```
***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

              PLAN  2 INPUT DATA FOR STATION     PIPE ARE SAME AS FOR PLAN  1
                              COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                   COMPUTATION TIME STEP
                 ELEMENT    ALPHA       M         DT        DX       PEAK    TIME TO     VOLUME    MAXIMUM
                                                                      PEAK                        CELERITY
                                                (MIN)      (FT)      (CFS)    (MIN)       (IN)      (FPS)

                  MAIN       5.39      1.25        .59    337.00      60.27   725.82       6.94      9.51

                                   INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                  MAIN       5.39      1.25       5.00                59.95   725.00       6.94

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9625E+01 EXCESS= .0000E+00 OUTFLOW= .9623E+01 BASIN STORAGE= .2529E-02 PERCENT ERROR=     .0

     ***             ***             ***             ***             ***

                     HYDROGRAPH AT STATION     PIPE
                       FOR PLAN 2, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                           (CFS)
+     60.      12.08                  14.         5.          5.          5.
                        (INCHES)    5.168       6.940       6.940       6.940
                         (AC-FT)       7.         10.         10.         10.

                        CUMULATIVE AREA =     .03 SQ MI

***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

              PLAN  3 INPUT DATA FOR STATION     PIPE ARE SAME AS FOR PLAN  1
                              COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                   COMPUTATION TIME STEP
                 ELEMENT    ALPHA       M         DT        DX       PEAK    TIME TO     VOLUME    MAXIMUM
                                                                      PEAK                        CELERITY
                                                (MIN)      (FT)      (CFS)    (MIN)       (IN)      (FPS)

                  MAIN       5.39      1.25        .58    337.00      66.44   729.66       8.32      9.69

                                   INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                  MAIN       5.39      1.25       5.00                66.42   730.00       8.32

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1154E+02 EXCESS= .0000E+00 OUTFLOW= .1154E+02 BASIN STORAGE= .3040E-02 PERCENT ERROR=     .0

     ***             ***             ***             ***             ***

                     HYDROGRAPH AT STATION     PIPE
                       FOR PLAN 3, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                           (CFS)
+     66.      12.17                  18.         6.          6.          6.
                        (INCHES)    6.267       8.324       8.324       8.324
                         (AC-FT)       9.         12.         12.         12.

                        CUMULATIVE AREA =     .03 SQ MI

***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

              PLAN  4 INPUT DATA FOR STATION     PIPE ARE SAME AS FOR PLAN  1
```

COMPUTED MUSKINGUM-CUNGE PARAMETERS
COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	5.39	1.25	.57	337.00	73.95	726.39	9.61	9.91
INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL								
MAIN	5.39	1.25	5.00		73.47	730.00	9.61	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1333E+02 EXCESS= .0000E+00 OUTFLOW= .1333E+02 BASIN STORAGE= .3534E-02 PERCENT ERROR= .0

*** *** *** *** ***

HYDROGRAPH AT STATION PIPE
FOR PLAN 4, RATIO = 1.00

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
+ 73.	12.17	(CFS)	20.	7.	7.	7.
		(INCHES)	7.265	9.610	9.610	9.610
		(AC-FT)	10.	13.	13.	13.

CUMULATIVE AREA = .03 SQ MI

* *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

PLAN 5 INPUT DATA FOR STATION PIPE ARE SAME AS FOR PLAN 1
COMPUTED MUSKINGUM-CUNGE PARAMETERS
COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	5.39	1.25	.55	337.00	83.16	726.25	10.71	10.14
INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL								
MAIN	5.39	1.25	5.00		82.89	730.00	10.71	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1485E+02 EXCESS= .0000E+00 OUTFLOW= .1485E+02 BASIN STORAGE= .3512E-02 PERCENT ERROR= .0

*** *** *** *** ***

HYDROGRAPH AT STATION PIPE
FOR PLAN 5, RATIO = 1.00

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
+ 83.	12.17	(CFS)	22.	7.	7.	7.
		(INCHES)	7.850	10.706	10.706	10.706
		(AC-FT)	11.	15.	15.	15.

CUMULATIVE AREA = .03 SQ MI

* ***

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* *

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271 KK      *        P2B  *
            *             *
            **************

***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

272 KP        PLAN  1 FOR STATION      P2B
                              RUNOFF COMPUTATION 2-YRS STORM IN BASIN

              SUBBASIN RUNOFF DATA

273 BA          SUBBASIN CHARACTERISTICS
                      TAREA          .03  SUBBASIN AREA

                PRECIPITATION DATA

278 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .18     .50    2.40    2.55    2.75    3.30    4.10    4.75     .00     .00     .00     .00

                                                STORM AREA =      .03

274 LS          SCS LOSS RATE
                      STRTL          .15  INITIAL ABSTRACTION
                     CRVNBR        93.00  CURVE NUMBER
                      RTIMP          .00  PERCENT IMPERVIOUS AREA

275 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG          .18  LAG

                                                     ***

                                                UNIT HYDROGRAPH
                                          13 END-OF-PERIOD ORDINATES
              17.       53.       59.       41.       21.       12.        6.        3.        2.        1.
               1.        0.        0.

***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

279 KP        PLAN  2 FOR STATION      P2B
                              RUNOFF COMPUTATION 10-YRS STORM IN BASIN

              SUBBASIN RUNOFF DATA

273 BA          SUBBASIN CHARACTERISTICS
                      TAREA          .03  SUBBASIN AREA

                PRECIPITATION DATA

281 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .27     .75    3.35    3.95    4.40    5.40    6.60    7.80     .00     .00     .00     .00

                                                STORM AREA =      .03

274 LS          SCS LOSS RATE
                      STRTL          .15  INITIAL ABSTRACTION
                     CRVNBR        93.00  CURVE NUMBER
                      RTIMP          .00  PERCENT IMPERVIOUS AREA

275 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG          .18  LAG

                                                     ***

                                                UNIT HYDROGRAPH
                                          13 END-OF-PERIOD ORDINATES
              17.       53.       59.       41.       21.       12.        6.        3.        2.        1.
               1.        0.        0.

*       ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

282 KP        PLAN  3 FOR STATION      P2B
                              RUNOFF COMPUTATION 25-YRS STORM IN BASIN

              SUBBASIN RUNOFF DATA
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273 BA          SUBBASIN CHARACTERISTICS
                      TAREA          .03  SUBBASIN AREA

                PRECIPITATION DATA

284 PH                                 DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .32     .90    3.62    4.65    5.25    6.50    7.70    9.20     .00     .00     .00     .00

                                                STORM AREA =      .03

274 LS          SCS LOSS RATE
                      STRTL          .15  INITIAL ABSTRACTION
                     CRVNBR        93.00  CURVE NUMBER
                      RTIMP          .00  PERCENT IMPERVIOUS AREA

275 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG          .18  LAG

                                                   ***

                                                UNIT HYDROGRAPH
                                           13 END-OF-PERIOD ORDINATES
                 17.       53.       59.       41.       21.       12.        6.        3.        2.        1.
                  1.        0.        0.

***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

285 KP          PLAN  4 FOR STATION      P2B
                                   RUNOFF COMPUTATION 50-YRS STORM IN BASIN

                SUBBASIN RUNOFF DATA

 73 BA            SUBBASIN CHARACTERISTICS
                      TAREA          .03  SUBBASIN AREA

                  PRECIPITATION DATA

287 PH                                 DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .34     .97    4.00    5.30    5.90    7.50    8.70   10.50     .00     .00     .00     .00

                                                STORM AREA =      .03

274 LS            SCS LOSS RATE
                      STRTL          .15  INITIAL ABSTRACTION
                     CRVNBR        93.00  CURVE NUMBER
                      RTIMP          .00  PERCENT IMPERVIOUS AREA

275 UD            SCS DIMENSIONLESS UNITGRAPH
                       TLAG          .18  LAG

                                                   ***

                                                UNIT HYDROGRAPH
                                           13 END-OF-PERIOD ORDINATES
                 17.       53.       59.       41.       21.       12.        6.        3.        2.        1.
                  1.        0.        0.

***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

288 KP          PLAN  5 FOR STATION      P2B
                                   RUNOFF COMPUTATION 100-YRS STORM IN BASIN

                SUBBASIN RUNOFF DATA

273 BA            SUBBASIN CHARACTERISTICS
                      TAREA          .03  SUBBASIN AREA

                  PRECIPITATION DATA

 90 PH                                 DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .39    1.10    4.50    5.65    6.80    8.00    9.80   11.60     .00     .00     .00     .00
```

```
                                        STORM AREA =      .03

274 LS          SCS LOSS RATE
                      STRTL          .15  INITIAL ABSTRACTION
                     CRVNBR        93.00  CURVE NUMBER
                      RTIMP          .00  PERCENT IMPERVIOUS AREA

275 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG          .18  LAG

                                                 ***

                                            UNIT HYDROGRAPH
                                        13 END-OF-PERIOD ORDINATES
              17.       53.       59.       41.       21.       12.        6.        3.        2.        1.
               1.        0.        0.

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
291 KK      *      COMB  *
            *            *
            **************

292 HC          HYDROGRAPH COMBINATION
                      ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                 ***


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
293 KK      *       P2D  *
            *            *
            **************

***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

294 KP          PLAN  1 FOR STATION      P2D
                                RUNOFF COMPUTATION 2-YRS STORM IN BASIN

                SUBBASIN RUNOFF DATA

295 BA            SUBBASIN CHARACTERISTICS
                      TAREA          .03  SUBBASIN AREA

                  PRECIPITATION DATA

300 PH                            DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                    .18     .50    2.40    2.55    2.75    3.30    4.10    4.75     .00     .00     .00     .00

                                        STORM AREA =      .03

296 LS            SCS LOSS RATE
                      STRTL          .15  INITIAL ABSTRACTION
                     CRVNBR        93.00  CURVE NUMBER
                      RTIMP          .00  PERCENT IMPERVIOUS AREA

297 UD            SCS DIMENSIONLESS UNITGRAPH
                       TLAG          .24  LAG

                                                 ***

                                            UNIT HYDROGRAPH
                                        16 END-OF-PERIOD ORDINATES
                  9.       32.       49.       47.       35.       20.       13.        8.        5.        3.
                  2.        1.        1.        0.        0.        0.

***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***
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301 KP        PLAN  2 FOR STATION      P2D
                          RUNOFF COMPUTATION 10-YRS STORM IN BASIN

              SUBBASIN RUNOFF DATA

295 BA          SUBBASIN CHARACTERISTICS
                      TAREA          .03  SUBBASIN AREA

                PRECIPITATION DATA

303 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .27     .75    3.35    3.95    4.40    5.40    6.60    7.80     .00     .00     .00     .00

                                                STORM AREA =      .03

296 LS          SCS LOSS RATE
                      STRTL          .15  INITIAL ABSTRACTION
                     CRVNBR        93.00  CURVE NUMBER
                      RTIMP          .00  PERCENT IMPERVIOUS AREA

297 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG          .24  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                          16 END-OF-PERIOD ORDINATES
                9.      32.      49.      47.      35.      20.      13.       8.       5.       3.
                2.       1.       1.       0.       0.       0.

***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***

 04 KP        PLAN  3 FOR STATION      P2D
                          RUNOFF COMPUTATION 25-YRS STORM IN BASIN

              SUBBASIN RUNOFF DATA

295 BA          SUBBASIN CHARACTERISTICS
                      TAREA          .03  SUBBASIN AREA

                PRECIPITATION DATA

306 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .32     .90    3.62    4.65    5.25    6.50    7.70    9.20     .00     .00     .00     .00

                                                STORM AREA =      .03

296 LS          SCS LOSS RATE
                      STRTL          .15  INITIAL ABSTRACTION
                     CRVNBR        93.00  CURVE NUMBER
                      RTIMP          .00  PERCENT IMPERVIOUS AREA

297 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG          .24  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                          16 END-OF-PERIOD ORDINATES
                9.      32.      49.      47.      35.      20.      13.       8.       5.       3.
                2.       1.       1.       0.       0.       0.

***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***

307 KP        PLAN  4 FOR STATION      P2D
                          RUNOFF COMPUTATION 50-YRS STORM IN BASIN

              SUBBASIN RUNOFF DATA

 95 BA          SUBBASIN CHARACTERISTICS
                      TAREA          .03  SUBBASIN AREA

                PRECIPITATION DATA
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309 PH                          DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
              ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
              5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                .34     .97    4.00    5.30    5.90    7.50    8.70   10.50     .00     .00     .00     .00

                                          STORM AREA =     .03

296 LS        SCS LOSS RATE
                   STRTL         .15  INITIAL ABSTRACTION
                  CRVNBR       93.00  CURVE NUMBER
                   RTIMP         .00  PERCENT IMPERVIOUS AREA

297 UD        SCS DIMENSIONLESS UNITGRAPH
                   TLAG         .24  LAG

                                              ***

                                          UNIT HYDROGRAPH
                                     16 END-OF-PERIOD ORDINATES
              9.      32.      49.      47.      35.      20.      13.       8.       5.       3.
              2.       1.       1.       0.       0.       0.

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

310 KP        PLAN  5 FOR STATION      P2D
                           RUNOFF COMPUTATION 100-YRS STORM IN BASIN

              SUBBASIN RUNOFF DATA

295 BA          SUBBASIN CHARACTERISTICS
                     TAREA         .03  SUBBASIN AREA

                PRECIPITATION DATA

312 PH                          DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
              ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
              5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                .39    1.10    4.50    5.65    6.80    8.00    9.80   11.60     .00     .00     .00     .00

                                          STORM AREA =     .03

296 LS          SCS LOSS RATE
                   STRTL         .15  INITIAL ABSTRACTION
                  CRVNBR       93.00  CURVE NUMBER
                   RTIMP         .00  PERCENT IMPERVIOUS AREA

297 UD          SCS DIMENSIONLESS UNITGRAPH
                   TLAG         .24  LAG

                                              ***

                                          UNIT HYDROGRAPH
                                     16 END-OF-PERIOD ORDINATES
              9.      32.      49.      47.      35.      20.      13.       8.       5.       3.
              2.       1.       1.       0.       0.       0.

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              **************
              *            *
313 KK        *      PIPE  *
              *            *
              **************

314 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        289  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS

                HYDROGRAPH ROUTING DATA
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315 RD          MUSKINGUM-CUNGE CHANNEL ROUTING
                          L        426.  CHANNEL LENGTH
                          S       .0050  SLOPE
                          N        .013  CHANNEL ROUGHNESS COEFFICIENT
                         CA         .00  CONTRIBUTING AREA
                      SHAPE        CIRC  CHANNEL SHAPE
                         WD        3.50  BOTTOM WIDTH OR DIAMETER
                          Z         .00  SIDE SLOPE

                                                 ***
                          COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                COMPUTATION TIME STEP
      ELEMENT    ALPHA       M        DT        DX       PEAK    TIME TO     VOLUME    MAXIMUM
                                                                    PEAK                CELERITY
                                     (MIN)      (FT)     (CFS)     (MIN)       (IN)      (FPS)

        MAIN      5.39     1.25       .80    213.00     43.80    726.93       3.94       8.92

                                INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

        MAIN      5.39     1.25      5.00                43.69    730.00       3.94

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .6092E+01 EXCESS= .0000E+00 OUTFLOW= .6090E+01 BASIN STORAGE= .2105E-02 PERCENT ERROR=     .0

      ***          ***          ***          ***          ***

                          HYDROGRAPH AT STATION     PIPE
                            FOR PLAN 1, RATIO = 1.00

  PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
                                          6-HR       24-HR       72-HR     24.00-HR
   (CFS)        (HR)
                                 (CFS)
+     44.      12.17                       9.          3.          3.          3.
                             (INCHES)    3.028       3.939       3.939       3.939
                              (AC-FT)       5.          6.          6.          6.

                          CUMULATIVE AREA =     .03 SQ MI

 ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***

                PLAN  2 INPUT DATA FOR STATION     PIPE ARE SAME AS FOR PLAN  1
                          COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                COMPUTATION TIME STEP
      ELEMENT    ALPHA       M        DT        DX       PEAK    TIME TO     VOLUME    MAXIMUM
                                                                    PEAK                CELERITY
                                     (MIN)      (FT)     (CFS)     (MIN)       (IN)      (FPS)

        MAIN      5.39     1.25       .73    426.00     65.45    729.58       6.94       9.66

                                INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

        MAIN      5.39     1.25      5.00                65.44    730.00       6.94

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .1073E+02 EXCESS= .0000E+00 OUTFLOW= .1073E+02 BASIN STORAGE= .3495E-02 PERCENT ERROR=     .0

      ***          ***          ***          ***          ***

                          HYDROGRAPH AT STATION     PIPE
                            FOR PLAN 2, RATIO = 1.00

  PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
                                          6-HR       24-HR       72-HR     24.00-HR
   (CFS)        (HR)
                                 (CFS)
+     65.      12.17                      16.          5.          5.          5.
                             (INCHES)    5.168       6.938       6.938       6.938
                              (AC-FT)       8.         11.         11.         11.
```

CUMULATIVE AREA - .03 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

PLAN 3 INPUT DATA FOR STATION PIPE ARE SAME AS FOR PLAN 1
COMPUTED MUSKINGUM-CUNGE PARAMETERS
COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	5.39	1.25	.72	426.00	73.23	730.38	8.32	9.89
INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL								
MAIN	5.39	1.25	5.00		73.12	730.00	8.32	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1287E+02 EXCESS= .0000E+00 OUTFLOW= .1287E+02 BASIN STORAGE= .4199E-02 PERCENT ERROR= .0

*** *** *** *** ***

HYDROGRAPH AT STATION PIPE
FOR PLAN 3, RATIO = 1.00

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 73.	12.17		20.	6.	6.	6.
		(INCHES)	6.266	8.321	8.321	8.321
		(AC-FT)	10.	13.	13.	13.

CUMULATIVE AREA = .03 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

PLAN 4 INPUT DATA FOR STATION PIPE ARE SAME AS FOR PLAN 1
COMPUTED MUSKINGUM-CUNGE PARAMETERS
COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	5.39	1.25	.70	426.00	81.17	730.32	9.61	10.09
INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL								
MAIN	5.39	1.25	5.00		81.12	730.00	9.61	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1486E+02 EXCESS= .0000E+00 OUTFLOW= .1486E+02 BASIN STORAGE= .4882E-02 PERCENT ERROR= .0

*** *** *** *** ***

HYDROGRAPH AT STATION PIPE
FOR PLAN 4, RATIO = 1.00

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 81.	12.17		23.	7.	7.	7.
		(INCHES)	7.263	9.607	9.607	9.607
		(AC-FT)	11.	15.	15.	15.

CUMULATIVE AREA = .03 SQ MI

```
***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

                PLAN  5 INPUT DATA FOR STATION     PIPE ARE SAME AS FOR PLAN  1
                                COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                      COMPUTATION TIME STEP
                     ELEMENT    ALPHA       M         DT        DX       PEAK    TIME TO     VOLUME    MAXIMUM
                                                                                   PEAK                CELERITY
                                                     (MIN)     (FT)     (CFS)    (MIN)      (IN)      (FPS)

                       MAIN      5.39      1.25        .69    426.00     91.46   730.25     10.70     10.34

                                      INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                       MAIN      5.39      1.25       5.00               91.39   730.00     10.70

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1656E+02 EXCESS= .0000E+00 OUTFLOW= .1655E+02 BASIN STORAGE- .4851E-02 PERCENT ERROR=     .0

      ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION     PIPE
                          FOR PLAN 5, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                            (CFS)
+      91.     12.17                 24.          8.          8.           8.
                         (INCHES)  7.850      10.703      10.703       10.703
                          (AC-FT)    12.         17.         17.          17.

                         CUMULATIVE AREA =     .03 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
 316 KK     *       P2C  *
            *            *
            **************


***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

 317 KP         PLAN  1 FOR STATION      P2C
                                RUNOFF COMPUTATION 2-YRS STORM IN BASIN

                SUBBASIN RUNOFF DATA

 318 BA         SUBBASIN CHARACTERISTICS
                      TAREA          .02  SUBBASIN AREA

                PRECIPITATION DATA

 323 PH                          DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .18     .50    2.40    2.55    2.75    3.30    4.10    4.75     .00     .00     .00     .00

                                          STORM AREA =     .02

 319 LS         SCS LOSS RATE
                      STRTL          .15  INITIAL ABSTRACTION
                     CRVNBR        93.00  CURVE NUMBER
                      RTIMP          .00  PERCENT IMPERVIOUS AREA

  20 UD         SCS DIMENSIONLESS UNITGRAPH
                       TLAG          .26  LAG

                                      ***

                                UNIT HYDROGRAPH
```

```
                                        18 END-OF-PERIOD ORDINATES
          6.      21.      35.      36.      29.      18.      12.       8.       5.       3.
          2.       1.       1.       1.       0.       0.       0.       0.

***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***

324 KP      PLAN  2 FOR STATION      P2C
                        RUNOFF COMPUTATION 10-YRS STORM IN BASIN

            SUBBASIN RUNOFF DATA

318 BA        SUBBASIN CHARACTERISTICS
                TAREA          .02  SUBBASIN AREA

              PRECIPITATION DATA

326 PH                          DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
          ..... HYDRO-35 ......  ............... TP-40 ...............  ........... TP-49 ...........
          5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
            .27     .75    3.35    3.95    4.40    5.40    6.60    7.80     .00     .00     .00     .00

                                        STORM AREA =      .02

319 LS        SCS LOSS RATE
                STRTL          .15  INITIAL ABSTRACTION
               CRVNBR        93.00  CURVE NUMBER
                RTIMP          .00  PERCENT IMPERVIOUS AREA

320 UD        SCS DIMENSIONLESS UNITGRAPH
                 TLAG          .26  LAG

                                            ***

                                          UNIT HYDROGRAPH
                                        18 END-OF-PERIOD ORDINATES
          6.      21.      35.      36.      29.      18.      12.       8.       5.       3.
          2.       1.       1.       1.       0.       0.       0.       0.

***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***

327 KP      PLAN  3 FOR STATION      P2C
                        RUNOFF COMPUTATION 25-YRS STORM IN BASIN

            SUBBASIN RUNOFF DATA

318 BA        SUBBASIN CHARACTERISTICS
                TAREA          .02  SUBBASIN AREA

              PRECIPITATION DATA

329 PH                          DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
          ..... HYDRO-35 ......  ............... TP-40 ...............  ........... TP-49 ...........
          5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
            .32     .90    3.62    4.65    5.25    6.50    7.70    9.20     .00     .00     .00     .00

                                        STORM AREA =      .02

319 LS        SCS LOSS RATE
                STRTL          .15  INITIAL ABSTRACTION
               CRVNBR        93.00  CURVE NUMBER
                RTIMP          .00  PERCENT IMPERVIOUS AREA

320 UD        SCS DIMENSIONLESS UNITGRAPH
                 TLAG          .26  LAG

                                            ***

                                          UNIT HYDROGRAPH
                                        18 END-OF-PERIOD ORDINATES
          6.      21.      35.      36.      29.      18.      12.       8.       5.       3.
          2.       1.       1.       1.       0.       0.       0.       0.

*     ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***   ***

330 KP      PLAN  4 FOR STATION      P2C
                        RUNOFF COMPUTATION 50-YRS STORM IN BASIN

            SUBBASIN RUNOFF DATA
```

```
318 BA          SUBBASIN CHARACTERISTICS
                      TAREA          .02  SUBBASIN AREA

                PRECIPITATION DATA

332 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .34     .97    4.00    5.30    5.90    7.50    8.70   10.50     .00     .00     .00     .00

                                                STORM AREA =     .02

319 LS          SCS LOSS RATE
                      STRTL          .15  INITIAL ABSTRACTION
                     CRVNBR        93.00  CURVE NUMBER
                      RTIMP          .00  PERCENT IMPERVIOUS AREA

320 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG          .26  LAG

                                                      ***

                                                UNIT HYDROGRAPH
                                            18 END-OF-PERIOD ORDINATES
                6.      21.      35.      36.      29.      18.      12.       8.       5.       3.
                2.       1.       1.       1.       0.       0.       0.       0.

***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

333 KP          PLAN  5 FOR STATION      P2C
                                   RUNOFF COMPUTATION 100-YRS STORM IN BASIN

                SUBBASIN RUNOFF DATA

 18 BA            SUBBASIN CHARACTERISTICS
                      TAREA          .02  SUBBASIN AREA

                  PRECIPITATION DATA

335 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .39    1.10    4.50    5.65    6.80    8.00    9.80   11.60     .00     .00     .00     .00

                                                STORM AREA =     .02

319 LS            SCS LOSS RATE
                      STRTL          .15  INITIAL ABSTRACTION
                     CRVNBR        93.00  CURVE NUMBER
                      RTIMP          .00  PERCENT IMPERVIOUS AREA

320 UD            SCS DIMENSIONLESS UNITGRAPH
                       TLAG          .26  LAG

                                                      ***

                                                UNIT HYDROGRAPH
                                            18 END-OF-PERIOD ORDINATES
                6.      21.      35.      36.      29.      18.      12.       8.       5.       3.
                2.       1.       1.       1.       0.       0.       0.       0.

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

                **************
                *            *
336 KK          *      COMB  *
                *            *
                **************

337 HC            HYDROGRAPH COMBINATION
                       ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                      ***
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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
338 KK    *      PIPE  *
          *            *
          **************

339 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        289  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS

             HYDROGRAPH ROUTING DATA

340 RD          MUSKINGUM-CUNGE CHANNEL ROUTING
                          L       524.  CHANNEL LENGTH
                          S      .0050  SLOPE
                          N       .013  CHANNEL ROUGHNESS COEFFICIENT
                         CA        .00  CONTRIBUTING AREA
                      SHAPE       CIRC  CHANNEL SHAPE
                         WD       4.00  BOTTOM WIDTH OR DIAMETER
                          Z        .00  SIDE SLOPE

                                                  ***
                          COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                COMPUTATION TIME STEP
                ELEMENT    ALPHA       M        DT        DX       PEAK    TIME TO     VOLUME    MAXIMUM
                                                                            PEAK                  CELERITY
                                                (MIN)      (FT)     (CFS)    (MIN)       (IN)      (FPS)

                  MAIN      5.51     1.25        .86    524.00     77.73   730.67       3.94     10.18

                                INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                  MAIN      5.51     1.25       5.00               77.66   730.00       3.94

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1092E+02 EXCESS= .0000E+00 OUTFLOW= .1092E+02 BASIN STORAGE= .4063E-02 PERCENT ERROR=     .0

    ***             ***             ***             ***             ***

                     HYDROGRAPH AT STATION     PIPE
                       FOR PLAN 1, RATIO = 1.00

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                              6-HR       24-HR      72-HR    24.00-HR
+   (CFS)      (HR)
                                  (CFS)
+     78.     12.17                 17.         6.         6.         6.
                              (INCHES)      3.028      3.938      3.938      3.938
                               (AC-FT)         8.        11.        11.        11.

                              CUMULATIVE AREA =     .05 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

             PLAN  2 INPUT DATA FOR STATION     PIPE ARE SAME AS FOR PLAN  1
                          COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                COMPUTATION TIME STEP
                ELEMENT    ALPHA       M        DT        DX       PEAK    TIME TO     VOLUME    MAXIMUM
                                                                            PEAK                  CELERITY
                                                (MIN)      (FT)     (CFS)    (MIN)       (IN)      (FPS)

                  MAIN      5.51     1.25        .79    524.00    116.42   730.86       6.94     11.04

                                INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL
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                    MAIN        5.51       1.25       5.00                116.33     730.00       6.94

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1924E+02 EXCESS= .0000E+00 OUTFLOW= .1923E+02 BASIN STORAGE= .6745E-02 PERCENT ERROR=     .0

     ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION     PIPE
                        FOR PLAN 2, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                                   (CFS)
+     116.     12.17                  29.         10.         10.         10.
                                (INCHES)      5.168       6.937       6.937       6.937
                                 (AC-FT)        14.         19.         19.         19.

                       CUMULATIVE AREA =      .05 SQ MI

***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***

                PLAN  3 INPUT DATA FOR STATION     PIPE ARE SAME AS FOR PLAN  1
                                COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                      COMPUTATION TIME STEP
                     ELEMENT    ALPHA        M          DT         DX        PEAK    TIME TO     VOLUME    MAXIMUM
                                                                                        PEAK                CELERITY
                                                      (MIN)       (FT)      (CFS)     (MIN)       (IN)      (FPS)

                       MAIN       5.51       1.25        .77     524.00     130.06    731.14       8.32     11.29

                                          INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                       MAIN       5.51       1.25       5.00                129.51    730.00       8.32

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2308E+02 EXCESS= .0000E+00 OUTFLOW= .2307E+02 BASIN STORAGE= .8105E-02 PERCENT ERROR=     .0

     ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION     PIPE
                        FOR PLAN 3, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                                   (CFS)
+     130.     12.17                  35.         12.         12.         12.
                                (INCHES)      6.265       8.319       8.319       8.319
                                 (AC-FT)        17.         23.         23.         23.

                       CUMULATIVE AREA =      .05 SQ MI

***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***

                PLAN  4 INPUT DATA FOR STATION     PIPE ARE SAME AS FOR PLAN  1
                                COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                      COMPUTATION TIME STEP
                     ELEMENT    ALPHA        M          DT         DX        PEAK    TIME TO     VOLUME    MAXIMUM
                                                                                        PEAK                CELERITY
                                                      (MIN)       (FT)      (CFS)     (MIN)       (IN)      (FPS)

                       MAIN       5.51       1.25        .76     524.00     144.25    731.20       9.60     11.53

                                          INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                       MAIN       5.51       1.25       5.00                143.94    730.00       9.60
```

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2664E+02 EXCESS= .0000E+00 OUTFLOW= .2664E+02 BASIN STORAGE= .9423E-02 PERCENT ERROR= .0

*** *** *** *** ***

HYDROGRAPH AT STATION PIPE
FOR PLAN 4, RATIO = 1.00

	PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
+			(CFS)				
+	144.	12.17		41.	13.	13.	13.
			(INCHES)	7.262	9.605	9.605	9.605
			(AC-FT)	20.	27.	27.	27.

CUMULATIVE AREA = .05 SQ MI

*** ***

PLAN 5 INPUT DATA FOR STATION PIPE ARE SAME AS FOR PLAN 1
COMPUTED MUSKINGUM-CUNGE PARAMETERS
COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	5.51	1.25	.74	524.00	162.49	731.05	10.70	11.80

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	5.51	1.25	5.00		162.02	730.00	10.70

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2968E+02 EXCESS= .0000E+00 OUTFLOW= .2968E+02 BASIN STORAGE= .9362E-02 PERCENT ERROR= .0

*** *** *** *** ***

HYDROGRAPH AT STATION PIPE
FOR PLAN 5, RATIO = 1.00

	PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
+			(CFS)				
+	162.	12.17		44.	15.	15.	15.
			(INCHES)	7.850	10.701	10.701	10.701
			(AC-FT)	22.	30.	30.	30.

CUMULATIVE AREA = .05 SQ MI

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            **************
            *            *
341 KK      *      COMB  *
            *            *
            **************
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342 HC HYDROGRAPH COMBINATION
ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

***

*** ***

```
              **************
              *            *
  343 KK      *      PIPE  *
              *            *
              **************

  344 KO          OUTPUT CONTROL VARIABLES
                        IPRNT          3  PRINT CONTROL
                        IPLOT          0  PLOT CONTROL
                        QSCAL         0.  HYDROGRAPH PLOT SCALE
                        IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                         IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                        ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                        ISAV2        289  LAST ORDINATE PUNCHED OR SAVED
                       TIMINT       .083  TIME INTERVAL IN HOURS


                 HYDROGRAPH ROUTING DATA

  345 RD          MUSKINGUM-CUNGE CHANNEL ROUTING
                            L        524.  CHANNEL LENGTH
                            S       .0050  SLOPE
                            N        .013  CHANNEL ROUGHNESS COEFFICIENT
                           CA         .00  CONTRIBUTING AREA
                        SHAPE        CIRC  CHANNEL SHAPE
                           WD        5.00  BOTTOM WIDTH OR DIAMETER
                            Z         .00  SIDE SLOPE

                                                          ***
                                  COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                         COMPUTATION TIME STEP
                       ELEMENT    ALPHA       M         DT         DX       PEAK    TIME TO     VOLUME    MAXIMUM
                                                                                      PEAK                  CELERITY
                                                        (MIN)       (FT)     (CFS)    (MIN)       (IN)      (FPS)

                         MAIN      5.72      1.25        .72     524.00    160.67   726.20       3.94      12.13


                                         INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL


                         MAIN      5.72      1.25       5.00               159.34   745.00       3.94

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .2227E+02 EXCESS= .0000E+00 OUTFLOW= .2226E+02 BASIN STORAGE= .6962E-02 PERCENT ERROR=     .0


      ***            ***            ***            ***            ***

                        HYDROGRAPH AT STATION     PIPE
                          FOR PLAN 1, RATIO - 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                            (CFS)
+     159.     12.42                35.         11.         11.         11.
                         (INCHES)  3.028       3.939       3.939       3.939
                          (AC-FT)   17.         22.         22.         22.

                        CUMULATIVE AREA =     .11 SQ MI


 ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

                 PLAN  2 INPUT DATA FOR STATION     PIPE ARE SAME AS FOR PLAN  1
                                  COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                         COMPUTATION TIME STEP
                       ELEMENT    ALPHA       M         DT         DX       PEAK    TIME TO     VOLUME    MAXIMUM
                                                                                      PEAK                  CELERITY
                                                        (MIN)       (FT)     (CFS)    (MIN)       (IN)      (FPS)

                         MAIN      5.72      1.25        .66     524.00    239.69   726.32       6.94      13.14


                                         INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL
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                    MAIN        5.72       1.25        5.00                238.42    730.00       6.94

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3923E+02 EXCESS= .0000E+00 OUTFLOW= .3922E+02 BASIN STORAGE= .1156E-01 PERCENT ERROR=     .0


     ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION     PIPE
                        FOR PLAN 2, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
+     238.     12.17                 59.         20.         20.         20.
                        (INCHES)    5.169       6.939       6.939       6.939
                         (AC-FT)    29.         39.         39.         39.

                       CUMULATIVE AREA =     .11 SQ MI


***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***

                PLAN  3 INPUT DATA FOR STATION     PIPE ARE SAME AS FOR PLAN  1
                                COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                      COMPUTATION TIME STEP
                     ELEMENT    ALPHA       M         DT         DX       PEAK    TIME TO     VOLUME    MAXIMUM
                                                                                     PEAK                CELERITY
                                                     (MIN)      (FT)     (CFS)    (MIN)       (IN)      (FPS)

                       MAIN       5.72       1.25        .65    524.00    267.35    730.24      8.32     13.43


                                      INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL


                       MAIN       5.72       1.25        5.00                267.23    730.00      8.32

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4705E+02 EXCESS= .0000E+00 OUTFLOW= .4704E+02 BASIN STORAGE= .1389E-01 PERCENT ERROR=     .0


     ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION     PIPE
                        FOR PLAN 3, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
+     267.     12.17                 71.         24.         24.         24.
                        (INCHES)    6.266       8.322       8.322       8.322
                         (AC-FT)    35.         47.         47.         47.

                       CUMULATIVE AREA =     .11 SQ MI


***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***

                PLAN  4 INPUT DATA FOR STATION     PIPE ARE SAME AS FOR PLAN  1
                                COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                      COMPUTATION TIME STEP
                     ELEMENT    ALPHA       M         DT         DX       PEAK    TIME TO     VOLUME    MAXIMUM
                                                                                     PEAK                CELERITY
                                                     (MIN)      (FT)     (CFS)    (MIN)       (IN)      (FPS)

                       MAIN       5.72       1.25        .64    524.00    296.05    729.63      9.61     13.71


                                      INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL


                       MAIN       5.72       1.25        5.00                296.03    730.00      9.61
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CONTINUITY SUMMARY (AC-FT) - INFLOW= .5432E+02 EXCESS= .0000E+00 OUTFLOW= .5431E+02 BASIN STORAGE= .1615E-01 PERCENT ERROR=    .0


     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION     PIPE
                          FOR PLAN 4, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
+     296.     12.17                   83.         27.         27.         27.
                        (INCHES)     7.264       9.608       9.608       9.608
                         (AC-FT)      41.         54.         54.         54.

                        CUMULATIVE AREA =     .11 SQ MI


***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

               PLAN  5 INPUT DATA FOR STATION     PIPE ARE SAME AS FOR PLAN  1
                                COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                          COMPUTATION TIME STEP
                     ELEMENT    ALPHA       M          DT         DX        PEAK    TIME TO      VOLUME    MAXIMUM
                                                                                      PEAK                  CELERITY
                                                     (MIN)      (FT)      (CFS)     (MIN)       (IN)       (FPS)

                       MAIN       5.72      1.25        .62    524.00     333.78    730.31      10.70      14.04


                                          INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL


                       MAIN       5.72      1.25       5.00               333.75    730.00      10.70

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6052E+02 EXCESS= .0000E+00 OUTFLOW= .6051E+02 BASIN STORAGE= .1605E-01 PERCENT ERROR=    .0


     ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION     PIPE
                          FOR PLAN 5, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
+     334.     12.17                   89.         31.         31.         31.
                        (INCHES)     7.850      10.704      10.704      10.704
                         (AC-FT)      44.         61.         61.         61.

                        CUMULATIVE AREA =     .11 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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            *            *
  346 KK    *       P2F  *
            *            *
            **************


***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

  347 KP        PLAN  1 FOR STATION      P2F
                                RUNOFF COMPUTATION 2-YRS STORM IN BASIN

                SUBBASIN RUNOFF DATA

  348 BA          SUBBASIN CHARACTERISTICS
                        TAREA         .04  SUBBASIN AREA
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                PRECIPITATION DATA

353 PH                                  DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .18     .50    2.40    2.55    2.75    3.30    4.10    4.75     .00     .00     .00     .00

                                                STORM AREA =      .04

349 LS          SCS LOSS RATE
                      STRTL         .15  INITIAL ABSTRACTION
                     CRVNBR       93.00  CURVE NUMBER
                      RTIMP         .00  PERCENT IMPERVIOUS AREA

350 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG         .19  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                           13 END-OF-PERIOD ORDINATES
                24.       77.       91.       68.       36.       20.       11.        6.        3.        2.
                 1.        1.        0.

***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

354 KP          PLAN  2 FOR STATION      P2F
                                   RUNOFF COMPUTATION 10-YRS STORM IN BASIN

                SUBBASIN RUNOFF DATA

348 BA          SUBBASIN CHARACTERISTICS
                      TAREA         .04  SUBBASIN AREA

                PRECIPITATION DATA

356 PH                                  DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .27     .75    3.35    3.95    4.40    5.40    6.60    7.80     .00     .00     .00     .00

                                                STORM AREA =      .04

349 LS          SCS LOSS RATE
                      STRTL         .15  INITIAL ABSTRACTION
                     CRVNBR       93.00  CURVE NUMBER
                      RTIMP         .00  PERCENT IMPERVIOUS AREA

350 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG         .19  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                           13 END-OF-PERIOD ORDINATES
                24.       77.       91.       68.       36.       20.       11.        6.        3.        2.
                 1.        1.        0.

***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

357 KP          PLAN  3 FOR STATION      P2F
                                   RUNOFF COMPUTATION 25-YRS STORM IN BASIN

                SUBBASIN RUNOFF DATA

348 BA          SUBBASIN CHARACTERISTICS
                      TAREA         .04  SUBBASIN AREA

                PRECIPITATION DATA

359 PH                                  DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .32     .90    3.62    4.65    5.25    6.50    7.70    9.20     .00     .00     .00     .00

                                                STORM AREA =      .04

349 LS          SCS LOSS RATE
                      STRTL         .15  INITIAL ABSTRACTION
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                CRVNBR        93.00  CURVE NUMBER
                 RTIMP          .00  PERCENT IMPERVIOUS AREA

350 UD        SCS DIMENSIONLESS UNITGRAPH
                 TLAG          .19  LAG

                                                  ***

                                              UNIT HYDROGRAPH
                                          13 END-OF-PERIOD ORDINATES
            24.       77.       91.       68.       36.       20.       11.        6.        3.        2.
             1.        1.        0.

***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***

360 KP      PLAN  4 FOR STATION      P2F
                          RUNOFF COMPUTATION 50-YRS STORM IN BASIN

            SUBBASIN RUNOFF DATA

348 BA        SUBBASIN CHARACTERISTICS
                 TAREA          .04  SUBBASIN AREA

              PRECIPITATION DATA

362 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
              ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
              5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                .34     .97    4.00    5.30    5.90    7.50    8.70   10.50     .00     .00     .00     .00

                                              STORM AREA =      .04

349 LS        SCS LOSS RATE
                 STRTL          .15  INITIAL ABSTRACTION
                CRVNBR        93.00  CURVE NUMBER
                 RTIMP          .00  PERCENT IMPERVIOUS AREA

350 UD        SCS DIMENSIONLESS UNITGRAPH
                 TLAG          .19  LAG

                                                  ***

                                              UNIT HYDROGRAPH
                                          13 END-OF-PERIOD ORDINATES
            24.       77.       91.       68.       36.       20.       11.        6.        3.        2.
             1.        1.        0.

***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***

363 KP      PLAN  5 FOR STATION      P2F
                          RUNOFF COMPUTATION 100-YRS STORM IN BASIN

            SUBBASIN RUNOFF DATA

348 BA        SUBBASIN CHARACTERISTICS
                 TAREA          .04  SUBBASIN AREA

              PRECIPITATION DATA

365 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
              ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
              5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                .39    1.10    4.50    5.65    6.80    8.00    9.80   11.60     .00     .00     .00     .00

                                              STORM AREA =      .04

349 LS        SCS LOSS RATE
                 STRTL          .15  INITIAL ABSTRACTION
                CRVNBR        93.00  CURVE NUMBER
                 RTIMP          .00  PERCENT IMPERVIOUS AREA

350 UD        SCS DIMENSIONLESS UNITGRAPH
                 TLAG          .19  LAG

                                                  ***

                                              UNIT HYDROGRAPH
                                          13 END-OF-PERIOD ORDINATES
            24.       77.       91.       68.       36.       20.       11.        6.        3.        2.
```

```
                1.        1.        0.

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
 366 KK     *      COMB  *
            *            *
            **************

 367 HC          HYDROGRAPH COMBINATION
                      ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                  ***


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
 368 KK     *      PIPE  *
            *            *
            **************

 369 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                       IOUT          21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2         289  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT        .083  TIME INTERVAL IN HOURS


              HYDROGRAPH ROUTING DATA

 370 RD          MUSKINGUM-CUNGE CHANNEL ROUTING
                          L       1807.  CHANNEL LENGTH
                          S       .0050  SLOPE
                          N        .013  CHANNEL ROUGHNESS COEFFICIENT
                         CA         .00  CONTRIBUTING AREA
                      SHAPE        CIRC  CHANNEL SHAPE
                         WD        5.00  BOTTOM WIDTH OR DIAMETER
                          Z         .00  SIDE SLOPE

                                                  ***
                                 COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                       COMPUTATION TIME STEP
                   ELEMENT    ALPHA       M         DT        DX       PEAK    TIME TO      VOLUME    MAXIMUM
                                                                                  PEAK                CELERITY
                                                   (MIN)      (FT)     (CFS)    (MIN)       (IN)      (FPS)

                     MAIN       5.72      1.25       2.31    903.50    228.81   727.72       3.93      13.04

                                       INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                     MAIN       5.72      1.25       5.00              227.64   730.00       3.93

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .3152E+02 EXCESS= .0000E+00 OUTFLOW= .3148E+02 BASIN STORAGE= .3177E-01 PERCENT ERROR=     .0


      ***            ***            ***            ***            ***

                        HYDROGRAPH AT STATION     PIPE
                          FOR PLAN 1, RATIO = 1.00

  EAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.00-HR
+   (CFS)      (HR)
                          (CFS)
+     228.    12.17                 49.         16.         16.          16.
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                    (INCHES)      3.025        3.934        3.934        3.934
                    (AC-FT)        24.          31.          31.          31.

                    CUMULATIVE AREA =      .15 SQ MI


***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***

              PLAN  2 INPUT DATA FOR STATION     PIPE ARE SAME AS FOR PLAN  1
                                COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                      COMPUTATION TIME STEP
                    ELEMENT    ALPHA        M          DT          DX        PEAK    TIME TO      VOLUME    MAXIMUM
                                                                                       PEAK                   CELERITY
                                                     (MIN)        (FT)      (CFS)     (MIN)       (IN)      (FPS)

                    MAIN        5.72       1.25        2.13      903.50     341.52    727.29       6.93      14.12

                                          INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                    MAIN        5.72       1.25        5.00                 340.15    730.00       6.93

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5553E+02 EXCESS= .0000E+00 OUTFLOW= .5547E+02 BASIN STORAGE= .5270E-01 PERCENT ERROR=     .0


     ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION     PIPE
                        FOR PLAN 2, RATIO = 1.00

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR     24.00-HR
   (CFS)       (HR)
                          (CFS)
+    340.     12.17                   83.          28.          28.          28.
                        (INCHES)    5.167        6.933        6.933        6.933
                         (AC-FT)     41.          55.          55.          55.

                      CUMULATIVE AREA =      .15 SQ MI


***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***

              PLAN  3 INPUT DATA FOR STATION     PIPE ARE SAME AS FOR PLAN  1
                                COMPUTED MUSKINGUM-CUNGE PARAMETERS
                                      COMPUTATION TIME STEP
                    ELEMENT    ALPHA        M          DT          DX        PEAK    TIME TO      VOLUME    MAXIMUM
                                                                                       PEAK                   CELERITY
                                                     (MIN)        (FT)      (CFS)     (MIN)       (IN)      (FPS)

                    MAIN        5.72       1.25        2.09      903.50     379.58    729.61       8.31      14.41

                                          INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

                    MAIN        5.72       1.25        5.00                 379.50    730.00       8.32

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6658E+02 EXCESS= .0000E+00 OUTFLOW= .6652E+02 BASIN STORAGE= .6340E-01 PERCENT ERROR=     .0


     ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION     PIPE
                        FOR PLAN 3, RATIO = 1.00

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR     24.00-HR
   (CFS)       (HR)
                          (CFS)
+    379.     12.17                  101.          34.          34.          34.
                        (INCHES)    6.265        8.316        8.316        8.316
                         (AC-FT)     50.          67.          67.          67.
```

CUMULATIVE AREA = .15 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

PLAN 4 INPUT DATA FOR STATION PIPE ARE SAME AS FOR PLAN 1

COMPUTED MUSKINGUM-CUNGE PARAMETERS

COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	5.72	1.25	2.05	903.50	421.28	728.84	9.60	14.71
INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL								
MAIN	5.72	1.25	5.00		420.63	730.00	9.60	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .7689E+02 EXCESS= .0000E+00 OUTFLOW= .7681E+02 BASIN STORAGE= .7364E-01 PERCENT ERROR= .0

*** *** *** *** ***

HYDROGRAPH AT STATION PIPE
FOR PLAN 4, RATIO = 1.00

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
+		(CFS)				
+ 421.	12.17		117.	39.	39.	39.
		(INCHES)	7.262	9.601	9.601	9.601
		(AC-FT)	58.	77.	77.	77.

CUMULATIVE AREA = .15 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

PLAN 5 INPUT DATA FOR STATION PIPE ARE SAME AS FOR PLAN 1

COMPUTED MUSKINGUM-CUNGE PARAMETERS

COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	5.72	1.25	2.00	1807.00	474.09	730.02	10.70	15.06
INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL								
MAIN	5.72	1.25	5.00		474.08	730.00	10.70	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8564E+02 EXCESS= .0000E+00 OUTFLOW= .8558E+02 BASIN STORAGE= .7318E-01 PERCENT ERROR= .0

*** *** *** *** ***

HYDROGRAPH AT STATION PIPE
FOR PLAN 5, RATIO = 1.00

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
+		(CFS)				
+ 474.	12.17		127.	43.	43.	43.
		(INCHES)	7.849	10.701	10.701	10.701
		(AC-FT)	63.	86.	86.	86.

CUMULATIVE AREA = .15 SQ MI

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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
371 KK      *       P2G  *
            *            *
            **************

***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

372 KP        PLAN  1 FOR STATION      P2G
                              RUNOFF COMPUTATION 2-YRS STORM IN BASIN

              SUBBASIN RUNOFF DATA

373 BA          SUBBASIN CHARACTERISTICS
                      TAREA         .06  SUBBASIN AREA

                PRECIPITATION DATA

378 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .18     .50    2.40    2.55    2.75    3.30    4.10    4.75     .00     .00     .00     .00

                                                   STORM AREA -      .06

374 LS          SCS LOSS RATE
                      STRTL         .15  INITIAL ABSTRACTION
                     CRVNBR       93.00  CURVE NUMBER
                      RTIMP         .00  PERCENT IMPERVIOUS AREA

375 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG         .23  LAG

                                                     ***

                                                UNIT HYDROGRAPH
                                            16 END-OF-PERIOD ORDINATES
              23.       79.      115.      105.       74.       42.       26.       16.       10.        6.
               4.        2.        1.        1.        0.        0.

***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

379 KP        PLAN  2 FOR STATION      P2G
                              RUNOFF COMPUTATION 10-YRS STORM IN BASIN

              SUBBASIN RUNOFF DATA

373 BA          SUBBASIN CHARACTERISTICS
                      TAREA         .06  SUBBASIN AREA

                PRECIPITATION DATA

381 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .27     .75    3.35    3.95    4.40    5.40    6.60    7.80     .00     .00     .00     .00

                                                   STORM AREA =      .06

374 LS          SCS LOSS RATE
                      STRTL         .15  INITIAL ABSTRACTION
                     CRVNBR       93.00  CURVE NUMBER
                      RTIMP         .00  PERCENT IMPERVIOUS AREA

375 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG         .23  LAG

                                                     ***

                                                UNIT HYDROGRAPH
                                            16 END-OF-PERIOD ORDINATES
              23.       79.      115.      105.       74.       42.       26.       16.       10.        6.
               4.        2.        1.        1.        0.        0.
```

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***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

382 KP          PLAN  3 FOR STATION      P2G
                                RUNOFF COMPUTATION 25-YRS STORM IN BASIN

                SUBBASIN RUNOFF DATA

373 BA            SUBBASIN CHARACTERISTICS
                        TAREA          .06  SUBBASIN AREA

                  PRECIPITATION DATA

384 PH                                  DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                    .32     .90    3.62    4.65    5.25    6.50    7.70    9.20     .00     .00     .00     .00

                                                STORM AREA =      .06

374 LS            SCS LOSS RATE
                        STRTL          .15  INITIAL ABSTRACTION
                       CRVNBR        93.00  CURVE NUMBER
                        RTIMP          .00  PERCENT IMPERVIOUS AREA

375 UD            SCS DIMENSIONLESS UNITGRAPH
                         TLAG          .23  LAG

                                                        ***

                                                UNIT HYDROGRAPH
                                            16 END-OF-PERIOD ORDINATES
                 23.       79.      115.      105.       74.       42.       26.       16.       10.        6.
                  4.        2.        1.        1.        0.        0.

*     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

385 KP          PLAN  4 FOR STATION      P2G
                                RUNOFF COMPUTATION 50-YRS STORM IN BASIN

                SUBBASIN RUNOFF DATA

373 BA            SUBBASIN CHARACTERISTICS
                        TAREA          .06  SUBBASIN AREA

                  PRECIPITATION DATA

387 PH                                  DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                    .34     .97    4.00    5.30    5.90    7.50    8.70   10.50     .00     .00     .00     .00

                                                STORM AREA =      .06

374 LS            SCS LOSS RATE
                        STRTL          .15  INITIAL ABSTRACTION
                       CRVNBR        93.00  CURVE NUMBER
                        RTIMP          .00  PERCENT IMPERVIOUS AREA

375 UD            SCS DIMENSIONLESS UNITGRAPH
                         TLAG          .23  LAG

                                                        ***

                                                UNIT HYDROGRAPH
                                            16 END-OF-PERIOD ORDINATES
                 23.       79.      115.      105.       74.       42.       26.       16.       10.        6.
                  4.        2.        1.        1.        0.        0.

***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

388 KP          PLAN  5 FOR STATION      P2G
                                RUNOFF COMPUTATION 100-YRS STORM IN BASIN

                SUBBASIN RUNOFF DATA

373 BA            SUBBASIN CHARACTERISTICS
                        TAREA          .06  SUBBASIN AREA
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                PRECIPITATION DATA

390 PH                                  DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .39    1.10    4.50    5.65    6.80    8.00    9.80   11.60     .00     .00     .00     .00

                                                STORM AREA =      .06

374 LS          SCS LOSS RATE
                      STRTL         .15  INITIAL ABSTRACTION
                     CRVNBR       93.00  CURVE NUMBER
                      RTIMP         .00  PERCENT IMPERVIOUS AREA

375 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG         .23  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                            16 END-OF-PERIOD ORDINATES
              23.       79.      115.      105.       74.       42.       26.       16.       10.        6.
               4.        2.        1.        1.        0.        0.


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


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            *            *
391 KK      *      POND  *
            *            *
            **************
                      RUNOFF MITIGATION POND CALCULATION

393 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           1  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

394 RS          STORAGE ROUTING
                      NSTPS           1  NUMBER OF SUBREACHES
                       ITYP        ELEV  TYPE OF INITIAL CONDITION
                     RSVRIC         .00  INITIAL CONDITION
                          X         .00 WORKING R AND D COEFFICIENT

396 SV            STORAGE          .0       1.7       3.4       5.3       7.2       9.1      11.2      13.4      15.6      17.9

397 SE          ELEVATION         .00      1.25      2.49      3.74      4.99      6.23      7.48      8.72      9.97     11.22

395 SQ          DISCHARGE          0.        3.        5.        7.        8.        9.       10.       61.      130.      295.

                                                  ***

     ***            ***            ***            ***            ***

                      HYDROGRAPH AT STATION     POND
                        FOR PLAN 1, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                           (CFS)
+       9.     13.33         9.          4.          4.          4.
                        (INCHES)     1.235       2.491       2.491       2.491
                         (AC-FT)        4.          9.          9.          9.

 PEAK STORAGE   TIME                         MAXIMUM AVERAGE STORAGE
                                      6-HR       24-HR       72-HR     24.00-HR
   (AC-FT)      (HR)
       8.      13.33         8.          4.          4.          4.

  PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
                                      6-HR       24-HR       72-HR     24.00-HR
+   (FEET)      (HR)
```

```
     5.79     13.42                    5.57        2.59        2.59        2.59

                          CUMULATIVE AREA =      .06 SQ MI


 ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

                 PLAN  2 INPUT DATA FOR STATION     POND ARE SAME AS FOR PLAN  1

       ***             ***             ***             ***             ***

                            HYDROGRAPH AT STATION     POND
                              FOR PLAN 2, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
+      54.     12.92                   19.          8.          8.          8.
                         (INCHES)    2.744       4.529       4.529       4.529
                         (AC-FT)      10.         16.         16.         16.

 PEAK STORAGE   TIME                         MAXIMUM AVERAGE STORAGE
                                      6-HR       24-HR       72-HR     24.00-HR
+  (AC-FT)      (HR)
      13.      12.92                   12.          6.          6.          6.

  PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
                                      6-HR       24-HR       72-HR     24.00-HR
+   (FEET)      (HR)
      8.55     12.92                   7.66        3.85        3.85        3.85

                          CUMULATIVE AREA =      .06 SQ MI


   *     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

                 PLAN  3 INPUT DATA FOR STATION     POND ARE SAME AS FOR PLAN  1

       ***             ***             ***             ***             ***

                            HYDROGRAPH AT STATION     POND
                              FOR PLAN 3, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
+      87.     12.75                   27.         10.         10.         10.
                         (INCHES)    3.869       5.781       5.781       5.781
                         (AC-FT)      13.         20.         20.         20.

 PEAK STORAGE   TIME                         MAXIMUM AVERAGE STORAGE
                                      6-HR       24-HR       72-HR     24.00-HR
+  (AC-FT)      (HR)
      14.      12.75                   12.          6.          6.          6.

  PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
                                      6-HR       24-HR       72-HR     24.00-HR
+   (FEET)      (HR)
      9.18     12.75                   7.85        4.04        4.04        4.04

                          CUMULATIVE AREA =      .06 SQ MI


 ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

                 PLAN  4 INPUT DATA FOR STATION     POND ARE SAME AS FOR PLAN  1

       ***             ***             ***             ***             ***

                            HYDROGRAPH AT STATION     POND
                              FOR PLAN 4, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
```

```
+     115.     12.75                    34.         12.         12.         12.
                          (INCHES)    4.902       6.936       6.936       6.936
                           (AC-FT)     17.         24.         24.         24.

 PEAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
                                        6-HR       24-HR       72-HR     24.00-HR
+  (AC-FT)      (HR)
       15.     12.75                    12.          6.          6.          6.

  PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
                                        6-HR       24-HR       72-HR     24.00-HR
+   (FEET)      (HR)
      9.69     12.75                    8.01        4.22        4.22        4.22

                          CUMULATIVE AREA =     .06 SQ MI


 ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

                PLAN  5 INPUT DATA FOR STATION     POND ARE SAME AS FOR PLAN  1

       ***             ***             ***             ***             ***

                           HYDROGRAPH AT STATION     POND
                             FOR PLAN 5, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                           (CFS)
+     149.     12.67                    41.         14.         14.         14.
                          (INCHES)    5.802       7.937       7.937       7.937
                           (AC-FT)     20.         28.         28.         28.

 PEAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
                                        6-HR       24-HR       72-HR     24.00-HR
   (AC-FT)      (HR)
       16.     12.67                    12.          7.          7.          7.

  PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
                                        6-HR       24-HR       72-HR     24.00-HR
+   (FEET)      (HR)
     10.11     12.67                    8.15        4.39        4.39        4.39

                          CUMULATIVE AREA =     .06 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
  398 KK    *       P3B  *
            *            *
            **************


 ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

  399 KP        PLAN  1 FOR STATION      P3B
                                 RUNOFF COMPUTATION 2-YRS STORM IN BASIN

                SUBBASIN RUNOFF DATA

  400 BA          SUBBASIN CHARACTERISTICS
                        TAREA          .05  SUBBASIN AREA

                  PRECIPITATION DATA

  405 PH                                 DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                    .18     .50    2.40    2.55    2.75    3.30    4.10    4.75     .00     .00     .00     .00

                                                   STORM AREA =     .05

  401 LS          SCS LOSS RATE
                        STRTL          .15  INITIAL ABSTRACTION
```

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                CRVNBR        93.00  CURVE NUMBER
                 RTIMP          .00  PERCENT IMPERVIOUS AREA

402 UD        SCS DIMENSIONLESS UNITGRAPH
                 TLAG          .09  LAG

                                                  ***

                                              UNIT HYDROGRAPH
                                          7 END-OF-PERIOD ORDINATES
            128.      159.       59.       22.        8.        3.        1.

***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***

406 KP        PLAN  2 FOR STATION      P3B
                            RUNOFF COMPUTATION 10-YRS STORM IN BASIN

            SUBBASIN RUNOFF DATA

400 BA        SUBBASIN CHARACTERISTICS
                 TAREA          .05  SUBBASIN AREA

              PRECIPITATION DATA

408 PH                          DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
              ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
              5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                .27     .75    3.35    3.95    4.40    5.40    6.60    7.80     .00     .00     .00     .00

                                          STORM AREA =      .05

401 LS        SCS LOSS RATE
                 STRTL          .15  INITIAL ABSTRACTION
                CRVNBR        93.00  CURVE NUMBER
                 RTIMP          .00  PERCENT IMPERVIOUS AREA

.02 UD        SCS DIMENSIONLESS UNITGRAPH
                 TLAG          .09  LAG

                                                  ***

                                              UNIT HYDROGRAPH
                                          7 END-OF-PERIOD ORDINATES
            128.      159.       59.       22.        8.        3.        1.

***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***

409 KP        PLAN  3 FOR STATION      P3B
                            RUNOFF COMPUTATION 25-YRS STORM IN BASIN

            SUBBASIN RUNOFF DATA

400 BA        SUBBASIN CHARACTERISTICS
                 TAREA          .05  SUBBASIN AREA

              PRECIPITATION DATA

411 PH                          DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
              ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
              5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                .32     .90    3.62    4.65    5.25    6.50    7.70    9.20     .00     .00     .00     .00

                                          STORM AREA =      .05

401 LS        SCS LOSS RATE
                 STRTL          .15  INITIAL ABSTRACTION
                CRVNBR        93.00  CURVE NUMBER
                 RTIMP          .00  PERCENT IMPERVIOUS AREA

402 UD        SCS DIMENSIONLESS UNITGRAPH
                 TLAG          .09  LAG

                                                  ***

                                              UNIT HYDROGRAPH
                                          7 END-OF-PERIOD ORDINATES
            128.      159.       59.       22.        8.        3.        1.
```

```
***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

412 KP        PLAN  4 FOR STATION      P3B
                              RUNOFF COMPUTATION 50-YRS STORM IN BASIN

              SUBBASIN RUNOFF DATA

400 BA          SUBBASIN CHARACTERISTICS
                      TAREA          .05  SUBBASIN AREA

                PRECIPITATION DATA

414 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .34     .97    4.00    5.30    5.90    7.50    8.70   10.50     .00     .00     .00     .00

                                                STORM AREA =      .05

401 LS          SCS LOSS RATE
                      STRTL          .15  INITIAL ABSTRACTION
                     CRVNBR        93.00  CURVE NUMBER
                      RTIMP          .00  PERCENT IMPERVIOUS AREA

402 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG          .09  LAG

                                                     ***

                                                UNIT HYDROGRAPH
                                            7 END-OF-PERIOD ORDINATES
              128.      159.       59.       22.        8.        3.        1.

***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

 15 KP        PLAN  5 FOR STATION      P3B
                              RUNOFF COMPUTATION 100-YRS STORM IN BASIN

              SUBBASIN RUNOFF DATA

400 BA          SUBBASIN CHARACTERISTICS
                      TAREA          .05  SUBBASIN AREA

                PRECIPITATION DATA

417 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 .....   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .39    1.10    4.50    5.65    6.80    8.00    9.80   11.60     .00     .00     .00     .00

                                                STORM AREA =      .05

401 LS          SCS LOSS RATE
                      STRTL          .15  INITIAL ABSTRACTION
                     CRVNBR        93.00  CURVE NUMBER
                      RTIMP          .00  PERCENT IMPERVIOUS AREA

402 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG          .09  LAG

                                                     ***

                                                UNIT HYDROGRAPH
                                            7 END-OF-PERIOD ORDINATES
              128.      159.       59.       22.        8.        3.        1.

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            **************
            *            *
418 KK      *       P3A  *
            *            *
            **************

***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***
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419 KP        PLAN  1 FOR STATION      P3A
                           RUNOFF COMPUTATION 2-YRS STORM IN BASIN

              SUBBASIN RUNOFF DATA

420 BA          SUBBASIN CHARACTERISTICS
                      TAREA          .02  SUBBASIN AREA

                PRECIPITATION DATA

425 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .18     .50    2.40    2.55    2.75    3.30    4.10    4.75     .00     .00     .00     .00

                                                  STORM AREA =      .02

421 LS          SCS LOSS RATE
                      STRTL          .15  INITIAL ABSTRACTION
                     CRVNBR        93.00  CURVE NUMBER
                      RTIMP          .00  PERCENT IMPERVIOUS AREA

422 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG          .08  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                            7 END-OF-PERIOD ORDINATES
                65.       66.       21.        7.        2.        1.        0.

***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***

426 KP        PLAN  2 FOR STATION      P3A
                           RUNOFF COMPUTATION 10-YRS STORM IN BASIN

              SUBBASIN RUNOFF DATA

420 BA          SUBBASIN CHARACTERISTICS
                      TAREA          .02  SUBBASIN AREA

                PRECIPITATION DATA

428 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .27     .75    3.35    3.95    4.40    5.40    6.60    7.80     .00     .00     .00     .00

                                                  STORM AREA =      .02

421 LS          SCS LOSS RATE
                      STRTL          .15  INITIAL ABSTRACTION
                     CRVNBR        93.00  CURVE NUMBER
                      RTIMP          .00  PERCENT IMPERVIOUS AREA

422 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG          .08  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                            7 END-OF-PERIOD ORDINATES
                65.       66.       21.        7.        2.        1.        0.

***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***    ***

429 KP        PLAN  3 FOR STATION      P3A
                           RUNOFF COMPUTATION 25-YRS STORM IN BASIN

              SUBBASIN RUNOFF DATA

420 BA          SUBBASIN CHARACTERISTICS
                      TAREA          .02  SUBBASIN AREA

                PRECIPITATION DATA

431 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
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```
                .32      .90     3.62     4.65     5.25     6.50     7.70     9.20      .00      .00      .00      .00

                                                STORM AREA =      .02

421 LS          SCS LOSS RATE
                      STRTL         .15  INITIAL ABSTRACTION
                     CRVNBR       93.00  CURVE NUMBER
                      RTIMP         .00  PERCENT IMPERVIOUS AREA

422 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG         .08  LAG

                                                     ***

                                                UNIT HYDROGRAPH
                                             7 END-OF-PERIOD ORDINATES
              65.       66.       21.        7.        2.        1.        0.


***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

432 KP        PLAN  4 FOR STATION      P3A
                                RUNOFF COMPUTATION 50-YRS STORM IN BASIN

              SUBBASIN RUNOFF DATA

420 BA          SUBBASIN CHARACTERISTICS
                       TAREA         .02  SUBBASIN AREA

                PRECIPITATION DATA

434 PH                                  DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .34     .97    4.00    5.30    5.90    7.50    8.70   10.50     .00     .00     .00     .00

                                                STORM AREA =      .02

421 LS          SCS LOSS RATE
                      STRTL         .15  INITIAL ABSTRACTION
                     CRVNBR       93.00  CURVE NUMBER
                      RTIMP         .00  PERCENT IMPERVIOUS AREA

422 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG         .08  LAG

                                                     ***

                                                UNIT HYDROGRAPH
                                             7 END-OF-PERIOD ORDINATES
              65.       66.       21.        7.        2.        1.        0.


***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

435 KP        PLAN  5 FOR STATION      P3A
                                RUNOFF COMPUTATION 100-YRS STORM IN BASIN

              SUBBASIN RUNOFF DATA

420 BA          SUBBASIN CHARACTERISTICS
                       TAREA         .02  SUBBASIN AREA

                PRECIPITATION DATA

437 PH                                  DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                  .39    1.10    4.50    5.65    6.80    8.00    9.80   11.60     .00     .00     .00     .00

                                                STORM AREA =      .02

421 LS          SCS LOSS RATE
                      STRTL         .15  INITIAL ABSTRACTION
                     CRVNBR       93.00  CURVE NUMBER
                      RTIMP         .00  PERCENT IMPERVIOUS AREA

422 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG         .08  LAG

                                                     ***
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```
                                                    UNIT HYDROGRAPH
                                                 7 END-OF-PERIOD ORDINATES
              65.       66.       21.        7.        2.        1.        0.


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


           **************
           *            *
 438 KK    *      COMB  *
           *            *
           **************

 439 HC          HYDROGRAPH COMBINATION
                      ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


           **************
           *            *
 440 KK    *      POND  *
           *            *
           **************
                        RUNOFF MITIGATION POND CALCULATION

 442 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           1  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

               HYDROGRAPH ROUTING DATA

 443 RS          STORAGE ROUTING
                      NSTPS           1  NUMBER OF SUBREACHES
                       ITYP        ELEV  TYPE OF INITIAL CONDITION
                     RSVRIC         .00  INITIAL CONDITION
                          X         .00 WORKING R AND D COEFFICIENT

 445 SV            STORAGE          .0       2.0       4.2       6.3       8.6      10.9      13.4      15.9      18.4      21.1

 446 SE          ELEVATION         .00      1.18      2.36      3.54      4.72      5.90      7.08      8.27      9.45     10.63

 444 SQ          DISCHARGE          0.        7.       18.       25.       30.       34.       38.       41.       55.      100.

                                                                  ***

      ***             ***             ***             ***             ***

                          HYDROGRAPH AT STATION     POND
                            FOR PLAN 1, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR        72-HR     24.00-HR
+   (CFS)       (HR)
                             (CFS)
+      28.     12.67                  19.          7.           7.           7.
                           (INCHES)  2.588       3.654        3.654        3.654
                            (AC-FT)  10.          14.          14.          14.

 PEAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
                                      6-HR        24-HR        72-HR     24.00-HR
+  (AC-FT)      (HR)
        8.     12.67                   5.          2.           2.           2.

   EAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
                                      6-HR        24-HR        72-HR     24.00-HR
+   (FEET)      (HR)
      4.31     12.67                  2.78        1.05         1.05         1.05

                          CUMULATIVE AREA =     .07 SQ MI
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***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

                PLAN  2 INPUT DATA FOR STATION     POND ARE SAME AS FOR PLAN  1

       ***             ***             ***             ***             ***

                          HYDROGRAPH AT STATION     POND
                            FOR PLAN 2, RATIO = 1.00

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                           (CFS)
+      37.      12.75                 31.          12.          12.          12.
                          (INCHES)  4.092       6.460        6.460        6.460
                          (AC-FT)     15.         24.          24.          24.

 PEAK STORAGE    TIME                         MAXIMUM AVERAGE STORAGE
                                      6-HR        24-HR        72-HR      24.00-HR
+  (AC-FT)       (HR)
      13.       12.75                  9.          4.           4.           4.

  PEAK STAGE     TIME                          MAXIMUM AVERAGE STAGE
                                      6-HR        24-HR        72-HR      24.00-HR
+   (FEET)       (HR)
      6.85      12.75                 5.11        1.96         1.96         1.96

                          CUMULATIVE AREA =     .07 SQ MI


***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

                PLAN  3 INPUT DATA FOR STATION     POND ARE SAME AS FOR PLAN  1

       ***             ***             ***             ***             ***

                          HYDROGRAPH AT STATION     POND
                            FOR PLAN 3, RATIO = 1.00

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                           (CFS)
+      41.      13.00                 35.          15.          15.          15.
                          (INCHES)  4.652       7.752        7.752        7.752
                          (AC-FT)     17.         29.          29.          29.

 PEAK STORAGE    TIME                         MAXIMUM AVERAGE STORAGE
                                      6-HR        24-HR        72-HR      24.00-HR
+  (AC-FT)       (HR)
      15.       13.00                 12.          4.           4.           4.

  PEAK STAGE     TIME                          MAXIMUM AVERAGE STAGE
                                      6-HR        24-HR        72-HR      24.00-HR
+   (FEET)       (HR)
      7.98      13.00                 6.28        2.44         2.44         2.44

                          CUMULATIVE AREA =     .07 SQ MI


***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

                PLAN  4 INPUT DATA FOR STATION     POND ARE SAME AS FOR PLAN  1

       ***             ***             ***             ***             ***

                          HYDROGRAPH AT STATION     POND
                            FOR PLAN 4, RATIO = 1.00

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR        24-HR        72-HR      24.00-HR
    (CFS)        (HR)
                           (CFS)
+      50.      13.00                 39.          17.          17.          17.
                          (INCHES)  5.191       8.945        8.945        8.945
                          (AC-FT)     19.         33.          33.          33.
```

```
 PEAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
                                     6-HR        24-HR        72-HR      24.00-HR
+  (AC-FT)      (HR)
      17.      13.00                  14.          5.           5.           5.

  PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
                                     6-HR        24-HR        72-HR      24.00-HR
+   (FEET)      (HR)
     9.00      13.00                 7.19         2.85         2.85         2.85

                          CUMULATIVE AREA =      .07 SQ MI


***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***     ***

                PLAN  5 INPUT DATA FOR STATION     POND ARE SAME AS FOR PLAN  1

       ***             ***             ***             ***             ***

                            HYDROGRAPH AT STATION     POND
                              FOR PLAN 5, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+   (CFS)       (HR)
                            (CFS)
+      64.      12.75                 43.         19.          19.          19.
                          (INCHES)  5.764       9.988        9.988        9.988
                           (AC-FT)   22.         37.          37.          37.

 PEAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
                                     6-HR        24-HR        72-HR      24.00-HR
+  (AC-FT)      (HR)
      19.      12.75                  15.          6.           6.           6.

   EAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
                                     6-HR        24-HR        72-HR      24.00-HR
+   (FEET)      (HR)
     9.69      12.75                 7.73         3.13         3.13         3.13

                          CUMULATIVE AREA =      .07 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
 447 KK     *      COMB  *
            *            *
            **************

 448 HC          HYDROGRAPH COMBINATION
                       ICOMP           5  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***
1

                PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
                                FLOWS IN CUBIC FEET PER SECOND,  AREA IN SQUARE MILES
                                              TIME TO PEAK IN HOURS


                                                                  RATIOS APPLIED TO FLOWS
 OPERATION        STATION      AREA     PLAN              RATIO 1
                                                            1.00

 HYDROGRAPH AT
+                    E3        .03      1   FLOW            45.
                                            TIME          11.92
                                         2  FLOW            71.
                                            TIME          11.92
                                         3  FLOW            77.
                                            TIME          12.00
                                         4  FLOW            87.
                                            TIME          11.92
                                         5  FLOW            98.
```

```
                                        TIME        11.92

 ROUTED TO
+                    CHANN       .03    1   FLOW         46.
                                            TIME        12.08
                                        2   FLOW         71.
                                            TIME        12.08
                                        3   FLOW         78.
                                            TIME        12.08
                                        4   FLOW         88.
                                            TIME        12.08
                                        5   FLOW         99.
                                            TIME        12.08

 HYDROGRAPH AT
+                      E4        .02    1   FLOW         30.
                                            TIME        12.33
                                        2   FLOW         50.
                                            TIME        12.00
                                        3   FLOW         58.
                                            TIME        12.00
                                        4   FLOW         66.
                                            TIME        12.00
                                        5   FLOW         76.
                                            TIME        12.00

 ROUTED TO
+                    CHANN       .02    1   FLOW         28.
                                            TIME        12.50
                                        2   FLOW         50.
                                            TIME        12.08
                                        3   FLOW         57.
                                            TIME        12.08
                                        4   FLOW         67.
                                            TIME        12.08
                                        5   FLOW         77.
                                            TIME        12.08

  2 COMBINED AT
+                    COMB1       .05    1   FLOW         71.
                                            TIME        12.08
                                        2   FLOW        121.
                                            TIME        12.08
                                        3   FLOW        135.
                                            TIME        12.08
                                        4   FLOW        154.
                                            TIME        12.08
                                        5   FLOW        176.
                                            TIME        12.08

 HYDROGRAPH AT
+                      E2        .01    1   FLOW         15.
                                            TIME        11.92
                                        2   FLOW         23.
                                            TIME        11.92
                                        3   FLOW         25.
                                            TIME        12.00
                                        4   FLOW         28.
                                            TIME        11.92
                                        5   FLOW         31.
                                            TIME        11.92

  2 COMBINED AT
+                    COMB2       .06    1   FLOW         83.
                                            TIME        12.08
                                        2   FLOW        141.
                                            TIME        12.08
                                        3   FLOW        158.
                                            TIME        12.08
                                        4   FLOW        180.
                                            TIME        12.08
                                        5   FLOW        205.
                                            TIME        12.08

 ROUTED TO
                     CHANN       .06    1   FLOW         81.
                                            TIME        12.08
                                        2   FLOW        138.
                                            TIME        12.08
                                        3   FLOW        156.
                                            TIME        12.08
```

```
                                    4   FLOW        177.
                                        TIME       12.08
                                    5   FLOW        202.
                                        TIME       12.08

 HYDROGRAPH AT
+                    P1       .14    1   FLOW        157.
                                        TIME       12.58
                                    2   FLOW        255.
                                        TIME       12.58
                                    3   FLOW        290.
                                        TIME       12.58
                                    4   FLOW        327.
                                        TIME       12.58
                                    5   FLOW        370.
                                        TIME       12.58

  2 COMBINED AT
+                  COMB3      .20    1   FLOW        232.
                                        TIME       12.50
                                    2   FLOW        372.
                                        TIME       12.50
                                    3   FLOW        420.
                                        TIME       12.50
                                    4   FLOW        472.
                                        TIME       12.50
                                    5   FLOW        534.
                                        TIME       12.50

 ROUTED TO
+                  CHANN      .20    1   FLOW        230.
                                        TIME       12.58
                                    2   FLOW        370.
                                        TIME       12.50
                                    3   FLOW        418.
                                        TIME       12.50
                                    4   FLOW        470.
                                        TIME       12.50
                                    5   FLOW        533.
                                        TIME       12.50

 HYDROGRAPH AT
+                    E5       .03    1   FLOW         51.
                                        TIME       11.92
                                    2   FLOW         82.
                                        TIME       11.92
                                    3   FLOW         90.
                                        TIME       12.00
                                    4   FLOW        101.
                                        TIME       11.92
                                    5   FLOW        114.
                                        TIME       12.00

  2 COMBINED AT
+                  COMB4      .23    1   FLOW        268.
                                        TIME       12.50
                                    2   FLOW        427.
                                        TIME       12.50
                                    3   FLOW        480.
                                        TIME       12.42
                                    4   FLOW        541.
                                        TIME       12.42
                                    5   FLOW        613.
                                        TIME       12.42

 ROUTED TO
+                  CHANN      .23    1   FLOW        264.
                                        TIME       12.58
                                    2   FLOW        423.
                                        TIME       12.50
                                    3   FLOW        479.
                                        TIME       12.50
                                    4   FLOW        539.
                                        TIME       12.50
                                    5   FLOW        611.
                                        TIME       12.50

 HYDROGRAPH AT
+                   P2E       .08    1   FLOW        113.
                                        TIME       12.42
                                    2   FLOW        167.
```

```
                                        TIME        12.42
                                   3    FLOW         188.
                                        TIME        12.25
                                   4    FLOW         209.
                                        TIME        12.25
                                   5    FLOW         235.
                                        TIME        12.25

 ROUTED TO
+                   PIPE       .08     1    FLOW         113.
                                        TIME        12.50
                                   2    FLOW         167.
                                        TIME        12.42
                                   3    FLOW         188.
                                        TIME        12.33
                                   4    FLOW         208.
                                        TIME        12.33
                                   5    FLOW         234.
                                        TIME        12.33

 HYDROGRAPH AT
+                     E6       .06     1    FLOW          93.
                                        TIME        12.00
                                   2    FLOW         150.
                                        TIME        12.00
                                   3    FLOW         167.
                                        TIME        12.00
                                   4    FLOW         189.
                                        TIME        12.00
                                   5    FLOW         214.
                                        TIME        12.00

  3 COMBINED AT
+                  COMB5       .37     1    FLOW         448.
                                        TIME        12.50
                                   2    FLOW         706.
                                        TIME        12.42
                                   3    FLOW         801.
                                        TIME        12.33
                                   4    FLOW         899.
                                        TIME        12.33
                                   5    FLOW        1017.
                                        TIME        12.33

 ROUTED TO
+                  CHANN       .37     1    FLOW         447.
                                        TIME        12.50
                                   2    FLOW         705.
                                        TIME        12.42
                                   3    FLOW         798.
                                        TIME        12.42
                                   4    FLOW         894.
                                        TIME        12.42
                                   5    FLOW        1013.
                                        TIME        12.42

 HYDROGRAPH AT
+                     E7       .15     1    FLOW         175.
                                        TIME        12.58
                                   2    FLOW         278.
                                        TIME        12.58
                                   3    FLOW         315.
                                        TIME        12.58
                                   4    FLOW         353.
                                        TIME        12.58
                                   5    FLOW         400.
                                        TIME        12.58

  2 COMBINED AT
+                  COMB6       .52     1    FLOW         619.
                                        TIME        12.50
                                   2    FLOW         975.
                                        TIME        12.50
                                   3    FLOW        1102.
                                        TIME        12.42
                                   4    FLOW        1237.
                                        TIME        12.42
                                   5    FLOW        1400.
                                        TIME        12.42

 ROUTED TO
```

+	CHANN	.52	1	FLOW	616.
				TIME	12.50
			2	FLOW	974.
				TIME	12.50
			3	FLOW	1099.
				TIME	12.42
			4	FLOW	1233.
				TIME	12.42
			5	FLOW	1396.
				TIME	12.42
HYDROGRAPH AT					
+	E	.45	1	FLOW	456.
				TIME	12.75
			2	FLOW	752.
				TIME	12.67
			3	FLOW	862.
				TIME	12.67
			4	FLOW	974.
				TIME	12.67
			5	FLOW	1103.
				TIME	12.67
HYDROGRAPH AT					
+	E1	.01	1	FLOW	10.
				TIME	12.42
			2	FLOW	17.
				TIME	12.08
			3	FLOW	19.
				TIME	12.08
			4	FLOW	22.
				TIME	12.08
			5	FLOW	25.
				TIME	12.08
2 COMBINED AT					
	COMB8	.46	1	FLOW	460.
				TIME	12.67
			2	FLOW	762.
				TIME	12.67
			3	FLOW	873.
				TIME	12.67
			4	FLOW	987.
				TIME	12.67
			5	FLOW	1117.
				TIME	12.67
HYDROGRAPH AT					
+	P2A	.03	1	FLOW	41.
				TIME	12.08
			2	FLOW	60.
				TIME	12.08
			3	FLOW	66.
				TIME	12.17
			4	FLOW	74.
				TIME	12.08
			5	FLOW	83.
				TIME	12.08
ROUTED TO					
+	PIPE	.03	1	FLOW	40.
				TIME	12.08
			2	FLOW	60.
				TIME	12.08
			3	FLOW	66.
				TIME	12.17
			4	FLOW	73.
				TIME	12.17
			5	FLOW	83.
				TIME	12.17
HYDROGRAPH AT					
+	P2B	.03	1	FLOW	46.
				TIME	12.08
			2	FLOW	68.
				TIME	12.08
			3	FLOW	75.
				TIME	12.08
			4	FLOW	84.
				TIME	12.08
			5	FLOW	94.

```
                                        TIME        12.08

  2 COMBINED AT
+                   COMB        .05     1   FLOW         86.
                                            TIME        12.08
                                        2   FLOW        128.
                                            TIME        12.08
                                        3   FLOW        141.
                                            TIME        12.08
                                        4   FLOW        157.
                                            TIME        12.08
                                        5   FLOW        177.
                                            TIME        12.08

 HYDROGRAPH AT
+                   P2D         .03     1   FLOW         44.
                                            TIME        12.08
                                        2   FLOW         66.
                                            TIME        12.17
                                        3   FLOW         73.
                                            TIME        12.17
                                        4   FLOW         81.
                                            TIME        12.17
                                        5   FLOW         92.
                                            TIME        12.17

 ROUTED TO
+                   PIPE        .03     1   FLOW         44.
                                            TIME        12.17
                                        2   FLOW         65.
                                            TIME        12.17
                                        3   FLOW         73.
                                            TIME        12.17
                                        4   FLOW         81.
                                            TIME        12.17
                                        5   FLOW         91.
                                            TIME        12.17

 HYDROGRAPH AT
+                   P2C         .02     1   FLOW         34.
                                            TIME        12.42
                                        2   FLOW         51.
                                            TIME        12.17
                                        3   FLOW         57.
                                            TIME        12.17
                                        4   FLOW         64.
                                            TIME        12.17
                                        5   FLOW         71.
                                            TIME        12.17

  2 COMBINED AT
+                   COMB        .05     1   FLOW         78.
                                            TIME        12.17
                                        2   FLOW        117.
                                            TIME        12.17
                                        3   FLOW        130.
                                            TIME        12.17
                                        4   FLOW        145.
                                            TIME        12.17
                                        5   FLOW        163.
                                            TIME        12.17

 ROUTED TO
+                   PIPE        .05     1   FLOW         78.
                                            TIME        12.17
                                        2   FLOW        116.
                                            TIME        12.17
                                        3   FLOW        130.
                                            TIME        12.17
                                        4   FLOW        144.
                                            TIME        12.17
                                        5   FLOW        162.
                                            TIME        12.17

  2 COMBINED AT
                    COMB        .11     1   FLOW        161.
                                            TIME        12.08
                                        2   FLOW        240.
                                            TIME        12.08
                                        3   FLOW        268.
                                            TIME        12.17
```

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                                  4   FLOW        296.
                                      TIME       12.17
                                  5   FLOW        334.
                                      TIME       12.17

 ROUTED TO
+                    PIPE     .11   1   FLOW        159.
                                      TIME       12.42
                                  2   FLOW        238.
                                      TIME       12.17
                                  3   FLOW        267.
                                      TIME       12.17
                                  4   FLOW        296.
                                      TIME       12.17
                                  5   FLOW        334.
                                      TIME       12.17

 HYDROGRAPH AT
+                    P2F      .04   1   FLOW         71.
                                      TIME       12.08
                                  2   FLOW        106.
                                      TIME       12.08
                                  3   FLOW        117.
                                      TIME       12.08
                                  4   FLOW        130.
                                      TIME       12.08
                                  5   FLOW        147.
                                      TIME       12.08

  2 COMBINED AT
+                    COMB     .15   1   FLOW        231.
                                      TIME       12.08
                                  2   FLOW        344.
                                      TIME       12.08
                                  3   FLOW        380.
                                      TIME       12.17
                                  4   FLOW        422.
                                      TIME       12.08
                                  5   FLOW        474.
                                      TIME       12.08

 ROUTED TO
+                    PIPE     .15   1   FLOW        228.
                                      TIME       12.17
                                  2   FLOW        340.
                                      TIME       12.17
                                  3   FLOW        379.
                                      TIME       12.17
                                  4   FLOW        421.
                                      TIME       12.17
                                  5   FLOW        474.
                                      TIME       12.17

 HYDROGRAPH AT
+                    P2G      .06   1   FLOW        100.
                                      TIME       12.08
                                  2   FLOW        149.
                                      TIME       12.08
                                  3   FLOW        165.
                                      TIME       12.17
                                  4   FLOW        183.
                                      TIME       12.17
                                  5   FLOW        206.
                                      TIME       12.17

 ROUTED TO
+                    POND     .06   1   FLOW          9.
                                      TIME       13.33
                                  2   FLOW         54.
                                      TIME       12.92
                                  3   FLOW         87.
                                      TIME       12.75
                                  4   FLOW        115.
                                      TIME       12.75
                                  5   FLOW        149.
                                      TIME       12.67

                                 ** PEAK STAGES IN FEET **
                                  1   STAGE        5.79
                                      TIME       13.42
                                  2   STAGE        8.55
```

```
                                        TIME        12.92
                                   3    STAGE        9.18
                                        TIME        12.75
                                   4    STAGE        9.69
                                        TIME        12.75
                                   5    STAGE       10.11
                                        TIME        12.67

 HYDROGRAPH AT
+                    P3B       .05     1    FLOW         95.
                                        TIME        11.92
                                   2    FLOW        137.
                                        TIME        11.92
                                   3    FLOW        145.
                                        TIME        11.92
                                   4    FLOW        163.
                                        TIME        11.92
                                   5    FLOW        183.
                                        TIME        11.92

 HYDROGRAPH AT
+                    P3A       .02     1    FLOW         41.
                                        TIME        11.92
                                   2    FLOW         60.
                                        TIME        11.92
                                   3    FLOW         64.
                                        TIME        11.92
                                   4    FLOW         71.
                                        TIME        11.92
                                   5    FLOW         80.
                                        TIME        11.92

  2 COMBINED AT
+                   COMB       .07     1    FLOW        136.
                                        TIME        11.92
                                   2    FLOW        197.
                                        TIME        11.92
                                   3    FLOW        208.
                                        TIME        11.92
                                   4    FLOW        234.
                                        TIME        11.92
                                   5    FLOW        263.
                                        TIME        11.92

 ROUTED TO
+                   POND       .07     1    FLOW         28.
                                        TIME        12.67
                                   2    FLOW         37.
                                        TIME        12.75
                                   3    FLOW         41.
                                        TIME        13.00
                                   4    FLOW         50.
                                        TIME        13.00
                                   5    FLOW         64.
                                        TIME        12.75

                                   ** PEAK STAGES IN FEET **
                                   1    STAGE        4.31
                                        TIME        12.67
                                   2    STAGE        6.85
                                        TIME        12.75
                                   3    STAGE        7.98
                                        TIME        13.00
                                   4    STAGE        9.00
                                        TIME        13.00
                                   5    STAGE        9.69
                                        TIME        12.75

  5 COMBINED AT
+                   COMB      1.26     1    FLOW       1299.
                                        TIME        12.58
                                   2    FLOW       2065.
                                        TIME        12.58
                                   3    FLOW       2370.
                                        TIME        12.50
                                   4    FLOW       2696.
                                        TIME        12.50
                                   5    FLOW       3073.
                                        TIME        12.50
 1
                                        SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
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                                        (FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)
                                                                          INTERPOLATED TO
                                                                      COMPUTATION INTERVAL
     ISTAQ    ELEMENT      DT       PEAK    TIME TO     VOLUME      DT       PEAK    TIME TO     VOLUME
                                             PEAK                                     PEAK

                          (MIN)     (CFS)     (MIN)     (IN)     (MIN)     (CFS)     (MIN)       (IN)

   FOR PLAN = 1  RATIO=  .00
      CHANN  MANE         5.00     46.02    725.00      3.40      5.00     46.02    725.00       3.40

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5102E+01 EXCESS= .0000E+00 OUTFLOW= .5080E+01 BASIN STORAGE= .3816E-01 PERCENT ERROR=   -.3

   FOR PLAN = 2  RATIO=  .00
      CHANN  MANE         5.00     70.52    725.00      6.33      5.00     70.52    725.00       6.33

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9485E+01 EXCESS= .0000E+00 OUTFLOW= .9456E+01 BASIN STORAGE= .5866E-01 PERCENT ERROR=   -.3

   FOR PLAN = 3  RATIO=  .00
      CHANN  MANE         5.00     78.15    725.00      7.69      5.00     78.15    725.00       7.69

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1153E+02 EXCESS= .0000E+00 OUTFLOW= .1149E+02 BASIN STORAGE= .6846E-01 PERCENT ERROR=   -.3

   FOR PLAN = 4  RATIO=  .00
      CHANN  MANE         5.00     87.51    725.00      8.97      5.00     87.51    725.00       8.97

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1344E+02 EXCESS= .0000E+00 OUTFLOW= .1340E+02 BASIN STORAGE= .7762E-01 PERCENT ERROR=   -.3

   FOR PLAN = 5  RATIO=  .00
      CHANN  MANE         5.00     98.97    725.00     10.05      5.00     98.97    725.00      10.05

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1506E+02 EXCESS= .0000E+00 OUTFLOW= .1502E+02 BASIN STORAGE= .7730E-01 PERCENT ERROR=   -.2

   FOR PLAN = 1  RATIO=  .00
      CHANN  MANE         5.00     28.49    750.00      2.57      5.00     28.49    750.00       2.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3307E+01 EXCESS= .0000E+00 OUTFLOW= .3286E+01 BASIN STORAGE= .3998E-01 PERCENT ERROR=   -.6

   FOR PLAN = 2  RATIO=  .00
      CHANN  MANE         5.00     50.35    725.00      5.28      5.00     50.35    725.00       5.28

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6801E+01 EXCESS= .0000E+00 OUTFLOW= .6767E+01 BASIN STORAGE= .6372E-01 PERCENT ERROR=   -.4

   FOR PLAN = 3  RATIO=  .00
      CHANN  MANE         5.00     57.21    725.00      6.59      5.00     57.21    725.00       6.59

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8478E+01 EXCESS= .0000E+00 OUTFLOW= .8436E+01 BASIN STORAGE= .7492E-01 PERCENT ERROR=   -.4

   FOR PLAN = 4  RATIO=  .00
      CHANN  MANE         5.00     66.58    725.00      7.81      5.00     66.58    725.00       7.81

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1006E+02 EXCESS= .0000E+00 OUTFLOW= .1001E+02 BASIN STORAGE= .8537E-01 PERCENT ERROR=   -.4

   FOR PLAN = 5  RATIO=  .00
      CHANN  MANE         5.00     76.83    725.00      8.87      5.00     76.83    725.00       8.87

NTINUITY SUMMARY (AC-FT) - INFLOW= .1141E+02 EXCESS= .0000E+00 OUTFLOW= .1136E+02 BASIN STORAGE= .8529E-01 PERCENT ERROR=   -.3

   FOR PLAN = 1  RATIO=  .00
      CHANN  MANE         1.21     82.64    726.41      3.07      5.00     80.67    725.00       3.07
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CONTINUITY SUMMARY (AC-FT) - INFLOW= .9997E+01 EXCESS= .0000E+00 OUTFLOW= .9991E+01 BASIN STORAGE= .1061E-01 PERCENT ERROR=    .0

          FOR PLAN = 2  RATIO=  .00
             CHANN  MANE          1.03    139.20    725.49      5.92      5.00    138.39    725.00        5.92

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1926E+02 EXCESS= .0000E+00 OUTFLOW= .1925E+02 BASIN STORAGE= .1680E-01 PERCENT ERROR=    .0

          FOR PLAN = 3  RATIO=  .00
             CHANN  MANE           .99    157.36    726.34      7.26      5.00    155.77    725.00        7.26

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2362E+02 EXCESS= .0000E+00 OUTFLOW= .2361E+02 BASIN STORAGE= .1978E-01 PERCENT ERROR=    .0

          FOR PLAN = 4  RATIO=  .00
             CHANN  MANE           .95    178.62    725.85      8.51      5.00    177.34    725.00        8.51

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2770E+02 EXCESS= .0000E+00 OUTFLOW= .2769E+02 BASIN STORAGE= .2258E-01 PERCENT ERROR=    .0

          FOR PLAN = 5  RATIO=  .00
             CHANN  MANE           .91    203.49    725.57      9.58      5.00    202.45    725.00        9.59

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3119E+02 EXCESS= .0000E+00 OUTFLOW= .3118E+02 BASIN STORAGE= .2252E-01 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
             CHANN  MANE          1.49    231.51    751.80      3.15      5.00    229.73    755.00        3.15

 NTINUITY SUMMARY (AC-FT) - INFLOW= .3377E+02 EXCESS= .0000E+00 OUTFLOW= .3375E+02 BASIN STORAGE= .4165E-01 PERCENT ERROR=    .0

          FOR PLAN = 2  RATIO=  .00
             CHANN  MANE          1.29    370.81    750.62      6.01      5.00    369.90    750.00        6.01

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6448E+02 EXCESS= .0000E+00 OUTFLOW= .6444E+02 BASIN STORAGE= .6575E-01 PERCENT ERROR=    .0

          FOR PLAN = 3  RATIO=  .00
             CHANN  MANE          1.24    418.56    750.12      7.35      5.00    418.45    750.00        7.35

CONTINUITY SUMMARY (AC-FT) - INFLOW= .7889E+02 EXCESS= .0000E+00 OUTFLOW= .7884E+02 BASIN STORAGE= .7732E-01 PERCENT ERROR=    .0

          FOR PLAN = 4  RATIO=  .00
             CHANN  MANE          1.19    470.63    750.47      8.61      5.00    470.39    750.00        8.61

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9234E+02 EXCESS= .0000E+00 OUTFLOW= .9228E+02 BASIN STORAGE= .8824E-01 PERCENT ERROR=    .0

          FOR PLAN = 5  RATIO=  .00
             CHANN  MANE          1.15    532.79    750.48      9.69      5.00    532.65    750.00        9.69

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1039E+03 EXCESS= .0000E+00 OUTFLOW= .1038E+03 BASIN STORAGE= .8797E-01 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
             CHANN  MANE          4.39    263.72    755.43      3.16      5.00    263.60    755.00        3.17

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3956E+02 EXCESS= .0000E+00 OUTFLOW= .3947E+02 BASIN STORAGE= .1433E+00 PERCENT ERROR=   -.1

          FOR PLAN = 2  RATIO=  .00
             CHANN  MANE          3.79    423.76    750.72      6.02      5.00    423.24    750.00        6.03

CONTINUITY SUMMARY (AC-FT) - INFLOW= .7536E+02 EXCESS= .0000E+00 OUTFLOW= .7522E+02 BASIN STORAGE= .2258E+00 PERCENT ERROR=   -.1
```

```
FOR PLAN = 3  RATIO=  .00
   CHANN  MANE          3.65     480.25     749.15       7.37       5.00     479.49     750.00          7.37

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9221E+02 EXCESS= .0000E+00 OUTFLOW= .9203E+02 BASIN STORAGE= .2649E+00 PERCENT ERROR=   -.1

FOR PLAN = 4  RATIO=  .00
   CHANN  MANE          3.52     539.61     746.31       8.63       5.00     539.31     750.00          8.63

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1079E+03 EXCESS= .0000E+00 OUTFLOW= .1077E+03 BASIN STORAGE= .3021E+00 PERCENT ERROR=   -.1

FOR PLAN = 5  RATIO=  .00
   CHANN  MANE          3.38     612.96     747.79       9.70       5.00     610.66     750.00          9.71

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1213E+03 EXCESS= .0000E+00 OUTFLOW= .1211E+03 BASIN STORAGE= .3015E+00 PERCENT ERROR=   -.1

FOR PLAN = 1  RATIO=  .00
    PIPE  MANE          1.62     113.02     748.68       3.93       5.00     112.88     750.00          3.93

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1616E+02 EXCESS= .0000E+00 OUTFLOW= .1615E+02 BASIN STORAGE= .1137E-01 PERCENT ERROR=    .0

FOR PLAN = 2  RATIO=  .00
    PIPE  MANE          1.50     167.07     746.12       6.93       5.00     166.96     745.00          6.93

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2847E+02 EXCESS= .0000E+00 OUTFLOW= .2845E+02 BASIN STORAGE= .1886E-01 PERCENT ERROR=    .0

FOR PLAN = 3  RATIO=  .00
    PIPE  MANE          1.46     188.32     737.39       8.31       5.00     188.18     740.00          8.31

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3415E+02 EXCESS= .0000E+00 OUTFLOW= .3413E+02 BASIN STORAGE= .2267E-01 PERCENT ERROR=    .0

FOR PLAN = 4  RATIO=  .00
    PIPE  MANE          1.43     208.24     736.96       9.59       5.00     207.68     740.00          9.59

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3943E+02 EXCESS= .0000E+00 OUTFLOW= .3940E+02 BASIN STORAGE= .2635E-01 PERCENT ERROR=    .0

FOR PLAN = 5  RATIO=  .00
    PIPE  MANE          1.40     234.76     737.73      10.69       5.00     234.36     740.00         10.69

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4392E+02 EXCESS= .0000E+00 OUTFLOW= .4389E+02 BASIN STORAGE= .2620E-01 PERCENT ERROR=    .0

FOR PLAN = 1  RATIO=  .00
   CHANN  MANE          1.41     447.40     749.95       3.34       5.00     447.37     750.00          3.34

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6652E+02 EXCESS= .0000E+00 OUTFLOW= .6647E+02 BASIN STORAGE= .7484E-01 PERCENT ERROR=    .0

FOR PLAN = 2  RATIO=  .00
   CHANN  MANE          1.22     705.37     745.15       6.24       5.00     705.24     745.00          6.24

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1242E+03 EXCESS= .0000E+00 OUTFLOW= .1241E+03 BASIN STORAGE= .1174E+00 PERCENT ERROR=    .0

FOR PLAN = 3  RATIO=  .00
   CHANN  MANE          1.17     800.56     741.94       7.59       5.00     797.90     745.00          7.59

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1511E+03 EXCESS= .0000E+00 OUTFLOW= .1510E+03 BASIN STORAGE= .1377E+00 PERCENT ERROR=    .0

FOR PLAN = 4  RATIO=  .00
   CHANN  MANE          1.13     897.74     741.65       8.85       5.00     894.11     745.00          8.86
```

```
CONTINUITY SUMMARY (AC-FT) - INFLOW= .1762E+03 EXCESS= .0000E+00 OUTFLOW= .1761E+03 BASIN STORAGE= .1569E+00 PERCENT ERROR=    .0

        FOR PLAN = 5  RATIO=  .00
           CHANN  MANE          1.09   1016.28    741.64      9.94      5.00   1013.01    745.00        9.94

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1978E+03 EXCESS= .0000E+00 OUTFLOW= .1977E+03 BASIN STORAGE= .1564E+00 PERCENT ERROR=    .0

        FOR PLAN = 1  RATIO=  .00
           CHANN  MANE          1.26    617.62    751.28      3.32      5.00    616.10    750.00        3.33

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9243E+02 EXCESS= .0000E+00 OUTFLOW= .9237E+02 BASIN STORAGE= .9311E-01 PERCENT ERROR=    .0

        FOR PLAN = 2  RATIO=  .00
           CHANN  MANE          1.09    974.21    750.28      6.22      5.00    974.10    750.00        6.22

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1729E+03 EXCESS= .0000E+00 OUTFLOW= .1728E+03 BASIN STORAGE= .1461E+00 PERCENT ERROR=    .0

        FOR PLAN = 3  RATIO=  .00
           CHANN  MANE          1.05   1101.60    746.06      7.57      5.00   1098.75    745.00        7.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2105E+03 EXCESS= .0000E+00 OUTFLOW= .2104E+03 BASIN STORAGE= .1715E+00 PERCENT ERROR=    .0

        FOR PLAN = 4  RATIO=  .00
           CHANN  MANE          1.01   1235.50    745.83      8.83      5.00   1233.19    745.00        8.83

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2456E+03 EXCESS= .0000E+00 OUTFLOW= .2454E+03 BASIN STORAGE= .1955E+00 PERCENT ERROR=    .0

        FOR PLAN = 5  RATIO=  .00
           CHANN  MANE           .97   1399.10    746.41      9.91      5.00   1396.23    745.00        9.92

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2757E+03 EXCESS= .0000E+00 OUTFLOW= .2755E+03 BASIN STORAGE= .1948E+00 PERCENT ERROR=    .0

        FOR PLAN = 1  RATIO=  .00
            PIPE  MANE           .64     40.56    725.63      3.94      5.00     40.35    725.00        3.94

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5464E+01 EXCESS= .0000E+00 OUTFLOW= .5462E+01 BASIN STORAGE= .1523E-02 PERCENT ERROR=    .0

        FOR PLAN = 2  RATIO=  .00
            PIPE  MANE           .59     60.27    725.82      6.94      5.00     59.95    725.00        6.94

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9625E+01 EXCESS= .0000E+00 OUTFLOW= .9623E+01 BASIN STORAGE= .2529E-02 PERCENT ERROR=    .0

        FOR PLAN = 3  RATIO=  .00
            PIPE  MANE           .58     66.44    729.66      8.32      5.00     66.42    730.00        8.32

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1154E+02 EXCESS= .0000E+00 OUTFLOW= .1154E+02 BASIN STORAGE= .3040E-02 PERCENT ERROR=    .0

        FOR PLAN = 4  RATIO=  .00
            PIPE  MANE           .57     73.95    726.39      9.61      5.00     73.47    730.00        9.61

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1333E+02 EXCESS= .0000E+00 OUTFLOW= .1333E+02 BASIN STORAGE= .3534E-02 PERCENT ERROR=    .0

        FOR PLAN = 5  RATIO=  .00
            PIPE  MANE           .55     83.16    726.25     10.71      5.00     82.89    730.00       10.71

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1485E+02 EXCESS= .0000E+00 OUTFLOW= .1485E+02 BASIN STORAGE= .3512E-02 PERCENT ERROR=    .0

        FOR PLAN = 1  RATIO=  .00
```

```
        PIPE  MANE          .80     43.80    726.93      3.94      5.00     43.69    730.00        3.94

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6092E+01 EXCESS= .0000E+00 OUTFLOW= .6090E+01 BASIN STORAGE= .2105E-02 PERCENT ERROR=    .0

      FOR PLAN = 2  RATIO=  .00
        PIPE  MANE          .73     65.45    729.58      6.94      5.00     65.44    730.00        6.94

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1073E+02 EXCESS= .0000E+00 OUTFLOW= .1073E+02 BASIN STORAGE= .3495E-02 PERCENT ERROR=    .0

      FOR PLAN = 3  RATIO=  .00
        PIPE  MANE          .72     73.23    730.38      8.32      5.00     73.12    730.00        8.32

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1287E+02 EXCESS= .0000E+00 OUTFLOW= .1287E+02 BASIN STORAGE= .4199E-02 PERCENT ERROR=    .0

      FOR PLAN = 4  RATIO=  .00
        PIPE  MANE          .70     81.17    730.32      9.61      5.00     81.12    730.00        9.61

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1486E+02 EXCESS= .0000E+00 OUTFLOW= .1486E+02 BASIN STORAGE= .4882E-02 PERCENT ERROR=    .0

      FOR PLAN = 5  RATIO=  .00
        PIPE  MANE          .69     91.46    730.25     10.70      5.00     91.39    730.00       10.70

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1656E+02 EXCESS= .0000E+00 OUTFLOW= .1655E+02 BASIN STORAGE= .4851E-02 PERCENT ERROR=    .0

      FOR PLAN = 1  RATIO=  .00
        PIPE  MANE          .86     77.73    730.67      3.94      5.00     77.66    730.00        3.94

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1092E+02 EXCESS= .0000E+00 OUTFLOW= .1092E+02 BASIN STORAGE= .4063E-02 PERCENT ERROR=    .0

      FOR PLAN = 2  RATIO=  .00
        PIPE  MANE          .79    116.42    730.86      6.94      5.00    116.33    730.00        6.94

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1924E+02 EXCESS= .0000E+00 OUTFLOW= .1923E+02 BASIN STORAGE= .6745E-02 PERCENT ERROR=    .0

      FOR PLAN = 3  RATIO=  .00
        PIPE  MANE          .77    130.06    731.14      8.32      5.00    129.51    730.00        8.32

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2308E+02 EXCESS= .0000E+00 OUTFLOW= .2307E+02 BASIN STORAGE= .8105E-02 PERCENT ERROR=    .0

      FOR PLAN = 4  RATIO=  .00
        PIPE  MANE          .76    144.25    731.20      9.60      5.00    143.94    730.00        9.60

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2664E+02 EXCESS= .0000E+00 OUTFLOW= .2664E+02 BASIN STORAGE= .9423E-02 PERCENT ERROR=    .0

      FOR PLAN = 5  RATIO=  .00
        PIPE  MANE          .74    162.49    731.05     10.70      5.00    162.02    730.00       10.70

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2968E+02 EXCESS= .0000E+00 OUTFLOW= .2968E+02 BASIN STORAGE= .9362E-02 PERCENT ERROR=    .0

      FOR PLAN = 1  RATIO=  .00
        PIPE  MANE          .72    160.67    726.20      3.94      5.00    159.34    745.00        3.94

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2227E+02 EXCESS= .0000E+00 OUTFLOW= .2226E+02 BASIN STORAGE= .6962E-02 PERCENT ERROR=    .0

      FOR PLAN = 2  RATIO=  .00
        PIPE  MANE          .66    239.69    726.32      6.94      5.00    238.42    730.00        6.94

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3923E+02 EXCESS= .0000E+00 OUTFLOW= .3922E+02 BASIN STORAGE= .1156E-01 PERCENT ERROR=    .0
```

```
FOR PLAN = 3  RATIO=  .00
    PIPE  MANE          .65    267.35    730.24      8.32      5.00    267.23    730.00        8.32

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4705E+02 EXCESS= .0000E+00 OUTFLOW= .4704E+02 BASIN STORAGE= .1389E-01 PERCENT ERROR=    .0

FOR PLAN = 4  RATIO=  .00
    PIPE  MANE          .64    296.05    729.63      9.61      5.00    296.03    730.00        9.61

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5432E+02 EXCESS= .0000E+00 OUTFLOW= .5431E+02 BASIN STORAGE= .1615E-01 PERCENT ERROR=    .0

FOR PLAN = 5  RATIO=  .00
    PIPE  MANE          .62    333.78    730.31     10.70      5.00    333.75    730.00       10.70

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6052E+02 EXCESS= .0000E+00 OUTFLOW= .6051E+02 BASIN STORAGE= .1605E-01 PERCENT ERROR=    .0

FOR PLAN = 1  RATIO=  .00
    PIPE  MANE         2.31    228.81    727.72      3.93      5.00    227.64    730.00        3.93

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3152E+02 EXCESS= .0000E+00 OUTFLOW= .3148E+02 BASIN STORAGE= .3177E-01 PERCENT ERROR=    .0

FOR PLAN = 2  RATIO=  .00
    PIPE  MANE         2.13    341.52    727.29      6.93      5.00    340.15    730.00        6.93

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5553E+02 EXCESS= .0000E+00 OUTFLOW= .5547E+02 BASIN STORAGE= .5270E-01 PERCENT ERROR=    .0

FOR PLAN = 3  RATIO=  .00
    PIPE  MANE         2.09    379.58    729.61      8.31      5.00    379.50    730.00        8.32

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6658E+02 EXCESS= .0000E+00 OUTFLOW= .6652E+02 BASIN STORAGE= .6340E-01 PERCENT ERROR=    .0

FOR PLAN = 4  RATIO=  .00
    PIPE  MANE         2.05    421.28    728.84      9.60      5.00    420.63    730.00        9.60

CONTINUITY SUMMARY (AC-FT) - INFLOW= .7689E+02 EXCESS= .0000E+00 OUTFLOW= .7681E+02 BASIN STORAGE= .7364E-01 PERCENT ERROR=    .0

FOR PLAN = 5  RATIO=  .00
    PIPE  MANE         2.00    474.09    730.02     10.70      5.00    474.08    730.00       10.70

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8564E+02 EXCESS= .0000E+00 OUTFLOW= .8558E+02 BASIN STORAGE= .7318E-01 PERCENT ERROR=    .0


*** NORMAL END OF HEC-1 ***
```

APPENDIX F

HECRAS RESULTS FOR PROPOSED CONDITION

HEC-RAS Version 3.1.1 May 2003
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: pipesw/manning
Project File : sabana.prj
Run Date and Time: 8/30/2007 1:41:37 PM

Project in SI units

PLAN DATA

Plan Title: proposed condition
Plan File : p:\414-La Sabana, Vega Baja\hecras\sabana.p01

Geometry Title: proposed condition
Geometry File : p:\414-La Sabana, Vega Baja\hecras\sabana.g01

Flow Title : proposed condition
Flow File : p:\414-La Sabana, Vega Baja\hecras\sabana.f01

Plan Summary Information:

Number of:	Cross Sections =	42	Mulitple Openings =	0
	Culverts =	17	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information
Water surface calculation tolerance = 0.003
Critical depth calculaton tolerance = 0.003
Maximum number of interations = 20
Maximum difference tolerance = 0.1
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: proposed condition
Flow File : p:\414-La Sabana, Vega Baja\hecras\sabana.f01

Flow Data (m3/s)

River	Reach	RS	100 year
pipe4	one	19	.6
pipe4	one	18.5	1.2
pipe4	one	18	2.01
pipe5	one	22	14.98
pipe5	one	21	20.09
pipe1	two	5	.7
pipe1	two	4.5	23.95
pipe1	two	3.5	26.36
pipe1	one	2	64.42
pipe1	one	1.5	68.59
pipe2	two	12	7.92
pipe2	two	10	10.28
pipe2	one	7	33.44
pipe3	two	17	.78
pipe3	two	16.5	1.56
pipe3	two	16	2.6
pipe3	one	14	4.61

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
pipe4	one	100 year	Critical	
pipe5	one	100 year	Critical	
pipe1	two	100 year	Critical	
pipe1	one	100 year		Normal S = 0.006
pipe2	two	100 year	Critical	
pipe3	two	100 year	Critical	

GEOMETRY DATA

Geometry Title: proposed condition
Geometry File : p:\414-La Sabana, Vega Baja\hecras\sabana.g01

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
pipe4	one		B
pipe5	one		C
pipe1	two		A
pipe1	one	A	
pipe2	two		C
pipe2	one	C	A
pipe3	two		B
pipe3	one	B	A

JUNCTION INFORMATION

Name: A
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
pipe1	two	to pipe1	one	0	0
pipe2	one	to pipe1	one	0	0
pipe3	one	to pipe1	one	0	0

Name: B
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
pipe3	two	to pipe3	one	0	0
pipe4	one	to pipe3	one	0	0

Name: C
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
pipe2	two	to pipe2	one	0	0
pipe5	one	to pipe2	one	0	0

CROSS SECTION

RIVER: pipe4
REACH: one RS: 19

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	75	3	75	3	73.34	5	73.34	5	75
8	75								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
3	5	190	190	190	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	74.30	Element	Left OB	Channel	Right OB
Vel Head (m)	0.01	Wt. n-Val.		0.013	
W.S. Elev (m)	74.30	Reach Len. (m)	190.00	190.00	190.00

Crit W.S. (m)	73.55	Flow Area (m2)	1.91
E.G. Slope (m/m)	0.000043	Area (m2)	1.91
Q Total (m3/s)	0.60	Flow (m3/s)	0.60
Top Width (m)	2.00	Top Width (m)	2.00
Vel Total (m/s)	0.31	Avg. Vel. (m/s)	0.31
Max Chl Dpth (m)	0.96	Hydr. Depth (m)	0.96
Conv. Total (m3/s)	91.2	Conv. (m3/s)	91.2
Length Wtd. (m)	190.00	Wetted Per. (m)	3.91
Min Ch El (m)	73.34	Shear (N/m2)	0.21
Alpha	1.00	Stream Power (N/m s)	0.07
Frctn Loss (m)		Cum Volume (1000 m3)	1.39
C & E Loss (m)		Cum SA (1000 m2)	0.90

CULVERT

RIVER: pipe4
REACH: one RS: 18.8

INPUT
Description:
Distance from Upstream XS = .5
Deck/Roadway Width = 189
Weir Coefficient = 1.44
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	75		8	75	

Upstream Bridge Cross Section Data
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	75	3	75	3	73.34	5	73.34	5	75
8	75								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left Right Coeff Contr. Expan.
3 5 .1 .3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	72		8	72	

Downstream Bridge Cross Section Data
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	72	3	72	3	70.34	5	70.34	5	72
8	72								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left Right Coeff Contr. Expan.
3 5 .1 .3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 75
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name Shape Rise Span
Culvert #1 Circular .6
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	.5	189	.013	.013	0	.6	1

Upstream Elevation = 73.34
Centerline Station = 4
Downstream Elevation = 70.34
Centerline Station = 4

CULVERT OUTPUT Profile #100 year Culv Group: Culvert #1

Q Culv Group (m3/s)	0.60	Culv Full Len (m)	90.87
# Barrels	1	Culv Vel US (m/s)	2.12
Q Barrel (m3/s)	0.60	Culv Vel DS (m/s)	2.12

E.G. US. (m)	74.30	Culv Inv El Up (m)	73.34
W.S. US. (m)	74.30	Culv Inv El Dn (m)	70.34
E.G. DS (m)	71.52	Culv Frctn Ls (m)	2.42
W.S. DS (m)	71.52	Culv Exit Loss (m)	0.23
Delta EG (m)	2.78	Culv Entr Loss (m)	0.14
Delta WS (m)	2.78	Q Weir (m3/s)	
E.G. IC (m)	74.32	Weir Sta Lft (m)	
E.G. OC (m)	74.30	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	73.94	Weir Max Depth (m)	
Culv WS Outlet (m)	70.94	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.40	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.50	Min El Weir Flow (m)	75.00

CROSS SECTION

RIVER: pipe4
REACH: one RS: 18.51

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	72	3	72	3	70.34	5	70.34	5	72
8	72								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
3	5	1	1	1	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	71.52	Element	Left OB	Channel	Right OB
Vel Head (m)	0.00	Wt. n-Val.		0.013	
W.S. Elev (m)	71.52	Reach Len. (m)	1.00	1.00	1.00
Crit W.S. (m)		Flow Area (m2)		2.35	
E.G. Slope (m/m)	0.000025	Area (m2)		2.35	
Q Total (m3/s)	0.60	Flow (m3/s)		0.60	
Top Width (m)	2.00	Top Width (m)		2.00	
Vel Total (m/s)	0.26	Avg. Vel. (m/s)		0.26	
Max Chl Dpth (m)	1.18	Hydr. Depth (m)		1.18	
Conv. Total (m3/s)	120.0	Conv. (m3/s)		120.0	
Length Wtd. (m)	1.00	Wetted Per. (m)		4.35	
Min Ch El (m)	70.34	Shear (N/m2)		0.13	
Alpha	1.00	Stream Power (N/m s)		0.03	
Frctn Loss (m)	0.00	Cum Volume (1000 m3)		0.98	
C & E Loss (m)	0.00	Cum SA (1000 m2)		0.52	

CROSS SECTION

RIVER: pipe4
REACH: one RS: 18.5

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	72	3	72	3	70.19	5	70.19	5	72
8	72								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
3	5	130	130	130	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	71.52	Element	Left OB	Channel	Right OB
Vel Head (m)	0.01	Wt. n-Val.		0.013	
W.S. Elev (m)	71.51	Reach Len. (m)	130.00	130.00	130.00
Crit W.S. (m)	70.52	Flow Area (m2)		2.64	
E.G. Slope (m/m)	0.000074	Area (m2)		2.64	
Q Total (m3/s)	1.20	Flow (m3/s)		1.20	
Top Width (m)	2.00	Top Width (m)		2.00	
Vel Total (m/s)	0.46	Avg. Vel. (m/s)		0.46	
Max Chl Dpth (m)	1.32	Hydr. Depth (m)		1.32	
Conv. Total (m3/s)	139.2	Conv. (m3/s)		139.2	
Length Wtd. (m)	130.00	Wetted Per. (m)		4.64	
Min Ch El (m)	70.19	Shear (N/m2)		0.41	

Alpha	1.00	Stream Power (N/m s)	0.19
Frctn Loss (m)		Cum Volume (1000 m3)	0.98
C & E Loss (m)		Cum SA (1000 m2)	0.52

CULVERT

RIVER: pipe4
REACH: one RS: 18.3

INPUT
Description:
Distance from Upstream XS = .5
Deck/Roadway Width = 129
Weir Coefficient = 1.44
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	72		8	72	

Upstream Bridge Cross Section Data
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	72	3	72	3	70.19	5	70.19	5	72
8	72								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left	Right	Coeff Contr.	Expan.
3	5	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	67		8	67	

Downstream Bridge Cross Section Data
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	67	3	67	3	65.04	5	65.04	5	67
8	67								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left	Right	Coeff Contr.	Expan.
3	5	.1	.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 72
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Circular	.76	

FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	.5	129	.013	.013	0	.6	1

Upstream Elevation = 70.19
Centerline Station = 4
Downstream Elevation = 65.04
Centerline Station = 4

CULVERT OUTPUT Profile #100 year Culv Group: Culvert #1

Q Culv Group (m3/s)	1.20	Culv Full Len (m)	40.02
# Barrels	1	Culv Vel US (m/s)	2.65
Q Barrel (m3/s)	1.20	Culv Vel DS (m/s)	2.65
E.G. US. (m)	71.52	Culv Inv El Up (m)	70.19
W.S. US. (m)	71.51	Culv Inv El Dn (m)	65.04
E.G. DS (m)	66.97	Culv Frctn Ls (m)	3.99
W.S. DS (m)	66.96	Culv Exit Loss (m)	0.35
Delta EG (m)	4.55	Culv Entr Loss (m)	0.21
Delta WS (m)	4.54	Q Weir (m3/s)	
E.G. IC (m)	71.60	Weir Sta Lft (m)	
E.G. OC (m)	71.52	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	

Culv WS Inlet (m)	70.95	Weir Max Depth (m)	
Culv WS Outlet (m)	65.80	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.39	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.66	Min El Weir Flow (m)	72.00

CROSS SECTION

RIVER: pipe4
REACH: one RS: 18.1

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	67	3	67	3	65.04	5	65.04	5	67
8	67								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
3	5	1	1	1	.1	.3

CROSS SECTION OUTPUT Profile #100 year

			Left OB	Channel	Right OB
E.G. Elev (m)	66.97	Element			
Vel Head (m)	0.00	Wt. n-Val.		0.013	
W.S. Elev (m)	66.96	Reach Len. (m)	1.00	1.00	1.00
Crit W.S. (m)		Flow Area (m2)		3.85	
E.G. Slope (m/m)	0.000029	Area (m2)		3.85	
Q Total (m3/s)	1.20	Flow (m3/s)		1.20	
Top Width (m)	2.00	Top Width (m)		2.00	
Vel Total (m/s)	0.31	Avg. Vel. (m/s)		0.31	
Max Chl Dpth (m)	1.92	Hydr. Depth (m)		1.92	
Conv. Total (m3/s)	223.9	Conv. (m3/s)		223.9	
Length Wtd. (m)	1.00	Wetted Per. (m)		5.85	
Min Ch El (m)	65.04	Shear (N/m2)		0.19	
Alpha	1.00	Stream Power (N/m s)		0.06	
Frctn Loss (m)	0.00	Cum Volume (1000 m3)		0.56	
C & E Loss (m)	0.00	Cum SA (1000 m2)		0.26	

CROSS SECTION

RIVER: pipe4
REACH: one RS: 18

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	67	3	67	3	64.59	5	64.59	5	67
8	67								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
3	5	127	127	127	.1	.3

CROSS SECTION OUTPUT Profile #100 year

			Left OB	Channel	Right OB
E.G. Elev (m)	66.97	Element			
Vel Head (m)	0.01	Wt. n-Val.		0.013	
W.S. Elev (m)	66.96	Reach Len. (m)	127.00	127.00	127.00
Crit W.S. (m)	65.06	Flow Area (m2)		4.74	
E.G. Slope (m/m)	0.000049	Area (m2)		4.74	
Q Total (m3/s)	2.01	Flow (m3/s)		2.01	
Top Width (m)	2.00	Top Width (m)		2.00	
Vel Total (m/s)	0.42	Avg. Vel. (m/s)		0.42	
Max Chl Dpth (m)	2.37	Hydr. Depth (m)		2.37	
Conv. Total (m3/s)	288.2	Conv. (m3/s)		288.2	
Length Wtd. (m)	127.00	Wetted Per. (m)		6.74	
Min Ch El (m)	64.59	Shear (N/m2)		0.34	
Alpha	1.00	Stream Power (N/m s)		0.14	
Frctn Loss (m)		Cum Volume (1000 m3)		0.55	
C & E Loss (m)		Cum SA (1000 m2)		0.25	

CULVERT

RIVER: pipe4

REACH: one RS: 17.8

INPUT
Description:
Distance from Upstream XS = .5
Deck/Roadway Width = 126
Weir Coefficient = 1.44
Upstream Deck/Roadway Coordinates
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
0	67	8	67

Upstream Bridge Cross Section Data
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	67	3	67	3	64.59	5	64.59	5	67
8	67								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left	Right	Coeff Contr.	Expan.
3	5	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
0	67	8	67

Downstream Bridge Cross Section Data
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	67	3	67	3	64.43	5	64.43	5	67
8	67								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left	Right	Coeff Contr.	Expan.
3	5	.1	.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 67
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Circular	1.22	

FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	.5	126	.013	.013	0	.6	1

Upstream Elevation = 64.59
Centerline Station = 4
Downstream Elevation = 64.43
Centerline Station = 4

CULVERT OUTPUT Profile #100 year Culv Group: Culvert #1

Q Culv Group (m3/s)	2.01	Culv Full Len (m)	126.00
# Barrels	1	Culv Vel US (m/s)	1.72
Q Barrel (m3/s)	2.01	Culv Vel DS (m/s)	1.72
E.G. US. (m)	66.97	Culv Inv El Up (m)	64.59
W.S. US. (m)	66.96	Culv Inv El Dn (m)	64.43
E.G. DS (m)	66.43	Culv Frctn Ls (m)	0.31
W.S. DS (m)	66.42	Culv Exit Loss (m)	0.14
Delta EG (m)	0.53	Culv Entr Loss (m)	0.09
Delta WS (m)	0.54	Q Weir (m3/s)	
E.G. IC (m)	65.79	Weir Sta Lft (m)	
E.G. OC (m)	66.97	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	65.81	Weir Max Depth (m)	
Culv WS Outlet (m)	65.65	Weir Avg Depth (m)	
Culv Nml Depth (m)		Weir Flow Area (m2)	
Culv Crt Depth (m)	0.78	Min El Weir Flow (m)	67.00

CROSS SECTION

RIVER: pipe4
REACH: one RS: 17.5

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	67	3	67	3	64.43	5	64.43	5	67
8	67								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
3	5	0	0	0	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	66.43	Element	Left OB	Channel	Right OB
Vel Head (m)	0.01	Wt. n-Val.		0.013	
W.S. Elev (m)	66.42	Reach Len. (m)	0.00	0.00	0.00
Crit W.S. (m)		Flow Area (m2)		3.98	
E.G. Slope (m/m)	0.000074	Area (m2)		3.98	
Q Total (m3/s)	2.01	Flow (m3/s)		2.01	
Top Width (m)	2.00	Top Width (m)		2.00	
Vel Total (m/s)	0.50	Avg. Vel. (m/s)		0.50	
Max Chl Dpth (m)	1.99	Hydr. Depth (m)		1.99	
Conv. Total (m3/s)	233.5	Conv. (m3/s)		233.5	
Length Wtd. (m)	0.00	Wetted Per. (m)		5.98	
Min Ch El (m)	64.43	Shear (N/m2)		0.48	
Alpha	1.00	Stream Power (N/m s)		0.24	
Frctn Loss (m)	0.00	Cum Volume (1000 m3)			
C & E Loss (m)	0.00	Cum SA (1000 m2)			

CROSS SECTION

RIVER: pipe5
REACH: one RS: 22

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	62.5	2	62.5	2	59.16	6	59.16	6	62.5
8	62.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	2	.013	6	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2	6	454	454	454	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	62.24	Element	Left OB	Channel	Right OB
Vel Head (m)	0.08	Wt. n-Val.		0.013	
W.S. Elev (m)	62.17	Reach Len. (m)	454.00	454.00	454.00
Crit W.S. (m)	60.28	Flow Area (m2)		12.02	
E.G. Slope (m/m)	0.000206	Area (m2)		12.02	
Q Total (m3/s)	14.98	Flow (m3/s)		14.98	
Top Width (m)	4.00	Top Width (m)		4.00	
Vel Total (m/s)	1.25	Avg. Vel. (m/s)		1.25	
Max Chl Dpth (m)	3.01	Hydr. Depth (m)		3.01	
Conv. Total (m3/s)	1045.0	Conv. (m3/s)		1045.0	
Length Wtd. (m)	454.00	Wetted Per. (m)		10.01	
Min Ch El (m)	59.16	Shear (N/m2)		2.42	
Alpha	1.00	Stream Power (N/m s)		3.02	
Frctn Loss (m)		Cum Volume (1000 m3)		10.78	
C & E Loss (m)		Cum SA (1000 m2)		2.99	

CULVERT

RIVER: pipe5
REACH: one RS: 21.5

INPUT
Description:
Distance from Upstream XS = .5
Deck/Roadway Width = 453
Weir Coefficient = 1.44
Upstream Deck/Roadway Coordinates
num= 2

```
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0    62.5                8    62.5

Upstream Bridge Cross Section Data
Station Elevation Data     num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0    62.5       2    62.5       2   59.16       6   59.16       6    62.5
       8    62.5

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .013       2    .013       6    .013

Bank Sta: Left   Right    Coeff Contr.   Expan.
             2       6              .1       .3

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0    60.2                8    60.2

Downstream Bridge Cross Section Data
Station Elevation Data     num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0    60.2       2    60.2       2    56.5       6    56.5       6    60.2
       8    60.2

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .013       2    .013       6    .013

Bank Sta: Left   Right    Coeff Contr.   Expan.
             2       6              .1       .3

Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins           =    62.5
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Culverts =  1

Culvert Name      Shape      Rise    Span
Culvert #1            Box    2.74    2.13
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                  .5     453     .013      .013          0                   .6                1
Upstream   Elevation =  59.16
           Centerline Station =  4
Downstream Elevation =  56.5
           Centerline Station =  4

CULVERT OUTPUT  Profile #100 year  Culv Group:  Culvert #1

  Q Culv Group (m3/s)       14.98    Culv Full Len (m)        256.37
  # Barrels                     1    Culv Vel US (m/s)          4.10
  Q Barrel (m3/s)           14.98    Culv Vel DS (m/s)          2.57
  E.G. US. (m)              62.25    Culv Inv El Up (m)        59.16
  W.S. US. (m)              62.17    Culv Inv El Dn (m)        56.50
  E.G. DS (m)               60.23    Culv Frctn Ls (m)          1.22
  W.S. DS (m)               60.18    Culv Exit Loss (m)         0.28
  Delta EG (m)               2.01    Culv Entr Loss (m)         0.51
  Delta WS (m)               1.99    Q Weir (m3/s)
  E.G. IC (m)               61.92    Weir Sta Lft (m)
  E.G. OC (m)               62.25    Weir Sta Rgt (m)
  Culvert Control          Outlet    Weir Submerg
  Culv WS Inlet (m)         60.87    Weir Max Depth (m)
  Culv WS Outlet (m)        59.24    Weir Avg Depth (m)
  Culv Nml Depth (m)         1.61    Weir Flow Area (m2)
  Culv Crt Depth (m)         1.71    Min El Weir Flow (m)      62.50


CROSS SECTION


RIVER: pipe5
REACH: one                RS: 21.1

INPUT
Description:
Station Elevation Data     num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0    60.2       2    60.2       2    56.5       6    56.5       6    60.2
       8    60.2
```

```
Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
       0    .013       2    .013       6    .013

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             2       6                 1       1       1              .1       .3

CROSS SECTION OUTPUT  Profile #100 year

  E.G. Elev (m)            60.23    Element                  Left OB    Channel   Right OB
  Vel Head (m)              0.05    Wt. n-Val.                          0.013
  W.S. Elev (m)            60.18    Reach Len. (m)             1.00      1.00       1.00
  Crit W.S. (m)                     Flow Area (m2)                      14.72
  E.G. Slope (m/m)       0.000124    Area (m2)                           14.72
  Q Total (m3/s)           14.98    Flow (m3/s)                         14.98
  Top Width (m)             4.00    Top Width (m)                        4.00
  Vel Total (m/s)           1.02    Avg. Vel. (m/s)                      1.02
  Max Chl Dpth (m)          3.68    Hydr. Depth (m)                      3.68
  Conv. Total (m3/s)      1346.0    Conv. (m3/s)                       1346.0
  Length Wtd. (m)           1.00    Wetted Per. (m)                     11.36
  Min Ch El (m)            56.50    Shear (N/m2)                         1.57
  Alpha                     1.00    Stream Power (N/m s)                 1.60
  Frctn Loss (m)            0.00    Cum Volume (1000 m3)                 4.71
  C & E Loss (m)            0.00    Cum SA (1000 m2)                     1.17


Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: pipe5
REACH: one                RS: 21

INPUT
Description:
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0    60.2       1    60.2       1    56.5       7    56.5       7    60.2
       8    60.2

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
       0    .013       1    .013       7    .013

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             1       7                195     195     195              .1       .3

CROSS SECTION OUTPUT  Profile #100 year

  E.G. Elev (m)            60.23    Element                  Left OB    Channel   Right OB
  Vel Head (m)              0.04    Wt. n-Val.                          0.013
  W.S. Elev (m)            60.19    Reach Len. (m)           195.00     195.00     195.00
  Crit W.S. (m)            57.54    Flow Area (m2)                      22.13
  E.G. Slope (m/m)       0.000071    Area (m2)                           22.13
  Q Total (m3/s)           20.09    Flow (m3/s)                         20.09
  Top Width (m)             6.00    Top Width (m)                        6.00
  Vel Total (m/s)           0.91    Avg. Vel. (m/s)                      0.91
  Max Chl Dpth (m)          3.69    Hydr. Depth (m)                      3.69
  Conv. Total (m3/s)      2380.8    Conv. (m3/s)                       2380.8
  Length Wtd. (m)         195.00    Wetted Per. (m)                     13.38
  Min Ch El (m)            56.50    Shear (N/m2)                         1.16
  Alpha                     1.00    Stream Power (N/m s)                 1.05
  Frctn Loss (m)                    Cum Volume (1000 m3)                 4.70
  C & E Loss (m)                    Cum SA (1000 m2)                     1.17


CULVERT


RIVER: pipe5
REACH: one                RS: 20.5

INPUT
Description:
Distance from Upstream XS =       .5
Deck/Roadway Width        =     194
Weir Coefficient          =    1.44
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0    60.2                8    60.2

Upstream Bridge Cross Section Data
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

```
      0    60.2        1    60.2        1    56.5        7    56.5        7    60.2
      8    60.2

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
       0    .013        1    .013        7    .013

Bank Sta: Left   Right    Coeff Contr.   Expan.
             1       7              .1       .3

Downstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0      60                8      60

Downstream Bridge Cross Section Data
Station Elevation Data     num=        6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
       0      60        1      60        1    55.5        7    55.5        7      60
       8      60

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
       0    .013        1    .013        7    .013

Bank Sta: Left   Right    Coeff Contr.   Expan.
             1       7              .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =    60.2
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts = 1

Culvert Name      Shape      Rise    Span
Culvert #1            Box     3.35    3.35
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                .5     194     .013     .013         0                  .6                  1
Upstream   Elevation =  56.5
           Centerline Station =  4
Downstream Elevation =  55.5
           Centerline Station =  4

CULVERT OUTPUT  Profile #100 year  Culv Group:  Culvert #1

  Q Culv Group (m3/s)       20.03    Culv Full Len (m)        194.00
  # Barrels                     1    Culv Vel US (m/s)         1.78
  Q Barrel (m3/s)           20.03    Culv Vel DS (m/s)         1.78
  E.G. US. (m)              60.23    Culv Inv El Up (m)       56.50
  W.S. US. (m)              60.19    Culv Inv El Dn (m)       55.50
  E.G. DS (m)               59.87    Culv Frctn Ls (m)         0.13
  W.S. DS (m)               59.84    Culv Exit Loss (m)        0.13
  Delta EG (m)               0.36    Culv Entr Loss (m)        0.10
  Delta WS (m)               0.35    Q Weir (m3/s)             0.06
  E.G. IC (m)               58.96    Weir Sta Lft (m)          0.00
  E.G. OC (m)               60.23    Weir Sta Rgt (m)          8.00
  Culvert Control          Outlet    Weir Submerg              0.00
  Culv WS Inlet (m)         59.85    Weir Max Depth (m)        0.03
  Culv WS Outlet (m)        58.85    Weir Avg Depth (m)        0.03
  Culv Nml Depth (m)                 Weir Flow Area (m2)       0.24
  Culv Crt Depth (m)         1.54    Min El Weir Flow (m)     60.20


Warning: During the culvert inlet computations, the program could not balance the culvert/weir flow.  The
         reported inlet energy grade answer may not be valid.

CROSS SECTION


RIVER: pipe5
REACH: one                RS: 20

INPUT
Description:
Station Elevation Data     num=        6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
       0      60        1      60        1    55.5        7    55.5        7      60
       8      60

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
```

```
      0    .013       1    .013       7    .013

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             1       7                 0       0       0             .1       .3

CROSS SECTION OUTPUT  Profile #100 year

  E.G. Elev (m)            59.87    Element                  Left OB    Channel   Right OB
  Vel Head (m)              0.03    Wt. n-Val.                          0.013
  W.S. Elev (m)            59.84    Reach Len. (m)             0.00      0.00       0.00
  Crit W.S. (m)                     Flow Area (m2)                      26.03
  E.G. Slope (m/m)       0.000047    Area (m2)                           26.03
  Q Total (m3/s)           20.09    Flow (m3/s)                         20.09
  Top Width (m)             6.00    Top Width (m)                        6.00
  Vel Total (m/s)           0.77    Avg. Vel. (m/s)                      0.77
  Max Chl Dpth (m)          4.34    Hydr. Depth (m)                      4.34
  Conv. Total (m3/s)      2933.4    Conv. (m3/s)                       2933.4
  Length Wtd. (m)           0.00    Wetted Per. (m)                     14.68
  Min Ch El (m)            55.50    Shear (N/m2)                         0.82
  Alpha                     1.00    Stream Power (N/m s)                 0.63
  Frctn Loss (m)            0.00    Cum Volume (1000 m3)
  C & E Loss (m)            0.01    Cum SA (1000 m2)


CROSS SECTION


RIVER: pipe1
REACH: two                RS: 5

INPUT
Description:
Station Elevation Data     num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0    77.4    2.13   76.34    3.04   76.34    5.17    77.4

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .013       0    .013    5.17    .013

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0    5.17                160     160     160             .1       .3

CROSS SECTION OUTPUT  Profile #100 year

  E.G. Elev (m)            76.76    Element                  Left OB    Channel   Right OB
  Vel Head (m)              0.11    Wt. n-Val.                          0.013
  W.S. Elev (m)            76.65    Reach Len. (m)           160.00    160.00     160.00
  Crit W.S. (m)            76.65    Flow Area (m2)                       0.47
  E.G. Slope (m/m)       0.003043    Area (m2)                            0.47
  Q Total (m3/s)            0.70    Flow (m3/s)                          0.70
  Top Width (m)             2.15    Top Width (m)                        2.15
  Vel Total (m/s)           1.48    Avg. Vel. (m/s)                      1.48
  Max Chl Dpth (m)          0.31    Hydr. Depth (m)                      0.22
  Conv. Total (m3/s)        12.7    Conv. (m3/s)                         12.7
  Length Wtd. (m)         160.00    Wetted Per. (m)                      2.30
  Min Ch El (m)           76.34     Shear (N/m2)                         6.15
  Alpha                     1.00    Stream Power (N/m s)                 9.09
  Frctn Loss (m)            0.37    Cum Volume (1000 m3)                 6.60
  C & E Loss (m)            0.05    Cum SA (1000 m2)                     3.11


Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: pipe1
REACH: two                RS: 4.5

INPUT
Description:
Station Elevation Data     num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   73.23    2.13   72.17    3.04   72.17    5.17   73.23

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
```

0	.013	0	.013	5.17	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	5.17	145	145	145	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	75.13	Element	Left OB	Channel	Right OB
Vel Head (m)	1.73	Wt. n-Val.		0.013	
W.S. Elev (m)	73.40	Reach Len. (m)	145.00	145.00	145.00
Crit W.S. (m)	73.90	Flow Area (m2)		4.11	
E.G. Slope (m/m)	0.009556	Area (m2)		4.11	
Q Total (m3/s)	23.95	Flow (m3/s)		23.95	
Top Width (m)	5.17	Top Width (m)		5.17	
Vel Total (m/s)	5.83	Avg. Vel. (m/s)		5.83	
Max Chl Dpth (m)	1.23	Hydr. Depth (m)		0.79	
Conv. Total (m3/s)	245.0	Conv. (m3/s)		245.0	
Length Wtd. (m)	145.00	Wetted Per. (m)		6.01	
Min Ch El (m)	72.17	Shear (N/m2)		64.02	
Alpha	1.00	Stream Power (N/m s)		373.42	
Frctn Loss (m)	1.46	Cum Volume (1000 m3)		6.23	
C & E Loss (m)	0.16	Cum SA (1000 m2)		2.52	

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: pipe1
REACH: two RS: 4.1

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	69.4	2.13	68.34	3.04	68.34	5.17	69.4

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	0	.013	5.17	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	5.17	1	1	1	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	72.81	Element	Left OB	Channel	Right OB
Vel Head (m)	3.47	Wt. n-Val.		0.013	
W.S. Elev (m)	69.34	Reach Len. (m)	1.00	1.00	1.00
Crit W.S. (m)	70.07	Flow Area (m2)		2.90	
E.G. Slope (m/m)	0.026228	Area (m2)		2.90	
Q Total (m3/s)	23.95	Flow (m3/s)		23.95	
Top Width (m)	4.92	Top Width (m)		4.92	
Vel Total (m/s)	8.25	Avg. Vel. (m/s)		8.25	
Max Chl Dpth (m)	1.00	Hydr. Depth (m)		0.59	
Conv. Total (m3/s)	147.9	Conv. (m3/s)		147.9	
Length Wtd. (m)	1.00	Wetted Per. (m)		5.38	
Min Ch El (m)	68.34	Shear (N/m2)		138.66	
Alpha	1.00	Stream Power (N/m s)		1144.17	
Frctn Loss (m)	2.16	Cum Volume (1000 m3)		5.73	
C & E Loss (m)	0.17	Cum SA (1000 m2)		1.79	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: pipe1
REACH: two RS: 4

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	70	2	70	2	66.36	6	66.36	6	70

```
      8      70

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
       0    .013       2    .013        6    .013

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             2       6              221     221     221              .1       .3

CROSS SECTION OUTPUT  Profile #100 year

  E.G. Elev (m)            69.93    Element                  Left OB    Channel   Right OB
  Vel Head (m)              0.16    Wt. n-Val.                          0.013
  W.S. Elev (m)            69.77    Reach Len. (m)          221.00     221.00     221.00
  Crit W.S. (m)            67.90    Flow Area (m2)                      13.64
  E.G. Slope (m/m)      0.000383    Area (m2)                           13.64
  Q Total (m3/s)           23.95    Flow (m3/s)                         23.95
  Top Width (m)             4.00    Top Width (m)                        4.00
  Vel Total (m/s)           1.76    Avg. Vel. (m/s)                      1.76
  Max Chl Dpth (m)          3.41    Hydr. Depth (m)                      3.41
  Conv. Total (m3/s)       1224.5   Conv. (m3/s)                       1224.5
  Length Wtd. (m)         221.00    Wetted Per. (m)                     10.82
  Min Ch El (m)            66.36    Shear (N/m2)                         4.73
  Alpha                     1.00    Stream Power (N/m s)                 8.30
  Frctn Loss (m)                    Cum Volume (1000 m3)                 5.72
  C & E Loss (m)                    Cum SA (1000 m2)                     1.78


Note:    Hydraulic jump has occurred between this cross section and the previous upstream section.

CULVERT


RIVER: pipe1
REACH: two                RS: 3.8

INPUT
Description:
Distance from Upstream XS =       .5
Deck/Roadway Width        =     220
Weir Coefficient          =    1.44
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0      70               8      70

Upstream Bridge Cross Section Data
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0      70       2      70       2   66.36       6   66.36       6      70
       8      70

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
       0    .013       2    .013        6    .013

Bank Sta: Left   Right    Coeff Contr.   Expan.
             2       6              .1       .3

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0      67               8      67

Downstream Bridge Cross Section Data
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0      67       2      67       2   63.66       6   63.66       6      67
       8      67

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
       0    .013       2    .013        6    .013

Bank Sta: Left   Right    Coeff Contr.   Expan.
             2       6              .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =      70
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
```

```
Culvert #1            Box    2.74    2.74
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 .5     220     .013     .013        0                .6                  1
Upstream   Elevation =  66.36
           Centerline Station =  4
Downstream Elevation =  63.66
           Centerline Station =  4

CULVERT OUTPUT  Profile #100 year  Culv Group:  Culvert #1

  Q Culv Group (m3/s)       23.95    Culv Full Len (m)        45.11
  # Barrels                     1    Culv Vel US (m/s)         4.41
  Q Barrel (m3/s)           23.95    Culv Vel DS (m/s)         3.19
  E.G. US. (m)              69.93    Culv Inv El Up (m)       66.36
  W.S. US. (m)              69.77    Culv Inv El Dn (m)       63.66
  E.G. DS (m)               67.01    Culv Frctn Ls (m)         1.99
  W.S. DS (m)               66.83    Culv Exit Loss (m)        0.34
  Delta EG (m)               2.92    Culv Entr Loss (m)        0.59
  Delta WS (m)               2.95    Q Weir (m3/s)
  E.G. IC (m)               69.56    Weir Sta Lft (m)
  E.G. OC (m)               69.93    Weir Sta Rgt (m)
  Culvert Control          Outlet    Weir Submerg
  Culv WS Inlet (m)         68.34    Weir Max Depth (m)
  Culv WS Outlet (m)        66.40    Weir Avg Depth (m)
  Culv Nml Depth (m)         1.33    Weir Flow Area (m2)
  Culv Crt Depth (m)         1.98    Min El Weir Flow (m)     70.00


CROSS SECTION


RIVER: pipe1
REACH: two                RS: 3.51

INPUT
Description:
Station Elevation Data    num=      6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0      67       2      67       2   63.66       6   63.66       6      67
       8      67

Manning's n Values        num=      3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .013       2    .013       6    .013

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             2       6                 1       1       1             .1       .3

CROSS SECTION OUTPUT  Profile #100 year

  E.G. Elev (m)             67.01    Element                  Left OB    Channel   Right OB
  Vel Head (m)               0.18    Wt. n-Val.                          0.013
  W.S. Elev (m)             66.83    Reach Len. (m)             1.00      1.00       1.00
  Crit W.S. (m)                      Flow Area (m2)                      12.66
  E.G. Slope (m/m)        0.000461   Area (m2)                           12.66
  Q Total (m3/s)            23.95    Flow (m3/s)                         23.95
  Top Width (m)              4.00    Top Width (m)                        4.00
  Vel Total (m/s)            1.89    Avg. Vel. (m/s)                      1.89
  Max Chl Dpth (m)           3.17    Hydr. Depth (m)                      3.17
  Conv. Total (m3/s)       1115.4    Conv. (m3/s)                      1115.4
  Length Wtd. (m)            1.00    Wetted Per. (m)                     10.33
  Min Ch El (m)             63.66    Shear (N/m2)                         5.54
  Alpha                      1.00    Stream Power (N/m s)                10.48
  Frctn Loss (m)             0.00    Cum Volume (1000 m3)                 2.81
  C & E Loss (m)             0.00    Cum SA (1000 m2)                     0.90


CROSS SECTION


RIVER: pipe1
REACH: two                RS: 3.5

INPUT
Description:
Station Elevation Data    num=      6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0      67       2      67       2    63.2       6    63.2       6      67
       8      67

Manning's n Values        num=      3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .013       2    .013       6    .013

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
```

```
          2       6              224     224     224              .1       .3

CROSS SECTION OUTPUT  Profile #100 year

  E.G. Elev (m)            67.00    Element                  Left OB    Channel   Right OB
  Vel Head (m)              0.17    Wt. n-Val.                          0.013
  W.S. Elev (m)            66.84    Reach Len. (m)           224.00    224.00     224.00
  Crit W.S. (m)            64.84    Flow Area (m2)                      14.54
  E.G. Slope (m/m)      0.000395    Area (m2)                           14.54
  Q Total (m3/s)           26.36    Flow (m3/s)                         26.36
  Top Width (m)             4.00    Top Width (m)                        4.00
  Vel Total (m/s)           1.81    Avg. Vel. (m/s)                      1.81
  Max Chl Dpth (m)          3.64    Hydr. Depth (m)                      3.64
  Conv. Total (m3/s)      1325.6    Conv. (m3/s)                       1325.6
  Length Wtd. (m)         224.00    Wetted Per. (m)                     11.27
  Min Ch El (m)            63.20    Shear (N/m2)                         5.00
  Alpha                     1.00    Stream Power (N/m s)                 9.07
  Frctn Loss (m)                    Cum Volume (1000 m3)                 2.80
  C & E Loss (m)                    Cum SA (1000 m2)                     0.90


CULVERT


RIVER: pipe1
REACH: two                RS: 3.3

INPUT
Description:
Distance from Upstream XS =       .5
Deck/Roadway Width        =      223
Weir Coefficient          =     1.44
Upstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0      67                8      67

Upstream Bridge Cross Section Data
Station Elevation Data     num=        6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0      67       2      67       2    63.2       6    63.2       6      67
       8      67

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .013       2    .013       6    .013

Bank Sta: Left   Right    Coeff Contr.   Expan.
             2       6             .1       .3

Downstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0    59.5                8    59.5

Downstream Bridge Cross Section Data
Station Elevation Data     num=        6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0    59.5       2    59.5       2   56.16       6   56.16       6    59.5
       8    59.5

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .013       2    .013       6    .013

Bank Sta: Left   Right    Coeff Contr.   Expan.
             2       6             .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =      67
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name      Shape      Rise     Span
Culvert #1            Box     2.74     2.74
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
              .5     223     .013     .013        0                  .6                 1
Upstream   Elevation =  63.2
           Centerline Station =  4
Downstream Elevation =  56.16
```

Centerline Station = 4

CULVERT OUTPUT Profile #100 year Culv Group: Culvert #1

Q Culv Group (m3/s)	26.36	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	4.55
Q Barrel (m3/s)	26.36	Culv Vel DS (m/s)	9.23
E.G. US. (m)	67.00	Culv Inv El Up (m)	63.20
W.S. US. (m)	66.84	Culv Inv El Dn (m)	56.16
E.G. DS (m)	59.09	Culv Frctn Ls (m)	4.83
W.S. DS (m)	58.77	Culv Exit Loss (m)	2.45
Delta EG (m)	7.91	Culv Entr Loss (m)	0.63
Delta WS (m)	8.07	Q Weir (m3/s)	
E.G. IC (m)	66.82	Weir Sta Lft (m)	
E.G. OC (m)	67.00	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	65.31	Weir Max Depth (m)	
Culv WS Outlet (m)	57.20	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.01	Weir Flow Area (m2)	
Culv Crt Depth (m)	2.11	Min El Weir Flow (m)	67.00

Note: During the supercritical calculations a hydraulic jump occurred at the outlet of (leaving) the culvert.

CROSS SECTION

RIVER: pipe1
REACH: two RS: 3

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	59.5	2	59.5	2	56.16	6	56.16	6	59.5
8	59.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	2	.013	6	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2	6	0	0	0	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	59.09	Element	Left OB	Channel	Right OB
Vel Head (m)	0.32	Wt. n-Val.		0.013	
W.S. Elev (m)	58.77	Reach Len. (m)	0.00	0.00	0.00
Crit W.S. (m)		Flow Area (m2)		10.44	
E.G. Slope (m/m)	0.000913	Area (m2)		10.44	
Q Total (m3/s)	26.36	Flow (m3/s)		26.36	
Top Width (m)	4.00	Top Width (m)		4.00	
Vel Total (m/s)	2.53	Avg. Vel. (m/s)		2.53	
Max Chl Dpth (m)	2.61	Hydr. Depth (m)		2.61	
Conv. Total (m3/s)	872.2	Conv. (m3/s)		872.2	
Length Wtd. (m)	0.00	Wetted Per. (m)		9.22	
Min Ch El (m)	56.16	Shear (N/m2)		10.14	
Alpha	1.00	Stream Power (N/m s)		25.61	
Frctn Loss (m)	0.00	Cum Volume (1000 m3)			
C & E Loss (m)	0.06	Cum SA (1000 m2)			

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: pipe1
REACH: one RS: 2

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	59.5	1	59.5	1	54.7	11	54.7	11	59.5
12	59.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	1	.013	11	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1	11	205	205	205	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	59.03	Element	Left OB	Channel	Right OB
Vel Head (m)	0.12	Wt. n-Val.		0.013	
W.S. Elev (m)	58.91	Reach Len. (m)	205.00	205.00	205.00
Crit W.S. (m)	56.31	Flow Area (m2)		42.13	
E.G. Slope (m/m)	0.000131	Area (m2)		42.13	
Q Total (m3/s)	64.42	Flow (m3/s)		64.42	
Top Width (m)	10.00	Top Width (m)		10.00	
Vel Total (m/s)	1.53	Avg. Vel. (m/s)		1.53	
Max Chl Dpth (m)	4.21	Hydr. Depth (m)		4.21	
Conv. Total (m3/s)	5625.2	Conv. (m3/s)		5625.2	
Length Wtd. (m)	205.00	Wetted Per. (m)		18.43	
Min Ch El (m)	54.70	Shear (N/m2)		2.94	
Alpha	1.00	Stream Power (N/m s)		4.50	
Frctn Loss (m)		Cum Volume (1000 m3)		14.43	
C & E Loss (m)		Cum SA (1000 m2)		5.87	

CULVERT

RIVER: pipe1
REACH: one RS: 1.8

INPUT
Description:
Distance from Upstream XS = .5
Deck/Roadway Width = 204
Weir Coefficient = 1.44
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	59.5		12	59.5	

Upstream Bridge Cross Section Data
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	59.5	1	59.5	1	54.7	11	54.7	11	59.5
12	59.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	1	.013	11	.013

Bank Sta: Left	Right	Coeff Contr.	Expan.
1	11	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	58.1		12	58.1	

Downstream Bridge Cross Section Data
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	58.1	1	58.1	1	54.15	11	54.15	11	58.1
12	58.1								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	1	.013	11	.013

Bank Sta: Left	Right	Coeff Contr.	Expan.
1	11	.1	.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 59.5
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Box	2.74	3.35

FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	.5	204	.013	.013	0	.6	1

Number of Barrels = 2
Upstream Elevation = 54.7
Centerline Stations

Sta.	Sta.
3.87	8.13

Downstream Elevation = 54.15
Centerline Stations

Sta.	Sta.
3.87	8.13

CULVERT OUTPUT Profile #100 year Culv Group: Culvert #1

Q Culv Group (m3/s)	64.42	Culv Full Len (m)	204.00
# Barrels	2	Culv Vel US (m/s)	3.51
Q Barrel (m3/s)	32.21	Culv Vel DS (m/s)	3.51
E.G. US. (m)	59.03	Culv Inv El Up (m)	54.70
W.S. US. (m)	58.91	Culv Inv El Dn (m)	54.15
E.G. DS (m)	57.61	Culv Frctn Ls (m)	0.62
W.S. DS (m)	57.41	Culv Exit Loss (m)	0.43
Delta EG (m)	1.42	Culv Entr Loss (m)	0.38
Delta WS (m)	1.50	Q Weir (m3/s)	
E.G. IC (m)	58.35	Weir Sta Lft (m)	
E.G. OC (m)	59.03	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	57.44	Weir Max Depth (m)	
Culv WS Outlet (m)	56.89	Weir Avg Depth (m)	
Culv Nml Depth (m)		Weir Flow Area (m2)	
Culv Crt Depth (m)	2.11	Min El Weir Flow (m)	59.50

CROSS SECTION

RIVER: pipe1
REACH: one RS: 1.51

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	58.1	1	58.1	1	54.15	11	54.15	11	58.1
12	58.1								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	1	.013	11	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1	11	1	1	1	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	57.61	Element	Left OB	Channel	Right OB
Vel Head (m)	0.20	Wt. n-Val.		0.013	
W.S. Elev (m)	57.41	Reach Len. (m)	1.00	1.00	1.00
Crit W.S. (m)		Flow Area (m2)		32.62	
E.G. Slope (m/m)	0.000266	Area (m2)		32.62	
Q Total (m3/s)	64.42	Flow (m3/s)		64.42	
Top Width (m)	10.00	Top Width (m)		10.00	
Vel Total (m/s)	1.97	Avg. Vel. (m/s)		1.97	
Max Chl Dpth (m)	3.26	Hydr. Depth (m)		3.26	
Conv. Total (m3/s)	3948.5	Conv. (m3/s)		3948.5	
Length Wtd. (m)	1.00	Wetted Per. (m)		16.52	
Min Ch El (m)	54.15	Shear (N/m2)		5.15	
Alpha	1.00	Stream Power (N/m s)		10.18	
Frctn Loss (m)	0.00	Cum Volume (1000 m3)		6.76	
C & E Loss (m)	0.00	Cum SA (1000 m2)		3.82	

CROSS SECTION

RIVER: pipe1
REACH: one RS: 1.5

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	58.1	1	58.1	1	54.15	11	54.15	11	58.1
12	58.1								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	1	.013	11	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1	11	167	167	167	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	57.61	Element	Left OB	Channel	Right OB
Vel Head (m)	0.23	Wt. n-Val.		0.013	
W.S. Elev (m)	57.38	Reach Len. (m)	167.00	167.00	167.00
Crit W.S. (m)	55.84	Flow Area (m2)		32.27	

E.G. Slope (m/m)	0.000311	Area (m2)	32.27
Q Total (m3/s)	68.59	Flow (m3/s)	68.59
Top Width (m)	10.00	Top Width (m)	10.00
Vel Total (m/s)	2.13	Avg. Vel. (m/s)	2.13
Max Chl Dpth (m)	3.23	Hydr. Depth (m)	3.23
Conv. Total (m3/s)	3889.3	Conv. (m3/s)	3889.3
Length Wtd. (m)	167.00	Wetted Per. (m)	16.45
Min Ch El (m)	54.15	Shear (N/m2)	5.98
Alpha	1.00	Stream Power (N/m s)	12.71
Frctn Loss (m)		Cum Volume (1000 m3)	6.73
C & E Loss (m)		Cum SA (1000 m2)	3.81

CULVERT

RIVER: pipe1
REACH: one RS: 1.2

INPUT
Description:
Distance from Upstream XS = .5
Deck/Roadway Width = 166
Weir Coefficient = 1.44
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	58.1		12	58.1	

Upstream Bridge Cross Section Data
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	58.1	1	58.1	1	54.15	11	54.15	11	58.1
12	58.1								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	1	.013	11	.013

Bank Sta: Left	Right	Coeff Contr.	Expan.
1	11	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	57.3		12	57.3	

Downstream Bridge Cross Section Data
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	57.3	1	57.3	1	53.85	11	53.85	11	57.3
12	57.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	1	.013	11	.013

Bank Sta: Left	Right	Coeff Contr.	Expan.
1	11	.1	.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 58.1
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Box	3.35	3.96

FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	.5	166	.013	.013	0	.6	1

Number of Barrels = 2
Upstream Elevation = 54.15
Centerline Stations

Sta.	Sta.
3.87	8.13

Downstream Elevation = 53.85
Centerline Stations

Sta.	Sta.
3.87	8.13

CULVERT OUTPUT Profile #100 year Culv Group: Culvert #1

Q Culv Group (m3/s)	68.59	Culv Full Len (m)	
# Barrels	2	Culv Vel US (m/s)	3.68
Q Barrel (m3/s)	34.30	Culv Vel DS (m/s)	4.40
E.G. US. (m)	57.61	Culv Inv El Up (m)	54.15
W.S. US. (m)	57.38	Culv Inv El Dn (m)	53.85
E.G. DS (m)	56.38	Culv Frctn Ls (m)	0.39
W.S. DS (m)	55.53	Culv Exit Loss (m)	0.43
Delta EG (m)	1.23	Culv Entr Loss (m)	0.41
Delta WS (m)	1.84	Q Weir (m3/s)	
E.G. IC (m)	57.32	Weir Sta Lft (m)	
E.G. OC (m)	57.61	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	56.50	Weir Max Depth (m)	
Culv WS Outlet (m)	55.82	Weir Avg Depth (m)	
Culv Nml Depth (m)	2.48	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.97	Min El Weir Flow (m)	58.10

CROSS SECTION

RIVER: pipe1
REACH: one RS: 1

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	57.3	1	57.3	1	53.85	11	53.85	11	57.3
12	57.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	1	.013	11	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1	11	1	1	1	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	56.38	Element	Left OB	Channel	Right OB
Vel Head (m)	0.84	Wt. n-Val.		0.013	
W.S. Elev (m)	55.53	Reach Len. (m)	1.00	1.00	1.00
Crit W.S. (m)	55.53	Flow Area (m2)		16.85	
E.G. Slope (m/m)	0.002057	Area (m2)		16.85	
Q Total (m3/s)	68.59	Flow (m3/s)		68.59	
Top Width (m)	10.00	Top Width (m)		10.00	
Vel Total (m/s)	4.07	Avg. Vel. (m/s)		4.07	
Max Chl Dpth (m)	1.69	Hydr. Depth (m)		1.69	
Conv. Total (m3/s)	1512.3	Conv. (m3/s)		1512.3	
Length Wtd. (m)	1.00	Wetted Per. (m)		13.37	
Min Ch El (m)	53.85	Shear (N/m2)		25.42	
Alpha	1.00	Stream Power (N/m s)		103.49	
Frctn Loss (m)	0.00	Cum Volume (1000 m3)		2.63	
C & E Loss (m)	0.02	Cum SA (1000 m2)		2.14	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: pipe1
REACH: one RS: 0.8

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	55.15	1.5	53.65	9.5	53.65	11	55.15

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	0	.013	11	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	11	83	83	83	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	56.34	Element	Left OB	Channel	Right OB
Vel Head (m)	1.20	Wt. n-Val.		0.013	
W.S. Elev (m)	55.14	Reach Len. (m)	83.00	83.00	83.00

Crit W.S. (m)	55.44	Flow Area (m2)	14.10
E.G. Slope (m/m)	0.003296	Area (m2)	14.10
Q Total (m3/s)	68.59	Flow (m3/s)	68.59
Top Width (m)	10.97	Top Width (m)	10.97
Vel Total (m/s)	4.86	Avg. Vel. (m/s)	4.86
Max Chl Dpth (m)	1.49	Hydr. Depth (m)	1.29
Conv. Total (m3/s)	1194.7	Conv. (m3/s)	1194.7
Length Wtd. (m)	83.00	Wetted Per. (m)	12.21
Min Ch El (m)	53.65	Shear (N/m2)	37.35
Alpha	1.00	Stream Power (N/m s)	181.64
Frctn Loss (m)	0.00	Cum Volume (1000 m3)	2.62
C & E Loss (m)	0.04	Cum SA (1000 m2)	2.13

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: pipe1
REACH: one RS: 0.5

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	54.75	1.5	53.25	9.5	53.25	11	54.75

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	0	.013	11	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	11	114	114	114	.1	.3

CROSS SECTION OUTPUT Profile #100 year

			Left OB	Channel	Right OB
E.G. Elev (m)	56.03	Element			
Vel Head (m)	1.37	Wt. n-Val.		0.013	
W.S. Elev (m)	54.66	Reach Len. (m)	114.00	114.00	114.00
Crit W.S. (m)	55.04	Flow Area (m2)		13.23	
E.G. Slope (m/m)	0.003977	Area (m2)		13.23	
Q Total (m3/s)	68.59	Flow (m3/s)		68.59	
Top Width (m)	10.81	Top Width (m)		10.81	
Vel Total (m/s)	5.18	Avg. Vel. (m/s)		5.18	
Max Chl Dpth (m)	1.41	Hydr. Depth (m)		1.22	
Conv. Total (m3/s)	1087.7	Conv. (m3/s)		1087.7	
Length Wtd. (m)	114.00	Wetted Per. (m)		11.98	
Min Ch El (m)	53.25	Shear (N/m2)		43.08	
Alpha	1.00	Stream Power (N/m s)		223.31	
Frctn Loss (m)	0.30	Cum Volume (1000 m3)		1.48	
C & E Loss (m)	0.02	Cum SA (1000 m2)		1.23	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: pipe1
REACH: one RS: 0.1

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	54.2	1.5	52.7	9.5	52.7	11	54.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	0	.013	11	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	11	0	0	0	.1	.3

CROSS SECTION OUTPUT Profile #100 year

			Left OB	Channel	Right OB
E.G. Elev (m)	55.54	Element			
Vel Head (m)	1.47	Wt. n-Val.		0.013	
W.S. Elev (m)	54.06	Reach Len. (m)			
Crit W.S. (m)	54.49	Flow Area (m2)		12.75	
E.G. Slope (m/m)	0.004439	Area (m2)		12.75	
Q Total (m3/s)	68.59	Flow (m3/s)		68.59	
Top Width (m)	10.72	Top Width (m)		10.72	

Vel Total (m/s)	5.38	Avg. Vel. (m/s)	5.38
Max Chl Dpth (m)	1.36	Hydr. Depth (m)	1.19
Conv. Total (m3/s)	1029.5	Conv. (m3/s)	1029.5
Length Wtd. (m)		Wetted Per. (m)	11.85
Min Ch El (m)	52.70	Shear (N/m2)	46.83
Alpha	1.00	Stream Power (N/m s)	251.95
Frctn Loss (m)	0.48	Cum Volume (1000 m3)	
C & E Loss (m)	0.01	Cum SA (1000 m2)	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: pipe2
REACH: two RS: 12

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	69.4	1.52	68.64	2.43	68.64	3.95	69.4

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	0	.013	3.95	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	3.95	160	160	160	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	70.05	Element	Left OB	Channel	Right OB
Vel Head (m)	0.38	Wt. n-Val.		0.013	
W.S. Elev (m)	69.67	Reach Len. (m)	160.00	160.00	160.00
Crit W.S. (m)	69.67	Flow Area (m2)		2.92	
E.G. Slope (m/m)	0.002456	Area (m2)		2.92	
Q Total (m3/s)	7.92	Flow (m3/s)		7.92	
Top Width (m)	3.95	Top Width (m)		3.95	
Vel Total (m/s)	2.72	Avg. Vel. (m/s)		2.72	
Max Chl Dpth (m)	1.03	Hydr. Depth (m)		0.74	
Conv. Total (m3/s)	159.8	Conv. (m3/s)		159.8	
Length Wtd. (m)	160.00	Wetted Per. (m)		4.85	
Min Ch El (m)	68.64	Shear (N/m2)		14.48	
Alpha	1.00	Stream Power (N/m s)		39.33	
Frctn Loss (m)	0.17	Cum Volume (1000 m3)		3.55	
C & E Loss (m)	0.07	Cum SA (1000 m2)		1.73	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: pipe2
REACH: two RS: 11.1

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	62.4	1.52	61.64	2.43	61.64	3.95	62.4

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	0	.013	3.95	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	3.95	1	1	1	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	68.27	Element	Left OB	Channel	Right OB
Vel Head (m)	6.22	Wt. n-Val.		0.013	
W.S. Elev (m)	62.05	Reach Len. (m)	1.00	1.00	1.00

Crit W.S. (m)	62.67	Flow Area (m2)	0.72
E.G. Slope (m/m)	0.124271	Area (m2)	0.72
Q Total (m3/s)	7.92	Flow (m3/s)	7.92
Top Width (m)	2.56	Top Width (m)	2.56
Vel Total (m/s)	11.05	Avg. Vel. (m/s)	11.05
Max Chl Dpth (m)	0.41	Hydr. Depth (m)	0.28
Conv. Total (m3/s)	22.5	Conv. (m3/s)	22.5
Length Wtd. (m)	1.00	Wetted Per. (m)	2.76
Min Ch El (m)	61.64	Shear (N/m2)	316.89
Alpha	1.00	Stream Power (N/m s)	3500.79
Frctn Loss (m)	1.19	Cum Volume (1000 m3)	3.26
C & E Loss (m)	0.58	Cum SA (1000 m2)	1.21

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: pipe2
REACH: two RS: 11

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	63	3	63	3	60.58	5	60.58	5	63
8	63								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
3	5	355	355	355	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	68.04	Element	Left OB	Channel	Right OB
Vel Head (m)	7.13	Wt. n-Val.		0.013	
W.S. Elev (m)	60.91	Reach Len. (m)	355.00	355.00	355.00
Crit W.S. (m)	61.75	Flow Area (m2)		0.67	
E.G. Slope (m/m)	0.149494	Area (m2)		0.67	
Q Total (m3/s)	7.92	Flow (m3/s)		7.92	
Top Width (m)	2.00	Top Width (m)		2.00	
Vel Total (m/s)	11.83	Avg. Vel. (m/s)		11.83	
Max Chl Dpth (m)	0.33	Hydr. Depth (m)		0.33	
Conv. Total (m3/s)	20.5	Conv. (m3/s)		20.5	
Length Wtd. (m)	355.00	Wetted Per. (m)		2.67	
Min Ch El (m)	60.58	Shear (N/m2)		367.71	
Alpha	1.00	Stream Power (N/m s)		4349.57	
Frctn Loss (m)	0.14	Cum Volume (1000 m3)		3.26	
C & E Loss (m)	0.09	Cum SA (1000 m2)		1.21	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CULVERT

RIVER: pipe2
REACH: two RS: 10.5

INPUT
Description:
Distance from Upstream XS = .5
Deck/Roadway Width = 354
Weir Coefficient = 1.44
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	63		8	63	

Upstream Bridge Cross Section Data
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	63	3	63	3	60.58	5	60.58	5	63
8	63								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

```
ank Sta: Left   Right    Coeff Contr.   Expan.
            3       5              .1       .3

Downstream  Deck/Roadway Coordinates
   num=       2
    Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      0    61.5               8    61.5

Downstream Bridge Cross Section Data
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0    61.5       3    61.5       3   57.37       5   57.37       5    61.5
       8    61.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .013       3    .013       5    .013

Bank Sta: Left   Right    Coeff Contr.   Expan.
            3       5              .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =      63
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts = 1

Culvert Name     Shape      Rise    Span
Culvert #1      Circular    1.67
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                .5     354     .013     .013        0                .6                 1
Upstream   Elevation =  60.58
           Centerline Station =  4
Downstream Elevation =  57.37
           Centerline Station =  4

CULVERT OUTPUT  Profile #100 year  Culv Group:  Culvert #1

  Q Culv Group (m3/s)        6.28    Culv Full Len (m)        354.00
  # Barrels                     1    Culv Vel US (m/s)          9.19
  Q Barrel (m3/s)            6.28    Culv Vel DS (m/s)          2.87
  E.G. US. (m)              68.04    Culv Inv El Up (m)        60.58
  W.S. US. (m)              68.04    Culv Inv El Dn (m)        57.37
  E.G. DS (m)               61.09    Culv Frctn Ls (m)          3.96
  W.S. DS (m)               61.03    Culv Exit Loss (m)         0.42
  Delta EG (m)               6.95    Culv Entr Loss (m)         2.58
  Delta WS (m)               7.01    Q Weir (m3/s)
  E.G. IC (m)                        Weir Sta Lft (m)           0.00
  E.G. OC (m)                        Weir Sta Rgt (m)           8.00
  Culvert Control          Outlet    Weir Submerg               0.00
  Culv WS Inlet (m)          61.16   Weir Max Depth (m)         0.27
  Culv WS Outlet (m)         59.04   Weir Avg Depth (m)         0.27
  Culv Nml Depth (m)                 Weir Flow Area (m2)        2.18
  Culv Crt Depth (m)          1.41   Min El Weir Flow (m)      63.00


Note:    During supercritical analysis, the culvert direct step method went to normal depth.  The program
         then assumed normal depth at the outlet.
Note:    During the supercritical calculations a hydraulic jump occurred inside of the culvert.

CROSS SECTION


RIVER: pipe2
REACH: two                RS: 10.1

INPUT
Description:
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0    61.5       3    61.5       3   57.37       5   57.37       5    61.5
       8    61.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .013       3    .013       5    .013

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            3       5                 1       1       1              .1       .3
```

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	61.09	Element	Left OB	Channel	Right OB
Vel Head (m)	0.06	Wt. n-Val.		0.013	
W.S. Elev (m)	61.03	Reach Len. (m)	1.00	1.00	1.00
Crit W.S. (m)		Flow Area (m2)		7.32	
E.G. Slope (m/m)	0.000273	Area (m2)		7.32	
Q Total (m3/s)	7.92	Flow (m3/s)		7.92	
Top Width (m)	2.00	Top Width (m)		2.00	
Vel Total (m/s)	1.08	Avg. Vel. (m/s)		1.08	
Max Chl Dpth (m)	3.66	Hydr. Depth (m)		3.66	
Conv. Total (m3/s)	479.1	Conv. (m3/s)		479.1	
Length Wtd. (m)	1.00	Wetted Per. (m)		9.32	
Min Ch El (m)	57.37	Shear (N/m2)		2.10	
Alpha	1.00	Stream Power (N/m s)		2.28	
Frctn Loss (m)	0.00	Cum Volume (1000 m3)		1.84	
C & E Loss (m)	0.01	Cum SA (1000 m2)		0.50	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: pipe2
REACH: two RS: 10

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	61.5	2	61.5	2	57.12	6	57.12	6	61.5
8	61.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	2	.013	6	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2	6	32	32	32	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	61.08	Element	Left OB	Channel	Right OB
Vel Head (m)	0.02	Wt. n-Val.		0.013	
W.S. Elev (m)	61.06	Reach Len. (m)	32.00	32.00	32.00
Crit W.S. (m)	57.99	Flow Area (m2)		15.74	
E.G. Slope (m/m)	0.000049	Area (m2)		15.74	
Q Total (m3/s)	10.28	Flow (m3/s)		10.28	
Top Width (m)	4.00	Top Width (m)		4.00	
Vel Total (m/s)	0.65	Avg. Vel. (m/s)		0.65	
Max Chl Dpth (m)	3.94	Hydr. Depth (m)		3.94	
Conv. Total (m3/s)	1461.4	Conv. (m3/s)		1461.4	
Length Wtd. (m)	32.00	Wetted Per. (m)		11.87	
Min Ch El (m)	57.12	Shear (N/m2)		0.64	
Alpha	1.00	Stream Power (N/m s)		0.42	
Frctn Loss (m)		Cum Volume (1000 m3)		1.83	
C & E Loss (m)		Cum SA (1000 m2)		0.50	

Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CULVERT

RIVER: pipe2
REACH: two RS: 9.5

INPUT
Description:
Distance from Upstream XS = .5
Deck/Roadway Width = 31
Weir Coefficient = 1.44
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	61.5		8	61.5	

Upstream Bridge Cross Section Data
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	61.5	2	61.5	2	57.12	6	57.12	6	61.5
8	61.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	2	.013	6	.013

```
Bank Sta: Left   Right    Coeff Contr.   Expan.
            2       6              .1       .3

Downstream  Deck/Roadway Coordinates
   num=        2
    Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
      0      61                8      61

Downstream Bridge Cross Section Data
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0      61       2      61       2   56.91       6   56.91       6      61
       8      61

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .013       2    .013       6    .013

Bank Sta: Left   Right    Coeff Contr.   Expan.
            2       6              .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =    61.5
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1      Circular    1.67
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                .5      31     .013     .013        0                .6                 1
Number of Barrels =  2
Upstream   Elevation =  57.12
Centerline Stations
    Sta.    Sta.
    3.09    4.91
Downstream Elevation =  56.91
Centerline Stations
    Sta.    Sta.
    3.09    4.91

CULVERT OUTPUT  Profile #100 year  Culv Group:  Culvert #1

  Q Culv Group (m3/s)       10.28    Culv Full Len (m)        31.00
  # Barrels                     2    Culv Vel US (m/s)         2.35
  Q Barrel (m3/s)            5.14    Culv Vel DS (m/s)         2.35
  E.G. US. (m)              61.08    Culv Inv El Up (m)       57.12
  W.S. US. (m)              61.06    Culv Inv El Dn (m)       56.91
  E.G. DS (m)               60.56    Culv Frctn Ls (m)         0.09
  W.S. DS (m)               60.54    Culv Exit Loss (m)        0.25
  Delta EG (m)               0.52    Culv Entr Loss (m)        0.17
  Delta WS (m)               0.52    Q Weir (m3/s)
  E.G. IC (m)               58.96    Weir Sta Lft (m)
  E.G. OC (m)               61.08    Weir Sta Rgt (m)
  Culvert Control          Outlet    Weir Submerg
  Culv WS Inlet (m)         58.79    Weir Max Depth (m)
  Culv WS Outlet (m)        58.58    Weir Avg Depth (m)
  Culv Nml Depth (m)                 Weir Flow Area (m2)
  Culv Crt Depth (m)         1.15    Min El Weir Flow (m)     61.50


CROSS SECTION


RIVER: pipe2
REACH: two                RS: 9.1

INPUT
Description:
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0      61       2      61       2   56.91       6   56.91       6      61
       8      61

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .013       2    .013       6    .013

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            2       6                 1       1       1              .1       .3
```

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	60.56	Element	Left OB	Channel	Right OB
Vel Head (m)	0.03	Wt. n-Val.		0.013	
W.S. Elev (m)	60.54	Reach Len. (m)	1.00	1.00	1.00
Crit W.S. (m)		Flow Area (m2)		14.50	
E.G. Slope (m/m)	0.000061	Area (m2)		14.50	
Q Total (m3/s)	10.28	Flow (m3/s)		10.28	
Top Width (m)	4.00	Top Width (m)		4.00	
Vel Total (m/s)	0.71	Avg. Vel. (m/s)		0.71	
Max Chl Dpth (m)	3.63	Hydr. Depth (m)		3.63	
Conv. Total (m3/s)	1321.2	Conv. (m3/s)		1321.2	
Length Wtd. (m)	1.00	Wetted Per. (m)		11.25	
Min Ch El (m)	56.91	Shear (N/m2)		0.77	
Alpha	1.00	Stream Power (N/m s)		0.54	
Frctn Loss (m)	0.00	Cum Volume (1000 m3)		1.34	
C & E Loss (m)	0.00	Cum SA (1000 m2)		0.37	

CROSS SECTION

RIVER: pipe2
REACH: two RS: 9

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	61	2	61	2	56.91	6	56.91	6	61
8	61								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	2	.013	6	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
2	6	91	91	91	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	60.56	Element	Left OB	Channel	Right OB
Vel Head (m)	0.03	Wt. n-Val.		0.013	
W.S. Elev (m)	60.54	Reach Len. (m)	91.00	91.00	91.00
Crit W.S. (m)	57.78	Flow Area (m2)		14.50	
E.G. Slope (m/m)	0.000061	Area (m2)		14.50	
Q Total (m3/s)	10.28	Flow (m3/s)		10.28	
Top Width (m)	4.00	Top Width (m)		4.00	
Vel Total (m/s)	0.71	Avg. Vel. (m/s)		0.71	
Max Chl Dpth (m)	3.63	Hydr. Depth (m)		3.63	
Conv. Total (m3/s)	1321.2	Conv. (m3/s)		1321.2	
Length Wtd. (m)	91.00	Wetted Per. (m)		11.25	
Min Ch El (m)	56.91	Shear (N/m2)		0.77	
Alpha	1.00	Stream Power (N/m s)		0.54	
Frctn Loss (m)		Cum Volume (1000 m3)		1.33	
C & E Loss (m)		Cum SA (1000 m2)		0.36	

CULVERT

RIVER: pipe2
REACH: two RS: 8.5

INPUT
Description:
Distance from Upstream XS = .5
Deck/Roadway Width = 90
Weir Coefficient = 1.44
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	61		8	61	

Upstream Bridge Cross Section Data
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	61	2	61	2	56.91	6	56.91	6	61
8	61								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	2	.013	6	.013

Bank Sta: Left	Right	Coeff Contr.	Expan.
2	6	.1	.3

```
Downstream  Deck/Roadway Coordinates
   num=        2
    Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
      0      60                8      60

Downstream Bridge Cross Section Data
Station Elevation Data     num=        6
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0       60        2       60        2    56.17        6    56.17        6       60
       8       60

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
       0     .013        2     .013        6     .013

Bank Sta: Left    Right     Coeff Contr.    Expan.
             2        6              .1        .3

Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =      .95
Elevation at which weir flow begins           =      61
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Culverts =  1

Culvert Name      Shape       Rise     Span
Culvert #1       Circular     1.67
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria - Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                .5      90     .013     .013        0                  .6                  1
Number of Barrels =  2
Upstream   Elevation =  56.91
Centerline Stations
    Sta.     Sta.
    3.09     4.91
Downstream Elevation =  56.17
Centerline Stations
    Sta.     Sta.
    3.09     4.91

CULVERT OUTPUT  Profile #100 year  Culv Group:  Culvert #1

  Q Culv Group (m3/s)       10.28    Culv Full Len (m)        90.00
  # Barrels                     2    Culv Vel US (m/s)         2.35
  Q Barrel (m3/s)            5.14    Culv Vel DS (m/s)         2.35
  E.G. US. (m)              60.56    Culv Inv El Up (m)       56.91
  W.S. US. (m)              60.54    Culv Inv El Dn (m)       56.17
  E.G. DS (m)               59.87    Culv Frctn Ls (m)         0.27
  W.S. DS (m)               59.84    Culv Exit Loss (m)        0.26
  Delta EG (m)               0.69    Culv Entr Loss (m)        0.17
  Delta WS (m)               0.69    Q Weir (m3/s)
  E.G. IC (m)               58.75    Weir Sta Lft (m)
  E.G. OC (m)               60.56    Weir Sta Rgt (m)
  Culvert Control          Outlet    Weir Submerg
  Culv WS Inlet (m)         58.58    Weir Max Depth (m)
  Culv WS Outlet (m)        57.84    Weir Avg Depth (m)
  Culv Nml Depth (m)                 Weir Flow Area (m2)
  Culv Crt Depth (m)         1.15    Min El Weir Flow (m)     61.00


CROSS SECTION


RIVER: pipe2
REACH: two                  RS: 8

INPUT
Description:
Station Elevation Data     num=        6
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0       60        2       60        2    56.17        6    56.17        6       60
       8       60

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
       0     .013        2     .013        6     .013

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
             2        6                  0       0        0               .1        .3

CROSS SECTION OUTPUT  Profile #100 year

  E.G. Elev (m)             59.87    Element                   Left OB    Channel   Right OB
```

Vel Head (m)	0.02	Wt. n-Val.			0.013	
W.S. Elev (m)	59.84	Reach Len. (m)		0.00	0.00	0.00
Crit W.S. (m)		Flow Area (m2)			14.70	
E.G. Slope (m/m)	0.000059	Area (m2)			14.70	
Q Total (m3/s)	10.28	Flow (m3/s)			10.28	
Top Width (m)	4.00	Top Width (m)			4.00	
Vel Total (m/s)	0.70	Avg. Vel. (m/s)			0.70	
Max Chl Dpth (m)	3.67	Hydr. Depth (m)			3.67	
Conv. Total (m3/s)	1343.0	Conv. (m3/s)			1343.0	
Length Wtd. (m)	0.00	Wetted Per. (m)			11.35	
Min Ch El (m)	56.17	Shear (N/m2)			0.74	
Alpha	1.00	Stream Power (N/m s)			0.52	
Frctn Loss (m)	0.00	Cum Volume (1000 m3)				
C & E Loss (m)	0.01	Cum SA (1000 m2)				

CROSS SECTION

RIVER: pipe2
REACH: one RS: 7

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	60	1	60	1	55.5	7	55.5	7	60
8	60								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	1	.013	7	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1	7	102	102	102	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	59.86	Element	Left OB	Channel	Right OB
Vel Head (m)	0.09	Wt. n-Val.		0.013	
W.S. Elev (m)	59.78	Reach Len. (m)	102.00	102.00	102.00
Crit W.S. (m)	56.97	Flow Area (m2)		25.66	
E.G. Slope (m/m)	0.000135	Area (m2)		25.66	
Q Total (m3/s)	33.44	Flow (m3/s)		33.44	
Top Width (m)	6.00	Top Width (m)		6.00	
Vel Total (m/s)	1.30	Avg. Vel. (m/s)		1.30	
Max Chl Dpth (m)	4.28	Hydr. Depth (m)		4.28	
Conv. Total (m3/s)	2880.3	Conv. (m3/s)		2880.3	
Length Wtd. (m)	102.00	Wetted Per. (m)		14.55	
Min Ch El (m)	55.50	Shear (N/m2)		2.33	
Alpha	1.00	Stream Power (N/m s)		3.04	
Frctn Loss (m)		Cum Volume (1000 m3)		2.61	
C & E Loss (m)		Cum SA (1000 m2)		0.61	

CULVERT

RIVER: pipe2
REACH: one RS: 6.5

INPUT
Description:
Distance from Upstream XS = .5
Deck/Roadway Width = 101
Weir Coefficient = 1.44
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	60		8	60	

Upstream Bridge Cross Section Data
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	60	1	60	1	55.5	7	55.5	7	60
8	60								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	1	.013	7	.013

Bank Sta: Left	Right	Coeff Contr.	Expan.
1	7	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	59.5		8	59.5	

Downstream Bridge Cross Section Data
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	59.5	1	59.5	1	54.7	7	54.7	7	59.5
8	59.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	1	.013	7	.013

Bank Sta: Left	Right	Coeff Contr.	Expan.
1	7	.1	.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 60
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Box	3.35	3.35

FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria - Highest U.S. EG

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	.5	101	.013	.013	0	.6	1

Upstream Elevation = 55.5
Centerline Station = 4
Downstream Elevation = 54.7
Centerline Station = 4

CULVERT OUTPUT Profile #100 year Culv Group: Culvert #1

Q Culv Group (m3/s)	33.44	Culv Full Len (m)	101.00
# Barrels	1	Culv Vel US (m/s)	2.98
Q Barrel (m3/s)	33.44	Culv Vel DS (m/s)	2.98
E.G. US. (m)	59.86	Culv Inv El Up (m)	55.50
W.S. US. (m)	59.78	Culv Inv El Dn (m)	54.70
E.G. DS (m)	59.04	Culv Frctn Ls (m)	0.19
W.S. DS (m)	58.95	Culv Exit Loss (m)	0.36
Delta EG (m)	0.83	Culv Entr Loss (m)	0.27
Delta WS (m)	0.83	Q Weir (m3/s)	
E.G. IC (m)	58.99	Weir Sta Lft (m)	
E.G. OC (m)	59.86	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	58.85	Weir Max Depth (m)	
Culv WS Outlet (m)	58.05	Weir Avg Depth (m)	
Culv Nml Depth (m)		Weir Flow Area (m2)	
Culv Crt Depth (m)	2.17	Min El Weir Flow (m)	60.00

CROSS SECTION

RIVER: pipe2
REACH: one RS: 6

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	59.5	1	59.5	1	54.7	7	54.7	7	59.5
8	59.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	1	.013	7	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
1	7	0	0	1	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	59.04	Element	Left OB	Channel	Right OB
Vel Head (m)	0.09	Wt. n-Val.		0.013	
W.S. Elev (m)	58.95	Reach Len. (m)	0.00	0.00	0.00
Crit W.S. (m)		Flow Area (m2)		25.49	
E.G. Slope (m/m)	0.000137	Area (m2)		25.49	
Q Total (m3/s)	33.44	Flow (m3/s)		33.44	
Top Width (m)	6.00	Top Width (m)		6.00	
Vel Total (m/s)	1.31	Avg. Vel. (m/s)		1.31	
Max Chl Dpth (m)	4.25	Hydr. Depth (m)		4.25	
Conv. Total (m3/s)	2856.1	Conv. (m3/s)		2856.1	

Length Wtd. (m)	0.00	Wetted Per. (m)	14.50
Min Ch El (m)	54.70	Shear (N/m2)	2.36
Alpha	1.00	Stream Power (N/m s)	3.10
Frctn Loss (m)	0.00	Cum Volume (1000 m3)	
C & E Loss (m)	0.00	Cum SA (1000 m2)	

CROSS SECTION

RIVER: pipe3
REACH: two RS: 17

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	78	3	78	3	76.49	5	76.49	5	78
8	78								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
3	5	190	190	190	.1	.3

CROSS SECTION OUTPUT Profile #100 year

			Left OB	Channel	Right OB
E.G. Elev (m)	77.44	Element			
Vel Head (m)	0.01	Wt. n-Val.		0.013	
W.S. Elev (m)	77.43	Reach Len. (m)	190.00	190.00	190.00
Crit W.S. (m)	76.74	Flow Area (m2)		1.89	
E.G. Slope (m/m)	0.000075	Area (m2)		1.89	
Q Total (m3/s)	0.78	Flow (m3/s)		0.78	
Top Width (m)	2.00	Top Width (m)		2.00	
Vel Total (m/s)	0.41	Avg. Vel. (m/s)		0.41	
Max Chl Dpth (m)	0.95	Hydr. Depth (m)		0.95	
Conv. Total (m3/s)	89.8	Conv. (m3/s)		89.8	
Length Wtd. (m)	190.00	Wetted Per. (m)		3.89	
Min Ch El (m)	76.49	Shear (N/m2)		0.36	
Alpha	1.00	Stream Power (N/m s)		0.15	
Frctn Loss (m)		Cum Volume (1000 m3)		1.59	
C & E Loss (m)		Cum SA (1000 m2)		1.17	

CULVERT

RIVER: pipe3
REACH: two RS: 16.8

INPUT
Description:
Distance from Upstream XS = .5
Deck/Roadway Width = 189
Weir Coefficient = 1.44
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	78		8	78	

Upstream Bridge Cross Section Data
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	78	3	78	3	76.49	5	76.49	5	78
8	78								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left	Right	Coeff Contr.	Expan.
3	5	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	75		8	75	

Downstream Bridge Cross Section Data
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	75	3	75	3	73.34	5	73.34	5	75
8	75								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

0	.013	3	.013	5	.013

Bank Sta: Left	Right	Coeff Contr.	Expan.
3	5	.1	.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 78
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Circular	.76	

FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	.5	189	.013	.013	0	.6	1

Upstream Elevation = 76.49
Centerline Station = 4
Downstream Elevation = 73.34
Centerline Station = 4

CULVERT OUTPUT Profile #100 year Culv Group: Culvert #1

Q Culv Group (m3/s)	0.78	Culv Full Len (m)	40.53
# Barrels	1	Culv Vel US (m/s)	2.24
Q Barrel (m3/s)	0.78	Culv Vel DS (m/s)	1.72
E.G. US. (m)	77.44	Culv Inv El Up (m)	76.49
W.S. US. (m)	77.43	Culv Inv El Dn (m)	73.34
E.G. DS (m)	74.59	Culv Frctn Ls (m)	2.55
W.S. DS (m)	74.59	Culv Exit Loss (m)	0.15
Delta EG (m)	2.85	Culv Entr Loss (m)	0.15
Delta WS (m)	2.85	Q Weir (m3/s)	
E.G. IC (m)	77.38	Weir Sta Lft (m)	
E.G. OC (m)	77.44	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	77.04	Weir Max Depth (m)	
Culv WS Outlet (m)	74.10	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.39	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.55	Min El Weir Flow (m)	78.00

CROSS SECTION

RIVER: pipe3
REACH: two RS: 16.51

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	75	3	75	3	73.34	5	73.34	5	75
8	75								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
3	5	1	1	1	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	74.59	Element	Left OB	Channel	Right OB
Vel Head (m)	0.00	Wt. n-Val.		0.013	
W.S. Elev (m)	74.59	Reach Len. (m)	1.00	1.00	1.00
Crit W.S. (m)		Flow Area (m2)		2.50	
E.G. Slope (m/m)	0.000036	Area (m2)		2.50	
Q Total (m3/s)	0.78	Flow (m3/s)		0.78	
Top Width (m)	2.00	Top Width (m)		2.00	
Vel Total (m/s)	0.31	Avg. Vel. (m/s)		0.31	
Max Chl Dpth (m)	1.25	Hydr. Depth (m)		1.25	
Conv. Total (m3/s)	129.9	Conv. (m3/s)		129.9	
Length Wtd. (m)	1.00	Wetted Per. (m)		4.50	
Min Ch El (m)	73.34	Shear (N/m2)		0.20	
Alpha	1.00	Stream Power (N/m s)		0.06	
Frctn Loss (m)	0.00	Cum Volume (1000 m3)		1.17	
C & E Loss (m)	0.00	Cum SA (1000 m2)		0.79	

CROSS SECTION

RIVER: pipe3
REACH: two RS: 16.5

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	75	3	75	3	73.34	5	73.34	5	75
8	75								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
3	5	243	243	243	.1	.3

CROSS SECTION OUTPUT Profile #100 year

			Left OB	Channel	Right OB
E.G. Elev (m)	74.59	Element			
Vel Head (m)	0.02	Wt. n-Val.		0.013	
W.S. Elev (m)	74.57	Reach Len. (m)	243.00	243.00	243.00
Crit W.S. (m)	73.73	Flow Area (m2)		2.47	
E.G. Slope (m/m)	0.000149	Area (m2)		2.47	
Q Total (m3/s)	1.56	Flow (m3/s)		1.56	
Top Width (m)	2.00	Top Width (m)		2.00	
Vel Total (m/s)	0.63	Avg. Vel. (m/s)		0.63	
Max Chl Dpth (m)	1.23	Hydr. Depth (m)		1.23	
Conv. Total (m3/s)	127.6	Conv. (m3/s)		127.6	
Length Wtd. (m)	243.00	Wetted Per. (m)		4.47	
Min Ch El (m)	73.34	Shear (N/m2)		0.81	
Alpha	1.00	Stream Power (N/m s)		0.51	
Frctn Loss (m)		Cum Volume (1000 m3)		1.17	
C & E Loss (m)		Cum SA (1000 m2)		0.79	

CULVERT

RIVER: pipe3
REACH: two RS: 16.2

INPUT
Description:
Distance from Upstream XS = .5
Deck/Roadway Width = 242
Weir Coefficient = 1.44
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	75		8	75	

Upstream Bridge Cross Section Data
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	75	3	75	3	73.34	5	73.34	5	75
8	75								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left	Right	Coeff Contr.	Expan.
3	5	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	72.5		8	72.5	

Downstream Bridge Cross Section Data
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	72.5	3	72.5	3	70.69	5	70.69	5	72.5
8	72.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left	Right	Coeff Contr.	Expan.
3	5	.1	.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 75

Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Circular	.91	

FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	.5	242	.013	.013	0	.6	1

Upstream Elevation = 73.34
Centerline Station = 4
Downstream Elevation = 70.69
Centerline Station = 4

CULVERT OUTPUT Profile #100 year Culv Group: Culvert #1

Q Culv Group (m3/s)	1.56	Culv Full Len (m)	242.00
# Barrels	1	Culv Vel US (m/s)	2.40
Q Barrel (m3/s)	1.56	Culv Vel DS (m/s)	2.40
E.G. US. (m)	74.59	Culv Inv El Up (m)	73.34
W.S. US. (m)	74.57	Culv Inv El Dn (m)	70.69
E.G. DS (m)	72.44	Culv Frctn Ls (m)	1.82
W.S. DS (m)	72.43	Culv Exit Loss (m)	0.28
Delta EG (m)	2.15	Culv Entr Loss (m)	0.18
Delta WS (m)	2.14	Q Weir (m3/s)	
E.G. IC (m)	74.70	Weir Sta Lft (m)	
E.G. OC (m)	74.59	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	74.25	Weir Max Depth (m)	
Culv WS Outlet (m)	71.60	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.62	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.73	Min El Weir Flow (m)	75.00

CROSS SECTION

RIVER: pipe3
REACH: two RS: 16.1

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	72.5	3	72.5	3	70.69	5	70.69	5	72.5
8	72.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
3	5	1	1	1	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	72.44	Element	Left OB	Channel	Right OB
Vel Head (m)	0.01	Wt. n-Val.		0.013	
W.S. Elev (m)	72.43	Reach Len. (m)	1.00	1.00	1.00
Crit W.S. (m)		Flow Area (m2)		3.48	
E.G. Slope (m/m)	0.000062	Area (m2)		3.48	
Q Total (m3/s)	1.56	Flow (m3/s)		1.56	
Top Width (m)	2.00	Top Width (m)		2.00	
Vel Total (m/s)	0.45	Avg. Vel. (m/s)		0.45	
Max Chl Dpth (m)	1.74	Hydr. Depth (m)		1.74	
Conv. Total (m3/s)	198.0	Conv. (m3/s)		198.0	
Length Wtd. (m)	1.00	Wetted Per. (m)		5.48	
Min Ch El (m)	70.69	Shear (N/m2)		0.39	
Alpha	1.00	Stream Power (N/m s)		0.17	
Frctn Loss (m)	0.00	Cum Volume (1000 m3)		0.44	
C & E Loss (m)	0.00	Cum SA (1000 m2)		0.31	

CROSS SECTION

RIVER: pipe3
REACH: two RS: 16

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	72.5	3	72.5	3	70.69	5	70.69	5	72.5

```
      8    72.5

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
       0    .013       3    .013        5    .013

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             3       5              152     152     152              .1       .3

CROSS SECTION OUTPUT  Profile #100 year

  E.G. Elev (m)             72.44    Element                  Left OB    Channel   Right OB
  Vel Head (m)               0.03    Wt. n-Val.                          0.013
  W.S. Elev (m)             72.41    Reach Len. (m)           152.00    152.00     152.00
  Crit W.S. (m)             71.24    Flow Area (m2)                       3.44
  E.G. Slope (m/m)       0.000178    Area (m2)                            3.44
  Q Total (m3/s)             2.60    Flow (m3/s)                          2.60
  Top Width (m)              2.00    Top Width (m)                        2.00
  Vel Total (m/s)            0.76    Avg. Vel. (m/s)                      0.76
  Max Chl Dpth (m)           1.72    Hydr. Depth (m)                      1.72
  Conv. Total (m3/s)        195.0    Conv. (m3/s)                        195.0
  Length Wtd. (m)          152.00    Wetted Per. (m)                      5.44
  Min Ch El (m)             70.69    Shear (N/m2)                         1.10
  Alpha                      1.00    Stream Power (N/m s)                 0.83
  Frctn Loss (m)                     Cum Volume (1000 m3)                 0.44
  C & E Loss (m)                     Cum SA (1000 m2)                     0.30


CULVERT


RIVER: pipe3
REACH: two                RS: 15.5

INPUT
Description:
Distance from Upstream XS =       .5
Deck/Roadway Width        =      151
Weir Coefficient          =     1.44
Upstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0    72.5                8    72.5

Upstream Bridge Cross Section Data
Station Elevation Data    num=        6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
       0    72.5        3    72.5        3   70.69        5   70.69        5    72.5
       8    72.5

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
       0    .013       3    .013        5    .013

Bank Sta: Left   Right    Coeff Contr.   Expan.
             3       5              .1       .3

Downstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0      67                8      67

Downstream Bridge Cross Section Data
Station Elevation Data    num=        6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
       0      67        3      67        3   65.19        5   65.19        5      67
       8      67

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
       0    .013       3    .013        5    .013

Bank Sta: Left   Right    Coeff Contr.   Expan.
             3       5              .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =    72.5
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name      Shape      Rise    Span
Culvert #1       Circular   1.066
FHWA Chart # 1 - Concrete Pipe Culvert
```

FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	.5	151	.013	.013	0	.6	1

Upstream Elevation = 70.69
Centerline Station = 4
Downstream Elevation = 65.19
Centerline Station = 4

CULVERT OUTPUT Profile #100 year Culv Group: Culvert #1

Q Culv Group (m3/s)	2.60	Culv Full Len (m)	3.96
# Barrels	1	Culv Vel US (m/s)	2.91
Q Barrel (m3/s)	2.60	Culv Vel DS (m/s)	2.91
E.G. US. (m)	72.44	Culv Inv El Up (m)	70.69
W.S. US. (m)	72.41	Culv Inv El Dn (m)	65.19
E.G. DS (m)	66.43	Culv Frctn Ls (m)	5.39
W.S. DS (m)	66.37	Culv Exit Loss (m)	0.37
Delta EG (m)	6.01	Culv Entr Loss (m)	0.26
Delta WS (m)	6.04	Q Weir (m3/s)	
E.G. IC (m)	72.49	Weir Sta Lft (m)	
E.G. OC (m)	72.44	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	71.76	Weir Max Depth (m)	
Culv WS Outlet (m)	66.26	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.52	Weir Flow Area (m2)	
Culv Crt Depth (m)	0.90	Min El Weir Flow (m)	72.50

CROSS SECTION

RIVER: pipe3
REACH: two RS: 15

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	67	3	67	3	65.19	5	65.19	5	67
8	67								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
3	5	0	0	0	.1	.3

CROSS SECTION OUTPUT Profile #100 year

			Left OB	Channel	Right OB
E.G. Elev (m)	66.43	Element			
Vel Head (m)	0.06	Wt. n-Val.		0.013	
W.S. Elev (m)	66.37	Reach Len. (m)	0.00	0.00	0.00
Crit W.S. (m)		Flow Area (m2)		2.35	
E.G. Slope (m/m)	0.000468	Area (m2)		2.35	
Q Total (m3/s)	2.60	Flow (m3/s)		2.60	
Top Width (m)	2.00	Top Width (m)		2.00	
Vel Total (m/s)	1.10	Avg. Vel. (m/s)		1.10	
Max Chl Dpth (m)	1.18	Hydr. Depth (m)		1.18	
Conv. Total (m3/s)	120.1	Conv. (m3/s)		120.1	
Length Wtd. (m)	0.00	Wetted Per. (m)		4.35	
Min Ch El (m)	65.19	Shear (N/m2)		2.48	
Alpha	1.00	Stream Power (N/m s)		2.74	
Frctn Loss (m)	0.00	Cum Volume (1000 m3)			
C & E Loss (m)	0.00	Cum SA (1000 m2)			

CROSS SECTION

RIVER: pipe3
REACH: one RS: 14

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	67	3	67	3	64.28	5	64.28	5	67
8	67								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
3	5	198	198	198	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	66.43	Element	Left OB	Channel	Right OB
Vel Head (m)	0.06	Wt. n-Val.		0.013	
W.S. Elev (m)	66.37	Reach Len. (m)	198.00	198.00	198.00
Crit W.S. (m)	65.09	Flow Area (m2)		4.17	
E.G. Slope (m/m)	0.000348	Area (m2)		4.17	
Q Total (m3/s)	4.61	Flow (m3/s)		4.61	
Top Width (m)	2.00	Top Width (m)		2.00	
Vel Total (m/s)	1.10	Avg. Vel. (m/s)		1.10	
Max Chl Dpth (m)	2.09	Hydr. Depth (m)		2.09	
Conv. Total (m3/s)	247.3	Conv. (m3/s)		247.3	
Length Wtd. (m)	198.00	Wetted Per. (m)		6.17	
Min Ch El (m)	64.28	Shear (N/m2)		2.30	
Alpha	1.00	Stream Power (N/m s)		2.54	
Frctn Loss (m)		Cum Volume (1000 m3)		1.05	
C & E Loss (m)		Cum SA (1000 m2)		0.40	

CULVERT

RIVER: pipe3
REACH: one RS: 13.5

INPUT
Description:
Distance from Upstream XS = .5
Deck/Roadway Width = 197
Weir Coefficient = 1.44
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	67		8	67	

Upstream Bridge Cross Section Data
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	67	3	67	3	64.28	5	64.28	5	67
8	67								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left	Right	Coeff Contr.	Expan.
3	5	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	59.5		8	59.5	

Downstream Bridge Cross Section Data
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	59.5	3	59.5	3	55.82	5	55.82	5	59.5
8	59.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left	Right	Coeff Contr.	Expan.
3	5	.1	.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 67
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Circular	1.37	

FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	.5	197	.013	.013	0	.6	1

Upstream Elevation = 64.28
Centerline Station = 4
Downstream Elevation = 55.82
Centerline Station = 4

CULVERT OUTPUT Profile #100 year Culv Group: Culvert #1

Q Culv Group (m3/s)	4.61	Culv Full Len (m)	50.63
# Barrels	1	Culv Vel US (m/s)	3.13
Q Barrel (m3/s)	4.61	Culv Vel DS (m/s)	3.13
E.G. US. (m)	66.43	Culv Inv El Up (m)	64.28
W.S. US. (m)	66.37	Culv Inv El Dn (m)	55.82
E.G. DS (m)	59.04	Culv Frctn Ls (m)	6.63
W.S. DS (m)	59.02	Culv Exit Loss (m)	0.47
Delta EG (m)	7.39	Culv Entr Loss (m)	0.30
Delta WS (m)	7.35	Q Weir (m3/s)	
E.G. IC (m)	66.45	Weir Sta Lft (m)	
E.G. OC (m)	66.43	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	65.65	Weir Max Depth (m)	
Culv WS Outlet (m)	57.19	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.60	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.14	Min El Weir Flow (m)	67.00

CROSS SECTION

RIVER: pipe3
REACH: one RS: 13

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	59.5	3	59.5	3	55.82	5	55.82	5	59.5
8	59.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.013	3	.013	5	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
3	5	0	0	0	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (m)	59.04	Element	Left OB	Channel	Right OB
Vel Head (m)	0.03	Wt. n-Val.		0.013	
W.S. Elev (m)	59.02	Reach Len. (m)	0.00	0.00	0.00
Crit W.S. (m)		Flow Area (m2)		6.39	
E.G. Slope (m/m)	0.000126	Area (m2)		6.39	
Q Total (m3/s)	4.61	Flow (m3/s)		4.61	
Top Width (m)	2.00	Top Width (m)		2.00	
Vel Total (m/s)	0.72	Avg. Vel. (m/s)		0.72	
Max Chl Dpth (m)	3.20	Hydr. Depth (m)		3.20	
Conv. Total (m3/s)	409.9	Conv. (m3/s)		409.9	
Length Wtd. (m)	0.00	Wetted Per. (m)		8.39	
Min Ch El (m)	55.82	Shear (N/m2)		0.94	
Alpha	1.00	Stream Power (N/m s)		0.68	
Frctn Loss (m)	0.00	Cum Volume (1000 m3)			
C & E Loss (m)	0.01	Cum SA (1000 m2)			

SUMMARY OF MANNING'S N VALUES

River:pipe4

Reach	River Sta.	n1	n2	n3
one	19	.013	.013	.013
one	18.8	Culvert		
one	18.51	.013	.013	.013
one	18.5	.013	.013	.013
one	18.3	Culvert		
one	18.1	.013	.013	.013
one	18	.013	.013	.013
one	17.8	Culvert		
one	17.5	.013	.013	.013

River:pipe5

Reach	River Sta.	n1	n2	n3
one	22	.013	.013	.013
one	21.5	Culvert		
one	21.1	.013	.013	.013
one	21	.013	.013	.013
one	20.5	Culvert		
one	20	.013	.013	.013

River:pipe1

Reach	River Sta.	n1	n2	n3
two	5	.013	.013	.013
two	4.5	.013	.013	.013
two	4.1	.013	.013	.013
two	4	.013	.013	.013
two	3.8	Culvert		
two	3.51	.013	.013	.013
two	3.5	.013	.013	.013
two	3.3	Culvert		
two	3	.013	.013	.013
one	2	.013	.013	.013
one	1.8	Culvert		
one	1.51	.013	.013	.013
one	1.5	.013	.013	.013
one	1.2	Culvert		
one	1	.013	.013	.013
one	0.8	.013	.013	.013
one	0.5	.013	.013	.013
one	0.1	.013	.013	.013

River:pipe2

Reach	River Sta.	n1	n2	n3
two	12	.013	.013	.013
two	11.1	.013	.013	.013
two	11	.013	.013	.013
two	10.5	Culvert		
two	10.1	.013	.013	.013
two	10	.013	.013	.013
two	9.5	Culvert		
two	9.1	.013	.013	.013
two	9	.013	.013	.013
two	8.5	Culvert		
two	8	.013	.013	.013
one	7	.013	.013	.013
one	6.5	Culvert		
one	6	.013	.013	.013

River:pipe3

Reach	River Sta.	n1	n2	n3
two	17	.013	.013	.013
two	16.8	Culvert		
two	16.51	.013	.013	.013
two	16.5	.013	.013	.013
two	16.2	Culvert		
two	16.1	.013	.013	.013
two	16	.013	.013	.013
two	15.5	Culvert		
two	15	.013	.013	.013
one	14	.013	.013	.013
one	13.5	Culvert		
one	13	.013	.013	.013

SUMMARY OF REACH LENGTHS

River: pipe4

Reach	River Sta.	Left	Channel	Right
one	19	190	190	190
one	18.8	Culvert		
one	18.51	1	1	1
one	18.5	130	130	130
one	18.3	Culvert		
one	18.1	1	1	1
one	18	127	127	127
one	17.8	Culvert		
one	17.5	0	0	0

River: pipe5

Reach	River Sta.	Left	Channel	Right
one	22	454	454	454

one	21.5	Culvert		
one	21.1	1	1	1
one	21	195	195	195
one	20.5	Culvert		
one	20	0	0	0

River: pipe1

Reach	River Sta.	Left	Channel	Right
two	5	160	160	160
two	4.5	145	145	145
two	4.1	1	1	1
two	4	221	221	221
two	3.8	Culvert		
two	3.51	1	1	1
two	3.5	224	224	224
two	3.3	Culvert		
two	3	0	0	0
one	2	205	205	205
one	1.8	Culvert		
one	1.51	1	1	1
one	1.5	167	167	167
one	1.2	Culvert		
one	1	1	1	1
one	0.8	83	83	83
one	0.5	114	114	114
one	0.1	0	0	0

River: pipe2

Reach	River Sta.	Left	Channel	Right
two	12	160	160	160
two	11.1	1	1	1
two	11	355	355	355
two	10.5	Culvert		
two	10.1	1	1	1
two	10	32	32	32
two	9.5	Culvert		
two	9.1	1	1	1
two	9	91	91	91
two	8.5	Culvert		
two	8	0	0	0
one	7	102	102	102
one	6.5	Culvert		
one	6	0	0	1

River: pipe3

Reach	River Sta.	Left	Channel	Right
two	17	190	190	190
two	16.8	Culvert		
two	16.51	1	1	1
two	16.5	243	243	243
two	16.2	Culvert		
two	16.1	1	1	1
two	16	152	152	152
two	15.5	Culvert		
two	15	0	0	0
one	14	198	198	198
one	13.5	Culvert		
one	13	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: pipe4

Reach	River Sta.	Contr.	Expan.
one	19	.1	.3
one	18.8	Culvert	
one	18.51	.1	.3
one	18.5	.1	.3
one	18.3	Culvert	
one	18.1	.1	.3
one	18	.1	.3
one	17.8	Culvert	
one	17.5	.1	.3

River: pipe5

Reach	River Sta.	Contr.	Expan.
one	22	.1	.3
one	21.5	Culvert	
one	21.1	.1	.3
one	21	.1	.3
one	20.5	Culvert	
one	20	.1	.3

River: pipe1

Reach	River Sta.	Contr.	Expan.
two	5	.1	.3
two	4.5	.1	.3
two	4.1	.1	.3
two	4	.1	.3
two	3.8	Culvert	
two	3.51	.1	.3
two	3.5	.1	.3
two	3.3	Culvert	
two	3	.1	.3
one	2	.1	.3
one	1.8	Culvert	
one	1.51	.1	.3
one	1.5	.1	.3
one	1.2	Culvert	
one	1	.1	.3
one	0.8	.1	.3
one	0.5	.1	.3
one	0.1	.1	.3

River: pipe2

Reach	River Sta.	Contr.	Expan.
two	12	.1	.3
two	11.1	.1	.3
two	11	.1	.3
two	10.5	Culvert	
two	10.1	.1	.3
two	10	.1	.3
two	9.5	Culvert	
two	9.1	.1	.3
two	9	.1	.3
two	8.5	Culvert	
two	8	.1	.3
one	7	.1	.3
one	6.5	Culvert	
one	6	.1	.3

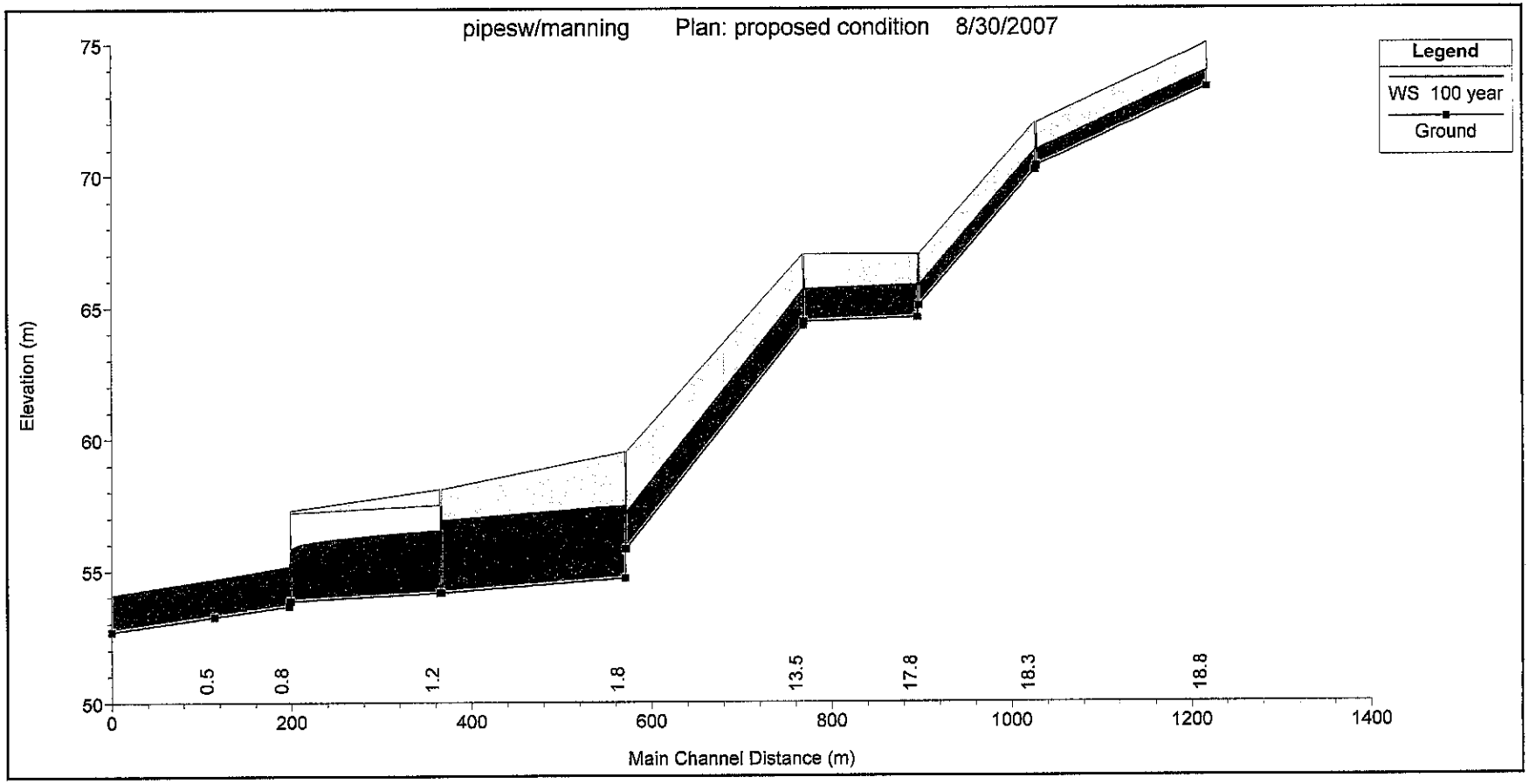
River: pipe3

Reach	River Sta.	Contr.	Expan.
two	17	.1	.3
two	16.8	Culvert	
two	16.51	.1	.3
two	16.5	.1	.3
two	16.2	Culvert	
two	16.1	.1	.3
two	16	.1	.3
two	15.5	Culvert	
two	15	.1	.3
one	14	.1	.3
one	13.5	Culvert	
one	13	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
two	17	100 year	0.78	76.49	77.43	76.74	77.44	0.000075	0.41	1.89	2.00	0.14
two	16.8		Culvert									
two	16.51	100 year	0.78	73.34	74.59		74.59	0.000036	0.31	2.50	2.00	0.09
two	16.5	100 year	1.56	73.34	74.57	73.73	74.59	0.000149	0.63	2.47	2.00	0.18
two	16.2		Culvert									
two	16.1	100 year	1.56	70.69	72.43		72.44	0.000062	0.45	3.48	2.00	0.11
two	16	100 year	2.60	70.69	72.41	71.24	72.44	0.000178	0.76	3.44	2.00	0.18
two	15.5		Culvert									
two	15	100 year	2.60	65.19	66.37		66.43	0.000468	1.10	2.35	2.00	0.33

one	14	100 year	4.61	64.28	66.37	65.09	66.43	0.000348	1.10	4.17	2.00	0.24
one	13.5		Culvert									
one	13	100 year	4.61	55.82	59.02		59.04	0.000126	0.72	6.39	2.00	0.13
two	12	100 year	7.92	68.64	69.67	69.67	70.05	0.002456	2.72	2.92	3.95	1.01
two	11.1	100 year	7.92	61.64	62.05	62.67	68.27	0.124271	11.05	0.72	2.56	6.67
two	11	100 year	7.92	60.58	60.91	61.75	68.04	0.149494	11.83	0.67	2.00	6.53
two	10.5		Culvert									
two	10.1	100 year	7.92	57.37	61.03		61.09	0.000273	1.08	7.32	2.00	0.18
two	10	100 year	10.28	57.12	61.06	57.99	61.08	0.000049	0.65	15.74	4.00	0.11
two	9.5		Culvert									
two	9.1	100 year	10.28	56.91	60.54		60.56	0.000061	0.71	14.50	4.00	0.12
two	9	100 year	10.28	56.91	60.54	57.78	60.56	0.000061	0.71	14.50	4.00	0.12
two	8.5		Culvert									
two	8	100 year	10.28	56.17	59.84		59.87	0.000059	0.70	14.70	4.00	0.12
one	7	100 year	33.44	55.50	59.78	56.97	59.86	0.000135	1.30	25.66	6.00	0.20
one	6.5		Culvert									
one	6	100 year	33.44	54.70	58.95		59.04	0.000137	1.31	25.49	6.00	0.20
two	5	100 year	0.70	76.34	76.65	76.65	76.76	0.003043	1.48	0.47	2.15	1.01
two	4.5	100 year	23.95	72.17	73.40	73.90	75.13	0.009556	5.83	4.11	5.17	2.09
two	4.1	100 year	23.95	68.34	69.34	70.07	72.81	0.026228	8.25	2.90	4.92	3.43
two	4	100 year	23.95	66.36	69.77	67.90	69.93	0.000383	1.76	13.64	4.00	0.30
two	3.8		Culvert									
two	3.51	100 year	23.95	63.66	66.83		67.01	0.000461	1.89	12.66	4.00	0.34
two	3.5	100 year	26.36	63.20	66.84	64.84	67.00	0.000395	1.81	14.54	4.00	0.30
two	3.3		Culvert									
two	3	100 year	26.36	56.16	58.77		59.09	0.000913	2.53	10.44	4.00	0.50
one	2	100 year	64.42	54.70	58.91	56.31	59.03	0.000131	1.53	42.13	10.00	0.24
one	1.8		Culvert									
one	1.51	100 year	64.42	54.15	57.41		57.61	0.000266	1.97	32.62	10.00	0.35
one	1.5	100 year	68.59	54.15	57.38	55.84	57.61	0.000311	2.13	32.27	10.00	0.38
one	1.2		Culvert									
one	1	100 year	68.59	53.85	55.53	55.53	56.38	0.002057	4.07	16.85	10.00	1.00
one	0.8	100 year	68.59	53.65	55.14	55.44	56.34	0.003296	4.86	14.10	10.97	1.37
one	0.5	100 year	68.59	53.25	54.66	55.04	56.03	0.003977	5.18	13.23	10.81	1.50
one	0.1	100 year	68.59	52.70	54.06	54.49	55.54	0.004439	5.38	12.75	10.72	1.58
one	22	100 year	14.98	59.16	62.17	60.28	62.24	0.000206	1.25	12.02	4.00	0.23
one	21.5		Culvert									
one	21.1	100 year	14.98	56.50	60.18		60.23	0.000124	1.02	14.72	4.00	0.17
one	21	100 year	20.09	56.50	60.19	57.54	60.23	0.000071	0.91	22.13	6.00	0.15
one	20.5		Culvert									
one	20	100 year	20.09	55.50	59.84		59.87	0.000047	0.77	26.03	6.00	0.12
one	19	100 year	0.60	73.34	74.30	73.55	74.30	0.000043	0.31	1.91	2.00	0.10
one	18.8		Culvert									
one	18.51	100 year	0.60	70.34	71.52		71.52	0.000025	0.26	2.35	2.00	0.08
one	18.5	100 year	1.20	70.19	71.51	70.52	71.52	0.000074	0.46	2.64	2.00	0.13
one	18.3		Culvert									
one	18.1	100 year	1.20	65.04	66.96		66.97	0.000029	0.31	3.85	2.00	0.07
one	18	100 year	2.01	64.59	66.96	65.06	66.97	0.000049	0.42	4.74	2.00	0.09
one	17.8		Culvert									
one	17.5	100 year	2.01	64.43	66.42		66.43	0.000074	0.50	3.98	2.00	0.11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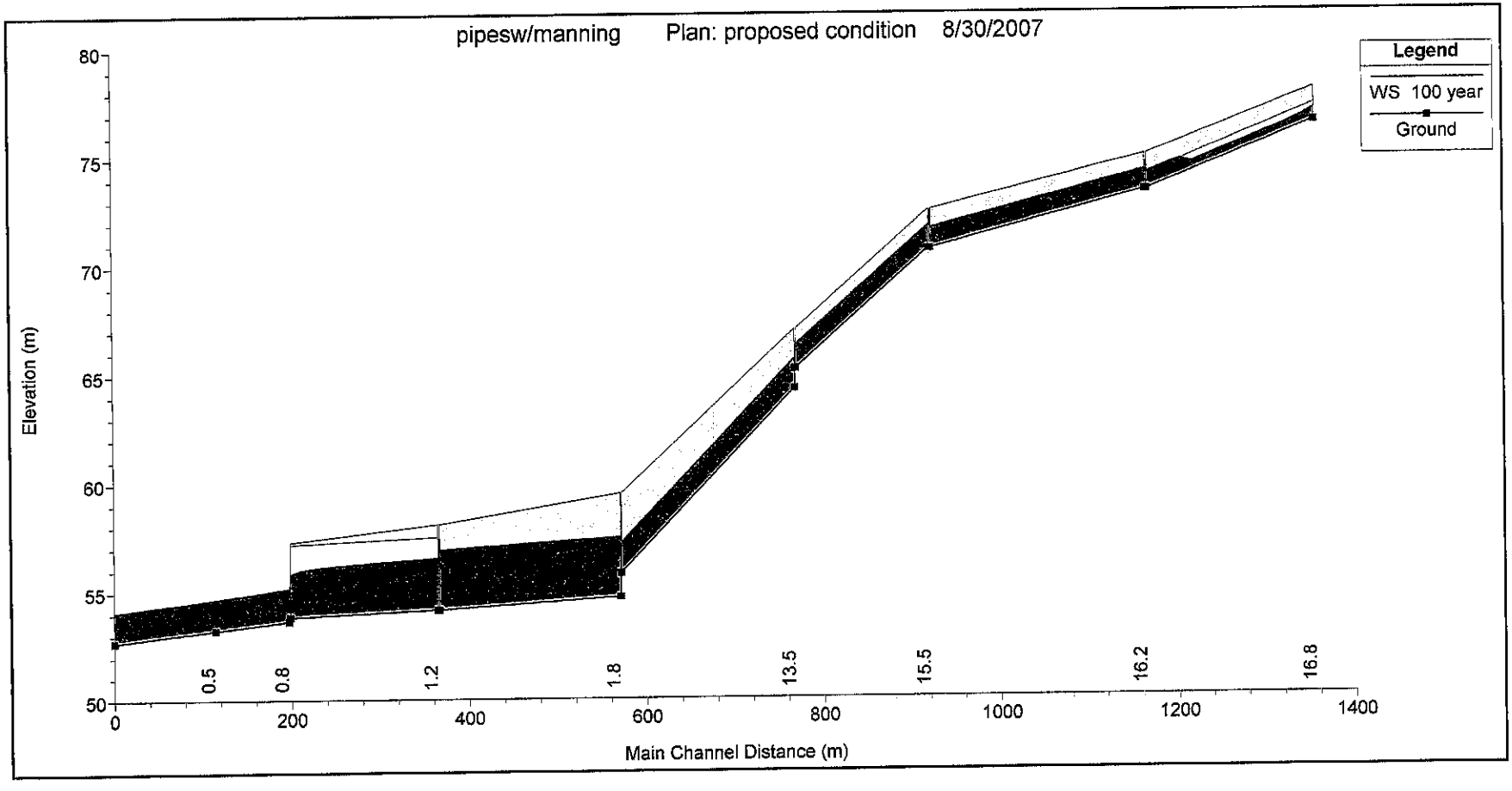
Legend
WS 100 year
Ground
Elevation (m)
75
70
65
60
55
50
0
200
400
600
800
1000
1200
1400
Main Channel Distance (m)
0.5
0.8
1.2
1.8
13.5
17.8
18.3
18.8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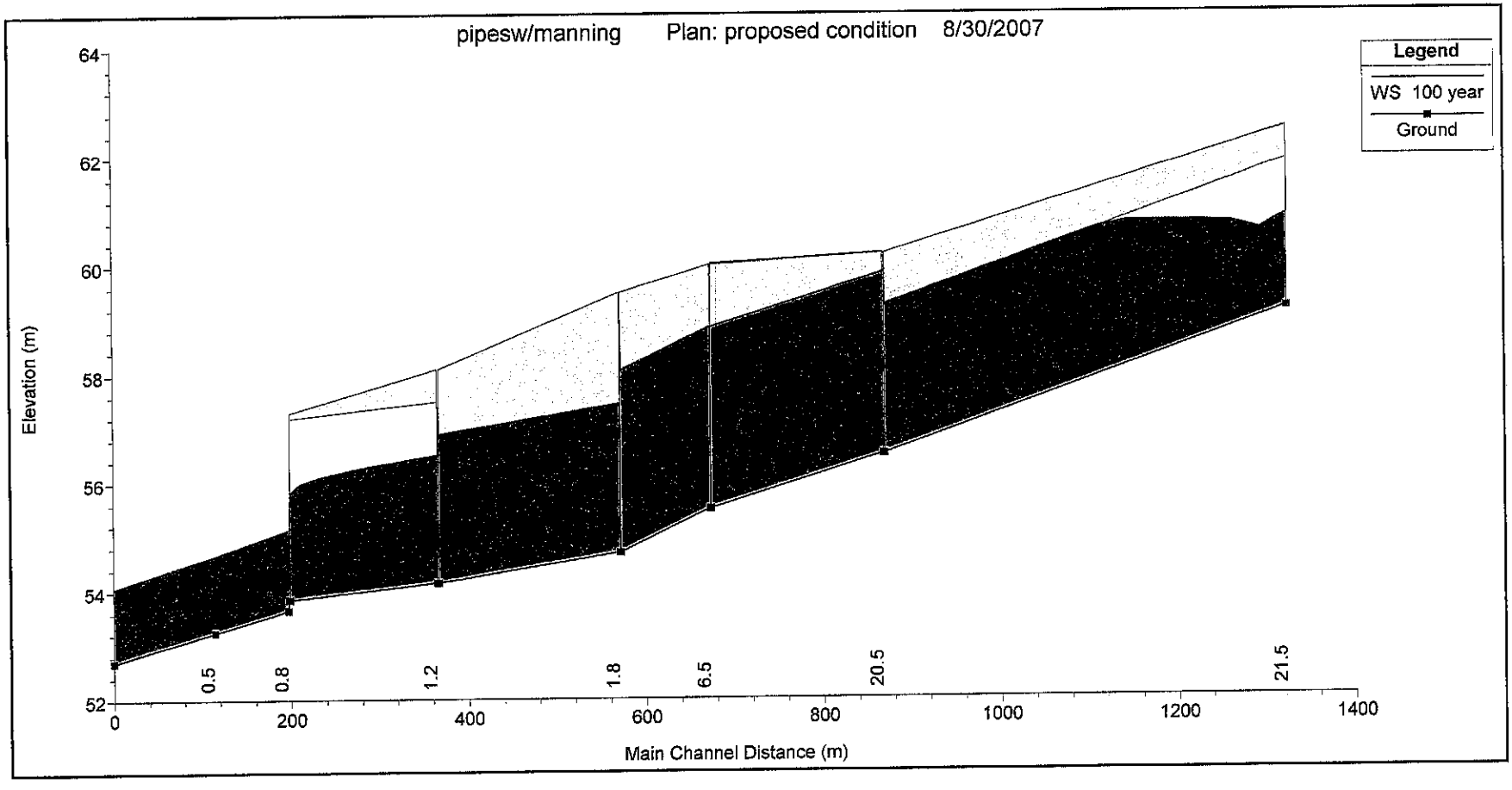
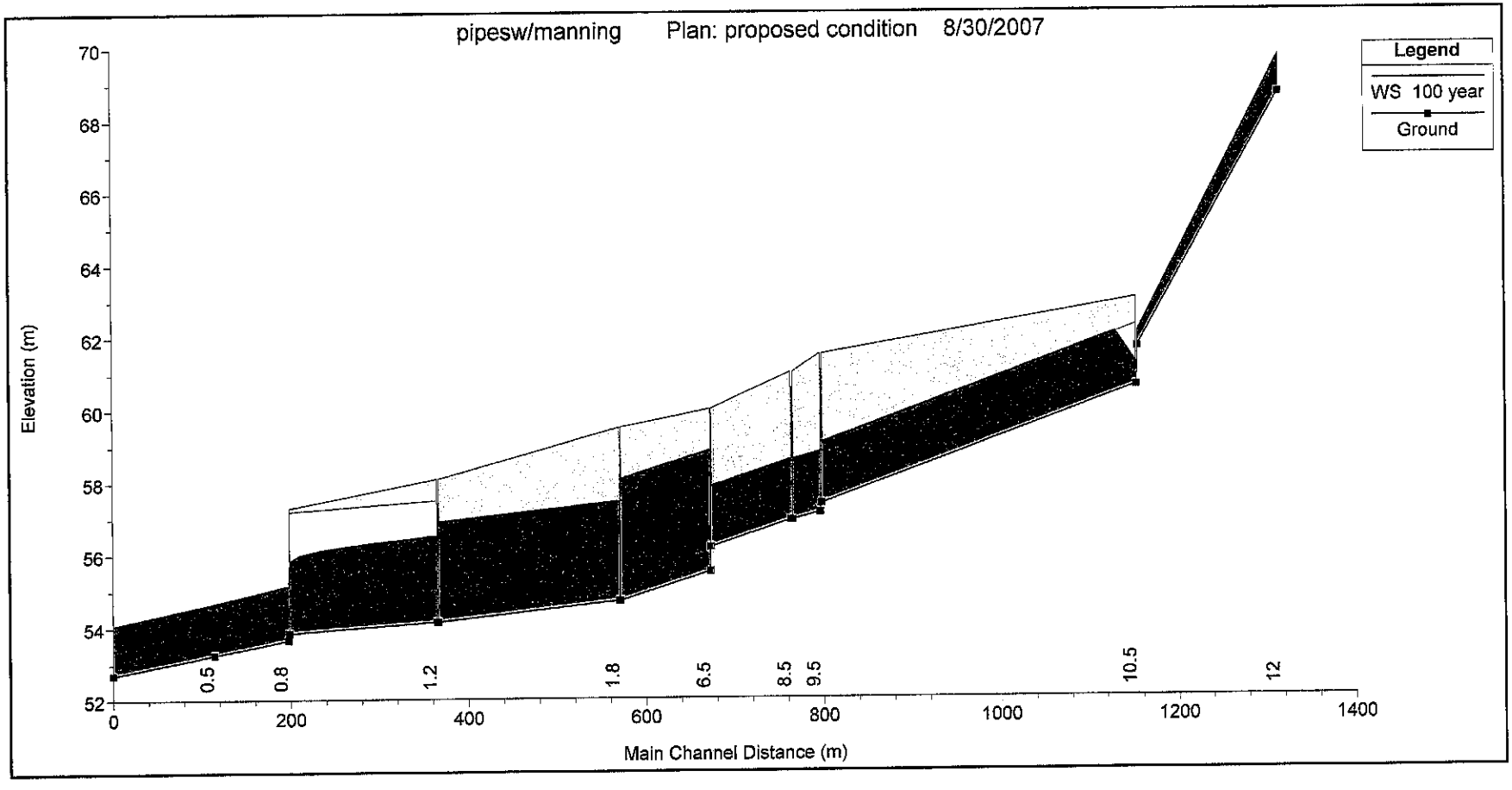
Legend
WS 100 year
Ground
Elevation (m)
80
75
70
65
60
55
50
0
200
400
600
800
1000
1200
1400
Main Channel Distance (m)
0.5
0.8
1.2
1.8
13.5
15.5
16.2
16.8


pipesw/manning Plan: proposed condition 8/30/2007
Legend
WS 100 year
Ground
Elevation (m)
64
62
60
58
56
54
52
0
200
400
600
800
1000
1200
1400
Main Channel Distance (m)
0.5
0.8
1.2
1.8
6.5
20.5
21.5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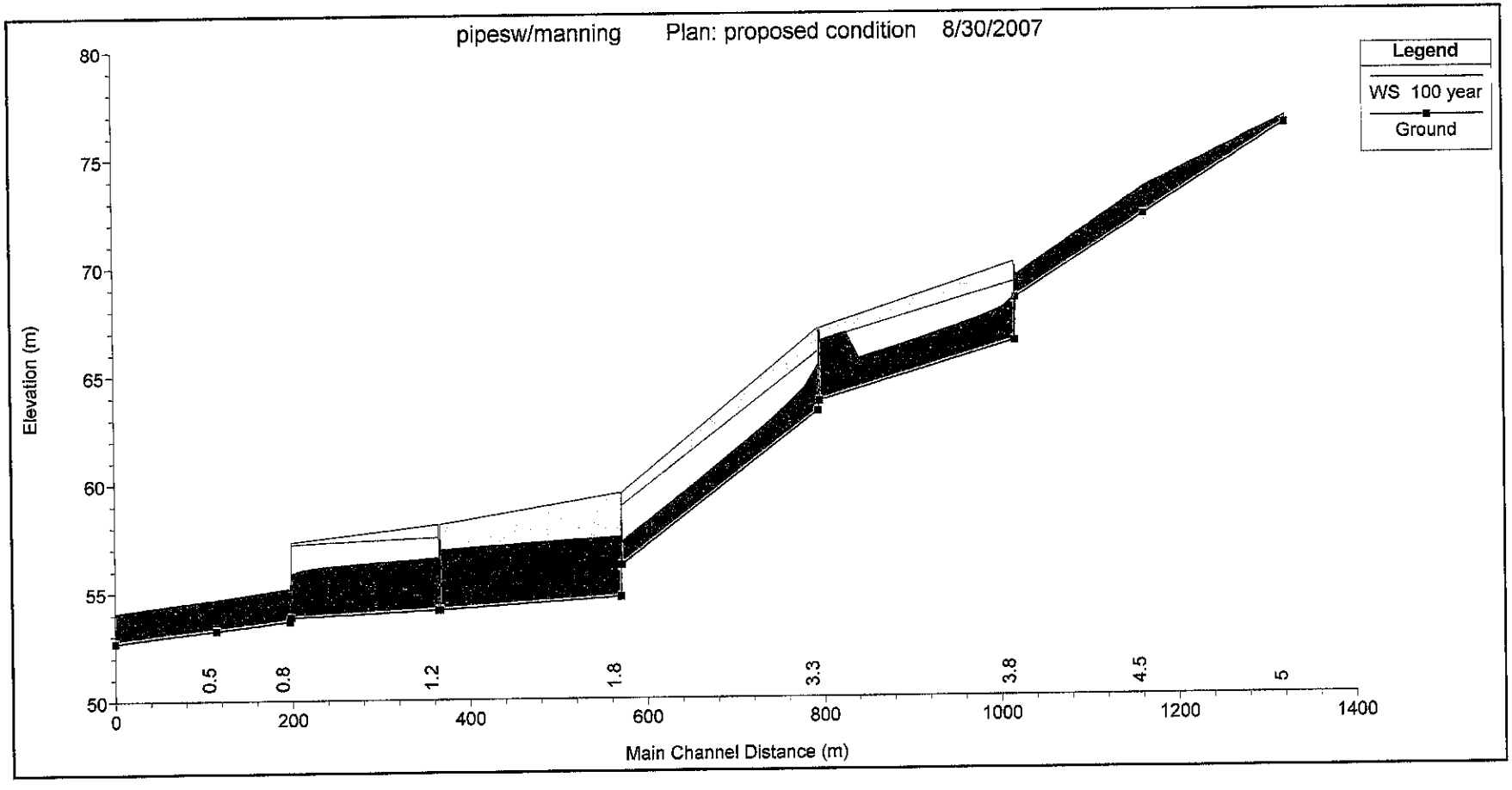
Legend
WS 100 year
Ground
Elevation (m)
70
68
66
64
62
60
58
56
54
52
0
200
400
600
800
1000
1200
1400
Main Channel Distance (m)
0.5
0.8
1.2
1.8
6.5
8.5
9.5
10.5
12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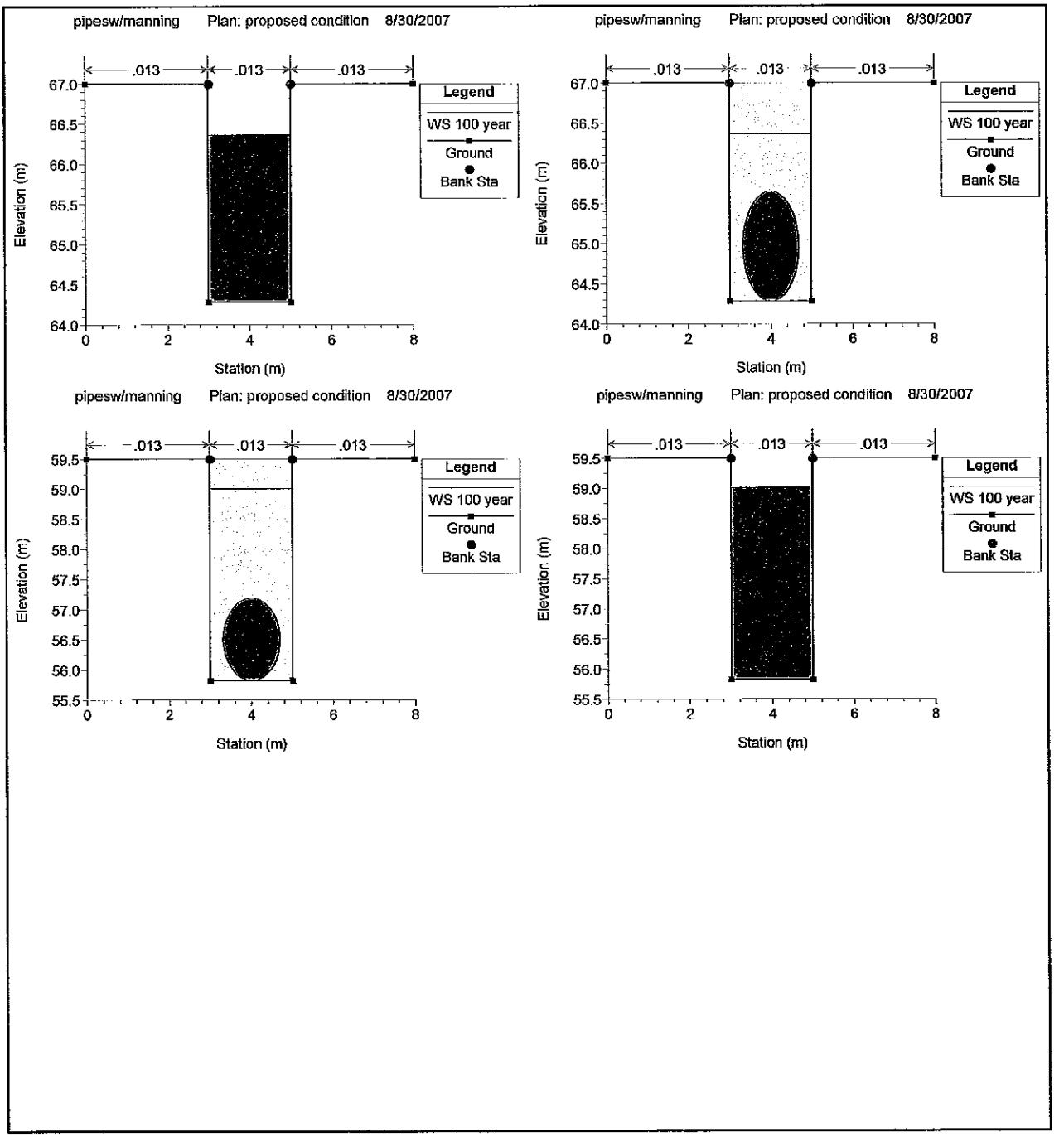
Legend
WS 100 year
Ground
Elevation (m)
80
75
70
65
60
55
50
0
200
400
600
800
1000
1200
1400
Main Channel Distance (m)
0.5
0.8
1.2
1.8
3.3
3.8
4.5
5


pipesw/manning Plan: proposed condition 8/30/2007
.013
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Legend
WS 100 year
Ground
Bank Sta
Elevation (m)
Station (m)
pipesw/manning Plan: proposed condition 8/30/2007
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WS 100 year
Ground
Bank Sta
Elevation (m)
Station (m)
pipesw/manning Plan: proposed condition 8/30/2007
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WS 100 year
Ground
Bank Sta
Elevation (m)
Station (m)
pipesw/manning Plan: proposed condition 8/30/2007
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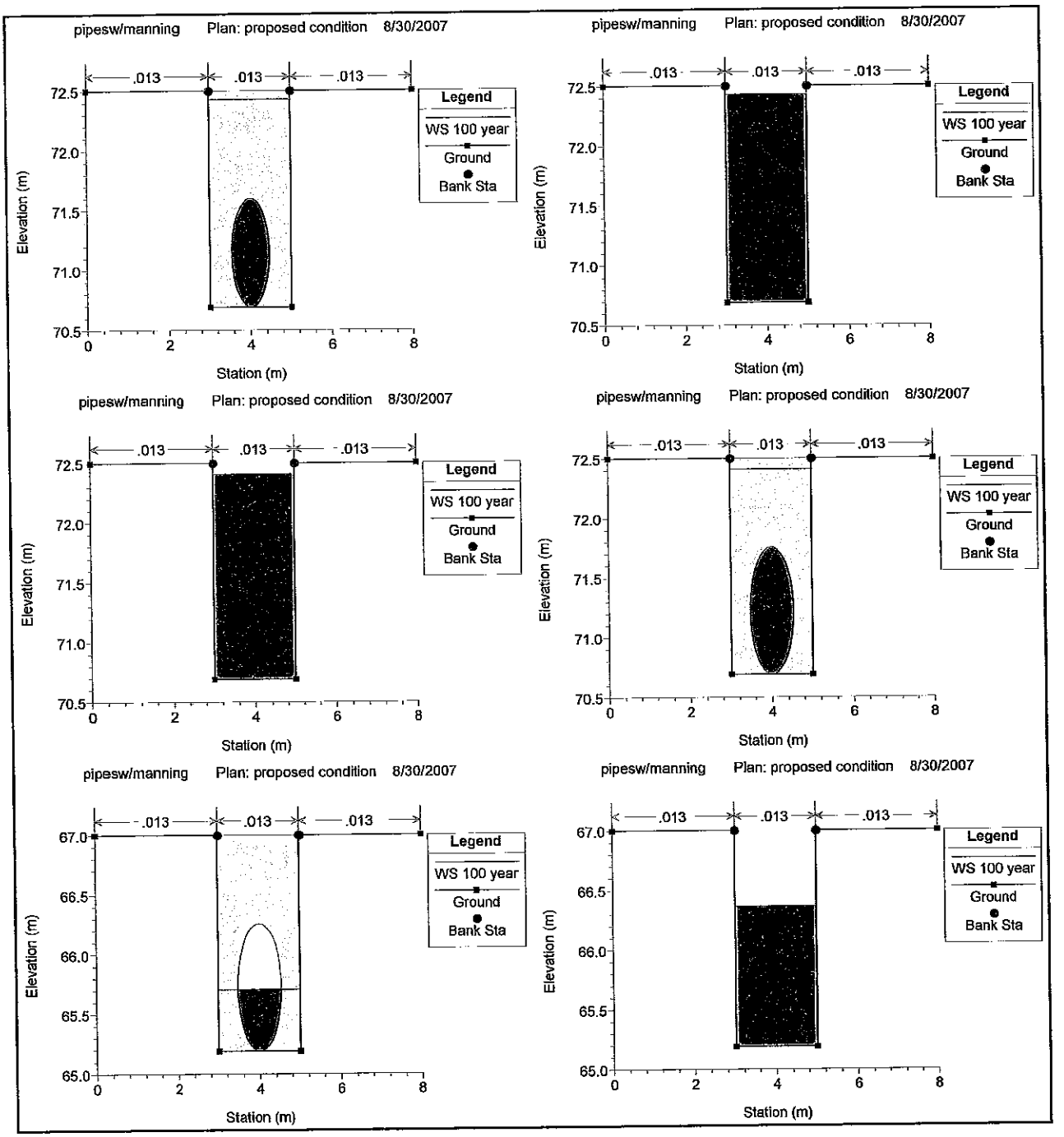
Legend
WS 100 year
Ground
Bank Sta
Elevation (m)
Station (m)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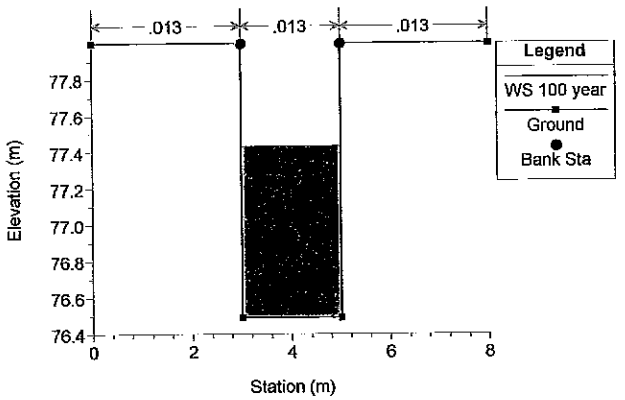
.013
Legend
WS 100 year
Ground
Bank Sta
Elevation (m)
Station (m)

pipesw/manning Plan: proposed condition 8/30/2007



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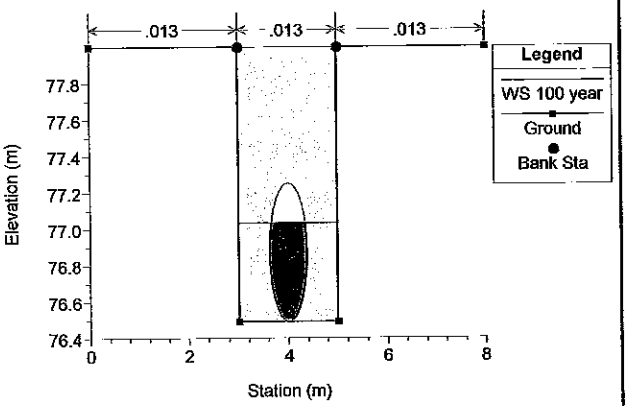

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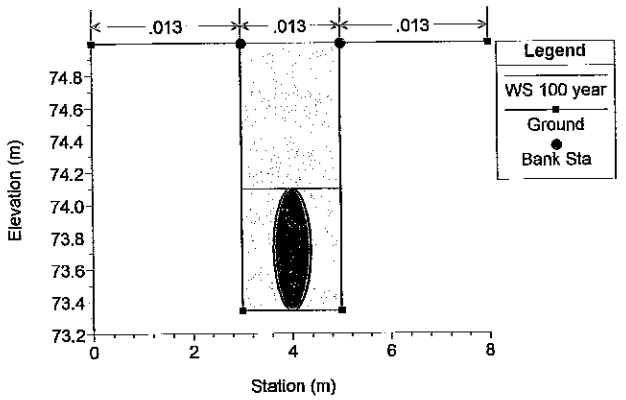

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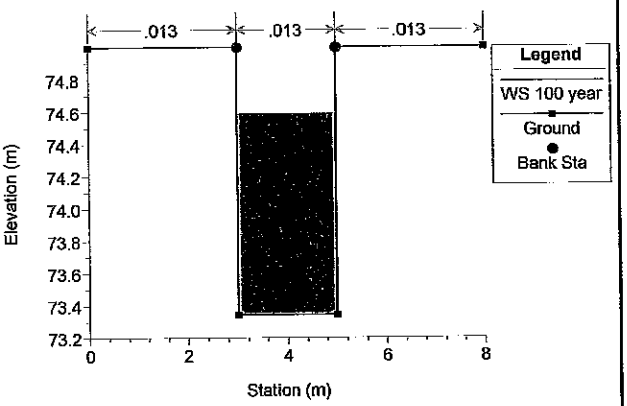

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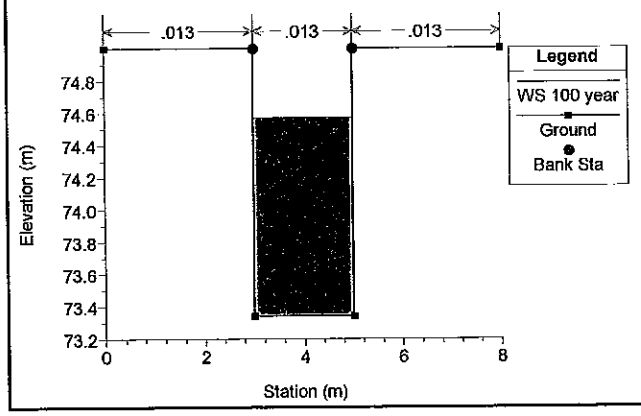

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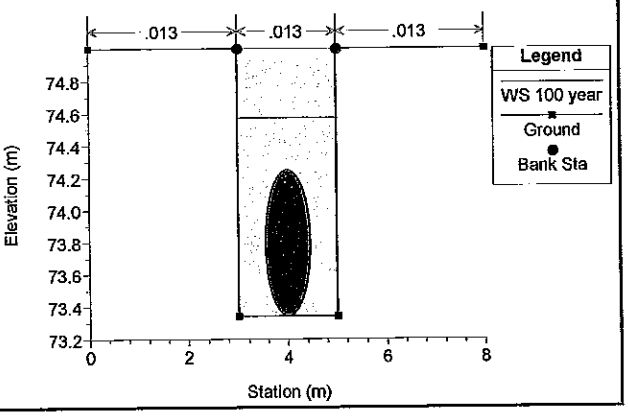

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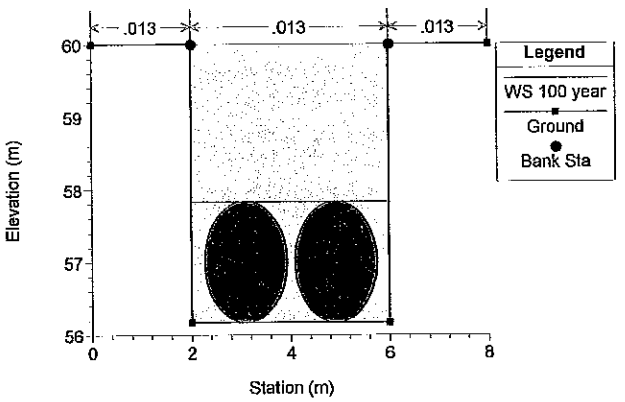

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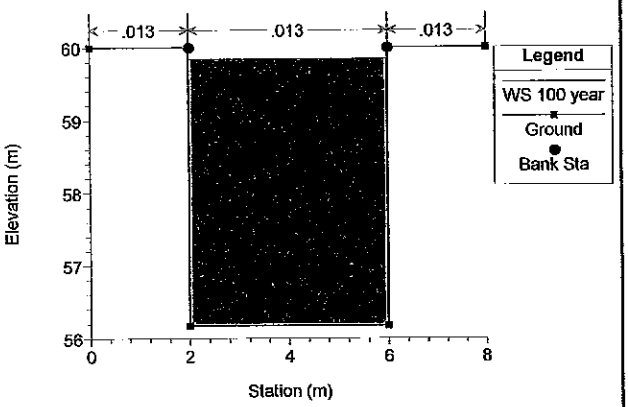

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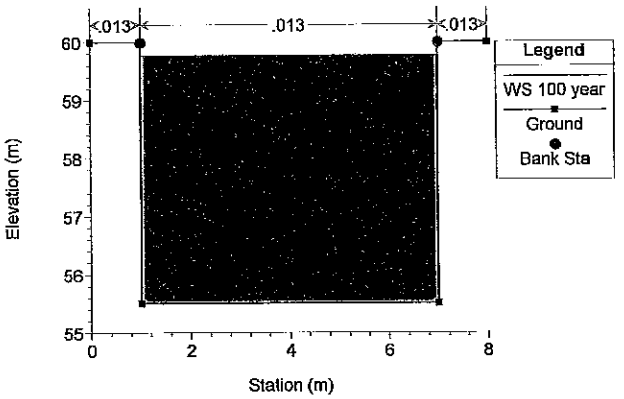

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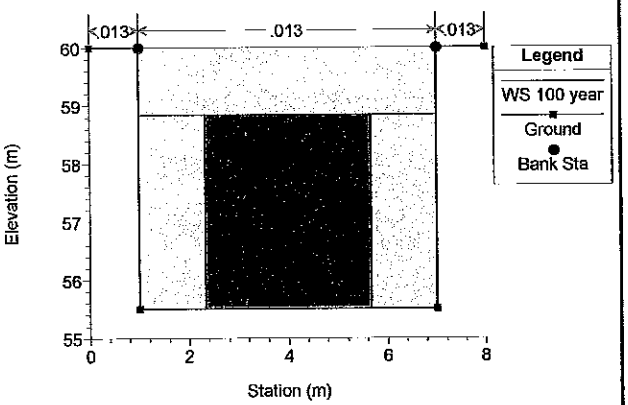

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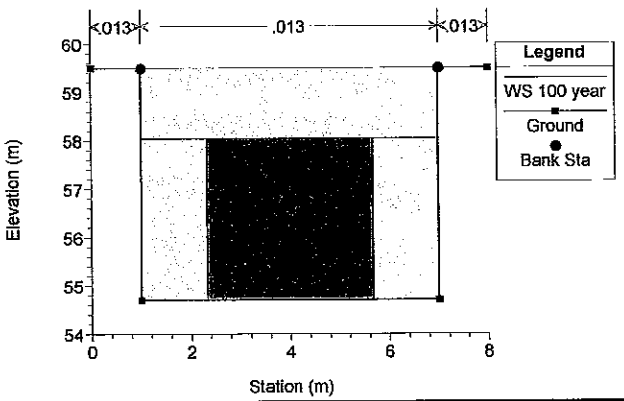

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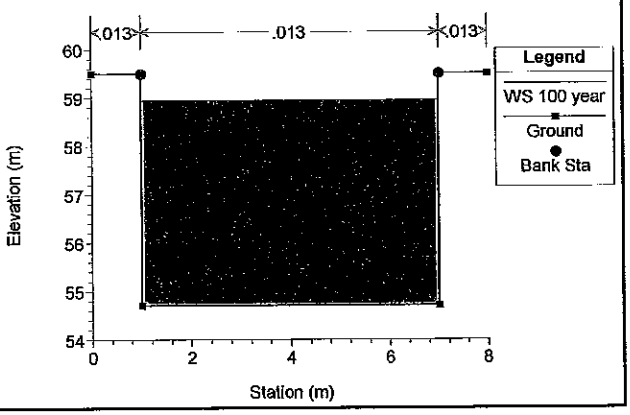

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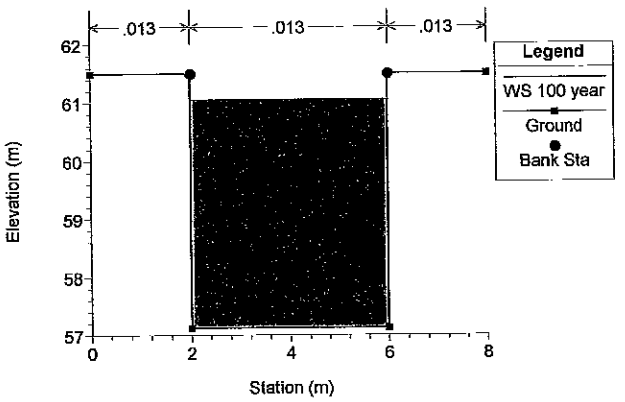

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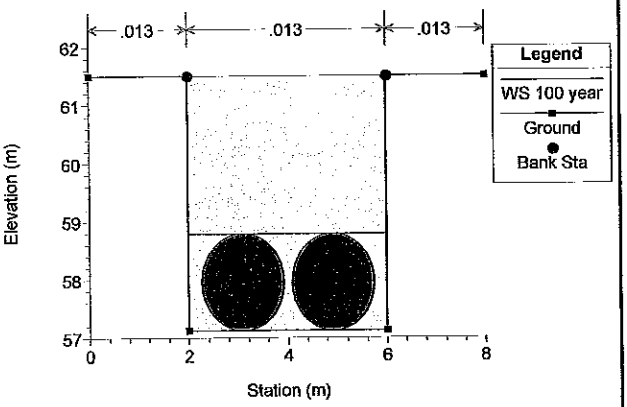

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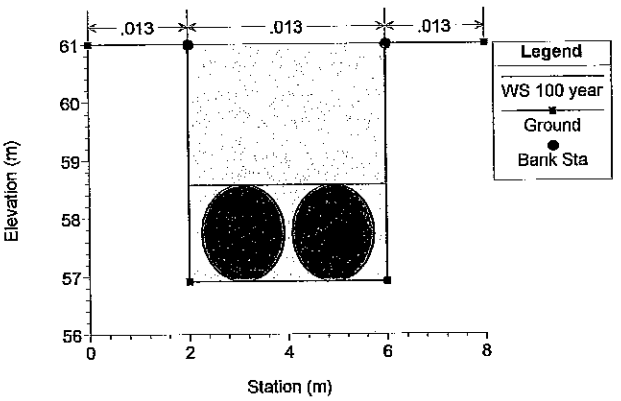

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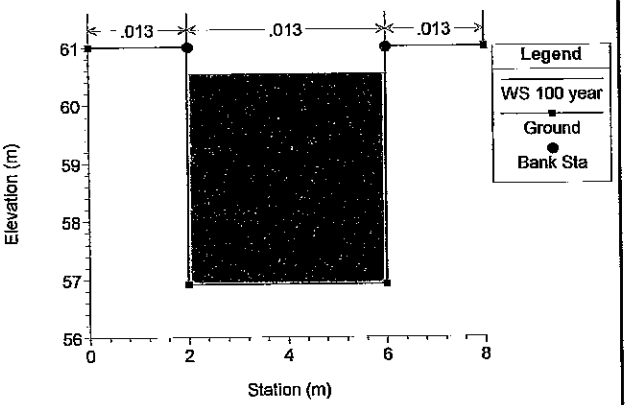

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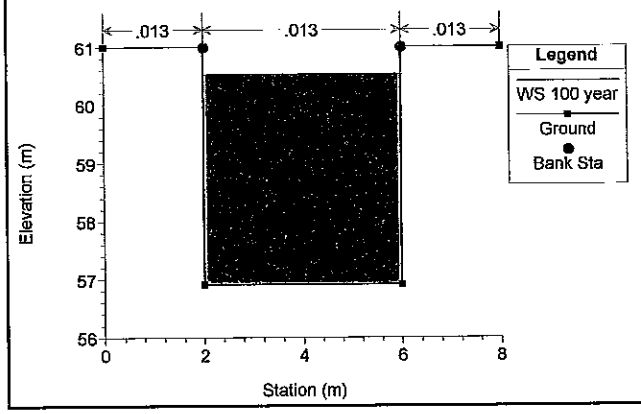

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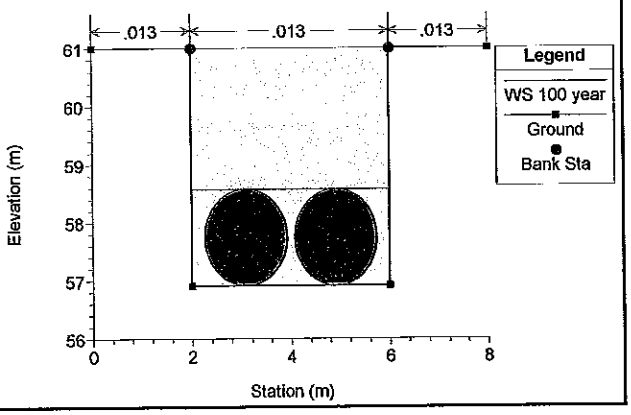
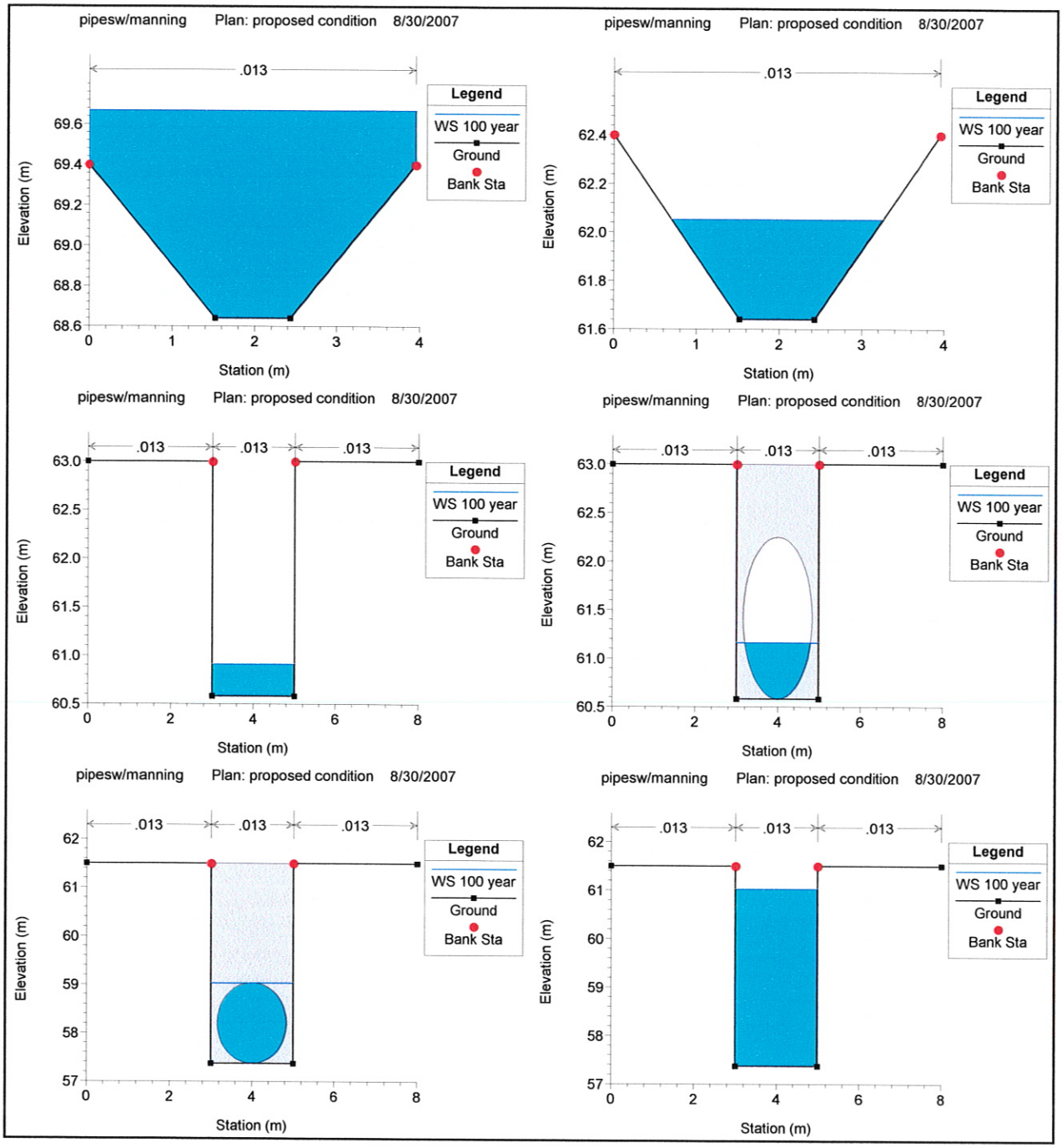
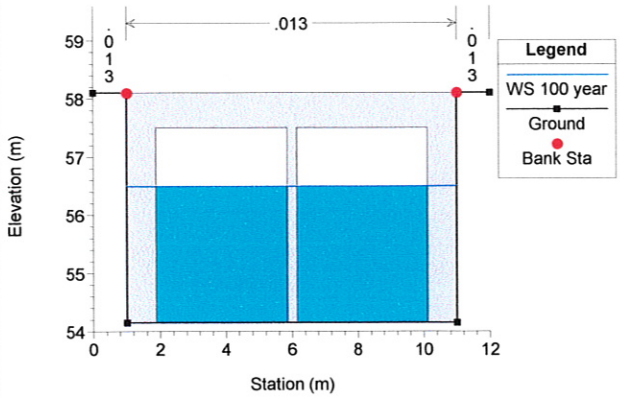



pipesw/manning Plan: proposed condition 8/30/2007
.013
Legend
WS 100 year
Ground
Bank Sta
Elevation (m)
Station (m)
pipesw/manning Plan: proposed condition 8/30/2007
.013
Legend
WS 100 year
Ground
Bank Sta
Elevation (m)
Station (m)
pipesw/manning Plan: proposed condition 8/30/2007
.013 .013 .013
Legend
WS 100 year
Ground
Bank Sta
Elevation (m)
Station (m)
pipesw/manning Plan: proposed condition 8/30/2007
.013 .013 .013
Legend
WS 100 year
Ground
Bank Sta
Elevation (m)
Station (m)
pipesw/manning Plan: proposed condition 8/30/2007
.013 .013 .013
Legend
WS 100 year
Ground
Bank Sta
Elevation (m)
Station (m)
pipesw/manning Plan: proposed condition 8/30/2007
.013 .013 .013
Legend
WS 100 year
Ground
Bank Sta
Elevation (m)
Station (m)

pipesw/manning Plan: proposed condition 8/30/2007



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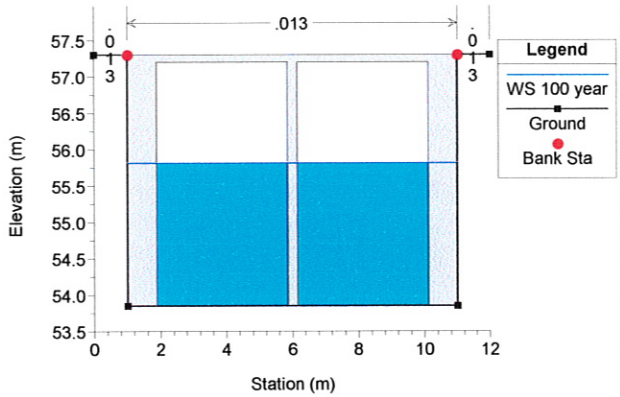

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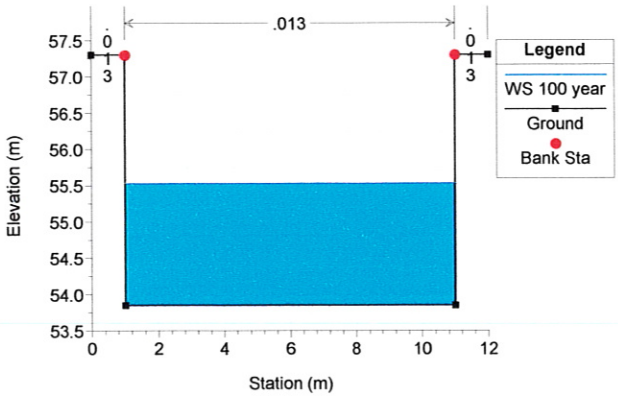

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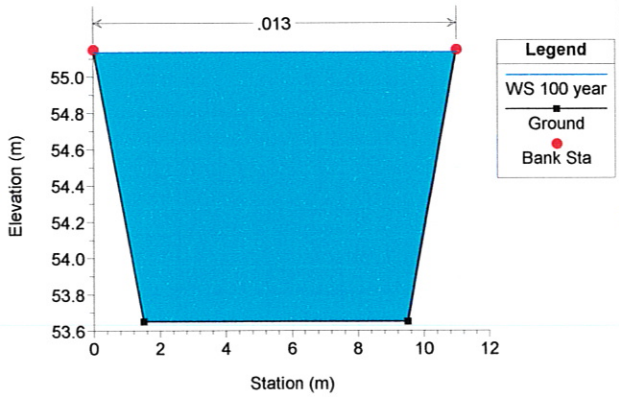

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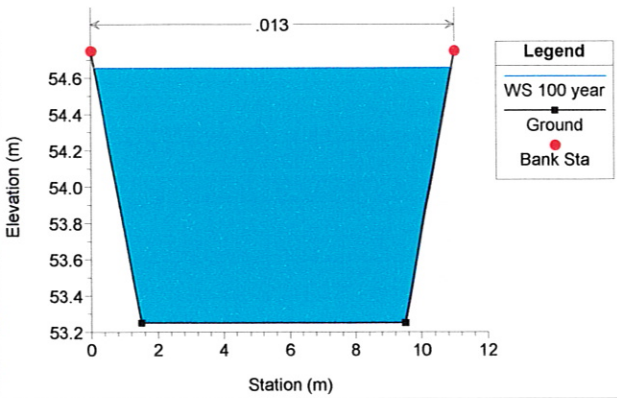

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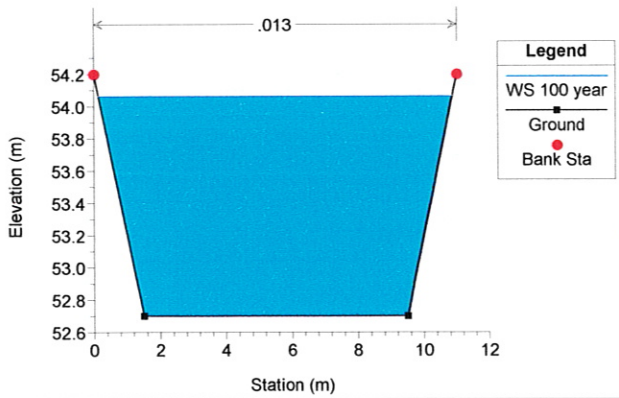

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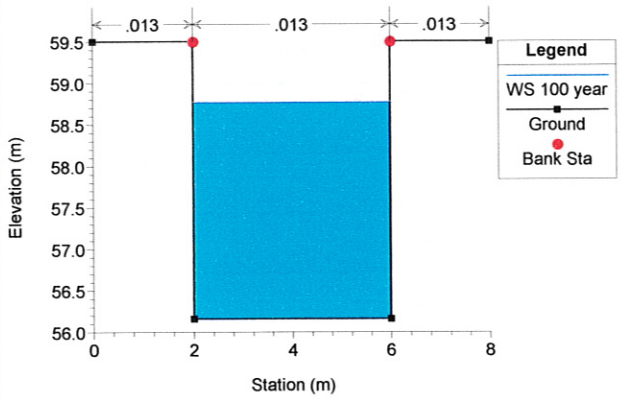

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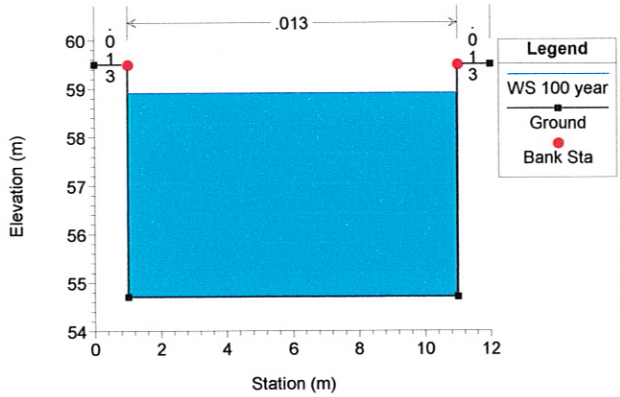

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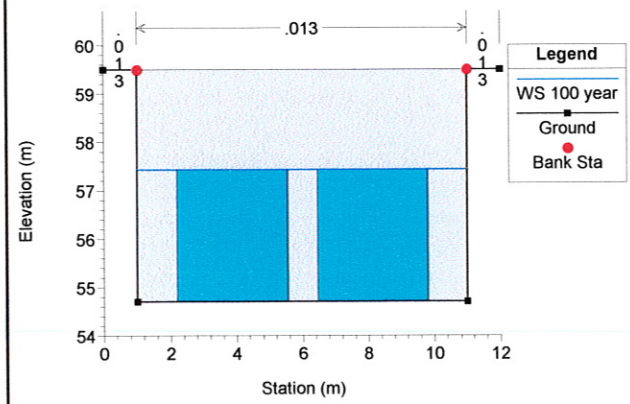

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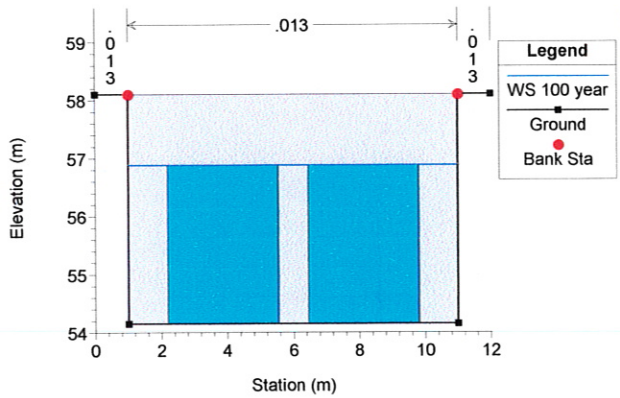

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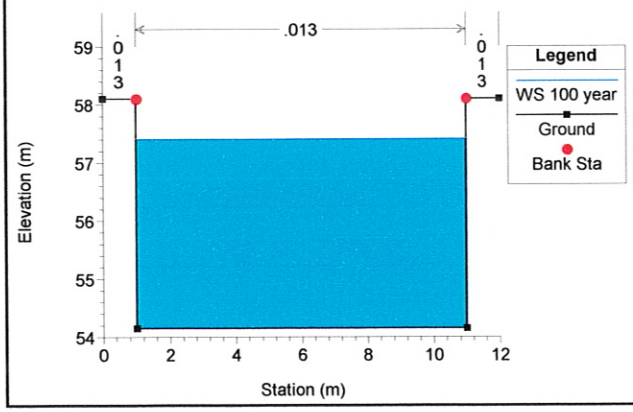

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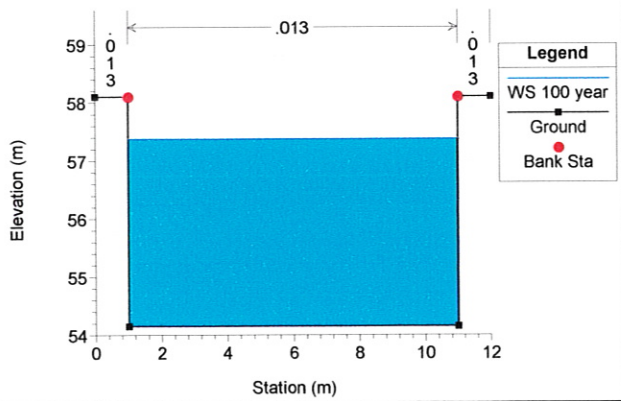

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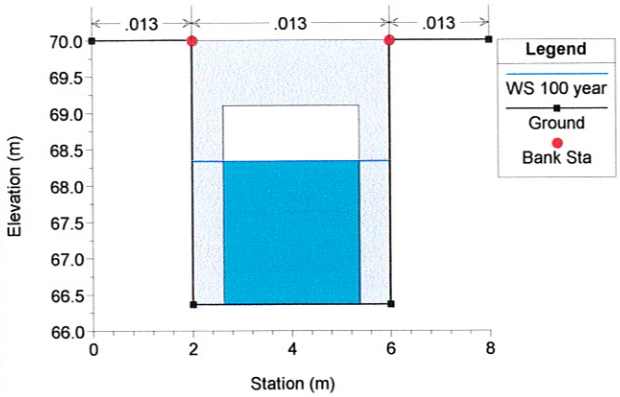

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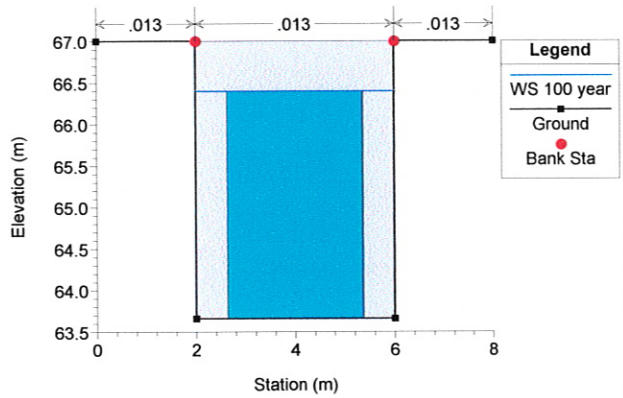

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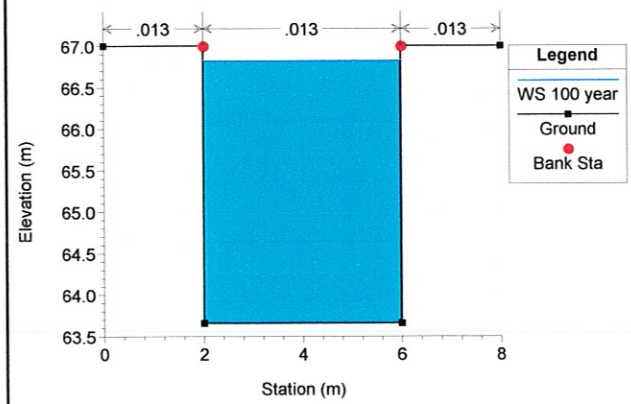

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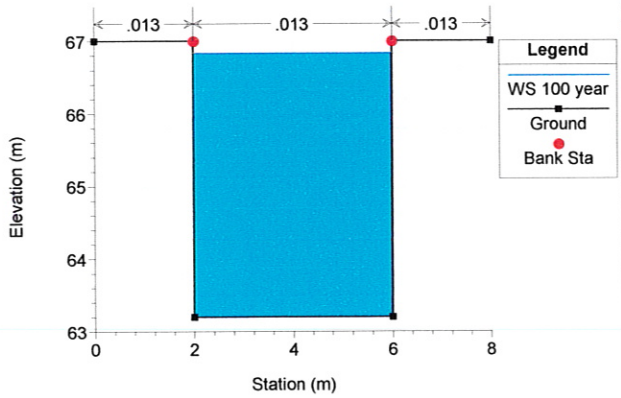

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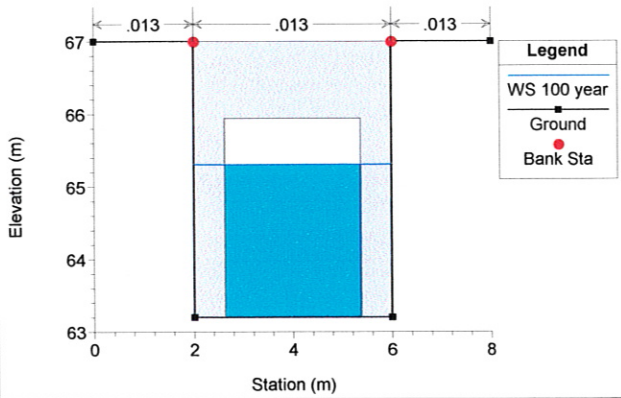

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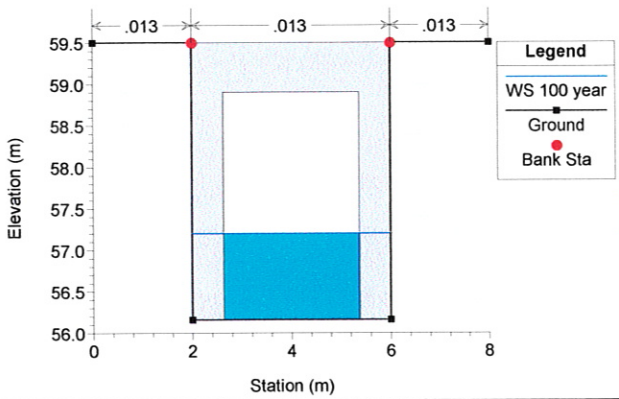

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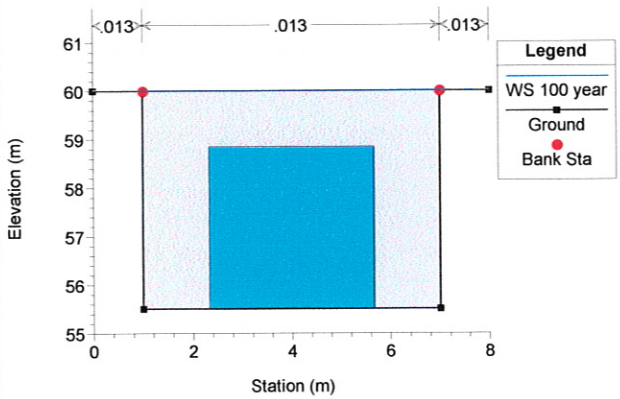

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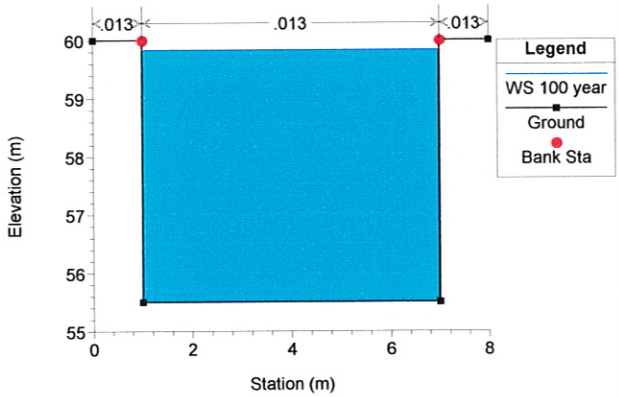

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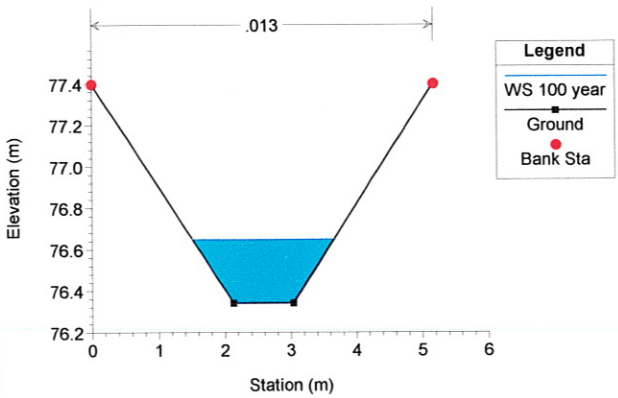

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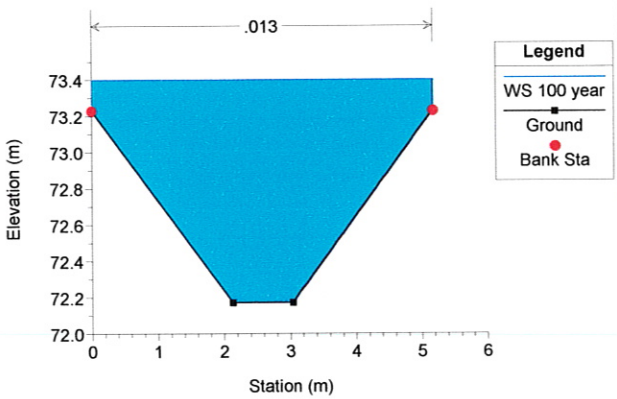

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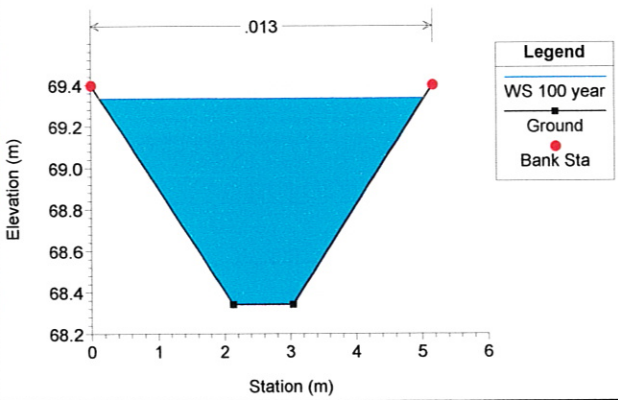
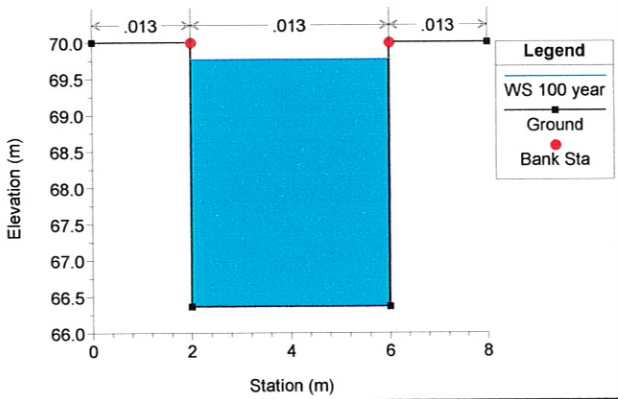
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