS-17 U.S. FROM M-13 BRIDGE

9300.00	.74	597.24	0.00	0.00	597.34	.11	3.78	.04	599.30
11.	0.	11.	0.	0.	4.	0.	62.	29.	599.10
6.56	0.00	2.60	0.00	.120	.060	.120	.048	596.50	786.68
.034458	655.	655.	655.	3	0	1	0.00	9.77	796.46

SUMMARY PRINTOUT FOR MULTIPLE PROFILES

ER TWP, BAY CO.

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TOPWID	STENCL	STENCR	EG	HV	VCH
500.00	500.00	0.00	0.00	579.20	100.00	581.90	23.04	900.00	1100.00	581.99	.09	2.43
550.00	50.00	0.00	0.00	579.00	100.00	581.99	23.17	900.00	1100.00	582.07	.08	2.26
573.00	23.00	0.00	0.00	577.90	100.00	581.93	6.00	0.00	0.00	582.21	.28	4.26
574.00	1.00	585.00	582.60	577.90	100.00	581.92	6.00	0.00	0.00	582.22	.30	4.38
594.00	20.00	585.00	582.60	578.30	100.00	581.96	6.00	0.00	0.00	582.31	.35	4.77
595.00	1.00	0.00	0.00	578.30	100.00	582.00	6.00	0.00	0.00	582.32	.32	4.57
605.00	10.00	0.00	0.00	578.40	100.00	582.34	17.80	0.00	0.00	582.41	.07	2.20
627.00	22.00	0.00	0.00	578.70	100.00	582.15	5.00	0.00	0.00	582.69	.53	5.85
653.00	26.00	584.40	582.20	578.70	100.00	583.43	5.00	0.00	0.00	583.71	.28	4.26
663.00	10.00	0.00	0.00	578.80	100.00	583.76	24.87	0.00	0.00	583.80	.04	1.54
688.00	25.00	0.00	0.00	579.10	100.00	583.75	9.00	0.00	0.00	583.85	.10	2.54
712.00	24.00	584.90	581.90	579.10	100.00	584.26	9.00	0.00	0.00	584.34	.08	2.27
730.00	18.00	0.00	0.00	579.50	100.00	584.33	23.85	488.00	512.00	584.37	.03	1.48
769.00	39.00	584.40	582.70	579.50	100.00	584.76	24.00	488.00	512.00	584.79	.03	1.37
778.00	9.00	0.00	0.00	579.50	100.00	584.77	214.00	300.00	514.00	584.79	.02	1.77
802.00	24.00	584.40	583.70	579.50	100.00	584.77	214.00	300.00	514.00	584.79	.02	1.75
812.00	10.00	0.00	0.00	579.50	100.00	584.79	214.00	300.00	514.00	584.80	.01	.98
988.00	176.00	0.00	0.00	579.80	100.00	584.81	209.00	815.00	1024.00	584.81	.01	.80
1005.00	17.00	0.00	0.00	578.60	100.00	584.80	194.77	815.00	1014.00	584.82	.02	1.62
1006.00	1.00	583.70	581.90	578.60	100.00	584.81	194.77	815.00	1014.00	584.83	.01	1.46
1026.00	20.00	583.70	581.90	578.60	100.00	584.83	195.07	815.00	1014.00	584.84	.01	1.44
1027.00	1.00	0.00	0.00	578.60	100.00	584.82	195.09	815.00	1014.00	584.84	.02	1.60
1037.00	10.00	0.00	0.00	578.60	100.00	584.84	195.33	815.00	1014.00	584.85	.01	.80
1198.00	161.00	0.00	0.00	579.70	100.00	584.85	344.39	660.00	1014.00	584.86	.00	.41
1217.00	19.00	0.00	0.00	579.70	100.00	584.86	344.40	660.00	1014.00	584.86	.00	.64
1218.00	1.00	584.30	583.20	579.70	100.00	584.86	344.40	660.00	1014.00	584.86	.00	.34
1236.00	18.00	584.30	583.20	579.70	100.00	584.86	344.41	660.00	1014.00	584.86	.00	.34
1237.00	1.00	0.00	0.00	579.70	100.00	584.86	344.42	660.00	1014.00	584.86	.00	.64

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TOPWID	STENCL	STENCR	EG	HV	VCH
1247.00	10.00	0.00	0.00	580.10	100.00	584.86	344.42	660.00	1014.00	584.86	.00	.41
1324.00	77.00	0.00	0.00	579.20	100.00	584.86	342.19	660.00	1013.00	584.86	.00	.43
1344.00	20.00	0.00	0.00	579.20	100.00	584.86	342.20	660.00	1013.00	584.86	.00	.68
1345.00	1.00	584.40	582.80	579.20	100.00	584.86	342.20	660.00	1013.00	584.86	.00	.34
1375.00	30.00	584.40	582.80	579.20	100.00	584.86	342.22	660.00	1013.00	584.86	.00	.34
1376.00	1.00	0.00	0.00	579.20	100.00	584.86	342.22	660.00	1013.00	584.86	.00	.68
1386.00	10.00	0.00	0.00	579.20	100.00	584.86	342.22	660.00	1013.00	584.86	.00	.42
1554.00	168.00	0.00	0.00	579.80	100.00	584.87	348.15	660.00	1013.00	584.87	.00	.41
1579.00	25.00	0.00	0.00	579.80	100.00	584.87	348.16	660.00	1013.00	584.87	.00	.61
1580.00	1.00	584.20	583.80	579.80	100.00	584.87	348.16	660.00	1013.00	584.87	.00	.35
1604.00	24.00	584.20	583.80	579.80	100.00	584.87	348.18	660.00	1013.00	584.87	.00	.35
1605.00	1.00	0.00	0.00	579.80	100.00	584.87	348.18	660.00	1013.00	584.87	.00	.61
1615.00	10.00	0.00	0.00	579.80	100.00	584.87	348.18	660.00	1013.00	584.87	.00	.41
1966.00	351.00	0.00	0.00	580.20	100.00	584.88	351.00	660.00	1011.00	584.88	.00	.40
1991.00	25.00	0.00	0.00	580.20	100.00	584.88	351.00	660.00	1011.00	584.88	.00	.58
1992.00	1.00	584.30	584.10	580.20	100.00	584.88	351.00	660.00	1011.00	584.88	.00	.34
2012.00	20.00	584.30	584.10	580.20	100.00	584.88	351.00	660.00	1011.00	584.88	.00	.34
2013.00	1.00	0.00	0.00	580.20	100.00	584.88	351.00	660.00	1011.00	584.88	.00	.58
2023.00	10.00	0.00	0.00	580.20	100.00	584.88	351.00	660.00	1011.00	584.88	.00	.40
2056.00	33.00	0.00	0.00	580.50	100.00	584.88	353.51	660.00	1018.00	584.88	.00	.42
2071.00	15.00	0.00	0.00	580.80	100.00	584.88	353.52	660.00	1018.00	584.88	.00	.40
2072.00	1.00	584.50	583.60	580.80	100.00	584.88	353.52	660.00	1018.00	584.88	.00	.25
2094.00	22.00	584.50	583.60	580.80	100.00	584.88	353.53	660.00	1018.00	584.88	.00	.24
2095.00	1.00	0.00	0.00	580.80	100.00	584.88	353.53	660.00	1018.00	584.88	.00	.45
2106.00	11.00	0.00	0.00	581.10	100.00	584.88	346.11	570.00	1600.00	584.88	.00	.68
2107.00	1.00	582.40	584.20	581.10	100.00	584.88	338.68	570.00	1600.00	584.88	.00	.34
2133.00	26.00	582.40	584.20	581.10	100.00	584.89	338.78	570.00	1600.01	584.89	.00	.34
2134.00	1.00	0.00	0.00	581.10	100.00	584.88	346.22	570.00	1600.00	584.89	.00	.60

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TOPWID	STENCL	STENCR	EG	HV	VCH
2144.00	10.00	0.00	0.00	581.10	100.00	584.89	346.26	570.00	1600.00	584.89	.00	.41
2308.00	164.00	0.00	0.00	579.80	100.00	584.88	17.17	0.00	0.00	584.92	.04	1.63
2358.00	50.00	0.00	0.00	579.80	100.00	584.87	7.00	1000.00	1007.00	584.99	.12	2.82
2376.00	18.00	585.30	583.20	579.80	100.00	585.26	7.00	1000.00	1007.00	585.36	.11	2.62
2386.00	10.00	0.00	0.00	579.80	100.00	585.36	18.00	996.00	1014.00	585.39	.03	1.43
3710.00	1324.00	0.00	0.00	580.80	100.00	585.71	116.28	900.00	1300.00	585.73	.02	1.23
3760.00	50.00	0.00	0.00	580.30	100.00	585.63	5.00	0.00	0.00	585.87	.24	3.97
3802.00	42.00	586.80	584.80	580.30	100.00	586.20	5.00	0.00	0.00	586.39	.20	3.56
3812.00	10.00	0.00	0.00	580.30	100.00	586.42	23.01	988.00	1012.00	586.45	.04	1.51
4162.00	350.00	0.00	0.00	580.80	100.00	586.52	40.00	989.00	1029.00	586.53	.01	1.02
4212.00	50.00	0.00	0.00	581.50	100.00	586.40	5.00	0.00	0.00	586.68	.28	4.24
4245.00	33.00	588.50	585.80	581.50	100.00	587.21	5.00	997.50	1002.50	587.42	.20	3.62
4255.00	10.00	0.00	0.00	581.50	100.00	587.43	18.00	991.00	1009.00	587.48	.05	1.79
5310.00	1055.00	0.00	0.00	581.60	100.00	587.51	600.00	700.00	1300.00	587.51	.00	.19
6364.00	1054.00	0.00	0.00	582.20	85.00	587.52	40.00	990.00	1030.00	587.54	.02	1.05
6414.00	50.00	0.00	0.00	582.40	85.00	587.54	12.00	0.00	0.00	587.57	.03	1.50
6447.00	33.00	588.00	587.00	582.40	85.00	587.60	12.00	0.00	0.00	587.63	.03	1.48
6457.00	10.00	0.00	0.00	582.40	85.00	587.62	20.36	0.00	0.00	587.64	.02	1.14
6784.00	327.00	0.00	0.00	583.80	85.00	587.86	19.12	0.00	0.00	587.90	.04	1.67
7110.00	326.00	0.00	0.00	585.00	85.00	588.57	16.27	0.00	0.00	588.66	.09	2.43
7437.00	327.00	0.00	0.00	586.30	85.00	589.86	16.27	0.00	0.00	589.96	.09	2.42
7763.00	326.00	0.00	0.00	587.60	85.00	591.12	16.29	0.00	0.00	591.21	.09	2.39
8090.00	327.00	0.00	0.00	589.00	85.00	592.36	16.18	0.00	0.00	592.45	.09	2.41
8417.00	327.00	0.00	0.00	590.30	11.00	593.12	13.27	0.00	0.00	593.13	.00	.47
8450.00	33.00	0.00	0.00	590.70	11.00	593.13	10.35	0.00	0.00	593.14	.01	.67
8483.00	33.00	0.00	0.00	591.20	11.00	593.15	8.38	0.00	0.00	593.17	.01	.95
8517.00	34.00	0.00	0.00	591.60	11.00	593.20	4.00	0.00	0.00	593.25	.06	1.90
8518.00	1.00	605.90	595.40	591.60	11.00	593.20	4.00	0.00	0.00	593.26	.06	1.90

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TOPWID	STENCL	STENCR	EG	HV	VCH
8628.00	110.00	605.90	595.40	591.60	11.00	593.44	4.00	0.00	0.00	593.48	.04	1.63
8629.00	1.00	0.00	0.00	591.60	11.00	593.44	4.00	0.00	0.00	593.49	.04	1.62
8645.00	15.00	0.00	0.00	591.60	11.00	593.50	6.00	0.00	0.00	593.52	.02	1.25
9300.00	655.00	0.00	0.00	596.50	11.00	597.24	9.77	0.00	0.00	597.34	.11	2.60

SECTION NUMBER	DISCHARGE CFS	CWSEL	CWSEL DIFF EACH Q	CWSEL DIFF EACH SECTION	CWSEL-WSELK	TOPWID	T.W. DIFF	LENGTH
500.000	100.000	581.900	0.000	0.000	0.000	23.035	0.000	500.000
550.000	100.000	581.988	0.000	.088	0.000	23.174	0.000	50.000
573.000	100.000	581.929	0.000	-.058	0.000	6.000	0.000	23.000
574.000	100.000	581.924	0.000	-.005	0.000	6.000	0.000	1.000
594.000	100.000	581.957	0.000	.033	0.000	6.000	0.000	20.000
595.000	100.000	581.999	0.000	.042	0.000	6.000	0.000	1.000
605.000	100.000	582.338	0.000	.339	0.000	17.799	0.000	10.000
627.000	100.000	582.154	0.000	-.184	0.000	5.000	0.000	22.000
653.000	100.000	583.433	0.000	1.279	0.000	5.000	0.000	26.000
663.000	100.000	583.760	0.000	.328	0.000	24.873	0.000	10.000
688.000	100.000	583.746	0.000	-.015	0.000	9.000	0.000	25.000
712.000	100.000	584.264	0.000	.519	0.000	9.000	0.000	24.000
730.000	100.000	584.334	0.000	.070	0.000	23.850	0.000	18.000
769.000	100.000	584.762	0.000	.428	0.000	23.999	0.000	39.000
778.000	100.000	584.767	0.000	.005	0.000	213.999	0.000	9.000
802.000	100.000	584.768	0.000	.001	0.000	213.999	0.000	24.000
812.000	100.000	584.786	0.000	.018	0.000	213.999	0.000	10.000
988.000	100.000	584.806	0.000	.020	0.000	208.999	0.000	176.000
1005.000	100.000	584.801	0.000	-.005	0.000	194.766	0.000	17.000
1006.000	100.000	584.814	0.000	.013	0.000	194.768	0.000	1.000
1026.000	100.000	584.827	0.000	.013	0.000	195.074	0.000	20.000
1027.000	100.000	584.822	0.000	-.005	0.000	195.088	0.000	1.000
1037.000	100.000	584.839	0.000	.017	0.000	195.327	0.000	10.000
1198.000	100.000	584.855	0.000	.015	0.000	344.388	0.000	161.000
1217.000	100.000	584.855	0.000	.000	0.000	344.403	0.000	19.000
1218.000	100.000	584.856	0.000	.001	0.000	344.403	0.000	1.000

1236.000	100.000	584.857	0.000	.001	0.000	344.415	0.000	18.000
1237.000	100.000	584.857	0.000	-.000	0.000	344.415	0.000	1.000
1247.000	100.000	584.857	0.000	.001	0.000	344.422	0.000	10.000
1324.000	100.000	584.859	0.000	.002	0.000	342.190	0.000	77.000
1344.000	100.000	584.859	0.000	.000	0.000	342.198	0.000	20.000
1345.000	100.000	584.861	0.000	.001	0.000	342.199	0.000	1.000
1375.000	100.000	584.862	0.000	.001	0.000	342.216	0.000	30.000
1376.000	100.000	584.861	0.000	-.001	0.000	342.216	0.000	1.000
1386.000	100.000	584.862	0.000	.001	0.000	342.222	0.000	10.000
1554.000	100.000	584.866	0.000	.004	0.000	348.150	0.000	168.000
1579.000	100.000	584.867	0.000	.000	0.000	348.161	0.000	25.000
1580.000	100.000	584.868	0.000	.001	0.000	348.161	0.000	1.000
1604.000	100.000	584.869	0.000	.001	0.000	348.176	0.000	24.000
1605.000	100.000	584.868	0.000	-.000	0.000	348.177	0.000	1.000
1615.000	100.000	584.869	0.000	.001	0.000	348.183	0.000	10.000
1966.000	100.000	584.878	0.000	.009	0.000	350.999	0.000	351.000
1991.000	100.000	584.878	0.000	.001	0.000	350.999	0.000	25.000
1992.000	100.000	584.879	0.000	.001	0.000	350.999	0.000	1.000
2012.000	100.000	584.880	0.000	.001	0.000	350.999	0.000	20.000
2013.000	100.000	584.879	0.000	-.000	0.000	350.999	0.000	1.000
2023.000	100.000	584.880	0.000	.001	0.000	350.999	0.000	10.000
2056.000	100.000	584.881	0.000	.001	0.000	353.509	0.000	33.000
2071.000	100.000	584.881	0.000	.001	0.000	353.517	0.000	15.000
2072.000	100.000	584.882	0.000	.000	0.000	353.517	0.000	1.000
2094.000	100.000	584.883	0.000	.001	0.000	353.533	0.000	22.000
2095.000	100.000	584.882	0.000	-.000	0.000	353.533	0.000	1.000
2106.000	100.000	584.882	0.000	-.000	0.000	346.106	0.000	11.000
2107.000	100.000	584.884	0.000	.002	0.000	338.684	0.000	1.000
2133.000	100.000	584.885	0.000	.001	0.000	338.783	0.000	26.000
2134.000	100.000	584.885	0.000	-.000	0.000	346.215	0.000	1.000
2144.000	100.000	584.886	0.000	.001	0.000	346.255	0.000	10.000
2308.000	100.000	584.878	0.000	-.008	0.000	17.168	0.000	164.000
2358.000	100.000	584.870	0.000	-.007	0.000	6.999	0.000	50.000

2376.000	100.000	585.259	0.000	.388	0.000	6.999	0.000	18.000
2386.000	100.000	585.361	0.000	.102	0.000	17.999	0.000	10.000
3710.000	100.000	585.706	0.000	.345	0.000	116.277	0.000	1324.000
3760.000	100.000	585.626	0.000	-.080	0.000	5.000	0.000	50.000
3802.000	100.000	586.198	0.000	.572	0.000	5.000	0.000	42.000
3812.000	100.000	586.418	0.000	.220	0.000	23.006	0.000	10.000
4162.000	100.000	586.519	0.000	.102	0.000	39.999	0.000	350.000
4212.000	100.000	586.404	0.000	-.115	0.000	5.000	0.000	50.000
4245.000	100.000	587.212	0.000	.808	0.000	4.999	0.000	33.000
4255.000	100.000	587.430	0.000	.218	0.000	17.999	0.000	10.000
5310.000	100.000	587.514	0.000	.084	0.000	599.999	0.000	1055.000
6364.000	85.000	587.522	0.000	.008	0.000	39.999	0.000	1054.000
6414.000	85.000	587.536	0.000	.015	0.000	12.000	0.000	50.000
6447.000	85.000	587.601	0.000	.065	0.000	12.000	0.000	33.000
6457.000	85.000	587.624	0.000	.023	0.000	20.359	0.000	10.000
6784.000	85.000	587.861	0.000	.237	0.000	19.122	0.000	327.000
7110.000	85.000	588.570	0.000	.708	0.000	16.273	0.000	326.000
7437.000	85.000	589.865	0.000	1.295	0.000	16.271	0.000	327.000
7763.000	85.000	591.119	0.000	1.254	0.000	16.290	0.000	326.000
8090.000	85.000	592.363	0.000	1.245	0.000	16.185	0.000	327.000
8417.000	11.000	593.125	0.000	.761	0.000	13.265	0.000	327.000
8450.000	11.000	593.133	0.000	.008	0.000	10.353	0.000	33.000
8483.000	11.000	593.152	0.000	.020	0.000	8.383	0.000	33.000
8517.000	11.000	593.198	0.000	.046	0.000	4.000	0.000	34.000
8518.000	11.000	593.201	0.000	.003	0.000	4.000	0.000	1.000
8628.000	11.000	593.442	0.000	.241	0.000	4.000	0.000	110.000
8629.000	11.000	593.444	0.000	.002	0.000	4.000	0.000	1.000
8645.000	11.000	593.500	0.000	.056	0.000	5.996	0.000	15.000
9300.000	11.000	597.238	0.000	3.737	0.000	9.771	0.000	655.000

DATA FOR LAST CROSS SECTION

PROFILE	TYPE ENC	TARGET	TOP WIDTH AREA-ACRES	TOP WIDTH AREA-DIFF
1	0.000	0.000	29.191	0.000

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Fraser Twp

3) WATERCOURSE: Rosebush Drain

4) DOCUMENT TYPE: 100-YR NATURAL

00BREAK00

ROSEBUSH DRAIN
NATURAL RUN (100-YR)

revised 9/28/76

SEP 22 '76

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$$$$$$$$$   $$$$$$$$   $$$$$$   $$$$$$   $$$$   $$$$$$$$$   $$$$$$$$$   FJ03AES
$$$$$$$$$   $$$$$$$$   $$$$$$   $$$$$$   $$$$   $$$$$$$$$   $$$$$$$$$   FJ03AES
$$          $$    $$   $$    $$   $$    $$   $$  $$   $$   $$          FJ03AES
$$          $$    $$   $$    $$   $$    $$   $$  $$   $$   $$          FJ03AES
$$$$$$$     $$    $$   $$        $$$   $$    $$   $$$$$$$   $$$$$$$     FJ03AES
$$$$$$$     $$    $$   $$        $$$   $$    $$   $$$$$$$   $$$$$$$     FJ03AES
$$          $$    $$   $$          $$  $$$$$$$$$$ $$                $$  FJ03AES
$$          $$    $$   $$          $$  $$$$$$$$$$ $$                $$  FJ03AES
$$      $$  $$    $$   $$    $$    $$  $$      $$ $$                $$  FJ03AES
$$      $$  $$    $$   $$    $$    $$  $$      $$ $$                $$  FJ03AES
$$      $$$$$$$   $$$$$$   $$$$$$   $$  $$      $$ $$$$$$$$$   $$$$$$$$$   FJ03AES
$$      $$$$$$$   $$$$$$   $$$$$$   $$  $$      $$ $$$$$$$$$   $$$$$$$$$   FJ03AES
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C
C      38
C     500          VS-1
C     574                DRIVEWAY CULVERT - 20FT. OF 72"  CMP WITH ENDS PROJEC-
C     574                TING FROM FILL
C     627          BS-2  60FT. D.S. DETROIT @ MACKINAC R.R. - 24FT. OF 60"  CMP
C     627                WITH ENDS FLUSH WITH HEADWALL
C     688          BS-3  DETROIT @ MACKINAW R.R. BRIDGE
C     730          BS-4  DETROIT @ MACKINAC R.R. SPUR LINE BRIDGE - 36FT. OF
C     730                48"  CMP WITH ENDS PROJECTING FROM FILL, AND TWO 37 FT
C     730                LENGTHS OF 36"  C.I. PIPE WITH ENDS PROJECTING FROM
C     730                FILL
C     778                DRIVEWAY CULVERT - 22FT. OF 66"  CMP WITH ENDS PROJEC-
C     778                TING FROM HEADWALL
C     988          VS-5  U.S. FROM DETROIT @ MACKINAW R.R.
C    1006                DRIVEWAY CULVERT - 20FT. OF 60"  CMP WITH ENDS PROJEC-
C    1006                TING FROM FILL
C    1218                DRIVEWAY CULVERT - 18FT. OF 54"  CMP WITH ENDS FLUSH
C    1218                WITH HEADWALL
C    1345                DRIVEWAY CULVERT - 30FT. OF 60"  CMP WITH ENDS PROJEC-
C    1345                TING FROM FILL
C    1580                DRIVEWAY CULVERT - 24FT. OF 66"  CMP WITH ENDS PROJEC-
C    1580                TING FROM FILL
C    1992                DRIVEWAY CULVERT - 20FT. OF 60"  CMP WITH ENDS PROJEC-
C    1992                TING FROM FILL
C    2056          VS-6  D.S. FROM LINWOOD ROAD BRIDGE
C    2072                DRIVEWAY CULVERT
C    2107          BS-7  LINWOOD ROAD BRIDGE
C    2358          BS-8  DETROIT @ MACKINAW R.R. SPUR LINE
C    3710          VS-9  D.S. FROM ELEVATOR ROAD BRIDGE
C    3760          BS-10 ELEVATOR ROAD CULVERT - 40FT. OF 60"  RCP WITH SQUARE
C    3760                ENDS FLUSH WITH HEADWALL
C    4162          VS-11 D.S. FROM PENN CENTRAL R.R. CULVERT
C    4212          BS-12 PENN CENTRAL R.R. CULVERT - 31FT. OF 60"  C.I. PIPE,
C    4212                WITH SQUARE ENDS PROJECTING FROM FILL
C    6364          VS-13 D.S. FROM TOWER ROAD BRIDGE
C    6414          BS-14 TOWER ROAD BRIDGE
C    8417          VS-15 D.S. FROM M-13 BRIDGE
C    8518          BS-16 M-13 BRIDGE
C    9300          VS-17 U.S. FROM M-13 BRIDGE
T1   ROSEBUSH DRAIN
T2   100 YEAR FLOOD
T3   FRASER TWP, BAY CO
J1   -10     4                                                    581.9
J2    -1            -1
J3     1     4     27     28      3     10     26
NC   .09   .09   .035     .3     .5
QT     4    75     95    100    115
X1   500    27   1000   1028    500    500    500
X3    10                900  585.5   1100  585.9
GR 583.9     0  584.1    100  585.2    200  585.4    300  585.3    400
GR 586.1   500  585.3    600  584.8    700  584.5    800  585.5    900
GR 584.7  1000  581.2   1004  580.1   1008  579.2   1016  579.9   1021
GR 581.5  1026  584.9   1028  585.9   1100  585.0   1200  585.0   1300
GR 585.6  1400  585.3   1500  584.8   1600  584.3   1700  584.5   1800
GR 585.1  1900  584.8   2000
X1   550    27   1000   1028     50     50     50
X3    10                900  585.5   1100  585.9  586.1  585.9
GR 583.9     0  584.1    100  585.2    200  585.4    300  585.3    400
GR 586.1   500  585.3    600  584.8    700  584.5    800  585.5    900
GR 584.7  1000  581.2   1004  580.1   1008  579.0   1016  579.9   1021
GR 581.5  1026  584.9   1028  585.9   1100  585.0   1200  585.0   1300
GR 585.6  1400  585.3   1500  584.8   1600  584.3   1700  584.5   1800
GR 585.1  1900  584.8   2000
```

X3	10	577.9						584.7	585.2	
GR	585.6	0	585.3	100	585.5	200	585.4	300	585.2	400
GR	585.1	500	584.6	600	584.3	700	584.2	800	584.7	990
GR	578.6	1000	577.2	1001	576.6	1003	577.2	1005	578.6	1006
GR	585.2	1016	585.2	1200	585.2	1300	585.5	1400	585.4	1500
GR	585.0	1600	584.6	1700	584.7	1800	585.0	1900	585.5	2000
NC	.09	.09	.03							
X1	574				1	1	1			
X2				582.6	585.0					
X3	10	577.9						584.7	585.2	
BT	27	0	585.6	0	100	585.3	0	200	585.5	0
BT	300	585.4	0	400	585.2	0	500	585.1	0	600
BT	584.6	0	700	584.3	0	800	584.2	0	990	584.7
BT	584.7	1000	584.9	578.6	1000	584.9	580.6	1001	584.9	582.0
BT	1003	585.0	582.6	1005	585.0	582.0	1006	585.0	580.6	1006
BT	585.0	578.6	1016	585.2	585.2	1200	585.2	0	1300	585.2
BT	0	1400	585.5	0	1500	585.4	0	1600	585.0	0
BT	1700	584.6	0	1800	584.7	0	1900	585.0	0	2000
BT	585.5	0								
X1	594				20	20	20			
X2				582.6	585.0		1			
X3	10	578.3						584.7	585.2	
NC	.09	.09	.035							
X1	595				1	1	1			
X3	10	578.3						584.7	585.2	
X1	605	25	990	1016	10	10	10			
X3	10	578.4								
GR	585.6	0	585.3	100	585.5	200	585.4	300	585.2	400
GR	585.1	500	584.6	600	584.3	700	584.2	800	584.7	990
GR	578.6	1000	577.2	1001	576.6	1003	577.2	1005	578.6	1006
GR	585.2	1016	585.2	1200	585.2	1300	585.5	1400	585.4	1500
GR	585.0	1600	584.6	1700	584.7	1800	585.0	1900	585.5	2000
X1	627	31	997.5	1002.5	22	22	22			
X3	10	578.7						584.4	584.4	
GR	585.5	0	587.0	100	585.6	200	584.6	300	584.5	400
GR	584.5	500	583.9	600	583.8	700	583.9	800	584.4	900
GR	585.0	972	584.4	986	579.7	997.5	578.7	997.6	577.9	998.2
GR	577.4	999	577.2	1000	577.4	1000.9	577.9	1001.7	578.8	1002.3
GR	579.7	1002.5	584.4	1014	585.2	1100	585.5	1200	585.7	1400
GR	585.5	1500	585.3	1600	585.1	1700	585.1	1800	585.4	1900
GR	585.4	2000								
SB		2.18	2.7		3.83		14.73		578.7	578.7
X1	653				26	26	26			
X2			1	582.2	584.4					
X3	10	578.7						584.4	584.4	
BT	11	986	584.4		997.5	584.4	579.7	997.6	584.4	580.6
BT	998.2	584.4	581.4	999.0	584.4	582.0	1000.0	584.4	582.2	1000.9
BT	584.4	582.0	1001.7	584.4	581.4	1002.3	584.4	580.6	1002.5	584.4
BT	579.7	1014	584.4							
X1	663	31	986	1014	10	10	10			
X3	10	578.8						584.4	584.4	
GR	585.5	0	587.0	100	585.6	200	584.6	300	584.5	400
GR	584.5	500	583.9	600	583.8	700	583.9	800	584.4	900
GR	585.0	972	584.4	986	579.7	997.5	578.7	997.6	577.9	998.2
GR	577.4	999	577.2	1000	577.4	1000.9	577.9	1001.7	578.8	1002.3
GR	579.7	1002.5	584.4	1014	585.2	1100	585.5	1200	585.7	1400
GR	585.5	1500	585.3	1600	585.1	1700	585.1	1800	585.4	1900
GR	585.4	2000								
X1	688	27	1000	1009	25	25	25			
X3	10									
GR	585.0	0	585.0	100	584.9	200	584.7	300	584.6	400
GR	584.6	500	584.7	600	584.8	700	584.8	800	584.8	900
GR	584.9	990.5	584.9	1000	579.8	1000	579.3	1004.5	579.1	1009
GR	584.9	1009	584.9	1018.5	584.8	1100	585.0	1200	585.0	1300
GR	585.2	1400	585.2	1500	585.1	1600	585.1	1700	585.1	1800

SB		2.04	2.7		9		23		579.1	579.1
X1	712				24	24	24			
X2			1	581.9	584.9					
X3	10									
BT	4	1000	584.9	581.9	1000	584.9	581.9	1009	584.9	581.9
BT	1009	584.9	581.9							
NC	.1	.1	.035							
X1	730	28	493	507	18	18	18			
X3	10	579.5		488		512		584.2	584.2	
GR	585.1	0	585.0	100	584.4	200	583.8	300	583.7	400
GR	584.4	488.0	580.0	493.0	579.3	493.5	579.0	494.5	579.3	495.5
GR	580.0	496.0	580.8	498.0	579.8	498.2	579.3	498.6	579.0	499.1
GR	578.8	500.0	579.0	500.9	579.3	501.4	579.8	501.8	580.8	502.0
GR	579.9	504.0	579.2	504.5	578.9	505.5	579.2	506.5	579.9	507.0
GR	584.4	512	584.6	600	584.8	700				
SB		2.3	3.0		6.6		23		579.7	579.5
X1	769				39	39	39			
X2			1	582.7	584.4					
X3	10	579.7		488		512		584.2	584.2	
BT	24	488	584.4	0	493	584.4	580.0	493	584.4	581.0
BT	493.5	584.4	581.7	494.5	584.4	582.0	495.5	584.4	581.7	496
BT	584.4	581.0	496	584.4	580.0	498	584.4	580.8	498.2	584.4
BT	581.8	498.6	584.4	582.3	500	584.4	582.8	500.9	584.4	582.6
BT	501.4	584.4	582.3	501.8	584.4	581.8	502	584.4	580.8	504
BT	584.4	579.9	504	584.4	580.9	504.5	584.4	581.6	505.5	584.4
BT	581.9	506.5	584.4	581.6	507	584.4	580.9	507	584.4	579.9
BT	512	584.4	0							
X1	778	15	500	505.4	9	9	9			
X3		579.5		300		514				
GR	585.1	0	585.0	100	584.4	200	583.8	300	583.7	400
GR	584.4	490	580.2	500	578.7	500.9	578.3	502.7	578.7	504.5
GR	580.2	505.4	584.4	514	584.6	600	584.8	700	585.1	800
SB		2.05	3.0		5.5		20		579.5	579.5
X1	802				24	24	24			
X2			1	583.7	584.4					
X3		579.5		300		514				
BT	11	300	583.8		400	583.7		490	584.4	584.4
BT	500	584.4	580.2	500	584.4	581.8	500.9	584.4	583.3	502.7
BT	584.4	583.7	504.5	584.4	583.3	505.4	584.4	581.8	505.4	584.4
BT	580.2	514	584.4	584.4						
X1	812	15	490	514	10	10	10			
X3	10	579.5		300		514				
GR	585.1	0	585.0	100	584.4	200	583.8	300	583.7	400
GR	584.4	490	580.2	500	578.7	500.9	578.3	502.7	578.7	504.5
GR	580.2	505.4	584.4	514	584.6	600	584.8	700	585.1	800
NC	.11	.11	.035							
X1	988	16	1000	1024	176	176	176			
X3				815						
GR	585.0	0	583.4	775	584.7	815	583.4	850	583.2	900
GR	584.5	958	584.2	990	583.9	1000	580.9	1003	579.8	1009
GR	579.9	1015	580.9	1021	583.3	1024	583.3	1100	582.4	1124
GR	585.0	2150								
X1	1005	18	1000	1005	17	17	17			
X3	10	578.6		815				584.2	583.3	
GR	585.0	0	583.4	775	585.0	815	583.4	850	583.2	900
GR	584.5	958	584.2	990	578.6	1000	578.0	1000.4	577.2	1001.2
GR	576.9	1002.5	577.2	1003.8	578.0	1004.6	578.6	1005	583.3	1014
GR	583.3	1100	582.4	1124	585.0	2150				
NC	.11	.11	.03							
X1	1006				1	1	1			
X2				581.9	583.7					
X3	10	578.6		815				584.2	583.3	
BT	20	0	585.0	0	775	583.4	0	815	585.0	0
BT	850	583.4	0	900	583.2	0	958	584.5	0	990
BT	584.2	0	1000	583.7	578.6	1000	583.7	580.2	1000.4	583.7

BT	1004.6	583.7	580.8	1005	583.7	580.2	1005	583.7	578.6	1014
BT	583.3	0	1100	583.3	0	1124	582.4	0	2150	585.0
BT	0									
X1	1026				20	20	20			
X2				581.9	583.7		1			
X3	10	578.6		815				584.2	583.3	
NC	.11	.11	.035							
X1	1027				1	1	1			
X3	10	578.6		815				584.2	583.3	
X1	1037	18	990	1014	10	10	10			
X3		578.6		815						
GR	585.0	0	583.4	775	585.0	815	583.4	850	583.2	900
GR	584.5	958	584.2	990	578.6	1000	578.0	1000.4	577.2	1001.2
GR	576.9	1002.5	577.2	1003.8	578.0	1004.6	578.6	1005	583.3	1014
GR	583.3	1100	582.4	1124	585.0	2150				
X1	1198	21	990	1014	161	161	161			
X3		579.7		660						
GR	584.0	0	582.4	600	585.4	660	583.1	700	582.3	717
GR	582.3	800	582.4	900	584.5	958	584.3	990	580.4	1000
GR	579.4	1000.7	578.6	1001.8	578.6	1002.8	579.4	1003.9	580.4	1004.6
GR	584.3	1014	583.7	1100	583.3	1200	582.9	1211	582.1	1213
GR	584.0	2000								
X1	1217	21	1000	1004.6	19	19	19			
X3	10	579.7		660				583.2	583.2	
GR	584.0	0	582.4	600	585.4	660	583.1	700	582.3	717
GR	582.3	800	582.4	900	584.5	958	584.3	990	580.4	1000
GR	579.4	1000.7	578.6	1001.8	578.6	1002.8	579.4	1003.9	580.4	1004.6
GR	584.3	1014	583.7	1100	583.3	1200	582.9	1211	582.1	1213
GR	584.0	2000								
NC	.11	.11	.03							
X1	1218				1	1	1			
X2				583.2	584.3					
X3	10	579.7		660				583.2	583.2	
BT	23	0	584.0	0	600	582.4	0	660	585.4	0
BT	700	583.1	0	717	582.3	0	800	582.3	0	900
BT	582.4	0	958	584.5	0	990	584.3	584.3	1000	584.3
BT	580.4	1000	584.3	581.4	1000.7	584.3	582.5	1001.8	584.3	583.2
BT	1002.8	584.3	583.2	1003.9	584.3	582.5	1004.6	584.3	581.4	1004.6
BT	584.3	580.4	1014	584.3	584.3	1100	583.7	0	1200	583.3
BT	0	1211	582.9	0	1213	582.1	0	2000	584.0	0
X1	1236				18	18	18			
X2				583.2	584.3		1			
X3	10	579.7		660				583.2	583.2	
NC	.11	.11	.035							
X1	1237				1	1	1			
X3	10	579.7		660				583.2	583.2	
X1	1247	21	990	1014	10	10	10			
X3		580.1		660						
GR	584.0	0	582.4	600	585.4	660	583.1	700	582.3	717
GR	582.3	800	582.4	900	584.5	958	584.3	990	580.4	1000
GR	579.4	1000.7	578.6	1001.8	578.6	1002.8	579.4	1003.9	580.4	1004.6
GR	584.3	1014	583.7	1100	583.3	1200	582.9	1211	582.1	1213
GR	584.0	2000								
X1	1324	22	993	1013	77	77	77			
X3		579.2		660						
GR	584.0	0	582.4	600	585.5	660	583.1	700	582.3	717
GR	582.3	800	582.4	900	584.7	988	584.4	993	579.5	1000
GR	578.9	1000.4	578.1	1001.2	577.8	1002.5	578.1	1003.8	578.9	1004.6
GR	579.5	1005	584.4	1013	583.7	1100	583.3	1200	582.9	1211
GR	582.1	1213	584.0	2000						
X1	1344	22	1000	1005	20	20	20			
X3	10	579.2		660				582.8	582.8	
GR	584.0	0	582.4	600	585.5	660	583.1	700	582.3	717
GR	582.3	800	582.4	900	584.7	988	584.4	993	579.5	1000
GR	578.9	1000.4	578.1	1001.2	577.8	1002.5	578.1	1003.8	578.9	1004.6

GR	582.1	1213	584.0	2000						
NC	.11	.11	.03							
X1	1345				1	1	1			
X2				582.8	584.4					
X3	10	579.2		660				582.8	582.8	
BT	24	0	584.0	0	600	582.4	0	660	585.5	0
BT	700	583.1	0	717	582.3	0	800	582.3	0	900
BT	582.4	0	988	584.7	0	993	584.4	584.4	1000	584.4
BT	579.5	1000	584.4	581.1	1000.4	584.4	581.7	1001.2	584.4	582.5
BT	1002.5	584.4	582.8	1003.8	584.4	582.5	1004.6	584.4	581.7	1005
BT	584.4	581.1	1005	584.4	579.5	1013	584.4	0	1100	583.7
BT	0	1200	583.3	0	1211	582.9	0	1213	582.1	0
BT	2000	584.0	0							
X1	1375				30	30	30			
X2				582.8	584.4		1			
X3	10	579.2		660				582.8	582.8	
NC	.11	.11	.035							
X1	1376	0	0	0	1	1	1			
X3	10	579.2		660				582.8	582.8	
X1	1386	22	993	1013	10	10	10			
X3		579.2		660						
GR	584.0	0	582.4	600	585.5	660	583.1	700	582.3	717
GR	582.3	800	582.4	900	584.7	988	584.4	993	579.5	1000
GR	578.9	1000.4	578.1	1001.2	577.8	1002.5	578.1	1003.8	578.9	1004.6
GR	579.5	1005	584.4	1013	583.7	1100	583.3	1200	582.9	1211
GR	582.1	1213	584.0	2000						
X1	1554	19	993	1013	168	168	168			
X3		579.8		660						
GR	584.0	0	582.4	600	585.1	660	583.1	700	582.3	717
GR	582.3	800	582.4	900	584.2	993	580.3	1000	578.8	1000.9
GR	578.4	1002.7	578.8	1004.5	580.3	1005.4	584.2	1013	583.7	1100
GR	583.3	1200	582.9	1211	582.1	1213	584.0	2000		
X1	1579	19	1000	1005.4	25	25	25			
X3	10	579.8		660				583.8	583.8	
GR	584.0	0	582.4	600	585.1	660	583.1	700	582.3	717
GR	582.3	800	582.4	900	584.2	993	580.3	1000	578.8	1000.9
GR	578.4	1002.7	578.8	1004.5	580.3	1005.4	584.2	1013	583.7	1100
GR	583.3	1200	582.9	1211	582.1	1213	584.0	2000		
NC	.11	.11	.03							
X1	1580				1	1	1			
X2				583.8	584.2					
X3	10	579.8		660				583.8	583.8	
BT	21	0	584.0	0	600	582.4	0	660	585.1	0
BT	700	583.1	0	717	582.3	0	800	582.3	0	900
BT	582.4	0	993	584.2	584.2	1000	584.2	580.3	1000	584.2
BT	581.9	1000.9	584.2	583.4	1002.7	584.2	583.8	1004.5	584.2	583.4
BT	1005.4	584.2	581.9	1005.4	584.2	580.3	1013	584.2	584.2	1100
BT	583.7	0	1200	583.3	0	1211	582.9	0	1213	582.1
BT	0	2000	584.0	0						
X1	1604				24	24	24			
X2				583.8	584.2		1			
X3	10	579.8		660				583.8	583.8	
NC	.11	.11	.035							
X1	1605				1	1	1			
X3	10	579.8		660				583.8	583.8	
X1	1615	19	993	1013	10	10	10			
X3		579.8		660						
GR	584.0	0	582.4	600	585.1	660	583.1	700	582.3	717
GR	582.3	800	582.4	900	584.2	993	580.3	1000	578.8	1000.9
GR	578.4	1002.7	578.8	1004.5	580.3	1005.4	584.2	1013	583.7	1100
GR	583.3	1200	582.9	1211	582.1	1213	584.0	2000		
X1	1966	21	993	1011	351	351	351			
X3		580.2		660						
GR	584.0	0	582.4	600	584.8	660	583.1	700	582.3	717
GR	582.3	800	582.4	900	584.3	993	580.8	1000	580.2	1000.4

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GR	584.3	1011	583.7	1100	583.3	1200	582.9	1211	582.1	1213
GR	584.0	2000								
X1	1991	21	1000	1005	25	25	25			
X3	10	580.2		660				584.1	584.1	
GR	584.0	0	582.4	600	584.8	660	583.1	700	582.3	717
GR	582.3	800	582.4	900	584.3	993	580.8	1000	580.2	1000.4
GR	579.4	1001.2	579.1	1002.5	579.4	1003.8	580.2	1004.6	580.8	1005
GR	584.3	1011	583.7	1100	583.3	1200	582.9	1211	582.1	1213
GR	584.0	2000								
NC	.11	.11	.03							
X1	1992				1	1	1			
X2				584.1	584.3					
X3	10	580.2		660				584.1	584.1	
BT	23	0	584.0	0	600	582.4	0	660	584.8	0
BT	700	583.1	0	717	582.3	0	800	582.3	0	900
BT	582.4	0	993	584.3	584.3	1000	584.3	580.8	1000	584.3
BT	582.4	1000.4	584.3	583.0	1001.2	584.3	583.8	1002.5	584.3	584.1
BT	1003.8	584.3	583.8	1004.6	584.3	583.0	1005	584.3	582.4	1005
BT	584.3	580.8	1011	584.3	584.3	1100	583.7	0	1200	583.3
BT	0	1211	582.9	0	1213	582.1	0	2000	584.0	0
X1	2012				20	20	20			
X2				584.1	584.3		1			
X3	10	580.2		660				584.1	584.1	
NC	.11	.11	.035							
X1	2013				1	1	1			
X3	10	580.2		660				584.1	584.1	
X1	2023	21	993	1011	10	10	10			
X3		580.2		660						
GR	584.0	0	582.4	600	584.8	660	583.1	700	582.3	717
GR	582.3	800	582.4	900	584.3	993	580.8	1000	580.2	1000.4
GR	579.4	1001.2	579.1	1002.5	579.4	1003.8	580.2	1004.6	580.8	1005
GR	584.3	1011	583.7	1100	583.3	1200	582.9	1211	582.1	1213
GR	584.0	2000								
X1	2056	18	1000	1018	33	33	33			
X3				660						
GR	584.0	0	582.4	600	585.1	660	583.1	700	582.3	717
GR	582.3	800	582.4	900	584.7	988	584.3	1000	581.7	1004
GR	580.5	1008	581.5	1014	583.9	1018	583.7	1100	583.3	1200
GR	582.9	1211	582.1	1213	584.0	2000				
X1	2071	17	998	1006	15	15	15			
X3	10			660				583.5	583.5	
GR	584.0	0	582.4	600	585.1	660	583.1	700	582.3	717
GR	582.3	800	582.4	900	584.5	998	581.2	998	580.8	1002
GR	581.6	1006	584.5	1006	583.7	1100	583.3	1200	582.9	1211
GR	582.1	1213	584.0	2000						
NC	.11	.11	.03							
X1	2072	17	998	1006	1	1	1			
X2				583.6	584.5					
X3	10			660				583.6	583.6	
BT	15	0	584.0	0	600	582.4	0	660	585.1	0
BT	700	583.1	0	717	582.3	0	800	582.3	0	900
BT	582.4	0	998	584.5	583.5	1002	584.5	583.6	1006	584.5
BT	583.6	1100	583.7	0	1200	583.3	0	1211	582.9	0
BT	1213	582.1	0	2000	584.0	0				
GR	584.0	0	582.4	600	585.1	660	583.1	700	582.3	717
GR	582.3	800	582.4	900	584.5	998	581.2	998	580.8	1002
GR	581.6	1006	584.5	1006	583.7	1100	583.3	1200	582.9	1211
GR	582.1	1213	584.0	2000						
X1	2094				22	22	22			
X2				583.6	584.5		1			
X3	10	581.1		660				583.5	583.5	
X1	2095				1	1	1			
X3	10	581.1		660				583.5	583.5	
X1	2106	18	1000	1008	11	11	11			
X3				570						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

GR	582.4	800	584.8	900	586.1	995	581.3	1000	581.1	1004
GR	581.4	1008	586.1	1013	586.3	1100	587.2	1200	587.7	1300
GR	587.4	1400	587.5	1500	587.6	1600				
NC	.11	.12	.03							
X1	2107	20	1000	1008	1	1	1			
X3				570						
BT	13	570	585.1	0	630	582.4	0	700	582.4	0
BT	800	582.4	0	900	584.8	0	995	586.1	0	1000
BT	586.3	581.3	1000	586.3	584.2	1008	586.3	584.2	1008	586.3
BT	581.4	1013	586.1	0	1100	586.3	0	1200	587.2	0
GR	584.0	0	582.4	510	585.1	570	582.4	630	582.4	700
GR	582.4	800	584.8	900	586.1	995	586.1	1000	581.3	1000
GR	581.1	1004	581.4	1008	586.1	1008	586.1	1013	586.3	1100
GR	587.2	1200	587.7	1300	587.4	1400	587.5	1500	587.6	1600
X1	2133				26	26	26			
X2							1			
X3				570						
NC	.11	.12	.035							
X1	2134	18	1000	1008	1	1	1			
X3				570						
GR	584.0	0	582.4	510	585.1	570	582.4	630	582.4	700
GR	582.4	800	584.8	900	586.1	995	581.3	1000	581.1	1004
GR	581.4	1008	586.1	1013	586.3	1100	587.2	1200	587.7	1300
GR	587.4	1400	587.5	1500	587.6	1600				
NC	.1	.12	.035							
X1	2144	18	995	1013	10	10	10			
X3				570						
GR	584.0	0	582.4	510	585.1	570	582.4	630	582.4	700
GR	582.4	800	584.8	900	586.1	995	581.3	1000	581.1	1004
GR	581.4	1008	586.1	1013	586.3	1100	587.2	1200	587.7	1300
GR	587.4	1400	587.5	1500	587.6	1600				
X1	2308	24	996	1014	164	164	164			
X3	10									
GR	585.2	0	585.3	100	585.4	200	585.5	300	585.4	400
GR	585.1	500	584.8	600	584.7	700	584.9	800	584.9	900
GR	585.3	996	579.8	1000	579.8	1003	579.8	1007	585.3	1014
GR	585.5	1100	585.4	1200	585.8	1300	586.3	1400	586.4	1500
GR	586.6	1600	586.6	1700	587.0	1800	587.2	1900		
NC	.1	.1	.035							
X1	2358	24	1000	1007	50	50	50			
X3	10			1000		1007		585.3	585.3	
GR	585.2	0	585.3	100	585.4	200	585.5	300	585.4	400
GR	585.1	500	584.8	600	584.7	700	584.9	800	584.9	900
GR	585.3	996	579.8	1000	579.8	1003	579.8	1007	585.3	1014
GR	585.5	1100	585.4	1200	585.8	1300	586.3	1400	586.4	1500
GR	586.6	1600	586.6	1700	587.0	1800	587.2	1900		
SB		1.68	2.7		7		23		579.8	579.8
X1	2376				18	18	18			
X2			1	583.2	585.3					
X3	10			1000		1007		585.3	585.3	
BT	4	1000	585.3	579.8	1000	585.3	583.2	1007	585.3	583.2
BT	1007	585.3	579.8							
X1	2386	24	996	1014	10	10	10			
X3				996		1014				
GR	585.2	0	585.3	100	585.4	200	585.5	300	585.4	400
GR	585.1	500	584.8	600	584.7	700	584.9	800	584.9	900
GR	585.3	996	579.8	1000	579.8	1003	579.8	1007	585.3	1014
GR	585.5	1100	585.4	1200	585.8	1300	586.3	1400	586.4	1500
GR	586.6	1600	586.6	1700	587.0	1800	587.2	1900		
NC	.09	.09	.04							
X1	3710	25	1000	1024	1324	1324	1324			
X3				900	587.2	1300	587.1	587.2	587.1	
GR	586.5	0	588.3	100	588.1	200	588.4	300	588.6	400
GR	589.6	500	589.7	600	587.8	700	587.8	800	587.2	900
GR	584.8	1000	581.3	1007	580.8	1012	581.6	1016	585.2	1024

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GR 586.2    1600    586.6    1700    587.0    1800    587.2    1900    587.3    2000
NC   .09     .09     .04
X1  3760      31   997.5  1002.5      50       50       50
X3    10   580.3                                          586.8   586.8
GR 586.8       0   587.3     100   587.8      200    588.4     300    589.0     400
GR 589.0     500   588.9     600   588.6      700    587.9     800    586.8     900
GR 586.8     988   582.3   997.5  581.35   997.60   580.53  998.20    580.0  999.00
GR 579.8    1000   580.0 1000.90  580.53  1001.70   581.35  1002.3    582.3  1002.5
GR 586.5    1012   586.5    1100   586.5     1200    586.9    1300    586.7    1400
GR 586.8    1500   587.0    1600   587.2     1700    587.1    1800    587.3    1900
GR 587.5    2000
SB     0    1.98     3.0       0     5.0        0       20       0   580.3   580.3
X1  3802                         42       42       42
X2                    1   584.8   586.8
X3    10   580.3                                          586.8   586.8
BT    30     0.0   586.8     0.0   100.0    587.3      0.0   200.0    587.8     0.0
BT 300.0   588.4     0.0   400.0   589.0      0.0    500.0   589.0      0.0   600.0
BT 588.9     0.0   700.0   588.6     0.0    800.0    587.9     0.0    900.0   586.8
BT   0.0   988.0   586.8     0.0   997.5    586.8    582.3   997.6    586.8   583.2
BT 998.2   586.8   584.0   999.0   586.8    584.6   1000.0   586.8    584.8  1000.9
BT 586.8   584.6  1001.7   586.8   584.0   1002.3    586.8   583.2   1002.5   586.8
BT 582.3  1012.0   586.5     0.0  1100.0    586.5      0.0  1200.0    586.5     0.0
BT1300.0   586.9     0.0  1400.0   586.7      0.0   1500.0   586.8      0.0  1600.0
BT 587.0     0.0  1700.0   587.2     0.0   1800.0    587.1     0.0   2000.0   587.5
BT   0.0
NC   .15     .05    .040      .3      .5
X1  3812      31     988    1012      10       10       10
X3                           988              1012
GR 586.8       0   587.3     100   587.8      200    588.4     300    589.0     400
GR 589.0     500   588.9     600   588.6      700    587.9     800    586.8     900
GR 586.8     988   582.3   997.5  581.35   997.60   580.53  998.20    580.3  999.00
GR 580.3    1000   580.3 1000.90  580.53  1001.70   581.35  1002.3    582.3  1002.5
GR 586.5    1012   586.5    1100   586.5     1200    586.9    1300    586.7    1400
GR 586.8    1500   587.0    1600   587.2     1700    587.1    1800    587.3    1900
GR 587.5    2000
NC   .12     .07     .04
X1  4162      25    1000    1018     350      350      350
X3                           989              1029
GR 583.2       0   583.2     100   583.6      200    583.7     300    583.8     400
GR 584.0     500   584.1     600   583.6      700    583.7     800    583.8     900
GR 584.6    1000   581.4    1006   580.8     1009    581.4    1015    583.9    1018
GR 584.6    1100   584.2    1200   584.2     1300    584.3    1400    584.9    1500
GR 586.0    1600   585.4    1700   586.7     1800    586.4    1900    586.2    2000
NC   .09     .09    .045
X1  4212      31   997.5  1002.5      50       50       50
X3    10   581.5                                          587.4   587.4
GR 586.8       0   586.9     100   587.0      200    587.0     300    587.2     400
GR 587.3     500   587.5     600   587.4      700    587.5     800    587.4     900
GR 587.4     991   583.3   997.5   582.4    997.6    581.5   998.2    581.0     999
GR 580.8    1000   581.0  1000.9   581.5   1001.7    582.4  1002.3    583.3  1002.5
GR 587.4    1009   587.6    1100   587.7     1200    587.7    1300    588.0    1400
GR 588.0    1500   588.1    1600   587.9     1700    587.7    1800    587.6    1900
GR 587.6    2000
SB     0    2.11     3.0       0     5.0        0       18       0   581.5   581.5
X1  4245                         33       33       33
X2                    1   585.8   588.5
X3    10   581.5            997.5          1002.5                587.4   587.4
BT    30     0.0   586.8     0.0   100.0    586.9      0.0   200.0    587.0     0.0
BT 300.0   587.0     0.0   400.0   587.2      0.0    500.0   587.3      0.0   600.0
BT 587.5     0.0   700.0   587.4     0.0    800.0    587.5     0.0    900.0   587.4
BT   0.0   991.0   587.4     0.0   997.5    587.4    583.3   997.6    587.4   584.2
BT 998.2   587.4   585.0   999.0   587.4    585.6   1000.0   587.4    585.8  1000.9
BT 587.4   585.6  1001.7   587.4   585.0   1002.3    587.4   584.2   1002.5   587.4
BT 583.3  1009.0   587.4     0.0  1100.0    587.6      0.0  1200.0    587.7     0.0
BT1300.0   587.7     0.0  1400.0   588.0      0.0   1500.0   588.0      0.0  1600.0
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BT		2000	587.6							
X1	4255	31	991	1009	10	10	10			
X3				991		1009				
GR	586.8	0	586.9	100	587.0	200	587.0	300	587.2	400
GR	587.3	500	587.5	600	587.4	700	587.5	800	587.4	900
GR	587.4	991	583.3	997.5	582.4	997.6	581.5	998.2	581.5	999
GR	581.5	1000	581.5	1000.9	581.5	1001.7	582.4	1002.3	583.3	1002.5
GR	587.4	1009	587.6	1100	587.7	1200	587.7	1300	588.0	1400
GR	588.0	1500	588.1	1600	587.9	1700	587.7	1800	587.6	1900
GR	587.6	2000								
X1	5310	15	997	1018	1055	1055	1055			
X3	10			700		1300		585.9	585.1	
GR	585.6	0	585.6	100	585.8	300	585.6	500	585.6	700
GR	584.7	900	585.9	997	581.6	1009	581.9	1013	585.1	1018
GR	585.6	1100	585.2	1300	586.3	1500	586.6	1700	588.0	2000
QT	4	50	70	85	1000					
NC	.07	.07	.06							
X1	6364	25	1000	1021	1054	1054	1054			
X3				990		1030				
GR	587.7	0	588.3	100	589.0	200	587.6	300	586.6	400
GR	587.3	500	587.7	600	587.6	700	587.2	800	586.1	900
GR	587.2	1000	582.7	1008	582.2	1011	582.5	1015	586.3	1021
GR	586.5	1100	586.5	1200	586.3	1300	587.3	1400	587.7	1500
GR	587.3	1600	588.1	1700	588.0	1800	586.9	1900	587.3	2000
X1	6414	26	1000	1012	50	50	50			
X3	10							588.4	588.4	
GR	588.1	0	588.6	100	588.8	200	588.0	300	587.5	400
GR	587.5	500	587.9	600	587.8	700	587.3	800	587.5	900
GR	588.4	995	583.9	1000	582.4	1003	582.5	1007	583.3	1012
GR	588.4	1017	587.8	1100	587.7	1200	587.7	1300	588.1	1400
GR	588.1	1500	588.3	1600	588.3	1700	588.1	1800	588.3	1900
GR	588.4	2000								
SB	0	2.2	3.0	0	12	0	50	0	582.4	582.4
X1	6447				33	33	33			
X2			1	587.0	588.0					
X3	10							588.4	588.4	
BT	26	0	588.1	0	100	588.6	0	200	588.8	0
BT	300	588.0	0	400	587.5	0	500	587.5	0	600
BT	587.9	0	700	587.8	0	800	587.3	0	900	587.5
BT	0	995	588.4	0	1000	588.4	583.9	1000	588.4	587.0
BT	1012	588.4	587.0	1012	588.4	583.3	1017	588.4	0	1100
BT	587.8	0	1200	587.7	0	1300	587.7	0	1400	588.1
BT	0	1500	588.1	0	1600	588.3	0	1700	588.3	0
BT	1800	588.1	0	1900	588.3	0	2000	588.4	0	
X1	6457	26	995	1017	10	10	10			
X3	10							588.4	588.4	
GR	588.1	0	588.6	100	588.8	200	588.0	300	587.5	400
GR	587.5	500	587.9	600	587.8	700	587.3	800	587.5	900
GR	588.4	995	583.9	1000	582.4	1003	582.5	1007	583.3	1012
GR	588.4	1017	587.8	1100	587.7	1200	587.7	1300	588.1	1400
GR	588.1	1500	588.3	1600	588.3	1700	588.1	1800	588.3	1900
GR	588.4	2000								
X1	6784	24	1000	1024	327	327	327			
GR	589.4	0	589.8	100	590.1	200	589.4	300	589.2	400
GR	589.3	500	589.7	600	589.6	700	589.2	800	589.5	900
GR	589.3	1000	584.3	1008	583.8	1012	584.2	1016	589.6	1024
GR	589.5	1100	589.4	1200	589.5	1300	589.6	1400	589.8	1500
GR	589.8	1600	589.9	1700	589.7	1800	589.8	1900		
X1	7110	24	1000	1026	326	326	326			
GR	590.7	0	591.0	100	591.3	200	590.7	300	590.9	400
GR	591.1	500	591.4	600	591.3	700	591.0	800	591.5	900
GR	591.1	1000	586.1	1010	585.0	1013	585.1	1016	591.6	1026
GR	591.2	1100	591.0	1200	591.2	1300	591.1	1400	591.4	1500
GR	591.2	1600	591.4	1700	591.3	1800	591.3	1900		
X1	7437	24	1000	1028	327	327	327			

GR	592.9	500	593.2	600	593.1	700	592.9	800	593.5	900
GR	592.9	1000	587.2	1011	586.3	1014	586.5	1017	593.7	1028
GR	592.9	1100	592.6	1200	593.0	1300	592.7	1400	593.1	1500
GR	592.7	1600	592.8	1700	592.9	1800	592.8	1900		
X1	7763	24	1000	1030	326	326	326			
GR	593.2	0	593.4	100	593.8	200	593.4	300	594.2	400
GR	594.7	500	594.9	600	594.9	700	594.8	800	595.4	900
GR	594.7	1000	588.3	1012	587.6	1015	587.8	1018	595.8	1030
GR	594.5	1100	594.2	1200	594.8	1300	594.2	1400	594.8	1500
GR	594.2	1600	594.2	1700	594.4	1800	594.3	1900		
X1	8090	24	1000	1032	327	327	327			
GR	594.5	0	594.6	100	595.1	200	594.8	300	595.9	400
GR	596.6	500	596.7	600	596.7	700	596.7	800	597.4	900
GR	596.6	1000	589.4	1013	589.0	1016	589.1	1019	597.9	1032
GR	596.2	1100	595.9	1200	596.6	1300	595.7	1400	596.5	1500
GR	595.7	1600	595.9	1700	596.0	1800	595.8	1900		
QT	4	5	8	11	15					
NC	.09	.09	.06							
X1	8417	28	1000	1034	327	327	327			
X3	10							598.4	599.9	
GR	595.8	0	595.8	100	596.3	200	596.1	300	597.6	400
GR	598.4	500	598.5	600	598.4	700	598.5	800	599.4	900
GR	598.4	1000	590.5	1015	590.3	1017	590.4	1019	599.9	1034
GR	599.3	1059	599.7	1067	598.1	1085	597.9	1100	597.9	1100
GR	597.5	1200	598.3	1300	597.2	1400	598.1	1500	597.1	1600
GR	597.5	1700	597.6	1800	597.3	1900				
X1	8450	24	1000	1034	33	33	33			
GR	599.2	0	599.2	100	599.5	200	599.4	300	600.4	400
GR	600.9	500	601.0	600	600.9	700	601.0	800	601.6	900
GR	600.9	1000	590.9	1013	590.7	1015	590.9	1017	601.9	1034
GR	600.6	1100	600.3	1200	600.8	1300	600.1	1400	600.7	1500
GR	600.0	1600	600.3	1700	600.4	1800	600.2	1900		
X1	8483	24	1000	1034	33	33	33			
GR	602.5	0	602.5	100	602.7	200	602.6	300	603.1	400
GR	603.4	500	603.4	600	603.4	700	603.4	800	603.7	900
GR	603.4	1000	591.2	1010	591.2	1012	591.4	1014	603.9	1034
GR	603.3	1100	603.1	1200	603.4	1300	603.0	1400	603.3	1500
GR	603.0	1600	603.1	1700	603.1	1800	603.0	1900		
NC	.12	.12	.06							
X1	8517	8	200	204	34	34	34			
X3	10							605.9	605.9	
GR	605.6	0	605.9	100	605.9	185	591.6	200	591.9	204
GR	605.9	219	606.0	300	605.9	400				
NC	.11	.12	.035							
X1	8518	8	200	204	1	1	1			
BT	6	0	605.9	0	100	605.9	0	200	605.9	595.4
BT	204	605.9	595.4	300	606.0	0	400	605.9	0	
GR	605.9	0	605.9	100	605.9	200	591.6	200	591.9	204
GR	605.9	204	606.0	300	605.9	400				
X1	8628				110	110	110			
X2				595.4	605.9		1			
NC	.12	.12	.06							
X1	8629	8	200	204	1	1	1			
X3	10							605.9	605.9	
GR	605.6	0	605.9	100	605.9	185	591.6	200	591.9	204
GR	605.9	219	606.0	300	605.9	400				
X1	8645	8	191	211	15	15	15			
GR	605.6	0	605.9	100	605.9	191	591.6	200	591.9	204
GR	605.9	211	606.0	300	605.9	400				
X1	9300	17	782	800	655	655	655			
X3	10							599.3	599.1	
GR	605.0	0	598.9	400	598.0	500	598.3	600	598.9	700
GR	599.3	782	597.1	787	596.5	792	597.0	796	599.1	800
GR	598.6	900	598.3	1000	599.4	1100	597.5	1200	597.8	1300
GR	597.5	1400	605.0	1600						

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EEEEEEEEEE   NN       NN   DDDDDDDDD
EEEEEEEEEE   NNN      NN   DDDDDDDDDD
EE           NN N     NN   DD       DD
EE           NN NN    NN   DD       DD
EEEEEE       NN  NN   NN   DD       DD
EEEEEE       NN  NN   NN   DD       DD
EE           NN   NN  NN   DD       DD
EE           NN    N  NN   DD       DD
EEEEEEEEEE   NN      NNN   DDDDDDDDDD
EEEEEEEEEE   NN       NN   DDDDDDDDD
```

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EEEEEEEEEE    CCCCCCCC    HH       HH    00000000
EEEEEEEEEE   CCCCCCCCCC   HH       HH   0000000000
EE           CC       C   HH       HH   00      00
EE           CC           HH       HH   00      00
EEEEEE       CC           HHHHHHHHHH    00      00
EEEEEE       CC           HHHHHHHHHH    00      00
EE           CC           HH       HH   00      00
EE           CC       C   HH       HH   00      00
EEEEEEEEEE   CCCCCCCCCC   HH       HH   0000000000
EEEEEEEEEE    CCCCCCCC    HH       HH    00000000
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*****************************************
HEC2 VERSION UPDATED JAN 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09
MODIFICATIONS 52,53,54,55,56,57,58
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C
1  ROSEBUSH DRAIN
T2  100 YEAR FLOOD
T3  FRASER TWP. BAY CO

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -10.       4.       -0.       -0. -0.000000     -0.00      -0.0      -0.    581.900    -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

CCHV=    .300 CEHV=    .500
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST


3470 ENCROACHMENT STATIONS=     900.0    1100.0  TYPE=     1  TARGET=     200.000
 ELENCL=    585.50  ELENCR=    585.90

OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA=      584.70 ELREA=      584.90

                    VS-1

   500.00      2.70    581.90      0.00    581.90    581.99       .09      0.00      0.00    584.70
     100.        0.     100.        0.        0.       41.        0.        0.        0.    584.90
     0.00      0.00      2.43      0.00      .090      .035      .090     0.000    579.20   1003.20
  .001608      500.      500.      500.         0         0         1      0.00     23.04   1026.24


3470 ENCROACHMENT STATIONS=     900.0    1100.0  TYPE=     1  TARGET=     200.000
 ELENCL=    585.50  ELENCR=    585.90

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      586.10 ELREA=      585.90

   550.00      2.99    581.99      0.00      0.00    582.07       .08       .07       .00    584.70
     100.        0.     100.        0.        0.       44.        0.        0.        0.    584.90
      .01      0.00      2.26      0.00      .090      .035      .090      .034    579.00   1003.11
  .001275       50.       50.       50.         0         0         1      0.00     23.17   1026.28


OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      584.70 ELREA=      585.20

   573.00      4.03    581.93      0.00      0.00    582.21       .28       .04       .10    578.60
     100.        0.     100.        0.        0.       23.        0.        0.        0.    578.60
      .01      0.00      4.26      0.00      .090      .035      .090      .034    577.90   1000.00
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NORMAL BRIDGE.NRD=27 MIN ELTRD=  585.00 MAX ELLC=  582.60

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      584.70 ELREA=      585.20

                        DRIVEWAY CULVERT - 20FT. OF 72"  CMP WITH ENDS PROJEC-

                        TING FROM FILL

   574.00      4.02   581.92      0.00      0.00   582.22       .30       .00       .01   578.60
     100.        0.     100.        0.        0.      23.        0.        0.        0.   578.60
      .01      0.00     4.38      0.00      .090     .030      .090      .034   577.90  1000.00
 .002734        1.       1.        1.         0        0         1     -4.03     6.00  1011.05

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

NORMAL BRIDGE.NRD=27 MIN ELTRD=  585.00 MAX ELLC=  582.60

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      584.70 ELREA=      585.20

   594.00      3.66   581.96      0.00      0.00   582.31       .35       .06       .03   578.60
     100.        0.     100.        0.        0.      21.        0.        0.        0.   578.60
      .01      0.00     4.77      0.00      .090     .030      .090      .033   578.30  1000.00
 .003381       20.      20.       20.         2        0         1     -4.13     6.00  1011.09

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      584.70 ELREA=      585.20

   595.00      3.70   582.00      0.00      0.00   582.32       .32       .00       .01   578.60
     100.        0.     100.        0.        0.      22.        0.        0.        0.   578.60
      .01      0.00     4.57      0.00      .090     .035      .090      .032   578.30  1000.00
 .003473        1.       1.        1.         2        0         1      0.00     6.00  1011.15

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      584.70 ELREA=      585.20

   605.00      3.94   582.34      0.00      0.00   582.41       .07       .02       .07   584.70
     100.        0.     100.        0.        0.      46.        0.        0.        0.   585.20
      .01      0.00     2.20      0.00      .090     .035      .090      .032   578.40   993.87
 .000896       10.      10.       10.         2        0         1      0.00    17.80  1011.67

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      584.40 ELREA=      584.40

                  BS-2  60FT. D.S. DETROIT @ MACKINAC R.R. - 24FT. OF 60"  CMP

                        WITH ENDS FLUSH WITH HEADWALL
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100.	0.	100.	0.	0.	17.	0.	0.	0.	579.70
.01	0.00	5.85	0.00	.090	.035	.090	.032	578.70	997.50
.008182	22.	22.	22.	2	0	1	0.00	5.00	1008.51

SPECIAL BRIDGE

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
-0.00	2.18	2.70	-0.00	3.83	-0.00	14.73	-0.00	578.70	578.70

PRESSURE FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	ELLC	ELTRD	CLASS
583.71	582.69	0.00	0.	100.	15.	582.20	584.40	10.00

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 584.40 ELREA= 584.40

653.00	4.73	583.43	0.00	0.00	583.71	.28	1.03	0.00	579.70
100.	0.	100.	0.	0.	23.	0.	0.	0.	579.70
.01	0.00	4.26	0.00	.090	.035	.090	.033	578.70	997.50
.003382	26.	26.	26.	2	0	1	0.00	5.00	1011.64

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

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 584.40 ELREA= 584.40

663.00	4.96	583.76	0.00	0.00	583.80	.04	.01	.07	584.40
100.	0.	100.	0.	0.	65.	0.	0.	0.	584.40
.01	0.00	1.54	0.00	.090	.035	.090	.033	578.80	987.56
.000427	10.	10.	10.	2	0	1	0.00	24.87	1012.44

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 584.90 ELREA= 584.90

BS-3 DETROIT @ MACKINAW R.R. BRIDGE

688.00	4.65	583.75	0.00	0.00	583.85	.10	.02	.03	584.90
100.	0.	100.	0.	0.	39.	0.	0.	0.	584.90
.02	0.00	2.54	0.00	.090	.035	.090	.033	579.10	1000.00
.001229	25.	25.	25.	2	0	1	0.00	9.00	1009.00

SPECIAL BRIDGE

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
-0.00	2.04	2.70	-0.00	9.00	-0.00	23.00	-0.00	579.10	579.10

PRESSURE FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	ELLC	ELTRD	CLASS

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584.34     583.85      0.00        0.       100.       23.    581.90    584.90     10.00

OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA=      584.90 ELREA=      584.90

  712.00      5.16   584.26      0.00      0.00   584.34       .08       .50      0.00   584.90
   100.        0.     100.        0.        0.     44.        0.        0.        0.    584.90
     .02      0.00     2.27      0.00      .090     .035      .090      .033    579.10  1000.00
 .000913       24.      24.       24.         2        0         1      0.00      9.00  1009.00

3470 ENCROACHMENT STATIONS=      488.0      512.0  TYPE=      1  TARGET=      24.000
                    BS-4  DETROIT @ MACKINAC R.R. SPUR LINE BRIDGE - 36FT. OF

                          48"  CMP WITH ENDS PROJECTING FROM FILL, AND TWO 37 FT

                          LENGTHS OF 36"  C.I. PIPE WITH ENDS PROJECTING FROM

                          FILL

  730.00      4.83   584.33      0.00      0.00   584.37       .03       .01       .01   580.00
   100.        3.       94.        3.       11.     63.       11.        0.        0.    579.90
     .02       .30     1.48       .30      .100     .035      .100      .033    579.50   488.08
 .000208       18.      18.       18.         2        0         1      0.00     23.85   511.93

SPECIAL BRIDGE

SB   XK        XKOR      COFQ     RDLEN      BWC      BWP     BAREA      SS      ELCHU     ELCHD
    -0.00      2.30      3.00     -0.00      6.60    -0.00     23.00    -0.00    579.70    579.50

PRESSURE AND WEIR FLOW

  EGPRS      EGLWC        H3     QWEIR      QPR     BAREA     ELLC     ELTRD     CLASS

  585.01     584.57      0.00       17.       82.       23.   582.70    584.40     30.00

3470 ENCROACHMENT STATIONS=      488.0      512.0  TYPE=      1  TARGET=      24.000
  769.00      5.26   584.76      0.00      0.00   584.79       .03       .42      0.00   580.00
   100.        4.       93.        4.       13.     68.       13.        0.        0.    579.90
     .03       .29     1.37       .29      .100     .035      .100      .033    579.50   488.00
 .000155       39.      39.       39.         2        0         2      0.00     24.00   512.00

  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=      300.0      514.0  TYPE=      1  TARGET=     214.000
                          DRIVEWAY CULVERT - 22FT. OF 66"  CMP WITH ENDS PROJEC-
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                    TING FROM HEADWALL

   778.00      5.27    584.77      0.00      0.00    584.79       .02       .00       .00    580.20
    100.       43.       49.       8.       190.       28.       21.       0.        0.     580.20
     .03       .23      1.77      .37      .100      .035      .100      .033    579.50    300.00
 .000218       9.        9.       9.         0         0         1      0.00    214.00    514.00


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
   -0.00      2.05      3.00     -0.00      5.50     -0.00     20.00     -0.00     579.50    579.50

6870 D.S. ENERGY OF  584.79 HIGHER THAN COMPUTED ENERGY OF  584.79
PRESSURE AND WEIR FLOW

  EGPRS     EGLWC      H3       QWEIR     QPR       BAREA     ELLC      ELTRD     CLASS

  585.56    584.79     0.00      85.       15.       20.     583.70    584.40     30.00


3470 ENCROACHMENT STATIONS=      300.0     514.0  TYPE=      1  TARGET=      214.000
   802.00      5.27    584.77      0.00      0.00    584.79       .02       0.00      0.00    580.20
    100.       43.       49.       8.       193.       28.       21.       0.        0.     580.20
     .04       .23      1.75      .37      .100      .035      .100      .033    579.50    300.00
 .000213       24.       24.      24.         1         0         7      0.00    214.00    514.00


3470 ENCROACHMENT STATIONS=      300.0     514.0  TYPE=      1  TARGET=      214.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      584.40 ELREA=   100000.00

   812.00      5.29    584.79      0.00      0.00    584.80       .01       .00       .00    584.40
    100.       27.       73.       0.       169.       74.       0.        1.        0. 100000.00
     .05       .16       .98     0.00      .100      .035      .100      .033    579.50    300.00
 .000137       10.       10.      10.         0         0         1      0.00    214.00    514.00


3470 ENCROACHMENT STATIONS=      815.0    2150.0  TYPE=      1  TARGET=     -815.000

                    VS-5  U.S. FROM DETROIT @ MACKINAW R.R.

   988.00      5.00    584.80      0.00      0.00    584.80       .00       .00       .00    583.90
    100.       8.        30.       62.       180.       98.     1308.       4.        3.     583.30
     .43       .04       .31       .05      .110      .035      .110      .034    579.80    815.00
 .000009      176.      176.      176.         0         0         1      0.00   1260.03   2075.03


3470 ENCROACHMENT STATIONS=      815.0    2150.0  TYPE=      1  TARGET=     -815.000
  1005.00      6.20    584.80      0.00      0.00    584.80       .00       .00       .00    578.60
    100.       11.       15.       74.       202.       31.     1359.       5.        4.     578.60
     .47       .06       .48       .05      .110      .035      .110      .034    578.60    819.13
 .000011       17.       17.      17.         0         0         1      0.00   1256.39   2075.52


NORMAL BRIDGE,NRD=20 MIN ELTRD=  583.70 MAX ELLC=  581.90
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                    DRIVEWAY CULVERT - 20FT. OF 60"  CMP WITH ENDS PROJEC-

                    TING FROM FILL
  1006.00      6.20    584.80      0.00      0.00    584.80       .00       .00       .00    578.60
     100.       10.        4.       85.       176.      19.      1343.       5.        4.     578.60
      .48       .06       .23       .06       .110     .030      .110      .034    578.60    819.13
  .000016        1.        1.        1.         0        0         1    -53.20   1256.40   2075.53

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

NORMAL BRIDGE,NRD=20 MIN ELTRD=  583.70 MAX ELLC=  581.90

3470 ENCROACHMENT STATIONS=      815.0     2150.0  TYPE=      1  TARGET=     -815.000
  1026.00      6.20    584.80      0.00      0.00    584.80       .00       .00       .00    578.60
     100.       10.        4.       85.       177.      19.      1344.       6.        4.     578.60
      .56       .06       .23       .06       .110     .030      .110      .033    578.60    819.12
  .000016       20.       20.       20.         0        0         1    -53.20   1256.51   2075.64

3470 ENCROACHMENT STATIONS=      815.0     2150.0  TYPE=      1  TARGET=     -815.000
  1027.00      6.20    584.80      0.00      0.00    584.81       .00       .00       .00    578.60
     100.       11.       15.       74.       202.      31.      1359.       6.        4.     578.60
      .56       .06       .48       .05       .110     .035      .110      .033    578.60    819.12
  .000011        1.        1.        1.         0        0         1      0.00   1256.52   2075.64

3470 ENCROACHMENT STATIONS=      815.0     2150.0  TYPE=      1  TARGET=     -815.000
  1037.00      6.20    584.80      0.00      0.00    584.81       .00       .00       .00    584.20
     100.        7.       31.       62.       168.     100.      1325.       6.        5.     583.30
      .58       .04       .31       .05       .110     .035      .110      .033    578.60    819.12
  .000009       10.       10.       10.         0        0         1      0.00   1256.58   2075.70

3280 CROSS SECTION   1198.00 EXTENDED        .81 FEET

3470 ENCROACHMENT STATIONS=      660.0     2000.0  TYPE=      1  TARGET=     -660.000
  1198.00      5.11    584.81      0.00      0.00    584.81       .00       .00       .00    584.30
     100.       27.       12.       61.       609.      71.      1612.      13.        9.     584.30
     1.40       .04       .16       .04       .110     .035      .110      .034    579.70    670.20
  .000004      161.      161.      161.         0        0         1      0.00   1329.80   2000.00

3280 CROSS SECTION   1217.00 EXTENDED        .81 FEET

3470 ENCROACHMENT STATIONS=      660.0     2000.0  TYPE=      1  TARGET=     -660.000
  1217.00      5.11    584.81      0.00      0.00    584.81       .00       .00       .00    580.40
     100.       30.        5.       65.       633.      23.      1636.      14.       10.     580.40
     1.50       .05       .24       .04       .110     .035      .110      .034    579.70    670.20
  .000004       19.       19.       19.         0        0         1      0.00   1329.80   2000.00
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3280 CROSS SECTION    1218.00 EXTENDED        .81 FEET

NORMAL BRIDGE,NRD=23 MIN ELTRD=  584.30 MAX ELLC=  583.20

3470 ENCROACHMENT STATIONS=      660.0     2000.0  TYPE=      1  TARGET=     -660.000
                         DRIVEWAY CULVERT - 18FT. OF 54"  CMP WITH ENDS FLUSH

                         WITH HEADWALL

  1218.00      5.11   584.81      0.00      0.00   584.81       .00       .00       .00   580.40
     100.       30.       2.       68.      614.      15.     1622.       14.       10.    580.40
     1.51       .05      .11       .04      .110     .030      .110      .034    579.70    670.20
  .000005        1.       1.        1.         0        0         1    -41.06   1329.80   2000.00

3280 CROSS SECTION    1236.00 EXTENDED        .81 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

NORMAL BRIDGE,NRD=23 MIN ELTRD=  584.30 MAX ELLC=  583.20

3470 ENCROACHMENT STATIONS=      660.0     2000.0  TYPE=      1  TARGET=     -660.000
  1236.00      5.11   584.81      0.00      0.00   584.81       .00       .00       .00   580.40
     100.       30.       2.       68.      614.      15.     1622.       15.       11.    580.40
     1.62       .05      .11       .04      .110     .030      .110      .033    579.70    670.20
  .000005       18.      18.       18.         0        0         1    -41.06   1329.80   2000.00

3280 CROSS SECTION    1237.00 EXTENDED        .81 FEET

3470 ENCROACHMENT STATIONS=      660.0     2000.0  TYPE=      1  TARGET=     -660.000
  1237.00      5.11   584.81      0.00      0.00   584.81       .00       .00       .00   580.40
     100.       30.       5.       65.      633.      23.     1636.       15.       11.    580.40
     1.62       .05      .24       .04      .110     .035      .110      .033    579.70    670.20
  .000004        1.       1.        1.         0        0         1      0.00   1329.80   2000.00

3280 CROSS SECTION    1247.00 EXTENDED        .81 FEET

3470 ENCROACHMENT STATIONS=      660.0     2000.0  TYPE=      1  TARGET=     -660.000
  1247.00      4.71   584.81      0.00      0.00   584.81       .00       .00       .00   584.30
     100.       27.      11.       61.      609.      69.     1613.       16.       11.    584.30
     1.68       .05      .16       .04      .110     .035      .110      .033    580.10    670.20
  .000004       10.      10.       10.         0        0         1      0.00   1329.80   2000.00

3280 CROSS SECTION    1324.00 EXTENDED        .81 FEET
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3470 ENCROACHMENT STATIONS=      660.0     2000.0  TYPE=      1  TARGET=     -660.000
  1324.00      5.61    584.81      0.00      0.00    584.81       .00       .00       .00    584.40
     100.       28.       12.       60.      628.       71.     1610.       20.       13.    584.40
     2.06       .04       .17       .04      .110      .035      .110      .033    579.20    671.43
  .000004       77.       77.       77.         0         0         1      0.00   1328.56   2000.00

3280 CROSS SECTION    1344.00 EXTENDED        .81 FEET

3470 ENCROACHMENT STATIONS=      660.0     2000.0  TYPE=      1  TARGET=     -660.000
  1344.00      5.61    584.81      0.00      0.00    584.81       .00       .00       .00    579.50
     100.       30.        7.       63.      648.       28.     1633.       21.       14.    579.50
     2.15       .05       .26       .04      .110      .035      .110      .033    579.20    671.43
  .000004       20.       20.       20.         0         0         1      0.00   1328.57   2000.00

3280 CROSS SECTION    1345.00 EXTENDED        .81 FEET

NORMAL BRIDGE.NRD=24 MIN ELTRD=  584.40 MAX ELLC=  582.80

3470 ENCROACHMENT STATIONS=      660.0     2000.0  TYPE=      1  TARGET=     -660.000
                          DRIVEWAY CULVERT - 30FT. OF 60"  CMP WITH ENDS PROJEC-

                          TING FROM FILL

  1345.00      5.61    584.81      0.00      0.00    584.81       .00       .00       .00    579.50
     100.       31.        2.       67.      631.       17.     1619.       21.       14.    579.50
     2.16       .05       .12       .04      .110      .030      .110      .033    579.20    671.43
  .000005        1.        1.        1.         0         0         1    -41.30   1328.57   2000.00

3280 CROSS SECTION    1375.00 EXTENDED        .81 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

NORMAL BRIDGE.NRD=24 MIN ELTRD=  584.40 MAX ELLC=  582.80

3470 ENCROACHMENT STATIONS=      660.0     2000.0  TYPE=      1  TARGET=     -660.000
  1375.00      5.61    584.81      0.00      0.00    584.81       .00       .00       .00    579.50
     100.       31.        2.       67.      631.       17.     1619.       22.       15.    579.50
     2.34       .05       .12       .04      .110      .030      .110      .033    579.20    671.43
  .000005       30.       30.       30.         0         0         1    -41.30   1328.57   2000.00

3280 CROSS SECTION    1376.00 EXTENDED        .81 FEET

3470 ENCROACHMENT STATIONS=      660.0     2000.0  TYPE=      1  TARGET=     -660.000
  1376.00      5.61    584.81      0.00      0.00    584.81       .00       .00       .00    579.50
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      2.35       .05       .26       .04      .110      .035      .110      .033    579.20    671.43
   .000004        1.        1.        1.         0         0         1      0.00   1328.57   2000.00

 3280 CROSS SECTION   1386.00 EXTENDED       .81 FEET


 3470 ENCROACHMENT STATIONS=     660.0    2000.0  TYPE=     1  TARGET=    -660.000
   1386.00      5.61    584.81      0.00      0.00    584.81       .00       .00       .00    584.40
      100.       28.       12.       60.      628.       71.     1610.       23.       15.    584.40
      2.40       .04       .17       .04      .110      .035      .110      .033    579.20    671.43
   .000004       10.       10.       10.         0         0         1      0.00   1328.57   2000.00

 3280 CROSS SECTION   1554.00 EXTENDED       .81 FEET


 3470 ENCROACHMENT STATIONS=     660.0    2000.0  TYPE=     1  TARGET=    -660.000
   1554.00      5.01    584.81      0.00      0.00    584.81       .00       .00       .00    584.20
      100.       29.       11.       60.      661.       64.     1619.       32.       20.    584.20
      3.28       .04       .17       .04      .110      .035      .110      .033    579.80    665.70
   .000004      168.      168.      168.         0         0         1      0.00   1334.30   2000.00

 3280 CROSS SECTION   1579.00 EXTENDED       .81 FEET


 3470 ENCROACHMENT STATIONS=     660.0    2000.0  TYPE=     1  TARGET=    -660.000
   1579.00      5.01    584.81      0.00      0.00    584.81       .00       .00       .00    580.30
      100.       31.        6.       63.      679.       27.     1639.       33.       21.    580.30
      3.41       .05       .24       .04      .110      .035      .110      .033    579.80    665.70
   .000004       25.       25.       25.         0         0         1      0.00   1334.30   2000.00

 3280 CROSS SECTION   1580.00 EXTENDED       .81 FEET


 NORMAL BRIDGE.NRD=21 MIN ELTRD=  584.20 MAX ELLC=  583.80

 3470 ENCROACHMENT STATIONS=     660.0    2000.0  TYPE=     1  TARGET=    -660.000
                          DRIVEWAY CULVERT - 24FT. OF 66"  CMP WITH ENDS PROJEC-

                          TING FROM FILL
   1580.00      5.01    584.81      0.00      0.00    584.81       .00       .00       .00    580.30
      100.       32.        3.       66.      666.       21.     1630.       33.       21.    580.30
      3.41       .05       .12       .04      .110      .030      .110      .033    579.80    665.70
   .000004        1.        1.        1.         0         0         1    -28.06   1334.30   2000.00

 3280 CROSS SECTION   1604.00 EXTENDED       .82 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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NORMAL BRIDGE.NRD=21 MIN ELTRD=  584.20 MAX ELLC=  583.80

3470 ENCROACHMENT STATIONS=      660.0     2000.0  TYPE=      1  TARGET=     -660.000
  1604.00      5.01    584.81      0.00      0.00    584.81      .00       .00       .00    580.30
     100.       32.        3.       66.      666.       21.    1630.       35.       22.    580.30
     3.56       .05       .12       .04      .110      .030     .110      .033    579.80    665.70
  .000004       24.       24.       24.         0         0        1    -28.05   1334.30   2000.00

3280 CROSS SECTION   1605.00 EXTENDED        .82 FEET

3470 ENCROACHMENT STATIONS=      660.0     2000.0  TYPE=      1  TARGET=     -660.000
  1605.00      5.01    584.81      0.00      0.00    584.81      .00       .00       .00    580.30
     100.       31.        6.       63.      679.       27.    1639.       35.       22.    580.30
     3.57       .05       .24       .04      .110      .035     .110      .033    579.80    665.70
  .000004        1.        1.        1.         0         0        1      0.00   1334.30   2000.00

3280 CROSS SECTION   1615.00 EXTENDED        .82 FEET

3470 ENCROACHMENT STATIONS=      660.0     2000.0  TYPE=      1  TARGET=     -660.000
  1615.00      5.01    584.81      0.00      0.00    584.81      .00       .00       .00    584.20
     100.       29.       11.       60.      662.       64.    1619.       35.       22.    584.20
     3.62       .04       .17       .04      .110      .035     .110      .033    579.80    665.70
  .000004       10.       10.       10.         0         0        1      0.00   1334.30   2000.00

3280 CROSS SECTION   1966.00 EXTENDED        .82 FEET

3470 ENCROACHMENT STATIONS=      660.0     2000.0  TYPE=      1  TARGET=     -660.000
  1966.00      4.61    584.81      0.00      0.00    584.81      .00       .00       .00    584.30
     100.       30.        8.       62.      663.       52.    1618.       54.       33.    584.30
     5.56       .05       .16       .04      .110      .035     .110      .034    580.20    660.00
  .000004      351.      351.      351.         0         0        1      0.00   1340.00   2000.00

3280 CROSS SECTION   1991.00 EXTENDED        .82 FEET

3470 ENCROACHMENT STATIONS=      660.0     2000.0  TYPE=      1  TARGET=     -660.000
  1991.00      4.61    584.81      0.00      0.00    584.81      .00       .00       .00    580.80
     100.       31.        5.       64.      678.       23.    1632.       55.       34.    580.80
     5.70       .05       .22       .04      .110      .035     .110      .034    580.20    660.00
  .000004       25.       25.       25.         0         0        1      0.00   1340.00   2000.00

3280 CROSS SECTION   1992.00 EXTENDED        .82 FEET

NORMAL BRIDGE.NRD=23 MIN ELTRD=  584.30 MAX ELLC=  584.10

3470 ENCROACHMENT STATIONS=      660.0     2000.0  TYPE=      1  TARGET=     -660.000
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                    TING FROM FILL

  1992.00     4.61   584.81     0.00     0.00   584.81      .00      .00      .00   580.80
     100.      32.       2.      66.     666.      19.    1626.      56.      34.    580.80
     5.70      .05      .12      .04     .110     .030     .110     .034   580.20   660.00
  .000005       1.       1.       1.        0        0        1   -21.90  1340.00  2000.00

3280 CROSS SECTION   2012.00 EXTENDED        .82 FEET

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

NORMAL BRIDGE.NRD=23 MIN ELTRD=  584.30 MAX ELLC=  584.10

3470 ENCROACHMENT STATIONS=      660.0    2000.0  TYPE=      1  TARGET=    -660.000
  2012.00     4.61   584.81     0.00     0.00   584.81      .00      .00      .00   580.80
     100.      32.       2.      66.     666.      19.    1626.      57.      34.    580.80
     5.83      .05      .12      .04     .110     .030     .110     .034   580.20   660.00
  .000005      20.      20.      20.        0        0        1   -21.90  1340.00  2000.00

3280 CROSS SECTION   2013.00 EXTENDED        .82 FEET

3470 ENCROACHMENT STATIONS=      660.0    2000.0  TYPE=      1  TARGET=    -660.000
  2013.00     4.61   584.81     0.00     0.00   584.81      .00      .00      .00   580.80
     100.      31.       5.      64.     678.      23.    1632.      57.      34.    580.80
     5.83      .05      .22      .04     .110     .035     .110     .034   580.20   660.00
  .000004       1.       1.       1.        0        0        1     0.00  1340.00  2000.00

3280 CROSS SECTION   2023.00 EXTENDED        .82 FEET

3470 ENCROACHMENT STATIONS=      660.0    2000.0  TYPE=      1  TARGET=    -660.000
  2023.00     4.61   584.81     0.00     0.00   584.81      .00      .00      .00   584.30
     100.      30.       8.      62.     663.      52.    1618.      57.      35.    584.30
     5.89      .05      .16      .04     .110     .035     .110     .034   580.20   660.00
  .000004      10.      10.      10.        0        0        1     0.00  1340.00  2000.00

3280 CROSS SECTION   2056.00 EXTENDED        .82 FEET

3470 ENCROACHMENT STATIONS=      660.0    2000.0  TYPE=      1  TARGET=    -660.000
                 VS-6  D.S. FROM LINWOOD ROAD BRIDGE
  2056.00     4.31   584.81     0.00     0.00   584.81      .00      .00      .00   584.30
     100.      29.       9.      63.     636.      54.    1629.      59.      36.    583.90
     6.06      .04      .17      .04     .110     .035     .110     .034   580.50   665.66
  .000004      33.      33.      33.        0        0        1     0.00  1334.34  2000.00
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3470 ENCROACHMENT STATIONS=      660.0     2000.0  TYPE=      1  TARGET=     -660.000
  2071.00      4.01    584.81      0.00      0.00    584.81       .00       .00       .00    584.50
     100.       31.        4.       65.      655.       30.     1613.       60.       36.    584.50
     6.15       .05       .15       .04      .110      .035      .110      .034    580.80    665.66
  .000004       15.       15.       15.         0         0         1      0.00   1334.34   2000.00

3280 CROSS SECTION    2072.00 EXTENDED        .82 FEET


NORMAL BRIDGE.NRD=15 MIN ELTRD=  584.50 MAX ELLC=  583.60

3470 ENCROACHMENT STATIONS=      660.0     2000.0  TYPE=      1  TARGET=     -660.000
                           DRIVEWAY CULVERT

  2072.00      4.01    584.81      0.00      0.00    584.81       .00       .00       .00    584.50
     100.       32.        2.       66.      655.       22.     1613.       60.       36.    584.50
     6.16       .05       .09       .04      .110      .030      .110      .034    580.80    665.66
  .000005        1.        1.        1.         0         0         1     -7.40   1334.34   2000.00

3280 CROSS SECTION    2094.00 EXTENDED        .82 FEET

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


NORMAL BRIDGE.NRD=15 MIN ELTRD=  584.50 MAX ELLC=  583.60

3470 ENCROACHMENT STATIONS=      660.0     2000.0  TYPE=      1  TARGET=     -660.000
  2094.00      4.01    584.81      0.00      0.00    584.81       .00       .00       .00    584.50
     100.       32.        2.       66.      655.       21.     1613.       61.       37.    584.50
     6.30       .05       .08       .04      .110      .030      .110      .033    580.80    665.66
  .000005       22.       22.       22.         0         0         1     -7.40   1334.34   2000.00

3280 CROSS SECTION    2095.00 EXTENDED        .82 FEET


3470 ENCROACHMENT STATIONS=      660.0     2000.0  TYPE=      1  TARGET=     -660.000
  2095.00      4.01    584.81      0.00      0.00    584.81       .00       .00       .00    584.50
     100.       31.        5.       65.      655.       29.     1613.       61.       37.    584.50
     6.30       .05       .16       .04      .110      .030      .110      .033    580.80    665.66
  .000004        1.        1.        1.         0         0         1      0.00   1334.34   2000.00


3265 DIVIDED FLOW


3470 ENCROACHMENT STATIONS=      570.0     1600.0  TYPE=      1  TARGET=     -570.000
  2106.00      3.71    584.81      0.00      0.00    584.81       .00       .00       .00    581.30
     100.       79.       20.        1.      604.       29.        6.       61.       37.    581.40
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 .000037      11.      11.      11.       0        0        1     0.00   340.26  1011.64

3265 DIVIDED FLOW

NORMAL BRIDGE.NRD=13 MIN ELTRD=  582.40 MAX ELLC=  584.20

3470 ENCROACHMENT STATIONS=     570.0    1600.0  TYPE=     1  TARGET=    -570.000

                  BS-7  LINWOOD ROAD BRIDGE

 2107.00      3.71   584.81     0.00     0.00   584.81      .00      .00      .00   586.10
    100.       91.       9.       0.     598.      24.       0.      61.      37.   586.10
    6.32       .15      .36     0.00     .110     .030     .120     .033   581.10   576.29
 .000050        1.       1.       1.       0        0        1    -4.94   332.96  1008.00

3265 DIVIDED FLOW

NORMAL BRIDGE.NRD=13 MIN ELTRD=  582.40 MAX ELLC=  584.20

3470 ENCROACHMENT STATIONS=     570.0    1600.0  TYPE=     1  TARGET=    -570.000
 2133.00      3.71   584.81     0.00     0.00   584.81      .00      .00      .00   586.10
    100.       91.       9.       0.     598.      24.       0.      62.      37.   586.10
    6.36       .15      .36     0.00     .110     .030     .120     .033   581.10   576.26
 .000050       26.      26.      26.       0        0        1    -4.95   333.07  1008.00

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=     570.0    1600.0  TYPE=     1  TARGET=    -570.000
 2134.00      3.71   584.81     0.00     0.00   584.81      .00      .00      .00   581.30
    100.       81.      18.       1.     604.      29.       6.      62.      37.   581.40
    6.36       .13      .62      .09     .110     .035     .120     .033   581.10   576.26
 .000039        1.       1.       1.       0        0        1     0.00   340.37  1011.64

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=     570.0    1600.0  TYPE=     1  TARGET=    -570.000
 2144.00      3.71   584.81     0.00     0.00   584.81      .00      .00      .00   586.10
    100.       82.      18.       0.     598.      41.       0.      62.      37.   586.10
    6.38       .14      .43     0.00     .100     .035     .120     .033   581.10   576.25
 .000034       10.      10.      10.       0        0        1     0.00   340.42  1011.64

OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA=      585.30 ELREA=      585.30
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   100.        0.      100.        0.        0.       60.        0.       63.       38.     585.30
  6.40       0.00      1.66      0.00      .100      .035      .120      .033    579.80     996.35
.000382      164.      164.      164.         1         0         1      0.00     17.03    1013.38

3470 ENCROACHMENT STATIONS=     1000.0     1007.0  TYPE=      1  TARGET=        7.000

OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA=       585.30 ELREA=       585.30

                    BS-8  DETROIT @ MACKINAW R.R. SPUR LINE

 2358.00      5.00    584.80      0.00      0.00    584.93       .13       .04       .04    579.80
   100.        0.      100.        0.        0.       35.        0.       63.       38. 100000.00
  6.41       0.00      2.86      0.00      .100      .035      .100      .033    579.80    1000.00
.001731       50.       50.       50.         2         0         1      0.00      7.00    1007.00


SPECIAL BRIDGE

SB   XK         XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
    -0.00       1.68       2.70      -0.00       7.00      -0.00      23.00      -0.00      579.80     579.80

PRESSURE FLOW

  EGPRS      EGLWC       H3        QWEIR      QPR        BAREA      ELLC       ELTRD      CLASS

  585.29     584.93      0.00        0.       100.        23.      583.20     585.30      10.00


3470 ENCROACHMENT STATIONS=     1000.0     1007.0  TYPE=      1  TARGET=        7.000

OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA=       585.30 ELREA=       585.30

 2376.00      5.38    585.18      0.00      0.00    585.29       .11       .37       0.00    579.80
   100.        0.      100.        0.        0.       38.        0.       63.       38. 100000.00
  6.41       0.00      2.65      0.00      .100      .035      .100      .033    579.80    1000.00
.001435       18.       18.       18.         2         0         1      0.00      7.00    1007.00


  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=      996.0     1014.0  TYPE=      1  TARGET=       18.000
 2386.00      5.49    585.29      0.00      0.00    585.32       .03       .01       .02    585.30
   100.        0.      100.        0.        0.       69.        0.       63.       38. 100000.00
  6.41       0.00      1.46      0.00      .100      .035      .100      .033    579.80     996.01
.000270       10.       10.       10.         2         0         1      0.00     17.97    1013.98


3470 ENCROACHMENT STATIONS=      900.0     1300.0  TYPE=      1  TARGET=      400.000
 ELENCL=     587.20  ELENCR=     587.10

                    VS-9  D.S. FROM ELEVATOR ROAD BRIDGE

 3710.00      4.85    585.65      0.00      0.00    585.68       .02       .35       .00    584.80
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     6.71       .15      1.25       .10      .090      .040      .090      .036    580.80    964.57
  .000264     1324.     1324.     1324.         2         0         1      0.00    108.31   1072.88

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       586.80 ELREA=       586.80

                    BS-10 ELEVATOR ROAD CULVERT - 40FT. OF 60"  RCP WITH SQUARE

                          ENDS FLUSH WITH HEADWALL

  3760.00      5.27    585.57      0.00      0.00    585.82       .25       .03       .11    582.30
     100.        0.     100.        0.        0.       25.        0.       66.       40.    582.30
     6.72      0.00      4.01      0.00      .090      .040      .090      .036    580.30    997.50
  .003804       50.       50.       50.         2         0         1      0.00      5.00   1009.90


SPECIAL BRIDGE

SB  XK          XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
     0.00       1.98       3.00       0.00       5.00       0.00       20.00      0.00       580.30     580.30

PRESSURE FLOW

  EGPRS      EGLWC       H3        QWEIR      QPR        BAREA      ELLC       ELTRD      CLASS

   586.34     585.82     0.00         0.      100.        20.     584.80     586.80      10.00


OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       586.80 ELREA=       586.80

  3802.00      5.84    586.14      0.00      0.00    586.34       .20       .52      0.00    582.30
     100.        0.     100.        0.        0.       28.        0.       66.       40.    582.30
     6.72      0.00      3.60      0.00      .090      .040      .090      .036    580.30    997.50
  .002844       42.       42.       42.         2         0         1      0.00      5.00   1011.19

CCHV=     .300 CEHV=     .500

3470 ENCROACHMENT STATIONS=      988.0     1012.0  TYPE=      1  TARGET=       24.000
  3812.00      6.06    586.36      0.00      0.00    586.40       .04       .01       .05    586.80
     100.        0.     100.        0.        0.       65.        0.       66.       40. 100000.00
     6.72      0.00      1.54      0.00      .150      .040      .050      .036    580.30    988.92
  .000532       10.       10.       10.         2         0         1      0.00     22.77   1011.69

3280 CROSS SECTION   4162.00 EXTENDED        .27 FEET


3470 ENCROACHMENT STATIONS=      989.0     1029.0  TYPE=      1  TARGET=       40.000

                    VS-11 D.S. FROM PENN CENTRAL R.R. CULVERT

  4162.00      5.67    586.47      0.00      0.00    586.49       .01       .08       .01    584.60
     100.        4.       84.       12.       21.       81.       28.       67.       40.    583.90
     6.83       .21      1.04       .43      .120      .040      .070      .037    580.80    989.00
  .000120      350.      350.      350.         2         0         1      0.00     40.00   1029.00
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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

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 587.40 ELREA= 587.40

BS-12 PENN CENTRAL R.R. CULVERT - 31FT. OF 60" C.I. PIPE,

WITH SQUARE ENDS PROJECTING FROM FILL

4212.00	4.85	586.35	0.00	0.00	586.64	.29	.02	.14	583.30
100.	0.	100.	0.	0.	23.	0.	67.	40.	583.30
6.83	0.00	4.29	0.00	.090	.045	.090	.037	581.50	997.50
.005845	50.	50.	50.	2	0	1	0.00	5.00	1007.34

SPECIAL BRIDGE

SB	XK	XKOR	CUFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	2.11	3.00	0.00	5.00	0.00	18.00	0.00	581.50	581.50

3280 CROSS SECTION 4245.00 EXTENDED .36 FEET

PRESSURE FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	ELLC	ELTRD	CLASS
587.36	586.64	0.00	0.	100.	18.	585.80	588.50	10.00

3470 ENCROACHMENT STATIONS= 997.5 1002.5 TYPE= 1 TARGET= 5.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 587.40 ELREA= 587.40

4245.00	5.66	587.16	0.00	0.00	587.36	.21	.73	0.00	583.30
100.	0.	100.	0.	0.	27.	0.	67.	40.	100000.00
6.83	0.00	3.66	0.00	.090	.045	.090	.037	581.50	997.50
.005612	33.	33.	33.	2	0	1	0.00	5.00	1002.50

3470 ENCROACHMENT STATIONS= 991.0 1009.0 TYPE= 1 TARGET= 18.000

4255.00	5.88	587.38	0.00	0.00	587.43	.05	.02	.05	587.40
100.	0.	100.	0.	0.	55.	0.	67.	40.	100000.00
6.83	0.00	1.82	0.00	.090	.045	.090	.037	581.50	991.03
.000946	10.	10.	10.	2	0	1	0.00	17.93	1008.97

3470 ENCROACHMENT STATIONS= 700.0 1300.0 TYPE= 1 TARGFT= 600.000

5310.00	5.87	587.47	0.00	0.00	587.47	.00	.02	.02	585.90
100.	46.	17.	38.	674.	87.	587.	64.	48.	585.10
10.19	.07	.19	.06	.090	.045	.090	.038	581.60	700.00
.000006	1055.	1055.	1055.	3	0	1	0.00	600.00	1300.00

3280 CROSS SECTION 6364.00 EXTENDED .18 FEET

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3470 ENCROACHMENT STATIONS=      990.0     1030.0  TYPE=      1  TARGET=      40.000

                    VS-13 D.S. FROM TOWER ROAD BRIDGE

  6364.00      5.28   587.48      0.00      0.00   587.49       .02       .02       .01   587.20
      85.        1.      79.        5.        3.      74.       10.      101.       56.   586.30
   10.47       .20     1.07       .47      .070     .060      .070      .042   582.20   990.00
  .000399     1054.   1054.     1054.         2        0         1      0.00     40.00  1030.00

   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

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      588.40 ELREA=      588.40

                    BS-14 TOWER ROAD BRIDGE

  6414.00      5.09   587.49      0.00      0.00   587.53       .04       .02       .01   583.90
      85.        0.      85.        0.        0.      56.        0.      101.       56.   583.30
   10.48      0.00     1.52      0.00      .070     .060      .070      .042   582.40  1000.00
  .000644       50.     50.       50.         0        0         1      0.00     12.00  1016.10

SPECIAL BRIDGE

SB  XK        XKOR      COEQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     0.00      2.20      3.00      0.00     12.00      0.00     50.00      0.00    582.40    582.40

PRESSURE FLOW

  EGPRS     EGLWC     H3        QWEIR     QPR       BAREA     ELLC      ELTRD     CLASS

  587.59    587.53    0.00        0.       85.       50.     587.00    588.00     10.00

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      588.40 ELREA=      588.40

  6447.00      5.15   587.55      0.00      0.00   587.59       .03       .06      0.00   583.90
      85.        0.      85.        0.        0.      57.        0.      101.       56.   583.30
   10.49      0.00     1.49      0.00      .070     .060      .070      .043   582.40  1000.00
  .000616       33.     33.       33.         2        0         1      0.00     12.00  1016.17

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      588.40 ELREA=      588.40

  6457.00      5.18   587.58      0.00      0.00   587.60       .02       .01       .00   588.40
      85.        0.      85.        0.        0.      74.        0.      101.       56.   588.40
   10.49      0.00     1.16      0.00      .070     .060      .070      .043   582.40   995.92
  .000487       10.     10.       10.         1        0         1      0.00     20.26  1016.19

  6784.00      4.02   587.82      0.00      0.00   587.87       .04       .26       .01   589.30
      85.        0.      85.        0.        0.      50.        0.      102.       56.   589.60
   10.55      0.00     1.70      0.00      .070     .060      .070      .043   583.80  1002.36
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.001495     327.     327.     327.        2        0        1     0.00    19.01  1021.31

7110.00     3.56   588.56     0.00     0.00   588.65      .09      .76      .02   591.10
    85.       0.       85.      0.       0.      35.       0.     102.      56.    591.60
  10.58     0.00     2.45     0.00     .070     .060     .070     .044   585.00  1005.09
.004074     326.     326.     326.        2        0        1     0.00    16.22  1021.31

7437.00     3.56   589.86     0.00     0.00   589.96      .09     1.31      .00   592.90
    85.       0.       85.      0.       0.      35.       0.     102.      56.    593.70
  10.62     0.00     2.42     0.00     .070     .060     .070     .045   586.30  1005.87
.003915     327.     327.     327.        2        0        1     0.00    16.27  1022.13

 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

7763.00     3.52   591.12     0.00     0.00   591.21      .09     1.26      .00   594.70
    85.       0.       85.      0.       0.      36.       0.     103.      56.    595.80
  10.66     0.00     2.39     0.00     .070     .060     .070     .046   587.60  1006.71
.003789     326.     326.     326.        2        0        1     0.00    16.28  1022.98

8090.00     3.37   592.37     0.00     0.00   592.46      .09     1.25      .00   596.60
    85.       0.       85.      0.       0.      35.       0.     103.      56.    597.90
  10.70     0.00     2.40     0.00     .070     .060     .070     .046   589.00  1007.64
.003832     327.     327.     327.        1        0        1     0.00    16.20  1023.83

OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA=      598.40 ELREA=      599.90

                    VS-15 D.S. FROM M-13 BRIDGE

8417.00     2.83   593.13     0.00     0.00   593.13      .00      .65      .03   598.40
    11.       0.       11.      0.       0.      23.       0.     103.      56.    599.90
  10.89     0.00      .47     0.00     .090     .060     .090     .047   590.30  1010.02
.000196     327.     327.     327.        2        0        1     0.00    13.27  1023.30

8450.00     2.43   593.13     0.00     0.00   593.14      .01      .01      .00   600.90
    11.       0.       11.      0.       0.      16.       0.     103.      56.    601.90
  10.90     0.00      .67     0.00     .090     .060     .090     .047   590.70  1010.10
.000469      33.      33.      33.        2        0        1     0.00    10.36  1020.45

8483.00     1.95   593.15     0.00     0.00   593.17      .01      .02      .00   603.40
    11.       0.       11.      0.       0.      12.       0.     103.      56.    603.90
  10.91     0.00      .95     0.00     .090     .060     .090     .047   591.20  1008.41
.001184      33.      33.      33.        0        0        1     0.00     8.39  1016.79

OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA=      605.90 ELREA=      605.90

8517.00     1.60   593.20     0.00     0.00   593.26      .06      .07      .02   591.60
    11.       0.       11.      0.       0.       6.       0.     103.      56.    591.90
  10.92     0.00     1.90     0.00     .120     .060     .120     .047   591.60   200.00
.003823      34.      34.      34.        2        0        1     0.00     4.00   205.39
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NORMAL BRIDGE,NRD= 6 MIN ELTRD= 605.90 MAX ELLC= 595.40

BS-16 M-13 BRIDGE

8518.00	1.60	593.20	0.00	0.00	593.26	.06	.00	.00	605.90
11.	0.	11.	0.	0.	6.	0.	103.	56.	605.90
10.92	0.00	1.89	0.00	.110	.035	.120	.047	591.60	200.00
.002510	1.	1.	1.	0	0	1	0.00	4.00	204.00

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

NORMAL BRIDGE,NRD= 6 MIN ELTRD= 605.90 MAX ELLC= 595.40

8628.00	1.84	593.44	0.00	0.00	593.48	.04	.22	.00	605.90
11.	0.	11.	0.	0.	7.	0.	103.	56.	605.90
10.94	0.00	1.62	0.00	.110	.035	.120	.047	591.60	200.00
.001647	110.	110.	110.	2	0	1	0.00	4.00	204.00

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 605.90 ELREA= 605.90

8629.00	1.85	593.45	0.00	0.00	593.49	.04	.00	.00	591.60
11.	0.	11.	0.	0.	7.	0.	103.	56.	591.90
10.94	0.00	1.62	0.00	.120	.060	.120	.047	591.60	200.00
.002329	1.	1.	1.	0	0	1	0.00	4.00	205.66

8645.00	1.90	593.50	0.00	0.00	593.53	.02	.03	.00	605.90
11.	0.	11.	0.	0.	9.	0.	103.	56.	605.90
10.94	0.00	1.25	0.00	.120	.060	.120	.047	591.60	198.80
.002275	15.	15.	15.	2	0	1	0.00	6.00	204.80

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLFA= 599.30 ELREA= 599.10

VS-17 U.S. FROM M-13 BRIDGE

9300.00	.74	597.24	0.00	0.00	597.34	.11	3.78	.04	599.30
11.	0.	11.	0.	0.	4.	0.	103.	57.	599.10
11.01	0.00	2.61	0.00	.120	.060	.120	.048	596.50	786.69
.034613	655.	655.	655.	3	0	1	0.00	9.77	796.45

SUMMARY PRINTOUT FOR MULTIPLE PROFILES

ER TWP. BAY CO

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TOPWID	STENCL	STENCR	EG	HV	VCH
500.00	500.00	0.00	0.00	579.20	100.00	581.90	23.04	900.00	1100.00	581.99	.09	2.43
550.00	50.00	0.00	0.00	579.00	100.00	581.99	23.17	900.00	1100.00	582.07	.08	2.26
573.00	23.00	0.00	0.00	577.90	100.00	581.93	6.00	0.00	0.00	582.21	.28	4.26
574.00	1.00	585.00	582.60	577.90	100.00	581.92	6.00	0.00	0.00	582.22	.30	4.38
594.00	20.00	585.00	582.60	578.30	100.00	581.96	6.00	0.00	0.00	582.31	.35	4.77
595.00	1.00	0.00	0.00	578.30	100.00	582.00	6.00	0.00	0.00	582.32	.32	4.57
605.00	10.00	0.00	0.00	578.40	100.00	582.34	17.80	0.00	0.00	582.41	.07	2.20
627.00	22.00	0.00	0.00	578.70	100.00	582.15	5.00	0.00	0.00	582.69	.53	5.85
653.00	26.00	584.40	582.20	578.70	100.00	583.43	5.00	0.00	0.00	583.71	.28	4.26
663.00	10.00	0.00	0.00	578.80	100.00	583.76	24.87	0.00	0.00	583.80	.04	1.54
688.00	25.00	0.00	0.00	579.10	100.00	583.75	9.00	0.00	0.00	583.85	.10	2.54
712.00	24.00	584.90	581.90	579.10	100.00	584.26	9.00	0.00	0.00	584.34	.08	2.27
730.00	18.00	0.00	0.00	579.50	100.00	584.33	23.85	488.00	512.00	584.37	.03	1.48
769.00	39.00	584.40	582.70	579.50	100.00	584.76	24.00	488.00	512.00	584.79	.03	1.37
778.00	9.00	0.00	0.00	579.50	100.00	584.77	214.00	300.00	514.00	584.79	.02	1.77
802.00	24.00	584.40	583.70	579.50	100.00	584.77	214.00	300.00	514.00	584.79	.02	1.75
812.00	10.00	0.00	0.00	579.50	100.00	584.79	214.00	300.00	514.00	584.80	.01	.98
988.00	176.00	0.00	0.00	579.80	100.00	584.80	1260.03	815.00	2150.00	584.80	.00	.31
1005.00	17.00	0.00	0.00	578.60	100.00	584.80	1256.39	815.00	2150.00	584.80	.00	.48
1006.00	1.00	583.70	581.90	578.60	100.00	584.80	1256.40	815.00	2150.01	584.80	.00	.23
1026.00	20.00	583.70	581.90	578.60	100.00	584.80	1256.51	815.00	2150.01	584.80	.00	.23
1027.00	1.00	0.00	0.00	578.60	100.00	584.80	1256.52	815.00	2150.01	584.81	.00	.48
1037.00	10.00	0.00	0.00	578.60	100.00	584.80	1256.58	815.00	2150.00	584.81	.00	.31
1198.00	161.00	0.00	0.00	579.70	100.00	584.81	1329.80	660.00	2000.00	584.81	.00	.16
1217.00	19.00	0.00	0.00	579.70	100.00	584.81	1329.80	660.00	2000.00	584.81	.00	.24
1218.00	1.00	584.30	583.20	579.70	100.00	584.81	1329.80	660.00	2000.01	584.81	.00	.11
1236.00	18.00	584.30	583.20	579.70	100.00	584.81	1329.80	660.00	2000.01	584.81	.00	.11
1237.00	1.00	0.00	0.00	579.70	100.00	584.81	1329.80	660.00	2000.01	584.81	.00	.24

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TOPWID	STENCL	STENCR	EG	HV	VCH
1247.00	10.00	0.00	0.00	580.10	100.00	584.81	1329.80	660.00	2000.00	584.81	.00	.16
1324.00	77.00	0.00	0.00	579.20	100.00	584.81	1328.56	660.00	2000.00	584.81	.00	.17
1344.00	20.00	0.00	0.00	579.20	100.00	584.81	1328.57	660.00	2000.00	584.81	.00	.26
1345.00	1.00	584.40	582.80	579.20	100.00	584.81	1328.57	660.00	2000.01	584.81	.00	.12
1375.00	30.00	584.40	582.80	579.20	100.00	584.81	1328.57	660.00	2000.01	584.81	.00	.12
1376.00	1.00	0.00	0.00	579.20	100.00	584.81	1328.57	660.00	2000.01	584.81	.00	.26
1386.00	10.00	0.00	0.00	579.20	100.00	584.81	1328.57	660.00	2000.00	584.81	.00	.17
1554.00	168.00	0.00	0.00	579.80	100.00	584.81	1334.30	660.00	2000.00	584.81	.00	.17
1579.00	25.00	0.00	0.00	579.80	100.00	584.81	1334.30	660.00	2000.00	584.81	.00	.24
1580.00	1.00	584.20	583.80	579.80	100.00	584.81	1334.30	660.00	2000.01	584.81	.00	.12
1604.00	24.00	584.20	583.80	579.80	100.00	584.81	1334.30	660.00	2000.01	584.81	.00	.12
1605.00	1.00	0.00	0.00	579.80	100.00	584.81	1334.30	660.00	2000.01	584.81	.00	.24
1615.00	10.00	0.00	0.00	579.80	100.00	584.81	1334.30	660.00	2000.00	584.81	.00	.17
1966.00	351.00	0.00	0.00	580.20	100.00	584.81	1340.00	660.00	2000.00	584.81	.00	.16
1991.00	25.00	0.00	0.00	580.20	100.00	584.81	1340.00	660.00	2000.00	584.81	.00	.22
1992.00	1.00	584.30	584.10	580.20	100.00	584.81	1340.00	660.00	2000.01	584.81	.00	.12
2012.00	20.00	584.30	584.10	580.20	100.00	584.81	1340.00	660.00	2000.01	584.81	.00	.12
2013.00	1.00	0.00	0.00	580.20	100.00	584.81	1340.00	660.00	2000.01	584.81	.00	.22
2023.00	10.00	0.00	0.00	580.20	100.00	584.81	1340.00	660.00	2000.00	584.81	.00	.16
2056.00	33.00	0.00	0.00	580.50	100.00	584.81	1334.34	660.00	2000.00	584.81	.00	.17
2071.00	15.00	0.00	0.00	580.80	100.00	584.81	1334.34	660.00	2000.00	584.81	.00	.15
2072.00	1.00	584.50	583.60	580.80	100.00	584.81	1334.34	660.00	2000.00	584.81	.00	.09
2094.00	22.00	584.50	583.60	580.80	100.00	584.81	1334.34	660.00	2000.01	584.81	.00	.08
2095.00	1.00	0.00	0.00	580.80	100.00	584.81	1334.34	660.00	2000.01	584.81	.00	.16
2106.00	11.00	0.00	0.00	581.10	100.00	584.81	340.26	570.00	1600.00	584.81	.00	.71
2107.00	1.00	582.40	584.20	581.10	100.00	584.81	332.96	570.00	1600.00	584.81	.00	.36
2133.00	26.00	582.40	584.20	581.10	100.00	584.81	333.07	570.00	1600.01	584.81	.00	.36
2134.00	1.00	0.00	0.00	581.10	100.00	584.81	340.37	570.00	1600.00	584.81	.00	.62

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TOPWID	STENCL	STENCR	EG	HV	VCH
2144.00	10.00	0.00	0.00	581.10	100.00	584.81	340.42	570.00	1600.00	584.81	.00	.43
2308.00	164.00	0.00	0.00	579.80	100.00	584.81	17.03	0.00	0.00	584.85	.04	1.66
2358.00	50.00	0.00	0.00	579.80	100.00	584.80	7.00	1000.00	1007.00	584.93	.13	2.86
2376.00	18.00	585.30	583.20	579.80	100.00	585.18	7.00	1000.00	1007.00	585.29	.11	2.65
2386.00	10.00	0.00	0.00	579.80	100.00	585.29	17.97	996.00	1014.00	585.32	.03	1.46
3710.00	1324.00	0.00	0.00	580.80	100.00	585.65	103.31	900.00	1300.00	585.68	.02	1.25
3760.00	50.00	0.00	0.00	580.30	100.00	585.57	5.00	0.00	0.00	585.82	.25	4.01
3802.00	42.00	586.80	584.80	580.30	100.00	586.14	5.00	0.00	0.00	586.34	.20	3.60
3812.00	10.00	0.00	0.00	580.30	100.00	586.36	22.77	988.00	1012.00	586.40	.04	1.54
4162.00	350.00	0.00	0.00	580.80	100.00	586.47	40.00	989.00	1029.00	586.49	.01	1.04
4212.00	50.00	0.00	0.00	581.50	100.00	586.35	5.00	0.00	0.00	586.64	.29	4.29
4245.00	33.00	588.50	585.80	581.50	100.00	587.16	5.00	997.50	1002.50	587.36	.21	3.66
4255.00	10.00	0.00	0.00	581.50	100.00	587.38	17.93	991.00	1009.00	587.43	.05	1.82
5310.00	1055.00	0.00	0.00	581.60	100.00	587.47	600.00	700.00	1300.00	587.47	.00	.19
6364.00	1054.00	0.00	0.00	582.20	85.00	587.48	40.00	990.00	1030.00	587.49	.02	1.07
6414.00	50.00	0.00	0.00	582.40	85.00	587.49	12.00	0.00	0.00	587.53	.04	1.52
6447.00	33.00	588.00	587.00	582.40	85.00	587.55	12.00	0.00	0.00	587.59	.03	1.49
6457.00	10.00	0.00	0.00	582.40	85.00	587.58	20.26	0.00	0.00	587.60	.02	1.16
6784.00	327.00	0.00	0.00	583.80	85.00	587.82	19.01	0.00	0.00	587.87	.04	1.70
7110.00	326.00	0.00	0.00	585.00	85.00	588.56	16.22	0.00	0.00	588.65	.09	2.45
7437.00	327.00	0.00	0.00	586.30	85.00	589.86	16.27	0.00	0.00	589.96	.09	2.42
7763.00	326.00	0.00	0.00	587.60	85.00	591.12	16.28	0.00	0.00	591.21	.09	2.39
8090.00	327.00	0.00	0.00	589.00	85.00	592.37	16.20	0.00	0.00	592.46	.09	2.40
8417.00	327.00	0.00	0.00	590.30	11.00	593.13	13.27	0.00	0.00	593.13	.00	.47
8450.00	33.00	0.00	0.00	590.70	11.00	593.13	10.36	0.00	0.00	593.14	.01	.67
8483.00	33.00	0.00	0.00	591.20	11.00	593.15	8.39	0.00	0.00	593.17	.01	.95
8517.00	34.00	0.00	0.00	591.60	11.00	593.20	4.00	0.00	0.00	593.26	.06	1.90
8518.00	1.00	605.90	595.40	591.60	11.00	593.20	4.00	0.00	0.00	593.26	.06	1.89

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSFL	TOPWID	STENCL	STENCR	EG	HV	VCH
8628.00	110.00	605.90	595.40	591.60	11.00	593.44	4.00	0.00	0.00	593.48	.04	1.62
8629.00	1.00	0.00	0.00	591.60	11.00	593.45	4.00	0.00	0.00	593.49	.04	1.62
8645.00	15.00	0.00	0.00	591.60	11.00	593.50	6.00	0.00	0.00	593.53	.02	1.25
9300.00	655.00	0.00	0.00	596.50	11.00	597.24	9.77	0.00	0.00	597.34	.11	2.61

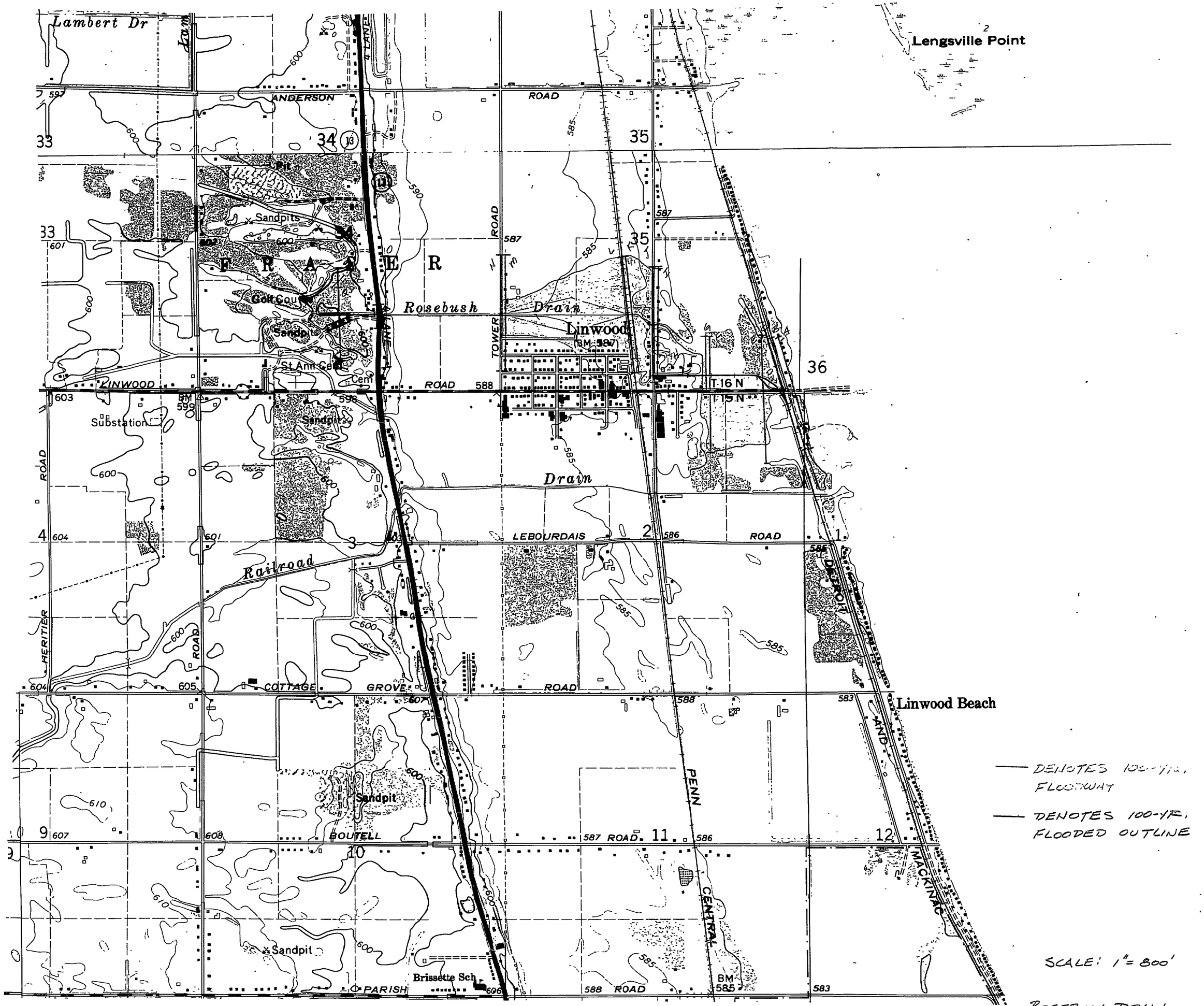
SECTION NUMBER	DISCHARGE CFS	CWSEL	CWSEL DIFF EACH Q	CWSEL DIFF EACH SECTION	CWSEL-WSELK	TOPWID	T.W. DIFF	LENGTH
500.000	100.000	581.900	0.000	0.000	0.000	23.035	0.000	500.000
550.000	100.000	581.988	0.000	.088	0.000	23.174	0.000	50.000
573.000	100.000	581.929	0.000	-.058	0.000	6.000	0.000	23.000
574.000	100.000	581.924	0.000	-.005	0.000	6.000	0.000	1.000
594.000	100.000	581.957	0.000	.033	0.000	6.000	0.000	20.000
595.000	100.000	581.999	0.000	.042	0.000	6.000	0.000	1.000
605.000	100.000	582.338	0.000	.339	0.000	17.799	0.000	10.000
627.000	100.000	582.154	0.000	-.184	0.000	5.000	0.000	22.000
653.000	100.000	583.433	0.000	1.279	0.000	5.000	0.000	26.000
663.000	100.000	583.760	0.000	.328	0.000	24.873	0.000	10.000
688.000	100.000	583.746	0.000	-.015	0.000	9.000	0.000	25.000
712.000	100.000	584.264	0.000	.519	0.000	9.000	0.000	24.000
730.000	100.000	584.334	0.000	.070	0.000	23.850	0.000	18.000
769.000	100.000	584.762	0.000	.428	0.000	23.999	0.000	39.000
778.000	100.000	584.767	0.000	.005	0.000	213.999	0.000	9.000
802.000	100.000	584.768	0.000	.001	0.000	213.999	0.000	24.000
812.000	100.000	584.786	0.000	.018	0.000	213.999	0.000	10.000
988.000	100.000	584.804	0.000	.018	0.000	1260.034	0.000	176.000
1005.000	100.000	584.804	0.000	.000	0.000	1256.394	0.000	17.000
1006.000	100.000	584.804	0.000	.001	0.000	1256.400	0.000	1.000
1026.000	100.000	584.805	0.000	.000	0.000	1256.514	0.000	20.000
1027.000	100.000	584.804	0.000	-.000	0.000	1256.521	0.000	1.000
1037.000	100.000	584.805	0.000	.000	0.000	1256.577	0.000	10.000
1198.000	100.000	584.806	0.000	.001	0.000	1329.796	0.000	161.000
1217.000	100.000	584.806	0.000	.000	0.000	1329.793	0.000	19.000
1218.000	100.000	584.806	0.000	.000	0.000	1329.799	0.000	1.000

1236.000	100.000	584.806	0.000	.000	0.000	1329.801	0.000	18.000
1237.000	100.000	584.806	0.000	-.000	0.000	1329.901	0.000	1.000
1247.000	100.000	584.806	0.000	.000	0.000	1329.801	0.000	10.000
1324.000	100.000	584.807	0.000	.000	0.000	1328.564	0.000	77.000
1344.000	100.000	584.807	0.000	.000	0.000	1328.565	0.000	20.000
1345.000	100.000	584.807	0.000	.000	0.000	1328.567	0.000	1.000
1375.000	100.000	584.807	0.000	.000	0.000	1328.569	0.000	30.000
1376.000	100.000	584.807	0.000	-.000	0.000	1328.569	0.000	1.000
1386.000	100.000	584.807	0.000	.000	0.000	1328.568	0.000	10.000
1554.000	100.000	584.808	0.000	.001	0.000	1334.296	0.000	168.000
1579.000	100.000	584.808	0.000	.000	0.000	1334.297	0.000	25.000
1580.000	100.000	584.808	0.000	.000	0.000	1334.299	0.000	1.000
1604.000	100.000	584.808	0.000	.000	0.000	1334.301	0.000	24.000
1605.000	100.000	584.808	0.000	-.000	0.000	1334.301	0.000	1.000
1615.000	100.000	584.808	0.000	.000	0.000	1334.301	0.000	10.000
1966.000	100.000	584.809	0.000	.001	0.000	1339.999	0.000	351.000
1991.000	100.000	584.809	0.000	.000	0.000	1339.999	0.000	25.000
1992.000	100.000	584.809	0.000	.000	0.000	1340.000	0.000	1.000
2012.000	100.000	584.810	0.000	.000	0.000	1340.000	0.000	20.000
2013.000	100.000	584.810	0.000	-.000	0.000	1340.000	0.000	1.000
2023.000	100.000	584.810	0.000	.000	0.000	1339.999	0.000	10.000
2056.000	100.000	584.810	0.000	.000	0.000	1334.335	0.000	33.000
2071.000	100.000	584.810	0.000	.000	0.000	1334.337	0.000	15.000
2072.000	100.000	584.810	0.000	.000	0.000	1334.337	0.000	1.000
2094.000	100.000	584.810	0.000	.000	0.000	1334.340	0.000	22.000
2095.000	100.000	584.810	0.000	-.000	0.000	1334.340	0.000	1.000
2106.000	100.000	584.809	0.000	-.001	0.000	340.255	0.000	11.000
2107.000	100.000	584.811	0.000	.002	0.000	332.954	0.000	1.000
2133.000	100.000	584.812	0.000	.001	0.000	333.067	0.000	26.000
2134.000	100.000	584.812	0.000	-.000	0.000	340.373	0.000	1.000
2144.000	100.000	584.813	0.000	.001	0.000	340.417	0.000	10.000
2308.000	100.000	584.805	0.000	-.008	0.000	17.030	0.000	164.000
2358.000	100.000	584.798	0.000	-.007	0.000	6.999	0.000	50.000

2376.000	100.000	585.182	0.000	.384	0.000	6.999	0.000	18.000
2386.000	100.000	585.287	0.000	.105	0.000	17.972	0.000	10.000
3710.000	100.000	585.653	0.000	.366	0.000	108.308	0.000	1324.000
3760.000	100.000	585.573	0.000	-.080	0.000	5.000	0.000	50.000
3802.000	100.000	586.141	0.000	.568	0.000	5.000	0.000	42.000
3812.000	100.000	586.365	0.000	.224	0.000	22.775	0.000	10.000
4162.000	100.000	586.471	0.000	.106	0.000	39.999	0.000	350.000
4212.000	100.000	586.354	0.000	-.117	0.000	5.000	0.000	50.000
4245.000	100.000	587.157	0.000	.803	0.000	4.999	0.000	33.000
4255.000	100.000	587.379	0.000	.222	0.000	17.933	0.000	10.000
5310.000	100.000	587.467	0.000	.087	0.000	599.999	0.000	1055.000
6364.000	85.000	587.475	0.000	.008	0.000	39.999	0.000	1054.000
6414.000	85.000	587.491	0.000	.016	0.000	12.000	0.000	50.000
6447.000	85.000	587.555	0.000	.064	0.000	12.000	0.000	33.000
6457.000	85.000	587.578	0.000	.024	0.000	20.263	0.000	10.000
6784.000	85.000	587.824	0.000	.246	0.000	19.008	0.000	327.000
7110.000	85.000	588.555	0.000	.731	0.000	16.222	0.000	326.000
7437.000	85.000	589.864	0.000	1.309	0.000	16.268	0.000	327.000
7763.000	85.000	591.122	0.000	1.258	0.000	16.275	0.000	326.000
8090.000	85.000	592.368	0.000	1.246	0.000	16.196	0.000	327.000
8417.000	11.000	593.127	0.000	.759	0.000	13.271	0.000	327.000
8450.000	11.000	593.134	0.000	.008	0.000	10.358	0.000	33.000
8483.000	11.000	593.154	0.000	.020	0.000	8.387	0.000	33.000
8517.000	11.000	593.200	0.000	.046	0.000	4.000	0.000	34.000
8518.000	11.000	593.203	0.000	.003	0.000	4.000	0.000	1.000
8628.000	11.000	593.443	0.000	.240	0.000	4.000	0.000	110.000
8629.000	11.000	593.445	0.000	.002	0.000	4.000	0.000	1.000
8645.000	11.000	593.501	0.000	.056	0.000	5.997	0.000	15.000
9300.000	11.000	597.237	0.000	3.735	0.000	9.768	0.000	655.000

DATA FOR LAST CROSS SECTION

PROFILE	TYPE ENC	TARGET	TOP WIDTH AREA-ACRES	TOP WIDTH AREA-DIFF
1	0.000	0.000	56.582	0.000


Lambert Dr
Lam
Lengsville Point
ANDERSON
ROAD
33
34
35
36
Pit
Sandpits
F R A S E R
Golf Cou
Rosebush
Drain
Linwood
(BM 587)
TOWER
ROAD
St Ann Cem
Cem
LINWOOD
ROAD
588
T 16 N
T 15 N
BM
599
Substation
Sandpits
Drain
LEBOURDAIS
ROAD
Railroad
DETROIT
HERITIER
ROAD
COTTAGE
GROVE
ROAD
Linwood Beach
AND
PENN
CENTRAL
Sandpit
BOUTELL
ROAD
MACKINAC
Sandpit
Brissette Sch
PARISH
ROAD
BM
585
DENOTES 100-YR. FLOODWAY
DENOTES 100-YR. FLOODED OUTLINE
SCALE: 1" = 800'
ROSEBUSH DRAIN

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Fraser Twp

3) WATERCOURSE: Tebo Drain

4) DOCUMENT TYPE: 100-YR NATURAL

00BREAK00

```
C
C      17
C      40              VS-1 AT D.N.R. PUBLIC ACCESS
C    2850              VS-2 AT N.S. 1/4 LINE - SECTION 12
C    3563              BS-2A FARM HOUSE BRIDGE - 24FT. OF TWIN 7' X 14' BOX CULVERT
C    3563              WITH ENDS FLUSH WITH HEADWALL
C    5353              VS-3  D.S. FROM TOWER BEACH ROAD BRIDGE
C    5453              BS-4  TOWER BEACH ROAD DOUBLE BOX CULVERT - 40FT. OF TWIN
C    5453              7' X 14' BOX CULVERT WITH ENDS FLUSH WITH HEADWALL
C    7686              VS-5  D.S. FROM DETROIT @ MACKINAW R.R.
C    7736              BS-6 DETROIT @ MACKINAW R.R. BRIDGE
C    8177              VS-7 D.S. FROM OLD STATE ROAD BRIDGE
C    8227              BS-8 OLD STATE ROAD BRIDGE
C    9954              VS-9 D.S. FROM KAISER ROAD BRIDGE
C    9974              BS-10 KAISER ROAD BRIDGE
C   10097              BS-11 PENN CENTRAL R.R. BRIDGE
C   10312              VS-12 U.S. FROM PENN CENTRAL R.R.
C   11295              VS-13 D.S. FROM M-13 BRIDGE
C   11344              BS-14 M-13 BRIDGE
T1   TEBO DRAIN
T2   10 YEAR FLOOD
T3   FRASER TWP. BAY CO.
J1    -10      2                                                    581.9
J2      1             -1
J3      1     34       3       4      36      27      28
NC    .07    .05    .035      .3      .5
QT      4    645     905    1040    1290
X1     40     26     939    1000      40      40      40
GR  583.8      0   584.6     100   583.9     200   584.4     300   587.1     400
GR  587.1    500   585.8     600   586.4     700   586.8     800   587.0     900
GR  587.8    939   580.8     945   578.8     952   577.1     960   577.0     970
GR  577.0    980   578.8     986   581.8     993   586.2    1000   585.5    1100
GR  585.3   1200   584.7    1300   586.1    1400   584.9    1450   583.6    1455
GR  585.0   1465
NC    .09    .09    .035
X1    340                      300     300     300
X3                     939            1000
X1    640     11     500     564     300     300     300
X3                     200             850
GR  584.0      0   583.5     100   583.5     500   581.1     506   577.4     522
GR  577.2    531   577.2     538   578.6     547   583.5     552   583.5     564
GR  584.0   1100
X1   1770     27     950    1000    1130    1130    1130
X3     10                    950                            584.9   586.6
GR  585.0      0   585.0     100   585.0     200   585.0     300   585.0     400
GR  585.0    500   584.8     600   584.8     700   584.8     800   584.8     900
GR  584.9    950   578.6     963   577.6     975   578.6     987   586.6    1000
GR  586.3   1022   583.9    1027   583.4    1100   583.2    1200   583.5    1300
GR  583.4   1400   583.4    1500   583.6    1600   583.5    1700   583.6    1800
GR  583.6   1900   583.5    2000
NC    .05    .05    .035
X1   2850     29     956    1000    1080    1080    1080
X3     10                                            583.9   586.8
GR  584.5      0   584.3     100   584.3     200   584.2     300   584.1     400
GR  584.2    500   584.1     600   583.8     700   584.7     800   584.2     900
GR  583.9    956   579.7     962   578.2     968   577.8     976   578.4     985
GR  580.8    993   586.8    1000   586.5    1022   583.9    1027   583.4    1100
GR  583.2   1200   583.5    1300   583.4    1400   583.4    1500   583.6    1600
GR  583.5   1700   583.6    1800   583.6    1900   583.5    2000
X1   3513     13     994    1034     663     663     663
X3                                           1034
GR  584.0      0   585.8     800   585.9     900   586.2     988   586.2     994
GR  577.4   1000   577.8  1029.5   587.8    1034   587.6    1054   585.7    1062
GR  585.9   1100   585.8    1200   585.0    2000
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X1   3562      13    1000  1029.5      49      49      49
X3                                   1029.5
GR  584.0       0   585.8     800   585.9     900   586.2     988   586.2     994
GR  577.4    1000   577.8  1029.5   587.8    1034   587.6    1054   585.7    1062
GR  585.9    1100   585.8    1200   585.0    2000
NC    .06     .06    .025
X1   3563      16    1000  1029.5       1       1       1
X3                                   1029.5
BT      5       0   584.0            800   585.8             900   585.9
BT   1000   587.5   584.4  1029.5   587.8   584.4
GR  584.0       0   585.8     800   585.9     900   587.5    1000   577.4    1000
GR  577.9    1014   584.4    1014   584.4  1015.5   577.9  1015.5   577.8  1029.5
GR  587.8  1029.5   587.6    1054   585.7    1062   585.9    1100   585.8    1200
GR  585.0    2000
X1   3587                                 24      24      24
X2                                                   1
X3                                   1029.5
NC    .05     .05    .035
X1   3588      13    1000  1029.5       1       1       1
X3                                   1029.5
GR  584.0       0   585.8     800   585.9     900   586.2     988   586.2     994
GR  577.4    1000   577.8  1029.5   587.8    1034   587.6    1054   585.7    1062
GR  585.9    1100   585.8    1200   585.0    2000
X1   3608      13     994    1034      20      20      20
X3                                   1034
GR  584.0       0   585.8     800   585.9     900   586.2     988   586.2     994
GR  577.4    1000   577.8  1029.5   587.8    1034   587.6    1054   585.7    1062
GR  585.9    1100   585.8    1200   585.0    2000
X1   4507      25    1000    1050     899     899     899
X3     10                    200            1050            585.3   587.4
GR  585.5       0   585.4     100   585.3     200   585.2     300   585.1     400
GR  584.9     500   585.0     600   585.1     700   585.3     800   585.6     900
GR  585.9    1000   579.0    1020   578.0    1025   579.0    1030   587.4    1050
GR  585.0    1100   584.9    1200   584.8    1300   584.6    1400   584.4    1500
GR  584.2    1600   583.9    1700   583.9    1800   583.9    1900   584.0    2000
NC    .05     .06    .035
X1   5353      28    1000    1063     846     846     846
X3                              400            1063
GR  584.8       0   585.8     100   585.9     200   585.7     300   585.7     400
GR  585.6     500   585.4     600   585.5     700   585.4     800   585.3     900
GR  585.7    1000   581.7    1004   579.0    1010   578.6    1014   578.8    1022
GR  586.8    1036   587.0    1063   584.9    1071   584.9    1100   584.6    1200
GR  584.6    1300   584.2    1400   584.2    1500   583.9    1600   584.1    1700
GR  583.8    1800   583.8    1900   583.8    2000
X1   5452      26     995  1024.5      99      99      99
X3                              400          1024.5
GR  586.3       0   586.4     100   586.5     200   586.1     300   586.1     400
GR  585.9     500   586.0     600   585.9     700   585.8     800   586.0     900
GR  587.7     978   579.0     995   578.2    1009   578.2  1010.5   578.3  1024.5
GR  587.5    1040   587.3    1100   586.9    1200   586.5    1300   586.1    1400
GR  585.8    1500   585.9    1600   585.7    1700   585.7    1800   585.7    1900
GR  585.5    2000
NC    .05     .05    .025
*X1  5453      28     995  1024.5       1       1       1
X3                              400          1024.5
BT      8     400   586.1       0     500   585.9       0     600   586.0       0
BT    700   585.9       0     800   585.8       0     900   586.0       0     995
BT   587.7   585.2  1024.5   587.5   585.2
GR  586.3       0   586.4     100   586.5     200   586.1     300   586.1     400
GR  585.9     500   586.0     600   585.9     700   585.8     800   586.0     900
GR  587.7     995   579.0     995   578.2    1009   585.2    1009   585.2  1010.5
GR  578.2  1010.5   578.3  1024.5   587.5  1024.5   587.3    1100   586.9    1200
GR  586.5    1300   586.1    1400   585.8    1500   585.9    1600   585.7    1700
GR  585.7    1800   585.7    1900   585.5    2000
X1   5493       0       0       0      40      40      40
X2                                                   1
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*ch = 1024.5 - 995 = 29.5

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X3                          400          1024.5
NC    .05      .05     .035
X1   5494       26      995   1024.5        1        1        1
X3                          400          1024.5
GR  586.3        0    586.4     100    586.5      200    586.1      300    586.1      400
GR  585.9      500    586.0     600    585.9      700    585.8      800    586.0      900
GR  587.7      978    579.0     995    578.2     1009    578.2   1010.5    578.3   1024.5
GR  587.5     1040    587.3    1100    586.9     1200    586.5     1300    586.1     1400
GR  585.8     1500    585.9    1600    585.7     1700    585.7     1800    585.7     1900
GR  585.5     2000
X1   5504       26      978    1040       10       10       10
X3                          400           1040
GR  586.3        0    586.4     100    586.5      200    586.1      300    586.1      400
GR  585.9      500    586.0     600    585.9      700    585.8      800    586.0      900
GR  587.7      978    579.0     995    578.2     1009    578.2   1010.5    578.3   1024.5
GR  587.5     1040    587.3    1100    586.9     1200    586.5     1300    586.1     1400
GR  585.8     1500    585.9    1600    585.7     1700    585.7     1800    585.7     1900
GR  585.5     2000
X1   6230       25      978    1023      726      726      726
X3                          650           1023
GR  587.0        0    587.0     100    587.0      200    587.0      300    587.0      400
GR  586.8      500    586.4     600    586.2      700    586.0      800    585.8      900
GR  585.5      978    580.5     985    579.8     1000    581.2     1015    589.5     1023
GR  588.7     1100    588.1    1200    587.9     1300    587.7     1400    587.5     1500
GR  587.8     1600    588.1    1700    587.8     1800    587.8     1900    587.6     2000
X1   6960       25      973    1028      730      730      730
X3                          850           1028
GR  588.9        0    589.1     100    589.4      200    589.0      300    589.6      400
GR  589.2      500    588.8     600    588.2      700    587.6      800    587.5      900
GR  587.3      973    582.0     985    581.5     1000    584.0     1015    591.6     1028
GR  590.2     1100    589.4    1200    589.2     1300    589.2     1400    589.3     1500
GR  589.7     1600    590.6    1700    589.9     1800    589.8     1900    589.6     2000
X1   7686       27      936    1000      726      726      726
X3     10                                                        592.4    593.6
GR  590.3        0    590.4     100    590.8      200    590.5      300    591.3      400
GR  590.8      500    592.0     600    591.8      700    591.4      800    591.7      900
GR  592.4      936    583.5     957    583.1      961    583.6      968    586.8      977
GR  586.9      988    593.6    1000    591.6     1100    590.6     1200    590.6     1300
GR  590.8     1400    591.0    1500    591.6     1600    593.0     1700    592.1     1800
GR  591.9     1900    591.7    2000
X1   7711                                 25       25       25
X3                          950           990
X1   7735       27   1001.7  1026.3       24       24       24
X3     10                                                        592.8    592.8
GR  594.8        0    594.9     100    594.9      200    594.9      300    595.0      400
GR  595.1      500    595.2     600    595.4      700    595.7      800    595.8      900
GR  595.9      982    585.9  1001.7    585.3     1006    584.3     1009    583.8     1017
GR  583.5   1026.3    595.9    1046    596.1     1100    596.0     1200    595.8     1300
GR  595.7     1400    595.5    1500    595.3     1600    595.1     1700    594.8     1800
GR  594.7     1900    594.6    2000
X1   7736       33   1001.7  1026.3        1        1        1
BT      4   1001.7    595.9    592.8   1001.7    595.9    592.8   1026.3    595.9    592.8
BT1026.3    595.9    592.8
GR  594.8       00    594.9     100    594.9      200    594.9      300    595.0      400
GR  595.1      500    595.2     600    595.4      700    595.7      800    595.8      900
GR  595.9     1000    595.9  1001.7    587.7  1001.7    587.7     1003    585.9     1003
GR  585.3     1006    584.3    1009    583.8     1017    583.5     1025    587.7     1025
GR  587.7   1026.3    595.9  1026.3    595.9     1028    596.1     1100    596.0     1200
GR  595.8     1300    595.7    1400    595.5     1500    595.3     1600    595.1     1700
GR  594.8     1800    594.7    1900    594.6     2000
X1   7746        0        0       0       10       10       10
X2                                                           1
X1   7747       27   1001.7  1026.3        1        1        1
X3     10                                                        592.8    592.8
GR  594.8        0    594.9     100    594.9      200    594.9      300    595.0      400
GR  595.1      500    595.2     600    595.4      700    595.7      800    595.8      900
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GR 595.9	982	585.9	1001.7	585.3	1006	584.3	1009	583.8	1017
GR 583.5	1026.3	595.9	1046	596.1	1100	596.0	1200	595.8	1300
GR 595.7	1400	595.5	1500	595.3	1600	595.1	1700	594.8	1800
GR 594.7	1900	594.6	2000						
X1 7757	27	982	1046	10	10	10			
X3			995		1033				
GR 594.8	0	594.9	100	594.9	200	594.9	300	595.0	400
GR 595.1	500	595.2	600	595.4	700	595.7	800	595.8	900
GR 595.9	982	585.9	1001.7	585.3	1006	584.3	1009	583.8	1017
GR 583.5	1026.3	595.9	1046	596.1	1100	596.0	1200	595.8	1300
GR 595.7	1400	595.5	1500	595.3	1600	595.1	1700	594.8	1800
GR 594.7	1900	594.6	2000						
NC .07	.07	.03							
X1 8177	11	200	271	420	420	420			
GR 600.3	0	600.3	73	598.2	100	593.5	158	593.3	200
GR 584.0	224	583.8	230	583.9	234	600.5	271	600.6	300
GR 601.3	400								
X1 8226	13	200	227.4	49	49	49			
X3 10							596.3	596.3	
GR 602.5	0	599.9	100	598.7	150	590.9	195	587.4	200
GR 584.1	207	584.2	224	584.5	227.4	592.1	235	600.5	272
GR 600.1	300	600.7	400	601.6	482				
NC .04	.04	.028							
X1 8227	15	200	227.4	1	1	1			
BT 4	200	598.7	596.2	200	598.7	596.2	227.4	599.0	596.3
BT 227.4	599.0	596.3							
GR 602.5	00	599.9	100	598.7	150	598.7	200	584.9	200
GR 584.3	205	584.0	210	584.1	215	583.9	220	584.2	225
GR 584.5	227.4	599.0	227.4	600.1	300	600.7	400	601.6	482
X1 8250	0	0	0	23	23	23			
X2						1			
NC .07	.07	.03							
X1 8251	13	200	227.4	1	1	1			
X3 10							596.3	596.3	
GR 602.5	0	599.9	100	598.7	150	590.9	195	587.4	200
GR 584.1	207	584.2	224	584.5	227.4	592.1	235	600.5	272
GR 600.1	300	600.7	400	601.6	482				
X1 8275	13	195	272	24	24	24			
GR 602.5	0	599.9	100	598.7	150	590.9	195	587.4	200
GR 584.1	207	584.2	224	584.5	227.4	592.1	235	600.5	272
GR 600.1	300	600.7	400	601.6	482				
X1 9115	9	140	210	840	840	840			
GR 600.0	0	599.0	100	598.1	140	585.6	165	584.6	175
GR 585.6	185	597.4	210	600.0	275	600.0	300		
X1 9954	10	300	369	839	839	839			
GR 601.2	0	601.0	100	599.0	200	598.1	300	586.1	330
GR 585.2	344	585.5	350	597.4	369	598.9	400	602.3	500
X1 9974	15	400	425.3	20	20	20			
X3 10							599.3	599.2	
GR 601.4	0	601.3	100	600.5	200	599.3	300	599.3	378
GR 585.6	400	585.6	406	585.6	412	585.8	413.3	585.9	419.3
GR 587.0	425.3	599.2	447	600.2	500	602.2	600	603.4	712
SB 1.25	1.63	2.8		25.3	1.3	164		585.6	585.6
X1 10016				42	42	42			
X2		1	592.7	599.0					
X3 10							599.3	599.2	
BT 17	0.0	601.4	0.0	100.0	601.3	0.0	200.0	600.5	0.0
BT 300	599.3		378	599.3		400	599.0	585.6	400
BT 599.0	592.7	412	599.1	592.7	412	599.1	585.6	413.3	599.1
BT 585.8	413.3	599.1	592.7	425.3	599.2	592.7	425.3	599.2	587.0
BT 447	599.2		500	600.2		600	602.2		712
BT 603.4									
X1 10041	15	378	447	25	25	25			
GR 601.4	0	601.3	100	600.5	200	599.3	300	599.3	378
GR 585.6	400	585.6	406	585.6	412	585.8	413.3	585.9	419.3
GR 587.0	425.3	599.2	447	600.2	500	602.2	600	603.4	712

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X1 10071                                30      30      30
X3                        396           428
X1 10096     12     200     220      25      25      25
X3    10                                                599.9   599.9
GR 603.6      0   603.5     100   603.5     181   587.5     200   586.3     203
GR 585.4    209   586.2     213   589.0     216   590.1     220   603.6     236
GR 603.5    300   603.5     400
NC   .07    .05     .03
X1 10097     12     200     220       1       1       1
BT     4    200   603.6   599.9     200   603.6   599.9     220   603.6   599.9
BT   220  603.6   599.9
GR 603.6     00   603.5     100   603.6     200   587.5   200.5   586.3     203
GR 585.4    209   586.2     213   589.0     216   590.1   219.5   603.6     220
GR 603.5    300   603.5     400
X1 10112      0       0       0      15      15      15
X2                                                  1
NC   .07    .07     .03
X1 10113     12     200     220       1       1       1
X3    10                                                599.9   599.9
GR 603.6      0   603.5     100   603.5     181   587.5     200   586.3     203
GR 585.4    209   586.2     213   589.0     216   590.1     220   603.6     236
GR 603.5    300   603.5     400
X1 10135     12     181     236      22      22      22
GR 603.6      0   603.5     100   603.5     181   587.5     200   586.3     203
GR 585.4    209   586.2     213   589.0     216   590.1     220   603.6     236
GR 603.5    300   603.5     400
NC   .09    .09     .04
X1 10312     22     647     700     177     177     177
GR 606.8      0   602.8      43   600.9     100   602.2     200   600.8     300
GR 599.9    400   598.5     500   596.1     600   595.3     647   585.9     664
GR 585.6    670   585.8     677   597.3     700   597.7     712   598.2     723
GR 598.8    737   600.1     800   600.5     900   602.1    1000   602.3    1100
GR 603.5   1200   603.3    1244
NC   .05    .09     .04
X1 11295     20     500     551     983     983     983
X3                        500             551
GR 603.5      0   601.2     100   597.9     200   597.2     300   596.7     400
GR 595.4    500   586.3     523   586.0     529   586.1     536   593.9     551
GR 593.3    600   593.4     700   594.2     800   597.2     900   597.1    1000
GR 599.1   1100   600.8    1200   601.1    1300   601.1    1400   601.2    1500
X1 11344     11     200     224      49      49      49
X3    10                                                602.2   602.2
GR 602.6          602.2     100   602.2     191   588.3     200   586.9     204
GR 586.1    212   586.9     220   586.5     224   602.2     240   602.0     300
GR 601.9    400
SB         2.06     3.0              24             221
X1 11424                             80      80      80
X2                    1   596.0   602.2
X3    10                                                602.2   602.2
BT     6    191   602.2             200   602.2   588.3     200   602.2   595.9
BT   224  602.2   595.9     224   602.2   586.5     240   602.2
NC   .05    .09     .04
X1 11449     11     191     240      25      25      25
X3                        178             253
GR 602.6      0   602.2     100   596.2     191   588.3     200   586.9     204
GR 586.1    212   586.9     220   586.5     224   594.0     240   602.0     300
GR 601.9    400
EJ
T1  TEBO DRAIN
T2   50 YEAR FLOOD
T3  FRASER TWP. BAY CO.
J1   -10       3                                         581.9
J2     2              -1
T1  TEBO DRAIN
T2  100 YEAR FLOOD
T3  FRASER TWP, BAY CO.   5555-03
```

```
J1   -10        4                                        581.9
J2     3                -1
T1  TEBO DRAIN
T2  500 YEAR FLOOD
T3  FRASER TWP. BAY CO.    5555-03
J1   -10        5                                        581.9
J2    15                -1

ER
```

```
*****************************************
HEC2 VERSION UPDATED JAN 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09
MODIFICATIONS 52,53,54,55,56,57,58
*****************************************

T1  TEBO DRAIN
T2  100 YEAR FLOOD
T3  FRASER TWP, BAY CO.   5555-03

J1  ICHECK    INQ      NINV     IDIR     STRT      METRIC   HVINS    Q        *WSEL    FQ
     -10.      4.      -0.      -0. -0.000000      -0.00    -0.0     -0.    581.900  -0.000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH     FN       ALLDC    IBW      CHNIM    ITRACE
     3.000   -0.000   -1.000   -0.000   -0.000    -0.000   -0.000   -0.000   -0.000   -0.000

CCHV=    .300 CEHV=    .500
   SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
   Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA    LEFT/RIGHT
   TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN      SSTA
   SLOPE    XLOBL    XLCH     XLOBR    ITRIAL   IDC      ICONT    CORAR    TOPWID     ENDST

                    VS-1 AT D.N.R. PUBLIC ACCESS

    40.00     4.90   581.90     0.00   581.90   582.42      .52     0.00     0.00   587.80
    1040.       0.    1040.       0.       0.     180.       0.       0.       0.   586.20
     0.00     0.00     5.79     0.00     .070     .035     .050    0.000   577.00   944.06
  .003474      40.      40.      40.        0        0        1     0.00    49.10   993.16

3470 ENCROACHMENT STATIONS=     939.0    1000.0  TYPE=     1  TARGET=     61.000
   340.00     5.86   582.86     0.00     0.00   583.19      .32      .71      .06   587.80
    1040.       0.    1040.       0.       0.     228.       0.       1.       0. 100000.00
      .02     0.00     4.56     0.00     .090     .035     .090     .035   577.00   943.23
  .001696      300.     300.     300.        2        0        1     0.00    51.46   994.69

3470 ENCROACHMENT STATIONS=     200.0     850.0  TYPE=     1  TARGET=    650.000
   640.00     6.17   583.37     0.00     0.00   583.69      .31      .50      .00   583.50
    1040.       0.    1040.       0.       0.     231.       0.       3.       1.   583.50
      .04     0.00     4.50     0.00     .090     .035     .090     .035   577.20   500.31
  .001631      300.     300.     300.        4        0        1     0.00    51.56   551.87

3280 CROSS SECTION   1770.00 EXTENDED      1.53 FEET

3470 ENCROACHMENT STATIONS=     950.0    2000.0  TYPE=     1  TARGET=   -950.000
OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA=      584.90 ELREA=      586.60

  1770.00     7.43   585.03     0.00     0.00   585.32      .29     1.62      .01   584.90
```

*100-yr flood level of 584.56, Saginaw Bay, to be superposed

```
     1040.       0.    1040.       0.       0.     243.       0.       9.       2.    586.60
       .11    0.00     4.29    0.00     .090     .035     .090     .035   577.60    950.00
   .001272   1130.    1130.   1130.        2        0        1     0.00    47.45    997.45

3280 CROSS SECTION    2850.00 EXTENDED       2.21 FEET

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=       583.90 ELREA=       586.80

                    VS-2 AT N.S. 1/4 LINE - SECTION 12

  2850.00      7.91   585.71    0.00     0.00   585.73      .02      .33      .08   583.90
     1040.      645.     395.      0.    1430.     257.       0.      33.      15.   586.80
       .46      .45     1.54    0.00     .050     .035     .050     .035   577.80     0.00
   .000133    1080.    1080.   1080.        3        0        1     0.00   998.73   998.73

3265 DIVIDED FLOW

3280 CROSS SECTION    3513.00 EXTENDED        .82 FEET

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

3470 ENCROACHMENT STATIONS=          .0    1034.0  TYPE=      1  TARGET=     1033.999
  3513.00      8.42   585.82    0.00     0.00   585.88      .06      .13      .02   586.20
     1040.      363.     677.      0.     736.     281.       0.      54.      29. 100000.00
       .56      .49     2.41    0.00     .050     .035     .050     .035   577.40      .00
   .000309     663.     663.    663.        2        0        1     0.00   858.26  1033.11

3265 DIVIDED FLOW

3280 CROSS SECTION    3562.00 EXTENDED        .83 FEET

3470 ENCROACHMENT STATIONS=          .0    1029.5  TYPE=      1  TARGET=     1029.499
  3562.00      8.43   585.83    0.00     0.00   585.90      .07      .02      .00   577.40
     1040.      400.     640.      0.     769.     243.       0.      55.      30. 100000.00
       .57      .52     2.64    0.00     .050     .035     .050     .035   577.40      .00
   .000320      49.      49.     49.        0        0        1     0.00   865.49  1029.50

3265 DIVIDED FLOW

3280 CROSS SECTION    3563.00 EXTENDED        .83 FEET

NORMAL BRIDGE,NRD= 5 MIN ELTRD=  584.00 MAX ELLC=  584.40
```

perched structure

representative reach length

```
3470 ENCROACHMENT STATIONS=          .0    1029.5  TYPE=      1  TARGET=     1029.499
```

B -2A FARM HOU E BRIDGE - 24FT. OF TWIN 7' X 14' BOX CULVERT

ELLC = 584.4 2X 14 X 7 = 196

WITH ENDS FLUSH WITH HEADWALL 585.83 > 584.4 — pressure flow - material bridge

submerged outlet condition TW over rdway

```
3563.00     8.43    585.83     0.00     0.00    585.90      .07      .00      .00    587.50
  1040.     508.     532.       0.      745.     186.        0.      55.      30. 100000.00
    .57      .68     2.86     0.00     .060     .025      .060     .035   577.40      .00
 .000836      1.       1.       1.       0        0         1   -42.20   860.06  1029.50
```

check

CORAR

$\frac{1.83}{1.85} = .989$; $\frac{1.83}{1.92} = .953$ ⇒ high submergence

```
3265 DIVIDED FLOW

3280 CROSS SECTION    3587.00 EXTENDED        .84 FEET
```

⇒ special bridge input for orifice flow & weir coef adjusted to simulate backwater over rdway (easiest use X5 card hand computation)

? low spot in rdway

NORMAL BRIDGE, NRD= 5 MIN ELTRD= 584.00 MAX ELLC= 584.4

consider reasonable waterway area

```
3470 ENCROACHMENT STATIONS=        .0    1029.5  TYPE=      TARGET=    1029.499
3587.00     8.45    585.85     0.00     0.00    585.92      .07      .02      .00    587.50
  1040.     515.     525.       0.      757.     186.        0.      55.      31. 100000.00
    .58      .68     2.82     0.00     .060     .025      .060     .035   577.40      .00
 .000817     24.      24.      24.       0        0         1   -42.61   873.93  1029.50
```

CORAR

see DNR check, P 3 of 6 (9/15/76 office memo)

```
3265 DIVIDED FLOW

3280 CROSS SECTION    3588.00 EXTENDED        .85 FEET

3470 ENCROACHMENT STATIONS=        .0    1029.5  TYPE=      1  TARGET=    1029.499
3588.00     8.45    585.85     0.00     0.00    585.92      .07      .00      .00    577.40
  1040.     406.     634.       0.      782.     243.        0.      55.      31. 100000.00
    .58      .52     2.61     0.00     .050     .035      .050     .035   577.40      .00
 .000313      1.       1.       1.       0        0         1     0.00   880.52  1029.50
```

```
* 3265 DIVIDED FLOW

3280 CROSS SECTION    3608.00 EXTENDED        .86 FEET
```

6 divided flow sections (3608 thru 3513)

```
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      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    1034.0  TYPE=      1  TARGET=    1033.999
3608.00     8.47    585.87     0.00     0.00    585.93      .06      .01      .00    586.20
  1040.     380.     660.       0.      773.     283.        0.      56.      31. 100000.00
    .58      .49     2.33     0.00     .050     .035      .050     .035   577.40      .00
 .000288     20.      20.      20.       1        0         1     0.00   903.13  1033.13

3280 CROSS SECTION    4507.00 EXTENDED       2.21 FEET
```

```
3470 ENCROACHMENT STATIONS=      200.0     1050.0  TYPE=      1  TARGET=      850.000

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      585.30 ELREA=      587.40

  4507.00      8.21    586.21      0.00      0.00    586.26       .05       .33       .00    585.90
     1040.      519.      521.        0.      784.      214.        0.       77.       49. 100000.00
       .74       .66      2.44      0.00      .050      .035      .050      .035    578.00    200.00
  .000473      899.      899.      899.         2         0         1      0.00    847.16   1047.16

3280 CROSS SECTION    5353.00 EXTENDED       2.81 FEET

3470 ENCROACHMENT STATIONS=      400.0     1063.0  TYPE=      1  TARGET=      663.000

                    VS-3  D.S. FROM TOWER BEACH ROAD BRIDGE

  5353.00      8.01    586.61      0.00      0.00    586.68       .07       .41       .01    585.70
     1040.      494.      546.        0.      678.      197.        0.       95.       63. 100000.00
       .87       .73      2.77      0.00      .050      .035      .060      .035    578.60    400.00
  .000507      846.      846.      846.         2         0         1      0.00    635.67   1035.67

3265 DIVIDED FLOW

3280 CROSS SECTION    5452.00 EXTENDED       1.14 FEET

3470 ENCROACHMENT STATIONS=      400.0     1024.5  TYPE=      1  TARGET=      624.500
  5452.00      8.44    586.64      0.00      0.00    586.75       .12       .05       .03    579.00
     1040.      267.      773.        0.      419.      243.        0.       97.       65. 100000.00
       .88       .64      3.19      0.00      .050      .035      .060      .035    578.20    400.00
  .000473       99.       99.       99.         2         0         1      0.00    573.57   1024.50

3265 DIVIDED FLOW

3280 CROSS SECTION    5453.00 EXTENDED       1.11 FEET

NORMAL BRIDGE.NRD= 8,MIN ELTRD=  585.80 MAX ELLC=  585.20

3470 ENCROACHMENT STATIONS=      400.0     1024.5  TYPE=      1  TARGET=      624.500

                    BS-4  TOWER BEACH ROAD DOUBLE BOX CULVERT - 40FT. OF TWIN
                                                                    ELLC @ 585.20
                                                                    586.61 > 585.20  Pressure check
                    7' X 14' BOX CULVERT WITH ENDS FLUSH WITH HEADWALL
and submerged outlet condition, TW over rdway
  5453.00      8.41    586.61      0.00      0.00    586.78       .16       .00       .02    587.70
     1040.      310.      730.        0.    352.LOB   190.ch     0.ROB      97.       65. 100000.00
d/s    .88       .88      3.85      0.00      .050      .025      .050      .035    578.20    400.00
  .001491        1.        1.        1.         2         0         1    -41.69    563.76   1024.50
                                                                          CORDR

3265 DIVIDED FLOW

3280 CROSS SECTION    5493.00 EXTENDED       1.21 FEET
```

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

check

consider reasonable ?

NORMAL BRIDGE.NRD= 8 MIN ELTRD= 585.80 MAX ELLC= 585.20 ⇒ requires special bridge input for orifice flow & weir flow

-8/9 = .89 ⇒ low submergence

```
3470 ENCROACHMENT STATIONS=      400.0     1024.5  TYPE=      1  TARGET=      624.500
  5493.00      8.51    586.71      0.00      0.00    586.84      .13       .06       .01    587.70
U/S 1040.      361.     679.        0.      404.     190.        0.       97.       65. 100000.00
     .89       .89      3.58      0.00      .050      .025      .050      .035    578.20    400.00
 .001294       40.      40.       40.         2         0         1    -44.52    569.14   1024.50
                                                                        CORCR
```

see DNR check p. 4 of 6 (9/15/76 office memo)

channel & lob flow should be reversed (problem in continuity)

```
3265 DIVIDED FLOW
3280 CROSS SECTION    5494.00 EXTENDED      1.25 FEET

3470 ENCROACHMENT STATIONS=      400.0     1024.5  TYPE=      1  TARGET=      624.500
  5494.00      8.55    586.75      0.00      0.00    586.85      .10       .00       .01    579.00
   1040.      303.     737.        0.      483.     246.        0.       98.       65. 100000.00
     .89       .63      2.99      0.00      .050      .035      .050      .035    578.20    400.00
 .000412        1.       1.        1.         2         0         1      0.00    579.20   1024.50
```

5 divided flow sections (sta 5452 through 5504)

```
3265 DIVIDED FLOW
3280 CROSS SECTION    5504.00 EXTENDED      1.30 FEET

3470 ENCROACHMENT STATIONS=      400.0     1040.0  TYPE=      1  TARGET=      640.000
  5504.00      8.60    586.80      0.00      0.00    586.87      .07       .00       .01    587.70
   1040.      201.     839.        0.      450.     368.        0.       98.       65. 100000.00
     .89       .45      2.28      0.00      .050      .035      .050      .035    578.20    400.00
 .000277       10.      10.       10.         2         0         1      0.00    595.83   1038.82
```

continuity

```
3470 ENCROACHMENT STATIONS=      650.0     1023.0  TYPE=      1  TARGET=      373.000
  6230.00      7.26    587.06      0.00      0.00    587.17      .11       .28       .02    585.50
   1040.      278.     762.        0.      360.     247.        0.      110.       74. 100000.00
     .97       .77      3.09      0.00      .050      .035      .050      .035    579.80    650.00
 .000577      726.     726.      726.         0         0         1      0.00    370.64   1020.64

3470 ENCROACHMENT STATIONS=      850.0     1028.0  TYPE=      1  TARGET=      178.000
  6960.00      6.14    587.64      0.00      0.00    588.02      .37       .72       .13    587.30
   1040.       11.     1029.        0.       24.     209.        0.      117.       78. 100000.00
    1.01       .47      4.92      0.00      .050      .035      .050      .035    581.50    850.00
 .002021      730.     730.      730.         2         0         1      0.00    171.23   1021.23
```

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 592.40 ELREA= 593.60

VS-5 D.S. FROM DETROIT MACKINAW R.R.

```
 7686.00     6.36   589.46     0.00     0.00   589.96      .51     1.88      .07   592.40
   1040.       0.    1040.       0.       0.     182.       0.     120.      80.   593.60
    1.05     0.00     5.72     0.00     .050     .035     .050     .035   583.10   942.96
 .003434     726.     726.     726.        2        0        1     0.00    49.60   992.57

   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=      950.0      990.0  TYPE=      1  TARGET=      40.000
 7711.00     6.41   589.51     0.00     0.00   590.08      .57      .09      .03100000.00
   1040.       0.    1040.       0.       0.     172.       0.     120.      80. 100000.00
    1.05     0.00     6.04     0.00     .050     .035     .050     .035   583.10   950.00
 .003492      25.      25.      25.        0        0        1     0.00    40.00   990.00

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      592.80 ELREA=      592.80

 7735.00     5.86   589.36     0.00     0.00   590.43     1.07      .10      .25   585.90
   1040.       0.    1040.       0.       0.     125.       0.     120.      80.   583.50
    1.05     0.00     8.29     0.00     .050     .035     .050     .035   583.50  1001.70
 .004768      24.      24.      24.        2        0        1     0.00    24.60  1035.61

NORMAL BRIDGE,NRD= 4 MIN ELTRD=  595.90 MAX ELLC=  592.80 > 589.27
unsubmerged outlet condition
BS-6 DETROIT @ MACKINAW R.R. BRIDGE

 7736.00     5.77   589.27     0.00     0.00   590.53     1.27      .01      .10   595.90
   1040.       0.    1040.       0.       0.     115.       0.     120.      80.   595.90
    1.05     0.00     9.03     0.00     .050     .035     .050     .035   583.50  1001.70
 .008889       1.       1.       1.        2        0        1     0.00    24.60  1026.30

NORMAL BRIDGE,NRD= 4 MIN ELTRD=  595.90 MAX ELLC=  592.80

 7746.00     6.01   589.51     0.00     0.00   590.65     1.14      .08      .04   595.90
   1040.       0.    1040.       0.       0.     121.       0.     120.      80.   595.90
    1.05     0.00     8.58     0.00     .050     .035     .050     .035   583.50  1001.70
 .007624      10.      10.      10.        2        0        1     0.00    24.60  1026.30

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      592.80 ELREA=      592.80

 7747.00     6.34   589.84     0.00     0.00   590.73      .89      .01      .08   585.90
   1040.       0.    1040.       0.       0.     137.       0.     120.      80.   583.50
    1.05     0.00     7.58     0.00     .050     .035     .050     .035   583.50  1001.70
 .003595       1.       1.       1.        3        0        1     0.00    24.60  1036.37

3470 ENCROACHMENT STATIONS=      995.0     1033.0  TYPE=      1  TARGET=      38.000
 7757.00     7.01   590.51     0.00     0.00   590.91      .40      .02      .15100000.00
   1040.       0.    1040.       0.       0.     206.       0.     120.      80. 100000.00
    1.05     0.00     5.05     0.00     .050     .035     .050     .035   583.50   995.00
```

```
.001817      10.      10.      10.       3       0       1    0.00    38.00  1033.00

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

                 VS-7 D.S. FROM OLD STATE ROAD BRIDGE

8177.00      7.42    591.22      0.00      0.00    591.64       .42       .72       .01    593.30
  1040.        0.     1040.        0.        0.      200.        0.      122.       80.    600.50
   1.07      0.00      5.19      0.00      .070      .030      .070      .035    583.80    205.36
.001625      420.      420.      420.         3         0         1      0.00     44.96    250.32

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      596.30 ELREA=      596.30

8226.00      7.15    591.25      0.00      0.00    591.75       .50       .07       .04    587.40
  1040.        0.     1040.        0.        0.      183.        0.      122.       80.    584.50
   1.07      0.00      5.70      0.00      .070      .030      .070      .035    584.10    200.00
.001212       49.       49.       49.         2         0         1      0.00     27.40    234.15

NORMAL BRIDGE,NRD= 4 MIN ELTRD=  598.70 MAX ELLC=  596.30 > 591.33
unsubmerged outlet condition
                 BS-8 OLD STATE ROAD BRIDGE

8227.00      7.43    591.33      0.00      0.00    591.77       .44       .00       .02    598.70
  1040.        0.     1040.        0.        0.      196.        0.      122.       80.    599.00
   1.07      0.00      5.31      0.00      .040      .028      .040      .035    583.90    200.00
.001234        1.        1.        1.         2         0         1      0.00     27.40    227.40

NORMAL BRIDGE,NRD= 4 MIN ELTRD=  598.70 MAX ELLC=  596.30

8250.00      7.47    591.37      0.00      0.00    591.80       .43       .03       .00    598.70
  1040.        0.     1040.        0.        0.      197.        0.      123.       80.    599.00
   1.07      0.00      5.29      0.00      .040      .028      .040      .034    583.90    200.00
.001220       23.       23.       23.         0         0         1      0.00     27.40    227.40

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      596.30 ELREA=      596.30

8251.00      7.24    591.34      0.00      0.00    591.83       .49       .00       .03    587.40
  1040.        0.     1040.        0.        0.      185.        0.      123.       80.    584.50
   1.07      0.00      5.62      0.00      .070      .030      .070      .034    584.10    200.00
.001161        1.        1.        1.         2         0         1      0.00     27.40    234.24

8275.00      7.49    591.59      0.00      0.00    591.91       .32       .02       .05    590.90
  1040.        0.     1040.        0.        1.      229.        0.      123.       80.    600.50
   1.08       .32      4.54      0.00      .070      .030      .070      .034    584.10    191.03
.000936       24.       24.       24.         2         0         1      0.00     43.46    234.49

SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS   BANK ELEV
Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA   LEFT/RIGHT
TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
```

SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
9115.00	7.82	592.42	0.00	0.00	592.71	.29	.79	.01	598.10
1040.	0.	1040.	0.	0.	242.	0.	127.	81.	597.40
1.13	0.00	4.29	0.00	.070	.030	.070	.034	584.60	151.36
.000949	840.	840.	840.	2	0	1	0.00	48.09	199.45

VS-9 D.S. FROM KAISER ROAD BRIDGE

9954.00	7.99	593.19	0.00	0.00	593.43	.24	.71	.01	598.10
1040.	0.	1040.	0.	0.	263.	0.	132.	82.	597.40
1.19	0.00	3.96	0.00	.070	.030	.070	.034	585.20	312.27
.000768	839.	839.	839.	2	0	1	0.00	50.01	362.28

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 599.30 ELREA= 599.20

ELLC @ 592.70

BS-10 KAISER ROAD BRIDGE 593.08 > 592.70

submerged outlet condition

9974.00	7.48	593.08	0.00	0.00	593.58	.50	.02	.13	585.60
d/s 1040.	0.	1040.	0.	0.	182.	0.	132.	82.	587.00
1.19	0.00	5.70	0.00	.070	.030	.070	.034	585.60	400.00
.001139	20.	20.	20.	2	0	1	0.00	25.30	436.11

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	1.63	2.80	-0.00	25.30	1.30	164.00	-0.00	585.60	585.60

PRESSURE FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	ELLC	ELTRD	CLASS
594.10	593.66	.09	0.	1040.	164.	592.70	599.00	10.00

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 599.30 ELREA= 599.20

10016.00	8.07	593.67	0.00	0.00	594.10	.43	.51	0.00	585.60
1040.	0.	1040.	0.	0.	197.	0.	132.	82.	587.00
1.19	0.00	5.27	0.00	.070	.030	.070	.034	585.60	400.00
.000896	42.	42.	42.	2	0	1	0.00	25.30	437.16
10041.00	8.41	594.01	0.00	0.00	594.19	.18	.02	.08	599.30
1040.	0.	1040.	0.	0.	307.	0.	133.	82.	599.20
1.19	0.00	3.39	0.00	.070	.030	.070	.034	585.60	386.49
.000482	25.	25.	25.	2	0	1	0.00	51.28	437.77

3470 ENCROACHMENT STATIONS= 396.0 428.0 TYPE= 1 TARGET= 32.000

10071.00	8.38	593.98	0.00	0.00	594.25	.27	.02	.04	100000.00
1040.	0.	1040.	0.	0.	251.	0.	133.	82.	100000.00
1.20	0.00	4.15	0.00	.070	.030	.070	.034	585.60	396.00
.000701	30.	30.	30.	2	0	1	0.00	32.00	428.00

Kaiser Road

check on pressure flow

$K = 1.63;\ C = 1/\sqrt{K} = 1/\sqrt{1.63} = .78$

$Q = CA\sqrt{2gH}$

$Q = .78(164)(8.025)H^{1/2}$

$Q = 1030.849\,H^{1/2}$

$TW = 593.08$

let $HW = 594.01$

$H = (594.01 - 593.08) = .93$

consider reasonable

$Q = 1030.849(.964) = 994.1$ cfs

3301 HV CHANGED MORE THAN HVINS

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

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 599.90 ELREA= 599.90

10096.00	8.28	593.68	0.00	0.00	594.62	.94	.03	.34	587.50
1040.	0.	1040.	0.	0.	134.	0.	133.	82.	590.10
1.20	0.00	7.79	0.00	.070	.030	.070	.034	585.40	200.00
.002839	25.	25.	25.	2	0	1	0.00	20.00	224.24

NORMAL BRIDGE,NRD= 4 MIN ELTRD= 603.60 MAX ELLC= 599.90 >593.64

unsubmerged outlet condition

BS-11 PENN CENTRAL R.R. BRIDGE

10097.00	8.24	593.64	0.00	0.00	594.66	1.02	.00	.04	603.60
1040.	0.	1040.	0.	0.	128.	0.	133.	82.	603.60
1.20	0.00	8.11	0.00	.070	.030	.050	.034	585.40	200.31
.003932	1.	1.	1.	2	0	1	0.00	19.32	219.63

NORMAL BRIDGE,NRD= 4 MIN ELTRD= 603.60 MAX ELLC= 599.90

10112.00	8.34	593.74	0.00	0.00	594.73	.99	.06	.01	603.60
1040.	0.	1040.	0.	0.	130.	0.	133.	82.	603.60
1.20	0.00	8.00	0.00	.070	.030	.050	.034	585.40	200.31
.003781	15.	15.	15.	2	0	1	0.00	19.33	219.63

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 599.90 ELREA= 599.90

10113.00	8.48	593.88	0.00	0.00	594.76	.89	.00	.03	587.50
1040.	0.	1040.	0.	0.	138.	0.	133.	82.	590.10
1.20	0.00	7.56	0.00	.070	.030	.070	.034	585.40	200.00
.002600	1.	1.	1.	2	0	1	0.00	20.00	224.48

10135.00	9.07	594.47	0.00	0.00	594.93	.47	.04	.13	603.50
1040.	0.	1040.	0.	0.	190.	0.	133.	82.	603.60
1.20	0.00	5.48	0.00	.070	.030	.070	.034	585.40	191.72
.001497	22.	22.	22.	2	0	1	0.00	33.47	225.19

VS-12 U.S. FROM PENN CENTRAL R.R.

10312.00	9.42	595.02	0.00	0.00	595.23	.21	.22	.08	595.30
1040.	0.	1040.	0.	0.	281.	0.	134.	83.	597.30
1.21	0.00	3.70	0.00	.090	.040	.090	.034	585.60	647.51
.001060	177.	177.	177.	2	0	1	0.00	47.92	695.43

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	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=      500.0      551.0  TYPE=      1  TARGET=      51.000

                    VS-13 D.S. FROM M-13 BRIDGE

 11295.00      9.92    595.92      0.00      0.00    596.07       .15       .82       .02    595.40
     1040.        0.     1040.        0.        0.      333.        0.      141.       84. 100000.00
      1.30      0.00      3.12      0.00      .050      .040      .090      .034    586.00    500.00
  .000675      983.      983.      983.         2         0         1      0.00     51.00    551.00

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      602.20 ELREA=      602.20
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ELLC @ 596.0 ; |596.0 − 595.86| = 0.14 ft

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                    BS-14 M-13 BRIDGE
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unsubmerged outlet condition

```
 11344.00      9.76    595.86      0.00      0.00    596.21       .35       .04       .10    588.30
     1040.        0.     1040.        0.        0.      219.        0.      141.       84.    586.50
      1.30      0.00      4.74      0.00      .050      .040      .090      .034    586.10    200.00
  .001141       49.       49.       49.         2         0         1      0.00     24.00    233.54
```

d/s

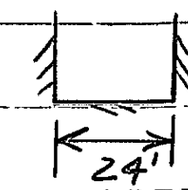
check $\left(Y_c + \left(\frac{ELLC - Y_c}{2}\right)\right) = 589.96 + \left(\frac{596.0 - 589.96}{2}\right) = 589.96 + 3.02 = 592.98$ OK

SPECIAL BRIDGE 595.86 > 592.98 ⇒ TW @ 595.86

```
5070,VARIABLE ELCHU OR ELCHD ON CARD SB NOT SPECIFIED
SB   XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     -0.00      2.06      3.00      -0.00     24.00     -0.00    221.00     -0.00    586.10    586.10

PRESSURE FLOW

  EGPRS     EGLWC       H3     QWEIR      QPR     BAREA      ELLC     ELTRD     CLASS
 596.57    596.21     0.00        0.     1040.      221.    596.00    602.20     10.00

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      602.20 ELREA=      602.20

 11424.00     10.15    596.25      0.00      0.00    596.57       .32       .36      0.00    588.30
     1040.        0.     1040.        0.        0.      229.        0.      142.       84.    586.50
      1.31      0.00      4.55      0.00      .050      .040      .090      .034    596.10    200.00
  .001009       80.       80.       80.         2         0         1      0.00     24.00    233.94

3470 ENCROACHMENT STATIONS=      178.0      253.0  TYPE=      1  TARGET=      75.000
 11449.00     10.43    596.53      0.00      0.00    596.65       .12       .02       .06    596.20
     1040.        0.     1030.       10.        1.      375.       22.      142.       84.    594.00
      1.31      .18      2.75       .47      .050      .040      .090      .034    586.10    185.99
  .000414       25.       25.       25.         2         0         1      0.00     67.01    253.00
```

M-13 Bridge 113+44

check on Y_c @ 1040 cfs



$Fr^2 = \frac{Q^2 B}{g A_c^3} = 1$

$A_c = \left(\frac{Q^2 B}{g}\right)^{1/3} = \left(\frac{1040^2 (24)}{32.2}\right)^{1/3}$

$A_c = 92.64$ sf

$Y_c = \frac{A_c}{B} = \frac{92.64}{24} = 3.86'$

TW = 9.76 > 3.86

3.86 + 586.1 = 589.96

M-13 Bridge 113+44

check on pressure flow

$K = 2.06$, $C = 1/\sqrt{K} = 1/\sqrt{2.06} = .696$

$Q = CA\sqrt{2gH}$

$Q = .696(221)(8.025)H^{1/2}$

$Q = 1235.67\ H^{1/2}$

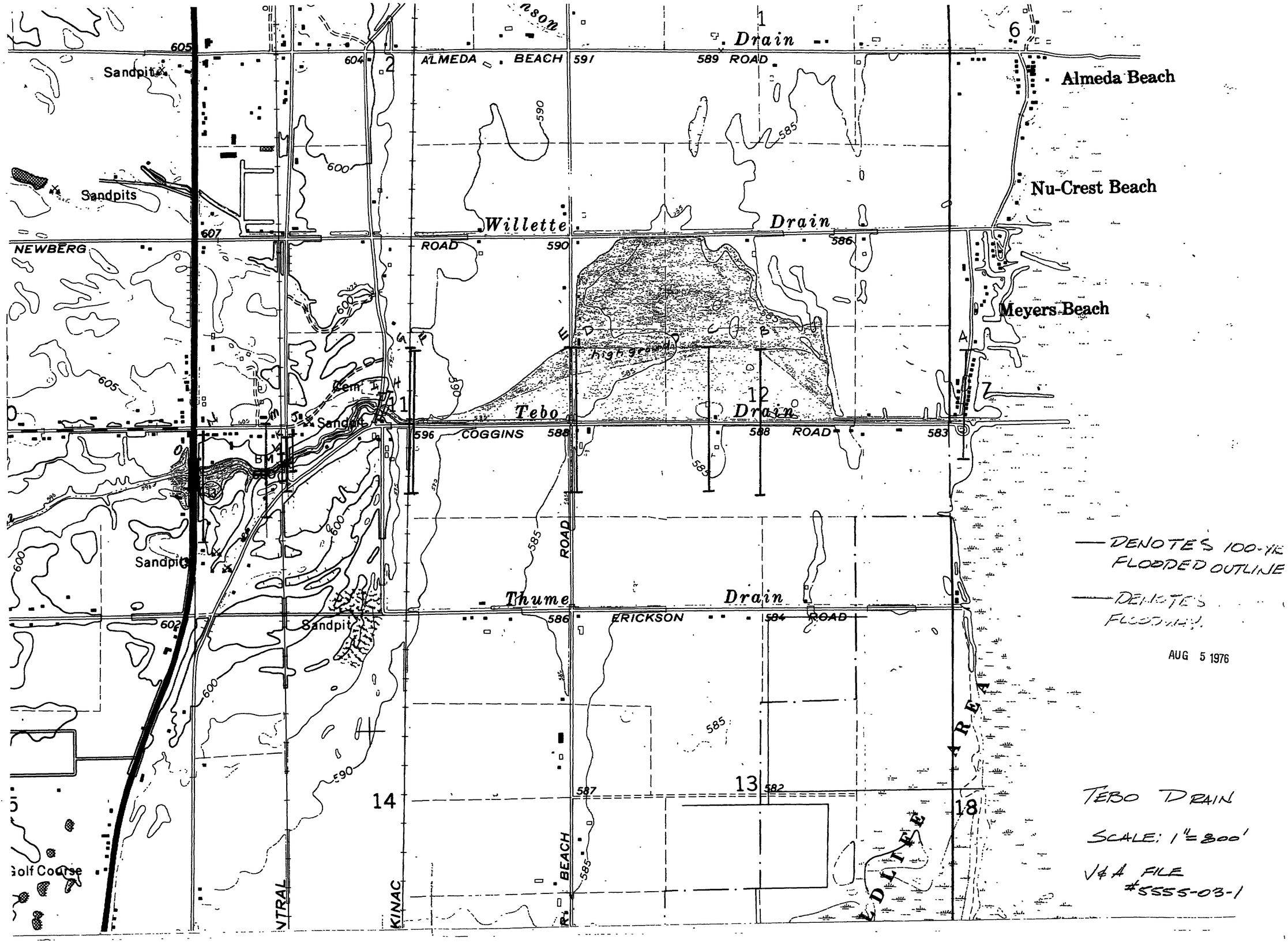
TW = 595.86

let HW @ 596.53

$H = (596.53 - 595.86) = .67$

$Q = 1235.67\ (.818) = 1011.4$ cfs

consider reasonable



— DENOTES 100-YR FLOODED OUTLINE

— DENOTES FLOODWAY

AUG 5 1976

TEBO DRAIN

SCALE: 1" = 800'

V&A FILE #5555-03-1

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Fraser Twp

3) WATERCOURSE: Tebo Drain

4) DOCUMENT TYPE: Summary

00BREAK00

SUMMARY PRINTOUT FOR MULTIPLE PROFILES

ER TWP, BAY CO. 5555-0

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TQ	FG	TOPWID	PERENC	STENCL	STENCR
40.00	40.00	0.00	0.00	577.00	645.00	581.90	176.44	582.10	49.10	0.00	0.00	0.00
40.00	40.00	0.00	0.00	577.00	905.00	581.90	176.44	582.29	49.10	0.00	0.00	0.00
40.00	40.00	0.00	0.00	577.00	1040.00	581.90	176.44	582.42	49.10	0.00	0.00	0.00
40.00	40.00	0.00	0.00	577.00	1290.00	581.90	176.44	582.70	49.10	0.00	0.00	0.00
340.00	300.00	0.00	0.00	577.00	645.00	582.29	206.30	582.45	50.07	61.00	939.00	1000.00
340.00	300.00	0.00	0.00	577.00	905.00	582.64	234.26	582.91	50.92	61.00	939.00	1000.00
340.00	300.00	0.00	0.00	577.00	1040.00	582.86	252.57	583.19	51.46	61.00	939.00	1000.00
340.00	300.00	0.00	0.00	577.00	1290.00	583.32	292.70	583.73	52.58	61.00	939.00	1000.00
640.00	300.00	0.00	0.00	577.20	645.00	582.59	196.53	582.77	48.80	650.00	200.00	850.00
640.00	300.00	0.00	0.00	577.20	905.00	583.09	234.52	583.36	50.56	650.00	200.00	850.00
640.00	300.00	0.00	0.00	577.20	1040.00	583.37	257.54	583.69	51.56	650.00	200.00	850.00
640.00	300.00	0.00	0.00	577.20	1290.00	584.03	323.19	584.30	650.00	650.00	200.00	850.00
1770.00	1130.00	0.00	0.00	577.60	645.00	583.78	200.43	583.97	43.10	-950.00	950.00	2000.00
1770.00	1130.00	0.00	0.00	577.60	905.00	584.63	259.84	584.88	46.23	-950.00	950.00	2000.00
1770.00	1130.00	0.00	0.00	577.60	1040.00	585.03	291.60	585.32	47.45	-950.00	950.00	2000.00
1770.00	1130.00	0.00	0.00	577.60	1290.00	585.67	346.73	586.01	48.48	-950.00	950.00	2000.00
2850.00	1080.00	0.00	0.00	577.80	645.00	584.60	314.15	584.68	966.88	0.00	0.00	0.00
2850.00	1080.00	0.00	0.00	577.80	905.00	585.34	661.08	585.37	998.30	0.00	0.00	0.00
2850.00	1080.00	0.00	0.00	577.80	1040.00	585.71	900.52	585.73	998.73	0.00	0.00	0.00
2850.00	1080.00	0.00	0.00	577.80	1290.00	586.34	1396.94	586.35	999.46	0.00	0.00	0.00
3513.00	663.00	0.00	0.00	577.40	645.00	584.86	340.76	584.94	415.16	1034.00	.00	1034.00
3513.00	663.00	0.00	0.00	577.40	905.00	585.48	479.69	585.56	698.95	1034.00	.00	1034.00
3513.00	663.00	0.00	0.00	577.40	1040.00	585.82	591.89	585.88	858.26	1034.00	.00	1034.00
3513.00	663.00	0.00	0.00	577.40	1290.00	586.41	924.05	586.44	1033.37	1034.00	.00	1034.00
3562.00	49.00	0.00	0.00	577.40	645.00	584.87	333.83	584.96	420.49	1029.50	.00	1029.50
3562.00	49.00	0.00	0.00	577.40	905.00	585.50	470.26	585.58	701.42	1029.50	.00	1029.50
3562.00	49.00	0.00	0.00	577.40	1040.00	585.83	581.48	585.90	865.49	1029.50	.00	1029.50
3562.00	49.00	0.00	0.00	577.40	1290.00	586.42	907.96	586.46	1029.50	1029.50	.00	1029.50
3563.00	1.00	584.00	584.40	577.40	645.00	584.85	209.82	584.98	411.70	1029.50	.00	1029.50
3563.00	1.00	584.00	584.40	577.40	905.00	585.49	286.96	585.59	696.06	1029.50	.00	1029.50
3563.00	1.00	584.00	584.40	577.40	1040.00	585.83	359.59	585.90	860.06	1029.50	.00	1029.50
3563.00	1.00	584.00	584.40	577.40	1290.00	586.43	593.67	586.46	962.37	1029.50	.00	1029.50
3587.00	24.00	584.00	584.40	577.40	645.00	584.88	210.93	585.01	418.73	1029.50	.00	1029.50
3587.00	24.00	584.00	584.40	577.40	905.00	585.52	289.92	585.62	703.34	1029.50	.00	1029.50
3587.00	24.00	584.00	584.40	577.40	1040.00	585.85	363.95	585.92	873.93	1029.50	.00	1029.50
3587.00	24.00	584.00	584.40	577.40	1290.00	586.44	597.46	586.47	962.87	1029.50	.00	1029.50
3588.00	1.00	0.00	0.00	577.40	645.00	584.92	342.68	585.02	445.39	1029.50	.00	1029.50
3588.00	1.00	0.00	0.00	577.40	905.00	585.54	481.78	585.62	719.01	1029.50	.00	1029.50
3588.00	1.00	0.00	0.00	577.40	1040.00	585.85	588.25	585.92	880.52	1029.50	.00	1029.50
3588.00	1.00	0.00	0.00	577.40	1290.00	586.44	917.14	586.47	1029.50	1029.50	.00	1029.50

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TQ	EG	TOPWID	PERENC	STENCL	STENCR
3608.00	20.00	0.00	0.00	577.40	645.00	584.95	356.23	585.03	457.37	1034.00	.00	1034.00
3608.00	20.00	0.00	0.00	577.40	905.00	585.56	500.97	585.63	730.77	1034.00	.00	1034.00
3608.00	20.00	0.00	0.00	577.40	1040.00	585.87	612.44	585.93	903.13	1034.00	.00	1034.00
3608.00	20.00	0.00	0.00	577.40	1290.00	586.45	942.48	586.48	1033.39	1034.00	.00	1034.00
4507.00	899.00	0.00	0.00	578.00	645.00	585.39	207.55	585.53	673.50	850.00	200.00	1050.00
4507.00	899.00	0.00	0.00	578.00	905.00	585.95	369.30	586.02	846.55	850.00	200.00	1050.00
4507.00	899.00	0.00	0.00	578.00	1040.00	586.21	478.13	586.26	847.16	850.00	200.00	1050.00
4507.00	899.00	0.00	0.00	578.00	1290.00	586.66	721.21	586.70	848.25	850.00	200.00	1050.00
5353.00	846.00	0.00	0.00	578.60	645.00	586.06	279.58	586.14	634.70	663.00	400.00	1063.00
5353.00	846.00	0.00	0.00	578.60	905.00	586.43	393.06	586.50	635.35	663.00	400.00	1063.00
5353.00	846.00	0.00	0.00	578.60	1040.00	586.61	461.72	586.68	635.67	663.00	400.00	1063.00
5353.00	846.00	0.00	0.00	578.60	1290.00	587.01	560.48	587.04	663.00	663.00	400.00	1063.00
5452.00	99.00	0.00	0.00	578.20	645.00	586.10	359.58	586.19	545.62	624.50	400.00	1024.50
5452.00	99.00	0.00	0.00	578.20	905.00	586.45	430.45	586.57	564.86	624.50	400.00	1024.50
5452.00	99.00	0.00	0.00	578.20	1040.00	586.64	478.05	586.75	573.57	624.50	400.00	1024.50
5452.00	99.00	0.00	0.00	578.20	1290.00	587.02	600.39	587.12	591.93	624.50	400.00	1024.50
5453.00	1.00	585.80	585.20	578.20	645.00	586.06	195.92	586.22	511.87	624.50	400.00	1024.50
5453.00	1.00	585.80	585.20	578.20	905.00	586.42	235.38	586.60	552.91	624.50	400.00	1024.50
5453.00	1.00	585.80	585.20	578.20	1040.00	586.61	269.35	586.78	563.76	624.50	400.00	1024.50
5453.00	1.00	585.80	585.20	578.20	1290.00	587.02	364.97	587.13	586.48	624.50	400.00	1024.50
5493.00	40.00	585.80	585.20	578.20	645.00	586.11	199.53	586.27	535.79	624.50	400.00	1024.50
5493.00	40.00	585.80	585.20	578.20	905.00	586.52	251.91	586.67	558.51	624.50	400.00	1024.50
5493.00	40.00	585.80	585.20	578.20	1040.00	586.71	289.07	586.84	569.14	624.50	400.00	1024.50
5493.00	40.00	585.80	585.20	578.20	1290.00	587.08	382.97	587.18	590.08	624.50	400.00	1024.50
5494.00	1.00	0.00	0.00	578.20	645.00	586.21	379.18	586.29	553.37	624.50	400.00	1024.50
5494.00	1.00	0.00	0.00	578.20	905.00	586.59	466.23	586.69	571.52	624.50	400.00	1024.50
5494.00	1.00	0.00	0.00	578.20	1040.00	586.75	512.50	586.85	579.20	624.50	400.00	1024.50
5494.00	1.00	0.00	0.00	578.20	1290.00	587.08	624.28	587.18	595.09	624.50	400.00	1024.50
5504.00	10.00	0.00	0.00	578.20	645.00	586.25	468.09	586.30	568.76	640.00	400.00	1040.00
5504.00	10.00	0.00	0.00	578.20	905.00	586.64	572.06	586.70	587.83	640.00	400.00	1040.00
5504.00	10.00	0.00	0.00	578.20	1040.00	586.80	625.34	586.87	595.83	640.00	400.00	1040.00
5504.00	10.00	0.00	0.00	578.20	1290.00	587.12	747.84	587.19	611.84	640.00	400.00	1040.00
6230.00	726.00	0.00	0.00	579.80	645.00	586.44	296.97	586.53	370.04	373.00	650.00	1023.00
6230.00	726.00	0.00	0.00	579.80	905.00	586.88	387.68	586.98	370.46	373.00	650.00	1023.00
6230.00	726.00	0.00	0.00	579.80	1040.00	587.06	432.93	587.17	370.64	373.00	650.00	1023.00
6230.00	726.00	0.00	0.00	579.80	1290.00	587.40	527.54	587.51	370.97	373.00	650.00	1023.00
6960.00	730.00	0.00	0.00	581.50	645.00	586.92	175.53	587.14	46.15	178.00	850.00	1028.00
6960.00	730.00	0.00	0.00	581.50	905.00	587.43	212.13	587.75	97.36	178.00	850.00	1028.00
6960.00	730.00	0.00	0.00	581.50	1040.00	587.64	231.34	588.02	171.23	178.00	850.00	1028.00
6960.00	730.00	0.00	0.00	581.50	1290.00	588.00	272.34	588.43	171.84	178.00	850.00	1028.00

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TQ	EG	TOPWID	PERENC	STENCL	STENCR
7686.00	726.00	0.00	0.00	583.10	645.00	588.34	107.81	588.73	45.00	0.00	0.00	0.00
7686.00	726.00	0.00	0.00	583.10	905.00	589.13	155.09	589.59	48.24	0.00	0.00	0.00
7686.00	726.00	0.00	0.00	583.10	1040.00	589.46	177.48	589.96	49.60	0.00	0.00	0.00
7686.00	726.00	0.00	0.00	583.10	1290.00	589.95	214.25	590.56	51.67	0.00	0.00	0.00
7711.00	25.00	0.00	0.00	583.10	645.00	588.43	111.59	588.82	40.00	40.00	950.00	990.00
7711.00	25.00	0.00	0.00	583.10	905.00	589.19	155.45	589.69	40.00	40.00	950.00	990.00
7711.00	25.00	0.00	0.00	583.10	1040.00	589.51	175.99	590.08	40.00	40.00	950.00	990.00
7711.00	25.00	0.00	0.00	583.10	1290.00	590.00	206.99	590.70	40.00	40.00	950.00	990.00
7735.00	24.00	0.00	0.00	583.50	645.00	588.39	107.65	589.02	24.60	0.00	0.00	0.00
7735.00	24.00	0.00	0.00	583.50	905.00	589.08	137.77	589.99	24.60	0.00	0.00	0.00
7735.00	24.00	0.00	0.00	583.50	1040.00	589.36	150.61	590.43	24.60	0.00	0.00	0.00
7735.00	24.00	0.00	0.00	583.50	1290.00	589.76	169.50	591.17	24.60	0.00	0.00	0.00
7736.00	1.00	595.90	592.80	583.50	645.00	588.33	78.88	589.09	24.60	0.00	0.00	0.00
7736.00	1.00	595.90	592.80	583.50	905.00	589.00	101.10	590.08	24.60	0.00	0.00	0.00
7736.00	1.00	595.90	592.80	583.50	1040.00	589.27	110.31	590.53	24.60	0.00	0.00	0.00
7736.00	1.00	595.90	592.80	583.50	1290.00	589.63	123.28	591.31	24.60	0.00	0.00	0.00
7746.00	10.00	595.90	592.80	583.50	645.00	588.46	83.03	589.17	24.60	0.00	0.00	0.00
7746.00	10.00	595.90	592.80	583.50	905.00	589.19	107.69	590.18	24.60	0.00	0.00	0.00
7746.00	10.00	595.90	592.80	583.50	1040.00	589.51	119.11	590.65	24.60	0.00	0.00	0.00
7746.00	10.00	595.90	592.80	583.50	1290.00	590.04	137.81	591.48	24.60	0.00	0.00	0.00
7747.00	1.00	0.00	0.00	583.50	645.00	588.68	119.90	589.22	24.60	0.00	0.00	0.00
7747.00	1.00	0.00	0.00	583.50	905.00	589.48	156.65	590.25	24.60	0.00	0.00	0.00
7747.00	1.00	0.00	0.00	583.50	1040.00	589.84	173.45	590.73	24.60	0.00	0.00	0.00
7747.00	1.00	0.00	0.00	583.50	1290.00	590.48	205.11	591.58	24.60	0.00	0.00	0.00
7757.00	10.00	0.00	0.00	583.50	645.00	589.04	151.75	589.32	37.49	38.00	995.00	1033.00
7757.00	10.00	0.00	0.00	583.50	905.00	590.04	212.66	590.40	38.00	38.00	995.00	1033.00
7757.00	10.00	0.00	0.00	583.50	1040.00	590.51	243.98	590.91	38.00	38.00	995.00	1033.00
7757.00	10.00	0.00	0.00	583.50	1290.00	591.35	302.19	591.80	38.00	38.00	995.00	1033.00
8177.00	420.00	0.00	0.00	583.80	645.00	589.74	157.90	590.08	37.84	0.00	0.00	0.00
8177.00	420.00	0.00	0.00	583.80	905.00	590.75	222.68	591.14	42.68	0.00	0.00	0.00
8177.00	420.00	0.00	0.00	583.80	1040.00	591.22	257.96	591.64	44.96	0.00	0.00	0.00
8177.00	420.00	0.00	0.00	583.80	1290.00	592.06	328.46	592.51	49.01	0.00	0.00	0.00
8226.00	49.00	0.00	0.00	584.10	645.00	589.83	204.68	590.14	27.40	0.00	0.00	0.00
8226.00	49.00	0.00	0.00	584.10	905.00	590.79	267.35	591.23	27.40	0.00	0.00	0.00
8226.00	49.00	0.00	0.00	584.10	1040.00	591.25	298.68	591.75	27.40	0.00	0.00	0.00
8226.00	49.00	0.00	0.00	584.10	1290.00	592.04	356.14	592.66	27.40	0.00	0.00	0.00
8227.00	1.00	598.70	596.30	583.90	645.00	589.90	213.81	590.16	27.40	0.00	0.00	0.00
8227.00	1.00	598.70	596.30	583.90	905.00	590.87	268.94	591.25	27.40	0.00	0.00	0.00
8227.00	1.00	598.70	596.30	583.90	1040.00	591.33	296.07	591.77	27.40	0.00	0.00	0.00
8227.00	1.00	598.70	596.30	583.90	1290.00	592.14	344.98	592.69	27.40	0.00	0.00	0.00

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TQ	EG	TOPWID	PERENC	STENCL	STENCR
8250.00	23.00	598.70	596.30	583.90	645.00	589.92	215.01	590.18	27.40	0.00	0.00	0.00
8250.00	23.00	598.70	596.30	583.90	905.00	590.90	270.46	591.28	27.40	0.00	0.00	0.00
8250.00	23.00	598.70	596.30	583.90	1040.00	591.37	297.74	591.80	27.40	0.00	0.00	0.00
8250.00	23.00	598.70	596.30	583.90	1290.00	592.18	346.89	592.72	27.40	0.00	0.00	0.00
8251.00	1.00	0.00	0.00	584.10	645.00	589.90	209.81	590.20	27.40	0.00	0.00	0.00
8251.00	1.00	0.00	0.00	584.10	905.00	590.88	273.11	591.30	27.40	0.00	0.00	0.00
8251.00	1.00	0.00	0.00	584.10	1040.00	591.34	305.23	591.83	27.40	0.00	0.00	0.00
8251.00	1.00	0.00	0.00	584.10	1290.00	592.15	364.01	592.75	27.40	0.00	0.00	0.00
8275.00	24.00	0.00	0.00	584.10	645.00	590.02	217.26	590.25	36.67	0.00	0.00	0.00
8275.00	24.00	0.00	0.00	584.10	905.00	591.08	295.24	591.37	40.02	0.00	0.00	0.00
8275.00	24.00	0.00	0.00	584.10	1040.00	591.59	339.93	591.91	43.46	0.00	0.00	0.00
8275.00	24.00	0.00	0.00	584.10	1290.00	592.49	419.72	592.85	50.87	0.00	0.00	0.00
9115.00	840.00	0.00	0.00	584.60	645.00	590.80	206.69	591.03	41.40	0.00	0.00	0.00
9115.00	840.00	0.00	0.00	584.60	905.00	591.91	292.27	592.17	45.97	0.00	0.00	0.00
9115.00	840.00	0.00	0.00	584.60	1040.00	592.42	337.62	592.71	48.09	0.00	0.00	0.00
9115.00	840.00	0.00	0.00	584.60	1290.00	593.33	427.08	593.64	51.85	0.00	0.00	0.00
9954.00	839.00	0.00	0.00	585.20	645.00	591.57	235.59	591.75	43.38	0.00	0.00	0.00
9954.00	839.00	0.00	0.00	585.20	905.00	592.68	327.09	592.90	47.90	0.00	0.00	0.00
9954.00	839.00	0.00	0.00	585.20	1040.00	593.19	375.38	593.43	50.01	0.00	0.00	0.00
9954.00	839.00	0.00	0.00	585.20	1290.00	594.08	468.35	594.35	53.66	0.00	0.00	0.00
9974.00	20.00	0.00	0.00	585.60	645.00	591.52	210.88	591.83	25.30	0.00	0.00	0.00
9974.00	20.00	0.00	0.00	585.60	905.00	592.59	276.39	593.03	25.30	0.00	0.00	0.00
9974.00	20.00	0.00	0.00	585.60	1040.00	593.08	308.10	593.58	25.30	0.00	0.00	0.00
9974.00	20.00	0.00	0.00	585.60	1290.00	593.93	365.16	594.55	25.30	0.00	0.00	0.00
10016.00	42.00	599.00	592.70	585.60	645.00	591.57	213.71	591.88	25.30	0.00	0.00	0.00
10016.00	42.00	599.00	592.70	585.60	905.00	592.97	300.77	593.36	25.30	0.00	0.00	0.00
10016.00	42.00	599.00	592.70	585.60	1040.00	593.67	347.42	594.10	25.30	0.00	0.00	0.00
10016.00	42.00	599.00	592.70	585.60	1290.00	595.01	441.84	595.49	25.30	0.00	0.00	0.00
10041.00	25.00	0.00	0.00	585.60	645.00	591.78	262.05	591.94	43.73	0.00	0.00	0.00
10041.00	25.00	0.00	0.00	585.60	905.00	593.27	395.96	593.44	48.76	0.00	0.00	0.00
10041.00	25.00	0.00	0.00	585.60	1040.00	594.01	473.82	594.19	51.28	0.00	0.00	0.00
10041.00	25.00	0.00	0.00	585.60	1290.00	595.42	642.63	595.60	56.06	0.00	0.00	0.00
10071.00	30.00	0.00	0.00	585.60	645.00	591.78	242.84	591.98	32.00	32.00	396.00	428.00
10071.00	30.00	0.00	0.00	585.60	905.00	593.25	340.89	593.50	32.00	32.00	396.00	428.00
10071.00	30.00	0.00	0.00	585.60	1040.00	593.98	392.74	594.25	32.00	32.00	396.00	428.00
10071.00	30.00	0.00	0.00	585.60	1290.00	595.38	495.58	595.67	32.00	32.00	396.00	428.00
10096.00	25.00	0.00	0.00	585.40	645.00	591.52	107.20	592.31	20.00	0.00	0.00	0.00
10096.00	25.00	0.00	0.00	585.40	905.00	592.96	164.14	593.85	20.00	0.00	0.00	0.00
10096.00	25.00	0.00	0.00	585.40	1040.00	593.68	195.20	594.62	20.00	0.00	0.00	0.00
10096.00	25.00	0.00	0.00	585.40	1290.00	595.06	258.57	596.05	20.00	0.00	0.00	0.00

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TQ	EG	TOPWID	PERENC	STENCL	STENCR
10097.00	1.00	603.60	599.90	585.40	645.00	591.49	95.87	592.35	19.18	0.00	0.00	0.00
10097.00	1.00	603.60	599.90	585.40	905.00	592.92	141.55	593.89	19.27	0.00	0.00	0.00
10097.00	1.00	603.60	599.90	585.40	1040.00	593.64	165.86	594.66	19.32	0.00	0.00	0.00
10097.00	1.00	603.60	599.90	585.40	1290.00	595.02	214.58	596.10	19.42	0.00	0.00	0.00
10112.00	15.00	603.60	599.90	585.40	645.00	591.61	99.68	592.43	19.18	0.00	0.00	0.00
10112.00	15.00	603.60	599.90	585.40	905.00	593.02	144.97	593.96	19.28	0.00	0.00	0.00
10112.00	15.00	603.60	599.90	585.40	1040.00	593.74	169.14	594.73	19.33	0.00	0.00	0.00
10112.00	15.00	603.60	599.90	585.40	1290.00	595.10	217.54	596.16	19.42	0.00	0.00	0.00
10113.00	1.00	0.00	0.00	585.40	645.00	591.74	115.37	592.46	20.00	0.00	0.00	0.00
10113.00	1.00	0.00	0.00	585.40	905.00	593.16	172.75	594.00	20.00	0.00	0.00	0.00
10113.00	1.00	0.00	0.00	585.40	1040.00	593.88	203.95	594.76	20.00	0.00	0.00	0.00
10113.00	1.00	0.00	0.00	585.40	1290.00	595.24	267.18	596.19	20.00	0.00	0.00	0.00
10135.00	22.00	0.00	0.00	585.40	645.00	592.12	139.16	592.59	27.90	0.00	0.00	0.00
10135.00	22.00	0.00	0.00	585.40	905.00	593.68	220.52	594.15	31.61	0.00	0.00	0.00
10135.00	22.00	0.00	0.00	585.40	1040.00	594.47	268.76	594.93	33.47	0.00	0.00	0.00
10135.00	22.00	0.00	0.00	585.40	1290.00	595.93	372.40	596.38	36.93	0.00	0.00	0.00
10312.00	177.00	0.00	0.00	585.60	645.00	592.77	178.88	592.96	39.36	0.00	0.00	0.00
10312.00	177.00	0.00	0.00	585.60	905.00	594.27	267.22	594.48	45.07	0.00	0.00	0.00
10312.00	177.00	0.00	0.00	585.60	1040.00	595.02	319.48	595.23	47.92	0.00	0.00	0.00
10312.00	177.00	0.00	0.00	585.60	1290.00	596.42	446.78	596.63	111.69	0.00	0.00	0.00
11295.00	983.00	0.00	0.00	586.00	645.00	593.82	234.04	593.94	46.83	51.00	500.00	551.00
11295.00	983.00	0.00	0.00	586.00	905.00	595.23	339.35	595.37	50.57	51.00	500.00	551.00
11295.00	983.00	0.00	0.00	586.00	1040.00	595.92	400.30	596.07	51.00	51.00	500.00	551.00
11295.00	983.00	0.00	0.00	586.00	1290.00	597.17	521.49	597.34	51.00	51.00	500.00	551.00
11344.00	49.00	0.00	0.00	586.10	645.00	593.81	210.32	594.03	24.00	0.00	0.00	0.00
11344.00	49.00	0.00	0.00	586.10	905.00	595.19	274.84	595.50	24.00	0.00	0.00	0.00
11344.00	49.00	0.00	0.00	586.10	1040.00	595.86	307.86	596.21	24.00	0.00	0.00	0.00
11344.00	49.00	0.00	0.00	586.10	1290.00	597.09	370.36	597.50	24.00	0.00	0.00	0.00
11424.00	80.00	602.20	596.00	586.10	645.00	593.89	213.96	594.11	24.00	0.00	0.00	0.00
11424.00	80.00	602.20	596.00	586.10	905.00	595.28	279.40	595.58	24.00	0.00	0.00	0.00
11424.00	80.00	602.20	596.00	586.10	1040.00	596.25	327.35	596.57	24.00	0.00	0.00	0.00
11424.00	80.00	602.20	596.00	586.10	1290.00	597.81	408.65	598.18	24.00	0.00	0.00	0.00
11449.00	25.00	0.00	0.00	586.10	645.00	594.06	280.28	594.16	47.05	75.00	178.00	253.00
11449.00	25.00	0.00	0.00	586.10	905.00	595.54	408.24	595.66	59.78	75.00	178.00	253.00
11449.00	25.00	0.00	0.00	586.10	1040.00	596.53	511.22	596.65	67.01	75.00	178.00	253.00
11449.00	25.00	0.00	0.00	586.10	1290.00	598.15	720.63	598.26	75.00	75.00	178.00	253.00

SECTION NUMBER	DISCHARGE CFS	CWSEL	CWSEL DIFF EACH Q	CWSEL DIFF EACH SECTION	CWSEL-WSELK	TOPWID	T.W. DIFF	LENGTH
40.000	645.000	581.900	0.000	0.000	0.000	49.102	0.000	40.000
40.000	905.000	581.900	0.000	0.000	0.000	49.102	0.000	40.000
40.000	1040.000	581.900	0.000	0.000	0.000	49.102	0.000	40.000
40.000	1290.000	581.900	0.000	0.000	0.000	49.102	0.000	40.000
340.000	645.000	582.290	0.000	.390	0.000	50.069	0.000	300.000
340.000	905.000	582.644	.354	.744	0.000	50.922	-.853	300.000
340.000	1040.000	582.862	.219	.962	0.000	51.457	-1.388	300.000
340.000	1290.000	583.319	.457	1.419	0.000	52.575	-2.506	300.000
640.000	645.000	582.591	0.000	.301	0.000	48.800	0.000	300.000
640.000	905.000	583.091	.500	.448	0.000	50.562	-1.762	300.000
640.000	1040.000	583.373	.282	.511	0.000	51.564	-2.764	300.000
640.000	1290.000	584.033	.659	.713	0.000	649.999	-601.199	300.000

1770.000	645.000	583.778	0.000	1.187	0.000	43.100	0.000	1130.000
1770.000	905.000	584.627	.849	1.536	0.000	46.230	-3.130	1130.000
1770.000	1040.000	585.032	.405	1.658	0.000	47.450	-4.350	1130.000
1770.000	1290.000	585.667	.636	1.635	0.000	48.481	-5.380	1130.000
2850.000	645.000	584.603	0.000	.825	0.000	966.877	0.000	1080.000
2850.000	905.000	585.343	.740	.716	0.000	998.303	-31.426	1080.000
2850.000	1040.000	585.711	.367	.679	0.000	998.732	-31.855	1080.000
2850.000	1290.000	586.342	.631	.675	0.000	999.465	-32.587	1080.000
3513.000	645.000	584.855	0.000	.252	0.000	415.163	0.000	663.000
3513.000	905.000	585.485	.629	.141	0.000	698.954	-283.791	663.000
3513.000	1040.000	585.818	.333	.107	0.000	858.263	-443.100	663.000
3513.000	1290.000	586.413	.595	.071	0.000	1033.374	-618.211	663.000
3562.000	645.000	584.867	0.000	.011	0.000	420.494	0.000	49.000
3562.000	905.000	585.497	.630	.012	0.000	701.420	-280.926	49.000
3562.000	1040.000	585.829	.332	.011	0.000	865.492	-444.998	49.000
3562.000	1290.000	586.421	.592	.008	0.000	1029.498	-609.004	49.000
3563.000	645.000	584.851	0.000	-.016	0.000	411.701	0.000	1.000
3563.000	905.000	585.491	.640	-.006	0.000	696.059	-284.358	1.000
3563.000	1040.000	585.829	.339	.000	0.000	860.058	-448.357	1.000
3563.000	1290.000	586.432	.602	.011	0.000	962.368	-550.667	1.000
3587.000	645.000	584.876	0.000	.025	0.000	418.732	0.000	24.000
3587.000	905.000	585.518	.642	.028	0.000	703.338	-284.607	24.000
3587.000	1040.000	585.852	.334	.023	0.000	873.933	-455.202	24.000
3587.000	1290.000	586.443	.591	.012	0.000	962.874	-544.142	24.000
3588.000	645.000	584.924	0.000	.048	0.000	445.388	0.000	1.000
3588.000	905.000	585.539	.615	.021	0.000	719.012	-273.624	1.000
3588.000	1040.000	585.853	.314	.000	0.000	880.518	-435.130	1.000
3588.000	1290.000	586.440	.587	-.003	0.000	1029.498	-584.110	1.000
3608.000	645.000	584.951	0.000	.027	0.000	457.366	0.000	20.000
3608.000	905.000	585.563	.612	.025	0.000	730.766	-273.399	20.000
3608.000	1040.000	585.873	.309	.020	0.000	903.128	-445.762	20.000
3608.000	1290.000	586.449	.576	.009	0.000	1033.387	-576.020	20.000
4507.000	645.000	585.389	0.000	.438	0.000	673.496	0.000	899.000
4507.000	905.000	585.952	.563	.389	0.000	846.553	-173.057	899.000
4507.000	1040.000	586.207	.255	.334	0.000	847.155	-173.659	899.000
4507.000	1290.000	586.665	.458	.216	0.000	848.248	-174.752	899.000
5353.000	645.000	586.058	0.000	.668	0.000	634.702	0.000	846.000
5353.000	905.000	586.427	.369	.474	0.000	635.346	-.644	846.000
5353.000	1040.000	586.613	.186	.406	0.000	635.672	-.970	846.000
5353.000	1290.000	587.007	.394	.342	0.000	662.999	-28.297	846.000
5452.000	645.000	586.096	0.000	.038	0.000	545.619	0.000	99.000
5452.000	905.000	586.453	.357	.027	0.000	564.857	-19.238	99.000
5452.000	1040.000	586.635	.182	.022	0.000	573.568	-27.949	99.000
5452.000	1290.000	587.019	.384	.013	0.000	591.931	-46.311	99.000
5453.000	645.000	586.058	0.000	-.037	0.000	511.869	0.000	1.000
5453.000	905.000	586.419	.360	-.034	0.000	552.908	-41.039	1.000
5453.000	1040.000	586.613	.194	-.022	0.000	563.763	-51.893	1.000
5453.000	1290.000	587.019	.406	.000	0.000	586.480	-74.611	1.000
5493.000	645.000	586.113	0.000	.054	0.000	535.793	0.000	40.000
5493.000	905.000	586.518	.405	.099	0.000	558.511	-22.718	40.000
5493.000	1040.000	586.708	.190	.095	0.000	569.137	-33.344	40.000
5493.000	1290.000	587.084	.375	.065	0.000	590.076	-54.284	40.000

5494.000	645.000	586.213	0.000	.100	0.000	553.367	0.000	1.000
5494.000	905.000	586.592	.379	.074	0.000	571.521	-18.154	1.000
5494.000	1040.000	586.753	.161	.045	0.000	579.200	-25.833	1.000
5494.000	1290.000	587.083	.330	-.001	0.000	595.090	-41.723	1.000
5504.000	645.000	586.255	0.000	.041	0.000	568.760	0.000	10.000
5504.000	905.000	586.640	.385	.048	0.000	587.834	-19.074	10.000
5504.000	1040.000	586.801	.161	.048	0.000	595.826	-27.066	10.000
5504.000	1290.000	587.125	.323	.041	0.000	611.842	-43.081	10.000
6230.000	645.000	586.438	0.000	.183	0.000	370.039	0.000	726.000
6230.000	905.000	586.875	.438	.236	0.000	370.462	-.423	726.000
6230.000	1040.000	587.059	.184	.258	0.000	370.639	-.600	726.000
6230.000	1290.000	587.399	.340	.275	0.000	370.969	-.930	726.000
6960.000	645.000	586.924	0.000	.487	0.000	46.151	0.000	730.000
6960.000	905.000	587.433	.509	.558	0.000	97.356	-51.204	730.000
6960.000	1040.000	587.644	.211	.585	0.000	171.234	-125.082	730.000
6960.000	1290.000	587.998	.354	.599	0.000	171.842	-125.691	730.000
7686.000	645.000	588.341	0.000	1.417	0.000	45.002	0.000	726.000
7686.000	905.000	589.125	.784	1.692	0.000	48.237	-3.235	726.000
7686.000	1040.000	589.455	.330	1.811	0.000	49.602	-4.600	726.000
7686.000	1290.000	589.954	.499	1.956	0.000	51.674	-6.672	726.000
7711.000	645.000	588.425	0.000	.084	0.000	39.999	0.000	25.000
7711.000	905.000	589.190	.765	.065	0.000	39.999	-.000	25.000
7711.000	1040.000	589.513	.323	.057	0.000	39.999	-.000	25.000
7711.000	1290.000	589.996	.484	.042	0.000	39.999	-.000	25.000
7735.000	645.000	588.391	0.000	-.034	0.000	24.600	0.000	24.000
7735.000	905.000	589.081	.690	-.108	0.000	24.600	0.000	24.000
7735.000	1040.000	589.360	.279	-.152	0.000	24.600	0.000	24.000
7735.000	1290.000	589.756	.396	-.240	0.000	24.600	0.000	24.000
7736.000	645.000	588.328	0.000	-.064	0.000	24.600	0.000	1.000
7736.000	905.000	589.000	.672	-.081	0.000	24.600	0.000	1.000
7736.000	1040.000	589.266	.266	-.094	0.000	24.600	0.000	1.000
7736.000	1290.000	589.632	.365	-.124	0.000	24.600	0.000	1.000
7746.000	645.000	588.456	0.000	.129	0.000	24.600	0.000	10.000
7746.000	905.000	589.189	.733	.189	0.000	24.600	0.000	10.000
7746.000	1040.000	589.511	.322	.244	0.000	24.600	0.000	10.000
7746.000	1290.000	590.036	.525	.405	0.000	24.600	0.000	10.000
7747.000	645.000	588.676	0.000	.219	0.000	24.600	0.000	1.000
7747.000	905.000	589.483	.807	.294	0.000	24.600	0.000	1.000
7747.000	1040.000	589.842	.359	.331	0.000	24.600	0.000	1.000
7747.000	1290.000	590.477	.635	.441	0.000	24.600	0.000	1.000
7757.000	645.000	589.037	0.000	.362	0.000	37.488	0.000	10.000
7757.000	905.000	590.039	1.002	.556	0.000	37.999	-.511	10.000
7757.000	1040.000	590.511	.472	.669	0.000	37.999	-.511	10.000
7757.000	1290.000	591.346	.835	.869	0.000	37.999	-.511	10.000
8177.000	645.000	589.743	0.000	.705	0.000	37.839	0.000	420.000
8177.000	905.000	590.748	1.005	.709	0.000	42.676	-4.837	420.000
8177.000	1040.000	591.221	.473	.710	0.000	44.957	-7.118	420.000
8177.000	1290.000	592.060	.839	.714	0.000	49.005	-11.166	420.000
8226.000	645.000	589.831	0.000	.089	0.000	27.400	0.000	49.000
8226.000	905.000	590.792	.961	.044	0.000	27.400	0.000	49.000
8226.000	1040.000	591.247	.455	.025	0.000	27.400	0.000	49.000
8226.000	1290.000	592.045	.798	-.015	0.000	27.400	0.000	49.000
8227.000	645.000	589.896	0.000	.065	0.000	27.400	0.000	1.000

8227.000	905.000	590.872	.976	.080	0.000	27.400	0.000	1.000
8227.000	1040.000	591.334	.462	.087	0.000	27.400	0.000	1.000
8227.000	1290.000	592.143	.810	.098	0.000	27.400	0.000	1.000
8250.000	645.000	589.919	0.000	.023	0.000	27.400	0.000	23.000
8250.000	905.000	590.901	.982	.030	0.000	27.400	0.000	23.000
8250.000	1040.000	591.366	.465	.033	0.000	27.400	0.000	23.000
8250.000	1290.000	592.181	.815	.037	0.000	27.400	0.000	23.000
8251.000	645.000	589.899	0.000	-.020	0.000	27.400	0.000	1.000
8251.000	905.000	590.877	.977	-.025	0.000	27.400	0.000	1.000
8251.000	1040.000	591.340	.463	-.027	0.000	27.400	0.000	1.000
8251.000	1290.000	592.151	.812	-.030	0.000	27.400	0.000	1.000
8275.000	645.000	590.022	0.000	.123	0.000	36.669	0.000	24.000
8275.000	905.000	591.080	1.057	.203	0.000	40.020	-3.351	24.000
8275.000	1040.000	591.587	.507	.247	0.000	43.455	-6.786	24.000
8275.000	1290.000	592.486	.900	.335	0.000	50.868	-14.199	24.000
9115.000	645.000	590.801	0.000	.779	0.000	41.399	0.000	840.000
9115.000	905.000	591.906	1.105	.827	0.000	45.974	-4.575	840.000
9115.000	1040.000	592.421	.515	.835	0.000	48.095	-6.695	840.000
9115.000	1290.000	593.333	.912	.847	0.000	51.849	-10.450	840.000
9954.000	645.000	591.568	0.000	.766	0.000	43.383	0.000	839.000
9954.000	905.000	592.678	1.110	.771	0.000	47.905	-4.522	839.000
9954.000	1040.000	593.191	.513	.770	0.000	50.007	-6.625	839.000
9954.000	1290.000	594.083	.892	.750	0.000	53.661	-10.279	839.000
9974.000	645.000	591.518	0.000	-.049	0.000	25.300	0.000	20.000
9974.000	905.000	592.589	1.070	-.089	0.000	25.300	0.000	20.000
9974.000	1040.000	593.079	.490	-.112	0.000	25.300	0.000	20.000
9974.000	1290.000	593.927	.848	-.156	0.000	25.300	0.000	20.000
10016.000	645.000	591.567	0.000	.048	0.000	25.300	0.000	42.000
10016.000	905.000	592.965	1.399	.377	0.000	25.300	0.000	42.000
10016.000	1040.000	593.666	.701	.587	0.000	25.300	0.000	42.000
10016.000	1290.000	595.010	1.344	1.083	0.000	25.300	0.000	42.000
10041.000	645.000	591.780	0.000	.213	0.000	43.728	0.000	25.000
10041.000	905.000	593.267	1.487	.301	0.000	48.761	-5.032	25.000
10041.000	1040.000	594.010	.743	.344	0.000	51.277	-7.549	25.000
10041.000	1290.000	595.422	1.412	.412	0.000	56.057	-12.328	25.000
10071.000	645.000	591.780	0.000	.000	0.000	31.999	0.000	30.000
10071.000	905.000	593.249	1.469	-.017	0.000	31.999	-.000	30.000
10071.000	1040.000	593.983	.734	-.027	0.000	31.999	-.000	30.000
10071.000	1290.000	595.378	1.395	-.044	0.000	31.999	-.000	30.000
10096.000	645.000	591.519	0.000	-.262	0.000	20.000	0.000	25.000
10096.000	905.000	592.957	1.438	-.292	0.000	20.000	0.000	25.000
10096.000	1040.000	593.677	.721	-.306	0.000	20.000	0.000	25.000
10096.000	1290.000	595.058	1.380	-.320	0.000	20.000	0.000	25.000
10097.000	645.000	591.489	0.000	-.030	0.000	19.175	0.000	1.000
10097.000	905.000	592.922	1.432	-.035	0.000	19.273	-.098	1.000
10097.000	1040.000	593.640	.719	-.037	0.000	19.322	-.146	1.000
10097.000	1290.000	595.020	1.379	-.038	0.000	19.416	-.240	1.000
10112.000	645.000	591.613	0.000	.124	0.000	19.184	0.000	15.000
10112.000	905.000	593.024	1.411	.103	0.000	19.280	-.096	15.000
10112.000	1040.000	593.736	.711	.095	0.000	19.328	-.144	15.000
10112.000	1290.000	595.102	1.366	.082	0.000	19.421	-.237	15.000
10113.000	645.000	591.738	0.000	.124	0.000	20.000	0.000	1.000
10113.000	905.000	593.161	1.423	.137	0.000	20.000	0.000	1.000

10113.000	1040.000	593.875	.714	.140	0.000	20.000	0.000	1.000
10113.000	1290.000	595.239	1.363	.137	0.000	20.000	0.000	1.000
10135.000	645.000	592.124	0.000	.386	0.000	27.904	0.000	22.000
10135.000	905.000	593.683	1.559	.522	0.000	31.610	-3.706	22.000
10135.000	1040.000	594.466	.783	.591	0.000	33.469	-5.565	22.000
10135.000	1290.000	595.933	1.468	.695	0.000	36.928	-9.024	22.000
10312.000	645.000	592.769	0.000	.646	0.000	39.362	0.000	177.000
10312.000	905.000	594.267	1.497	.584	0.000	45.065	-5.703	177.000
10312.000	1040.000	595.017	.750	.551	0.000	47.922	-8.560	177.000
10312.000	1290.000	596.423	1.406	.489	0.000	111.693	-72.330	177.000
11295.000	645.000	593.820	0.000	1.050	0.000	46.829	0.000	983.000
11295.000	905.000	595.229	1.409	.962	0.000	50.570	-3.741	983.000
11295.000	1040.000	595.917	.689	.901	0.000	50.999	-4.170	983.000
11295.000	1290.000	597.172	1.254	.749	0.000	50.999	-4.170	983.000
11344.000	645.000	593.811	0.000	-.008	0.000	24.000	0.000	49.000
11344.000	905.000	595.189	1.378	-.040	0.000	24.000	0.000	49.000
11344.000	1040.000	595.861	.672	-.056	0.000	24.000	0.000	49.000
11344.000	1290.000	597.086	1.225	-.086	0.000	24.000	0.000	49.000
11424.000	645.000	593.891	0.000	.080	0.000	24.000	0.000	80.000
11424.000	905.000	595.283	1.392	.094	0.000	24.000	0.000	80.000
11424.000	1040.000	596.249	.965	.387	0.000	24.000	0.000	80.000
11424.000	1290.000	597.812	1.563	.725	0.000	24.000	0.000	80.000
11449.000	645.000	594.064	0.000	.172	0.000	47.047	0.000	25.000
11449.000	905.000	595.538	1.474	.254	0.000	59.779	-12.732	25.000
11449.000	1040.000	596.530	.992	.281	0.000	67.007	-19.960	25.000
11449.000	1290.000	598.150	1.620	.339	0.000	74.999	-27.952	25.000

DATA FOR LAST CROSS SECTION

PROFILE	TYPE ENC	TARGET	TOP WIDTH AREA-ACRES	TOP WIDTH AREA-DIFF
1	0.000	75.000	67.649	0.000
2	0.000	75.000	78.895	11.246
3	0.000	75.000	83.817	16.168
4	0.000	75.000	98.275	30.626

PANEL 2

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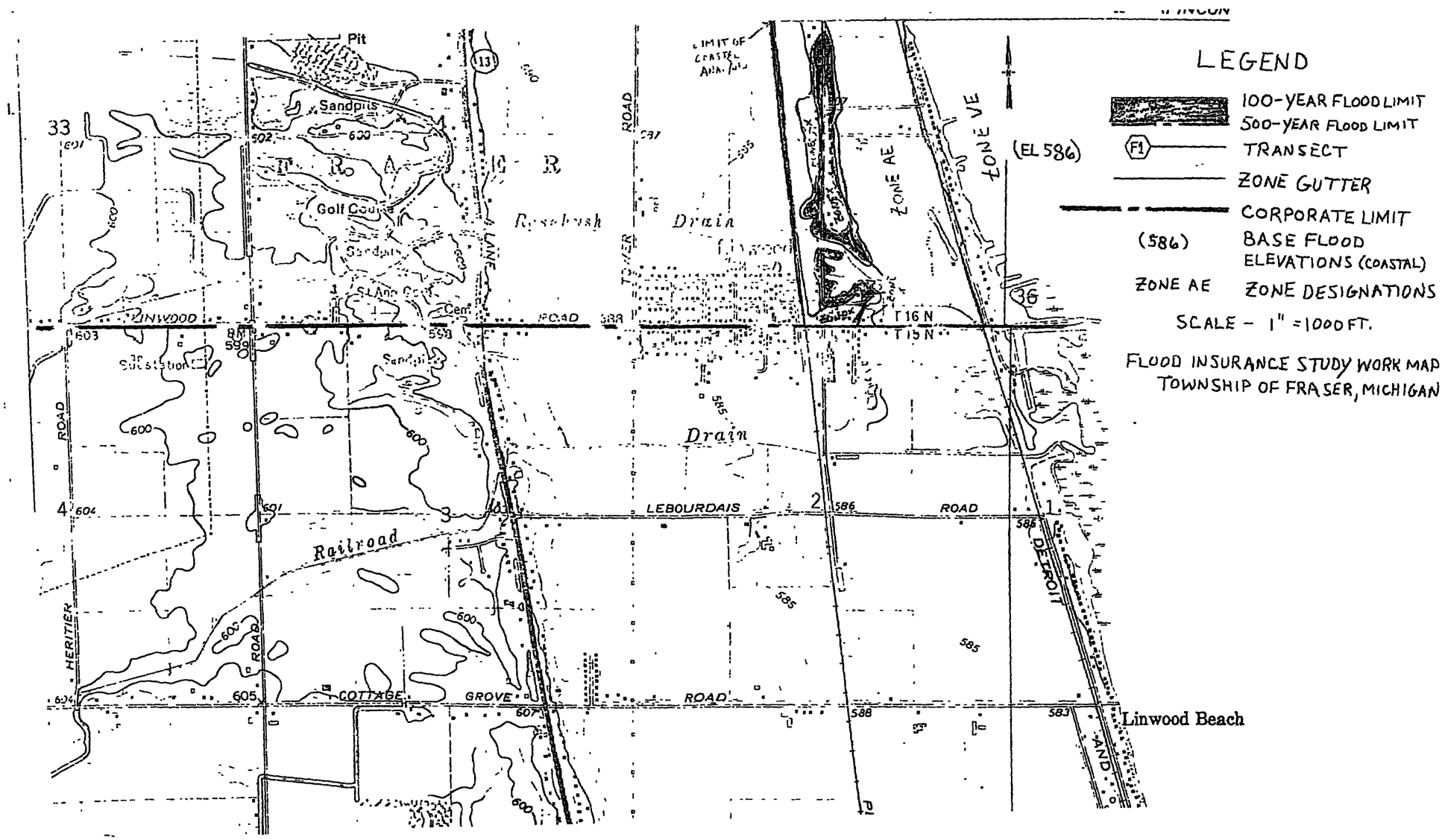
LAND & WATER MGMT.



PANEL 2

RECEIVED
JAN 07 1991
NATURAL RESOURCES
LAND & WATER MGMT.

PANEL 1

PANEL 1

PANEL 2

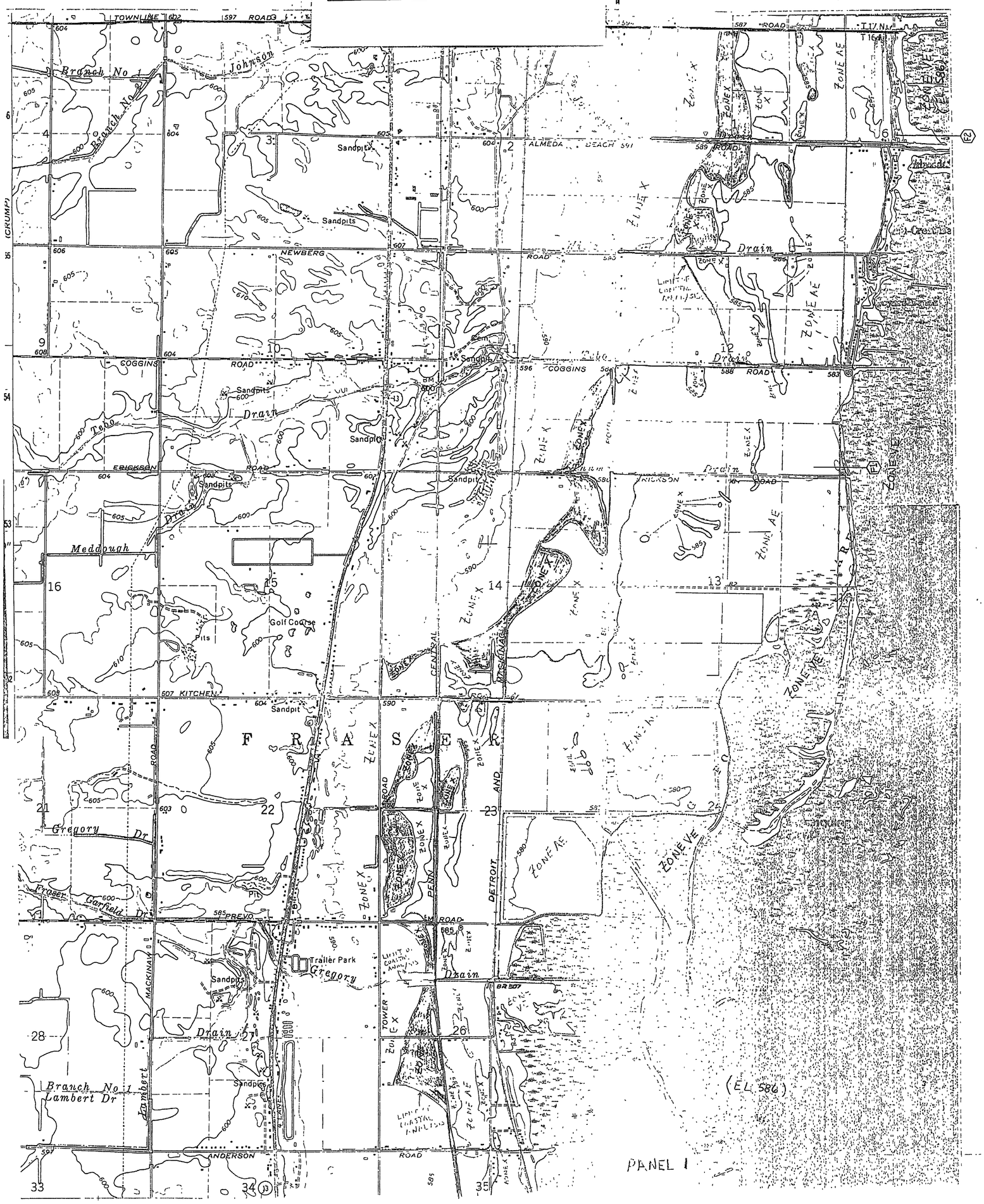
TOWNSHIP OF FRASER, FIS
INDEX MAP

LEGEND

(586) BASE FLOOD ELEVATIONS (COASTAL)
ZONE AE ZONE DESIGNATIONS
SCALE - 1" = 1000"

100-YEAR FLOOD LIMIT
500-YEAR FLOOD LIMIT
F1 TRANSECT
ZONE GUTTER
CORPORATE LIMIT

FLOOD INSURANCE STUDY WORK MAP
TOWNSHIP OF FRASER, MICHIGAN



00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Kawkawlin Township

3) WATERCOURSE: Saginaw Bay - Wave Runup

4) DOCUMENT TYPE: Report

00BREAK00

TECHNICAL LETTER REPORT ON
KAWKAWLIN TOWNSHIP, MICHIGAN

Prepared by the U.S. Army Corps of Engineers
for the Federal Emergency Management Agency

Detroit, Michigan
November 1990

TECHNICAL LETTER REPORT ON
KAWKAWLIN TOWNSHIP, MICHIGAN

TABLE OF CONTENTS

Title	Page
TABLE OF CONTENTS	i
LIST OF FIGURES	ii
LIST OF TABLES	ii
1.0 INTRODUCTION	1
1.1 PURPOSE OF STUDY	1
1.2 AUTHORITY AND ACKNOWLEDGMENTS	1
1.3 COORDINATION	3
2.0 AREA STUDIED	3
2.1 COMMUNITY DESCRIPTION	3
2.2 PRINCIPAL FLOOD PROBLEMS	5
3.0 ENGINEERING METHODS	5
4.0 A-ZONE AND V-ZONE DELINEATION	6
5.0 CONCLUSIONS	11
6.0 GLOSSARY	14
7.0 REFERENCES	16

LIST OF FIGURES

Number	Title	Page
1.	KAWKAWLIN TOWNSHIP LOCATION MAP	4
2.	KAWKAWLIN TOWNSHIP A & V-ZONE DELINEATIONS ON A BEACH/BLUFF SYSTEM (PROFILE K-1)	8
3.	KAWKAWLIN TOWNSHIP A & V-ZONE DELINEATIONS ON A BEACH/STRUCTURE SYSTEM (PROFILE K-2)	9
4.	KAWKAWLIN TOWNSHIP A & V-ZONE DELINEATIONS ON A BEACH/STRUCTURE SYSTEM (PROFILE K-3)	10
5.	KAWKAWLIN TOWNSHIP A & V-ZONE DELINEATIONS ON A BEACH/STRUCTURE SYSTEM (PROFILE K-4)	12

LIST OF TABLES

Number	Title	Page
1.	SHORELINE PROFILES, KAWKAWLIN TOWNSHIP, MICHIGAN	2
2.	WAVE RUNUP ELEVATIONS	13

Appendix	Title
A	FIS PROFILES AND COMPUTATIONS

TECHNICAL LETTER REPORT ON
KAWKAWLIN TOWNSHIP, MICHIGAN

1.0 INTRODUCTION

1.1 Purpose of Study

This report describes the application of the procedures developed in the 1989 "Great Lakes Wave Runup Methodology Study" to flood levels on Saginaw Bay, specifically in Kawkawlin Township, Michigan. The flood levels applicable to Kawkawlin Township were developed in the September 1989 "Flood Levels Report for Saginaw Bay".

1.2 Authority and Acknowledgments

The "Great Lakes Wave Runup Methodology Study" was prepared in 1989 by the U.S. Army Corps of Engineers (COE) for the Federal Emergency Management Agency (FEMA), for application to future coastal Flood Insurance Studies (FIS) and/or restudies of communities bordering the Great Lakes. The work was conducted under Inter-Agency Work Agreement, EMW-89-E-3218, Project Order No. 1, between the COE and FEMA. The 100-year and 500-year flood levels from the September 1989 report referenced above, were used to compute the maximum wave runup elevations required for updating the existing FIS in Kawkawlin Township on Saginaw Bay. TABLE 1 lists profile locations, and the 100-year and 500-year "base" flood levels at four locations along the Kawkawlin Township shoreline. The four profiles were plotted from data obtained from a June 1990 survey.

SHORELINE PROFILES
KAWKAWLIN TOWNSHIP, MICHIGAN

	Profile Location	100-year Flood Level *	500-year Flood Level *
1.	Kawkawlin-1	585.7	586.7
2.	Kawkawlin-2	585.7	586.7
3.	Kawkawlin-3	585.7	586.7
4.	Kawkawlin-4	585.7	586.7

* NOTE: All elevations in FT, NGVD from the September 1989 "Flood Levels Report for Saginaw Bay"

TABLE 1

1.3 Coordination

The 1989 "Flood Levels Report for Saginaw Bay", along with examples of the application of the methodology from the 1989 "Great Lakes Wave Runup Methodology Study", were presented to FEMA on March 1, 1990. The procedures outlined in the above references were approved at this meeting for application to all Saginaw Bay FIS sites, including Kawkawlin Township.

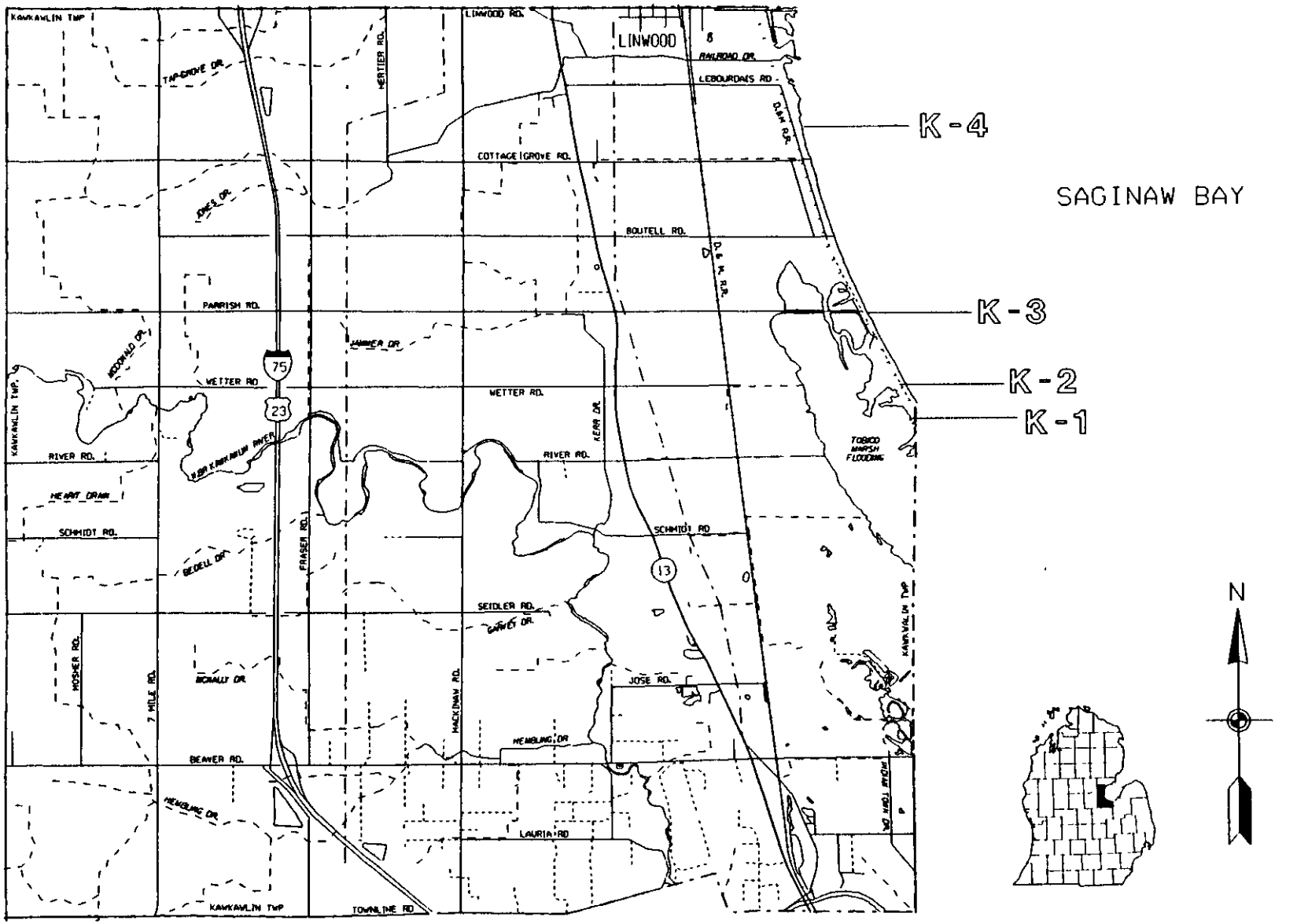
2.0 AREA STUDIED

2.1 Community Description

Kawkawlin Township, Michigan, shown on FIGURE 1, is located in Bay County along 5 miles of Saginaw Bay shoreline. There are no major populated communities located along the Kawkawlin Township shoreline. The developed shoreline consists of year-round residential homes and small summer cottages, having a population of 5,225.

The majority of the Kawkawlin Township shoreline on Saginaw Bay is exposed from the northeast to a fetch of about 150 miles. The bathymetry along this shoreline varies from 30-foot depths offshore to less than five feet deep near shore. Ordinary fluctuations of water levels along the shoreline are subject to change due to wind. A storm from the northeast can push water into the bay and raise the water level along the Kawkawlin Township shoreline 3 to 4 feet. Accordingly, a southwest wind can lower the water level sufficiently to cause large vessels to ground in the shipping channels. The lowest seasonal bay stages

KAWKAWLIN TOWNSHIP LOCATION MAP



U.S. ARMY CORPS OF ENGINEERS, DETROIT DISTRICT
COMPUTER MAPPING CENTER

FIGURE 1

usually prevail during the winter months and the highest during the summer months. During the past 13 years, fluctuations of monthly mean water levels on Saginaw Bay, as measured at the Essexville, Michigan water level gage, have ranged from a minimum of 578.14 feet to a maximum of 581.59 feet (IGLD, 1955).

2.2 Principal Flood Problems

Short-term Saginaw Bay water level fluctuations are most often due to variations in wind and barometric pressure. Occasionally, a surge of considerable proportions takes place within a few hours, due to strong and persistent northerly or southerly winds.

When lake levels are high and storms occur from the northeast, Kawkawlin Township shoreline communities are usually subjected to extreme conditions. Along the Kawkawlin Township shoreline, substantial flooding has occurred because of the flat topography along the reaches on Saginaw Bay.

3.0 ENGINEERING METHODS

The flood levels established in the U.S. Army Corps of Engineer's September 1989 "Flood Levels Report for Saginaw Bay" and the procedures developed in the 1989 "Great Lakes Wave Runup Methodology Study" were used to analyze the flooding potential at the four Kawkawlin Township FIS sites shown on FIGURE 1. The hydraulic analyses presented herein involved the determination of the wave runup components and maximum wave runup elevations for selected sites.

Input data used for flood calculations include site specific design wave, water depth at the toe of the structure, and wave period. Additional data such as nearshore profiles, high water marks, existing conditions, bathymetry, and topography, were also analyzed to determine the maximum wave runup elevation at each site. This technical letter report presents the wave runup application procedures for each of the four FIS sites located in Kawkawlin Township. Representative profiles for each site are included in APPENDIX A.

4.0 A-Zone and V-Zone Delineations

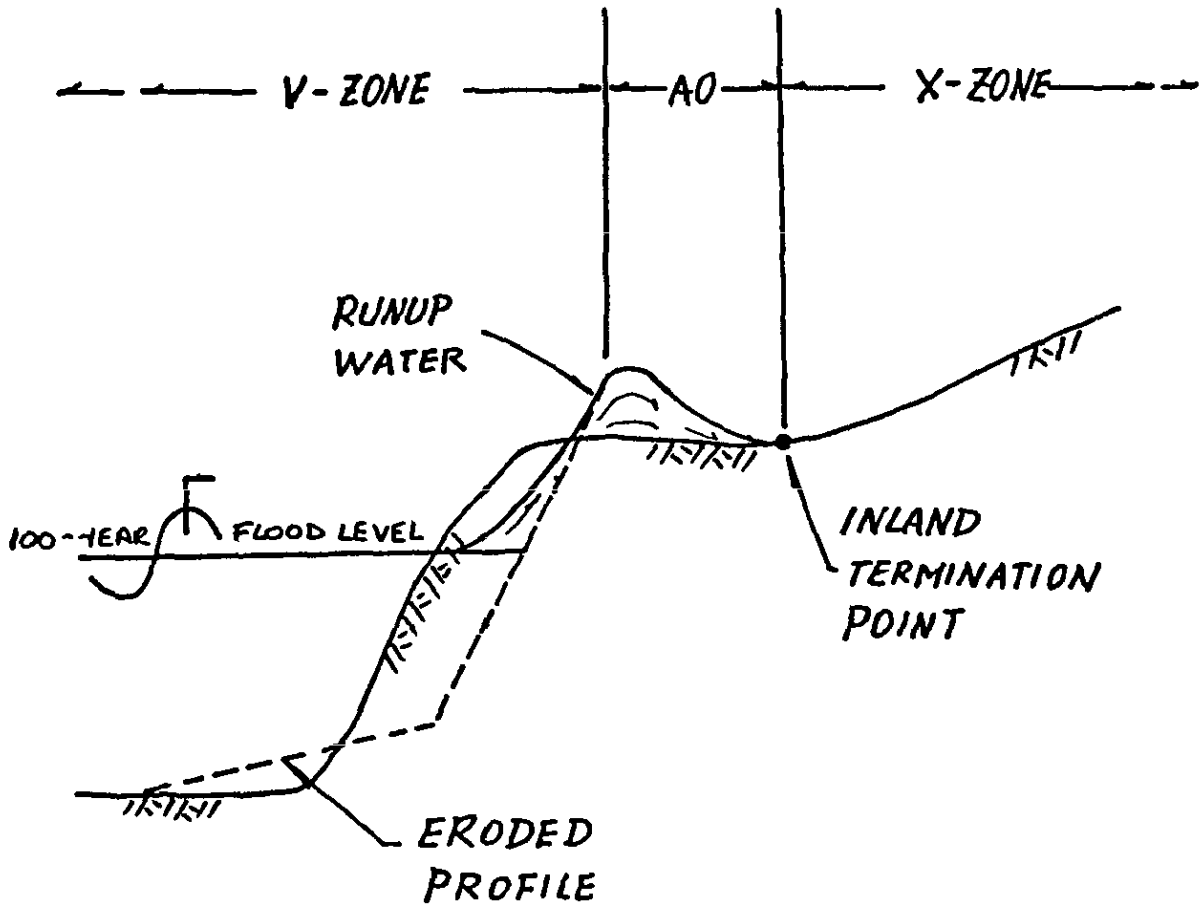
Reaches of the Kawkawlin Township shoreline in the surf zone which are subject to significant wave attack are referred to by FEMA as Coastal High Hazard Zones or velocity ("V") Zones. A "V" Zone is the flood insurance rate zone that corresponds to the 100-year coastal floodplain that has additional hazards associated with storm waves. The "V" Zone is defined in FEMA's 1990 "Guidelines For Great Lakes Wave Runup Computation And Mapping" as the maximum elevation reached by the wave runup associated with the 100-year flood level. This portion of the shoreline and/or structure is critical in terms of causing significant structural damage. An "A" Zone is the flood insurance rate zone that corresponds to the 100-year flood level that is determined in the FIS using the detailed method. It is further defined as that area that is inundated by the 100-year flood and shoreward of the "V" Zone.

Three different A and V-Zone flood conditions as defined by FEMA, most closely represent the FIS sites in Kawkawlin Township. The first type of condition involves wave runup overtopping a beach/bluff system. In this case, the V/A-Zone demarcation line is located at the extended front crest of the calculated post-storm profile. The segment from the extended front crest to the inland termination point of the wave runup overtopping is mapped as an AO-Zone. However, since the shoreline along Saginaw Bay does not have AO-Zone conditions, this zone will be mapped as an AE-Zone. This mapping is considered appropriate for profile Kawkawlin-1, and is shown on FIGURE 2.

The second flood condition existing along the Kawkawlin Township shoreline involves a coastal structure that is not flooded or damaged, but overtopped by wave runup. The V/A demarcation line is fixed at the most landward edge of the exposed portion of the structure. The segment between the V-Zone and the inland termination point of overtopping is mapped as an AO-Zone. Again as discussed above, the shoreline along Saginaw Bay does not have AO-Zone conditions, therefore this zone will be mapped as an AE-Zone. This type of flooding condition is representative of profiles Kawkawlin-2 and Kawkawlin-3 and is shown on FIGURES 3 & 4.

In the last configuration, the structure is not flooded, damaged or overtopped by wave runup. The V/X-Zone demarcation line is fixed at the most landward edge of the exposed portion of the structure. The landward side of the V-Zone is mapped as a

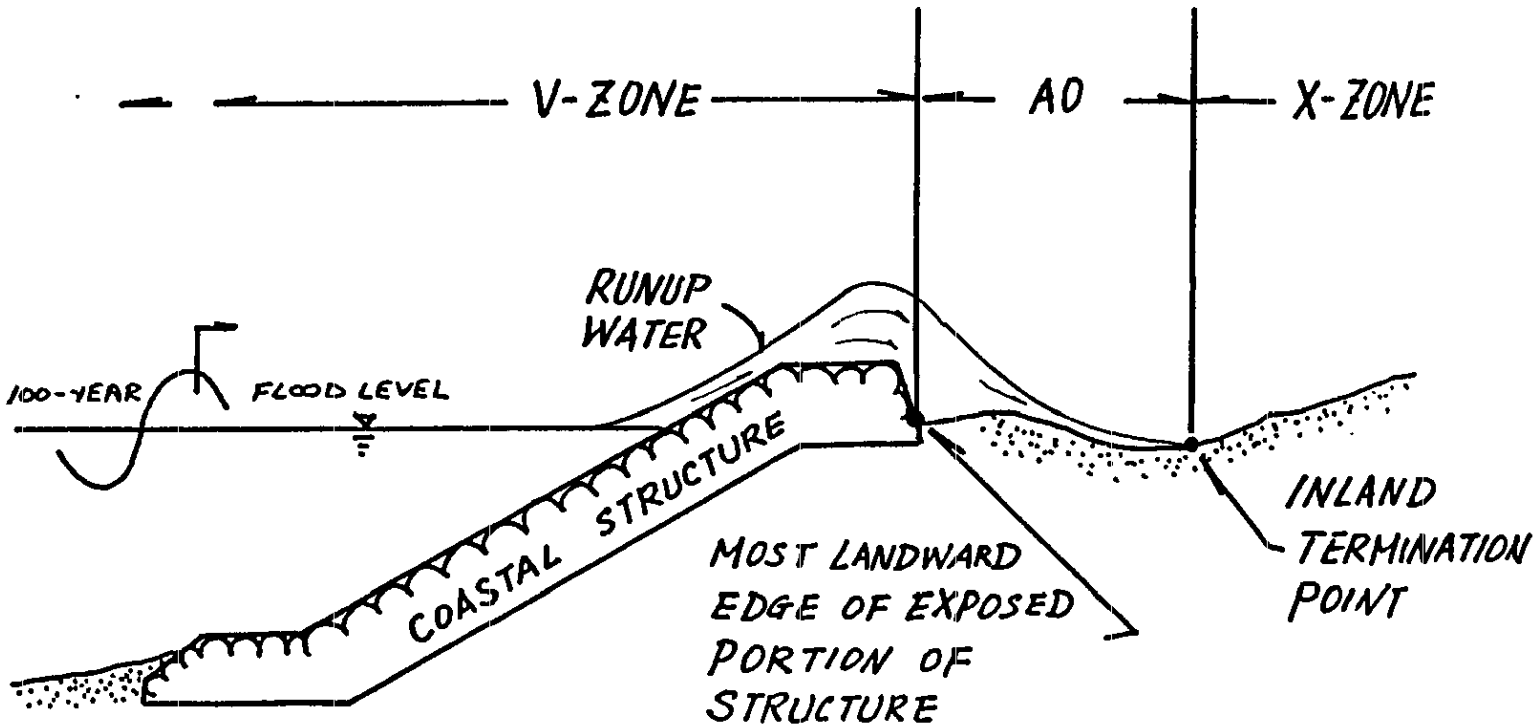
KAWKAWLIN TOWNSHIP A & V ZONE DELINEATIONS ON A BEACH/BLUFF SYSTEM



Kawkawlin-1

FIGURE 2

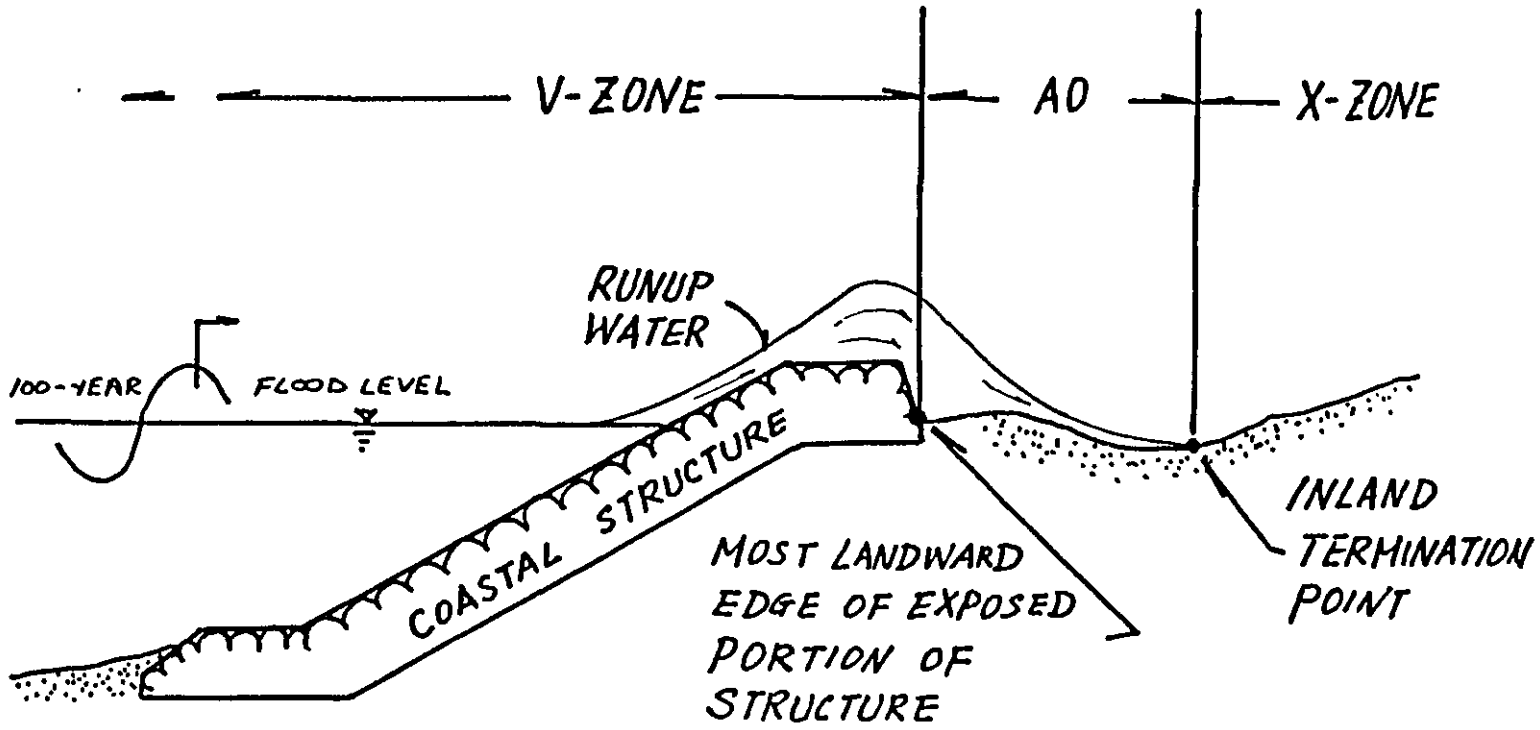
KAWKAWLIN TOWNSHIP A & V ZONE DELINEATIONS ON A BEACH/STRUCTURE SYSTEM



Kawkawlin-2

FIGURE 3

KAWKAWLIN TOWNSHIP A & V ZONE DELINEATIONS ON A BEACH/STRUCTURE SYSTEM



Kawkawlin-3

FIGURE 4

X-Zone. FIGURE 5 depicts this condition, which is representative of Kawkawlin-4.

The "A" and "V" Zones for these sites have been delineated according to FEMA's Guidelines for Great Lakes Wave Runup Computation and Mapping and are shown on the attached work maps.

The formal submittal of the Kawkawlin Township study will include original mylar copies showing sufficient detail for submittal to FEMA's technical review contractor.

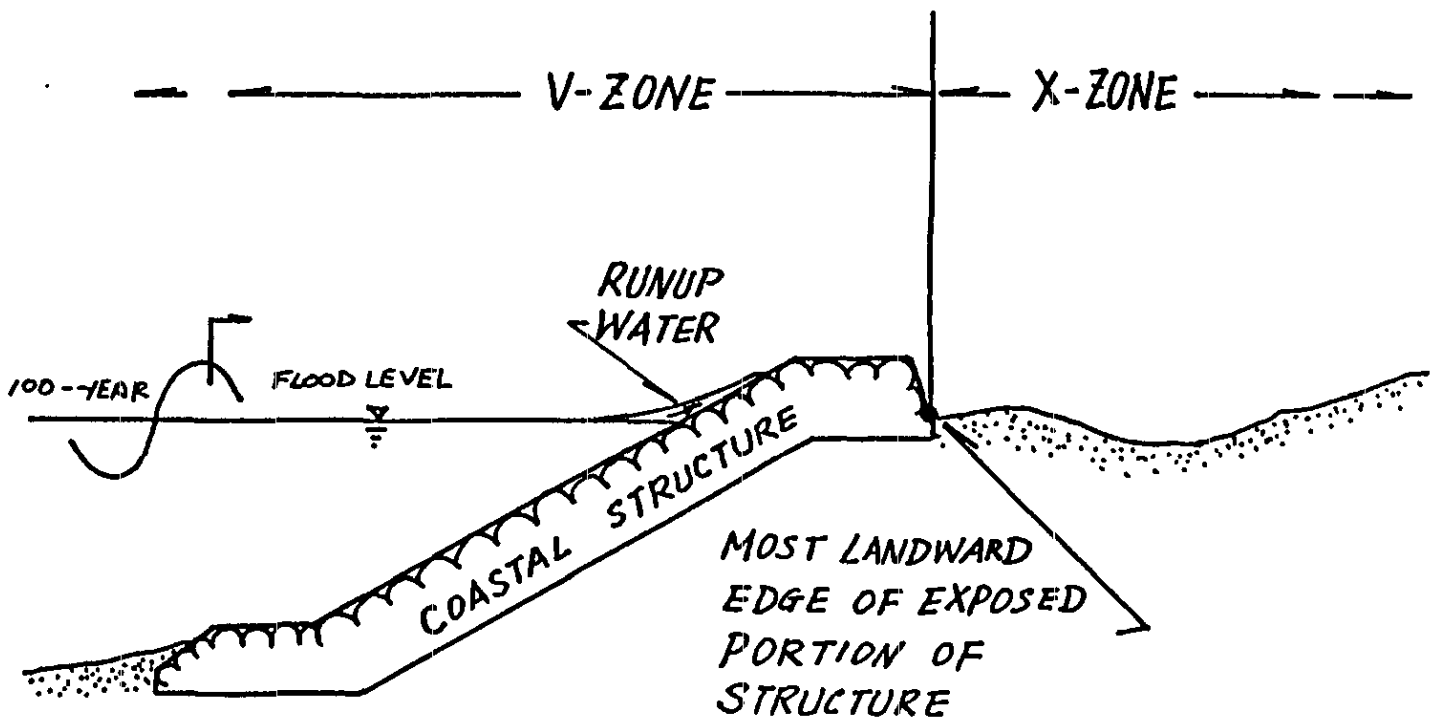
5.0 CONCLUSIONS

For each of the Kawkawlin Township sites where the 100-year and 500-year flood levels inundate shoreline property, the inundated area will experience a minimal water depth shoreward of the shoreline protection. This water depth will generate a negligible wave across the property. Therefore, the 100-year and 500-year flood levels will be used to delineate the flood profiles at each site.

Accordingly, where structures protect against flooding, the 100-year and 500-year "A" and "V" Zones, based on wave runup elevations, will be delineated on the work maps in the final FIS for the site. TABLE 2 lists the 100-year and 500-year wave runup elevations for the four sites.

In conclusion, it is recommended that the delineated 100-year and 500-year flood profiles for the six Kawkawlin Township sites included herein be used by FEMA for updating the Kawkawlin Township FIS.

KAWKAWLIN TOWNSHIP A & V ZONE DELINEATIONS ON A BEACH/STRUCTURE SYSTEM



Kawkawlin-4

FIGURE 5

TABLE 2

WAVE RUNUP ELEVATIONS

Kawkawlin Township FIS Sites	100-year Computed Wave Runup (ft.)	100-year Wave Runup Elevation (ft., NGVD)	500-year Computed Wave (ft., NGVD)	500-year Wave Runup Elevation (ft., NGVD)
1. Kawkawlin-1	2.3	588.0	2.3	589.0
2. Kawkawlin-2	3.6 *	589.3	4.6	591.3
3. Kawkawlin-3	0.9 *	586.6	2.6	589.3
4. Kawkawlin-4	2.9 *	588.6	3.9	590.6

* NOTE: The wave runup component computed for the Kawkawlin Township structures using the 100-year and 500-year flood levels obtained from the September 1989 "Flood Levels Report for Saginaw Bay", is not directly proportional to the 1.0 foot difference between the 100-year and 500-year flood levels. The additional wave runup is due to a variation of water at the toe of the individual structures.

6.0 GLOSSARY

Annual Maximum Instantaneous Water Level: The highest water level that was recorded during a year by a gage with a sampling frequency of an hour or less.

A-Zone: The Flood Insurance Rate Zone that corresponds to the 100-year floodplain that is determined in the Flood Insurance Study by detailed methods.

AO-Zone: The Flood Insurance Rate Zone that corresponds to the inland termination point of water overtopping a beach and/or dune condition.

Beach: The zone of sedimentary material that extends landward from the low water line to the place where there is a marked change in material or form, or to the line of permanent vegetation.

Bluff: A high, steep bank composed of erodible materials.

Floodplain: The area adjoining a river, stream, watercourse, ocean, lake or other body of standing water that has been or may be covered by floodwater.

International Great Lakes Datum (IGLD): Common reference datum for the Great Lakes area established in 1955 based on mean water level in the St. Lawrence River at Father Point, Quebec (near Atlantic Ocean).

Runup: The rush of water up a beach or structure from the breaking of a wave. Also, the vertical height of uprush above the still-water level.

Still-water level: The elevation that the water surface would assume if all wave action were absent.

Storm-water level: The rise above the normal water level on the open-coast, due to wind stress on the water surface.

V-Zone: The maximum elevation reached by the wave runup associated with the 100-year flood level.

Wave height: The vertical distance between the wave crest and the preceding trough.

Wave setup: The superelevation of the water surface over normal surge elevation due to the onshore mass transport of the water by wave action alone.

Wind setup: The vertical rise in the still-water level on the leeward side of a body of water caused by wind stresses on the surface of the water.

X-Zone: The Flood Insurance Rate Zone that corresponds to the landward side of a dune heel point.

7.0 REFERENCES

1. U.S. Army Corps of Engineers, Coastal Engineering Research Center, Vicksburg, MS, "Shore Protection Manual," Volumes I & II, 1984.

2. U.S. Army Corps of Engineers, Detroit District, "Phase I, Revised Report on Great Lakes Open-Coast Flood Levels," April 1988.

3. U.S. Army Corps of Engineers, Detroit District, "Phase II, Revised Report on Great Lakes Open-Coast Flood Levels," April 1988.

4. U.S. Army Corps of Engineers, Detroit District, "Appendices, Revised Report on Great Lakes Open-Coast Flood Levels," April 1988.

5. U.S. Army Corps of Engineers, Coordinating Committee on Great Lakes Basin Hydraulic and Hydrologic Data, "History of Water Level Gauges, Upper Great Lakes and the St. Clair - Detroit Rivers," January 1978.

6. U.S. Army Corps of Engineers, North Central Division, "Great Lakes Region Inventory Report National Shoreline Study," August 1978.

7. U.S. Army Corps of Engineers, Detroit District, "Flood Levels Report - Saginaw Bay," September 1989.

8. U.S. Army Corps of Engineers, Detroit District, "Flood Levels Report - Anchor Bay," September 1989.

9. Great Lakes Environmental Research Laboratory, Ann Arbor, Michigan, SCHWAB, D.J., and LYNN, E.W., "Great Lakes Storm Surge Planning Program," 1987.

10. U.S. Army Corps of Engineers, Detroit District, "Phase II Report on Great Lakes Flood Levels - Little Bay De Noc," August 1981.

11. U.S. Army Corps of Engineers, Detroit District, "Phase II Report on Great Lakes Flood Levels - Big Bay De Noc", July 1981.

12. FEMA Great Lakes "A" Zone and "V" Zone Delineations

TECHNICAL LETTER REPORT ON KAWKAWLIN TOWNSHIP, MICHIGAN

APPENDIX A

Prepared by the U.S. Army Corps of Engineers
for the Federal Emergency Management Agency

Detroit, Michigan
November 1990

SYNOPSIS

APPENDIX A outlines the procedures necessary to calculate the wave runup component and the maximum wave runup elevation associated with the 100-year flood level. These data, with the information provided from the profile surveys will enable the user to delineate the 100-year VE, AE, AO, and X- Zone profiles according to FEMA's 1990 "Guidelines for Great Lakes Wave Runup Computation and Mapping". The following list shows the four Kawkawlin Township sites and the 100-year wave runup flood elevations. Samples of these computations are included in APPENDIX A.

Kawkawlin Township FIS Sites	100-year Computed Wave Runup (ft.)	100-year Wave Runup Elevation (ft., NGVD)
1. Kawkawlin-1	1.9	587.6
2. Kawkawlin-2	3.6 *	589.3
3. Kawkawlin-3	0.9 *	586.6
4. Kawkawlin-4	2.9 *	588.6

* NOTE: 100-year flood level obtained from the September 1989 "Flood Levels Report for Saginaw Bay"

TABLE 2

WAVE RUNUP ELEVATIONS

Kawkawlin Township FIS Sites	100-year Computed Wave Runup (ft.)	100-year Wave Runup Elevation (ft., NGVD)
1. Kawkawlin-1	1.9	587.6
2. Kawkawlin-2	3.6	589.3
3. Kawkawlin-3	0.9	586.6
4. Kawkawlin-4	2.9	588.6

```
                    RUNUP COMPUTATION
         WAVE RUNUP AT KAWKAWLIN TOWNSHIP, KAWKAWLIN-1
              runup on:  beach
       100-year flood: 585.7 feet above IGLD, optional
    water depth at toe:  26.0 feet            1st: significant wave computation
 100-year wave period T:  11.4       (enter per Ref. 3)
                    T':   5.7
                     L: 329.59
100-yr deep water wave H:  24.9 feet  (enter per Ref. 3)
                     K:   2.0
                 alpha:   0.0110
                   Hmo:  11.0
                 d bar:   0.0062
              epsilon:   0.0083
               Hs/Hmo:   1.018     (enter per Ref. 4, Figure 10)
      Hs in deep water:  11.2                (significant wave)
           beach slope:   0.02300  (tan 30H:1V = 0.03333)
            beach zeta:   0.177              2nd: wave runup computation
           beach runup:   1.9
        runup elevation: 587.6 feet above IGLD


A:\>NOTE:  ALL ELEVATIONS ABOVE ARE IN FEET ABOVE NGVD
```

FIS PROFILE
KAWKAWLIN 1

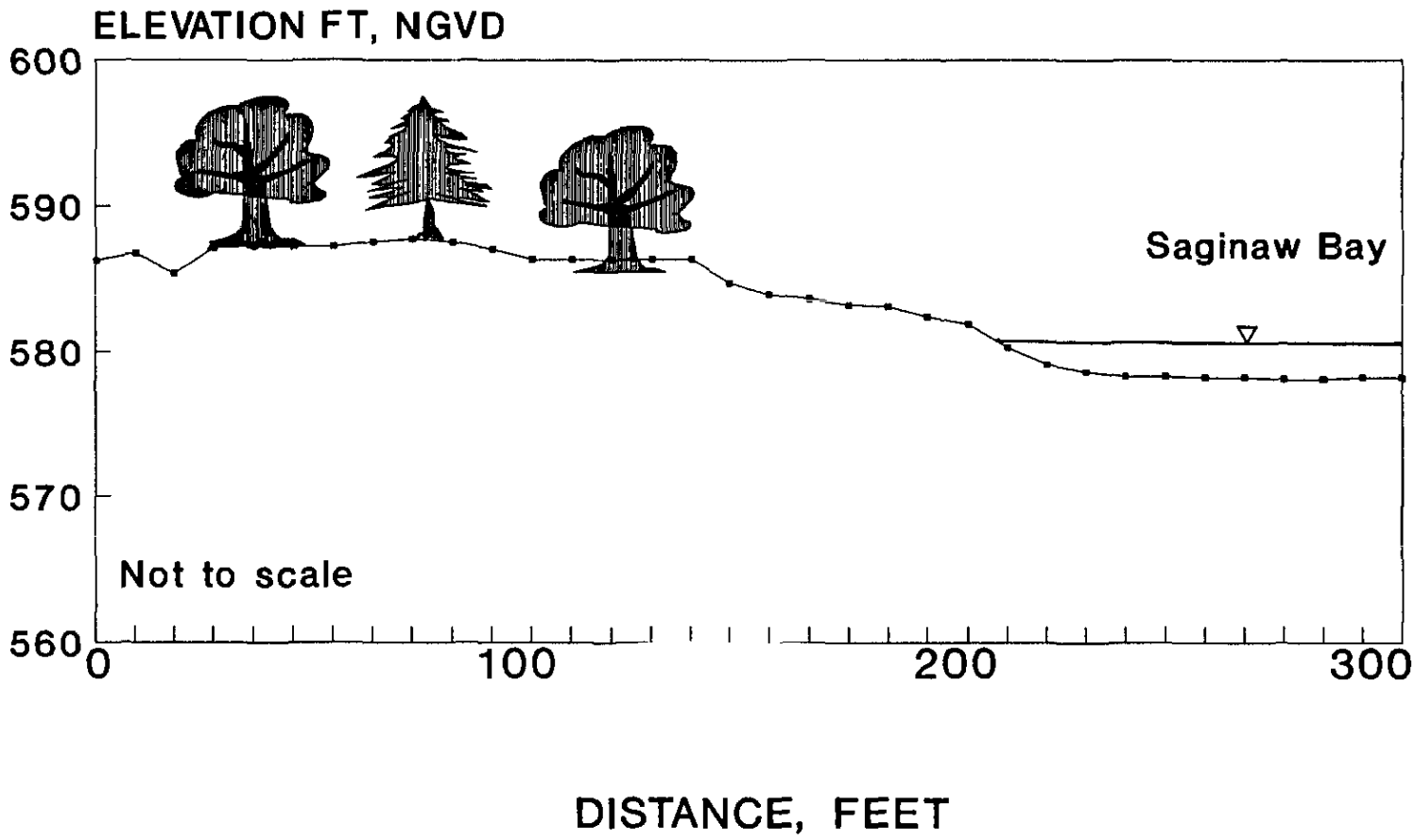


FIGURE K-1

FIS PROFILE
KAWKAWLIN 2

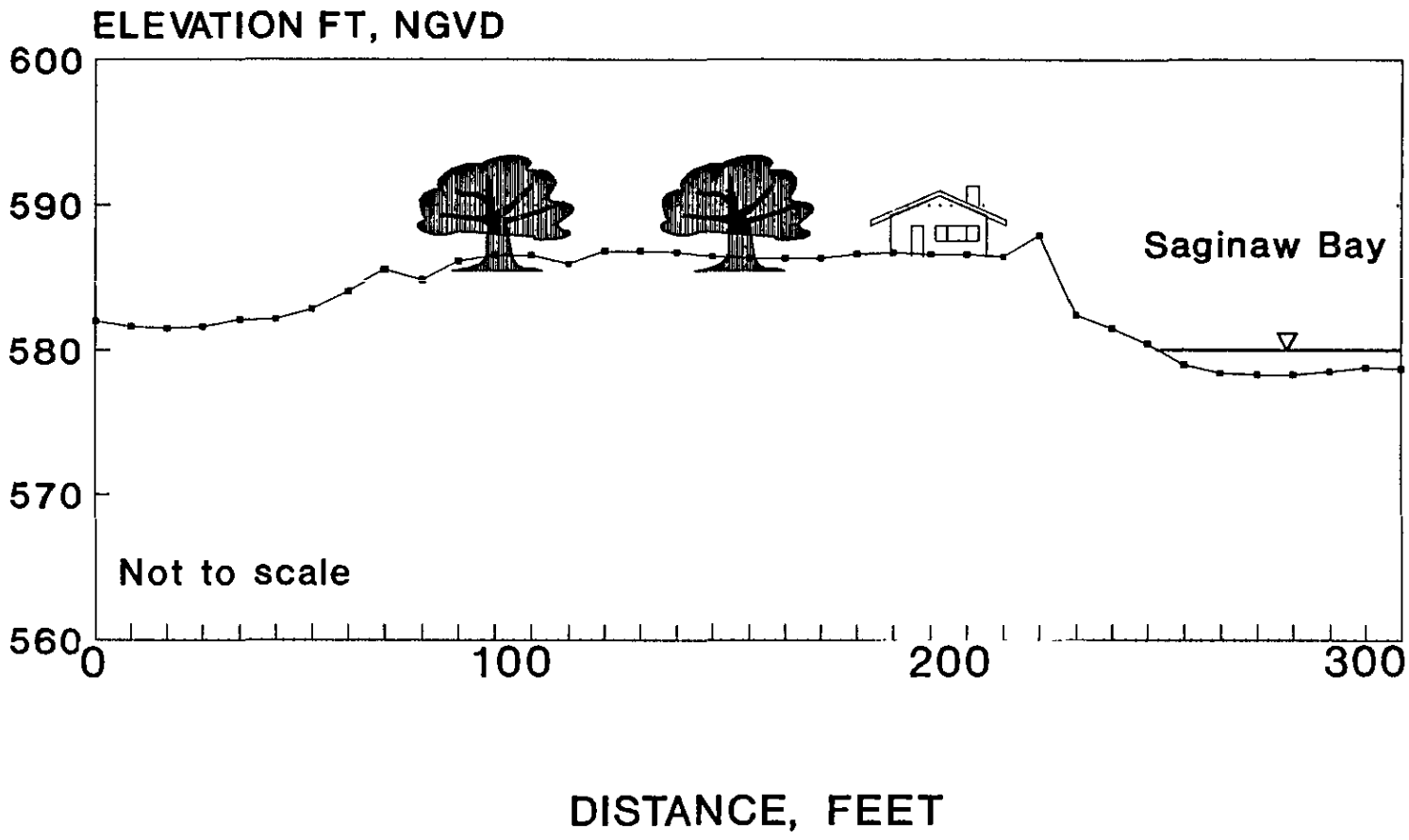


FIGURE K-2

FIS PROFILE
KAWKAWLIN 3

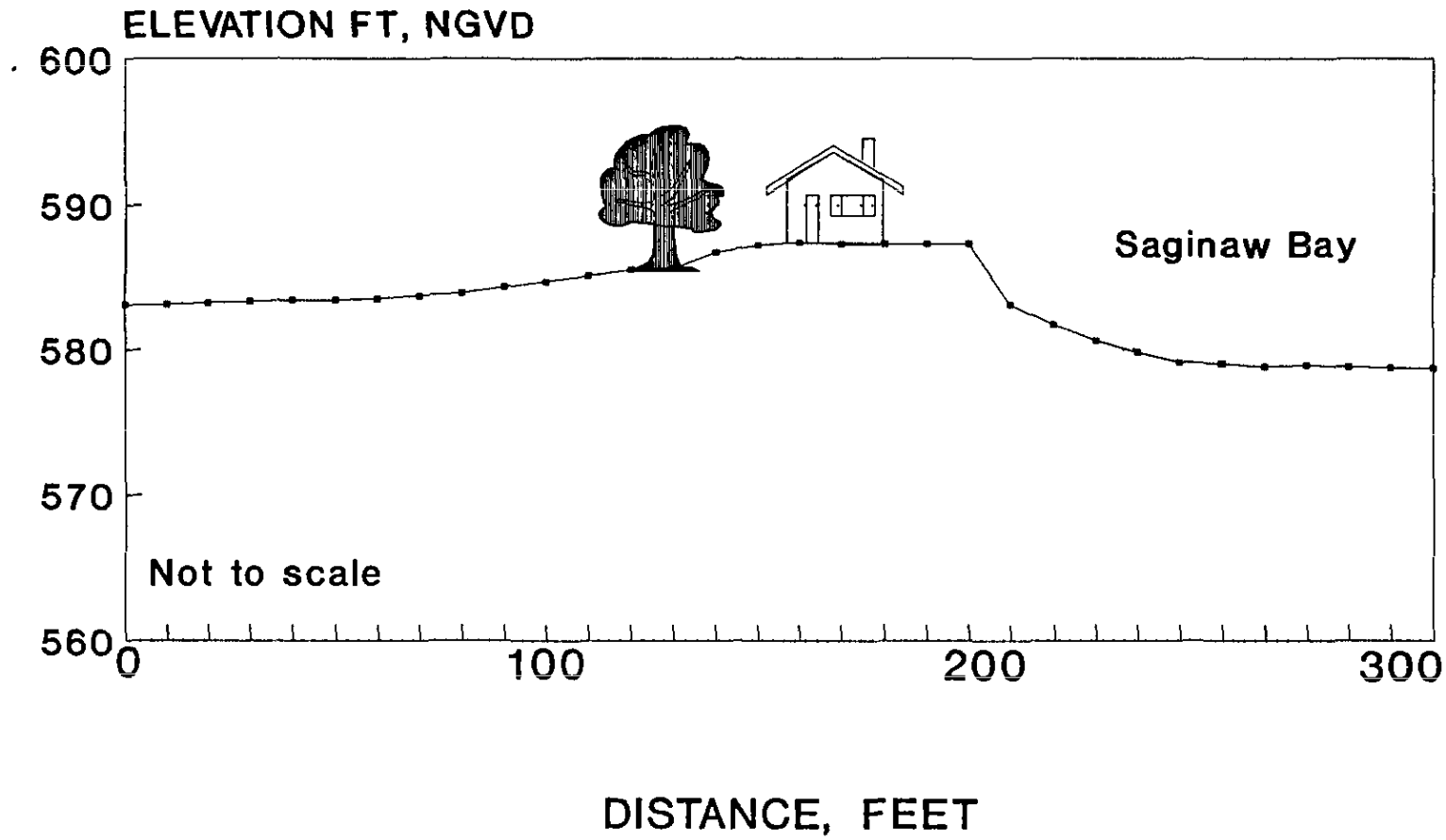


FIGURE K-3

FIS PROFILE
KAWKAWLIN 4

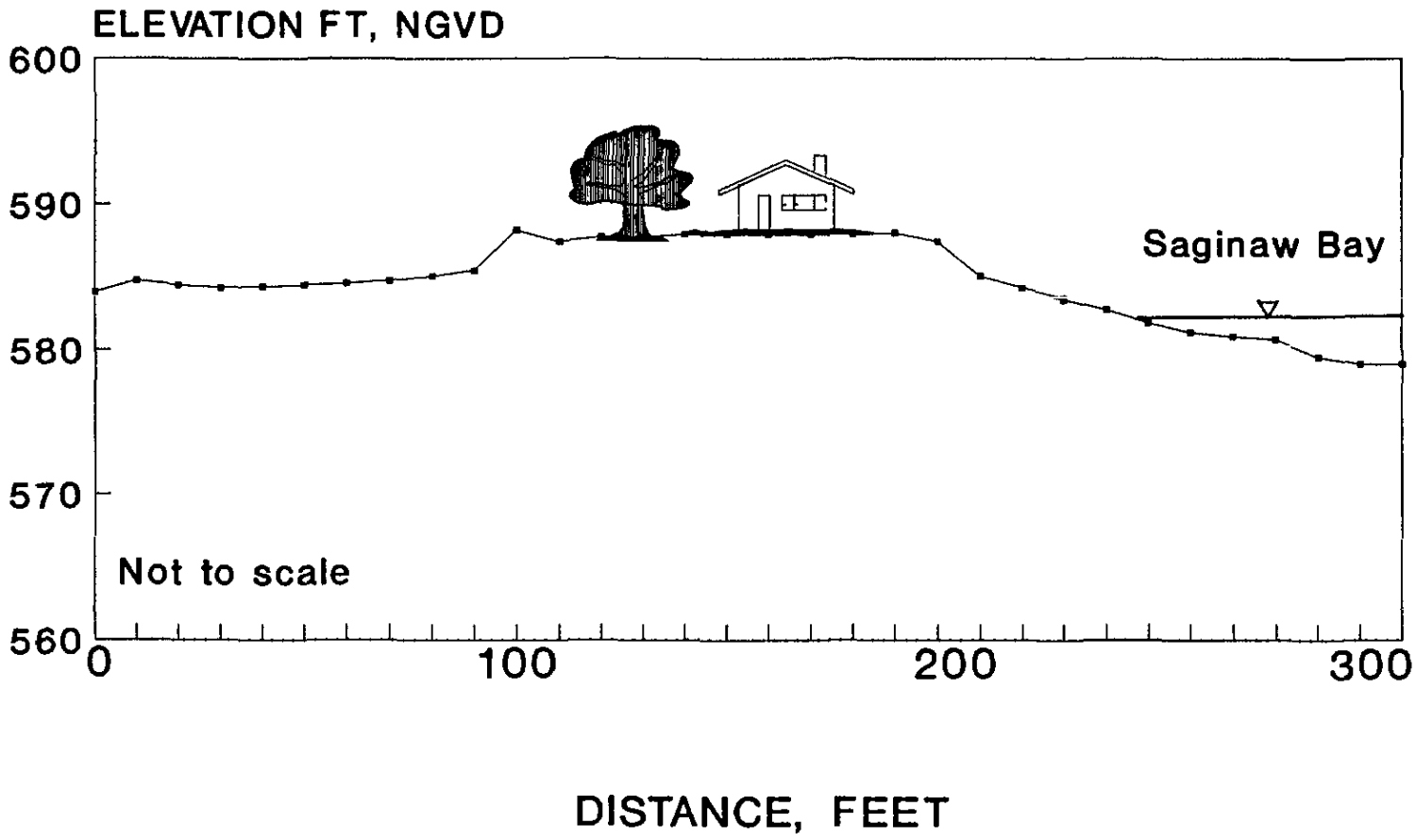


FIGURE K-4

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Kawkawlin Twp & ~~Bay~~ Bangor Twp

3) WATERCOURSE: Kawkawlin R.

4) DOCUMENT TYPE: 100-yr ~~[illegible]~~ Encroached

00BREAK00

```
C      32
C     150    150' U/S MOUTH
C    2450    1250' D/S DETROIT AND MACKINAC R.R. BR.
C    3550    150' D/S DETROIT AND MACKINAC R.R. BR.
C    3700    BRIDGE AT DETROIT AND MACKINAC RAILROAD (D/S FACE)
C    4550    150' D/S STATE PARK RD. BR.
C    4700    BRIDGE AT STATE PARK RD. (D/S FACE)
C    5900    1200' U/S STATE PARK RD. BR.
C    7800    3100' U/S STATE PARK RD. BR. (D/S FACE)
C    9900    150' D/S EUCLID RD. BR.
C   10050    BRIDGE AT EUCLID RD. (D/S FACE)
C   12450    2400' U/S EUCLID RD. BR.
C   14850    4800' U/S EUCLID RD. BR.
C   17050    7000' U/S EUCLID RD. BR.
C   19450    150' D/S PENN CENTRAL R.R. BR.
C   19600    BRIDGE AT PENN CENTRAL RAILROAD (D/S FACE)
C   19700    BRIDGE AT M-13 (D/S FACE)
C   19900    200' U/S M-13 BR.
C   21300    100' D/S OLD BEAVER RD. BR.
C   21400    BRIDGE AT OLD BEAVER RD. (D/S FACE)
C   22400    1000' U/S OLD BEAVER RD. BR.
C   23600    2200' U/S OLD BEAVER RD. BR.
C   23900    2500' U/S OLD BEAVER RD. BR.
C   27300    150' D/S CHIP RD. BR.
C   27450    BRIDGE AT CHIP RD. (D/S FACE)
C   28650    1200' U/S CHIP RD. BR.
C   31450    150" D/S OLD BEAVER RD. BR.
C   31600    BRIDGE AT OLD BEAVER RD. (D/S FACE)
C   33100    1500' U/S OLD BEAVER RD. BR.
C   35300    1950' D/S BEAVER RD. BR.
C   37100    150" D/S BEAVER RD. BR.
C   37250    BRIDGE AT BEAVER RD. (D/S FACE)
C   38000    750' U/S BEAVER RD. BR.
T1       BANGOR AND KAWKAWLIN TWP. BAY CO., #55555-01, 06
T2       10  YEAR  FLOW
T3       KAWKAWLIN  RIVER
J1   -10       2                                          581.9
J2                  -1
J3     1      34       4      27      28      10      26
NC 0.09    0.09   0.035     0.3     0.5
QT     4    3760    5250    5950    7000
X1   150      42    1500    1721     150     150     150
GR 587.8       0   587.5     100   586.9     200   585.7     300   584.8     400
GR 584.9     500   585.7     600   585.1     700   584.9     800   585.0     900
GR 584.8    1000   584.6    1100   584.3    1200   584.3    1300   584.4    1400
GR 585.1    1500   576.9    1501   574.1    1520   574.6    1540   573.9    1560
GR 573.7    1580   573.7    1600   573.2    1620   573.7    1640   575.1    1660
GR 578.9    1680   579.7    1700   579.9    1720   584.8    1721   585.5    1800
GR 584.5    1900   585.0    2000   584.6    2100   584.4    2200   584.1    2300
GR 584.0    2400   584.1    2500   584.3    2600   584.1    2700   584.0    2800
GR 584.1    2900   584.1    3000
X1  2450      44    1500    1747    2300    2300    2300
X3                          1500            1747
GR 583.7       0   585.0     100   585.7     200   585.3     300   585.1     400
GR 584.2     500   584.2     600   584.9     700   584.9     800   585.1     900
GR 584.5    1000   584.1    1100   583.9    1200   584.5    1300   585.4    1400
GR 583.8    1500   582.1    1501   579.2    1505   577.1    1520   575.6    1540
GR 572.5    1560   571.5    1580   571.4    1600   571.5    1620   571.8    1640
GR 572.1    1660   574.1    1680   575.8    1700   576.8    1720   580.0    1735
GR 583.5    1747   583.7    1800   584.6    1900   584.4    2000   583.9    2100
GR 583.4    2200   583.1    2300   583.5    2400   584.6    2500   584.2    2600
GR 584.1    2700   583.9    2800   583.6    2900   583.6    3000
X1  3550      29    1350    1565    1100    1100    1100
X3                          1350            1565
GR 587.2       0   585.3      50   586.4     150   584.1     250   584.5     350
GR 582.5     450   582.0     550   582.5     650   584.7     750   583.8     850
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GR 582.7     950   585.0   1050   584.5   1150   583.8   1250   582.9   1350
GR 579.5    1351   575.4   1370   572.1   1390   571.9   1410   570.3   1430
GR 571.1    1450   572.4   1470   571.2   1490   570.6   1510   576.5   1530
GR 579.4    1550   582.7   1563   584.5   1565   585.1   1650
X1  3700      43    1000   1191     150    150     150
X3    10
GR 588.2       0   588.8    100   589.4    200   589.8    300   590.3    400
GR 590.9     500   591.4    600   592.0    700   592.6    800   593.2    900
GR 594.0    1000   580.9   1000   578.3   1010   572.6   1020   571.9   1030
GR 572.6    1041   572.6   1045   590.0   1045   590.0   1053   572.5   1053
GR 570.6    1060   571.1   1070   572.1   1080   571.5   1091   590.0   1091
GR 590.0    1101   570.7   1101   571.1   1110   571.8   1120   570.5   1130
GR 570.5    1141   572.6   1151    590.   1151    590.   1159   572.6   1159
GR 571.6    1160   573.5   1170   578.5   1180   581.9   1191    594.   1191
GR 592.4    1500   591.9   1600   589.9   2000
NC   .09     .09     .03
X1  3701                          1       1       1
X3                          1000            1191
BT     4    1000    594.    590.   1100    594.    590.   1150    594.    590.
BT  1191    594.    590.
X1  3724                         23      23      23
X2                                        1
X3                          1000            1191
NC  0.09    0.09   0.035
X1  3725                          1       1       1
X3    10
X1  3875      29    1350   1565    150     150     150
X3                          1350            1565
GR 587.2       0   585.3     50   586.4    150   584.1    250   584.5    350
GR 582.5     450   582.0    550   582.5    650   584.7    750   583.8    850
GR 582.7     950   585.0   1050   584.5   1150   583.8   1250   582.9   1350
GR 579.5    1351   575.4   1370   572.1   1390   571.9   1410   570.3   1430
GR 571.1    1450   572.4   1470   571.2   1490   570.6   1510   576.5   1530
GR 579.4    1550   582.7   1563   584.5   1565   585.1   1650
X1  4550      42    1500   1730     675    675     675
X3                          1500            1730
GR 585.7       0   585.8    100   587.4    200   583.6    300   583.4    400
GR 583.6     500   585.3    600   585.6    700   585.7    800   586.5    900
GR 585.7    1000   585.4   1100   585.8   1200   584.2   1300   583.9   1400
GR 583.2    1500   581.9   1502   579.1   1520   574.5   1540   571.9   1560
GR 571.3    1580   571.2   1600   570.8   1620   571.6   1640   572.9   1660
GR 574.8    1680   578.4   1700   581.0   1720   582.2   1728   582.9   1730
GR 584.2    1800   584.7   1900   584.1   2000   583.6   2100   584.2   2220
GR 585.0    2300   584.3   2400   584.6   2500   583.8   2600   584.0   2700
GR 585.7    2800   584.1   2900
X1  4700      58     806    983     150    150     150
X3    10
GR 585.7       0   585.8    100   586.1    200   586.7    400   587.4    500
GR 588.4     600   589.8    700   591.4    800   592.1    806   583.2    806
GR 583.2     807   576.2    807   575.3    820   571.8    830   571.2    840
GR 571.2     850   576.9    862   576.9    864   583.6    864   583.6    865
GR 586.2     865   586.2    867   583.6    867   583.6    868   576.4    868
GR 571.5     870   571.0    880   571.3    890   571.6    900   570.8    916
GR 575.9     925   583.7    925   583.7    926   586.2    926   586.2    928
GR 583.7     928   583.7    929   576.4    929   573.6    930   570.5    940
GR 572.1     950   575.0    960   576.6    970   577.0    982   583.3    982
GR 583.3     983   591.6    983   591.6   1000   590.1   1100   588.4   1200
GR 586.8    1300   585.6   1400   585.2   1500   585.2   1600   585.5   1700
GR 585.6    1800   585.5   1900   585.4   2000
NC   .09     .09     .03
X1  4701                          1       1       1
X3                           806            983
BT    34     0.0    585.7    0.0   100.0   585.8     0.0   200.0   586.1     0.0
BT 400.0   586.7      0.0  500.0   587.4     0.0   600.0   588.4     0.0   700.0
BT 589.8     0.0    800.0  591.4     0.0   806.0   592.1   583.2   814.0   592.1
BT 586.2   858.0    592.1  586.2   865.0   592.1   583.6   867.0   592.1   583.6
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BT	875.0	592.1	586.2	876.0	592.1	586.2	876.0	592.1	586.2	916.0
BT	592.1	588.2	916.0	592.1	586.2	916.0	592.1	586.2	926.0	592.1
BT	583.6	928.0	592.1	583.6	936.0	592.1	586.2	975.0	592.1	586.2
BT	983.0	591.6	583.6	1000.0	591.6	0.0	1100	590.1	0	1200
BT	588.4	0	1300	586.8	0	1400	585.6	0	1500	585.2
BT	0	1600	585.2	0	1800	585.6	0	1900	585.5	0
BT	2000	585.4	0							
X1	4760				59	59	59			
X2							1			
X3				806		983				
NC	0.09	0.09	0.035							
X1	4761				1	1	1			
X3	10									
X1	4911	41	1500	1730	150	150	150			
X3				1500		1730				
GR	585.7	0	585.8	100	587.4	200	583.6	300	583.4	400
GR	583.6	500	585.3	600	585.6	700	585.7	800	586.5	900
GR	585.7	1000	585.4	1100	585.8	1200	584.2	1300	583.9	1400
GR	583.2	1500	581.9	1502	579.1	1520	574.5	1540	571.9	1560
GR	571.3	1580	571.2	1600	570.8	1620	571.6	1640	572.9	1660
GR	574.8	1680	578.4	1700	581.0	1720	582.2	1728	582.9	1730
GR	584.2	1800	584.7	1900	584.1	2000	583.6	2100	584.2	2220
GR	585.0	2300	584.3	2400	584.6	2500	583.8	2600	584.0	2700
GR	585.7	2800								
X1	5900	44	1500	1695	989	989	989			
X3				1500		1695				
GR	584.9	0	586.1	100	586.0	200	584.4	300	584.7	400
GR	585.8	440	584.0	500	584.0	600	584.3	700	584.0	800
GR	583.9	900	584.1	1000	584.8	1100	584.2	1200	584.4	1300
GR	584.6	1400	584.3	1500	582.2	1503	579.2	1520	574.5	1540
GR	571.7	1560	570.9	1580	570.6	1600	570.4	1620	570.4	1640
GR	572.9	1660	575.6	1680	576.9	1694	584.0	1695	585.8	1712
GR	584.3	1800	584.3	1900	584.5	1959	583.1	2000	583.5	2100
GR	582.8	2200	583.0	2300	583.7	2400	584.7	2500	585.7	2600
GR	583.9	2700	585.5	2800	585.6	2900	585.7	3000		
X1	7800	41	1500	1699	1900	1900	1900			
X3				1500		1699				
GR	585.4	0	586.0	100	586.5	200	587.0	300	587.3	400
GR	587.0	500	586.8	600	587.3	700	586.9	800	587.2	900
GR	587.5	1000	587.4	1100	587.3	1200	587.5	1300	587.4	1400
GR	586.3	1500	581.5	1511	579.2	1520	575.8	1540	571.8	1560
GR	571.9	1580	571.9	1600	571.9	1620	571.9	1640	574.1	1660
GR	577.1	1680	580.0	1697	583.7	1699	584.2	1800	584.1	1900
GR	584.0	2000	584.9	2100	586.0	2200	584.5	2300	584.7	2400
GR	584.9	2500	585.9	2600	585.6	2700	585.7	2800	586.1	2900
GR	586.3	3000								
QT	4	3720	5180	5870	6900					
X1	9900	38	1500	1700	2100	2100	2100			
X3				1500		1680				
GR	586.1	0	587.0	100	586.6	200	587.2	300	586.9	400
GR	586.8	500	587.0	600	587.3	700	587.2	800	587.2	900
GR	588.0	1000	588.1	1100	588.8	1200	589.2	1300	590.4	1400
GR	584.5	1500	573.6	1580	573.8	1600	573.2	1620	573.7	1621
GR	574.0	1640	574.9	1650	580.0	1660	581.5	1664	588.6	1700
GR	589.1	1800	591.3	1900	591.4	2000	589.9	2100	590.7	2200
GR	590.1	2300	588.7	2400	589.7	2500	589.6	2600	589.7	2700
GR	589.9	2800	589.7	2900	591.5	3000				
X1	10050	37	1000	1131	150	150	150			
X3	10									
GR	587.9	0	588.0	100	588.1	200	588.5	300	588.6	500
GR	589.7	600	590.7	700	592.2	800	592.9	900	593.0	1000
GR	579.6	1000	577.0	1010	576.4	1020	576.4	1030	578.1	1041
GR	589.8	1041	589.8	1044	577.2	1044	575.4	1050	573.2	1060
GR	573.4	1070	575.0	1080	576.7	1086	589.8	1086	589.8	1090
GR	577.3	1090	575.2	1100	576.7	1110	577.0	1120	579.4	1131
GR	593.0	1131	593.0	1200	592.7	1300	592.1	1400	591.4	1500

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GR 590.4    1800.   590.2    2000
NC   .09     .09     .03
X1 10051                          1       1       1
X3                          1000          1131
BT     4     900   592.9            1000     593   589.8    1131     593   589.8
BT  1200     593
X1 10100                         49      49      49
X2                                        1
X3                          1000          1131
NC    .1      .1     .04
X1 10101                          1       1       1
X3    10
X1 10251      38    1500    1700     150     150     150
X3                          1500          1685
GR   587       0   587.0     100   586.6     200   587.2     300   586.9     400
GR 586.8     500   587.0     600   587.3     700   587.2     800   587.2     900
GR 588.0    1000   588.1    1100   588.8    1200   589.2    1300   590.4    1400
GR 584.5    1500   573.6    1580   573.8    1600   573.2    1620   573.7    1621
GR 574.0    1640   574.9    1650   580.0    1660   581.5    1664   588.6    1700
GR 589.1    1800   591.3    1900   591.4    2000   589.9    2100   590.7    2200
GR 590.1    2300   588.7    2400   589.7    2500   589.6    2600   589.7    2700
GR 589.9    2800   589.7    2900   591.5    3000
X1 12450      23     660     820    2199    2199    2199
X3                           660             820
GR 594.5       0   592.9      60   592.4     160   592.0     260   593.1     360
GR 593.2     460   592.2     560   585.5     660   580.7     661   577.2     680
GR 577.0     700   576.5     720   576.2     740   575.8     760   575.4     780
GR 577.7     800   581.5     812   587.8     820   591.3     860   591.0     960
GR 591.4    1060   593.2    1160   594.1    1260
X1 14850      21     100     248    2400    2400    2400
X3                           105             285
GR 596.2       0   592.4     100   581.1     115   576.7     130   575.1     140
GR 573.3     150   573.2     160   573.2     170   574.5     180   574.9     190
GR 575.2     200   576.5     210   577.3     220   578.6     230   581.1     240
GR 581.7     245   583.0     248   584.9     265   585.9     270   585.8     280
GR 595.5     300
X1 17050      23     100     272    2200    2200    2200
X3                           118             440
GR 598.8       0   601.5      32   596.5     100   581.3     137   577.3     150
GR 575.5     160   574.6     170   575.3     180   575.5     190   575.3     200
GR 576.1     210   576.6     220   576.9     230   577.1     240   577.9     250
GR 579.6     260   581.5     269   583.1     272   584.2     300   585.3     400
GR 586.1     420   595.3     484   595.8     500
X1 19450      15     103     200    2400    2400    2400
X3                           104             199
GR 595.5       0   595.0     103   581.6     105   577.9     110   575.0     120
GR 573.6     130   573.5     140   575.9     150   576.1     160   575.9     170
GR 576.0     180   577.6     190   581.4     198   594.4     200   596.0     300
X1 19600      22     100     196     150     150     150
X3    10
GR 599.3       0   599.3     100   581.7     100   581.7     105   575.1     105
GR 574.1     110   574.1     120   573.1     130   572.8     138   581.6     138
GR 581.6     143   592.5     143   592.5     153   581.6     153   581.6     159
GR 576.8     159   577.0     180   577.5     190   581.6     190   581.6     196
GR 599.4     196   599.3     300
NC   .09     .09    .035
X1 19601                          1       1       1
X3                           100             196
BT     4       0   599.3            100   599.3   592.6     196   599.4   592.5
BT   300   599.3
X1 19619                         18      18      18
X2                                        1
X3                           100             196
NC   .09     .09     .04
X1 19620                          1       1       1
X3    10
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X1 19700      25     102     210      80      80      80
X3    10
GR 596.0       0   595.9      77   596.6      98   596.6     100   596.6     102
GR 579.6     102   578.0     110   576.1     120   576.3     130   576.4     140
GR 576.5     150   576.7     155   582.6     157   592.4     157   592.4     161
GR 582.6     161   576.6     170   577.2     180   577.8     190   579.6     200
GR 582.2     209   582.2     210   597.3     210    597.     218   597.3     300
NC   .09     .09    .035
X1 19701                         1       1       1
X3                            102     210
BT     4     100   596.6           102   596.6   592.4     210   597.3   592.4
BT   218    597.
X1 19756                        55      55      55
X2                                               1
X3                            102     210
NC   .09     .09     .04      .3      .5
X1 19757                         1       1       1
X3    10
X1 19900      21     268     401     143     143     143
X3                            268     460
GR 596.1       0   593.6     100   592.6     157   591.2     200   588.5     268
GR 580.8     280   577.4     290   576.0     300   576.0     310   576.1     320
GR 576.2     330   576.7     340   577.0     350   577.3     360   577.5     370
GR 578.4     380   579.8     390   581.5     398   584.4     401   594.9     500
GR 599.5     600
X1 21300      22      82     257    1400    1400    1400
X3                             82     257
GR 594.6       0   593.0      15   591.9      45   590.2      82   581.4     102
GR 578.1     110   575.5     120   574.8     130   575.4     140   575.4     150
GR 575.2     160   575.4     170   575.3     180   576.2     190   577.9     200
GR 579.3     210   580.1     219   582.5     220   583.9     240   588.5     257
GR 591.4     300   595.5     400
X1 21400      30     235     365     100     100     100
X3                            235     365
GR 595.4       0   594.8     100   593.0     180   592.9     200   592.5     234
GR 592.5     235   587.8     235   587.5     238   584.7     246   581.8     247
GR 579.5     255   577.1     265   575.0     276   575.3   278.5   575.0     290
GR 575.0     300   575.5     310   576.4     321   576.9   323.5   577.7     335
GR 579.9     345   582.4     354   585.0     356   586.8     362   587.5     365
GR 592.4     365   592.4     400   593.5     500   594.6     600   594.6     700
SB  1.15     1.5     2.5           100       5    1500           575.0   575.0
X1 21431                        31      31      31
X2                      1
X3                            235     365
BT    17     0.0   595.4     0.0   100.0   594.8     0.0   180.0   593.0     0.0
BT 235.0   592.5   590.4   276.0   592.5   590.4   276.0   592.5   575.0   278.0
BT 592.5   575.3   278.0   592.5   590.4   321.0   592.5   590.4   321.0   592.5
BT 576.4   324.0   592.5   576.9   324.0   592.5   590.4   365.0   592.4   590.4
BT 400.0   592.4     0.0   500.0   593.5     0.0   600.0   594.6     0.0   700.0
BT 594.6     0.0
X1 21581      22      82     257     150     150     150
X3                             82     257
GR 594.6       0   593.0      15   591.9      45   590.2      82   581.4     102
GR 578.1     110   575.5     120   574.8     130   575.4     140   575.4     150
GR 575.2     160   575.4     170   575.3     180   576.2     190   577.9     200
GR 579.3     210   580.1     219   582.5     220   583.9     240   588.5     257
GR 591.4     300   595.5     400
X1 21981       8     520     870     400     400     400
X3                            520     870
GR   595       0     590     520     576     655     576     735     585     870
GR   590     900     590    1000     595    1200
NC   .06     .06    .045      .3      .5
X1 22400      28    1100    1218     419     419     419
X3    10                      511    1531
GR  595.       0   592.4     200   591.4     300   590.8     400    589.     500
GR 584.6     600   582.1     655   580.8     900   582.3    1000   582.2    1080
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GR	580.4	1100	576.9	1112	577.	1134	576.8	1142	576.9	1152
GR	577.	1172	577.2	1192	577.8	1212	580.7	1218	580.2	1292
GR	581.5	1479	585.1	1537	589.3	1546	590.3	1571	590.8	1600
GR	593.2	1700	593.1	1800	595.	3000				
NC	.07	.07	.045	.3	.5					
X1	23600	42	1465	1553	1200	1200	1200			
X3	10			600		2200				
GR	594.1	0	592.2	65	591.6	165	590.2	265	590.	365
GR	589.3	465	589.4	565	585.3	665	581.2	765	581.4	865
GR	581.7	965	581.9	1065	582.1	1165	581.3	1265	582.1	1365
GR	582.5	1465	579.3	1475	577.3	1485	576.9	1495	576.0	1505
GR	575.4	1515	575.6	1525	576.3	1535	578.8	1545	581.3	1550
GR	584.8	1553	584.6	1565	585.2	1665	585.0	1765	584.4	1865
GR	582.2	1885	583.4	1965	584.0	2065	587.2	2165	588.9	2265
GR	588.7	2365	589.6	2465	590.5	2565	591.0	2665	590.7	2765
GR	590.5	2865	591.3	3000						
NC	.07	.07	.050							
X1	23900	41	1500	1585	300	300	300			
X3	10			300		2000				
GR	593.	0	590.5	100	590.0	200	588.9	300	588.6	400
GR	589.1	500	590.9	600	590.7	700	589.5	800	586.3	900
GR	583.1	1000	584.4	1100	582.9	1200	582.9	1300	582.6	1400
GR	583.2	1500	581.2	1502	579.4	1510	578.4	1520	577.4	1530
GR	577.1	1540	576.3	1550	576.4	1560	577.6	1570	580.5	1578
GR	589.1	1585	588.8	1600	589.7	1700	590.1	1800	590.2	1900
GR	590.3	2000	590.3	2100	590.6	2200	590.4	2300	590.9	2400
GR	590.4	2500	590.5	2600	590.4	2700	590.4	2800	590.5	2900
GR	593.	3000								
NC	.07	.07	.055							
QT	4	1610	2080	2340	2790					
X1	25030	9	1500	1550	1130	1130	1130			
X3	10			800		2000				
GR	592	0	590	900	585	1000	583	1500	576.6	1520
GR	576.6	1535	585	1550	590	1600	592	3000		
NC	.08	.08	.055							
X1	26160	10	1200	1250	1130	1130	1130			
X3	10			1100		2300				
GR	595		590	1050	584	1150	584	1200	577.2	1220
GR	577.2	1235	584	1250	587	1450	590	1600	590	2500
NC	.09	.07	.055							
ET		6.1	8.1	8.1	8.1	1400	1530	500	2000	
X1	27300	35	1450	1500	1140	1140	1140			
GR	594.	0	589.3	100	589.8	200	589.8	300	589.9	400
GR	590.4	500	590.0	600	589.6	700	591.2	800	583.9	820
GR	586.8	1300	586.3	1300	585.1	1400	582.7	1450	581.9	1462
GR	579.7	1469	578.2	1481	579.9	1487	581.9	1494	586.9	1500
GR	586.7	1600	590.3	1700	589.8	1800	589.9	1900	590.1	2000
GR	590.5	2100	590.5	2200	591.2	2300	590.7	2400	592.1	2500
GR	592.7	2600	593.5	2700	593.2	2800	593.8	2900	594.0	3000
NC	.09	.07	.050							
X1	27450	29	971	1026	150	150	150			
X3				500		1026				
GR	591.2	0	591.1	100	591.3	200	591.0	300	591.1	400
GR	591.2	500	591.0	600	591.0	700	591.0	800	592.1	900
GR	595.1	971	581.9	971	581.9	973	581.4	988	581.7	1000
GR	581.8	1023	585.6	1025	594.0	1026	594.0	1030	592.0	1100
GR	592.0	1200	591.8	1300	592.0	1400	592.4	1500	592.7	1600
GR	593.1	1700	593.5	1800	593.7	1900	593.8	2000		
SB		1.5	2.3		50		400		581.4	581.4
X1	27476				26	26	26			
X2			1	590.3	591.0					
X3				500		1026				
BT	23	0	591.2	0	100	591.1	0	200	591.3	0
BT	300	591.0	0	400	591.1	0	500	591.2	0	600
BT	591.0	0	700	591.0	0	800	591.0	0	900	592.1
BT	0	971	595.1	590.3	1026	594.0	590.3	1030	594.0	0

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BT   1100    592.0        0    1200    592.0        0    1300    591.8        0    1400
BT  592.0        0     1500   592.4        0     1600   592.7        0     1700   593.1
BT      0     1800    593.5       0     1900   593.7        0     2000    593.8        0
NC    .09      .07     .055
ET            6.1      8.1      8.1      8.1     1400     1555      200     2000
X1  27526       35     1450     1500       50       50       50
GR    594        0    589.3      100    589.8      200    589.8      300    589.9      400
GR  590.4      500    590.0      600    589.6      700    591.2     1200    583.9     1250
GR  586.8     1300    586.3     1300    585.1     1400    582.7     1450    581.9     1462
GR  579.7     1469    578.2     1481    579.9     1487    581.9     1494    586.9     1500
GR  586.7     1600    590.3     1700    589.8     1800    589.9     1900    590.1     2000
GR  590.5     2100    590.5     2200    591.2     2300    590.7     2400    592.1     2500
GR  592.7     2600    593.5     2700    593.2     2800    593.8     2900    594.0     3000
NC    .08      .07     .055
X1  28026       39     1500     1553      500      500      500
X3                             600             2300
GR  593.3        0    592.5      100    591.3      200    591.2      300    591.0      400
GR  590.3      500     590.      600     590.      700     590.      800     590.      900
GR  589.6     1000    590.4     1100    590.6     1200    590.1     1300    590.2     1400
GR  586.0     1500    582.5     1504    581.1     1508    579.4     1512    579.6     1517
GR  580.5     1526    581.7     1531    583.1     1533    585.8     1553    586.3     1600
GR  587.1     1700    587.4     1800    589.0     1900    590.8     2000     590.     2100
GR   590.     2200     590.     2300     590.     2400    591.5     2500    592.5     2600
GR  592.8     2700    593.1     2800    593.6     2900    594.1     3000
NC    .07      .08     .055
X1  28650                              624      624      624
X3                             550             2250
NC    .07      .09     .055
X1  31450       42     1466     1500     2800     2800     2800
X3                            1440             1575
GR   594.        0    590.6      100     591.      125    591.1      200    591.4      300
GR  591.3      400    591.3      500    591.8      600    592.3      700    592.7      800
GR  593.1      900    593.7     1000    594.2     1100    593.9     1200    593.2     1300
GR  592.6     1400    592.7     1437    586.6     1450    586.1     1466    582.3     1475
GR  582.2     1481    582.7     1488    585.2     1493    586.5     1500    586.5     1600
GR  587.7     1700    587.0     1800    587.9     1838    591.7     1854    592.6     1880
GR  591.4     1900    592.0     2000    592.3     2100    592.8     2200    593.0     2300
GR  593.8     2400    593.2     2500    593.4     2600    593.1     2700    593.3     2800
GR  593.4     2900    593.8     3000
NC    .07      .09     .050
X1  31600       21      971     1030      150      150      150
X3                             971             1030
GR  592.5        0    592.9      100    593.4      200    593.6      300    593.9      400
GR  594.0      500    593.8      600    593.6      700    593.8      800    594.6      900
GR  594.6      971    585.1      971    584.3      972    582.9      981    582.4      983
GR  582.4     1020    585.1     1030    595.9     1030    595.1     1100    595.0     1200
GR  595.8     1300
SB            1.5      2.5                50                400             582.4    582.4
NC    .09      .07     .050
X1  31623                               23       23       23
X2                        1    591.6    593.8
X3                             971             1030
BT     10        0    592.5        0      100    592.9        0      200    593.4        0
BT    500      594        0      700    593.6        0      800    593.8        0      900
BT  594.6        0      971    594.6    591.6     1030    595.9    591.6     1100    595.1
BT      0
NC    .09      .07     .055
X1  31673       42     1466      150       50       50       50
X3                            1440             1600
GR    594        0    590.6      100      591      125    591.1      200    591.4      300
GR  591.3      400    591.3      500    591.8      600    592.3      700    592.7      800
GR  593.1      900    593.7     1000    594.2     1100    593.9     1200    593.2     1300
GR  592.6     1400    592.7     1437    586.6     1450    586.1     1466    582.3     1475
GR  582.2     1481    582.7     1488    585.2     1493    586.5     1500    586.5     1600
GR  587.7     1700    587.0     1800    587.9     1838    591.7     1854    592.6     1880
GR  591.4     1900    592.0     2000    592.3     2100    592.8     2200    593.0     2300
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GR 593.8    2400    593.2    2500    593.4    2600    593.1    2700    593.3    2800
GR 593.4    2900    593.8    3000
NC   .09     .07     .055      .3      .5
X1 33100      36    1408    1484    1427    1427    1427
X3                          900            1950
GR 594.7       0    594.6     100    594.6     200    594.1     300    594.5     400
GR 594.7     500    594.5     600    593.7     700    593.1     800    592.7     900
GR 592.3    1000    591.9    1100    591.9    1200    591.8    1300    591.8    1400
GR 591.4    1408    585.0    1437    583.7    1449    585.4    1464    586.3    1484
GR 589.5    1500    592.9    1600    593.5    1700    592.6    1800    592.8    1900
GR 593.2    2000    593.4    2100    593.7    2200    593.9    2300    594.8    2400
GR 594.5    2500    594.2    2600    594.7    2700    594.5    2800    594.1    2900
GR 594.4    3000
NC   .08     .08     .06
X1 35300      37    1334    1400    2200    2200    2200
X3                          800            2450
GR 594.6       0    594.6     100    594.6     200    594.6     300    594.6     400
GR 594.6     500    593.9     600    593.2     700    592.6     772    592.1     800
GR 591.7     900    591.4    1000    591.0    1100    590.6    1200    589.6    1300
GR 589.1    1334    587.1    1342    585.1    1353    584.6    1370    585.4    1378
GR 588.9    1388    591.3    1400    591.1    1500    591.3    1600    591.1    1700
GR 591.5    1800    592.5    1900    591.9    2000    591.6    2100    592.2    2200
GR 592.8    2300    592.9    2400    593.1    2500    593.5    2597    593.5    2700
GR 593.7    2800    594.4    2900
NC   .09     .09     .065
X1 37100      40    1437    1500    1800    1800    1800
X3                                          1900
GR 594.3       0    594.2     100    594.1     200    593.8     300    593.7     400
GR 593.8     500    593.9     600    593.9     700    594.1     800    594.1     900
GR 594.2    1000    593.8    1100    592.8    1200    592.5    1300    591.4    1400
GR 590.8    1437    588.1    1450    586.3    1456    585.5    1470    586.5    1485
GR 588.1    1490    590.3    1500    590.0    1566    592.3    1582    592.9    1600
GR 594.5    1655    593.8    1700    593.6    1800    593.7    1900    593.8    2000
GR 594.0    2100    594.6    2200    594.8    2300    595.6    2400    596.4    2500
GR 596.9    2600    598.8    2700    598.2    2800    597.2    2900    595.6    3000
X1 37250      37    1473    1527     150     150     150
GR 594.3       0    594.2     100    594.1     200    593.8     300    593.7     400
GR 593.8     500    593.9     600    593.9     700    594.1     800    594.1     900
GR 594.2    1000    594.2    1100    594.4    1200    594.7    1300    596.3    1400
GR 598.0    1473    601.5    1473    585.9    1473    585.5    1480    586.0    1500
GR 589.0    1527    601.5    1527     598.    1527    596.4    1600    594.7    1700
GR 594.6    1800    594.9    1900    595.1    2000    595.2    2100    595.5    2200
GR 596.0    2300    596.9    2400    597.7    2500    598.0    2600    598.4    2700
GR 598.6    2800    598.4    2900
NC   .09     .09     .060
X1 37251                              1       1       1
BT     4    1473    601.5     598    1474   601.5     598    1526   601.5     598
BT  1527   601.5     598
X1 37279      37    1473    1527      28      28      28
BT     4    1473    601.5     598    1473   601.5     598    1527   601.5     598
BT  1527   601.5     598
GR 594.3       0    594.2     100    594.1     200    593.8     300    593.7     400
GR 593.8     500    593.9     600    593.9     700    594.1     800    594.1     900
GR 594.2    1000    594.2    1100    594.4    1200    594.7    1300    596.3    1400
GR 598.0    1473    601.5    1473    585.9    1473    585.2    1480    585.3    1500
GR 586.1    1527    601.5    1527     598.    1527    596.4    1600    594.7    1700
GR 594.6    1800    594.9    1900    595.1    2000    595.2    2100    595.5    2200
GR 596.0    2300    596.9    2400    597.7    2500    598.0    2600    598.4    2700
GR 598.6    2800    598.4    2900
NC   .09     .09     .065
X1 37280                              1       1       1
X1 37330      40    1437    1500      50      50      50
GR 592.8       0    592.5     100    592.3     200    592.2     300    592.2     400
GR 591.5     500    590.9     600    592.2     700    592.8     800    592.0     900
GR 592.0    1000    592.0    1100    592.0    1200    594.0    1300    594.0    1350
GR 590.8    1437    588.1    1450    586.3    1456    585.2    1470    586.5    1485
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GR 588.1    1490    590.3    1500    591.7    1566    592.3    1582    592.9    1600
GR 592.8    1655    592.7    1700    592.5    1800    592.1    1900    592.9    2000
GR 592.8    2100    592.7    2200    593.8    2300    596.3    2400    596.4    2500
GR 596.9    2600    598.8    2700    598.2    2800    597.2    2900    595.6    3000
X1 38000      38     1500    1580      670     670      670
X3                           800             2525
GR 594.2       0    594.3     100    594.2     200    595.5     300    595.1     400
GR 596.0     500    596.6     609    597.0     700    596.7     800    596.5     900
GR 596.1    1000    596.0    1100    596.3    1200    594.9    1300    591.4    1400
GR 590.9    1500    590.0    1515    586.4    1527    585.7    1534    586.1    1543
GR 589.3    1551    592.7    1580    592.6    1600    592.2    1700    592.5    1800
GR 592.1    1900    592.9    2000    592.8    2100    592.7    2200    593.8    2300
GR 596.4    2400    597.0    2500    597.8    2530    596.7    2600    597.2    2700
GR 597.8    2800    596.4    2900    596.5    3000
EJ
T1      BANGOR AND KAWKAWLIN TWP, BAY CO., #55555-01, 06
T2      50   YEAR  FLOW
T3      KAWKAWLIN  RIVER
J1   -10       3                                                    581.9
J2     2              -1
T1      BANGOR AND KAWKAWLIN TWP, BAY CO., #55555-01, 06
T2  100 YEAR FLOO - NATURAL FLOODWAY
T3      KAWKAWLIN  RIVER
J1   -10       4                                                    581.9
J2     3              -1
T1      BANGOR AND KAWKAWLIN TWP, BAY CO., #55555-01, 06
T2      500  YEAR  FLOW
T3      KAWKAWLIN RIVER
J1   -10       5                                                    581.9
J2    15              -1
ER
```

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*****************************************
HEC2 VERSION UPDATED JAN 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09
MODIFICATIONS 52,53,54,55,56,57,58
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T1      BANGOR AND KAWKAWLIN TWP. BAY CO., #55555-01, 06
T2  100 YEAR FLOO - NATURAL FLOODWAY
T3      KAWKAWLIN  RIVER

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -10.       4.       -0.       -0. -0.000000     -0.00      -0.0      -0.     581.900   -0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     3.000    -0.000    -1.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000

CCHV=    .300 CEHV=    .500
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA     LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

          150' U/S MOUTH                                                                  low

   150.00     8.70    581.90      0.00    581.90    582.17       .27      0.00      0.00    585.10
    5950.       0.     5950.       0.       0.     1434.        0.        0.        0.    584.80
     0.00     0.00      4.15      0.00      .090      .035      .090     0.000    573.20   1500.39
  .000817      150.      150.      150.         0         0         1      0.00    220.02   1720.41

3470 ENCROACHMENT STATIONS=    1500.0    1747.0  TYPE=     1  TARGET=     247.000

          1250' D/S DETROIT AND MACKINAC R.R. BR.

  2450.00    11.65    583.05      0.00      0.00    583.17       .12       .96       .04    583.80
    5950.       0.     5950.       0.       0.     2113.        0.       94.       12. 100000.00
      .23     0.00      2.82      0.00      .090      .035      .090      .035    571.40   1500.44
  .000253    2300.     2300.     2300.         2         0         1      0.00    244.99   1745.44

3470 ENCROACHMENT STATIONS=    1350.0    1565.0  TYPE=     1  TARGET=     215.000

          150' D/S DETROIT AND MACKINAC R.R. BR.

  3550.00    13.01    583.31      0.00      0.00    583.44       .13       .27       .00    582.90
    5950.       0.     5950.       0.       0.     2068.        0.      146.       18. 100000.00
      .33     0.00      2.88      0.00      .090      .035      .090      .035    570.30   1350.00
  .000230    1100.     1100.     1100.         2         0         1      0.00    213.68   1563.68

3265 DIVIDED FLOW

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      594.00 ELREA=      594.00
```

Slope appears steep. Non slope upstream ∴ starting elev is low for this restrictive section

BRIDGE AT DETROIT AND MACKINAC RAILROAD (D/S FACE)

```
 3700.00    12.83   583.33     0.00     0.00   583.52      .19      .05      .03   594.00
   5950.       0.     5950.      0.       0.    1682.       0.     153.      19.   594.00
     .34     0.00     3.54     0.00     .090     .035     .090     .035   570.50  1000.00
 .000521     150.     150.     150.        1        0        1     0.00   165.00  1191.00
```

3265 DIVIDED FLOW

NORMAL BRIDGE,NRD= 4 MIN ELTRD= 594.00 MAX ELLC= 590.00

3470 ENCROACHMENT STATIONS= 1000.0 1191.0 TYPE= 1 TARGET= 191.000

```
 3701.00    12.83   583.33     0.00     0.00   583.52      .19      .00      .00   594.00
   5950.       0.     5950.      0.       0.    1682.       0.     153.      19. 100000.00
     .34     0.00     3.54     0.00     .090     .030     .090     .035   570.50  1000.00
 .000383       1.       1.       1.        0        0        1     0.00   165.00  1191.00
```

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
```

NORMAL BRIDGE,NRD= 4 MIN ELTRD= 594.00 MAX ELLC= 590.00

3470 ENCROACHMENT STATIONS= 1000.0 1191.0 TYPE= 1 TARGET= 191.000

```
 3724.00    12.84   583.34     0.00     0.00   583.53      .19      .01      .00   594.00
   5950.       0.     5950.      0.       0.    1684.       0.     154.      19. 100000.00
     .35     0.00     3.53     0.00     .090     .030     .090     .035   570.50  1000.00
 .000381      23.      23.      23.        0        0        1     0.00   165.00  1191.00
```

3265 DIVIDED FLOW

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 594.00 ELREA= 594.00

```
 3725.00    12.84   583.34     0.00     0.00   583.53      .19      .00      .00   594.00
   5950.       0.     5950.      0.       0.    1684.       0.     154.      19.   594.00
     .35     0.00     3.53     0.00     .090     .035     .090     .035   570.50  1000.00
 .000519       1.       1.       1.        0        0        1     0.00   165.00  1191.00
```

3470 ENCROACHMENT STATIONS= 1350.0 1565.0 TYPE= 1 TARGET= 215.000

```
 3875.00    13.18   583.48     0.00     0.00   583.60      .12      .05      .02   582.90
   5950.       0.     5950.      0.       0.    2104.       0.     160.      19. 100000.00
     .36     0.00     2.83     0.00     .090     .035     .090     .035   570.30  1350.00
 .000218     150.     150.     150.        2        0        1     0.00   213.86  1563.86
```

3470 ENCROACHMENT STATIONS= 1500.0 1730.0 TYPE= 1 TARGET= 230.000

```
150' D/S STATE PARK RD. BR.

  4550.00    12.83   583.63     0.00     0.00   583.76      .13      .16      .00   583.20
    5950.       0.    5950.       0.       0.    2054.       0.     193.      23. 100000.00
      .43     0.00     2.90     0.00     .090     .035     .090     .035   570.80  1500.00
  .000256     675.     675.     675.        2        0        1     0.00   230.00  1730.00


3265 DIVIDED FLOW

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      592.10 ELREA=      591.60

          BRIDGE AT STATE PARK RD. (D/S FACE)

  4700.00    13.16   583.66     0.00     0.00   583.83      .17      .05      .02   592.10
    5950.       0.    5950.       0.       0.    1774.       0.     199.      24.   591.60
      .44     0.00     3.35     0.00     .090     .035     .090     .035   570.50   806.00
  .000395     150.     150.     150.        1        0        1     0.00   171.00   983.00


3265 DIVIDED FLOW

NORMAL BRIDGE,NRD=34 MIN ELTRD=  585.20 MAX ELLC=  588.20

3470 ENCROACHMENT STATIONS=     806.0     983.0  TYPE=     1  TARGET=     177.000
  4701.00    13.16   583.66     0.00     0.00   583.83      .17      .00      .00   592.10
    5950.       0.    5950.       0.       0.    1773.       0.     199.      24. 100000.00
      .44     0.00     3.36     0.00     .090     .030     .090     .035   570.50   806.00
  .000294       1.       1.       1.        0        0        1     -.94   171.00   983.00


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


NORMAL BRIDGE,NRD=34 MIN ELTRD=  585.20 MAX ELLC=  588.20

3470 ENCROACHMENT STATIONS=     806.0     983.0  TYPE=     1  TARGET=     177.000
  4760.00    13.18   583.68     0.00     0.00   583.85      .17      .02      .00   592.10
    5950.       0.    5950.       0.       0.    1776.       0.     202.      24. 100000.00
      .44     0.00     3.35     0.00     .090     .030     .090     .035   570.50   806.00
  .000293      59.      59.      59.        0        0        1    -1.13   171.00   983.00


3265 DIVIDED FLOW

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      592.10 ELREA=      591.60

  4761.00    13.18   583.68     0.00     0.00   583.85      .17      .00      .00   592.10
    5950.       0.    5950.       0.       0.    1777.       0.     202.      24.   591.60
      .44     0.00     3.35     0.00     .090     .035     .090     .035   570.50   806.00
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 .000393      1.      1.      1.       0       0       1    0.00  171.00  983.00


3470 ENCROACHMENT STATIONS=    1500.0    1730.0  TYPE=     1  TARGET=     230.000
 4911.00    12.98  583.78     0.00    0.00  583.91     .13     .05     .01  583.20
   5950.       0.   5950.       0.      0.   2089.      0.    208.     25. 100000.00
     .46     0.00    2.85     0.00    .090    .035    .090    .035  570.80 1500.00
 .000242     150.    150.     150.       2       0       1    0.00  230.00 1730.00


3470 ENCROACHMENT STATIONS=    1500.0    1695.0  TYPE=     1  TARGET=     195.000

          1200' U/S STATE PARK RD. BR.

 5900.00    13.61  584.01     0.00    0.00  584.14     .13     .23     .00  584.30
   5950.       0.   5950.       0.      0.   2036.      0.    255.     29. 100000.00
     .55     0.00    2.92     0.00    .090    .035    .090    .035  570.40 1500.42
 .000219     989.    989.     989.       2       0       1    0.00  194.58 1695.00


3470 ENCROACHMENT STATIONS=    1500.0    1699.0  TYPE=     1  TARGET=     199.000

          3100' U/S STATE PARK RD. BR. (D/S FACE)

 7800.00    12.65  584.45     0.00    0.00  584.60     .15     .45     .01  586.30
   5950.       0.   5950.       0.      0.   1915.      0.    341.     38. 100000.00
     .72     0.00    3.11     0.00    .090    .035    .090    .035  571.80 1504.25
 .000263    1900.   1900.    1900.       0       0       1    0.00  194.75 1699.00


3470 ENCROACHMENT STATIONS=    1500.0    1680.0  TYPE=     1  TARGET=     180.000

          150' D/S EUCLID RD. BR.

 9900.00    12.01  585.21     0.00    0.00  585.47     .26     .81     .06  584.50
   5870.       0.   5870.       0.      0.   1421.      0.    422.     47. 100000.00
     .86     0.00    4.13     0.00    .090    .035    .090    .035  573.20 1500.00
 .000620    2100.   2100.    2100.       2       0       1    0.00  180.00 1680.00


3265 DIVIDED FLOW

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      593.00 ELREA=      593.00

          BRIDGE AT EUCLID RD. (D/S FACE)

10050.00    12.05  585.25     0.00    0.00  585.67     .42     .13     .08  593.00
   5870.       0.   5870.       0.      0.   1127.      0.    426.     47.  593.00
     .87     0.00    5.21     0.00    .090    .035    .090    .035  573.20 1000.00
 .001200     150.    150.     150.       1       0       1    0.00  124.00 1131.00


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
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NORMAL BRIDGE,NRD= 4 MIN ELTRD=  592.90 MAX ELLC=  589.80

3470 ENCROACHMENT STATIONS=    1000.0    1131.0  TYPE=     1  TARGET=     131.000
 10051.00    12.05   585.25     0.00      0.00   585.68      .42      .00      .00   593.00
    5870.       0.    5870.       0.        0.    1127.       0.     426.      47. 100000.00
      .87     0.00     5.21     0.00      .090     .030     .090     .035   573.20  1000.00
  .000881       1.       1.       1.         0        0        1     0.00   124.00  1131.00

3265 DIVIDED FLOW

NORMAL BRIDGE,NRD= 4 MIN ELTRD=  592.90 MAX ELLC=  589.80

3470 ENCROACHMENT STATIONS=    1000.0    1131.0  TYPE=     1  TARGET=     131.000
 10100.00    12.10   585.30     0.00      0.00   585.72      .42      .04      .00   593.00
    5870.       0.    5870.       0.        0.    1133.       0.     427.      48. 100000.00
      .87     0.00     5.18     0.00      .090     .030     .090     .035   573.20  1000.00
  .000869      49.      49.      49.         1        0        1     0.00   124.00  1131.00

3265 DIVIDED FLOW

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      593.00 ELREA=      593.00
 10101.00    12.10   585.30     0.00      0.00   585.72      .42      .00      .00   593.00
    5870.       0.    5870.       0.        0.    1133.       0.     427.      48.   593.00
      .87     0.00     5.18     0.00      .100     .040     .100     .035   573.20  1000.00
  .001544       1.       1.       1.         0        0        1     0.00   124.00  1131.00

3470 ENCROACHMENT STATIONS=    1500.0    1685.0  TYPE=     1  TARGET=     185.000
 10251.00    12.49   585.69     0.00      0.00   585.92      .23      .15      .05   584.50
    5870.       0.    5870.       0.        0.    1511.       0.     432.      48. 100000.00
      .88     0.00     3.88     0.00      .100     .040     .100     .035   573.20  1500.00
  .000684     150.     150.     150.         2        0        1     0.00   185.00  1685.00

3470 ENCROACHMENT STATIONS=     660.0     820.0  TYPE=     1  TARGET=     160.000

          2400' U/S EUCLID RD. BR.

 12450.00    11.64   587.04     0.00      0.00   587.26      .22     1.34      .00   585.50
    5870.       0.    5870.       0.        0.    1543.       0.     509.      57. 100000.00
     1.05     0.00     3.80     0.00      .100     .040     .100     .036   575.40   660.00
  .000543    2199.    2199.    2199.         2        0        1     0.00   159.02   819.02

3470 ENCROACHMENT STATIONS=     105.0     285.0  TYPE=     1  TARGET=     180.000

          4800' U/S EUCLID RD. BR.

 14850.00    14.96   588.16     0.00      0.00   588.35      .20     1.08      .01100000.00
    5870.       0.    5795.      75.        0.    1613.     114.     599.      66.   583.00
     1.23     0.00     3.59      .66      .100     .040     .100     .037   573.20   105.63
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.000382    2400.    2400.    2400.       2        0        1     0.00   179.22   284.86

 SECNO     DEPTH    CWSEL    CRIWS    WSELK     EG       HV       HL      OLOSS   BANK ELEV
 Q         QLOB     QCH      QROB     ALOB      ACH      AROB     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=     118.0     440.0  TYPE=     1  TARGET=     322.000

          7000' U/S EUCLID RD. BR.

 17050.00    14.38   588.98     0.00     0.00   589.13      .15      .76     .02100000.00
    5870.       0.    5412.     458.       0.    1689.     667.     702.      79.   583.10
     1.44     0.00     3.20      .69     .100     .040     .100     .037   574.60   118.30
  .000313    2200.    2200.    2200.        2        0        1     0.00   321.70   440.00


3470 ENCROACHMENT STATIONS=     104.0     199.0  TYPE=     1  TARGET=      95.000

          150' D/S PENN CENTRAL R.R. BR.

 19450.00    16.39   589.89     0.00     0.00   590.21      .32      .99     .09100000.00
    5870.       0.    5870.       0.       0.    1297.       0.     803.      90. 100000.00
     1.58     0.00     4.52     0.00     .100     .040     .100     .037   573.50   104.00
  .000572    2400.    2400.    2400.        2        0        1     0.00    95.00   199.00


3265 DIVIDED FLOW

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      599.30 ELREA=      599.40

          BRIDGE AT PENN CENTRAL RAILROAD (D/S FACE)

 19600.00    17.16   589.96     0.00     0.00   590.38      .43      .12      .05   599.30
    5870.       0.    5870.       0.       0.    1119.       0.     807.      91.   599.40
     1.59     0.00     5.24     0.00     .100     .040     .100     .037   572.80   100.00
  .001291     150.     150.     150.        0        0        1     0.00    86.00   196.00


3265 DIVIDED FLOW

NORMAL BRIDGE,NRD= 4 MIN ELTRD=  599.30 MAX ELLC=  592.60

3470 ENCROACHMENT STATIONS=     100.0     196.0  TYPE=     1  TARGET=      96.000
 19601.00    17.16   589.96     0.00     0.00   590.38      .43      .00      .00   599.30
    5870.       0.    5870.       0.       0.    1119.       0.     807.      91. 100000.00
     1.59     0.00     5.24     0.00     .090     .035     .090     .037   572.80   100.00
  .000988       1.       1.       1.        0        0        1     0.00    86.00   196.00


3265 DIVIDED FLOW

NORMAL BRIDGE,NRD= 4 MIN ELTRD=  599.30 MAX ELLC=  592.60
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3470 ENCROACHMENT STATIONS=      100.0      196.0  TYPE=      1  TARGET=      96.000
 19619.00     17.18    589.98      0.00      0.00    590.40       .43       .02       .00    599.30
    5870.        0.     5870.        0.        0.     1121.        0.      808.       91. 100000.00
     1.59      0.00      5.24      0.00      .090      .035      .090      .037    572.80    100.00
  .000984       18.       18.       18.         0         0         1      0.00     86.00    196.00


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


OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      599.30 ELREA=      599.40

 19620.00     17.18    589.98      0.00      0.00    590.40       .43       .00       .00    599.30
    5870.        0.     5870.        0.        0.     1121.        0.      808.       91.    599.40
     1.59      0.00      5.24      0.00      .090      .040      .090      .037    572.80    100.00
  .001285        1.        1.        1.         0         0         1      0.00     86.00    196.00


3265 DIVIDED FLOW

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      596.60 ELREA=      597.30

          BRIDGE AT M-13 (D/S FACE)

 19700.00     14.09    590.19      0.00      0.00    590.52       .32       .08       .03    596.60
    5870.        0.     5870.        0.        0.     1289.        0.      810.       91.    597.30
     1.60      0.00      4.55      0.00      .090      .040      .090      .037    576.10    102.00
  .000813       80.       80.       80.         2         0         1      0.00    104.00    210.00


3265 DIVIDED FLOW

NORMAL BRIDGE,NRD= 4 MIN ELTRD=  596.60 MAX ELLC=  592.40

3470 ENCROACHMENT STATIONS=      102.0      210.0  TYPE=      1  TARGET=     108.000
 19701.00     14.09    590.19      0.00      0.00    590.52       .32       .00       .00    596.60
    5870.        0.     5870.        0.        0.     1289.        0.      810.       91. 100000.00
     1.60      0.00      4.55      0.00      .090      .035      .090      .037    576.10    102.00
  .000622        1.        1.        1.         0         0         1      0.00    104.00    210.00


3265 DIVIDED FLOW

NORMAL BRIDGE,NRD= 4 MIN ELTRD=  596.60 MAX ELLC=  592.40

3470 ENCROACHMENT STATIONS=      102.0      210.0  TYPE=      1  TARGET=     108.000
 19756.00     14.13    590.23      0.00      0.00    590.55       .32       .03       .00    596.60
    5870.        0.     5870.        0.        0.     1294.        0.      811.       91. 100000.00
     1.60      0.00      4.54      0.00      .090      .035      .090      .037    576.10    102.00
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.000617	55.	55.	55.	0	0	1	0.00	104.00	210.00

CCHV= .300 CEHV= .500

3265 DIVIDED FLOW

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 596.60 ELREA= 597.30

19757.00	14.13	590.23	0.00	0.00	590.55	.32	.00	.00	596.60
5870.	0.	5870.	0.	0.	1294.	0.	811.	91.	597.30
1.60	0.00	4.54	0.00	.090	.040	.090	.037	576.10	102.00
.000805	1.	1.	1.	0	0	1	0.00	104.00	210.00

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= 268.0 460.0 TYPE= 1 TARGET= 192.000

200' U/S M-13 BR.

19900.00	14.47	590.47	0.00	0.00	590.66	.19	.07	.04	588.50
5870.	0.	5760.	110.	0.	1634.	174.	817.	91.	584.40
1.61	0.00	3.52	.63	.090	.040	.090	.037	576.00	268.00
.000338	143.	143.	143.	2	0	1	0.00	190.26	458.26

3470 ENCROACHMENT STATIONS= 82.0 257.0 TYPE= 1 TARGET= 175.000

100' D/S OLD BEAVER RD. BR.

21300.00	16.15	590.95	0.00	0.00	591.08	.13	.40	.02	590.20
5870.	0.	5870.	0.	0.	2036.	0.	878.	97.	100000.00
1.75	0.00	2.88	0.00	.090	.040	.090	.038	574.80	82.00
.000243	1400.	1400.	1400.	2	0	1	0.00	175.00	257.00

3470 ENCROACHMENT STATIONS= 235.0 365.0 TYPE= 1 TARGET= 130.000

BRIDGE AT OLD BEAVER RD. (D/S FACE)

21400.00	15.94	590.94	0.00	0.00	591.15	.21	.03	.04	592.50
5870.	0.	5870.	0.	0.	1589.	0.	883.	98.	100000.00
1.75	0.00	3.69	0.00	.090	.040	.090	.038	575.00	235.00
.000396	100.	100.	100.	2	0	1	0.00	130.00	365.00

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.15	1.50	2.50	-0.00	100.00	5.00	1500.00	-0.00	575.00	575.00

PRESSURE FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	ELLC	ELTRD	CLASS

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591.30    591.17     .02      0.     5870.     1500.    590.40    592.40    10.00

3470 ENCROACHMENT STATIONS=     235.0     365.0  TYPE=     1  TARGET=     130.000
 21431.00    16.09   591.09     0.00      0.00   591.30     .21      .14      0.00    592.50
    5870.       0.    5870.       0.        0.    1609.      0.     884.      98. 100000.00
     1.76     0.00     3.65     0.00      .090     .040    .090     .038   575.00    235.00
  .000381      31.      31.      31.         2        0       1     0.00   130.00    365.00

3470 ENCROACHMENT STATIONS=      82.0     257.0  TYPE=     1  TARGET=     175.000
 21581.00    16.44   591.24     0.00      0.00   591.36     .12      .04      .03    590.20
    5870.       0.    5870.       0.        0.    2087.      0.     890.      98. 100000.00
     1.77     0.00     2.81     0.00      .090     .040    .090     .038   574.80     82.00
  .000225     150.     150.     150.         2        0       1     0.00   175.00    257.00

3470 ENCROACHMENT STATIONS=     520.0     870.0  TYPE=     1  TARGET=     350.000
 21981.00    15.40   591.40     0.00      0.00   591.44     .04      .05      .03    590.00
    5870.       0.    5870.       0.        0.    3838.      0.     917.     101. 100000.00
     1.84     0.00     1.53     0.00      .090     .040    .090     .038   576.00    520.00
  .000072     400.     400.     400.         2        0       1     0.00   350.00    870.00

CCHV=    .300 CEHV=    .500

3470 ENCROACHMENT STATIONS=     511.0    1531.0  TYPE=     1  TARGET=    1020.000

          1000' U/S OLD BEAVER RD. BR.

 22400.00    14.66   591.46     0.00      0.00   591.46     .01      .01      .01    580.40
    5870.    2646.     1469.    1755.     5268.    1666.   3234.     985.     107.    580.70        T
     2.04      .50      .88      .54      .060     .045    .060     .038   576.80    511.00
  .000021     419.     419.     419.         0        0       1     0.00  1020.00   1531.00

CCHV=    .300 CEHV=    .500
3280 CROSS SECTION  23600.00 EXTENDED       .18 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=     600.0    2200.0  TYPE=     1  TARGET=    1600.000

          2200' U/S OLD BEAVER RD. BR.

 23600.00    16.08   591.48     0.00      0.00   591.49     .00      .02      .00    582.50
    5870.    3328.     1018.    1524.     7942.    1227.   4421.    1312.     143.    584.80        U
     2.74      .42      .83      .34      .070     .045    .070     .038   575.40    600.00
  .000020    1200.    1200.    1200.         2        0       1     0.00  1600.00   2200.00

3470 ENCROACHMENT STATIONS=     300.0    2000.0  TYPE=     1  TARGET=    1700.000

          2500' U/S OLD BEAVER RD. BR.

 23900.00    15.19   591.49     0.00      0.00   591.50     .01      .01      .00    583.20
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   5870.     4135.     1549.      185.     6082.     1103.      679.     1386.      155.     589.10
    2.84       .68      1.40       .27      .070      .050      .070      .038    576.30    300.00
 .000080      300.      300.      300.         0         0         1      0.00   1700.00   2000.00


3470 ENCROACHMENT STATIONS=      800.0    2000.0  TYPE=      1  TARGET=     1200.000
 25030.00     14.96    591.56      0.00      0.00    591.57       .00       .06       .00    583.00
    2340.     1762.      454.      124.     4327.      621.      710.     1561.      192.    585.00
     3.53       .41       .73       .17      .070      .055      .070      .039    576.60    800.00
 .000028      1130.     1130.     1130.         1         0         1      0.00   1200.00   2000.00


3280 CROSS SECTION  26160.00 EXTENDED      1.62 FEET


3470 ENCROACHMENT STATIONS=     1100.0    2300.0  TYPE=      1  TARGET=     1200.000
 26160.00     14.41    591.61      0.00      0.00    591.62       .01       .05       .00    584.00
    2340.      430.      766.     1145.      687.      602.     2822.     1688.      223.    584.00
     3.96       .63      1.27       .41      .080      .055      .080      .040    577.20   1100.00
 .000086      1130.     1130.     1130.         0         0         1      0.00   1200.00   2300.00


3470 ENCROACHMENT STATIONS=      500.0    2000.0  TYPE=      1  TARGET=     1500.000

          150' D/S CHIP RD. BR.

 27300.00     13.49    591.69      0.00      0.00    591.69       .00       .06       .00    582.70
    2340.     1533.      429.      379.     4573.      536.     1320.     1826.      259.    586.90
     4.72       .34       .80       .29      .090      .055      .070      .040    578.20    500.00
 .000040      1140.     1140.     1140.         0         0         1      0.00   1500.00   2000.00


3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=      500.0    1026.0  TYPE=      1  TARGET=      526.000

          BRIDGE AT CHIP RD. (D/S FACE)

 27450.00     10.17    591.57      0.00      0.00    591.84       .27       .02       .14    595.10
    2340.       70.     2270.        0.      175.      532.        0.     1838.      262. 100000.00
     4.73       .40      4.27      0.00      .090      .050      .070      .040    581.40    500.00
 .001432      150.      150.      150.         2         0         1      0.00    406.31   1025.71


SPECIAL BRIDGE

SB   XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
    -0.00      1.50      2.30      -0.00     50.00     -0.00     400.00    -0.00     581.40    581.40

6870 D.S. ENERGY OF  591.84 HIGHER THAN COMPUTED ENERGY OF  591.81

3265 DIVIDED FLOW

PRESSURE AND WEIR FLOW

  EGPRS     EGLWC       H3      QWEIR      QPR     BAREA     ELLC     ELTRD    CLASS

  592.36    591.84     0.00     1071.     1283.     400.    590.30    591.00    30.00
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3470 ENCROACHMENT STATIONS=      500.0     1026.0  TYPE=      1  TARGET=      526.000
 27476.00     10.17    591.57      0.00      0.00    591.84      .27      0.00      0.00    595.10
    2340.       70.     2270.        0.      175.      532.       0.     1838.      262. 100000.00
     4.74       .40      4.27      0.00      .090      .050     .070      .040    581.40    500.00
  .001432       26.       26.       26.         2         0        3      0.00    406.33   1025.71

   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      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     2000.0  TYPE=      1  TARGET=     1800.000
 27526.00     13.73    591.93      0.00      0.00    591.93      .01       .01       .08    582.70
    2340.     1140.      609.      590.     3317.      549.    1443.     1842.      263.    586.90
     4.76       .34      1.11       .41      .090      .055     .070      .040    578.20    200.00
  .000074       50.       50.       50.         2         0        1      0.00   1800.00   2000.00

3470 ENCROACHMENT STATIONS=      600.0     2300.0  TYPE=      1  TARGET=     1700.000
 28026.00     12.57    591.97      0.00      0.00    591.97      .01       .04       .00    586.00
    2340.      571.      577.     1192.     1879.      512.    2409.     1900.      284.    585.80
     4.99       .30      1.13       .49      .080      .055     .070      .041    579.40    600.00
  .000090      500.      500.      500.         2         0        1      0.00   1700.00   2300.00

3470 ENCROACHMENT STATIONS=      550.0     2250.0  TYPE=      1  TARGET=     1700.000
          1200' U/S CHIP RD. BR.
 28650.00     12.62    592.02      0.00      0.00    592.03      .01       .06       .00    586.00
    2340.      712.      585.     1044.     2023.      514.    2347.     1969.      308.    585.80
     5.28       .35      1.14       .44      .070      .055     .080      .041    579.40    550.00
  .000091      624.      624.      624.         0         0        1      0.00   1700.00   2250.00

3470 ENCROACHMENT STATIONS=     1440.0     1575.0  TYPE=      1  TARGET=      135.000
          150" D/S OLD BEAVER RD. BR.
 31450.00     10.38    592.58      0.00      0.00    592.73      .15       .63       .07    586.10
    2340.      308.     1160.      872.      136.      299.     456.     2155.      367.    586.50
     5.55      2.27      3.88      1.91      .070      .055     .090      .042    582.20   1440.00
  .001207     2800.     2800.     2800.         2         0        1      0.00    135.00   1575.00

3470 ENCROACHMENT STATIONS=      971.0     1030.0  TYPE=      1  TARGET=       59.000
          BRIDGE AT OLD BEAVER RD. (D/S FACE)
 31600.00     10.31    592.71      0.00      0.00    592.96      .25       .18       .05    594.60
    2340.        0.     2340.        0.        0.      581.       0.     2157.      367. 100000.00
     5.56      0.00      4.03      0.00      .070      .050     .090      .042    582.40    971.00
  .001197      150.      150.      150.         2         0        1      0.00     59.00   1030.00
```

"Y"

"Z"

"AA"

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	-0.00	1.50	2.50	-0.00	50.00	-0.00	400.00	-0.00	582.40	582.40

PRESSURE FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	ELLC	ELTRD	CLASS
593.51	592.96	0.00	0.	2340.	400.	591.60	593.80	10.00

3470 ENCROACHMENT STATIONS= 971.0 1030.0 TYPE= 1 TARGET= 59.000

31623.00	10.88	593.28	0.00	0.00	593.51	.22	.55	0.00	594.60
2340.	0.	2340.	0.	0.	615.	0.	2158.	367.	100000.00
5.56	0.00	3.81	0.00	.090	.050	.070	.042	582.40	971.00
.001012	23.	23.	23.	2	0	1	0.00	59.00	1030.00

3470 ENCROACHMENT STATIONS= 1440.0 1600.0 TYPE= 1 TARGET= 160.000

31673.00	11.32	593.52	0.00	0.00	593.59	.07	.04	.05	586.10
2340.	204.	897.	1239.	160.	330.	702.	2159.	367.	586.50
5.57	1.27	2.71	1.77	.090	.055	.070	.042	582.20	1440.00
.000515	50.	50.	50.	2	0	1	0.00	160.00	1600.00

CCHV= .300 CEHV= .500

SECNO	DEPTH	CWSEL	CR1WS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	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= 900.0 1950.0 TYPE= 1 TARGET= 1050.000

1500' U/S OLD BEAVER RD. BR.

33100.00	10.47	594.17	0.00	0.00	594.20	.03	.60	.01	591.40
2340.	566.	1205.	569.	1088.	601.	814.	2219.	387.	586.30
5.87	.52	2.00	.70	.090	.055	.070	.043	583.70	900.00
.000354	1427.	1427.	1427.	2	0	1	0.00	1050.00	1950.00

3280 CROSS SECTION 35300.00 EXTENDED .16 FEET

3470 ENCROACHMENT STATIONS= 800.0 2450.0 TYPE= 1 TARGET= 1650.000

1950' D/S BEAVER RD. BR.

35300.00	9.97	594.57	0.00	0.00	594.58	.00	.37	.01	589.10
2340.	828.	484.	1028.	1905.	514.	2836.	2415.	455.	591.30
7.07	.43	.94	.36	.080	.060	.080	.044	584.60	800.00
.000096	2200.	2200.	2200.	2	0	1	0.00	1650.00	2450.00

3470 ENCROACHMENT STATIONS= .0 1900.0 TYPE= 1 TARGET= 1899.999

150" D/S BEAVER RD. BR.

37100.00	9.39	594.89	0.00	0.00	594.92	.02	.33	.01	590.80

2840.	907.	896.	537.	1816.	471.	757.	2587.	529.	590.30
7.53	.50	1.90	.71	.090	.065	.090	.045	585.50	.00
.000484	1800.	1800.	1800.	2	0	1	0.00	1900.00	1900.00

3265 DIVIDED FLOW

3280 CROSS SECTION 37250.00 EXTENDED .67 FEET

BRIDGE AT BEAVER RD. (D/S FACE)

37250.00	9.47	594.97	0.00	0.00	595.09	.12	.13	.05	598.00
2340.	796.	1527.	17.	1177.	451.	58.	2595.	535.	598.00
7.55	.68	3.39	.29	.090	.065	.090	.045	585.50	0.00
.001801	150.	150.	150.	2	0	1	0.00	1623.46	1936.37

3265 DIVIDED FLOW

3280 CROSS SECTION 37251.00 EXTENDED .67 FEET

NORMAL BRIDGE,NRD= 4 MIN ELTRD= 601.50 MAX ELLC= 598.00

37251.00	9.47	594.97	0.00	0.00	595.10	.13	.00	.00	598.00
2340.	756.	1568.	16.	1178.	451.	58.	2595.	535.	598.00
7.55	.64	3.48	.28	.090	.060	.090	.045	585.50	0.00
.001617	1.	1.	1.	0	0	1	0.00	1624.17	1936.94

3265 DIVIDED FLOW

3280 CROSS SECTION 37279.00 EXTENDED .73 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

NORMAL BRIDGE,NRD= 4 MIN ELTRD= 601.50 MAX ELLC= 598.00

37279.00	9.83	595.03	0.00	0.00	595.14	.11	.04	.01	598.00
2340.	707.	1615.	19.	1249.	514.	73.	2596.	536.	598.00
7.55	.57	3.14	.26	.090	.060	.090	.045	585.20	0.00
.001174	28.	28.	28.	1	0	1	0.00	1657.53	1963.79

3265 DIVIDED FLOW

3280 CROSS SECTION 37280.00 EXTENDED .75 FEET

37280.00	9.85	595.05	0.00	0.00	595.15	.10	.00	.00	598.00
2340.	763.	1555.	22.	1280.	515.	79.	2596.	536.	598.00
7.55	.60	3.02	.28	.090	.065	.090	.045	585.20	0.00
.001268	1.	1.	1.	2	0	1	0.00	1672.02	1975.45

3280 CROSS SECTION 37330.00 EXTENDED 2.38 FEET

37330.00	9.98	595.18	0.00	0.00	595.18	.00	.01	.03	590.80
2340.	1328.	399.	614.	4238.	494.	2134.	2601.	538.	590.30
7.59	.31	.81	.29	.090	.065	.090	.045	585.20	0.00
.000082	50.	50.	50.	2	0	1	0.00	2355.28	2355.28

3470 ENCROACHMENT STATIONS= 800.0 2525.0 TYPE= 1 TARGET= 1725.000

750' U/S BEAVER RD. BR.

38000.00	9.58	595.28	0.00	0.00	595.29	.01	.10	.01	590.90
2340.	449.	714.	1177.	631.	491.	1949.	2677.	565.	592.70
7.80	.71	1.45	.60	.090	.065	.090	.045	585.70	1273.02
.000369	670.	670.	670.	2	0	1	0.00	1083.82	2356.84

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Kawkawlin Twp & Bangor Twp

3) WATERCOURSE: Kawkawlin R.

4) DOCUMENT TYPE: Report

00BREAK00

HYDRAULIC ANALYSIS

Introduction

The stream being studied is the Kawkawlin River in Bangor and Kawkawlin Townships, Bay County, Michigan. The study limits are from the Saginaw Bay to approximately 750' upstream of Beaver Road on the North Branch. The flows were computed by the SCS method and have been approved by the Michigan Department of Natural Resources.

Method of Analysis

Water surface profiles were computed through use of the COE HEC-2 step-backwater computer program. Bridges which were under low flow conditions for all four flows were coded according to the "normal bridge" routine requirements. Those bridges which experienced pressure or weir flow for any of the four flows were coded according to the "special bridge" routine requirements.

The hydraulic model was developed for the 100-year flow. Valley sections upstream and downstream of culverts or bridges were located where full cross section flow would be developed out of the influence of the bridge constriction.

Variables and Coefficients

The roughness factors (Manning's "n") were established by comparing photographs and field inspection with the photographs and descriptions found on

pages 101 to 123 in Open-Channel Hydraulics, by Ven Te Chow. In general, the following range of values were used:

Description	Manning "n"
1. Channel	
a. Clean silt bottom with good alignment	.03 - .04
b. Silt bottom with snags and fair alignment	.04 - .05
c. Silt bottom with good growth of weeds and some fallen limbs from overhanging trees and fair to poor alignment	.05 - .07
2. Flood Plains	
a. Short grass	.035 - .045
b. Cornfield or other row crops	.045 - .055
c. Woods with medium to heavy brush	.07 - .10

The contraction and expansion coefficient used in the Kawkawlin River study were .3 and .5 respectively. These values were used throughout the study. References used in the selection of these values were the HEC-2 Users Manual, exhibit 2, page 2, and Open-Channel Hydraulics, Ven Te Chow, pages 311 and 468.

The orifice and weir coefficients used in the HEC-2 "special bridge" routine were determined as outlined in the HEC-2 Users Manual, exhibit 2, pages 1 and 2 and Application of the HEC-2 Bridge Routines, pp 27-35.

Starting Point

Profile computations began at the Saginaw Bay by inputting the mean bay elevation as a known water surface elevation. In the final Flood Insurance Report, the 10-, 50-, 100- and 500-year Saginaw Bay elevations will be extended

horizontally upstream until the corresponding Kawkawlin River profiles are intersected. The floodway and flood plain as delineated in this submittal are based on the calculated water surface profiles began at the Saginaw Bay by inputting the known water surface elevation. In the final Flood Insurance Study, the floodway will be based on the Kawkawlin River water surface profiles; the flood plain will reflect the influence of the Saginaw Bay.

High Water References

High water references were given for the lower reaches of the Kawkawlin River in Detailed Project Report on Flood Control for Kawkawlin River, Michigan, U.S. Army Corps of Engineers, 1966. The water marks were observed in March of 1948 during a flood event estimated at a flow of 5300 cfs which corresponds to the 50-year flood in this submittal. The water elevations for the 1948 event were higher because of an ice jam at the mouth of the river and ice formations around the Detroit and Mackinaw Railroad Bridge. However, the difference between consecutive high water elevations is consistent with this submittal. good!

A gaging station is located on the upstream side of the Beaver Road bridge on the North Branch. The water surface elevation for the 100-year natural profile in this submittal matched the rating curve for a flow of 1630 cfs going through the bridge. good!

Cross Section Location

Cross sections are located on the map as taken by field survey. However, the overbank portions of some cross sections had to be adjusted in the modeling process so that flow would be perpendicular to each cross section along its length. In the event of two cross sections intersecting, the downstream section was adjusted such that no part of this section extended past the upstream section.

Floodway Determination

The location of the floodway encroachments was determined by encroaching the right and left overbanks of each cross section such that the water surface elevation increased a maximum of .1' above the natural water surface elevation. OK!

However, with a type 4 encroachment you start with an elev 0.1 ft higher than the natural run so that all sections, if causing a backwater effect contribute to a total increase (max) of .1' Not the way this was acomplished with this model

use method 4 followed by method 1

Bangor & Kawkawlin Twps.
Kawkawlin River
5555-01, 06
Bay County
TAB 4-2-76

Original Cross Section Location

Cross Section	SECNO	Location
A	150	150' u/s mouth of river
B	2450	1250' d/s Detroit & Mackinaw Railroad
C	3550	150' d/s Detroit & Mackinaw Railroad
D	3700	Bridge at Detroit & Mackinaw Railroad (d/s face)
E	4550	150' d/s State Park Road
F	4700	Bridge at State Park Road (d/s face)
G	5900	1200' u/s State Park Road
H	7800	3100' u/s State Park Road
I	9900	150' d/s Euclid Road
J	10050	Bridge at Euclid Road (d/s face)
K	12450	2400' u/s Euclid Road
L	14850	4800' u/s Euclid Road
M	17050	7000' u/s Euclid Road
N	19450	150' d/s Penn Central Railroad
O	19600	Bridge at Penn Central Railroad (d/s face)
P	19700	Bridge at M-13 (d/s face)
Q	19900	200' u/s M-13
R	21300	100' d/s Old Beaver Road
S	21400	Bridge at Old Beaver Road (d/s face)
T	22400	1000' u/s Old Beaver Road
U	23600	2200' u/s Old Beaver Road
V	23900	2500' u/s Old Beaver Road

Bangor & Kawkawlin Twps.
Kawkawlin River
5555-01, 06
Bay County
TAB 4-2-76

Cross Section	SECNO	Location
W	27300	150' d/s Chip Road
X	27450	Bridge at Chip Road (d/s face)
Y	28650	1200' u/s Chip Road
Z	31450	150' d/s Old Beaver Road
AA	31600	Bridge at Old Beaver Road (d/s face)
AB	33100	1500' u/s Old Beaver Road
AC	35300	1950' d/s Beaver Road
AD	37100	150' d/s Beaver Road
AE	37250	Bridge at Beaver Road (d/s face)
AF	38000	750' u/s Beaver Road

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Kawkawlin Twp & ~~Bay~~ Bangor Twp

3) WATERCOURSE: Kawkawlin R.

4) DOCUMENT TYPE: Summary

00BREAK00

SUMMARY PRINTOUT FOR MULTIPLE PROFILES.

KAWKAWLIN RIVER

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TQ	TOPWID	STENCL	STENCR	HV	VCH
150.00	150.00	0.00	0.00	573.20	3760.00	581.90	2081.16	220.02	0.00	0.00	.11	2.62
150.00	150.00	0.00	0.00	573.20	5250.00	581.90	2081.16	220.02	0.00	0.00	.21	3.66
150.00	150.00	0.00	0.00	573.20	5950.00	581.90	2081.16	220.02	0.00	0.00	.27	4.15
150.00	150.00	0.00	0.00	573.20	7000.00	581.90	2081.16	220.02	0.00	0.00	.37	4.88
2450.00	2300.00	0.00	0.00	571.40	3760.00	582.41	3323.80	242.44	1500.00	1747.00	.06	1.92
2450.00	2300.00	0.00	0.00	571.40	5250.00	582.83	3595.03	244.11	1500.00	1747.00	.10	2.55
2450.00	2300.00	0.00	0.00	571.40	5950.00	583.05	3742.60	244.99	1500.00	1747.00	.12	2.82
2450.00	2300.00	0.00	0.00	571.40	7000.00	583.40	3987.02	246.43	1500.00	1747.00	.16	3.18
3550.00	1100.00	0.00	0.00	570.30	3760.00	582.54	3444.88	212.28	1350.00	1565.00	.06	1.97
3550.00	1100.00	0.00	0.00	570.30	5250.00	583.05	3755.31	213.39	1350.00	1565.00	.11	2.61
3550.00	1100.00	0.00	0.00	570.30	5950.00	583.31	3921.75	213.68	1350.00	1565.00	.13	2.88
3550.00	1100.00	0.00	0.00	570.30	7000.00	583.72	4187.97	214.13	1350.00	1565.00	.16	3.25
3700.00	150.00	0.00	0.00	570.50	3760.00	582.55	2325.80	165.00	0.00	0.00	.09	2.42
3700.00	150.00	0.00	0.00	570.50	5250.00	583.06	2510.07	165.00	0.00	0.00	.16	3.20
3700.00	150.00	0.00	0.00	570.50	5950.00	583.33	2607.14	165.00	0.00	0.00	.19	3.54
3700.00	150.00	0.00	0.00	570.50	7000.00	583.74	2756.68	165.00	0.00	0.00	.25	4.00
3701.00	1.00	594.00	590.00	570.50	3760.00	582.55	2713.51	165.00	1000.00	1191.00	.09	2.42
3701.00	1.00	594.00	590.00	570.50	5250.00	583.06	2928.55	165.00	1000.00	1191.00	.16	3.20
3701.00	1.00	594.00	590.00	570.50	5950.00	583.33	3041.83	165.00	1000.00	1191.00	.19	3.54
3701.00	1.00	594.00	590.00	570.50	7000.00	583.74	3216.32	165.00	1000.00	1191.00	.25	4.00
3724.00	23.00	594.00	590.00	570.50	3760.00	582.56	2715.69	165.00	1000.00	1191.00	.09	2.42
3724.00	23.00	594.00	590.00	570.50	5250.00	583.07	2932.27	165.00	1000.00	1191.00	.16	3.20
3724.00	23.00	594.00	590.00	570.50	5950.00	583.34	3046.30	165.00	1000.00	1191.00	.19	3.53
3724.00	23.00	594.00	590.00	570.50	7000.00	583.75	3221.93	165.00	1000.00	1191.00	.25	4.00
3725.00	1.00	0.00	0.00	570.50	3760.00	582.56	2327.81	165.00	0.00	0.00	.09	2.42
3725.00	1.00	0.00	0.00	570.50	5250.00	583.07	2513.49	165.00	0.00	0.00	.16	3.20
3725.00	1.00	0.00	0.00	570.50	5950.00	583.34	2611.25	165.00	0.00	0.00	.19	3.53
3725.00	1.00	0.00	0.00	570.50	7000.00	583.75	2761.83	165.00	0.00	0.00	.25	4.00
3875.00	150.00	0.00	0.00	570.30	3760.00	582.62	3492.50	212.62	1350.00	1565.00	.06	1.96
3875.00	150.00	0.00	0.00	570.30	5250.00	583.19	3843.74	213.54	1350.00	1565.00	.10	2.57
3875.00	150.00	0.00	0.00	570.30	5950.00	583.48	4030.94	213.86	1350.00	1565.00	.12	2.83
3875.00	150.00	0.00	0.00	570.30	7000.00	583.93	4330.06	214.36	1350.00	1565.00	.16	3.18
4550.00	675.00	0.00	0.00	570.80	3760.00	582.71	3125.75	228.70	1500.00	1730.00	.06	2.04
4550.00	675.00	0.00	0.00	570.80	5250.00	583.32	3512.51	230.00	1500.00	1730.00	.11	2.65
4550.00	675.00	0.00	0.00	570.80	5950.00	583.63	3719.78	230.00	1500.00	1730.00	.13	2.90
4550.00	675.00	0.00	0.00	570.80	7000.00	584.11	4049.22	230.00	1500.00	1730.00	.16	3.23
4700.00	150.00	0.00	0.00	570.50	3760.00	582.73	2640.59	167.00	0.00	0.00	.08	2.33
4700.00	150.00	0.00	0.00	570.50	5250.00	583.34	2879.24	169.00	0.00	0.00	.14	3.05
4700.00	150.00	0.00	0.00	570.50	5950.00	583.66	2992.59	171.00	0.00	0.00	.17	3.35
4700.00	150.00	0.00	0.00	570.50	7000.00	584.14	3186.26	173.00	0.00	0.00	.22	3.77

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	C. SEL	TQ	TOP ID	STENCL	STENCR	HV	VCH
4701.00	1.00	585.20	588.20	570.50	3760.00	582.73	3080.77	167.00	806.00	983.00	.08	2.33
4701.00	1.00	585.20	588.20	570.50	5250.00	583.34	3359.01	169.00	806.00	983.00	.14	3.05
4701.00	1.00	585.20	588.20	570.50	5950.00	583.66	3467.83	171.00	806.00	983.00	.17	3.36
4701.00	1.00	585.20	588.20	570.50	7000.00	584.14	3421.72	173.00	806.00	983.00	.22	3.79
4760.00	59.00	585.20	588.20	570.50	3760.00	582.73	3085.67	167.00	806.00	983.00	.08	2.32
4760.00	59.00	585.20	588.20	570.50	5250.00	583.36	3364.84	169.00	806.00	983.00	.14	3.05
4760.00	59.00	585.20	588.20	570.50	5950.00	583.68	3477.33	171.00	806.00	983.00	.17	3.35
4760.00	59.00	585.20	588.20	570.50	7000.00	584.17	3432.40	173.00	806.00	983.00	.22	3.78
4761.00	1.00	0.00	0.00	570.50	3760.00	582.73	2644.92	167.00	0.00	0.00	.08	2.32
4761.00	1.00	0.00	0.00	570.50	5250.00	583.36	2884.47	169.00	0.00	0.00	.14	3.05
4761.00	1.00	0.00	0.00	570.50	5950.00	583.68	3001.55	171.00	0.00	0.00	.17	3.35
4761.00	1.00	0.00	0.00	570.50	7000.00	584.17	3198.28	173.00	0.00	0.00	.22	3.76
4911.00	150.00	0.00	0.00	570.80	3760.00	582.79	3172.15	229.04	1500.00	1730.00	.06	2.02
4911.00	150.00	0.00	0.00	570.80	5250.00	583.45	3596.84	230.00	1500.00	1730.00	.11	2.61
4911.00	150.00	0.00	0.00	570.80	5950.00	583.78	3822.65	230.00	1500.00	1730.00	.13	2.85
4911.00	150.00	0.00	0.00	570.80	7000.00	584.31	4183.48	230.00	1500.00	1730.00	.16	3.17
5900.00	989.00	0.00	0.00	570.40	3760.00	582.91	3384.45	192.87	1500.00	1695.00	.07	2.06
5900.00	989.00	0.00	0.00	570.40	5250.00	583.64	3806.78	194.01	1500.00	1695.00	.11	2.67
5900.00	989.00	0.00	0.00	570.40	5950.00	584.01	4024.32	194.58	1500.00	1695.00	.13	2.92
5900.00	989.00	0.00	0.00	570.40	7000.00	584.57	4370.00	195.00	1500.00	1695.00	.17	3.26
7800.00	1900.00	0.00	0.00	571.80	3760.00	583.18	2959.23	191.54	1500.00	1699.00	.08	2.25
7800.00	1900.00	0.00	0.00	571.80	5250.00	584.04	3427.86	193.79	1500.00	1699.00	.13	2.86
7800.00	1900.00	0.00	0.00	571.80	5950.00	584.45	3666.88	194.75	1500.00	1699.00	.15	3.11
7800.00	1900.00	0.00	0.00	571.80	7000.00	585.08	4038.85	196.20	1500.00	1699.00	.18	3.43
9900.00	2100.00	0.00	0.00	573.20	3720.00	583.67	1734.80	168.87	1500.00	1680.00	.16	3.24
9900.00	2100.00	0.00	0.00	573.20	5180.00	584.72	2130.60	180.00	1500.00	1680.00	.23	3.88
9900.00	2100.00	0.00	0.00	573.20	5870.00	585.21	2358.02	180.00	1500.00	1680.00	.26	4.13
9900.00	2100.00	0.00	0.00	573.20	6900.00	585.91	2707.13	180.00	1500.00	1680.00	.31	4.46
10050.00	150.00	0.00	0.00	573.20	3720.00	583.72	1288.68	124.00	0.00	0.00	.25	3.98
10050.00	150.00	0.00	0.00	573.20	5180.00	584.78	1565.20	124.00	0.00	0.00	.37	4.85
10050.00	150.00	0.00	0.00	573.20	5870.00	585.25	1694.46	124.00	0.00	0.00	.42	5.21
10050.00	150.00	0.00	0.00	573.20	6900.00	585.95	1883.47	124.00	0.00	0.00	.50	5.69
10051.00	1.00	592.90	589.80	573.20	3720.00	583.72	1503.65	124.00	1000.00	1131.00	.25	3.98
10051.00	1.00	592.90	589.80	573.20	5180.00	584.78	1826.31	124.00	1000.00	1131.00	.37	4.85
10051.00	1.00	592.90	589.80	573.20	5870.00	585.25	1977.15	124.00	1000.00	1131.00	.42	5.21
10051.00	1.00	592.90	589.80	573.20	6900.00	585.95	2197.69	124.00	1000.00	1131.00	.50	5.69
10100.00	49.00	592.90	589.80	573.20	3720.00	583.75	1514.09	124.00	1000.00	1131.00	.24	3.96
10100.00	49.00	592.90	589.80	573.20	5180.00	584.82	1840.74	124.00	1000.00	1131.00	.36	4.83
10100.00	49.00	592.90	589.80	573.20	5870.00	585.30	1991.50	124.00	1000.00	1131.00	.42	5.18
10100.00	49.00	592.90	589.80	573.20	6900.00	586.01	2216.17	124.00	1000.00	1131.00	.50	5.66

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TQ	TOP WID	STENCL	STENCR	HV	VCH
10101.00	1.00	0.00	0.00	573.20	3720.00	583.75	1135.71	124.00	0.00	0.00	.24	3.96
10101.00	1.00	0.00	0.00	573.20	5180.00	584.82	1380.75	124.00	0.00	0.00	.36	4.83
10101.00	1.00	0.00	0.00	573.20	5870.00	585.30	1493.84	124.00	0.00	0.00	.42	5.18
10101.00	1.00	0.00	0.00	573.20	6900.00	586.01	1662.37	124.00	0.00	0.00	.50	5.66
10251.00	150.00	0.00	0.00	573.20	3720.00	583.98	1614.10	172.81	1500.00	1685.00	.15	3.09
10251.00	150.00	0.00	0.00	573.20	5180.00	585.16	2029.82	182.55	1500.00	1685.00	.21	3.66
10251.00	150.00	0.00	0.00	573.20	5870.00	585.69	2244.06	185.00	1500.00	1685.00	.23	3.88
10251.00	150.00	0.00	0.00	573.20	6900.00	586.46	2595.01	185.00	1500.00	1685.00	.27	4.17
12450.00	2199.00	0.00	0.00	575.40	3720.00	585.06	1765.81	156.42	660.00	820.00	.14	3.02
12450.00	2199.00	0.00	0.00	575.40	5180.00	586.44	2281.63	158.27	660.00	820.00	.20	3.58
12450.00	2199.00	0.00	0.00	575.40	5870.00	587.04	2519.48	159.02	660.00	820.00	.22	3.80
12450.00	2199.00	0.00	0.00	575.40	6900.00	587.87	2868.22	160.00	660.00	820.00	.26	4.12
14850.00	2400.00	0.00	0.00	573.20	3720.00	585.96	2122.64	171.77	105.00	285.00	.12	2.84
14850.00	2400.00	0.00	0.00	573.20	5180.00	587.50	2726.10	177.00	105.00	285.00	.18	3.37
14850.00	2400.00	0.00	0.00	573.20	5870.00	588.16	3004.29	179.22	105.00	285.00	.20	3.59
14850.00	2400.00	0.00	0.00	573.20	6900.00	589.07	3416.66	180.00	105.00	285.00	.23	3.89
17050.00	2200.00	0.00	0.00	574.60	3720.00	586.63	2193.86	299.68	118.00	440.00	.11	2.70
17050.00	2200.00	0.00	0.00	574.60	5180.00	588.28	2957.10	315.16	118.00	440.00	.14	3.06
17050.00	2200.00	0.00	0.00	574.60	5870.00	588.98	3318.56	321.70	118.00	440.00	.15	3.20
17050.00	2200.00	0.00	0.00	574.60	6900.00	589.95	3873.16	322.00	118.00	440.00	.16	3.40
19450.00	2400.00	0.00	0.00	573.50	3720.00	587.42	1814.15	94.79	104.00	199.00	.19	3.50
19450.00	2400.00	0.00	0.00	573.50	5180.00	589.16	2259.13	95.00	104.00	199.00	.28	4.22
19450.00	2400.00	0.00	0.00	573.50	5870.00	589.89	2454.46	95.00	104.00	199.00	.32	4.52
19450.00	2400.00	0.00	0.00	573.50	6900.00	590.89	2729.61	95.00	104.00	199.00	.38	4.95
19600.00	150.00	0.00	0.00	572.80	3720.00	587.47	1204.16	86.00	0.00	0.00	.26	4.11
19600.00	150.00	0.00	0.00	572.80	5180.00	589.22	1503.35	86.00	0.00	0.00	.37	4.90
19600.00	150.00	0.00	0.00	572.80	5870.00	589.96	1633.51	86.00	0.00	0.00	.43	5.24
19600.00	150.00	0.00	0.00	572.80	6900.00	590.96	1815.81	86.00	0.00	0.00	.51	5.72
19601.00	1.00	599.30	592.60	572.80	3720.00	587.48	1376.31	86.00	100.00	196.00	.26	4.11
19601.00	1.00	599.30	592.60	572.80	5180.00	589.22	1718.28	86.00	100.00	196.00	.37	4.90
19601.00	1.00	599.30	592.60	572.80	5870.00	589.96	1867.05	86.00	100.00	196.00	.43	5.24
19601.00	1.00	599.30	592.60	572.80	6900.00	590.97	2075.41	86.00	100.00	196.00	.51	5.72
19619.00	18.00	599.30	592.60	572.80	3720.00	587.49	1379.20	86.00	100.00	196.00	.26	4.10
19619.00	18.00	599.30	592.60	572.80	5180.00	589.24	1722.06	86.00	100.00	196.00	.37	4.90
19619.00	18.00	599.30	592.60	572.80	5870.00	589.98	1871.24	86.00	100.00	196.00	.43	5.24
19619.00	18.00	599.30	592.60	572.80	6900.00	590.99	2080.21	86.00	100.00	196.00	.51	5.71
19620.00	1.00	0.00	0.00	572.80	3720.00	587.49	1206.93	86.00	0.00	0.00	.26	4.10
19620.00	1.00	0.00	0.00	572.80	5180.00	589.24	1506.98	86.00	0.00	0.00	.37	4.90
19620.00	1.00	0.00	0.00	572.80	5870.00	589.98	1637.53	86.00	0.00	0.00	.43	5.24
19620.00	1.00	0.00	0.00	572.80	6900.00	590.99	1820.40	86.00	0.00	0.00	.51	5.71

SECTIO NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	AX EL OF LOW CHORD	IN EL GROUND	DISCHARGE (CFS)	C SEL	TQ	TOP ID	STENCL	STENCR	HV	VCH
19700.00	80.00	0.00	0.00	576.10	3720.00	587.62	1467.84	104.00	0.00	0.00	.21	3.64
19700.00	80.00	0.00	0.00	576.10	5180.00	589.43	1878.15	104.00	0.00	0.00	.28	4.28
19700.00	80.00	0.00	0.00	576.10	5870.00	590.19	2058.45	104.00	0.00	0.00	.32	4.55
19700.00	80.00	0.00	0.00	576.10	6900.00	591.25	2312.87	104.00	0.00	0.00	.38	4.93
19701.00	1.00	596.60	592.40	576.10	3720.00	587.62	1677.73	104.00	102.00	210.00	.21	3.64
19701.00	1.00	596.60	592.40	576.10	5180.00	589.43	2146.70	104.00	102.00	210.00	.28	4.28
19701.00	1.00	596.60	592.40	576.10	5870.00	590.19	2352.78	104.00	102.00	210.00	.32	4.55
19701.00	1.00	596.60	592.40	576.10	6900.00	591.25	2643.59	104.00	102.00	210.00	.38	4.93
19756.00	55.00	596.60	592.40	576.10	3720.00	587.65	1685.57	104.00	102.00	210.00	.20	3.63
19756.00	55.00	596.60	592.40	576.10	5180.00	589.47	2156.57	104.00	102.00	210.00	.28	4.27
19756.00	55.00	596.60	592.40	576.10	5870.00	590.23	2363.56	104.00	102.00	210.00	.32	4.54
19756.00	55.00	596.60	592.40	576.10	6900.00	591.29	2655.71	104.00	102.00	210.00	.38	4.92
19757.00	1.00	0.00	0.00	576.10	3720.00	587.65	1474.99	104.00	0.00	0.00	.20	3.63
19757.00	1.00	0.00	0.00	576.10	5180.00	589.47	1887.15	104.00	0.00	0.00	.28	4.27
19757.00	1.00	0.00	0.00	576.10	5870.00	590.23	2068.28	104.00	0.00	0.00	.32	4.54
19757.00	1.00	0.00	0.00	576.10	6900.00	591.29	2323.93	104.00	0.00	0.00	.38	4.92
19900.00	143.00	0.00	0.00	576.00	3720.00	587.81	2132.86	164.11	268.00	460.00	.13	2.89
19900.00	143.00	0.00	0.00	576.00	5180.00	589.68	2855.30	182.79	268.00	460.00	.17	3.34
19900.00	143.00	0.00	0.00	576.00	5870.00	590.47	3192.78	190.26	268.00	460.00	.19	3.52
19900.00	143.00	0.00	0.00	576.00	6900.00	591.57	3693.76	192.00	268.00	460.00	.22	3.77
21300.00	1400.00	0.00	0.00	574.80	3720.00	588.23	2507.31	169.50	82.00	257.00	.09	2.38
21300.00	1400.00	0.00	0.00	574.80	5180.00	590.14	3356.76	174.87	82.00	257.00	.12	2.73
21300.00	1400.00	0.00	0.00	574.80	5870.00	590.95	3761.81	175.00	82.00	257.00	.13	2.88
21300.00	1400.00	0.00	0.00	574.80	6900.00	592.07	4348.79	175.00	82.00	257.00	.15	3.09
21400.00	100.00	0.00	0.00	575.00	3720.00	588.23	1992.71	130.00	235.00	365.00	.14	3.01
21400.00	100.00	0.00	0.00	575.00	5180.00	590.13	2653.30	130.00	235.00	365.00	.19	3.49
21400.00	100.00	0.00	0.00	575.00	5870.00	590.94	2950.00	130.00	235.00	365.00	.21	3.69
21400.00	100.00	0.00	0.00	575.00	6900.00	592.05	3376.10	130.00	235.00	365.00	.25	3.98
21431.00	31.00	592.40	590.40	575.00	3720.00	588.24	1996.21	130.00	235.00	365.00	.14	3.01
21431.00	31.00	592.40	590.40	575.00	5180.00	590.15	2658.63	130.00	235.00	365.00	.19	3.48
21431.00	31.00	592.40	590.40	575.00	5870.00	591.09	3006.37	130.00	235.00	365.00	.21	3.65
21431.00	31.00	592.40	590.40	575.00	6900.00	592.30	3474.42	130.00	235.00	365.00	.24	3.91
21581.00	150.00	0.00	0.00	574.80	3720.00	588.35	2555.75	170.23	82.00	257.00	.09	2.35
21581.00	150.00	0.00	0.00	574.80	5180.00	590.29	3429.59	175.00	82.00	257.00	.11	2.70
21581.00	150.00	0.00	0.00	574.80	5870.00	591.24	3911.93	175.00	82.00	257.00	.12	2.81
21581.00	150.00	0.00	0.00	574.80	6900.00	592.47	4567.86	175.00	82.00	257.00	.14	3.00
21981.00	400.00	0.00	0.00	576.00	3720.00	588.47	4301.14	335.21	520.00	870.00	.03	1.32
21981.00	400.00	0.00	0.00	576.00	5180.00	590.44	5963.92	350.00	520.00	870.00	.03	1.48
21981.00	400.00	0.00	0.00	576.00	5870.00	591.40	6922.18	350.00	520.00	870.00	.04	1.53
21981.00	400.00	0.00	0.00	576.00	6900.00	592.65	8246.20	350.00	520.00	870.00	.04	1.61

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	C SEL	TQ	TOP TO	STENCL	STENCR	HV	VCH
22400.00	419.00	0.00	0.00	576.80	3720.00	588.52	7406.71	1020.00	511.00	1531.00	.01	.82
22400.00	419.00	0.00	0.00	576.80	5180.00	590.49	10866.92	1020.00	511.00	1531.00	.01	.87
22400.00	419.00	0.00	0.00	576.80	5870.00	591.46	12759.74	1020.00	511.00	1531.00	.01	.88
22400.00	419.00	0.00	0.00	576.80	6900.00	592.71	15399.56	1020.00	511.00	1531.00	.01	.91
23600.00	1200.00	0.00	0.00	575.40	3720.00	588.55	6934.33	1600.00	600.00	2200.00	.00	.86
23600.00	1200.00	0.00	0.00	575.40	5180.00	590.52	10959.19	1600.00	600.00	2200.00	.00	.84
23600.00	1200.00	0.00	0.00	575.40	5870.00	591.48	13203.09	1600.00	600.00	2200.00	.00	.83
23600.00	1200.00	0.00	0.00	575.40	6900.00	592.73	16394.27	1600.00	600.00	2200.00	.00	.83
23900.00	300.00	0.00	0.00	576.30	3720.00	588.56	3109.15	755.14	300.00	2000.00	.02	1.59
23900.00	300.00	0.00	0.00	576.30	5180.00	590.53	5156.58	1565.39	300.00	2000.00	.02	1.50
23900.00	300.00	0.00	0.00	576.30	5870.00	591.49	6560.23	1700.00	300.00	2000.00	.01	1.40
23900.00	300.00	0.00	0.00	576.30	6900.00	592.74	8787.87	1700.00	300.00	2000.00	.01	1.31
25030.00	1130.00	0.00	0.00	576.60	1610.00	588.70	2023.10	660.97	800.00	2000.00	.01	.93
25030.00	1130.00	0.00	0.00	576.60	2080.00	590.63	3472.48	1200.00	800.00	2000.00	.00	.79
25030.00	1130.00	0.00	0.00	576.60	2340.00	591.56	4444.06	1200.00	800.00	2000.00	.00	.73
25030.00	1130.00	0.00	0.00	576.60	2790.00	592.80	5998.78	1200.00	800.00	2000.00	.00	.69
26160.00	1130.00	0.00	0.00	577.20	1610.00	588.81	1015.24	440.79	1100.00	2300.00	.03	1.82
26160.00	1130.00	0.00	0.00	577.20	2080.00	590.69	1842.20	1200.00	1100.00	2300.00	.02	1.47
26160.00	1130.00	0.00	0.00	577.20	2340.00	591.61	2523.61	1200.00	1100.00	2300.00	.01	1.27
26160.00	1130.00	0.00	0.00	577.20	2790.00	592.83	3668.81	1200.00	1100.00	2300.00	.01	1.11
27300.00	1140.00	0.00	0.00	578.20	1610.00	589.23	602.37	130.00	1400.00	1530.00	.10	2.85
27300.00	1140.00	0.00	0.00	578.20	2080.00	590.80	2770.54	1473.19	500.00	2000.00	.00	.90
27300.00	1140.00	0.00	0.00	578.20	2340.00	591.69	3711.85	1500.00	500.00	2000.00	.00	.80
27300.00	1140.00	0.00	0.00	578.20	2790.00	592.88	5245.88	1500.00	500.00	2000.00	.00	.72
27450.00	150.00	0.00	0.00	581.40	1610.00	589.31	403.71	54.44	500.00	1026.00	.24	3.94
27450.00	150.00	0.00	0.00	581.40	2080.00	590.68	520.06	54.60	500.00	1026.00	.29	4.30
27450.00	150.00	0.00	0.00	581.40	2340.00	591.57	618.43	406.31	500.00	1026.00	.27	4.27
27450.00	150.00	0.00	0.00	581.40	2790.00	592.80	868.96	471.50	500.00	1026.00	.19	3.83
27476.00	26.00	591.00	590.30	581.40	1610.00	589.36	407.83	54.45	500.00	1026.00	.24	3.91
27476.00	26.00	591.00	590.30	581.40	2080.00	590.97	545.35	54.64	500.00	1026.00	.27	4.17
27476.00	26.00	591.00	590.30	581.40	2340.00	591.57	618.46	406.33	500.00	1026.00	.27	4.27
27476.00	26.00	591.00	590.30	581.40	2790.00	592.80	868.97	471.50	500.00	1026.00	.19	3.83
27526.00	50.00	0.00	0.00	578.20	1610.00	589.61	690.01	155.00	1400.00	1555.00	.08	2.56
27526.00	50.00	0.00	0.00	578.20	2080.00	591.32	2102.03	1800.00	200.00	2000.00	.01	1.23
27526.00	50.00	0.00	0.00	578.20	2340.00	591.93	2711.52	1800.00	200.00	2000.00	.01	1.11
27526.00	50.00	0.00	0.00	578.20	2790.00	593.05	4099.93	1800.00	200.00	2000.00	.00	.93
28026.00	500.00	0.00	0.00	579.40	1610.00	589.89	858.38	649.56	600.00	2300.00	.03	1.89
28026.00	500.00	0.00	0.00	579.40	2080.00	591.37	1847.56	1700.00	600.00	2300.00	.01	1.28
28026.00	500.00	0.00	0.00	579.40	2340.00	591.97	2459.80	1700.00	600.00	2300.00	.01	1.13
28026.00	500.00	0.00	0.00	579.40	2790.00	593.08	3864.41	1700.00	600.00	2300.00	.00	.92

SECTION NUMBER	CHANNEL LENGTH	IN EL OF ROADWAY	AX EL OF LOW CHORD	IN EL GROUND	DISCHARGE (CFS)	C.SEL	TQ	TOP ID	STENCL	STENCR	HV	VCH
28650.00	624.00	0.00	0.00	579.40	1610.00	590.10	896.34	1218.07	550.00	2250.00	.03	1.84
28650.00	624.00	0.00	0.00	579.40	2080.00	591.45	1853.06	1700.00	550.00	2250.00	.01	1.28
28650.00	624.00	0.00	0.00	579.40	2340.00	592.02	2448.66	1700.00	550.00	2250.00	.01	1.14
28650.00	624.00	0.00	0.00	579.40	2790.00	593.11	3839.25	1700.00	550.00	2250.00	.00	.93
31450.00	2800.00	0.00	0.00	582.20	1610.00	591.52	513.89	135.00	1440.00	1575.00	.10	3.21
31450.00	2800.00	0.00	0.00	582.20	2080.00	592.19	612.14	135.00	1440.00	1575.00	.13	3.68
31450.00	2800.00	0.00	0.00	582.20	2340.00	592.58	673.52	135.00	1440.00	1575.00	.15	3.88
31450.00	2800.00	0.00	0.00	582.20	2790.00	593.43	814.39	135.00	1440.00	1575.00	.16	4.07
31600.00	150.00	0.00	0.00	582.40	1610.00	591.63	567.83	59.00	971.00	1030.00	.15	3.11
31600.00	150.00	0.00	0.00	582.40	2080.00	592.31	636.04	59.00	971.00	1030.00	.22	3.73
31600.00	150.00	0.00	0.00	582.40	2340.00	592.71	676.29	59.00	971.00	1030.00	.25	4.03
31600.00	150.00	0.00	0.00	582.40	2790.00	593.55	763.55	59.00	971.00	1030.00	.30	4.42
31623.00	23.00	593.80	591.60	582.40	1610.00	591.87	591.49	59.00	971.00	1030.00	.14	3.03
31623.00	23.00	593.80	591.60	582.40	2080.00	592.75	680.00	59.00	971.00	1030.00	.20	3.57
31623.00	23.00	593.80	591.60	582.40	2340.00	593.28	735.59	59.00	971.00	1030.00	.22	3.81
31623.00	23.00	593.80	591.60	582.40	2790.00	593.78	788.62	59.00	971.00	1030.00	.29	4.33
31673.00	50.00	0.00	0.00	582.20	1610.00	592.01	720.85	160.00	1440.00	1600.00	.06	2.39
31673.00	50.00	0.00	0.00	582.20	2080.00	592.95	908.83	160.00	1440.00	1600.00	.07	2.63
31673.00	50.00	0.00	0.00	582.20	2340.00	593.52	1030.86	160.00	1440.00	1600.00	.07	2.71
31673.00	50.00	0.00	0.00	582.20	2790.00	594.09	1160.70	160.00	1440.00	1600.00	.09	2.99
33100.00	1427.00	0.00	0.00	583.70	1610.00	592.82	626.39	826.41	900.00	1950.00	.07	2.42
33100.00	1427.00	0.00	0.00	583.70	2080.00	593.67	972.44	1050.00	900.00	1950.00	.05	2.18
33100.00	1427.00	0.00	0.00	583.70	2340.00	594.17	1243.51	1050.00	900.00	1950.00	.03	2.00
33100.00	1427.00	0.00	0.00	583.70	2790.00	594.74	1611.76	1050.00	900.00	1950.00	.03	1.93
35300.00	2200.00	0.00	0.00	584.60	1610.00	593.49	1337.22	1650.00	800.00	2450.00	.01	1.05
35300.00	2200.00	0.00	0.00	584.60	2080.00	594.17	1966.45	1650.00	800.00	2450.00	.01	.98
35300.00	2200.00	0.00	0.00	584.60	2340.00	594.57	2389.26	1650.00	800.00	2450.00	.00	.94
35300.00	2200.00	0.00	0.00	584.60	2790.00	595.10	3007.16	1650.00	800.00	2450.00	.00	.93
37100.00	1800.00	0.00	0.00	585.50	1610.00	593.98	585.22	1293.51	.00	1900.00	.05	2.18
37100.00	1800.00	0.00	0.00	585.50	2080.00	594.55	843.61	1900.00	.00	1900.00	.03	2.07
37100.00	1800.00	0.00	0.00	585.50	2340.00	594.89	1064.06	1900.00	.00	1900.00	.02	1.90
37100.00	1800.00	0.00	0.00	585.50	2790.00	595.37	1435.97	1900.00	.00	1900.00	.02	1.75
37250.00	150.00	0.00	0.00	585.50	1610.00	594.08	311.74	637.46	0.00	0.00	.23	3.89
37250.00	150.00	0.00	0.00	585.50	2080.00	594.64	429.71	1384.35	0.00	0.00	.18	3.78
37250.00	150.00	0.00	0.00	585.50	2340.00	594.97	551.37	1623.46	0.00	0.00	.12	3.39
37250.00	150.00	0.00	0.00	585.50	2790.00	595.44	789.91	1924.97	0.00	0.00	.07	2.90
37251.00	1.00	601.50	598.00	585.50	1610.00	594.08	337.23	638.89	0.00	0.00	.23	3.89
37251.00	1.00	601.50	598.00	585.50	2080.00	594.64	458.36	1386.81	0.00	0.00	.18	3.84
37251.00	1.00	601.50	598.00	585.50	2340.00	594.97	581.84	1624.17	0.00	0.00	.13	3.48
37251.00	1.00	601.50	598.00	585.50	2790.00	595.44	822.96	1925.34	0.00	0.00	.08	3.01

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	IQ	TOPWID	STENCL	STENCR	HV	VCH
37279.00	28.00	601.50	598.00	585.20	1610.00	594.22	432.17	1088.25	0.00	0.00	.16	3.27
37279.00	28.00	601.50	598.00	585.20	2080.00	594.75	570.34	1508.90	0.00	0.00	.13	3.30
37279.00	28.00	601.50	598.00	585.20	2340.00	595.03	682.81	1657.53	0.00	0.00	.11	3.14
37279.00	28.00	601.50	598.00	585.20	2790.00	595.47	922.26	1940.59	0.00	0.00	.07	2.84
37280.00	1.00	0.00	0.00	585.20	1610.00	594.23	400.72	1091.00	0.00	0.00	.16	3.26
37280.00	1.00	0.00	0.00	585.20	2080.00	594.76	536.27	1509.67	0.00	0.00	.13	3.24
37280.00	1.00	0.00	0.00	585.20	2340.00	595.05	657.03	1672.02	0.00	0.00	.10	3.02
37280.00	1.00	0.00	0.00	585.20	2790.00	595.48	884.07	1941.06	0.00	0.00	.06	2.73
37330.00	50.00	0.00	0.00	585.20	1610.00	594.44	1685.31	2325.55	0.00	0.00	.00	.80
37330.00	50.00	0.00	0.00	585.20	2080.00	594.93	2259.17	2345.21	0.00	0.00	.00	.80
37330.00	50.00	0.00	0.00	585.20	2340.00	595.18	2583.70	2355.28	0.00	0.00	.00	.81
37330.00	50.00	0.00	0.00	585.20	2790.00	595.57	3127.92	2370.96	0.00	0.00	.00	.82
38000.00	670.00	0.00	0.00	585.70	1610.00	594.54	816.30	1018.47	800.00	2525.00	.01	1.37
38000.00	670.00	0.00	0.00	585.70	2080.00	595.03	1072.21	1056.47	800.00	2525.00	.01	1.43
38000.00	670.00	0.00	0.00	585.70	2340.00	595.28	1218.85	1083.82	800.00	2525.00	.01	1.45
38000.00	670.00	0.00	0.00	585.70	2790.00	595.67	1467.10	1126.58	800.00	2525.00	.01	1.50

SECTION NUMBER	DISCHARGE CFS	CWSEL	CWSEL DIFF EACH Q	CWSEL DIFF EACH SECTION	CWSEL-WSELK	TOPWID	T.W. DIFF	LENGTH
150.000	3760.000	581.900	0.000	0.000	0.000	220.018	0.000	150.000
150.000	5250.000	581.900	0.000	0.000	0.000	220.018	0.000	150.000
150.000	5950.000	581.900	0.000	0.000	0.000	220.018	0.000	150.000
150.000	7000.000	581.900	0.000	0.000	0.000	220.018	0.000	150.000
2450.000	3760.000	582.410	0.000	.510	0.000	242.442	0.000	2300.000
2450.000	5250.000	582.827	.417	.927	0.000	244.108	-1.666	2300.000
2450.000	5950.000	583.048	.221	1.148	0.000	244.993	-2.551	2300.000
2450.000	7000.000	583.401	.353	1.501	0.000	246.426	-3.984	2300.000
3550.000	3760.000	582.544	0.000	.134	0.000	212.280	0.000	1100.000
3550.000	5250.000	583.049	.505	.222	0.000	213.387	-1.107	1100.000
3550.000	5950.000	583.310	.262	.263	0.000	213.675	-1.395	1100.000
3550.000	7000.000	583.721	.410	.319	0.000	214.128	-1.848	1100.000
3700.000	3760.000	582.554	0.000	.010	0.000	165.000	0.000	150.000
3700.000	5250.000	583.064	.510	.015	0.000	165.000	0.000	150.000
3700.000	5950.000	583.327	.264	.017	0.000	165.000	0.000	150.000
3700.000	7000.000	583.739	.412	.018	0.000	165.000	0.000	150.000
3701.000	3760.000	582.554	0.000	.000	0.000	164.999	0.000	1.000
3701.000	5250.000	583.064	.510	.000	0.000	164.999	-.000	1.000
3701.000	5950.000	583.328	.264	.000	0.000	164.999	-.000	1.000
3701.000	7000.000	583.740	.412	.001	0.000	164.999	-.000	1.000
3724.000	3760.000	582.559	0.000	.005	0.000	164.999	0.000	23.000
3724.000	5250.000	583.072	.513	.008	0.000	164.999	-.000	23.000
3724.000	5950.000	583.337	.265	.009	0.000	164.999	-.000	23.000
3724.000	7000.000	583.751	.414	.012	0.000	164.999	-.000	23.000
3725.000	3760.000	582.559	0.000	.000	0.000	165.000	0.000	1.000
3725.000	5250.000	583.072	.513	.000	0.000	165.000	0.000	1.000
3725.000	5950.000	583.338	.265	.000	0.000	165.000	0.000	1.000
3725.000	7000.000	583.752	.414	.001	0.000	165.000	0.000	1.000
3875.000	3760.000	582.625	0.000	.066	0.000	212.623	0.000	150.000
3875.000	5250.000	583.187	.562	.114	0.000	213.541	-.917	150.000
3875.000	5950.000	583.476	.290	.139	0.000	213.862	-1.239	150.000
3875.000	7000.000	583.929	.452	.177	0.000	214.365	-1.741	150.000
4550.000	3760.000	582.709	0.000	.085	0.000	228.700	0.000	675.000
4550.000	5250.000	583.321	.612	.134	0.000	229.999	-1.299	675.000

4550.000	5950.000	583.632	.311	.156	0.000	229.999	-1.299	675.000
4550.000	7000.000	584.115	.482	.186	0.000	229.999	-1.299	675.000
4700.000	3760.000	582.725	0.000	.016	0.000	167.000	0.000	150.000
4700.000	5250.000	583.344	.619	.023	0.000	169.000	-2.000	150.000
4700.000	5950.000	583.657	.314	.025	0.000	171.000	-4.000	150.000
4700.000	7000.000	584.142	.484	.027	0.000	173.000	-6.000	150.000
4701.000	3760.000	582.725	0.000	.000	0.000	167.000	0.000	1.000
4701.000	5250.000	583.344	.619	.000	0.000	168.999	-1.999	1.000
4701.000	5950.000	583.658	.313	.000	0.000	170.999	-3.999	1.000
4701.000	7000.000	584.141	.483	-.001	0.000	172.999	-5.999	1.000
4760.000	3760.000	582.734	0.000	.009	0.000	167.000	0.000	59.000
4760.000	5250.000	583.359	.625	.015	0.000	168.999	-1.999	59.000
4760.000	5950.000	583.676	.317	.018	0.000	170.999	-3.999	59.000
4760.000	7000.000	584.167	.491	.026	0.000	172.999	-5.999	59.000
4761.000	3760.000	582.735	0.000	.000	0.000	167.000	0.000	1.000
4761.000	5250.000	583.359	.625	.000	0.000	169.000	-2.000	1.000
4761.000	5950.000	583.676	.317	.001	0.000	171.000	-4.000	1.000
4761.000	7000.000	584.170	.494	.004	0.000	173.000	-6.000	1.000
4911.000	3760.000	582.786	0.000	.052	0.000	229.037	0.000	150.000
4911.000	5250.000	583.449	.662	.089	0.000	229.999	-.962	150.000
4911.000	5950.000	583.785	.336	.108	0.000	229.999	-.962	150.000
4911.000	7000.000	584.307	.522	.137	0.000	229.999	-.962	150.000
5900.000	3760.000	582.915	0.000	.129	0.000	192.868	0.000	989.000
5900.000	5250.000	583.645	.730	.196	0.000	194.013	-1.146	989.000
5900.000	5950.000	584.009	.364	.224	0.000	194.583	-1.715	989.000
5900.000	7000.000	584.567	.558	.260	0.000	194.999	-2.131	989.000
7800.000	3760.000	583.176	0.000	.261	0.000	191.542	0.000	1900.000
7800.000	5250.000	584.037	.861	.392	0.000	193.792	-2.251	1900.000
7800.000	5950.000	584.455	.418	.446	0.000	194.751	-3.210	1900.000
7800.000	7000.000	585.085	.630	.518	0.000	196.196	-4.654	1900.000
9900.000	3720.000	583.667	0.000	.491	0.000	168.872	0.000	2100.000
9900.000	5180.000	584.723	1.056	.686	0.000	179.999	-11.127	2100.000
9900.000	5870.000	585.206	.483	.751	0.000	179.999	-11.127	2100.000
9900.000	6900.000	585.914	.708	.829	0.000	179.999	-11.127	2100.000
10050.000	3720.000	583.716	0.000	.049	0.000	124.000	0.000	150.000
10050.000	5180.000	584.775	1.059	.052	0.000	124.000	0.000	150.000
10050.000	5870.000	585.253	.478	.048	0.000	124.000	0.000	150.000
10050.000	6900.000	585.952	.699	.038	0.000	124.000	0.000	150.000
10051.000	3720.000	583.717	0.000	.001	0.000	123.999	0.000	1.000
10051.000	5180.000	584.776	1.059	.001	0.000	123.999	-.000	1.000
10051.000	5870.000	585.255	.479	.001	0.000	123.999	-.000	1.000
10051.000	6900.000	585.954	.699	.001	0.000	123.999	-.000	1.000
10100.000	3720.000	583.750	0.000	.033	0.000	123.999	0.000	49.000
10100.000	5180.000	584.820	1.071	.044	0.000	123.999	-.000	49.000
10100.000	5870.000	585.303	.483	.048	0.000	123.999	-.000	49.000
10100.000	6900.000	586.009	.706	.055	0.000	123.999	-.000	49.000
10101.000	3720.000	583.751	0.000	.001	0.000	124.000	0.000	1.000
10101.000	5180.000	584.821	1.071	.001	0.000	124.000	0.000	1.000
10101.000	5870.000	585.304	.483	.001	0.000	124.000	0.000	1.000
10101.000	6900.000	586.010	.706	.001	0.000	124.000	0.000	1.000
10251.000	3720.000	583.984	0.000	.233	0.000	172.805	0.000	150.000
10251.000	5180.000	585.159	1.175	.337	0.000	182.551	-9.746	150.000
10251.000	5870.000	585.689	.530	.385	0.000	184.999	-12.194	150.000

10251.000	6900.000	586.462	.773	.452	0.000	184.999	-12.194	150.000
12450.000	3720.000	585.058	0.000	1.074	0.000	156.420	0.000	2199.000
12450.000	5180.000	586.441	1.383	1.283	0.000	158.267	-1.846	2199.000
12450.000	5870.000	587.037	.596	1.348	0.000	159.023	-2.603	2199.000
12450.000	6900.000	587.875	.837	1.412	0.000	159.999	-3.579	2199.000
14850.000	3720.000	585.958	0.000	.901	0.000	171.774	0.000	2400.000
14850.000	5180.000	587.499	1.541	1.058	0.000	176.996	-5.221	2400.000
14850.000	5870.000	588.156	.657	1.119	0.000	179.223	-7.449	2400.000
14850.000	6900.000	589.073	.917	1.199	0.000	179.999	-8.225	2400.000
17050.000	3720.000	586.632	0.000	.674	0.000	299.682	0.000	2200.000
17050.000	5180.000	588.280	1.648	.781	0.000	315.158	-15.477	2200.000
17050.000	5870.000	588.980	.700	.824	0.000	321.695	-22.013	2200.000
17050.000	6900.000	589.950	.970	.877	0.000	321.999	-22.317	2200.000
19450.000	3720.000	587.419	0.000	.787	0.000	94.794	0.000	2400.000
19450.000	5180.000	589.157	1.738	.877	0.000	94.999	-.205	2400.000
19450.000	5870.000	589.888	.730	.907	0.000	94.999	-.205	2400.000
19450.000	6900.000	590.889	1.002	.939	0.000	94.999	-.205	2400.000
19600.000	3720.000	587.474	0.000	.055	0.000	86.000	0.000	150.000
19600.000	5180.000	589.222	1.748	.065	0.000	86.000	0.000	150.000
19600.000	5870.000	589.957	.734	.069	0.000	86.000	0.000	150.000
19600.000	6900.000	590.964	1.007	.075	0.000	86.000	0.000	150.000
19601.000	3720.000	587.475	0.000	.001	0.000	85.999	0.000	1.000
19601.000	5180.000	589.223	1.748	.001	0.000	85.999	-.000	1.000
19601.000	5870.000	589.958	.735	.001	0.000	85.999	-.000	1.000
19601.000	6900.000	590.965	1.008	.001	0.000	85.999	-.000	1.000
19619.000	3720.000	587.489	0.000	.014	0.000	85.999	0.000	18.000
19619.000	5180.000	589.241	1.752	.018	0.000	85.999	-.000	18.000
19619.000	5870.000	589.977	.736	.019	0.000	85.999	-.000	18.000
19619.000	6900.000	590.988	1.010	.022	0.000	85.999	-.000	18.000
19620.000	3720.000	587.490	0.000	.001	0.000	86.000	0.000	1.000
19620.000	5180.000	589.242	1.752	.001	0.000	86.000	0.000	1.000
19620.000	5870.000	589.979	.736	.001	0.000	86.000	0.000	1.000
19620.000	6900.000	590.989	1.010	.001	0.000	86.000	0.000	1.000
19700.000	3720.000	587.624	0.000	.134	0.000	104.000	0.000	80.000
19700.000	5180.000	589.431	1.807	.189	0.000	104.000	0.000	80.000
19700.000	5870.000	590.194	.763	.216	0.000	104.000	0.000	80.000
19700.000	6900.000	591.245	1.051	.256	0.000	104.000	0.000	80.000
19701.000	3720.000	587.624	0.000	.001	0.000	103.999	0.000	1.000
19701.000	5180.000	589.432	1.808	.001	0.000	103.999	-.000	1.000
19701.000	5870.000	590.195	.763	.001	0.000	103.999	-.000	1.000
19701.000	6900.000	591.246	1.051	.001	0.000	103.999	-.000	1.000
19756.000	3720.000	587.653	0.000	.029	0.000	103.999	0.000	55.000
19756.000	5180.000	589.466	1.813	.034	0.000	103.999	-.000	55.000
19756.000	5870.000	590.232	.766	.037	0.000	103.999	-.000	55.000
19756.000	6900.000	591.286	1.055	.040	0.000	103.999	-.000	55.000
19757.000	3720.000	587.654	0.000	.001	0.000	104.000	0.000	1.000
19757.000	5180.000	589.467	1.813	.001	0.000	104.000	0.000	1.000
19757.000	5870.000	590.232	.766	.001	0.000	104.000	0.000	1.000
19757.000	6900.000	591.287	1.055	.001	0.000	104.000	0.000	1.000
19900.000	3720.000	587.813	0.000	.159	0.000	164.106	0.000	143.000
19900.000	5180.000	589.681	1.868	.214	0.000	182.789	-18.682	143.000
19900.000	5870.000	590.473	.792	.241	0.000	190.260	-26.154	143.000
19900.000	6900.000	591.571	1.098	.283	0.000	191.999	-27.893	143.000

21300.000	3720.000	588.226	0.000	.413	0.000	169.499	0.000	1400.000
21300.000	5180.000	590.141	1.915	.460	0.000	174.865	-5.367	1400.000
21300.000	5870.000	590.951	.809	.477	0.000	174.999	-5.500	1400.000
21300.000	6900.000	592.070	1.119	.499	0.000	174.999	-5.500	1400.000
21400.000	3720.000	588.227	0.000	.001	0.000	129.999	0.000	100.000
21400.000	5180.000	590.134	1.908	-.007	0.000	129.999	-.000	100.000
21400.000	5870.000	590.940	.805	-.011	0.000	129.999	-.000	100.000
21400.000	6900.000	592.053	1.113	-.017	0.000	129.999	-.000	100.000
21431.000	3720.000	588.237	0.000	.011	0.000	129.999	0.000	31.000
21431.000	5180.000	590.149	1.912	.015	0.000	129.999	-.000	31.000
21431.000	5870.000	591.090	.941	.150	0.000	129.999	-.000	31.000
21431.000	6900.000	592.303	1.214	.250	0.000	129.999	-.000	31.000
21581.000	3720.000	588.349	0.000	.111	0.000	170.232	0.000	150.000
21581.000	5180.000	590.291	1.942	.142	0.000	174.999	-4.767	150.000
21581.000	5870.000	591.242	.951	.152	0.000	174.999	-4.767	150.000
21581.000	6900.000	592.474	1.232	.171	0.000	174.999	-4.767	150.000
21981.000	3720.000	588.472	0.000	.123	0.000	335.208	0.000	400.000
21981.000	5180.000	590.442	1.970	.151	0.000	349.999	-14.791	400.000
21981.000	5870.000	591.401	.959	.159	0.000	349.999	-14.791	400.000
21981.000	6900.000	592.649	1.248	.175	0.000	349.999	-14.791	400.000
22400.000	3720.000	588.517	0.000	.045	0.000	1019.999	0.000	419.000
22400.000	5180.000	590.494	1.978	.052	0.000	1019.999	-.000	419.000
22400.000	5870.000	591.456	.961	.054	0.000	1019.999	-.000	419.000
22400.000	6900.000	592.708	1.252	.058	0.000	1019.999	-.000	419.000
23600.000	3720.000	588.551	0.000	.034	0.000	1599.999	0.000	1200.000
23600.000	5180.000	590.524	1.973	.030	0.000	1599.999	-.000	1200.000
23600.000	5870.000	591.483	.959	.027	0.000	1599.999	-.000	1200.000
23600.000	6900.000	592.734	1.251	.026	0.000	1599.999	-.000	1200.000
23900.000	3720.000	588.559	0.000	.009	0.000	755.144	0.000	300.000
23900.000	5180.000	590.530	1.971	.006	0.000	1565.387	-810.243	300.000
23900.000	5870.000	591.489	.959	.006	0.000	1699.999	-944.855	300.000
23900.000	6900.000	592.739	1.250	.006	0.000	1699.999	-944.855	300.000
25030.000	1610.000	588.699	0.000	.140	0.000	660.973	0.000	1130.000
25030.000	2080.000	590.626	1.927	.095	0.000	1199.999	-539.026	1130.000
25030.000	2340.000	591.564	.939	.075	0.000	1199.999	-539.026	1130.000
25030.000	2790.000	592.798	1.234	.059	0.000	1199.999	-539.026	1130.000
26160.000	1610.000	588.814	0.000	.115	0.000	440.787	0.000	1130.000
26160.000	2080.000	590.689	1.875	.063	0.000	1199.999	-759.212	1130.000
26160.000	2340.000	591.612	.923	.047	0.000	1199.999	-759.212	1130.000
26160.000	2790.000	592.833	1.222	.036	0.000	1199.999	-759.212	1130.000
27300.000	1610.000	589.231	0.000	.417	0.000	129.999	0.000	1140.000
27300.000	2080.000	590.797	1.566	.108	0.000	1473.186	-1343.187	1140.000
27300.000	2340.000	591.686	.889	.074	0.000	1499.999	-1370.000	1140.000
27300.000	2790.000	592.884	1.199	.051	0.000	1499.999	-1370.000	1140.000
27450.000	1610.000	589.314	0.000	.083	0.000	54.441	0.000	150.000
27450.000	2080.000	590.679	1.365	-.118	0.000	54.604	-.163	150.000
27450.000	2340.000	591.568	.888	-.118	0.000	406.315	-351.873	150.000
27450.000	2790.000	592.803	1.236	-.081	0.000	471.502	-417.061	150.000
27476.000	1610.000	589.359	0.000	.045	0.000	54.447	0.000	26.000
27476.000	2080.000	590.967	1.608	.288	0.000	54.638	-.191	26.000
27476.000	2340.000	591.568	.600	.000	0.000	406.329	-351.882	26.000
27476.000	2790.000	592.803	1.236	.000	0.000	471.503	-417.056	26.000

27526.000	1610.000	589.611	0.000	.252	0.000	134.999	0.000	50.000
27526.000	2080.000	591.319	1.708	.352	0.000	1799.999	-1645.000	50.000
27526.000	2340.000	591.926	.607	.358	0.000	1799.999	-1645.000	50.000
27526.000	2790.000	593.051	1.125	.247	0.000	1799.999	-1645.000	50.000
28026.000	1610.000	589.887	0.000	.276	0.000	649.557	0.000	500.000
28026.000	2080.000	591.374	1.487	.055	0.000	1699.999	-1050.442	500.000
28026.000	2340.000	591.966	.592	.041	0.000	1699.999	-1050.442	500.000
28026.000	2790.000	593.075	1.109	.024	0.000	1699.999	-1050.442	500.000
28650.000	1610.000	590.101	0.000	.213	0.000	1218.075	0.000	624.000
28650.000	2080.000	591.453	1.353	.079	0.000	1699.999	-481.924	624.000
28650.000	2340.000	592.023	.570	.057	0.000	1699.999	-481.924	624.000
28650.000	2790.000	593.108	1.085	.033	0.000	1699.999	-481.924	624.000
31450.000	1610.000	591.523	0.000	1.423	0.000	134.999	0.000	2800.000
31450.000	2080.000	592.188	.665	.735	0.000	134.999	-.000	2800.000
31450.000	2340.000	592.582	.393	.559	0.000	134.999	-.000	2800.000
31450.000	2790.000	593.432	.850	.324	0.000	134.999	-.000	2800.000
31600.000	1610.000	591.632	0.000	.109	0.000	58.999	0.000	150.000
31600.000	2080.000	592.314	.682	.125	0.000	58.999	-.000	150.000
31600.000	2340.000	592.710	.396	.128	0.000	58.999	-.000	150.000
31600.000	2790.000	593.548	.838	.116	0.000	58.999	-.000	150.000
31623.000	1610.000	591.867	0.000	.235	0.000	58.999	0.000	23.000
31623.000	2080.000	592.746	.879	.432	0.000	58.999	-.000	23.000
31623.000	2340.000	593.283	.536	.572	0.000	58.999	-.000	23.000
31623.000	2790.000	593.784	.501	.236	0.000	58.999	-.000	23.000
31673.000	1610.000	592.011	0.000	.144	0.000	159.999	0.000	50.000
31673.000	2080.000	592.950	.939	.204	0.000	159.999	-.000	50.000
31673.000	2340.000	593.517	.567	.234	0.000	159.999	-.000	50.000
31673.000	2790.000	594.090	.573	.306	0.000	159.999	-.000	50.000
33100.000	1610.000	592.818	0.000	.808	0.000	826.406	0.000	1427.000
33100.000	2080.000	593.675	.857	.725	0.000	1049.999	-223.593	1427.000
33100.000	2340.000	594.169	.494	.652	0.000	1049.999	-223.593	1427.000
33100.000	2790.000	594.743	.574	.653	0.000	1049.999	-223.593	1427.000
35300.000	1610.000	593.493	0.000	.675	0.000	1649.999	0.000	2200.000
35300.000	2080.000	594.169	.676	.494	0.000	1649.999	-.000	2200.000
35300.000	2340.000	594.573	.404	.404	0.000	1649.999	-.000	2200.000
35300.000	2790.000	595.096	.523	.353	0.000	1649.999	-.000	2200.000
37100.000	1610.000	593.978	0.000	.486	0.000	1293.509	0.000	1800.000
37100.000	2080.000	594.550	.571	.381	0.000	1899.998	-606.489	1800.000
37100.000	2340.000	594.894	.344	.321	0.000	1899.998	-606.489	1800.000
37100.000	2790.000	595.373	.480	.277	0.000	1899.998	-606.489	1800.000
37250.000	1610.000	594.080	0.000	.102	0.000	637.459	0.000	150.000
37250.000	2080.000	594.638	.558	.089	0.000	1384.350	-746.891	150.000
37250.000	2340.000	594.973	.335	.079	0.000	1623.457	-985.998	150.000
37250.000	2790.000	595.443	.470	.069	0.000	1924.970	-1287.511	150.000
37251.000	1610.000	594.082	0.000	.002	0.000	638.886	0.000	1.000
37251.000	2080.000	594.636	.554	-.002	0.000	1386.809	-747.923	1.000
37251.000	2340.000	594.970	.334	-.003	0.000	1624.167	-985.282	1.000
37251.000	2790.000	595.440	.470	-.003	0.000	1925.339	-1286.453	1.000
37279.000	1610.000	594.223	0.000	.141	0.000	1088.254	0.000	28.000
37279.000	2080.000	594.747	.524	.111	0.000	1508.898	-420.644	28.000
37279.000	2340.000	595.035	.287	.065	0.000	1657.531	-569.277	28.000
37279.000	2790.000	595.475	.440	.035	0.000	1940.594	-852.340	28.000
37280.000	1610.000	594.227	0.000	.004	0.000	1091.004	0.000	1.000

37280.000	2080.000	594.758	.530	.010	0.000	1509.669	-41[illegible].664	1.000
37280.000	2340.000	595.051	.293	.016	0.000	1672.024	-581.020	1.000
37280.000	2790.000	595.485	.434	.010	0.000	1941.063	-850.059	1.000
37330.000	1610.000	594.439	0.000	.212	0.000	2325.555	0.000	50.000
37330.000	2080.000	594.930	.491	.172	0.000	2345.206	-19.651	50.000
37330.000	2340.000	595.182	.252	.131	0.000	2355.281	-29.726	50.000
37330.000	2790.000	595.574	.392	.089	0.000	2370.961	-45.406	50.000
38000.000	1610.000	594.545	0.000	.106	0.000	1018.465	0.000	670.000
38000.000	2080.000	595.029	.484	.099	0.000	1056.470	-38.004	670.000
38000.000	2340.000	595.278	.249	.096	0.000	1083.817	-65.352	670.000
38000.000	2790.000	595.667	.389	.093	0.000	1126.577	-108.111	670.000

DATA FOR LAST CROSS SECTION

PROFILE	TYPE ENC	TARGET	TOP WIDTH AREA-ACRES	TOP WIDTH AREA-DIFF
1	1.000	1725.000	421.635	0.000
2	1.000	1725.000	559.339	137.703
3	1.000	1725.000	564.712	143.076
4	1.000	1725.000	566.529	144.894

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Kawkawlin Twp & Bangor Twp

3) WATERCOURSE: Kawkawlin River

4) DOCUMENT TYPE: 100-yr Natural

00BREAK00

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C
C      32
C     150     150' U/S MOUTH
C    2450     1250' D/S DETROIT AND MACKINAC R.R. BR.
C    3550     150' D/S DETROIT AND MACKINAC R.R. BR.
C    3700     BRIDGE AT DETROIT AND MACKINAC RAILROAD (D/S FACE)
C    4550     150' D/S STATE PARK RD. BR.
C    4700     BRIDGE AT STATE PARK RD. (D/S FACE)
C    5900     1200' U/S STATE PARK RD. BR.
C    7800     3100' U/S STATE PARK RD. BR. (D/S FACE)
C    9900     150' D/S EUCLID RD. BR.
C   10050     BRIDGE AT EUCLID RD. (D/S FACE)
C   12450     2400' U/S EUCLID RD. BR.
C   14850     4800' U/S EUCLID RD. BR.
C   17050     7000' U/S EUCLID RD. BR.
C   19450     150' D/S PENN CENTRAL R.R. BR.
C   19600     BRIDGE AT PENN CENTRAL RAILROAD (D/S FACE)
C   19700     BRIDGE AT M-13 (D/S FACE)
C   19900     200' U/S M-13 BR.
C   21300     100' D/S OLD BEAVER RD. BR.
C   21400     BRIDGE AT OLD BEAVER RD. (D/S FACE)
C   22400     1000' U/S OLD BEAVER RD. BR.
C   23600     2200' U/S OLD BEAVER RD. BR.
C   23900     2500' U/S OLD BEAVER RD. BR.
C   27300     150' D/S CHIP RD. BR.
C   27450     BRIDGE AT CHIP RD. (D/S FACE)
C   28650     1200' U/S CHIP RD. BR.
C   31450     150" D/S OLD BEAVER RD. BR.
C   31600     BRIDGE AT OLD BEAVER RD. (D/S FACE)
C   33100     1500' U/S OLD BEAVER RD. BR.
C   35300     1950' D/S BEAVER RD. BR.
C   37100     150" D/S BEAVER RD. BR.
C   37250     BRIDGE AT BEAVER RD. (D/S FACE)
C   38000     750' U/S BEAVER RD. BR.
T1        BANGOR AND KAWKAWLIN TWP. BAY CO., #55555-01.06
T2   100 YEAR FLOO - NATURAL FLOODWAY
T3        KAWKAWLIN  RIVER
J1   -10      4                                                    581.9
J2    -1                -1
J3     1      34        4       27      28      10      26
NC  0.09    0.09     0.035     0.3     0.5
QT     4    3760      5250    5950    7000
X1   150      42      1500    1721     150     150     150
GR 587.8       0     587.5     100   586.9     200   585.7     300   584.8     400
GR 584.9     500     585.7     600   585.1     700   584.9     800   585.0     900
GR 584.8    1000     584.6    1100   584.3    1200   584.3    1300   584.4    1400
GR 585.1    1500     576.9    1501   574.1    1520   574.6    1540   573.9    1560
GR 573.7    1580     573.7    1600   573.2    1620   573.7    1640   575.1    1660
GR 578.9    1680     579.7    1700   579.9    1720   584.8    1721   585.5    1800
GR 584.5    1900     585.0    2000   584.6    2100   584.4    2200   584.1    2300
GR 584.0    2400     584.1    2500   584.3    2600   584.1    2700   584.0    2800
GR 584.1    2900     584.1    3000
X1  2450      44      1500    1747    2300    2300    2300
X3                            1400   585.4    1900   584.6
GR 583.7       0     585.0     100   585.7     200   585.3     300   585.1     400
GR 584.2     500     584.2     600   584.9     700   584.9     800   585.1     900
GR 584.5    1000     584.1    1100   583.9    1200   584.5    1300   585.4    1400
GR 583.8    1500     582.1    1501   579.2    1505   577.1    1520   575.6    1540
GR 572.5    1560     571.5    1580   571.4    1600   571.5    1620   571.8    1640
GR 572.1    1660     574.1    1680   575.8    1700   576.8    1720   580.0    1735
GR 583.5    1747     583.7    1800   584.6    1900   584.4    2000   583.9    2100
GR 583.4    2200     583.1    2300   583.5    2400   584.6    2500   584.2    2600
GR 584.1    2700     583.9    2800   583.6    2900   583.6    3000
X1  3550      29      1350    1565    1100    1100    1100
X3                            1050   585.0    1650   585.0
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why not start at in the lake or adjust lake stage by $1.0 \frac{V^2}{2g}$

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GR 587.2      0   585.3     50   586.4    150   584.1    250   584.5    350
GR 582.5    450   582.0    550   582.5    650   584.7    750   583.8    850
GR 582.7    950   585.0   1050   584.5   1150   583.8   1250   582.9   1350
GR 579.5   1351   575.4   1370   572.1   1390   571.9   1410   570.3   1430
GR 571.1   1450   572.4   1470   571.2   1490   570.6   1510   576.5   1530
GR 579.4   1550   582.7   1563   584.5   1565   585.1   1650
X1  3700     43    1000   1191     150    150     150
X3    10
GR 588.2      0   588.8    100   589.4    200   589.8    300   590.3    400
GR 590.9    500   591.4    600   592.0    700   592.6    800   593.2    900
GR 594.0   1000   580.9   1000   578.3   1010   572.6   1020   571.9   1030
GR 572.6   1041   572.6   1045   590.0   1045   590.0   1053   572.5   1053
GR 570.6   1060   571.1   1070   572.1   1080   571.5   1091   590.0   1091
GR 590.0   1101   570.7   1101   571.1   1110   571.8   1120   570.5   1130
GR 570.5   1141   572.6   1151    590.   1151    590.   1159   572.6   1159
GR 571.6   1160   573.5   1170   578.5   1180   581.9   1191    594.   1191
GR 592.4   1500   591.9   1600   589.9   2000
NC   .09    .09     .03
X1  3701                          1       1       1
BT     4   1000    594.    590.   1100    594.    590.   1150    594.    590.
BT  1191    594.    590.
X1  3724                         23      23      23
X2                                                1
NC  0.09   0.09   0.035
X1  3725                          1       1       1
X3    10
X1  3875     29    1350   1565    150     150     150
X3                         1050   585.0    1650   585.0
GR 587.2      0   585.3     50   586.4    150   584.1    250   584.5    350
GR 582.5    450   582.0    550   582.5    650   584.7    750   583.8    850
GR 582.7    950   585.0   1050   584.5   1150   583.8   1250   582.9   1350
GR 579.5   1351   575.4   1370   572.1   1390   571.9   1410   570.3   1430
GR 571.1   1450   572.4   1470   571.2   1490   570.6   1510   576.5   1530
GR 579.4   1550   582.7   1563   584.5   1565   585.1   1650
X1  4550     42    1500   1730     675    675     675
X3                         1200   585.8    1900   584.7
GR 585.7      0   585.8    100   587.4    200   583.6    300   583.4    400
GR 583.6    500   585.3    600   585.6    700   585.7    800   586.5    900
GR 585.7   1000   585.4   1100   585.8   1200   584.2   1300   583.9   1400
GR 583.2   1500   581.9   1502   579.1   1520   574.5   1540   571.9   1560
GR 571.3   1580   571.2   1600   570.8   1620   571.6   1640   572.9   1660
GR 574.8   1680   578.4   1700   581.0   1720   582.2   1728   582.9   1730
GR 584.2   1800   584.7   1900   584.1   2000   583.6   2100   584.2   2220
GR 585.0   2300   584.3   2400   584.6   2500   583.8   2600   584.0   2700
GR 585.7   2800   584.1   2900
X1  4700     58     806    983    150     150     150
X3    10
GR 585.7      0   585.8    100   586.1    200   586.7    400   587.4    500
GR 588.4    600   589.8    700   591.4    800   592.1    806   583.2    806
GR 583.2    807   576.2    807   575.3    820   571.8    830   571.2    840
GR 571.2    850   576.9    862   576.9    864   583.6    864   583.6    865
GR 586.2    865   586.2    867   583.6    867   583.6    868   576.4    868
GR 571.5    870   571.0    880   571.3    890   571.6    900   570.8    916
GR 575.9    925   583.7    925   583.7    926   586.2    926   586.2    928
GR 583.7    928   583.7    929   576.4    929   573.6    930   570.5    940
GR 572.1    950   575.0    960   576.6    970   577.0    982   583.3    982
GR 583.3    983   591.6    983   591.6   1000   590.1   1100   588.4   1200
GR 586.8   1300   585.6   1400   585.2   1500   585.2   1600   585.5   1700
GR 585.6   1800   585.5   1900   585.4   2000
NC   .09    .09     .03
X1  4701                          1       1       1
BT    34    0.0   585.7    0.0   100.0   585.8    0.0   200.0   586.1    0.0
BT 400.0   586.7    0.0   500.0   587.4    0.0   600.0   588.4    0.0   700.0
BT 589.8    0.0   800.0   591.4     0.0   806.0   592.1   583.2   814.0   592.1
BT 586.2  858.0   592.1   586.2   865.0   592.1   583.6   867.0   592.1   583.6
BT 875.0  592.1   586.2   876.0   592.1   586.2   876.0   592.1   588.2   916.0
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Typo width of col ... 1730 & 1500 = 230'

use PXSECR: .6667

X1.8 on col 57

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BT 592.1   588.2   916.0   592.1   586.2   916.0   592.1   586.2   926.0   592.1
BT 583.6   928.0   592.1   583.6   936.0   592.1   586.2   975.0   592.1   586.2
BT 983.0   591.6   583.6  1000.0   591.6     0.0    1100   590.1       0    1200
BT 588.4       0    1300   586.8       0    1400   585.6       0    1500   585.2
BT     0    1600   585.2       0    1800   585.6       0    1900   585.5       0
BT  2000   585.4       0
X1  4760                          59      59      59
X2                                         1
NC  0.09    0.09   0.035
X1  4761                           1       1       1
X3    10
X1  4911      41    1500    1730     150     150     150
X3                          1200   585.8    1900   584.7
GR 585.7       0   585.8     100   587.4     200   583.6     300   583.4     400
GR 583.6     500   585.3     600   585.6     700   585.7     800   586.5     900
GR 585.7    1000   585.4    1100   585.8    1200   584.2    1300   583.9    1400
GR 583.2    1500   581.9    1502   579.1    1520   574.5    1540   571.9    1560
GR 571.3    1580   571.2    1600   570.8    1620   571.6    1640   572.9    1660
GR 574.8    1680   578.4    1700   581.0    1720   582.2    1728   582.9    1730
GR 584.2    1800   584.7    1900   584.1    2000   583.6    2100   584.2    2220
GR 585.0    2300   584.3    2400   584.6    2500   583.8    2600   584.0    2700
GR 585.7    2800
X1  5900      44    1500    1695     989     989     989
X3                          1440   585.8    1712   585.8
GR 584.9       0   586.1     100   586.0     200   584.4     300   584.7     400
GR 585.8     440   584.0     500   584.0     600   584.3     700   584.0     800
GR 583.9     900   584.1    1000   584.8    1100   584.2    1200   584.4    1300
GR 584.6    1400   584.3    1500   582.2    1503   579.2    1520   574.5    1540
GR 571.7    1560   570.9    1580   570.6    1600   570.4    1620   570.4    1640
GR 572.9    1660   575.6    1680   576.9    1694   584.0    1695   585.8    1712
GR 584.3    1800   584.3    1900   584.5    1959   583.1    2000   583.5    2100
GR 582.8    2200   583.0    2300   583.7    2400   584.7    2500   585.7    2600
GR 583.9    2700   585.5    2800   585.6    2900   585.7    3000
X1  7800      41    1500    1699    1900    1900    1900
X3                          1400   587.4    2200   586.0
GR 585.4       0   586.0     100   586.5     200   587.0     300   587.3     400
GR 587.0     500   586.8     600   587.3     700   586.9     800   587.2     900
GR 587.5    1000   587.4    1100   587.3    1200   587.5    1300   587.4    1400
GR 586.3    1500   581.5    1511   579.2    1520   575.8    1540   571.8    1560
GR 571.9    1580   571.9    1600   571.9    1620   571.9    1640   574.1    1660
GR 577.1    1680   580.0    1697   583.7    1699   584.2    1800   584.1    1900
GR 584.0    2000   584.9    2100   586.0    2200   584.5    2300   584.7    2400
GR 584.9    2500   585.9    2600   585.6    2700   585.7    2800   586.1    2900
GR 586.3    3000
QT     4    3720    5180    5870    6900
X1  9900      38    1500    1700    2100    2100    2100
X3                          1400   590.4    1900   591.3
GR 586.1       0   587.0     100   586.6     200   587.2     300   586.9     400
GR 586.8     500   587.0     600   587.3     700   587.2     800   587.2     900
GR 588.0    1000   588.1    1100   588.8    1200   589.2    1300   590.4    1400
GR 584.5    1500   573.6    1580   573.8    1600   573.2    1620   573.7    1621
GR 574.0    1640   574.9    1650   580.0    1660   581.5    1664   588.6    1700
GR 589.1    1800   591.3    1900   591.4    2000   589.9    2100   590.7    2200
GR 590.1    2300   588.7    2400   589.7    2500   589.6    2600   589.7    2700
GR 589.9    2800   589.7    2900   591.5    3000
X1 10050      37    1000    1131     150     150     150
X3    10
GR 587.9       0   588.0     100   588.1     200   588.5     300   588.6     500
GR 589.7     600   590.7     700   592.2     800   592.9     900   593.0    1000
GR 579.6    1000   577.0    1010   576.4    1020   576.4    1030   578.1    1041
GR 589.8    1041   589.8    1044   577.2    1044   575.4    1050   573.2    1060
GR 573.4    1070   575.0    1080   576.7    1086   589.8    1086   589.8    1090
GR 577.3    1090   575.2    1100   576.7    1110   577.0    1120   579.4    1131
GR 593.0    1131   593.0    1200   592.7    1300   592.1    1400   591.4    1500
GR 590.4    1800   590.2    2000
NC     09      09      03
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Same GR as 4550
the last GR
5591.1 / 1200
use P/SLCP = .33

I

J

D/S face

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X1 10051                                  1       1       1
BT     4     900    592.9              1000     593   589.8    1131     593   589.8
BT  1200     593
X1 10100                                 49      49      49
X2                                                        1
NC    .1      .1     .04
X1 10101                                  1       1       1
X3    10
X1 10251      38    1500    1700     150     150     150
X3                          1400    590.4    1900   591.3
GR   587       0    587.0     100    586.6     200   587.2     300   586.9     400
GR 586.8     500    587.0     600    587.3     700   587.2     800   587.2     900
GR 588.0    1000    588.1    1100    588.8    1200   589.2    1300   590.4    1400
GR 584.5    1500    573.6    1580    573.8    1600   573.2    1620   573.7    1621
GR 574.0    1640    574.9    1650    580.0    1660   581.5    1664   588.6    1700
GR 589.1    1800    591.3    1900    591.4    2000   589.9    2100   590.7    2200
GR 590.1    2300    588.7    2400    589.7    2500   589.6    2600   589.7    2700
GR 589.9    2800    589.7    2900    591.5    3000
X1 12450      23      660     820     2199    2199    2199
GR 594.5       0    592.9      60    592.4     160   592.0     260   593.1     360
GR 593.2     460    592.2     560    585.5     660   580.7     661   577.2     680
GR 577.0     700    576.5     720    576.2     740   575.8     760   575.4     780
GR 577.7     800    581.5     812    587.8     820   591.3     860   591.0     960
GR 591.4    1060    593.2    1160    594.1    1260
X1 14850      21      100     248     2400    2400    2400
GR 596.2       0    592.4     100    581.1     115   576.7     130   575.1     140
GR 573.3     150    573.2     160    573.2     170   574.5     180   574.9     190
GR 575.2     200    576.5     210    577.3     220   578.6     230   581.1     240
GR 581.7     245    583.0     248    584.9     265   585.9     270   585.8     280
GR 595.5     300
X1 17050      23      100     272     2200    2200    2200
GR 598.8       0    601.5      32    596.5     100   581.3     137   577.3     150
GR 575.5     160    574.6     170    575.3     180   575.5     190   575.3     200
GR 576.1     210    576.6     220    576.9     230   577.1     240   577.9     250
GR 579.6     260    581.5     269    583.1     272   584.2     300   585.3     400
GR 586.1     420    595.3     484    595.8     500
X1 19450      15      103     200     2400    2400    2400
GR 595.5       0    595.0     103    581.6     105   577.9     110   575.0     120
GR 573.6     130    573.5     140    575.9     150   576.1     160   575.9     170
GR 576.0     180    577.6     190    581.4     198   594.4     200   596.0     300
X1 19600      22      100     196     150     150     150
X3    10
GR 599.3       0    599.3     100    581.7     100   581.7     105   575.1     105
GR 574.1     110    574.1     120    573.1     130   572.8     138   581.6     138
GR 581.6     143    592.5     143    592.5     153   581.6     153   581.6     159
GR 576.8     159    577.0     180    577.5     190   581.6     190   581.6     196
GR 599.4     196    599.3     300
NC   .09     .09     .035
X1 19601                                  1       1       1
BT     4       0    599.3              100   599.3   592.6     196   599.4   592.5
BT   300   599.3
X1 19619                                 18      18      18
X2                                                        1
NC   .09     .09     .04
X1 19620                                  1       1       1
X3    10
X1 19700      25      102     210      80      80      80
X3    10
GR 596.0       0    595.9      77    596.6      98   596.6     100   596.6     102
GR 579.6     102    578.0     110    576.1     120   576.3     130   576.4     140
GR 576.5     150    576.7     155    582.6     157   592.4     157   592.4     161
GR 582.6     161    576.6     170    577.2     180   577.8     190   579.6     200
GR 582.2     209    582.2     210    597.3     210   597.      218   597.3     300
NC   .09     .09     .035
X1 19701                                  1       1       1
BT     4     100    596.6              102   596.6   593
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O D/S face

P

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BT   218    597.
X1 19756                          55      55      55
X2                                                 1
NC   .09     .09     .04     .3     .5
X1 19757                           1       1       1
X3    10
X1 19900     21     268     401    143     143     143
GR 596.1      0   593.6     100  592.6     157   591.2     200   588.5     268
GR 580.8    280   577.4     290  576.0     300   576.0     310   576.1     320
GR 576.2    330   576.7     340  577.0     350   577.3     360   577.5     370
GR 578.4    380   579.8     390  581.5     398   584.4     401   594.9     500
GR 599.5    600
X1 21300     22      82     257   1400    1400    1400
GR 594.6      0   593.0      15  591.9      45   590.2      82   581.4     102
GR 578.1    110   575.5     120  574.8     130   575.4     140   575.4     150
GR 575.2    160   575.4     170  575.3     180   576.2     190   577.9     200
GR 579.3    210   580.1     219  582.5     220   583.9     240   588.5     257
GR 591.4    300   595.5     400
X1 21400     30     235     365    100     100     100
GR 595.4      0   594.8     100  593.0     180   592.9     200   592.5     234
GR 592.5    235   587.8     235  587.5     238   584.7     246   581.8     247
GR 579.5    255   577.1     265  575.0     276   575.3   278.5   575.0     290
GR 575.0    300   575.5     310  576.4     321   576.9   323.5   577.7     335
GR 579.9    345   582.4     354  585.0     356   586.8     362   587.5     365
GR 592.4    365   592.4     400  593.5     500   594.6     600   594.6     700
SB  1.15    1.5     2.5             100       5    1500           575.0   575.0
X1 21431                           31      31      31
X2                    1
BT    17    0.0   595.4     0.0  100.0   594.8     0.0   180.0   593.0     0.0
BT 235.0  592.5   590.4   276.0  592.5   590.4   276.0   592.5   575.0   278.0
BT 592.5  575.3   278.0   592.5  590.4   321.0   592.5   590.4   321.0   592.5
BT 576.4  324.0   592.5   576.9  324.0   592.5   590.4   365.0   592.4   590.4
BT 400.0  592.4     0.0   500.0  593.5     0.0   600.0   594.6     0.0   700.0
BT 594.6    0.0
X1 21581     22      82     257    150     150     150
GR 594.6      0   593.0      15  591.9      45   590.2      82   581.4     102
GR 578.1    110   575.5     120  574.8     130   575.4     140   575.4     150
GR 575.2    160   575.4     170  575.3     180   576.2     190   577.9     200
GR 579.3    210   580.1     219  582.5     220   583.9     240   588.5     257
GR 591.4    300   595.5     400
X1 21981      8     520     870    400     400     400
GR   595      0     590     520    576     655     576     735     585     870
GR   590    900     590    1000    595    1200
NC   .06    .06    .045      .3     .5
X1 22400     28    1100    1218    419     419     419
GR  595.      0   592.4     200  591.4     300   590.8     400    589.     500
GR 584.6    600   582.1     655  580.8     900   582.3    1000   582.2    1080
GR 580.4   1100   576.9    1112   577.    1134   576.8    1142   576.9    1152
GR  577.   1172   577.2    1192  577.8    1212   580.7    1218   580.2    1292
GR 581.5   1479   585.1    1537  589.3    1546   590.3    1571   590.8    1600
GR 593.2   1700   593.1    1800   595.    3000
NC   .07    .07    .045      .3     .5
X1 23600     42    1465    1553   1200    1200    1200
GR 594.1      0   592.2      65  591.6     165   590.2     265    590.     365
GR 589.3    465   589.4     565  585.3     665   581.2     765   581.4     865
GR 581.7    965   581.9    1065  582.1    1165   581.3    1265   582.1    1365
GR 582.5   1465   579.3    1475  577.3    1485   576.9    1495   576.0    1505
GR 575.4   1515   575.6    1525  576.3    1535   578.8    1545   581.3    1550
GR 584.8   1553   584.6    1565  585.2    1665   585.0    1765   584.4    1865
GR 582.2   1885   583.4    1965  584.0    2065   587.2    2165   588.9    2265
GR 588.7   2365   589.6    2465  590.5    2565   591.0    2665   590.7    2765
GR 590.5   2865   591.3    3000
NC   .07    .07    .050
X1 23900     41    1500    1585    300     300     300
GR  593.      0   590.5     100  590.0     200   588.9     300   588.6     400
GR 589.1    500   590.9     600  590.7     700   589.5     800   586.2     900
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See V

Sect "V"

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GR 583.1    1000    584.4    1100    582.9    1200    582.9    1300    582.6    1400
GR 583.2    1500    581.2    1502    579.4    1510    578.4    1520    577.4    1530
GR 577.1    1540    576.3    1550    576.4    1560    577.6    1570    580.5    1578
GR 589.1    1585    588.8    1600    589.7    1700    590.1    1800    590.2    1900
GR 590.3    2000    590.3    2100    590.6    2200    590.4    2300    590.9    2400
GR 590.4    2500    590.5    2600    590.4    2700    590.4    2800    590.5    2900
GR  593.    3000
NC   .07     .07     .055
QT     4    1610    2080    2340    2790
X1 25030       9    1500    1550    1130    1130    1130
GR   592       0     590     900     585    1000     583    1500    576.6    1520
GR 576.6    1535     585    1550     590    1600     592    3000
NC   .08     .08     .055
X1 26160      10    1200    1250    1130    1130    1130
GR   595            590    1050     584    1150     584    1200    577.2    1220
GR 577.2    1235     584    1250     587    1450     590    1600     590    2500
NC   .09     .07     .055
X1 27300      35    1450    1500    1140    1140    1140
GR  594.       0    589.3     100    589.8     200    589.8     300    589.9     400
GR 590.4     500    590.0     600    589.6     700    591.2     800    583.9     820
GR 586.8    1300    586.3    1300    585.1    1400    582.7    1450    581.9    1462
GR 579.7    1469    578.2    1481    579.9    1487    581.9    1494    586.9    1500
GR 586.7    1600    590.3    1700    589.8    1800    589.9    1900    590.1    2000
GR 590.5    2100    590.5    2200    591.2    2300    590.7    2400    592.1    2500
GR 592.7    2600    593.5    2700    593.2    2800    593.8    2900    594.0    3000
NC   .09     .07     .050
X1 27450      29     971    1026     150     150     150
X3                                   1026
GR 591.2       0    591.1     100    591.3     200    591.0     300    591.1     400
GR 591.2     500    591.0     600    591.0     700    591.0     800    592.1     900
GR 595.1     971    581.9     971    581.9     973    581.4     988    581.7    1000
GR 581.8    1023    585.6    1025    594.0    1026    594.0    1030    592.0    1100
GR 592.0    1200    591.8    1300    592.0    1400    592.4    1500    592.7    1600
GR 593.1    1700    593.5    1800    593.7    1900    593.8    2000
SB            1.5      2.3              50             400             581.4    581.4
X1 27476                               26      26      26
X2                     1    590.3    591.0
X3                                   1026
BT     23       0    591.2       0     100    591.1       0     200    591.3       0
BT    300   591.0       0     400    591.1       0     500    591.2       0     600
BT  591.0       0     700    591.0       0     800    591.0       0     900    592.1
BT      0     971    595.1    590.3    1026    594.0    590.3    1030    594.0       0
BT   1100   592.0       0    1200    592.0       0    1300    591.8       0    1400
BT  592.0       0    1500    592.4       0    1600    592.7       0    1700    593.1
BT      0    1800    593.5       0    1900    593.7       0    2000    593.8       0
NC   .09     .07     .055
X1 27526      35    1450    1500      50      50      50
GR   594       0    589.3     100    589.8     200    589.8     300    589.9     400
GR 590.4     500    590.0     600    589.6     700    591.2    1200    583.9    1250
GR 586.8    1300    586.3    1300    585.1    1400    582.7    1450    581.9    1462
GR 579.7    1469    578.2    1481    579.9    1487    581.9    1494    586.9    1500
GR 586.7    1600    590.3    1700    589.8    1800    589.9    1900    590.1    2000
GR 590.5    2100    590.5    2200    591.2    2300    590.7    2400    592.1    2500
GR 592.7    2600    593.5    2700    593.2    2800    593.8    2900    594.0    3000
NC   .08     .07     .055
X1 28026      39    1500    1553     500     500     500
GR 593.3       0    592.5     100    591.3     200    591.2     300    591.0     400
GR 590.3     500    590.      600    590.      700    590.      800    590.      900
GR 589.6    1000    590.4    1100    590.6    1200    590.1    1300    590.2    1400
GR 586.0    1500    582.5    1504    581.1    1508    579.4    1512    579.6    1517
GR 580.5    1526    581.7    1531    583.1    1533    585.8    1553    586.3    1600
GR 587.1    1700    587.4    1800    589.0    1900    590.8    2000     590.    2100
GR  590.    2200     590.    2300     590.    2400    591.5    2500    592.5    2600
GR 592.8    2700    593.1    2800    593.6    2900    594.1    3000
NC   .07     .08     .055
X1 2865                                 624     624     624
```

Sec "W"

Sect. X

Low

Sec W

Data ? "Y"

See "Y"

NC	.07	.09	.055							
X1	31450	42	1466	1500	2800	2800	2800			
X3				1440		1575				
GR	594.	0	590.6	100	591.	125	591.1	200	591.4	300
GR	591.3	400	591.3	500	591.8	600	592.3	700	592.7	800
GR	593.1	900	593.7	1000	594.2	1100	593.9	1200	593.2	1300
GR	592.6	1400	592.7	1437	586.6	1450	586.1	1466	582.3	1475
GR	582.2	1481	582.7	1488	585.2	1493	586.5	1500	586.5	1600
GR	587.7	1700	587.0	1800	587.9	1838	591.7	1854	592.6	1880
GR	591.4	1900	592.0	2000	592.3	2100	592.8	2200	593.0	2300
GR	593.8	2400	593.2	2500	593.4	2600	593.1	2700	593.3	2800
GR	593.4	2900	593.8	3000						
NC	.07	.09	.050							
X1	31600	21	971	1030	150	150	150			
X3				971		1030				
GR	592.5	0	592.9	100	593.4	200	593.6	300	593.9	400
GR	594.0	500	593.8	600	593.6	700	593.8	800	594.6	900
GR	594.6	971	585.1	971	584.3	972	582.9	981	582.4	983
GR	582.4	1020	585.1	1030	595.9	1030	595.1	1100	595.0	1200
GR	595.8	1300								
SB		1.5	2.5		50		400		582.4	582.4
NC	.09	.07	.050							
X1	31623				23	23	23			
X2			1	591.6	593.8					
X3				971		1030				
BT	10	0	592.5	0	100	592.9	0	200	593.4	0
BT	500	594	0	700	593.6	0	800	593.8	0	900
BT	594.6	0	971	594.6	591.6	1030	595.9	591.6	1100	595.1
BT	0									
NC	.09	.07	.055							
X1	31673	42	1466	150	50	50	50			
X3				1440		1600				
GR	594	0	590.6	100	591	125	591.1	200	591.4	300
GR	591.3	400	591.3	500	591.8	600	592.3	700	592.7	800
GR	593.1	900	593.7	1000	594.2	1100	593.9	1200	593.2	1300
GR	592.6	1400	592.7	1437	586.6	1450	586.1	1466	582.3	1475
GR	582.2	1481	582.7	1488	585.2	1493	586.5	1500	586.5	1600
GR	587.7	1700	587.0	1800	587.9	1838	591.7	1854	592.6	1880
GR	591.4	1900	592.0	2000	592.3	2100	592.8	2200	593.0	2300
GR	593.8	2400	593.2	2500	593.4	2600	593.1	2700	593.3	2800
GR	593.4	2900	593.8	3000						
NC	.09	.07	.055	.3	.5					
X1	33100	36	1408	1484	1427	1427	1427			
GR	594.7	0	594.6	100	594.6	200	594.1	300	594.5	400
GR	594.7	500	594.5	600	593.7	700	593.1	800	592.7	900
GR	592.3	1000	591.9	1100	591.9	1200	591.8	1300	591.8	1400
GR	591.4	1408	585.0	1437	583.7	1449	585.4	1464	586.3	1484
GR	589.5	1500	592.9	1600	593.5	1700	592.6	1800	592.8	1900
GR	593.2	2000	593.4	2100	593.7	2200	593.9	2300	594.8	2400
GR	594.5	2500	594.2	2600	594.7	2700	594.5	2800	594.1	2900
GR	594.4	3000								
NC	.08	.08	.06							
X1	35300	37	1334	1400	2200	2200	2200			
GR	594.6	0	594.6	100	594.6	200	594.6	300	594.6	400
GR	594.6	500	593.9	600	593.2	700	592.6	772	592.1	800
GR	591.7	900	591.4	1000	591.0	1100	590.6	1200	589.6	1300
GR	589.1	1334	587.1	1342	585.1	1353	584.6	1370	585.4	1378
GR	588.9	1388	591.3	1400	591.1	1500	591.3	1600	591.1	1700
GR	591.5	1800	592.5	1900	591.9	2000	591.6	2100	592.2	2200
GR	592.8	2300	592.9	2400	593.1	2500	593.5	2597	593.5	2700
GR	593.7	2800	594.4	2900						
NC	.09	.09	.065							
X1	37100	40	1437	1500	1800	1800	1800			
GR	594.3	0	594.2	100	594.1	200	593.8	300	593.7	400
GR	593.8	500	593.9	600	593.9	700	594.1	800	594.1	900
GR	594.2	1000	593.8	1100	593.8	1200	593.5	1300	591.	14.0

Z

AA

Z ?

AB

AC

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GR 590.8    1437    588.1    1450    586.3    1456    585.5    1470    586.5    1485
GR 588.1    1490    590.3    1500    590.0    1566    592.3    1582    592.9    1600
GR 594.5    1655    593.8    1700    593.6    1800    593.7    1900    593.8    2000
GR 594.0    2100    594.6    2200    594.8    2300    595.6    2400    596.4    2500
GR 596.9    2600    598.8    2700    598.2    2800    597.2    2900    595.6    3000
X1 37250      37     1473     1527     150      150      150
GR 594.3       0    594.2     100    594.1     200    593.8     300    593.7     400
GR 593.8     500    593.9     600    593.9     700    594.1     800    594.1     900
GR 594.2    1000    594.2    1100    594.4    1200    594.7    1300    596.3    1400
GR 598.0    1473    601.5    1473    585.9    1473    585.5    1480    586.0    1500
GR 589.0    1527    601.5    1527     598.    1527    596.4    1600    594.7    1700
GR 594.6    1800    594.9    1900    595.1    2000    595.2    2100    595.5    2200
GR 596.0    2300    596.9    2400    597.7    2500    598.0    2600    598.4    2700
GR 598.6    2800    598.4    2900
NC    .09     .09     .060
X1 37251                              1        1        1
BT     4    1473    601.5     598    1474    601.5     598    1526    601.5     598
BT  1527    601.5     598
X1 37279      37     1473     1527      28       28       28
BT     4    1473    601.5     598    1473    601.5     598    1527    601.5     598
BT  1527    601.5     598
GR 594.3       0    594.2     100    594.1     200    593.8     300    593.7     400
GR 593.8     500    593.9     600    593.9     700    594.1     800    594.1     900
GR 594.2    1000    594.2    1100    594.4    1200    594.7    1300    596.3    1400
GR 598.0    1473    601.5    1473    585.9    1473    585.2    1480    585.3    1500
GR 586.1    1527    601.5    1527     598.    1527    596.4    1600    594.7    1700
GR 594.6    1800    594.9    1900    595.1    2000    595.2    2100    595.5    2200
GR 596.0    2300    596.9    2400    597.7    2500    598.0    2600    598.4    2700
GR 598.6    2800    598.4    2900
NC    .09     .09     .065
X1 37280                              1        1        1
X1 37330      40     1437     1500      50       50       50
GR 592.8       0    592.5     100    592.3     200    592.2     300    592.2     400
GR 591.5     500    590.9     600    592.2     700    592.8     800    592.0     900
GR 592.0    1000    592.0    1100    592.0    1200    594.0    1300    594.0    1350
GR 590.8    1437    588.1    1450    586.3    1456    585.2    1470    586.5    1485
GR 588.1    1490    590.3    1500    591.7    1566    592.3    1582    592.9    1600
GR 592.8    1655    592.7    1700    592.5    1800    592.1    1900    592.9    2000
GR 592.8    2100    592.7    2200    593.8    2300    596.3    2400    596.4    2500
GR 596.9    2600    598.8    2700    598.2    2800    597.2    2900    595.6    3000
X1 38000      38     1500     1580     670      670      670
X3                           800             2525
GR 594.2       0    594.3     100    594.2     200    595.5     300    595.1     400
GR 596.0     500    596.6     609    597.0     700    596.7     800    596.5     900
GR 596.1    1000    596.0    1100    596.3    1200    594.9    1300    591.4    1400
GR 590.9    1500    590.0    1515    586.4    1527    585.7    1534    586.1    1543
GR 589.3    1551    592.7    1580    592.6    1600    592.2    1700    592.5    1800
GR 592.1    1900    592.9    2000    592.8    2100    592.7    2200    593.8    2300
GR 596.4    2400    597.0    2500    597.8    2530    596.7    2600    597.2    2700
GR 597.8    2800    596.4    2900    596.5    3000
EJ
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A F

A F

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AF

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ER
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*****************************************
HEC2 VERSION UPDATED JAN 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09
MODIFICATIONS 52,53,54,55,56,57,58
*****************************************


C
1       BANGOR AND KAWKAWLIN TWP. BAY CO., #55555-01, 06
T2  100 YEAR FLOO - NATURAL FLOODWAY
T3      KAWKAWLIN RIVER

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -10.       4.       -0.       -0. -0.000000     -0.00      -0.0      -0.    581.900   -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

CCHV=     .300 CEHV=     .500
     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS  BANK ELEV
       Q       QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

          150' U/S MOUTH

    150.00     8.70    581.90      0.00    581.90    582.17       .27      0.00      0.00    585.10
     5950.       0.     5950.       0.        0.     1434.        0.        0.        0.    584.80
      0.00      0.00     4.15      0.00      .090      .035      .090     0.000    573.20   1500.39
   .000817     150.     150.      150.         0         0         1      0.00    220.02   1720.41


3470 ENCROACHMENT STATIONS=     1400.0     1900.0  TYPE=     1  TARGET=     500.000
 ELENCL=     585.40  ELENCR=     584.60

          1250' D/S DETROIT AND MACKINAC R.R. BR.

   2450.00    11.65    583.05      0.00      0.00    583.17       .12       .96       .04    583.80
     5950.       0.     5950.       0.        0.     2113.        0.       94.       12.    583.50
       .23      0.00     2.82      0.00      .090      .035      .090      .035    571.40   1500.44
   .000253    2300.    2300.     2300.         2         0         1      0.00    245.00   1745.44


3470 ENCROACHMENT STATIONS=     1050.0     1650.0  TYPE=     1  TARGET=     600.000
 ELENCL=     585.00  ELENCR=     585.00

          150' D/S DETROIT AND MACKINAC R.R. BR.

   3550.00    13.01    583.31      0.00      0.00    583.44       .13       .26       .00    582.90
     5950.       1.     5949.       0.        9.     2068.        0.      147.       19.    584.50
       .33      .09     2.88      0.00      .090      .035      .090      .035    570.30   1304.72
   .000230    1100.    1100.     1100.         2         0         1      0.00    258.95   1563.68
```

Loss of Vel Head at lake min is .27'
lake stage + $\frac{V^2}{2g}$
Section 150 is low
see Δ slip

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3265 DIVIDED FLOW

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      594.00 ELREA=      594.00

            BRIDGE AT DETROIT AND MACKINAC RAILROAD (D/S FACE)

   3700.00    12.83   583.33     0.00     0.00   583.52      .19      .05      .03   594.00
     5950.       0.    5950.       0.       0.    1682.       0.     153.      19.   594.00
       .34     0.00     3.54     0.00     .090     .035     .090     .035   570.50  1000.00
   .000521     150.     150.     150.        1        0        1     0.00   165.00  1191.00


3265 DIVIDED FLOW

NORMAL BRIDGE,NRD= 4 MIN ELTRD=  594.00 MAX ELLC=  590.00

   3701.00    12.83   583.33     0.00     0.00   583.52      .19      .00      .00   594.00
     5950.       0.    5950.       0.       0.    1682.       0.     153.      19.   594.00
       .34     0.00     3.54     0.00     .090     .030     .090     .035   570.50  1000.00
   .000383       1.       1.       1.        0        0        1     0.00   165.00  1191.00


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


NORMAL BRIDGE,NRD= 4 MIN ELTRD=  594.00 MAX ELLC=  590.00

   3724.00    12.84   583.34     0.00     0.00   583.53      .19      .01      .00   594.00
     5950.       0.    5950.       0.       0.    1684.       0.     154.      19.   594.00
       .35     0.00     3.53     0.00     .090     .030     .090     .035   570.50  1000.00
   .000382      23.      23.      23.        0        0        1     0.00   165.00  1191.00


3265 DIVIDED FLOW

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      594.00 ELREA=      594.00

   3725.00    12.84   583.34     0.00     0.00   583.53      .19      .00      .00   594.00
     5950.       0.    5950.       0.       0.    1684.       0.     154.      19.   594.00
       .35     0.00     3.53     0.00     .090     .035     .090     .035   570.50  1000.00
   .000519       1.       1.       1.        0        0        1     0.00   165.00  1191.00


3470 ENCROACHMENT STATIONS=    1050.0    1650.0  TYPE=     1  TARGET=     600.000
 ELENCL=     585.00  ELENCR=    585.00
   3875.00    13.18   583.48     0.00     0.00   583.60      .12      .05      .02   582.90
     5950.       2.    5948.       0.      18.    2104.       0.     161.      20.   584.50
       .36      .11     2.83     0.00     .090     .035     .090     .035   570.30  1286.01
   .000217     150.     150.     150.        2        0        1     0.00   277.85  1563.86
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3470 ENCROACHMENT STATIONS=     1200.0     1900.0  TYPE=      1  TARGET=      700.000
 ELENCL=     585.80  ELENCR=     584.70

            150' D/S STATE PARK RD. BR.

   4550.00     12.83    583.63      0.00      0.00    583.76       .13       .16       .00    583.20
      5950.        1.     5947.        2.       13.     2054.       14.       193.       25.    582.90
       .43       .09      2.90       .13      .090      .035      .090      .035    570.80   1438.41
   .000254      675.      675.      675.         2         0         1      0.00    330.96   1769.37


3265 DIVIDED FLOW

OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA=       592.10 ELREA=       591.60

            BRIDGE AT STATE PARK RD. (D/S FACE)

   4700.00     13.16    583.66      0.00      0.00    583.83       .17       .05       .02    592.10
      5950.        0.     5950.        0.        0.     1773.        0.       200.       26.    591.60
       .44      0.00      3.36      0.00      .090      .035      .090      .035    570.50    806.00
   .000395      150.      150.      150.         1         0         1      0.00    171.00    983.00


3265 DIVIDED FLOW

NORMAL BRIDGE.NRD=34 MIN ELTRD=  585.20 MAX ELLC=  588.20

   4701.00     13.16    583.66      0.00      0.00    583.83       .17       .00       .00    592.10
      5950.        0.     5950.        0.        0.     1772.        0.       200.       26.    591.60
       .44      0.00      3.36      0.00      .090      .030      .090      .035    570.50    806.00
   .000295        1.        1.        1.         0         0         1     -.93    171.00    983.00


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


NORMAL BRIDGE.NRD=34 MIN ELTRD=  585.20 MAX ELLC=  588.20

   4760.00     13.17    583.67      0.00      0.00    583.85       .17       .02       .00    592.10
      5950.        0.     5950.        0.        0.     1776.        0.       202.       26.    591.60
       .44      0.00      3.35      0.00      .090      .030      .090      .035    570.50    806.00
   .000293       59.       59.       59.         0         0         1     -1.11    171.00    983.00


3265 DIVIDED FLOW

OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA=       592.10 ELREA=       591.60

   4761.00     13.17    583.67      0.00      0.00    583.85       .17       .00       .00    592.10
      5950.        0.     5950.        0.        0.     1777.        0.       202.       26.    591.60
       .44      0.00      3.35      0.00      .090      .035      .090      .035    570.50    806.00
   .000393         1         1         1         0         0         1      0.00    171.00    983.00
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Source field data as built 4-5-70

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3470 ENCROACHMENT STATIONS=     1200.0     1900.0  TYPE=      1  TARGET=      700.000
 ELENCL=     585.80  ELENCR=     584.70
 4911.00      12.98     583.78      0.00      0.00     583.91       .13       .05       .01    583.20
    5950.         3.     5944.        3.       24.     2089.       21.       209.       27.    582.90
     .46        .11      2.85       .15      .090      .035      .090      .035    570.80   1416.68
 .000240       150.      150.      150.         2         0         1      0.00    360.88   1777.56


3470 ENCROACHMENT STATIONS=     1440.0     1712.0  TYPE=      1  TARGET=      272.000
 ELENCL=     585.80  ELENCR=     585.80

          1200' U/S STATE PARK RD. BR.

 5900.00      13.61     584.01      0.00      0.00     584.14       .13       .23       .00    584.30
    5950.         0.     5950.        0.        0.     2036.        0.       256.       33.    584.00
     .55       0.00      2.92       .00      .090      .035      .090      .035    570.40   1500.42
 .000219       989.      989.      989.         2         0         1      0.00    194.64   1695.06


3470 ENCROACHMENT STATIONS=     1400.0     2200.0  TYPE=      1  TARGET=      800.000
 ELENCL=     587.40  ELENCR=     586.00

          3100' U/S STATE PARK RD. BR. (D/S FACE)

 7800.00      12.65     584.45      0.00      0.00     584.60       .15       .45       .01    586.30
    5950.         0.     5932.       18.        0.     1914.      129.       345.       49.    583.70
     .72       0.00      3.10       .14      .090      .035      .090      .035    571.80   1504.26
 .000261      1900.     1900.     1900.         0         0         1      0.00    544.83   2049.09


3470 ENCROACHMENT STATIONS=     1400.0     1900.0  TYPE=      1  TARGET=      500.000
 ELENCL=     590.40  ELENCR=     591.30

          150' D/S EUCLID RD. BR.          I        measured

 9900.00      12.00     585.20      0.00      0.00     585.46       .26       .81       .06    584.50
    5870.         1.     5869.        0.        4.     1421.        0.       429.       67.    588.60
     .86       .21      4.13       0.00      .090      .035      .090      .035    573.20   1488.14
 .000627      2100.     2100.     2100.         2         0         1      0.00    194.63   1682.76


3265 DIVIDED FLOW


OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA=      593.00 ELREA=      593.00

          BRIDGE AT EUCLID RD. (D/S FACE)      J        measured

10050.00      12.05     585.25      0.00      0.00     585.67       .42       .13       .08    593.00
    5870.         0.     5870.        0.        0.     1127.        0.       433.       68.    593.00
     .87       0.00      5.21       0.00      .090      .035      .090      .035    573.20   1000.00
 .001202       150.      150.      150.         1         0         1      0.00    124.00   1131.00


3265 DIVIDED FLOW

   SECNO     DEPTH     CHSEL     CRITS     WSELK      EG        HV        HL     QLOSS   BANK ELEV
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```
Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA    LEFT/RIGHT
TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

NORMAL BRIDGE,NRD= 4 MIN ELTRD=  592.90 MAX ELLC=  589.80

 10051.00    12.05    585.25      0.00       0.00    585.67       .42        .00        .00    593.00
    5870.       0.     5870.       0.         0.     1127.        0.        433.       68.     593.00
      .87      0.00      5.21     0.00       .090      .030      .090       .035    573.20   1000.00
 .000883        1.        1.        1.         0         0         1       0.00    124.00   1131.00

3265 DIVIDED FLOW

NORMAL BRIDGE,NRD= 4 MIN ELTRD=  592.90 MAX ELLC=  589.80

 10100.00    12.10    585.30      0.00       0.00    585.72       .42        .04        .00    593.00
    5870.       0.     5870.       0.         0.     1132.        0.        435.       68.     593.00
      .88      0.00      5.18     0.00       .090      .030      .090       .035    573.20   1000.00
 .000870       49.       49.       49.         1         0         1       0.00    124.00   1131.00

3265 DIVIDED FLOW

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      593.00 ELREA=      593.00

 10101.00    12.10    585.30      0.00       0.00    585.72       .42        .00        .00    593.00
    5870.       0.     5870.       0.         0.     1132.        0.        435.       68.     593.00
      .88      0.00      5.18     0.00       .100      .040      .100       .035    573.20   1000.00
 .001546        1.        1.        1.         0         0         1       0.00    124.00   1131.00

3470 ENCROACHMENT STATIONS=    1400.0     1900.0  TYPE=      1  TARGET=      500.000
 ELENCL=     590.40  ELENCR=    591.30
 10251.00    12.48    585.68      0.00       0.00    585.92       .23        .15        .05    584.50
    5870.       3.     5867.       0.        12.     1510.        0.        439.       68.     588.60
      .89      .27      3.88     0.00       .100      .040      .100       .035    573.20   1479.92
 .000680      150.      150.      150.         2         0         1       0.00    205.30   1685.22

              2400' U/S EUCLID RD. BR.

 12450.00    11.62    587.02      0.00       0.00    587.25       .22       1.33        .00    585.50
    5870.       5.     5865.       0.        17.     1541.        0.        517.       78.     587.80
     1.05      .29      3.81     0.00       .100      .040      .100       .036    575.40    637.35
 .000538     2199.     2199.     2199.         2         0         1       0.00    181.65    819.01

              4800' U/S EUCLID RD. BR.

 14850.00    14.94    588.14      0.00       0.00    588.34       .20       1.08        .01    592.40
    5870.       0.     5795.      75.         0.     1611.      113.        607.       88.     583.00
     1.23      0.00      3.60      .66       .100      .040      .100       .037    573.20    105.66
 .000384     2400.     2400.     2400.         2         0         1       0.00    179.16    284.82

SECND     DEPTH     CUSEL     CRITS     USELK     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

            7000' U/S EUCLID RD. BR.

 17050.00     14.37     588.97       0.00       0.00     589.11        .15        .76        .02     596.50
    5870.        0.      5413.       457.         0.      1687.       664.       710.       101.     583.10
     1.44      0.00       3.21        .69       .100       .040       .100       .037     574.60     118.34
 .000314      2200.      2200.      2200.          2          0          1       0.00     321.60     439.94

            150' D/S PENN CENTRAL R.R. BR.   "N"

 19450.00     16.38     589.88       0.00       0.00     590.20        .32       1.00        .09     595.00
    5870.        0.      5870.         0.         0.      1297.         0.       811.       112.     594.40
     1.58      0.00       4.53       0.00       .100       .040       .100       .037     573.50     103.76
 .000573      2400.      2400.      2400.          2          0          1       0.00      95.54     199.30

3265 DIVIDED FLOW

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      599.30 ELREA=      599.40

            BRIDGE AT PENN CENTRAL RAILROAD (D/S FACE)   "B"

 19600.00     17.15     589.95       0.00       0.00     590.37        .43        .12        .05     599.30
    5870.        0.      5870.         0.         0.      1118.         0.       815.       113.     599.40
     1.59      0.00       5.25       0.00       .100       .040       .100       .037     572.80     100.00
 .001294       150.       150.       150.          0          0          1       0.00      86.00     196.00

3265 DIVIDED FLOW

NORMAL BRIDGE,NRD= 4 MIN ELTRD=  599.30 MAX ELLC=  592.60

 19601.00     17.15     589.95       0.00       0.00     590.38        .43        .00        .00     599.30
    5870.        0.      5870.         0.         0.      1119.         0.       815.       113.     599.40
     1.59      0.00       5.25       0.00       .090       .035       .090       .037     572.80     100.00
 .000991         1.         1.         1.          0          0          1       0.00      86.00     196.00

3265 DIVIDED FLOW

NORMAL BRIDGE,NRD= 4 MIN ELTRD=  599.30 MAX ELLC=  592.60

 19619.00     17.17     589.97       0.00       0.00     590.39        .43        .02        .00     599.30
    5870.        0.      5870.         0.         0.      1120.         0.       815.       113.     599.40
     1.59      0.00       5.24       0.00       .090       .035       .090       .037     572.80     100.00
 .000986        18.        18.        18.          0          0          1       0.00      86.00     196.00

3265 DIVIDED FLOW

SECND     DEPTH     CWSEL     CRITS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
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Subtract 0 drop

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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

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      599.30 ELREA=      599.40

 19620.00     17.17     589.97      0.00       0.00     590.39       .43       .00       .00     599.30
    5870.        0.      5870.        0.         0.     1120.        0.      815.      113.     599.40
     1.59      0.00       5.24      0.00       .090       .040      .090      .037    572.80     100.00
  .001288        1.         1.        1.          0          0         1      0.00     86.00     196.00


3265 DIVIDED FLOW

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      596.60 ELREA=      597.30

            BRIDGE AT M-13 (D/S FACE)

 19700.00     14.08     590.18      0.00       0.00     590.51       .32       .08       .03     596.60
    5870.        0.      5870.        0.         0.     1288.        0.      818.      113.     597.30
     1.60      0.00       4.56      0.00       .090       .040      .090      .037    576.10     102.00
  .000815       80.        80.       80.          2          0         1      0.00    104.00     210.00


3265 DIVIDED FLOW

NORMAL BRIDGE,NRD= 4 MIN ELTRD=  596.60 MAX ELLC=  592.40

 19701.00     14.09     590.19      0.00       0.00     590.51       .32       .00       .00     596.60
    5870.        0.      5870.        0.         0.     1288.        0.      818.      113.     597.30
     1.60      0.00       4.56      0.00       .090       .035      .090      .037    576.10     102.00
  .000624        1.         1.        1.          0          0         1      0.00    104.00     210.00


3265 DIVIDED FLOW

NORMAL BRIDGE,NRD= 4 MIN ELTRD=  596.60 MAX ELLC=  592.40

 19756.00     14.12     590.22      0.00       0.00     590.54       .32       .03       .00     596.60
    5870.        0.      5870.        0.         0.     1292.        0.      819.      113.     597.30
     1.60      0.00       4.54      0.00       .090       .035      .090      .037    576.10     102.00
  .000618       55.        55.       55.          0          0         1      0.00    104.00     210.00


CCHV=    .300 CEHV=    .500

3265 DIVIDED FLOW

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      596.60 ELREA=      597.30

 19757.00     14.12     590.22      0.00       0.00     590.54       .32       .00       .00     596.60
    5870.        0.      5870.        0.         0.     1293.        0.      819.      113.     597.30
     1.60      0.00       4.54      0.00       .090       .040      .090      .037    576.10     102.00
  .000807        1.         1.        1.          0          0         1      0.00    104.00     210.00
```

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

200' U/S M-13 BR.

19900.00	14.46	590.46	0.00	0.00	590.65	.19	.07	.04	588.50
5870.	14.	5747.	109.	49.	1633.	173.	824.	114.	584.40
1.61	.30	3.52	.63	.090	.040	.090	.037	576.00	218.53
.000331	143.	143.	143.	2	0	1	0.00	239.65	458.18

100' D/S OLD BEAVER RD. BR.

21300.00	16.13	590.93	0.00	0.00	591.06	.13	.39	.02	590.20
5870.	1.	5857.	13.	6.	2033.	44.	888.	121.	588.50
1.75	.13	2.88	.29	.090	.040	.090	.038	574.80	66.06
.000238	1400.	1400.	1400.	2	0	1	0.00	227.00	293.07

BRIDGE AT OLD BEAVER RD. (D/S FACE)

21400.00	15.92	590.92	0.00	0.00	591.13	.21	.03	.04	592.50
5870.	0.	5870.	0.	0.	1587.	0.	892.	121.	592.40
1.76	0.00	3.70	0.00	.090	.040	.090	.038	575.00	235.00
.000398	100.	100.	100.	2	0	1	0.00	130.00	365.00

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.15	1.50	2.50	-0.00	100.00	5.00	1500.00	-0.00	575.00	575.00

PRESSURE FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	ELLC	ELTRD	CLASS
591.28	591.15	.02	0.	5870.	1500.	590.40	592.40	10.00

21431.00	16.07	591.07	0.00	0.00	591.28	.21	.14	0.00	592.50
5870.	0.	5870.	0.	0.	1606.	0.	893.	122.	592.40
1.76	0.00	3.65	0.00	.090	.040	.090	.038	575.00	235.00
.000383	31.	31.	31.	2	0	1	0.00	130.00	365.00
21581.00	16.42	591.22	0.00	0.00	591.35	.12	.04	.03	590.20
5870.	2.	5852.	16.	11.	2084.	55.	900.	122.	588.50
1.77	.16	2.81	.30	.090	.040	.090	.038	574.80	59.72
.000219	150.	150.	150.	2	0	1	0.00	237.66	297.38
21981.00	15.38	591.38	0.00	0.00	591.42	.04	.05	.03	590.00
5870.	11.	5793.	66.	99.	3831.	293.	929.	126.	585.00
1.85	.11	1.51	.23	.090	.040	.090	.038	576.00	376.31
.000068	400.	400.	400.	2	0	1	0.00	678.96	1055.27

CCHV= .300 CEHV= .500

1000' U/S OLD BEAVER RD. BR.

22400.00	14.63	591.43	0.00	0.00	591.44	.01	.01	.01	580.40
5870.	2645.	1454.	1771.	5473.	1663.	3380.	1000.	136.	580.70
2.04	.48	.87	.52	.060	.045	.060	.038	576.80	295.82
.000021	419.	419.	419.	0	0	1	0.00	1330.93	1626.74

CCHV= .300 CEHV= .500
3280 CROSS SECTION 23600.00 EXTENDED .16 FEET

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

2200' U/S OLD BEAVER RD. BR.

23600.00	16.06	591.46	0.00	0.00	591.46	.00	.02	.00	582.50
5870.	3277.	976.	1617.	8605.	1225.	5541.	1356.	193.	584.80
2.83	.38	.80	.29	.070	.045	.070	.038	575.40	174.94
.000018	1200.	1200.	1200.	2	0	1	0.00	2825.06	3000.00

2500' U/S OLD BEAVER RD. BR.

Sect "V"

23900.00	15.17	591.47	0.00	0.00	591.48	.01	.01	.00	583.20
5870.	4044.	1487.	339.	6397.	1101.	1578.	1440.	213.	589.10
2.93	.63	1.35	.21	.070	.050	.070	.038	576.30	61.33
.000074	300.	300.	300.	0	0	1	0.00	2877.34	2938.67

25030.00	14.94	591.54	0.00	0.00	591.54	.00	.06	.00	583.00
2340.	1760.	448.	132.	4692.	619.	1019.	1640.	282.	585.00
3.67	.38	.72	.13	.070	.055	.070	.039	576.60	212.39
.000027	1130.	1130.	1130.	1	0	1	0.00	2457.21	2669.61

3280 CROSS SECTION 26160.00 EXTENDED 1.59 FEET

26160.00	14.38	591.58	0.00	0.00	591.59	.01	.05	.00	584.00
2340.	481.	721.	1137.	1102.	600.	3107.	1785.	337.	584.00
4.16	.44	1.20	.37	.080	.055	.080	.040	577.20	717.10
.000077	1130.	1130.	1130.	0	0	1	0.00	1782.90	2500.00

"W"

150' D/S CHIP RD. BR.

Sect W

27300.00	13.45	591.65	0.00	0.00	591.65	.00	.06	.00	582.70
2340.	1537.	401.	403.	5320.	535.	1732.	1947.	392.	586.90
5.04	.29	.75	.23	.090	.055	.070	.040	578.20	50.11
.000035	1140.	1140.	1140.	0	0	1	0.00	2417.36	2467.47

3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS- 0 1026.0 TYPE- 1 TARGET- 1025.000

See X

BRIDGE AT CHIP RD. (D/S FACE) "X"

27450.00	10.14	591.54	0.00	0.00	591.79	.26	.02	.13	595.10
2340.	128.	2212.	0.	362.	530.	0.	1962.	398.	100000.00
5.05	.35	4.17	0.00	.090	.050	.070	.040	581.40	.00
.001373	150.	150.	150.	2	0	1	0.00	903.49	1025.71

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	-0.00	1.50	2.30	-0.00	50.00	-0.00	400.00	-0.00	581.40	581.40

XKOR appears low causing note 6870

try $1.5 + K_f$

6870 D.S. ENERGY OF 591.79 HIGHER THAN COMPUTED ENERGY OF 591.79

equal... slight round off difference?

3265 DIVIDED FLOW

PRESSURE AND WEIR FLOW

Max Area = 53 X 8.5 = 450

$$1.5 + \frac{(29.1)(0.04)^2 30}{\left(\frac{400}{125}\right)^{4/3}}$$

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	ELLC	ELTRD	CLASS
592.33	591.79	0.00	1037.	1316.	400.	590.30	591.00	30.00

$1.5 + .3 = 1.8$

3470 ENCROACHMENT STATIONS= .0 1026.0 TYPE= 1 TARGET= 1025.999

27476.00	10.14	591.54	0.00	0.00	591.79	.26	0.00	0.00	595.10
2340.	129.	2211.	0.	364.	530.	0.	1962.	398.	100000.00
5.05	.35	4.17	0.00	.090	.050	.070	.040	581.40	.00
.001371	26.	26.	26.	2	0	3	0.00	903.62	1025.71

See W

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
27526.00	13.67	591.87	0.00	0.00	591.88	.01	.01	.07	582.70
2340.	1118.	573.	649.	3551.	546.	1953.	1966.	400.	586.90
5.08	.31	1.05	.33	.090	.055	.070	.040	578.20	45.31
.000067	50.	50.	50.	2	0	1	0.00	2438.31	2483.62
28026.00	12.51	591.91	0.00	0.00	591.91	.01	.04	.00	586.00
2340.	609.	544.	1187.	2289.	509.	2680.	2032.	428.	585.80
5.34	.27	1.07	.44	.080	.055	.070	.041	579.40	149.43
.000082	500.	500.	500.	2	0	1	0.00	2391.25	2540.68

1200' U/S CHIP RD. BR.

28650.00	12.56	591.96	0.00	0.00	591.96	.01	.05	.00	586.00
2340.	725.	549.	1065.	2352.	511.	2726.	2111.	462.	585.80
5.67	.31	1.08	.39	.070	.055	.080	.041	579.40	145.56
.000082	624.	624.	624.	0	0	1	0.00	2399.77	2545.33

"H"

See Y

3470 ENCROACHMENT STATIONS= 1440.0 1575.0 TYPE= 1 TARGET= 135.000

1500' D/S OLD BEAVER RD. BR.

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31450.00    10.27   592.47     0.00     0.00   592.62      .15      .59      .07   586.10
   2340.      306.    1166.     868.     133.     295.     448.    2319.     544.   586.50
    5.93     2.30     3.95     1.94     .070     .055     .090     .042   582.20  1440.00
 .001272    2800.    2800.    2800.        2        0        1     0.00   135.00  1575.00
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Z

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3470 ENCROACHMENT STATIONS=    971.0   1030.0  TYPE=     1  TARGET=     59.000

          BRIDGE AT OLD BEAVER RD. (D/S FACE)

31600.00    10.21   592.61     0.00     0.00   592.86      .26      .19      .05   594.60
   2340.        0.    2340.       0.       0.     575.       0.    2322.     544. 100000.00
    5.94     0.00     4.07     0.00     .070     .050     .090     .042   582.40   971.00
 .001235     150.     150.     150.        2        0        1     0.00    59.00  1030.00
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AA

```
SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
    -0.00     1.50      2.50      -0.00     50.00     -0.00     400.00    -0.00     582.40    582.40

PRESSURE FLOW

  EGPRS     EGLWC     H3        QWEIR     QPR       BAREA     ELLC      ELTRD     CLASS

  593.40    592.86    0.00      0.        2340.     400.      591.60    593.80    10.00

3470 ENCROACHMENT STATIONS=    971.0   1030.0  TYPE=     1  TARGET=     59.000
31623.00    10.78   593.18     0.00     0.00   593.40      .23      .54     0.00   594.60
   2340.        0.    2340.       0.       0.     609.       0.    2322.     544. 100000.00
    5.94     0.00     3.84     0.00     .090     .050     .070     .042   582.40   971.00
 .001043      23.      23.      23.        2        0        1     0.00    59.00  1030.00

3470 ENCROACHMENT STATIONS=   1440.0   1600.0  TYPE=     1  TARGET=    160.000
31673.00    11.21   593.41     0.00     0.00   593.49      .07      .04      .05   586.10
   2340.      203.     901.    1236.     158.     327.     691.    2323.     544.   586.50
    5.95     1.29     2.76     1.79     .090     .055     .070     .042   582.20  1440.00
 .000539      50.      50.      50.        2        0        1     0.00   160.00  1600.00
```

Z used

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CCHV=    .300 CEHV=    .500
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

          1500' U/S OLD BEAVER RD. BR.

33100.00    10.38   594.08     0.00     0.00   594.11      .03      .61      .01   591.40
   2340.      580.    1171.     589.    1236.     594.     980.    2388.     574.   586.30
    6.26      .47     1.97      .60     .090     .055     .070     .043   583.70   653.18
 .000348    1427.    1427.    1427.        2        0        1     0.00  1666.21  2319.40
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AB

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3280 CROSS SECTION  35300.00 EXTENDED       .06 FEET
```

1950' D/S BEAVER RD. BR.

35300.00	9.87	594.47	0.00	0.00	594.48	.00	.36	.01	589.10
2340.	843.	468.	1029.	2136.	508.	3139.	2605.	676.	591.30
7.56	.39	.92	.33	.080	.060	.080	.044	584.60	519.58
.000094	2200.	2200.	2200.	2	0	1	0.00	2380.42	2900.00

AC

3280 CROSS SECTION 37100.00 EXTENDED .49 FEET

150' D/S BEAVER RD. BR.

37100.00	9.29	594.79	0.00	0.00	594.82	.03	.33	.01	590.80
2340.	836.	903.	601.	1672.	465.	969.	2789.	773.	590.30
8.02	.50	1.94	.62	.090	.065	.090	.045	585.50	0.00
.000514	1800.	1800.	1800.	2	0	1	0.00	2296.61	2296.61

AD

3265 DIVIDED FLOW

3280 CROSS SECTION 37250.00 EXTENDED .57 FEET

BRIDGE AT BEAVER RD. (D/S FACE)

"AE"

37250.00	9.37	594.87	0.00	0.00	595.02	.14	.14	.06	598.00
2340.	712.	1619.	9.	1045.	446.	35.	2797.	780.	598.00
8.04	.68	3.63	.25	.090	.065	.090	.045	585.50	0.00
.002100	150.	150.	150.	2	0	1	0.00	1565.56	1890.68

3265 DIVIDED FLOW

3280 CROSS SECTION 37251.00 EXTENDED .57 FEET

NORMAL BRIDGE.NRD= 4 MIN ELTRD= 601.50 MAX ELLC= 598.00

low pt in road 594
AE used

37251.00	9.37	594.87	0.00	0.00	595.02	.15	.00	.00	598.00
2340.	674.	1657.	8.	1046.	446.	36.	2797.	780.	598.00
8.04	.64	3.72	.23	.090	.060	.090	.045	585.50	0.00
.001874	1.	1.	1.	0	0	1	0.00	1566.15	1891.12

3265 DIVIDED FLOW

3280 CROSS SECTION 37279.00 EXTENDED .65 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

NORMAL BRIDGE.NRD= 4 MIN ELTRD= 601.50 MAX ELLC= 598.00

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37279.00      9.75    594.95      0.00      0.00    595.08       .12       .04       .01    598.00
    2340.      653.     1674.       13.     1153.      510.       54.     2798.      781.    598.00
     8.04       .57      3.28       .24      .090      .060      .090      .045    585.20      0.00
 .001292       28.       28.       28.         2         0         1      0.00   1612.26   1927.36
```

AE

3265 DIVIDED FLOW

3280 CROSS SECTION 37280.00 EXTENDED .66 FEET

```
37280.00      9.77    594.97      0.00      0.00    595.08       .11       .00       .00    598.00
    2340.      696.     1630.       14.     1162.      510.       55.     2798.      781.    598.00
     8.04       .60      3.19       .25      .090      .065      .090      .045    585.20      0.00
 .001434        1.        1.        1.         1         0         1      0.00   1616.46   1930.73
```

AE

3280 CROSS SECTION 37330.00 EXTENDED 2.32 FEET

```
37330.00      9.92    595.12      0.00      0.00    595.12       .00       .01       .03    590.80
    2340.     1325.      406.      609.     4150.      490.     2081.     2803.      783.    590.30
     8.07       .32       .83       .29      .090      .065      .090      .045    585.20      0.00
 .000087       50.       50.       50.         2         0         1      0.00   2352.83   2352.83
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Section?

3470 ENCROACHMENT STATIONS= 800.0 2525.0 TYPE= 1 TARGET= 1725.000

750' U/S BEAVER RD. BR.

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38000.00      9.52    595.22      0.00      0.00    595.24       .02       .11       .01    590.90
    2340.      449.      723.     1168.      618.      487.     1906.     2878.      809.    592.70
     8.28       .73      1.49       .61      .090      .065      .090      .045    585.70   1276.96
 .000390      670.      670.      670.         2         0         1      0.00   1077.76   2354.72
```

AE

SUMMARY PRINTOUT FOR MULTIPLE PROFILES

KAWKAWLIN RIVER

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TQ	TOPWID	STENCL	STENCR	HV	VCH
150.00	150.00	0.00	0.00	573.20	5950.00	581.90	2081.16	220.02	0.00	0.00	.27	4.15
2450.00	2300.00	0.00	0.00	571.40	5950.00	583.05	3742.97	245.00	1400.00	1900.00	.12	2.82
3550.00	1100.00	0.00	0.00	570.30	5950.00	583.31	3926.74	258.95	1050.00	1650.00	.13	2.88
3700.00	150.00	0.00	0.00	570.50	5950.00	583.33	2606.92	165.00	0.00	0.00	.19	3.54
3701.00	1.00	594.00	590.00	570.50	5950.00	583.33	3041.56	165.00	0.00	0.00	.19	3.54
3724.00	23.00	594.00	590.00	570.50	5950.00	583.34	3046.03	165.00	0.00	0.00	.19	3.53
3725.00	1.00	0.00	0.00	570.50	5950.00	583.34	2611.03	165.00	0.00	0.00	.19	3.53
3875.00	150.00	0.00	0.00	570.30	5950.00	583.48	4039.00	277.85	1050.00	1650.00	.12	2.83
4550.00	675.00	0.00	0.00	570.80	5950.00	583.63	3733.27	330.96	1200.00	1900.00	.13	2.90
4700.00	150.00	0.00	0.00	570.50	5950.00	583.66	2991.91	171.00	0.00	0.00	.17	3.36
4701.00	1.00	585.20	588.20	570.50	5950.00	583.66	3467.06	171.00	0.00	0.00	.17	3.36
4760.00	59.00	585.20	588.20	570.50	5950.00	583.67	3476.56	171.00	0.00	0.00	.17	3.35
4761.00	1.00	0.00	0.00	570.50	5950.00	583.67	3000.87	171.00	0.00	0.00	.17	3.35
4911.00	150.00	0.00	0.00	570.80	5950.00	583.78	3841.56	360.88	1200.00	1900.00	.13	2.85
5900.00	989.00	0.00	0.00	570.40	5950.00	584.01	4022.84	194.64	1440.00	1712.00	.13	2.92
7800.00	1900.00	0.00	0.00	571.80	5950.00	584.45	3684.61	544.83	1400.00	2200.00	.15	3.10
9900.00	2100.00	0.00	0.00	573.20	5870.00	585.20	2344.47	194.63	1400.00	1900.00	.26	4.13
10050.00	150.00	0.00	0.00	573.20	5870.00	585.25	1693.10	124.00	0.00	0.00	.42	5.21
10051.00	1.00	592.90	589.80	573.20	5870.00	585.25	1975.57	124.00	0.00	0.00	.42	5.21
10100.00	49.00	592.90	589.80	573.20	5870.00	585.30	1989.98	124.00	0.00	0.00	.42	5.18
10101.00	1.00	0.00	0.00	573.20	5870.00	585.30	1492.69	124.00	0.00	0.00	.42	5.18
10251.00	150.00	0.00	0.00	573.20	5870.00	585.68	2251.23	205.30	1400.00	1900.00	.23	3.88
12450.00	2199.00	0.00	0.00	575.40	5870.00	587.02	2531.13	181.65	0.00	0.00	.22	3.81
14850.00	2400.00	0.00	0.00	573.20	5870.00	588.14	2996.68	179.16	0.00	0.00	.20	3.60
17050.00	2200.00	0.00	0.00	574.60	5870.00	588.97	3311.07	321.60	0.00	0.00	.15	3.21
19450.00	2400.00	0.00	0.00	573.50	5870.00	589.88	2452.60	95.54	0.00	0.00	.32	4.53
19600.00	150.00	0.00	0.00	572.80	5870.00	589.95	1631.68	86.00	0.00	0.00	.43	5.25
19601.00	1.00	599.30	592.60	572.80	5870.00	589.95	1864.97	86.00	0.00	0.00	.43	5.25

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TQ	TOPWID	STENCL	STENCR	HV	VCH
19619.00	18.00	599.30	592.60	572.80	5870.00	589.97	1869.17	86.00	0.00	0.00	.43	5.24
19620.00	1.00	0.00	0.00	572.80	5870.00	589.97	1635.70	86.00	0.00	0.00	.43	5.24
19700.00	80.00	0.00	0.00	576.10	5870.00	590.18	2056.06	104.00	0.00	0.00	.32	4.56
19701.00	1.00	596.60	592.40	576.10	5870.00	590.19	2350.07	104.00	0.00	0.00	.32	4.56
19756.00	55.00	596.60	592.40	576.10	5870.00	590.22	2360.87	104.00	0.00	0.00	.32	4.54
19757.00	1.00	0.00	0.00	576.10	5870.00	590.22	2065.91	104.00	0.00	0.00	.32	4.54
19900.00	143.00	0.00	0.00	576.00	5870.00	590.46	3226.62	239.65	0.00	0.00	.19	3.52
21300.00	1400.00	0.00	0.00	574.80	5870.00	590.93	3805.00	227.00	0.00	0.00	.13	2.88
21400.00	100.00	0.00	0.00	575.00	5870.00	590.92	2942.87	130.00	0.00	0.00	.21	3.70
21431.00	31.00	592.40	590.40	575.00	5870.00	591.07	2998.95	130.00	0.00	0.00	.21	3.65
21581.00	150.00	0.00	0.00	574.80	5870.00	591.22	3968.54	237.66	0.00	0.00	.12	2.81
21981.00	400.00	0.00	0.00	576.00	5870.00	591.38	7096.45	678.96	0.00	0.00	.04	1.51
22400.00	419.00	0.00	0.00	576.80	5870.00	591.43	12857.52	1330.93	0.00	0.00	.01	.87
23600.00	1200.00	0.00	0.00	575.40	5870.00	591.46	13729.13	2825.06	0.00	0.00	.00	.80
23900.00	300.00	0.00	0.00	576.30	5870.00	591.47	6815.57	2877.34	0.00	0.00	.01	1.35
25030.00	1130.00	0.00	0.00	576.60	2340.00	591.54	4491.60	2457.21	0.00	0.00	.00	.72
26160.00	1130.00	0.00	0.00	577.20	2340.00	591.58	2666.93	1782.90	0.00	0.00	.01	1.20
27300.00	1140.00	0.00	0.00	578.20	2340.00	591.65	3950.91	2417.36	0.00	0.00	.00	.75
27450.00	150.00	0.00	0.00	581.40	2340.00	591.54	631.62	903.49	.00	1026.00	.26	4.17
27476.00	26.00	591.00	590.30	581.40	2340.00	591.54	631.93	903.62	.00	1026.00	.26	4.17
27526.00	50.00	0.00	0.00	578.20	2340.00	591.87	2861.54	2438.31	0.00	0.00	.01	1.05
28026.00	500.00	0.00	0.00	579.40	2340.00	591.91	2582.48	2391.25	0.00	0.00	.01	1.07
28650.00	624.00	0.00	0.00	579.40	2340.00	591.96	2577.31	2399.77	0.00	0.00	.01	1.08
31450.00	2800.00	0.00	0.00	582.20	2340.00	592.47	656.07	135.00	1440.00	1575.00	.15	3.95
31600.00	150.00	0.00	0.00	582.40	2340.00	592.61	665.83	59.00	971.00	1030.00	.26	4.07
31623.00	23.00	593.80	591.60	582.40	2340.00	593.18	724.39	59.00	971.00	1030.00	.23	3.84
31673.00	50.00	0.00	0.00	582.20	2340.00	593.41	1008.33	160.00	1440.00	1600.00	.07	2.76
33100.00	1427.00	0.00	0.00	583.70	2340.00	594.08	1254.63	1666.21	0.00	0.00	.03	1.97

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TQ	TOPWID	STENCL	STENCR	HV	VCH
35300.00	2200.00	0.00	0.00	584.60	2340.00	594.47	2417.14	2380.42	0.00	0.00	.00	.92
37100.00	1800.00	0.00	0.00	585.50	2340.00	594.79	1032.23	2296.61	0.00	0.00	.03	1.94
37250.00	150.00	0.00	0.00	585.50	2340.00	594.87	510.60	1565.56	0.00	0.00	.14	3.63
37251.00	1.00	601.50	598.00	585.50	2340.00	594.87	540.56	1566.15	0.00	0.00	.15	3.72
37279.00	28.00	601.50	598.00	585.20	2340.00	594.95	650.93	1612.26	0.00	0.00	.12	3.28
37280.00	1.00	0.00	0.00	585.20	2340.00	594.97	617.94	1616.46	0.00	0.00	.11	3.19
37330.00	50.00	0.00	0.00	585.20	2340.00	595.12	2503.03	2352.83	0.00	0.00	.00	.83
38000.00	670.00	0.00	0.00	585.70	2340.00	595.22	1185.56	1077.76	800.00	2525.00	.02	1.49

SECTION NUMBER	DISCHARGE CFS	CWSEL	CWSEL DIFF EACH Q	CWSEL DIFF EACH SECTION	CWSEL-WSELK	TOPWID	T.W. DIFF	LENGTH
150.000	5950.000	581.900	0.000	0.000	0.000	220.018	0.000	150.000
2450.000	5950.000	583.048	0.000	1.148	0.000	244.996	0.000	2300.000
3550.000	5950.000	583.310	0.000	.262	0.000	258.953	0.000	1100.000
3700.000	5950.000	583.327	0.000	.017	0.000	165.000	0.000	150.000
3701.000	5950.000	583.327	0.000	.000	0.000	165.000	0.000	1.000
3724.000	5950.000	583.337	0.000	.009	0.000	165.000	0.000	23.000
3725.000	5950.000	583.337	0.000	.000	0.000	165.000	0.000	1.000
3875.000	5950.000	583.476	0.000	.139	0.000	277.852	0.000	150.000
4550.000	5950.000	583.631	0.000	.155	0.000	330.955	0.000	675.000
4700.000	5950.000	583.656	0.000	.025	0.000	171.000	0.000	150.000
4701.000	5950.000	583.656	0.000	.000	0.000	171.000	0.000	1.000
4760.000	5950.000	583.674	0.000	.018	0.000	171.000	0.000	59.000
4761.000	5950.000	583.675	0.000	.001	0.000	171.000	0.000	1.000
4911.000	5950.000	583.783	0.000	.108	0.000	360.875	0.000	150.000
5900.000	5950.000	584.006	0.000	.223	0.000	194.638	0.000	989.000
7800.000	5950.000	584.451	0.000	.445	0.000	544.830	0.000	1900.000
9900.000	5870.000	585.200	0.000	.749	0.000	194.625	0.000	2100.000
10050.000	5870.000	585.249	0.000	.048	0.000	124.000	0.000	150.000
10051.000	5870.000	585.250	0.000	.001	0.000	124.000	0.000	1.000
10100.000	5870.000	585.298	0.000	.048	0.000	124.000	0.000	49.000
10101.000	5870.000	585.299	0.000	.001	0.000	124.000	0.000	1.000
10251.000	5870.000	585.685	0.000	.385	0.000	205.301	0.000	150.000

12450.000	5870.000	587.022	0.000	1.337	0.000	181.652	0.000	2199.000
14850.000	5870.000	588.139	0.000	1.117	0.000	179.164	0.000	2400.000
17050.000	5870.000	588.967	0.000	.828	0.000	321.602	0.000	2200.000
19450.000	5870.000	589.877	0.000	.911	0.000	95.540	0.000	2400.000
19600.000	5870.000	589.946	0.000	.069	0.000	86.000	0.000	150.000
19601.000	5870.000	589.948	0.000	.001	0.000	86.000	0.000	1.000
19619.000	5870.000	589.967	0.000	.020	0.000	86.000	0.000	18.000
19620.000	5870.000	589.968	0.000	.001	0.000	86.000	0.000	1.000
19700.000	5870.000	590.184	0.000	.216	0.000	104.000	0.000	80.000
19701.000	5870.000	590.185	0.000	.001	0.000	104.000	0.000	1.000
19756.000	5870.000	590.222	0.000	.037	0.000	104.000	0.000	55.000
19757.000	5870.000	590.223	0.000	.001	0.000	104.000	0.000	1.000
19900.000	5870.000	590.464	0.000	.242	0.000	239.651	0.000	143.000
21300.000	5870.000	590.932	0.000	.468	0.000	227.005	0.000	1400.000
21400.000	5870.000	590.921	0.000	-.012	0.000	130.000	0.000	100.000
21431.000	5870.000	591.070	0.000	.149	0.000	130.000	0.000	31.000
21581.000	5870.000	591.224	0.000	.154	0.000	237.662	0.000	150.000
21981.000	5870.000	591.382	0.000	.158	0.000	678.962	0.000	400.000
22400.000	5870.000	591.434	0.000	.052	0.000	1330.928	0.000	419.000
23600.000	5870.000	591.461	0.000	.027	0.000	2825.064	0.000	1200.000
23900.000	5870.000	591.467	0.000	.006	0.000	2877.342	0.000	300.000
25030.000	2340.000	591.537	0.000	.070	0.000	2457.215	0.000	1130.000
26160.000	2340.000	591.583	0.000	.046	0.000	1782.903	0.000	1130.000
27300.000	2340.000	591.647	0.000	.065	0.000	2417.356	0.000	1140.000
27450.000	2340.000	591.537	0.000	-.111	0.000	903.490	0.000	150.000
27476.000	2340.000	591.537	0.000	.000	0.000	903.618	0.000	26.000
27526.000	2340.000	591.871	0.000	.334	0.000	2438.313	0.000	50.000
28026.000	2340.000	591.907	0.000	.037	0.000	2391.254	0.000	500.000
28650.000	2340.000	591.959	0.000	.052	0.000	2399.774	0.000	624.000
31450.000	2340.000	592.472	0.000	.513	0.000	134.999	0.000	2800.000
31600.000	2340.000	592.608	0.000	.136	0.000	58.999	0.000	150.000
31623.000	2340.000	593.175	0.000	.568	0.000	58.999	0.000	23.000
31673.000	2340.000	593.414	0.000	.239	0.000	159.999	0.000	50.000

33100.000	2340.000	594.078	0.000	.664	0.000	1666.215	0.000	1427.000
35300.000	2340.000	594.472	0.000	.394	0.000	2380.421	0.000	2200.000
37100.000	2340.000	594.793	0.000	.321	0.000	2296.614	0.000	1800.000
37250.000	2340.000	594.872	0.000	.079	0.000	1565.556	0.000	150.000
37251.000	2340.000	594.869	0.000	-.003	0.000	1566.150	0.000	1.000
37279.000	2340.000	594.955	0.000	.086	0.000	1612.259	0.000	28.000
37280.000	2340.000	594.968	0.000	.013	0.000	1616.457	0.000	1.000
37330.000	2340.000	595.121	0.000	.153	0.000	2352.834	0.000	50.000
38000.000	2340.000	595.223	0.000	.102	0.000	1077.760	0.000	670.000

DATA FOR LAST CROSS SECTION

PROFILE	TYPE ENC	TARGET	TOP WIDTH AREA-ACRES	TOP WIDTH AREA-DIFF
1	0.000	1725.000	809.400	0.000

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: KawKawlin Twp & Fraser Twp

3) WATERCOURSE: Tap-Gove Drain

4) DOCUMENT TYPE: 100-yr Natural

00BREAK00

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C
C      13
C      50            BS-1  50FT. U.S. FROM JUNCTION TO RAILROAD DRAIN
C    1950            VS-2   50FT. D.S. FROM M-13 BRIDGE
C    2000            BS-3  M-13 BRIDGE
C    2950            VS-4   50FT. D.S. FROM LINWOOD ROAD
C    3000            BS-5  LINWOOD ROAD CULVERT - 42FT. OF 9.1'X14.25' MULTIPLATE
C    3000                  ARCH WITH ENDS PROJECTING FROM FILL
C    4250            VS-6   50FT. D.S. FROM LINWOOD SPORTSMANS CLUB
C    4299            BS-7  CULVERT AT ENTRANCE TO LINWOOD SPORTSMANS CLUB - 17FT.
C    4299                  OF 60"  RCP WITH ENDS PROJECTING FROM FILL, AND 24FT. OF
C    4299                  60"  CMP WITH SQUARE ENDS PROJECTING FROM FILL
C    5600            VS-8  50FT. D.S. FROM MACKINAC ROAD
C    5650            BS-9  MACKINAC ROAD CULVERT - TWO 37FT. LENGTHS OF 72"  RCP
C    5650                  WITH SQUARE ENDS FLUSH WITH FILL
T1   TAP-GOVE DRAIN
T2   100 YEAR FLOOD
T3   KAWKAWLIN AND FRASER TWPS., BAY COUNTY
J1    -10      4                                                    589.76
J2     -1              -1
J3      9      1       34       3       4      10      26
NC    .06    .06     .045      .3      .5
QT      4    270      365     420     510
X1      1     27     1000    1047       0       0       0
X3     10
GR  587.9      0    587.9     100   588.1     200   588.3     300   588.6     400
GR  588.8    500    588.5     600   588.5     700   589.2     800   589.9     900
GR  592.7   1000    583.7    1013   582.8    1024   581.3    1029   580.8    1033
GR  581.6   1039    591.5    1047   590.3    1100   589.5    1200   589.8    1300
GR  589.9   1400    599.4    1500   589.2    1600   589.6    1700   589.3    1800
GR  589.6   1900    589.9    1985
X1     49     27     1000    1015      49      49      49
X3     10                                                  591.3   591.3
GR  588.7      0    588.8     100   588.7     200   589.0     300   589.3     400
GR  589.0    500    588.8     600   588.8     700   589.6     800   590.9     900
GR  590.9    984    585.3    1000   581.6    1003   582.4    1006   582.3    1009
GR  583.7   1012    583.8    1015   591.2    1032   591.2    1100   591.0    1200
GR  592.9   1300    592.6    1400   593.3    1500   595.0    1600   593.4    1700
GR  597.7   1800    597.7    1900
NC    .06    .06     .035
X1     50     27     1000    1015       1       1       1
X3     10                                                  591.3   591.3
BT      4   1000    591.3            1000   591.3   590.3    1015   591.2   590.4
BT   1015   591.2
GR  588.7      0    588.8     100   588.7     200   589.0     300   589.3     400
GR  589.0    500    588.8     600   588.8     700   589.6     800   590.9     900
GR  591.3   1000    585.3    1000   581.6    1003   582.4    1006   582.3    1009
GR  583.7   1012    583.8    1015   591.2    1015   591.2    1100   591.0    1200
GR  592.9   1300    592.6    1400   593.3    1500   595.0    1600   593.4    1700
GR  597.7   1800    597.7    1900
X1     66     26     1000    1015      16      16      16
X3     10                                                  591.3   591.3
BT      4   1000    591.3   590.2    1000   591.3   590.2    1015   591.2   590.1
BT   1015   591.2   590.1
GR  588.7      0    588.6     100   588.7     200   589.0     300   589.3     400
GR  589.0    500    588.8     600   588.8     700   589.6     800   590.9     900
GR  591.3   1000    585.8    1000   582.5    1006   582.1    1009   582.0    1012
GR  583.0   1015    591.2    1015   591.2    1100   591.0    1200   592.9    1300
GR  592.6   1400    593.3    1500   595.0    1600   593.4    1700   597.7    1800
GR  597.7   1900
NC    .06    .06     .045
X1     67     26     1000    1015       1       1       1
X3     10                                                  591.3   591.3
GR  588.7      0    588.6     100   588.7     200   589.0     300   589.3     400
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GR 589.0     500   588.8     600   588.8     700   589.6     800   590.9     900
GR 591.3     984   585.8    1000   582.5    1006   582.1    1009   582.0    1012
GR 583.0    1015   591.2    1032   591.2    1100   591.0    1200   592.9    1300
GR 592.6    1400   593.3    1500   595.0    1600   593.4    1700   597.7    1800
GR 597.7    1900
X1     82      26     984    1032      15      15      15
X3     10
GR 588.7       0   588.6     100   588.7     200   589.0     300   589.3     400
GR 589.0     500   588.8     600   588.8     700   589.6     800   590.9     900
GR 591.3     984   585.8    1000   582.5    1006   582.1    1009   582.0    1012
GR 583.0    1015   591.2    1032   591.2    1100   591.0    1200   592.9    1300
GR 592.6    1400   593.3    1500   595.0    1600   593.4    1700   597.7    1800
GR 597.7    1900
X1   1019                              937     937     937              2.3
X3     10
NC    .08     .08     .05
X1   1950      16     500     541     931     931     931
GR 599.4       0   598.2     103   599.6     200   599.0     300   598.0     400
GR 595.3     500   588.1     512   586.6     516   586.9     520   588.3     523
GR 596.9     541   599.1     570   599.4     600   598.9     700   598.7     800
GR 598.5     885
X1   1975                               25      25      25
X1   1999      19     429     446      24      24      24     .94
X3     10                                                   600.7   600.3
GR 601.5       0   602.1      21   601.7     100   601.4     200   601.3     300
GR 601.0     400   601.0     419   589.0     429   587.9     440   587.2     442
GR 587.9     444   587.9     446   600.3     459   600.3     500   599.2     600
GR 598.5     700   598.3     800   598.2     900   598.1    1000
NC    .02     .02     .03
X1   2000      19     429     446       1       1       1     .94
X2                                                            .94
X3     10                                                   600.7   600.3
BT      4     429   600.7             429   600.7   595.6     446   600.3   595.5
BT    446   600.3
GR 601.5       0   602.1      21   601.7     100   601.4     200   601.3     300
GR 601.0     400   600.7     429   589.0     429   587.9     440   587.2     442
GR 587.9     444   587.9     446   600.3     446   600.3     500   599.2     600
GR 598.5     700   598.3     800   598.2     900   598.1    1000
X1   2088      16     400     417      88      88      88     .94
X2                                                            .94
X3     10                                                   600.7   600.3
BT      4     400   601.0   595.4     400   601.0   595.4     417   601.0   595.4
BT    417   601.0   595.4
GR 601.5       0   602.1      21  601.65     100   601.4     200   601.3     300
GR 601.0     400   587.8     400   587.1     409   588.1     417   601.0     417
GR 600.3     500   599.2     600   598.5     700   598.3     800   598.1     900
GR 598.1    1000
NC    .08     .08     .05
X1   2089      16     400     417       1       1       1     .94
X3     10                                                   600.7   600.3
GR 601.5       0   602.1      21   601.7     100   601.4     200   601.3     300
GR 601.0     389   587.8     400   587.1     409   588.1     417   601.0     429
GR 600.3     500   599.2     600   598.5     700   598.3     800   598.1     900
GR 598.1    1000
X1   2099      16     389     429      10      10      10
GR 601.5       0   602.1      21   601.7     100   601.4     200   601.3     300
GR 601.0     389   587.8     400   587.1     409   588.1     417   601.0     429
GR 600.3     500   599.2     600   598.5     700   598.3     800   598.1     900
GR 598.1    1000
NC     .1      .1     .05
X1   2950      20     400     431     851     851     851
GR 606.4       0   599.0     100   599.1     200   601.8     255   598.6     300
GR 599.0     386   598.2     400   591.5     408   590.8     410   588.9     412
GR 588.5     414   588.7     416   590.5     419   590.6     423   595.1     431
GR 597.2     500   597.3     600   600.3     700   600.3     800   601.5     900
X1   2999      19   699.8   714.3      49      49      49
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X3      10                                                      599.0   599.0
GR  602.1       0   601.1     100   599.5     200   599.3     300   599.4     400
GR  599.3     500   599.9     600   599.0     692   589.8   699.8   589.3   702.6
GR  589.3     707   590.2   709.6   590.1   714.3   599.0     722   599.6     800
GR  600.3     900   601.0    1000   601.7    1100   602.4    1200
NC    .02     .02    .025
X1   3000      27   699.8   714.3       1       1       1
X3      10                                                      599.0   599.0
BT      13   699.8   599.0   590.1   699.9   599.0   591.3   701.3   599.0   594.3
BT  702.6   599.0   595.6   703.9   599.0   596.4   705.3   599.0   596.7   707.0
BT  599.0   596.8   708.3   599.0   596.7   709.6   599.0   596.4   710.9   599.0
BT  595.6   712.3   599.0   594.3   713.6   599.0   591.3   714.3   599.0   590.1
GR  602.1       0   601.1     100   599.5     200   599.3     300   599.4     400
GR  599.3     500   599.0     600   599.0   699.8   590.1   699.8   589.4   699.9
GR  589.6   701.3   589.3   702.6   589.3   703.9   589.3   705.3   589.3     707
GR  589.8   708.3   590.2   709.6   590.2   710.9   590.2   712.3   590.1   713.6
GR  590.1   714.3   599.0   714.3   599.6     800   600.3     900   601.0    1000
GR  601.7    1100   602.4    1200
X1   3042                       42      42      42
X2                                          1
X3      10                                                      599.0   599.0
NC      .1      .1     .06
X1   3043      19   699.8   714.3       1       1       1
X3      10                                                      599.0   599.0
GR  602.1       0   601.1     100   599.5     200   599.3     300   599.4     400
GR  599.3     500   599.9     600   599.0     692   589.8   699.8   589.3   702.6
GR  589.3     707   590.2   709.6   590.1   714.3   599.0     722   599.6     800
GR  600.3     900   601.0    1000   601.7    1100   602.4    1200
X1   3058      19     692     722      15      15      15
GR  602.1       0   601.1     100   599.5     200   599.3     300   599.4     400
GR  599.3     500   599.9     600   599.0     692   589.8   699.8   589.3   702.6
GR  589.3     707   590.2   709.6   590.1   714.3   599.0     722   599.6     800
GR  600.3     900   601.0    1000   601.7    1100   602.4    1200
NC     .06     .06     .04      .3      .5
X1   4250      23     676     709    1192    1192    1192
X3                           576   598.9
GR  608.3       0   602.2      38   600.6      76   599.2     176   598.2     276
GR  597.2     376   597.8     476   598.9     576   598.1     676   592.3     688
GR  592.3     693   592.3     698   598.1     709   598.6     776   602.1     876
GR  604.5     951   603.7     976   602.8    1076   601.8    1176   602.6    1291
GR  601.9    1376   602.2    1476   601.8    1576
X1   4299      29     600     610      49      49      49
X3      10   591.6                                              597.1   597.1
GR  604.9       0   604.2     100   602.8     200   601.4     300   600.2     400
GR  597.4     500   597.4     589   591.7     600   591.1   600.4   590.3   601.2
GR  590.0   602.5   590.3   603.8   591.1   604.6   591.7     605   591.1   605.4
GR  590.3   606.2   590.0   607.5   590.3   608.8   591.1   609.6   591.7     610
GR  597.4     621   601.2     800   601.4     900   601.0    1000   601.2    1100
GR  601.7    1300   602.0    1400   601.6    1500   601.2    1600
SB          1.96     2.7             6.2            28.7
X1   4321      29     600     610      22      22      22
X2                       1   595.8   598.4
X3      10   591.6                                              598.4   598.4
BT      30       0   604.9       0     100   604.2       0     200   602.8       0
BT     300   601.4       0     400   600.2       0     500   598.5       0     589
BT  598.5       0     600   598.5   591.7     600   598.5   593.3   600.4   598.5
BT  593.9   601.2   598.5   594.7   602.5   598.5   595.0   603.8   598.5   594.7
BT  604.6   598.5   593.9     605   598.5   593.3   606.2   598.5   594.7   607.5
BT  598.5   595.0   608.8   598.5   594.7   609.6   598.5   593.9     610   598.5
BT  593.3     610   598.5   591.7     621   598.5       0     800   601.2       0
BT     900   601.4       0    1000   601.0       0    1100   601.2       0    1300
BT  601.7       0    1400   602.0       0    1500   601.6       0    1600   601.2
BT      0
GR  604.9       0   604.2     100   602.8     200   601.4     300   600.2     400
GR  598.5     500   598.5     589   591.7     600   591.1   600.4   590.3   601.2
GR  590.0   602.5   590.3   603.8   591.1   604.6   591.7     605   591.1   605.4
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GR 590.3   606.2   590.0   607.5   590.3   608.8   591.1   609.6   591.7   610
GR 598.5   621     601.2   800     601.4   900     601.0   1000    601.2   1100
GR 601.7   1300    602.0   1400    601.6   1500    601.2   1600
X1  4336   23      589     621     15      15      15
GR 604.9   0       604.2   100     602.8   200     601.4   300     600.2   400
GR 598.5   500     598.5   589     591.2   600     591.1   602.5   591.2   605
GR 591.9   607.5   592.3   610     598.5   621     600.4   700     601.2   800
GR 601.4   900     601.0   1000    601.2   1100    602.6   1197    601.7   1300
GR 602.0   1400    601.6   1500    601.2   1600
NC   .05   .05     .04
X1  5600   26      1000    1029    1264    1264    1264
X3                                         1623
GR 601.7   0       601.6   100     601.4   200     602.4   300     601.9   400
GR 601.7   500     600.7   600     599.7   700     599.0   800     597.1   900
GR 597.2   1000    593.0   1007    592.3   1014    592.9   1019    598.0   1029
GR 597.4   1100    597.1   1200    597.5   1300    597.6   1400    599.5   1500
GR 600.6   1600    601.0   1623    599.0   1700    599.7   1800    600.8   1900
GR 600.8   2000
X1  5649   26      993     1007    49      49      49
X3    10                                                   595.1   595.1
GR 601.8   0       601.8   100     601.9   300     601.7   400     601.7   500
GR 601.1   600     598.8   800     597.9   900     597.9   985     592.1   993
GR 590.9   993.2   590.9   998.1   591.5   1001.2  591.5   1006.7  592.1   1007
GR 597.9   1015    597.9   1100    598.1   1200    598.7   1300    598.7   1400
GR 599.7   1500    600.7   1600    599.5   1700    599.9   1800    600.6   1900
GR 600.7   2000
NC   .03   .03     .02
X1  5650   39      993     1007    1       1       1
BT    18   993     597.9   592.1   993.2   597.9   593.2   993.8   597.9   594.2
BT 994.8   597.9   594.8   996     597.9   595.1   997.1   597.9   594.8   998.1
BT 597.9   594.2   998.7   597.9   593.2   999     597.9   592.1   1001    597.9
BT 592.1   1001.2  597.9   593.2   1001.8  597.9   594.2   1002.8  597.9   594.8
BT  1004   597.9   595.1   1005.1  597.9   594.8   1006.1  597.9   594.2   1006.7
BT 597.9   593.2   1007    597.9   592.1
GR 601.8   0       601.8   100     601.9   300     601.7   400     601.7   500
GR 601.1   600     599.9   700     598.8   800     597.9   900     597.9   993
GR 592.1   993     591.1   993.2   590.1   993.8   589.4   994.8   589.1   996
GR 589.4   997.1   590.1   998.1   591.1   998.7   592.1   999     592.1   1001
GR 591.1   1001.2  590.1   1001.8  589.4   1002.8  589.1   1004    589.4   1005.1
GR 590.1   1006.1  591.1   1006.7  592.1   1007    597.9   1007    597.9   1100
GR 598.1   1200    598.7   1300    598.7   1400    599.7   1500    600.7   1600
GR 599.5   1700    599.9   1800    600.6   1900    600.7   2000
X1  5687                                   37      37      37
X2                                                         1
NC   .05   .05     .045
X1  5688   26      993     1007    1       1       1
X3    10                                                   595.1   595.1
GR 601.8   0       601.8   100     601.9   300     601.7   400     601.7   500
GR 601.1   600     598.8   800     597.9   900     597.9   985     592.1   993
GR 590.9   993.2   590.9   998.1   591.5   1001.2  591.5   1006.7  592.1   1007
GR 597.9   1015    597.9   1100    598.1   1200    598.7   1300    598.7   1400
GR 599.7   1500    600.7   1600    599.5   1700    599.9   1800    600.6   1900
GR 600.7   2000
X1  5698   26      985     1015    10      10      10
GR 601.8   0       601.8   100     601.9   300     601.7   400     601.7   500
GR 601.1   600     598.8   800     597.9   900     597.9   985     592.1   993
GR 590.9   993.2   590.9   998.1   591.5   1001.2  591.5   1006.7  592.1   1007
GR 597.9   1015    597.9   1100    598.1   1200    598.7   1300    598.7   1400
GR 599.7   1500    600.7   1600    599.5   1700    599.9   1800    600.6   1900
GR 600.7   2000
EJ
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ER

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*****************************************
HEC2 VERSION UPDATED JAN 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09
MODIFICATIONS 52,53,54,55,56,57,58
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C
1  TAP-GOVE DRAIN
T2  100 YEAR FLOOD
T3  KAWKAWLIN AND FRASER TWPS., BAY COUNTY

J1  ICHECK    INO      NINV     IDIR     STRT      METRIC   HVINS    Q        WSEL     FQ

     -10.      4.      -0.      -0. -0.000000      -0.00    -0.0     -0.    589.760  -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

CCHV=    .300 CEHV=    .500
3280 CROSS SECTION      1.00 EXTENDED      1.86 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

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      592.70 ELREA=      591.50

      1.00     8.96   589.76     0.00   589.76   589.80      .04     0.00     0.00   592.70
      420.       0.     420.       0.       0.     250.       0.       0.       0.   591.50
      0.00     0.00     1.68     0.00     .060     .045     .060    0.000   580.80  1004.25
   .000283       0.       0.       0.        0        0        1     0.00    41.35  1045.59

3280 CROSS SECTION     49.00 EXTENDED      .98 FEET

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      591.30 ELREA=      591.30

     49.00     8.08   589.68     0.00     0.00   589.94      .27      .03      .11   585.30
      420.       0.     420.       0.       0.     102.       0.       0.       0.   583.80
       .00     0.00     4.14     0.00     .060     .045     .060     .044   581.60  1000.00
   .001924      49.      49.      49.        2        0        1     0.00    15.00  1028.50

3280 CROSS SECTION     50.00 EXTENDED      .98 FEET

NORMAL BRIDGE,NRD= 4 MIN ELTRD=  591.20 MAX ELLC=  590.40

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      591.30 ELREA=      591.30
```

BS-1 50FT. U.S. FROM JUNCTION TO RAILROAD DRAIN.

```
     50.00      8.08    589.68      0.00      0.00    589.95       .27       .00       .00    591.30
      420.        0.      420.        0.        0.      102.        0.        0.        0.    591.20
       .00      0.00      4.14      0.00      .060      .035      .060      .043    581.60   1000.00
  .001658        1.        1.        1.         0         0         1      0.00     15.00   1015.00

3280 CROSS SECTION      66.00 EXTENDED       1.01 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

NORMAL BRIDGE,NRD= 4 MIN ELTRD=  591.20 MAX ELLC=  590.20

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      591.30 ELREA=      591.30

     66.00      7.70    589.70      0.00      0.00    589.98       .27       .03       .00    591.30
      420.        0.      420.        0.        0.      100.        0.        0.        0.    591.20
       .00      0.00      4.19      0.00      .060      .035      .060      .041    582.00   1000.00
  .001669       16.       16.       16.         0         0         1      0.00     15.00   1015.00

3280 CROSS SECTION      67.00 EXTENDED       1.01 FEET

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      591.30 ELREA=      591.30

     67.00      7.70    589.70      0.00      0.00    589.98       .27       .00       .00    585.80
      420.        0.      420.        0.        0.      100.        0.        0.        0.    583.00
       .00      0.00      4.19      0.00      .060      .045      .060      .040    582.00   1000.00
  .001703        1.        1.        1.         0         0         1      0.00     15.00   1028.91

3280 CROSS SECTION      82.00 EXTENDED       1.27 FEET

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      591.30 ELREA=      591.20

     82.00      7.97    589.97      0.00      0.00    590.05       .08       .02       .06    591.30
      420.        0.      420.        0.        0.      180.        0.        0.        0.    591.20
       .01      0.00      2.34      0.00      .060      .045      .060      .040    582.00    987.88
  .000790       15.       15.       15.         2         0         1      0.00     41.56   1029.44

3280 CROSS SECTION    1019.00 EXTENDED        .00 FEET

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      593.60 ELREA=      593.50

   1019.00      6.70    591.00      0.00      0.00    591.16       .16      1.07       .04    593.60
      420.        0.      420.        0.        0.      131.        0.        4.        1.    593.50
       .09      0.00      3.20      0.00      .060      .045      .060      .045    584.30    991.56
  .001813      937.      937.      937.         2         0         1      0.00     35.27   1026.82
```

VS-2 50FT. D.S. FROM M-13 BRIDGE

1950.00	6.55	593.15	0.00	0.00	593.38	.22	2.18	.03	595.30
420.	0.	420.	0.	0.	111.	0.	6.	2.	596.90
.16	0.00	3.78	0.00	.080	.050	.080	.047	586.60	503.59
.003149	931.	931.	931.	2	0	1	0.00	29.56	533.14

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
1975.00	6.65	593.25	0.00	0.00	593.46	.21	.08	.00	595.30
420.	0.	420.	0.	0.	114.	0.	6.	2.	596.90
.16	0.00	3.68	0.00	.080	.050	.080	.047	586.60	503.42
.002937	25.	25.	25.	2	0	1	0.00	29.93	533.35

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 600.70 ELREA= 600.30

1999.00	6.02	593.22	0.00	0.00	593.64	.42	.08	.11	589.00
420.	0.	420.	0.	0.	81.	0.	6.	2.	587.90
.16	0.00	5.21	0.00	.080	.050	.080	.047	587.20	403.26
.004006	24.	24.	24.	2	0	1	0.00	15.98	424.48

NORMAL BRIDGE,NRD= 4 MIN ELTRD= 600.30 MAX ELLC= 595.60

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 600.70 ELREA= 600.30

BS-3 M-13 BRIDGE

2000.00	6.03	593.23	0.00	0.00	593.65	.42	.00	.00	600.70
420.	0.	420.	0.	0.	81.	0.	6.	2.	600.30
.16	0.00	5.20	0.00	.020	.030	.020	.047	587.20	403.26
.002416	1.	1.	1.	0	0	1	0.00	15.98	419.24

NORMAL BRIDGE,NRD= 4 MIN ELTRD= 601.00 MAX ELLC= 595.40

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 600.70 ELREA= 600.30

2088.00	6.45	593.55	0.00	0.00	593.84	.30	.16	.04	601.00
420.	0.	420.	0.	0.	96.	0.	7.	2.	601.00
.16	0.00	4.36	0.00	.020	.030	.020	.046	587.10	376.00
.001440	88.	88.	88.	2	0	1	0.00	15.98	391.98

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 600.70 ELREA= 600.30

2089.00	6.45	593.55	0.00	0.00	593.85	.29	.00	.00	587.80
420.	0.	420.	0.	0.	96.	0.	7.	2.	588.10
.16	0.00	4.36	0.00	.080	.050	.080	.046	587.10	376.00
.002334	1.	1.	1.	0	0	1	0.00	15.98	396.75

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

  2099.00     6.66    593.76      0.00      0.00    593.91       .15       .02       .04    601.00
     420.       0.      420.       0.        0.      136.        0.        7.        2.    601.00
      .17     0.00      3.09      0.00      .080      .050      .080      .046    587.10    395.03
 .001614       10.       10.       10.         2         0         1      0.00     27.23    422.27

                 VS-4   50FT. D.S. FROM LINWOOD ROAD

  2950.00     6.98    595.48      0.00      0.00    595.69       .21      1.75       .03    598.20
     420.       0.      419.       1.        0.      115.        2.        9.        2.    595.10
      .23     0.00      3.64      .26      .100      .050      .100      .047    588.50    403.25
 .002704      851.      851.      851.         2         0         1      0.00     40.27    443.51

OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA=      599.00 ELREA=      599.00

  2999.00     6.25    595.55      0.00      0.00    595.93       .38       .15       .09    589.80
     420.       0.      420.       0.        0.       85.        0.        9.        2.    590.10
      .23     0.00      4.96      0.00      .100      .050      .100      .047    589.30    699.80
 .003711       49.       49.       49.         2         0         1      0.00     14.50    719.01

NORMAL BRIDGE,NRD=13 MIN ELTRD=  599.00 MAX ELLC=  596.80

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      599.00 ELREA=      599.00

                 BS-5  LINWOOD ROAD CULVERT - 42FT. OF 9.1'X14.25' MULTIPLATE

                       ARCH WITH ENDS PROJECTING FROM FILL

  3000.00     6.17    595.47      0.00      0.00    596.01       .54       .00       .08    599.00
     420.       0.      420.       0.        0.       71.        0.        9.        2.    599.00
      .23     0.00      5.91      0.00      .020      .025      .020      .047    589.30    699.80
 .003174        1.        1.        1.         2         0         1    -12.60     14.50    714.30

NORMAL BRIDGE,NRD=13 MIN ELTRD=  599.00 MAX ELLC=  596.80

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLFA=      599.00 ELREA=      599.00

  3042.00     6.34    595.64      0.00      0.00    596.16       .52       .14       .01    599.00
     420.       0.      420.       0.        0.       73.        0.        9.        2.    599.00
      .24     0.00      5.79      0.00      .020      .025      .020      .047    589.30    699.80
 .003348       42.       42.       42.         2         0         1    -13.50     14.50    714.30

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      599.00 ELREA=      599.00

  3043.00     6.57    595.87      0.00      0.00    596.21       .34       .00       .05    589.80
     420.       0.      420.       0.        0.       89.        0.        9.        2.    590.10
      .24     0.00      4.70      0.00      .100      .060      .100      .047    589.30    699.80
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.004555        1.        1.        1.        2        0        1     0.00     14.50   719.29

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

  3058.00      6.85    596.15      0.00      0.00    596.32       .17       .05       .05    599.00
     420.        0.      420.        0.        0.      126.        0.        9.        2.    599.00
      .24      0.00      3.33      0.00      .100      .060      .100      .047    589.30    694.42
 .002772       15.       15.       15.         2         0         1      0.00     25.11    719.53

CCHV=     .300 CEHV=     .500

3470 ENCROACHMENT STATIONS=     576.0     1576.0  TYPE=     1  TARGET=     -576.000
 ELENCL=     598.90  ELENCR= 100000.00

                    VS-6   50FT. D.S. FROM LINWOOD SPORTSMANS CLUB

  4250.00      6.02    598.32      0.00      0.00    598.48       .16      2.16       .00    598.10
     420.        1.      419.        1.        3.      132.        3.       13.        4.    598.10
      .34       .21      3.17       .21      .060      .040      .060      .045    592.30    647.91
 .001274     1192.     1192.     1192.         3         0         1      0.00     91.21    739.12

                    BS-7  CULVERT AT ENTRANCE TO LINWOOD SPORTSMANS CLUB - 17FT.

                          OF 60"  RCP WITH ENDS PROJECTING FROM FILL, AND 24FT. OF

                          60"  CMP WITH SQUARE ENDS PROJECTING FROM FILL

  4299.00      6.84    598.44      0.00      0.00    598.54       .10       .04       .02    591.70
     420.      126.      224.       70.      155.       68.       69.       13.        4.    591.70
      .35       .81      3.28      1.02      .060      .040      .060      .045    591.60    462.69
 .000606       49.       49.       49.         2         0         1      0.00    207.51    670.21

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      1.96      2.70     -0.00      6.20     -0.00     28.70     -0.00    591.60    591.60

PRESSURE AND WEIR FLOW

  EGPRS     EGLWC     H3        QWEIR     QPR       BAREA     ELLC      ELTRD     CLASS
  604.96    598.54    0.00      273.      148.      29.       595.80    598.40    30.00

  4321.00      7.53    599.13      0.00      0.00    599.25       .13       .71       0.00    591.70
     420.       90.      264.       65.      112.       75.       57.       13.        4.    591.70
      .35       .81      3.52      1.14      .060      .040      .060      .045    591.60    463.01
 .000612       22.       22.       22.         2         0         7      0.00    199.68    662.69

  4336.00      8.10    599.20      0.00      0.00    599.28       .08       .01       .01    598.50
     420.       31.      386.        3.       77.      167.       10.       13.        4.    598.50
```

.35	.41	2.31	.28	.060	.040	.060	.045	591.10	458.75
.000501	15.	15.	15.	2	0	1	0.00	191.40	650.16

3470 ENCROACHMENT STATIONS= .0 1623.0 TYPE= 1 TARGET= 1622.999

VS-8 50FT. D.S. FROM MACKINAC ROAD

5600.00	7.11	599.41	0.00	0.00	599.41	.00	.11	.02	597.20
420.	100.	97.	223.	373.	151.	818.	36.	18.	598.00
1.34	.27	.64	.27	.050	.040	.050	.044	592.30	742.11
.000037	1264.	1264.	1264.	2	0	1	0.00	752.90	1495.01

5649.00	8.51	599.41	0.00	0.00	599.42	.01	.00	.00	592.10
420.	103.	150.	167.	288.	115.	506.	38.	19.	592.10
1.36	.36	1.31	.33	.050	.040	.050	.044	590.90	746.23
.000086	49.	49.	49.	0	0	1	0.00	725.61	1471.84

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

NORMAL BRIDGE,NRD=18 MIN ELTRD= 597.90 MAX ELLC= 595.10

BS-9 MACKINAC ROAD CULVERT - TWO 37FT. LENGTHS OF 72" RCP

WITH SQUARE ENDS FLUSH WITH FILL

5650.00	10.32	599.42	0.00	0.00	599.42	.01	.00	.00	597.90
420.	152.	65.	204.	265.	75.	412.	38.	19.	597.90
1.36	.57	.86	.49	.030	.020	.030	.044	589.10	743.78
.000100	1.	1.	1.	0	0	1	-124.71	728.07	1471.85

NORMAL BRIDGE,NRD=18 MIN ELTRD= 597.90 MAX ELLC= 595.10

5687.00	10.32	599.42	0.00	0.00	599.43	.01	.00	.00	597.90
420.	152.	64.	204.	266.	75.	413.	38.	19.	597.90
1.38	.57	.86	.49	.030	.020	.030	.044	589.10	743.46
.000099	37.	37.	37.	0	0	1	-124.87	728.73	1472.19

5688.00	8.52	599.42	0.00	0.00	599.43	.01	.00	.00	592.10
420.	107.	139.	174.	289.	115.	507.	38.	19.	592.10
1.38	.37	1.21	.34	.050	.045	.050	.044	590.90	745.91
.000093	1.	1.	1.	0	0	1	0.00	726.29	1472.20

5698.00	8.52	599.42	0.00	0.00	599.43	.01	.00	.00	597.90
420.	85.	182.	153.	254.	185.	472.	39.	20.	597.90
1.38	.33	.98	.32	.050	.045	.050	.044	590.90	745.83
.000096	10.	10.	10.	0	0	1	0.00	726.47	1472.30

SUMMARY PRINTOUT FOR MULTIPLE PROFILES

AWLIN AND FRASER TWPS.,

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	WSELK	CWSEL	TQ	EG	TOPWID	HV	VCH
1.00	0.00	0.00	0.00	580.80	420.00	589.76	589.76	249.52	589.80	41.35	.04	1.68
49.00	49.00	0.00	0.00	581.60	420.00	0.00	589.68	95.75	589.94	15.00	.27	4.14
50.00	1.00	591.20	590.40	581.60	420.00	0.00	589.68	103.14	589.95	15.00	.27	4.14
66.00	16.00	591.20	590.20	582.00	420.00	0.00	589.70	102.80	589.98	15.00	.27	4.19
67.00	1.00	0.00	0.00	582.00	420.00	0.00	589.70	101.79	589.98	15.00	.27	4.19
82.00	15.00	0.00	0.00	582.00	420.00	0.00	589.97	149.47	590.05	41.56	.08	2.34
1019.00	937.00	0.00	0.00	584.30	420.00	0.00	591.00	98.63	591.16	35.27	.16	3.20
1950.00	931.00	0.00	0.00	586.60	420.00	0.00	593.15	74.85	593.38	29.56	.22	3.78
1975.00	25.00	0.00	0.00	586.60	420.00	0.00	593.25	77.49	593.46	29.93	.21	3.68
1999.00	24.00	0.00	0.00	587.20	420.00	0.00	593.22	66.36	593.64	15.98	.42	5.21
2000.00	1.00	600.30	595.60	587.20	420.00	0.00	593.23	85.45	593.65	15.98	.42	5.20
2088.00	88.00	601.00	595.40	587.10	420.00	0.00	593.55	110.69	593.84	15.98	.30	4.36
2089.00	1.00	0.00	0.00	587.10	420.00	0.00	593.55	86.94	593.85	15.98	.29	4.36
2099.00	10.00	0.00	0.00	587.10	420.00	0.00	593.76	104.55	593.91	27.23	.15	3.09
2950.00	851.00	0.00	0.00	588.50	420.00	0.00	595.48	80.78	595.69	40.27	.21	3.64
2999.00	49.00	0.00	0.00	589.30	420.00	0.00	595.55	68.95	595.93	14.50	.38	4.96
3000.00	1.00	599.00	596.80	589.30	420.00	0.00	595.47	74.55	596.01	14.50	.54	5.91
3042.00	42.00	599.00	596.80	589.30	420.00	0.00	595.64	72.59	596.16	14.50	.52	5.79
3043.00	1.00	0.00	0.00	589.30	420.00	0.00	595.87	62.23	596.21	14.50	.34	4.70
3058.00	15.00	0.00	0.00	589.30	420.00	0.00	596.15	79.78	596.32	25.11	.17	3.33
4250.00	1192.00	0.00	0.00	592.30	420.00	0.00	598.32	117.67	598.48	91.21	.16	3.17
4299.00	49.00	0.00	0.00	591.60	420.00	0.00	598.44	170.68	598.54	207.51	.10	3.28
4321.00	22.00	598.40	595.80	591.60	420.00	0.00	599.13	169.81	599.25	199.68	.13	3.52
4336.00	15.00	0.00	0.00	591.10	420.00	0.00	599.20	187.62	599.28	191.40	.08	2.31
5600.00	1264.00	0.00	0.00	592.30	420.00	0.00	599.41	693.48	599.41	752.90	.00	.64
5649.00	49.00	0.00	0.00	590.90	420.00	0.00	599.41	452.85	599.42	725.61	.01	1.31
5650.00	1.00	597.90	595.10	589.10	420.00	0.00	599.42	420.14	599.42	728.07	.01	.86
5687.00	37.00	597.90	595.10	589.10	420.00	0.00	599.42	421.98	599.43	728.73	.01	.86

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	WSELK	CWSEL	TQ	EG	TOPWID	HV	VCH
5688.00	1.00	0.00	0.00	590.90	420.00	0.00	599.42	436.24	599.43	726.29	.01	1.21
5698.00	10.00	0.00	0.00	590.90	420.00	0.00	599.42	428.63	599.43	726.47	.01	.98

SECTION NUMBER	DISCHARGE CFS	CWSEL	CWSEL DIFF EACH Q	CWSEL DIFF EACH SECTION	CWSEL-WSELK	TOPWID	T.W. DIFF	LENGTH
1.000	420.000	589.760	0.000	0.000	0.000	41.347	0.000	0.000
49.000	420.000	589.678	0.000	-.082	0.000	15.000	0.000	49.000
50.000	420.000	589.680	0.000	.002	0.000	15.000	0.000	1.000
66.000	420.000	589.703	0.000	.023	0.000	15.000	0.000	16.000
67.000	420.000	589.705	0.000	.002	0.000	15.000	0.000	1.000
82.000	420.000	589.966	0.000	.261	0.000	41.562	0.000	15.000
1019.000	420.000	591.003	0.000	1.037	0.000	35.266	0.000	937.000
1950.000	420.000	593.155	0.000	2.152	0.000	29.556	0.000	931.000
1975.000	420.000	593.245	0.000	.091	0.000	29.926	0.000	25.000
1999.000	420.000	593.222	0.000	-.024	0.000	15.980	0.000	24.000
2000.000	420.000	593.225	0.000	.004	0.000	15.980	0.000	1.000
2088.000	420.000	593.550	0.000	.324	0.000	15.980	0.000	88.000
2089.000	420.000	593.552	0.000	.002	0.000	15.980	0.000	1.000
2099.000	420.000	593.761	0.000	.210	0.000	27.235	0.000	10.000
2950.000	420.000	595.481	0.000	1.720	0.000	40.266	0.000	851.000
2999.000	420.000	595.547	0.000	.066	0.000	14.500	0.000	49.000
3000.000	420.000	595.470	0.000	-.077	0.000	14.500	0.000	1.000
3042.000	420.000	595.636	0.000	.166	0.000	14.500	0.000	42.000
3043.000	420.000	595.872	0.000	.236	0.000	14.500	0.000	1.000
3058.000	420.000	596.146	0.000	.274	0.000	25.112	0.000	15.000
4250.000	420.000	598.325	0.000	2.179	0.000	91.209	0.000	1192.000
4299.000	420.000	598.445	0.000	.120	0.000	207.513	0.000	49.000
4321.000	420.000	599.128	0.000	.684	0.000	199.677	0.000	22.000
4336.000	420.000	599.201	0.000	.073	0.000	191.404	0.000	15.000
5600.000	420.000	599.412	0.000	.211	0.000	752.900	0.000	1264.000
5649.000	420.000	599.411	0.000	-.002	0.000	725.613	0.000	49.000
5650.000	420.000	599.418	0.000	.007	0.000	728.069	0.000	1.000
5687.000	420.000	599.422	0.000	.004	0.000	728.726	0.000	37.000

5688.000	420.000	599.420	0.000	-.002	0.000	726.286	0.000	1.000
5698.000	420.000	599.423	0.000	.003	0.000	726.466	0.000	10.000

DATA FOR LAST CROSS SECTION

PROFILE	TYPE ENC	TARGET	TOP WIDTH AREA-ACRES	TOP WIDTH AREA-DIFF
1	0.000	0.000	19.527	0.000

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Kawkawlin Twp & Fraser Twp

3) WATERCOURSE: TAP-Gove Drain

4) DOCUMENT TYPE: Summary

00BREAK00

SUMMARY PRINTOUT FOR MULTIPLE PROFILES

AWLIN AND FRASER TWPS..

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	WSELK	CWSEL	TQ	EG	TOPWID	HV	VCH
1.00	0.00	0.00	0.00	580.80	270.00	588.34	588.34	173.51	588.37	38.15	.03	1.40
1.00	0.00	0.00	0.00	580.80	365.00	589.29	589.29	222.91	589.33	40.29	.04	1.58
1.00	0.00	0.00	0.00	580.80	420.00	589.76	589.76	249.52	589.80	41.35	.04	1.68
1.00	0.00	0.00	0.00	580.80	510.00	590.44	590.44	290.62	590.49	42.88	.05	1.83
49.00	49.00	0.00	0.00	581.60	270.00	0.00	588.29	68.17	588.47	15.00	.17	3.34
49.00	49.00	0.00	0.00	581.60	365.00	0.00	589.22	86.39	589.45	15.00	.23	3.86
49.00	49.00	0.00	0.00	581.60	420.00	0.00	589.68	95.75	589.94	15.00	.27	4.14
49.00	49.00	0.00	0.00	581.60	510.00	0.00	590.34	109.59	590.66	15.00	.33	4.58
50.00	1.00	591.20	590.40	581.60	270.00	0.00	588.29	75.59	588.47	15.00	.17	3.34
50.00	1.00	591.20	590.40	581.60	365.00	0.00	589.22	93.90	589.45	15.00	.23	3.85
50.00	1.00	591.20	590.40	581.60	420.00	0.00	589.68	103.14	589.95	15.00	.27	4.14
50.00	1.00	591.20	590.40	581.60	510.00	0.00	590.34	109.03	590.66	15.00	.33	4.58
66.00	16.00	591.20	590.20	582.00	270.00	0.00	588.31	74.96	588.49	15.00	.18	3.40
66.00	16.00	591.20	590.20	582.00	365.00	0.00	589.24	93.46	589.48	15.00	.24	3.91
66.00	16.00	591.20	590.20	582.00	420.00	0.00	589.70	102.80	589.98	15.00	.27	4.19
66.00	16.00	591.20	590.20	582.00	510.00	0.00	590.37	83.19	590.72	15.00	.35	4.78
67.00	1.00	0.00	0.00	582.00	270.00	0.00	588.31	71.61	588.49	15.00	.18	3.40
67.00	1.00	0.00	0.00	582.00	365.00	0.00	589.25	91.54	589.48	15.00	.24	3.91
67.00	1.00	0.00	0.00	582.00	420.00	0.00	589.70	101.79	589.98	15.00	.27	4.19
67.00	1.00	0.00	0.00	582.00	510.00	0.00	590.40	117.68	590.73	15.00	.33	4.61
82.00	15.00	0.00	0.00	582.00	270.00	0.00	588.47	90.59	588.54	34.09	.07	2.20
82.00	15.00	0.00	0.00	582.00	365.00	0.00	589.47	127.70	589.55	39.07	.08	2.29
82.00	15.00	0.00	0.00	582.00	420.00	0.00	589.97	149.47	590.05	41.56	.08	2.34
82.00	15.00	0.00	0.00	582.00	510.00	0.00	590.73	187.19	590.82	45.38	.09	2.40
1019.00	937.00	0.00	0.00	584.30	270.00	0.00	589.66	58.60	589.80	28.57	.15	3.06
1019.00	937.00	0.00	0.00	584.30	365.00	0.00	590.55	83.54	590.70	33.00	.16	3.16
1019.00	937.00	0.00	0.00	584.30	420.00	0.00	591.00	98.63	591.16	35.27	.16	3.20
1019.00	937.00	0.00	0.00	584.30	510.00	0.00	591.70	124.81	591.86	38.72	.16	3.26
1950.00	931.00	0.00	0.00	586.60	270.00	0.00	592.02	48.31	592.19	25.31	.18	3.37
1950.00	931.00	0.00	0.00	586.60	365.00	0.00	592.77	65.02	592.98	28.11	.21	3.65
1950.00	931.00	0.00	0.00	586.60	420.00	0.00	593.15	74.85	593.38	29.56	.22	3.78
1950.00	931.00	0.00	0.00	586.60	510.00	0.00	593.73	91.23	593.97	31.73	.24	3.96
1975.00	25.00	0.00	0.00	586.60	270.00	0.00	592.11	50.16	592.27	25.64	.17	3.27
1975.00	25.00	0.00	0.00	586.60	365.00	0.00	592.86	67.44	593.06	28.48	.20	3.55
1975.00	25.00	0.00	0.00	586.60	420.00	0.00	593.25	77.49	593.46	29.93	.21	3.68
1975.00	25.00	0.00	0.00	586.60	510.00	0.00	593.82	94.17	594.05	32.09	.23	3.86
1999.00	24.00	0.00	0.00	587.20	270.00	0.00	592.13	44.91	592.41	15.98	.28	4.28
1999.00	24.00	0.00	0.00	587.20	365.00	0.00	592.85	58.84	593.22	15.98	.37	4.88
1999.00	24.00	0.00	0.00	587.20	420.00	0.00	593.22	66.36	593.64	15.98	.42	5.21
1999.00	24.00	0.00	0.00	587.20	510.00	0.00	593.77	78.02	594.27	15.98	.51	5.70

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	WSELK	CWSEL	TQ	EG	TOPWID	HV	VCH
2000.00	1.00	600.30	595.60	587.20	270.00	0.00	592.13	60.29	592.41	15.98	.28	4.27
2000.00	1.00	600.30	595.60	587.20	365.00	0.00	592.86	76.77	593.23	15.98	.37	4.88
2000.00	1.00	600.30	595.60	587.20	420.00	0.00	593.23	85.45	593.65	15.98	.42	5.20
2000.00	1.00	600.30	595.60	587.20	510.00	0.00	593.77	98.69	594.28	15.98	.50	5.70
2088.00	88.00	601.00	595.40	587.10	270.00	0.00	592.38	81.93	592.57	15.98	.19	3.48
2088.00	88.00	601.00	595.40	587.10	365.00	0.00	593.15	100.80	593.41	15.98	.26	4.05
2088.00	88.00	601.00	595.40	587.10	420.00	0.00	593.55	110.69	593.84	15.98	.30	4.36
2088.00	88.00	601.00	595.40	587.10	510.00	0.00	594.14	125.80	594.50	15.98	.36	4.82
2089.00	1.00	0.00	0.00	587.10	270.00	0.00	592.38	62.13	592.57	15.98	.19	3.48
2089.00	1.00	0.00	0.00	587.10	365.00	0.00	593.16	78.30	593.41	15.98	.26	4.05
2089.00	1.00	0.00	0.00	587.10	420.00	0.00	593.55	86.94	593.85	15.98	.29	4.36
2089.00	1.00	0.00	0.00	587.10	510.00	0.00	594.14	100.30	594.51	15.98	.36	4.82
2099.00	10.00	0.00	0.00	587.10	270.00	0.00	592.50	70.82	592.61	25.01	.11	2.62
2099.00	10.00	0.00	0.00	587.10	365.00	0.00	593.33	92.33	593.47	26.48	.13	2.94
2099.00	10.00	0.00	0.00	587.10	420.00	0.00	593.76	104.55	593.91	27.23	.15	3.09
2099.00	10.00	0.00	0.00	587.10	510.00	0.00	594.41	124.42	594.58	28.38	.17	3.31
2950.00	851.00	0.00	0.00	588.50	270.00	0.00	594.20	49.08	594.37	24.61	.17	3.33
2950.00	851.00	0.00	0.00	588.50	365.00	0.00	595.05	68.52	595.25	27.16	.19	3.53
2950.00	851.00	0.00	0.00	588.50	420.00	0.00	595.48	80.78	595.69	40.27	.21	3.64
2950.00	851.00	0.00	0.00	588.50	510.00	0.00	596.11	102.06	596.33	61.84	.22	3.78
2999.00	49.00	0.00	0.00	589.30	270.00	0.00	594.31	48.22	594.56	14.50	.25	4.05
2999.00	49.00	0.00	0.00	589.30	365.00	0.00	595.14	61.91	595.47	14.50	.33	4.63
2999.00	49.00	0.00	0.00	589.30	420.00	0.00	595.55	68.95	595.93	14.50	.38	4.96
2999.00	49.00	0.00	0.00	589.30	510.00	0.00	596.15	79.58	596.61	14.50	.46	5.46
3000.00	1.00	599.00	596.80	589.30	270.00	0.00	594.28	62.79	594.60	14.50	.32	4.54
3000.00	1.00	599.00	596.80	589.30	365.00	0.00	595.08	69.26	595.54	14.50	.46	5.43
3000.00	1.00	599.00	596.80	589.30	420.00	0.00	595.47	74.55	596.01	14.50	.54	5.91
3000.00	1.00	599.00	596.80	589.30	510.00	0.00	596.03	76.01	596.74	14.50	.71	6.78
3042.00	42.00	599.00	596.80	589.30	270.00	0.00	594.37	59.99	594.68	14.50	.31	4.46
3042.00	42.00	599.00	596.80	589.30	365.00	0.00	595.21	71.03	595.66	14.50	.44	5.33
3042.00	42.00	599.00	596.80	589.30	420.00	0.00	595.64	72.59	596.16	14.50	.52	5.79
3042.00	42.00	599.00	596.80	589.30	510.00	0.00	596.25	77.96	596.93	14.50	.68	6.64
3043.00	1.00	0.00	0.00	589.30	270.00	0.00	594.47	42.35	594.70	14.50	.24	3.91
3043.00	1.00	0.00	0.00	589.30	365.00	0.00	595.40	55.28	595.70	14.50	.30	4.42
3043.00	1.00	0.00	0.00	589.30	420.00	0.00	595.87	62.23	596.21	14.50	.34	4.70
3043.00	1.00	0.00	0.00	589.30	510.00	0.00	596.62	73.57	597.02	14.50	.40	5.08
3058.00	15.00	0.00	0.00	589.30	270.00	0.00	594.65	50.21	594.79	22.55	.14	2.98
3058.00	15.00	0.00	0.00	589.30	365.00	0.00	595.63	68.94	595.79	24.24	.16	3.21
3058.00	15.00	0.00	0.00	589.30	420.00	0.00	596.15	79.78	596.32	25.11	.17	3.33
3058.00	15.00	0.00	0.00	589.30	510.00	0.00	596.95	98.41	597.14	26.49	.19	3.47

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	WSELK	CWSEL	TQ	EG	TOPWID	HV	VCH
4250.00	1192.00	0.00	0.00	592.30	270.00	0.00	597.04	70.47	597.17	28.80	.13	2.94
4250.00	1192.00	0.00	0.00	592.30	365.00	0.00	597.90	99.13	598.05	32.22	.15	3.09
4250.00	1192.00	0.00	0.00	592.30	420.00	0.00	598.32	117.67	598.48	91.21	.16	3.17
4250.00	1192.00	0.00	0.00	592.30	510.00	0.00	598.90	157.99	599.04	208.04	.14	3.13
4299.00	49.00	0.00	0.00	591.60	270.00	0.00	597.02	47.11	597.40	10.00	.39	4.99
4299.00	49.00	0.00	0.00	591.60	365.00	0.00	597.97	130.28	598.10	168.48	.13	3.56
4299.00	49.00	0.00	0.00	591.60	420.00	0.00	598.44	170.68	598.54	207.51	.10	3.28
4299.00	49.00	0.00	0.00	591.60	510.00	0.00	599.03	238.86	599.09	255.67	.07	3.01
4321.00	22.00	598.40	595.80	591.60	270.00	0.00	598.70	140.19	598.78	146.55	.08	2.63
4321.00	22.00	598.40	595.80	591.60	365.00	0.00	599.00	159.80	599.11	183.85	.11	3.21
4321.00	22.00	598.40	595.80	591.60	420.00	0.00	599.13	169.81	599.25	199.68	.13	3.52
4321.00	22.00	598.40	595.80	591.60	510.00	0.00	599.31	185.71	599.46	221.96	.15	3.97
4336.00	15.00	0.00	0.00	591.10	270.00	0.00	598.75	149.98	598.80	145.16	.05	1.75
4336.00	15.00	0.00	0.00	591.10	365.00	0.00	599.07	175.19	599.13	177.77	.07	2.12
4336.00	15.00	0.00	0.00	591.10	420.00	0.00	599.20	187.62	599.28	191.40	.08	2.31
4336.00	15.00	0.00	0.00	591.10	510.00	0.00	599.39	207.11	599.49	210.65	.09	2.61
5600.00	1264.00	0.00	0.00	592.30	270.00	0.00	598.96	334.65	598.97	325.00	.01	.80
5600.00	1264.00	0.00	0.00	592.30	365.00	0.00	599.33	430.99	599.33	325.00	.01	.89
5600.00	1264.00	0.00	0.00	592.30	420.00	0.00	599.49	478.64	599.50	325.00	.01	.94
5600.00	1264.00	0.00	0.00	592.30	510.00	0.00	599.73	551.01	599.74	325.00	.01	1.02
5649.00	49.00	0.00	0.00	590.90	270.00	0.00	598.96	255.53	598.98	245.00	.02	1.44
5649.00	49.00	0.00	0.00	590.90	365.00	0.00	599.32	317.97	599.34	245.00	.02	1.61
5649.00	49.00	0.00	0.00	590.90	420.00	0.00	599.49	349.63	599.51	245.00	.02	1.71
5649.00	49.00	0.00	0.00	590.90	510.00	0.00	599.73	398.44	599.76	245.00	.03	1.86
5650.00	1.00	597.90	595.10	589.10	270.00	0.00	598.96	141.51	598.98	245.00	.02	1.55
5650.00	1.00	597.90	595.10	589.10	365.00	0.00	599.32	205.59	599.35	245.00	.02	1.51
5650.00	1.00	597.90	595.10	589.10	420.00	0.00	599.49	238.74	599.51	245.00	.02	1.53
5650.00	1.00	597.90	595.10	589.10	510.00	0.00	599.73	290.43	599.76	245.00	.03	1.57
5687.00	37.00	597.90	595.10	589.10	270.00	0.00	598.97	142.91	598.99	245.00	.02	1.54
5687.00	37.00	597.90	595.10	589.10	365.00	0.00	599.34	207.18	599.36	245.00	.02	1.50
5687.00	37.00	597.90	595.10	589.10	420.00	0.00	599.50	240.47	599.53	245.00	.02	1.52
5687.00	37.00	597.90	595.10	589.10	510.00	0.00	599.74	292.39	599.77	245.00	.03	1.56
5688.00	1.00	0.00	0.00	590.90	270.00	0.00	598.98	240.59	598.99	245.00	.02	1.36
5688.00	1.00	0.00	0.00	590.90	365.00	0.00	599.34	301.85	599.36	245.00	.02	1.51
5688.00	1.00	0.00	0.00	590.90	420.00	0.00	599.51	333.03	599.53	245.00	.02	1.60
5688.00	1.00	0.00	0.00	590.90	510.00	0.00	599.75	381.16	599.77	245.00	.02	1.73
5698.00	10.00	0.00	0.00	590.90	270.00	0.00	598.98	232.05	599.00	245.00	.01	1.11
5698.00	10.00	0.00	0.00	590.90	365.00	0.00	599.34	294.11	599.36	245.00	.02	1.23
5698.00	10.00	0.00	0.00	590.90	420.00	0.00	599.51	325.67	599.53	245.00	.02	1.30
5698.00	10.00	0.00	0.00	590.90	510.00	0.00	599.75	374.38	599.77	245.00	.02	1.41

SECTION NUMBER	DISCHARGE CFS	CWSEL	CWSEL DIFF EACH Q	CWSEL DIFF EACH SECTION	CWSEL-WSELK	TOPWID	T.W. DIFF	LENGTH
1.000	270.000	588.340	0.000	0.000	0.000	38.149	0.000	0.000
1.000	365.000	589.290	.950	0.000	0.000	40.289	-2.140	0.000
1.000	420.000	589.760	.470	0.000	0.000	41.347	-3.199	0.000
1.000	510.000	590.440	.680	0.000	0.000	42.879	-4.730	0.000
49.000	270.000	588.293	0.000	-.047	0.000	15.000	0.000	49.000
49.000	365.000	589.221	.929	-.069	0.000	15.000	0.000	49.000
49.000	420.000	589.678	.457	-.082	0.000	15.000	0.000	49.000
49.000	510.000	590.335	.657	-.105	0.000	15.000	0.000	49.000

50.000	270.000	588.294	0.000	.001	0.000	15.000	0.000	1.000
50.000	365.000	589.223	.929	.002	0.000	15.000	0.000	1.000
50.000	420.000	589.680	.457	.002	0.000	15.000	0.000	1.000
50.000	510.000	590.337	.657	.002	0.000	15.000	0.000	1.000
66.000	270.000	588.312	0.000	.017	0.000	15.000	0.000	16.000
66.000	365.000	589.244	.932	.021	0.000	15.000	0.000	16.000
66.000	420.000	589.703	.459	.023	0.000	15.000	0.000	16.000
66.000	510.000	590.368	.665	.031	0.000	15.000	0.000	16.000
67.000	270.000	588.313	0.000	.001	0.000	15.000	0.000	1.000
67.000	365.000	589.246	.932	.002	0.000	15.000	0.000	1.000
67.000	420.000	589.705	.459	.002	0.000	15.000	0.000	1.000
67.000	510.000	590.402	.697	.033	0.000	15.000	0.000	1.000
82.000	270.000	588.466	0.000	.153	0.000	34.089	0.000	15.000
82.000	365.000	589.465	.999	.220	0.000	39.068	-4.979	15.000
82.000	420.000	589.966	.501	.261	0.000	41.562	-7.473	15.000
82.000	510.000	590.732	.766	.330	0.000	45.380	-11.291	15.000
1019.000	270.000	589.658	0.000	1.192	0.000	28.569	0.000	937.000
1019.000	365.000	590.548	.889	1.082	0.000	32.999	-4.430	937.000
1019.000	420.000	591.003	.455	1.037	0.000	35.266	-6.698	937.000
1019.000	510.000	591.696	.693	.964	0.000	38.718	-10.149	937.000
1950.000	270.000	592.019	0.000	2.361	0.000	25.309	0.000	931.000
1950.000	365.000	592.770	.751	2.222	0.000	28.110	-2.801	931.000
1950.000	420.000	593.155	.385	2.152	0.000	29.556	-4.247	931.000
1950.000	510.000	593.732	.577	2.036	0.000	31.730	-6.422	931.000
1975.000	270.000	592.107	0.000	.088	0.000	25.645	0.000	25.000
1975.000	365.000	592.860	.753	.090	0.000	28.477	-2.832	25.000
1975.000	420.000	593.245	.385	.091	0.000	29.926	-4.281	25.000
1975.000	510.000	593.822	.577	.090	0.000	32.095	-6.450	25.000
1999.000	270.000	592.125	0.000	.019	0.000	15.980	0.000	24.000
1999.000	365.000	592.853	.728	-.007	0.000	15.980	0.000	24.000
1999.000	420.000	593.222	.369	-.024	0.000	15.980	0.000	24.000
1999.000	510.000	593.770	.548	-.052	0.000	15.980	0.000	24.000
2000.000	270.000	592.128	0.000	.003	0.000	15.980	0.000	1.000
2000.000	365.000	592.856	.728	.004	0.000	15.980	0.000	1.000
2000.000	420.000	593.225	.369	.004	0.000	15.980	0.000	1.000
2000.000	510.000	593.774	.548	.004	0.000	15.980	0.000	1.000
2088.000	270.000	592.379	0.000	.251	0.000	15.980	0.000	88.000
2088.000	365.000	593.153	.774	.297	0.000	15.980	0.000	88.000
2088.000	420.000	593.550	.396	.324	0.000	15.980	0.000	88.000
2088.000	510.000	594.142	.593	.368	0.000	15.980	0.000	88.000
2089.000	270.000	592.381	0.000	.002	0.000	15.980	0.000	1.000
2089.000	365.000	593.155	.774	.002	0.000	15.980	0.000	1.000
2089.000	420.000	593.552	.396	.002	0.000	15.980	0.000	1.000
2089.000	510.000	594.145	.593	.002	0.000	15.980	0.000	1.000
2099.000	270.000	592.503	0.000	.122	0.000	25.015	0.000	10.000
2099.000	365.000	593.331	.828	.176	0.000	26.476	-1.461	10.000
2099.000	420.000	593.761	.430	.210	0.000	27.235	-2.220	10.000
2099.000	510.000	594.412	.651	.268	0.000	28.383	-3.368	10.000
2950.000	270.000	594.196	0.000	1.694	0.000	24.610	0.000	851.000
2950.000	365.000	595.054	.858	1.723	0.000	27.161	-2.552	851.000
2950.000	420.000	595.481	.427	1.720	0.000	40.266	-15.656	851.000
2950.000	510.000	596.115	.634	1.702	0.000	61.840	-37.230	851.000

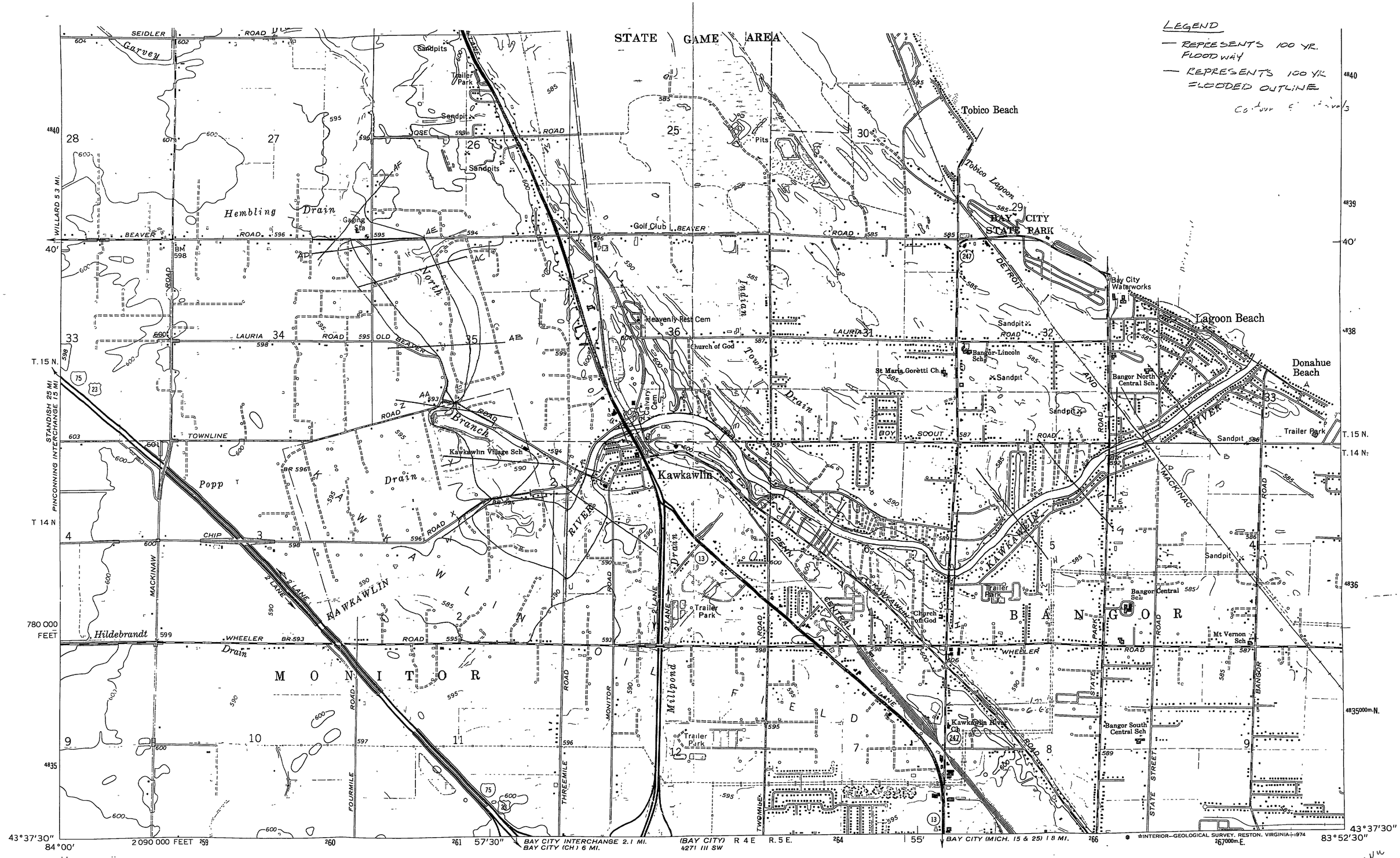
2999.000	270.000	594.306	0.000	.110	0.000	14.500	0.000	49.000
2999.000	365.000	595.139	.832	.084	0.000	14.500	0.000	49.000
2999.000	420.000	595.547	.409	.066	0.000	14.500	0.000	49.000
2999.000	510.000	596.147	.599	.032	0.000	14.500	0.000	49.000
3000.000	270.000	594.275	0.000	-.031	0.000	14.500	0.000	1.000
3000.000	365.000	595.079	.804	-.059	0.000	14.500	0.000	1.000
3000.000	420.000	595.470	.391	-.077	0.000	14.500	0.000	1.000
3000.000	510.000	596.026	.556	-.121	0.000	14.500	0.000	1.000
3042.000	270.000	594.371	0.000	.096	0.000	14.500	0.000	42.000
3042.000	365.000	595.214	.843	.136	0.000	14.500	0.000	42.000
3042.000	420.000	595.635	.421	.166	0.000	14.500	0.000	42.000
3042.000	510.000	596.247	.611	.221	0.000	14.500	0.000	42.000
3043.000	270.000	594.468	0.000	.096	0.000	14.500	0.000	1.000
3043.000	365.000	595.396	.928	.182	0.000	14.500	0.000	1.000
3043.000	420.000	595.872	.476	.236	0.000	14.500	0.000	1.000
3043.000	510.000	596.620	.749	.373	0.000	14.500	0.000	1.000
3058.000	270.000	594.648	0.000	.180	0.000	22.545	0.000	15.000
3058.000	365.000	595.634	.986	.238	0.000	24.235	-1.690	15.000
3058.000	420.000	596.146	.512	.274	0.000	25.112	-2.567	15.000
3058.000	510.000	596.952	.806	.332	0.000	26.493	-3.948	15.000
4250.000	270.000	597.040	0.000	2.392	0.000	28.801	0.000	1192.000
4250.000	365.000	597.899	.859	2.265	0.000	32.215	-3.414	1192.000
4250.000	420.000	598.325	.426	2.179	0.000	91.209	-62.407	1192.000
4250.000	510.000	598.897	.572	1.945	0.000	208.037	-179.236	1192.000
4299.000	270.000	597.017	0.000	-.023	0.000	10.000	0.000	49.000
4299.000	365.000	597.973	.957	.074	0.000	168.480	-158.480	49.000
4299.000	420.000	598.445	.471	.120	0.000	207.513	-197.513	49.000
4299.000	510.000	599.026	.581	.129	0.000	255.668	-245.668	49.000
4321.000	270.000	598.704	0.000	1.687	0.000	146.553	0.000	22.000
4321.000	365.000	599.002	.298	1.029	0.000	183.855	-37.302	22.000
4321.000	420.000	599.128	.126	.684	0.000	199.677	-53.124	22.000
4321.000	510.000	599.306	.178	.280	0.000	221.962	-75.409	22.000
4336.000	270.000	598.750	0.000	.046	0.000	145.164	0.000	15.000
4336.000	365.000	599.065	.315	.063	0.000	177.765	-32.601	15.000
4336.000	420.000	599.201	.136	.073	0.000	191.404	-46.239	15.000
4336.000	510.000	599.393	.192	.087	0.000	210.653	-65.488	15.000
5600.000	270.000	598.961	0.000	.211	0.000	324.999	0.000	1264.000
5600.000	365.000	599.326	.365	.261	0.000	324.999	-.000	1264.000
5600.000	420.000	599.493	.167	.292	0.000	324.999	-.000	1264.000
5600.000	510.000	599.733	.240	.341	0.000	324.999	-.000	1264.000
5649.000	270.000	598.953	0.000	-.003	0.000	244.999	0.000	49.000
5649.000	365.000	599.323	.365	-.003	0.000	244.999	-.000	49.000
5649.000	420.000	599.489	.167	-.004	0.000	244.999	-.000	49.000
5649.000	510.000	599.730	.240	-.004	0.000	244.999	-.000	49.000
5650.000	270.000	598.957	0.000	-.001	0.000	244.999	0.000	1.000
5650.000	365.000	599.323	.366	.001	0.000	244.999	-.000	1.000
5650.000	420.000	599.491	.167	.001	0.000	244.999	-.000	1.000
5650.000	510.000	599.731	.240	.002	0.000	244.999	-.000	1.000
5687.000	270.000	598.971	0.000	.014	0.000	244.999	0.000	37.000
5687.000	365.000	599.335	.364	.012	0.000	244.999	-.000	37.000
5687.000	420.000	599.503	.167	.012	0.000	244.999	-.000	37.000
5687.000	510.000	599.743	.240	.012	0.000	244.999	-.000	37.000
5688.000	270.000	598.977	0.000	.006	0.000	244.999	0.000	1.000

5688.000	365.000	599.339	.362	.003	0.000	244.999	-.000	1.000
5688.000	420.000	599.506	.167	.003	0.000	244.999	-.000	1.000
5688.000	510.000	599.747	.241	.004	0.000	244.999	-.000	1.000
5698.000	270.000	598.982	0.000	.005	0.000	244.999	0.000	10.000
5698.000	365.000	599.344	.362	.006	0.000	244.999	-.000	10.000
5698.000	420.000	599.512	.167	.006	0.000	244.999	-.000	10.000
5698.000	510.000	599.753	.241	.006	0.000	244.999	-.000	10.000

DATA FOR LAST CROSS SECTION

PROFILE	TYPE ENC	TARGET	TOP WIDTH AREA-ACRES	TOP WIDTH AREA-DIFF
1	0.000	245.000	10.118	0.000
2	0.000	245.000	11.037	.919
3	0.000	245.000	12.364	2.247
4	0.000	245.000	14.755	4.637

STATE GAME AREA
LEGEND
— REPRESENTS 100 YR FLOODED OUTLINE
— REPRESENTS 100 YR FLOODWAY
Tobico Beach
Tobico Lagoon
BAY CITY STATE PARK
Golf Club
BEAVER ROAD
Pits
Indian
Heavenly Rest Cem
Church of God
LAURIA ROAD
Town Drain
St Maria Goretti Ch
Bangor-Lincoln Sch
Sandpit
DETROIT AND MACKINAC RIVER
Bay City Waterworks
Lagoon Beach
Bangor North Central Sch
Donahue Beach
Trailer Park
BOY SCOUT ROAD
Kawkawlin
PENN CENTRAL
KAWKAWLIN
Church of God
Bangor Central Sch
BANGOR
Mt Vernon Sch
WHEELER ROAD
OLD FIELD
Millpond
Kawkawlin River Ch
Bangor South Central Sch
STATE STREET
MONITOR ROAD
TWO MILE ROAD
BANGOR ROAD
T. 15 N.
T. 14 N.
Caution May not correspond w/ supplied Data
CHANGE 2.1 MI.
(BAY CITY) R. 4 E. R. 5 E.
4271 III SW
BAY CITY (MICH. 15 & 25) 1.8 MI.
INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1974
43°37'30"
83°52'30"


LEGEND
— REPRESENTS 100 YR. FLOODWAY
— REPRESENTS 100 YR. FLOODED OUTLINE
STATE GAME AREA
Tobico Beach
Tobico Lagoon
BAY CITY STATE PARK
Bay City Waterworks
Lagoon Beach
Donahue Beach
Kawkawlin
BANGOR
MONITOR
Hembling Drain
Garvey Drain
North Branch Drain
Popp Drain
Kawkawlin River
Millpond Drain
Town Drain
Indian Drain
Heavenly Rest Cem
Church of God
St Maria Goretti Ch
Bangor-Lincoln Sch
Bangor North Central Sch
Bangor Central Sch
Mt Vernon Sch
Bangor South Central Sch
Kawkawlin River Ch
Kawkawlin Village Sch
Trailer Park
Sandpits
Sandpit
Pits
Golf Club
Gaging Sta
Hildebrandt
STANDISH 25 MI
PINCONNING INTERCHANGE 15 MI
WILLARD 5.3 MI.
BAY CITY INTERCHANGE 2.1 MI.
BAY CITY (CH) 6 MI.
(BAY CITY) R 4 E R. 5 E.
4271 III SW
BAY CITY (MICH. 15 & 25) 1.8 MI.
INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1974
43°37'30"
84°00'
83°52'30"
2 090 000 FEET
780 000 FEET
T. 15 N.
T. 14 N.
Scale 1"=790.4'

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Kawkawlin Twp

3) WATERCOURSE: Railroad Drain

4) DOCUMENT TYPE: 100-yr Natural

00BREAK00

RAILROAD DRAIN

```
C
C      13
C      50          VS-1  AT ENTRANCE TO HARBOR
C     549          VS-2  50 FT. D.S. FROM DETROIT & MACKINAC R.R.
C     600          BS-3  DETROIT & MACKINAC R.R. BRIDGE
C    3249          VS-4 50 FT. D.S. FROM ELEVATOR ROAD
C    3299          BS-5  ELEVATOR ROAD BOX CULVERT - 36 FT. OF 7' X 16' CONCRETE
C    3299                BOX WITH HEADWALL
C    3400          BS-6  PENN CENTRAL R.R. BRIDGE
C    3600          VS-7 200 FT. U.S. FROM PENN CENTRAL R.R.
C    5850          VS-8  AT TOWER LINE
C    6700          VS-9  D.S. FROM JUNCTION OF TRIBUTARY
C    7800          VS-10 200 FT. D.S. FROM BRIDGE ON M-13
C    8000          BS-11 M-13 BRIDGE
C    9250          VS-12 U.S. FROM M-13
T1   RAILROAD DRAIN
T2   10 YEAR FLOOD
T3   KAWKAWLIN TWP. BAY CO
J1   -10      2                                                    581.9
J2     1            -1
J3     9      1      34      3      4     10     26
NC   .05    .05    .035     .3     .5
QT     4    640    885   1015   1205
X1    50     20    405    466     50     50     50
GR 582.4      0  586.1     13  586.6    105  586.4    205  586.7    305
GR 584.5    405  580.4    405  578.1    413  575.8    415  572.8    425
GR 572.3    435  572.3    445  572.8    450  575.9    455  578.0    463
GR 580.3    466  584.7    466  585.5    505  586.0    590  583.0    591
X1   300     11    372    428    250    250    250
GR 585.1      0  584.9    100  585.1    200  585.2    300  584.2    372
GR 574.9    385  574.7    400  574.9    415  583.9    428  585.2    500
GR 585.8    600
NC    .07   .05   .035
X1   549     30   1000   1051    249    249    249
GR 585.0      0  585.4    100  585.7    200  585.7    300  585.7    400
GR 586.2    500  586.8    600  586.8    700  586.7    800  586.5    900
GR 585.9    990  583.9   1000  581.4   1004  578.8   1010  577.2   1020
GR 577.4   1030  577.7   1040  578.0   1044  581.3   1050  583.1   1051
GR 585.2   1100  585.8   1200  586.0   1300  585.9   1400  585.7   1500
GR 585.8   1600  585.1   1700  584.6   1800  584.0   1900  583.5   2000
X1   569                          20     20     20
NC    .09   .07   .035
X1   599     21   1000   1030     30     30     30
X3    10                                           585.5  585.5
GR 585.1      0  585.1    400  584.9    500  584.9    700  585.1    800
GR 585.2    900  585.4    990  577.2   1000  577.1   1015  576.8   1024
GR 577.2   1030  585.5   1040  585.6   1100  585.7   1200  585.7   1300
GR 585.6   1400  585.4   1500  585.3   1600  585.3   1800  585.1   1900
GR 585.0   2000
NC    .09   .07   .03
X1   600     21   1000   1030      1      1      1
BT     4   1000  585.5  582.5   1000  585.5  582.5   1030  585.5  582.4
BT  1030  585.5  582.4
GR 585.1      0  585.1    400  584.9    500  584.9    700  585.1    800
GR 585.2    900  585.5   1000  577.2   1000  577.1   1015  576.8   1024
GR 577.2   1030  585.5   1030  585.6   1100  585.7   1200  585.7   1300
GR 585.6   1400  585.4   1500  585.3   1600  585.3   1800  585.1   1900
GR 585.0   2000
X1   610                          10     10     10
X2                                           1
NC    .09   .07   .035
X1   611     21   1000   1030      1      1      1
X3    10                                           585.5  585.5
GR 585.1      0  585.1    400  584.9    500  584.9    700  585.1    800
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Fraser Twp
Kawkawlin Twp
Bay Co

Hydraulics

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GR 585.2     900   585.4     990   577.2    1000   577.1    1015   576.8    1024
GR 577.2    1030   585.5    1040   585.6    1100   585.7    1200   585.7    1300
GR 585.6    1400   585.4    1500   585.3    1600   585.3    1800   585.1    1900
GR 585.0    2000
X1   621      30    1000    1051      10      10      10
GR 585.0       0   585.4     100   585.7     200   585.7     300   585.7     400
GR 586.2     500   586.8     600   586.8     700   586.7     800   586.5     900
GR 585.9     990   583.9    1000   581.4    1004   578.8     101   576.8    1020
GR 577.4    1030   577.7    1040   578.0    1044   581.3    1050   583.1    1051
GR 585.2    1100   585.8    1200   586.0    1300   585.9    1400   585.7    1500
GR 585.8    1600   585.1    1700   584.6    1800   584.0    1900   583.5    2000
QT     4     620     855     985    1170
NC   .06     .08     .04
X1  3249      28    1000    1043    2628    2628    2628
X3                          625            1600
GR 584.6       0   585.0     100   583.1     200   583.2     300   583.5     400
GR 583.7     500   583.7     600   583.5     700   583.9     800   584.3     900
GR 586.4    1000   581.0    1005   578.8    1014   578.9    1022   579.2    1030
GR 581.3    1040   583.6    1043   583.7    1100   584.0    1200   582.5    1300
GR 582.5    1400   582.0    1500   582.3    1600   582.5    1700   582.1    1800
GR 584.2    1838   582.9    1900   582.9    2000
NC   .08     .08     .04
X1  3299      28    1000    1043      50      50      50
X3                          750            1600
GR 584.6       0   585.0     100   583.1     200   583.2     300   583.5     400
GR 583.7     500   583.7     600   583.5     700   583.9     800   584.3     900
GR 586.4    1000   581.0    1005   576.9    1014   578.9    1022   579.2    1030
GR 581.3    1040   583.6    1043   583.7    1100   584.0    1200   582.5    1300
GR 582.5    1400   582.0    1500   582.3    1600   582.5    1700   582.1    1800
GR 584.2    1838   582.9    1900   582.9    2000
SB     0    1.63     3.0       0      16       0     108       0   576.9   576.9
NC    .1      .1     .04
X1  3337      19    1000    1016      38      38      38
X2                     1   583.9   584.0
X3                          750            1600
BT    16     750   584.3       0     900   584.4       0     988   585.7   585.7
BT   988   585.7   583.7    1000   585.9   577.4    1000   565.9   583.9    1016
BT 586.0   583.8    1016   586.0   576.9    1028   585.9   583.6    1028   585.9
BT 585.9    1100   585.3       0    1200   585.8       0    1300   585.6       0
BT  1400   585.1       0    1500   584.2       0    1600   583.7       0
GR 584.8       0   584.4     100   583.5     400   583.7     500   583.7     600
GR 583.7     900   583.6     988   577.4    1000   577.1    1008   576.9    1016
GR 583.6    1028   583.7    1100   583.7    1200   582.5    1300   582.5    1400
GR 582.0    1500   582.3    1600   582.5    1700   582.1    1800
X1  3353                                 16      16      16                .1
X3                          800            1450
X1  3368                                 15      15      15                .2
X3                          850            1300
X1  3384                                 16      16      16                .1
X3                          968            1048
X1  3399      21    1000    1018      15      15      15
X3    10                                                     587.9   587.9
GR 586.8       0   586.9     100   587.1     200   586.9     300   587.1     400
GR 587.0     500   587.2     600   587.2     700   587.2     800   587.3     900
GR 587.9     988   578.6    1000   578.6    1006   577.4    1012   577.7    1018
GR 587.9    1028   587.7    1100   587.7    1500   587.3    1600   587.2    1800
GR 587.1    2000
NC    .1      .1    .035
X1  3400      21    1000    1018       1       1       1
X2                          585.0   587.9
BT    17       0   586.8       0     100   586.9       0     200   587.1       0
BT   300   586.9       0     400   587.1       0     500   587.0       0     600
BT 587.2       0     700   587.2       0     800   587.2       0     900   587.3
BT     0    1000   587.9   585.0    1018   587.7   585.0    1100   587.7       0
BT  1500   587.7       0    1600   587.3       0    1800   587.2       0    2000
BT 587.1       0
```

GR	586.8	0	586.9	100	587.1	200	586.9	300	587.1	400
GR	587.0	500	587.2	600	587.2	700	587.2	800	587.3	900
GR	587.9	1000	578.6	1000	578.6	1006	577.4	1012	577.7	1018
GR	587.7	1018	587.7	1100	587.7	1500	587.3	1600	587.2	1800
GR	587.1	2000								
X1	3409				9	9	9			
X2				585.0	587.9		1			
NC	.1	.1	.04							
X1	3410	21	1000	1018	1	1	1			
X3	10							587.9	587.9	
GR	586.8	0	586.9	100	587.1	200	586.9	300	587.1	400
GR	587.0	500	587.2	600	587.2	700	587.2	800	587.3	900
GR	587.9	989	578.6	1000	578.6	1006	577.4	1012	577.7	1018
GR	587.9	1028	587.7	1100	587.7	1500	587.3	1600	587.2	1800
GR	587.1	2000								
X1	3430	21	996	1020	20	20	20			
GR	586.8	0	586.9	100	587.1	200	586.9	300	587.1	400
GR	587.0	500	587.2	600	587.2	700	587.2	800	587.3	900
GR	587.9	996	578.6	1000	578.6	1006	577.4	1012	577.7	1018
GR	587.9	1020	587.7	1100	587.7	1500	587.3	1600	587.2	1800
GR	587.1	2000								
NC	.08	.08	.045							
X1	3486	27	963	1000	56	56	56			
X3				913		1050				
GR	584.4	0	583.9	100	583.6	200	583.5	300	583.4	400
GR	583.6	500	583.4	600	583.7	700	583.7	800	583.7	900
GR	585.7	963	580.8	968	578.7	976	578.6	983	578.7	989
GR	581.1	996	585.1	1000	583.6	1100	583.5	1200	584.0	1300
GR	583.7	1400	583.9	1500	584.4	1600	583.6	1700	584.8	1800
GR	583.6	1900	583.6	2000						
X1	3542				56	56	56			
X3				857		1106				
NC	.06	.06	.045							
X1	3600				58	58	58			
X3				800		1200				
X1	5850	28	957	1000	2250	2250	2250			
X3	10							589.5	588.9	
GR	586.7	0	586.8	100	586.7	200	586.6	300	586.5	400
GR	586.8	500	587.0	600	587.0	700	587.3	800	587.6	900
GR	589.5	957	585.2	971	580.4	974	579.7	984	580.0	990
GR	581.3	992	588.9	1000	587.4	1100	587.3	1200	587.1	1300
GR	587.1	1400	587.0	1500	587.3	1600	587.6	1700	588.2	1800
GR	588.8	1900	589.4	1989	589.0	2000				
QT	4	565	785	910	1130					
X1	6700	27	1000	1047	850	850	850			
X3	10							592.7	591.5	
GR	587.9	0	587.9	100	588.1	200	588.3	300	588.6	400
GR	588.8	500	588.5	600	588.5	700	589.2	800	589.9	900
GR	592.7	1000	583.7	1013	582.8	1024	581.3	1029	580.8	1033
GR	581.6	1039	591.5	1047	590.3	1100	589.5	1200	589.8	1300
GR	589.9	1400	589.4	1500	589.2	1600	589.6	1700	589.3	1800
GR	589.6	1900	589.9	1985						
NC	.09	.09	.05							
QT	4	300	420	490	620					
X1	7800	24	1000	1049	1100	1100	1100			
GR	598.0	0	597.8	100	597.7	200	597.3	300	597.7	400
GR	598.4	500	597.7	600	596.8	700	597.1	800	597.7	900
GR	596.7	1000	586.1	1021	584.4	1022	584.1	1028	584.3	1032
GR	585.6	1044	596.1	1049	596.4	1100	597.7	1200	598.8	1300
GR	599.1	1400	599.5	1500	600.6	1600	601.6	1700		
X1	7974				174	174	174			
X1	7999	23	1000	1018	25	25	25			
X3	10							594.8	594.8	
GR	598.2	0	598.2	100	598.3	200	598.4	300	598.7	400
GR	598.8	500	598.9	600	599.0	700	599.1	800	599.4	900
GR	599.7	984	594.9	1000	594.4	1002	594.7	1009	594.6	1016

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GR 584.9    1018   599.9    1034   599.9    1100   600.2    1200   600.9    1300
GR 601.6    1400   602.5    1500   603.1    1600
NC   .07     .07     .04
X1  8000      25    1000    1018       1       1       1
BT     4    1000   599.7   594.8    1000   599.7   594.8    1018   599.9   594.8
BT  1018   599.9   594.8
GR 598.2       0   598.2     100   598.3     200   598.4     300   598.7     400
GR 598.8     500   598.9     600   599.0     700   599.1     800   599.4     900
GR 599.7    1000   584.9    1000   584.9    1002   584.4    1002   584.7    1009
GR 584.6    1016   584.9    1016   584.9    1018   599.9    1018   599.9    1100
GR 600.2    1200   600.9    1300   601.6    1400   602.5    1500   603.1    1600
X1  8080      26    1065    1083      80      80      80
BT     4    1065   599.7          1065   599.7   594.9    1083   599.8   594.9
BT  1083   599.8
GR 598.2       0   598.2     100   598.3     200   598.4     300   598.7     400
GR 598.8     500   598.9     600   599.0     700   599.1     800   599.4     900
GR 599.7    1000   599.7    1065   584.9    1065   584.9    1067   584.6    1067
GR 584.5    1074   584.7    1081   584.9    1081   585.1    1083   599.9    1083
GR 599.9    1100   600.2    1200   600.9    1300   601.6    1400   602.5    1500
GR 603.1    1600
X1  8081      23    1000    1018       1       1       1
X3    10                                                   594.8   594.8
GR 598.2       0   598.2     100   598.3     200   598.4     300   598.7     400
GR 598.8     500   598.9     600   599.0     700   599.1     800   599.4     900
GR 599.7     984   584.9    1000   584.4    1002   584.7    1009   584.6    1016
GR 584.9    1018   599.9    1034   599.9    1100   600.2    1200   600.9    1300
GR 601.6    1400   602.5    1500   603.1    1600
X1  8091      23     984    1034      10      10      10
GR 598.2       0   598.2     100   598.3     200   598.4     300   598.7     400
GR 598.8     500   598.9     600   599.0     700   599.1     800   599.4     900
GR 599.7     984   584.9    1000   584.4    1002   584.7    1009   584.6    1016
GR 584.9    1018   599.9    1034   599.9    1100   600.2    1200   600.9    1300
GR 601.6    1400   602.5    1500   603.1    1600
NC   .07     .09    .055
X1  8676      11     228     272     585     585     585
GR 600.0       0   599.0     100   598.6     200   599.1     228   585.1     245
GR 585.1     250   585.1     255   598.9     272   598.8     300   598.7     400
GR 598.6     500
NC   .07     .09     .06
X1  9250      20     200     240     574     574     574
X3    10                                                   598.6   598.2
GR 599.4       0   599.1     100   598.6     200   588.2     213   586.3     216
GR 585.9     220   585.8     224   588.1     228   598.2     240   598.1     300
GR 598.1     400   597.5     432   597.4     500   594.3     600   592.9     700
GR 593.3     800   595.4     900   593.6    1000   593.3    1100   593.1    1200
EJ
T1  RAILROAD DRAIN
T2  50 YEAR FLOOD
T3  KAWKAWLIN TWP, BAY CO
J1   -10       3                                                   581.9
J2     2              -1
T1  RAILROAD DRAIN
T2  100 YEAR FLOOD
T3  KAWKAWLIN TWP, BAY CO
J1   -10       4                                                   581.9
J2     3              -1
T1  RAILROAD DRAIN
T2  500 YEAR FLOOD
T3  KAWKAWLIN TWP, BAY CO
J1   -10       5                                                   581.9
J2    15              -1
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ER

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*****************************************
HEC2 VERSION UPDATED JAN 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09
MODIFICATIONS 52,53,54,55,56,57,58
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MEAN ELEV.

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T1  RAILROAD DRAIN
T2  100 YEAR FLOOD
T3  KAWKAWLIN TWP, BAY CO

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
     -10.      4.        -0.       -0. -0.000000     -0.00     -0.0      -0.     581.900   -0.000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE
     3.000    -0.000    -1.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000    -0.000

CCHV=     .300 CEHV=     .500
   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST
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OK 8-18-76

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                    VS-1  AT ENTRANCE TO HARBOR

    50.00     9.60    581.90     0.00    581.90    581.99       .09      0.00      0.00    584.50
    1015.       0.     1015.       0.        0.     429.        0.        0.        0.    584.70
     0.00     0.00      2.37     0.00      .050      .035      .050     0.000    572.30    405.00
  .000266      50.       50.       50.         0         0         1      0.00     61.00    466.00

   300.00     7.25    581.95     0.00      0.00    582.15       .20       .11       .05    584.20
    1015.       0.     1015.       0.        0.     296.        0.        2.        0.    583.90
      .02     0.00      3.55     0.00      .050      .035      .050      .035    574.70    375.13
  .000771     250.      250.      250.         1         0         1      0.00     50.06    425.20
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Data ?

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                    VS-2  50 FT. D.S. FROM DETROIT & MACKINAC R.R.

   549.00     4.95    582.15     0.00      0.00    582.64       .49       .34       .15    583.90
    1015.       0.     1015.       0.        0.     181.        0.        3.        1.    583.10
      .03     0.00      5.61     0.00      .070      .035      .050      .035    577.20   1002.80
  .003128     249.      249.      249.         2         0         1      0.00     47.67   1050.47

   569.00     5.04    582.24     0.00      0.00    582.70       .47       .06       .01    583.90
    1015.       0.     1015.       0.        0.     185.        0.        3.        1.    583.10
      .03     0.00      5.48     0.00      .070      .035      .050      .035    577.20   1002.66
  .002915      20.       20.       20.         2         0         1      0.00     47.86   1050.52

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      585.50 ELREA=      585.50

   599.00     5.42    582.22     0.00      0.00    582.89       .67       .09       .10    577.20
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   1015.      0.    1015.      0.      0.    155.      0.      4.      1.    577.20
     .03    0.00     6.55    0.00    .090    .035    .070    .035  576.80   1000.00
 .002775     30.      30.     30.       2       0       1    0.00   30.00   1036.05

NORMAL BRIDGE.NRD= 4 MIN ELTRD=  585.50 MAX ELLC=  582.50

                    BS-3  DETROIT & MACKINAC R.R. BRIDGE

  600.00    5.43  582.23    0.00    0.00  582.89     .67     .00     .00  585.50
   1015.      0.    1015.      0.      0.    155.      0.      4.      1.    585.50
     .03    0.00     6.55    0.00    .090    .030    .070    .035  576.80   1000.00
 .002881      1.       1.      1.       0       0       1    0.00   30.00   1030.00

  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

NORMAL BRIDGE.NRD= 4 MIN ELTRD=  585.50 MAX ELLC=  582.50

  610.00    5.47  582.27    0.00    0.00  582.92     .66     .03     .00  585.50
   1015.      0.    1015.      0.      0.    156.      0.      4.      1.    585.50
     .03    0.00     6.51    0.00    .090    .030    .070    .035  576.80   1000.00
 .002826     10.      10.     10.       1       0       1    0.00   30.00   1030.00

OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA=      585.50 ELREA=      585.50

  611.00    5.47  582.27    0.00    0.00  582.93     .66     .00     .00  577.20
   1015.      0.    1015.      0.      0.    156.      0.      4.      1.    577.20
     .03    0.00     6.51    0.00    .090    .035    .070    .034  576.80   1000.00
 .002707      1.       1.      1.       0       0       1    0.00   30.00   1036.10

  621.00    5.88  582.68    0.00    0.00  583.04     .36     .02     .09  583.90
   1015.      0.    1015.      0.      0.    211.      0.      4.      1.    583.10
     .04    0.00     4.81    0.00    .090    .035    .070    .034  576.80   1001.94
 .001962     10.      10.     10.       2       0       1    0.00   48.83   1050.77

3265 DIVIDED FLOW

3280 CROSS SECTION   3249.00 EXTENDED      1.96 FEET

3470 ENCROACHMENT STATIONS=     625.0    1600.0  TYPE=     1  TARGET=     975.000

                    VS-4 50 FT. D.S. FROM ELEVATOR ROAD

 3249.00    5.95  584.75    0.00    0.00  584.77     .02    1.63     .10  586.40
    985.     110.     334.    540.    265.    195.   1041.     55.     29.  583.60
     .84     .42     1.71     .52    .060    .040    .080    .039  578.80   625.00
 .000295    2628.    2628.   2628.       6       0       1    0.00  895.18  1600.00

3265 DIVIDED FLOW
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? Where are the Bridge sketches Photos and other Data to check model

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3280 CROSS SECTION    3299.00 EXTENDED       1.87 FEET


3470 ENCROACHMENT STATIONS=      750.0     1600.0  TYPE=      1  TARGET=      850.000

                 BS-5 ELEVATOR ROAD BOX CULVERT - 36 FT. OF 7' X 16' CONCRETE

                         BOX WITH HEADWALL

   3299.00      7.87    584.77      0.00      0.00    584.79       .02       .02       .00    586.40
      985.       33.      390.      562.      120.      212.     1047.       57.       30.    583.60
       .85       .27      1.84       .54      .080      .040      .080      .039    576.90    750.00
  .000314       50.       50.       50.         2         0         1      0.00    770.73   1600.00


SPECIAL BRIDGE

SB  XK        XKOR        COFQ      RDLEN       BWC       BWP     BAREA        SS     ELCHU     ELCHD
     0.00      1.63        3.00      0.00     16.00      0.00    108.00      0.00    576.90    576.90

3280 CROSS SECTION    3337.00 EXTENDED       2.90 FEET


    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

PRESSURE AND WEIR FLOW

    EGPRS     EGLWC       H3      QWEIR       QPR     BAREA      ELLC     ELTRD     CLASS

    586.87    584.79     0.00      638.      347.      108.    583.90    584.00     30.00


3470 ENCROACHMENT STATIONS=      750.0     1600.0  TYPE=      1  TARGET=      850.000
   3337.00      8.10    585.00      0.00      0.00    585.03       .03       .24      0.00    577.40
      985.      125.      304.      556.      368.      126.     1284.       58.       31.    576.90
       .86       .34      2.41       .43      .100      .040      .100      .039    576.90    750.00
  .000269       38.       38.       38.         2         0         5      0.00    850.00   1600.00


3280 CROSS SECTION    3353.00 EXTENDED       2.78 FEET


3470 ENCROACHMENT STATIONS=      800.0     1450.0  TYPE=      1  TARGET=      650.000
   3353.00      7.98    584.98      0.00      0.00    585.06       .07       .01       .02    577.50
      985.      132.      413.      440.      279.      124.     .804.       59.       31.    577.00
       .86       .47      3.33       .55      .100      .040      .100      .039    577.00    800.00
  .000524       16.       16.       16.         2         0         1      0.00    650.00   1450.00


3280 CROSS SECTION    3368.00 EXTENDED       2.51 FEET


3470 ENCROACHMENT STATIONS=      850.0     1300.0  TYPE=      1  TARGET=      450.000
   3368.00      7.71    584.91      0.00      0.00    585.15       .25       .01       .09    577.70
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985.      128.      605.      253.      179.      120.      363.      59.      31.      577.20
.86       .71       5.05      .70       .100      .040      .100      .039     577.20   850.00
.001263   15.       15.       15.       2         0         1         0.00     450.00   1300.00

3280 CROSS SECTION   3384.00 EXTENDED      2.25 FEET


3470 ENCROACHMENT STATIONS=      968.0     1048.0  TYPE=      1  TARGET=      80.000
3384.00   7.45      584.75    0.00      0.00      585.37    .62       .03      .19      577.80
985.      87.       803.      95.       61.       116.      64.       59.      31.      577.30
.86       1.43      6.95      1.48      .100      .040      .100      .039     577.30   968.00
.002505   16.       16.       16.       2         0         1         0.00     80.00    1048.00


OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      587.90 ELREA=      587.90

3399.00   7.16      584.56    0.00      0.00      585.66    1.10      .05      .24      578.60
985.      0.        985.      0.        0.        117.      0.        59.      31.      577.70
.86       0.00      8.40      0.00      .100      .040      .100      .039     577.40   1000.00
.005027   15.       15.       15.       2         0         1         0.00     18.00    1024.73


NORMAL BRIDGE,NRD=17 MIN ELTRD=  587.90 MAX ELLC=  585.00

                BS-6  PENN CENTRAL R.R. BRIDGE

3400.00   7.17      584.57    0.00      0.00      585.66    1.09      .01      .00      587.90
985.      0.        985.      0.        0.        117.      0.        59.      31.      587.70
.86       0.00      8.40      0.00      .100      .035      .100      .039     577.40   1000.00
.006619   1.        1.        1.        0         0         1         0.00     18.00    1018.00

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


NORMAL BRIDGE,NRD=17 MIN ELTRD=  587.90 MAX ELLC=  585.00

3409.00   7.27      584.67    0.00      0.00      585.73    1.06      .06      .01      587.90
985.      0.        985.      0.        0.        119.      0.        59.      31.      587.70
.86       0.00      8.26      0.00      .100      .035      .100      .039     577.40   1000.00
.006329   9.        9.        9.        2         0         1         0.00     18.00    1018.00


OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      587.90 ELREA=      587.90

3410.00   7.28      584.68    0.00      0.00      585.74    1.06      .01      .00      578.60
985.      0.        985.      0.        0.        119.      0.        59.      31.      577.70
.86       0.00      8.25      0.00      .100      .040      .100      .039     577.40   1000.00
.004763   1.        1.        1.        0         0         1         0.00     18.00    1024.84

3430.00   7.81      585.21    0.00      0.00      585.93    .73       .10      .10      587.90
985.      0.        985.      0.        0.        144.      0.        60.      31.      587.90
.87       0.00      6.84      0.00      .100      .040      .100      .039     577.40   997.15
.004760   20.       20.       20.       2         0         1         0.00     22.32    1019.47
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3280 CROSS SECTION   3486.00 EXTENDED      2.39 FEET

3470 ENCROACHMENT STATIONS=      913.0     1050.0  TYPE=      1  TARGET=      137.000
  3486.00      7.39    585.99      0.00      0.00    586.23       .24       .15       .15    585.70
     985.       45.      882.       58.       54.      213.       63.       60.       31.    585.10
      .87       .82      4.14       .91      .080      .045      .080      .039    578.60    913.00
 .001758       56.       56.       56.         3         0         1      0.00    137.00   1050.00

3280 CROSS SECTION   3542.00 EXTENDED      2.66 FEET

3470 ENCROACHMENT STATIONS=      857.0     1106.0  TYPE=      1  TARGET=      249.000
  3542.00      7.66    586.26      0.00      0.00    586.34       .09       .06       .05    585.70
     985.      177.      639.      169.      208.      223.      207.       60.       32.    585.10
      .88       .85      2.86       .82      .080      .045      .080      .039    578.60    857.00
 .000795       56.       56.       56.         2         0         1      0.00    249.00   1106.00

3280 CROSS SECTION   3600.00 EXTENDED      2.77 FEET

3470 ENCROACHMENT STATIONS=      800.0     1200.0  TYPE=      1  TARGET=      400.000

                 VS-7 200 FT. U.S. FROM PENN CENTRAL R.R.

  3600.00      7.77    586.37      0.00      0.00    586.39       .02       .02       .02    585.70
     985.      261.      374.      350.      371.      227.      483.       62.       32.    585.10
      .89       .70      1.65       .72      .060      .045      .060      .039    578.60    800.00
 .000256       58.       58.       58.         2         0         1      0.00    400.00   1200.00

3280 CROSS SECTION   5850.00 EXTENDED       .90 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     ITRTAL    IDC       ICONT     CORAR    TOPWID     ENDST

OVERBANK AREA ASSUMED NON-EFFECTIVE,FLLEA=      589.50 ELREA=      588.90

                 VS-8  AT TOWER LINE

  5850.00      7.90    587.60      0.00      0.00    588.06       .46      1.45       .22    589.50
     985.        0.      985.        0.        0.      181.        0.       94.       43.    588.90
     1.01      0.00      5.46      0.00      .060      .045      .060      .041    579.70    963.19
 .003830     2250.     2250.     2250.         2         0         1      0.00     35.44    998.63

3280 CROSS SECTION   6700.00 EXTENDED      1.86 FEET

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      592.70 ELREA=      591.50

                 VS-9  D.S. FROM JUNCTION OF TRIBUTARY
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     6700.00      8.96    589.76      0.00      0.00    589.97       .21      1.83       .08    592.70
      910.         0.      910.        0.        0.      250.        0.       98.        44.     591.50
        1.07      0.00      3.64      0.00      .060      .045      .060      .042    580.80   1004.25
     .001331      850.      850.      850.         2         0         1      0.00     41.34   1045.59

                 VS-10 200 FT. D.S. FROM BRIDGE ON M-13

     7800.00      7.15    591.25      0.00      0.00    591.36       .11      1.36       .03    596.70
      490.         0.      490.        0.        0.      185.        0.      104.        45.     596.10
        1.19      0.00      2.65      0.00      .090      .050      .090      .043    584.10   1010.82
     .001085     1100.     1100.     1100.         2         0         1      0.00     35.86   1046.68

     7974.00      7.34    591.44      0.00      0.00    591.54       .10       .18       .00    596.70
      490.         0.      490.        0.        0.      193.        0.      105.        45.     596.10
        1.21      0.00      2.54      0.00      .090      .050      .090      .043    584.10   1010.42
     .000973      174.      174.      174.         1         0         1      0.00     36.37   1046.78

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      594.80 ELREA=      594.80

     7999.00      7.00    591.40      0.00      0.00    591.65       .25       .03       .08    584.90
      490.         0.      490.        0.        0.      122.        0.      105.        45.     584.90
        1.21      0.00      4.02      0.00      .090      .050      .090      .043    584.40   1000.00
     .002014       25.       25.       25.         2         0         1      0.00     18.00   1024.93

NORMAL BRIDGE,NRD= 4 MIN ELTRD=  599.70 MAX ELLC=  594.80

                 BS-11 M-13 BRIDGE

     8000.00      7.00    591.40      0.00      0.00    591.65       .25       .00       .00    599.70
      490.         0.      490.        0.        0.      121.        0.      105.        45.     599.90
        1.21      0.00      4.04      0.00      .070      .040      .070      .043    584.40   1000.00
     .001992        1.        1.        1.         0         0         1      0.00     18.00   1018.00

      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

NORMAL BRIDGE,NRD= 4 MIN ELTRD=  599.70 MAX ELLC=  594.90

     8080.00      7.06    591.56      0.00      0.00    591.81       .24       .15       .00    599.70
      490.         0.      490.        0.        0.      124.        0.      105.        45.     599.90
        1.21      0.00      3.95      0.00      .070      .040      .070      .043    584.50   1065.00
     .001821       80.       80.       80.         0         0         1      0.00     18.00   1083.00

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      594.80 ELREA=      594.80

     8081.00      7.17    591.57      0.00      0.00    591.81       .24       .00       .00    584.90
      490.         0.      490.        0.        0.      125.        0.      105.        45.     584.90
        1.21      0.00      3.92      0.00      .070      .040      .070      .043    584.40   1000.00
     .001201        1.        1.        1.         0         0         1      0.00     18.00   1025.10
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8091.00	7.34	591.74	0.00	0.00	591.85	.12	.01	.04	599.70
490.	0.	490.	0.	0.	178.	0.	105.	45.	599.90
1.21	0.00	2.75	0.00	.070	.040	.070	.043	584.40	992.61
.000701	10.	10.	10.	2	0	1	0.00	32.68	1025.29

8676.00	7.30	592.40	0.00	0.00	592.60	.19	.71	.04	599.10
490.	0.	490.	0.	0.	138.	0.	107.	46.	598.90
1.26	0.00	3.54	0.00	.070	.055	.090	.044	585.10	236.13
.002554	585.	585.	585.	2	0	1	0.00	27.87	264.00

3280 CROSS SECTION 9250.00 EXTENDED .76 FEET

OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA= 598.60 ELREA= 598.20

VS-12 U.S. FROM M-13

9250.00	8.07	593.87	0.00	0.00	594.03	.17	1.42	.01	598.60
490.	0.	490.	0.	0.	150.	0.	109.	46.	598.20
1.31	0.00	3.26	0.00	.070	.060	.090	.045	585.80	205.92
.002407	574.	574.	574.	2	0	1	0.00	28.92	234.84

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Kawkawlin Twp

3) WATERCOURSE: Railroad Drain

4) DOCUMENT TYPE: Summary

00BREAK00

SUMMARY PRINTOUT FOR MULTIPLE PROFILES

AWLIN TWP. BAY CO

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	WSELK	CWSEL	TQ	EG	TOPWID	HV	VCH
50.00	50.00	0.00	0.00	572.30	640.00	581.90	581.90	622.51	581.93	61.00	.03	1.49
50.00	50.00	0.00	0.00	572.30	885.00	581.90	581.90	622.51	581.97	61.00	.07	2.06
50.00	50.00	0.00	0.00	572.30	1015.00	581.90	581.90	622.51	581.99	61.00	.09	2.37
50.00	50.00	0.00	0.00	572.30	1205.00	581.90	581.90	622.51	582.02	61.00	.12	2.81
300.00	250.00	0.00	0.00	574.70	640.00	0.00	581.92	362.69	582.00	49.97	.08	2.25
300.00	250.00	0.00	0.00	574.70	885.00	0.00	581.94	364.34	582.09	50.02	.15	3.11
300.00	250.00	0.00	0.00	574.70	1015.00	0.00	581.95	365.63	582.15	50.06	.20	3.55
300.00	250.00	0.00	0.00	574.70	1205.00	0.00	581.97	366.85	582.25	50.10	.28	4.21
549.00	249.00	0.00	0.00	577.20	640.00	0.00	582.00	170.06	582.21	47.32	.21	3.69
549.00	249.00	0.00	0.00	577.20	885.00	0.00	582.09	177.17	582.47	47.54	.38	4.97
549.00	249.00	0.00	0.00	577.20	1015.00	0.00	582.15	181.48	582.64	47.67	.49	5.61
549.00	249.00	0.00	0.00	577.20	1205.00	0.00	582.25	189.07	582.90	47.89	.65	6.48
569.00	20.00	0.00	0.00	577.20	640.00	0.00	582.03	173.17	582.24	47.42	.21	3.65
569.00	20.00	0.00	0.00	577.20	885.00	0.00	582.15	181.90	582.52	47.68	.37	4.88
569.00	20.00	0.00	0.00	577.20	1015.00	0.00	582.24	187.98	582.70	47.86	.47	5.48
569.00	20.00	0.00	0.00	577.20	1205.00	0.00	582.38	198.94	582.99	48.18	.61	6.26
599.00	30.00	0.00	0.00	576.80	640.00	0.00	582.03	181.20	582.32	30.00	.29	4.29
599.00	30.00	0.00	0.00	576.80	885.00	0.00	582.15	188.09	582.67	30.00	.52	5.80
599.00	30.00	0.00	0.00	576.80	1015.00	0.00	582.22	192.69	582.89	30.00	.67	6.55
599.00	30.00	0.00	0.00	576.80	1205.00	0.00	582.35	200.59	583.25	30.00	.89	7.59
600.00	1.00	585.50	582.50	576.80	640.00	0.00	582.03	178.65	582.32	30.00	.29	4.29
600.00	1.00	585.50	582.50	576.80	885.00	0.00	582.15	184.93	582.67	30.00	.52	5.80
600.00	1.00	585.50	582.50	576.80	1015.00	0.00	582.23	189.09	582.89	30.00	.67	6.55
600.00	1.00	585.50	582.50	576.80	1205.00	0.00	582.36	196.23	583.25	30.00	.89	7.59
610.00	10.00	585.50	582.50	576.80	640.00	0.00	582.05	179.33	582.33	30.00	.28	4.28
610.00	10.00	585.50	582.50	576.80	885.00	0.00	582.18	186.15	582.69	30.00	.52	5.77
610.00	10.00	585.50	582.50	576.80	1015.00	0.00	582.27	190.93	582.92	30.00	.66	6.51
610.00	10.00	585.50	582.50	576.80	1205.00	0.00	582.43	162.00	583.30	30.00	.87	7.49
611.00	1.00	0.00	0.00	576.80	640.00	0.00	582.05	182.11	582.33	30.00	.28	4.28
611.00	1.00	0.00	0.00	576.80	885.00	0.00	582.18	189.73	582.70	30.00	.52	5.77
611.00	1.00	0.00	0.00	576.80	1015.00	0.00	582.27	195.08	582.93	30.00	.66	6.51
611.00	1.00	0.00	0.00	576.80	1205.00	0.00	582.44	205.46	583.31	30.00	.87	7.48
621.00	10.00	0.00	0.00	576.80	640.00	0.00	582.19	191.43	582.38	47.77	.18	3.42
621.00	10.00	0.00	0.00	576.80	885.00	0.00	582.48	213.29	582.78	48.39	.30	4.40
621.00	10.00	0.00	0.00	576.80	1015.00	0.00	582.68	229.15	583.04	48.83	.36	4.81
621.00	10.00	0.00	0.00	576.80	1205.00	0.00	583.03	256.92	583.46	49.57	.43	5.29
3249.00	2628.00	0.00	0.00	578.80	620.00	0.00	584.03	313.88	584.06	805.54	.03	1.79
3249.00	2628.00	0.00	0.00	578.80	855.00	0.00	584.52	475.68	584.54	883.61	.02	1.74
3249.00	2628.00	0.00	0.00	578.80	985.00	0.00	584.75	573.41	584.77	895.18	.02	1.71
3249.00	2628.00	0.00	0.00	578.80	1170.00	0.00	585.09	731.88	585.11	911.69	.02	1.66

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	WSELK	CWSEL	TQ	EG	TOPWID	HV	VCH
3299.00	50.00	0.00	0.00	576.90	620.00	0.00	584.05	332.94	584.08	684.92	.03	1.78
3299.00	50.00	0.00	0.00	576.90	855.00	0.00	584.54	475.21	584.56	759.50	.02	1.82
3299.00	50.00	0.00	0.00	576.90	985.00	0.00	584.77	556.11	584.79	770.73	.02	1.84
3299.00	50.00	0.00	0.00	576.90	1170.00	0.00	585.10	686.51	585.12	786.93	.02	1.84
3337.00	38.00	584.00	583.90	576.90	620.00	0.00	584.48	430.66	584.50	850.00	.03	2.02
3337.00	38.00	584.00	583.90	576.90	855.00	0.00	584.84	545.45	584.87	850.00	.03	2.27
3337.00	38.00	584.00	583.90	576.90	985.00	0.00	585.00	600.88	585.03	850.00	.03	2.41
3337.00	38.00	584.00	583.90	576.90	1170.00	0.00	585.26	699.19	585.29	850.00	.03	2.51
3353.00	16.00	0.00	0.00	577.00	620.00	0.00	584.46	311.83	584.53	650.00	.06	2.77
3353.00	16.00	0.00	0.00	577.00	855.00	0.00	584.82	390.85	584.89	650.00	.07	3.14
3353.00	16.00	0.00	0.00	577.00	985.00	0.00	584.98	430.44	585.06	650.00	.07	3.33
3353.00	16.00	0.00	0.00	577.00	1170.00	0.00	585.25	501.69	585.32	650.00	.07	3.47
3368.00	15.00	0.00	0.00	577.20	620.00	0.00	584.41	207.97	584.60	450.00	.19	4.05
3368.00	15.00	0.00	0.00	577.20	855.00	0.00	584.76	254.07	584.98	450.00	.23	4.72
3368.00	15.00	0.00	0.00	577.20	985.00	0.00	584.91	277.15	585.15	450.00	.25	5.05
3368.00	15.00	0.00	0.00	577.20	1170.00	0.00	585.17	321.13	585.42	450.00	.25	5.30
3384.00	16.00	0.00	0.00	577.30	620.00	0.00	584.37	175.62	584.67	80.00	.29	4.73
3384.00	16.00	0.00	0.00	577.30	855.00	0.00	584.65	190.92	585.14	80.00	.49	6.16
3384.00	16.00	0.00	0.00	577.30	985.00	0.00	584.75	196.79	585.37	80.00	.62	6.95
3384.00	16.00	0.00	0.00	577.30	1170.00	0.00	584.93	207.43	585.73	80.00	.80	7.96
3399.00	15.00	0.00	0.00	577.40	620.00	0.00	584.31	130.80	584.78	18.00	.47	5.50
3399.00	15.00	0.00	0.00	577.40	855.00	0.00	584.52	137.38	585.35	18.00	.84	7.35
3399.00	15.00	0.00	0.00	577.40	985.00	0.00	584.56	138.93	585.66	18.00	1.10	8.40
3399.00	15.00	0.00	0.00	577.40	1170.00	0.00	584.64	141.48	586.15	18.00	1.51	9.86
3400.00	1.00	587.90	585.00	577.40	620.00	0.00	584.31	114.54	584.78	18.00	.47	5.50
3400.00	1.00	587.90	585.00	577.40	855.00	0.00	584.52	119.82	585.36	18.00	.84	7.34
3400.00	1.00	587.90	585.00	577.40	985.00	0.00	584.57	121.07	585.66	18.00	1.09	8.40
3400.00	1.00	587.90	585.00	577.40	1170.00	0.00	584.65	123.12	586.16	18.00	1.51	9.85
3409.00	9.00	587.90	585.00	577.40	620.00	0.00	584.34	115.13	584.81	18.00	.47	5.48
3409.00	9.00	587.90	585.00	577.40	855.00	0.00	584.59	121.63	585.41	18.00	.82	7.26
3409.00	9.00	587.90	585.00	577.40	985.00	0.00	584.67	123.82	585.73	18.00	1.06	8.26
3409.00	9.00	587.90	585.00	577.40	1170.00	0.00	584.84	128.09	586.26	18.00	1.42	9.57
3410.00	1.00	0.00	0.00	577.40	620.00	0.00	584.35	131.69	584.81	18.00	.47	5.48
3410.00	1.00	0.00	0.00	577.40	855.00	0.00	584.60	139.93	585.41	18.00	.82	7.26
3410.00	1.00	0.00	0.00	577.40	985.00	0.00	584.68	142.72	585.74	18.00	1.06	8.25
3410.00	1.00	0.00	0.00	577.40	1170.00	0.00	584.85	148.19	586.27	18.00	1.42	9.56
3430.00	20.00	0.00	0.00	577.40	620.00	0.00	584.53	122.33	584.89	21.89	.36	4.81
3430.00	20.00	0.00	0.00	577.40	855.00	0.00	584.97	135.26	585.56	22.16	.59	6.18
3430.00	20.00	0.00	0.00	577.40	985.00	0.00	585.21	142.77	585.93	22.32	.73	6.84
3430.00	20.00	0.00	0.00	577.40	1170.00	0.00	585.64	156.01	586.54	22.58	.90	7.63

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	WSELK	CWSEL	TQ	EG	TOPWID	HV	VCH
3486.00	56.00	0.00	0.00	578.60	620.00	0.00	584.86	151.95	585.06	93.46	.20	3.57
3486.00	56.00	0.00	0.00	578.60	855.00	0.00	585.57	198.35	585.81	132.94	.24	4.06
3486.00	56.00	0.00	0.00	578.60	985.00	0.00	585.99	234.93	586.23	137.00	.24	4.14
3486.00	56.00	0.00	0.00	578.60	1170.00	0.00	586.68	305.93	586.89	137.00	.22	4.06
3542.00	56.00	0.00	0.00	578.60	620.00	0.00	585.04	188.30	585.16	223.71	.11	2.93
3542.00	56.00	0.00	0.00	578.60	855.00	0.00	585.83	282.82	585.92	249.00	.10	2.92
3542.00	56.00	0.00	0.00	578.60	985.00	0.00	586.26	349.39	586.34	249.00	.09	2.86
3542.00	56.00	0.00	0.00	578.60	1170.00	0.00	586.91	466.92	586.99	249.00	.07	2.73
3600.00	58.00	0.00	0.00	578.60	620.00	0.00	585.18	294.93	585.22	383.20	.03	1.90
3600.00	58.00	0.00	0.00	578.60	855.00	0.00	585.95	487.29	585.98	400.00	.02	1.72
3600.00	58.00	0.00	0.00	578.60	985.00	0.00	586.37	615.60	586.39	400.00	.02	1.65
3600.00	58.00	0.00	0.00	578.60	1170.00	0.00	587.00	841.34	587.02	400.00	.02	1.53
5850.00	2250.00	0.00	0.00	579.70	620.00	0.00	586.95	135.07	587.19	32.66	.24	3.91
5850.00	2250.00	0.00	0.00	579.70	855.00	0.00	587.39	150.99	587.77	34.54	.38	4.94
5850.00	2250.00	0.00	0.00	579.70	985.00	0.00	587.60	159.16	588.06	35.44	.46	5.46
5850.00	2250.00	0.00	0.00	579.70	1170.00	0.00	587.92	172.60	588.50	36.86	.57	6.08
6700.00	850.00	0.00	0.00	580.80	565.00	0.00	588.34	173.56	588.47	38.15	.13	2.92
6700.00	850.00	0.00	0.00	580.80	785.00	0.00	589.29	222.50	589.47	40.27	.18	3.41
6700.00	850.00	0.00	0.00	580.80	910.00	0.00	589.76	249.39	589.97	41.34	.21	3.64
6700.00	850.00	0.00	0.00	580.80	1130.00	0.00	590.44	290.20	590.69	42.86	.26	4.06
7800.00	1100.00	0.00	0.00	584.10	300.00	0.00	589.59	89.98	589.67	31.81	.08	2.32
7800.00	1100.00	0.00	0.00	584.10	420.00	0.00	590.69	127.56	590.79	34.51	.10	2.53
7800.00	1100.00	0.00	0.00	584.10	490.00	0.00	591.25	148.79	591.36	35.86	.11	2.65
7800.00	1100.00	0.00	0.00	584.10	620.00	0.00	592.10	185.19	592.22	37.97	.13	2.86
7974.00	174.00	0.00	0.00	584.10	300.00	0.00	589.78	95.99	589.86	32.28	.08	2.21
7974.00	174.00	0.00	0.00	584.10	420.00	0.00	590.88	135.19	590.97	35.01	.09	2.43
7974.00	174.00	0.00	0.00	584.10	490.00	0.00	591.44	157.09	591.54	36.37	.10	2.54
7974.00	174.00	0.00	0.00	584.10	620.00	0.00	592.29	194.12	592.41	38.46	.12	2.76
7999.00	25.00	0.00	0.00	584.40	300.00	0.00	589.77	72.36	589.93	18.00	.16	3.24
7999.00	25.00	0.00	0.00	584.40	420.00	0.00	590.85	96.43	591.07	18.00	.22	3.75
7999.00	25.00	0.00	0.00	584.40	490.00	0.00	591.40	109.20	591.65	18.00	.25	4.02
7999.00	25.00	0.00	0.00	584.40	620.00	0.00	592.23	129.55	592.55	18.00	.32	4.53
8000.00	1.00	599.70	594.80	584.40	300.00	0.00	589.77	74.42	589.94	18.00	.17	3.26
8000.00	1.00	599.70	594.80	584.40	420.00	0.00	590.85	97.64	591.07	18.00	.22	3.77
8000.00	1.00	599.70	594.80	584.40	490.00	0.00	591.40	109.78	591.65	18.00	.25	4.04
8000.00	1.00	599.70	594.80	584.40	620.00	0.00	592.23	128.91	592.55	18.00	.32	4.55
8080.00	80.00	599.70	594.90	584.50	300.00	0.00	589.91	78.32	590.06	18.00	.16	3.18
8080.00	80.00	599.70	594.90	584.50	420.00	0.00	591.01	102.27	591.22	18.00	.21	3.68
8080.00	80.00	599.70	594.90	584.50	490.00	0.00	591.56	114.82	591.81	18.00	.24	3.95
8080.00	80.00	599.70	594.90	584.50	620.00	0.00	592.43	134.91	592.73	18.00	.31	4.44

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	WSELK	CWSEL	TQ	EG	TOPWID	HV	VCH
8081.00	1.00	0.00	0.00	584.40	300.00	0.00	589.91	94.12	590.06	18.00	.15	3.15
8081.00	1.00	0.00	0.00	584.40	420.00	0.00	591.01	124.98	591.22	18.00	.21	3.66
8081.00	1.00	0.00	0.00	584.40	490.00	0.00	591.57	141.40	591.81	18.00	.24	3.92
8081.00	1.00	0.00	0.00	584.40	620.00	0.00	592.43	168.01	592.74	18.00	.30	4.42
8091.00	10.00	0.00	0.00	584.40	300.00	0.00	590.00	112.40	590.09	28.96	.09	2.40
8091.00	10.00	0.00	0.00	584.40	420.00	0.00	591.15	158.53	591.26	31.43	.11	2.63
8091.00	10.00	0.00	0.00	584.40	490.00	0.00	591.74	185.06	591.85	32.68	.12	2.75
8091.00	10.00	0.00	0.00	584.40	620.00	0.00	592.66	231.12	592.80	34.67	.14	2.96
8676.00	585.00	0.00	0.00	585.10	300.00	0.00	590.70	57.66	590.85	23.69	.16	3.18
8676.00	585.00	0.00	0.00	585.10	420.00	0.00	591.82	82.36	592.01	26.45	.18	3.43
8676.00	585.00	0.00	0.00	585.10	490.00	0.00	592.40	96.96	592.60	27.87	.19	3.54
8676.00	585.00	0.00	0.00	585.10	620.00	0.00	593.33	123.31	593.55	30.14	.22	3.75
9250.00	574.00	0.00	0.00	585.80	300.00	0.00	592.19	61.67	592.31	24.83	.13	2.85
9250.00	574.00	0.00	0.00	585.80	420.00	0.00	593.30	85.77	593.45	27.53	.15	3.13
9250.00	574.00	0.00	0.00	585.80	490.00	0.00	593.87	99.87	594.03	28.92	.17	3.26
9250.00	574.00	0.00	0.00	585.80	620.00	0.00	594.80	125.70	594.99	31.19	.19	3.48

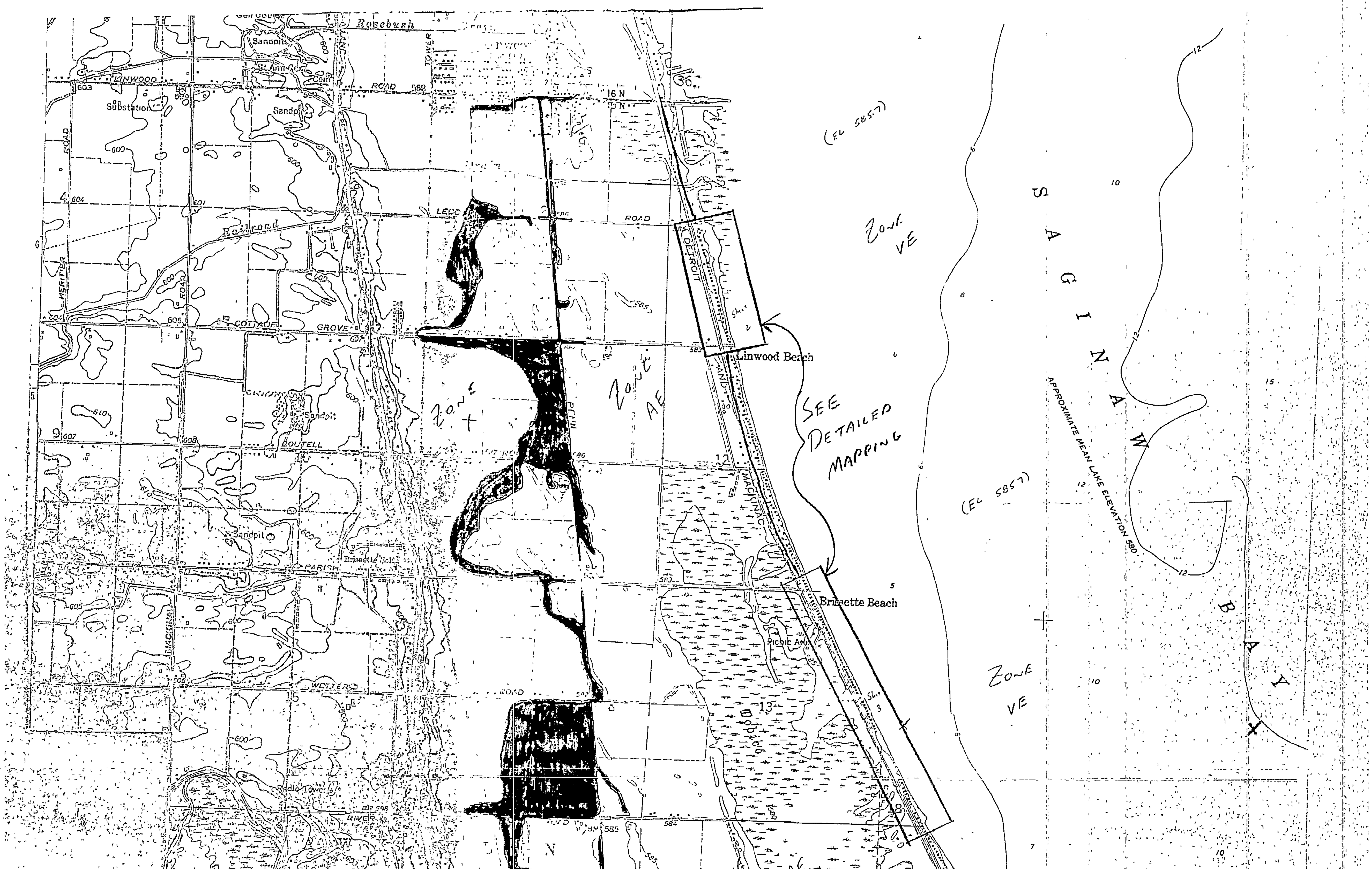
SECTION NUMBER	DISCHARGE CFS	CWSEL	CWSEL DIFF EACH Q	CWSEL DIFF EACH SECTION	CWSEL-WSELK	TOPWID	T.W. DIFF	LENGTH
50.000	640.000	581.900	0.000	0.000	0.000	61.000	0.000	50.000
50.000	885.000	581.900	0.000	0.000	0.000	61.000	0.000	50.000
50.000	1015.000	581.900	0.000	0.000	0.000	61.000	0.000	50.000
50.000	1205.000	581.900	0.000	0.000	0.000	61.000	0.000	50.000
300.000	640.000	581.920	0.000	.020	0.000	49.971	0.000	250.000
300.000	885.000	581.939	.018	.039	0.000	50.023	-.052	250.000
300.000	1015.000	581.951	.012	.051	0.000	50.063	-.092	250.000
300.000	1205.000	581.972	.021	.072	0.000	50.101	-.130	250.000
549.000	640.000	581.998	0.000	.077	0.000	47.323	0.000	249.000
549.000	885.000	582.088	.090	.149	0.000	47.539	-.216	249.000
549.000	1015.000	582.148	.060	.197	0.000	47.668	-.345	249.000
549.000	1205.000	582.252	.104	.280	0.000	47.892	-.570	249.000
569.000	640.000	582.032	0.000	.034	0.000	47.418	0.000	20.000
569.000	885.000	582.154	.122	.066	0.000	47.680	-.263	20.000
569.000	1015.000	582.237	.083	.089	0.000	47.860	-.443	20.000
569.000	1205.000	582.384	.147	.132	0.000	48.178	-.761	20.000
599.000	640.000	582.031	0.000	-.001	0.000	30.000	0.000	30.000
599.000	885.000	582.146	.115	-.008	0.000	30.000	0.000	30.000
599.000	1015.000	582.222	.076	-.015	0.000	30.000	0.000	30.000
599.000	1205.000	582.350	.129	-.034	0.000	30.000	0.000	30.000
600.000	640.000	582.033	0.000	.001	0.000	30.000	0.000	1.000
600.000	885.000	582.149	.116	.003	0.000	30.000	0.000	1.000
600.000	1015.000	582.225	.077	.004	0.000	30.000	0.000	1.000
600.000	1205.000	582.356	.130	.005	0.000	30.000	0.000	1.000
610.000	640.000	582.047	0.000	.015	0.000	30.000	0.000	10.000
610.000	885.000	582.178	.130	.029	0.000	30.000	0.000	10.000
610.000	1015.000	582.265	.088	.040	0.000	30.000	0.000	10.000
610.000	1205.000	582.430	.164	.074	0.000	30.000	0.000	10.000
611.000	640.000	582.049	0.000	.001	0.000	30.000	0.000	1.000
611.000	885.000	582.180	.132	.003	0.000	30.000	0.000	1.000
611.000	1015.000	582.269	.088	.004	0.000	30.000	0.000	1.000
611.000	1205.000	582.437	.169	.008	0.000	30.000	0.000	1.000

621.000	640.000	582.194	0.000	.145	0.000	47.769	0.000	10.000
621.000	885.000	582.481	.287	.301	0.000	48.394	-.625	10.000
621.000	1015.000	582.679	.198	.410	0.000	48.831	-1.062	10.000
621.000	1205.000	583.030	.351	.592	0.000	49.567	-1.798	10.000
3249.000	620.000	584.031	0.000	1.837	0.000	805.542	0.000	2628.000
3249.000	855.000	584.522	.491	2.041	0.000	883.612	-78.070	2628.000
3249.000	985.000	584.755	.233	2.075	0.000	895.178	-89.635	2628.000
3249.000	1170.000	585.090	.336	2.060	0.000	911.690	-106.147	2628.000
3299.000	620.000	584.048	0.000	.018	0.000	684.917	0.000	50.000
3299.000	855.000	584.536	.487	.014	0.000	759.500	-74.583	50.000
3299.000	985.000	584.767	.231	.013	0.000	770.730	-85.813	50.000
3299.000	1170.000	585.101	.334	.011	0.000	786.926	-102.009	50.000
3337.000	620.000	584.479	0.000	.430	0.000	849.999	0.000	38.000
3337.000	855.000	584.841	.362	.305	0.000	849.999	-.000	38.000
3337.000	985.000	584.999	.159	.232	0.000	849.999	-.000	38.000
3337.000	1170.000	585.262	.263	.162	0.000	849.999	-.000	38.000
3353.000	620.000	584.465	0.000	-.014	0.000	649.999	0.000	16.000
3353.000	855.000	584.825	.360	-.016	0.000	649.999	-.000	16.000
3353.000	985.000	584.983	.158	-.017	0.000	649.999	-.000	16.000
3353.000	1170.000	585.246	.264	-.016	0.000	649.999	-.000	16.000
3368.000	620.000	584.411	0.000	-.053	0.000	449.999	0.000	15.000
3368.000	855.000	584.757	.346	-.067	0.000	449.999	-.000	15.000
3368.000	985.000	584.909	.151	-.074	0.000	449.999	-.000	15.000
3368.000	1170.000	585.171	.263	-.075	0.000	449.999	-.000	15.000
3384.000	620.000	584.375	0.000	-.036	0.000	79.999	0.000	16.000
3384.000	855.000	584.650	.275	-.108	0.000	79.999	-.000	16.000
3384.000	985.000	584.750	.101	-.158	0.000	79.999	-.000	16.000
3384.000	1170.000	584.927	.176	-.245	0.000	79.999	-.000	16.000
3399.000	620.000	584.311	0.000	-.064	0.000	18.000	0.000	15.000
3399.000	855.000	584.516	.205	-.134	0.000	18.000	0.000	15.000
3399.000	985.000	584.563	.047	-.188	0.000	18.000	0.000	15.000
3399.000	1170.000	584.640	.077	-.287	0.000	18.000	0.000	15.000
3400.000	620.000	584.314	0.000	.003	0.000	18.000	0.000	1.000
3400.000	855.000	584.521	.207	.005	0.000	18.000	0.000	1.000
3400.000	985.000	584.570	.049	.007	0.000	18.000	0.000	1.000
3400.000	1170.000	584.650	.080	.011	0.000	18.000	0.000	1.000
3409.000	620.000	584.344	0.000	.031	0.000	18.000	0.000	9.000
3409.000	855.000	584.590	.245	.069	0.000	18.000	0.000	9.000
3409.000	985.000	584.674	.084	.104	0.000	18.000	0.000	9.000
3409.000	1170.000	584.837	.163	.187	0.000	18.000	0.000	9.000
3410.000	620.000	584.348	0.000	.003	0.000	18.000	0.000	1.000
3410.000	855.000	584.596	.248	.006	0.000	18.000	0.000	1.000
3410.000	985.000	584.682	.087	.008	0.000	18.000	0.000	1.000
3410.000	1170.000	584.849	.167	.012	0.000	18.000	0.000	1.000
3430.000	620.000	584.533	0.000	.186	0.000	21.892	0.000	20.000
3430.000	855.000	584.966	.433	.371	0.000	22.165	-.273	20.000
3430.000	985.000	585.207	.240	.525	0.000	22.319	-.427	20.000
3430.000	1170.000	585.639	.433	.790	0.000	22.584	-.691	20.000
3486.000	620.000	584.860	0.000	.327	0.000	93.457	0.000	56.000
3486.000	855.000	585.571	.711	.605	0.000	132.943	-39.486	56.000
3486.000	985.000	585.994	.423	.787	0.000	136.999	-43.542	56.000
3486.000	1170.000	586.677	.683	1.037	0.000	136.999	-43.542	56.000

3542.000	620.000	585.042	0.000	.182	0.000	223.707	0.000	56.000
3542.000	855.000	585.828	.786	.257	0.000	248.999	-25.292	56.000
3542.000	985.000	586.256	.428	.262	0.000	248.999	-25.292	56.000
3542.000	1170.000	586.915	.659	.238	0.000	248.999	-25.292	56.000
3600.000	620.000	585.183	0.000	.141	0.000	383.201	0.000	58.000
3600.000	855.000	585.951	.768	.123	0.000	399.999	-16.798	58.000
3600.000	985.000	586.365	.414	.109	0.000	399.999	-16.798	58.000
3600.000	1170.000	587.005	.639	.090	0.000	399.999	-16.798	58.000
5850.000	620.000	586.953	0.000	1.769	0.000	32.657	0.000	2250.000
5850.000	855.000	587.389	.436	1.438	0.000	34.537	-1.880	2250.000
5850.000	985.000	587.599	.210	1.234	0.000	35.443	-2.786	2250.000
5850.000	1170.000	587.925	.325	.920	0.000	36.860	-4.203	2250.000
6700.000	565.000	588.342	0.000	1.390	0.000	38.151	0.000	850.000
6700.000	785.000	589.285	.943	1.896	0.000	40.272	-2.121	850.000
6700.000	910.000	589.761	.475	2.161	0.000	41.342	-3.192	850.000
6700.000	1130.000	590.437	.676	2.512	0.000	42.864	-4.713	850.000
7800.000	300.000	589.591	0.000	1.249	0.000	31.815	0.000	1100.000
7800.000	420.000	590.694	1.103	1.409	0.000	34.513	-2.699	1100.000
7800.000	490.000	591.248	.554	1.487	0.000	35.865	-4.050	1100.000
7800.000	620.000	592.096	.848	1.659	0.000	37.972	-6.157	1100.000
7974.000	300.000	589.782	0.000	.191	0.000	32.279	0.000	174.000
7974.000	420.000	590.882	1.100	.188	0.000	35.011	-2.732	174.000
7974.000	490.000	591.437	.555	.189	0.000	36.367	-4.088	174.000
7974.000	620.000	592.293	.856	.197	0.000	38.456	-6.176	174.000
7999.000	300.000	589.770	0.000	-.012	0.000	18.000	0.000	25.000
7999.000	420.000	590.852	1.081	-.030	0.000	18.000	0.000	25.000
7999.000	490.000	591.395	.544	-.041	0.000	18.000	0.000	25.000
7999.000	620.000	592.229	.834	-.063	0.000	18.000	0.000	25.000
8000.000	300.000	589.771	0.000	.000	0.000	18.000	0.000	1.000
8000.000	420.000	590.852	1.081	.000	0.000	18.000	0.000	1.000
8000.000	490.000	591.396	.544	.000	0.000	18.000	0.000	1.000
8000.000	620.000	592.230	.834	.000	0.000	18.000	0.000	1.000
8080.000	300.000	589.906	0.000	.135	0.000	18.000	0.000	80.000
8080.000	420.000	591.008	1.102	.155	0.000	18.000	0.000	80.000
8080.000	490.000	591.564	.556	.168	0.000	18.000	0.000	80.000
8080.000	620.000	592.428	.864	.198	0.000	18.000	0.000	80.000
8081.000	300.000	589.910	0.000	.004	0.000	18.000	0.000	1.000
8081.000	420.000	591.012	1.102	.005	0.000	18.000	0.000	1.000
8081.000	490.000	591.569	.557	.005	0.000	18.000	0.000	1.000
8081.000	620.000	592.433	.864	.006	0.000	18.000	0.000	1.000
8091.000	300.000	590.002	0.000	.093	0.000	28.959	0.000	10.000
8091.000	420.000	591.151	1.148	.139	0.000	31.425	-2.467	10.000
8091.000	490.000	591.736	.586	.167	0.000	32.683	-3.724	10.000
8091.000	620.000	592.659	.923	.226	0.000	34.666	-5.707	10.000
8676.000	300.000	590.697	0.000	.694	0.000	23.691	0.000	585.000
8676.000	420.000	591.825	1.128	.674	0.000	26.450	-2.759	585.000
8676.000	490.000	592.404	.579	.668	0.000	27.867	-4.176	585.000
8676.000	620.000	593.334	.930	.675	0.000	30.143	-6.452	585.000
9250.000	300.000	592.188	0.000	1.491	0.000	24.830	0.000	574.000
9250.000	420.000	593.297	1.109	1.472	0.000	27.533	-2.703	574.000
9250.000	490.000	593.866	.568	1.462	0.000	28.919	-4.088	574.000
9250.000	620.000	594.798	.932	1.463	0.000	31.192	-6.362	574.000

DATA FOR LAST CROSS SECTION

PROFILE	TYPE ENC	TARGET	TOP WIDTH AREA-ACRES	TOP WIDTH AREA-DIFF
1	0.000	0.000	42.372	0.000
2	0.000	0.000	45.627	3.256
3	0.000	0.000	46.129	3.758
4	0.000	0.000	46.856	4.484



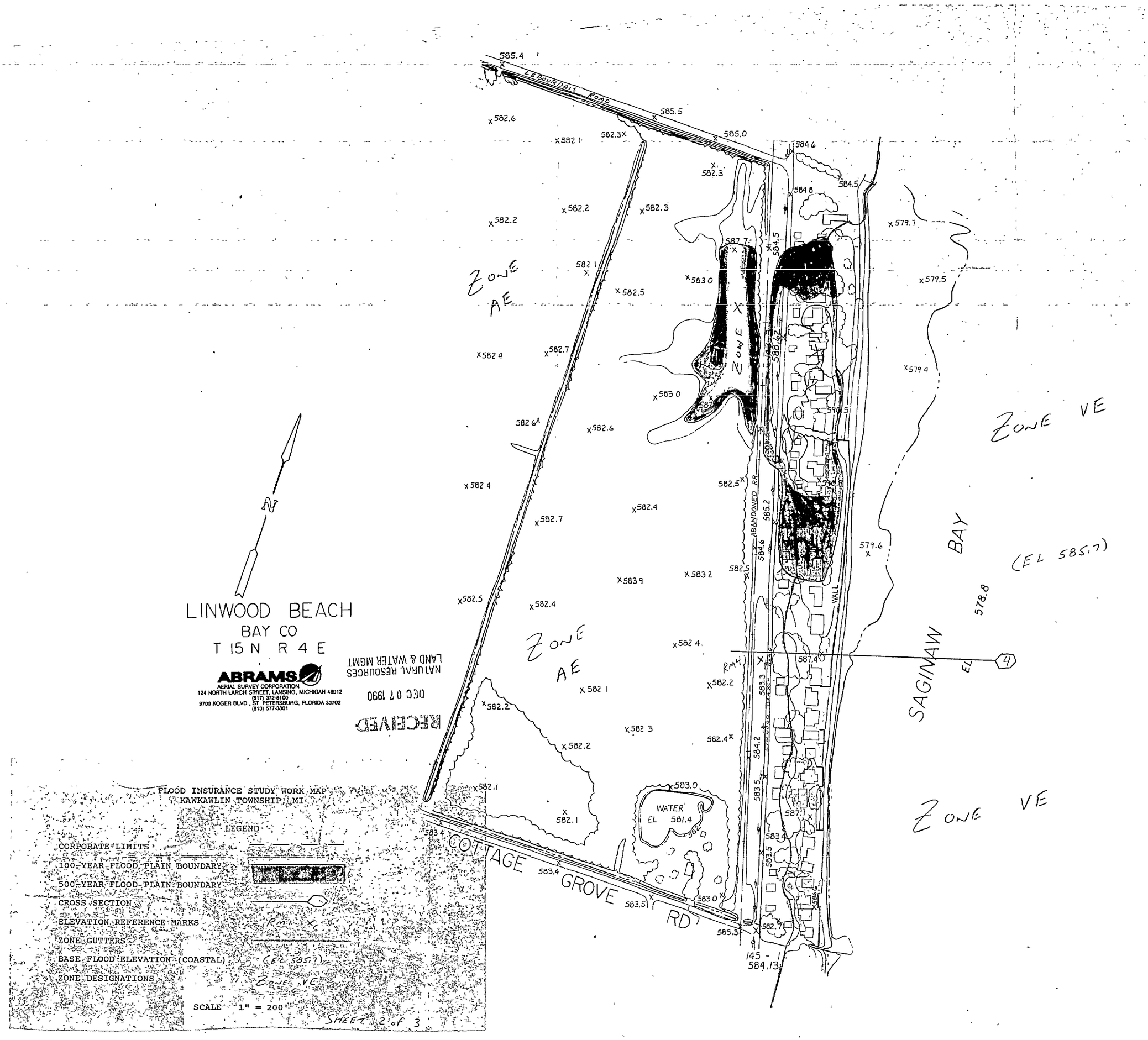
FLOOD INSURANCE STUDY WORK MAP
KAWKAWLIN TOWNSHIP, MI

LEGEND

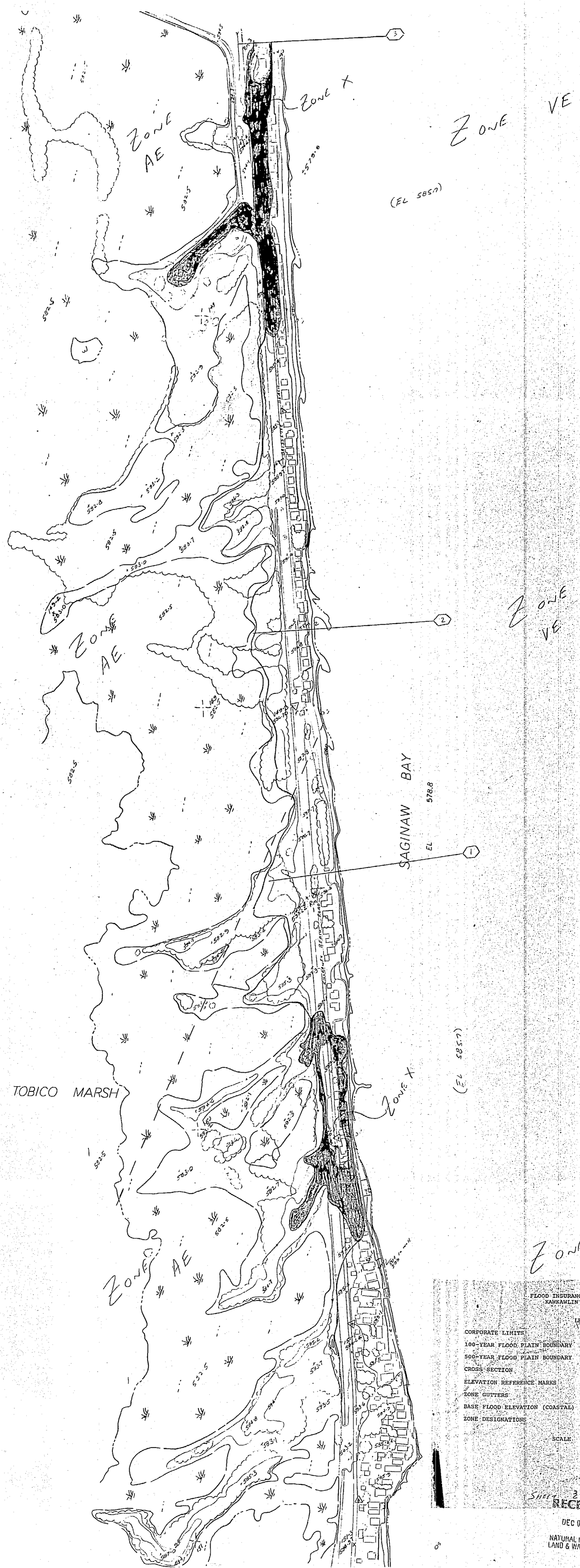
CORPORATE LIMITS
100-YEAR FLOOD PLAIN BOUNDARY
500-YEAR FLOOD PLAIN BOUNDARY
CROSS SECTION
ELEVATION REFERENCE MARKS — RM11 ×
ZONE GUTTERS
BASE FLOOD ELEVATION (COASTAL) — (EL 585.7)
ZONE DESIGNATIONS — Zone VE

1" = 1000 ft

Sheet 1 of 3



BAY Co. MI
Gaudie, Fraser
Kawkawlin Twp (Area 1)
1" = 200' 2' CI
W.O. 23535



BRISSETTE &
KILLARNEY BEACH
BAY CO
T 15 N R 4 & 5 E

ABRAMS
AERIAL SURVEY CORPORATION
124 NORTH LARCH STREET, LANSING, MICHIGAN 48912
(517) 372-8100
9700 KOGER BLVD., ST. PETERSBURG, FLORIDA 33702
(813) 577-3801

MANU 2

FLOOD INSURANCE STUDY WORK MAP
KAWKAWLIN TOWNSHIP, MI

LEGEND

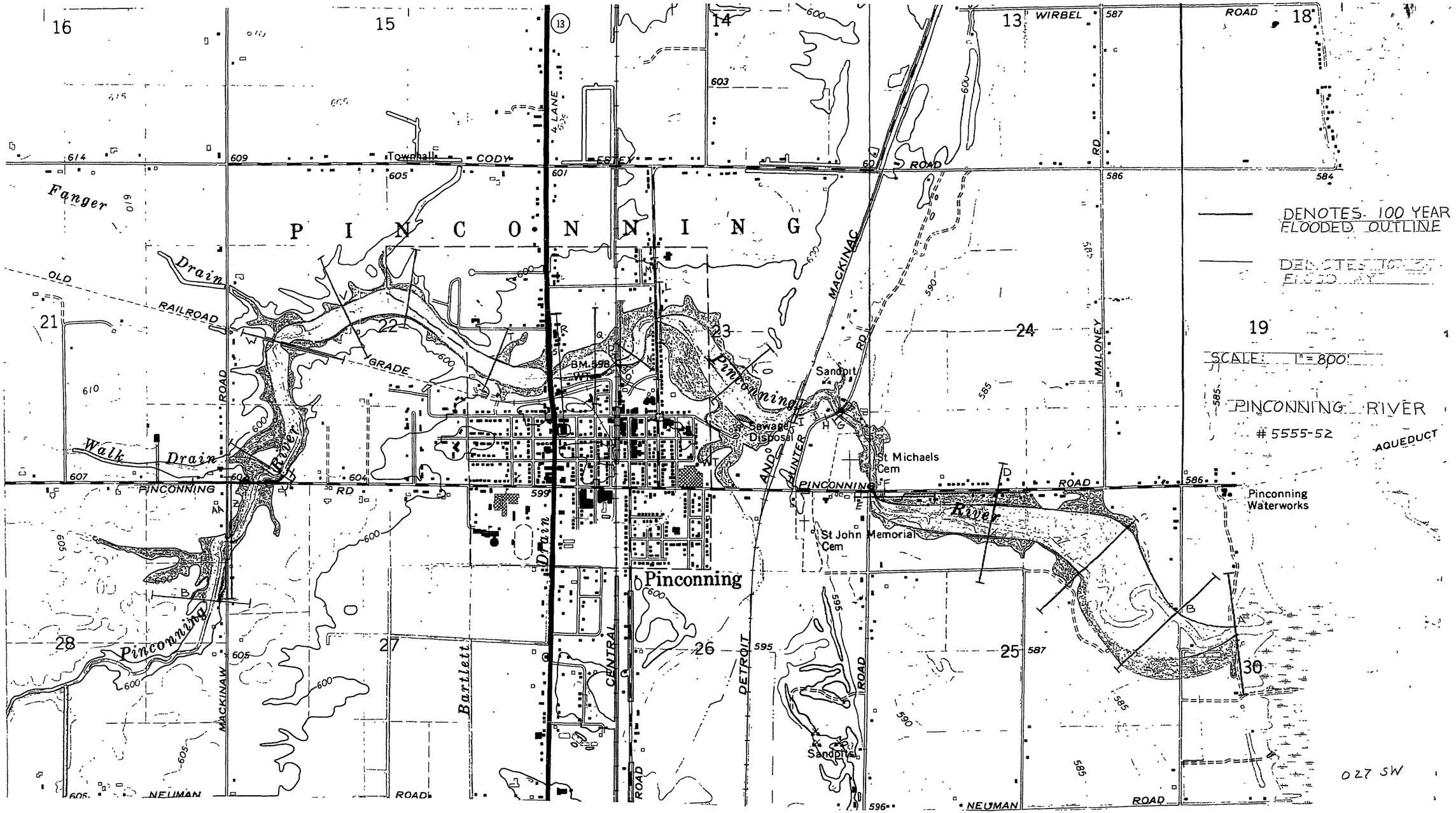
CORPORATE LIMITS	
100-YEAR FLOOD PLAIN BOUNDARY	
500-YEAR FLOOD PLAIN BOUNDARY	
CROSS SECTION	
ELEVATION REFERENCE MARKS	RM1 ×
ZONE GUTTERS	
BASE FLOOD ELEVATION (COASTAL)	(EL 585.7)
ZONE DESIGNATIONS	ZONE VE

SCALE 1" = 200'

SHEET 2 OF 3

RECEIVED
DEC 07 1990
NATURAL RESOURCES
LAND & WATER MGMT.

Goudie Fraser


DENOTES 100 YEAR FLOODED OUTLINE
SCALE 1" = 800'
PINCONNING RIVER
5555-52
AQUEDUCT
027 SW
P I N C O N N I N G
Pinconning
Fanger Drain
Walk Drain
Pinconning River
Bartlett Drain
Pinconning River
OLD RAILROAD GRADE
PINCONNING RD
CODY ROAD
ESTEY ROAD
WIRBEL ROAD
MACKINAC RD
MALONEY RD
NEUMAN ROAD
CENTRAL ROAD
DETROIT AND MINTER ROAD
4 LANE
Townhall
Sewage Disposal
Sandpit
St Michaels Cem
St John Memorial Cem
Pinconning Waterworks
BM 598
13
14
15
16
18
19
21
22
23
24
25
26
27
28
30

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Pinconning Twp

3) WATERCOURSE: Pinconning River

4) DOCUMENT TYPE: 100-yr Natural

00BREAK00

Natural Floodway
Pinconning Twp FIS
#5555-52

```
C
C      28
C       1          VS-1
C    1250          VS-2
C    4500          VS-3
C    6300          VS-4
C    8300          VS-5  D.S. FROM PINCONNING RD. BRIDGE
C    8350          BS-6 PINCONNING RD. AT TOWER BEACH RD.
C    9900          VS-7 D.S. FROM HUNTER RD. BRIDGE
C    9950          BS-8 HUNTER RD. BRIDGE
C   10900          VS-9 D.S. FROM DETROIT @ MACKINAW R.R.
C   10949          BS-10 DETROIT @ MACKINAW R.R. BRIDGE
C   12350          VS-11
C   13900          VS-12 D.S. FROM WATER STREET BRIDGE
C   13949          BS-13 WATER STREET BRIDGE
C   14700          VS-14
C   15000          VS-15 D.S. FROM PENN CENTRAL RAILROAD BRIDGE
C   15049          BS-16 PENN CENTRAL RAILROAD BRIDGE
C   15450          VS-17 AT WATER TOWER
C   16000          VS-18 D.S. FROM M-13 BRIDGE
C   16150          BS-19 M-13 BRIDGE
C   17150          VS-20
C   18900          VS-21
C   19930          VS-22
C   21150          VS-23
C   23500          VS-24
C   24000          BS-25 PINCONNING RD. BRIDGE AT MACKINAW ROAD
C   25050          VS-26 D.S. FROM MACKINAW RD.
C   25099          BS-27 MACKINAW RD. BRIDGE
C   26144          VS-28 U.S. OF MACKINAW RD.
T1  PINCONNING RIVER
T2  100 YEAR FLOOD
T3  PINCONNING TWP. BAY CO.
J1   -10     4                                                  581.9
J2    -1            -1
J3     1    34     3     4    10    26     9
NC   .07   .07  .035    .3    .5
OT     4  1195  1640  1875  2275
X1     1    33   875  1000
GR 584.0     0 583.0   100 583.8   200 584.1   300 583.0   400
GR 582.7   500 582.7   600 583.1   700 582.1   800 582.3   875
GR 581.1   880 579.9   890 578.6   900 577.8   910 577.0   920
GR 576.9   930 576.5   940 576.5   950 576.4   960 576.5   970
GR 577.3   980 580.5   990 581.6  1000 582.1  1100 582.4  1200
GR 582.3  1300 581.9  1400 582.8  1500 583.1  1600 583.5  1700
GR 584.4  1800 584.3  1900 584.6  2000
NC   .09   .09  .035
X1  1250    27   895  1000  1020  1150  1250
X3    10
GR 582.8     0 582.8   100 582.6   200 582.8   300 582.6   400
GR 582.6   500 582.7   600 582.5   700 582.8   800 583.0   895
GR 577.6   910 577.2   920 576.9   930 576.8   940 576.8   950
GR 576.9   960 577.0   970 578.8   980 580.6   990 581.6  1000
GR 581.1  1100 581.2  1300 581.3  1500 581.4  1700 581.5  1900
GR 582.5  2100 584.5  2250
NC   .07   .07  .040
X1  4500    38  1200  1276  1650  1650  3250
GR 585.0     0 582.4   200 582.7   300 584.1   400 583.1   500
GR 582.5   600 582.9   700 582.9   800 583.3   900 583.0  1000
GR 583.0  1005 582.9  1070 582.8  1135 582.8  1200 581.1  1202
GR 580.2  1207 579.6  1211 577.7  1218 577.1  1225 577.5  1230
GR 577.9  1235 577.8  1240 577.9  1245 578.0  1250 577.7  1255
GR 578.4  1260 579.9  1266 582.0  1276 582.3  1300 584.8  1400
GR 584.6  1500 585.1  1600 585.5  1700 585.5  1800 585.7  1900
```

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GR 586.6    2000    586.8    2100    587.1    2200
NC   .07     .09     .045
QT      4    1180    1615    1845    2240
X1   6300      43    1000    1063    1825    1775    1800
X3                           460            2000
GR 585.7       0    586.6     100    586.1     200    585.1     300    585.3     400
GR 584.4     431    588.4     438    588.6     450    587.9     460    585.2     470
GR 585.5     500    585.3     600    584.5     700    584.5     800    584.8     900
GR 583.3     990    587.5    1000    580.3    1008    579.7    1013    579.1    1020
GR 579.1    1025    578.7    1035    577.7    1040    577.8    1045    578.3    1050
GR 579.7    1055    587.5    1063    582.9    1076    583.0    1100    583.2    1200
GR 583.2    1209    583.4    1213    584.8    1236    585.4    1247    585.4    1300
GR 585.9    1400    585.8    1500    585.7    1600    586.3    1700    586.1    1800
GR 586.9    1826    586.4    1900    586.4    2000
NC   .05     .07     .035
X1   8300      22    1000    1063    1975    2025    2000
X3                           1005          1052.5
GR 586.7       0    587.0     100    587.3     200    587.7     300    587.8     400
GR 588.1     500    590.4     600    588.8     700    588.5     800    586.7     900
GR 585.9    1000    580.0    1012    578.4    1016    577.6    1025    578.0    1030
GR 577.8    1035    578.1    1040    579.9    1047    591.7    1063    592.6    1100
GR 592.7    1200    593.1    1300
X1   8330                                30      30      30
X3                          1012.5          1045
X1   8340                                10      10      10
X3                           1015          1042.5
X1   8349      12     200   222.5       9       9       9
X3     10                                                      593.0    593.0
GR 591.9       0    592.4     100    593.0     179    578.4     200    577.9     205
GR 577.7     210    576.4     215    577.5     220    578.5   222.5    593.1     242
GR 593.5     300    594.3     400
NC   .025   .025     .030
X1   8350      14     200   222.5       1       1       1
BT      4   200.0   593.7   589.4   200.0   593.7   589.4   222.5    593.7   589.4
BT  222.5   593.7   589.4
GR 591.9       0    592.4     100    593.0     200    593.7     200    578.4     200
GR 577.9     205    577.7     210    576.4     215    577.5     220    578.5   222.5
GR 593.7   222.5    593.1   222.5    593.5     300    594.3     400
X1   8376                                26      26      26
X2                                                       1
NC   .05     .07     .035
X1   8377      12     200   222.5       1       1       1
X3     10                                                      593.0    593.0
GR 591.9       0    592.4     100    593.0     179    578.4     200    577.9     205
GR 577.7     210    576.4     215    577.5     220    578.5   222.5    593.1     242
GR 593.5     300    594.3     400
X1   8380      22    1000    1063       3       3       3
X3                           1017          1045.5
GR 586.7       0    587.0     100    587.3     200    587.7     300    587.8     400
GR 588.1     500    590.4     600    588.8     700    588.5     800    586.7     900
GR 585.9    1000    580.0    1012    578.4    1016    576.4    1025    578.0    1030
GR 577.8    1035    578.1    1040    579.9    1047    591.7    1063    592.6    1100
GR 592.7    1200    593.1    1300
X1   8392                                12      12      12
X3                           1005          1057.5
NC   .06     .07     .055
X1   9900      14     200     255    1533    1483    1508
X3                            187          250.8
GR 597.8       0    594.3     100    590.4     166    585.9     200    581.5     210
GR 579.7     215    579.2     220    578.9     225    578.6     230    578.9     235
GR 580.7     239    593.3     255    593.6     300    594.2     400
X1   9949      15     200   238.8      49      49      49
X3     10                                                      594.3    594.3
GR 597.9       0    594.5     100    594.3     192    579.7     200    579.2     205
GR 579.6     210    579.7     215    579.8     220    579.5     225    579.3     230
GR 580.1   238.8    594.3     247    594.1     300    594.7     400    595.0     500
```

NC	.03	.03	.03							
X1	9950	17	200	238.8	1	1	1			
BT	4	200.0	596.9	591.6	200.0	596.9	591.6	238.8	596.9	591.6
BT	238.8	596.9	591.6							
GR	597.9	0	594.5	100	594.3	200	596.9	200	579.7	200
GR	579.2	205	579.6	210	579.7	215	579.8	220	579.5	225
GR	579.3	230	580.1	238.8	596.9	238.8	594.3	238.8	594.1	300
GR	594.7	400	595.0	500						
X1	9982				32	32	32			
X2							1			
NC	.06	.07	.055							
X1	9983	15	200	238.8	1	1	1			
X3	10							594.3	594.3	
GR	597.9	0	594.5	100	594.3	192	579.7	200	579.2	205
GR	579.6	210	579.7	215	579.8	220	579.5	225	579.3	230
GR	580.1	238.8	594.3	247	594.1	300	594.7	400	595.0	500
X1	10004	14	200	225	21	21	21			
X3				170		250.8				
GR	597.8	0	594.3	100	590.4	166	585.9	200	581.5	210
GR	579.7	215	579.2	220	579.2	225	579.2	230	579.2	235
GR	580.7	239	593.3	255	593.6	300	594.2	400		
NC	.05	.05	.035							
X1	10900	13	200	262	901	891	896			
X3				185		262				
GR	595.4	0	592.8	100	587.8	200	580.8	215	579.6	221
GR	579.3	230	578.9	235	581.0	245	590.5	262	588.1	281
GR	588.1	300	595.4	335	595.7	400				
X1	10949	18	200	252.4	49	49	49			
X3	10							597.9	597.8	
GR	597.9	0	597.8	100	597.9	195	581.9	200	580.9	202.4
GR	579.5	207.4	579.5	212.4	579.5	217.4	579.5	222.4	579.9	227.4
GR	580.3	232.4	580.9	237.4	581.2	242.4	584.0	247.4	585.7	252.4
GR	597.8	257	597.8	300	597.7	400				
SB		1.74	2.9		52.4		574		579.5	579.5
X1	10963				14	14	14			
X2			1	591.8	597.8					
X3	10							597.9	597.8	
BT	10	0	597.9	0.0	100	597.8	0.0	195	597.9	0.0
BT	200	597.9	581.9	200	597.9	591.8	252.4	597.8	591.7	252.4
BT	597.8	585.7	257	597.8	0.0	300	597.8	0.0	400	597.7
BT	0.0									
X1	10983	13	200	262	20	20	20			
X3				170		262				
GR	595.4	0	592.8	100	587.8	200	580.8	215	579.6	221
GR	579.5	230	579.5	235	581.0	245	590.5	262	588.1	281
GR	588.1	300	595.4	335	595.7	400				
NC	.08	.07	.055							
QT	4	945	1300	1495	1825					
X1	12350	20	957	1000	1342	1392	1367			
GR	597.4	0	594.9	100	593.6	200	593.1	300	593.2	400
GR	591.0	500	588.8	600	587.5	700	588.1	800	587.3	900
GR	587.4	957	581.6	962	581.5	972	580.7	978	581.3	986
GR	580.9	993	586.2	1000	584.2	1100	587.5	1200	594.6	1300
NC	.05	.06	.05							
X1	13900	20	600	637	1580	1520	1550			
X3				574		637				
GR	595.7	0	593.7	100	593.3	200	592.4	300	593.9	400
GR	593.5	448	589.2	475	588.4	500	584.6	600	580.4	605
GR	579.7	614	579.9	617	580.9	622	585.1	627	588.4	637
GR	587.7	700	588.3	800	589.0	900	591.2	956	595.1	968
X1	13949	30	1000	1038.2	49	49	49			
X3	10							593.0	593.1	
GR	599.0	0	597.7	100	596.6	200	595.8	300	595.1	400
GR	594.2	500	593.9	600	593.5	700	593.0	800	593.0	900
GR	593.0	989	582.2	1000	581.8	1005	581.3	1010	581.2	1015
GR	581.2	1025	580.9	1030	581.2	1035	581.8	1038.2	593.1	1045

GR	592.8	1100	593.0	1200	593.9	1300	594.8	1400	595.4	1500
GR	595.8	1600	595.7	1700	595.8	1800	596.0	1900	596.3	2000
SB	0	1.85	3		38.2		331		580.9	580.9
X1	13981				32	32	32			
X2			1	590.0	593.0					
X3	10							593.0	593.1	
BT	26	0	599.0	0.0	100	597.7	0.0	200	596.6	0.0
BT	300	595.8	0.0	400	595.1	0.0	500	594.2	0.0	600
BT	593.9	0.0	700	593.5	0.0	800	593.0	0.0	900	593.0
BT	0.0	989	593.0	0.0	1000	593.0	582.2	1000	595.5	590.0
BT	1038.2	595.6	590.0	1038.2	593.1	581.8	1045	593.1	0.0	1100
BT	592.8	0.0	1200	593.0	0.0	1300	593.9	0.0	1400	594.8
BT	0.0	1500	595.4	0.0	1600	595.8	0.0	1700	595.7	0.0
BT	1800	595.8	0.0	1900	596.0	0.0	2000	596.3	0.0	
X1	14030	20	600	637	49	49	49			
X3				500		637				
GR	595.7	0	593.7	100	593.3	200	592.4	300	593.9	400
GR	593.5	448	589.2	475	588.4	500	584.6	600	580.9	605
GR	580.9	614	580.9	617	580.9	622	585.1	627	588.4	637
GR	587.7	700	588.3	800	589.0	900	591.2	956	595.1	968
NC	.07	.07								
X1	14700	20	352	393	695	645	670			
X3				292		467				
GR	597.2	0	596.1	10	589.7	32	588.7	52	586.3	152
GR	586.0	252	586.2	281	589.7	292	587.2	306	585.4	352
GR	582.7	365	581.3	370	581.1	375	581.5	381	582.5	386
GR	589.3	393	589.0	452	593.9	552	595.8	652	597.6	752
NC	.09	.07	.045							
X1	15000	26	1000	1040	275	325	300			
X3				985		1040				
GR	591.4	0	591.3	100	591.1	200	590.2	300	589.1	400
GR	589.9	500	587.3	600	588.0	700	587.7	800	587.3	900
GR	586.9	946	589.9	956	587.8	984	585.8	1000	582.9	1010
GR	582.7	1020	583.3	1031	591.9	1040	591.9	1047	592.1	1058
GR	592.7	1100	593.4	1144	593.6	1155	595.1	1200	597.0	1300
GR	598.0	1400								
X1	15049	9	100	129.2	49	49	49			
X3	10							597.9	597.8	
GR	597.7	0	597.9	95	582.5	100	582.8	105	582.7	110
GR	582.6	125	582.4	129.2	597.8	135	597.8	200		
SB		1.70	2.9		28.1		271		582.4	582.4
X1	15092				43	43	43			
X2			1	593.1	597.8					
X3	10							597.9	597.8	
BT	8	0.0	597.7	0.0	95	597.9	0.0	100	597.9	582.8
BT	100	597.9	593.1	129.2	597.8	592.2	129.2	597.8	582.4	135
BT	597.8	0.0	200	597.8	0.0					
X1	15101	26	1000	1040	9	9	9			
X3				990		1040				
GR	591.4	0	591.3	100	591.1	200	590.2	300	589.1	400
GR	589.9	500	587.3	600	588.0	700	587.7	800	587.3	900
GR	586.9	946	589.9	956	587.8	984	585.8	1000	582.9	1010
GR	582.4	1020	583.3	1031	591.9	1040	591.9	1047	592.1	1058
GR	592.7	1100	593.4	1144	593.6	1155	595.1	1200	597.0	1300
GR	598.0	1400								
NC	.05	.06	.04							
X1	15304	22	958	1000	203	203	203			
X3				681		1134				
GR	594.5	0	594.4	100	594.4	200	594.9	300	594.0	400
GR	593.0	500	593.2	600	591.7	700	587.0	800	586.3	900
GR	587.4	958	582.7	969	582.2	978	582.0	985	582.3	992
GR	588.5	1000	591.9	1100	595.1	1200	596.7	1300	596.3	1400
GR	597.1	1500	598.6	1600						
X1	15450				146	146	146			
X3				700		1080				
NC	.07	.09	.04							

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X1 16000      25    1000    1054     550     550     550
X3                          943            1048
GR 595.9       0   596.7     100   596.9     200   597.1     300   597.2     400
GR 597.3     500   596.6     600   595.9     700   593.3     800   589.8     900
GR 587.7    1000   581.9    1010   581.2    1015   582.1    1022   595.7    1054
GR 595.1    1100   596.4    1200   597.8    1300   597.3    1400   597.9    1500
GR 599.5    1600   597.3    1700   598.9    1800   599.1    1900   598.7    2000
X1 16100                            100     100     100
X3                          993            1048
X1 16150      31    1000  1030.7      50      50      50
X3    10                                                     597.4   597.4
GR 596.9       0   596.9     100   596.9     200   597.0     300   597.0     400
GR 597.1     500   597.1     600   597.2     700   597.1     800   597.2     900
GR 597.4    1000   600.3    1000   594.3    1000   583.4    1005   583.2    1010
GR 583.1    1015   583.2    1020   584.4    1025   594.3  1030.7   600.3  1030.7
GR 597.4  1030.7   597.3    1100   597.5    1200   597.9    1300   598.0    1400
GR 598.2    1500   598.0    1600   597.8    1700   598.0    1800   598.4    1900
GR 598.8    2000
SB          1.97     3.0            25.7             274           583.1   583.1
X1 16212                      62      62      62
X2                     1   594.3   597.4
X3    10                                                     597.4   597.4
BT    24       0   596.9     0.0     100   596.9     0.0     200   596.9     0.0
BT   300   597.0     0.0     400   597.0     0.0     500   597.1     0.0     600
BT 597.1     0.0     700   597.2     0.0     800   597.1     0.0     900   597.2
BT   0.0    1000   597.4     0.0    1000   600.3   594.3  1030.7   600.3   594.3
BT1030.7   597.4     0.0    1100   597.3     0.0    1200   597.5     0.0    1300
BT 597.9     0.0    1400   598.0     0.0    1500   598.2     0.0    1600   598.0
BT   0.0    1700   597.8     0.0    1800   598.0     0.0    1900   598.4     0.0
BT  2000   598.8     0.0
X1 16226      25    1000    1054      14      14      14
X3                          990            1048
GR 595.9       0   596.7     100   596.9     200   597.1     300   597.2     400
GR 597.3     500   596.6     600   595.9     700   593.3     800   589.8     900
GR 587.7    1000   583.1    1010   583.1    1015   583.1    1022   595.7    1054
GR 595.1    1100   596.4    1200   597.8    1300   597.3    1400   597.9    1500
GR 599.5    1600   597.3    1700   598.9    1800   599.1    1900   598.7    2000
NC    .08     .08    .045
X1 17150      17     676     700     924     924     924
GR 597.9       0   595.8     100   596.0     200   597.6     300   595.5     400
GR 592.6     500   591.5     600   588.9     676   583.7     682   582.6     686
GR 583.8     690   589.7     700   589.1     750   592.0     800   596.0     900
GR 597.6    1000   598.7    1100
NC    .06     .06
X1 18900      19     962    1000    1750    1750    1750
GR 599.7       0   600.1     100   599.6     200   599.5     300   597.5     400
GR 596.8     500   594.8     600   593.6     700   593.1     800   592.6     900
GR 591.4     962   585.6     976   584.5     978   585.4     984   585.8     988
GR 590.9    1000   592.0    1100   596.8    1200   602.0    1300
NC    .09     .09
QT      4     905    1255    1445    1775
X1 19930      30     959    1000    1000     950    1030
GR 601.9       0   600.6     100   599.7     200   599.4     300   599.0     400
GR 599.4     500   599.3     600   599.6     700   598.9     800   596.0     893
GR 592.2     917   592.4     934   593.4     945   591.4     959   587.2     968
GR 587.0     975   587.3     980   587.4     985   587.8     991   592.0    1000
GR 593.2    1008   590.1    1019   590.6    1100   595.5    1200   597.7    1300
GR 599.7    1400   599.2    1500   600.4    1600   602.2    1700   603.1    1800
NH      3     .07     275    .035     305     .07     800
X1 20430      20     270     310     500     500     500
X3                          100             564
GR 600.0       0   595.0     100   594.0     175   592.4     228   592.6     245
GR 593.6     256   591.6     270   587.4     279   587.2     286   587.5     291
GR 587.6     296   588.0     302   592.2     310   593.6     324   592.6     335
GR 592.4     352   594.0     425   595.0     560   600.0     770   601.5     800
NH      3     .07     620    .035     700     .07    1700
```

QT	4	785	1095	1265	1565					
X1	21150	24	600	748	740	700	720			
GR	603.5	0	603.4	100	602.6	200	601.7	300	600.6	400
GR	599.5	500	599.4	586	598.2	600	587.8	650	587.4	655
GR	587.7	661	593.7	700	600.9	748	601.0	769	599.7	797
GR	599.2	900	599.3	1000	599.6	1100	599.9	1200	600.6	1300
GR	600.6	1400	601.4	1500	601.8	1600	602.6	1700		
NH	3	.07	125	.035	155	.07	1200			
X1	21300	20	120	160	160	140	150			
X3				50		454				
GR	600.0	0	595.0	50	592.7	78	592.9	95	593.9	106
GR	591.9	120	587.7	129	587.5	136	587.8	141	587.9	146
GR	588.3	152	592.5	160	593.9	174	592.9	185	592.7	202
GR	594.0	300	595.0	450	595.0	500	600.0	950	601.5	1150
NC	.05	.06								
X1	23500	17	964	1000	2100	2100	2200			
X3				718		992				
GR	602.1	0	599.8	100	597.6	200	595.2	300	598.0	400
GR	598.4	500	598.8	600	597.8	700	596.0	800	594.5	900
GR	592.7	964	589.6	970	588.8	975	589.5	979	601.7	1000
GR	603.5	1100	605.6	1204						
QT	4	610	860	1000	1245					
X1	24000	23	1000	1024	550	450	500			
X3	10							601.0	601.0	
GR	604.8	0	604.7	100	604.6	200	604.3	300	604.0	400
GR	603.4	500	602.8	600	602.2	700	601.7	800	601.4	900
GR	601.0	994	590.0	1000	588.7	1006	589.3	1012	589.5	1018
GR	589.9	1024	601.0	1030	601.1	1100	601.7	1200	602.2	1300
GR	603.2	1400	604.2	1500	605.6	1600				
SB		1.66	2.8		24		198		588.7	588.7
NC	.06	.06	.045							
X1	24032				32	32	32			
X2			1	597.5	601.0					
X3	10							601.0	601.0	
BT	23	0	604.8	0.0	100	604.7	0.0	200	604.6	0.0
BT	300	604.3	0.0	400	604.0	0.0	500	603.4	0.0	531
BT	603.3	0.0	600	602.8	0.0	700	602.2	0.0	800	601.7
BT	0.0	900	601.4	0.0	994	601.0	0.0	1000	601.0	590.0
BT	1000	601.0	597.4	1024	601.0	597.5	1024	601.0	589.9	1030
BT	601.0	0.0	1100	601.1	0.0	1200	601.7	0.0	1300	602.2
BT	0.0	1400	603.2	0.0	1500	604.2	0.0	1600	605.6	0.0
NC	.09	.06								
X1	24081	15	955	1015	49	49	49			
X3				916		1040				
GR	605.0	0	601.9	550	601.4	600	600.0	700	597.5	755
GR	596.1	855	596.0	955	589.4	975	588.7	980	590.0	984
GR	595.2	1015	596.5	1055	598.2	1155	600.0	1280	605.0	1460
NC	.07	.05	.045							
X1	25050	25	1000	1057	898	988	969			
X3				1006		1053				
GR	601.6	0	603.1	103	601.3	200	601.4	300	601.5	400
GR	599.6	500	599.8	600	599.8	700	597.5	800	596.1	900
GR	598.0	1000	591.4	1020	590.7	1025	592.0	1029	597.2	1057
GR	596.5	1100	598.2	1200	600.6	1300	602.3	1400	602.7	1500
GR	601.6	1600	602.1	1700	601.1	1800	602.1	1900	603.7	2000
X1	25099	26	1000	1020	49	49	49			
X3	10							600.0	600.0	
GR	603.0	0	603.3	80	603.1	100	601.9	200	602.1	300
GR	601.9	400	601.0	500	600.5	600	600.2	700	600.2	800
GR	599.5	900	600.0	981.5	590.3	1000	590.1	1010	590.3	1015
GR	590.6	1020	600.0	1038.5	599.3	1100	599.4	1200	600.1	1300
GR	600.8	1400	601.1	1500	601.9	1600	602.2	1700	602.1	1800
GR	603.2	2000								
SB	0	1.57	3		20		165		590.1	590.1
X1	25129				30	30	30			
X2			1	598.5	600.0					

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X3     10                                                  600.0    600.0
BT     26        0    603.0      0.0       80    603.3      0.0      100    603.1      0.0
BT    200    601.9      0.0      300    602.1      0.0      400    601.9      0.0      500
BT  601.0      0.0      600    600.5      0.0      700    600.2      0.0      800    600.2
BT    0.0      900    599.5      0.0    981.5    600.0      0.0     1000    600.0    590.6
BT   1000    602.8    598.5     1020    602.8    598.5     1020    600.0    590.3   1038.5
BT  600.0      0.0     1100    599.3      0.0     1200    599.4      0.0     1300    600.1
BT    0.0     1400    600.8      0.0     1500    601.1      0.0     1600    601.9      0.0
BT   1700    602.2      0.0     1800    602.1      0.0     2000    603.2      0.0
X1  25144       25     1000     1057       15       15       15
X3                             1004                1056
GR  601.6        0    603.1      103    601.3      200    601.4      300    601.5      400
GR  599.6      500    599.8      600    599.8      700    597.5      800    596.1      900
GR  598.0     1000    591.4     1020    590.1     1025    592.0     1029    597.2     1057
GR  596.5     1100    598.2     1200    600.6     1300    602.3     1400    602.7     1500
GR  601.6     1600    602.1     1700    601.1     1800    602.1     1900    603.7     2000
NH      4      .07      978     .035      994      .07     1400      .05     1600
X1  26144       22      966     1000     1000      950     1000
GR  603.5        0    603.6      100    603.0      200    603.0      300    602.6      400
GR  602.1      500    600.6      600    599.2      700    599.7      800    598.2      900
GR  598.0      966    592.6      978    592.6      987    593.0      994    597.1     1000
GR  599.8     1100    601.7     1200    603.3     1226    604.8     1300    605.8     1400
GR  606.1     1500    607.6     1600
EJ
ER
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*****************************************
HEC2 VERSION UPDATED JAN 1976
ERROR CORRECTIONS 01,02,03,04,05,06,07,08,09
MODIFICATIONS 52,53,54,55,56,57,58
*****************************************

C
1  PINCONNING RIVER
T2  100 YEAR FLOOD
T3  PINCONNING TWP. BAY CO.

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q      * WSEL    FQ
      -10.      4.      -0.      -0. -0.000000   -0.00    -0.0     -0.   581.900  -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

CCHV=    .300 CEHV=    .500
    SECNO    DEPTH    CWSEL    CRIWS    WSELK    EG       HV       HL       OLOSS    BANK ELEV
    Q        QLOB     QCH      QROB     ALOB     ACH      AROB     VOL      TWA   LEFT/RIGHT
    TIME     VLOB     VCH      VROB     XNL      XNCH     XNR      WTN      ELMIN     SSTA
    SLOPE    XLOBL    XLCH     XLOBR    TTRIAL   IDC      ICONT    CORAR    TOPWID    ENDST

                VS-1

      1.00     5.50   581.90     0.00   581.90   582.14      .24     0.00     0.00   582.30
     1875.       0.     1873.       2.       0.     477.       9.       0.       0.   581.60
      0.00     0.00     3.93      .23     .070     .035     .070    0.000   576.40   876.67
   .001424     -0.      -0.      -0.        0        0        1     0.00   183.33  1060.00

3280 CROSS SECTION    1250.00 EXTENDED        .15 FEET

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      583.00 ELREA=      581.60

                VS-2

   1250.00     6.15   582.95     0.00     0.00   583.00      .05      .81      .06   583.00
     1875.       0.     1154.     721.       0.     499.    1676.      36.      19.   581.60
      .22      0.00     2.31      .43     .090     .035     .090     .036   176.80   895.14
   .000376    1020.     1250.    1150.        3        0        1     0.00  1238.53  2133.67

                VS-3

   4500.00     7.04   584.14     0.00     0.00   584.20      .07     1.19      .01   582.80
     1875.     712.     1093.      70.     1260.     408.     115.     128.      71.   582.00
      .62      .56      2.68      .61     .070     .040     .070     .045   577.10    66.32
   .000567    1650.     3250.    1650.        3        0        1     0.00  1307.19  1373.51
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* 100-yr Flood level, Saginaw Bay ~ 584.41 to be superposed

Represents the 2 - swirling of flow

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3265 DIVIDED FLOW

3470 ENCROACHMENT STATIONS=     460.0     2000.0  TYPE=     1  TARGET=    1540.000

                 VS-4

  6300.00     7.81   585.51      0.00      0.00   585.63       .12      1.40       .03    587.50
   1845.      288.    1192.      365.      402.     346.      386.      189.      115.    587.50
     .82       .72     3.44       .94      .070     .045      .090      .045    577.70    468.84
 .001133     1825.    1800.     1775.         2        0         1      0.00    838.95   1322.39


3470 ENCROACHMENT STATIONS=    1005.0     1052.5  TYPE=     1  TARGET=      47.500

                 VS-5  D.S. FROM PINCONNING RD. BRIDGE

  8300.00     9.87   587.47      0.00      0.00   587.82       .34      2.08      .11100000.00
   1845.        0.    1845.        0.        0.     392.        0.      224.      136. 100000.00
     .93      0.00     4.70      0.00      .050     .035      .070      .042    577.60   1005.00
 .000954     1975.    2000.     2025.         2        0         1      0.00     47.50   1052.50

   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


3470 ENCROACHMENT STATIONS=    1012.5     1045.0  TYPE=     1  TARGET=      32.500
  8330.00     9.79   587.39      0.00      0.00   587.98       .59       .04      .12100000.00
   1845.        0.    1845.        0.        0.     299.        0.      224.      136. 100000.00
     .94      0.00     6.16      0.00      .050     .035      .070      .042    577.60   1012.50
 .001865       30.      30.       30.         2        0         1      0.00     32.50   1045.00


3470 ENCROACHMENT STATIONS=    1015.0     1042.5  TYPE=     1  TARGET=      27.500
  8340.00     9.70   587.30      0.00      0.00   588.11       .81       .02      .11100000.00
   1845.        0.    1845.        0.        0.     256.        0.      224.      136. 100000.00
     .94      0.00     7.21      0.00      .050     .035      .070      .042    577.60   1015.00
 .002821       10.      10.       10.         2        0         1      0.00     27.50   1042.50


OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLFA=      593.00 ELREA=      593.00

  8349.00    10.77   587.17      0.00      0.00   588.30      1.13       .02       .16    578.40
   1845.        0.    1845.        0.        0.     217.        0.      224.      136.    578.50
     .94      0.00     8.52      0.00      .050     .035      .070      .042    576.40    200.00
 .002697        9.       9.        9.         2        0         1      0.00     22.50    234.08


NORMAL BRIDGE,NRD= 4 MIN ELTRD=  593.70 MAX ELLC=  589.40

                 BS-6 PINCONNING RD. AT TOWER BEACH RD.

  8350.00    10.77   587.17      0.00      0.00   588.30      1.13       .00       .00    593.00
   1845.        0.    1845.        0.        0.     217.        0.      224.      136.    593.10
     .94      0.00     8.52      0.00      .025     .030      .025      .042    576.40    200.00
 .003155        1.       1.        1.         0        0         1      0.00     22.50    222.50
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NORMAL BRIDGE,NRD= 4 MIN ELTRD=  593.70 MAX ELLC=  589.40

  8376.00    10.89   587.29     0.00     0.00   588.39     1.10      .08      .01   593.00
    1845.       0.     1845.       0.       0.     219.       0.     224.     136.   593.10
      .94     0.00     8.42     0.00     .025     .030     .025     .042   576.40   200.00
 .003055      26.      26.      26.        2        0        1     0.00    22.50   222.50


OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      593.00 ELREA=      593.00

  8377.00    10.89   587.29     0.00     0.00   588.39     1.10      .00      .00   578.40
    1845.       0.     1845.       0.       0.     219.       0.     224.     136.   578.50
      .94     0.00     8.41     0.00     .050     .035     .070     .042   576.40   200.00
 .002599       1.       1.       1.        0        0        1     0.00    22.50   234.24


   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=     1017.0     1045.5  TYPE=      1  TARGET=      28.500
  8380.00    11.50   587.90     0.00     0.00   588.54      .64      .01      .14100000.00
    1845.       0.     1845.       0.       0.     288.       0.     224.     136. 100000.00
      .94     0.00     6.40     0.00     .050     .035     .070     .042   576.40  1017.00
 .002037       3.       3. ?     3.        2        0        1     0.00    28.50  1045.50


3470 ENCROACHMENT STATIONS=     1005.0     1057.5  TYPE=      1  TARGET=      52.500
  8392.00    12.01   588.41     0.00     0.00   588.66      .25      .01      .12100000.00
    1845.       0.     1845.       0.       0.     458.       0.     224.     136. 100000.00
      .94     0.00     4.02     0.00     .050     .035     .070     .042   576.40  1005.00
 .000632      12.      12.      12.        2        0        1     0.00    52.50  1057.50


3470 ENCROACHMENT STATIONS=      187.0      250.8  TYPE=      1  TARGET=      63.800
                 VS-7 D.S. FROM HUNTER RD. BRIDGE

  9900.00    11.26   589.86     0.00     0.00   590.12      .27     1.45      .01   585.90
    1845.      85.     1760.       0.      40.     418.       0.     240.     138. 100000.00
     1.04     2.12     4.21     0.00     .060     .055     .070     .044   578.60   187.00
 .001638    1533.    1508.    1483.        3        0        1     0.00    63.63   250.63


OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      594.30 ELREA=      594.30

  9949.00    10.70   589.90     0.00     0.00   590.23      .33      .08      .03   579.70
    1845.       0.     1845.       0.       0.     401.       0.     241.     138.   580.10
     1.04     0.00     4.60     0.00     .060     .055     .070     .044   579.20   200.00
 .001605      49.      49.      49.        0        0        1     0.00    38.80   244.47


NORMAL BRIDGE,NRD= 4 MIN ELTRD=  596.90 MAX ELLC=  591.60
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BS-8 HUNTER RD. BRIDGE

9950.00	10.71	589.91	0.00	0.00	590.23	.33	.00	.00	594.30
1845.	0.	1845.	0.	0.	401.	0.	241.	138.	594.30
1.04	0.00	4.60	0.00	.030	.030	.030	.044	579.20	200.00
.000670	1.	1.	1.	0	0	1	0.00	38.80	238.80

NORMAL BRIDGE,NRD= 4 MIN ELTRD= 596.90 MAX ELLC= 591.60

9982.00	10.73	589.93	0.00	0.00	590.26	.33	.02	.00	594.30
1845.	0.	1845.	0.	0.	401.	0.	241.	138.	594.30
1.05	0.00	4.60	0.00	.030	.030	.030	.044	579.20	200.00
.000667	32.	32.	32.	2	0	1	0.00	38.80	238.80

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 594.30 ELREA= 594.30

9983.00	10.73	589.93	0.00	0.00	590.26	.33	.00	.00	579.70
1845.	0.	1845.	0.	0.	401.	0.	241.	138.	580.10
1.05	0.00	4.60	0.00	.060	.055	.070	.044	579.20	200.00
.001597	1.	1.	1.	0	0	1	0.00	38.80	244.48

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	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= 170.0 250.8 TYPE= 1 TARGET= 80.800

10004.00	10.85	590.05	0.00	0.00	590.31	.26	.03	.02	585.90
1845.	111.	995.	739.	65.	218.	205.	241.	138.	579.20
1.05	1.70	4.56	3.62	.060	.055	.070	.044	579.20	170.00
.001695	21.	21.	21.	2	0	1	0.00	80.80	250.80

3470 ENCROACHMENT STATIONS= 185.0 262.0 TYPE= 1 TARGET= 77.000

VS-9 D.S. FROM DETROIT & MACKINAW R.R.

10900.00	11.94	590.84	0.00	0.00	591.02	.18	.69	.02	587.80
1845.	47.	1798.	0.	40.	518.	0.	252.	139.	100000.00
1.12	1.19	3.47	0.00	.050	.035	.050	.044	578.90	185.00
.000434	901.	896.	891.	2	0	1	0.00	77.00	262.00

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 597.90 ELREA= 597.80

BS-10 DETROIT & MACKINAW R.R. BRIDGE

10949.00	11.35	590.85	0.00	0.00	591.04	.19	.02	.00	581.90
1845.	0.	1845.	0.	0.	527.	0.	252.	139.	585.70
1.12	0.00	3.50	0.00	.050	.035	.050	.044	579.50	200.00
.000387	49.	49.	49.	2	0	1	0.00	52.40	254.36

SPECIAL BRIDGE

```
SH   XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHO
     -0.00      1.74      2.90     -0.00     52.40     -0.00    574.00     -0.00    579.50    579.50

6070.LOW FLOW BY NORMAL BRIDGE

EGPRS=     0.000  EGLWC=   591.044  ELLC=   591.800  PCWSE=   590.854  ELTRD=   597.800

NORMAL BRIDGE.NRD=10 MIN ELTRD=  597.80 MAX ELLC=  591.80

OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA=      597.90 ELREA=      597.80

 10963.00    11.36   590.86     0.00     0.00   591.05      .19      .01      .00   581.90
    1845.       0.     1845.      0.       0.     527.       0.     253.     139.   585.70
     1.13     0.00     3.50     0.00     .050     .035     .050     .043   579.50   200.00
  .000387      14.      14.      14.        0        0        1     0.00    52.40   254.36

3470 ENCROACHMENT STATIONS=      170.0      262.0  TYPE=      1  TARGET=      92.000
 10983.00    11.39   590.89     0.00     0.00   591.06      .18      .01      .00   587.80
    1845.      76.     1769.      0.      70.     516.       0.     253.     139. 100000.00
     1.13     1.08     3.43     0.00     .050     .035     .050     .043   579.50   170.00
  .000427      20.      20.      20.        2        0        1     0.00    92.00   262.00

                VS-11

 12350.00    10.61   591.31     0.00     0.00   591.32      .01      .20      .05   587.40
    1495.     463.      363.     668.    1397.     401.    1259.     310.     153.   586.20
     1.81      .33      .91      .53     .080     .055     .070     .045   580.70   485.89
  .000065    1342.    1367.    1392.        2        0        1     0.00   767.78  1253.67

    SECNO     DEPTH    CWSEL    CRIWS    WSELK     EG       HV       HL       OLOSS    BANK ELEV
    Q         QLOB     QCH      QROB     ALOB      ACH      AROB     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=      574.0      637.0  TYPE=      1  TARGET=      63.000
                VS-12 D.S. FROM WATER STREET BRIDGE

 13900.00    11.78   591.48     0.00     0.00   591.63      .14      .24      .07   584.60
    1495.     468.     1027.      0.     166.     328.       0.     373.     168. 100000.00
     1.95     2.82     3.13     0.00     .050     .050     .060     .045   579.70   574.00
  .000757    1580.    1550.    1520.        2        0        1     0.00    63.00   637.00

OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA=      593.00 ELREA=      593.10

                BS-13 WATER STREET BRIDGE

 13949.00    10.58   591.48     0.00     0.00   591.71      .23      .04      .04   582.20
    1495.       0.     1495.      0.       0.     387.       0.     374.     168.   581.80
     1.95     0.00     3.86     0.00     .050     .050     .060     .045   580.90  1000.00
  .000934      49.      49.      49.        2        0        1     0.00    38.20  1044.03
```

submerged outlet condition

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.85	3.00	-0.00	38.20	-0.00	331.00	-0.00	580.90	580.90

PRESSURE FLOW

EGPRS	EGLWC	H3	QWETR	QPR	BAREA	ELLC	ELTRD	CLASS
592.07	591.71	0.00	0.	1495.	331.	590.00	593.00	10.00

OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA= 593.00 ELREA= 593.10

13981.00	10.95	591.85	0.00	0.00	592.07	.22	.35	0.00	582.20
1495.	0.	1495.	0.	0.	401.	0.	374.	168.	581.80
1.95	0.00	3.72	0.00	.050	.050	.060	.045	580.90	1000.00
.000837	32.	32.	32.	2	0	1	0.00	38.20	1044.25

3470 ENCROACHMENT STATIONS= 500.0 637.0 TYPE= 1 TARGET= 137.000

14030.00	11.20	592.10	0.00	0.00	592.14	.04	.02	.05	584.60
1495.	860.	635.	0.	560.	336.	0.	375.	168.	100000.00
1.96	1.54	1.89	0.00	.050	.050	.060	.045	580.90	500.00
.000269	49.	49.	49.	2	0	1	0.00	137.00	637.00

3470 ENCROACHMENT STATIONS= 292.0 467.0 TYPE= 1 TARGET= 175.000

VS-14

14700.00	11.20	592.30	0.00	0.00	592.36	.06	.21	.01	585.40
1495.	418.	881.	196.	330.	376.	230.	389.	170.	589.30
2.06	1.27	2.34	.85	.070	.050	.070	.046	581.10	292.00
.000358	695.	670.	645.	2	0	1	0.00	175.00	467.00

3470 ENCROACHMENT STATIONS= 985.0 1040.0 TYPE= 1 TARGET= 55.000

VS-15 D.S. FROM PENN CENTRAL RAILROAD BRIDGE

15000.00	9.68	592.38	0.00	0.00	592.63	.25	.17	.09	585.80
1495.	149.	1346.	0.	85.	322.	0.	394.	171.	100000.00
2.08	1.75	4.17	0.00	.090	.045	.070	.046	582.70	985.00
.001135	275.	300.	325.	1	0	1	0.00	55.00	1040.00

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

OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA= 597.90 ELREA= 597.80

BS-16 PENN CENTRAL RAILROAD BRIDGE

15049.00	9.95	592.35	0.00	0.00	592.78	.43	.06	.09	582.50
1495.	0.	1495.	0.	0.	283.	0.	394.	171.	582.40

```
   2.09      0.00      5.28      0.00      .090      .045      .070      .046    582.40    100.00
.001569      49.       49.       49.        2         0         1      0.00     29.20    132.95


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
   -0.00      1.70      2.90     -0.00     28.10     -0.00    271.00    -0.00    582.40    582.40

6070.LOW FLOW BY NORMAL BRIDGE

EGPRS=     0.000  EGLWC=   592.783  ELLC=   593.100  PCWSE=   592.351  ELTRD=   597.800

NORMAL BRIDGE.NRD= 8 MIN ELTRD=  597.80 MAX ELLC=  593.10

OVERBANK AREA ASSUMED NON-EFFECTIVE.ELLEA=      597.90 ELREA=      597.80

 15092.00     10.04    592.44      0.00      0.00    592.87       .43       .09       .00    582.50
    1495.        0.      1495.       0.        0.      284.        0.      394.      171.    582.40
     2.09      0.00      5.26      0.00      .090      .045      .070      .046    582.40    100.00
 .002781       43.       43.       43.         2         0         1     -2.04     29.20    132.98


3470 ENCROACHMENT STATIONS=      990.0     1040.0  TYPE=      1  TARGET=      50.000
 15101.00     10.30    592.70      0.00      0.00    592.94       .24       .01       .06    585.80
    1495.      113.      1382.       0.       63.      338.        0.      394.      171. 100000.00
     2.09      1.79      4.09      0.00      .090      .045      .070      .046    582.40    990.00
 .001032        9.        9.        9.         2         0         1      0.00     50.00   1040.00


3470 ENCROACHMENT STATIONS=      681.0     1134.0  TYPE=      1  TARGET=     453.000
 15304.00     11.03    593.03      0.00      0.00    593.04       .01       .03       .07    587.40
    1495.      932.      458.      105.     1387.      397.      303.      400.      172.    588.50
     2.16       .67      1.15       .35      .050      .040      .060      .046    582.00    681.00
 .000053      203.      203.      203.         2         0         1      0.00    453.00   1134.00


3470 ENCROACHMENT STATIONS=      700.0     1080.0  TYPE=      1  TARGET=     380.000

                VS-17 AT WATER TOWER

 15450.00     11.04    593.04      0.00      0.00    593.05       .01       .01       .00    587.40
    1495.      934.      461.      100.     1366.      397.      254.      407.      174.    588.50
     2.21       .68      1.16       .39      .050      .040      .060      .045    582.00    700.00
 .000054      146.      146.      146.         2         0         1      0.00    380.00   1080.00


3470 ENCROACHMENT STATIONS=      943.0     1049.0  TYPE=      1  TARGET=     105.000

                VS-18 D.S. FROM M-13 BRIDGE

 16000.00     11.85    593.05      0.00      0.00    593.17       .12       .07       .05    587.70
    1495.      373.      1122.       0.      271.      361.        0.      424.      177. 100000.00
     2.27      1.37      3.11      0.00      .070      .040      .090      .045    581.20    943.00
 .000523      550.      550.      550.         1         0         1      0.00    104.78   1047.78


  SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
  Q         QLOB      QCH       QROB      ALOB      ACH       AROB      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= 993.0 1048.0 TYPE= 1 TARGET= 55.000

16100.00	11.86	593.06	0.00	0.00	593.29	.23	.07	.06	587.70
1495.	69.	1426.	0.	37.	361.	0.	425.	177.	100000.00
2.28	1.87	3.95	0.00	.070	.040	.090	.045	581.20	993.00
.000844	100.	100.	100.	2	0	1	0.00	54.79	1047.79

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 597.40 ELREA= 597.40

BS-19 M-13 BRIDGE

16150.00	9.93	592.93	0.00	0.00	593.57	.64	.07	.20	597.40
1495.	0.	1495.	0.	0.	233.	0.	425.	177.	597.40
2.28	0.00	6.41	0.00	.070	.040	.090	.045	583.10	1000.63
.002877	50.	50.	50.	2	0	1	0.00	29.28	1029.91

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	-0.00	1.97	3.00	-0.00	25.70	-0.00	274.00	-0.00	583.10	583.10

6070,LOW FLOW BY NORMAL BRIDGE

EGPRS= 0.000 EGLWC= 593.566 ELLC= 594.300 PCWSE= 592.928 ELTRD= 597.400

NORMAL BRIDGE,NRD=24 MIN ELTRD= 597.40 MAX ELLC= 594.30

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 597.40 ELREA= 597.40

16212.00	10.04	593.14	0.00	0.00	593.75	.60	.17	.01	597.40
1495.	0.	1495.	0.	0.	240.	0.	426.	177.	597.40
2.28	0.00	6.24	0.00	.070	.040	.090	.045	583.10	1000.53
.002673	62.	62.	62.	2	0	1	0.00	29.50	1030.03

3470 ENCROACHMENT STATIONS= 990.0 1048.0 TYPE= 1 TARGET= 58.000

16226.00	10.56	593.66	0.00	0.00	593.88	.23	.02	.11	587.70
1495.	118.	1377.	0.	59.	351.	0.	426.	177.	100000.00
2.28	2.02	3.93	0.00	.070	.040	.090	.045	583.10	990.00
.000860	14.	14.	14.	2	0	1	0.00	58.00	1048.00

VS-20

17150.00	11.81	594.41	0.00	0.00	594.45	.04	.51	.05	588.90
1495.	477.	547.	472.	611.	215.	515.	444.	182.	589.70
2.46	.78	2.54	.92	.080	.045	.080	.045	582.60	437.75
.000389	924.	924.	924.	3	0	1	0.00	422.38	860.13

VS-21

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18900.00     10.52    595.02     0.00     0.00    595.05      .04      .60      .00    591.40
   1495.      459.      620.     415.     652.     289.     451.     499.     202.    590.90
    2.81       .70      2.15      .92     .060     .045     .060     .045   584.50    589.27
 .000308     1750.     1750.    1750.        2        0        1     0.00   573.53   1162.80
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18900

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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

                VS-22

 19930.00      9.38   595.38     0.00     0.00   595.43      .06      .37      .01    591.40
    1445.      101.      729.     615.     153.     290.     702.     528.     212.    592.00
     2.98       .66      2.52      .88     .090     .045     .090     .045   587.00    896.98
  .000455     1000.     1030.     950.        1        0        1     0.00   300.35   1197.33

1490 NH CARD USED

3470 ENCROACHMENT STATIONS=      100.0      564.0  TYPE=      1  TARGET=      464.000
 20430.00      8.38   595.58     0.00     0.00   595.68      .09      .23      .02    591.60
    1445.      250.      881.     313.     329.     285.     440.     541.     217.    592.20
     3.04       .76      3.10      .71     .070     .037     .070     .045   587.20    100.00
  .000446      500.      500.     500.        2        0        1     0.00   464.00    564.00

1490 NH CARD USED

                VS-23

 21150.00      8.50   595.90     0.00     0.00   596.01      .11      .33      .01    598.20
    1265.        0.     1265.       0.       0.     469.       0.     553.     221.    600.90
     3.11      0.00      2.70     0.00     .070     .035     .070     .045   587.40    611.02
  .000462      740.      720.     700.        0        0        1     0.00   103.70    714.72

1490 NH CARD USED

3470 ENCROACHMENT STATIONS=       50.0      454.0  TYPE=      1  TARGET=      404.000
 21300.00      8.52   596.02     0.00     0.00   596.08      .06      .05      .02    591.90
    1265.      135.      742.     389.     188.     290.     617.     556.     222.    592.50
     3.14       .72      2.56      .63     .070     .037     .070     .045   587.50     50.00
  .000297      160.      150.     140.        2        0        1     0.00   404.00    454.00

3470 ENCROACHMENT STATIONS=      718.0      992.0  TYPE=      1  TARGET=      274.000

                VS-24

 23500.00      8.29   597.09     0.00     0.00   597.18      .09     1.08      .01    592.70
    1265.      776.      489.       0.     440.     156.       0.     597.     238. 100000.00
     3.40      1.76      3.13     0.00     .050     .045     .060     .045   588.80    739.47
  .001034     2100.     2200.    2100.        2        0        1     0.00   252.53    992.00

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      601.00 ELREA=      601.00
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BS-25 PINCONNING RD. BRIDGE AT MACKINAW ROAD

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24000.00      8.90    597.60      0.00      0.00    598.00       .40       .67       .15    590.00
    1000.        0.    1000.        0.        0.       198.        0.      602.      240.    589.90
     3.43      0.00      5.06      0.00      .050      .045      .060      .045    588.70   1000.00
 .001795      550.      500.      450.         2         0         1      0.00     24.00   1028.16

SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
    -0.00     1.66      2.80      -0.00     24.00     -0.00     198.00    -0.00     588.70    588.70

PRESSURE FLOW

  EGPRS     EGLWC     H3        QWEIR     QPR       BAREA     ELLC      ELTRD     CLASS

  598.26    598.00    0.00      0.        1000.     198.      597.50    601.00    10.00

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      601.00 ELREA=      601.00

24032.00      9.19    597.89      0.00      0.00    598.26       .37       .26      0.00    590.00
    1000.        0.    1000.        0.        0.       205.        0.      602.      240.    589.90
     3.43      0.00      4.89      0.00      .060      .045      .060      .045    588.70   1000.00
 .001619       32.       32.       32.         2         0         1      0.00     24.00   1028.32

  SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
  Q         QLOB      QCH       QROB      ALOB      ACH       AROB      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=      916.0     1040.0  TYPE=      1  TARGET=      124.000
24081.00      9.61    598.31      0.00      0.00    598.39       .08       .04       .09    596.00
    1000.       55.       875.       70.       89.       371.       68.      602.      240.    595.20
     3.44      .62      2.36      1.04      .090      .045      .060      .045    588.70    916.00
 .000465       49.       49.       49.         2         0         1      0.00    124.00   1040.00

3470 ENCROACHMENT STATIONS=     1006.0     1053.0  TYPE=      1  TARGET=       47.000

                VS-26 D.S. FROM MACKINAW RD.

25050.00      8.31    599.01      0.00      0.00    599.24       .23       .77      .08100000.00
    1000.        0.    1000.        0.        0.       259.        0.      611.      242. 100000.00
     3.51      0.00      3.86      0.00      .070      .045      .050      .045    590.70   1006.00
 .001683      898.      969.      988.         2         0         1      0.00     47.00   1053.00

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA=      600.00 ELREA=      600.00

                BS-27 MACKINAW RD. BRIDGE

25099.00      8.86    598.96      0.00      0.00    599.47       .51       .09       .14    590.30
    1000.        0.    1000.        0.        0.       174.        0.      611.      242.    590.60
     3.51      0.00      5.75      0.00      .070      .045      .050      .045    590.10   1000.00
 .002088       49.       49.       49.         2         0         1      0.00     20.00   1036.45
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SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	0.00	1.57	3.00	-0.00	20.00	-0.00	165.00	-0.00	590.10	590.10

PRESSURE FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	ELLC	ELTRD	CLASS
599.85	599.47	0.00	0.	1000.	165.	598.50	600.00	10.00

OVERBANK AREA ASSUMED NON-EFFECTIVE,ELLEA= 600.00 ELREA= 600.00

25129.00	9.29	599.39	0.00	0.00	599.85	.47	.38	0.00	590.30
1000.	0.	1000.	0.	0.	182.	0.	611.	242.	590.60
3.51	0.00	5.48	0.00	.070	.045	.050	.045	590.10	1000.00
.001806	30.	30.	30.	2	0	1	0.00	20.00	1037.29

3470 ENCROACHMENT STATIONS= 1004.0 1056.0 TYPE= 1 TARGET= 52.000

25144.00	9.71	599.81	0.00	0.00	599.96	.16	.02	.09	100000.00
1000.	0.	1000.	0.	0.	316.	0.	612.	242.	100000.00
3.51	0.00	3.17	0.00	.070	.045	.050	.045	590.10	1004.00
.001000	15.	15.	15.	2	0	1	0.00	52.00	1056.00

1490 NH CARD USED

VS-28 U.S. OF MACKINAW RD.

26144.00	7.95	600.55	0.00	0.00	600.61	.06	.61	.03	598.00
1000.	297.	550.	154.	499.	222.	225.	626.	248.	597.10
3.68	.60	2.48	.68	.070	.042	.070	.045	592.60	603.23
.000419	1000.	1000.	950.	3	0	1	0.00	536.50	1139.73

SUMMARY PRINTOUT FOR MULTIPLE PROFILES

ONNING TWP. BAY CO.

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TQ	EG	TOPWID	HV	VCH	WSELK
1.00	0.00	0.00	0.00	576.40	1875.00	581.90	496.81	582.14	183.33	.24	3.93	581.90
1250.00	1250.00	0.00	0.00	576.80	1875.00	582.95	966.34	583.00	1238.53	.05	2.31	0.00
4500.00	3250.00	0.00	0.00	577.10	1875.00	584.14	787.44	584.20	1307.19	.07	2.68	0.00
6300.00	1800.00	0.00	0.00	577.70	1845.00	585.51	548.15	585.63	838.95	.12	3.44	0.00
8300.00	2000.00	0.00	0.00	577.60	1845.00	587.47	597.21	587.82	47.50	.34	4.70	0.00
8330.00	30.00	0.00	0.00	577.60	1845.00	587.39	427.17	587.98	32.50	.59	6.16	0.00
8340.00	10.00	0.00	0.00	577.60	1845.00	587.30	347.40	588.11	27.50	.81	7.21	0.00
8349.00	9.00	0.00	0.00	576.40	1845.00	587.17	355.28	588.30	22.50	1.13	8.52	0.00
8350.00	1.00	593.70	589.40	576.40	1845.00	587.17	328.45	588.30	22.50	1.13	8.52	0.00
8376.00	26.00	593.70	589.40	576.40	1845.00	587.29	333.81	588.39	22.50	1.10	8.42	0.00
8377.00	1.00	0.00	0.00	576.40	1845.00	587.29	361.92	588.39	22.50	1.10	8.41	0.00
8380.00	3.00	0.00	0.00	576.40	1845.00	587.90	408.80	588.54	28.50	.64	6.40	0.00
8392.00	12.00	0.00	0.00	576.40	1845.00	588.41	734.11	588.66	52.50	.25	4.02	0.00
9900.00	1508.00	0.00	0.00	578.60	1845.00	589.86	455.93	590.12	63.63	.27	4.21	0.00
9949.00	49.00	0.00	0.00	579.20	1845.00	589.90	460.53	590.23	38.80	.33	4.60	0.00
9950.00	1.00	596.90	591.60	579.20	1845.00	589.91	712.82	590.23	38.80	.33	4.60	0.00
9982.00	32.00	596.90	591.60	579.20	1845.00	589.93	714.18	590.26	38.80	.33	4.60	0.00
9983.00	1.00	0.00	0.00	579.20	1845.00	589.93	461.63	590.26	38.80	.33	4.60	0.00
10004.00	21.00	0.00	0.00	579.20	1845.00	590.05	448.08	590.31	80.80	.26	4.56	0.00
10900.00	896.00	0.00	0.00	578.90	1845.00	590.84	885.76	591.02	77.00	.18	3.47	0.00
10949.00	49.00	0.00	0.00	579.50	1845.00	590.85	938.00	591.04	52.40	.19	3.50	0.00
10963.00	14.00	597.80	591.80	579.50	1845.00	590.86	938.00	591.05	52.40	.19	3.50	0.00
10983.00	20.00	0.00	0.00	579.50	1845.00	590.89	892.77	591.06	92.00	.18	3.43	0.00
12350.00	1367.00	0.00	0.00	580.70	1495.00	591.31	1848.51	591.32	767.78	.01	.91	0.00
13900.00	1550.00	0.00	0.00	579.70	1495.00	591.48	543.24	591.63	63.00	.14	3.13	0.00
13949.00	49.00	0.00	0.00	580.90	1495.00	591.48	489.28	591.71	38.20	.23	3.86	0.00
13981.00	32.00	593.00	590.00	580.90	1495.00	591.85	516.89	592.07	38.20	.22	3.72	0.00
14030.00	49.00	0.00	0.00	580.90	1495.00	592.10	911.30	592.14	137.00	.04	1.89	0.00

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TQ	EG	TOPWID	HV	VCH	WSELK
14700.00	670.00	0.00	0.00	581.10	1495.00	592.30	790.53	592.36	175.00	.06	2.34	0.00
15000.00	300.00	0.00	0.00	582.70	1495.00	592.38	443.78	592.63	55.00	.25	4.17	0.00
15049.00	49.00	0.00	0.00	582.40	1495.00	592.35	377.46	592.78	29.20	.43	5.28	0.00
15092.00	43.00	597.80	593.10	582.40	1495.00	592.44	283.47	592.87	29.20	.43	5.26	0.00
15101.00	9.00	0.00	0.00	582.40	1495.00	592.70	465.41	592.94	50.00	.24	4.09	0.00
15304.00	203.00	0.00	0.00	582.00	1495.00	593.03	2050.22	593.04	453.00	.01	1.15	0.00
15450.00	146.00	0.00	0.00	582.00	1495.00	593.04	2038.91	593.05	380.00	.01	1.16	0.00
16000.00	550.00	0.00	0.00	581.20	1495.00	593.05	653.63	593.17	104.78	.12	3.11	0.00
16100.00	100.00	0.00	0.00	581.20	1495.00	593.06	514.58	593.29	54.79	.23	3.95	0.00
16150.00	50.00	0.00	0.00	583.10	1495.00	592.93	278.71	593.57	29.28	.64	6.41	0.00
16212.00	62.00	597.40	594.30	583.10	1495.00	593.14	289.14	593.75	29.50	.60	6.24	0.00
16226.00	14.00	0.00	0.00	583.10	1495.00	593.66	509.84	593.88	58.00	.23	3.93	0.00
17150.00	924.00	0.00	0.00	582.60	1495.00	594.41	758.18	594.45	422.38	.04	2.54	0.00
18900.00	1750.00	0.00	0.00	584.50	1495.00	595.02	852.34	595.05	573.53	.04	2.15	0.00
19930.00	1030.00	0.00	0.00	587.00	1445.00	595.38	677.16	595.43	300.35	.06	2.52	0.00
20430.00	500.00	0.00	0.00	587.20	1445.00	595.58	684.20	595.68	464.00	.09	3.10	0.00
21150.00	720.00	0.00	0.00	587.40	1265.00	595.90	588.70	596.01	103.70	.11	2.70	0.00
21300.00	150.00	0.00	0.00	587.50	1265.00	596.02	733.86	596.08	404.00	.06	2.56	0.00
23500.00	2200.00	0.00	0.00	588.80	1265.00	597.09	393.42	597.18	252.53	.09	3.13	0.00
24000.00	500.00	0.00	0.00	588.70	1000.00	597.60	236.04	598.00	24.00	.40	5.06	0.00
24032.00	32.00	601.00	597.50	588.70	1000.00	597.89	248.56	598.26	24.00	.37	4.89	0.00
24081.00	49.00	0.00	0.00	588.70	1000.00	598.31	463.76	598.39	124.00	.08	2.36	0.00
25050.00	969.00	0.00	0.00	590.70	1000.00	599.01	243.74	599.24	47.00	.23	3.86	0.00
25099.00	49.00	0.00	0.00	590.10	1000.00	598.96	218.84	599.47	20.00	.51	5.75	0.00
25129.00	30.00	600.00	598.50	590.10	1000.00	599.39	235.28	599.85	20.00	.47	5.48	0.00
25144.00	15.00	0.00	0.00	590.10	1000.00	599.81	316.26	599.96	52.00	.16	3.17	0.00
26144.00	1000.00	0.00	0.00	592.60	1000.00	600.55	488.75	600.61	536.50	.06	2.48	0.00

SECTION NUMBER	DISCHARGE CFS	CWSEL	CWSEL DIFF EACH Q	CWSEL DIFF EACH SECTION	CWSEL-WSELK	TOPWID	T.W. DIFF	LENGTH
1.000	1875.000	581.900	0.000	0.000	0.000	183.333	0.000	-0.000
1250.000	1875.000	582.952	0.000	1.052	0.000	1238.528	0.000	1250.000
4500.000	1875.000	584.137	0.000	1.185	0.000	1307.187	0.000	3250.000

6300.000	1845.000	585.508	0.000	1.371	0.000	838.948	0.000	1800.000
8300.000	1845.000	587.475	0.000	1.966	0.000	47.499	0.000	2000.000
8330.000	1845.000	587.390	0.000	-.084	0.000	32.499	0.000	30.000
8340.000	1845.000	587.304	0.000	-.086	0.000	27.499	0.000	10.000
8349.000	1845.000	587.169	0.000	-.135	0.000	22.500	0.000	9.000
8350.000	1845.000	587.173	0.000	.004	0.000	22.500	0.000	1.000
8376.000	1845.000	587.288	0.000	.115	0.000	22.500	0.000	26.000
8377.000	1845.000	587.292	0.000	.004	0.000	22.500	0.000	1.000
8380.000	1845.000	587.901	0.000	.609	0.000	28.499	0.000	3.000
8392.000	1845.000	588.413	0.000	.512	0.000	52.499	0.000	12.000
9900.000	1845.000	589.857	0.000	1.444	0.000	63.627	0.000	1508.000
9949.000	1845.000	589.904	0.000	.047	0.000	38.800	0.000	49.000
9950.000	1845.000	589.905	0.000	.001	0.000	38.800	0.000	1.000
9982.000	1845.000	589.928	0.000	.023	0.000	38.800	0.000	32.000
9983.000	1845.000	589.929	0.000	.001	0.000	38.800	0.000	1.000
10004.000	1845.000	590.054	0.000	.125	0.000	80.799	0.000	21.000
10900.000	1845.000	590.838	0.000	.784	0.000	76.999	0.000	896.000
10949.000	1845.000	590.854	0.000	.016	0.000	52.400	0.000	49.000
10963.000	1845.000	590.860	0.000	.005	0.000	52.400	0.000	14.000
10983.000	1845.000	590.886	0.000	.026	0.000	91.999	0.000	20.000
12350.000	1495.000	591.311	0.000	.425	0.000	767.779	0.000	1367.000
13900.000	1495.000	591.485	0.000	.174	0.000	62.999	0.000	1550.000
13949.000	1495.000	591.481	0.000	-.003	0.000	38.200	0.000	49.000
13981.000	1495.000	591.852	0.000	.371	0.000	38.200	0.000	32.000
14030.000	1495.000	592.095	0.000	.243	0.000	136.999	0.000	49.000
14700.000	1495.000	592.298	0.000	.203	0.000	174.999	0.000	670.000
15000.000	1495.000	592.377	0.000	.079	0.000	54.999	0.000	300.000
15049.000	1495.000	592.351	0.000	-.027	0.000	29.200	0.000	49.000
15092.000	1495.000	592.443	0.000	.092	0.000	29.200	0.000	43.000
15101.000	1495.000	592.698	0.000	.255	0.000	49.999	0.000	9.000
15304.000	1495.000	593.029	0.000	.331	0.000	452.999	0.000	203.000
15450.000	1495.000	593.037	0.000	.008	0.000	379.999	0.000	146.000
16000.000	1495.000	593.050	0.000	.014	0.000	104.784	0.000	550.000

16100.000	1495.000	593.059	0.000	.009	0.000	54.785	0.000	100.000
16150.000	1495.000	592.928	0.000	-.131	0.000	29.281	0.000	50.000
16212.000	1495.000	593.143	0.000	.215	0.000	29.504	0.000	62.000
16226.000	1495.000	593.655	0.000	.512	0.000	57.999	0.000	14.000
17150.000	1495.000	594.405	0.000	.750	0.000	422.381	0.000	924.000
18900.000	1495.000	595.019	0.000	.614	0.000	573.528	0.000	1750.000
19930.000	1445.000	595.377	0.000	.358	0.000	300.347	0.000	1030.000
20430.000	1445.000	595.583	0.000	.206	0.000	463.999	0.000	500.000
21150.000	1265.000	595.900	0.000	.317	0.000	103.696	0.000	720.000
21300.000	1265.000	596.020	0.000	.120	0.000	403.999	0.000	150.000
23500.000	1265.000	597.090	0.000	1.069	0.000	252.534	0.000	2200.000
24000.000	1000.000	597.602	0.000	.513	0.000	24.000	0.000	500.000
24032.000	1000.000	597.889	0.000	.287	0.000	24.000	0.000	32.000
24081.000	1000.000	598.310	0.000	.421	0.000	123.999	0.000	49.000
25050.000	1000.000	599.006	0.000	.696	0.000	46.999	0.000	969.000
25099.000	1000.000	598.956	0.000	-.050	0.000	20.000	0.000	49.000
25129.000	1000.000	599.386	0.000	.429	0.000	20.000	0.000	30.000
25144.000	1000.000	599.809	0.000	.423	0.000	51.999	0.000	15.000
26144.000	1000.000	600.555	0.000	.746	0.000	536.502	0.000	1000.000

DATA FOR LAST CROSS SECTION

PROFILE	TYPE ENC	TARGET	TOP WIDTH AREA-ACRES	TOP WIDTH AREA-DIFF
1	0.000	0.000	248.377	0.000

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Pinconning Twp

3) WATERCOURSE: Pinconning River

4) DOCUMENT TYPE: Report

00BREAK00

HYDRAULIC ANALYSIS

Introduction

The stream being studied is the Pinconning River, Pinconning Township, Bay County, Michigan. The study limits are from the Saginaw Bay to 1000' upstream of the Mackinaw Road bridge. The flows were computed by the SCS method and have been approved by the Michigan Department of Natural Resources.

Method of Analysis

Water surface profiles were computed through use of the COE HEC-2 step-backwater computer program. Culverts and bridges which were under low flow conditions for all four flows were coded according to the "normal bridge" routine requirements. Those bridges which experienced pressure or weir flow for any of the four flows were coded according to the "special bridge" routine requirements.

The hydraulic model was developed for the 100-year flow. Valley sections upstream and downstream of culverts or bridges were located where full cross section flow would be developed out of the influence of the bridge constriction. The criteria for placement of these sections was that outlined on pages 18-21 in the HEC Training Document No. 6, Application of the HEC-2 Bridge Routines. If low flow or pressure flow was encountered at a bridge or culvert, the downstream section was placed at a distance of four times the bridge constriction and the upstream section was placed at

a distance equal to the bridge constriction. If these distances became too large, the upstream and downstream sections were placed at reasonable distances and then encroached according to the 1:1 contraction and 4:1 expansion ratios respectively. If additional sections were found necessary within these distances or if the actual field-surveyed cross sections fell within these distances, then these intermediate sections were encroached appropriately.

Variables and Coefficients

The roughness factors (Manning's "n") were established by comparing photographs and field inspection with the photographs and descriptions found on pages 101 to 123 in Open-Channel Hydraulics, by Ven Te Chow. In general, the following range of values was used:

Description	Manning's "n"
A. Channel	
1. Sand bottom	.035
2. Soft sand and silt with snags	.040
3. Sand with junk and trash	.040
4. Muck bottom with snags	.045
5. Sand bottom with trees along bank slope	.040 - .055
B. Overbanks	
1. Medium to heavy brush and trees	.080 - .090
2. Medium to heavy weeds with scattered brush and trees	.060 - .070
3. Open field with medium to heavy grass	.050 - .060

The contraction and expansion coefficients used in the Pinconning River study were .3 and .5, respectively. These values were used throughout the study. References evaluated in selection of these values were the HEC-2

Users Manual, exhibit 2, page 2, and Open-Channel Hydraulics, Ven Te Chow, pages 311 and 468.

The orifice and weir coefficients used in the HEC-2 "special bridge" routine were determined as outlined in the HEC-2 Users Manual, exhibit 2, pages 1 and 2, and Application of the HEC-2 Bridge Routines, pages 27-35.

Starting Point

For the Pinconning River, profile computations began at the Saginaw Bay by inputting the mean bay elevation as a known water surface elevation. In the final Flood Insurance Report, the 10-, 50-, 100- and 500-year Saginaw Bay flood elevations will be extended horizontally upstream until the corresponding Pinconning River profiles are intersected. The floodway and flood plain as delineated in this submittal are based on the calculated water surface profiles begun at the Saginaw Bay by inputting the mean bay elevation as a known water surface elevation. In the final Flood Insurance Study, the floodway will be based on the Pinconning River water surface profiles and the flood plain will reflect the influence of the Saginaw Bay.

*
Floodway Determination

Any cross section which was not encroached because of bridge contraction or expansion, was encroached so as to raise the water surface elevation up to a maximum? confusing /167 statute of one-tenth of a foot above the natural floodway water surface elevation of that cross section.

Type 1 encroachment used, not Type 3. J&A procedure is not an equal encroachment method, which would have to be used to delineate the floodway properly

see section 6300

not submitted unable to check

General Notes

*Section D clearly shows the presence of levees but aerial photographs reveal several breaks in the levees in the form of old meandering channels; thus the levees were deemed ineffective. ?

Section D is flooded between stations 0 and 550, although the plotted cross-section does not show it. The flooding is caused by water backing up from section D and being contained by Pinconning Road; thus the flooding does not appear on the plotted cross-section.

consider reasonable

**Field surveyed cross-sections N and O intersect at a point, but because the intersection occurs outside of the encroached floodway, the intersection was not significant.

Section X is flooded between stations 200 and 400, although the plotted cross-section does not show it. The flooding is caused by water backing up from section W and being contained in an old Walk Drain channel and in Walk Drain itself; thus the flooding does not appear on the plotted cross-section.

Field surveyed cross-sections Z and AA both intersect section Y, but because these intersections occur outside of the floodway, the intersections were not significant. checks

** sections N & O are downstream of Penn Central RR, where the flow is contained in the channel (sta 150+49, 150+92, d/s & u/s side of structure)

* What is guarantee that the breaks in the levee will not be repaired?

Original Cross Section Location

Cross Section	SECNO	Location
A	1	500'± U.S. from Mouth of River
B	1250	1250'± U.S. from Previous Section
C	4500	3250' U.S. from Previous Section
D	6300	1800' U.S. from Previous Section
E	8300	50' D.S. from Pinconning Rd
F	8350	Bridge at Pinconning Rd and Tower Beach Rd
G	9900	50' D.S. from Hunter Road
H	9950	Bridge at Hunter Road
I	10900	50' D.S. from Detroit and Mackinac R.R.
J	10949	Bridge at Detroit and Mackinac R.R.
K	12350	1300'± U.S. from Detroit and Mackinac R.R.
L	13900	50'± D.S. from Water Street
M	13949	Bridge at Water Street
N	14700	300'± D.S. from Penn Central R.R.
O	15000	50' D.S. from Penn Central R.R.
P	15049	Bridge at Penn Central R.R.
Q	15450	At Water Tower
R	16000	150'± D.S. from M-13 Bridge
S	16150	Bridge at M-13
T	17150	1300'± U.S. from M-13
U	18900	250'± D.S. from N.S. 1/4 Line - Section 22

Cross Section	SECNO	Location
V	19930	650'± U.S. from N.S. 1/4 Line - Section 22
W	21150	At Old R.R. Grade
X	23500	250'± D.S. from Junction of Walk Drain and Pinconning River
Y	24000	Bridge at Pinconning Road
Z	25050	50'± D.S. from Mackinaw Road
AA	25099	Bridge and CMP at Mackinaw Road
AB	26144	1000'± U.S. from Mackinaw Road

100-year

WATERCOURSE: Pinconning River
TOWNSHIP: Pinconning
COUNTY: Bay

STATION	LOCATION	CWSEL	EG	Q
1	Confluence of Saginaw Bay	581.90	582.14	1875
1250	1250' u/s of confluence	582.98	583.04	1875
4500	4500' u/s of confluence	584.24	584.31	1875
6300	6300' u/s of confluence	585.61	585.74	1845
8300	50' d/s of Pinconning Road	587.55	587.89	1845
8330	20' d/s of Pinconning Road	587.47	588.05	1845
8340	10 d/s of Pinconning Road	587.38	588.18	1845
8349	1' d/s of Pinconning Road	587.25	588.36	1845
8350	d/s face of Pinconning Road	587.25	588.36	1845
8376	u/s face of Pinconning Road	587.37	588.45	1845
8377	1' u/s of Pinconning Road	587.37	588.45	1845
8380	4' u/s of Pinconning Road	587.97	588.59	1845
8392	16' u/s of Pinconning Road	588.47	588.72	1845
9900	50' d/s of Hunter Road	589.89	590.15	1845
9949	1' d/s of Hunter Road	589.94	590.26	1845
9950	d/s face of Hunter Road	589.94	590.26	1845
9982	u/s face of Hunter Road	589.96	590.29	1845
9983	1' u/s of Hunter Road	589.96	590.29	1845
10004	22' u/s of Hunter Road	590.09	590.34	1845
10900	50' d/s of Detroit & Mackinaw RR	590.86	591.04	1845
10949	1' d/s of Detroit & Mackinaw RR	590.88	591.07	1845
10963	u/s face of Detroit & Mackinaw RR	590.88	591.07	1845
10983	20' u/s of Detroit & Mackinaw RR	590.91	591.08	1845
12350 12400	1387' u/s of Detroit & Mackinaw RR	591.36	591.37	1495
13900 14400	50' d/s of Water Street	591.57	591.71	1495
13949 14450	1' d/s of Water Street	591.57	591.80	1495
13981	u/s face of Water Street	591.94	592.15	1495 Approx
14030	50' u/s of Water Street	592.18	592.23	1495 City of
14700	301' d/s of Penn Central RR	592.38	592.43	1495 Pinconning
15000 15400	1' d/s of Penn Central RR	592.45	592.69	1495
15092	u/s face of Penn Central RR	592.51	592.94	1495 Limits
15101	10' u/s of Penn Central RR	592.77	593.00	1495
15304	213' u/s of Penn Central RR	593.09	593.10	1495
15450 15900	360' u/s of Penn Central RR	593.10	593.11	1495
16000 16550	150' d/s of M-13	593.11	593.23	1495
16100	50' d/s of M-13	593.12	593.35	1495
16150 16700	1' d/s of M-13	592.99	593.62	1495
16212	u/s face of M-13	593.20	593.79	1495
16226	14' u/s of M-13	593.70	593.93	1495
17150	938' u/s of M-13	594.46	594.51	1495
18900	2688' u/s of M-13	595.11	595.15	1495
19930	3718' u/s of M-13	595.47	595.52	1445
20430	4218' u/s of M-13	595.66	595.75	1445
21150	2850' d/s of Pinconning Road	595.96	596.07	1265
21300	2700' d/s of Pinconning Road	596.08	596.14	1265
23500	500' d/s of Pinconning Road	597.11	597.19	1265
24000	1' d/s of Pinconning Road	597.61	598.01	1000
24032	u/s face of Pinconning Road	597.90	598.27	1000
24081	50' u/s of Pinconning Road	598.32	598.39	1000
25050	1' d/s of Mackinaw Road	599.01	599.24	1000
25129	u/s face of Mackinaw Road	599.39	599.86	1000
25144	15' u/s of Mackinaw Road	599.81	599.97	1000
26144	1015' u/s of Mackinaw Road	600.62	600.70	1000

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Pinconning Twp

3) WATERCOURSE: Pinconning River

4) DOCUMENT TYPE: Summary

00BREAK00

SUMMARY PRINTOUT FOR MULTIPLE PROFILES

ONNING TWP. BAY CO.

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TQ	EG	TOPWID	HV	VCH	WSELK
1.00	0.00	0.00	0.00	576.40	1195.00	581.90	495.48	582.00	123.33	.10	2.51	581.90
1.00	0.00	0.00	0.00	576.40	1640.00	581.90	495.48	582.08	123.33	.18	3.44	581.90
1.00	0.00	0.00	0.00	576.40	1875.00	581.90	495.48	582.14	123.33	.24	3.93	581.90
1.00	0.00	0.00	0.00	576.40	2275.00	581.90	495.48	582.25	123.33	.35	4.77	581.90
1250.00	1250.00	0.00	0.00	576.80	1195.00	582.47	687.12	582.52	936.34	.04	1.95	0.00
1250.00	1250.00	0.00	0.00	576.80	1640.00	582.81	841.44	582.86	937.26	.06	2.28	0.00
1250.00	1250.00	0.00	0.00	576.80	1875.00	582.98	933.17	583.04	937.76	.06	2.40	0.00
1250.00	1250.00	0.00	0.00	576.80	2275.00	583.28	1097.82	583.34	937.80	.06	2.58	0.00
4500.00	3250.00	0.00	0.00	577.10	1195.00	583.62	499.97	583.69	988.58	.08	2.51	0.00
4500.00	3250.00	0.00	0.00	577.10	1640.00	584.05	686.22	584.12	1061.84	.07	2.66	0.00
4500.00	3250.00	0.00	0.00	577.10	1875.00	584.24	787.07	584.31	1071.50	.07	2.71	0.00
4500.00	3250.00	0.00	0.00	577.10	2275.00	584.53	962.42	584.60	1071.50	.07	2.79	0.00
6300.00	1800.00	0.00	0.00	577.70	1180.00	584.90	382.72	585.01	476.97	.11	2.99	0.00
6300.00	1800.00	0.00	0.00	577.70	1615.00	585.40	493.21	585.52	480.56	.12	3.32	0.00
6300.00	1800.00	0.00	0.00	577.70	1845.00	585.61	548.06	585.74	482.10	.13	3.47	0.00
6300.00	1800.00	0.00	0.00	577.70	2240.00	585.93	639.29	586.07	484.45	.14	3.70	0.00
8300.00	2000.00	0.00	0.00	577.60	1180.00	586.36	481.36	586.55	47.50	.19	3.48	0.00
8300.00	2000.00	0.00	0.00	577.60	1615.00	587.18	565.90	587.46	47.50	.28	4.27	0.00
8300.00	2000.00	0.00	0.00	577.60	1845.00	587.55	605.42	587.89	47.50	.34	4.66	0.00
8300.00	2000.00	0.00	0.00	577.60	2240.00	588.13	667.93	588.56	47.50	.43	5.29	0.00
8330.00	30.00	0.00	0.00	577.60	1180.00	586.32	358.37	586.63	32.50	.31	4.46	0.00
8330.00	30.00	0.00	0.00	577.60	1615.00	587.11	409.06	587.59	32.50	.48	5.56	0.00
8330.00	30.00	0.00	0.00	577.60	1845.00	587.47	432.25	588.05	32.50	.58	6.11	0.00
8330.00	30.00	0.00	0.00	577.60	2240.00	588.01	468.28	588.77	32.50	.76	7.01	0.00
8340.00	10.00	0.00	0.00	577.60	1180.00	586.28	295.12	586.70	27.50	.42	5.18	0.00
8340.00	10.00	0.00	0.00	577.60	1615.00	587.04	333.98	587.70	27.50	.65	6.49	0.00
8340.00	10.00	0.00	0.00	577.60	1845.00	587.38	351.48	588.18	27.50	.79	7.15	0.00
8340.00	10.00	0.00	0.00	577.60	2240.00	587.89	378.27	588.95	27.50	1.05	8.23	0.00
8349.00	9.00	0.00	0.00	576.40	1180.00	586.22	304.66	586.79	22.50	.57	6.05	0.00
8349.00	9.00	0.00	0.00	576.40	1615.00	586.94	342.86	587.85	22.50	.91	7.64	0.00
8349.00	9.00	0.00	0.00	576.40	1845.00	587.25	359.66	588.36	22.50	1.11	8.45	0.00
8349.00	9.00	0.00	0.00	576.40	2240.00	587.71	384.70	589.20	22.50	1.49	9.80	0.00
8350.00	1.00	593.70	589.40	576.40	1180.00	586.22	285.15	586.79	22.50	.57	6.04	0.00
8350.00	1.00	593.70	589.40	576.40	1615.00	586.94	317.87	587.85	22.50	.91	7.64	0.00
8350.00	1.00	593.70	589.40	576.40	1845.00	587.25	332.17	588.36	22.50	1.11	8.45	0.00
8350.00	1.00	593.70	589.40	576.40	2240.00	587.71	353.38	589.20	22.50	1.49	9.79	0.00
8376.00	26.00	593.70	589.40	576.40	1180.00	586.27	287.03	586.83	22.50	.56	6.02	0.00
8376.00	26.00	593.70	589.40	576.40	1615.00	587.03	321.94	587.92	22.50	.89	7.57	0.00
8376.00	26.00	593.70	589.40	576.40	1845.00	587.37	337.37	588.45	22.50	1.08	8.35	0.00
8376.00	26.00	593.70	589.40	576.40	2240.00	587.87	361.07	589.32	22.50	1.44	9.64	0.00

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TQ	EG	TOPWID	HV	VCH	WSELK
8377.00	1.00	0.00	0.00	576.40	1180.00	586.27	307.01	586.84	22.50	.56	6.01	0.00
8377.00	1.00	0.00	0.00	576.40	1615.00	587.03	347.90	587.92	22.50	.89	7.56	0.00
8377.00	1.00	0.00	0.00	576.40	1845.00	587.37	366.11	588.45	22.50	1.08	8.35	0.00
8377.00	1.00	0.00	0.00	576.40	2240.00	587.88	394.22	589.32	22.50	1.44	9.63	0.00
8380.00	3.00	0.00	0.00	576.40	1180.00	586.56	334.97	586.90	28.50	.35	4.72	0.00
8380.00	3.00	0.00	0.00	576.40	1615.00	587.51	386.84	588.04	28.50	.53	5.83	0.00
8380.00	3.00	0.00	0.00	576.40	1845.00	587.97	412.40	588.59	28.50	.63	6.36	0.00
8380.00	3.00	0.00	0.00	576.40	2240.00	588.72	454.45	589.52	28.50	.80	7.19	0.00
8392.00	12.00	0.00	0.00	576.40	1180.00	586.82	547.43	586.97	51.38	.15	3.15	0.00
8392.00	12.00	0.00	0.00	576.40	1615.00	587.92	673.84	588.14	52.50	.22	3.73	0.00
8392.00	12.00	0.00	0.00	576.40	1845.00	588.47	741.39	588.72	52.50	.25	4.00	0.00
8392.00	12.00	0.00	0.00	576.40	2240.00	589.39	857.81	589.69	52.50	.30	4.40	0.00
9900.00	1508.00	0.00	0.00	578.60	1180.00	587.96	300.55	588.16	61.22	.20	3.58	0.00
9900.00	1508.00	0.00	0.00	578.60	1615.00	589.27	403.84	589.51	62.88	.24	4.00	0.00
9900.00	1508.00	0.00	0.00	578.60	1845.00	589.89	458.94	590.15	63.67	.26	4.19	0.00
9900.00	1508.00	0.00	0.00	578.60	2240.00	590.90	557.71	591.20	63.80	.30	4.46	0.00
9949.00	49.00	0.00	0.00	579.20	1180.00	588.03	337.02	588.23	38.80	.20	3.60	0.00
9949.00	49.00	0.00	0.00	579.20	1615.00	589.32	420.51	589.60	38.80	.28	4.28	0.00
9949.00	49.00	0.00	0.00	579.20	1845.00	589.94	462.75	590.26	38.80	.33	4.59	0.00
9949.00	49.00	0.00	0.00	579.20	2240.00	590.93	531.55	591.33	38.80	.40	5.09	0.00
9950.00	1.00	596.90	591.60	579.20	1180.00	588.03	531.78	588.23	38.80	.20	3.60	0.00
9950.00	1.00	596.90	591.60	579.20	1615.00	589.32	654.61	589.61	38.80	.28	4.28	0.00
9950.00	1.00	596.90	591.60	579.20	1845.00	589.94	716.02	590.26	38.80	.33	4.59	0.00
9950.00	1.00	596.90	591.60	579.20	2240.00	590.93	815.17	591.33	38.80	.40	5.09	0.00
9982.00	32.00	596.90	591.60	579.20	1180.00	588.05	534.32	588.25	38.80	.20	3.59	0.00
9982.00	32.00	596.90	591.60	579.20	1615.00	589.34	657.84	589.63	38.80	.28	4.26	0.00
9982.00	32.00	596.90	591.60	579.20	1845.00	589.96	717.34	590.29	38.80	.33	4.58	0.00
9982.00	32.00	596.90	591.60	579.20	2240.00	590.96	818.62	591.36	38.80	.40	5.07	0.00
9983.00	1.00	0.00	0.00	579.20	1180.00	588.05	338.85	588.25	38.80	.20	3.59	0.00
9983.00	1.00	0.00	0.00	579.20	1615.00	589.34	422.87	589.63	38.80	.28	4.26	0.00
9983.00	1.00	0.00	0.00	579.20	1845.00	589.96	463.82	590.29	38.80	.33	4.58	0.00
9983.00	1.00	0.00	0.00	579.20	2240.00	590.96	534.14	591.36	38.80	.40	5.07	0.00
10004.00	21.00	0.00	0.00	579.20	1180.00	588.08	283.88	588.28	64.73	.20	3.88	0.00
10004.00	21.00	0.00	0.00	579.20	1615.00	589.43	390.73	589.67	76.76	.24	4.36	0.00
10004.00	21.00	0.00	0.00	579.20	1845.00	590.09	451.36	590.34	80.80	.26	4.54	0.00
10004.00	21.00	0.00	0.00	579.20	2240.00	591.16	567.19	591.43	80.80	.27	4.74	0.00
10900.00	896.00	0.00	0.00	578.90	1180.00	588.83	576.43	588.97	74.01	.14	2.96	0.00
10900.00	896.00	0.00	0.00	578.90	1615.00	590.21	779.84	590.38	76.48	.17	3.31	0.00
10900.00	896.00	0.00	0.00	578.90	1845.00	590.86	889.86	591.04	77.00	.18	3.46	0.00
10900.00	896.00	0.00	0.00	578.90	2240.00	591.91	1083.94	592.11	77.00	.20	3.69	0.00

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TQ	EG	TOPWID	HV	VCH	WSELK
10949.00	49.00	0.00	0.00	579.50	1180.00	588.87	665.51	588.99	52.40	.12	2.78	0.00
10949.00	49.00	0.00	0.00	579.50	1615.00	590.23	848.61	590.40	52.40	.17	3.26	0.00
10949.00	49.00	0.00	0.00	579.50	1845.00	590.88	941.28	591.07	52.40	.19	3.49	0.00
10949.00	49.00	0.00	0.00	579.50	2240.00	591.92	1096.50	592.15	52.40	.23	3.84	0.00
10963.00	14.00	597.80	591.80	579.50	1180.00	588.88	664.74	589.00	52.40	.12	2.79	0.00
10963.00	14.00	597.80	591.80	579.50	1615.00	590.23	848.61	590.40	52.40	.17	3.26	0.00
10963.00	14.00	597.80	591.80	579.50	1845.00	590.88	941.28	591.07	52.40	.19	3.49	0.00
10963.00	14.00	597.80	591.80	579.50	2240.00	592.11	1125.66	592.33	52.40	.22	3.78	0.00
10983.00	20.00	0.00	0.00	579.50	1180.00	588.88	569.21	589.01	80.68	.14	2.99	0.00
10983.00	20.00	0.00	0.00	579.50	1615.00	590.24	776.18	590.41	91.53	.17	3.30	0.00
10983.00	20.00	0.00	0.00	579.50	1845.00	590.91	897.11	591.08	92.00	.17	3.42	0.00
10983.00	20.00	0.00	0.00	579.50	2240.00	592.17	1149.28	592.35	92.00	.18	3.52	0.00
12350.00	1367.00	0.00	0.00	580.70	945.00	589.36	816.29	589.37	510.00	.01	1.11	0.00
12350.00	1367.00	0.00	0.00	580.70	1300.00	590.70	1358.83	590.71	510.00	.01	1.02	0.00
12350.00	1367.00	0.00	0.00	580.70	1495.00	591.36	1671.84	591.37	510.00	.01	1.01	0.00
12350.00	1367.00	0.00	0.00	580.70	1825.00	592.58	2332.49	592.59	510.00	.01	.95	0.00
13900.00	1550.00	0.00	0.00	579.70	945.00	589.72	364.05	589.81	63.00	.10	2.62	0.00
13900.00	1550.00	0.00	0.00	579.70	1300.00	590.95	486.45	591.08	63.00	.12	2.94	0.00
13900.00	1550.00	0.00	0.00	579.70	1495.00	591.57	552.76	591.71	63.00	.14	3.09	0.00
13900.00	1550.00	0.00	0.00	579.70	1825.00	592.73	684.96	592.89	63.00	.16	3.25	0.00
13949.00	49.00	0.00	0.00	580.90	945.00	589.73	365.65	589.87	38.20	.13	2.95	0.00
13949.00	49.00	0.00	0.00	580.90	1300.00	590.96	451.46	591.15	38.20	.19	3.54	0.00
13949.00	49.00	0.00	0.00	580.90	1495.00	591.57	495.67	591.80	38.20	.23	3.83	0.00
13949.00	49.00	0.00	0.00	580.90	1825.00	592.71	582.69	592.99	38.20	.27	4.20	0.00
13981.00	32.00	593.00	590.00	580.90	945.00	589.75	366.72	589.89	38.20	.13	2.94	0.00
13981.00	32.00	593.00	590.00	580.90	1300.00	591.21	469.62	591.40	38.20	.18	3.45	0.00
13981.00	32.00	593.00	590.00	580.90	1495.00	591.94	523.66	592.15	38.20	.21	3.69	0.00
13981.00	32.00	593.00	590.00	580.90	1825.00	593.15	764.47	593.34	446.13	.19	3.67	0.00
14030.00	49.00	0.00	0.00	580.90	945.00	589.90	480.40	589.94	137.00	.04	1.95	0.00
14030.00	49.00	0.00	0.00	580.90	1300.00	591.42	766.86	591.46	137.00	.04	1.88	0.00
14030.00	49.00	0.00	0.00	580.90	1495.00	592.18	930.44	592.23	137.00	.04	1.86	0.00
14030.00	49.00	0.00	0.00	580.90	1825.00	593.36	1206.93	593.40	137.00	.05	1.87	0.00
14700.00	670.00	0.00	0.00	581.10	945.00	590.18	417.74	590.25	175.00	.07	2.35	0.00
14700.00	670.00	0.00	0.00	581.10	1300.00	591.64	660.17	591.70	175.00	.06	2.32	0.00
14700.00	670.00	0.00	0.00	581.10	1495.00	592.38	806.67	592.43	175.00	.06	2.31	0.00
14700.00	670.00	0.00	0.00	581.10	1825.00	593.53	1062.64	593.58	175.00	.05	2.31	0.00
15000.00	300.00	0.00	0.00	582.70	945.00	590.34	279.34	590.53	53.37	.19	3.61	0.00
15000.00	300.00	0.00	0.00	582.70	1300.00	591.74	387.54	591.96	54.83	.23	3.97	0.00
15000.00	300.00	0.00	0.00	582.70	1495.00	592.45	450.41	592.69	55.00	.24	4.13	0.00
15000.00	300.00	0.00	0.00	582.70	1825.00	593.57	554.00	593.84	55.00	.27	4.39	0.00

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TQ	EG	TOPWID	HV	VCH	WSELK
15049.00	49.00	0.00	0.00	582.40	945.00	590.36	266.16	590.63	29.20	.27	4.20	0.00
15049.00	49.00	0.00	0.00	582.40	1300.00	591.72	341.37	592.10	29.20	.37	4.90	0.00
15049.00	49.00	0.00	0.00	582.40	1495.00	592.42	381.69	592.85	29.20	.43	5.24	0.00
15049.00	49.00	0.00	0.00	582.40	1825.00	593.51	446.99	594.03	29.20	.51	5.75	0.00
15092.00	43.00	597.80	593.10	582.40	945.00	590.42	269.29	590.69	29.20	.27	4.16	0.00
15092.00	43.00	597.80	593.10	582.40	1300.00	591.79	345.30	592.16	29.20	.37	4.87	0.00
15092.00	43.00	597.80	593.10	582.40	1495.00	592.51	285.24	592.94	29.20	.43	5.23	0.00
15092.00	43.00	597.80	593.10	582.40	1825.00	594.26	493.26	594.71	29.20	.45	5.38	0.00
15101.00	9.00	0.00	0.00	582.40	945.00	590.54	293.93	590.72	48.58	.18	3.52	0.00
15101.00	9.00	0.00	0.00	582.40	1300.00	591.99	405.03	592.22	50.00	.22	3.90	0.00
15101.00	9.00	0.00	0.00	582.40	1495.00	592.77	471.34	593.00	50.00	.24	4.05	0.00
15101.00	9.00	0.00	0.00	582.40	1825.00	594.55	636.18	594.78	50.00	.24	4.05	0.00
15304.00	203.00	0.00	0.00	582.00	945.00	590.80	981.91	590.82	348.67	.01	1.27	0.00
15304.00	203.00	0.00	0.00	582.00	1300.00	592.30	1640.20	592.31	431.51	.01	1.19	0.00
15304.00	203.00	0.00	0.00	582.00	1495.00	593.09	2087.30	593.10	453.00	.01	1.14	0.00
15304.00	203.00	0.00	0.00	582.00	1825.00	594.86	3295.75	594.87	453.00	.01	.99	0.00
15450.00	146.00	0.00	0.00	582.00	945.00	590.82	986.91	590.83	349.36	.01	1.27	0.00
15450.00	146.00	0.00	0.00	582.00	1300.00	592.31	1645.48	592.32	380.00	.01	1.19	0.00
15450.00	146.00	0.00	0.00	582.00	1495.00	593.10	2073.88	593.11	380.00	.01	1.15	0.00
15450.00	146.00	0.00	0.00	582.00	1825.00	594.87	3194.01	594.88	380.00	.01	1.02	0.00
16000.00	550.00	0.00	0.00	581.20	945.00	590.87	368.83	590.99	99.63	.12	3.03	0.00
16000.00	550.00	0.00	0.00	581.20	1300.00	592.33	550.75	592.45	103.09	.12	3.08	0.00
16000.00	550.00	0.00	0.00	581.20	1495.00	593.11	662.66	593.23	104.93	.12	3.07	0.00
16000.00	550.00	0.00	0.00	581.20	1825.00	594.86	963.27	594.96	105.00	.10	2.90	0.00
16100.00	100.00	0.00	0.00	581.20	945.00	590.91	323.20	591.10	49.72	.18	3.47	0.00
16100.00	100.00	0.00	0.00	581.20	1300.00	592.35	447.52	592.57	53.14	.22	3.79	0.00
16100.00	100.00	0.00	0.00	581.20	1495.00	593.12	520.50	593.35	54.93	.23	3.91	0.00
16100.00	100.00	0.00	0.00	581.20	1825.00	594.85	722.06	595.07	55.00	.22	3.86	0.00
16150.00	50.00	0.00	0.00	583.10	945.00	590.85	186.67	591.30	27.13	.45	5.41	0.00
16150.00	50.00	0.00	0.00	583.10	1300.00	592.24	246.68	592.82	28.57	.58	6.09	0.00
16150.00	50.00	0.00	0.00	583.10	1495.00	592.99	281.63	593.62	29.34	.63	6.36	0.00
16150.00	50.00	0.00	0.00	583.10	1825.00	594.70	369.75	595.33	30.70	.63	6.36	0.00
16212.00	62.00	597.40	594.30	583.10	945.00	591.03	194.26	591.46	27.32	.43	5.26	0.00
16212.00	62.00	597.40	594.30	583.10	1300.00	592.45	256.14	592.99	28.79	.55	5.93	0.00
16212.00	62.00	597.40	594.30	583.10	1495.00	593.20	291.85	593.79	29.56	.60	6.20	0.00
16212.00	62.00	597.40	594.30	583.10	1825.00	595.53	415.72	596.06	30.70	.53	5.84	0.00
16226.00	14.00	0.00	0.00	583.10	945.00	591.36	297.69	591.55	52.98	.19	3.62	0.00
16226.00	14.00	0.00	0.00	583.10	1300.00	592.90	431.55	593.11	56.89	.21	3.83	0.00
16226.00	14.00	0.00	0.00	583.10	1495.00	593.70	515.27	593.93	58.00	.22	3.90	0.00
16226.00	14.00	0.00	0.00	583.10	1825.00	595.99	793.32	596.17	58.00	.19	3.60	0.00

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TQ	EG	TOPWID	HV	VCH	WSELK
17150.00	924.00	0.00	0.00	582.60	945.00	592.36	315.77	592.46	258.89	.10	3.24	0.00
17150.00	924.00	0.00	0.00	582.60	1300.00	593.73	562.25	593.79	293.03	.06	2.83	0.00
17150.00	924.00	0.00	0.00	582.60	1495.00	594.46	730.09	594.51	300.00	.05	2.65	0.00
17150.00	924.00	0.00	0.00	582.60	1825.00	596.47	1310.68	596.50	300.00	.03	2.06	0.00
18900.00	1750.00	0.00	0.00	584.50	945.00	593.63	396.97	593.70	400.00	.07	2.55	0.00
18900.00	1750.00	0.00	0.00	584.50	1300.00	594.55	647.93	594.60	400.00	.05	2.35	0.00
18900.00	1750.00	0.00	0.00	584.50	1495.00	595.11	836.98	595.15	400.00	.04	2.20	0.00
18900.00	1750.00	0.00	0.00	584.50	1825.00	596.77	1541.56	596.79	400.00	.02	1.66	0.00
19930.00	1030.00	0.00	0.00	587.00	905.00	594.16	434.16	594.20	267.94	.05	2.17	0.00
19930.00	1030.00	0.00	0.00	587.00	1255.00	594.98	591.88	595.03	289.84	.05	2.41	0.00
19930.00	1030.00	0.00	0.00	587.00	1445.00	595.47	700.85	595.52	303.14	.05	2.46	0.00
19930.00	1030.00	0.00	0.00	587.00	1775.00	596.94	1102.62	596.98	402.54	.04	2.17	0.00
20430.00	500.00	0.00	0.00	587.20	905.00	594.36	385.60	594.48	326.37	.12	3.08	0.00
20430.00	500.00	0.00	0.00	587.20	1255.00	595.18	568.89	595.29	464.00	.10	3.13	0.00
20430.00	500.00	0.00	0.00	587.20	1445.00	595.66	708.35	595.75	464.00	.09	3.01	0.00
20430.00	500.00	0.00	0.00	587.20	1775.00	597.06	1233.84	597.10	464.00	.04	2.36	0.00
21150.00	720.00	0.00	0.00	587.40	785.00	594.75	405.63	594.83	90.41	.08	2.20	0.00
21150.00	720.00	0.00	0.00	587.40	1095.00	595.52	524.35	595.62	99.32	.10	2.54	0.00
21150.00	720.00	0.00	0.00	587.40	1265.00	595.96	598.30	596.07	104.33	.11	2.66	0.00
21150.00	720.00	0.00	0.00	587.40	1565.00	597.21	840.47	597.32	118.71	.10	2.55	0.00
21300.00	150.00	0.00	0.00	587.50	785.00	594.80	419.75	594.88	369.52	.07	2.49	0.00
21300.00	150.00	0.00	0.00	587.50	1095.00	595.62	615.67	595.69	404.00	.07	2.55	0.00
21300.00	150.00	0.00	0.00	587.50	1265.00	596.08	751.99	596.14	404.00	.06	2.51	0.00
21300.00	150.00	0.00	0.00	587.50	1565.00	597.33	1203.53	597.37	404.00	.04	2.13	0.00
23500.00	2200.00	0.00	0.00	588.80	785.00	596.08	224.01	596.18	195.02	.10	3.13	0.00
23500.00	2200.00	0.00	0.00	588.80	1095.00	596.76	330.62	596.85	233.78	.09	3.14	0.00
23500.00	2200.00	0.00	0.00	588.80	1265.00	597.11	396.86	597.19	253.46	.09	3.11	0.00
23500.00	2200.00	0.00	0.00	588.80	1565.00	597.96	602.23	598.03	274.00	.07	2.73	0.00
24000.00	500.00	0.00	0.00	588.70	610.00	596.60	193.97	596.80	24.00	.19	3.51	0.00
24000.00	500.00	0.00	0.00	588.70	860.00	597.29	222.66	597.61	24.00	.32	4.52	0.00
24000.00	500.00	0.00	0.00	588.70	1000.00	597.61	236.40	598.01	24.00	.40	5.05	0.00
24000.00	500.00	0.00	0.00	588.70	1245.00	598.27	265.46	598.80	24.00	.53	5.82	0.00
24032.00	32.00	601.00	597.50	588.70	610.00	596.64	195.36	596.83	24.00	.19	3.49	0.00
24032.00	32.00	601.00	597.50	588.70	860.00	597.47	230.52	597.78	24.00	.30	4.42	0.00
24032.00	32.00	601.00	597.50	588.70	1000.00	597.90	248.96	598.27	24.00	.37	4.88	0.00
24032.00	32.00	601.00	597.50	588.70	1245.00	598.83	290.44	599.29	24.00	.47	5.48	0.00
24081.00	49.00	0.00	0.00	588.70	610.00	596.84	271.12	596.90	124.00	.06	2.05	0.00
24081.00	49.00	0.00	0.00	588.70	860.00	597.81	392.74	597.88	124.00	.07	2.26	0.00
24081.00	49.00	0.00	0.00	588.70	1000.00	598.32	464.99	598.39	124.00	.08	2.35	0.00
24081.00	49.00	0.00	0.00	588.70	1245.00	599.37	632.33	599.44	124.00	.08	2.39	0.00

SECTION NUMBER	CHANNEL LENGTH	MIN EL OF ROADWAY	MAX EL OF LOW CHORD	MIN EL GROUND	DISCHARGE (CFS)	CWSEL	TQ	EG	TOPWID	HV	VCH	WSELK
25050.00	969.00	0.00	0.00	590.70	610.00	597.59	153.95	597.74	47.00	.16	3.17	0.00
25050.00	969.00	0.00	0.00	590.70	860.00	598.53	212.05	598.73	47.00	.20	3.63	0.00
25050.00	969.00	0.00	0.00	590.70	1000.00	599.01	244.08	599.24	47.00	.23	3.85	0.00
25050.00	969.00	0.00	0.00	590.70	1245.00	599.95	310.07	600.21	47.00	.26	4.10	0.00
25099.00	49.00	0.00	0.00	590.10	610.00	597.60	169.16	597.87	20.00	.27	4.16	0.00
25099.00	49.00	0.00	0.00	590.10	860.00	598.50	201.87	598.93	20.00	.42	5.22	0.00
25099.00	49.00	0.00	0.00	590.10	1000.00	598.96	219.02	599.47	20.00	.51	5.75	0.00
25099.00	49.00	0.00	0.00	590.10	1245.00	600.11	454.73	600.29	487.24	.18	4.15	0.00
25129.00	30.00	600.00	598.50	590.10	610.00	597.64	170.67	597.91	20.00	.27	4.13	0.00
25129.00	30.00	600.00	598.50	590.10	860.00	598.77	211.83	599.17	20.00	.40	5.05	0.00
25129.00	30.00	600.00	598.50	590.10	1000.00	599.39	235.49	599.86	20.00	.47	5.48	0.00
25129.00	30.00	600.00	598.50	590.10	1245.00	600.17	467.46	600.34	504.79	.17	4.05	0.00
25144.00	15.00	0.00	0.00	590.10	610.00	597.84	172.38	597.97	52.00	.13	2.86	0.00
25144.00	15.00	0.00	0.00	590.10	860.00	599.11	262.29	599.26	52.00	.15	3.08	0.00
25144.00	15.00	0.00	0.00	590.10	1000.00	599.81	316.66	599.97	52.00	.16	3.16	0.00
25144.00	15.00	0.00	0.00	590.10	1245.00	600.16	345.15	600.37	52.00	.22	3.72	0.00
26144.00	1000.00	0.00	0.00	592.60	610.00	598.92	198.48	599.06	186.55	.14	3.22	0.00
26144.00	1000.00	0.00	0.00	592.60	860.00	600.01	333.11	600.11	208.00	.10	2.99	0.00
26144.00	1000.00	0.00	0.00	592.60	1000.00	600.62	431.64	600.70	208.00	.08	2.82	0.00
26144.00	1000.00	0.00	0.00	592.60	1245.00	601.14	527.73	601.22	208.00	.09	2.99	0.00

SECTION NUMBER	DISCHARGE CFS	CWSEL	CWSEL DIFF EACH Q	CWSEL DIFF EACH SECTION	CWSEL-WSELK	TOPWID	T.W. DIFF	LENGTH
1.000	1195.000	581.900	0.000	0.000	0.000	123.332	0.000	-0.000
1.000	1640.000	581.900	0.000	0.000	0.000	123.332	0.000	-0.000
1.000	1875.000	581.900	0.000	0.000	0.000	123.332	0.000	-0.000
1.000	2275.000	581.900	0.000	0.000	0.000	123.332	0.000	-0.000
1250.000	1195.000	582.475	0.000	.575	0.000	936.340	0.000	1250.000
1250.000	1640.000	582.809	.334	.909	0.000	937.256	-.916	1250.000
1250.000	1875.000	582.984	.175	1.084	0.000	937.756	-1.416	1250.000
1250.000	2275.000	583.279	.295	1.379	0.000	937.799	-1.459	1250.000
4500.000	1195.000	583.617	0.000	1.142	0.000	988.583	0.000	3250.000
4500.000	1640.000	584.049	.433	1.240	0.000	1061.836	-73.252	3250.000
4500.000	1875.000	584.236	.187	1.252	0.000	1071.499	-82.916	3250.000
4500.000	2275.000	584.528	.292	1.248	0.000	1071.499	-82.916	3250.000
6300.000	1180.000	584.903	0.000	1.287	0.000	476.974	0.000	1800.000
6300.000	1615.000	585.398	.495	1.349	0.000	480.563	-3.589	1800.000
6300.000	1845.000	585.608	.210	1.372	0.000	482.104	-5.130	1800.000
6300.000	2240.000	585.928	.320	1.400	0.000	484.450	-7.476	1800.000
8300.000	1180.000	586.358	0.000	1.455	0.000	47.499	0.000	2000.000
8300.000	1615.000	587.179	.821	1.781	0.000	47.499	-.000	2000.000
8300.000	1845.000	587.551	.373	1.943	0.000	47.499	-.000	2000.000
8300.000	2240.000	588.128	.577	2.200	0.000	47.499	-.000	2000.000
8330.000	1180.000	586.321	0.000	-.037	0.000	32.499	0.000	30.000
8330.000	1615.000	587.113	.792	-.066	0.000	32.499	-.000	30.000
8330.000	1845.000	587.468	.355	-.083	0.000	32.499	-.000	30.000
8330.000	2240.000	588.011	.543	-.117	0.000	32.499	-.000	30.000
8340.000	1180.000	586.280	0.000	-.041	0.000	27.499	0.000	10.000
8340.000	1615.000	587.045	.765	-.068	0.000	27.499	-.000	10.000
8340.000	1845.000	587.383	.338	-.084	0.000	27.499	-.000	10.000
8340.000	2240.000	587.895	.512	-.116	0.000	27.499	-.000	10.000

8349.000	1180.000	586.219	0.000	-.062	0.000	22.500	0.000	9.000
8349.000	1615.000	586.939	.720	-.106	0.000	22.500	0.000	9.000
8349.000	1845.000	587.250	.311	-.133	0.000	22.500	0.000	9.000
8349.000	2240.000	587.706	.457	-.188	0.000	22.500	0.000	9.000
8350.000	1180.000	586.221	0.000	.002	0.000	22.500	0.000	1.000
8350.000	1615.000	586.942	.722	.003	0.000	22.500	0.000	1.000
8350.000	1845.000	587.253	.311	.004	0.000	22.500	0.000	1.000
8350.000	2240.000	587.711	.458	.005	0.000	22.500	0.000	1.000
8376.000	1180.000	586.272	0.000	.051	0.000	22.500	0.000	26.000
8376.000	1615.000	587.030	.758	.088	0.000	22.500	0.000	26.000
8376.000	1845.000	587.365	.335	.112	0.000	22.500	0.000	26.000
8376.000	2240.000	587.875	.510	.163	0.000	22.500	0.000	26.000
8377.000	1180.000	586.274	0.000	.002	0.000	22.500	0.000	1.000
8377.000	1615.000	587.033	.760	.003	0.000	22.500	0.000	1.000
8377.000	1845.000	587.369	.336	.004	0.000	22.500	0.000	1.000
8377.000	2240.000	587.880	.511	.005	0.000	22.500	0.000	1.000
8380.000	1180.000	586.558	0.000	.284	0.000	28.499	0.000	3.000
8380.000	1615.000	587.508	.950	.475	0.000	28.499	-.000	3.000
8380.000	1845.000	587.966	.458	.597	0.000	28.499	-.000	3.000
8380.000	2240.000	588.717	.751	.837	0.000	28.499	-.000	3.000
8392.000	1180.000	586.817	0.000	.259	0.000	51.378	0.000	12.000
8392.000	1615.000	587.924	1.107	.416	0.000	52.499	-1.121	12.000
8392.000	1845.000	588.472	.548	.506	0.000	52.499	-1.121	12.000
8392.000	2240.000	589.385	.914	.668	0.000	52.499	-1.121	12.000
9900.000	1180.000	587.964	0.000	1.147	0.000	61.223	0.000	1508.000
9900.000	1615.000	589.267	1.303	1.342	0.000	62.875	-1.652	1508.000
9900.000	1845.000	589.890	.624	1.418	0.000	63.669	-2.446	1508.000
9900.000	2240.000	590.902	1.012	1.516	0.000	63.799	-2.576	1508.000
9949.000	1180.000	588.028	0.000	.064	0.000	38.800	0.000	49.000
9949.000	1615.000	589.321	1.293	.054	0.000	38.800	0.000	49.000
9949.000	1845.000	589.937	.616	.046	0.000	38.800	0.000	49.000
9949.000	2240.000	590.932	.995	.030	0.000	38.800	0.000	49.000
9950.000	1180.000	588.029	0.000	.001	0.000	38.800	0.000	1.000
9950.000	1615.000	589.322	1.293	.001	0.000	38.800	0.000	1.000
9950.000	1845.000	589.938	.616	.001	0.000	38.800	0.000	1.000
9950.000	2240.000	590.933	.995	.001	0.000	38.800	0.000	1.000
9982.000	1180.000	588.046	0.000	.017	0.000	38.800	0.000	32.000
9982.000	1615.000	589.344	1.297	.022	0.000	38.800	0.000	32.000
9982.000	1845.000	589.960	.616	.022	0.000	38.800	0.000	32.000
9982.000	2240.000	590.960	1.000	.027	0.000	38.800	0.000	32.000
9983.000	1180.000	588.047	0.000	.001	0.000	38.800	0.000	1.000
9983.000	1615.000	589.345	1.297	.001	0.000	38.800	0.000	1.000
9983.000	1845.000	589.961	.616	.001	0.000	38.800	0.000	1.000
9983.000	2240.000	590.961	1.000	.001	0.000	38.800	0.000	1.000
10004.000	1180.000	588.077	0.000	.030	0.000	64.733	0.000	21.000
10004.000	1615.000	589.430	1.353	.086	0.000	76.760	-12.028	21.000
10004.000	1845.000	590.087	.656	.126	0.000	80.799	-16.066	21.000
10004.000	2240.000	591.164	1.077	.202	0.000	80.799	-16.066	21.000
10900.000	1180.000	588.835	0.000	.758	0.000	74.014	0.000	896.000
10900.000	1615.000	590.209	1.374	.778	0.000	76.477	-2.463	896.000
10900.000	1845.000	590.861	.652	.774	0.000	76.999	-2.985	896.000
10900.000	2240.000	591.908	1.047	.744	0.000	76.999	-2.985	896.000

10949.000	1180.000	588.873	0.000	.038	0.000	52.400	0.000	49.000
10949.000	1615.000	590.230	1.357	.021	0.000	52.400	0.000	49.000
10949.000	1845.000	590.877	.647	.016	0.000	52.400	0.000	49.000
10949.000	2240.000	591.917	1.040	.009	0.000	52.400	0.000	49.000
10963.000	1180.000	588.877	0.000	.004	0.000	52.400	0.000	14.000
10963.000	1615.000	590.235	1.358	.005	0.000	52.400	0.000	14.000
10963.000	1845.000	590.882	.647	.005	0.000	52.400	0.000	14.000
10963.000	2240.000	592.107	1.224	.190	0.000	52.400	0.000	14.000
10983.000	1180.000	588.876	0.000	-.001	0.000	80.678	0.000	20.000
10983.000	1615.000	590.243	1.368	.008	0.000	91.528	-10.851	20.000
10983.000	1845.000	590.909	.666	.027	0.000	91.999	-11.321	20.000
10983.000	2240.000	592.167	1.258	.060	0.000	91.999	-11.321	20.000
12350.000	945.000	589.364	0.000	.489	0.000	509.999	0.000	1367.000
12350.000	1300.000	590.703	1.338	.459	0.000	509.999	-.000	1367.000
12350.000	1495.000	591.357	.655	.449	0.000	509.999	-.000	1367.000
12350.000	1825.000	592.580	1.222	.413	0.000	509.999	-.000	1367.000
13900.000	945.000	589.718	0.000	.354	0.000	62.999	0.000	1550.000
13900.000	1300.000	590.952	1.234	.250	0.000	62.999	-.000	1550.000
13900.000	1495.000	591.572	.620	.214	0.000	62.999	-.000	1550.000
13900.000	1825.000	592.732	1.160	.152	0.000	62.999	-.000	1550.000
13949.000	945.000	589.732	0.000	.014	0.000	38.200	0.000	49.000
13949.000	1300.000	590.955	1.223	.003	0.000	38.200	0.000	49.000
13949.000	1495.000	591.568	.613	-.004	0.000	38.200	0.000	49.000
13949.000	1825.000	592.714	1.146	-.017	0.000	38.200	0.000	49.000
13981.000	945.000	589.754	0.000	.022	0.000	38.200	0.000	32.000
13981.000	1300.000	591.214	1.460	.259	0.000	38.200	0.000	32.000
13981.000	1495.000	591.942	.728	.374	0.000	38.200	0.000	32.000
13981.000	1825.000	593.149	1.207	.435	0.000	446.134	-407.934	32.000
14030.000	945.000	589.896	0.000	.142	0.000	136.999	0.000	49.000
14030.000	1300.000	591.420	1.524	.206	0.000	136.999	-.000	49.000
14030.000	1495.000	592.182	.762	.239	0.000	136.999	-.000	49.000
14030.000	1825.000	593.355	1.173	.206	0.000	136.999	-.000	49.000
14700.000	945.000	590.185	0.000	.289	0.000	174.999	0.000	670.000
14700.000	1300.000	591.637	1.452	.217	0.000	174.999	-.000	670.000
14700.000	1495.000	592.376	.739	.195	0.000	174.999	-.000	670.000
14700.000	1825.000	593.526	1.150	.171	0.000	174.999	-.000	670.000
15000.000	945.000	590.342	0.000	.157	0.000	53.368	0.000	300.000
15000.000	1300.000	591.736	1.395	.099	0.000	54.830	-1.461	300.000
15000.000	1495.000	592.451	.715	.075	0.000	54.999	-1.631	300.000
15000.000	1825.000	593.568	1.118	.042	0.000	54.999	-1.631	300.000
15049.000	945.000	590.358	0.000	.017	0.000	29.200	0.000	49.000
15049.000	1300.000	591.725	1.367	-.011	0.000	29.200	0.000	49.000
15049.000	1495.000	592.423	.698	-.028	0.000	29.200	0.000	49.000
15049.000	1825.000	593.514	1.091	-.055	0.000	29.200	0.000	49.000
15092.000	945.000	590.417	0.000	.059	0.000	29.200	0.000	43.000
15092.000	1300.000	591.794	1.377	.069	0.000	29.200	0.000	43.000
15092.000	1495.000	592.510	.716	.087	0.000	29.200	0.000	43.000
15092.000	1825.000	594.261	1.751	.748	0.000	29.200	0.000	43.000
15101.000	945.000	590.540	0.000	.123	0.000	48.576	0.000	9.000
15101.000	1300.000	591.994	1.454	.200	0.000	49.999	-1.423	9.000
15101.000	1495.000	592.765	.771	.256	0.000	49.999	-1.423	9.000
15101.000	1825.000	594.545	1.780	.284	0.000	49.999	-1.423	9.000
15304.000	945.000	590.803	0.000	.263	0.000	348.672	0.000	203.000

15304.000	1300.000	592.300	1.497	.306	0.000	431.510	-82.838	203.000
15304.000	1495.000	593.091	.791	.325	0.000	452.999	-104.327	203.000
15304.000	1825.000	594.862	1.771	.317	0.000	452.999	-104.327	203.000
15450.000	945.000	590.817	0.000	.014	0.000	349.361	0.000	146.000
15450.000	1300.000	592.309	1.492	.009	0.000	379.999	-30.638	146.000
15450.000	1495.000	593.098	.789	.007	0.000	379.999	-30.638	146.000
15450.000	1825.000	594.867	1.768	.004	0.000	379.999	-30.638	146.000
16000.000	945.000	590.870	0.000	.053	0.000	99.629	0.000	550.000
16000.000	1300.000	592.333	1.463	.023	0.000	103.089	-3.460	550.000
16000.000	1495.000	593.111	.778	.012	0.000	104.925	-5.296	550.000
16000.000	1825.000	594.862	1.752	-.004	0.000	104.999	-5.370	550.000
16100.000	945.000	590.915	0.000	.045	0.000	49.717	0.000	100.000
16100.000	1300.000	592.352	1.438	.020	0.000	53.142	-3.425	100.000
16100.000	1495.000	593.119	.766	.008	0.000	54.925	-5.208	100.000
16100.000	1825.000	594.849	1.730	-.014	0.000	54.999	-5.282	100.000
16150.000	945.000	590.847	0.000	-.068	0.000	27.128	0.000	50.000
16150.000	1300.000	592.243	1.396	-.110	0.000	28.572	-1.444	50.000
16150.000	1495.000	592.989	.746	-.130	0.000	29.344	-2.216	50.000
16150.000	1825.000	594.702	1.713	-.147	0.000	30.700	-3.572	50.000
16212.000	945.000	591.032	0.000	.185	0.000	27.320	0.000	62.000
16212.000	1300.000	592.448	1.416	.206	0.000	28.785	-1.465	62.000
16212.000	1495.000	593.199	.751	.210	0.000	29.562	-2.241	62.000
16212.000	1825.000	595.528	2.330	.827	0.000	30.700	-3.380	62.000
16226.000	945.000	591.359	0.000	.327	0.000	52.978	0.000	14.000
16226.000	1300.000	592.898	1.539	.450	0.000	56.887	-3.910	14.000
16226.000	1495.000	593.704	.806	.505	0.000	57.999	-5.021	14.000
16226.000	1825.000	595.986	2.282	.456	0.000	57.999	-5.021	14.000
17150.000	945.000	592.360	0.000	1.001	0.000	258.886	0.000	924.000
17150.000	1300.000	593.729	1.370	.831	0.000	293.030	-34.144	924.000
17150.000	1495.000	594.460	.731	.756	0.000	299.999	-41.113	924.000
17150.000	1825.000	596.473	2.013	.487	0.000	299.999	-41.113	924.000
18900.000	945.000	593.630	0.000	1.271	0.000	399.999	0.000	1750.000
18900.000	1300.000	594.554	.923	.824	0.000	399.999	-.000	1750.000
18900.000	1495.000	595.111	.557	.651	0.000	399.999	-.000	1750.000
18900.000	1825.000	596.768	1.658	.295	0.000	399.999	-.000	1750.000
19930.000	905.000	594.157	0.000	.527	0.000	267.943	0.000	1030.000
19930.000	1255.000	594.976	.819	.423	0.000	289.839	-21.896	1030.000
19930.000	1445.000	595.469	.493	.358	0.000	303.138	-35.195	1030.000
19930.000	1775.000	596.944	1.476	.176	0.000	402.535	-134.592	1030.000
20430.000	905.000	594.364	0.000	.207	0.000	326.366	0.000	500.000
20430.000	1255.000	595.184	.820	.208	0.000	463.999	-137.633	500.000
20430.000	1445.000	595.661	.478	.193	0.000	463.999	-137.633	500.000
20430.000	1775.000	597.056	1.395	.112	0.000	463.999	-137.633	500.000
21150.000	785.000	594.750	0.000	.386	0.000	90.412	0.000	720.000
21150.000	1095.000	595.521	.771	.337	0.000	99.318	-8.906	720.000
21150.000	1265.000	595.960	.439	.298	0.000	104.326	-13.914	720.000
21150.000	1565.000	597.214	1.255	.158	0.000	118.705	-28.294	720.000
21300.000	785.000	594.804	0.000	.055	0.000	369.517	0.000	150.000
21300.000	1095.000	595.620	.816	.099	0.000	403.999	-34.482	150.000
21300.000	1265.000	596.078	.458	.119	0.000	403.999	-34.482	150.000
21300.000	1565.000	597.333	1.255	.118	0.000	403.999	-34.482	150.000
23500.000	785.000	596.080	0.000	1.276	0.000	195.017	0.000	2200.000
23500.000	1095.000	596.761	.681	1.141	0.000	233.784	-38.767	2200.000

23500.000	1265.000	597.106	.345	1.028	0.000	253.464	-58.446	2200.000
23500.000	1565.000	597.961	.855	.628	0.000	273.999	-78.982	2200.000
24000.000	610.000	596.604	0.000	.523	0.000	24.000	0.000	500.000
24000.000	860.000	597.290	.687	.529	0.000	24.000	0.000	500.000
24000.000	1000.000	597.611	.320	.505	0.000	24.000	0.000	500.000
24000.000	1245.000	598.273	.662	.312	0.000	24.000	0.000	500.000
24032.000	610.000	596.637	0.000	.034	0.000	24.000	0.000	32.000
24032.000	860.000	597.474	.836	.183	0.000	24.000	0.000	32.000
24032.000	1000.000	597.898	.425	.288	0.000	24.000	0.000	32.000
24032.000	1245.000	598.826	.927	.553	0.000	24.000	0.000	32.000
24081.000	610.000	596.836	0.000	.199	0.000	123.999	0.000	49.000
24081.000	860.000	597.811	.975	.337	0.000	123.999	-.000	49.000
24081.000	1000.000	598.318	.507	.420	0.000	123.999	-.000	49.000
24081.000	1245.000	599.368	1.050	.543	0.000	123.999	-.000	49.000
25050.000	610.000	597.588	0.000	.751	0.000	46.999	0.000	969.000
25050.000	860.000	598.528	.940	.717	0.000	46.999	-.000	969.000
25050.000	1000.000	599.011	.483	.693	0.000	46.999	-.000	969.000
25050.000	1245.000	599.951	.940	.583	0.000	46.999	-.000	969.000
25099.000	610.000	597.601	0.000	.014	0.000	20.000	0.000	49.000
25099.000	860.000	598.503	.902	-.024	0.000	20.000	0.000	49.000
25099.000	1000.000	598.961	.458	-.050	0.000	20.000	0.000	49.000
25099.000	1245.000	600.105	1.144	.154	0.000	487.240	-467.240	49.000
25129.000	610.000	597.644	0.000	.043	0.000	20.000	0.000	30.000
25129.000	860.000	598.769	1.125	.266	0.000	20.000	0.000	30.000
25129.000	1000.000	599.391	.622	.430	0.000	20.000	0.000	30.000
25129.000	1245.000	600.166	.775	.061	0.000	504.788	-484.788	30.000
25144.000	610.000	597.843	0.000	.199	0.000	51.999	0.000	15.000
25144.000	860.000	599.113	1.271	.345	0.000	51.999	-.000	15.000
25144.000	1000.000	599.814	.701	.423	0.000	51.999	-.000	15.000
25144.000	1245.000	600.158	.344	-.008	0.000	51.999	-.000	15.000
26144.000	610.000	598.916	0.000	1.073	0.000	186.552	0.000	1000.000
26144.000	860.000	600.006	1.090	.892	0.000	207.999	-21.447	1000.000
26144.000	1000.000	600.621	.616	.807	0.000	207.999	-21.447	1000.000
26144.000	1245.000	601.135	.514	.977	0.000	207.999	-21.447	1000.000

DATA FOR LAST CROSS SECTION

PROFILE	TYPE ENC	TARGET	TOP WIDTH AREA-ACRES	TOP WIDTH AREA-DIFF
1	0.000	208.000	179.896	0.000
2	0.000	208.000	189.793	9.897
3	0.000	208.000	191.545	11.649
4	0.000	208.000	195.151	15.254

00BREAK00

1) COUNTY: Bay

2) STUDY NAME: Pinconning Twp

3) WATERCOURSE: Saginaw Bay

4) DOCUMENT TYPE: Report - Wave Runup

00BREAK00

TECHNICAL LETTER REPORT ON PINCONNING TOWNSHIP, MICHIGAN

Prepared by the U.S. Army Corps of Engineers
for the Federal Emergency Management Agency

Detroit, Michigan
November 1990

TECHNICAL LETTER REPORT ON
PINCONNING TOWNSHIP, MICHIGAN

TABLE OF CONTENTS

Title	Page
TABLE OF CONTENTS	i
LIST OF FIGURES	ii
LIST OF TABLES	ii
1.0 INTRODUCTION	1
1.1 PURPOSE OF STUDY	1
1.2 AUTHORITY AND ACKNOWLEDGMENTS	1
1.3 COORDINATION	3
2.0 AREA STUDIED	3
2.1 COMMUNITY DESCRIPTION	3
2.2 PRINCIPAL FLOOD PROBLEMS	5
3.0 ENGINEERING METHODS	5
4.0 A-ZONE AND V-ZONE DELINEATION	6
5.0 CONCLUSIONS	17
6.0 GLOSSARY	19
7.0 REFERENCES	21

TECHNICAL LETTER REPORT ON
PINCONNING TOWNSHIP, MICHIGAN

LIST OF FIGURES

Number	Title	Page
1.	PINCONNING TOWNSHIP LOCATION MAP	4
2.	PINCONNING TOWNSHIP A & V-ZONE DELINEATIONS ON A BEACH/BLUFF SYSTEM (PROFILE P-1)	8
3.	PINCONNING TOWNSHIP A & V-ZONE DELINEATIONS ON A BEACH SYSTEM (PROFILE P-2)	9
4.	PINCONNING TOWNSHIP A & V-ZONE DELINEATIONS ON A BEACH SYSTEM (PROFILE P-3)	10
5.	PINCONNING TOWNSHIP A & V-ZONE DELINEATIONS ON A BEACH SYSTEM (PROFILE P-4)	11
6.	PINCONNING TOWNSHIP A & V-ZONE DELINEATIONS ON A BEACH SYSTEM (PROFILE P-5)	12
7.	PINCONNING TOWNSHIP A & V-ZONE DELINEATIONS ON A BEACH SYSTEM (PROFILE P-6)	13
8.	PINCONNING TOWNSHIP A & V-ZONE DELINEATIONS ON A BEACH SYSTEM (PROFILE P-7)	14
9.	PINCONNING TOWNSHIP A & V-ZONE DELINEATIONS ON A BEACH SYSTEM (PROFILE P-8)	15
10.	PINCONNING TOWNSHIP A & V-ZONE DELINEATIONS ON A BEACH SYSTEM (PROFILE P-9)	16

LIST OF TABLES

Number	Title	Page
1.	SHORELINE PROFILES, PINCONNING TOWNSHIP, MICHIGAN	2
2.	WAVE RUNUP ELEVATIONS	18

Appendix	Title
A	FIS PROFILES AND COMPUTATIONS

TECHNICAL LETTER REPORT ON
PINCONNING TOWNSHIP, MICHIGAN

1.0 INTRODUCTION

1.1 Purpose of Study

This report describes the application of the procedures developed in the 1989 "Great Lakes Wave Runup Methodology Study" to flood levels on Saginaw Bay, specifically in Pinconning Township, Michigan. The flood levels applicable to Pinconning Township were developed in the September 1989 "Flood Levels Report for Saginaw Bay".

1.2 Authority and Acknowledgments

The "Great Lakes Wave Runup Methodology Study" was prepared in 1989 by the U.S. Army Corps of Engineers (COE) for the Federal Emergency Management Agency (FEMA), for application to future coastal Flood Insurance Studies (FIS) and/or restudies of communities bordering the Great Lakes. The work was conducted under Inter-Agency Work Agreement, EMW-89-E-3218, Project Order No. 1, between the COE and FEMA. The 100-year and 500-year flood levels from the September 1989 report referenced above, were used to compute the maximum wave runup elevations required for updating the previous study in Pinconning Township on Saginaw Bay. TABLE 1 lists profile locations, and the 100-year and 500-year "base" flood levels at nine locations along the Pinconning Township shoreline. The nine profiles were plotted from data obtained from a June 1990 survey.

SHORELINE PROFILES
PINCONNING TOWNSHIP, MICHIGAN

	Profile Location	100-Year Flood Level *	500-year Flood Level *
1.	Pinconning-1	585.5	586.5
2.	Pinconning-2	585.5	586.5
3.	Pinconning-3	585.5	586.5
4.	Pinconning-4	585.5	586.5
5.	Pinconning-5	585.5	586.5
6.	Pinconning-6	585.5	586.5
7.	Pinconning-7	585.5	586.5
8.	Pinconning-8	585.5	586.5
9.	Pinconning-9	585.5	586.5

* NOTE: All elevations in FT, NGVD from the September 1989 "Flood Levels Report for Saginaw Bay"

TABLE 1

1.3 Coordination

The "Flood Levels Report For Saginaw Bay", along with examples of the application of the methodology from the 1989 "Great Lakes Wave Runup Methodology Study", were presented to FEMA on March 1, 1990. The procedures outlined in the above references were approved at this meeting for application to all Saginaw Bay FIS sites, including Pinconning Township.

2.0 AREA STUDIED

2.1 Community Description

Pinconning Township, Michigan, shown on FIGURE 1, is located in Bay County along 6 miles of shoreline on Saginaw Bay. There are no major populated communities located along the Pinconning Township shoreline. The developed shoreline consists of small seasonal and year-round residential homes, having a population of about 3,200.

The entire Pinconning Township shoreline on Saginaw Bay is exposed from the northeast to a Lake Huron/Saginaw Bay fetch of about 150 miles. Bathymetry in Saginaw Bay along the Pinconning Township shoreline varies from 30-foot depths offshore to less than five feet deep near shore. Ordinary fluctuations of water levels along this shoreline are subject to change due to wind. A northeast storm can push water into the bay and raise the water level along the Pinconning Township 3 to 4 feet. Accordingly, a storm from the southwest can lower water levels sufficiently to cause large vessels to ground in the shipping channels. The lowest seasonal bay stages usually prevail during the winter

PINCONNING TOWNSHIP LOCATION MAP

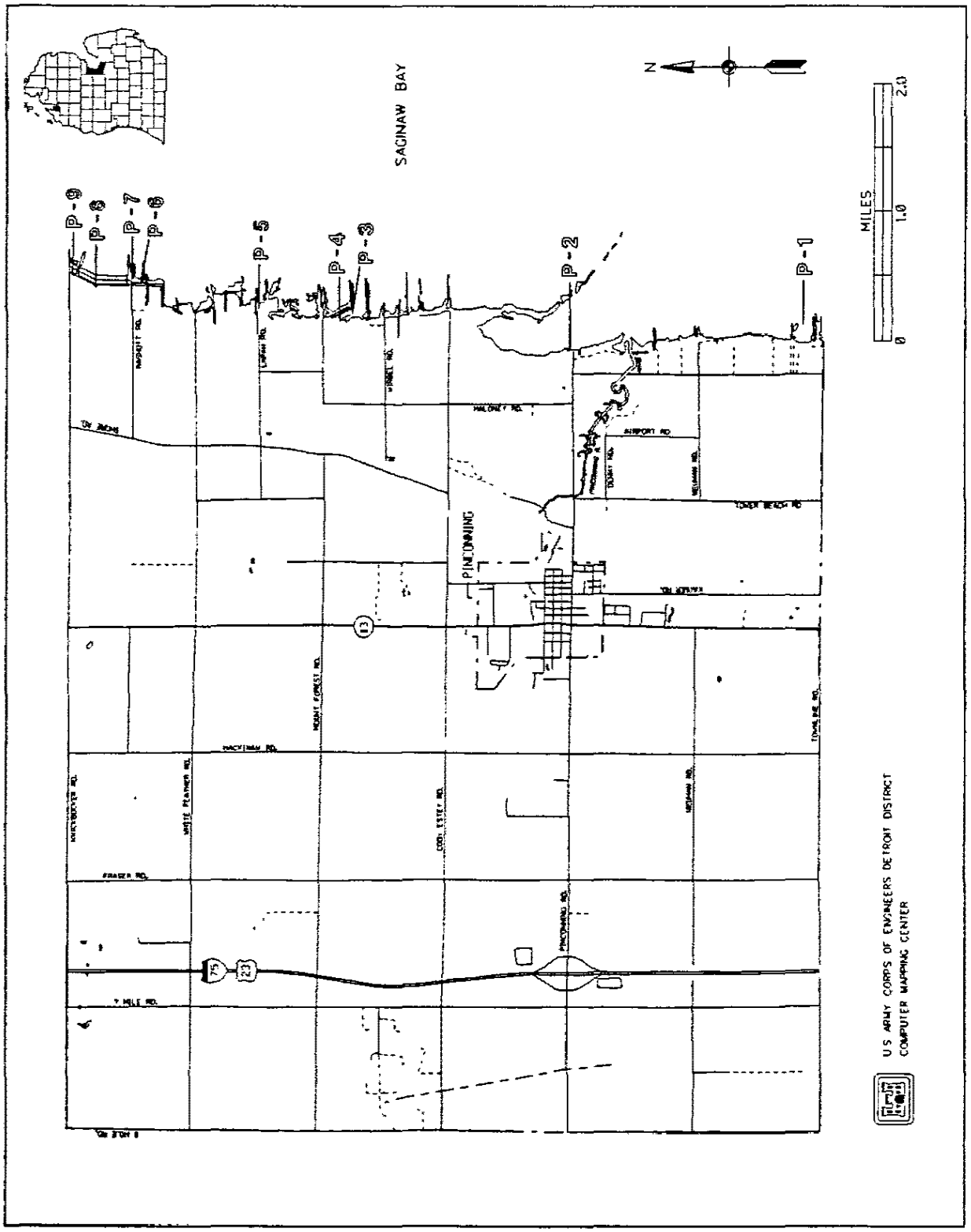


FIGURE 1

months and the highest during the summer months. During the past 13 years, fluctuations of monthly mean water levels on Saginaw Bay, as measured at the Essexville, Michigan water level gage, have ranged from a minimum of 578.14 to a maximum of 581.9 feet

2.2 Principal Flood Problems

Short-term Saginaw Bay water level fluctuations are most often due to variations in wind and barometric pressure. Occasionally, a surge of considerable proportions takes place within a few hours, due to strong and persistent northerly or southerly winds.

When lake levels are high and storms occur from the northeast, Pinconning Township shoreline communities are usually subjected to extreme conditions. Along the Pinconning Township shoreline, substantial flooding has occurred because of the flat topography along the reaches on Saginaw Bay.

3.0 ENGINEERING METHODS

The flood levels established in the U.S. Army Corps of Engineer's September 1989 "Flood Levels Report for Saginaw Bay" and the procedures developed in the 1989 "Great Lakes Wave Runup Methodology Study" were used to analyze the flooding potential at the nine Pinconning Township FIS sites shown on FIGURE 1. The hydraulic analyses presented herein involved the determination of the wave runup components and maximum wave runup elevations for selected sites.

Input data used for flood calculations include site specific design wave, water depth at the toe of the structure, and wave

period. Additional data such as nearshore profiles, high water marks, and existing conditions, bathymetry and topography, were also analyzed to determine the maximum wave runup elevation at each site. This technical letter report presents the wave runup application procedures for each of the nine FIS sites located in Pinconning Township. Representative profiles for each site are included in APPENDIX A.

4.0 A-Zone and V-Zone Delineations

Reaches of the Pinconning Township shoreline in the surf zone which are subject to significant wave attack are referred to by FEMA as Coastal High Hazard Zones or velocity ("V") Zones. A "V" Zone is the flood insurance rate zone that corresponds to the 100-year coastal floodplain that has additional hazards associated with storm waves. The "V" Zone is defined in FEMA's "Guidelines For Great Lakes Wave Runup Computation And Mapping" as the maximum elevation reached by the wave runup associated with the 100-year flood level. This portion of the shoreline and/or structure is critical in terms of causing significant structural damage. An "A" Zone is the flood insurance rate zone that corresponds to the 100-year flood level that is determined in the FIS using the detailed method. It is further defined as that area that is inundated by the 100-year flood and shoreward of the "V" Zone.

Two different A and V-Zone flood conditions as defined by FEMA, most closely represent the FIS sites in Pinconning Township. The first type of condition involves a beach/bluff

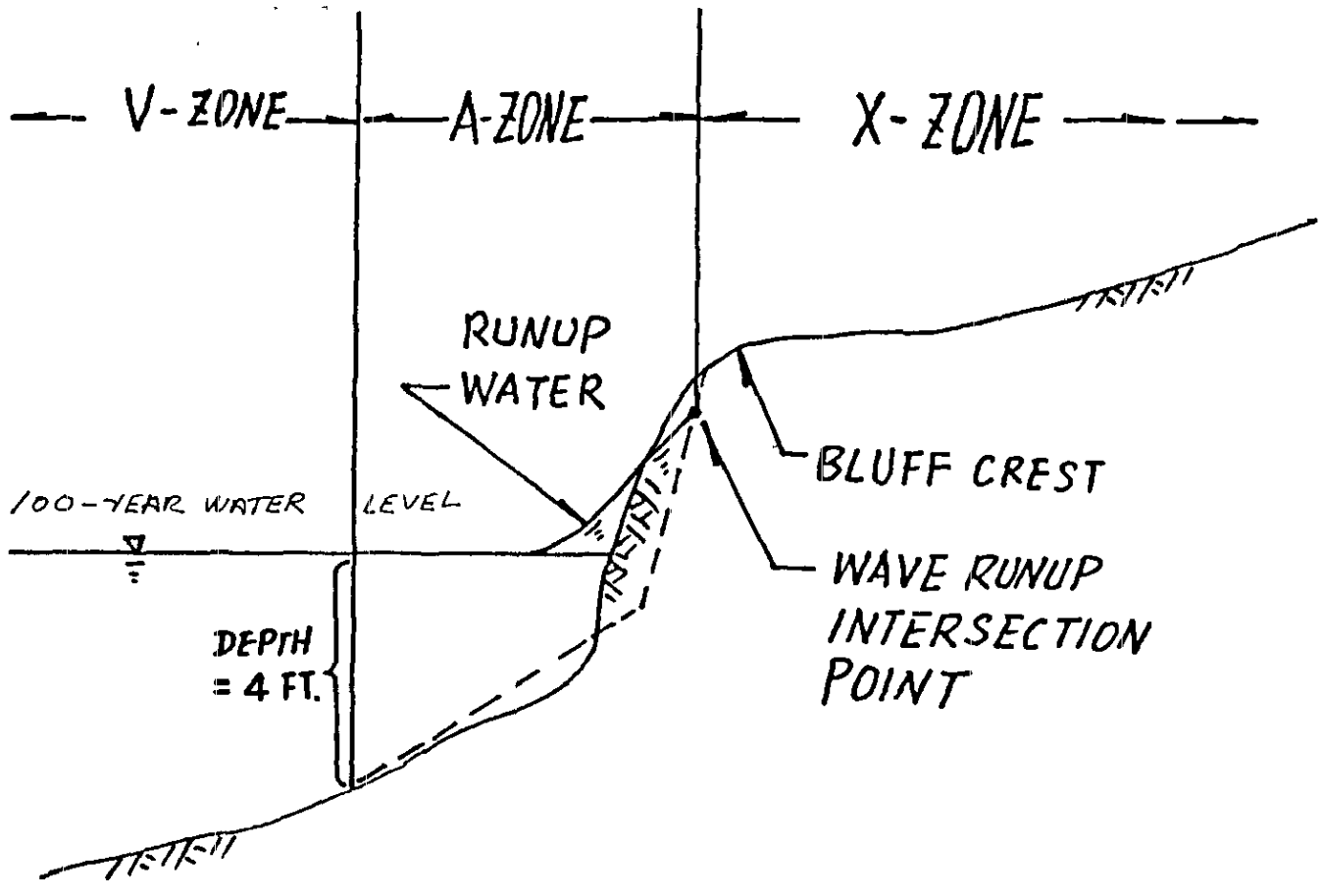
system where wave runup does not overtop the existing beach/bluff. The V/A demarcation line is fixed at the point where the 100-year storm water depth is equal to 4 feet on the lakeward side of the bluff. The A/X demarcation line is fixed at the point where the wave runup intersects the calculated post-storm profile. This mapping is considered appropriate for profile Pinconning-1, and is shown on FIGURE 2.

The second type of condition involves the flooding or breaching of an existing beach/dune by the 100-year flood. In this case, the V/A-zone demarcation line is located where the largest 100-year water depth for the flooded area on the landward side of the beach/dune heel point is less than 4 feet. The V-zone is lakeward of this line, while the A-zone is landward. The V-zone is the maximum elevation reached by wave runup associated with the 100-year flood level. This type of flooding condition is representative of profiles Pinconning-2 thru Pinconning-9 and is shown on FIGURES 3-10.

The "A" and "V" Zones for these sites have been delineated according to FEMA's "Guidelines for Great Lakes Wave Runup Computation and Mapping" and are shown on the attached work maps.

The formal submittal of the Pinconning Township study will include original mylar copies showing sufficient detail for submittal to FEMA's technical review contractor.

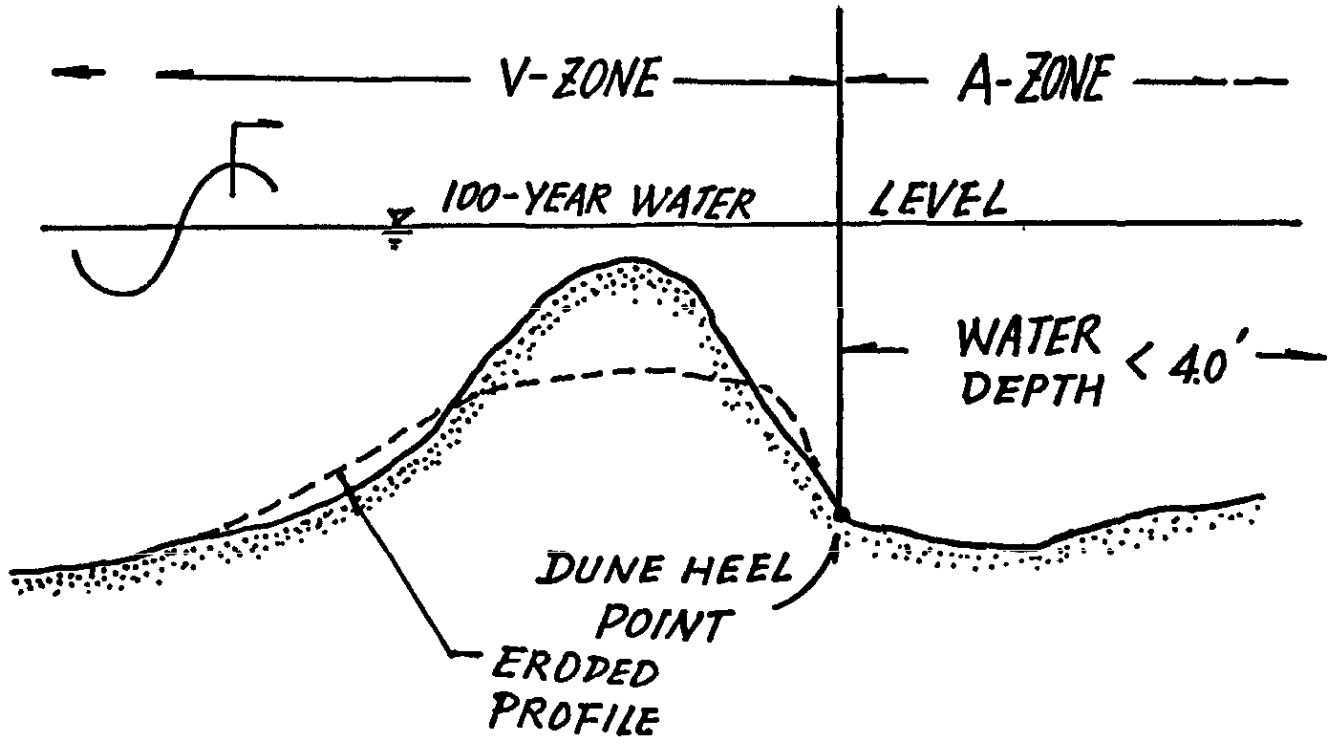
PINCONNING TOWNSHIP A & V ZONE DELINEATIONS ON A BEACH/BLUFF SYSTEM



Pinconning-1

FIGURE 2

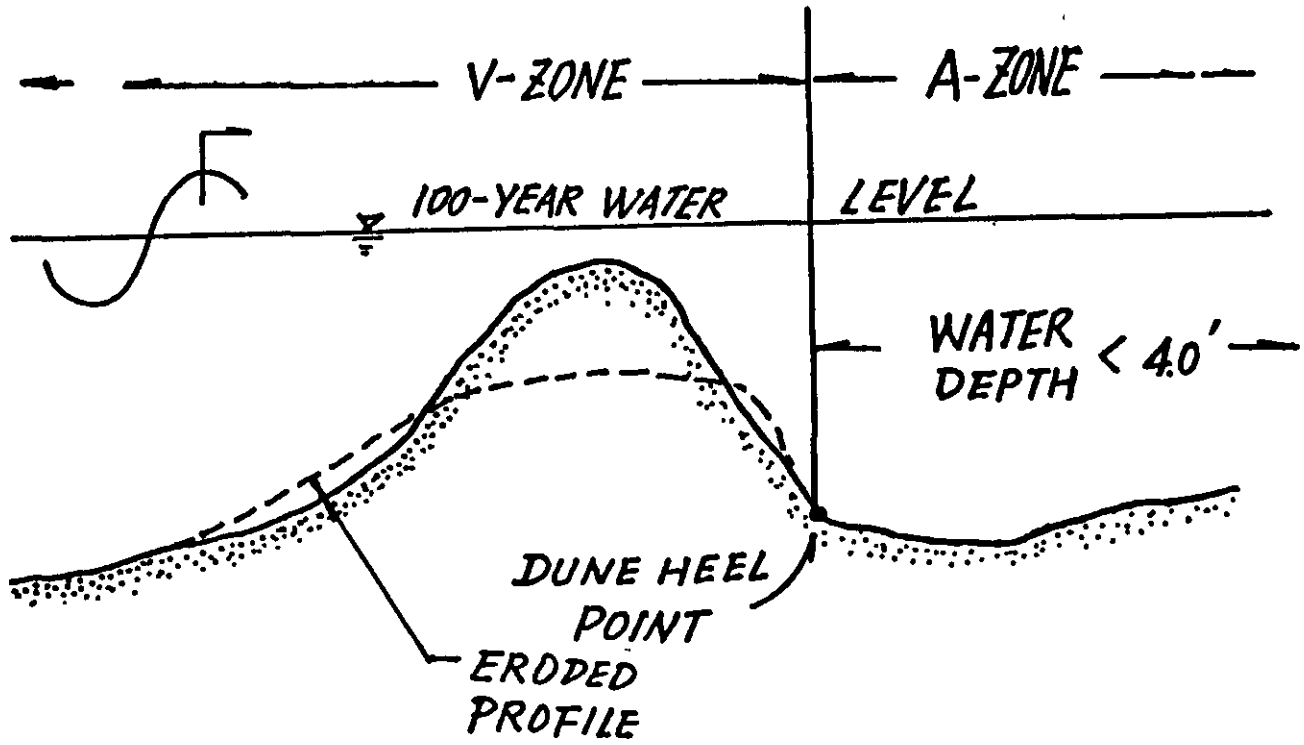
PINCONNING TOWNSHIP A & V ZONE DELINEATIONS ON A BEACH SYSTEM



Pinclnning-2

FIGURE 3

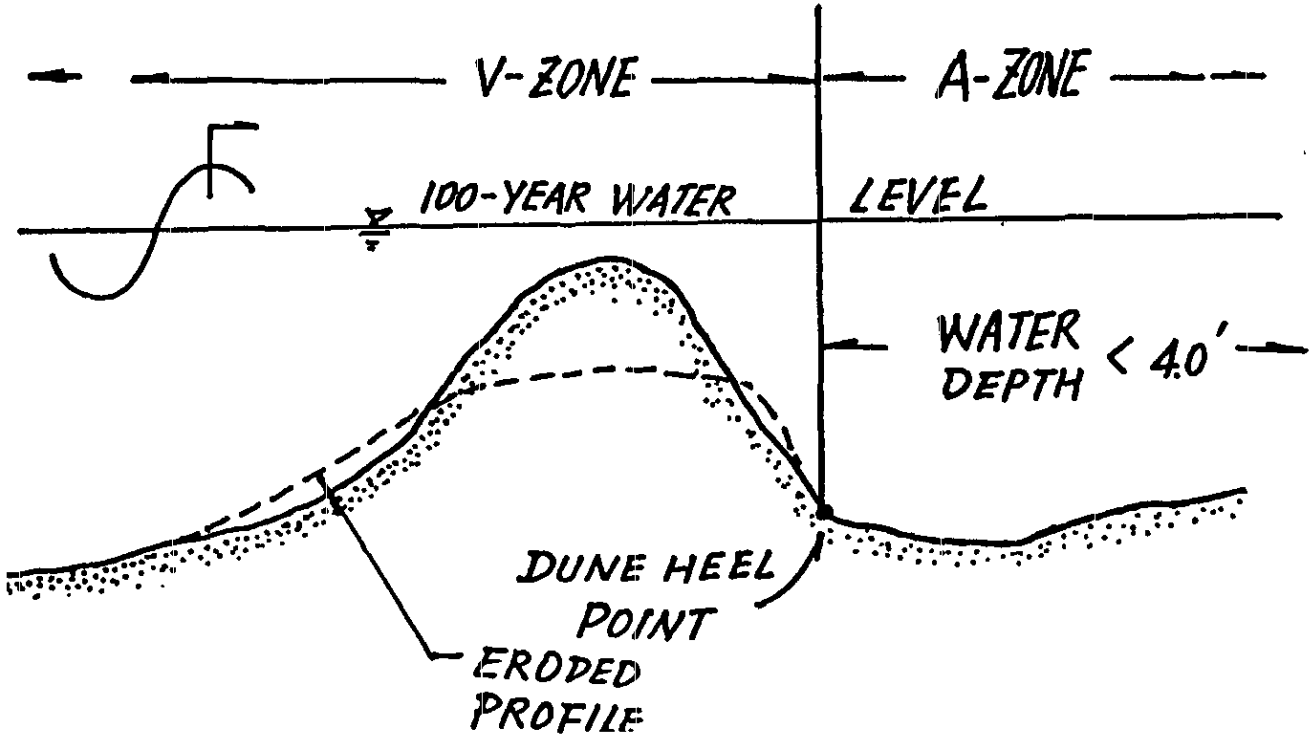
PINCONNING TOWNSHIP A & V ZONE DELINEATIONS ON A BEACH SYSTEM



Pinconning-3

FIGURE 4

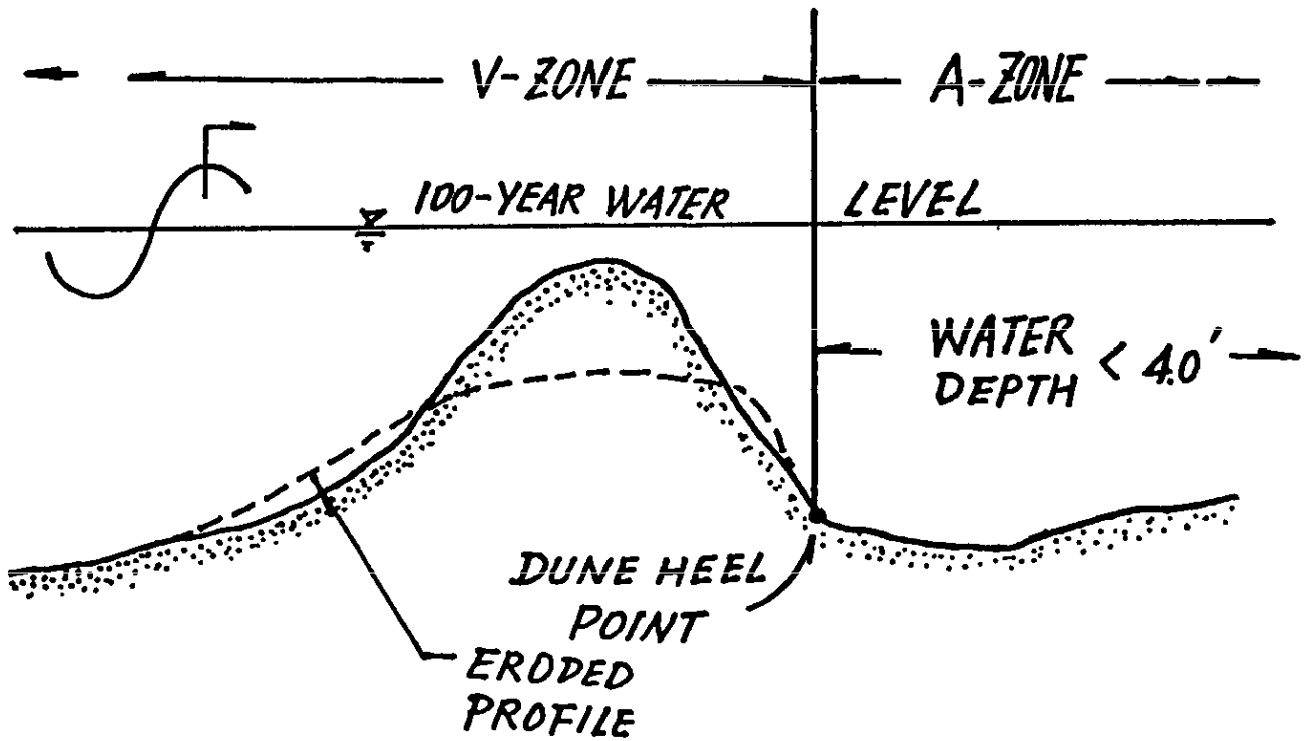
PINCONNING TOWNSHIP A & V ZONE DELINEATIONS ON A BEACH SYSTEM



Pinconning-4

FIGURE 5

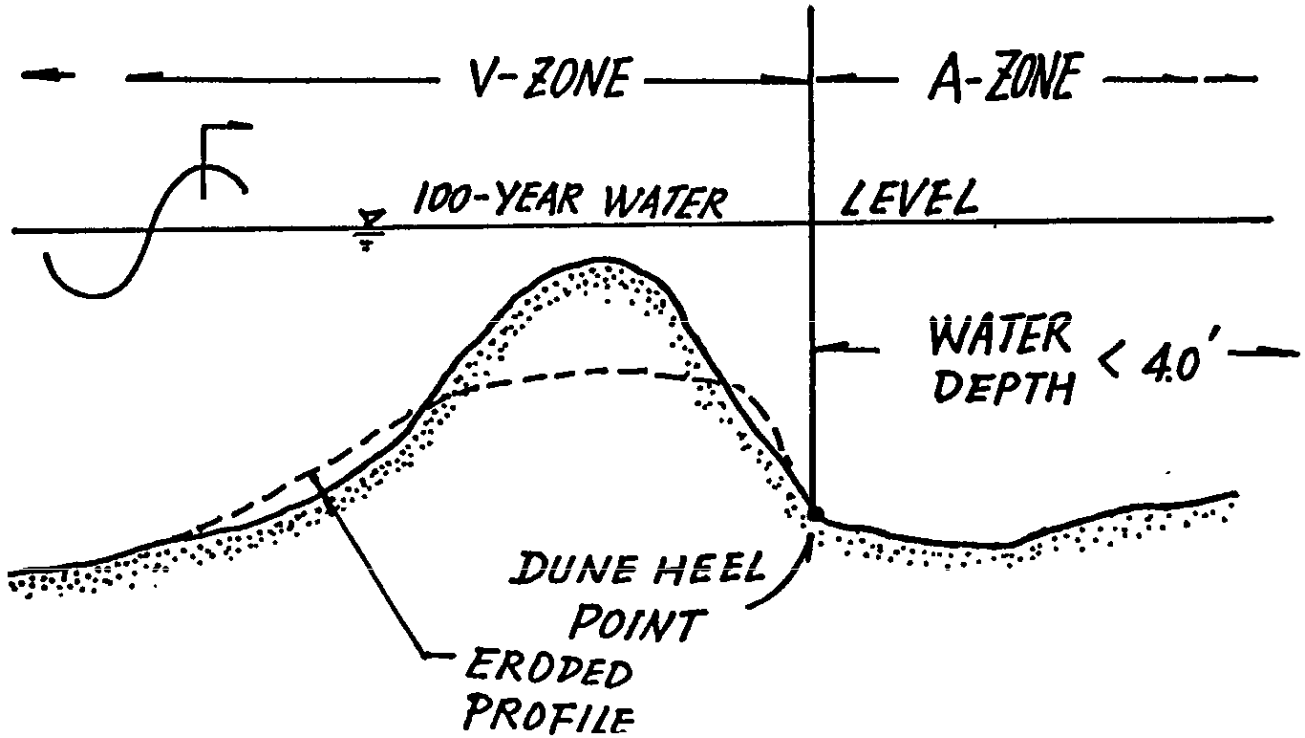
PINCONNING TOWNSHIP A & V ZONE DELINEATIONS ON A BEACH SYSTEM



Pinconning-5

FIGURE 6

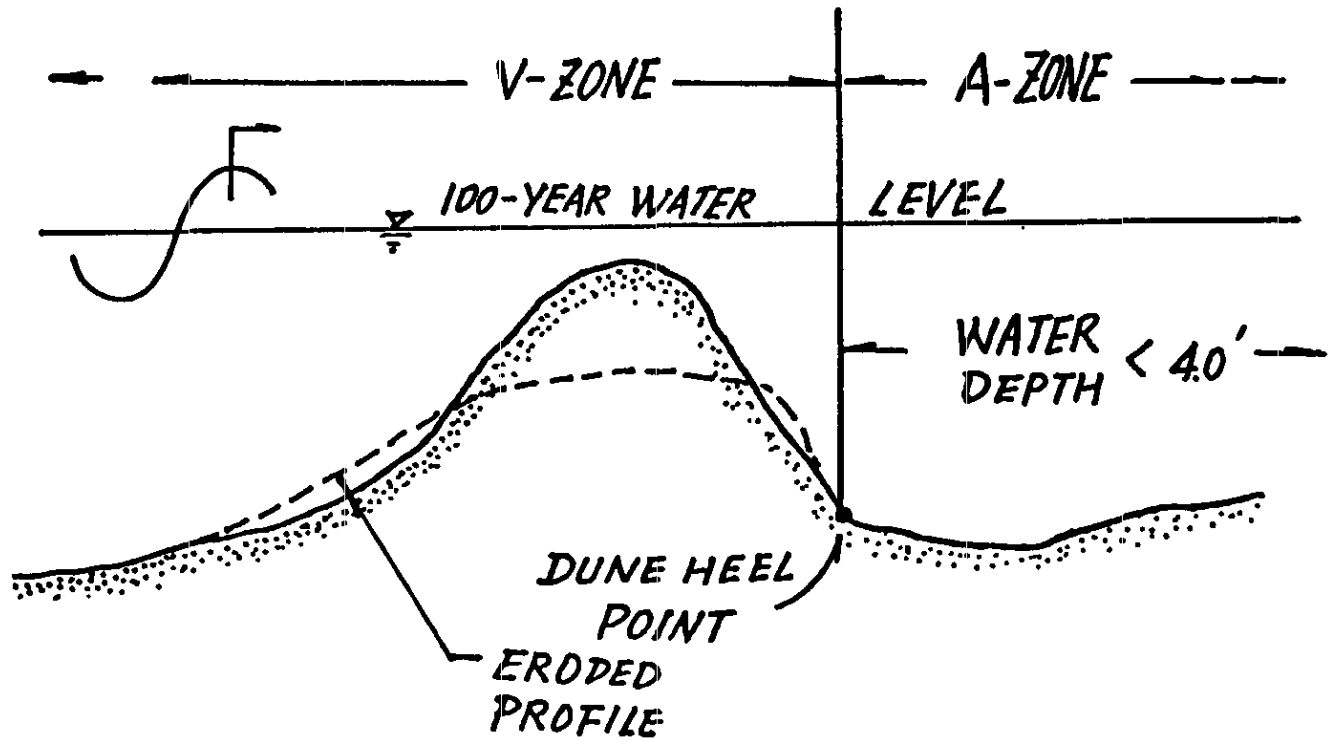
PINCONNING TOWNSHIP A & V ZONE DELINEATIONS ON A BEACH SYSTEM



Pinconning-6

FIGURE 7

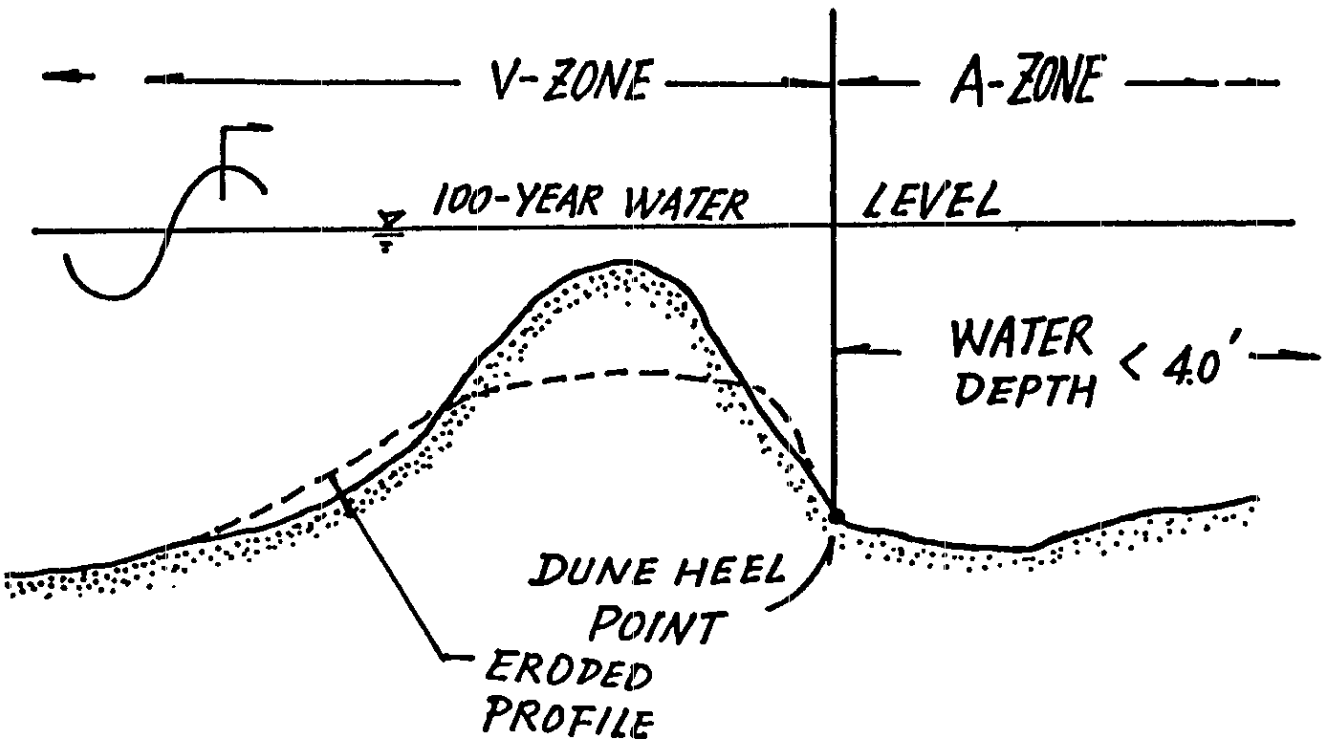
PINCONNING TOWNSHIP A & V ZONE DELINEATIONS ON A BEACH SYSTEM



Pinconning-7

FIGURE 8

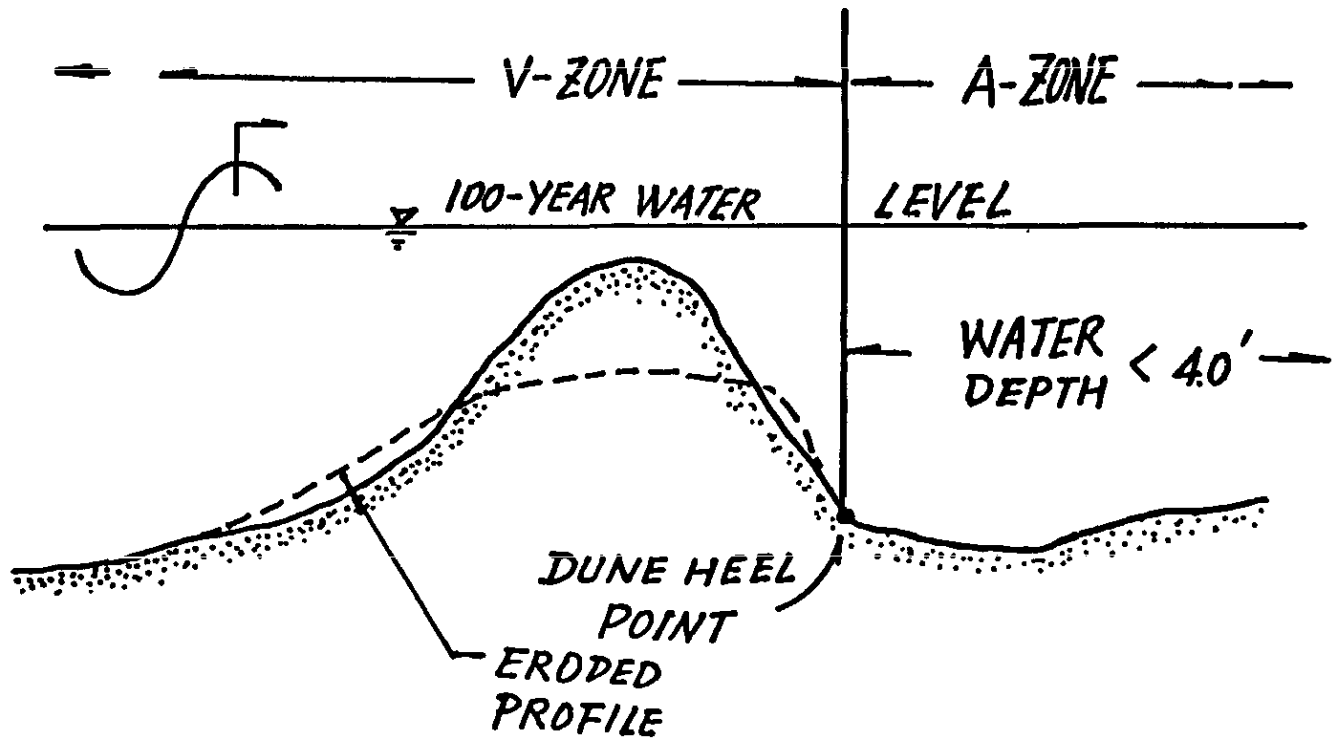
PINCONNING TOWNSHIP A & V ZONE DELINEATIONS ON A BEACH SYSTEM



Pinconning-8

FIGURE 9

PINCONNING TOWNSHIP A & V ZONE DELINEATIONS ON A BEACH SYSTEM



Pinconning-9

FIGURE 10

5.0 CONCLUSIONS

For each of the Pinconning Township sites where the 100-year and 500-year flood levels inundate shoreline property, the inundated area will experience a minimal water depth shoreward of the shoreline protection. This water depth will generate a negligible wave across the property. Therefore, the 100-year and 500-year flood levels will be used to delineate the flood profiles at each site.

Accordingly, where structures protect against flooding, the 100-year and 500-year "A" and "V" Zones, based on wave runup elevations, will be delineated on the work maps in the final FIS for the site. TABLE 2 lists the 100-year and 500-year computed wave runup components and the associated wave runup elevations for the nine sites.

In conclusion, it is recommended that the delineated 100-year and 500-year flood profiles for the nine Pinconning Township sites included herein be used by FEMA for updating the Pinconning Township FIS.

TABLE 2

WAVE RUNUP ELEVATIONS

Pinconning Township FIS Sites	100-year Computed Wave Runup(ft.)	100-year Wave Runup Elevation (ft., NGVD)	500-year Computed Wave Runup(ft.)	500-year Wave Runup Elevation (ft., NGVD)
1. Pinconning-1	2.4	~~587.9~~ 587.5 585.5	2.4	~~588.9~~ 586.5
2. Pinconning-2	0.0 *	585.5	0.0 *	~~586.5~~ 585.5
3. Pinconning-3	0.0 *	585.5	0.0 *	586.5
4. Pinconning-4	0.0 *	585.5	0.0 *	586.5
5. Pinconning-5	0.0 *	585.5	0.0 *	586.5
6. Pinconning-6	0.0 *	585.5	0.0 *	586.5
7. Pinconning-7	0.0 *	585.5	0.0 *	586.5
8. Pinconning-8	0.0 *	585.5	0.0 *	586.5
9. Pinconning-9	0.0 *	585.5	0.0 *	586.5

* NOTE: No wave runup computed since Pinconning Township shoreline is completely inundated by the 100-year and 500-year flood levels obtained from the September 1989 "Flood Levels Report for Saginaw Bay"

6.0 GLOSSARY

Annual Maximum Instantaneous Water Level: The highest water level that was recorded during a year by a gage with a sampling frequency of an hour or less.

A-Zone: The Flood Insurance Rate Zone that corresponds to the 100-year floodplain that is determined in the Flood Insurance Study by detailed methods.

AO-Zone: The Flood Insurance Rate Zone that corresponds to the inland termination point of water overtopping a beach and/or dune condition.

Beach: The zone of sedimentary material that extends landward from the low water line to the place where there is a marked change in material or form, or to the line of permanent vegetation.

Bluff: A high, steep bank composed of erodible materials.

Floodplain: The area adjoining a river, stream, watercourse, ocean, lake or other body of standing water that has been or may be covered by floodwater.

International Great Lakes Datum (IGLD): Common reference datum for the Great Lakes area established in 1955 based on mean water level in the St. Lawrence River at Father Point, Quebec (near Atlantic Ocean).

Runup: The rush of water up a beach or structure from the breaking of a wave. Also, the vertical height of uprush above the still-water level.

Still-water level: The elevation that the water surface would assume if all wave action were absent.

Storm-water level: The rise above the normal water level on the open-coast, due to wind stress on the water surface.

V-Zone: The maximum elevation reached by the wave runup associated with the 100-year flood level.

Wave height: The vertical distance between the wave crest and the preceding trough.

Wave setup: The superelevation of the water surface over normal surge elevation due to the onshore mass transport of the water by wave action alone.

Wind setup: The vertical rise in the still-water level on the leeward side of a body of water caused by wind stresses on the surface of the water.

X-Zone: The Flood Insurance Rate Zone that corresponds to the landward side of a dune heel point.

7.0 REFERENCES

1. U.S. Army Corps of Engineers, Coastal Engineering Research Center, Vicksburg, MS, "Shore Protection Manual," Volumes I & II, 1984.

2. U.S. Army Corps of Engineers, Detroit District, "Phase I, Revised Report on Great Lakes Open-Coast Flood Levels," April 1988.

3. U.S. Army Corps of Engineers, Detroit District, "Phase II, Revised Report on Great Lakes Open-Coast Flood Levels," April 1988.

4. U.S. Army Corps of Engineers, Detroit District, "Appendices, Revised Report on Great Lakes Open-Coast Flood Levels," April 1988.

5. U.S. Army Corps of Engineers, Coordinating Committee on Great Lakes Basin Hydraulic and Hydrologic Data, "History of Water Level Gauges, Upper Great Lakes and the St. Clair - Detroit Rivers," January 1978.

6. U.S. Army Corps of Engineers, North Central Division, "Great Lakes Region Inventory Report National Shoreline Study," August 1978.

7. U.S. Army Corps of Engineers, Detroit District, "Flood Levels Report - Saginaw Bay," September 1989.

8. U.S. Army Corps of Engineers, Detroit District, "Flood Levels Report - Anchor Bay," September 1989.

9. Great Lakes Environmental Research Laboratory, Ann Arbor, Michigan, SCHWAB, D.J., and LYNN, E.W., "Great Lakes Storm Surge Planning Program," 1987.

10. U.S. Army Corps of Engineers, Detroit District, "Phase II Report on Great Lakes Flood Levels - Little Bay De Noc," August 1981.

11. U.S. Army Corps of Engineers, Detroit District, "Phase II Report on Great Lakes Flood Levels - Big Bay De Noc", July 1981.

12. FEMA Great Lakes "A" Zone and "V" Zone Delineations

TECHNICAL LETTER REPORT ON PINCONNING TOWNSHIP, MICHIGAN

APPENDIX A

Prepared by the U.S. Army Corps of Engineers
for the Federal Emergency Management Agency

Detroit, Michigan
November 1990

SYNOPSIS

APPENDIX A outlines the procedures necessary to calculate the wave runup component and the maximum wave runup elevation associated with the 100-year flood level. These data, with the information provided from the profile surveys will enable the user to delineate the 100-year "A" and "V" Zone profiles according to FEMA's Guidelines for Great Lakes Wave Runup Computation and Mapping. The following list shows the nine Pinconning Township sites and the 100-year and 500-year wave runup flood profiles. It should be noted that the same procedures used for the 100-year computations can be used to calculate the 500-year profiles. Samples of these computations are included in APPENDIX A.

Pinconning Township FIS Sites	100-year Computed Wave Runup(ft.)	100-year Wave Runup Elevation (ft., NGVD)	500-year Computed Wave Runup(ft.)	500-year Wave Runup Elevation (ft., NGVD)
1. Pinconning-1	2.4	585.5 ~~587.9~~	0 ~~2.4~~	586.5 ~~588.9~~
2. Pinconning-2	0.0 *	585.5	0.0 *	586.5
3. Pinconning-3	0.0 *	585.5	0.0 *	586.5
4. Pinconning-4	0.0 *	585.5	0.0 *	586.5
5. Pinconning-5	0.0 *	585.5	0.0 *	586.5
6. Pinconning-6	0.0 *	585.5	0.0 *	586.5
7. Pinconning-7	0.0 *	585.5	0.0 *	586.5
8. Pinconning-8	0.0 *	585.5	0.0 *	586.5
9. Pinconning-9	0.0 *	585.5	0.0 *	586.5

* NOTE: No wave runup computed since the Pinconning Township shoreline is completely inundated by the 100-year and 500-year flood levels obtained from the September 1989 "Flood Levels Report for Saginaw Bay."

FIS PROFILE
PINCONNING-1

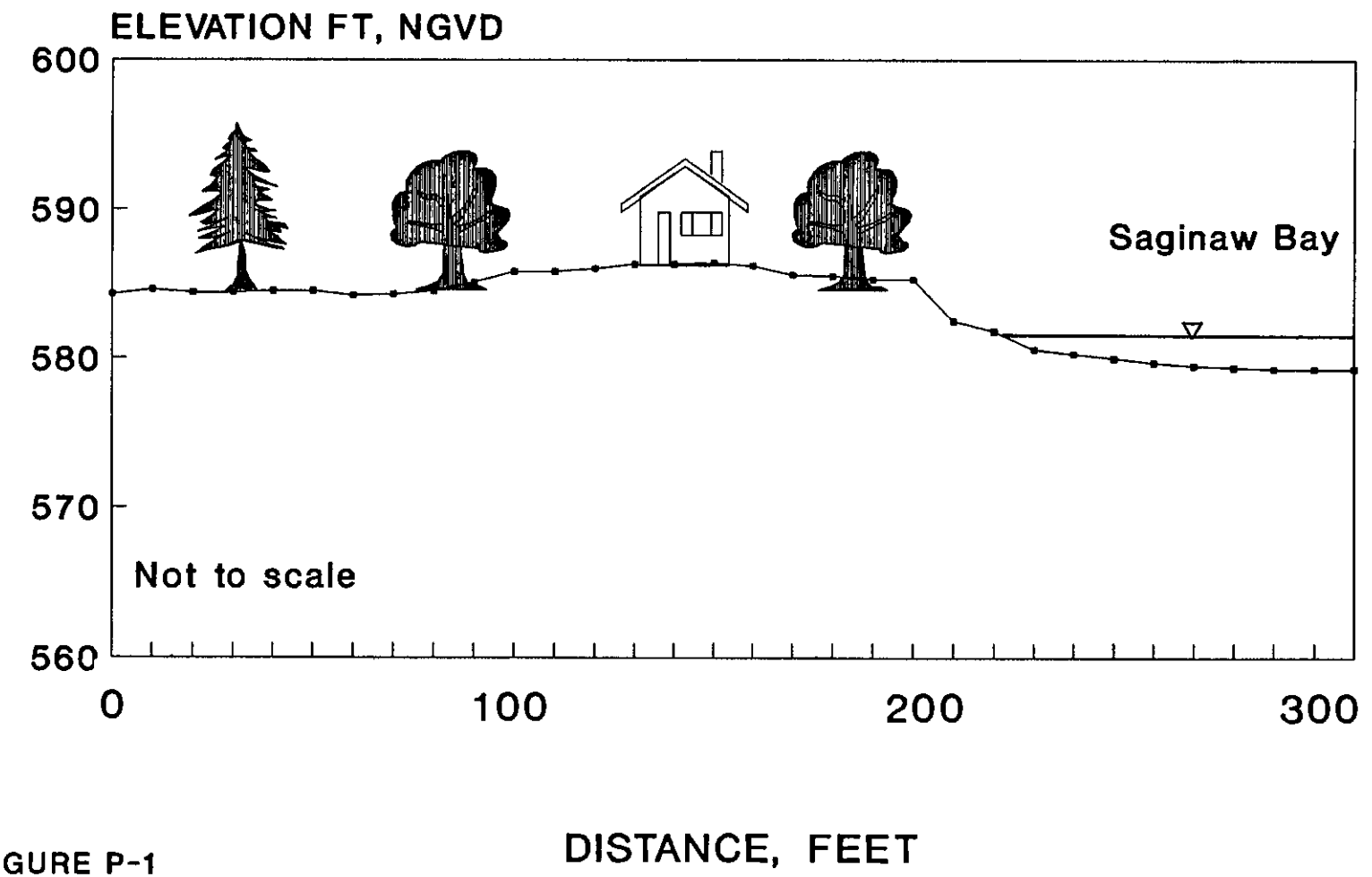


FIGURE P-1

FIS PROFILE
PINCONNING-2

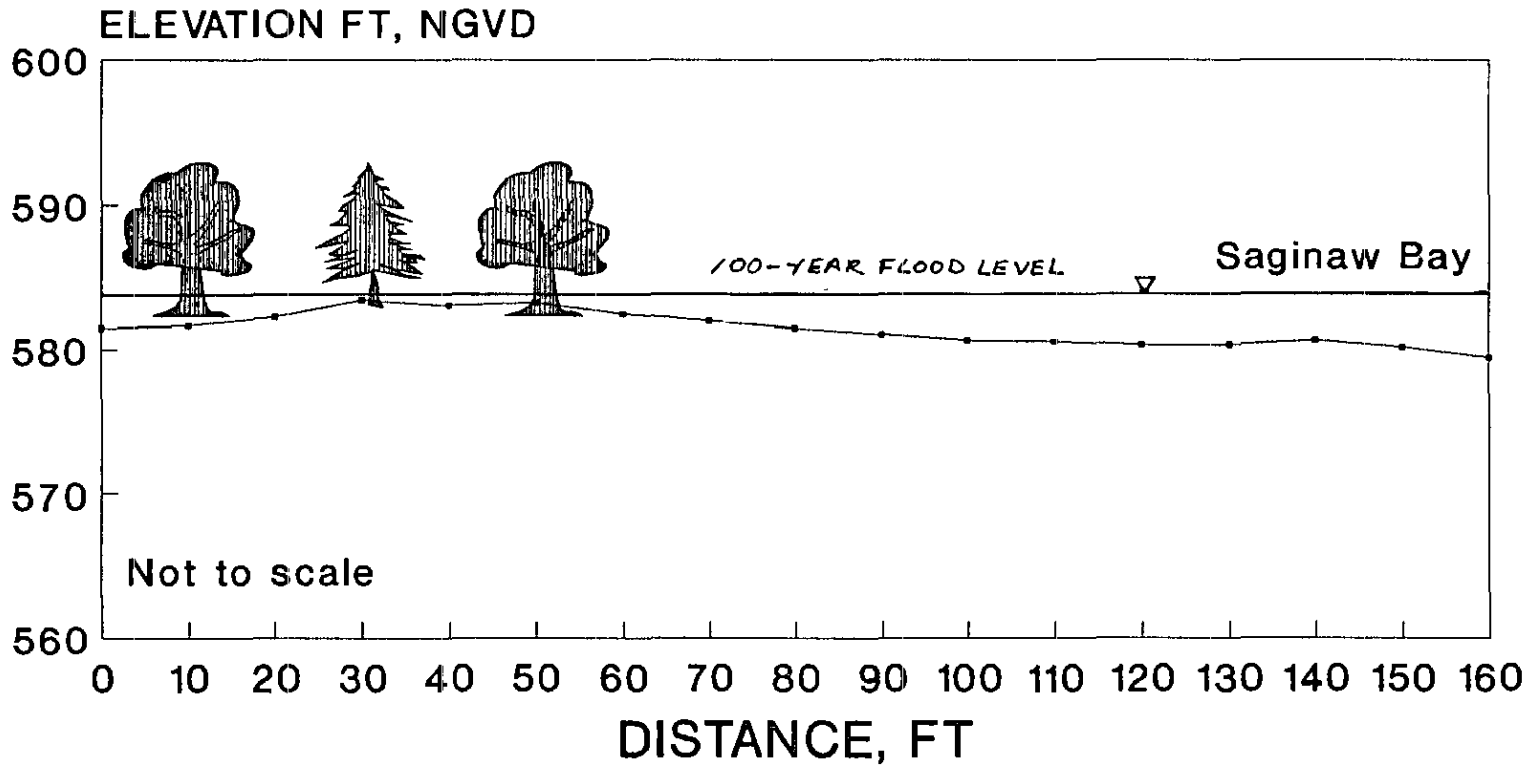


FIGURE P-2

FIS PROFILE
PINCONNING-3

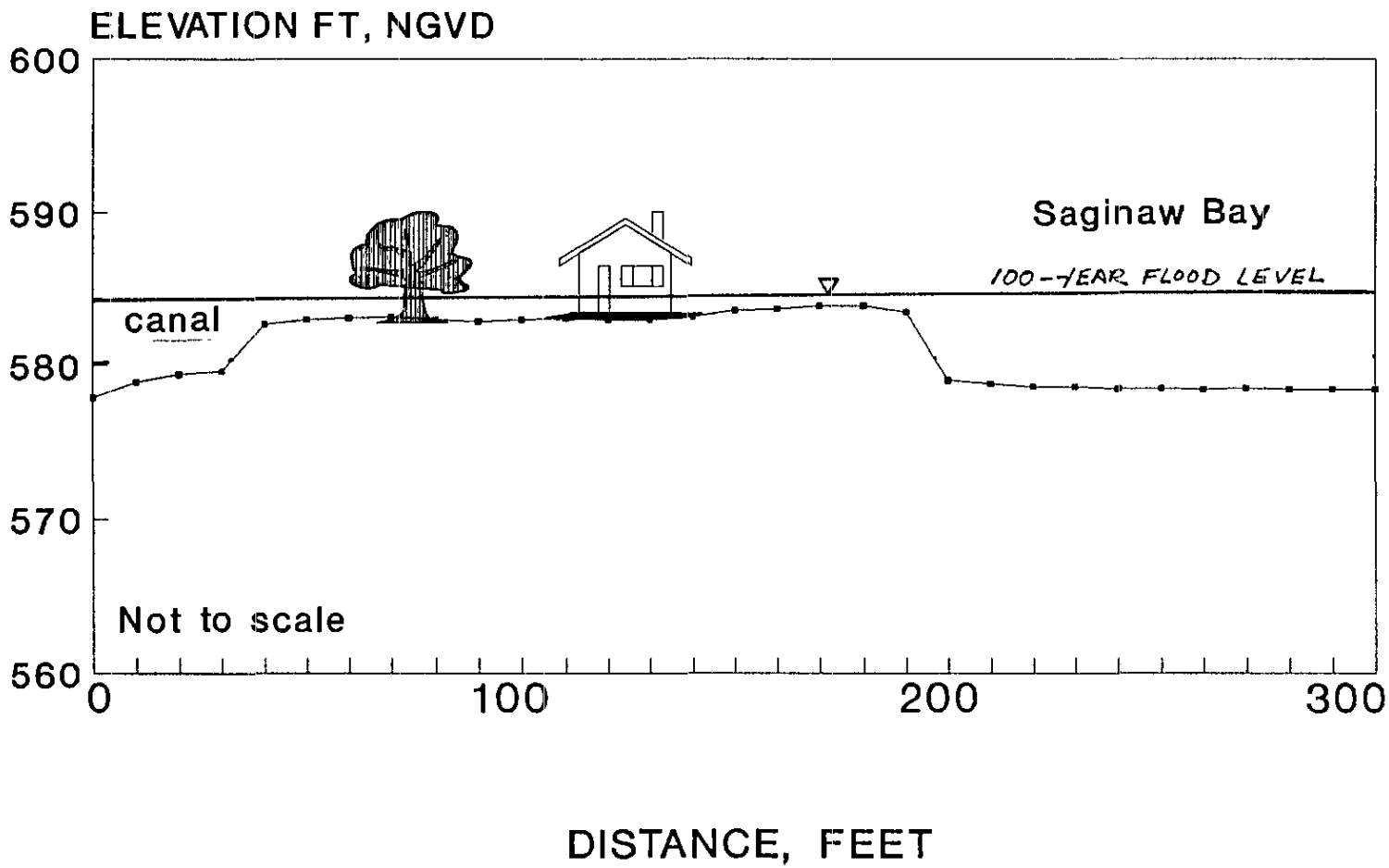


FIGURE P-3

FIS PROFILE
PINCONNING-4

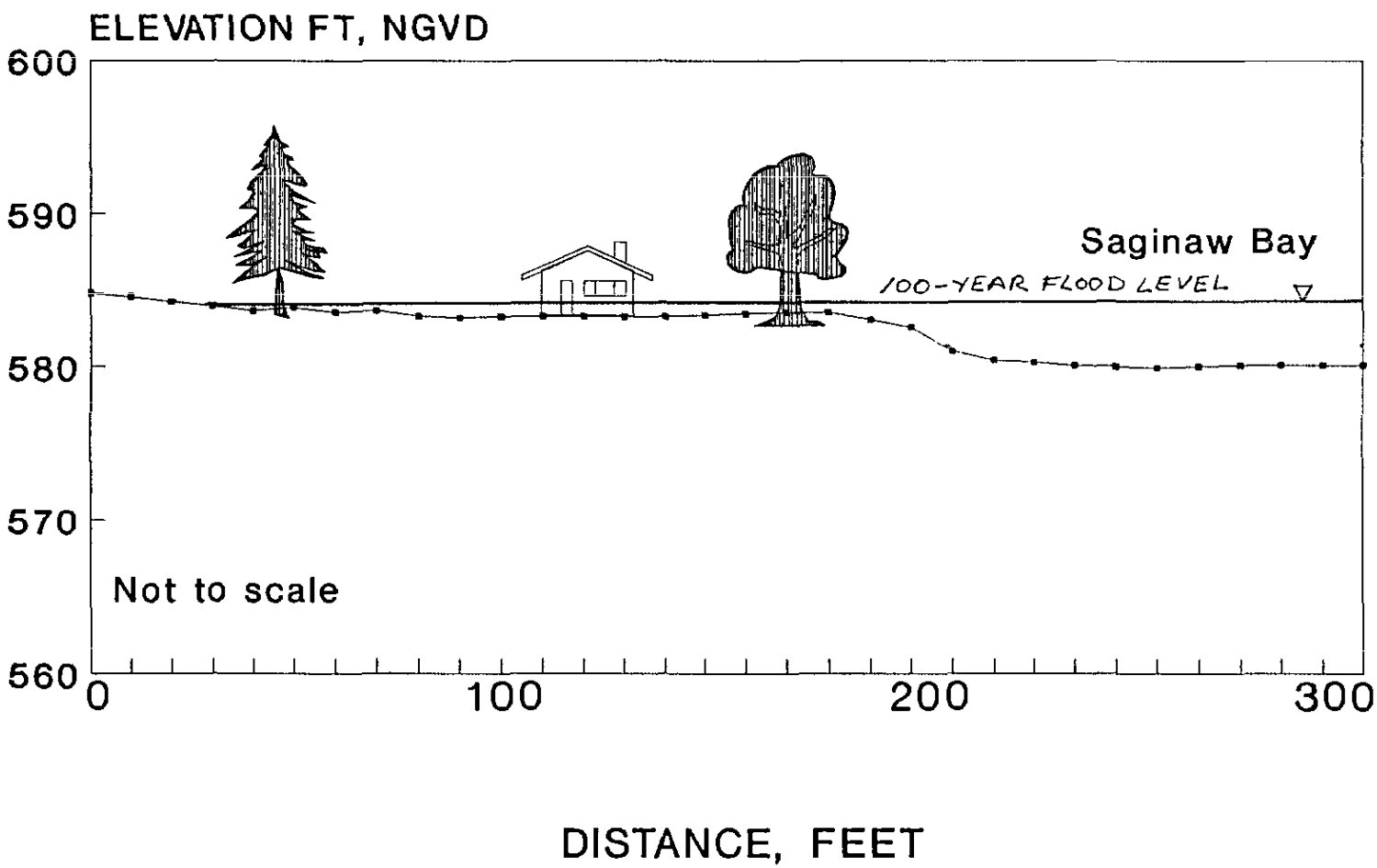


FIGURE P-4

FIS PROFILE
PINCONNING-5

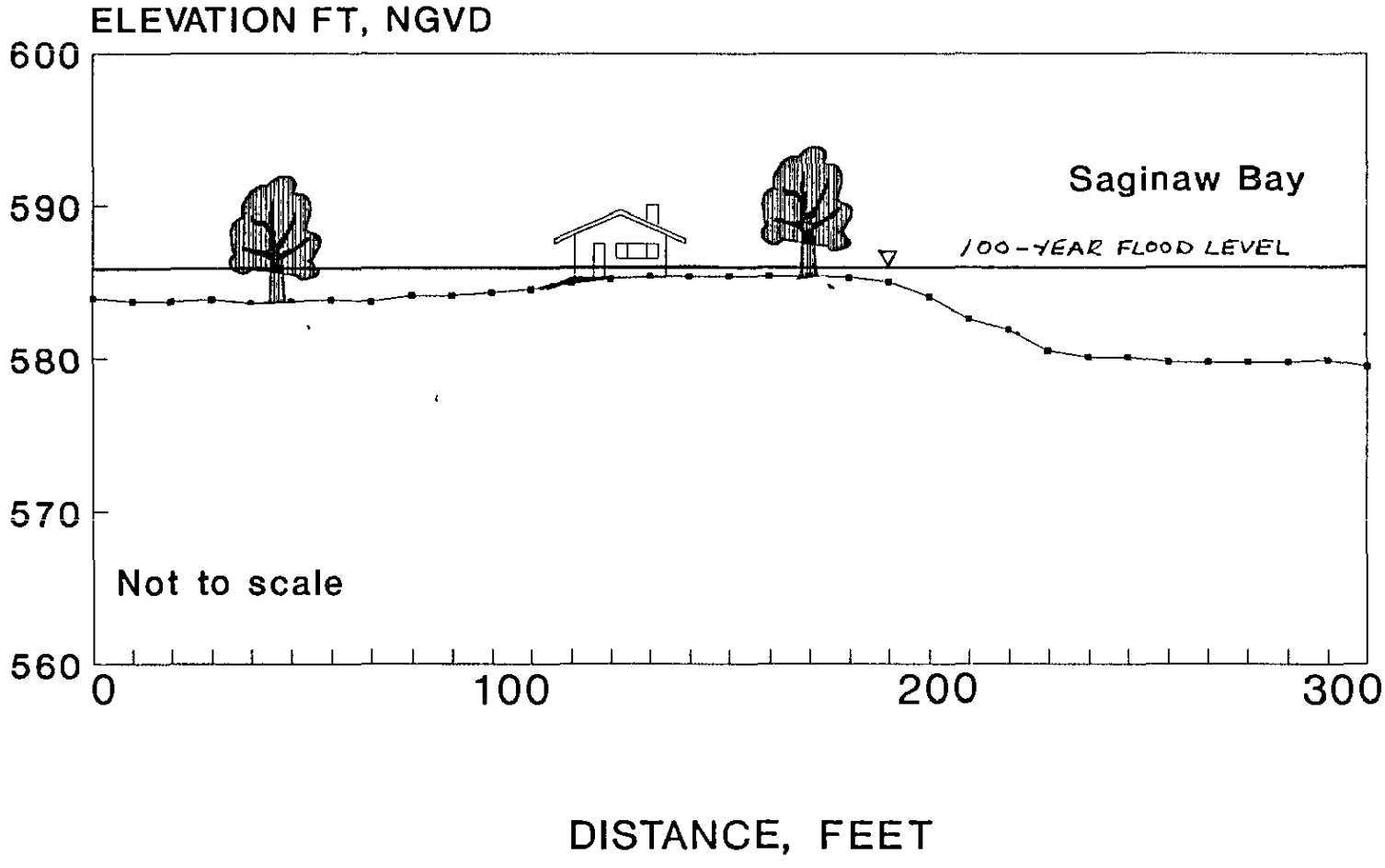


FIGURE P-5

FIS PROFILE
PINCONNING-6

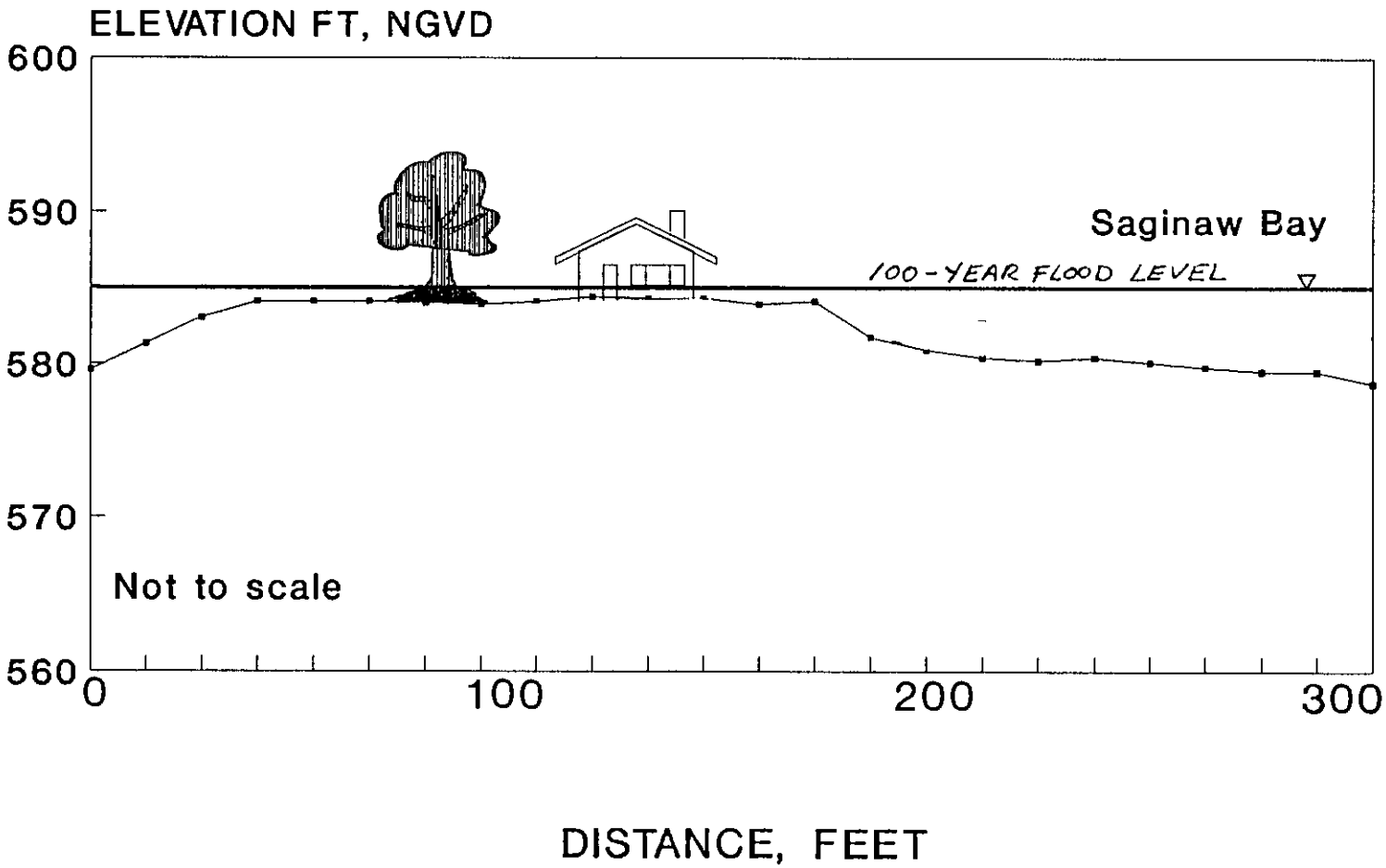


FIGURE P-6

FIS PROFILE
PINCONNING-7

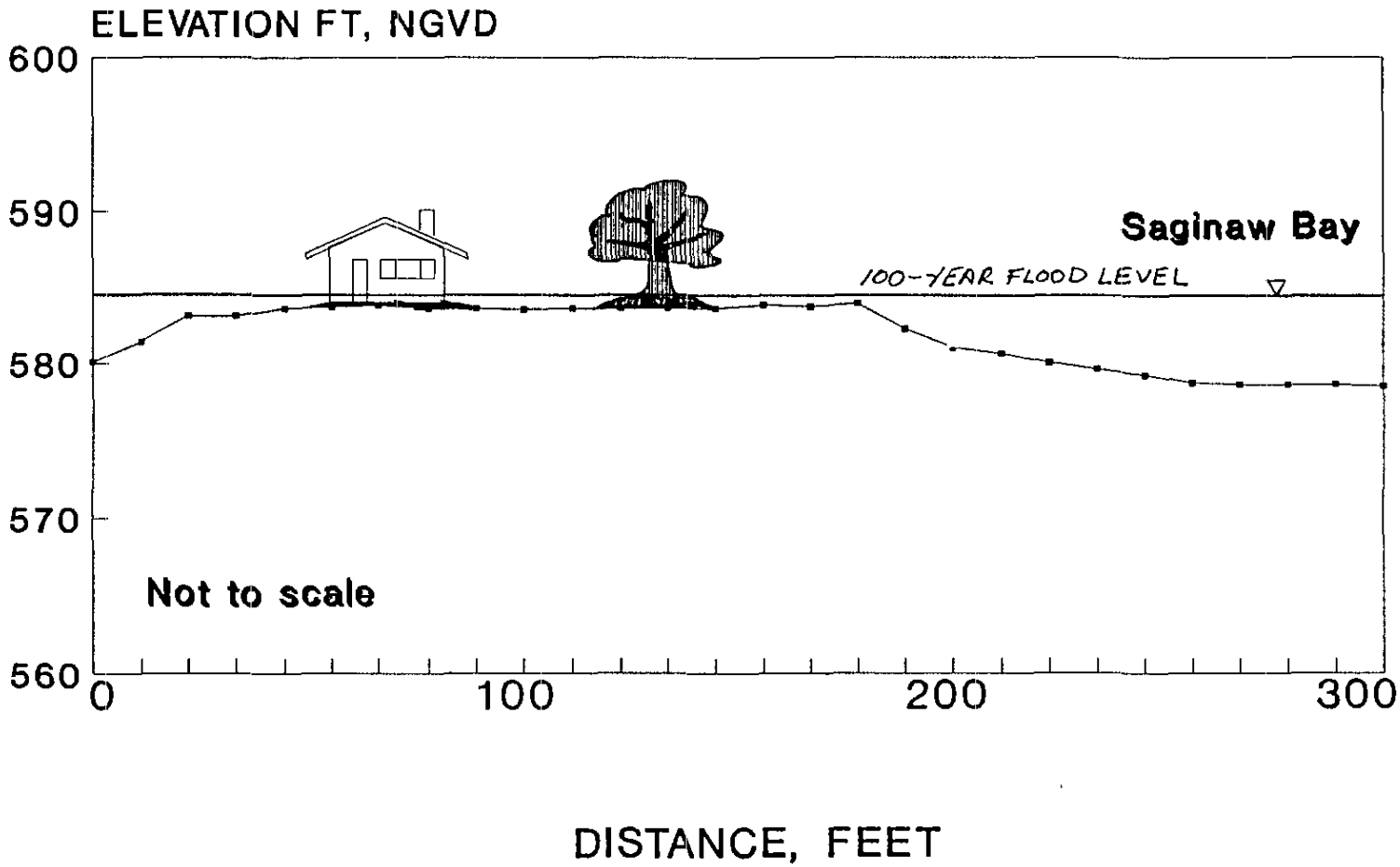


FIGURE P-7

FIS PROFILE
PINCONNING-8

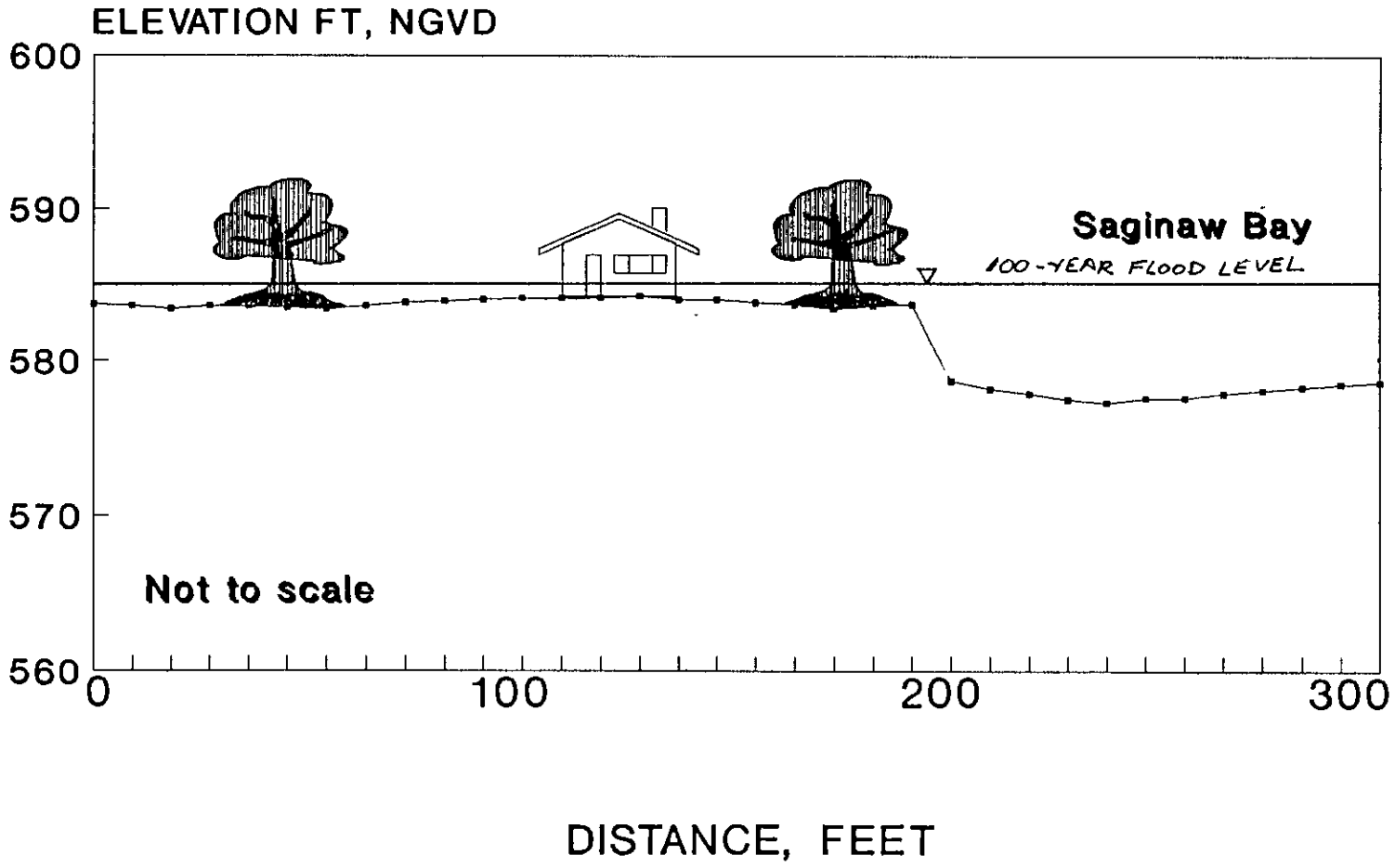


FIGURE P-8

FIS PROFILE
PINCONNING-9

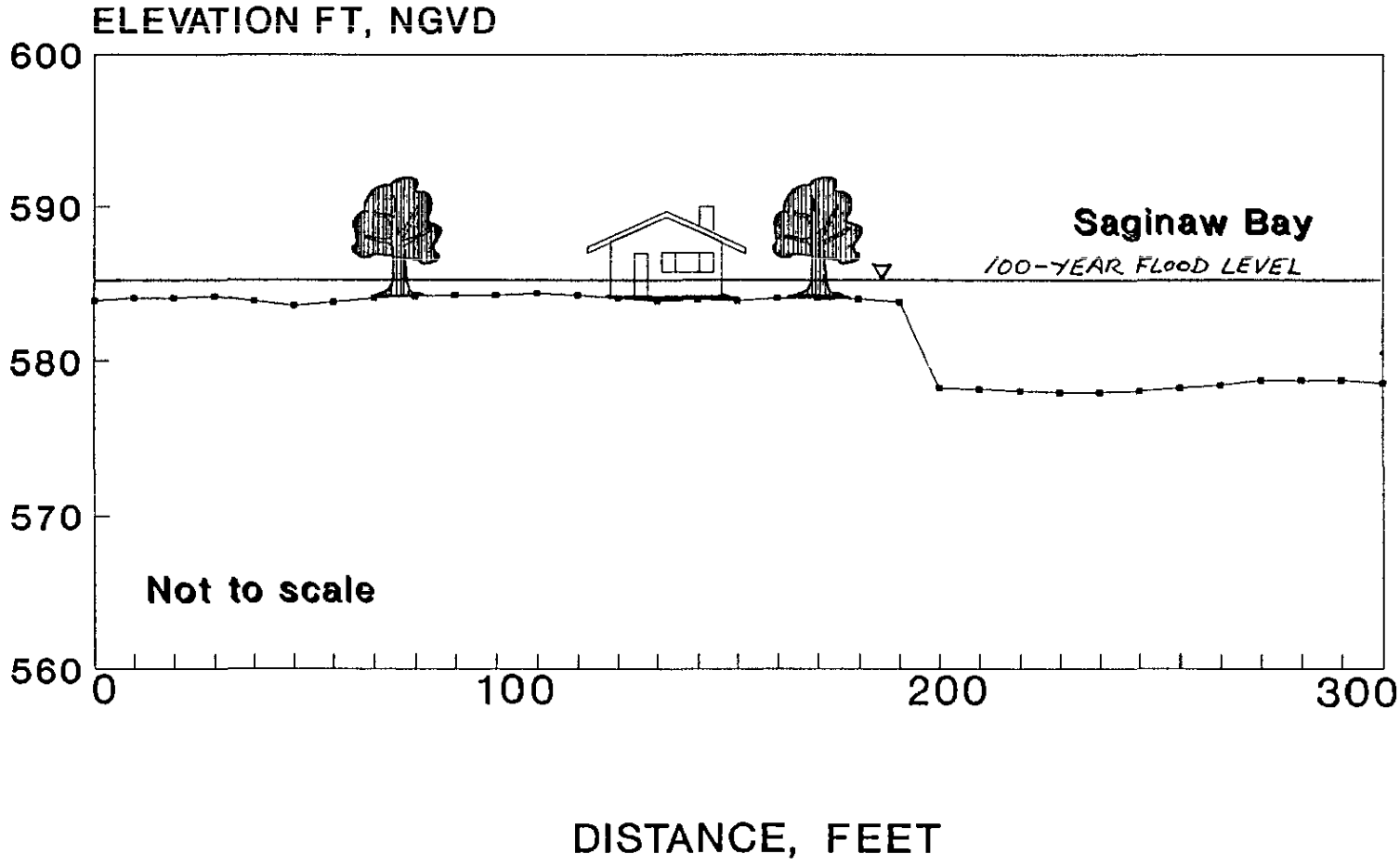


FIGURE P-9

1/92

SYNOPSIS

APPENDIX A outlines the procedures necessary to calculate the wave runup component and the maximum wave runup elevation associated with the 100-year flood level. These data, with the information provided from the profile surveys will enable the user to delineate the 100-year VE, AE, AO and X-Zone profiles according to FEMA's 1990 "Guidelines for Great Lakes Wave Runup Computation and Mapping". The following list shows the nine Pinconning Township sites and the 100-year wave runup elevations. Samples of these computations are included in APPENDIX A.

Pinconning Township FIS Sites	100-year Computed Wave Runup(ft.)	100-year Wave Runup Elevation (ft., NGVD)
1. Pinconning-1	2.0	587.5
2. Pinconning-2	0.0 *	585.5
3. Pinconning-3	0.0 *	585.5
4. Pinconning-4	0.0 *	585.5
5. Pinconning-5	0.0 *	585.5
6. Pinconning-6	0.0 *	585.5
7. Pinconning-7	0.0 *	585.5
8. Pinconning-8	0.0 *	585.5
9. Pinconning-9	0.0 *	585.5

* NOTE: 100-year flood level obtained from the September 1989 "Flood Levels Report for Saginaw Bay."

TABLE 2

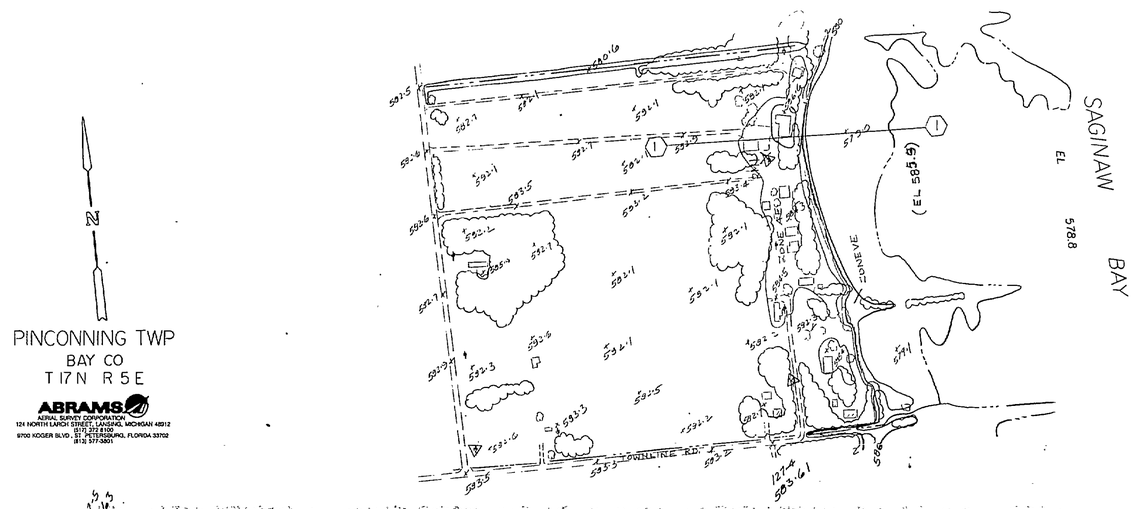
WAVE RUNUP ELEVATIONS

Pinconning Township FIS Sites	100-year Computed Wave Runup(ft.)	100-year Wave Runup Elevation (ft., NGVD)
1. Pinconning-1	2.0	587.5
2. Pinconning-2	0.0 *	585.5
3. Pinconning-3	0.0 *	585.5
4. Pinconning-4	0.0 *	585.5
5. Pinconning-5	0.0 *	585.5
6. Pinconning-6	0.0 *	585.5
7. Pinconning-7	0.0 *	585.5
8. Pinconning-8	0.0 *	585.5
9. Pinconning-9	0.0 *	585.5

* NOTE: 100-year flood level obtained from the September 1989 "Flood Levels Report for Saginaw Bay"

```
                              RUNUP COMPUTATION
              WAVE RUNUP AT PINCINNING TOWNSHIP, PINCONNING-1
              runup on:  beach
         100-year flood: 585.5 feet above IGLD, optional
     water depth at toe:  26.0 feet          1st: significant wave computation
  100-year wave period T:  11.4       (enter per Ref. 3)
                     T':   5.7
                      L: 329.59
100-yr deep water wave H:  24.9 feet  (enter per Ref. 3)
                      K:   2.0
                  alpha:   0.0110
                    Hmo:  11.0
                  d bar:   0.0062
               epsilon:   0.0083
                 Hs/Hmo:   1.018     (enter per Ref. 4, Figure 10)
        Hs in deep water:  11.2                (significant wave)
             beach slope:   0.02400  (tan 30H:1V = 0.03333)
              beach zeta:   0.185              2nd: wave runup computation
             beach runup:   2.0
          runup elevation: 587.5 feet above IGLD


A:\>NOTE:  ALL ELEVATIONS ABOVE ARE IN FEET ABOVE NGVD
```



N

PINCONNING TWP
BAY CO
T17N R5E

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9700 KOGER BLVD., ST. PETERSBURG, FLORIDA 33702
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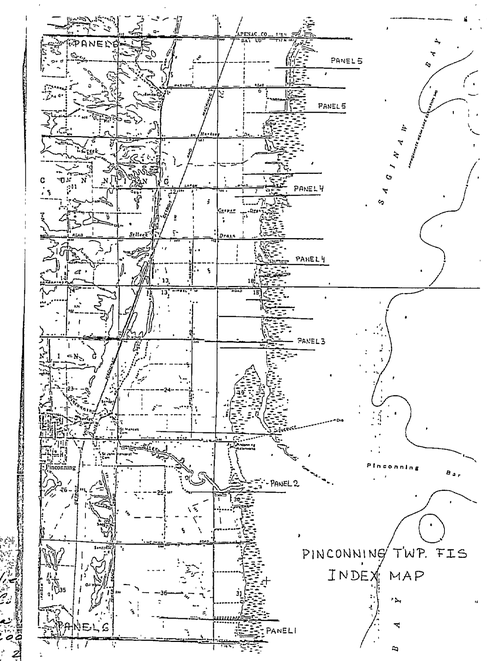


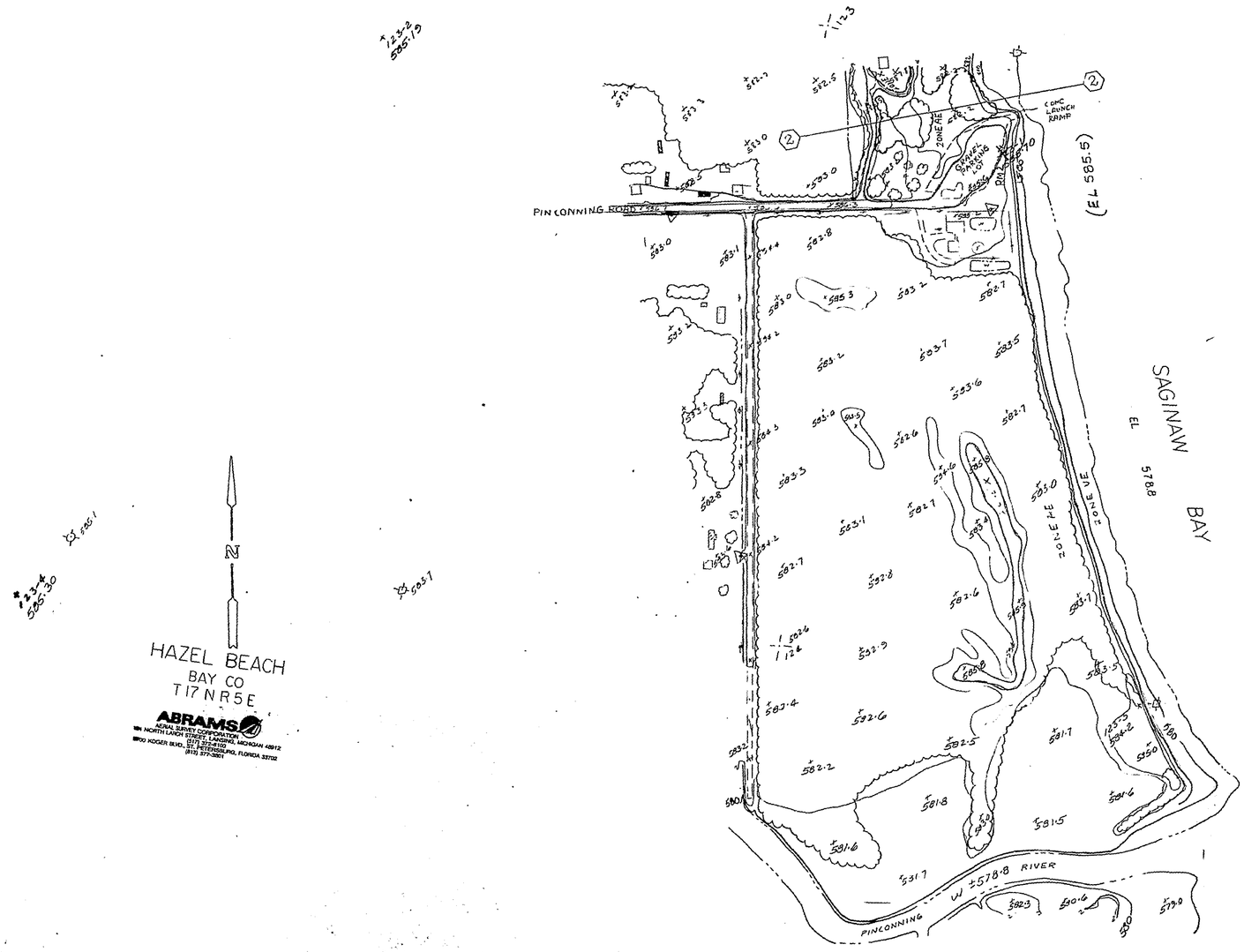
PANEL 1

FLOOD INSURANCE STUDY WORK MAP
PINCONNING TOWNSHIP, MI

LEGEND

CORPORATE LIMITS	
100-YEAR FLOOD PLAIN BOUNDARY	
500-YEAR FLOOD PLAIN BOUNDARY	
CROSS SECTION	I — I
ELEVATION REFERENCE MARKS	RM3 X
ZONE GUTTERS	
BASE FLOOD ELEVATION (COASTAL)	(EL 587.0)
ZONE DESIGNATIONS	ZONE VE

SCALE 1" = 200'

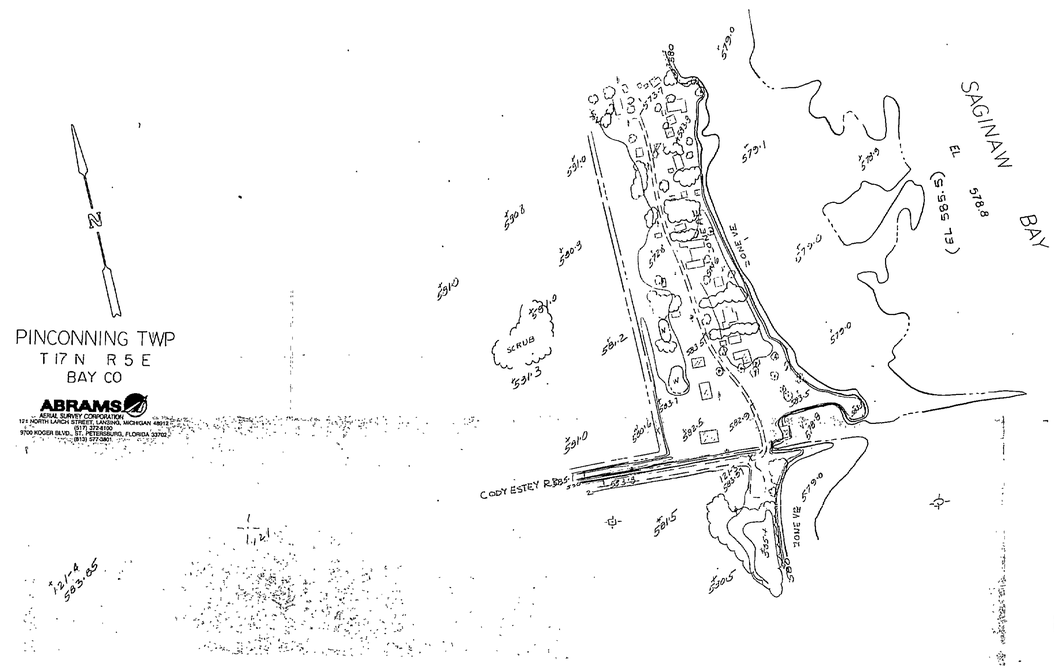


PANEL 2

Gordie Fraser
Bay Co Pinon Twp.
Area #6 Model 125,126,133
1" = 200' 2' CI
WO 23535

FLOOD INSURANCE STUDY WORK MAP
PINCONNING TOWNSHIP, MI

	LEGEND
CORPORATE LIMITS	
100-YEAR FLOOD PLAIN BOUNDARY	
500-YEAR FLOOD PLAIN BOUNDARY	
CROSS SECTION	
ELEVATION REFERENCE MARKS	RM3 x
ZONE GUTTERS	
BASE FLOOD ELEVATION (COASTAL)	(EL 587.0)
ZONE DESIGNATIONS	



PINCONNING TWP
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BAY CO

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9700 KOGER BLVD., ST. PETERSBURG, FLORIDA 33702
(813) 577-2901

Gordie Fraser
Bay Co., Pinconning Twp
Area 5 model 121-120
1" = 200' 2' CI
WO 23535

PANEL 3

FLOOD INSURANCE STUDY WORK MAP
PINCONNING TOWNSHIP, MI

LEGEND

CORPORATE LIMITS	
100-YEAR FLOOD PLAIN BOUNDARY	
500-YEAR FLOOD PLAIN BOUNDARY	
CROSS SECTION	1 — 1
ELEVATION REFERENCE MARKS	RM3 X
ZONE GUTTERS	
BASE FLOOD ELEVATION (COASTAL)	(EL 587.0)
ZONE DESIGNATIONS	ZONE VE

SCALE 1" = 200'

FLOOD INSURANCE STUDY WORK MAP
PINCONNING TOWNSHIP, MI

LEGEND

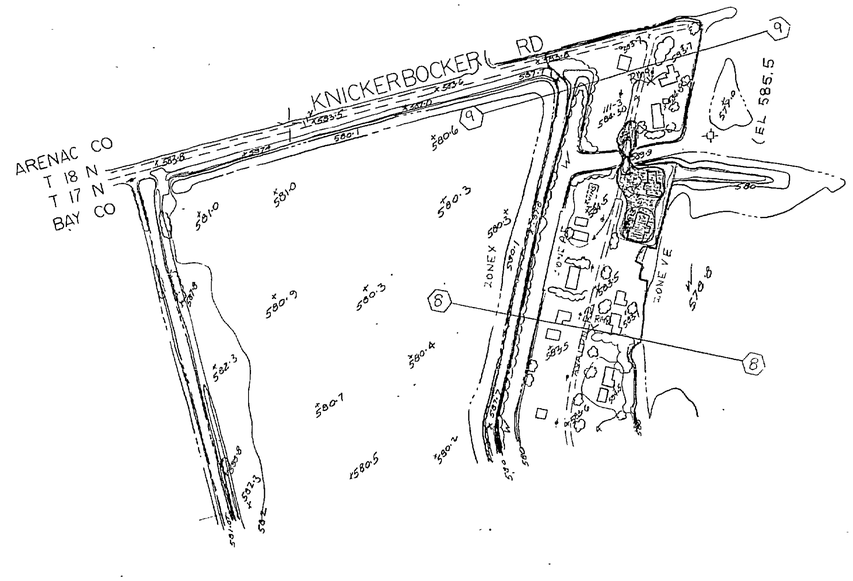
CORPORATE LIMITS	
100-YEAR FLOOD PLAIN BOUNDARY	
500-YEAR FLOOD PLAIN BOUNDARY	
CROSS SECTION	
ELEVATION REFERENCE MARKS	RM3 X
ZONE GUTTERS	
BASE FLOOD ELEVATION (COASTAL)	(EL 587.0)
ZONE DESIGNATIONS	ZONE VE

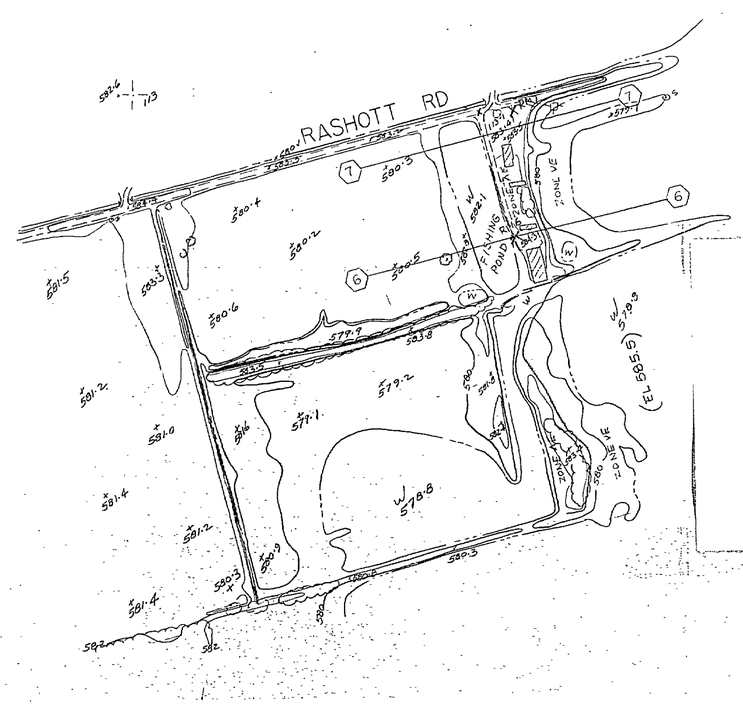
SCALE 1" = 200'

PANEL 4

Gourdie Fraser
BAY CO. MI
Pincon Twp.
1" = 200' 2' CI
WO. 23535
Area 3 & 4
model 117-116 116-115

PANEL 4





N

PART OF SECTION 6
BAY CO
T17N R5E

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FLOOD INSURANCE STUDY WORK MAP
PINCONNING TOWNSHIP, MI

LEGEND

CORPORATE LIMITS	
100-YEAR FLOOD PLAIN BOUNDARY	
500-YEAR FLOOD PLAIN BOUNDARY	
CROSS SECTION	1 — 1
ELEVATION REFERENCE MARKS	RM3X
ZONE GUTTERS	
BASE FLOOD ELEVATION (COASTAL)	(EL 587.0)
ZONE DESIGNATIONS	ZONE VE

SCALE 1" = 200'

PANEL 5

Gourdie Fraser
Bay Co. Pincon Twp
1" = 200' 2'CI