APPENDIX J
ALIGNMENT ALTERNATIVES
HEC-RAS ANALYSIS

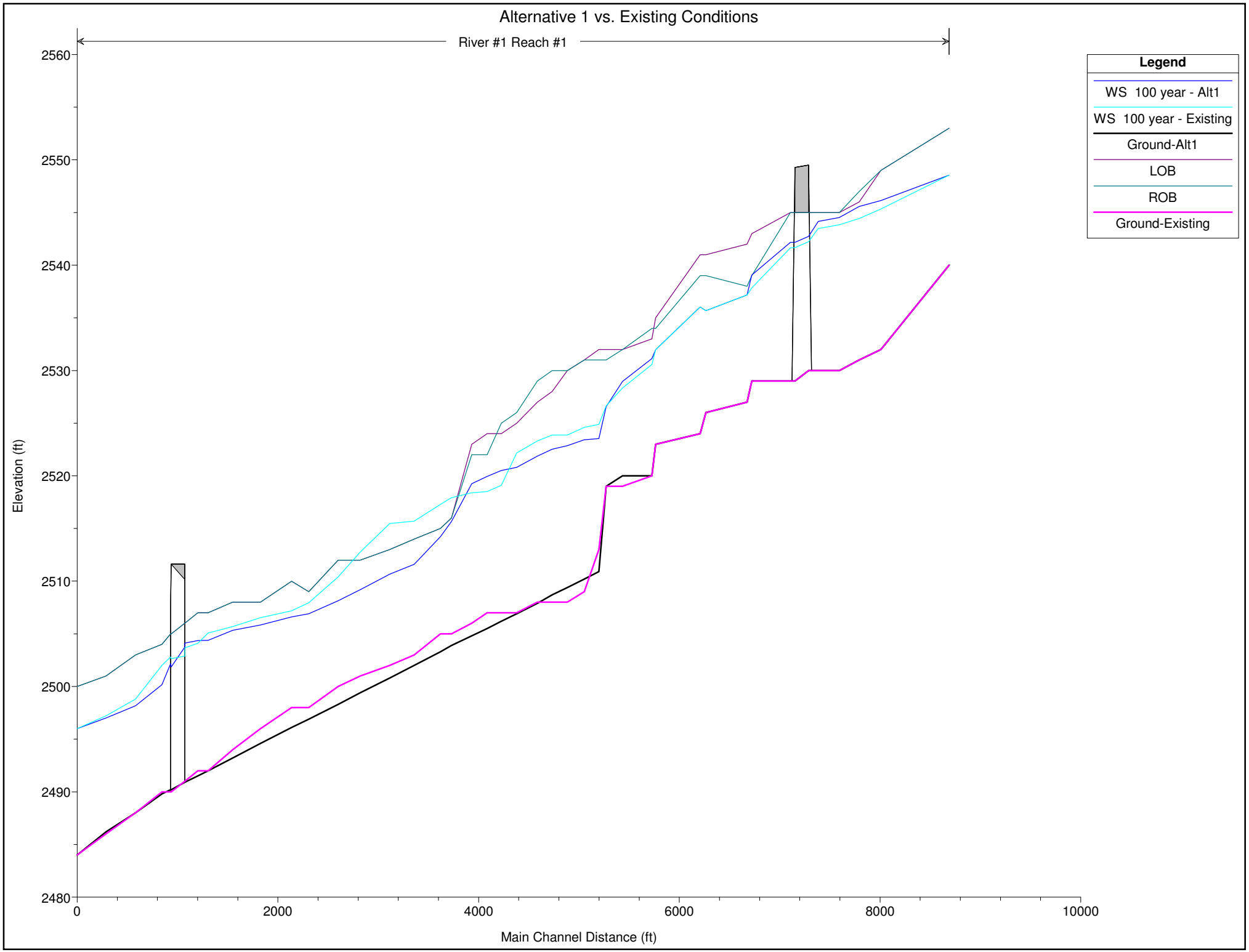
Appendix J.1
Alternative 1 Output and
Cross-Section and Profile Plots

Appendix J.2
Alternative 2 Output and
Cross-Section and Profile Plots

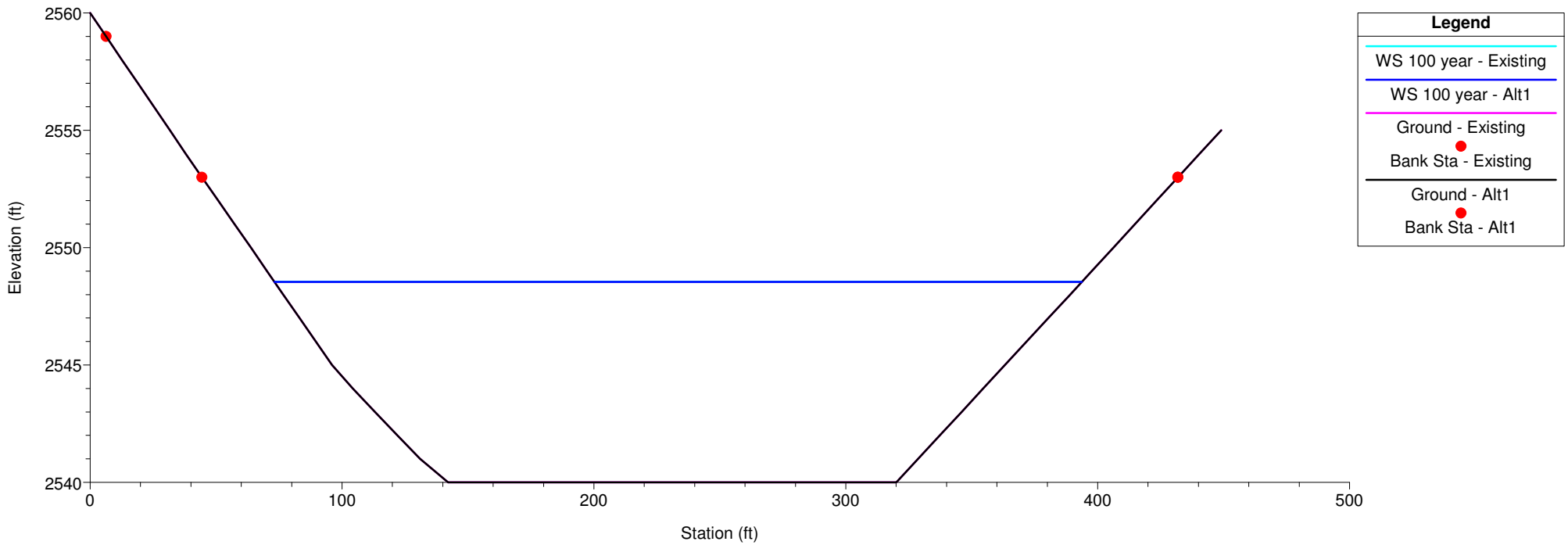
Appendix J.3
Alternative 3 Output and
Cross-Section and Profile Plots

Appendix J.4
Alternative 4 Output and
Cross-Section and Profile Plots

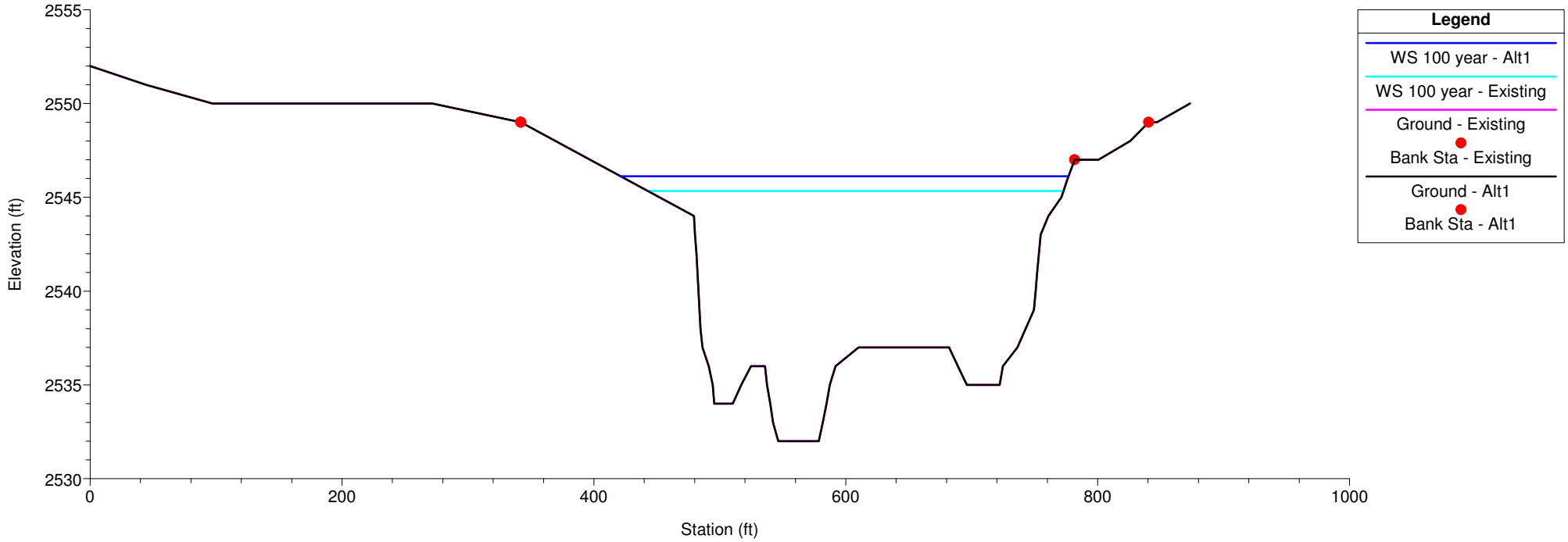
APPENDIX J.1
ALTERNATIVE 1 OUTPUT AND CROSS-SECTION AND PROFILE PLOTS

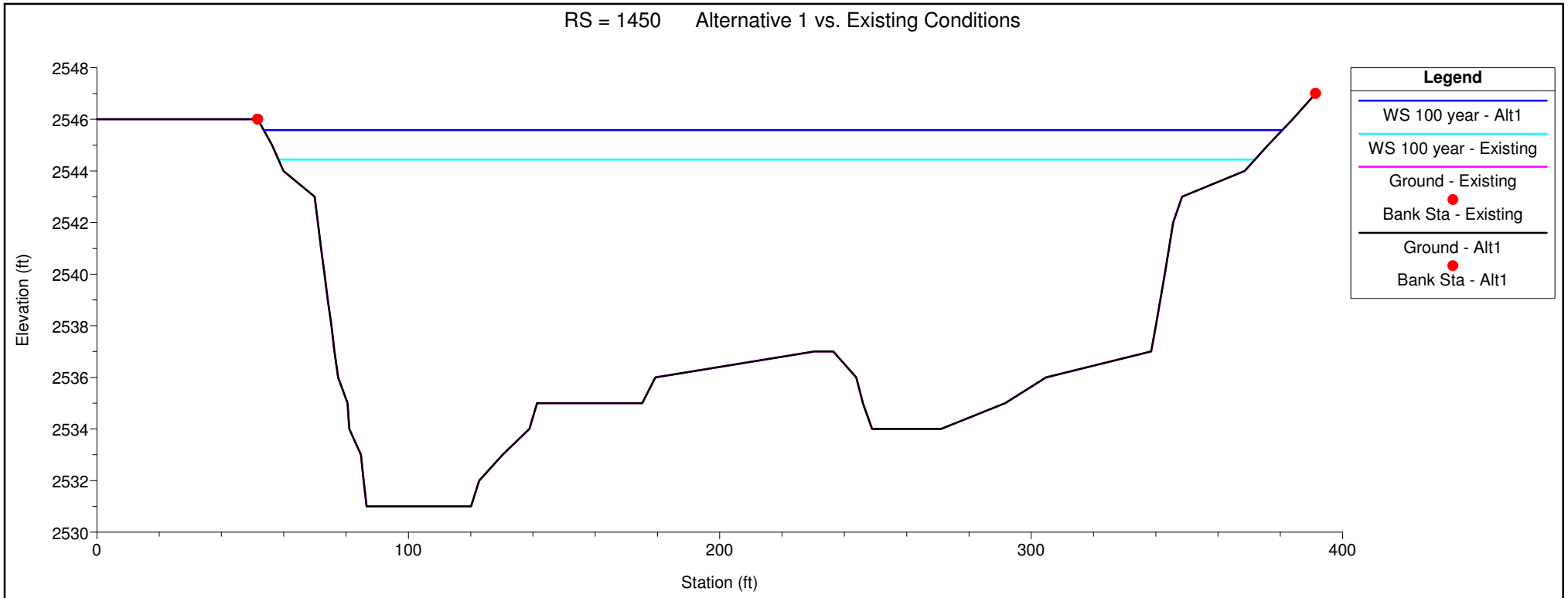

Alternative 1 vs. Existing Conditions
River #1 Reach #1
Legend
WS 100 year - Alt1
WS 100 year - Existing
Ground-Alt1
LOB
ROB
Ground-Existing
Elevation (ft)
2560
2550
2540
2530
2520
2510
2500
2490
2480
0
2000
4000
6000
8000
10000
Main Channel Distance (ft)

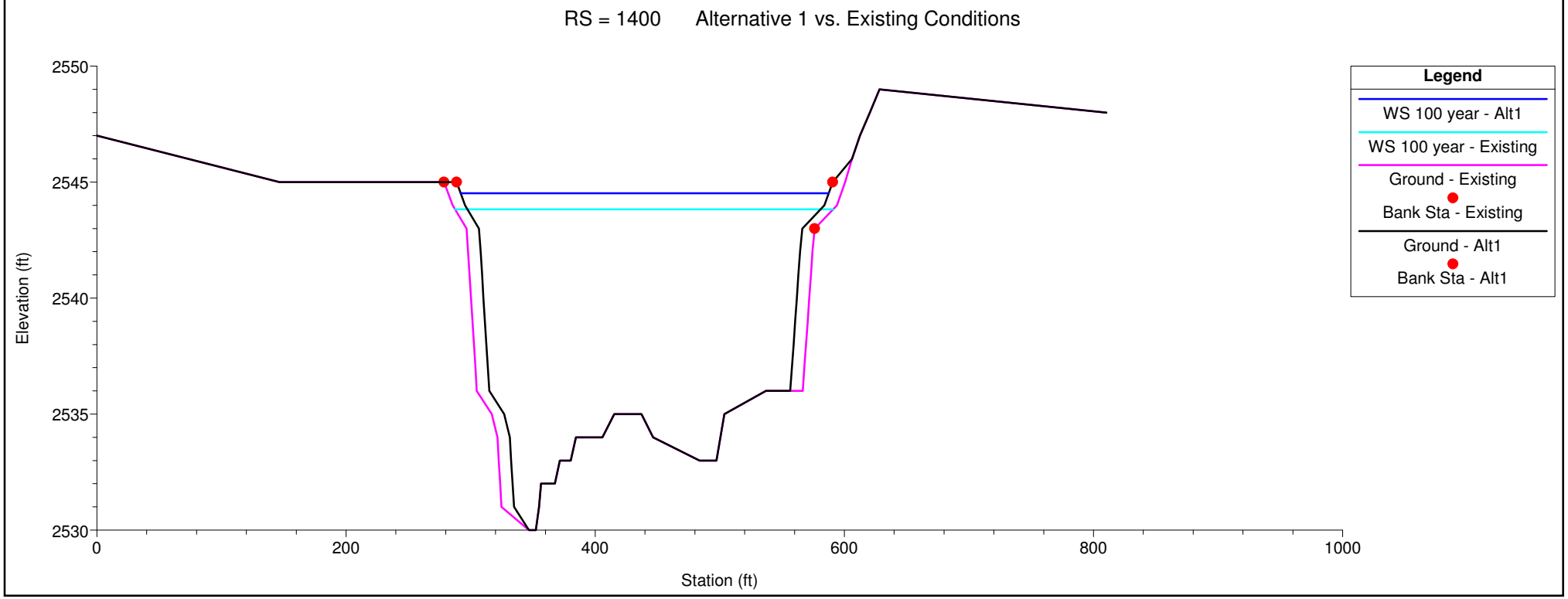
RS = 1600 Alternative 1 vs. Existing Conditions



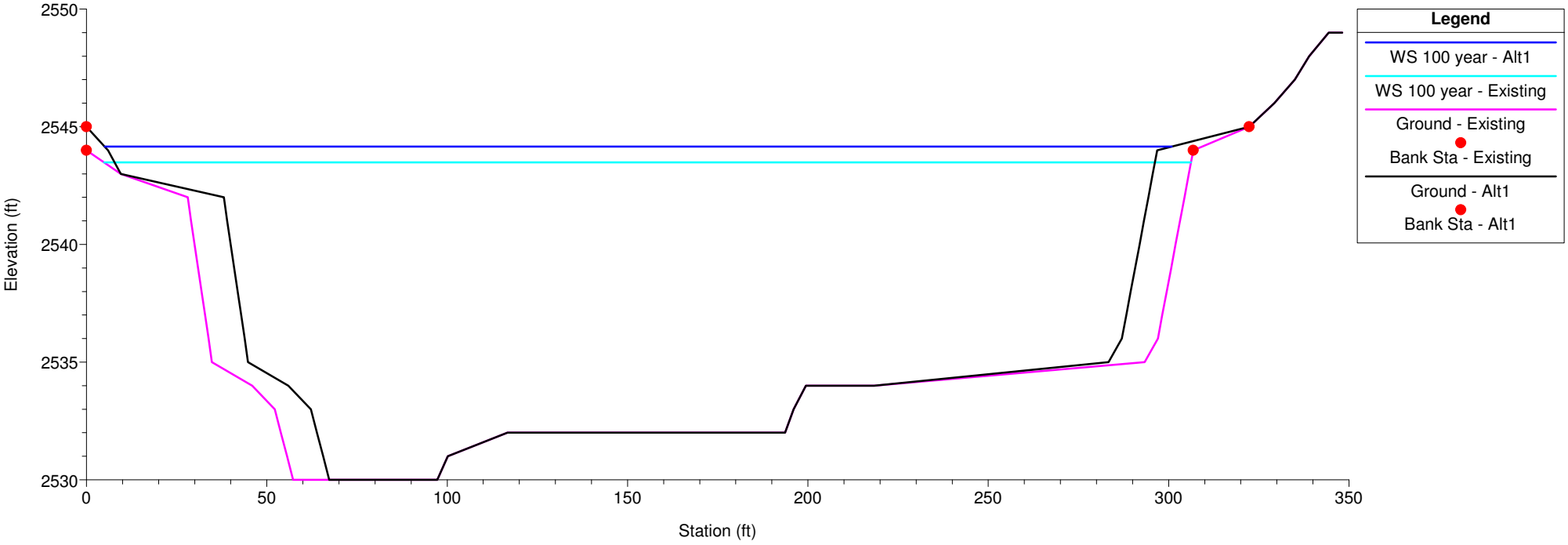
RS = 1500 Alternative 1 vs. Existing Conditions




RS = 1450 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2548
2546
2544
2542
2540
2538
2536
2534
2532
2530
0
100
200
300
400
Legend
WS 100 year - Alt1
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1

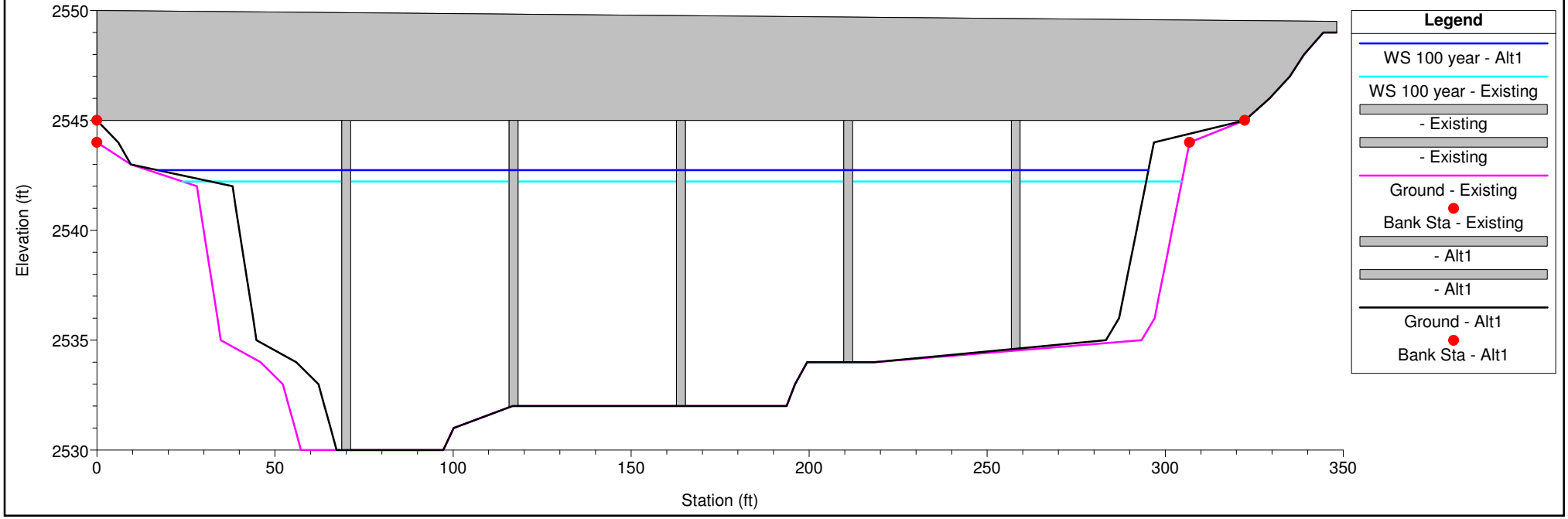

RS = 1400 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2550
2545
2540
2535
2530
0
200
400
600
800
1000
Legend
WS 100 year - Alt1
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1

RS = 1350 Alternative 1 vs. Existing Conditions



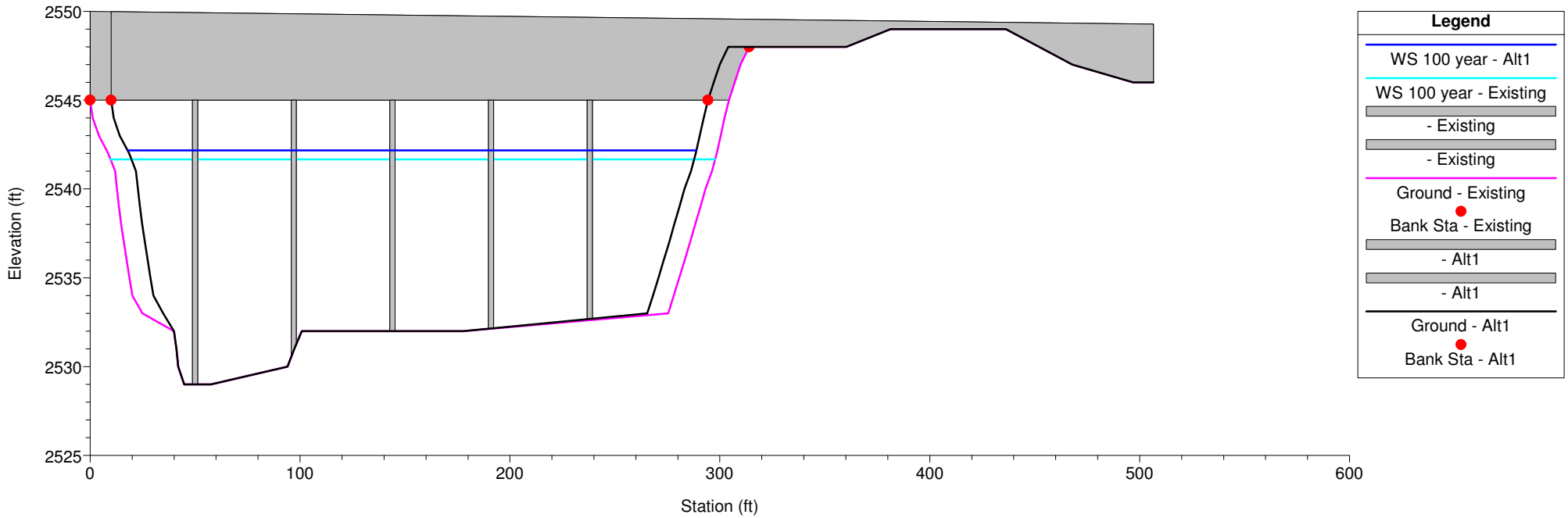
RS = 1325 BR

Alternative 1 vs. Existing Conditions

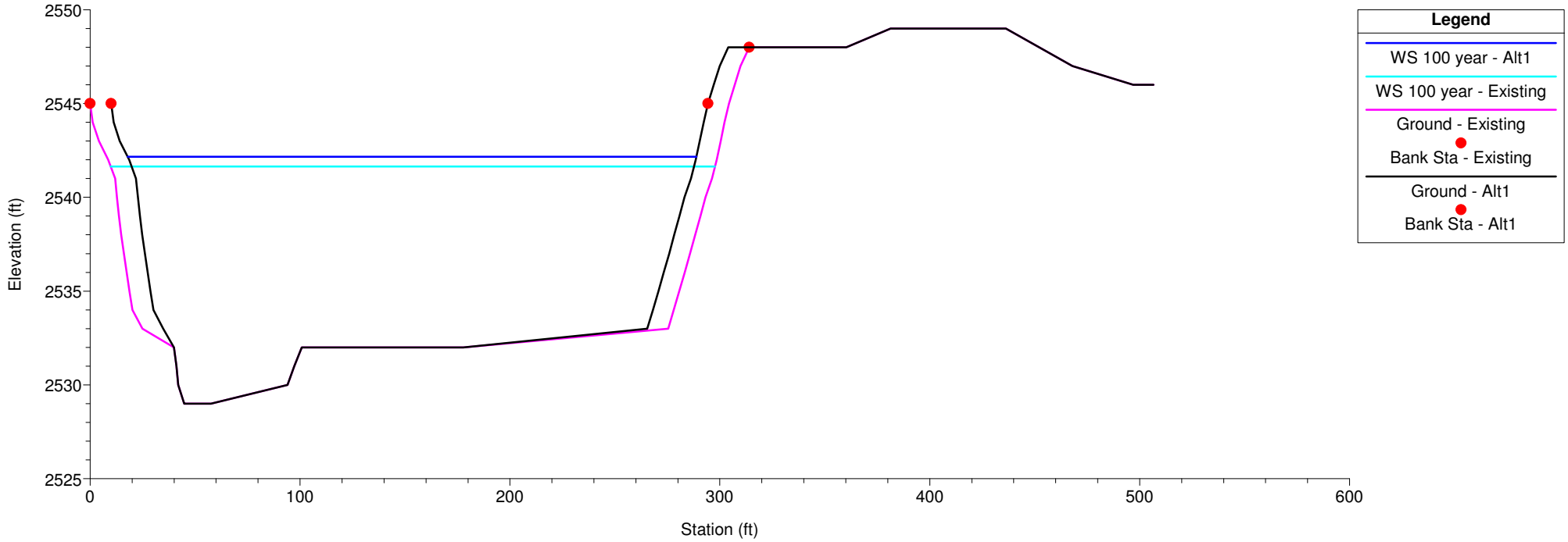


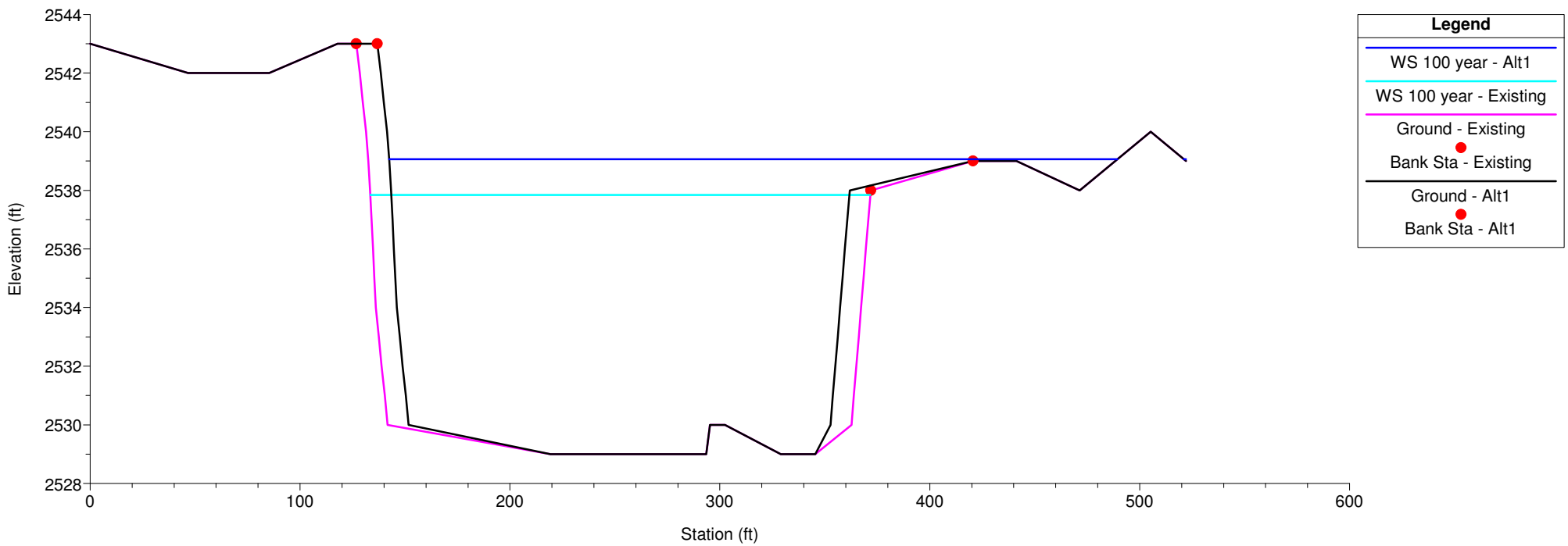
RS = 1325 BR

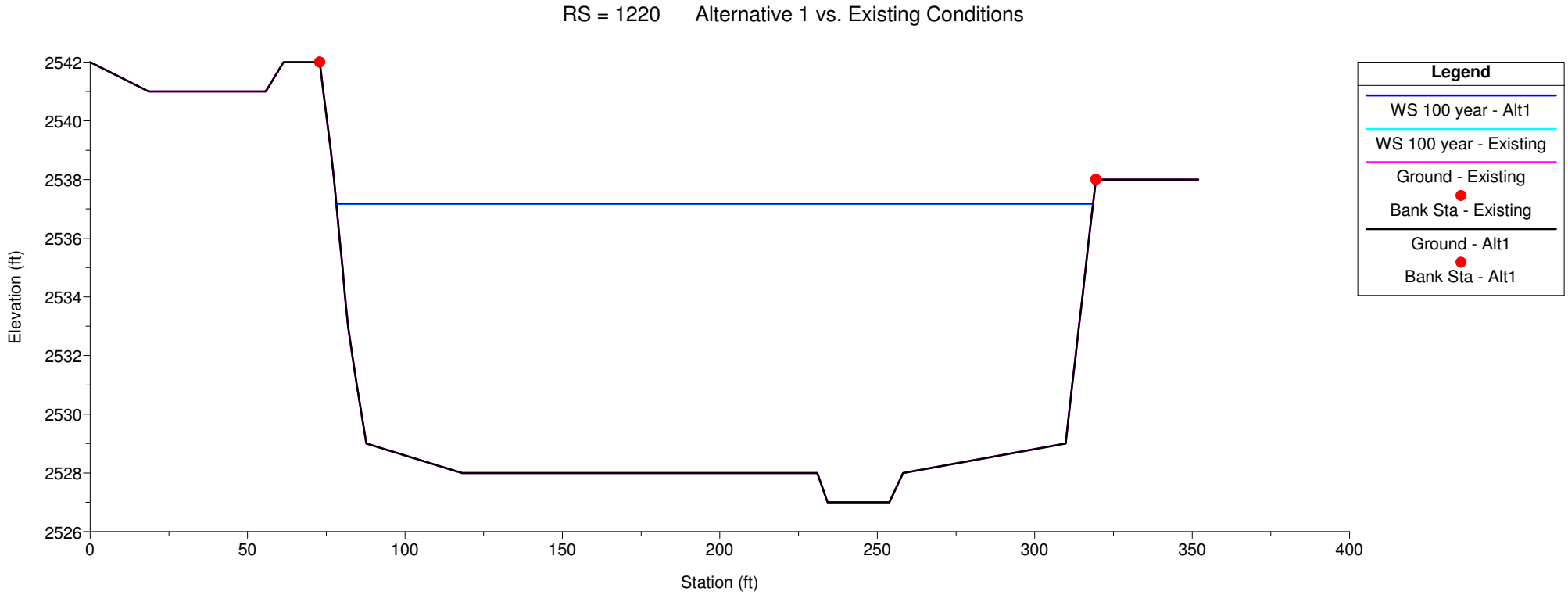
Alternative 1 vs. Existing Conditions

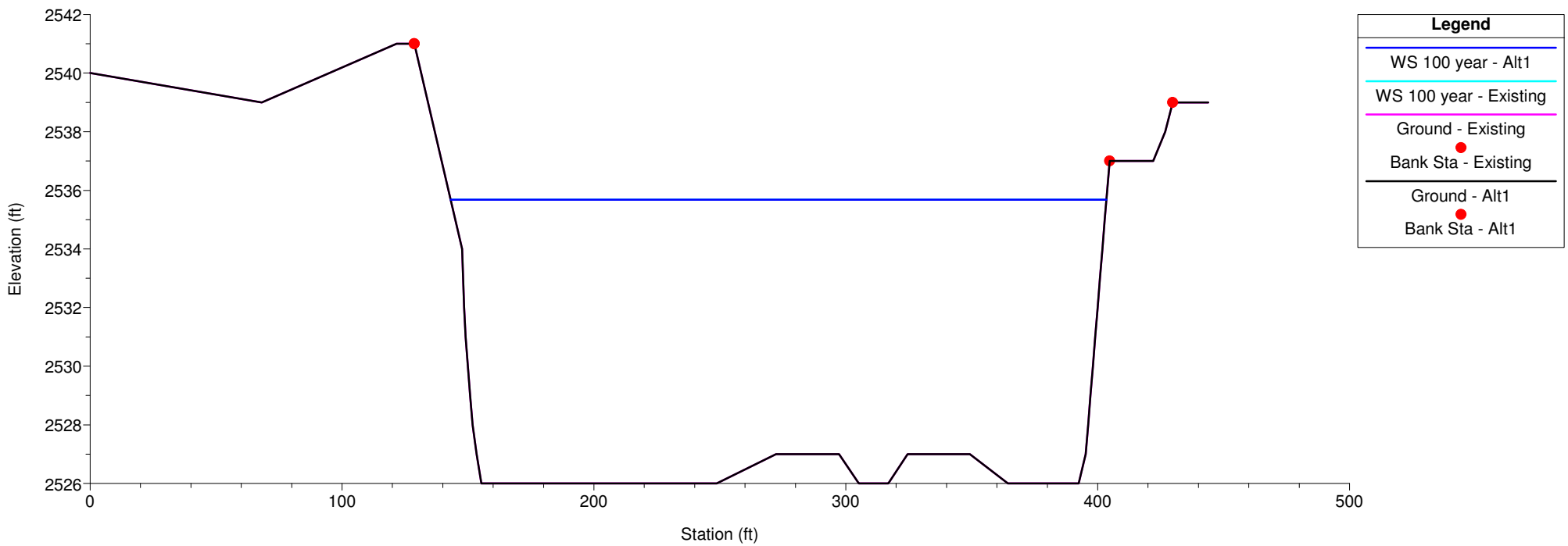


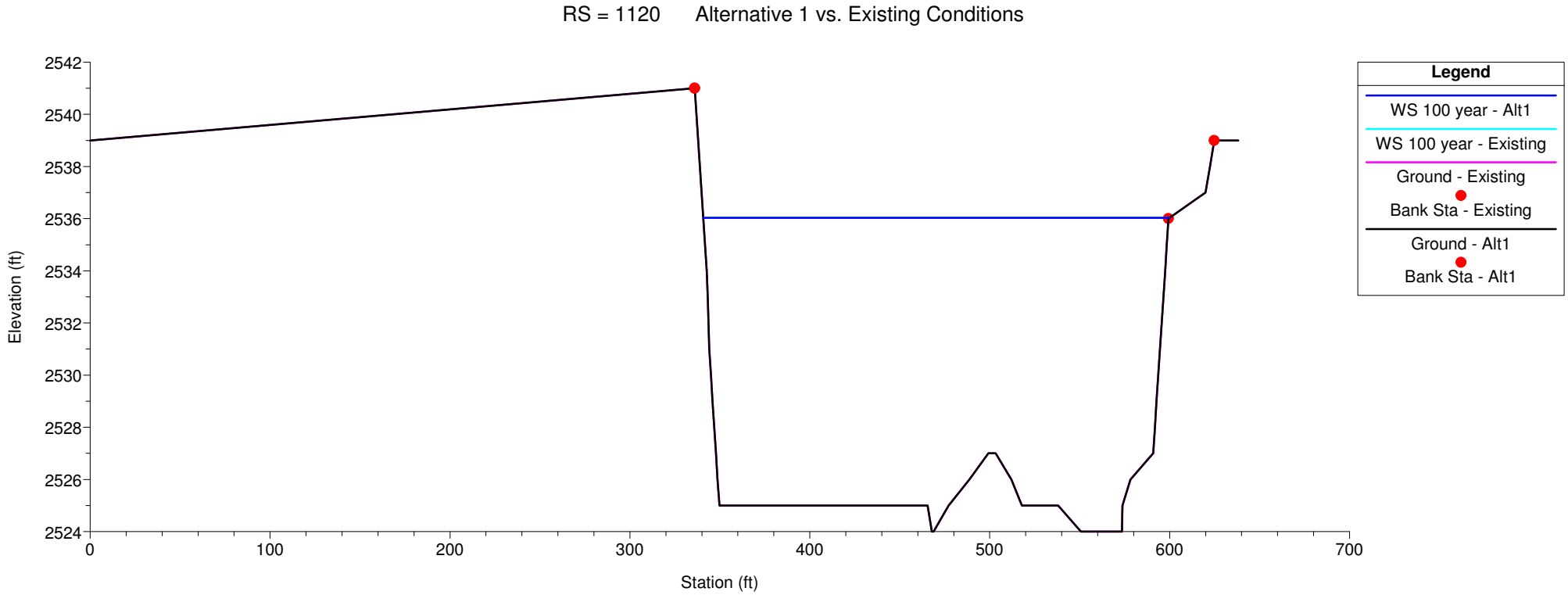
RS = 1300 Alternative 1 vs. Existing Conditions



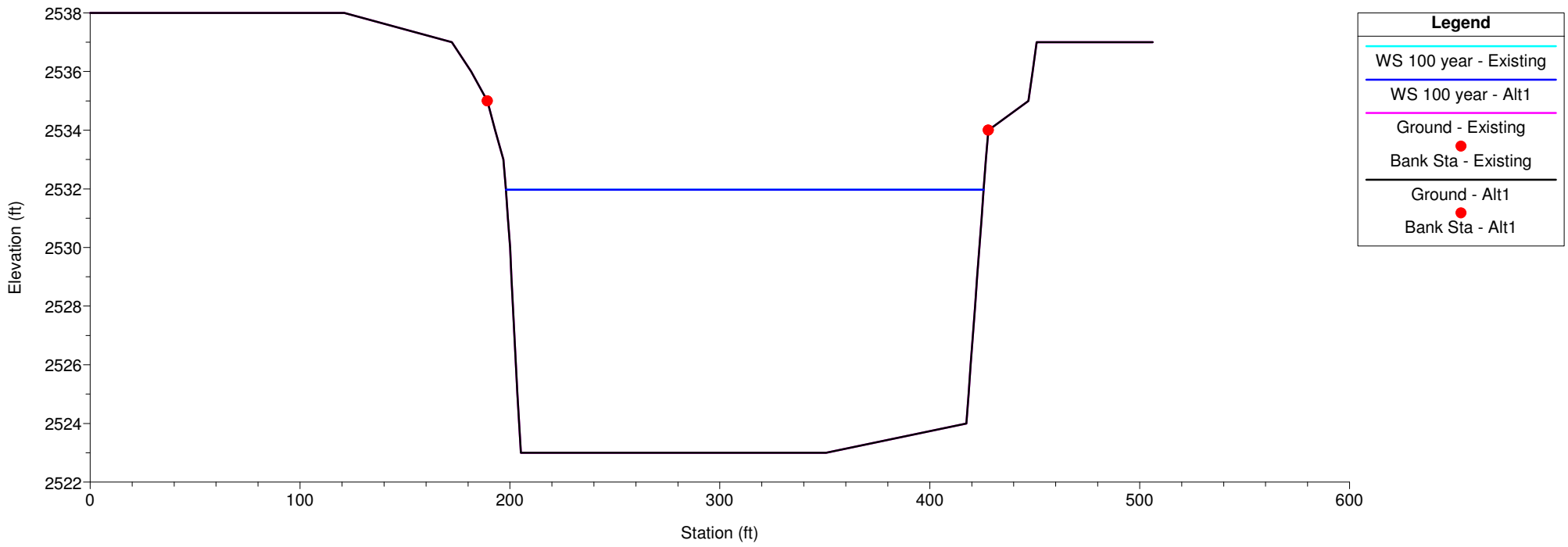

RS = 1230 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2544
2542
2540
2538
2536
2534
2532
2530
2528
0
100
200
300
400
500
600
Legend
WS 100 year - Alt1
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1


RS = 1220 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2542
2540
2538
2536
2534
2532
2530
2528
2526
0
50
100
150
200
250
300
350
400
Legend
WS 100 year - Alt1
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1

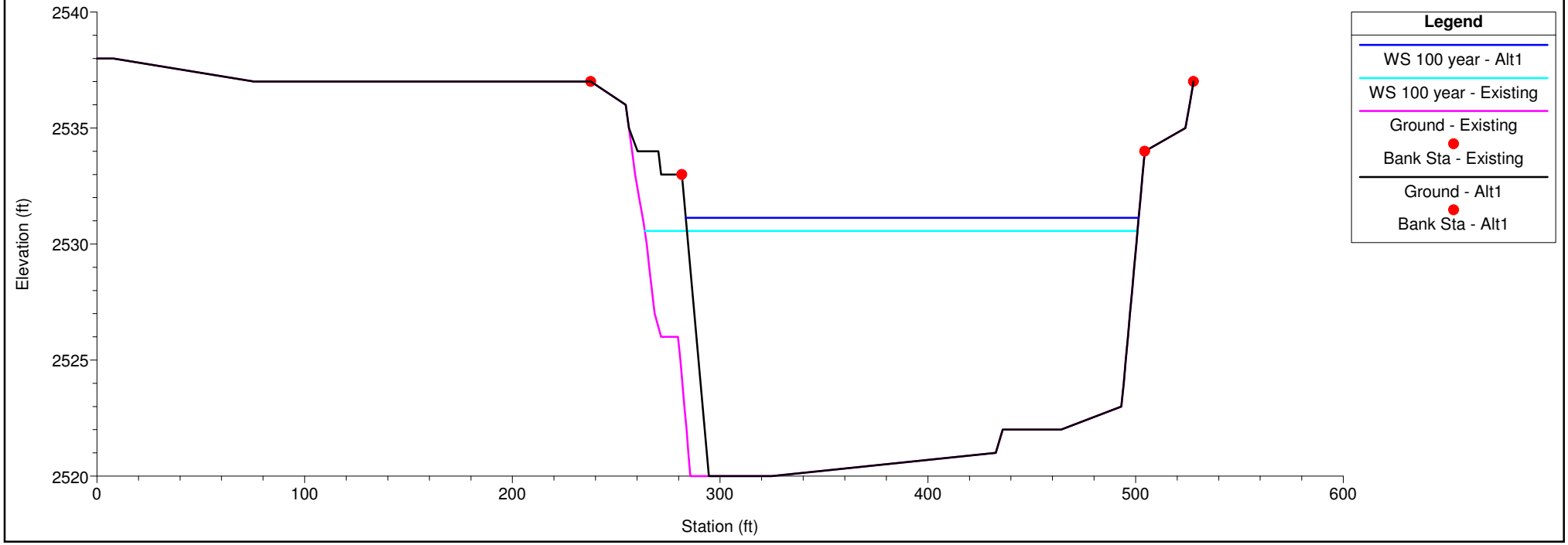

RS = 1200 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2542
2540
2538
2536
2534
2532
2530
2528
2526
0
100
200
300
400
500
Legend
WS 100 year - Alt1
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1

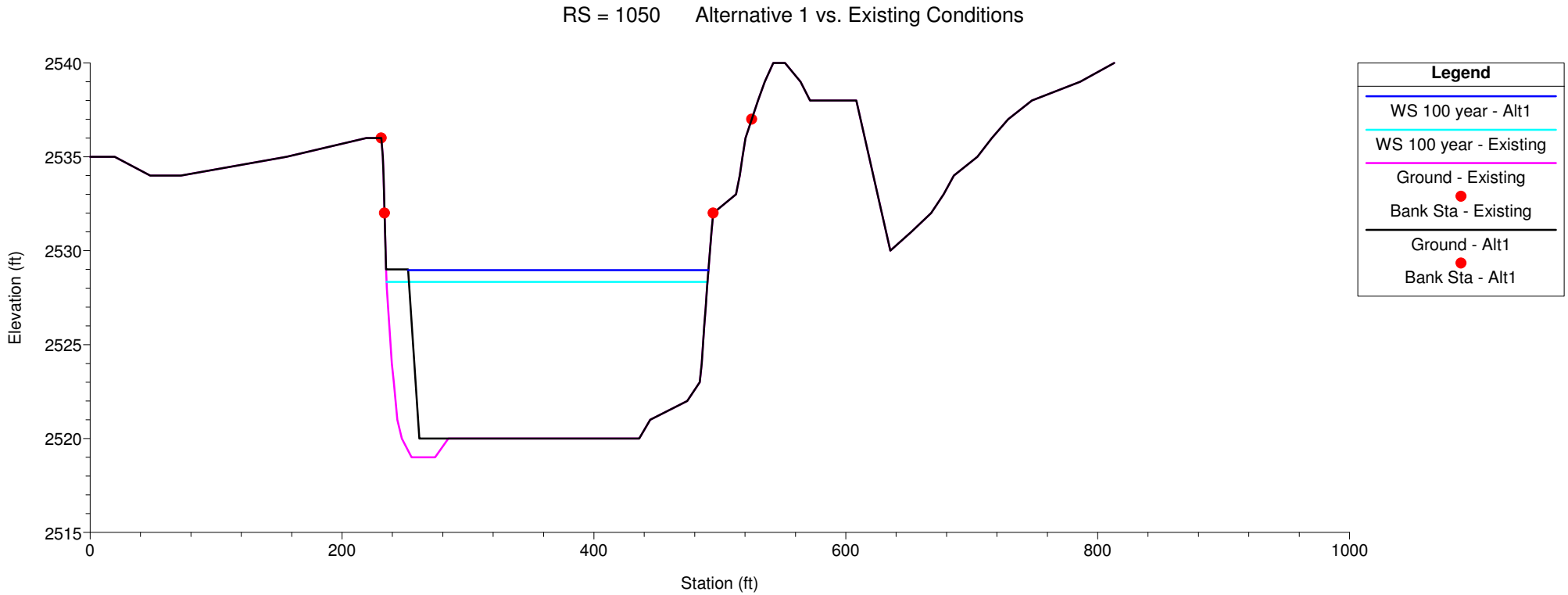

RS = 1120 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2542
2540
2538
2536
2534
2532
2530
2528
2526
2524
0
100
200
300
400
500
600
700
Legend
WS 100 year - Alt1
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1

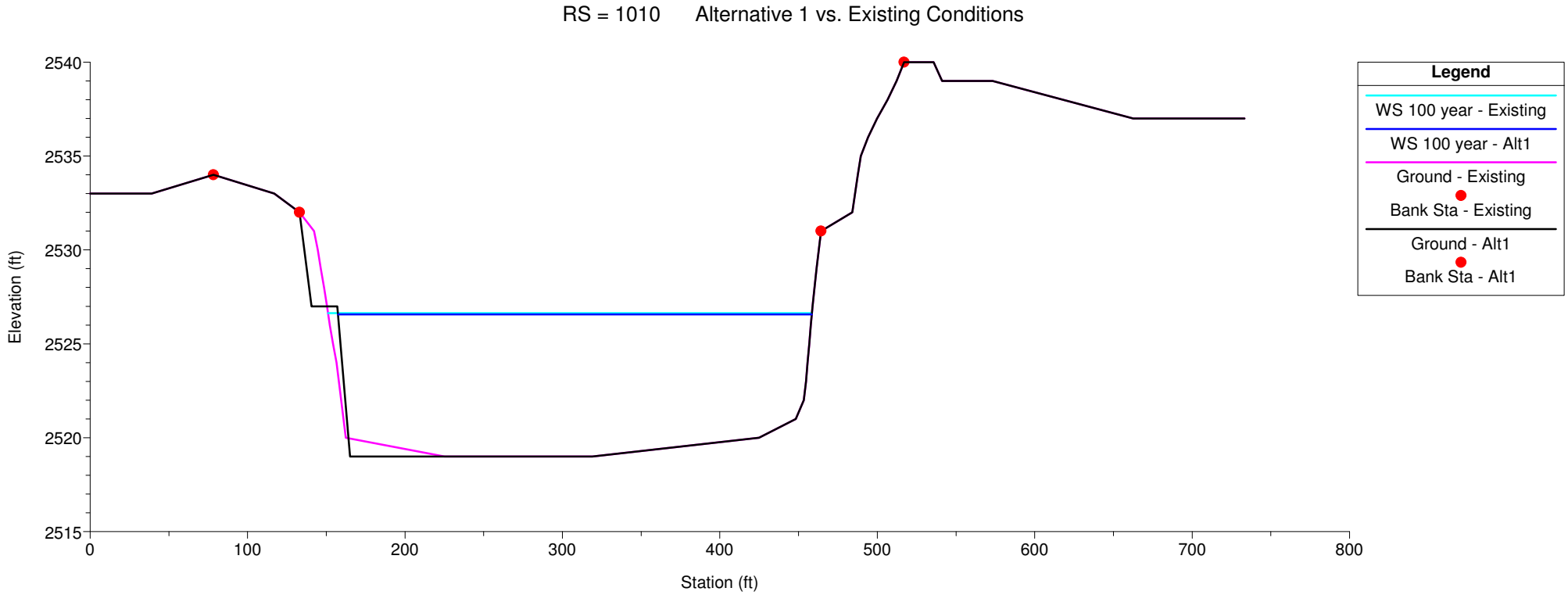
RS = 1110 Alternative 1 vs. Existing Conditions



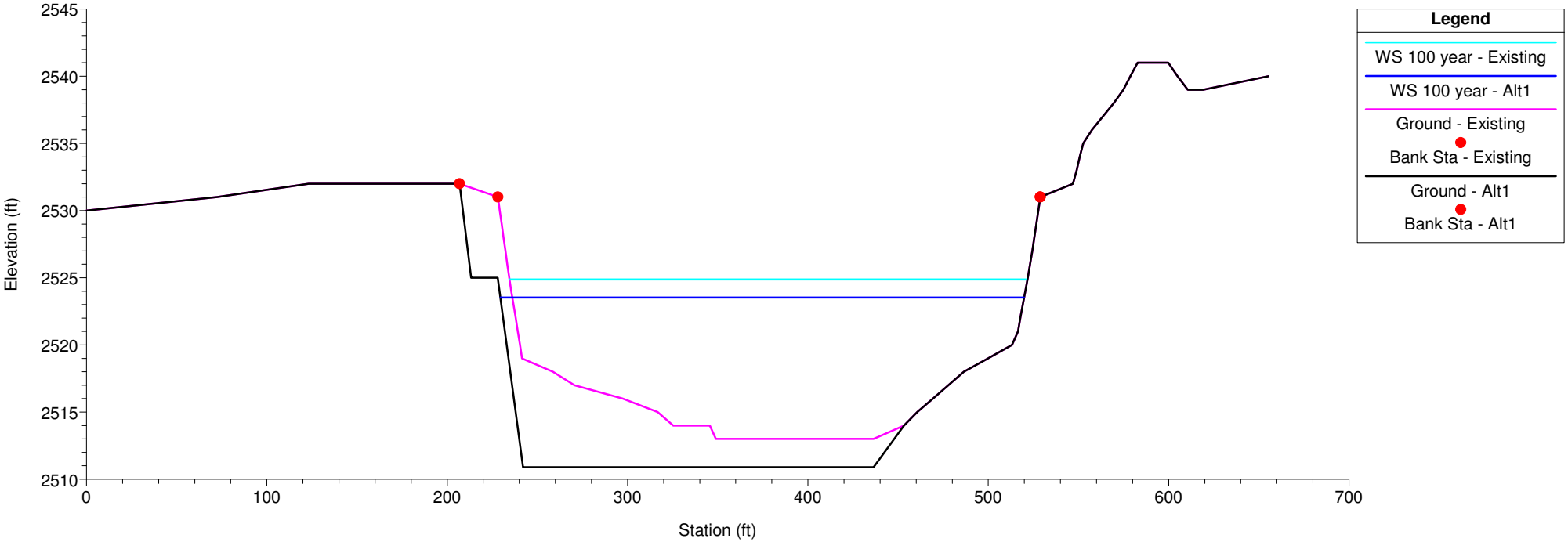
RS = 1100 Alternative 1 vs. Existing Conditions



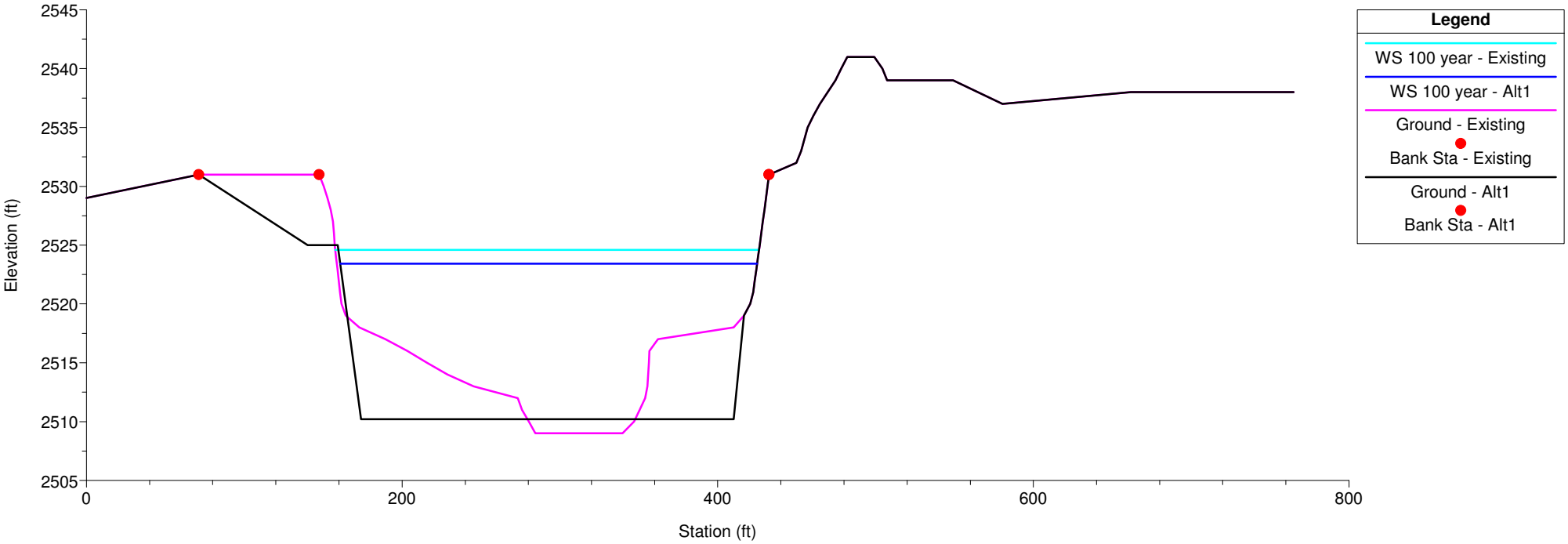

RS = 1050 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2540
2535
2530
2525
2520
2515
0
200
400
600
800
1000
Legend
WS 100 year - Alt1
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1

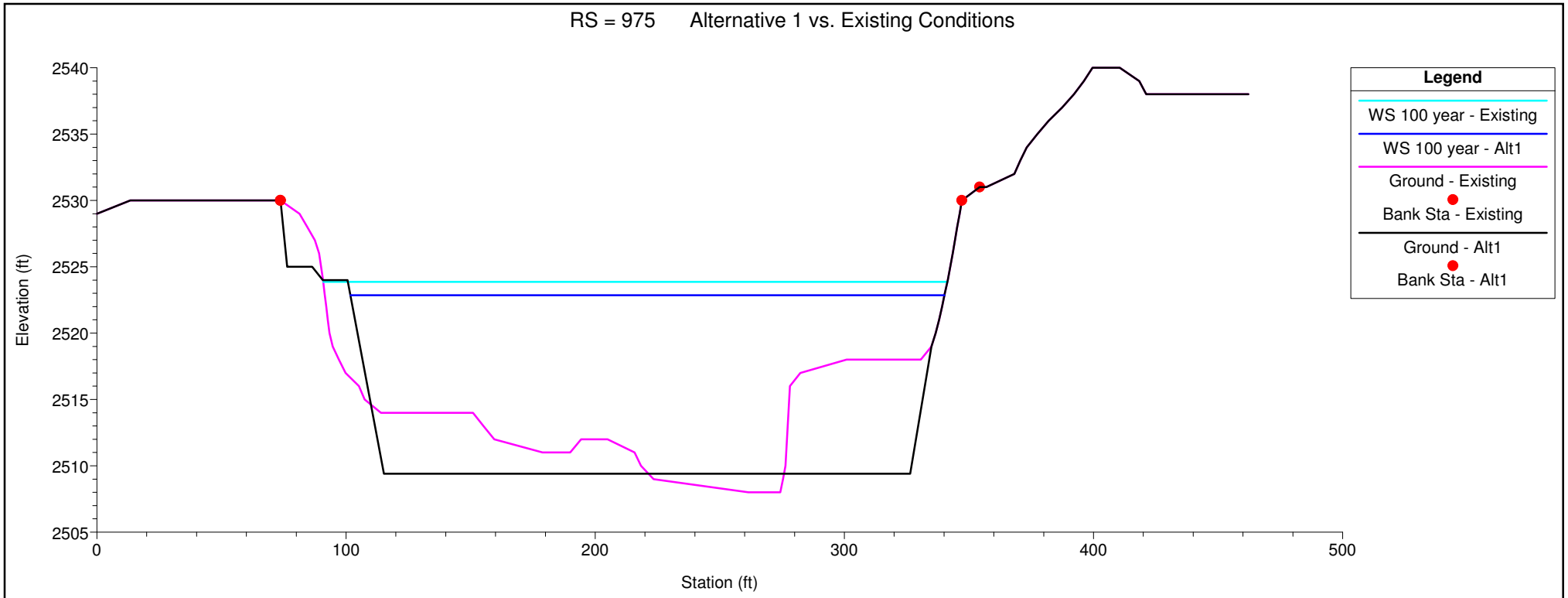

RS = 1010 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2540
2535
2530
2525
2520
2515
0
100
200
300
400
500
600
700
800
Legend
WS 100 year - Existing
WS 100 year - Alt1
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1

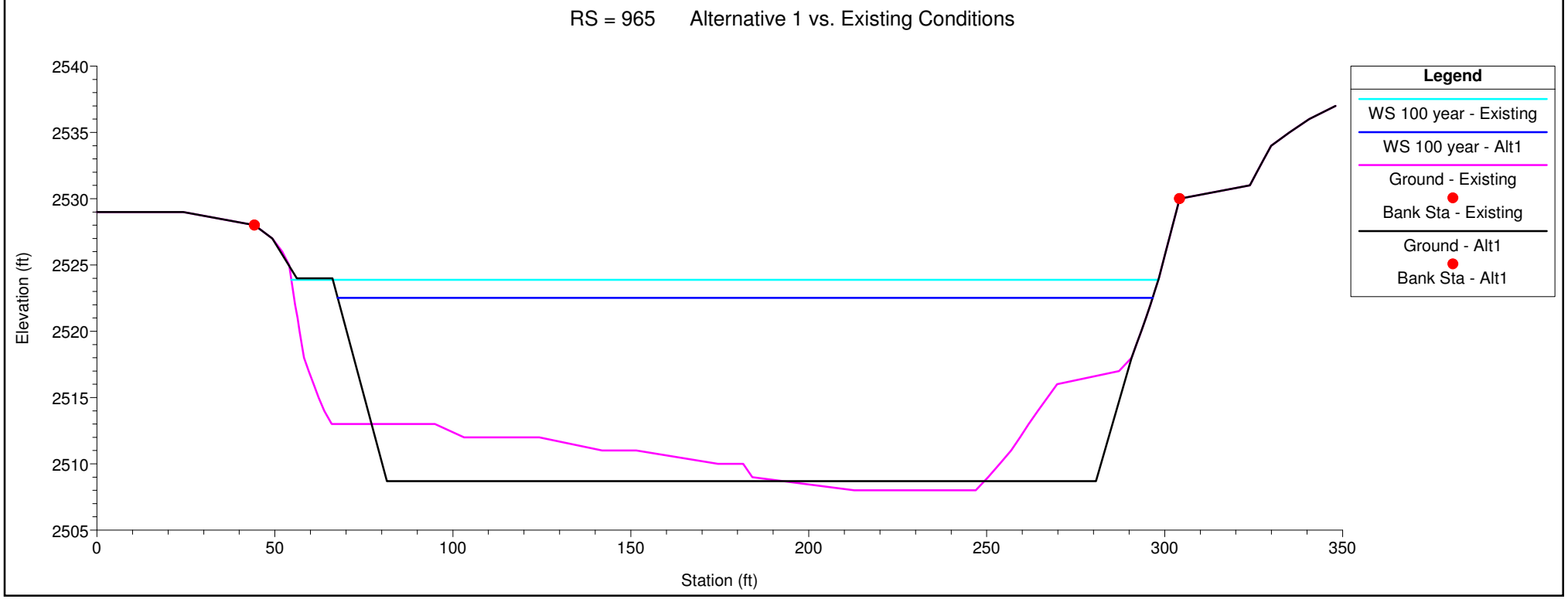
RS = 1000 Alternative 1 vs. Existing Conditions

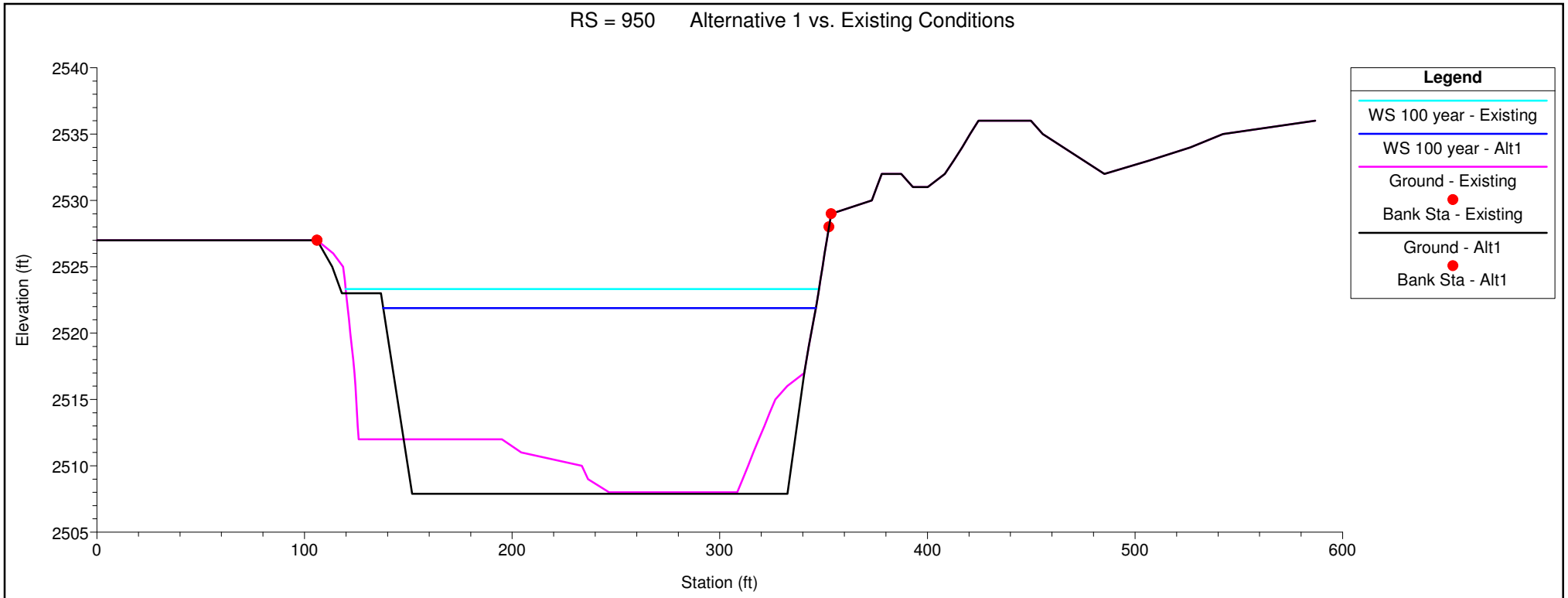


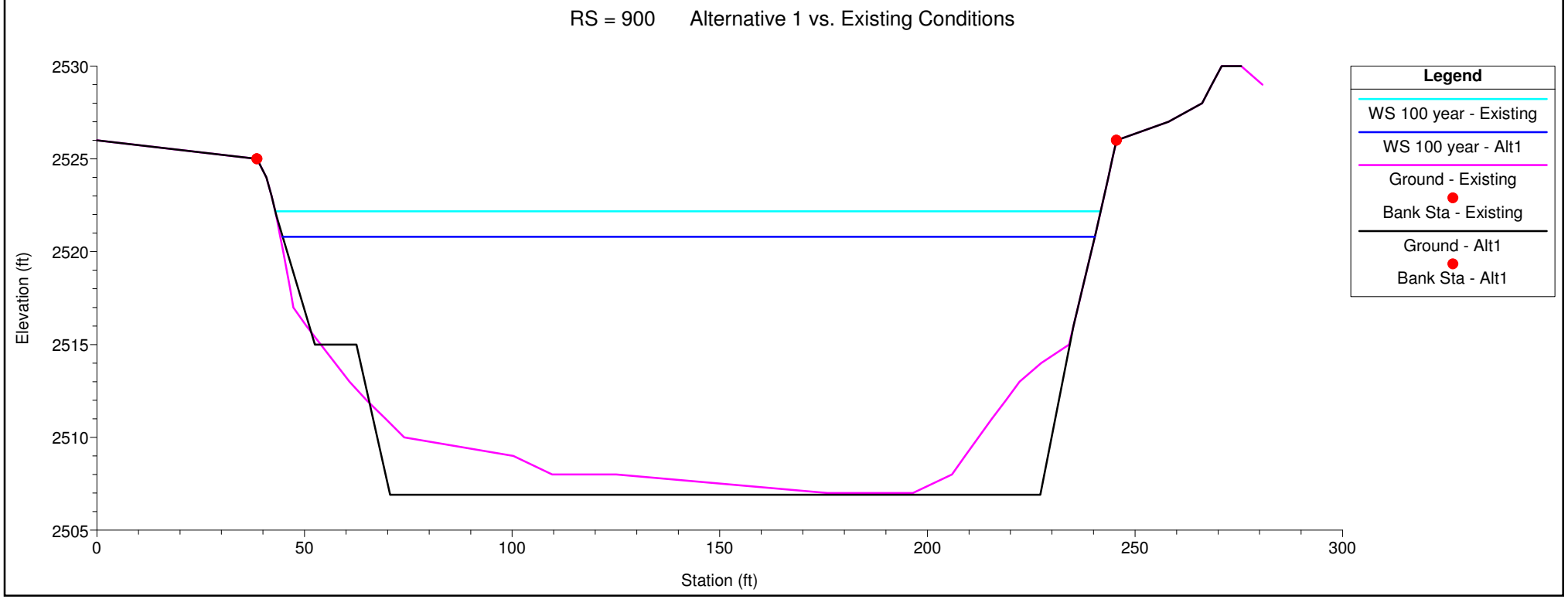
RS = 990 Alternative 1 vs. Existing Conditions

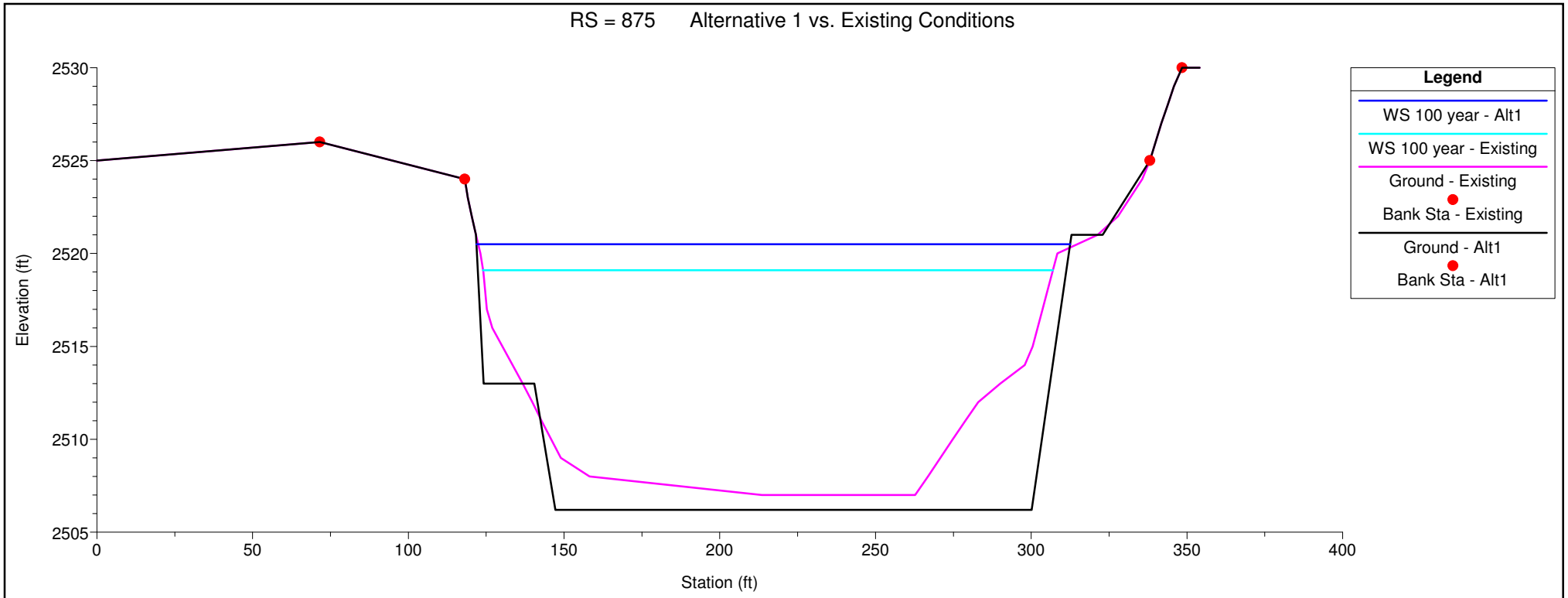


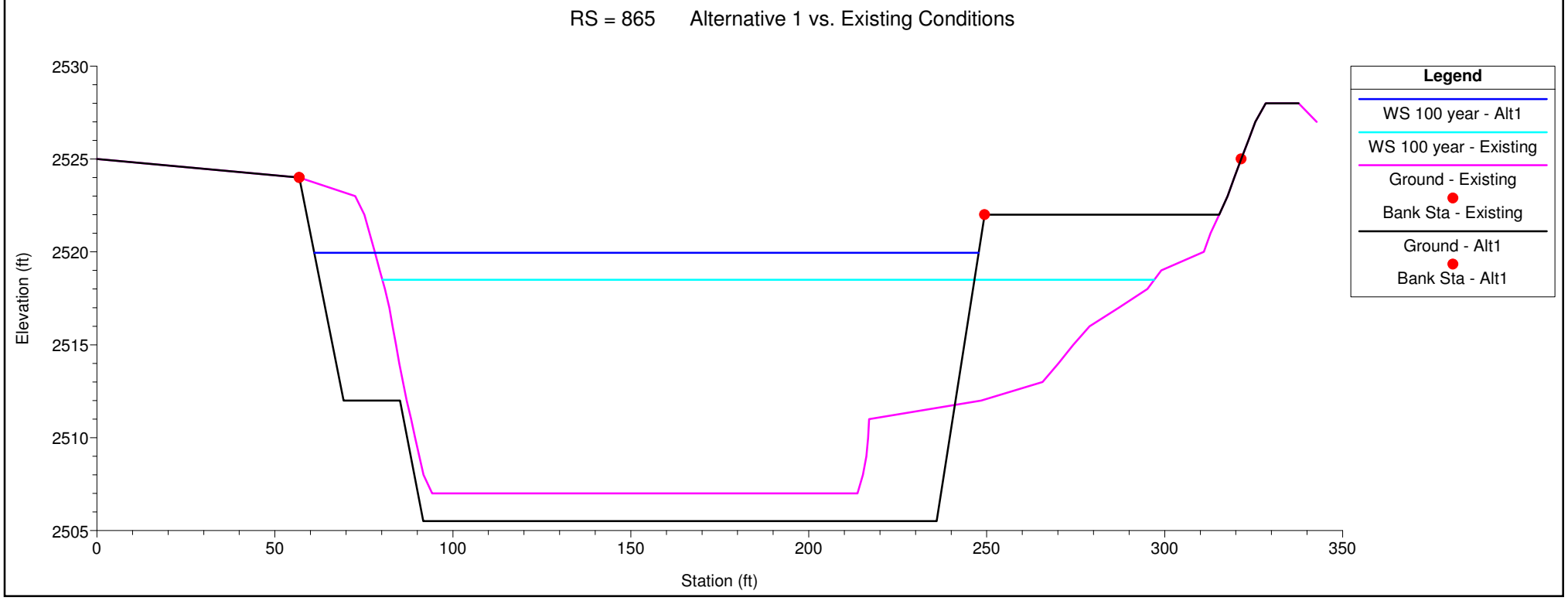

RS = 975 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2540
2535
2530
2525
2520
2515
2510
2505
0
100
200
300
400
500
Legend
WS 100 year - Existing
WS 100 year - Alt1
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1

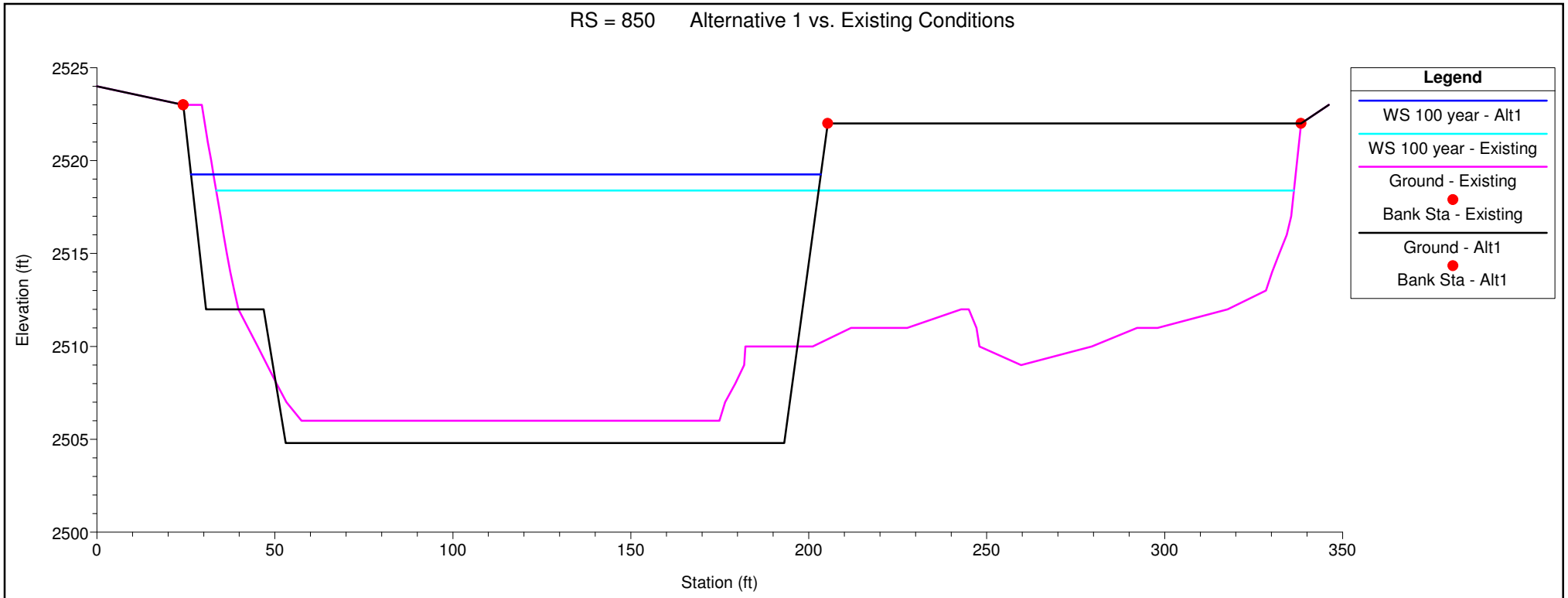

RS = 965 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2540
2535
2530
2525
2520
2515
2510
2505
0
50
100
150
200
250
300
350
Legend
WS 100 year - Existing
WS 100 year - Alt1
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1

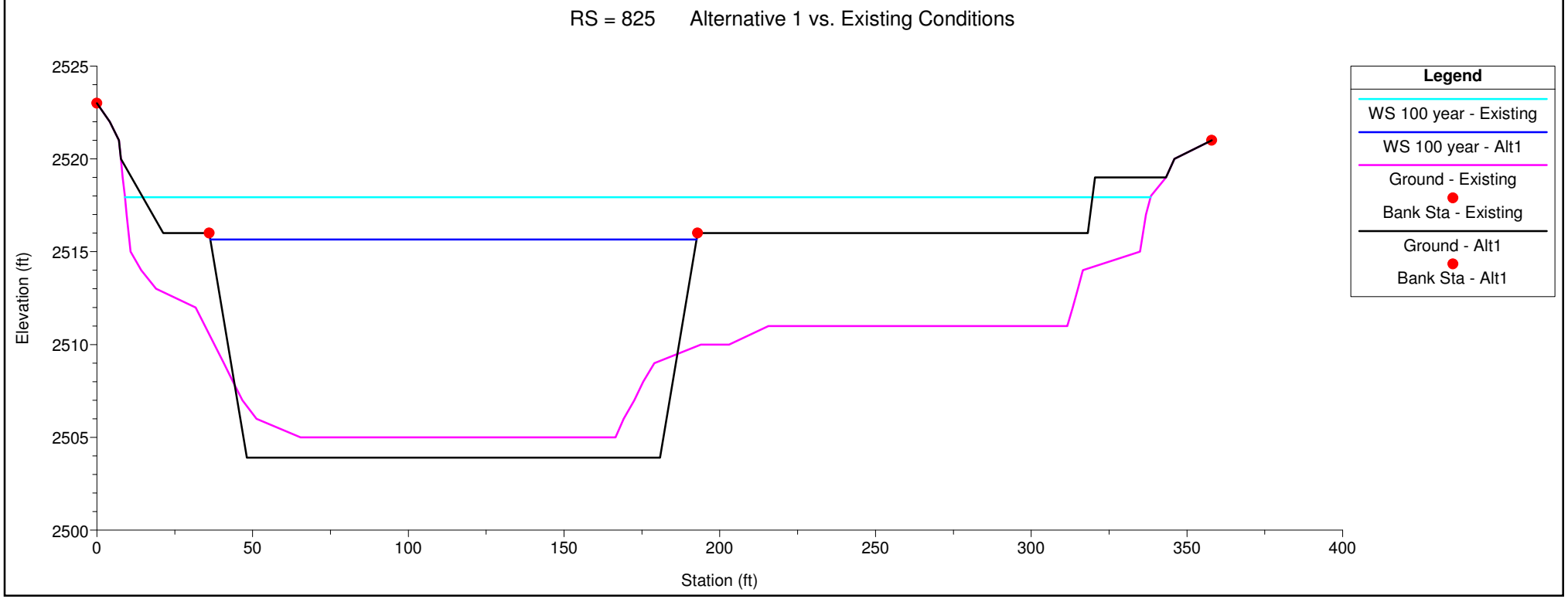

RS = 950 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2540
2535
2530
2525
2520
2515
2510
2505
0
100
200
300
400
500
600
Legend
WS 100 year - Existing
WS 100 year - Alt1
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1

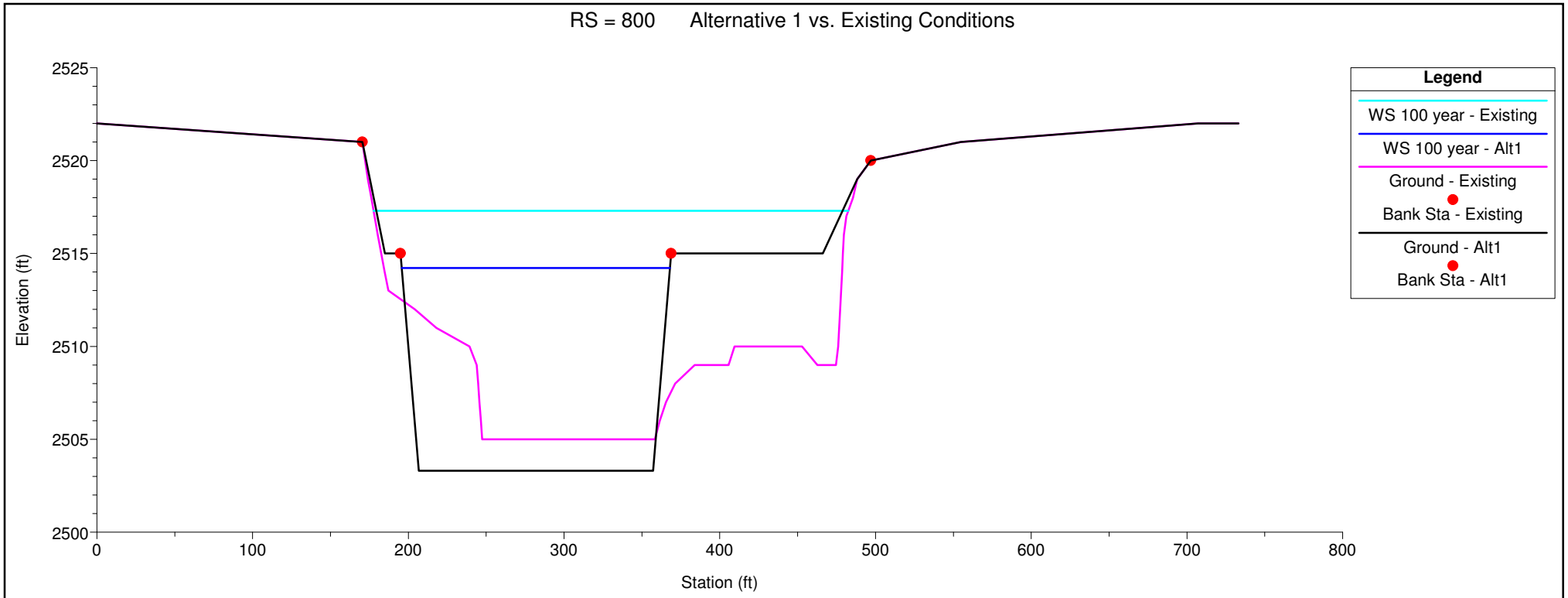

RS = 900 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2530
2525
2520
2515
2510
2505
0
50
100
150
200
250
300
Legend
WS 100 year - Existing
WS 100 year - Alt1
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1

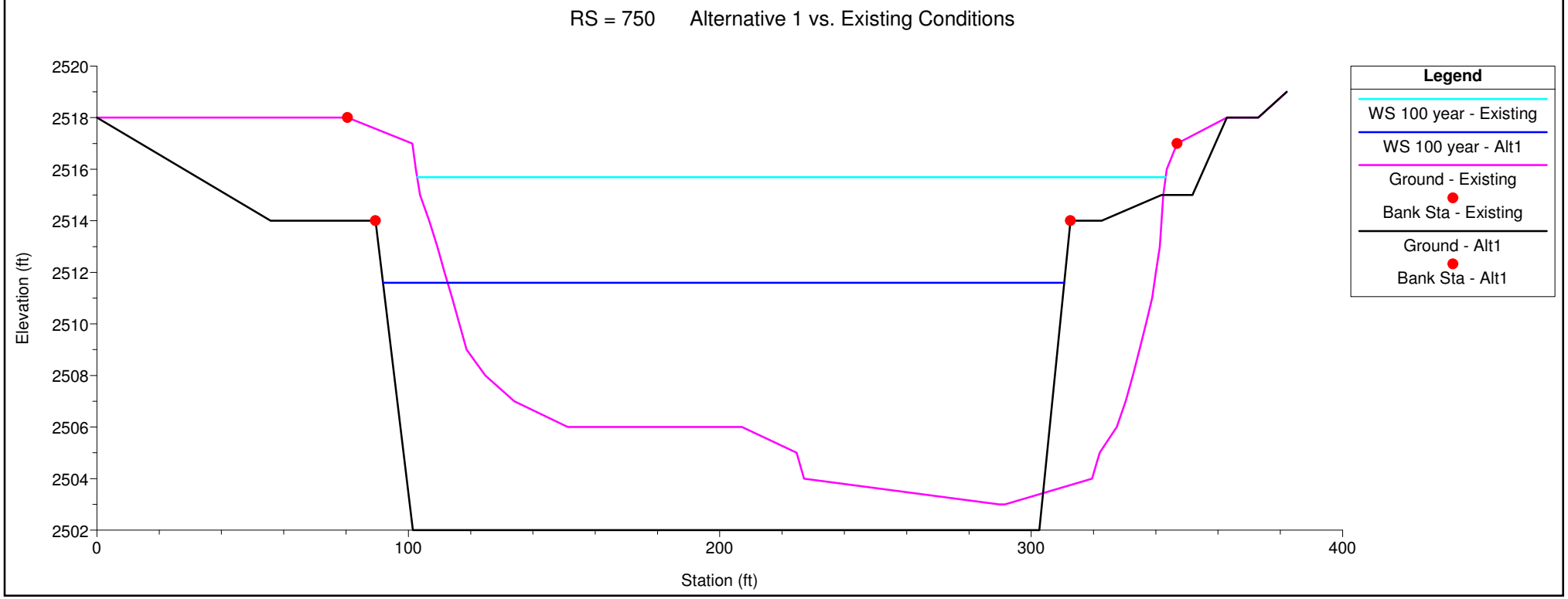

RS = 875 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2530
2525
2520
2515
2510
2505
0
50
100
150
200
250
300
350
400
Legend
WS 100 year - Alt1
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1


RS = 865 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2530
2525
2520
2515
2510
2505
0
50
100
150
200
250
300
350
Legend
WS 100 year - Alt1
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1

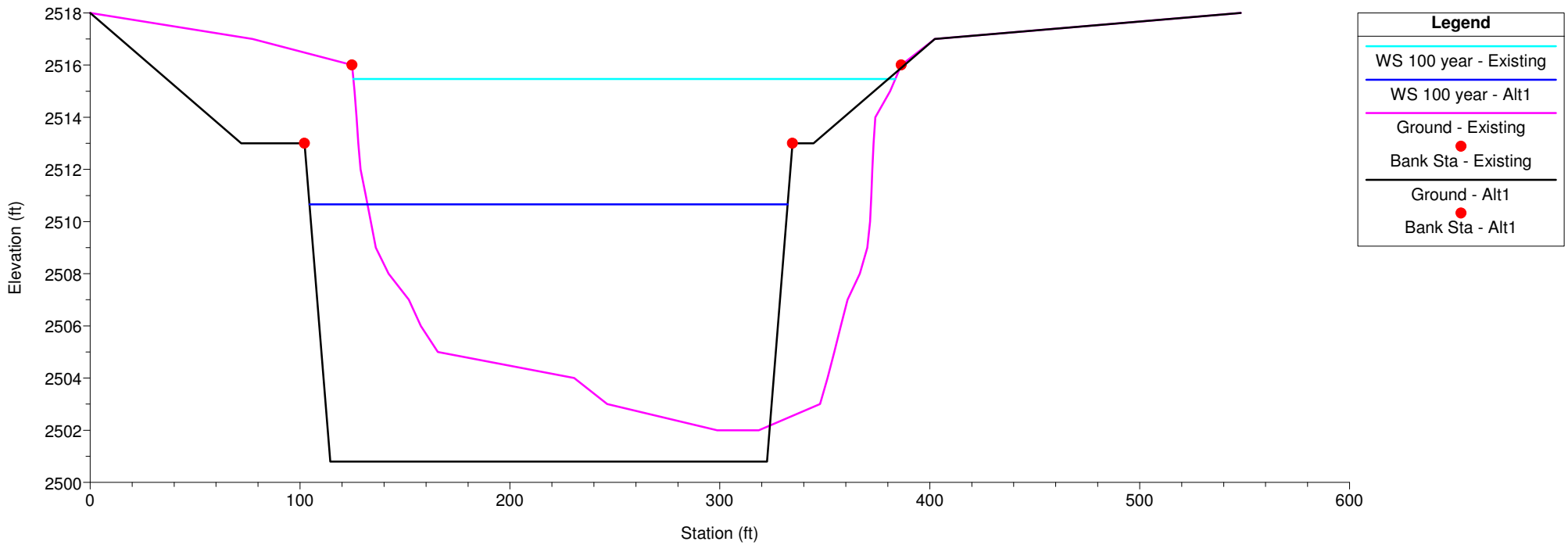

RS = 850 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2525
2520
2515
2510
2505
2500
0
50
100
150
200
250
300
350
Legend
WS 100 year - Alt1
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1


RS = 825 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2525
2520
2515
2510
2505
2500
0
50
100
150
200
250
300
350
400
Legend
WS 100 year - Existing
WS 100 year - Alt1
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1

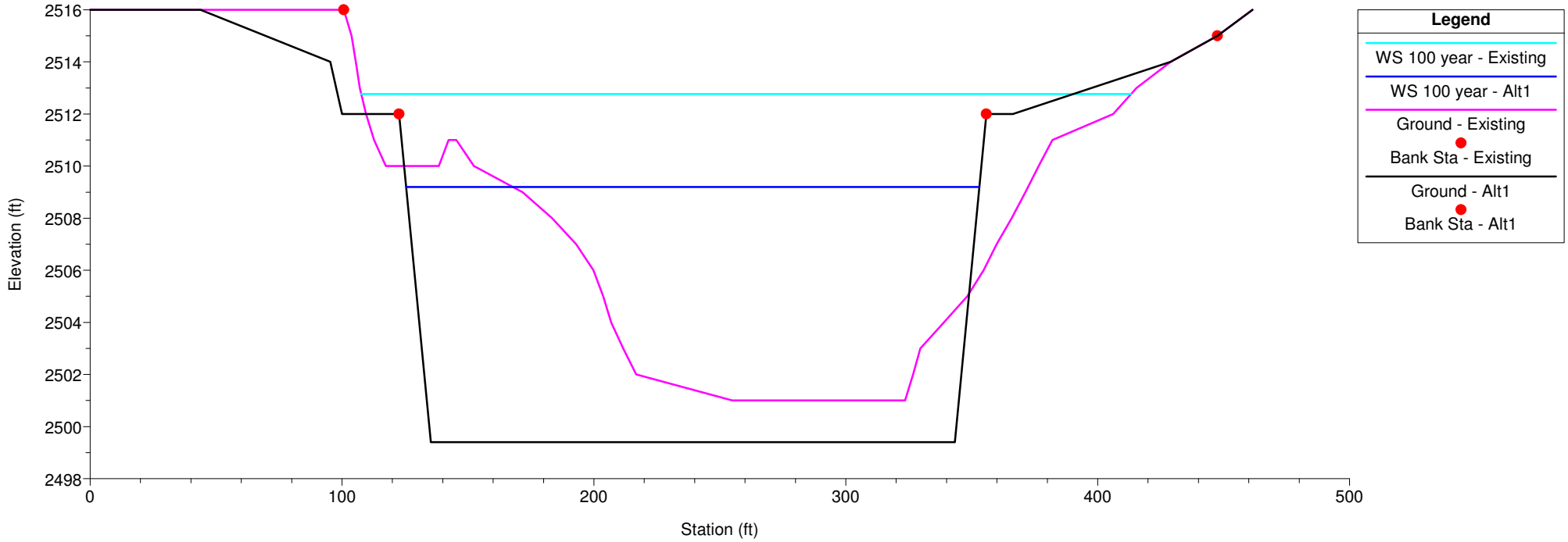

RS = 800 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2525
2520
2515
2510
2505
2500
0
100
200
300
400
500
600
700
800
Legend
WS 100 year - Existing
WS 100 year - Alt1
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1

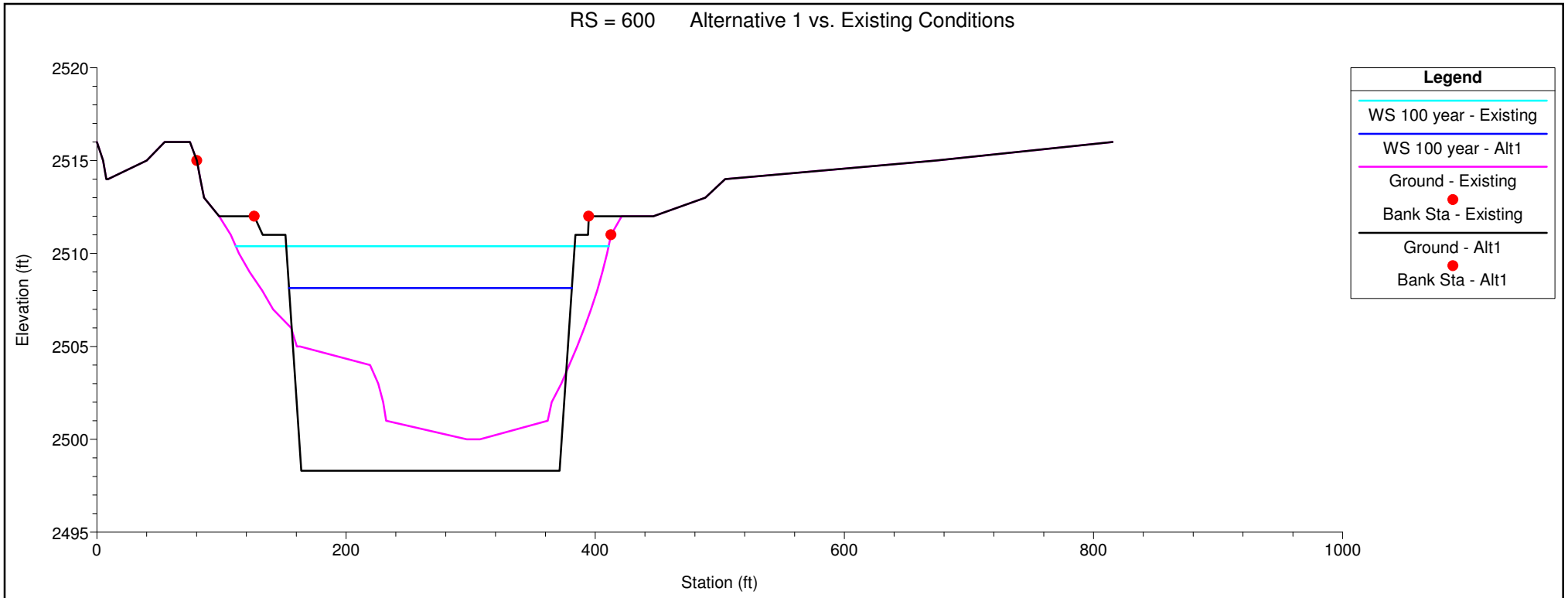

RS = 750 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2520
2518
2516
2514
2512
2510
2508
2506
2504
2502
0
100
200
300
400
Legend
WS 100 year - Existing
WS 100 year - Alt1
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1

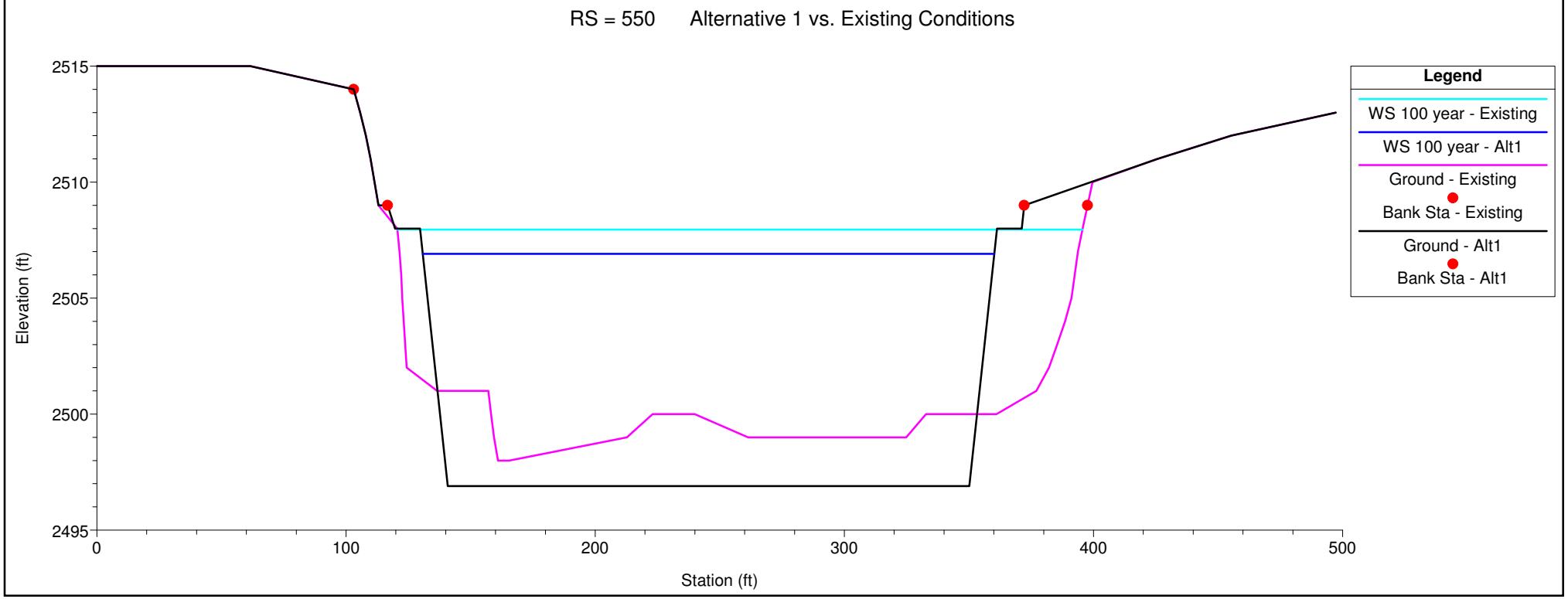
RS = 700 Alternative 1 vs. Existing Conditions

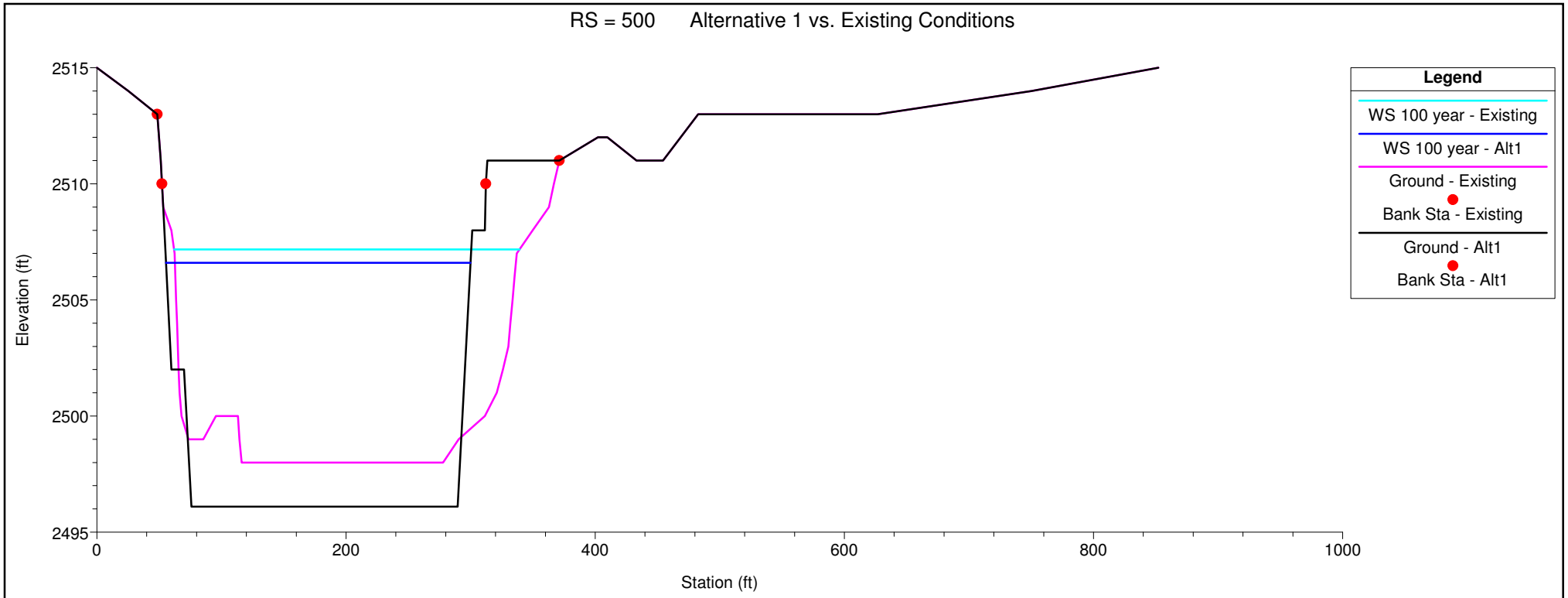


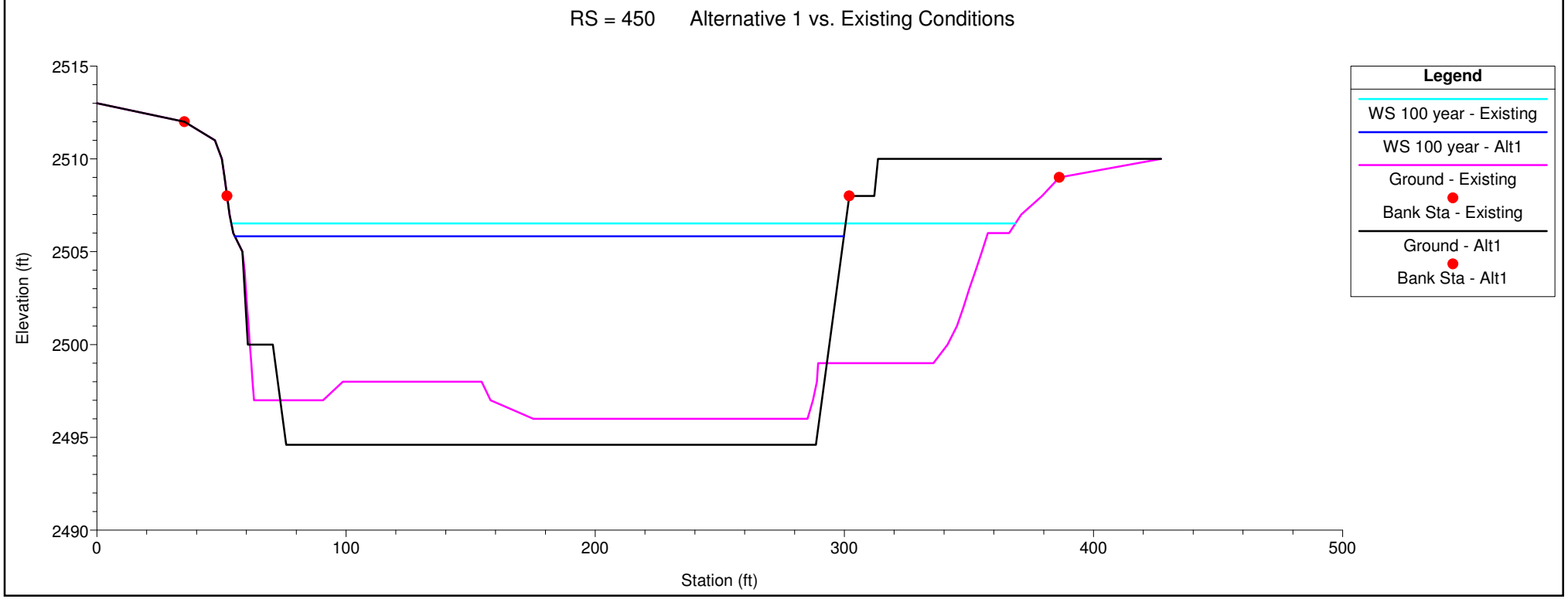
RS = 650 Alternative 1 vs. Existing Conditions

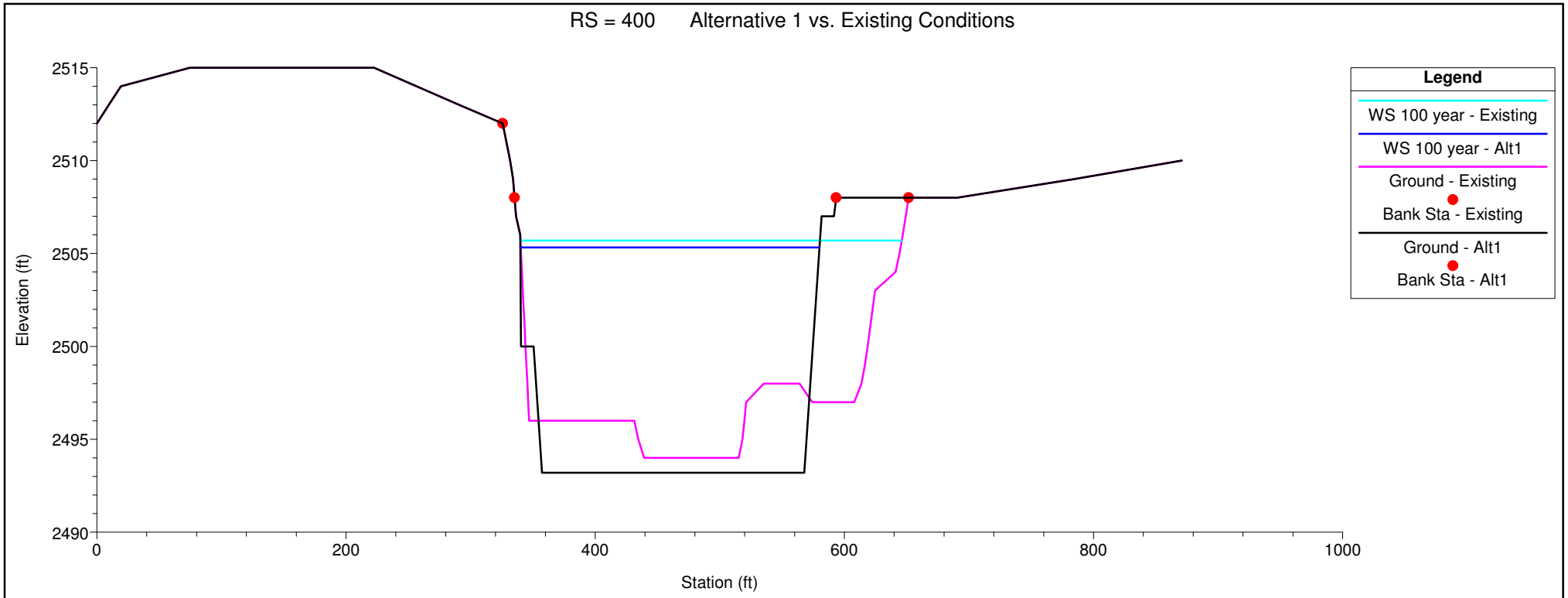


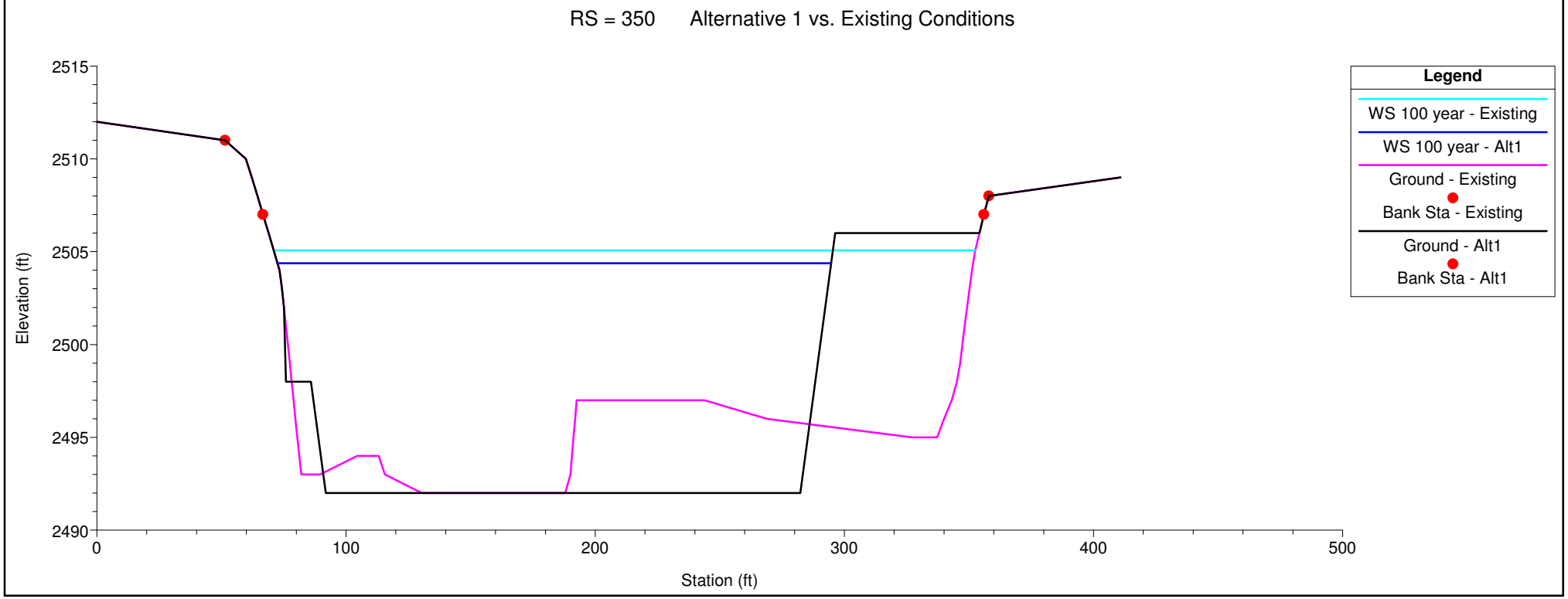

RS = 600 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2520
2515
2510
2505
2500
2495
0
200
400
600
800
1000
Legend
WS 100 year - Existing
WS 100 year - Alt1
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1

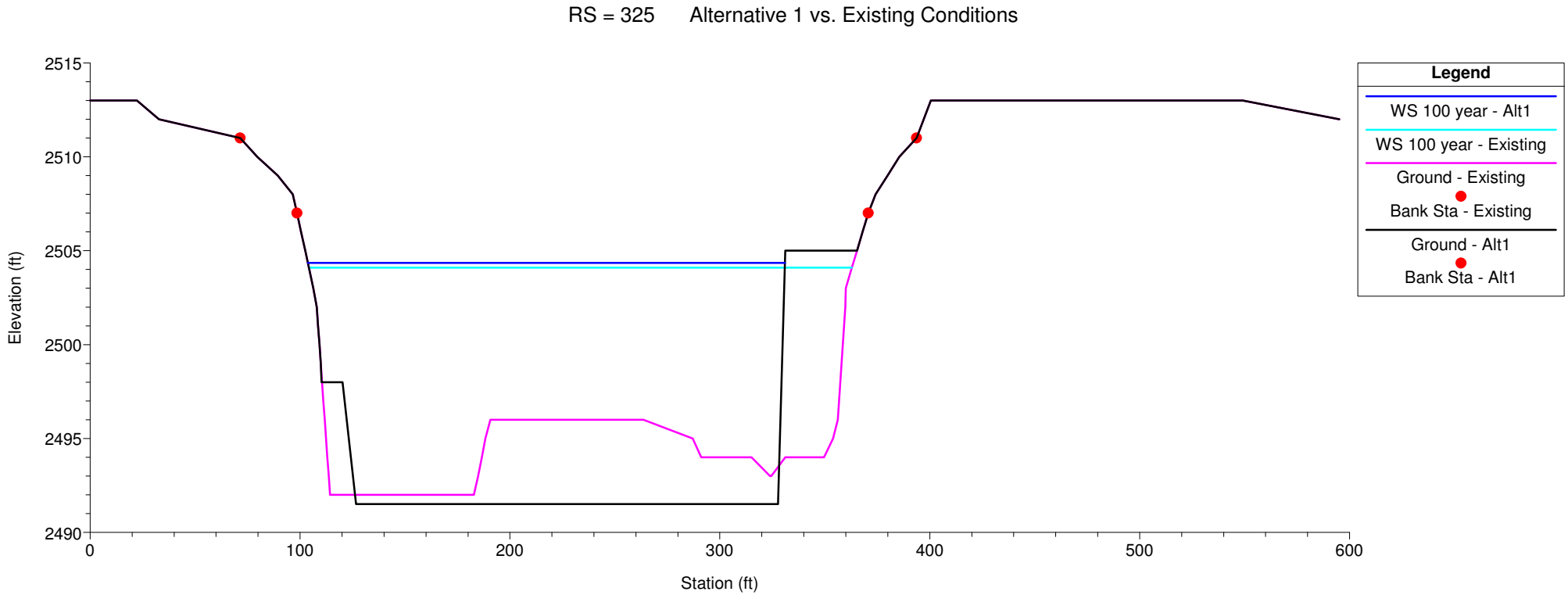

RS = 550 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
0
100
200
300
400
500
Legend
WS 100 year - Existing
WS 100 year - Alt1
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1

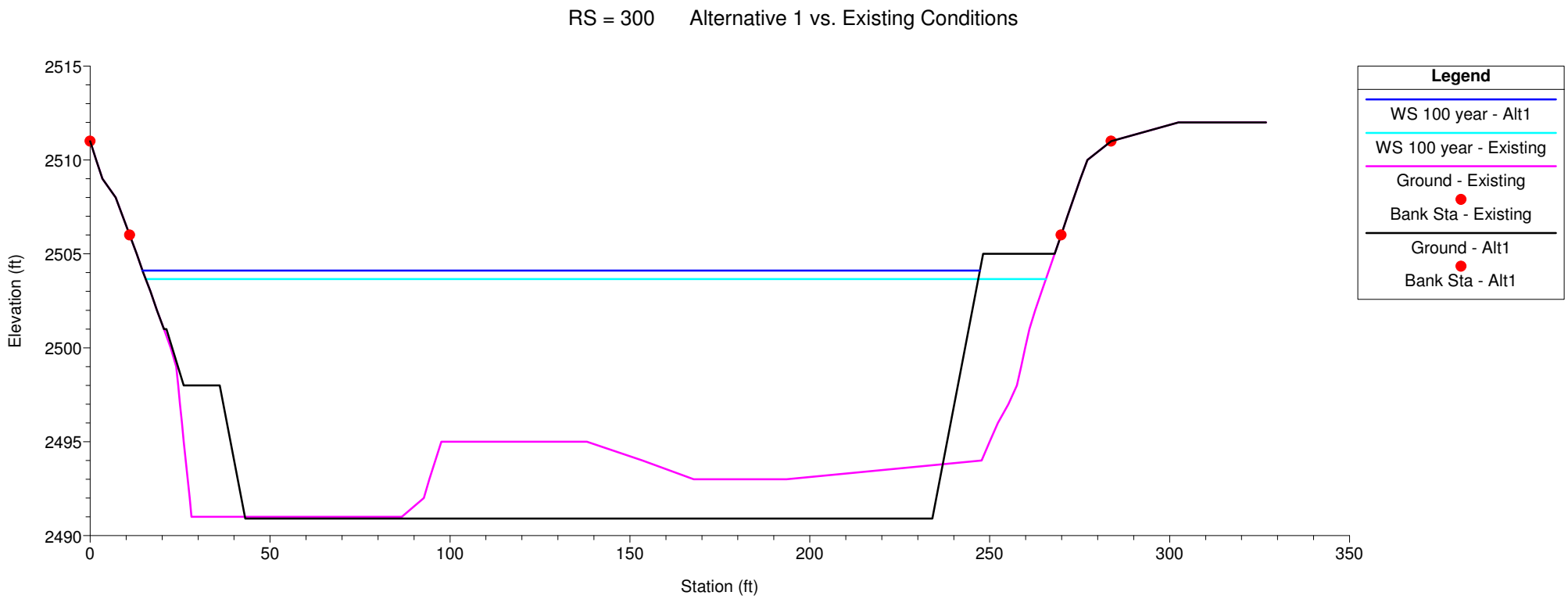

RS = 500 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
0
200
400
600
800
1000
Legend
WS 100 year - Existing
WS 100 year - Alt1
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1


RS = 450 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
2490
0
100
200
300
400
500
Legend
WS 100 year - Existing
WS 100 year - Alt1
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1


RS = 400 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
2490
0
200
400
600
800
1000
Legend
WS 100 year - Existing
WS 100 year - Alt1
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1

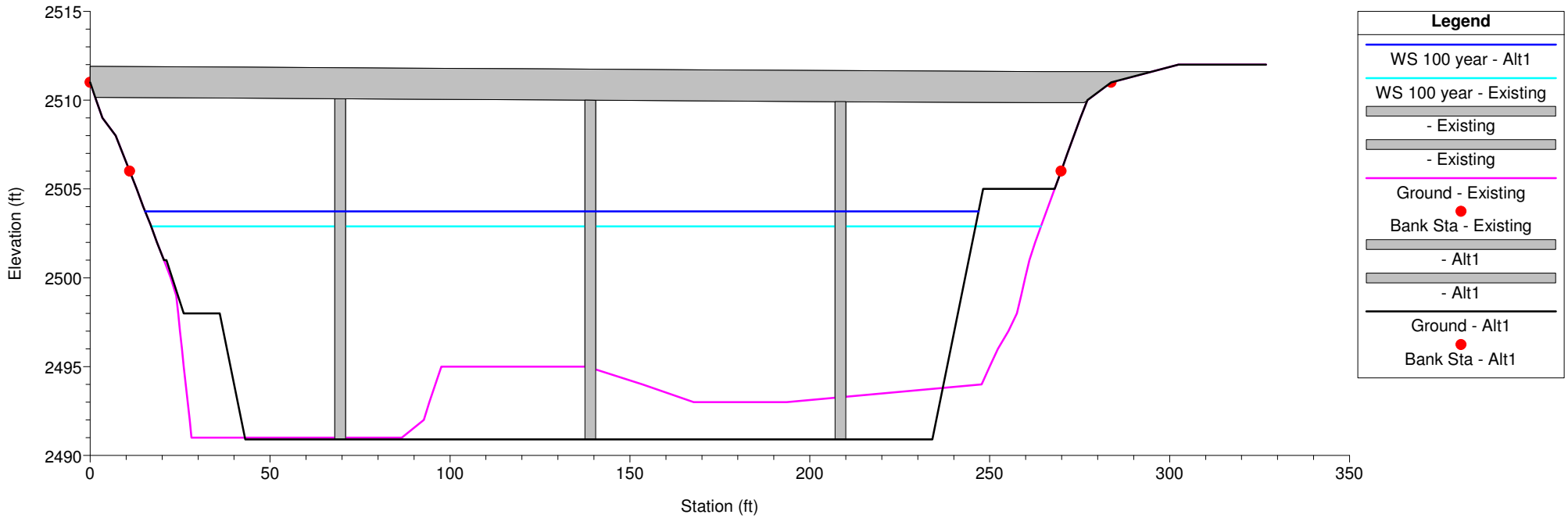

RS = 350 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
2490
0
100
200
300
400
500
Legend
WS 100 year - Existing
WS 100 year - Alt1
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1


RS = 325 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
2490
0
100
200
300
400
500
600
Legend
WS 100 year - Alt1
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1


RS = 300 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
2490
0
50
100
150
200
250
300
350
Legend
WS 100 year - Alt1
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1

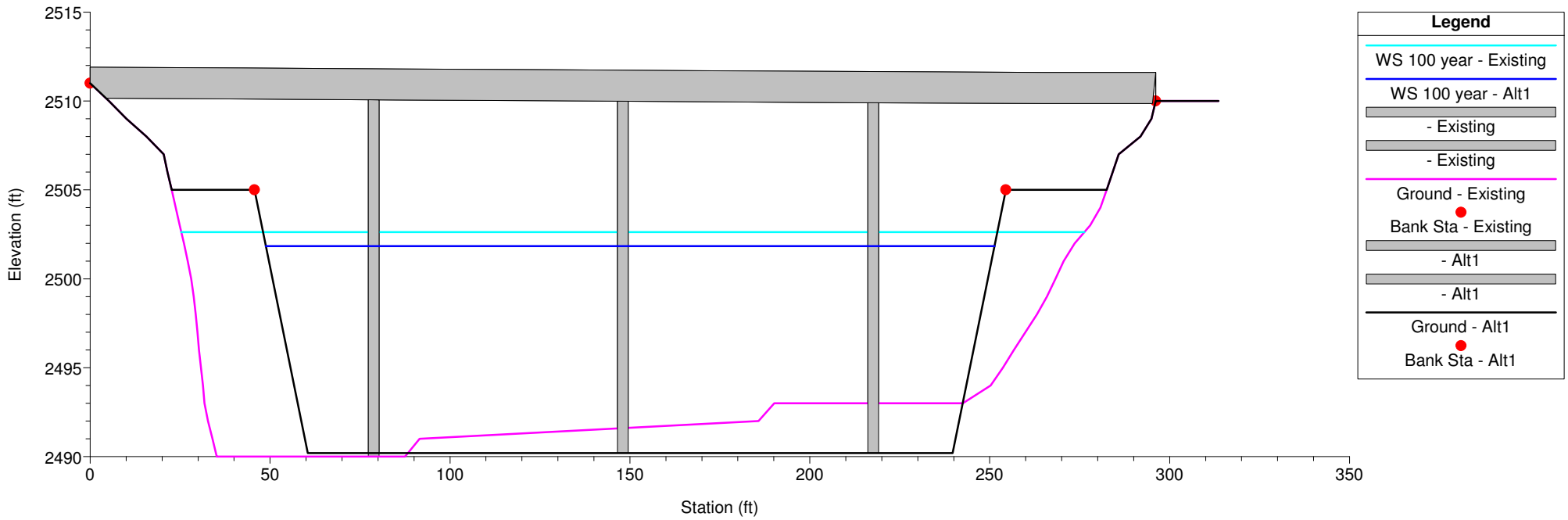
RS = 295 BR

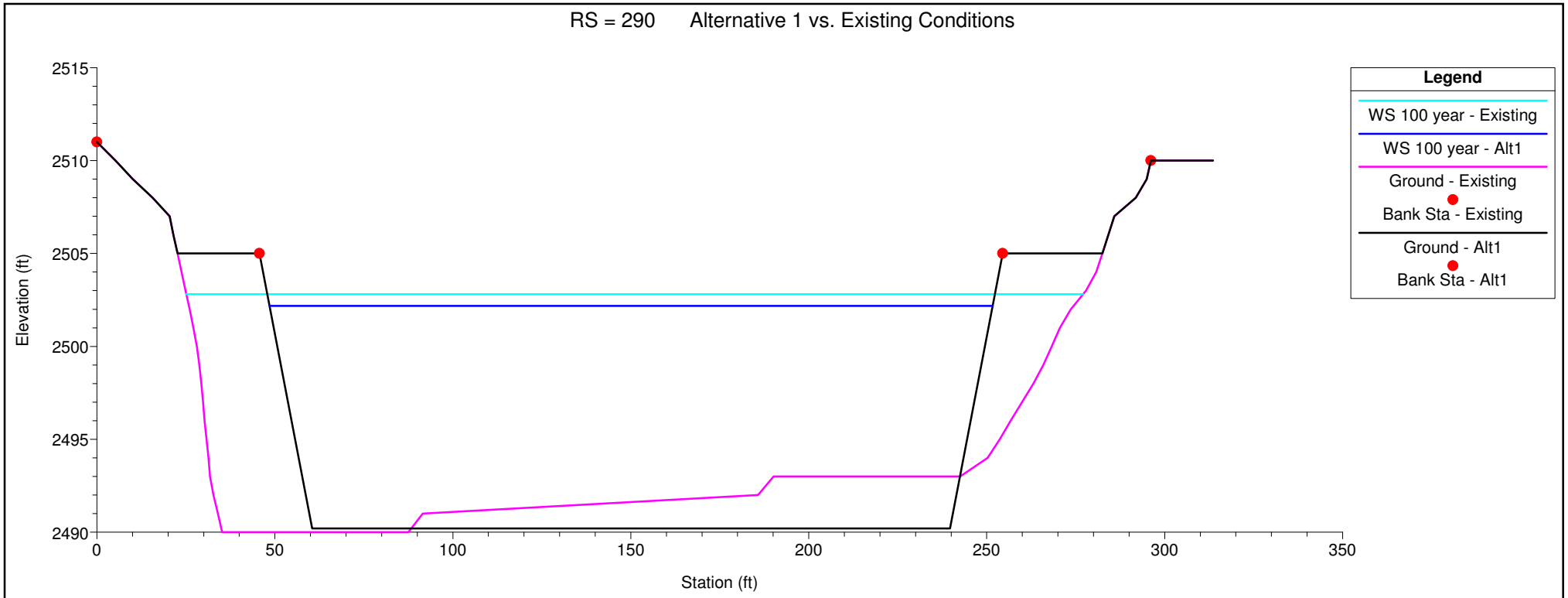
Alternative 1 vs. Existing Conditions

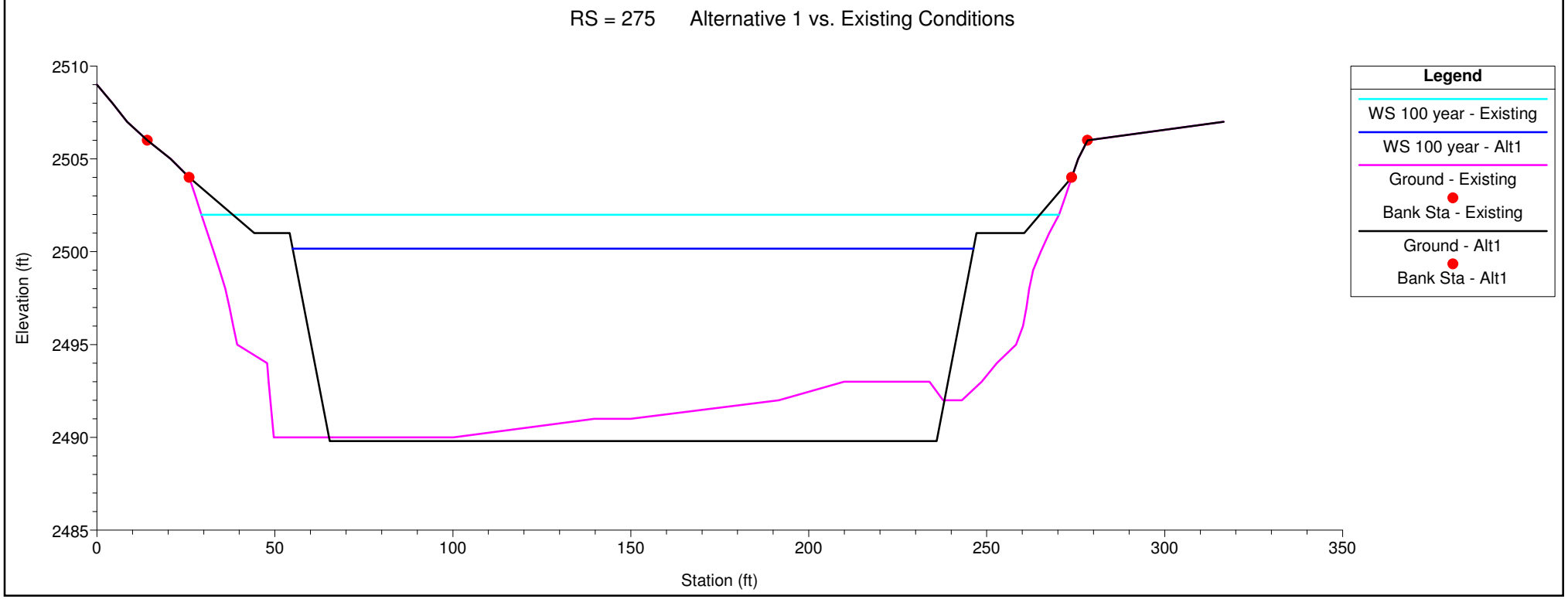


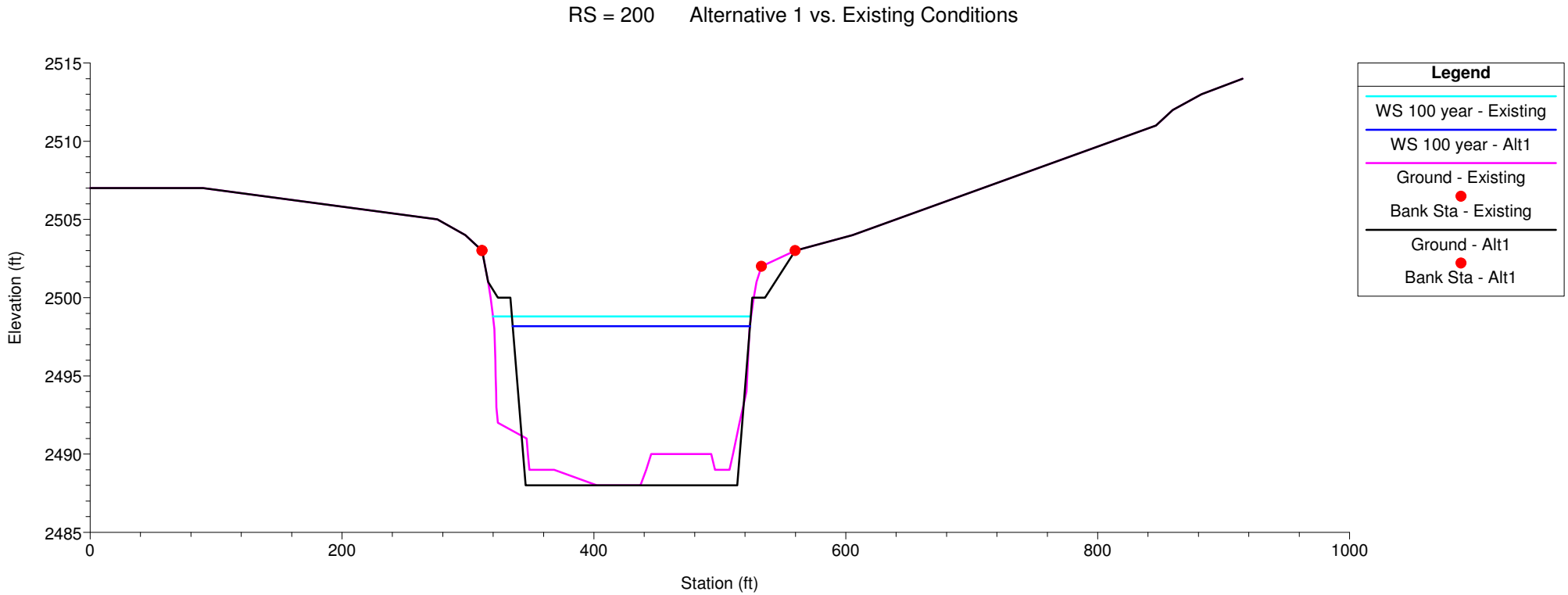
RS = 295 BR

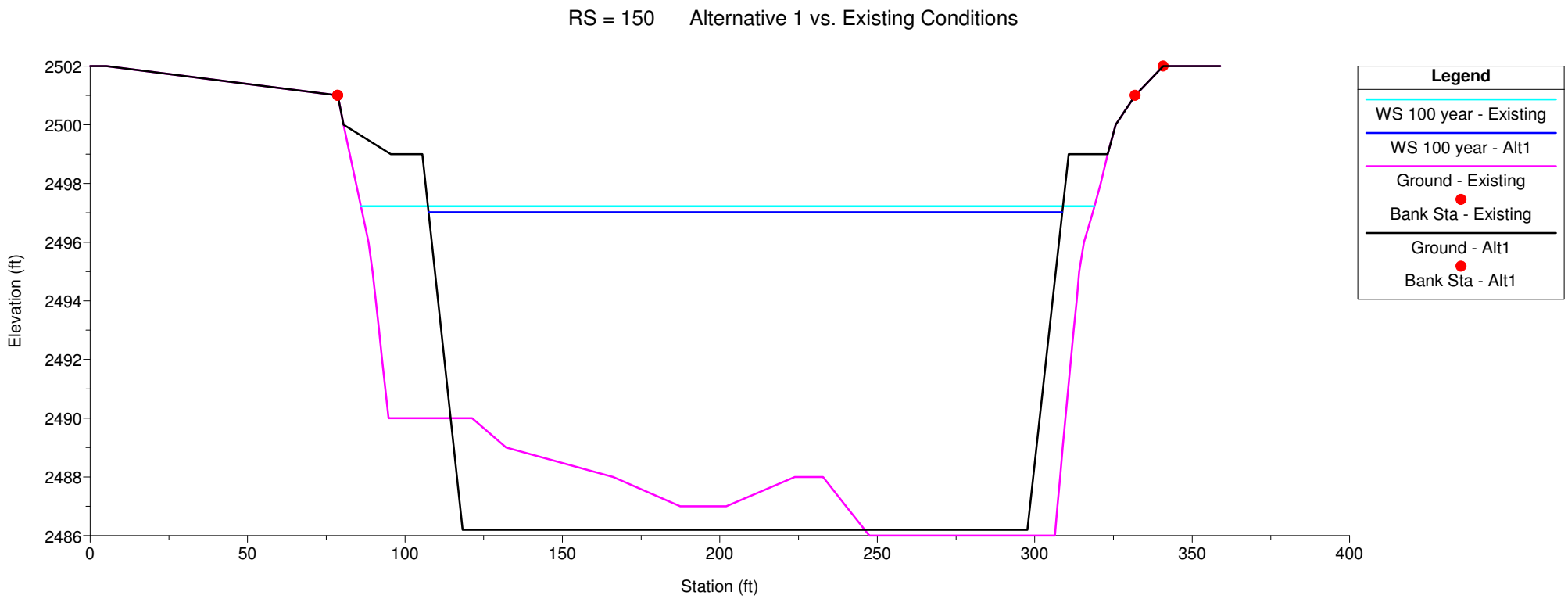
Alternative 1 vs. Existing Conditions



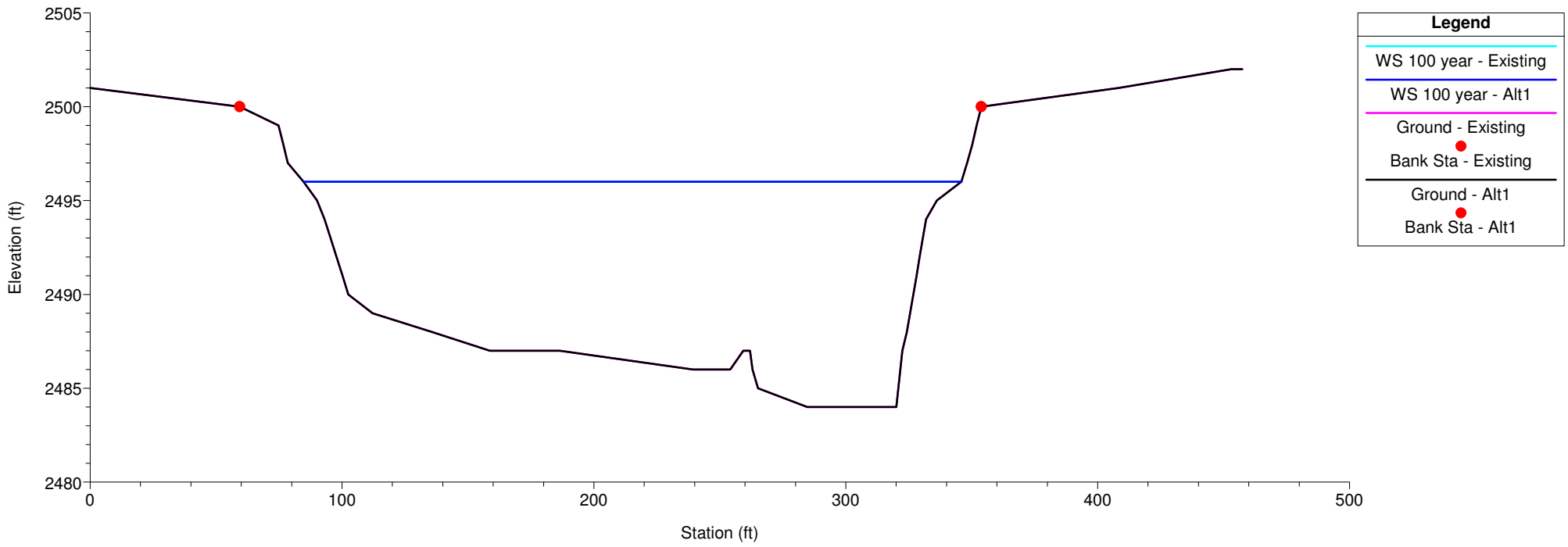

RS = 290 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
2490
0
50
100
150
200
250
300
350
Legend
WS 100 year - Existing
WS 100 year - Alt1
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1


RS = 275 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2510
2505
2500
2495
2490
2485
0
50
100
150
200
250
300
350
Legend
WS 100 year - Existing
WS 100 year - Alt1
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1


RS = 200 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
2490
2485
0
200
400
600
800
1000
Legend
WS 100 year - Existing
WS 100 year - Alt1
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1


RS = 150 Alternative 1 vs. Existing Conditions
Elevation (ft)
Station (ft)
2502
2500
2498
2496
2494
2492
2490
2488
2486
0
50
100
150
200
250
300
350
400
Legend
WS 100 year - Existing
WS 100 year - Alt1
Ground - Existing
Bank Sta - Existing
Ground - Alt1
Bank Sta - Alt1

RS = 100 Alternative 1 vs. Existing Conditions



HEC-RAS Version 3.1.3 May 2005
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
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: Pantano-Sediment Transport
Project File : PantanoSediment.prj
Run Date and Time: 9/12/2008 11:53:12 AM

Project in English units

****

PLAN DATA

Plan Title: Alt1
Plan File : t:\07125\01\WATRES\GLBBASE\CALCS\Hydraulics\HEC-RAS (Sediment)\PantanoSediment.p21

Geometry Title: Alternative1
Geometry File : t:\07125\01\WATRES\GLBBASE\CALCS\Hydraulics\HEC-RAS (Sediment)\PantanoSediment.g01

Flow Title : 1 Flow Profiles
Flow File : t:\07125\01\WATRES\GLBBASE\CALCS\Hydraulics\HEC-RAS (Sediment)\PantanoSediment.F01

Plan Summary Information:
Number of: Cross Sections = 41 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 2 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
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: Subcritical Flow

****

FLOW DATA

Flow Title: 1 Flow Profiles
Flow File : t:\07125\01\WATRES\GLBBASE\CALCS\Hydraulics\HEC-RAS (Sediment)\PantanoSediment.F01

Flow Data (cfs)
****
* River Reach RS * 100 year 50 year 25 year 10 year *
* River #1 Reach #1 1600 * 32000 20000 14000 8700 *
****

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
River #1	Reach #1	100 year		Normal S = 0.005
River #1	Reach #1	50 year		Normal S = 0.005
River #1	Reach #1	25 year		Normal S = 0.005
River #1	Reach #1	10 year		Normal S = 0.005

GEOMETRY DATA

Geometry Title: Alternative1
Geometry File : t:\07125\01\WATRES\GLBBASE\CALCS\Hydraulics\HEC-RAS (Sediment)\PantanoSediment.g01

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1600

INPUT
Description:
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2560	6.4	2559	12.63	2558	18.96	2557	25.3	2556
31.64	2555	37.97	2554	44.38	2553	50.84	2552	57.29	2551
63.85	2550	70.23	2549	76.66	2548	83.12	2547	89.57	2546
96.03	2545	104.28	2544	113.13	2543	121.99	2542	130.94	2541
142.12	2540	202.75	2540	242.37	2540	320.07	2540	328.69	2541
337.31	2542	345.93	2543	354.55	2544	363.17	2545	371.79	2546
380.41	2547	389.03	2548	397.65	2549	406.22	2550	414.78	2551
423.34	2552	431.9	2553	440.46	2554	449.02	2555		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	6.4	.03	431.9	.55

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
6.4	431.9	714.84	679.42	666.96	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (ft)	2551.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.41	Wt. n-Val.		0.030	
W.S. Elev (ft)	2548.54	Reach Len. (ft)	714.84	679.42	666.96
Crit W.S. (ft)	2548.54	Flow Area (sq ft)		2160.17	
E.G. Slope (ft/ft)	0.007058	Area (sq ft)		2160.17	
Q Total (cfs)	32000.00	Flow (cfs)		32000.00	
Top Width (ft)	320.56	Top Width (ft)		320.56	
Vel Total (ft/s)	14.81	Avg. Vel. (ft/s)		14.81	
Max Chl Dpth (ft)	8.54	Hydr. Depth (ft)		6.74	
Conv. Total (cfs)	380897.9	Conv. (cfs)		380897.9	
Length Wtd. (ft)	679.42	Wetted Per. (ft)		321.60	
Min Ch El (ft)	2540.00	Shear (lb/sq ft)		2.96	
Alpha	1.00	Stream Power (lb/ft s)		43.84	
Frctn Loss (ft)	2.93	Cum Volume (acre-ft)	0.20	473.76	0.05
C & E Loss (ft)	0.48	Cum SA (acres)	0.19	48.08	0.24

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
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 OUTPUT Profile #10 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2545.59  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.70  * Wt. n-Val.            *         *   0.030  *         *
* W.S. Elev (ft)        * 2543.89  * Reach Len. (ft)       *  714.84  *  679.42  *  666.96  *
* Crit W.S. (ft)        * 2543.89  * Flow Area (sq ft)     *         *  832.23  *         *
* E.G. Slope (ft/ft)    *0.008903  * Area (sq ft)          *         *  832.23  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  248.33  * Top Width (ft)        *         *  248.33  *         *
* Vel Total (ft/s)      *   10.45  * Avg. Vel. (ft/s)      *         *   10.45  *         *
* Max Chl Dpth (ft)     *    3.89  * Hydr. Depth (ft)      *         *    3.35  *         *
* Conv. Total (cfs)     * 92206.1  * Conv. (cfs)           *         * 92206.1  *         *
* Length Wtd. (ft)      *  679.42  * Wetted Per. (ft)      *         *  248.76  *         *
* Min Ch El (ft)        * 2540.00  * Shear (lb/sq ft)      *         *    1.86  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   19.44  *         *
* Frctn Loss (ft)       *    3.40  * Cum Volume (acre-ft)  *         *  195.06  *         *
* C & E Loss (ft)       *    0.25  * Cum SA (acres)        *         *   43.27  *         *
*****************************************************************************************
```

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: River #1
REACH: Reach #1 RS: 1500

INPUT
Description:
Station Elevation Data num= 55

```
   Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev
*******************************************************************************
     0   2552   44.32   2551   97.21   2550   217.4   2550  271.68   2550
  341.92   2549  479.35   2544  480.31   2543  481.37   2542   482.2   2541
  483.05   2540  483.78   2539  484.55   2538  486.23   2537  491.23   2536
  494.37   2535  495.54   2534  510.31   2534  516.95   2535  524.67   2536
  535.82   2536   537.4   2535  539.99   2534   542.3   2533  546.34   2532
   578.5   2532   581.8   2533  584.65   2534   587.3   2535   591.8   2536
  610.04   2537  650.01   2537  656.48   2537  682.04   2537     689   2536
   696.1   2535  722.11   2535   724.8   2536  736.31   2537  742.79   2538
  749.32   2539  750.68   2540  752.02   2541  753.35   2542  754.71   2543
   760.8   2544  771.13   2545  776.07   2546  781.82   2547  788.07   2547
  800.68   2547  825.75   2548  840.49   2549  847.09   2549  873.22   2550
```

Manning's n Values num= 3

```
   Sta   n Val    Sta   n Val    Sta   n Val
*************************************************
     0   .055  341.92    .03  781.82   .055
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
341.92 781.82 249.55 214.55 208.7 .1 .3

CROSS SECTION OUTPUT Profile #100 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2547.91  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.82  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2546.09  * Reach Len. (ft)       *  249.55  *  214.55  *  208.70  *
* Crit W.S. (ft)        *          * Flow Area (sq ft)     *         * 2955.01  *         *
* E.G. Slope (ft/ft)    *0.002910  * Area (sq ft)          *         * 2955.01  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  354.78  * Top Width (ft)        *         *  354.78  *         *
* Vel Total (ft/s)      *   10.83  * Avg. Vel. (ft/s)      *         *   10.83  *         *
* Max Chl Dpth (ft)     *   14.09  * Hydr. Depth (ft)      *         *    8.33  *         *
* Conv. Total (cfs)     *593232.6  * Conv. (cfs)           *         *593232.6  *         *
* Length Wtd. (ft)      *  214.55  * Wetted Per. (ft)      *         *  362.14  *         *
* Min Ch El (ft)        * 2532.00  * Shear (lb/sq ft)      *         *    1.48  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   16.05  *         *
* Frctn Loss (ft)       *    0.58  * Cum Volume (acre-ft)   *    0.20  *  433.87  *    0.05  *
* C & E Loss (ft)       *    0.01  * Cum SA (acres)         *    0.19  *   42.81  *    0.24  *
*****************************************************************************************
```

CROSS SECTION OUTPUT Profile #10 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2540.77  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    0.86  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2539.91  * Reach Len. (ft)       *  249.55  *  214.55  *  208.70  *
* Crit W.S. (ft)        *          * Flow Area (sq ft)     *         * 1172.33  *         *
* E.G. Slope (ft/ft)    *0.003196  * Area (sq ft)          *         * 1172.33  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  267.45  * Top Width (ft)        *         *  267.45  *         *
* Vel Total (ft/s)      *    7.42  * Avg. Vel. (ft/s)      *         *    7.42  *         *
* Max Chl Dpth (ft)     *    7.91  * Hydr. Depth (ft)      *         *    4.38  *         *
* Conv. Total (cfs)     *153895.4  * Conv. (cfs)           *         *153895.4  *         *
* Length Wtd. (ft)      *  214.55  * Wetted Per. (ft)      *         *  271.70  *         *
* Min Ch El (ft)        * 2532.00  * Shear (lb/sq ft)      *         *    0.86  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *    6.39  *         *
* Frctn Loss (ft)       *    0.69  * Cum Volume (acre-ft)   *         *  179.42  *         *
* C & E Loss (ft)       *    0.00  * Cum SA (acres)         *         *   39.25  *         *
*****************************************************************************************
```

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1450

INPUT
Description:
Station Elevation Data num= 45

```
    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev
*****************************************************************************
      0   2546     19   2546   51.63   2546   56.22   2545   59.92   2544
  69.95   2543   70.94   2542   71.97   2541   73.05   2540   74.14   2539
  75.29   2538   76.27   2537   77.42   2536   80.49   2535   81.02   2534
  84.75   2533   85.65   2532   86.57   2531  120.14   2531  122.76   2532
 130.25   2533  138.86   2534  141.33   2535  146.34   2535   175.1   2535
 179.28   2536  230.48   2537   236.4   2537  243.84   2536  245.96   2535
 248.93   2534  271.08   2534   291.6   2535  304.77   2536  338.54   2537
    340   2538  341.44   2539  342.85   2540  344.25   2541  345.61   2542
 348.41   2543  368.53   2544  376.03   2545  383.95   2546  391.36   2547
```

Manning's n Values num= 3

```
    Sta   n Val    Sta   n Val    Sta   n Val
**************************************************
      0   .055   51.63    .03  391.36   .055
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
51.63 391.36 208.28 198.72 196.75 .1 .3

CROSS SECTION OUTPUT Profile #100 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2547.32  * Element              *  Left OB *  Channel * Right OB *
```

```
* Vel Head (ft)         *    1.79  * Wt. n-Val.            *         *   0.030  *         *
* W.S. Elev (ft)        * 2545.54  * Reach Len. (ft)       *  208.28  *  198.72  *  196.75  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)      *         * 2983.01  *         *
* E.G. Slope (ft/ft)    *0.002535  * Area (sq ft)          *         * 2983.01  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  326.53  * Top Width (ft)        *         *  326.53  *         *
* Vel Total (ft/s)      *   10.73  * Avg. Vel. (ft/s)      *         *   10.73  *         *
* Max Chl Dpth (ft)     *   14.54  * Hydr. Depth (ft)      *         *    9.14  *         *
* Conv. Total (cfs)     *635549.9  * Conv. (cfs)           *         *635549.9  *         *
* Length Wtd. (ft)      *  198.72  * Wetted Per. (ft)       *         *  334.37  *         *
* Min Ch El (ft)        * 2531.00  * Shear (lb/sq ft)      *         *    1.41  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   15.15  *         *
* Frctn Loss (ft)       *    0.57  * Cum Volume (acre-ft)   *    0.20  *  419.25  *    0.05  *
* C & E Loss (ft)       *    0.05  * Cum SA (acres)         *    0.19  *   41.13  *    0.24  *
*****************************************************************************************************

CROSS SECTION OUTPUT  Profile #10 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2540.08  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    0.85  * Wt. n-Val.            *         *   0.030  *         *
* W.S. Elev (ft)        * 2539.23  * Reach Len. (ft)       *  208.28  *  198.72  *  196.75  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)      *         * 1172.50  *         *
* E.G. Slope (ft/ft)    *0.003211  * Area (sq ft)          *         * 1172.50  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  267.86  * Top Width (ft)        *         *  267.86  *         *
* Vel Total (ft/s)      *    7.42  * Avg. Vel. (ft/s)      *         *    7.42  *         *
* Max Chl Dpth (ft)     *    8.23  * Hydr. Depth (ft)      *         *    4.38  *         *
* Conv. Total (cfs)     *153537.0  * Conv. (cfs)           *         *153537.0  *         *
* Length Wtd. (ft)      *  198.72  * Wetted Per. (ft)       *         *  272.75  *         *
* Min Ch El (ft)        * 2531.00  * Shear (lb/sq ft)      *         *    0.86  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *    6.39  *         *
* Frctn Loss (ft)       *    0.72  * Cum Volume (acre-ft)   *         *  173.65  *         *
* C & E Loss (ft)       *    0.02  * Cum SA (acres)         *         *   37.93  *         *
*****************************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 1400

INPUT
Description:
Station Elevation Data    num=      58
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2547  146.64    2545  255.29    2545  288.69    2545  295.61    2544
  306.7    2543  307.96    2542  309.18    2541  310.32    2540  311.47    2539
 312.62    2538  313.79    2537  314.95    2536  326.94    2535  331.52    2534
 332.56    2533  333.65    2532  334.79    2531  346.78    2530  352.41    2530
 354.84    2531  356.53    2532  364.04    2532  367.65    2532  371.65    2533
 377.04    2533  380.29    2533  384.46    2534   389.3    2534  391.66    2534
 397.87    2534  405.78    2534  415.27    2535  416.31    2535  427.87    2535
 437.22    2535  446.39    2534  483.73    2533  497.25    2533  500.49    2534
 503.73    2535  537.05    2536  541.55    2536  556.55    2536  557.89    2537
 559.19    2538  560.53    2539  561.83    2540  563.15    2541  564.36    2542
 566.21    2543  583.98    2544  590.64    2545   606.2    2546  612.52    2547
 620.38    2548  628.23    2549  810.24    2548

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
**************************************************
      0    .055  288.69     .03  590.64    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       288.69  590.64          208.05  211.15  211.05            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2546.71  * Element                *  Left OB *  Channel * Right OB *
```

```
* Vel Head (ft)         *    2.26  * Wt. n-Val.            *         *   0.030  *         *
* W.S. Elev (ft)        * 2544.44  * Reach Len. (ft)       *  208.05  *  211.15  *  211.05  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         * 2651.62  *         *
* E.G. Slope (ft/ft)    *0.003276  * Area (sq ft)          *         * 2651.62  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  294.40  * Top Width (ft)        *         *  294.40  *         *
* Vel Total (ft/s)      *   12.07  * Avg. Vel. (ft/s)      *         *   12.07  *         *
* Max Chl Dpth (ft)     *   14.44  * Hydr. Depth (ft)      *         *    9.01  *         *
* Conv. Total (cfs)     *559073.2  * Conv. (cfs)           *         *559073.2  *         *
* Length Wtd. (ft)      *  211.15  * Wetted Per. (ft)       *         *  301.92  *         *
* Min Ch El (ft)        * 2530.00  * Shear (lb/sq ft)      *         *    1.80  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   21.68  *         *
* Frctn Loss (ft)       *    0.57  * Cum Volume (acre-ft)   *    0.20  *  406.39  *    0.05  *
* C & E Loss (ft)       *    0.08  * Cum SA (acres)         *    0.19  *   39.71  *    0.24  *
*****************************************************************************************************

CROSS SECTION OUTPUT  Profile #10 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2539.34  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.06  * Wt. n-Val.            *         *   0.030  *         *
* W.S. Elev (ft)        * 2538.29  * Reach Len. (ft)       *  208.05  *  211.15  *  211.05  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         * 1054.82  *         *
* E.G. Slope (ft/ft)    *0.004098  * Area (sq ft)          *         * 1054.82  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  247.28  * Top Width (ft)        *         *  247.28  *         *
* Vel Total (ft/s)      *    8.25  * Avg. Vel. (ft/s)      *         *    8.25  *         *
* Max Chl Dpth (ft)     *    8.29  * Hydr. Depth (ft)      *         *    4.27  *         *
* Conv. Total (cfs)     *135910.6  * Conv. (cfs)           *         *135910.6  *         *
* Length Wtd. (ft)      *  211.15  * Wetted Per. (ft)       *         *  251.41  *         *
* Min Ch El (ft)        * 2530.00  * Shear (lb/sq ft)      *         *    1.07  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *    8.85  *         *
* Frctn Loss (ft)       *    0.65  * Cum Volume (acre-ft)   *         *  168.57  *         *
* C & E Loss (ft)       *    0.09  * Cum SA (acres)         *         *   36.75  *         *
*****************************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 1350

INPUT
Description:
Station Elevation Data    num=      42
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
       0    2544    9.54    2543   38.09    2542      39    2541   39.96    2540
   40.94    2539    41.9    2538   42.89    2537   43.85    2536   44.79    2535
   55.98    2534   62.23    2533   63.89    2532   65.61    2531    67.3    2530
   97.27    2530   100.2    2531  116.73    2532  164.32    2532  176.99    2532
  188.83    2532  193.69    2532     196    2533  199.44    2534  206.79    2534
  218.33    2534  283.32    2535     287    2536  288.24    2537  289.46    2538
   290.7    2539  291.93    2540  293.13    2541  294.37    2542  295.58    2543
  296.81    2544  322.32    2545  329.31    2546     335    2547  338.98    2548
  344.34    2549  348.11    2549

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
       0    .055   38.09     .03  296.81    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         38.09  296.81          267.52  277.24  286.29            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2546.06  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.99  * Wt. n-Val.            *   0.055  *   0.030  *   0.055  *
* W.S. Elev (ft)        * 2544.07  * Reach Len. (ft)       *   95.00  *   95.00  *   95.00  *
* Crit W.S. (ft)        * 2540.89  * Flow Area (sq ft)     *   50.17  * 2818.65  *    0.06  *
```

```
* E.G. Slope (ft/ft)     *0.002249  * Area (sq ft)          *   50.17  * 2818.65  *    0.06  *
* Q Total (cfs)          *32000.00  * Flow (cfs)           *   77.05  *31922.94  *    0.01  *
* Top Width (ft)         *  298.54  * Top Width (ft)        *   38.09  *  258.72  *    1.73  *
* Vel Total (ft/s)       *   11.15  * Avg. Vel. (ft/s)      *    1.54  *   11.33  *    0.13  *
* Max Chl Dpth (ft)      *   14.07  * Hydr. Depth (ft)      *    1.32  *   10.89  *    0.03  *
* Conv. Total (cfs)      *674827.5  * Conv. (cfs)           *  1624.8  *673202.5  *     0.2  *
* Length Wtd. (ft)       *   95.00  * Wetted Per. (ft)      *   38.23  *  266.19  *    1.73  *
* Min Ch El (ft)         * 2530.00  * Shear (lb/sq ft)      *    0.18  *    1.49  *    0.00  *
* Alpha                  *    1.03  * Stream Power (lb/ft s) *    0.28  *   16.84  *    0.00  *
* Frctn Loss (ft)        *    0.33  * Cum Volume (acre-ft)  *    0.08  *  393.14  *    0.05  *
* C & E Loss (ft)        *    0.09  * Cum SA (acres)        *    0.10  *   38.37  *    0.24  *
*****************************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #10 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2538.61  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.77  * Wt. n-Val.            *         *   0.030  *         *
* W.S. Elev (ft)         * 2537.84  * Reach Len. (ft)       *   95.00  *   95.00  *   95.00  *
* Crit W.S. (ft)         * 2536.14  * Flow Area (sq ft)     *         * 1238.82  *         *
* E.G. Slope (ft/ft)     *0.002389  * Area (sq ft)          *         * 1238.82  *         *
* Q Total (cfs)          * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)         *  247.21  * Top Width (ft)        *         *  247.21  *         *
* Vel Total (ft/s)       *    7.02  * Avg. Vel. (ft/s)      *         *    7.02  *         *
* Max Chl Dpth (ft)      *    7.84  * Hydr. Depth (ft)      *         *    5.01  *         *
* Conv. Total (cfs)      *178012.4  * Conv. (cfs)           *         *178012.4  *         *
* Length Wtd. (ft)       *   95.00  * Wetted Per. (ft)      *         *  250.70  *         *
* Min Ch El (ft)         * 2530.00  * Shear (lb/sq ft)      *         *    0.74  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *    5.17  *         *
* Frctn Loss (ft)        *    0.35  * Cum Volume (acre-ft)  *         *  163.01  *         *
* C & E Loss (ft)        *    0.05  * Cum SA (acres)        *         *   35.56  *         *
*****************************************************************************************************

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.

BRIDGE


RIVER: River #1
REACH: Reach #1          RS: 1325

INPUT
Description:
Distance from Upstream XS =      95
Deck/Roadway Width       =     136
Weir Coefficient         =     2.6
Upstream  Deck/Roadway Coordinates
   num=      2
    Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
************************************************
      0    2550    2545     700    2549    2545

Upstream Bridge Cross Section Data
Station Elevation Data    num=      42
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2544    9.54    2543   38.09    2542      39    2541   39.96    2540
  40.94    2539    41.9    2538   42.89    2537   43.85    2536   44.79    2535
  55.98    2534   62.23    2533   63.89    2532   65.61    2531    67.3    2530
  97.27    2530   100.2    2531  116.73    2532  164.32    2532  176.99    2532
 188.83    2532  193.69    2532     196    2533  199.44    2534  206.79    2534
 218.33    2534  283.32    2535     287    2536  288.24    2537  289.46    2538
```

290.7 2539 291.93 2540 293.13 2541 294.37 2542 295.58 2543
296.81 2544 322.32 2545 329.31 2546 335 2547 338.98 2548
344.34 2549 348.11 2549

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .055 38.09 .03 296.81 .055

Bank Sta: Left Right Coeff Contr. Expan.
38.09 296.81 .1 .3

Downstream Deck/Roadway Coordinates
num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
****
0 2550 2545 700 2549 2545

Downstream Bridge Cross Section Data
Station Elevation Data num= 46
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
10 2545 11.19 2544 14.12 2543 18.6 2542 21.86 2541
22.76 2540 23.68 2539 24.75 2538 26.09 2537 27.41 2536
28.72 2535 30.14 2534 34.85 2533 39.94 2532 41.07 2531
41.99 2530 44.79 2529 57.58 2529 93.97 2530 97.18 2531
100.8 2532 177.85 2532 265.38 2533 268.07 2534 270.69 2535
273.27 2536 275.81 2537 278.31 2538 280.77 2539 283.19 2540
286.23 2541 288.55 2542 290.43 2543 292.26 2544 294.33 2545
297.09 2546 299.89 2547 303.97 2548 329.07 2548 360.23 2548
381.39 2549 436.21 2549 452.08 2548 467.95 2547 496.98 2546
506.55 2546

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
10 .055 10 .03 303.97 .055

Bank Sta: Left Right Coeff Contr. Expan.
10 303.97 .1 .3

Upstream Embankment side slope = 1.5 horiz. to 1.0 vertical
Downstream Embankment side slope = 1.5 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 2550
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 5

Pier Data
Pier Station Upstream= 70 Downstream= 50
Upstream num= 2
Width Elev Width Elev
****
2.5 2525 2.5 2545
Downstream num= 2
Width Elev Width Elev
****
2.5 2525 2.5 2545

Pier Data
Pier Station Upstream= 117 Downstream= 97
Upstream num= 2
Width Elev Width Elev
****
2.5 2525 2.5 2545
Downstream num= 2
Width Elev Width Elev

```
********************************
    2.5    2525     2.5    2545

Pier Data
Pier Station     Upstream=     164    Downstream=     144
Upstream     num=       2
   Width   Elev    Width   Elev
********************************
    2.5    2529     2.5    2550
Downstream     num=       2
   Width   Elev    Width   Elev
********************************
    2.5    2529     2.5    2550

Pier Data
Pier Station     Upstream=     211    Downstream=     191
Upstream     num=       2
   Width   Elev    Width   Elev
********************************
    2.5    2525     2.5    2545
Downstream     num=       2
   Width   Elev    Width   Elev
********************************
    2.5    2525     2.5    2545

Pier Data
Pier Station     Upstream=     258    Downstream=     238
Upstream     num=       2
   Width   Elev    Width   Elev
********************************
    2.5    2525     2.5    2545
Downstream     num=       2
   Width   Elev    Width   Elev
********************************
    2.5    2525     2.5    2545

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
      Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
      Energy Only

Additional Bridge Parameters
      Add Friction component to Momentum
      Do not add Weight component to Momentum
      Class B flow critical depth computations use critical depth
         inside the bridge at the upstream end
      Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT  Profile #100 year
*********************************************************************************************
* E.G. US. (ft)          *    2546.06  * Element                *Inside BR US *Inside BR DS *
* W.S. US. (ft)          *    2544.07  * E.G. Elev (ft)         *    2545.64  *    2544.78  *
* Q Total (cfs)          *   32000.00  * W.S. Elev (ft)         *    2542.79  *    2542.30  *
* Q Bridge (cfs)         *   32000.00  * Crit W.S. (ft)         *    2541.23  *    2540.17  *
* Q Weir (cfs)           *             * Max Chl Dpth (ft)      *      12.79  *      13.30  *
* Weir Sta Lft (ft)      *             * Vel Total (ft/s)       *      13.51  *      12.62  *
* Weir Sta Rgt (ft)      *             * Flow Area (sq ft)      *    2369.08  *    2535.84  *
* Weir Submerg           *             * Froude # Chl           *       0.77  *       0.71  *
* Weir Max Depth (ft)    *             * Specif Force (cu ft)   *   25449.68  *   25895.52  *
* Min El Weir Flow (ft)  *    2550.00  * Hydr Depth (ft)        *       8.86  *       9.78  *
* Min El Prs (ft)        *    2545.00  * W.P. Total (ft)        *     377.01  *     374.85  *
* Delta EG (ft)          *       1.52  * Conv. Total (cfs)       *  413861.2  *  449268.7  *
* Delta WS (ft)          *       1.76  * Top Width (ft)          *     267.24  *     259.38  *
* BR Open Area (sq ft)   *    3002.30  * Frctn Loss (ft)         *       0.75  *       0.17  *
* BR Open Vel (ft/s)     *      13.51  * C & E Loss (ft)         *       0.11  *       0.07  *
* Coef of Q              *             * Shear Total (lb/sq ft) *       2.35  *       2.14  *
```

```
* Br Sel Method          *Energy only  * Power Total (lb/ft s)  *      31.68  *      27.04  *
*****************************************************************************************

Warning: Pier drag coefficient of 2.0 assumed for Class B flow.

BRIDGE OUTPUT  Profile #10 year
*****************************************************************************************
* E.G. US. (ft)          *    2538.61  * Element                *Inside BR US *Inside BR DS *
* W.S. US. (ft)          *    2537.84  * E.G. Elev (ft)         *    2538.20  *    2537.37  *
* Q Total (cfs)          *    8700.00  * W.S. Elev (ft)         *    2536.91  *    2536.35  *
* Q Bridge (cfs)         *    8700.00  * Crit W.S. (ft)         *    2536.33  *    2535.27  *
* Q Weir (cfs)           *             * Max Chl Dpth (ft)      *       6.91  *       7.35  *
* Weir Sta Lft (ft)      *             * Vel Total (ft/s)       *       9.10  *       8.13  *
* Weir Sta Rgt (ft)      *             * Flow Area (sq ft)      *     955.58  *    1070.69  *
* Weir Submerg           *             * Froude # Chl           *       0.79  *       0.67  *
* Weir Max Depth (ft)    *             * Specif Force (cu ft)   *    4736.16  *    4878.74  *
* Min El Weir Flow (ft)  *    2550.00  * Hydr Depth (ft)        *       4.11  *       4.56  *
* Min El Prs (ft)        *    2545.00  * W.P. Total (ft)        *     279.40  *     287.45  *
* Delta EG (ft)          *       1.43  * Conv. Total (cfs)      *   107440.9  *   127431.3  *
* Delta WS (ft)          *       1.65  * Top Width (ft)         *     232.66  *     234.70  *
* BR Open Area (sq ft)   *    3002.30  * Frctn Loss (ft)        *       0.75  *       0.19  *
* BR Open Vel (ft/s)     *       9.10  * C & E Loss (ft)        *       0.08  *       0.01  *
* Coef of Q              *             * Shear Total (lb/sq ft) *       1.40  *       1.08  *
* Br Sel Method          *Energy only  * Power Total (lb/ft s)  *      12.75  *       8.81  *
*****************************************************************************************

Warning: Pier drag coefficient of 2.0 assumed for Class B flow.

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 1300

INPUT
Description:
Station Elevation Data    num=      46
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      10    2545   11.19    2544   14.12    2543    18.6    2542   21.86    2541
   22.76    2540   23.68    2539   24.75    2538   26.09    2537   27.41    2536
   28.72    2535   30.14    2534   34.85    2533   39.94    2532   41.07    2531
   41.99    2530   44.79    2529   57.58    2529   93.97    2530   97.18    2531
   100.8    2532  177.85    2532  265.38    2533  268.07    2534  270.69    2535
  273.27    2536  275.81    2537  278.31    2538  280.77    2539  283.19    2540
  286.23    2541  288.55    2542  290.43    2543  292.26    2544  294.33    2545
  297.09    2546  299.89    2547  303.97    2548  329.07    2548  360.23    2548
  381.39    2549  436.21    2549  452.08    2548  467.95    2547  496.98    2546
  506.55    2546

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
************************************************
      10    .055      10     .03  303.97    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           10  303.97          385.44  383.36  385.44            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)         * 2544.53  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    2.23  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2542.30  * Reach Len. (ft)        *  385.44  *  383.36  *  385.44  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)      *         * 2672.72  *         *
* E.G. Slope (ft/ft)     *0.002857  * Area (sq ft)           *         * 2672.72  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)         *  271.88  * Top Width (ft)          *         *  271.88  *         *
* Vel Total (ft/s)       *   11.97  * Avg. Vel. (ft/s)        *         *   11.97  *         *
* Max Chl Dpth (ft)      *   13.30  * Hydr. Depth (ft)        *         *    9.83  *         *
* Conv. Total (cfs)      *598634.1  * Conv. (cfs)             *         *598634.1  *         *
```

```
* Length Wtd. (ft)      *  383.36  * Wetted Per. (ft)      *        *  277.94  *        *
* Min Ch El (ft)        * 2529.00  * Shear (lb/sq ft)      *        *    1.72  *        *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *   20.54  *        *
* Frctn Loss (ft)       *    1.58  * Cum Volume (acre-ft)   *        *  377.08  *    0.05  *
* C & E Loss (ft)       *    0.21  * Cum SA (acres)         *        *   36.76  *    0.23  *
*****************************************************************************************

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 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 OUTPUT  Profile #10 year
*****************************************************************************************
* E.G. Elev (ft)        * 2537.17  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    0.98  * Wt. n-Val.           *        *   0.030  *        *
* W.S. Elev (ft)        * 2536.19  * Reach Len. (ft)       *  385.44  *  383.36  *  385.44  *
* Crit W.S. (ft)        * 2535.10  * Flow Area (sq ft)     *        * 1094.12  *        *
* E.G. Slope (ft/ft)    *0.003589  * Area (sq ft)          *        * 1094.12  *        *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *        * 8700.00  *        *
* Top Width (ft)        *  246.60  * Top Width (ft)        *        *  246.60  *        *
* Vel Total (ft/s)      *    7.95  * Avg. Vel. (ft/s)      *        *    7.95  *        *
* Max Chl Dpth (ft)     *    7.19  * Hydr. Depth (ft)      *        *    4.44  *        *
* Conv. Total (cfs)     *145227.4  * Conv. (cfs)           *        *145227.4  *        *
* Length Wtd. (ft)      *  383.36  * Wetted Per. (ft)      *        *  249.40  *        *
* Min Ch El (ft)        * 2529.00  * Shear (lb/sq ft)      *        *    0.98  *        *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *    7.82  *        *
* Frctn Loss (ft)       *    2.04  * Cum Volume (acre-ft)   *        *  156.30  *        *
* C & E Loss (ft)       *    0.09  * Cum SA (acres)         *        *   34.05  *        *
*****************************************************************************************

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: River #1
REACH: Reach #1          RS: 1230

INPUT
Description:
Station Elevation Data    num=      38
    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev
*******************************************************************************
      0   2543   46.64   2542   85.37   2542  117.86   2543  136.81   2543
  138.42   2542  139.93   2541  141.48   2540  142.52   2539  143.32   2538
  144.03   2537  144.72   2536   145.4   2535  146.08   2534  147.48   2533
  148.88   2532  150.34   2531  151.74   2530   219.3   2529   293.5   2529
  295.33   2530  302.46   2530  328.97   2529  345.46   2529  352.73   2530
  353.86   2531  355.01   2532  356.16   2533   357.3   2534  358.41   2535
  359.57   2536  360.76   2537  361.92   2538  420.65   2539  441.25   2539
  471.42   2538  505.23   2540  522.09   2539

Manning's n Values        num=       3
    Sta   n Val    Sta   n Val    Sta   n Val
*************************************************
      0    .05  136.81    .03  361.92    .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       136.81  361.92           47.48   47.44   47.31            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
```

```
* E.G. Elev (ft)        * 2542.74  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    4.30  * Wt. n-Val.            *        *   0.030  *   0.050  *
* W.S. Elev (ft)        * 2538.44  * Reach Len. (ft)       *   47.48  *   47.44  *   47.31  *
* Crit W.S. (ft)        * 2538.44  * Flow Area (sq ft)     *        * 1921.82  *   10.10  *
* E.G. Slope (ft/ft)    *0.006503  * Area (sq ft)          *        * 1921.82  *   10.10  *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *        *31991.22  *    8.78  *
* Top Width (ft)        *  265.19  * Top Width (ft)        *        *  218.95  *   46.24  *
* Vel Total (ft/s)      *   16.56  * Avg. Vel. (ft/s)       *        *   16.65  *    0.87  *
* Max Chl Dpth (ft)     *    9.44  * Hydr. Depth (ft)       *        *    8.78  *    0.22  *
* Conv. Total (cfs)     *396826.3  * Conv. (cfs)            *        *396717.4  *   108.9  *
* Length Wtd. (ft)      *   47.44  * Wetted Per. (ft)       *        *  225.88  *   46.26  *
* Min Ch El (ft)        * 2529.00  * Shear (lb/sq ft)       *        *    3.45  *    0.09  *
* Alpha                 *    1.01  * Stream Power (lb/ft s) *        *   57.50  *    0.08  *
* Frctn Loss (ft)       *    0.28  * Cum Volume (acre-ft)   *        *  356.86  *    0.01  *
* C & E Loss (ft)       *    0.21  * Cum SA (acres)         *        *   34.60  *    0.03  *
*****************************************************************************************************

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: Divided flow computed for this cross-section.
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.
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 OUTPUT  Profile #10 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2535.04  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.90  * Wt. n-Val.            *        *   0.030  *        *
* W.S. Elev (ft)        * 2533.14  * Reach Len. (ft)       *   47.48  *   47.44  *   47.31  *
* Crit W.S. (ft)        * 2533.14  * Flow Area (sq ft)     *        *  786.03  *        *
* E.G. Slope (ft/ft)    *0.008678  * Area (sq ft)          *        *  786.03  *        *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *        * 8700.00  *        *
* Top Width (ft)        *  209.04  * Top Width (ft)        *        *  209.04  *        *
* Vel Total (ft/s)      *   11.07  * Avg. Vel. (ft/s)       *        *   11.07  *        *
* Max Chl Dpth (ft)     *    4.14  * Hydr. Depth (ft)       *        *    3.76  *        *
* Conv. Total (cfs)     * 93392.9  * Conv. (cfs)            *        * 93392.9  *        *
* Length Wtd. (ft)      *   47.44  * Wetted Per. (ft)       *        *  211.56  *        *
* Min Ch El (ft)        * 2529.00  * Shear (lb/sq ft)       *        *    2.01  *        *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *   22.28  *        *
* Frctn Loss (ft)       *    0.26  * Cum Volume (acre-ft)   *        *  148.03  *        *
* C & E Loss (ft)       *    0.25  * Cum SA (acres)         *        *   32.04  *        *
*****************************************************************************************************

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: River #1
REACH: Reach #1          RS: 1220

INPUT
Description:
Station Elevation Data    num=      49
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
```

```
     0   2542   18.62   2541   39.62   2541   45.78   2541   55.76   2541
  61.41   2542   72.93   2542   74.08   2541   75.24   2540   76.4   2539
  77.46   2538   78.36   2537   79.23   2536   80.14   2535   80.97   2534
  81.91   2533   83.24   2532   84.71   2531   86.18   2530   87.71   2529
 118.12   2528   120.9   2528  128.57   2528  156.62   2528  164.95   2528
 178.24   2528  185.15   2528  189.77   2528  193.91   2528  201.47   2528
 213.24   2528  215.78   2528     222   2528  227.84   2528  230.94   2528
 234.18   2527   253.8   2527   258.2   2528  309.84   2529  310.87   2530
 311.93   2531     313   2532  314.07   2533  315.14   2534  316.18   2535
 317.25   2536  318.31   2537  319.41   2538  351.91   2538

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***************************************************
     0    .05   72.93    .03  319.41    .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        72.93  319.41          415.98  411.75  408.51            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)        * 2540.78  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    3.60  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2537.18  * Reach Len. (ft)       *  415.98  *  411.75  *  408.51  *
* Crit W.S. (ft)        * 2536.61  * Flow Area (sq ft)     *         * 2100.79  *         *
* E.G. Slope (ft/ft)    *0.005447  * Area (sq ft)          *         * 2100.79  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  240.31  * Top Width (ft)        *         *  240.31  *         *
* Vel Total (ft/s)      *   15.23  * Avg. Vel. (ft/s)      *         *   15.23  *         *
* Max Chl Dpth (ft)     *   10.18  * Hydr. Depth (ft)      *         *    8.74  *         *
* Conv. Total (cfs)     *433586.9  * Conv. (cfs)           *         *433586.9  *         *
* Length Wtd. (ft)      *  411.75  * Wetted Per. (ft)      *         *  246.98  *         *
* Min Ch El (ft)        * 2527.00  * Shear (lb/sq ft)      *         *    2.89  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   44.06  *         *
* Frctn Loss (ft)       *    1.98  * Cum Volume (acre-ft)  *         *  354.67  *    0.00  *
* C & E Loss (ft)       *    0.21  * Cum SA (acres)        *         *   34.35  *    0.00  *
*****************************************************************************************

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 OUTPUT  Profile #10 year
*****************************************************************************************
* E.G. Elev (ft)        * 2533.79  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.07  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2532.73  * Reach Len. (ft)       *  415.98  *  411.75  *  408.51  *
* Crit W.S. (ft)        * 2531.70  * Flow Area (sq ft)     *         * 1049.52  *         *
* E.G. Slope (ft/ft)    *0.003796  * Area (sq ft)          *         * 1049.52  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  231.50  * Top Width (ft)        *         *  231.50  *         *
* Vel Total (ft/s)      *    8.29  * Avg. Vel. (ft/s)      *         *    8.29  *         *
* Max Chl Dpth (ft)     *    5.72  * Hydr. Depth (ft)      *         *    4.53  *         *
* Conv. Total (cfs)     *141205.2  * Conv. (cfs)           *         *141205.2  *         *
* Length Wtd. (ft)      *  411.75  * Wetted Per. (ft)      *         *  234.43  *         *
* Min Ch El (ft)        * 2527.00  * Shear (lb/sq ft)      *         *    1.06  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *    8.80  *         *
* Frctn Loss (ft)       *    2.30  * Cum Volume (acre-ft)  *         *  147.03  *         *
* C & E Loss (ft)       *    0.06  * Cum SA (acres)        *         *   31.80  *         *
*****************************************************************************************

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: River #1
REACH: Reach #1 RS: 1200

INPUT
Description:
Station Elevation Data num= 40

```
   Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev
*******************************************************************************
     0   2540   68.09   2539  121.68   2541  128.69   2541  147.65   2534
   148.1   2533   148.5   2532  149.06   2531  149.92   2530  150.86   2529
   151.8   2528  153.39   2527  155.27   2526  248.74   2526  272.27   2527
  297.29   2527  305.15   2526  307.38   2526  310.49   2526  316.89   2526
  324.53   2527  349.28   2527  364.33   2526  392.42   2526  395.21   2527
  396.18   2528  397.09   2529  398.09   2530  398.98   2531  399.97   2532
   400.9   2533  401.85   2534  402.79   2535  403.76   2536   404.8   2537
  410.44   2537  422.02   2537  426.84   2538   429.8   2539  443.87   2539
```

Manning's n Values num= 3

```
   Sta   n Val    Sta   n Val    Sta   n Val
***************************************************
     0    .05  128.69    .03   404.8    .05
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
128.69 404.8 57.6 56.56 56.62 .1 .3

CROSS SECTION OUTPUT Profile #100 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2538.60  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    2.91  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2535.69  * Reach Len. (ft)      *   57.60  *   56.56  *   56.62  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         * 2338.39  *         *
* E.G. Slope (ft/ft)    *0.004261  * Area (sq ft)         *         * 2338.39  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)           *         *32000.00  *         *
* Top Width (ft)        *  260.39  * Top Width (ft)        *         *  260.39  *         *
* Vel Total (ft/s)      *   13.68  * Avg. Vel. (ft/s)      *         *   13.68  *         *
* Max Chl Dpth (ft)     *    9.69  * Hydr. Depth (ft)      *         *    8.98  *         *
* Conv. Total (cfs)     *490214.0  * Conv. (cfs)           *         *490214.0  *         *
* Length Wtd. (ft)      *   56.56  * Wetted Per. (ft)      *         *  268.55  *         *
* Min Ch El (ft)        * 2526.00  * Shear (lb/sq ft)      *         *    2.32  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   31.70  *         *
* Frctn Loss (ft)       *    0.18  * Cum Volume (acre-ft)   *         *  333.69  *    0.00  *
* C & E Loss (ft)       *    0.23  * Cum SA (acres)         *         *   31.98  *    0.00  *
*****************************************************************************************
```

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 OUTPUT Profile #10 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2531.43  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.70  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2529.73  * Reach Len. (ft)      *   57.60  *   56.56  *   56.62  *
* Crit W.S. (ft)        * 2529.73  * Flow Area (sq ft)     *         *  831.82  *         *
* E.G. Slope (ft/ft)    *0.008999  * Area (sq ft)         *         *  831.82  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)           *         * 8700.00  *         *
* Top Width (ft)        *  247.65  * Top Width (ft)        *         *  247.65  *         *
* Vel Total (ft/s)      *   10.46  * Avg. Vel. (ft/s)      *         *   10.46  *         *
* Max Chl Dpth (ft)     *    3.73  * Hydr. Depth (ft)      *         *    3.36  *         *
* Conv. Total (cfs)     * 91713.2  * Conv. (cfs)           *         * 91713.2  *         *
* Length Wtd. (ft)      *   56.56  * Wetted Per. (ft)      *         *  250.46  *         *
* Min Ch El (ft)        * 2526.00  * Shear (lb/sq ft)      *         *    1.87  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   19.51  *         *
* Frctn Loss (ft)       *    0.26  * Cum Volume (acre-ft)   *         *  138.14  *         *
* C & E Loss (ft)       *    0.26  * Cum SA (acres)         *         *   29.54  *         *
*****************************************************************************************
```

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and

assumed values.
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: 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: River #1
REACH: Reach #1 RS: 1120

INPUT
Description:
Station Elevation Data num= 44
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2539 336.05 2541 342.65 2534 343.23 2533 343.69 2532
344.08 2531 345.04 2530 345.92 2529 346.9 2528 347.83 2527
348.74 2526 349.76 2525 440.16 2525 445.47 2525 451.76 2525
465.52 2525 467.89 2524 468.82 2524 477.19 2525 488.72 2526
499.18 2527 503.32 2527 512.05 2526 517.81 2525 524.94 2525
538.1 2525 550.62 2524 573.43 2524 573.77 2525 578.28 2526
590.85 2527 591.77 2528 592.73 2529 593.66 2530 594.62 2531
595.54 2532 596.52 2533 597.47 2534 598.38 2535 599.33 2536
619.96 2537 622.38 2538 624.78 2539 638.13 2539

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 336.05 .03 599.33 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
336.05 599.33 440.1 443.7 447.39 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2538.19 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 2.15 * Wt. n-Val. * * 0.030 * 0.050 *
* W.S. Elev (ft) * 2536.04 * Reach Len. (ft) * 440.10 * 443.70 * 447.39 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 2721.32 * 0.02 *
* E.G. Slope (ft/ft) *0.002579 * Area (sq ft) * * 2721.32 * 0.02 *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * 0.00 *
* Top Width (ft) * 259.41 * Top Width (ft) * * 258.60 * 0.81 *
* Vel Total (ft/s) * 11.76 * Avg. Vel. (ft/s) * * 11.76 * 0.11 *
* Max Chl Dpth (ft) * 12.04 * Hydr. Depth (ft) * * 10.52 * 0.02 *
* Conv. Total (cfs) *630080.0 * Conv. (cfs) * *630079.9 * 0.0 *
* Length Wtd. (ft) * 443.70 * Wetted Per. (ft) * * 269.26 * 0.81 *
* Min Ch El (ft) * 2524.00 * Shear (lb/sq ft) * * 1.63 * 0.00 *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 19.14 * 0.00 *
* Frctn Loss (ft) * 1.75 * Cum Volume (acre-ft) * * 330.41 * 0.00 *
* C & E Loss (ft) * 0.21 * Cum SA (acres) * * 31.64 * 0.00 *
****

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 OUTPUT Profile #10 year
****
* E.G. Elev (ft) * 2530.83 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 0.83 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2530.00 * Reach Len. (ft) * 440.10 * 443.70 * 447.39 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 1190.39 * *

```
* E.G. Slope (ft/ft)     *0.002769  * Area (sq ft)          *         * 1190.39  *         *
* Q Total (cfs)          * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)         *  248.62  * Top Width (ft)        *         *  248.62  *         *
* Vel Total (ft/s)       *    7.31  * Avg. Vel. (ft/s)      *         *    7.31  *         *
* Max Chl Dpth (ft)      *    6.00  * Hydr. Depth (ft)      *         *    4.79  *         *
* Conv. Total (cfs)      *165344.6  * Conv. (cfs)           *         *165344.6  *         *
* Length Wtd. (ft)       *  443.70  * Wetted Per. (ft)      *         *  253.48  *         *
* Min Ch El (ft)         * 2524.00  * Shear (lb/sq ft)      *         *    0.81  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *    5.93  *         *
* Frctn Loss (ft)        *    2.01  * Cum Volume (acre-ft)   *         *  136.83  *         *
* C & E Loss (ft)        *    0.10  * Cum SA (acres)         *         *   29.22  *         *
*****************************************************************************************************
```

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: River #1
REACH: Reach #1 RS: 1110

INPUT
Description:
Station Elevation Data num= 38

```
    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev
*******************************************************************************
      0   2538  104.77   2538  121.02   2538  172.26   2537  181.45   2536
  189.22   2535  192.95   2534   196.9   2533  198.01   2532  198.99   2531
  200.02   2530  200.72   2529  201.39   2528  202.12   2527  202.84   2526
  203.53   2525  204.37   2524  205.16   2523  280.28   2523  285.89   2523
  288.08   2523  311.08   2523  350.63   2523   417.4   2524  418.47   2525
  419.48   2526  420.52   2527  421.57   2528  422.55   2529  423.62   2530
  424.67   2531  425.68   2532  426.76   2533  427.88   2534  446.96   2535
  448.96   2536  450.96   2537  506.22   2537
```

Manning's n Values num= 3

```
    Sta   n Val    Sta   n Val    Sta   n Val
***************************************************
      0    .05  189.22    .03  427.88    .05
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
189.22 427.88 46.86 36.39 42.45 .1 .3

CROSS SECTION OUTPUT Profile #100 year

```
*****************************************************************************************************
* E.G. Elev (ft)         * 2536.22  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    4.28  * Wt. n-Val.            *         *   0.030  *         *
* W.S. Elev (ft)         * 2531.94  * Reach Len. (ft)       *   46.86  *   36.39  *   42.45  *
* Crit W.S. (ft)         * 2531.94  * Flow Area (sq ft)     *         * 1927.92  *         *
* E.G. Slope (ft/ft)     *0.006792  * Area (sq ft)          *         * 1927.92  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)         *  227.56  * Top Width (ft)        *         *  227.56  *         *
* Vel Total (ft/s)       *   16.60  * Avg. Vel. (ft/s)      *         *   16.60  *         *
* Max Chl Dpth (ft)      *    8.94  * Hydr. Depth (ft)      *         *    8.47  *         *
* Conv. Total (cfs)      *388288.3  * Conv. (cfs)           *         *388288.3  *         *
* Length Wtd. (ft)       *   36.39  * Wetted Per. (ft)      *         *  235.13  *         *
* Min Ch El (ft)         * 2523.00  * Shear (lb/sq ft)      *         *    3.48  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   57.71  *         *
* Frctn Loss (ft)        *    0.20  * Cum Volume (acre-ft)   *         *  306.73  *         *
* C & E Loss (ft)        *    0.24  * Cum SA (acres)         *         *   29.17  *         *
*****************************************************************************************************
```

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 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 OUTPUT Profile #10 year
****
* E.G. Elev (ft) * 2528.72 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 1.84 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2526.87 * Reach Len. (ft) * 46.86 * 36.39 * 42.45 *
* Crit W.S. (ft) * 2526.87 * Flow Area (sq ft) * * 798.14 * *
* E.G. Slope (ft/ft) *0.008754 * Area (sq ft) * * 798.14 * *
* Q Total (cfs) * 8700.00 * Flow (cfs) * * 8700.00 * *
* Top Width (ft) * 218.17 * Top Width (ft) * * 218.17 * *
* Vel Total (ft/s) * 10.90 * Avg. Vel. (ft/s) * * 10.90 * *
* Max Chl Dpth (ft) * 3.87 * Hydr. Depth (ft) * * 3.66 * *
* Conv. Total (cfs) * 92984.3 * Conv. (cfs) * * 92984.3 * *
* Length Wtd. (ft) * 36.39 * Wetted Per. (ft) * * 221.26 * *
* Min Ch El (ft) * 2523.00 * Shear (lb/sq ft) * * 1.97 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 21.49 * *
* Frctn Loss (ft) * 0.18 * Cum Volume (acre-ft) * * 126.70 * *
* C & E Loss (ft) * 0.25 * Cum SA (acres) * * 26.84 * *
****

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: River #1
REACH: Reach #1 RS: 1100

INPUT
Description:
Station Elevation Data num= 33
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2538 7.97 2538 75.6 2537 183.84 2537 194.63 2537
237.75 2537 254.58 2536 256.12 2535 260.21 2534 270.21 2534
271.56 2533 281.56 2533 294.56 2520 324.84 2520 432.65 2521
435.97 2522 448.45 2522 464.17 2522 493.16 2523 494.3 2524
495.3 2525 496.31 2526 497.31 2527 498.31 2528 499.33 2529
500.34 2530 501.37 2531 502.41 2532 503.41 2533 504.48 2534
524.02 2535 525.94 2536 527.91 2537

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 281.56 .03 504.48 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
281.56 504.48 294 294 294 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2534.69 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 3.49 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2531.21 * Reach Len. (ft) * 294.00 * 294.00 * 294.00 *

```
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         * 2135.82  *         *
* E.G. Slope (ft/ft)    *0.004590  * Area (sq ft)          *         * 2135.82  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  218.23  * Top Width (ft)        *         *  218.23  *         *
* Vel Total (ft/s)      *   14.98  * Avg. Vel. (ft/s)      *         *   14.98  *         *
* Max Chl Dpth (ft)     *   11.21  * Hydr. Depth (ft)      *         *    9.79  *         *
* Conv. Total (cfs)     *472335.7  * Conv. (cfs)           *         *472335.7  *         *
* Length Wtd. (ft)      *  294.00  * Wetted Per. (ft)      *         *  226.38  *         *
* Min Ch El (ft)        * 2520.00  * Shear (lb/sq ft)      *         *    2.70  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   40.50  *         *
* Frctn Loss (ft)       *    1.62  * Cum Volume (acre-ft)   *         *  305.03  *         *
* C & E Loss (ft)       *    0.06  * Cum SA (acres)         *         *   28.98  *         *
*****************************************************************************************************
```

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 OUTPUT Profile #10 year

```
*****************************************************************************************************
* E.G. Elev (ft)        * 2527.24  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.03  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)        * 2526.21  * Reach Len. (ft)        *  294.00  *  294.00  *  294.00  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         * 1070.77  *         *
* E.G. Slope (ft/ft)    *0.003109  * Area (sq ft)          *         * 1070.77  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  208.17  * Top Width (ft)        *         *  208.17  *         *
* Vel Total (ft/s)      *    8.13  * Avg. Vel. (ft/s)      *         *    8.13  *         *
* Max Chl Dpth (ft)     *    6.21  * Hydr. Depth (ft)      *         *    5.14  *         *
* Conv. Total (cfs)     *156024.5  * Conv. (cfs)           *         *156024.5  *         *
* Length Wtd. (ft)      *  294.00  * Wetted Per. (ft)      *         *  212.21  *         *
* Min Ch El (ft)        * 2520.00  * Shear (lb/sq ft)      *         *    0.98  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *    7.96  *         *
* Frctn Loss (ft)       *    1.44  * Cum Volume (acre-ft)   *         *  125.92  *         *
* C & E Loss (ft)       *    0.08  * Cum SA (acres)         *         *   26.66  *         *
*****************************************************************************************************
```

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: River #1
REACH: Reach #1 RS: 1050

INPUT
Description:
Station Elevation Data num= 54

```
   Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev
*******************************************************************************
     0   2535   19.46   2535   47.69   2534   72.02   2534   155.9   2535
 219.33   2536  231.16   2536  232.43   2535  232.95   2534  233.46   2533
 233.85   2532  234.25   2531  234.58   2530  234.94   2529  237.29   2529
 242.44   2529  252.44   2529  261.44   2520  435.94   2520   444.6   2521
 474.12   2522  484.03   2523  485.53   2524  486.59   2525  487.65   2526
 488.72   2527  489.75   2528  490.87   2529  492.17   2530  493.39   2531
 494.65   2532  512.73   2533  515.72   2534  517.96   2535  520.35   2536
 525.36   2537  530.35   2538   535.6   2539  542.47   2540  551.81   2540
 564.09   2539  571.52   2538  608.38   2538  635.45   2530  651.98   2531
 667.79   2532  677.67   2533   685.8   2534  704.45   2535  715.92   2536
 728.92   2537  747.85   2538  786.05   2539  813.15   2540
```

Manning's n Values num= 3

```
   Sta   n Val    Sta   n Val    Sta   n Val
```

```
************************************************
      0     .05  252.44     .03  494.65     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       252.44  494.65              162     162     162            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2533.01  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    4.13  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2528.87  * Reach Len. (ft)       *  162.00  *  162.00  *  162.00  *
* Crit W.S. (ft)        * 2528.87  * Flow Area (sq ft)     *         * 1961.80  *         *
* E.G. Slope (ft/ft)    *0.006740  * Area (sq ft)          *         * 1961.80  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  238.16  * Top Width (ft)        *         *  238.16  *         *
* Vel Total (ft/s)      *   16.31  * Avg. Vel. (ft/s)      *         *   16.31  *         *
* Max Chl Dpth (ft)     *    8.87  * Hydr. Depth (ft)      *         *    8.24  *         *
* Conv. Total (cfs)     *389770.9  * Conv. (cfs)           *         *389770.9  *         *
* Length Wtd. (ft)      *  162.00  * Wetted Per. (ft)       *         *  244.19  *         *
* Min Ch El (ft)        * 2520.00  * Shear (lb/sq ft)      *         *    3.38  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   55.14  *         *
* Frctn Loss (ft)       *    1.11  * Cum Volume (acre-ft)   *         *  291.20  *         *
* C & E Loss (ft)       *    0.18  * Cum SA (acres)         *         *   27.44  *         *
*****************************************************************************************************

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 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 OUTPUT  Profile #10 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2525.72  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.79  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2523.93  * Reach Len. (ft)       *  162.00  *  162.00  *  162.00  *
* Crit W.S. (ft)        * 2523.93  * Flow Area (sq ft)     *         *  809.53  *         *
* E.G. Slope (ft/ft)    *0.008791  * Area (sq ft)          *         *  809.53  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  227.91  * Top Width (ft)        *         *  227.91  *         *
* Vel Total (ft/s)      *   10.75  * Avg. Vel. (ft/s)      *         *   10.75  *         *
* Max Chl Dpth (ft)     *    3.93  * Hydr. Depth (ft)      *         *    3.55  *         *
* Conv. Total (cfs)     * 92791.6  * Conv. (cfs)           *         * 92791.6  *         *
* Length Wtd. (ft)      *  162.00  * Wetted Per. (ft)       *         *  229.95  *         *
* Min Ch El (ft)        * 2520.00  * Shear (lb/sq ft)      *         *    1.93  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   20.76  *         *
* Frctn Loss (ft)       *    1.46  * Cum Volume (acre-ft)   *         *  119.57  *         *
* C & E Loss (ft)       *    0.08  * Cum SA (acres)         *         *   25.19  *         *
*****************************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
       program selected the water surface that had the least amount of error between computed and
       assumed values.
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: River #1
REACH: Reach #1          RS: 1010

INPUT
```

Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2533	38.6	2533	39.06	2533	78.35	2534	116.92	2533
133.06	2532	140.62	2527	147.06	2527	157.06	2527	165.06	2519
319.11	2519	424.94	2520	448.16	2521	453.24	2522	454.76	2523
455.72	2524	456.73	2525	457.7	2526	458.85	2527	460.14	2528
461.47	2529	462.88	2530	464.32	2531	484.17	2532	485.92	2533
487.69	2534	489.54	2535	494.16	2536	499.81	2537	506.54	2538
512.26	2539	517.03	2540	535.74	2540	541.23	2539	573.19	2539
662.53	2537	733.3	2537						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	157.06	.03	464.32	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
157.06	464.32	111.18	71.92	89.38	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (ft)	2530.10	Element	Left OB	Channel / Right OB
Vel Head (ft)	3.53	Wt. n-Val.		0.030
W.S. Elev (ft)	2526.57	Reach Len. (ft)	111.18	71.92 / 89.38
Crit W.S. (ft)	2526.57	Flow Area (sq ft)		2121.98
E.G. Slope (ft/ft)	0.007007	Area (sq ft)		2121.98
Q Total (cfs)	32000.00	Flow (cfs)		32000.00
Top Width (ft)	300.86	Top Width (ft)		300.86
Vel Total (ft/s)	15.08	Avg. Vel. (ft/s)		15.08
Max Chl Dpth (ft)	7.57	Hydr. Depth (ft)		7.05
Conv. Total (cfs)	382290.3	Conv. (cfs)		382290.3
Length Wtd. (ft)	71.92	Wetted Per. (ft)		305.90
Min Ch El (ft)	2519.00	Shear (lb/sq ft)		3.03
Alpha	1.00	Stream Power (lb/ft s)		45.76
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)		283.61
C & E Loss (ft)	0.56	Cum SA (acres)		26.44

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 OUTPUT Profile #10 year

E.G. Elev (ft)	2523.90	Element	Left OB	Channel / Right OB
Vel Head (ft)	1.52	Wt. n-Val.		0.030
W.S. Elev (ft)	2522.38	Reach Len. (ft)	111.18	71.92 / 89.38
Crit W.S. (ft)	2522.38	Flow Area (sq ft)		879.03
E.G. Slope (ft/ft)	0.009260	Area (sq ft)		879.03
Q Total (cfs)	8700.00	Flow (cfs)		8700.00
Top Width (ft)	292.13	Top Width (ft)		292.13
Vel Total (ft/s)	9.90	Avg. Vel. (ft/s)		9.90
Max Chl Dpth (ft)	3.38	Hydr. Depth (ft)		3.01
Conv. Total (cfs)	90408.9	Conv. (cfs)		90408.9
Length Wtd. (ft)	71.92	Wetted Per. (ft)		293.77
Min Ch El (ft)	2519.00	Shear (lb/sq ft)		1.73
Alpha	1.00	Stream Power (lb/ft s)		17.12
Frctn Loss (ft)	0.50	Cum Volume (acre-ft)		116.43
C & E Loss (ft)	0.05	Cum SA (acres)		24.22

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 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: River #1
REACH: Reach #1 RS: 1000

INPUT
Description:
Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2530	72.47	2531	123.23	2532	127.39	2532	206.84	2532
213.29	2525	218	2525	228	2525	242.1	2510.9	436.36	2510.9
453.28	2514	460.62	2515	469.34	2516	477.85	2517	486.46	2518
499.76	2519	513.14	2520	516.43	2521	517.76	2522	519.14	2523
520.49	2524	521.85	2525	523.2	2526	524.36	2527	525.49	2528
526.62	2529	527.74	2530	528.86	2531	546.98	2532	548.95	2533
550.75	2534	552.59	2535	557.43	2536	563.53	2537	569.55	2538
574.84	2539	578.79	2540	582.76	2541	599.7	2541	604.88	2540
610.61	2539	619.05	2539	655.41	2540				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	228	.03	528.86	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
228	528.86	147	147	147	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (ft)	2525.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.65	Wt. n-Val.	0.030		
W.S. Elev (ft)	2523.53	Reach Len. (ft)	147.00	147.00	147.00
Crit W.S. (ft)		Flow Area (sq ft)		3103.56	
E.G. Slope (ft/ft)	0.001898	Area (sq ft)		3103.56	
Q Total (cfs)	32000.00	Flow (cfs)		32000.00	
Top Width (ft)	290.38	Top Width (ft)		290.38	
Vel Total (ft/s)	10.31	Avg. Vel. (ft/s)		10.31	
Max Chl Dpth (ft)	12.63	Hydr. Depth (ft)		10.69	
Conv. Total (cfs)	734424.8	Conv. (cfs)		734424.8	
Length Wtd. (ft)	147.00	Wetted Per. (ft)		297.19	
Min Ch El (ft)	2510.90	Shear (lb/sq ft)		1.24	
Alpha	1.00	Stream Power (lb/ft s)		12.76	
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)		279.30	
C & E Loss (ft)	0.05	Cum SA (acres)		25.95	

CROSS SECTION OUTPUT Profile #10 year

E.G. Elev (ft)	2516.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.35	Wt. n-Val.	0.030		
W.S. Elev (ft)	2515.36	Reach Len. (ft)	147.00	147.00	147.00
Crit W.S. (ft)		Flow Area (sq ft)		932.61	
E.G. Slope (ft/ft)	0.005433	Area (sq ft)		932.61	
Q Total (cfs)	8700.00	Flow (cfs)		8700.00	
Top Width (ft)	226.13	Top Width (ft)		226.13	
Vel Total (ft/s)	9.33	Avg. Vel. (ft/s)		9.33	
Max Chl Dpth (ft)	4.46	Hydr. Depth (ft)		4.12	
Conv. Total (cfs)	118028.3	Conv. (cfs)		118028.3	
Length Wtd. (ft)	147.00	Wetted Per. (ft)		228.34	

```
* Min Ch El (ft)        * 2510.90  * Shear (lb/sq ft)       *         *    1.39  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   12.92  *         *
* Frctn Loss (ft)       *    0.54  * Cum Volume (acre-ft)   *         *  114.94  *         *
* C & E Loss (ft)       *    0.16  * Cum SA (acres)         *         *   23.79  *         *
*****************************************************************************************************

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.

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 990

INPUT
Description:
Station Elevation Data    num=      38
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2529   71.19    2531  140.11    2525  149.22    2525  159.22    2525
  174.02  2510.2  410.03  2510.2  416.62    2519  420.58    2520  422.41    2521
  423.44    2522  424.47    2523  425.48    2524  426.54    2525  427.53    2526
  428.54    2527   429.6    2528   430.6    2529  431.56    2530  432.54    2531
  449.79    2532  452.84    2533  454.88    2534   456.9    2535  460.69    2536
  464.69    2537  469.64    2538  474.54    2539   478.3    2540  482.08    2541
  499.22    2541  504.31    2540   507.3    2539   549.1    2539  580.36    2537
   661.7    2538   705.6    2538  764.81    2538

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
************************************************
      0     .05  159.22     .03  432.54     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        159.22  432.54             168     168     168            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2524.89  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.47  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)        * 2523.42  * Reach Len. (ft)        *  168.00  *  168.00  *  168.00  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)       *         * 3288.01  *         *
* E.G. Slope (ft/ft)    *0.001414  * Area (sq ft)           *         * 3288.01  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)        *  264.08  * Top Width (ft)          *         *  264.08  *         *
* Vel Total (ft/s)      *    9.73  * Avg. Vel. (ft/s)        *         *    9.73  *         *
* Max Chl Dpth (ft)     *   13.21  * Hydr. Depth (ft)        *         *   12.45  *         *
* Conv. Total (cfs)     *850881.5  * Conv. (cfs)             *         *850881.5  *         *
* Length Wtd. (ft)      *  168.00  * Wetted Per. (ft)        *         *  275.32  *         *
* Min Ch El (ft)        * 2510.20  * Shear (lb/sq ft)        *         *    1.05  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   10.26  *         *
* Frctn Loss (ft)       *    0.26  * Cum Volume (acre-ft)   *         *  268.51  *         *
* C & E Loss (ft)       *    0.03  * Cum SA (acres)         *         *   25.01  *         *
*****************************************************************************************************

CROSS SECTION OUTPUT  Profile #10 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2516.01  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    0.81  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)        * 2515.20  * Reach Len. (ft)        *  168.00  *  168.00  *  168.00  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)       *         * 1201.91  *         *
* E.G. Slope (ft/ft)    *0.002623  * Area (sq ft)           *         * 1201.91  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)             *         * 8700.00  *         *
* Top Width (ft)        *  244.75  * Top Width (ft)          *         *  244.75  *         *
* Vel Total (ft/s)      *    7.24  * Avg. Vel. (ft/s)        *         *    7.24  *         *
* Max Chl Dpth (ft)     *    5.00  * Hydr. Depth (ft)        *         *    4.91  *         *
* Conv. Total (cfs)     *169882.0  * Conv. (cfs)             *         *169882.0  *         *
```

```
* Length Wtd. (ft)      *  168.00  * Wetted Per. (ft)      *        *  249.33  *        *
* Min Ch El (ft)        * 2510.20  * Shear (lb/sq ft)      *        *    0.79  *        *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *    5.71  *        *
* Frctn Loss (ft)       *    0.46  * Cum Volume (acre-ft)  *        *  111.34  *        *
* C & E Loss (ft)       *    0.01  * Cum SA (acres)        *        *   23.00  *        *
*****************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 975

INPUT
Description:
Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2529   13.44    2530   73.64    2530   76.35    2525   86.35    2525
   90.63    2524  100.63    2524  115.23  2509.4  326.44  2509.4  334.94    2519
  336.61    2520  338.04    2521  339.21    2522   340.3    2523  341.46    2524
  342.54    2525  343.49    2526  344.41    2527  345.32    2528  346.26    2529
   347.2    2530  354.36    2531  356.86    2531  357.02    2531  368.19    2532
  370.63    2533  373.14    2534  377.42    2535  382.06    2536  387.37    2537
  392.15    2538  396.09    2539  399.58    2540  410.55    2540  418.34    2539
  421.18    2538   462.2    2538

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**************************************************
      0     .05  100.63     .03  354.36     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        100.63  354.36              151     151     151            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)        * 2524.60  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.75  * Wt. n-Val.             *        *   0.030  *        *
* W.S. Elev (ft)        * 2522.85  * Reach Len. (ft)        *  151.00  *  151.00  *  151.00  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)      *        * 3016.54  *        *
* E.G. Slope (ft/ft)    *0.001653  * Area (sq ft)           *        * 3016.54  *        *
* Q Total (cfs)         *32000.00  * Flow (cfs)             *        *32000.00  *        *
* Top Width (ft)        *  238.36  * Top Width (ft)         *        *  238.36  *        *
* Vel Total (ft/s)      *   10.61  * Avg. Vel. (ft/s)       *        *   10.61  *        *
* Max Chl Dpth (ft)     *   13.45  * Hydr. Depth (ft)       *        *   12.66  *        *
* Conv. Total (cfs)     *786952.3  * Conv. (cfs)            *        *786952.3  *        *
* Length Wtd. (ft)      *  151.00  * Wetted Per. (ft)       *        *  249.55  *        *
* Min Ch El (ft)        * 2509.40  * Shear (lb/sq ft)       *        *    1.25  *        *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *   13.24  *        *
* Frctn Loss (ft)       *    0.25  * Cum Volume (acre-ft)  *        *  256.35  *        *
* C & E Loss (ft)       *    0.01  * Cum SA (acres)        *        *   24.05  *        *
*****************************************************************************************

CROSS SECTION OUTPUT  Profile #10 year
*****************************************************************************************
* E.G. Elev (ft)        * 2515.55  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    0.92  * Wt. n-Val.             *        *   0.030  *        *
* W.S. Elev (ft)        * 2514.62  * Reach Len. (ft)        *  151.00  *  151.00  *  151.00  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)      *        * 1128.74  *        *
* E.G. Slope (ft/ft)    *0.002829  * Area (sq ft)           *        * 1128.74  *        *
* Q Total (cfs)         * 8700.00  * Flow (cfs)             *        * 8700.00  *        *
* Top Width (ft)        *  221.06  * Top Width (ft)         *        *  221.06  *        *
* Vel Total (ft/s)      *    7.71  * Avg. Vel. (ft/s)       *        *    7.71  *        *
* Max Chl Dpth (ft)     *    5.22  * Hydr. Depth (ft)       *        *    5.11  *        *
* Conv. Total (cfs)     *163558.4  * Conv. (cfs)            *        *163558.4  *        *
* Length Wtd. (ft)      *  151.00  * Wetted Per. (ft)       *        *  225.57  *        *
* Min Ch El (ft)        * 2509.40  * Shear (lb/sq ft)       *        *    0.88  *        *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *    6.81  *        *
* Frctn Loss (ft)       *    0.41  * Cum Volume (acre-ft)  *        *  106.84  *        *
```

```
* C & E Loss (ft)        *    0.00  * Cum SA (acres)        *         *   22.10  *         *
*****************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 965

INPUT
Description:
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2529   24.24    2529   44.28    2528   49.27    2527   56.18    2524
   66.18    2524   81.48  2508.7  280.69  2508.7  290.69    2518  292.01    2519
  293.41    2520  294.74    2521  295.97    2522  297.18    2523  298.34    2524
   299.3    2525   300.3    2526  301.26    2527  302.22    2528  303.24    2529
  304.18    2530  323.93    2531  325.91    2532  327.91    2533  329.91    2534
  335.04    2535  340.64    2536  347.99    2537

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0     .05   66.18     .03  304.18     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        66.18  304.18             148     148     148            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)         * 2524.34  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.82  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2522.52  * Reach Len. (ft)        *  148.00  *  148.00  *  148.00  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)      *         * 2953.54  *         *
* E.G. Slope (ft/ft)     *0.001683  * Area (sq ft)           *         * 2953.54  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)         *  228.94  * Top Width (ft)         *         *  228.94  *         *
* Vel Total (ft/s)       *   10.83  * Avg. Vel. (ft/s)       *         *   10.83  *         *
* Max Chl Dpth (ft)      *   13.82  * Hydr. Depth (ft)       *         *   12.90  *         *
* Conv. Total (cfs)      *780109.3  * Conv. (cfs)            *         *780109.3  *         *
* Length Wtd. (ft)       *  148.00  * Wetted Per. (ft)       *         *  239.85  *         *
* Min Ch El (ft)         * 2508.70  * Shear (lb/sq ft)       *         *    1.29  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   14.02  *         *
* Frctn Loss (ft)        *    0.27  * Cum Volume (acre-ft)   *         *  246.01  *         *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)         *         *   23.24  *         *
*****************************************************************************************

CROSS SECTION OUTPUT  Profile #10 year
*****************************************************************************************
* E.G. Elev (ft)         * 2515.13  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.92  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2514.21  * Reach Len. (ft)        *  148.00  *  148.00  *  148.00  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)      *         * 1128.64  *         *
* E.G. Slope (ft/ft)     *0.002656  * Area (sq ft)           *         * 1128.64  *         *
* Q Total (cfs)          * 8700.00  * Flow (cfs)             *         * 8700.00  *         *
* Top Width (ft)         *  210.64  * Top Width (ft)         *         *  210.64  *         *
* Vel Total (ft/s)       *    7.71  * Avg. Vel. (ft/s)       *         *    7.71  *         *
* Max Chl Dpth (ft)      *    5.51  * Hydr. Depth (ft)       *         *    5.36  *         *
* Conv. Total (cfs)      *168806.7  * Conv. (cfs)            *         *168806.7  *         *
* Length Wtd. (ft)       *  148.00  * Wetted Per. (ft)       *         *  215.09  *         *
* Min Ch El (ft)         * 2508.70  * Shear (lb/sq ft)       *         *    0.87  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *    6.71  *         *
* Frctn Loss (ft)        *    0.40  * Cum Volume (acre-ft)   *         *  102.93  *         *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)         *         *   21.35  *         *
*****************************************************************************************

CROSS SECTION
```

RIVER: River #1
REACH: Reach #1 RS: 950

INPUT
Description:
Station Elevation Data num= 40

```
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0   2527   30.62    2527  106.02    2527   113.3    2525  118.02    2523
  126.75    2523  136.75    2523  151.85  2507.9  332.64  2507.9  340.64    2517
  341.74    2518  342.88    2519  344.04    2520  345.21    2521  346.36    2522
  347.43    2523  348.48    2524  349.49    2525  350.46    2526   351.5    2527
  352.57    2528  353.69    2529  373.26    2530  375.56    2531  377.95    2532
  387.41    2532  393.05    2531  400.12    2531  408.37    2532  412.67    2533
  416.69    2534  420.58    2535  424.63    2536   449.9    2536  455.61    2535
  485.24    2532  506.85    2533  526.58    2534  542.36    2535  586.79    2536
```

Manning's n Values num= 3

```
    Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
      0     .05  136.75     .03  353.69     .05
```

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

```
        136.75  353.69          216.25  206.25   199.7            .1       .3
```

CROSS SECTION OUTPUT Profile #100 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2524.04  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    2.16  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2521.88  * Reach Len. (ft)       *  216.25  *  206.25  *  199.70  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         * 2713.63  *         *
* E.G. Slope (ft/ft)    *0.001990  * Area (sq ft)          *         * 2713.63  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  208.35  * Top Width (ft)        *         *  208.35  *         *
* Vel Total (ft/s)      *   11.79  * Avg. Vel. (ft/s)      *         *   11.79  *         *
* Max Chl Dpth (ft)     *   13.98  * Hydr. Depth (ft)      *         *   13.02  *         *
* Conv. Total (cfs)     *717350.9  * Conv. (cfs)           *         *717350.9  *         *
* Length Wtd. (ft)      *  206.25  * Wetted Per. (ft)      *         *  220.09  *         *
* Min Ch El (ft)        * 2507.90  * Shear (lb/sq ft)      *         *    1.53  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   18.06  *         *
* Frctn Loss (ft)       *    0.47  * Cum Volume (acre-ft)   *         *  236.38  *         *
* C & E Loss (ft)       *    0.05  * Cum SA (acres)         *         *   22.49  *         *
*****************************************************************************************
```

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 OUTPUT Profile #10 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2514.73  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.00  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2513.73  * Reach Len. (ft)       *  216.25  *  206.25  *  199.70  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         * 1086.05  *         *
* E.G. Slope (ft/ft)    *0.002682  * Area (sq ft)          *         * 1086.05  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  191.75  * Top Width (ft)        *         *  191.75  *         *
* Vel Total (ft/s)      *    8.01  * Avg. Vel. (ft/s)      *         *    8.01  *         *
* Max Chl Dpth (ft)     *    5.83  * Hydr. Depth (ft)      *         *    5.66  *         *
* Conv. Total (cfs)     *167986.5  * Conv. (cfs)           *         *167986.5  *         *
* Length Wtd. (ft)      *  206.25  * Wetted Per. (ft)      *         *  196.80  *         *
* Min Ch El (ft)        * 2507.90  * Shear (lb/sq ft)      *         *    0.92  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *    7.40  *         *
* Frctn Loss (ft)       *    0.63  * Cum Volume (acre-ft)   *         *   99.17  *         *
* C & E Loss (ft)       *    0.03  * Cum SA (acres)         *         *   20.67  *         *
*****************************************************************************************
```

CROSS SECTION

RIVER: River #1

REACH: Reach #1 RS: 900

INPUT
Description:
Station Elevation Data num= 25
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2526 38.53 2525 40.82 2524 42.06 2523 43.14 2522
52.48 2515 62.48 2515 70.58 2506.9 227.2 2506.9 235.2 2516
236.25 2517 237.32 2518 238.4 2519 239.49 2520 240.52 2521
241.56 2522 242.54 2523 243.58 2524 244.55 2525 245.52 2526
258.04 2527 266.14 2528 268.5 2529 270.88 2530 275.59 2530

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 38.53 .03 245.52 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
38.53 245.52 159.28 151.88 152.96 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2523.51 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 2.70 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2520.81 * Reach Len. (ft) * 159.28 * 151.88 * 152.96 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 2426.12 * *
* E.G. Slope (ft/ft) *0.002662 * Area (sq ft) * * 2426.12 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 195.59 * Top Width (ft) * * 195.59 * *
* Vel Total (ft/s) * 13.19 * Avg. Vel. (ft/s) * * 13.19 * *
* Max Chl Dpth (ft) * 13.91 * Hydr. Depth (ft) * * 12.40 * *
* Conv. Total (cfs) *620219.3 * Conv. (cfs) * *620219.3 * *
* Length Wtd. (ft) * 151.88 * Wetted Per. (ft) * * 206.91 * *
* Min Ch El (ft) * 2506.90 * Shear (lb/sq ft) * * 1.95 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 25.70 * *
* Frctn Loss (ft) * 0.39 * Cum Volume (acre-ft) * * 224.21 * *
* C & E Loss (ft) * 0.03 * Cum SA (acres) * * 21.54 * *
****

CROSS SECTION OUTPUT Profile #10 year
****
* E.G. Elev (ft) * 2514.07 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 1.30 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2512.77 * Reach Len. (ft) * 159.28 * 151.88 * 152.96 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 951.88 * *
* E.G. Slope (ft/ft) *0.003498 * Area (sq ft) * * 951.88 * *
* Q Total (cfs) * 8700.00 * Flow (cfs) * * 8700.00 * *
* Top Width (ft) * 167.65 * Top Width (ft) * * 167.65 * *
* Vel Total (ft/s) * 9.14 * Avg. Vel. (ft/s) * * 9.14 * *
* Max Chl Dpth (ft) * 5.87 * Hydr. Depth (ft) * * 5.68 * *
* Conv. Total (cfs) *147088.9 * Conv. (cfs) * *147088.9 * *
* Length Wtd. (ft) * 151.88 * Wetted Per. (ft) * * 172.74 * *
* Min Ch El (ft) * 2506.90 * Shear (lb/sq ft) * * 1.20 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 11.00 * *
* Frctn Loss (ft) * 0.51 * Cum Volume (acre-ft) * * 94.34 * *
* C & E Loss (ft) * 0.01 * Cum SA (acres) * * 19.82 * *
****

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 875

INPUT
Description:
Station Elevation Data num= 20
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****

```
     0   2525   71.61    2526  118.17    2524  119.09    2523  120.35    2522
  121.74    2521  124.15    2513  130.44    2513  140.44    2513  147.24  2506.2
  300.13  2506.2  312.93    2521  322.93    2521  338.11    2525  339.93    2526
  341.79    2527  343.82    2528   345.8    2529  348.47    2530   354.1    2530

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
     0     .05  118.17     .03  312.93     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       118.17  312.93              143     143     143            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2523.09  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    2.59  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2520.50  * Reach Len. (ft)        *  143.00  *  143.00  *  143.00  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)       *         * 2480.00  *         *
* E.G. Slope (ft/ft)     *0.002452  * Area (sq ft)           *         * 2480.00  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)         *  190.61  * Top Width (ft)         *         *  190.61  *         *
* Vel Total (ft/s)       *   12.90  * Avg. Vel. (ft/s)       *         *   12.90  *         *
* Max Chl Dpth (ft)      *   14.30  * Hydr. Depth (ft)       *         *   13.01  *         *
* Conv. Total (cfs)      *646188.1  * Conv. (cfs)            *         *646188.1  *         *
* Length Wtd. (ft)       *  143.00  * Wetted Per. (ft)       *         *  205.54  *         *
* Min Ch El (ft)         * 2506.20  * Shear (lb/sq ft)       *         *    1.85  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   23.84  *         *
* Frctn Loss (ft)        *    0.36  * Cum Volume (acre-ft)   *         *  215.66  *         *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)         *         *   20.86  *         *
*****************************************************************************************************

CROSS SECTION OUTPUT  Profile #10 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2513.54  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.26  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2512.28  * Reach Len. (ft)        *  143.00  *  143.00  *  143.00  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)       *         *  963.97  *         *
* E.G. Slope (ft/ft)     *0.003271  * Area (sq ft)           *         *  963.97  *         *
* Q Total (cfs)          * 8700.00  * Flow (cfs)             *         * 8700.00  *         *
* Top Width (ft)         *  164.23  * Top Width (ft)         *         *  164.23  *         *
* Vel Total (ft/s)       *    9.03  * Avg. Vel. (ft/s)       *         *    9.03  *         *
* Max Chl Dpth (ft)      *    6.08  * Hydr. Depth (ft)       *         *    5.87  *         *
* Conv. Total (cfs)      *152110.0  * Conv. (cfs)            *         *152110.0  *         *
* Length Wtd. (ft)       *  143.00  * Wetted Per. (ft)       *         *  169.53  *         *
* Min Ch El (ft)         * 2506.20  * Shear (lb/sq ft)       *         *    1.16  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   10.48  *         *
* Frctn Loss (ft)        *    0.48  * Cum Volume (acre-ft)   *         *   91.00  *         *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)         *         *   19.24  *         *
*****************************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 865

INPUT
Description:
Station Elevation Data    num=      17
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
     0   2525   56.88    2524   69.29    2512   75.16    2512   85.16    2512
  91.66  2505.5   235.9  2505.5   249.4    2522   259.4    2522  315.34    2522
  317.65    2523  319.58    2524  321.52    2525   323.5    2526  325.43    2527
  328.41    2528  337.65    2528

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

```
     0    .05   56.88    .03   249.4    .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        56.88   249.4             153     153     153            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)        * 2522.71  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    2.76  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2519.95  * Reach Len. (ft)       *  153.00  *  153.00  *  153.00  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         * 2401.46  *         *
* E.G. Slope (ft/ft)    *0.002622  * Area (sq ft)          *         * 2401.46  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  186.66  * Top Width (ft)        *         *  186.66  *         *
* Vel Total (ft/s)      *   13.33  * Avg. Vel. (ft/s)      *         *   13.33  *         *
* Max Chl Dpth (ft)     *   14.45  * Hydr. Depth (ft)      *         *   12.87  *         *
* Conv. Total (cfs)     *624933.4  * Conv. (cfs)           *         *624933.4  *         *
* Length Wtd. (ft)      *  153.00  * Wetted Per. (ft)      *         *  199.41  *         *
* Min Ch El (ft)        * 2505.50  * Shear (lb/sq ft)      *         *    1.97  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   26.27  *         *
* Frctn Loss (ft)       *    0.42  * Cum Volume (acre-ft)   *         *  207.65  *         *
* C & E Loss (ft)       *    0.03  * Cum SA (acres)         *         *   20.24  *         *
*****************************************************************************************

CROSS SECTION OUTPUT  Profile #10 year
*****************************************************************************************
* E.G. Elev (ft)        * 2513.05  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.37  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2511.68  * Reach Len. (ft)       *  153.00  *  153.00  *  153.00  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         *  926.26  *         *
* E.G. Slope (ft/ft)    *0.003487  * Area (sq ft)          *         *  926.26  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  155.48  * Top Width (ft)        *         *  155.48  *         *
* Vel Total (ft/s)      *    9.39  * Avg. Vel. (ft/s)      *         *    9.39  *         *
* Max Chl Dpth (ft)     *    6.18  * Hydr. Depth (ft)      *         *    5.96  *         *
* Conv. Total (cfs)     *147324.2  * Conv. (cfs)           *         *147324.2  *         *
* Length Wtd. (ft)      *  153.00  * Wetted Per. (ft)      *         *  160.97  *         *
* Min Ch El (ft)        * 2505.50  * Shear (lb/sq ft)      *         *    1.25  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   11.77  *         *
* Frctn Loss (ft)       *    0.53  * Cum Volume (acre-ft)   *         *   87.90  *         *
* C & E Loss (ft)       *    0.00  * Cum SA (acres)         *         *   18.71  *         *
*****************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 850

INPUT
Description:
Station Elevation Data    num=      11
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
     0   2524   24.24    2523   30.65    2512   36.83    2512   46.83    2512
  53.03  2504.8  193.14  2504.8  205.34    2522  215.34    2522  338.33    2522
  346.1    2523

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
     0    .05   24.24     .03  205.34     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        24.24  205.34           199.45     202  207.35            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)        * 2522.26  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    3.01  * Wt. n-Val.           *         *   0.030  *         *
```

```
* W.S. Elev (ft)        * 2519.25  * Reach Len. (ft)       *  199.45  *  202.00  *  207.35  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)      *        * 2299.13  *        *
* E.G. Slope (ft/ft)     *0.002880  * Area (sq ft)          *        * 2299.13  *        *
* Q Total (cfs)          *32000.00  * Flow (cfs)            *        *32000.00  *        *
* Top Width (ft)         *  176.97  * Top Width (ft)        *        *  176.97  *        *
* Vel Total (ft/s)       *   13.92  * Avg. Vel. (ft/s)      *        *   13.92  *        *
* Max Chl Dpth (ft)      *   14.45  * Hydr. Depth (ft)      *        *   12.99  *        *
* Conv. Total (cfs)      *596237.6  * Conv. (cfs)           *        *596237.6  *        *
* Length Wtd. (ft)       *  202.00  * Wetted Per. (ft)      *        *  191.91  *        *
* Min Ch El (ft)         * 2504.80  * Shear (lb/sq ft)      *        *    2.15  *        *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *        *   29.99  *        *
* Frctn Loss (ft)        *    0.84  * Cum Volume (acre-ft)   *        *  199.39  *        *
* C & E Loss (ft)        *    0.25  * Cum SA (acres)         *        *   19.61  *        *
*****************************************************************************************

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 OUTPUT  Profile #10 year
*****************************************************************************************
* E.G. Elev (ft)         * 2512.51  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.40  * Wt. n-Val.            *        *   0.030  *        *
* W.S. Elev (ft)         * 2511.11  * Reach Len. (ft)       *  199.45  *  202.00  *  207.35  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)      *        *  915.62  *        *
* E.G. Slope (ft/ft)     *0.003481  * Area (sq ft)          *        *  915.62  *        *
* Q Total (cfs)          * 8700.00  * Flow (cfs)            *        * 8700.00  *        *
* Top Width (ft)         *  150.02  * Top Width (ft)        *        *  150.02  *        *
* Vel Total (ft/s)       *    9.50  * Avg. Vel. (ft/s)      *        *    9.50  *        *
* Max Chl Dpth (ft)      *    6.31  * Hydr. Depth (ft)      *        *    6.10  *        *
* Conv. Total (cfs)      *147453.8  * Conv. (cfs)           *        *147453.8  *        *
* Length Wtd. (ft)       *  202.00  * Wetted Per. (ft)      *        *  156.18  *        *
* Min Ch El (ft)         * 2504.80  * Shear (lb/sq ft)      *        *    1.27  *        *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *        *   12.11  *        *
* Frctn Loss (ft)        *    1.03  * Cum Volume (acre-ft)   *        *   84.66  *        *
* C & E Loss (ft)        *    0.10  * Cum SA (acres)         *        *   18.18  *        *
*****************************************************************************************

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: River #1
REACH: Reach #1          RS: 825

INPUT
Description:
Station Elevation Data    num=      17
    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev
*******************************************************************************
      0   2523    4.12   2522    7.04   2521    7.67   2520   21.29   2516
  26.03   2516   36.03   2516   48.13  2503.9  180.78  2503.9  192.88   2516
 202.88   2516  308.17   2516  318.17   2516  320.44   2519  343.25   2519
 345.95   2520  357.95   2521

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
      0    .05   36.03    .03  192.88    .05

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

36.03 192.88 112.29 110.49 112.71 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2521.17 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 5.51 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2515.66 * Reach Len. (ft) * 112.29 * 110.49 * 112.71 *
* Crit W.S. (ft) * 2515.66 * Flow Area (sq ft) * * 1698.61 * *
* E.G. Slope (ft/ft) *0.006508 * Area (sq ft) * * 1698.61 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 156.17 * Top Width (ft) * * 156.17 * *
* Vel Total (ft/s) * 18.84 * Avg. Vel. (ft/s) * * 18.84 * *
* Max Chl Dpth (ft) * 11.76 * Hydr. Depth (ft) * * 10.88 * *
* Conv. Total (cfs) *396672.0 * Conv. (cfs) * *396672.0 * *
* Length Wtd. (ft) * 110.49 * Wetted Per. (ft) * * 165.92 * *
* Min Ch El (ft) * 2503.90 * Shear (lb/sq ft) * * 4.16 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 78.36 * *
* Frctn Loss (ft) * 0.72 * Cum Volume (acre-ft) * * 190.12 * *
* C & E Loss (ft) * 0.12 * Cum SA (acres) * * 18.83 * *
****

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 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 OUTPUT Profile #10 year
****
* E.G. Elev (ft) * 2511.38 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 2.45 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2508.93 * Reach Len. (ft) * 112.29 * 110.49 * 112.71 *
* Crit W.S. (ft) * 2508.93 * Flow Area (sq ft) * * 692.40 * *
* E.G. Slope (ft/ft) *0.008142 * Area (sq ft) * * 692.40 * *
* Q Total (cfs) * 8700.00 * Flow (cfs) * * 8700.00 * *
* Top Width (ft) * 142.71 * Top Width (ft) * * 142.71 * *
* Vel Total (ft/s) * 12.57 * Avg. Vel. (ft/s) * * 12.57 * *
* Max Chl Dpth (ft) * 5.03 * Hydr. Depth (ft) * * 4.85 * *
* Conv. Total (cfs) * 96419.9 * Conv. (cfs) * * 96419.9 * *
* Length Wtd. (ft) * 110.49 * Wetted Per. (ft) * * 146.87 * *
* Min Ch El (ft) * 2503.90 * Shear (lb/sq ft) * * 2.40 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 30.11 * *
* Frctn Loss (ft) * 0.91 * Cum Volume (acre-ft) * * 80.94 * *
* C & E Loss (ft) * 0.05 * Cum SA (acres) * * 17.50 * *
****

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
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: River #1
REACH: Reach #1 RS: 800

INPUT
Description:
Station Elevation Data num= 15
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2522 170.51 2521 185.01 2515 195.01 2515 206.71 2503.3
357.11 2503.3 368.81 2515 378.31 2515 456.16 2515 466.16 2515

```
  488.24    2519  496.98    2520  554.82    2521  707.06    2522  733.08    2522

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0     .05  195.01     .03  368.81     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       195.01  368.81          269.64  259.44  283.92            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
**********************************************************************************************
* E.G. Elev (ft)        * 2519.34  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    5.12  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2514.23  * Reach Len. (ft)       *  269.64  *  259.44  *  283.92  *
* Crit W.S. (ft)        * 2514.23  * Flow Area (sq ft)     *         * 1762.40  *         *
* E.G. Slope (ft/ft)    *0.006477  * Area (sq ft)          *         * 1762.40  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  172.25  * Top Width (ft)        *         *  172.25  *         *
* Vel Total (ft/s)      *   18.16  * Avg. Vel. (ft/s)      *         *   18.16  *         *
* Max Chl Dpth (ft)     *   10.92  * Hydr. Depth (ft)      *         *   10.23  *         *
* Conv. Total (cfs)     *397603.9  * Conv. (cfs)           *         *397603.9  *         *
* Length Wtd. (ft)      *  259.44  * Wetted Per. (ft)       *         *  181.30  *         *
* Min Ch El (ft)        * 2503.30  * Shear (lb/sq ft)      *         *    3.93  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   71.37  *         *
* Frctn Loss (ft)       *    1.56  * Cum Volume (acre-ft)   *         *  185.73  *         *
* C & E Loss (ft)       *    0.36  * Cum SA (acres)         *         *   18.42  *         *
**********************************************************************************************

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 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 OUTPUT  Profile #10 year
**********************************************************************************************
* E.G. Elev (ft)        * 2510.21  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    2.27  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2507.94  * Reach Len. (ft)       *  269.64  *  259.44  *  283.92  *
* Crit W.S. (ft)        * 2507.94  * Flow Area (sq ft)     *         *  719.37  *         *
* E.G. Slope (ft/ft)    *0.008271  * Area (sq ft)          *         *  719.37  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  159.68  * Top Width (ft)        *         *  159.68  *         *
* Vel Total (ft/s)      *   12.09  * Avg. Vel. (ft/s)      *         *   12.09  *         *
* Max Chl Dpth (ft)     *    4.64  * Hydr. Depth (ft)      *         *    4.51  *         *
* Conv. Total (cfs)     * 95662.0  * Conv. (cfs)           *         * 95662.0  *         *
* Length Wtd. (ft)      *  259.44  * Wetted Per. (ft)       *         *  163.52  *         *
* Min Ch El (ft)        * 2503.30  * Shear (lb/sq ft)      *         *    2.27  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   27.47  *         *
* Frctn Loss (ft)       *    1.70  * Cum Volume (acre-ft)   *         *   79.15  *         *
* C & E Loss (ft)       *    0.26  * Cum SA (acres)         *         *   17.12  *         *
**********************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program selected the water surface that had the least amount of error between computed and
         assumed values.
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.
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: River #1
REACH: Reach #1 RS: 750

INPUT
Description:
Station Elevation Data num= 15

```
   Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev
*******************************************************************************
     0   2518  55.74   2514  65.74   2514  79.43   2514  89.43   2514
 101.43   2502 302.61   2502 312.61   2514 322.61   2514 341.81   2515
 351.81   2515 362.84   2518 363.83   2518 372.89   2518 382.01   2519
```

Manning's n Values num= 3

```
   Sta  n Val    Sta  n Val    Sta  n Val
*************************************************
     0    .05  89.43    .03 312.61    .05
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
89.43 312.61 249.1 245.15 242.35 .1 .3

CROSS SECTION OUTPUT Profile #100 year

```
*****************************************************************************************************
* E.G. Elev (ft)        * 2515.51  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    3.92  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2511.59  * Reach Len. (ft)       *  249.10  *  245.15  *  242.35  *
* Crit W.S. (ft)        * 2511.09  * Flow Area (sq ft)     *         * 2013.69  *         *
* E.G. Slope (ft/ft)    *0.005613  * Area (sq ft)          *         * 2013.69  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  218.76  * Top Width (ft)        *         *  218.76  *         *
* Vel Total (ft/s)      *   15.89  * Avg. Vel. (ft/s)      *         *   15.89  *         *
* Max Chl Dpth (ft)     *    9.59  * Hydr. Depth (ft)      *         *    9.20  *         *
* Conv. Total (cfs)     *427126.5  * Conv. (cfs)           *         *427126.5  *         *
* Length Wtd. (ft)      *  245.15  * Wetted Per. (ft)      *         *  227.23  *         *
* Min Ch El (ft)        * 2502.00  * Shear (lb/sq ft)      *         *    3.11  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   49.35  *         *
* Frctn Loss (ft)       *    1.26  * Cum Volume (acre-ft)   *         *  174.49  *         *
* C & E Loss (ft)       *    0.14  * Cum SA (acres)         *         *   17.25  *         *
*****************************************************************************************************
```

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 OUTPUT Profile #10 year

```
*****************************************************************************************************
* E.G. Elev (ft)        * 2507.86  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.41  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2506.45  * Reach Len. (ft)       *  249.10  *  245.15  *  242.35  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         *  913.09  *         *
* E.G. Slope (ft/ft)    *0.005323  * Area (sq ft)          *         *  913.09  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  209.34  * Top Width (ft)        *         *  209.34  *         *
* Vel Total (ft/s)      *    9.53  * Avg. Vel. (ft/s)      *         *    9.53  *         *
* Max Chl Dpth (ft)     *    4.45  * Hydr. Depth (ft)      *         *    4.36  *         *
* Conv. Total (cfs)     *119248.2  * Conv. (cfs)           *         *119248.2  *         *
* Length Wtd. (ft)      *  245.15  * Wetted Per. (ft)      *         *  213.26  *         *
* Min Ch El (ft)        * 2502.00  * Shear (lb/sq ft)      *         *    1.42  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   13.56  *         *
* Frctn Loss (ft)       *    1.23  * Cum Volume (acre-ft)   *         *   74.28  *         *
* C & E Loss (ft)       *    0.04  * Cum SA (acres)         *         *   16.02  *         *
*****************************************************************************************************
```

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: River #1

REACH: Reach #1 RS: 700

INPUT
Description:
Station Elevation Data num= 11
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2518 71.98 2513 81.98 2513 92.14 2513 102.14 2513
114.34 2500.8 322.47 2500.8 334.67 2513 344.67 2513 402.46 2517
548.15 2518

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 102.14 .03 334.67 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
102.14 334.67 293.94 294.12 299.33 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2514.10 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 3.44 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2510.66 * Reach Len. (ft) * 293.94 * 294.12 * 299.33 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 2150.35 * *
* E.G. Slope (ft/ft) *0.004744 * Area (sq ft) * * 2150.35 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 227.86 * Top Width (ft) * * 227.86 * *
* Vel Total (ft/s) * 14.88 * Avg. Vel. (ft/s) * * 14.88 * *
* Max Chl Dpth (ft) * 9.86 * Hydr. Depth (ft) * * 9.44 * *
* Conv. Total (cfs) *464598.6 * Conv. (cfs) * *464598.6 * *
* Length Wtd. (ft) * 294.12 * Wetted Per. (ft) * * 236.03 * *
* Min Ch El (ft) * 2500.80 * Shear (lb/sq ft) * * 2.70 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 40.15 * *
* Frctn Loss (ft) * 1.41 * Cum Volume (acre-ft) * * 162.77 * *
* C & E Loss (ft) * 0.01 * Cum SA (acres) * * 16.00 * *
****

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 OUTPUT Profile #10 year
****
* E.G. Elev (ft) * 2506.59 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 1.27 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2505.32 * Reach Len. (ft) * 293.94 * 294.12 * 299.33 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 960.23 * *
* E.G. Slope (ft/ft) *0.004717 * Area (sq ft) * * 960.23 * *
* Q Total (cfs) * 8700.00 * Flow (cfs) * * 8700.00 * *
* Top Width (ft) * 217.16 * Top Width (ft) * * 217.16 * *
* Vel Total (ft/s) * 9.06 * Avg. Vel. (ft/s) * * 9.06 * *
* Max Chl Dpth (ft) * 4.52 * Hydr. Depth (ft) * * 4.42 * *
* Conv. Total (cfs) *126677.0 * Conv. (cfs) * *126677.0 * *
* Length Wtd. (ft) * 294.12 * Wetted Per. (ft) * * 220.90 * *
* Min Ch El (ft) * 2500.80 * Shear (lb/sq ft) * * 1.28 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 11.60 * *
* Frctn Loss (ft) * 1.42 * Cum Volume (acre-ft) * * 69.01 * *
* C & E Loss (ft) * 0.00 * Cum SA (acres) * * 14.82 * *
****

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: River #1
REACH: Reach #1 RS: 650

INPUT

Description:
Station Elevation Data num= 15
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2516 43.8 2516 95.36 2514 99.99 2512 109.99 2512
112.67 2512 122.67 2512 135.27 2499.4 343.25 2499.4 355.85 2512
365.85 2512 366.37 2512 428.98 2514 447.53 2515 461.5 2516

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 122.67 .03 355.85 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
122.67 355.85 225.9 219.6 226.45 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2512.69 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 3.49 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2509.19 * Reach Len. (ft) * 225.90 * 219.60 * 226.45 *
* Crit W.S. (ft) * 2508.29 * Flow Area (sq ft) * * 2132.98 * *
* E.G. Slope (ft/ft) *0.004864 * Area (sq ft) * * 2132.98 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 227.57 * Top Width (ft) * * 227.57 * *
* Vel Total (ft/s) * 15.00 * Avg. Vel. (ft/s) * * 15.00 * *
* Max Chl Dpth (ft) * 9.79 * Hydr. Depth (ft) * * 9.37 * *
* Conv. Total (cfs) *458809.3 * Conv. (cfs) * *458809.3 * *
* Length Wtd. (ft) * 219.60 * Wetted Per. (ft) * * 235.68 * *
* Min Ch El (ft) * 2499.40 * Shear (lb/sq ft) * * 2.75 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 41.23 * *
* Frctn Loss (ft) * 1.06 * Cum Volume (acre-ft) * * 148.31 * *
* C & E Loss (ft) * 0.00 * Cum SA (acres) * * 14.46 * *
****

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 OUTPUT Profile #10 year
****
* E.G. Elev (ft) * 2505.17 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 1.31 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2503.85 * Reach Len. (ft) * 225.90 * 219.60 * 226.45 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 945.78 * *
* E.G. Slope (ft/ft) *0.004951 * Area (sq ft) * * 945.78 * *
* Q Total (cfs) * 8700.00 * Flow (cfs) * * 8700.00 * *
* Top Width (ft) * 216.88 * Top Width (ft) * * 216.88 * *
* Vel Total (ft/s) * 9.20 * Avg. Vel. (ft/s) * * 9.20 * *
* Max Chl Dpth (ft) * 4.45 * Hydr. Depth (ft) * * 4.36 * *
* Conv. Total (cfs) *123639.1 * Conv. (cfs) * *123639.1 * *
* Length Wtd. (ft) * 219.60 * Wetted Per. (ft) * * 220.57 * *
* Min Ch El (ft) * 2499.40 * Shear (lb/sq ft) * * 1.33 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 12.19 * *
* Frctn Loss (ft) * 1.08 * Cum Volume (acre-ft) * * 62.58 * *
* C & E Loss (ft) * 0.00 * Cum SA (acres) * * 13.35 * *
****

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: River #1
REACH: Reach #1 RS: 600

INPUT
Description:
Station Elevation Data num= 27
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

```
*******************************************************************************
     0   2516    5.03    2515    7.53    2514    8.86    2514   39.93    2515
  54.49    2516   74.68    2516   80.26    2515   82.96    2514   86.05    2513
  98.03    2512  126.25    2512  133.06    2511  141.36    2511  151.36    2511
 164.06  2498.3  371.47  2498.3  384.17    2511  394.17    2511  394.79    2512
 421.34    2512  423.01    2512  446.66    2512  488.33    2513  504.23    2514
 673.38    2515  815.39    2516

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***************************************************
     0     .05  151.36     .03  384.17     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       151.36  384.17          296.16  292.56  291.61            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2511.62  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    3.48  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2508.14  * Reach Len. (ft)        *  296.16  *  292.56  *  291.61  *
* Crit W.S. (ft)         * 2507.19  * Flow Area (sq ft)      *         * 2137.76  *         *
* E.G. Slope (ft/ft)     *0.004816  * Area (sq ft)           *         * 2137.76  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)         *  227.09  * Top Width (ft)         *         *  227.09  *         *
* Vel Total (ft/s)       *   14.97  * Avg. Vel. (ft/s)       *         *   14.97  *         *
* Max Chl Dpth (ft)      *    9.84  * Hydr. Depth (ft)       *         *    9.41  *         *
* Conv. Total (cfs)      *461100.6  * Conv. (cfs)            *         *461100.6  *         *
* Length Wtd. (ft)       *  292.56  * Wetted Per. (ft)       *         *  235.24  *         *
* Min Ch El (ft)         * 2498.30  * Shear (lb/sq ft)       *         *    2.73  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   40.90  *         *
* Frctn Loss (ft)        *    1.36  * Cum Volume (acre-ft)   *         *  137.54  *         *
* C & E Loss (ft)        *    0.05  * Cum SA (acres)         *         *   13.31  *         *
*****************************************************************************************************

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 OUTPUT  Profile #10 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2504.08  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.31  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2502.78  * Reach Len. (ft)        *  296.16  *  292.56  *  291.61  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)       *         *  948.63  *         *
* E.G. Slope (ft/ft)     *0.004887  * Area (sq ft)           *         *  948.63  *         *
* Q Total (cfs)          * 8700.00  * Flow (cfs)             *         * 8700.00  *         *
* Top Width (ft)         *  216.36  * Top Width (ft)         *         *  216.36  *         *
* Vel Total (ft/s)       *    9.17  * Avg. Vel. (ft/s)       *         *    9.17  *         *
* Max Chl Dpth (ft)      *    4.48  * Hydr. Depth (ft)       *         *    4.38  *         *
* Conv. Total (cfs)      *124448.6  * Conv. (cfs)            *         *124448.6  *         *
* Length Wtd. (ft)       *  292.56  * Wetted Per. (ft)       *         *  220.07  *         *
* Min Ch El (ft)         * 2498.30  * Shear (lb/sq ft)       *         *    1.32  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   12.06  *         *
* Frctn Loss (ft)        *    1.45  * Cum Volume (acre-ft)   *         *   57.80  *         *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)         *         *   12.26  *         *
*****************************************************************************************************

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: River #1
REACH: Reach #1          RS: 550

INPUT
Description:
Station Elevation Data    num=      19
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

```
*******************************************************************************
     0   2515   61.52    2515  103.09    2514  105.64    2513  107.96    2512
  109.8    2511  111.38    2510  112.99    2509  116.73    2509   119.7    2508
  129.7    2508   140.8  2496.9  350.13  2496.9  361.23    2508  371.23    2508
  372.2    2509  425.74    2511  455.31    2512  497.23    2513

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
     0    .05   129.7     .03  361.23     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        129.7  361.23          174.16  170.24  169.04            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2510.21  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    3.30  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2506.91  * Reach Len. (ft)        *  174.16  *  170.24  *  169.04  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)      *         * 2195.76  *         *
* E.G. Slope (ft/ft)     *0.004465  * Area (sq ft)           *         * 2195.76  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)         *  229.35  * Top Width (ft)         *         *  229.35  *         *
* Vel Total (ft/s)       *   14.57  * Avg. Vel. (ft/s)       *         *   14.57  *         *
* Max Chl Dpth (ft)      *   10.01  * Hydr. Depth (ft)       *         *    9.57  *         *
* Conv. Total (cfs)      *478884.8  * Conv. (cfs)            *         *478884.8  *         *
* Length Wtd. (ft)       *  170.24  * Wetted Per. (ft)       *         *  237.64  *         *
* Min Ch El (ft)         * 2496.90  * Shear (lb/sq ft)       *         *    2.58  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   37.54  *         *
* Frctn Loss (ft)        *    0.68  * Cum Volume (acre-ft)   *         *  122.99  *         *
* C & E Loss (ft)        *    0.16  * Cum SA (acres)         *         *   11.78  *         *
*****************************************************************************************************

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 OUTPUT  Profile #10 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2502.64  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.31  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2501.32  * Reach Len. (ft)        *  174.16  *  170.24  *  169.04  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)      *         *  945.56  *         *
* E.G. Slope (ft/ft)     *0.004993  * Area (sq ft)           *         *  945.56  *         *
* Q Total (cfs)          * 8700.00  * Flow (cfs)             *         * 8700.00  *         *
* Top Width (ft)         *  218.18  * Top Width (ft)         *         *  218.18  *         *
* Vel Total (ft/s)       *    9.20  * Avg. Vel. (ft/s)       *         *    9.20  *         *
* Max Chl Dpth (ft)      *    4.42  * Hydr. Depth (ft)       *         *    4.33  *         *
* Conv. Total (cfs)      *123118.8  * Conv. (cfs)            *         *123118.8  *         *
* Length Wtd. (ft)       *  170.24  * Wetted Per. (ft)       *         *  221.84  *         *
* Min Ch El (ft)         * 2496.90  * Shear (lb/sq ft)       *         *    1.33  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   12.23  *         *
* Frctn Loss (ft)        *    0.83  * Cum Volume (acre-ft)   *         *   51.44  *         *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)         *         *   10.80  *         *
*****************************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 500

INPUT
Description:
Station Elevation Data    num=      24
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
     0   2515   25.13    2514   48.43    2513   49.79    2512   51.21    2511
  52.21    2510    53.2    2509   59.88    2502   69.88    2502   75.78  2496.1
 289.48  2496.1  301.38    2508  311.38    2508  313.34    2511  371.25    2511
 402.18    2512  409.65    2512  433.25    2511   454.4    2511  482.62    2513
```

```
  540.62    2513  626.61    2513  750.39    2514  852.01    2515

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0     .05   48.43     .03  301.38     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        48.43  301.38          312.55  311.99  314.79            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)         * 2509.36  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    2.76  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2506.60  * Reach Len. (ft)       *  312.55  *  311.99  *  314.79  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)      *         * 2400.28  *         *
* E.G. Slope (ft/ft)     *0.003612  * Area (sq ft)          *         * 2400.28  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)         *  244.50  * Top Width (ft)        *         *  244.50  *         *
* Vel Total (ft/s)       *   13.33  * Avg. Vel. (ft/s)      *         *   13.33  *         *
* Max Chl Dpth (ft)      *   10.50  * Hydr. Depth (ft)      *         *    9.82  *         *
* Conv. Total (cfs)      *532433.7  * Conv. (cfs)           *         *532433.7  *         *
* Length Wtd. (ft)       *  311.99  * Wetted Per. (ft)      *         *  253.26  *         *
* Min Ch El (ft)         * 2496.10  * Shear (lb/sq ft)      *         *    2.14  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   28.49  *         *
* Frctn Loss (ft)        *    1.01  * Cum Volume (acre-ft)   *         *  114.01  *         *
* C & E Loss (ft)        *    0.10  * Cum SA (acres)         *         *   10.85  *         *
*****************************************************************************************

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 OUTPUT  Profile #10 year
*****************************************************************************************
* E.G. Elev (ft)         * 2501.79  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.26  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2500.54  * Reach Len. (ft)       *  312.55  *  311.99  *  314.79  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)      *         *  967.50  *         *
* E.G. Slope (ft/ft)     *0.004749  * Area (sq ft)          *         *  967.50  *         *
* Q Total (cfs)          * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)         *  222.57  * Top Width (ft)        *         *  222.57  *         *
* Vel Total (ft/s)       *    8.99  * Avg. Vel. (ft/s)      *         *    8.99  *         *
* Max Chl Dpth (ft)      *    4.44  * Hydr. Depth (ft)      *         *    4.35  *         *
* Conv. Total (cfs)      *126251.6  * Conv. (cfs)           *         *126251.6  *         *
* Length Wtd. (ft)       *  311.99  * Wetted Per. (ft)      *         *  226.25  *         *
* Min Ch El (ft)         * 2496.10  * Shear (lb/sq ft)      *         *    1.27  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   11.40  *         *
* Frctn Loss (ft)        *    1.46  * Cum Volume (acre-ft)   *         *   47.70  *         *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)         *         *    9.94  *         *
*****************************************************************************************

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: River #1
REACH: Reach #1          RS: 450

INPUT
Description:
Station Elevation Data    num=      17
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
      0   2513   35.18    2512   47.41    2511   50.12    2510   51.27    2509
   52.21    2508   53.19    2507   54.73    2506   58.43    2505   60.57    2500
   70.57    2500   75.97  2494.6  288.62  2494.6  302.02    2508  312.02    2508
  313.47    2510  427.13    2510
```

```
Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0     .05   52.21     .03  302.02     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        52.21  302.02          276.48  275.94     282            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)         * 2508.25  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    2.42  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)         * 2505.83  * Reach Len. (ft)      *  276.48  *  275.94  *  282.00  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)     *         * 2564.12  *         *
* E.G. Slope (ft/ft)     *0.002922  * Area (sq ft)         *         * 2564.12  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)           *         *32000.00  *         *
* Top Width (ft)         *  244.50  * Top Width (ft)       *         *  244.50  *         *
* Vel Total (ft/s)       *   12.48  * Avg. Vel. (ft/s)      *         *   12.48  *         *
* Max Chl Dpth (ft)      *   11.23  * Hydr. Depth (ft)      *         *   10.49  *         *
* Conv. Total (cfs)      *591984.9  * Conv. (cfs)           *         *591984.9  *         *
* Length Wtd. (ft)       *  275.94  * Wetted Per. (ft)      *         *  254.79  *         *
* Min Ch El (ft)         * 2494.60  * Shear (lb/sq ft)      *         *    1.84  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   22.91  *         *
* Frctn Loss (ft)        *    0.71  * Cum Volume (acre-ft)   *         *   96.23  *         *
* C & E Loss (ft)        *    0.09  * Cum SA (acres)         *         *    9.10  *         *
*****************************************************************************************

CROSS SECTION OUTPUT  Profile #10 year
*****************************************************************************************
* E.G. Elev (ft)         * 2500.33  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.24  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)         * 2499.09  * Reach Len. (ft)      *  276.48  *  275.94  *  282.00  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)     *         *  974.09  *         *
* E.G. Slope (ft/ft)     *0.004617  * Area (sq ft)         *         *  974.09  *         *
* Q Total (cfs)          * 8700.00  * Flow (cfs)           *         * 8700.00  *         *
* Top Width (ft)         *  221.62  * Top Width (ft)       *         *  221.62  *         *
* Vel Total (ft/s)       *    8.93  * Avg. Vel. (ft/s)      *         *    8.93  *         *
* Max Chl Dpth (ft)      *    4.49  * Hydr. Depth (ft)      *         *    4.40  *         *
* Conv. Total (cfs)      *128031.2  * Conv. (cfs)           *         *128031.2  *         *
* Length Wtd. (ft)       *  275.94  * Wetted Per. (ft)      *         *  225.34  *         *
* Min Ch El (ft)         * 2494.60  * Shear (lb/sq ft)      *         *    1.25  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   11.13  *         *
* Frctn Loss (ft)        *    1.09  * Cum Volume (acre-ft)   *         *   40.75  *         *
* C & E Loss (ft)        *    0.06  * Cum SA (acres)         *         *    8.35  *         *
*****************************************************************************************

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: River #1
REACH: Reach #1          RS: 400

INPUT
Description:
Station Elevation Data    num=      24
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0   2512    9.62   2513   19.24   2514   74.73   2515  222.35   2515
  290.86   2513  325.73   2512  328.66   2511  331.67   2510  334.05   2509
  335.22   2508  336.46   2507  339.73   2506  340.45   2500  350.45   2500
  357.25  2493.2  567.83  2493.2  581.63   2507  591.63   2507  593.37   2508
  651.69   2508  690.61   2508  784.38   2509  870.86   2510

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0     .05  335.22     .03  581.63     .05
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       335.22  581.63            248.4   246.4   244.4            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)        * 2507.44  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    2.11  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2505.33  * Reach Len. (ft)       *  248.40  *  246.40  *  244.40  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)      *         * 2742.07  *         *
* E.G. Slope (ft/ft)    *0.002311  * Area (sq ft)          *         * 2742.07  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  240.15  * Top Width (ft)        *         *  240.15  *         *
* Vel Total (ft/s)      *   11.67  * Avg. Vel. (ft/s)      *         *   11.67  *         *
* Max Chl Dpth (ft)     *   12.13  * Hydr. Depth (ft)      *         *   11.42  *         *
* Conv. Total (cfs)     *665652.6  * Conv. (cfs)           *         *665652.6  *         *
* Length Wtd. (ft)      *  246.40  * Wetted Per. (ft)      *         *  252.72  *         *
* Min Ch El (ft)        * 2493.20  * Shear (lb/sq ft)      *         *    1.57  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   18.27  *         *
* Frctn Loss (ft)       *    0.61  * Cum Volume (acre-ft)  *         *   79.43  *         *
* C & E Loss (ft)       *    0.03  * Cum SA (acres)        *         *    7.57  *         *
*****************************************************************************************

CROSS SECTION OUTPUT  Profile #10 year
*****************************************************************************************
* E.G. Elev (ft)        * 2499.17  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.04  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2498.13  * Reach Len. (ft)       *  248.40  *  246.40  *  244.40  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)      *         * 1062.99  *         *
* E.G. Slope (ft/ft)    *0.003435  * Area (sq ft)          *         * 1062.99  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  220.44  * Top Width (ft)        *         *  220.44  *         *
* Vel Total (ft/s)      *    8.18  * Avg. Vel. (ft/s)      *         *    8.18  *         *
* Max Chl Dpth (ft)     *    4.93  * Hydr. Depth (ft)      *         *    4.82  *         *
* Conv. Total (cfs)     *148446.5  * Conv. (cfs)           *         *148446.5  *         *
* Length Wtd. (ft)      *  246.40  * Wetted Per. (ft)      *         *  224.53  *         *
* Min Ch El (ft)        * 2493.20  * Shear (lb/sq ft)      *         *    1.02  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *    8.31  *         *
* Frctn Loss (ft)       *    0.90  * Cum Volume (acre-ft)  *         *   34.30  *         *
* C & E Loss (ft)       *    0.02  * Cum SA (acres)        *         *    6.95  *         *
*****************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 350

INPUT
Description:
Station Elevation Data    num=      22
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0   2512   51.45    2511   59.82    2510   62.17    2509   64.45    2508
  66.67    2507   68.88    2506   71.09    2505   73.26    2504   74.24    2503
  75.08    2502   75.87    2498   85.87    2498   91.87    2492   282.3    2492
  296.3    2506   306.3    2506  308.49    2506   354.2    2506  355.99    2507
 357.95    2508  410.83    2509

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
      0     .05   66.67     .03   296.3     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        66.67   296.3             102     102     102            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)        * 2506.81  * Element              *  Left OB *  Channel * Right OB *
```

```
* Vel Head (ft)         *    2.43  * Wt. n-Val.            *         *   0.030  *         *
* W.S. Elev (ft)        * 2504.38  * Reach Len. (ft)       *  102.00  *  102.00  *  102.00  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         * 2560.59  *         *
* E.G. Slope (ft/ft)    *0.002622  * Area (sq ft)          *         * 2560.59  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  222.25  * Top Width (ft)        *         *  222.25  *         *
* Vel Total (ft/s)      *   12.50  * Avg. Vel. (ft/s)      *         *   12.50  *         *
* Max Chl Dpth (ft)     *   12.38  * Hydr. Depth (ft)      *         *   11.52  *         *
* Conv. Total (cfs)     *624908.4  * Conv. (cfs)           *         *624908.4  *         *
* Length Wtd. (ft)      *  102.00  * Wetted Per. (ft)      *         *  234.12  *         *
* Min Ch El (ft)        * 2492.00  * Shear (lb/sq ft)      *         *    1.79  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   22.38  *         *
* Frctn Loss (ft)       *    0.24  * Cum Volume (acre-ft)   *         *   64.43  *         *
* C & E Loss (ft)       *    0.10  * Cum SA (acres)         *         *    6.26  *         *
*****************************************************************************************************

CROSS SECTION OUTPUT  Profile #10 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2498.26  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.20  * Wt. n-Val.            *         *   0.030  *         *
* W.S. Elev (ft)        * 2497.05  * Reach Len. (ft)       *  102.00  *  102.00  *  102.00  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         *  987.72  *         *
* E.G. Slope (ft/ft)    *0.003879  * Area (sq ft)          *         *  987.72  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  200.54  * Top Width (ft)        *         *  200.54  *         *
* Vel Total (ft/s)      *    8.81  * Avg. Vel. (ft/s)      *         *    8.81  *         *
* Max Chl Dpth (ft)     *    5.05  * Hydr. Depth (ft)      *         *    4.93  *         *
* Conv. Total (cfs)     *139687.2  * Conv. (cfs)           *         *139687.2  *         *
* Length Wtd. (ft)      *  102.00  * Wetted Per. (ft)      *         *  204.72  *         *
* Min Ch El (ft)        * 2492.00  * Shear (lb/sq ft)      *         *    1.17  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   10.29  *         *
* Frctn Loss (ft)       *    0.34  * Cum Volume (acre-ft)   *         *   28.50  *         *
* C & E Loss (ft)       *    0.07  * Cum SA (acres)         *         *    5.76  *         *
*****************************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 325

INPUT
Description:
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
       0    2513   22.25    2513   32.72    2512   71.44    2511   79.59    2510
    89.4    2509   96.55    2508   98.58    2507  100.47    2506  102.47    2505
  104.44    2504  106.33    2503  107.96    2502  108.57    2501  109.23    2500
  109.82    2499  110.19    2498  120.19    2498  126.69  2491.5  327.71  2491.5
  331.21    2505  341.21    2505  343.09    2505  365.32    2505  368.01    2506
   370.7    2507  374.19    2508  379.86    2509  385.53    2510  393.68    2511
  400.54    2513  440.52    2513  445.44    2513  549.07    2513  595.08    2512

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
       0     .05   98.58     .03  331.21     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         98.58  331.21              128     128     128            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2506.47  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    2.11  * Wt. n-Val.            *         *   0.030  *         *
* W.S. Elev (ft)        * 2504.36  * Reach Len. (ft)       *  128.00  *  128.00  *  128.00  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         * 2746.54  *         *
* E.G. Slope (ft/ft)    *0.002181  * Area (sq ft)          *         * 2746.54  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
```

```
* Top Width (ft)        *  227.31  * Top Width (ft)        *        *  227.31  *        *
* Vel Total (ft/s)      *   11.65  * Avg. Vel. (ft/s)      *        *   11.65  *        *
* Max Chl Dpth (ft)     *   12.86  * Hydr. Depth (ft)      *        *   12.08  *        *
* Conv. Total (cfs)     *685256.1  * Conv. (cfs)           *        *685256.1  *        *
* Length Wtd. (ft)      *  128.00  * Wetted Per. (ft)      *        *  242.94  *        *
* Min Ch El (ft)        * 2491.50  * Shear (lb/sq ft)      *        *    1.54  *        *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *   17.93  *        *
* Frctn Loss (ft)       *    0.27  * Cum Volume (acre-ft)  *        *   58.21  *        *
* C & E Loss (ft)       *    0.01  * Cum SA (acres)        *        *    5.73  *        *
*****************************************************************************************

CROSS SECTION OUTPUT  Profile #10 year
*****************************************************************************************
* E.G. Elev (ft)        * 2497.85  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    0.97  * Wt. n-Val.            *        *   0.030  *        *
* W.S. Elev (ft)        * 2496.87  * Reach Len. (ft)       *  128.00  *  128.00  *  128.00  *
* Crit W.S. (ft)        *          * Flow Area (sq ft)     *        * 1098.37  *        *
* E.G. Slope (ft/ft)    *0.002892  * Area (sq ft)          *        * 1098.37  *        *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *        * 8700.00  *        *
* Top Width (ft)        *  207.79  * Top Width (ft)        *        *  207.79  *        *
* Vel Total (ft/s)      *    7.92  * Avg. Vel. (ft/s)      *        *    7.92  *        *
* Max Chl Dpth (ft)     *    5.37  * Hydr. Depth (ft)      *        *    5.29  *        *
* Conv. Total (cfs)     *161788.5  * Conv. (cfs)           *        *161788.5  *        *
* Length Wtd. (ft)      *  128.00  * Wetted Per. (ft)      *        *  214.17  *        *
* Min Ch El (ft)        * 2491.50  * Shear (lb/sq ft)      *        *    0.93  *        *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *    7.33  *        *
* Frctn Loss (ft)       *    0.36  * Cum Volume (acre-ft)  *        *   26.06  *        *
* C & E Loss (ft)       *    0.00  * Cum SA (acres)        *        *    5.28  *        *
*****************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 300

INPUT
Description:
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
       0   2511     1.7    2510    3.44    2509    7.08    2508    9.07    2507
   10.95    2506    12.9    2505   14.77    2504   16.73    2503   18.58    2502
   20.48    2501   21.21    2501   26.01    2498   36.01    2498   43.11  2490.9
  234.05  2490.9  248.15    2505  258.15    2505  261.99    2505  268.02    2505
  269.83    2506  271.59    2507  273.38    2508  275.21    2509  277.12    2510
  283.77    2511  302.46    2512  326.78    2512

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
       0     .05   10.95     .03  248.15     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         10.95  248.15          142.87  142.74  142.86           .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)        * 2506.18  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    2.07  * Wt. n-Val.            *        *   0.030  *        *
* W.S. Elev (ft)        * 2504.11  * Reach Len. (ft)       *    1.00  *    1.00  *    1.00  *
* Crit W.S. (ft)        * 2500.33  * Flow Area (sq ft)     *        * 2773.52  *        *
* E.G. Slope (ft/ft)    *0.002109  * Area (sq ft)          *        * 2773.52  *        *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *        *32000.00  *        *
* Top Width (ft)        *  232.70  * Top Width (ft)        *        *  232.70  *        *
* Vel Total (ft/s)      *   11.54  * Avg. Vel. (ft/s)      *        *   11.54  *        *
* Max Chl Dpth (ft)     *   13.21  * Hydr. Depth (ft)      *        *   11.92  *        *
* Conv. Total (cfs)     *696878.8  * Conv. (cfs)           *        *696878.8  *        *
* Length Wtd. (ft)      *    1.00  * Wetted Per. (ft)      *        *  242.75  *        *
* Min Ch El (ft)        * 2490.90  * Shear (lb/sq ft)      *        *    1.50  *        *
```

```
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   17.35  *         *
* Frctn Loss (ft)        *    0.00  * Cum Volume (acre-ft)   *         *   50.10  *         *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)         *         *    5.06  *         *
*****************************************************************************************************

CROSS SECTION OUTPUT  Profile #10 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2497.49  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.96  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2496.53  * Reach Len. (ft)        *    1.00  *    1.00  *    1.00  *
* Crit W.S. (ft)         * 2494.87  * Flow Area (sq ft)      *         * 1105.83  *         *
* E.G. Slope (ft/ft)     *0.002699  * Area (sq ft)           *         * 1105.83  *         *
* Q Total (cfs)          * 8700.00  * Flow (cfs)             *         * 8700.00  *         *
* Top Width (ft)         *  202.19  * Top Width (ft)         *         *  202.19  *         *
* Vel Total (ft/s)       *    7.87  * Avg. Vel. (ft/s)       *         *    7.87  *         *
* Max Chl Dpth (ft)      *    5.63  * Hydr. Depth (ft)       *         *    5.47  *         *
* Conv. Total (cfs)      *167460.4  * Conv. (cfs)            *         *167460.4  *         *
* Length Wtd. (ft)       *    1.00  * Wetted Per. (ft)       *         *  206.85  *         *
* Min Ch El (ft)         * 2490.90  * Shear (lb/sq ft)       *         *    0.90  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *    7.09  *         *
* Frctn Loss (ft)        *    0.00  * Cum Volume (acre-ft)   *         *   22.82  *         *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)         *         *    4.68  *         *
*****************************************************************************************************

BRIDGE


RIVER: River #1
REACH: Reach #1          RS: 295

INPUT
Description:
Distance from Upstream XS =       1
Deck/Roadway Width       =     136
Weir Coefficient         =     2.6
Upstream  Deck/Roadway Coordinates
   num=      10
    Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*************************************************************************
  -45.78 2511.91 2511.91       0 2511.91 2510.16    42.5 2511.86 2510.11
     85 2511.81 2510.06   127.5 2511.76 2510.01     170 2511.71 2509.96
   212.5 2511.66 2509.91     265 2511.61 2509.86  276.12 2511.61 2509.86
  295.19 2511.61 2511.61

Upstream Bridge Cross Section Data
Station Elevation Data    num=      28
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
      0    2511     1.7    2510    3.44    2509    7.08    2508    9.07    2507
  10.95    2506    12.9    2505   14.77    2504   16.73    2503   18.58    2502
  20.48    2501   21.21    2501   26.01    2498   36.01    2498   43.11  2490.9
 234.05  2490.9  248.15    2505  258.15    2505  261.99    2505  268.02    2505
 269.83    2506  271.59    2507  273.38    2508  275.21    2509  277.12    2510
 283.77    2511  302.46    2512  326.78    2512

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
************************************************
      0     .05   10.95     .03  248.15     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
        10.95  248.15            .1       .3

Downstream  Deck/Roadway Coordinates
   num=      10
    Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*************************************************************************
    -17 2511.91 2511.91       0 2511.91 2510.16    42.5 2511.86 2510.11
     85 2511.81 2510.06   127.5 2511.76 2510.01     170 2511.71 2509.96
   212.5 2511.66 2509.91     265 2511.61 2509.86  295.19 2511.61 2509.86
```

296.11 2511.61 2511.61

Downstream Bridge Cross Section Data
Station Elevation Data num= 21
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2511 5.21 2510 10.08 2509 15.67 2508 20.42 2507
21.51 2506 22.64 2505 35.67 2505 45.67 2505 60.47 2490.2
239.7 2490.2 254.5 2505 264.5 2505 282.48 2505 284.14 2506
285.85 2507 291.86 2508 294.96 2509 296.11 2510 308.44 2510
313.58 2510

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .045 45.67 .03 254.5 .04

Bank Sta: Left Right Coeff Contr. Expan.
45.67 254.5 .1 .3

Upstream Embankment side slope = 1.5 horiz. to 1.0 vertical
Downstream Embankment side slope = 1.5 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 2512.19
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 3

Pier Data
Pier Station Upstream= 69.45 Downstream= 78.8
Upstream num= 2
Width Elev Width Elev
****
3 2490 3 2511.91
Downstream num= 2
Width Elev Width Elev
****
3 2490 3 2511.91

Pier Data
Pier Station Upstream= 138.97 Downstream= 148.04
Upstream num= 2
Width Elev Width Elev
****
3 2490 3 2511.91
Downstream num= 2
Width Elev Width Elev
****
3 2490 3 2511.91

Pier Data
Pier Station Upstream= 208.52 Downstream= 217.6
Upstream num= 2
Width Elev Width Elev
****
3 2490 3 2511.91
Downstream num= 2
Width Elev Width Elev
****
3 2490 3 2511.91

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #100 year
****
* E.G. US. (ft) * 2506.18 * Element *Inside BR US *Inside BR DS *
* W.S. US. (ft) * 2504.11 * E.G. Elev (ft) * 2506.14 * 2505.39 *
* Q Total (cfs) * 32000.00 * W.S. Elev (ft) * 2503.74 * 2501.85 *
* Q Bridge (cfs) * 32000.00 * Crit W.S. (ft) * 2500.66 * 2500.33 *
* Q Weir (cfs) * * Max Chl Dpth (ft) * 12.83 * 11.65 *
* Weir Sta Lft (ft) * * Vel Total (ft/s) * 12.45 * 15.11 *
* Weir Sta Rgt (ft) * * Flow Area (sq ft) * 2570.16 * 2118.03 *
* Weir Submerg * * Froude # Chl * 0.65 * 0.80 *
* Weir Max Depth (ft) * * Specif Force (cu ft) * 28250.48 * 27084.08 *
* Min El Weir Flow (ft) * 2512.19 * Hydr Depth (ft) * 11.55 * 10.94 *
* Min El Prs (ft) * 2510.16 * W.P. Total (ft) * 309.40 * 273.04 *
* Delta EG (ft) * 0.97 * Conv. Total (cfs) * 522152.1 * 411095.2 *
* Delta WS (ft) * 1.94 * Top Width (ft) * 222.59 * 193.52 *
* BR Open Area (sq ft) * 4055.19 * Frctn Loss (ft) * 0.64 * 0.03 *
* BR Open Vel (ft/s) * 15.11 * C & E Loss (ft) * 0.11 * 0.15 *
* Coef of Q * * Shear Total (lb/sq ft) * 1.95 * 2.93 *
* Br Sel Method *Energy only * Power Total (lb/ft s) * 24.25 * 44.33 *
****

Warning: Pier drag coefficient of 2.0 assumed for Class B flow.
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 velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

BRIDGE OUTPUT Profile #10 year
****
* E.G. US. (ft) * 2497.49 * Element *Inside BR US *Inside BR DS *
* W.S. US. (ft) * 2496.53 * E.G. Elev (ft) * 2497.47 * 2496.78 *
* Q Total (cfs) * 8700.00 * W.S. Elev (ft) * 2496.33 * 2495.32 *
* Q Bridge (cfs) * 8700.00 * Crit W.S. (ft) * 2495.02 * 2494.50 *
* Q Weir (cfs) * * Max Chl Dpth (ft) * 5.43 * 5.12 *
* Weir Sta Lft (ft) * * Vel Total (ft/s) * 8.55 * 9.70 *
* Weir Sta Rgt (ft) * * Flow Area (sq ft) * 1017.26 * 897.11 *
* Weir Submerg * * Froude # Chl * 0.66 * 0.77 *
* Weir Max Depth (ft) * * Specif Force (cu ft) * 5045.52 * 4892.80 *
* Min El Weir Flow (ft) * 2512.19 * Hydr Depth (ft) * 5.28 * 4.97 *
* Min El Prs (ft) * 2510.16 * W.P. Total (ft) * 229.87 * 215.40 *
* Delta EG (ft) * 0.80 * Conv. Total (cfs) * 135812.8 * 115023.7 *
* Delta WS (ft) * 1.10 * Top Width (ft) * 192.80 * 180.46 *
* BR Open Area (sq ft) * 4055.19 * Frctn Loss (ft) * 0.65 * 0.03 *
* BR Open Vel (ft/s) * 9.70 * C & E Loss (ft) * 0.03 * 0.06 *
* Coef of Q * * Shear Total (lb/sq ft) * 1.13 * 1.49 *
* Br Sel Method *Energy only * Power Total (lb/ft s) * 9.70 * 14.43 *
****

Warning: Pier drag coefficient of 2.0 assumed for Class B flow.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 290

INPUT
Description:
Station Elevation Data num= 21
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****

```
     0   2511    5.21    2510   10.08    2509   15.67    2508   20.42    2507
  21.51    2506   22.64    2505   35.67    2505   45.67    2505   60.47  2490.2
  239.7  2490.2   254.5    2505   264.5    2505  282.48    2505  284.14    2506
 285.85    2507  291.86    2508  294.96    2509  296.11    2510  308.44    2510
 313.58    2510

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
     0    .045   45.67     .03   254.5     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        45.67   254.5              85      85      85            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2505.21  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    3.03  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2502.18  * Reach Len. (ft)        *   85.00  *   85.00  *   85.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)      *         * 2290.10  *         *
* E.G. Slope (ft/ft)     *0.003356  * Area (sq ft)           *         * 2290.10  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)         *  203.18  * Top Width (ft)         *         *  203.18  *         *
* Vel Total (ft/s)       *   13.97  * Avg. Vel. (ft/s)       *         *   13.97  *         *
* Max Chl Dpth (ft)      *   11.98  * Hydr. Depth (ft)       *         *   11.27  *         *
* Conv. Total (cfs)      *552373.3  * Conv. (cfs)            *         *552373.3  *         *
* Length Wtd. (ft)       *   85.00  * Wetted Per. (ft)       *         *  213.11  *         *
* Min Ch El (ft)         * 2490.20  * Shear (lb/sq ft)       *         *    2.25  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   31.46  *         *
* Frctn Loss (ft)        *    0.37  * Cum Volume (acre-ft)   *         *   42.43  *         *
* C & E Loss (ft)        *    0.15  * Cum SA (acres)         *         *    4.38  *         *
*****************************************************************************************************

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 OUTPUT  Profile #10 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2496.69  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.27  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2495.43  * Reach Len. (ft)        *   85.00  *   85.00  *   85.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)      *         *  963.84  *         *
* E.G. Slope (ft/ft)     *0.003918  * Area (sq ft)           *         *  963.84  *         *
* Q Total (cfs)          * 8700.00  * Flow (cfs)             *         * 8700.00  *         *
* Top Width (ft)         *  189.68  * Top Width (ft)         *         *  189.68  *         *
* Vel Total (ft/s)       *    9.03  * Avg. Vel. (ft/s)       *         *    9.03  *         *
* Max Chl Dpth (ft)      *    5.23  * Hydr. Depth (ft)       *         *    5.08  *         *
* Conv. Total (cfs)      *138995.8  * Conv. (cfs)            *         *138995.8  *         *
* Length Wtd. (ft)       *   85.00  * Wetted Per. (ft)       *         *  194.01  *         *
* Min Ch El (ft)         * 2490.20  * Shear (lb/sq ft)       *         *    1.22  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   10.97  *         *
* Frctn Loss (ft)        *    0.42  * Cum Volume (acre-ft)   *         *   19.68  *         *
* C & E Loss (ft)        *    0.05  * Cum SA (acres)         *         *    4.07  *         *
*****************************************************************************************************

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: River #1
REACH: Reach #1          RS: 275

INPUT
Description:
Station Elevation Data    num=      17
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
     0    2509    4.38    2508    8.49    2507   14.17    2506   20.74    2505
```

```
  25.94    2504   44.18    2501   54.18    2501   65.38  2489.8   235.9  2489.8
  247.1    2501   257.1    2501  260.52    2501  273.91    2504  275.67    2505
 278.33    2506  316.55    2507

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0    .045   54.18     .03   247.1     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        54.18   247.1             264     264     264            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)        * 2504.69  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    4.54  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2500.15  * Reach Len. (ft)       *  264.00  *  264.00  *  264.00  *
* Crit W.S. (ft)        * 2499.88  * Flow Area (sq ft)     *         * 1871.98  *         *
* E.G. Slope (ft/ft)    *0.006030  * Area (sq ft)          *         * 1871.98  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  191.22  * Top Width (ft)        *         *  191.22  *         *
* Vel Total (ft/s)      *   17.09  * Avg. Vel. (ft/s)      *         *   17.09  *         *
* Max Chl Dpth (ft)     *   10.35  * Hydr. Depth (ft)      *         *    9.79  *         *
* Conv. Total (cfs)     *412084.8  * Conv. (cfs)           *         *412084.8  *         *
* Length Wtd. (ft)      *  264.00  * Wetted Per. (ft)      *         *  199.79  *         *
* Min Ch El (ft)        * 2489.80  * Shear (lb/sq ft)      *         *    3.53  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   60.30  *         *
* Frctn Loss (ft)       *    1.66  * Cum Volume (acre-ft)   *         *   38.37  *         *
* C & E Loss (ft)       *    0.03  * Cum SA (acres)         *         *    3.99  *         *
*****************************************************************************************

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 OUTPUT  Profile #10 year
*****************************************************************************************
* E.G. Elev (ft)        * 2496.21  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.81  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2494.41  * Reach Len. (ft)       *  264.00  *  264.00  *  264.00  *
* Crit W.S. (ft)        * 2494.08  * Flow Area (sq ft)     *         *  806.89  *         *
* E.G. Slope (ft/ft)    *0.006581  * Area (sq ft)          *         *  806.89  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  179.73  * Top Width (ft)        *         *  179.73  *         *
* Vel Total (ft/s)      *   10.78  * Avg. Vel. (ft/s)      *         *   10.78  *         *
* Max Chl Dpth (ft)     *    4.61  * Hydr. Depth (ft)      *         *    4.49  *         *
* Conv. Total (cfs)     *107247.8  * Conv. (cfs)           *         *107247.8  *         *
* Length Wtd. (ft)      *  264.00  * Wetted Per. (ft)      *         *  183.55  *         *
* Min Ch El (ft)        * 2489.80  * Shear (lb/sq ft)      *         *    1.81  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   19.47  *         *
* Frctn Loss (ft)       *    1.74  * Cum Volume (acre-ft)   *         *   17.95  *         *
* C & E Loss (ft)       *    0.00  * Cum SA (acres)         *         *    3.70  *         *
*****************************************************************************************

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: River #1
REACH: Reach #1          RS: 200

INPUT
Description:
Station Elevation Data    num=      19
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2507    89.5    2507  275.72    2505     298    2504  311.14    2503
  313.65    2502  316.05    2501   323.7    2500   333.7    2500   345.7    2488
  513.81    2488  525.81    2500  535.81    2500  559.95    2503  605.45    2504
```

```
  846.35    2511  859.53    2512  882.51    2513  914.95    2514

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0    .045   333.7     .03  525.81     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        333.7  525.81          273.89  293.94  300.78            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2503.01  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    4.82  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2498.18  * Reach Len. (ft)        *  273.89  *  293.94  *  300.78  *
* Crit W.S. (ft)         * 2498.18  * Flow Area (sq ft)      *         * 1815.39  *         *
* E.G. Slope (ft/ft)     *0.006551  * Area (sq ft)           *         * 1815.39  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)         *  188.47  * Top Width (ft)         *         *  188.47  *         *
* Vel Total (ft/s)       *   17.63  * Avg. Vel. (ft/s)       *         *   17.63  *         *
* Max Chl Dpth (ft)      *   10.18  * Hydr. Depth (ft)       *         *    9.63  *         *
* Conv. Total (cfs)      *395349.2  * Conv. (cfs)            *         *395349.2  *         *
* Length Wtd. (ft)       *  293.94  * Wetted Per. (ft)       *         *  196.91  *         *
* Min Ch El (ft)         * 2488.00  * Shear (lb/sq ft)       *         *    3.77  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   66.47  *         *
* Frctn Loss (ft)        *    1.62  * Cum Volume (acre-ft)   *         *   27.20  *         *
* C & E Loss (ft)        *    0.32  * Cum SA (acres)         *         *    2.84  *         *
*****************************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
        program selected the water surface that had the least amount of error between computed and
        assumed values.
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.
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 OUTPUT  Profile #10 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2494.47  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.83  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2492.64  * Reach Len. (ft)        *  273.89  *  293.94  *  300.78  *
* Crit W.S. (ft)         * 2492.31  * Flow Area (sq ft)      *         *  801.84  *         *
* E.G. Slope (ft/ft)     *0.006607  * Area (sq ft)           *         *  801.84  *         *
* Q Total (cfs)          * 8700.00  * Flow (cfs)             *         * 8700.00  *         *
* Top Width (ft)         *  177.39  * Top Width (ft)         *         *  177.39  *         *
* Vel Total (ft/s)       *   10.85  * Avg. Vel. (ft/s)       *         *   10.85  *         *
* Max Chl Dpth (ft)      *    4.64  * Hydr. Depth (ft)       *         *    4.52  *         *
* Conv. Total (cfs)      *107034.4  * Conv. (cfs)            *         *107034.4  *         *
* Length Wtd. (ft)       *  293.94  * Wetted Per. (ft)       *         *  181.24  *         *
* Min Ch El (ft)         * 2488.00  * Shear (lb/sq ft)       *         *    1.82  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   19.80  *         *
* Frctn Loss (ft)        *    1.19  * Cum Volume (acre-ft)   *         *   13.08  *         *
* C & E Loss (ft)        *    0.25  * Cum SA (acres)         *         *    2.62  *         *
*****************************************************************************************************

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: River #1
```

REACH: Reach #1 RS: 150

INPUT
Description:
Station Elevation Data num= 15
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2502 5.17 2502 78.66 2501 80.48 2500 95.5 2499
105.5 2499 118.3 2486.2 297.7 2486.2 310.77 2499 323.2 2499
325.71 2500 331.93 2501 340.78 2502 358.61 2502 358.9 2502

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 105.5 .03 310.77 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
105.5 310.77 283.02 287.46 289.14 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2500.77 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 3.75 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2497.02 * Reach Len. (ft) * 283.02 * 287.46 * 289.14 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 2058.50 * *
* E.G. Slope (ft/ft) *0.004700 * Area (sq ft) * * 2058.50 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 201.26 * Top Width (ft) * * 201.26 * *
* Vel Total (ft/s) * 15.55 * Avg. Vel. (ft/s) * * 15.55 * *
* Max Chl Dpth (ft) * 10.82 * Hydr. Depth (ft) * * 10.23 * *
* Conv. Total (cfs) *466767.0 * Conv. (cfs) * *466767.0 * *
* Length Wtd. (ft) * 287.46 * Wetted Per. (ft) * * 210.15 * *
* Min Ch El (ft) * 2486.20 * Shear (lb/sq ft) * * 2.87 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 44.68 * *
* Frctn Loss (ft) * 1.39 * Cum Volume (acre-ft) * * 14.13 * *
* C & E Loss (ft) * 0.16 * Cum SA (acres) * * 1.53 * *
****

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 OUTPUT Profile #10 year
****
* E.G. Elev (ft) * 2493.04 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 1.01 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2492.03 * Reach Len. (ft) * 283.02 * 287.46 * 289.14 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 1080.36 * *
* E.G. Slope (ft/ft) *0.002714 * Area (sq ft) * * 1080.36 * *
* Q Total (cfs) * 8700.00 * Flow (cfs) * * 8700.00 * *
* Top Width (ft) * 191.18 * Top Width (ft) * * 191.18 * *
* Vel Total (ft/s) * 8.05 * Avg. Vel. (ft/s) * * 8.05 * *
* Max Chl Dpth (ft) * 5.83 * Hydr. Depth (ft) * * 5.65 * *
* Conv. Total (cfs) *166986.2 * Conv. (cfs) * *166986.2 * *
* Length Wtd. (ft) * 287.46 * Wetted Per. (ft) * * 195.98 * *
* Min Ch El (ft) * 2486.20 * Shear (lb/sq ft) * * 0.93 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 7.52 * *
* Frctn Loss (ft) * 1.04 * Cum Volume (acre-ft) * * 6.73 * *
* C & E Loss (ft) * 0.03 * Cum SA (acres) * * 1.38 * *
****

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: River #1
REACH: Reach #1 RS: 100

INPUT
Description:
Station Elevation Data num= 44

```
    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev
*******************************************************************************
      0   2501  59.43   2500  74.75   2499  76.67   2498   78.5   2497
  84.73   2496  90.07   2495  93.09   2494  95.46   2493  97.85   2492
 100.17   2491  102.5   2490 112.09   2489 135.78   2488 158.68   2487
 184.75   2487 186.54   2487 239.34   2486 254.14   2486  259.3   2487
 261.93   2487 262.97   2486  265.1   2485 284.74   2484 320.02   2484
 320.83   2485 321.62   2486 322.41   2487 324.25   2488 325.51   2489
 326.78   2490 328.08   2491 329.34   2492 330.57   2493 331.84   2494
 336.11   2495 345.88   2496 348.18   2497 350.24   2498 351.98   2499
 353.85   2500 408.32   2501    453   2502 457.38   2502
```

Manning's n Values num= 3

```
    Sta  n Val    Sta  n Val    Sta  n Val
***************************************************
      0   .045  59.43    .03 353.85    .04
```

Bank Sta: Left Right Coeff Contr. Expan.

```
        59.43 353.85          .1      .3
```

CROSS SECTION OUTPUT Profile #100 year

```
*****************************************************************************************************
* E.G. Elev (ft)        * 2499.21  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    3.22  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2496.00  * Reach Len. (ft)      *         *         *         *
* Crit W.S. (ft)        * 2495.07  * Flow Area (sq ft)    *         * 2223.50  *         *
* E.G. Slope (ft/ft)    *0.005001  * Area (sq ft)         *         * 2223.50  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)           *         *32000.00  *         *
* Top Width (ft)        *  261.12  * Top Width (ft)       *         *  261.12  *         *
* Vel Total (ft/s)      *   14.39  * Avg. Vel. (ft/s)     *         *   14.39  *         *
* Max Chl Dpth (ft)     *   12.00  * Hydr. Depth (ft)     *         *    8.52  *         *
* Conv. Total (cfs)     *452480.5  * Conv. (cfs)          *         *452480.5  *         *
* Length Wtd. (ft)      *          * Wetted Per. (ft)     *         *  267.00  *         *
* Min Ch El (ft)        * 2484.00  * Shear (lb/sq ft)     *         *    2.60  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   37.42  *         *
* Frctn Loss (ft)       *          * Cum Volume (acre-ft)  *         *         *         *
* C & E Loss (ft)       *          * Cum SA (acres)        *         *         *         *
*****************************************************************************************************
```

CROSS SECTION OUTPUT Profile #10 year

```
*****************************************************************************************************
* E.G. Elev (ft)        * 2491.98  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.28  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2490.70  * Reach Len. (ft)      *         *         *         *
* Crit W.S. (ft)        * 2490.02  * Flow Area (sq ft)    *         *  959.09  *         *
* E.G. Slope (ft/ft)    *0.005010  * Area (sq ft)         *         *  959.09  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)           *         * 8700.00  *         *
* Top Width (ft)        *  226.81  * Top Width (ft)       *         *  226.81  *         *
* Vel Total (ft/s)      *    9.07  * Avg. Vel. (ft/s)     *         *    9.07  *         *
* Max Chl Dpth (ft)     *    6.70  * Hydr. Depth (ft)     *         *    4.23  *         *
* Conv. Total (cfs)     *122915.1  * Conv. (cfs)          *         *122915.1  *         *
* Length Wtd. (ft)      *          * Wetted Per. (ft)     *         *  230.44  *         *
* Min Ch El (ft)        * 2484.00  * Shear (lb/sq ft)     *         *    1.30  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   11.81  *         *
* Frctn Loss (ft)       *          * Cum Volume (acre-ft)  *         *         *         *
* C & E Loss (ft)       *          * Cum SA (acres)        *         *         *         *
*****************************************************************************************************
```

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

SUMMARY OF MANNING'S N VALUES

River:River #1

```
*****************************************************************
*    Reach     *  River Sta.  *   n1   *   n2   *   n3   *
*****************************************************************
```

*Reach #1	*	1600	*	.055*	.03*	.55*
*Reach #1	*	1500	*	.055*	.03*	.055*
*Reach #1	*	1450	*	.055*	.03*	.055*
*Reach #1	*	1400	*	.055*	.03*	.055*
*Reach #1	*	1350	*	.055*	.03*	.055*
*Reach #1	*	1325	*Bridge	*	*	*
*Reach #1	*	1300	*	.055*	.03*	.055*
*Reach #1	*	1230	*	.05*	.03*	.05*
*Reach #1	*	1220	*	.05*	.03*	.05*
*Reach #1	*	1200	*	.05*	.03*	.05*
*Reach #1	*	1120	*	.05*	.03*	.05*
*Reach #1	*	1110	*	.05*	.03*	.05*
*Reach #1	*	1100	*	.05*	.03*	.05*
*Reach #1	*	1050	*	.05*	.03*	.05*
*Reach #1	*	1010	*	.05*	.03*	.05*
*Reach #1	*	1000	*	.05*	.03*	.05*
*Reach #1	*	990	*	.05*	.03*	.05*
*Reach #1	*	975	*	.05*	.03*	.05*
*Reach #1	*	965	*	.05*	.03*	.05*
*Reach #1	*	950	*	.05*	.03*	.05*
*Reach #1	*	900	*	.05*	.03*	.05*
*Reach #1	*	875	*	.05*	.03*	.05*
*Reach #1	*	865	*	.05*	.03*	.05*
*Reach #1	*	850	*	.05*	.03*	.05*
*Reach #1	*	825	*	.05*	.03*	.05*
*Reach #1	*	800	*	.05*	.03*	.05*
*Reach #1	*	750	*	.05*	.03*	.05*
*Reach #1	*	700	*	.05*	.03*	.05*
*Reach #1	*	650	*	.05*	.03*	.05*
*Reach #1	*	600	*	.05*	.03*	.05*
*Reach #1	*	550	*	.05*	.03*	.05*
*Reach #1	*	500	*	.05*	.03*	.05*
*Reach #1	*	450	*	.05*	.03*	.05*
*Reach #1	*	400	*	.05*	.03*	.05*
*Reach #1	*	350	*	.05*	.03*	.05*
*Reach #1	*	325	*	.05*	.03*	.05*
*Reach #1	*	300	*	.05*	.03*	.05*
*Reach #1	*	295	*Bridge	*	*	*
*Reach #1	*	290	*	.045*	.03*	.04*
*Reach #1	*	275	*	.045*	.03*	.04*
*Reach #1	*	200	*	.045*	.03*	.04*
*Reach #1	*	150	*	.05*	.03*	.05*
*Reach #1	*	100	*	.045*	.03*	.04*

****

****

SUMMARY OF REACH LENGTHS

River: River #1

* Reach	*	River Sta.	*	Left	* Channel *	Right	*
*Reach #1	*	1600	*	714.84*	679.42*	666.96*	
*Reach #1	*	1500	*	249.55*	214.55*	208.7*	
*Reach #1	*	1450	*	208.28*	198.72*	196.75*	
*Reach #1	*	1400	*	208.05*	211.15*	211.05*	
*Reach #1	*	1350	*	267.52*	277.24*	286.29*	
*Reach #1	*	1325	*Bridge	*	*	*	
*Reach #1	*	1300	*	385.44*	383.36*	385.44*	
*Reach #1	*	1230	*	47.48*	47.44*	47.31*	
*Reach #1	*	1220	*	415.98*	411.75*	408.51*	
*Reach #1	*	1200	*	57.6*	56.56*	56.62*	
*Reach #1	*	1120	*	440.1*	443.7*	447.39*	
*Reach #1	*	1110	*	46.86*	36.39*	42.45*	
*Reach #1	*	1100	*	294*	294*	294*	
*Reach #1	*	1050	*	162*	162*	162*	
*Reach #1	*	1010	*	111.18*	71.92*	89.38*	
*Reach #1	*	1000	*	147*	147*	147*	
*Reach #1	*	990	*	168*	168*	168*	

*Reach #1	*	975	* 151*	151*	151*
*Reach #1	*	965	* 148*	148*	148*
*Reach #1	*	950	* 216.25*	206.25*	199.7*
*Reach #1	*	900	* 159.28*	151.88*	152.96*
*Reach #1	*	875	* 143*	143*	143*
*Reach #1	*	865	* 153*	153*	153*
*Reach #1	*	850	* 199.45*	202*	207.35*
*Reach #1	*	825	* 112.29*	110.49*	112.71*
*Reach #1	*	800	* 269.64*	259.44*	283.92*
*Reach #1	*	750	* 249.1*	245.15*	242.35*
*Reach #1	*	700	* 293.94*	294.12*	299.33*
*Reach #1	*	650	* 225.9*	219.6*	226.45*
*Reach #1	*	600	* 296.16*	292.56*	291.61*
*Reach #1	*	550	* 174.16*	170.24*	169.04*
*Reach #1	*	500	* 312.55*	311.99*	314.79*
*Reach #1	*	450	* 276.48*	275.94*	282*
*Reach #1	*	400	* 248.4*	246.4*	244.4*
*Reach #1	*	350	* 102*	102*	102*
*Reach #1	*	325	* 128*	128*	128*
*Reach #1	*	300	* 142.87*	142.74*	142.86*
*Reach #1	*	295	*Bridge *	*	*
*Reach #1	*	290	* 85*	85*	85*
*Reach #1	*	275	* 264*	264*	264*
*Reach #1	*	200	* 273.89*	293.94*	300.78*
*Reach #1	*	150	* 283.02*	287.46*	289.14*
*Reach #1	*	100	* *	*	*

****

****

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: River #1

****

* Reach	*	River Sta.	* Contr.	* Expan.	*
*Reach #1	*	1600	* .1*	.3*	
*Reach #1	*	1500	* .1*	.3*	
*Reach #1	*	1450	* .1*	.3*	
*Reach #1	*	1400	* .1*	.3*	
*Reach #1	*	1350	* .1*	.3*	
*Reach #1	*	1325	*Bridge *	*	
*Reach #1	*	1300	* .1*	.3*	
*Reach #1	*	1230	* .1*	.3*	
*Reach #1	*	1220	* .1*	.3*	
*Reach #1	*	1200	* .1*	.3*	
*Reach #1	*	1120	* .1*	.3*	
*Reach #1	*	1110	* .1*	.3*	
*Reach #1	*	1100	* .1*	.3*	
*Reach #1	*	1050	* .1*	.3*	
*Reach #1	*	1010	* .1*	.3*	
*Reach #1	*	1000	* .1*	.3*	
*Reach #1	*	990	* .1*	.3*	
*Reach #1	*	975	* .1*	.3*	
*Reach #1	*	965	* .1*	.3*	
*Reach #1	*	950	* .1*	.3*	
*Reach #1	*	900	* .1*	.3*	
*Reach #1	*	875	* .1*	.3*	
*Reach #1	*	865	* .1*	.3*	
*Reach #1	*	850	* .1*	.3*	
*Reach #1	*	825	* .1*	.3*	
*Reach #1	*	800	* .1*	.3*	
*Reach #1	*	750	* .1*	.3*	
*Reach #1	*	700	* .1*	.3*	
*Reach #1	*	650	* .1*	.3*	
*Reach #1	*	600	* .1*	.3*	
*Reach #1	*	550	* .1*	.3*	
*Reach #1	*	500	* .1*	.3*	
*Reach #1	*	450	* .1*	.3*	
*Reach #1	*	400	* .1*	.3*	

```
*Reach #1      *   350    *      .1*      .3*
*Reach #1      *   325    *      .1*      .3*
*Reach #1      *   300    *      .1*      .3*
*Reach #1      *   295    *Bridge   *        *
*Reach #1      *   290    *      .1*      .3*
*Reach #1      *   275    *      .1*      .3*
*Reach #1      *   200    *      .1*      .3*
*Reach #1      *   150    *      .1*      .3*
*Reach #1      *   100    *      .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 *
*          *          *          *    (cfs) *      (ft) *      (ft) *      (ft) *      (ft) *    (ft/ft) *   (ft/s) *   (sq ft) *      (ft) *             *
*****************************************************************************************************************************
*****************************************
* Reach #1   * 1600      * 100 year * 32000.00 *   2540.00 *   2548.54 *   2548.54 *   2551.95 *   0.007058 *    14.81 *   2160.17 *    320.56 *
1.01 *
* Reach #1   * 1600      * 10 year  *  8700.00 *   2540.00 *   2543.89 *   2543.89 *   2545.59 *   0.008903 *    10.45 *    832.23 *    248.33 *
1.01 *
*          *          *          *          *          *          *          *          *          *          *          *          *
* Reach #1   * 1500      * 100 year * 32000.00 *   2532.00 *   2546.09 *          *   2547.91 *   0.002910 *    10.83 *   2955.01 *    354.78 *       0.66
*
* Reach #1   * 1500      * 10 year  *  8700.00 *   2532.00 *   2539.91 *          *   2540.77 *   0.003196 *     7.42 *   1172.33 *    267.45 *       0.62 *
*          *          *          *          *          *          *          *          *          *          *          *          *
* Reach #1   * 1450      * 100 year * 32000.00 *   2531.00 *   2545.54 *          *   2547.32 *   0.002535 *    10.73 *   2983.01 *    326.53 *       0.63
*
* Reach #1   * 1450      * 10 year  *  8700.00 *   2531.00 *   2539.23 *          *   2540.08 *   0.003211 *     7.42 *   1172.50 *    267.86 *       0.63 *
*          *          *          *          *          *          *          *          *          *          *          *          *
* Reach #1   * 1400      * 100 year * 32000.00 *   2530.00 *   2544.44 *          *   2546.71 *   0.003276 *    12.07 *   2651.62 *    294.40 *       0.71
*
* Reach #1   * 1400      * 10 year  *  8700.00 *   2530.00 *   2538.29 *          *   2539.34 *   0.004098 *     8.25 *   1054.82 *    247.28 *       0.70 *
*          *          *          *          *          *          *          *          *          *          *          *          *
* Reach #1   * 1350      * 100 year * 32000.00 *   2530.00 *   2544.07 *   2540.89 *   2546.06 *   0.002249 *    11.33 *   2868.88 *    298.54 *
0.60 *
* Reach #1   * 1350      * 10 year  *  8700.00 *   2530.00 *   2537.84 *   2536.14 *   2538.61 *   0.002389 *     7.02 *   1238.82 *    247.21 *
0.55 *
*          *          *          *          *          *          *          *          *          *          *          *          *
* Reach #1   * 1325      *          *   Bridge *          *          *          *          *          *          *          *          *
*          *          *          *          *          *          *          *          *          *          *          *
* Reach #1   * 1300      * 100 year * 32000.00 *   2529.00 *   2542.30 *          *   2544.53 *   0.002857 *    11.97 *   2672.72 *    271.88 *       0.67
*
* Reach #1   * 1300      * 10 year  *  8700.00 *   2529.00 *   2536.19 *   2535.10 *   2537.17 *   0.003589 *     7.95 *   1094.12 *    246.60 *
0.67 *
*          *          *          *          *          *          *          *          *          *          *          *          *
* Reach #1   * 1230      * 100 year * 32000.00 *   2529.00 *   2538.44 *   2538.44 *   2542.74 *   0.006503 *    16.65 *   1931.92 *    265.19 *
0.99 *
* Reach #1   * 1230      * 10 year  *  8700.00 *   2529.00 *   2533.14 *   2533.14 *   2535.04 *   0.008678 *    11.07 *    786.03 *    209.04 *
1.01 *
*          *          *          *          *          *          *          *          *          *          *          *          *
* Reach #1   * 1220      * 100 year * 32000.00 *   2527.00 *   2537.18 *   2536.61 *   2540.78 *   0.005447 *    15.23 *   2100.79 *    240.31 *
0.91 *
* Reach #1   * 1220      * 10 year  *  8700.00 *   2527.00 *   2532.73 *   2531.70 *   2533.79 *   0.003796 *     8.29 *   1049.52 *    231.50 *
0.69 *
*          *          *          *          *          *          *          *          *          *          *          *          *
* Reach #1   * 1200      * 100 year * 32000.00 *   2526.00 *   2535.69 *          *   2538.60 *   0.004261 *    13.68 *   2338.39 *    260.39 *       0.80
*
* Reach #1   * 1200      * 10 year  *  8700.00 *   2526.00 *   2529.73 *   2529.73 *   2531.43 *   0.008999 *    10.46 *    831.82 *    247.65 *
1.01 *
*          *          *          *          *          *          *          *          *          *          *          *          *
* Reach #1   * 1120      * 100 year * 32000.00 *   2524.00 *   2536.04 *          *   2538.19 *   0.002579 *    11.76 *   2721.33 *    259.41 *       0.64
*
* Reach #1   * 1120      * 10 year  *  8700.00 *   2524.00 *   2530.00 *          *   2530.83 *   0.002769 *     7.31 *   1190.39 *    248.62 *       0.59 *
*          *          *          *          *          *          *          *          *          *          *          *          *
* Reach #1   * 1110      * 100 year * 32000.00 *   2523.00 *   2531.94 *   2531.94 *   2536.22 *   0.006792 *    16.60 *   1927.92 *    227.56 *
1.00 *
```

```
* Reach #1   * 1110     * 10 year  *  8700.00 *   2523.00 *   2526.87 *   2526.87 *   2528.72 *   0.008754 *    10.90 *    798.14 *    218.17 *
1.00 *
*         *         *       *       *       *       *       *       *       *       *       *       *       *
* Reach #1   * 1100     * 100 year * 32000.00 *   2520.00 *   2531.21 *        *   2534.69 *   0.004590 *    14.98 *   2135.82 *    218.23 *        0.84
*
* Reach #1   * 1100     * 10 year  *  8700.00 *   2520.00 *   2526.21 *        *   2527.24 *   0.003109 *     8.13 *   1070.77 *    208.17 *        0.63 *
*         *         *       *       *       *       *       *       *       *       *       *       *       *
* Reach #1   * 1050     * 100 year * 32000.00 *   2520.00 *   2528.87 *   2528.87 *   2533.01 *   0.006740 *    16.31 *   1961.80 *    238.16 *
1.00 *
* Reach #1   * 1050     * 10 year  *  8700.00 *   2520.00 *   2523.93 *   2523.93 *   2525.72 *   0.008791 *    10.75 *    809.53 *    227.91 *
1.00 *
*         *         *       *       *       *       *       *       *       *       *       *       *       *
* Reach #1   * 1010     * 100 year * 32000.00 *   2519.00 *   2526.57 *   2526.57 *   2530.10 *   0.007007 *    15.08 *   2121.98 *    300.86 *
1.00 *
* Reach #1   * 1010     * 10 year  *  8700.00 *   2519.00 *   2522.38 *   2522.38 *   2523.90 *   0.009260 *     9.90 *    879.03 *    292.13 *
1.01 *
*         *         *       *       *       *       *       *       *       *       *       *       *       *
* Reach #1   * 1000     * 100 year * 32000.00 *   2510.90 *   2523.53 *        *   2525.18 *   0.001898 *    10.31 *   3103.56 *    290.38 *        0.56
*
* Reach #1   * 1000     * 10 year  *  8700.00 *   2510.90 *   2515.36 *        *   2516.71 *   0.005433 *     9.33 *    932.61 *    226.13 *        0.81 *
*         *         *       *       *       *       *       *       *       *       *       *       *       *
* Reach #1   * 990      * 100 year * 32000.00 *   2510.20 *   2523.42 *        *   2524.89 *   0.001414 *     9.73 *   3288.01 *    264.08 *        0.49
*
* Reach #1   * 990      * 10 year  *  8700.00 *   2510.20 *   2515.20 *        *   2516.01 *   0.002623 *     7.24 *   1201.91 *    244.75 *        0.58 *
*         *         *       *       *       *       *       *       *       *       *       *       *       *
* Reach #1   * 975      * 100 year * 32000.00 *   2509.40 *   2522.85 *        *   2524.60 *   0.001653 *    10.61 *   3016.54 *    238.36 *        0.53
*
* Reach #1   * 975      * 10 year  *  8700.00 *   2509.40 *   2514.62 *        *   2515.55 *   0.002829 *     7.71 *   1128.74 *    221.06 *        0.60 *
*         *         *       *       *       *       *       *       *       *       *       *       *       *
* Reach #1   * 965      * 100 year * 32000.00 *   2508.70 *   2522.52 *        *   2524.34 *   0.001683 *    10.83 *   2953.54 *    228.94 *        0.53
*
* Reach #1   * 965      * 10 year  *  8700.00 *   2508.70 *   2514.21 *        *   2515.13 *   0.002656 *     7.71 *   1128.64 *    210.64 *        0.59 *
*         *         *       *       *       *       *       *       *       *       *       *       *       *
* Reach #1   * 950      * 100 year * 32000.00 *   2507.90 *   2521.88 *        *   2524.04 *   0.001990 *    11.79 *   2713.63 *    208.35 *        0.58
*
* Reach #1   * 950      * 10 year  *  8700.00 *   2507.90 *   2513.73 *        *   2514.73 *   0.002682 *     8.01 *   1086.05 *    191.75 *        0.59 *
*         *         *       *       *       *       *       *       *       *       *       *       *       *
* Reach #1   * 900      * 100 year * 32000.00 *   2506.90 *   2520.81 *        *   2523.51 *   0.002662 *    13.19 *   2426.12 *    195.59 *        0.66
*
* Reach #1   * 900      * 10 year  *  8700.00 *   2506.90 *   2512.77 *        *   2514.07 *   0.003498 *     9.14 *    951.88 *    167.65 *        0.68 *
*         *         *       *       *       *       *       *       *       *       *       *       *       *
* Reach #1   * 875      * 100 year * 32000.00 *   2506.20 *   2520.50 *        *   2523.09 *   0.002452 *    12.90 *   2480.00 *    190.61 *        0.63
*
* Reach #1   * 875      * 10 year  *  8700.00 *   2506.20 *   2512.28 *        *   2513.54 *   0.003271 *     9.03 *    963.97 *    164.23 *        0.66 *
*         *         *       *       *       *       *       *       *       *       *       *       *       *
* Reach #1   * 865      * 100 year * 32000.00 *   2505.50 *   2519.95 *        *   2522.71 *   0.002622 *    13.33 *   2401.46 *    186.66 *        0.65
*
* Reach #1   * 865      * 10 year  *  8700.00 *   2505.50 *   2511.68 *        *   2513.05 *   0.003487 *     9.39 *    926.26 *    155.48 *        0.68 *
*         *         *       *       *       *       *       *       *       *       *       *       *       *
* Reach #1   * 850      * 100 year * 32000.00 *   2504.80 *   2519.25 *        *   2522.26 *   0.002880 *    13.92 *   2299.13 *    176.97 *        0.68
*
* Reach #1   * 850      * 10 year  *  8700.00 *   2504.80 *   2511.11 *        *   2512.51 *   0.003481 *     9.50 *    915.62 *    150.02 *        0.68 *
*         *         *       *       *       *       *       *       *       *       *       *       *       *
* Reach #1   * 825      * 100 year * 32000.00 *   2503.90 *   2515.66 *   2515.66 *   2521.17 *   0.006508 *    18.84 *   1698.61 *    156.17 *
1.01 *
* Reach #1   * 825      * 10 year  *  8700.00 *   2503.90 *   2508.93 *   2508.93 *   2511.38 *   0.008142 *    12.57 *    692.40 *    142.71 *
1.01 *
*         *         *       *       *       *       *       *       *       *       *       *       *       *
* Reach #1   * 800      * 100 year * 32000.00 *   2503.30 *   2514.23 *   2514.23 *   2519.34 *   0.006477 *    18.16 *   1762.40 *    172.25 *
1.00 *
* Reach #1   * 800      * 10 year  *  8700.00 *   2503.30 *   2507.94 *   2507.94 *   2510.21 *   0.008271 *    12.09 *    719.37 *    159.68 *
1.00 *
*         *         *       *       *       *       *       *       *       *       *       *       *       *
* Reach #1   * 750      * 100 year * 32000.00 *   2502.00 *   2511.59 *   2511.09 *   2515.51 *   0.005613 *    15.89 *   2013.69 *    218.76 *
0.92 *
* Reach #1   * 750      * 10 year  *  8700.00 *   2502.00 *   2506.45 *        *   2507.86 *   0.005323 *     9.53 *    913.09 *    209.34 *        0.80 *
*         *         *       *       *       *       *       *       *       *       *       *       *       *
* Reach #1   * 700      * 100 year * 32000.00 *   2500.80 *   2510.66 *        *   2514.10 *   0.004744 *    14.88 *   2150.35 *    227.86 *        0.85
*
* Reach #1   * 700      * 10 year  *  8700.00 *   2500.80 *   2505.32 *        *   2506.59 *   0.004717 *     9.06 *    960.23 *    217.16 *        0.76 *
```

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*          *          *        *        *        *        *        *        *        *        *        *        *        *
* Reach #1    * 650       * 100 year * 32000.00 *   2499.40 *   2509.19 *   2508.29 *   2512.69 *   0.004864 *    15.00 *   2132.98 *    227.57 *
0.86 *
* Reach #1    * 650       * 10 year  *  8700.00 *   2499.40 *   2503.85 *        *   2505.17 *   0.004951 *    9.20 *    945.78 *    216.88 *       0.78 *
*          *          *        *        *        *        *        *        *        *        *        *        *        *
* Reach #1    * 600       * 100 year * 32000.00 *   2498.30 *   2508.14 *   2507.19 *   2511.62 *   0.004816 *    14.97 *   2137.76 *    227.09 *
0.86 *
* Reach #1    * 600       * 10 year  *  8700.00 *   2498.30 *   2502.78 *        *   2504.08 *   0.004887 *    9.17 *    948.63 *    216.36 *       0.77 *
*          *          *        *        *        *        *        *        *        *        *        *        *
* Reach #1    * 550       * 100 year * 32000.00 *   2496.90 *   2506.91 *        *   2510.21 *   0.004465 *    14.57 *   2195.76 *    229.35 *       0.83
*
* Reach #1    * 550       * 10 year  *  8700.00 *   2496.90 *   2501.32 *        *   2502.64 *   0.004993 *    9.20 *    945.56 *    218.18 *       0.78 *
*          *          *        *        *        *        *        *        *        *        *        *        *
* Reach #1    * 500       * 100 year * 32000.00 *   2496.10 *   2506.60 *        *   2509.36 *   0.003612 *    13.33 *   2400.28 *    244.50 *       0.75
*
* Reach #1    * 500       * 10 year  *  8700.00 *   2496.10 *   2500.54 *        *   2501.79 *   0.004749 *    8.99 *    967.50 *    222.57 *       0.76 *
*          *          *        *        *        *        *        *        *        *        *        *        *
* Reach #1    * 450       * 100 year * 32000.00 *   2494.60 *   2505.83 *        *   2508.25 *   0.002922 *    12.48 *   2564.12 *    244.50 *       0.68
*
* Reach #1    * 450       * 10 year  *  8700.00 *   2494.60 *   2499.09 *        *   2500.33 *   0.004617 *    8.93 *    974.09 *    221.62 *       0.75 *
*          *          *        *        *        *        *        *        *        *        *        *        *
* Reach #1    * 400       * 100 year * 32000.00 *   2493.20 *   2505.33 *        *   2507.44 *   0.002311 *    11.67 *   2742.07 *    240.15 *       0.61
*
* Reach #1    * 400       * 10 year  *  8700.00 *   2493.20 *   2498.13 *        *   2499.17 *   0.003435 *    8.18 *   1062.99 *    220.44 *       0.66 *
*          *          *        *        *        *        *        *        *        *        *        *        *
* Reach #1    * 350       * 100 year * 32000.00 *   2492.00 *   2504.38 *        *   2506.81 *   0.002622 *    12.50 *   2560.59 *    222.25 *       0.65
*
* Reach #1    * 350       * 10 year  *  8700.00 *   2492.00 *   2497.05 *        *   2498.26 *   0.003879 *    8.81 *    987.72 *    200.54 *       0.70 *
*          *          *        *        *        *        *        *        *        *        *        *        *
* Reach #1    * 325       * 100 year * 32000.00 *   2491.50 *   2504.36 *        *   2506.47 *   0.002181 *    11.65 *   2746.54 *    227.31 *       0.59
*
* Reach #1    * 325       * 10 year  *  8700.00 *   2491.50 *   2496.87 *        *   2497.85 *   0.002892 *    7.92 *   1098.37 *    207.79 *       0.61 *
*          *          *        *        *        *        *        *        *        *        *        *        *
* Reach #1    * 300       * 100 year * 32000.00 *   2490.90 *   2504.11 *   2500.33 *   2506.18 *   0.002109 *    11.54 *   2773.52 *    232.70 *
0.59 *
* Reach #1    * 300       * 10 year  *  8700.00 *   2490.90 *   2496.53 *   2494.87 *   2497.49 *   0.002699 *    7.87 *   1105.83 *    202.19 *
0.59 *
*          *          *        *        *        *        *        *        *        *        *        *        *
* Reach #1    * 295       *        *  Bridge *        *        *        *        *        *        *        *        *
*          *          *        *        *        *        *        *        *        *        *        *        *
* Reach #1    * 290       * 100 year * 32000.00 *   2490.20 *   2502.18 *        *   2505.21 *   0.003356 *    13.97 *   2290.10 *    203.18 *       0.73
*
* Reach #1    * 290       * 10 year  *  8700.00 *   2490.20 *   2495.43 *        *   2496.69 *   0.003918 *    9.03 *    963.84 *    189.68 *       0.71 *
*          *          *        *        *        *        *        *        *        *        *        *        *
* Reach #1    * 275       * 100 year * 32000.00 *   2489.80 *   2500.15 *   2499.88 *   2504.69 *   0.006030 *    17.09 *   1871.98 *    191.22 *
0.96 *
* Reach #1    * 275       * 10 year  *  8700.00 *   2489.80 *   2494.41 *   2494.08 *   2496.21 *   0.006581 *    10.78 *    806.89 *    179.73 *
0.90 *
*          *          *        *        *        *        *        *        *        *        *        *        *
* Reach #1    * 200       * 100 year * 32000.00 *   2488.00 *   2498.18 *   2498.18 *   2503.01 *   0.006551 *    17.63 *   1815.39 *    188.47 *
1.00 *
* Reach #1    * 200       * 10 year  *  8700.00 *   2488.00 *   2492.64 *   2492.31 *   2494.47 *   0.006607 *    10.85 *    801.84 *    177.39 *
0.90 *
*          *          *        *        *        *        *        *        *        *        *        *        *
* Reach #1    * 150       * 100 year * 32000.00 *   2486.20 *   2497.02 *        *   2500.77 *   0.004700 *    15.55 *   2058.50 *    201.26 *       0.86
*
* Reach #1    * 150       * 10 year  *  8700.00 *   2486.20 *   2492.03 *        *   2493.04 *   0.002714 *    8.05 *   1080.36 *    191.18 *       0.60 *
*          *          *        *        *        *        *        *        *        *        *        *        *
* Reach #1    * 100       * 100 year * 32000.00 *   2484.00 *   2496.00 *   2495.07 *   2499.21 *   0.005001 *    14.39 *   2223.50 *    261.12 *
0.87 *
* Reach #1    * 100       * 10 year  *  8700.00 *   2484.00 *   2490.70 *   2490.02 *   2491.98 *   0.005010 *    9.07 *    959.09 *    226.81 *
0.78 *
*****************************************************************************************************************************
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Profile Output Table - Standard Table 2

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*****************************************************************************************************************************
************************
* Reach       * River Sta   * Profile  * E.G. Elev * W.S. Elev * Vel Head * Frctn Loss * C & E Loss * Q Left * Q Channel * Q Right * Top Width *
*          *          *        *      (ft) *     (ft) *     (ft) *      (ft) *      (ft) *  (cfs) *     (cfs) *   (cfs) *      (ft) *
```

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*****************************************************************************************************************************
************************
* Reach #1   * 1600     * 100 year *  2551.95 *  2548.54 *   3.41 *    2.93 *    0.48 *     * 32000.00 *      *   320.56 *
* Reach #1   * 1600     * 10 year  *  2545.59 *  2543.89 *   1.70 *    3.40 *    0.25 *     *  8700.00 *      *   248.33 *
*          *        *        *        *        *        *        *        *        *        *        *        *
* Reach #1   * 1500     * 100 year *  2547.91 *  2546.09 *   1.82 *    0.58 *    0.01 *     * 32000.00 *      *   354.78 *
* Reach #1   * 1500     * 10 year  *  2540.77 *  2539.91 *   0.86 *    0.69 *    0.00 *     *  8700.00 *      *   267.45 *
*          *        *        *        *        *        *        *        *        *        *        *        *
* Reach #1   * 1450     * 100 year *  2547.32 *  2545.54 *   1.79 *    0.57 *    0.05 *     * 32000.00 *      *   326.53 *
* Reach #1   * 1450     * 10 year  *  2540.08 *  2539.23 *   0.85 *    0.72 *    0.02 *     *  8700.00 *      *   267.86 *
*          *        *        *        *        *        *        *        *        *        *        *        *
* Reach #1   * 1400     * 100 year *  2546.71 *  2544.44 *   2.26 *    0.57 *    0.08 *     * 32000.00 *      *   294.40 *
* Reach #1   * 1400     * 10 year  *  2539.34 *  2538.29 *   1.06 *    0.65 *    0.09 *     *  8700.00 *      *   247.28 *
*          *        *        *        *        *        *        *        *        *        *        *        *
* Reach #1   * 1350     * 100 year *  2546.06 *  2544.07 *   1.99 *    0.33 *    0.09 * 77.05 * 31922.94 *   0.01 *   298.54 *
* Reach #1   * 1350     * 10 year  *  2538.61 *  2537.84 *   0.77 *    0.35 *    0.05 *     *  8700.00 *      *   247.21 *
*          *        *        *        *        *        *        *        *        *        *        *        *
* Reach #1   * 1325     *        *   Bridge *        *        *        *        *        *        *        *
*          *        *        *        *        *        *        *        *        *        *        *        *
* Reach #1   * 1300     * 100 year *  2544.53 *  2542.30 *   2.23 *    1.58 *    0.21 *     * 32000.00 *      *   271.88 *
* Reach #1   * 1300     * 10 year  *  2537.17 *  2536.19 *   0.98 *    2.04 *    0.09 *     *  8700.00 *      *   246.60 *
*          *        *        *        *        *        *        *        *        *        *        *        *
* Reach #1   * 1230     * 100 year *  2542.74 *  2538.44 *   4.30 *    0.28 *    0.21 *     * 31991.22 *   8.78 *   265.19 *
* Reach #1   * 1230     * 10 year  *  2535.04 *  2533.14 *   1.90 *    0.26 *    0.25 *     *  8700.00 *      *   209.04 *
*          *        *        *        *        *        *        *        *        *        *        *        *
* Reach #1   * 1220     * 100 year *  2540.78 *  2537.18 *   3.60 *    1.98 *    0.21 *     * 32000.00 *      *   240.31 *
* Reach #1   * 1220     * 10 year  *  2533.79 *  2532.73 *   1.07 *    2.30 *    0.06 *     *  8700.00 *      *   231.50 *
*          *        *        *        *        *        *        *        *        *        *        *        *
* Reach #1   * 1200     * 100 year *  2538.60 *  2535.69 *   2.91 *    0.18 *    0.23 *     * 32000.00 *      *   260.39 *
* Reach #1   * 1200     * 10 year  *  2531.43 *  2529.73 *   1.70 *    0.26 *    0.26 *     *  8700.00 *      *   247.65 *
*          *        *        *        *        *        *        *        *        *        *        *        *
* Reach #1   * 1120     * 100 year *  2538.19 *  2536.04 *   2.15 *    1.75 *    0.21 *     * 32000.00 *   0.00 *   259.41 *
* Reach #1   * 1120     * 10 year  *  2530.83 *  2530.00 *   0.83 *    2.01 *    0.10 *     *  8700.00 *      *   248.62 *
*          *        *        *        *        *        *        *        *        *        *        *        *
* Reach #1   * 1110     * 100 year *  2536.22 *  2531.94 *   4.28 *    0.20 *    0.24 *     * 32000.00 *      *   227.56 *
* Reach #1   * 1110     * 10 year  *  2528.72 *  2526.87 *   1.84 *    0.18 *    0.25 *     *  8700.00 *      *   218.17 *
*          *        *        *        *        *        *        *        *        *        *        *        *
* Reach #1   * 1100     * 100 year *  2534.69 *  2531.21 *   3.49 *    1.62 *    0.06 *     * 32000.00 *      *   218.23 *
* Reach #1   * 1100     * 10 year  *  2527.24 *  2526.21 *   1.03 *    1.44 *    0.08 *     *  8700.00 *      *   208.17 *
*          *        *        *        *        *        *        *        *        *        *        *        *
* Reach #1   * 1050     * 100 year *  2533.01 *  2528.87 *   4.13 *    1.11 *    0.18 *     * 32000.00 *      *   238.16 *
* Reach #1   * 1050     * 10 year  *  2525.72 *  2523.93 *   1.79 *    1.46 *    0.08 *     *  8700.00 *      *   227.91 *
*          *        *        *        *        *        *        *        *        *        *        *        *
* Reach #1   * 1010     * 100 year *  2530.10 *  2526.57 *   3.53 *    0.24 *    0.56 *     * 32000.00 *      *   300.86 *
* Reach #1   * 1010     * 10 year  *  2523.90 *  2522.38 *   1.52 *    0.50 *    0.05 *     *  8700.00 *      *   292.13 *
*          *        *        *        *        *        *        *        *        *        *        *        *
* Reach #1   * 1000     * 100 year *  2525.18 *  2523.53 *   1.65 *    0.24 *    0.05 *     * 32000.00 *      *   290.38 *
* Reach #1   * 1000     * 10 year  *  2516.71 *  2515.36 *   1.35 *    0.54 *    0.16 *     *  8700.00 *      *   226.13 *
*          *        *        *        *        *        *        *        *        *        *        *        *
* Reach #1   * 990      * 100 year *  2524.89 *  2523.42 *   1.47 *    0.26 *    0.03 *     * 32000.00 *      *   264.08 *
* Reach #1   * 990      * 10 year  *  2516.01 *  2515.20 *   0.81 *    0.46 *    0.01 *     *  8700.00 *      *   244.75 *
*          *        *        *        *        *        *        *        *        *        *        *        *
* Reach #1   * 975      * 100 year *  2524.60 *  2522.85 *   1.75 *    0.25 *    0.01 *     * 32000.00 *      *   238.36 *
* Reach #1   * 975      * 10 year  *  2515.55 *  2514.62 *   0.92 *    0.41 *    0.00 *     *  8700.00 *      *   221.06 *
*          *        *        *        *        *        *        *        *        *        *        *        *
* Reach #1   * 965      * 100 year *  2524.34 *  2522.52 *   1.82 *    0.27 *    0.03 *     * 32000.00 *      *   228.94 *
* Reach #1   * 965      * 10 year  *  2515.13 *  2514.21 *   0.92 *    0.40 *    0.01 *     *  8700.00 *      *   210.64 *
*          *        *        *        *        *        *        *        *        *        *        *        *
* Reach #1   * 950      * 100 year *  2524.04 *  2521.88 *   2.16 *    0.47 *    0.05 *     * 32000.00 *      *   208.35 *
* Reach #1   * 950      * 10 year  *  2514.73 *  2513.73 *   1.00 *    0.63 *    0.03 *     *  8700.00 *      *   191.75 *
*          *        *        *        *        *        *        *        *        *        *        *        *
* Reach #1   * 900      * 100 year *  2523.51 *  2520.81 *   2.70 *    0.39 *    0.03 *     * 32000.00 *      *   195.59 *
* Reach #1   * 900      * 10 year  *  2514.07 *  2512.77 *   1.30 *    0.51 *    0.01 *     *  8700.00 *      *   167.65 *
*          *        *        *        *        *        *        *        *        *        *        *        *
* Reach #1   * 875      * 100 year *  2523.09 *  2520.50 *   2.59 *    0.36 *    0.02 *     * 32000.00 *      *   190.61 *
* Reach #1   * 875      * 10 year  *  2513.54 *  2512.28 *   1.26 *    0.48 *    0.01 *     *  8700.00 *      *   164.23 *
*          *        *        *        *        *        *        *        *        *        *        *        *
* Reach #1   * 865      * 100 year *  2522.71 *  2519.95 *   2.76 *    0.42 *    0.03 *     * 32000.00 *      *   186.66 *
* Reach #1   * 865      * 10 year  *  2513.05 *  2511.68 *   1.37 *    0.53 *    0.00 *     *  8700.00 *      *   155.48 *
*          *        *        *        *        *        *        *        *        *        *        *        *
```

* Reach #1	* 850	* 100 year *	2522.26 *	2519.25 *	3.01 *	0.84 *	0.25 *	* 32000.00 *	*	176.97 *
* Reach #1	* 850	* 10 year *	2512.51 *	2511.11 *	1.40 *	1.03 *	0.10 *	* 8700.00 *	*	150.02 *
*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 825	* 100 year *	2521.17 *	2515.66 *	5.51 *	0.72 *	0.12 *	* 32000.00 *	*	156.17 *
* Reach #1	* 825	* 10 year *	2511.38 *	2508.93 *	2.45 *	0.91 *	0.05 *	* 8700.00 *	*	142.71 *
*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 800	* 100 year *	2519.34 *	2514.23 *	5.12 *	1.56 *	0.36 *	* 32000.00 *	*	172.25 *
* Reach #1	* 800	* 10 year *	2510.21 *	2507.94 *	2.27 *	1.70 *	0.26 *	* 8700.00 *	*	159.68 *
*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 750	* 100 year *	2515.51 *	2511.59 *	3.92 *	1.26 *	0.14 *	* 32000.00 *	*	218.76 *
* Reach #1	* 750	* 10 year *	2507.86 *	2506.45 *	1.41 *	1.23 *	0.04 *	* 8700.00 *	*	209.34 *
*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 700	* 100 year *	2514.10 *	2510.66 *	3.44 *	1.41 *	0.01 *	* 32000.00 *	*	227.86 *
* Reach #1	* 700	* 10 year *	2506.59 *	2505.32 *	1.27 *	1.42 *	0.00 *	* 8700.00 *	*	217.16 *
*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 650	* 100 year *	2512.69 *	2509.19 *	3.49 *	1.06 *	0.00 *	* 32000.00 *	*	227.57 *
* Reach #1	* 650	* 10 year *	2505.17 *	2503.85 *	1.31 *	1.08 *	0.00 *	* 8700.00 *	*	216.88 *
*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 600	* 100 year *	2511.62 *	2508.14 *	3.48 *	1.36 *	0.05 *	* 32000.00 *	*	227.09 *
* Reach #1	* 600	* 10 year *	2504.08 *	2502.78 *	1.31 *	1.45 *	0.00 *	* 8700.00 *	*	216.36 *
*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 550	* 100 year *	2510.21 *	2506.91 *	3.30 *	0.68 *	0.16 *	* 32000.00 *	*	229.35 *
* Reach #1	* 550	* 10 year *	2502.64 *	2501.32 *	1.31 *	0.83 *	0.02 *	* 8700.00 *	*	218.18 *
*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 500	* 100 year *	2509.36 *	2506.60 *	2.76 *	1.01 *	0.10 *	* 32000.00 *	*	244.50 *
* Reach #1	* 500	* 10 year *	2501.79 *	2500.54 *	1.26 *	1.46 *	0.01 *	* 8700.00 *	*	222.57 *
*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 450	* 100 year *	2508.25 *	2505.83 *	2.42 *	0.71 *	0.09 *	* 32000.00 *	*	244.50 *
* Reach #1	* 450	* 10 year *	2500.33 *	2499.09 *	1.24 *	1.09 *	0.06 *	* 8700.00 *	*	221.62 *
*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 400	* 100 year *	2507.44 *	2505.33 *	2.11 *	0.61 *	0.03 *	* 32000.00 *	*	240.15 *
* Reach #1	* 400	* 10 year *	2499.17 *	2498.13 *	1.04 *	0.90 *	0.02 *	* 8700.00 *	*	220.44 *
*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 350	* 100 year *	2506.81 *	2504.38 *	2.43 *	0.24 *	0.10 *	* 32000.00 *	*	222.25 *
* Reach #1	* 350	* 10 year *	2498.26 *	2497.05 *	1.20 *	0.34 *	0.07 *	* 8700.00 *	*	200.54 *
*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 325	* 100 year *	2506.47 *	2504.36 *	2.11 *	0.27 *	0.01 *	* 32000.00 *	*	227.31 *
* Reach #1	* 325	* 10 year *	2497.85 *	2496.87 *	0.97 *	0.36 *	0.00 *	* 8700.00 *	*	207.79 *
*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 300	* 100 year *	2506.18 *	2504.11 *	2.07 *	0.00 *	0.03 *	* 32000.00 *	*	232.70 *
* Reach #1	* 300	* 10 year *	2497.49 *	2496.53 *	0.96 *	0.00 *	0.02 *	* 8700.00 *	*	202.19 *
*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 295	*	* Bridge *	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 290	* 100 year *	2505.21 *	2502.18 *	3.03 *	0.37 *	0.15 *	* 32000.00 *	*	203.18 *
* Reach #1	* 290	* 10 year *	2496.69 *	2495.43 *	1.27 *	0.42 *	0.05 *	* 8700.00 *	*	189.68 *
*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 275	* 100 year *	2504.69 *	2500.15 *	4.54 *	1.66 *	0.03 *	* 32000.00 *	*	191.22 *
* Reach #1	* 275	* 10 year *	2496.21 *	2494.41 *	1.81 *	1.74 *	0.00 *	* 8700.00 *	*	179.73 *
*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 200	* 100 year *	2503.01 *	2498.18 *	4.82 *	1.62 *	0.32 *	* 32000.00 *	*	188.47 *
* Reach #1	* 200	* 10 year *	2494.47 *	2492.64 *	1.83 *	1.19 *	0.25 *	* 8700.00 *	*	177.39 *
*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 150	* 100 year *	2500.77 *	2497.02 *	3.75 *	1.39 *	0.16 *	* 32000.00 *	*	201.26 *
* Reach #1	* 150	* 10 year *	2493.04 *	2492.03 *	1.01 *	1.04 *	0.03 *	* 8700.00 *	*	191.18 *
*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 100	* 100 year *	2499.21 *	2496.00 *	3.22 *	*	*	* 32000.00 *	*	261.12 *
* Reach #1	* 100	* 10 year *	2491.98 *	2490.70 *	1.28 *	*	*	* 8700.00 *	*	226.81 *

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ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Alt1

River: River #1 Reach: Reach #1 RS: 1600 Profile: 100 year

Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.

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.
River: River #1 Reach: Reach #1 RS: 1600 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 1350 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 1350 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 1325 Profile: 100 year
Warning:Pier drag coefficient of 2.0 assumed for Class B flow.
River: River #1 Reach: Reach #1 RS: 1325 Profile: 10 year
Warning:Pier drag coefficient of 2.0 assumed for Class B flow.
River: River #1 Reach: Reach #1 RS: 1300 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 1300 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 1230 Profile: 100 year
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:Divided flow computed for this cross-section.
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.
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.
River: River #1 Reach: Reach #1 RS: 1230 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 1220 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 1220 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 1200 Profile: 100 year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: River #1 Reach: Reach #1 RS: 1200 Profile: 10 year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
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: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.
River: River #1 Reach: Reach #1 RS: 1120 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 1120 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 1110 Profile: 100 year
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 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.
River: River #1 Reach: Reach #1 RS: 1110 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 1100 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 1100 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 1050 Profile: 100 year
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 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.
River: River #1 Reach: Reach #1 RS: 1050 Profile: 10 year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
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.
River: River #1 Reach: Reach #1 RS: 1010 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 1010 Profile: 10 year
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 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.
River: River #1 Reach: Reach #1 RS: 1000 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 950 Profile: 100 year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: River #1 Reach: Reach #1 RS: 850 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 850 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 825 Profile: 100 year
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 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.
River: River #1 Reach: Reach #1 RS: 825 Profile: 10 year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
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.
River: River #1 Reach: Reach #1 RS: 800 Profile: 100 year
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 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.
River: River #1 Reach: Reach #1 RS: 800 Profile: 10 year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
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.
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.
River: River #1 Reach: Reach #1 RS: 750 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 750 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 700 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 700 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 650 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 650 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 600 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 600 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 550 Profile: 100 year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: River #1 Reach: Reach #1 RS: 500 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 500 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 450 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 295 Profile: 100 year
Warning:Pier drag coefficient of 2.0 assumed for Class B flow.
River: River #1 Reach: Reach #1 RS: 295 Profile: 100 year Upstream
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: River #1 Reach: Reach #1 RS: 295 Profile: 100 year Downstream
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: River #1 Reach: Reach #1 RS: 295 Profile: 10 year
Warning:Pier drag coefficient of 2.0 assumed for Class B flow.
River: River #1 Reach: Reach #1 RS: 290 Profile: 100 year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: River #1 Reach: Reach #1 RS: 290 Profile: 10 year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: River #1 Reach: Reach #1 RS: 275 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 275 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 200 Profile: 100 year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
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.
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.
River: River #1 Reach: Reach #1 RS: 200 Profile: 10 year
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.

River: River #1 Reach: Reach #1 RS: 150 Profile: 100 year

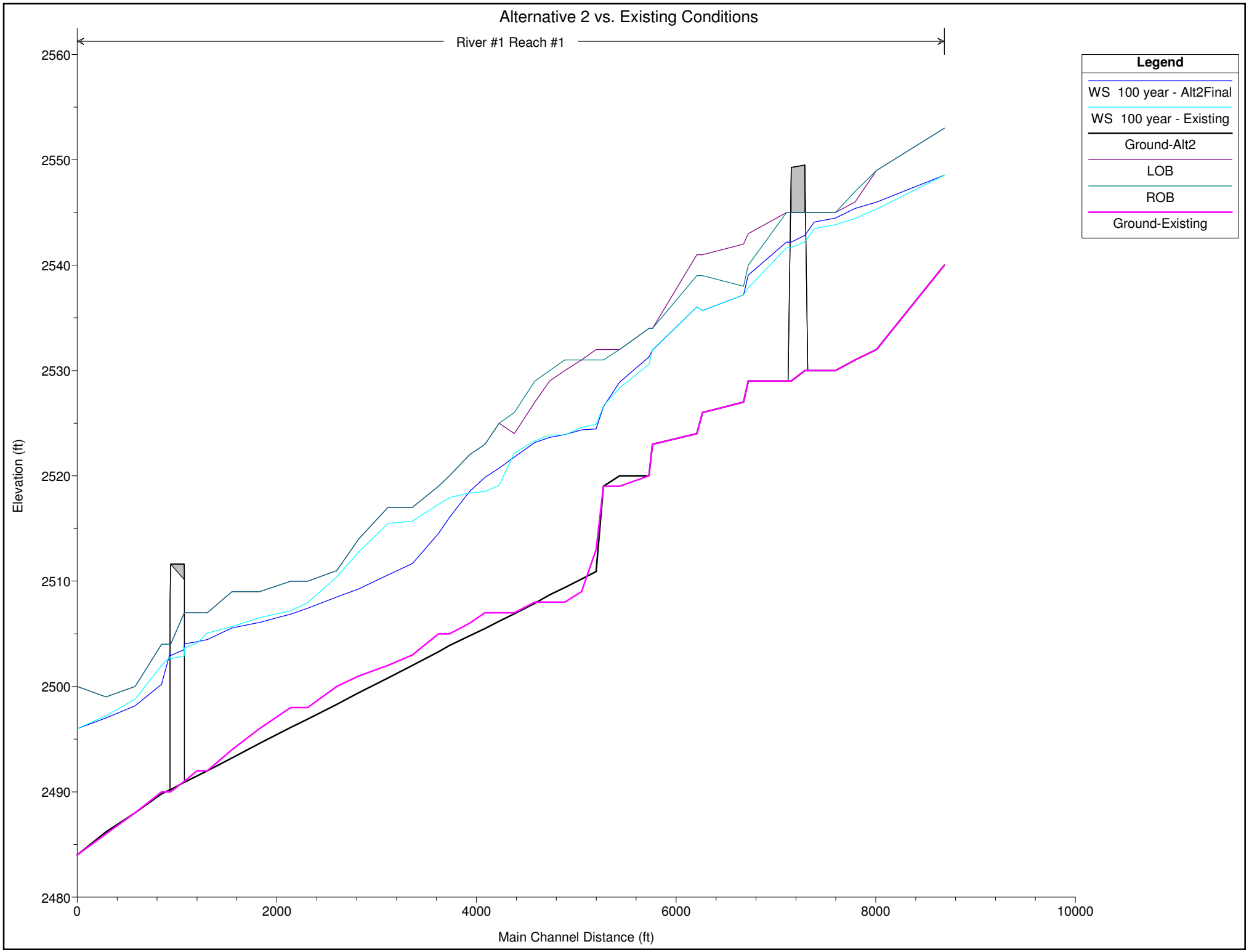
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

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.

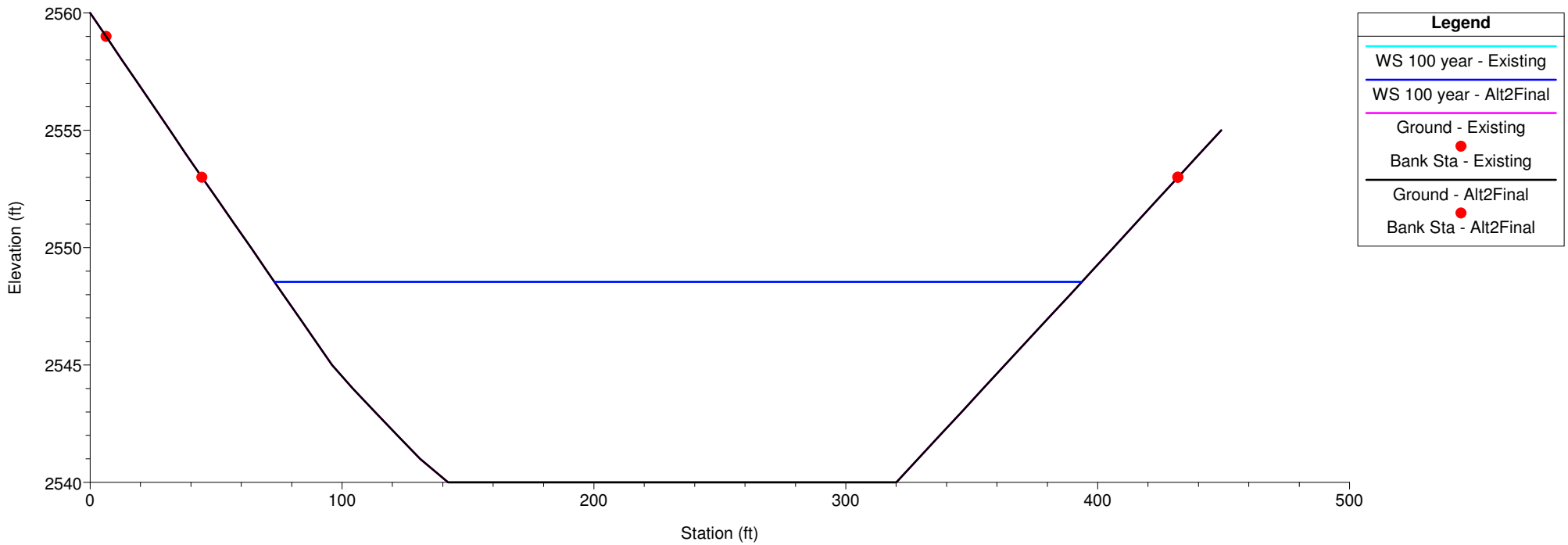
River: River #1 Reach: Reach #1 RS: 150 Profile: 10 year

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.

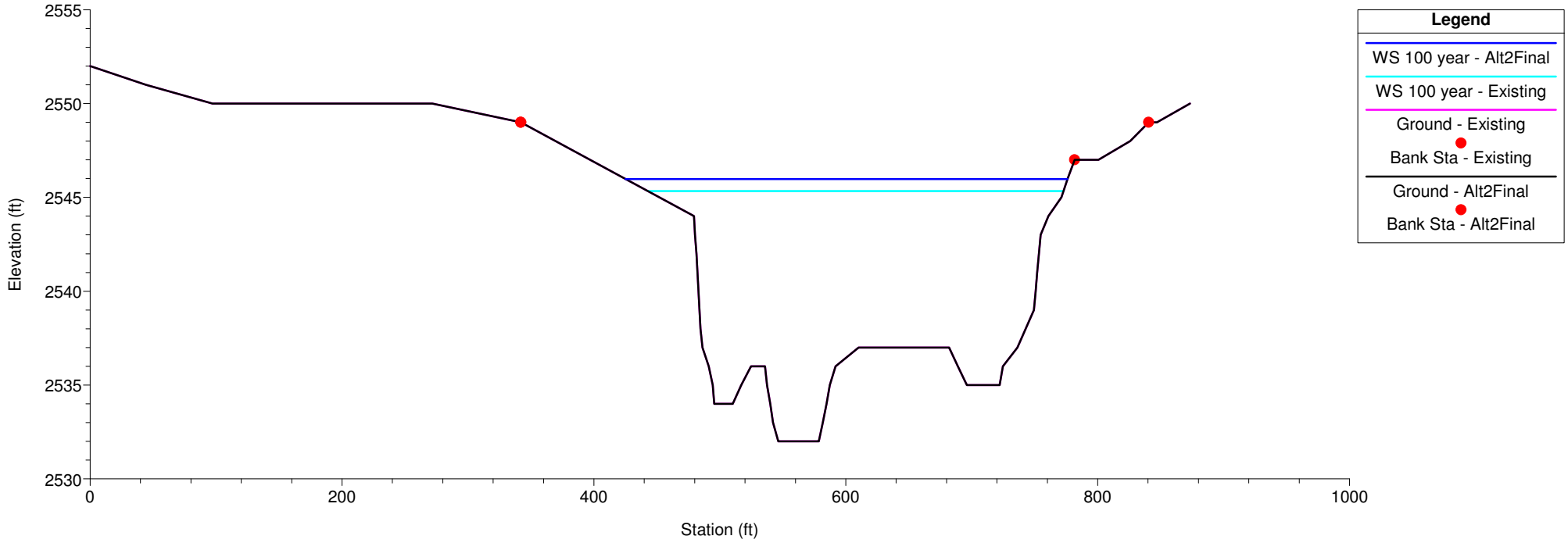
APPENDIX J.2
ALTERNATIVE 2 OUTPUT AND CROSS-SECTION AND PROFILE PLOTS


Alternative 2 vs. Existing Conditions
River #1 Reach #1
Legend
WS 100 year - Alt2Final
WS 100 year - Existing
Ground-Alt2
LOB
ROB
Ground-Existing
Elevation (ft)
2560
2550
2540
2530
2520
2510
2500
2490
2480
0
2000
4000
6000
8000
10000
Main Channel Distance (ft)

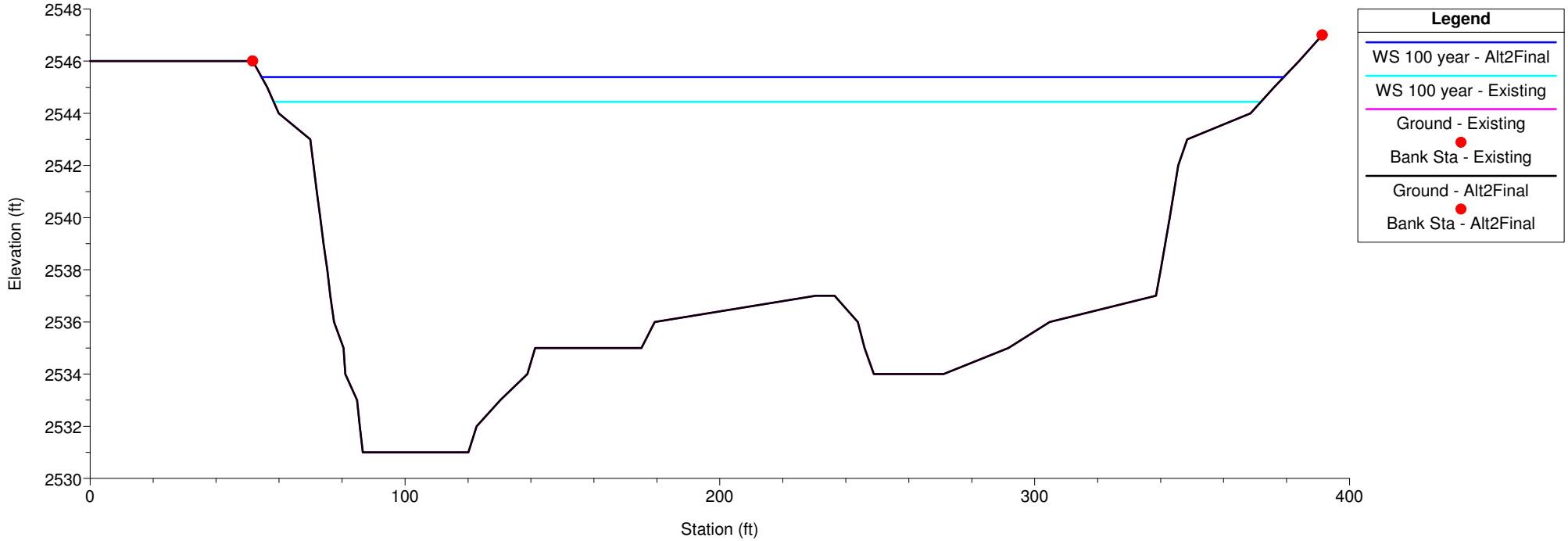
RS = 1600 Alternative 2 vs. Existing Conditions



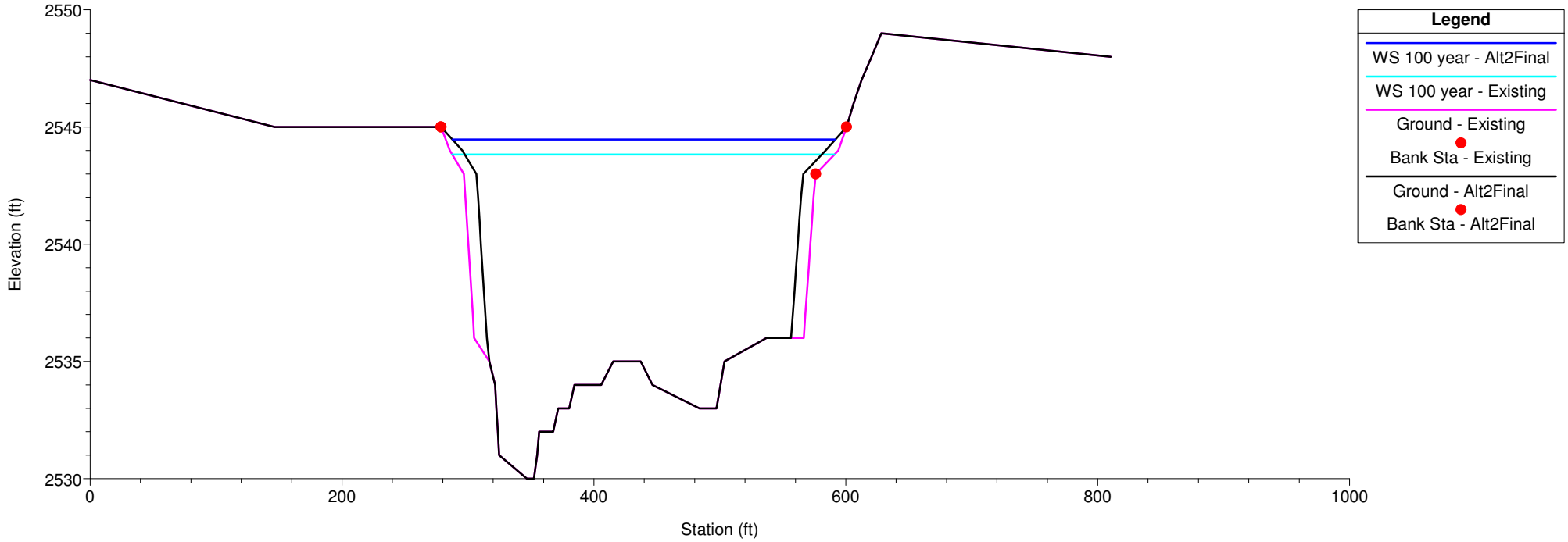
RS = 1500 Alternative 2 vs. Existing Conditions



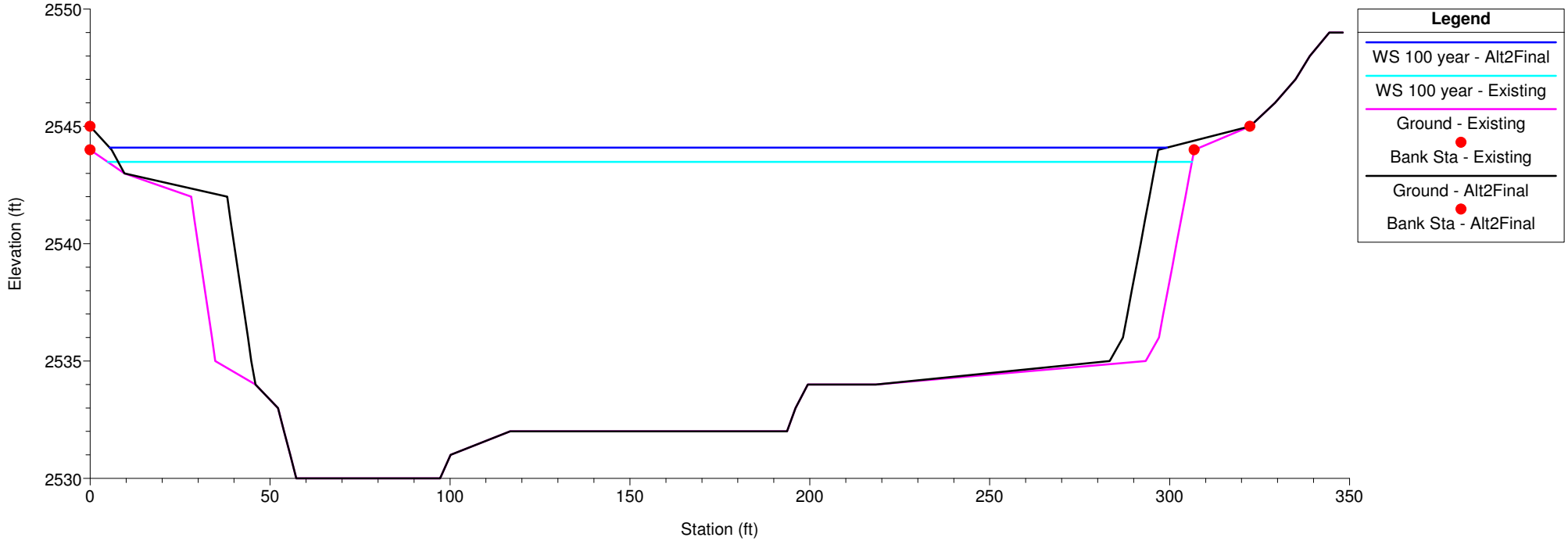
RS = 1450 Alternative 2 vs. Existing Conditions



RS = 1400 Alternative 2 vs. Existing Conditions

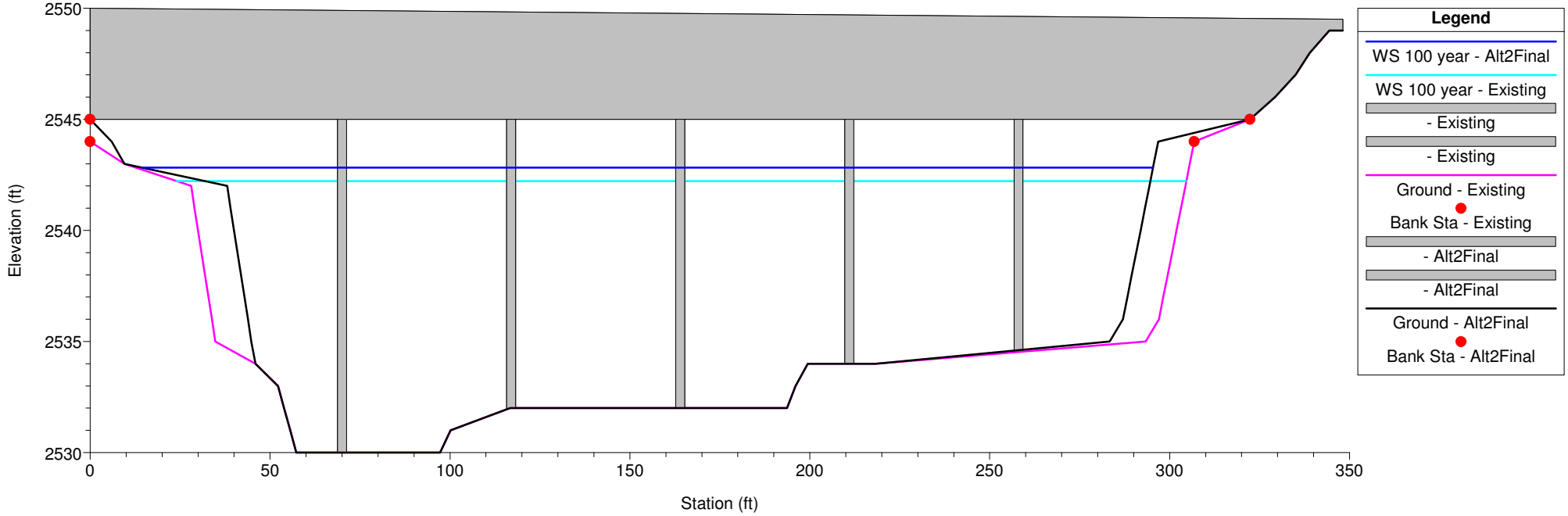


RS = 1350 Alternative 2 vs. Existing Conditions



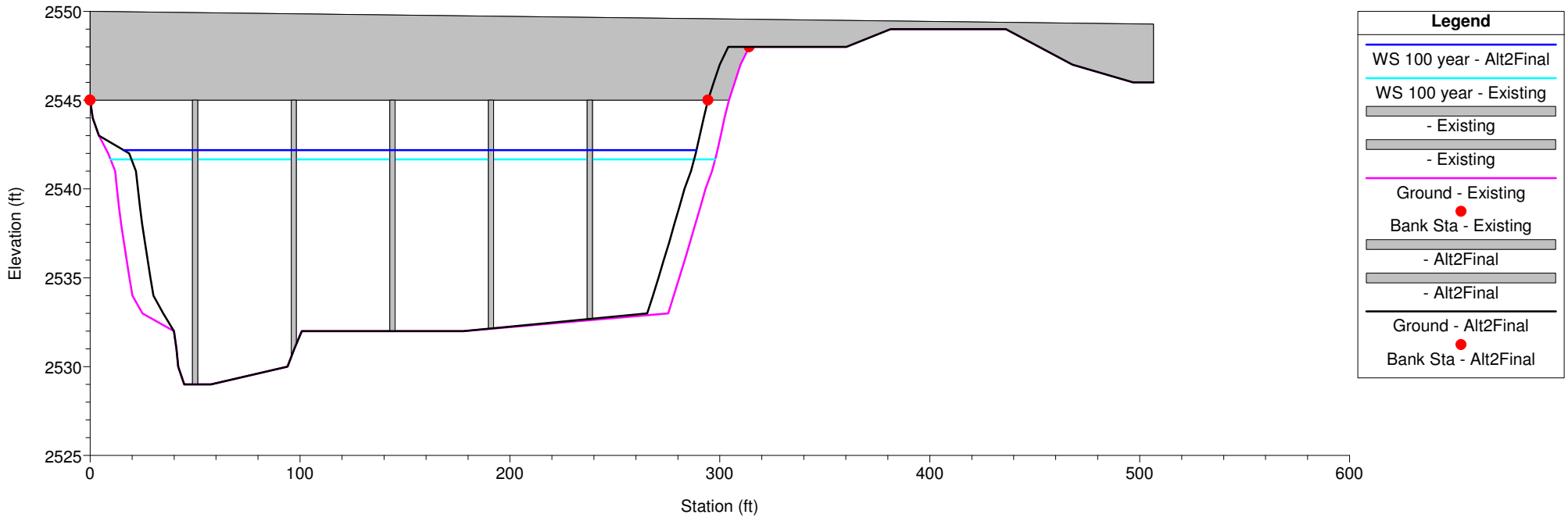
RS = 1325 BR

Alternative 2 vs. Existing Conditions

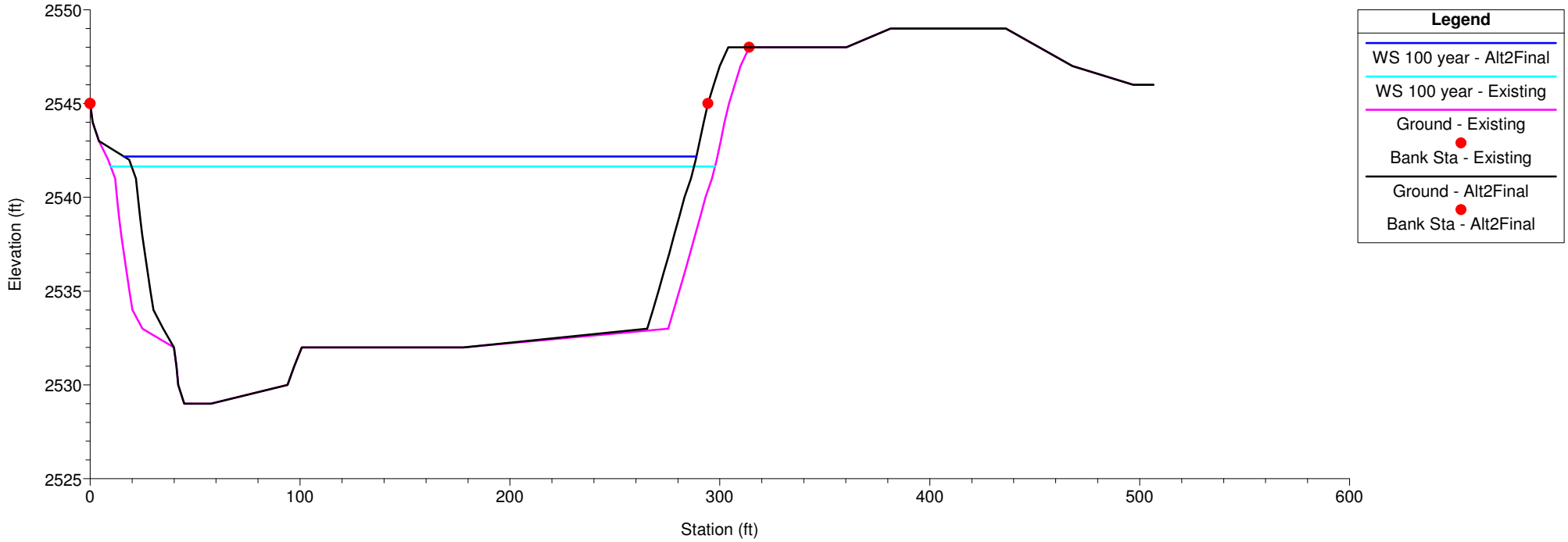


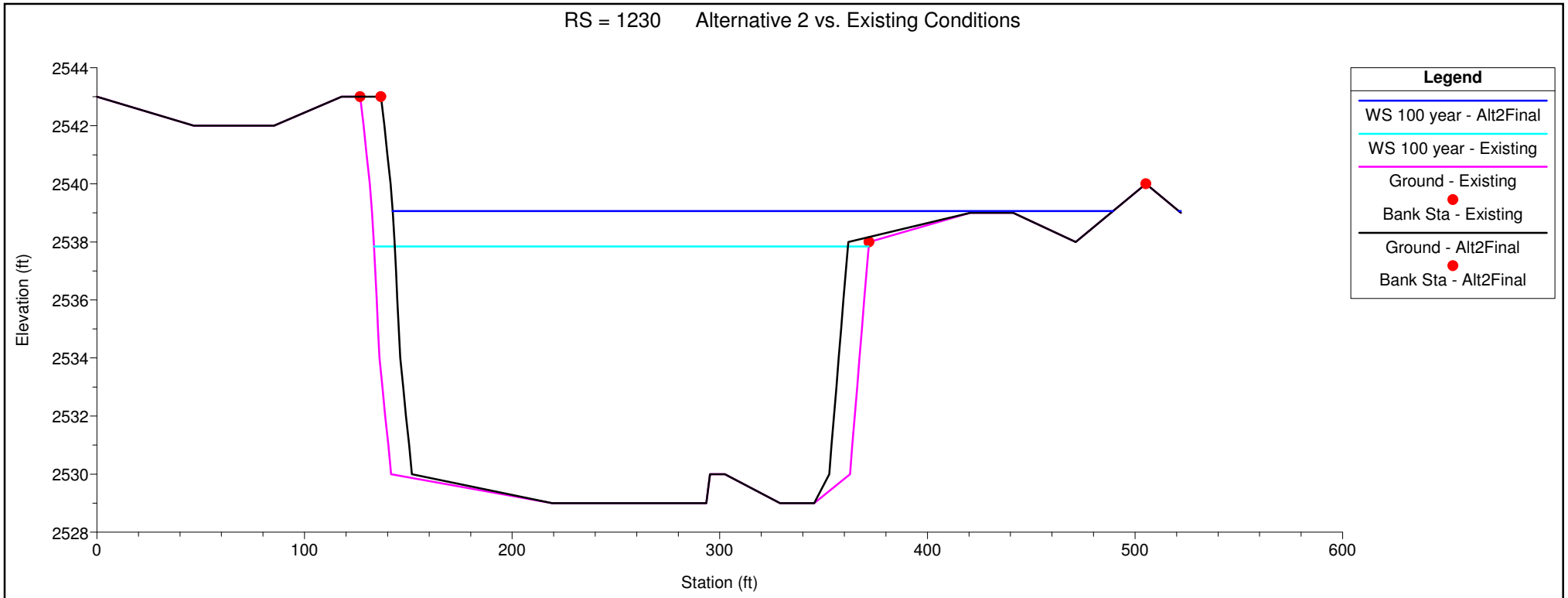
RS = 1325 BR

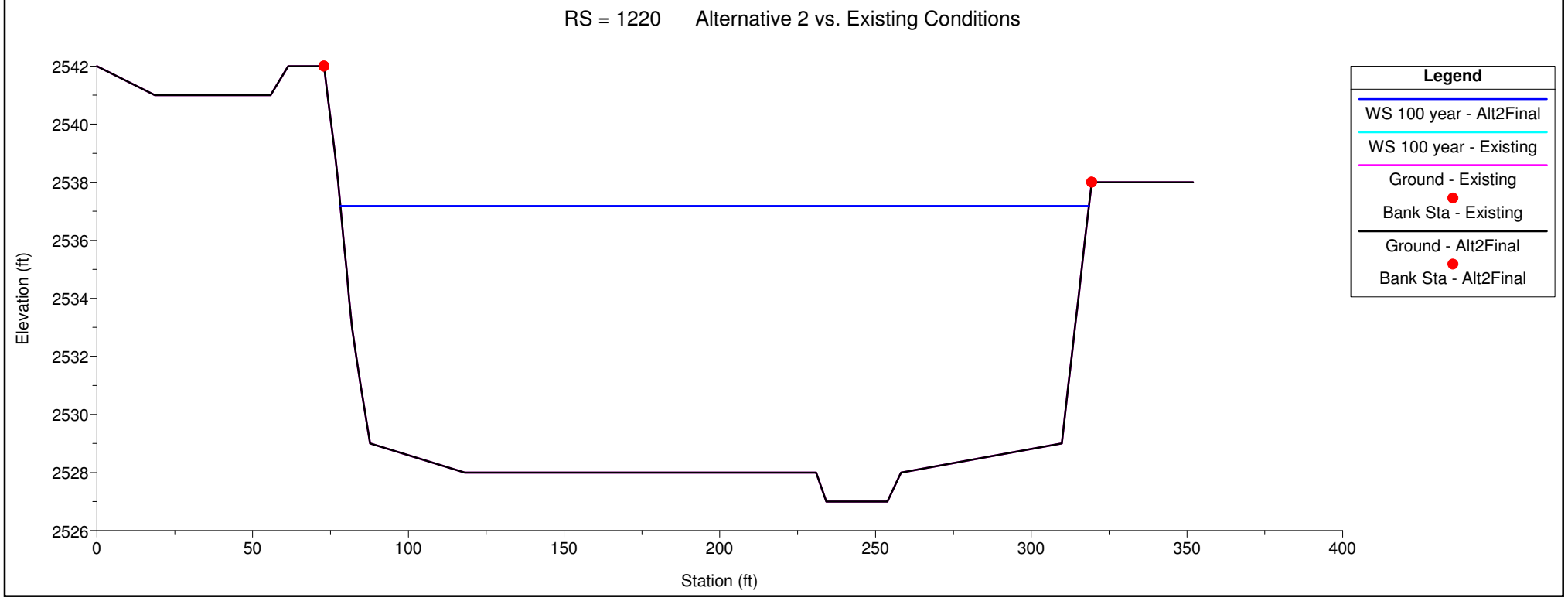
Alternative 2 vs. Existing Conditions

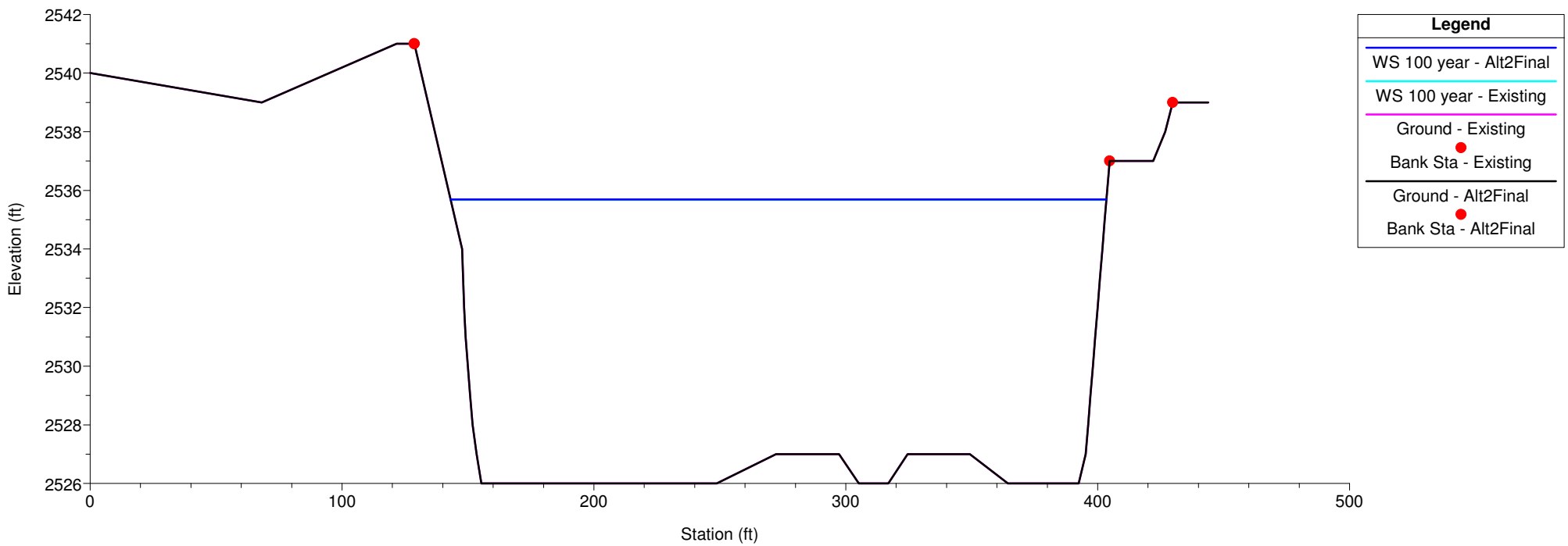


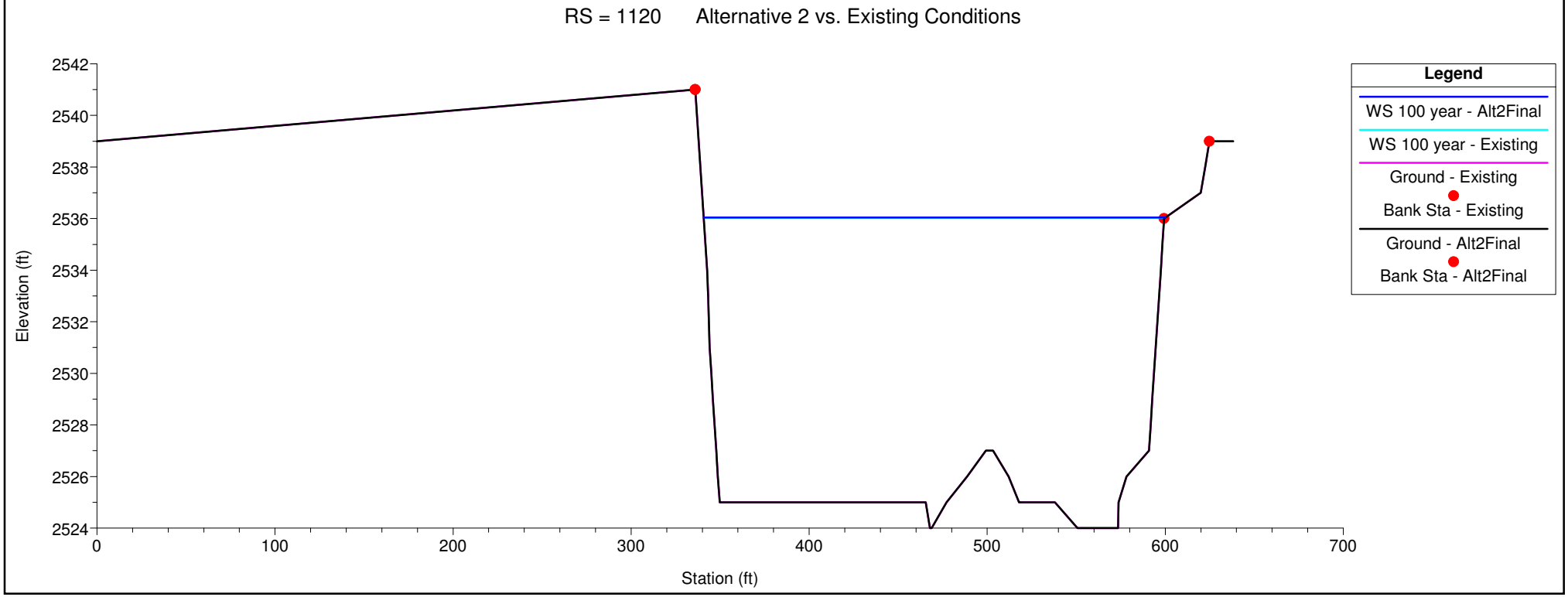
RS = 1300 Alternative 2 vs. Existing Conditions



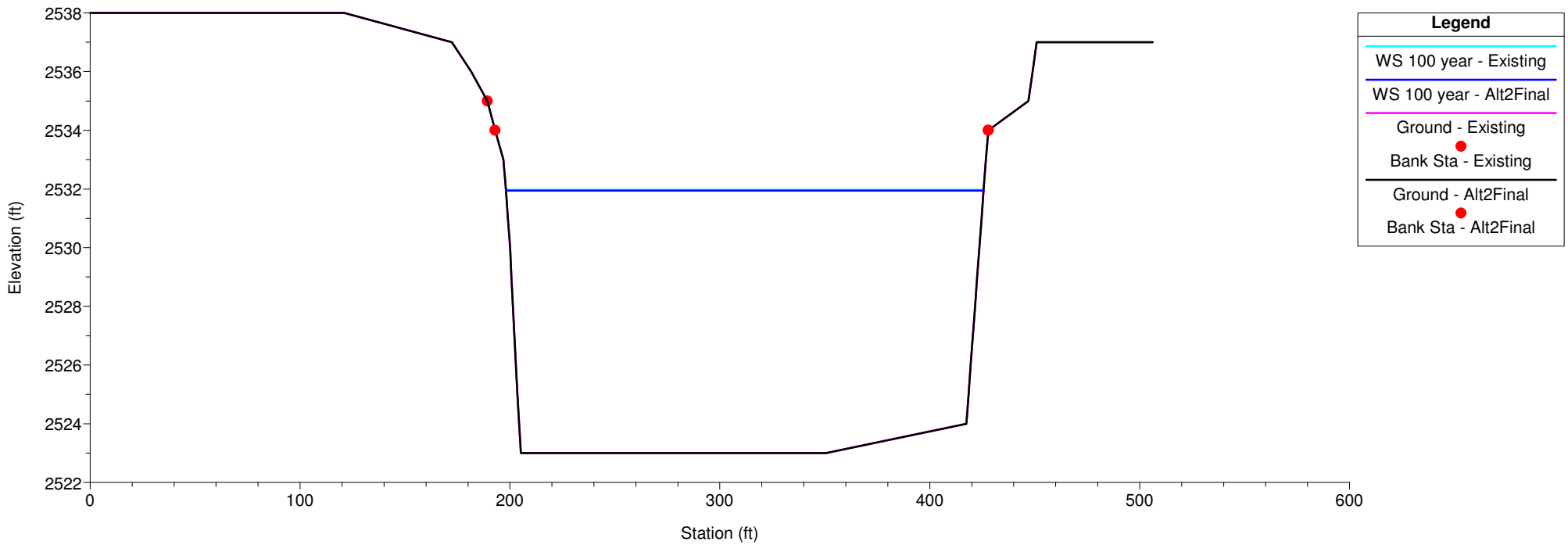

RS = 1230 Alternative 2 vs. Existing Conditions
Elevation (ft)
Station (ft)
2544
2542
2540
2538
2536
2534
2532
2530
2528
0
100
200
300
400
500
600
Legend
WS 100 year - Alt2Final
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt2Final
Bank Sta - Alt2Final


RS = 1220 Alternative 2 vs. Existing Conditions
Elevation (ft)
Station (ft)
2542
2540
2538
2536
2534
2532
2530
2528
2526
0
50
100
150
200
250
300
350
400
Legend
WS 100 year - Alt2Final
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt2Final
Bank Sta - Alt2Final

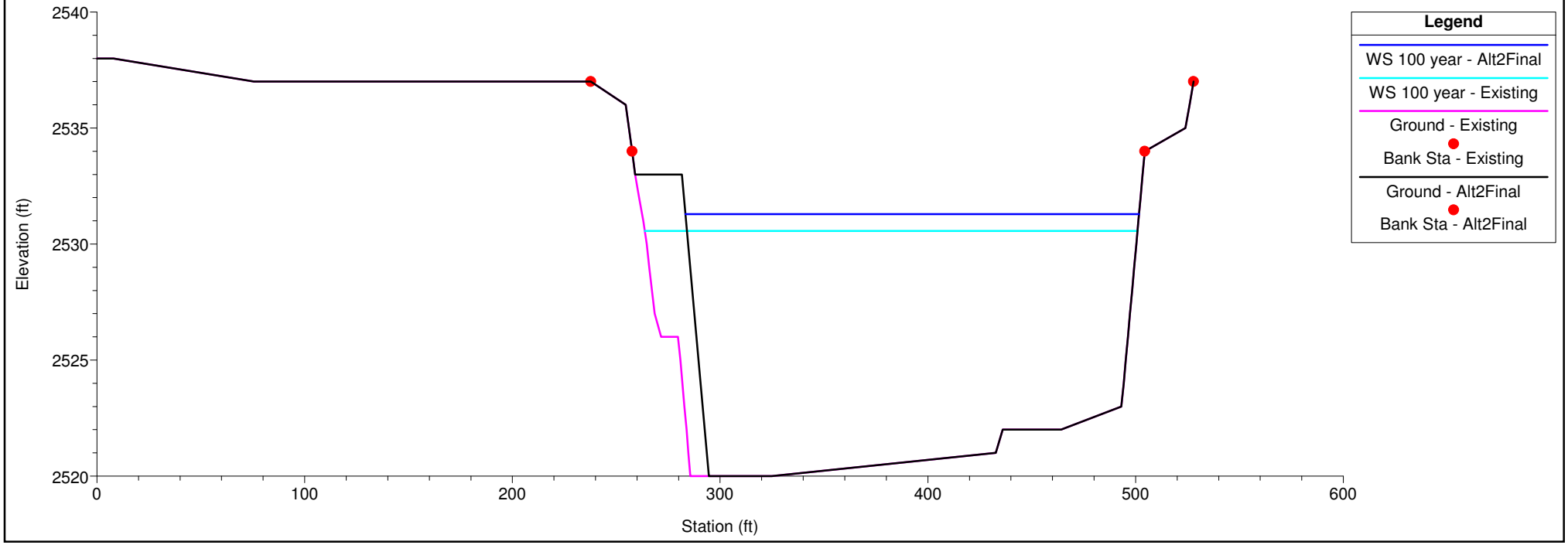

RS = 1200 Alternative 2 vs. Existing Conditions
Elevation (ft)
Station (ft)
2542
2540
2538
2536
2534
2532
2530
2528
2526
0
100
200
300
400
500
Legend
WS 100 year - Alt2Final
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt2Final
Bank Sta - Alt2Final


RS = 1120 Alternative 2 vs. Existing Conditions
Elevation (ft)
Station (ft)
2542
2540
2538
2536
2534
2532
2530
2528
2526
2524
0
100
200
300
400
500
600
700
Legend
WS 100 year - Alt2Final
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt2Final
Bank Sta - Alt2Final

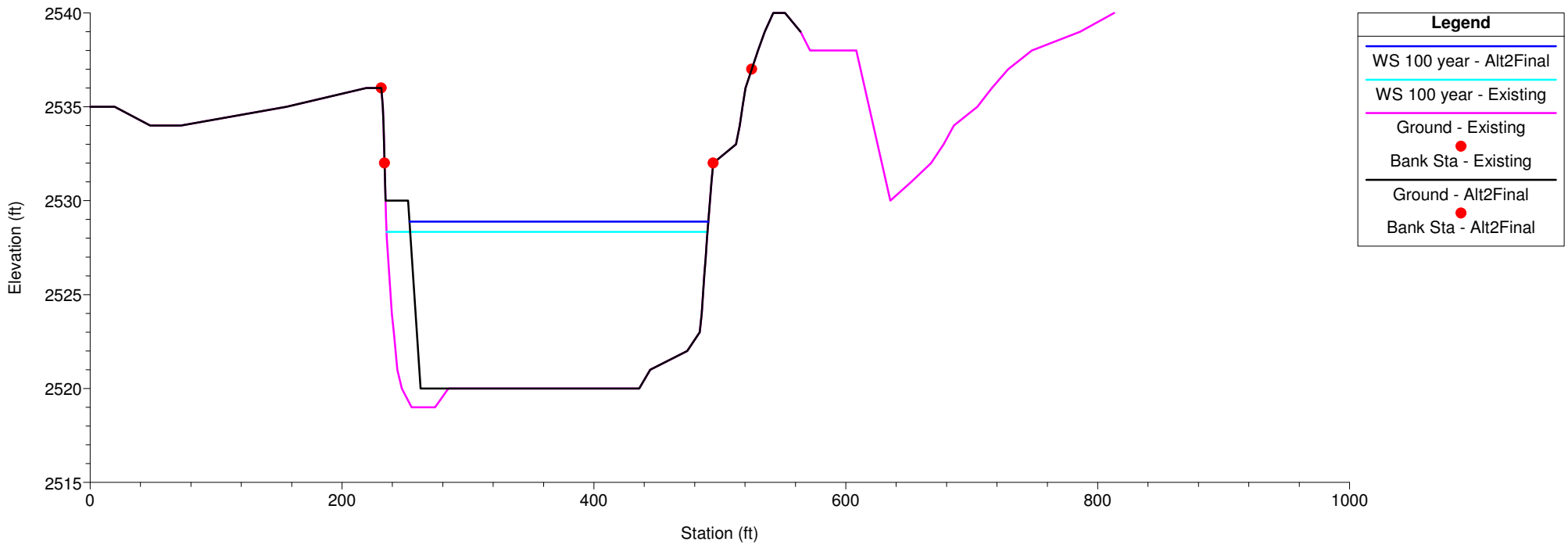
RS = 1110 Alternative 2 vs. Existing Conditions



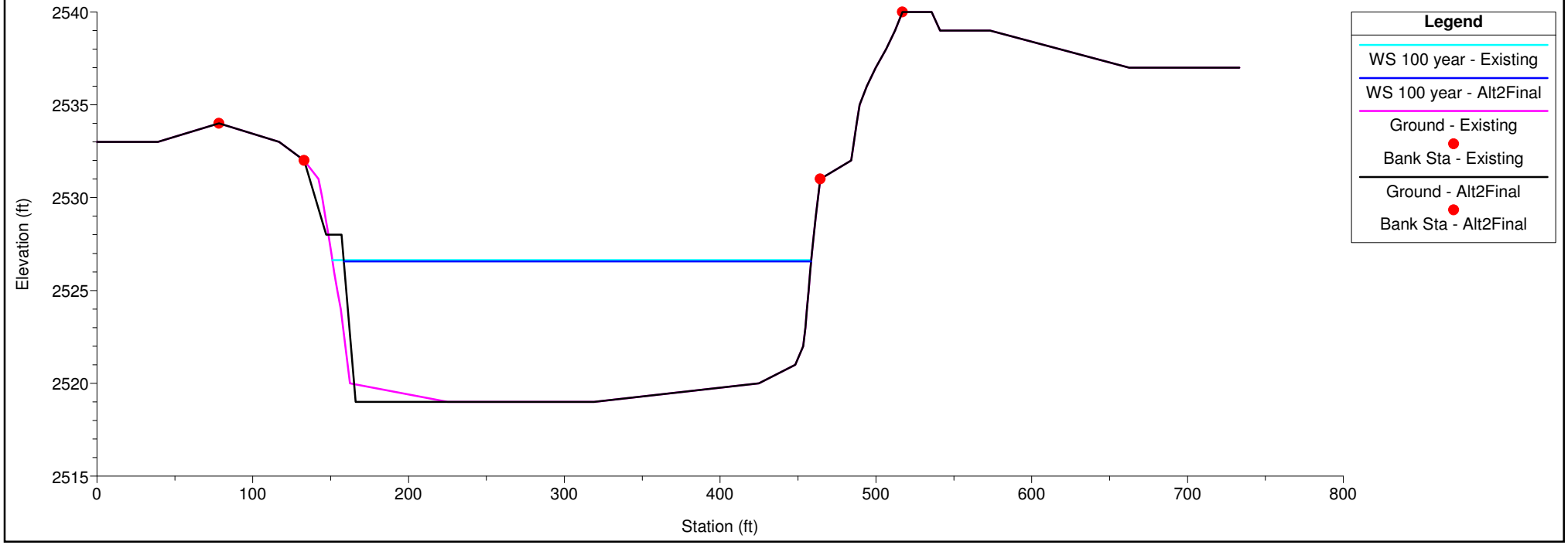
RS = 1100 Alternative 2 vs. Existing Conditions

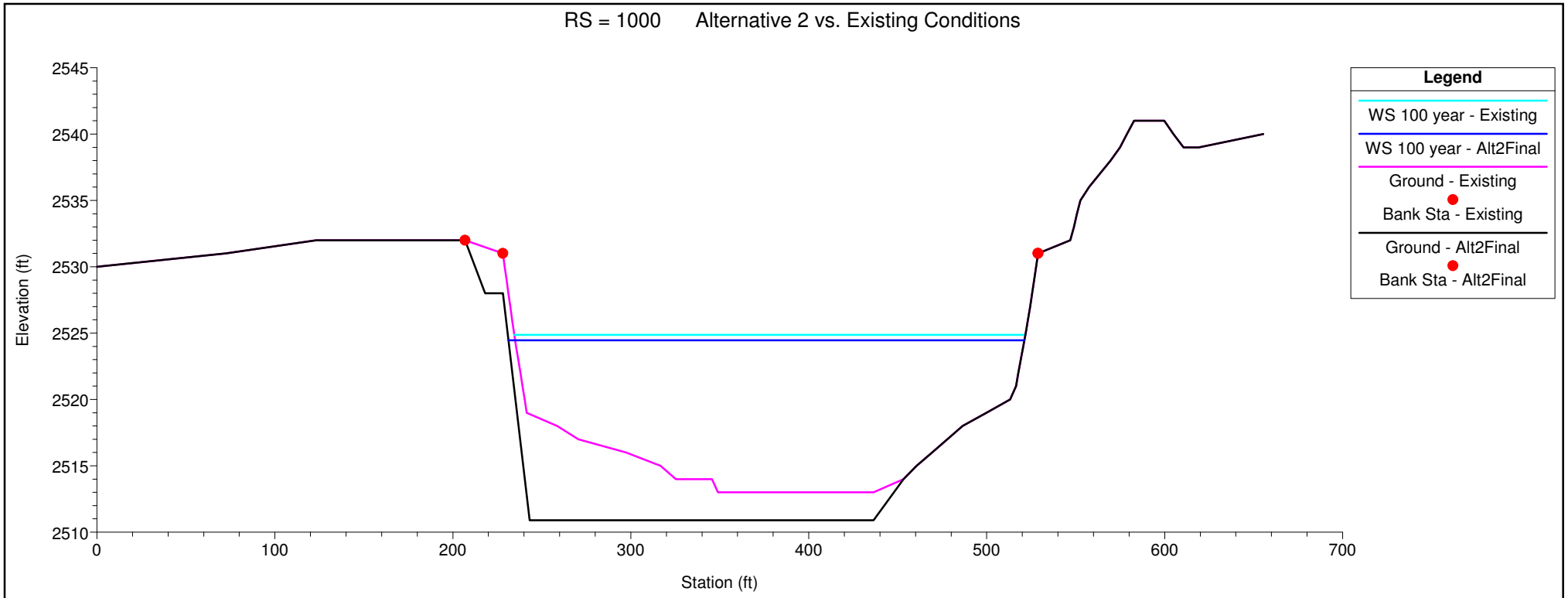


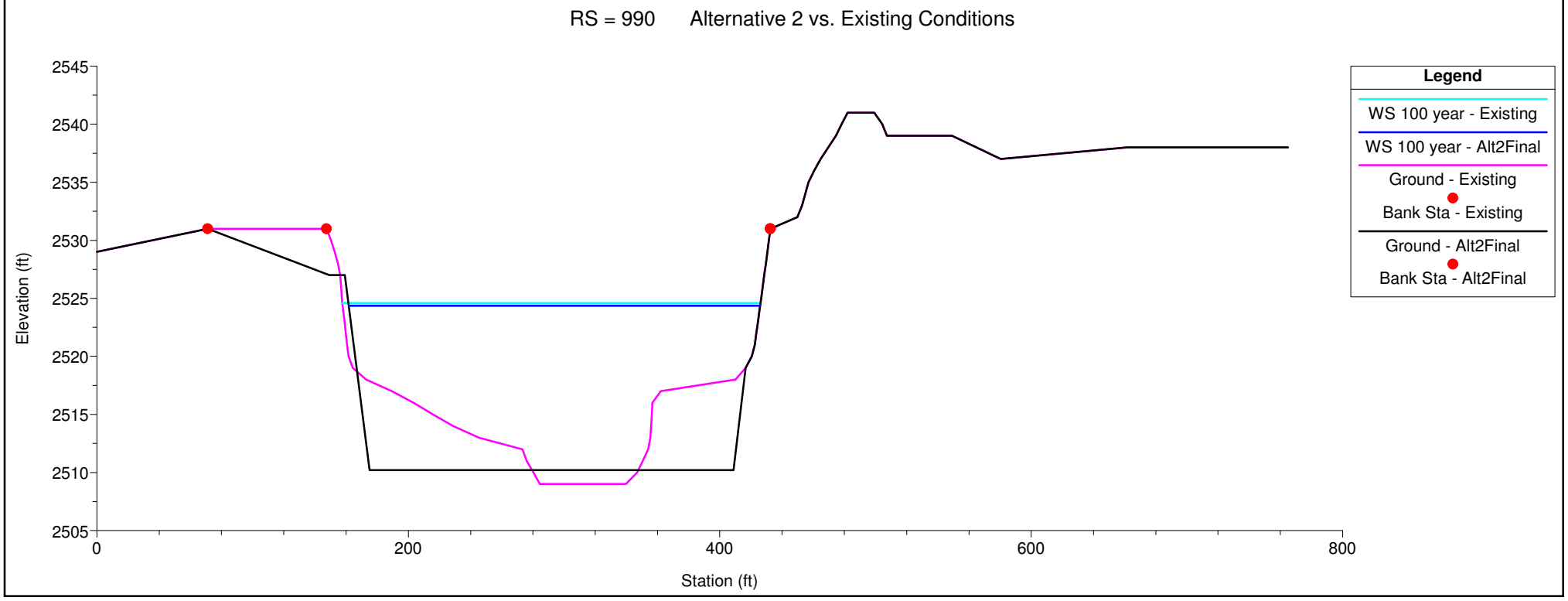
RS = 1050 Alternative 2 vs. Existing Conditions

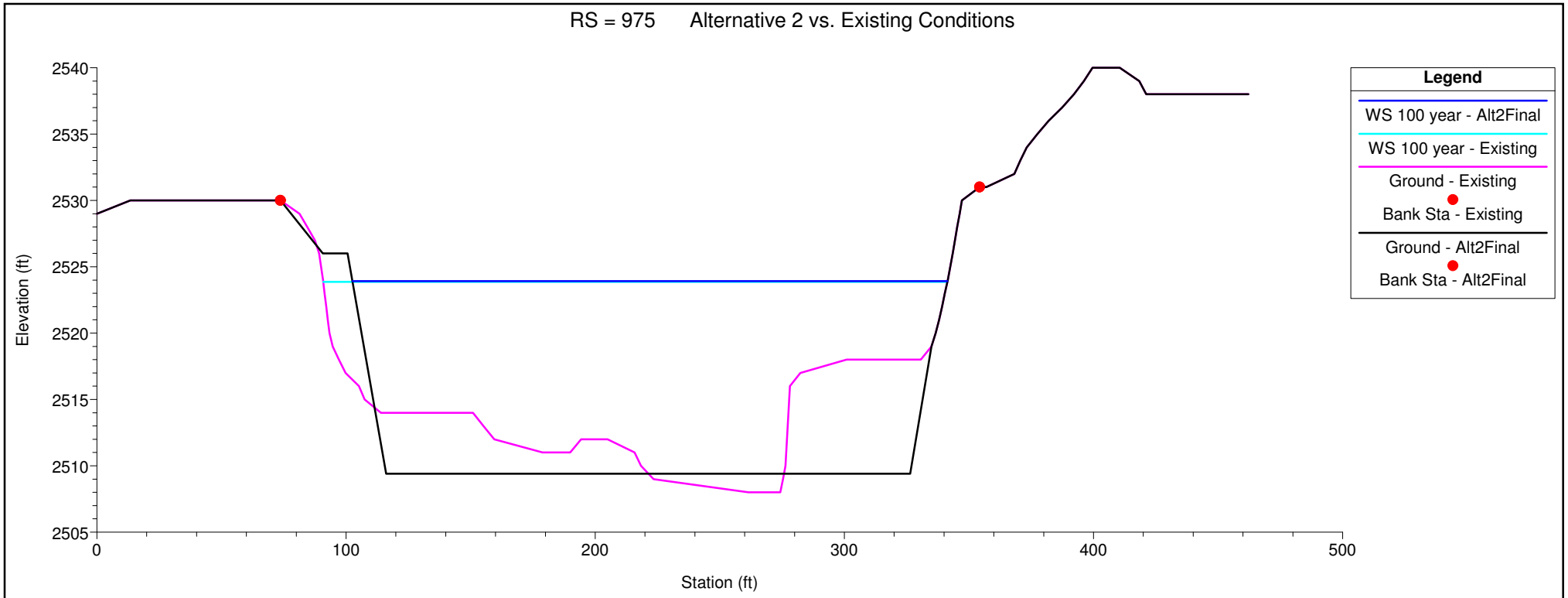


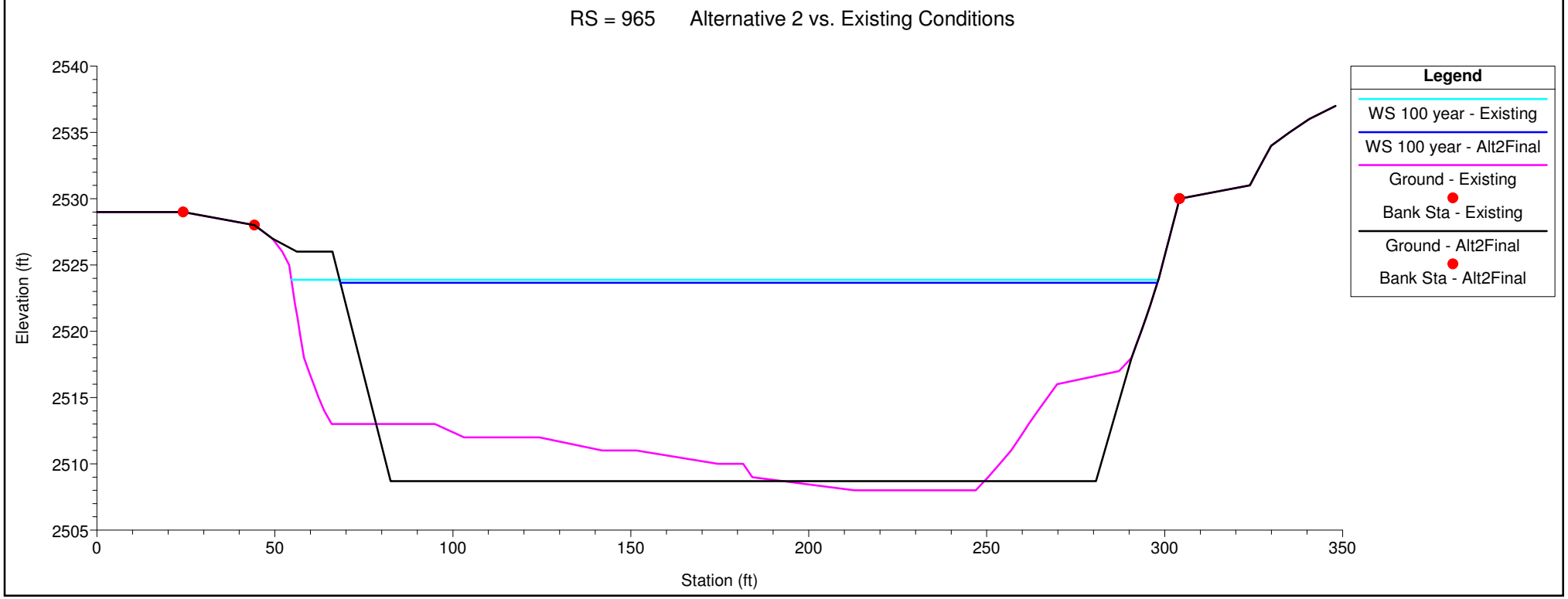
RS = 1010 Alternative 2 vs. Existing Conditions

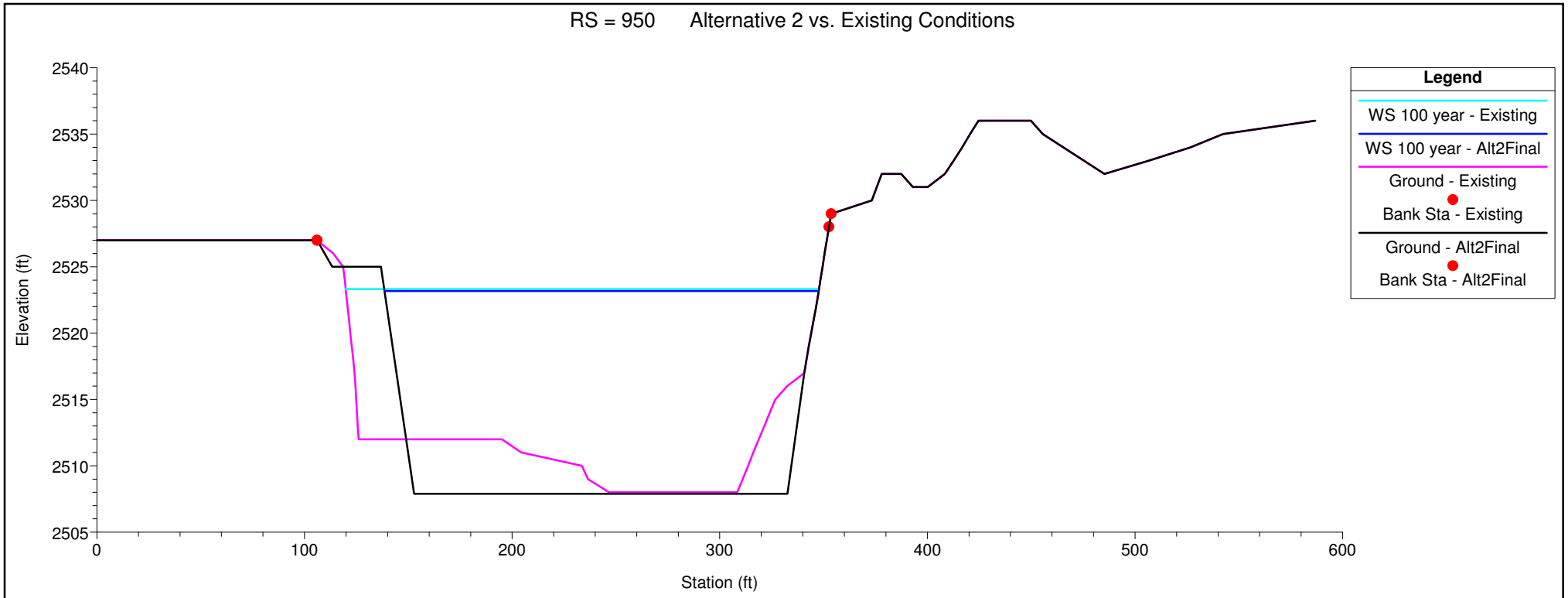


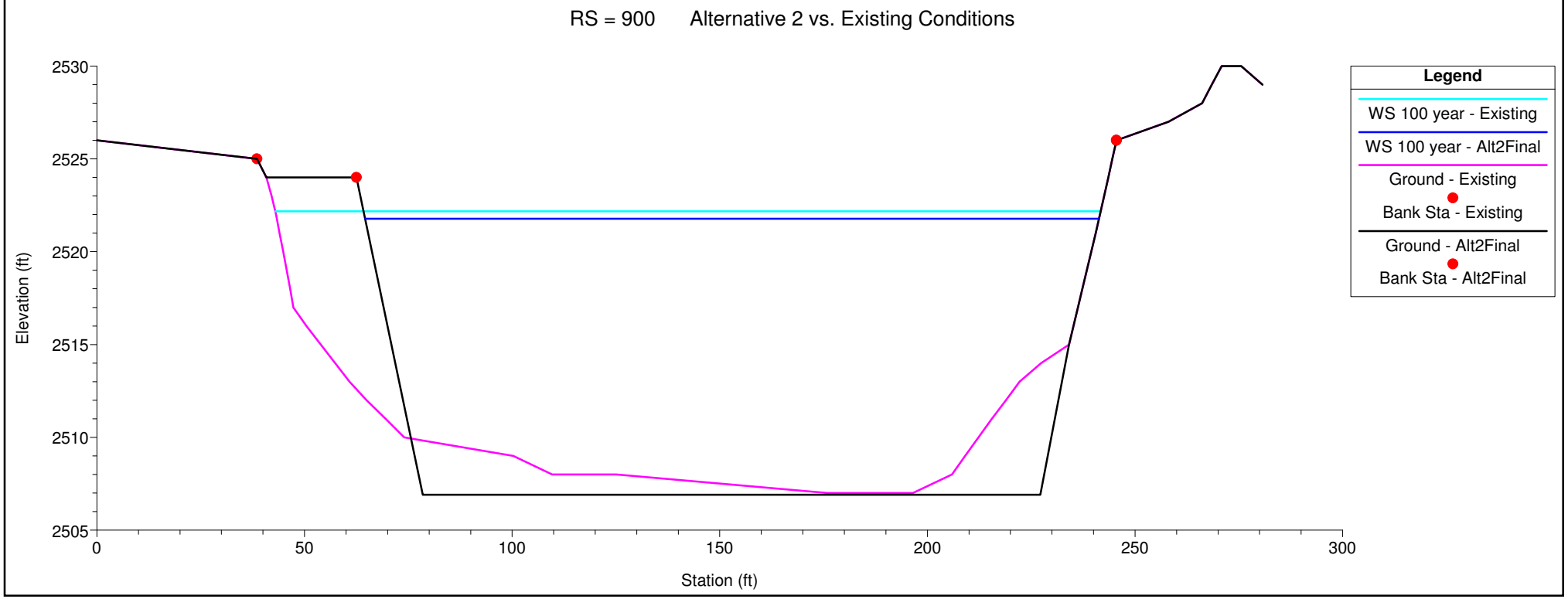

RS = 1000 Alternative 2 vs. Existing Conditions
Elevation (ft)
Station (ft)
2545
2540
2535
2530
2525
2520
2515
2510
0
100
200
300
400
500
600
700
Legend
WS 100 year - Existing
WS 100 year - Alt2Final
Ground - Existing
Bank Sta - Existing
Ground - Alt2Final
Bank Sta - Alt2Final


RS = 990 Alternative 2 vs. Existing Conditions
Elevation (ft)
Station (ft)
2545
2540
2535
2530
2525
2520
2515
2510
2505
0
200
400
600
800
Legend
WS 100 year - Existing
WS 100 year - Alt2Final
Ground - Existing
Bank Sta - Existing
Ground - Alt2Final
Bank Sta - Alt2Final

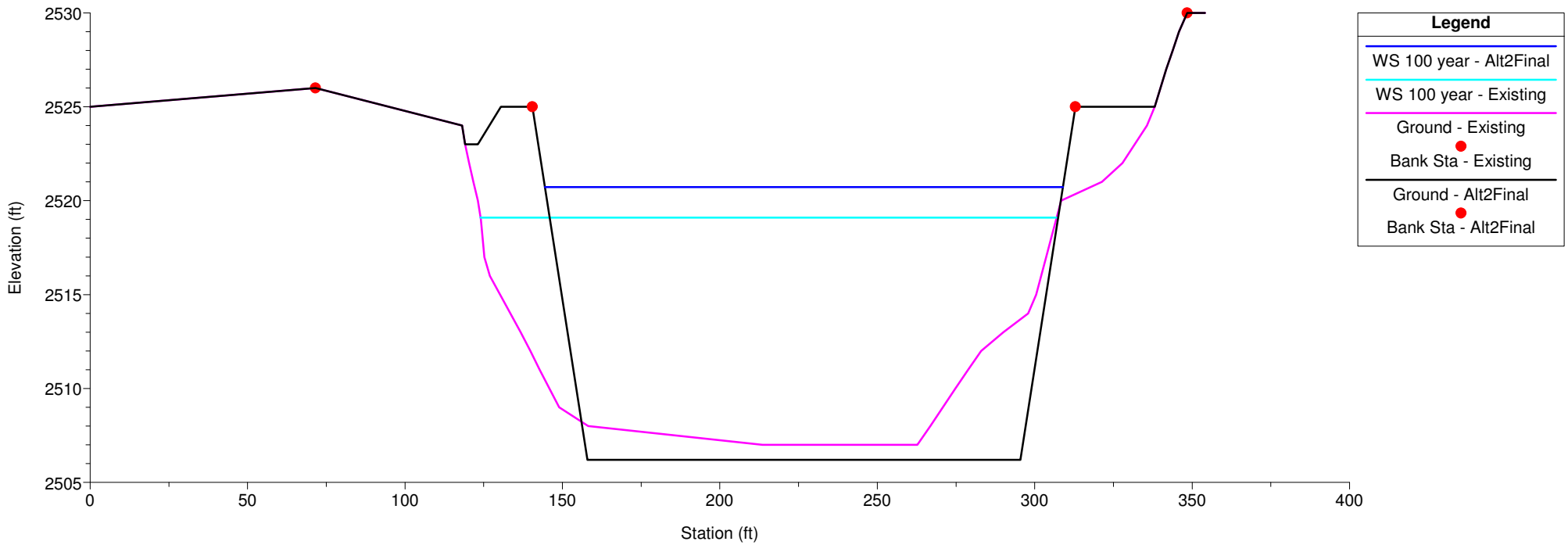

RS = 975 Alternative 2 vs. Existing Conditions
Elevation (ft)
Station (ft)
2540
2535
2530
2525
2520
2515
2510
2505
0
100
200
300
400
500
Legend
WS 100 year - Alt2Final
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt2Final
Bank Sta - Alt2Final


RS = 965 Alternative 2 vs. Existing Conditions
Elevation (ft)
Station (ft)
2540
2535
2530
2525
2520
2515
2510
2505
0
50
100
150
200
250
300
350
Legend
WS 100 year - Existing
WS 100 year - Alt2Final
Ground - Existing
Bank Sta - Existing
Ground - Alt2Final
Bank Sta - Alt2Final

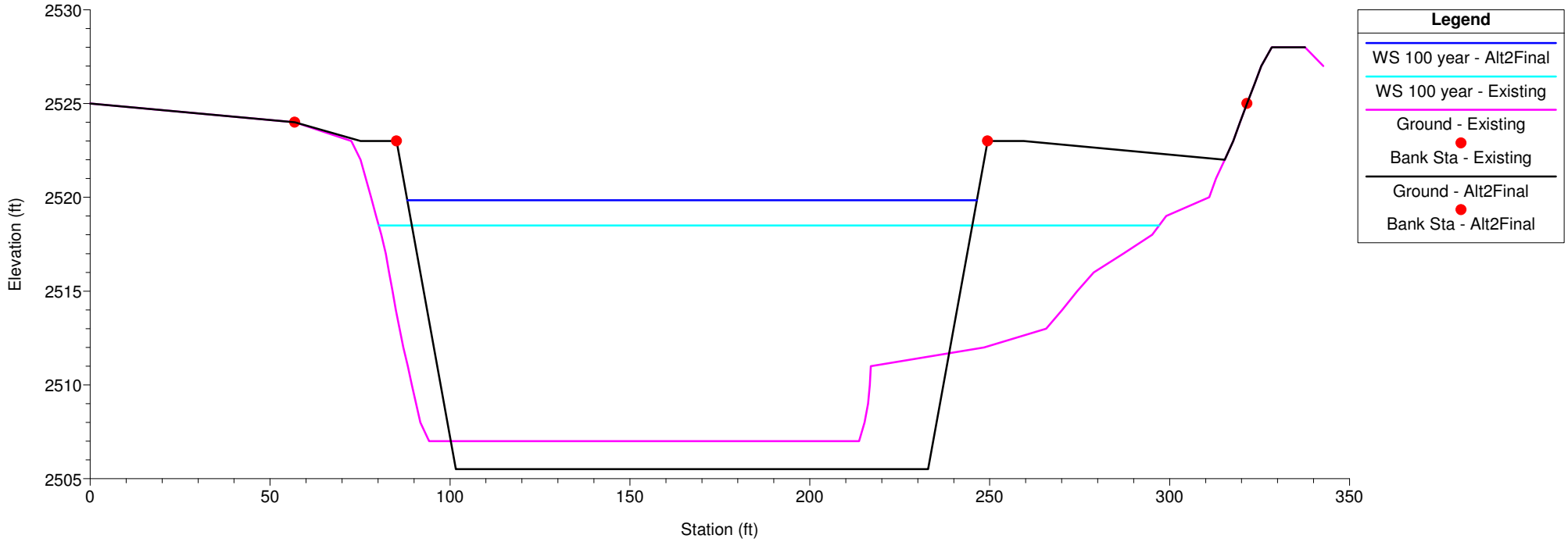

RS = 950 Alternative 2 vs. Existing Conditions
Elevation (ft)
Station (ft)
2540
2535
2530
2525
2520
2515
2510
2505
0
100
200
300
400
500
600
Legend
WS 100 year - Existing
WS 100 year - Alt2Final
Ground - Existing
Bank Sta - Existing
Ground - Alt2Final
Bank Sta - Alt2Final


RS = 900 Alternative 2 vs. Existing Conditions
Elevation (ft)
Station (ft)
2530
2525
2520
2515
2510
2505
0
50
100
150
200
250
300
Legend
WS 100 year - Existing
WS 100 year - Alt2Final
Ground - Existing
Bank Sta - Existing
Ground - Alt2Final
Bank Sta - Alt2Final

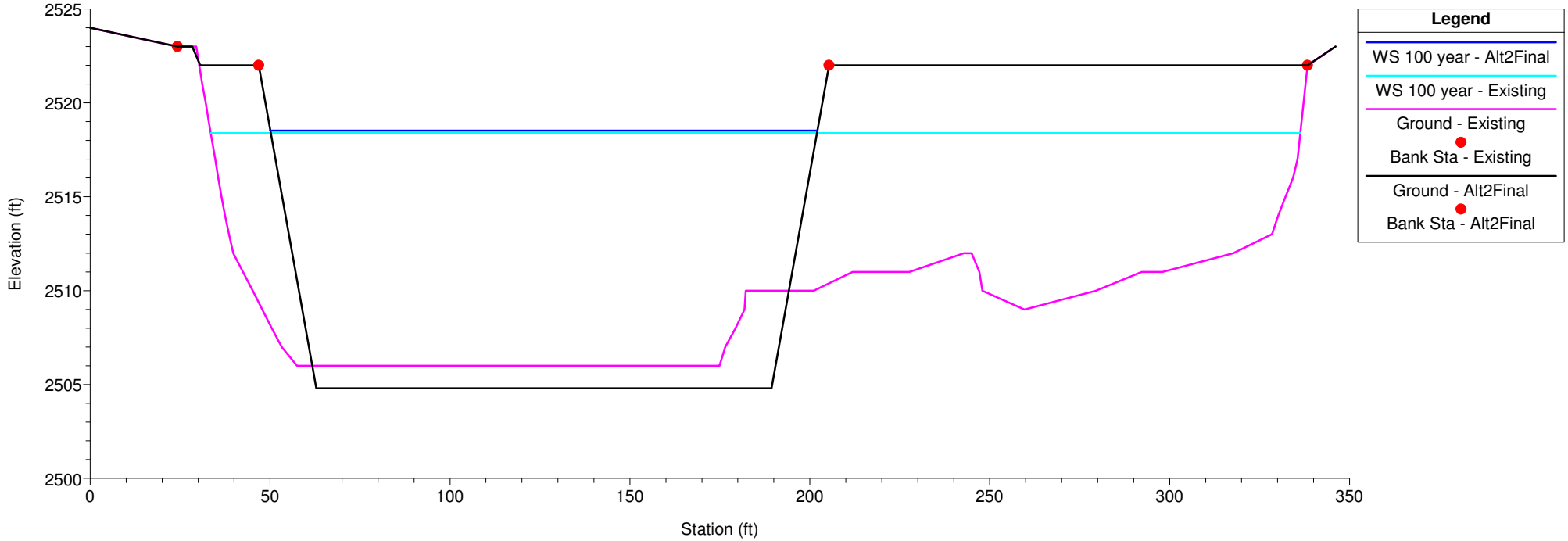
RS = 875 Alternative 2 vs. Existing Conditions



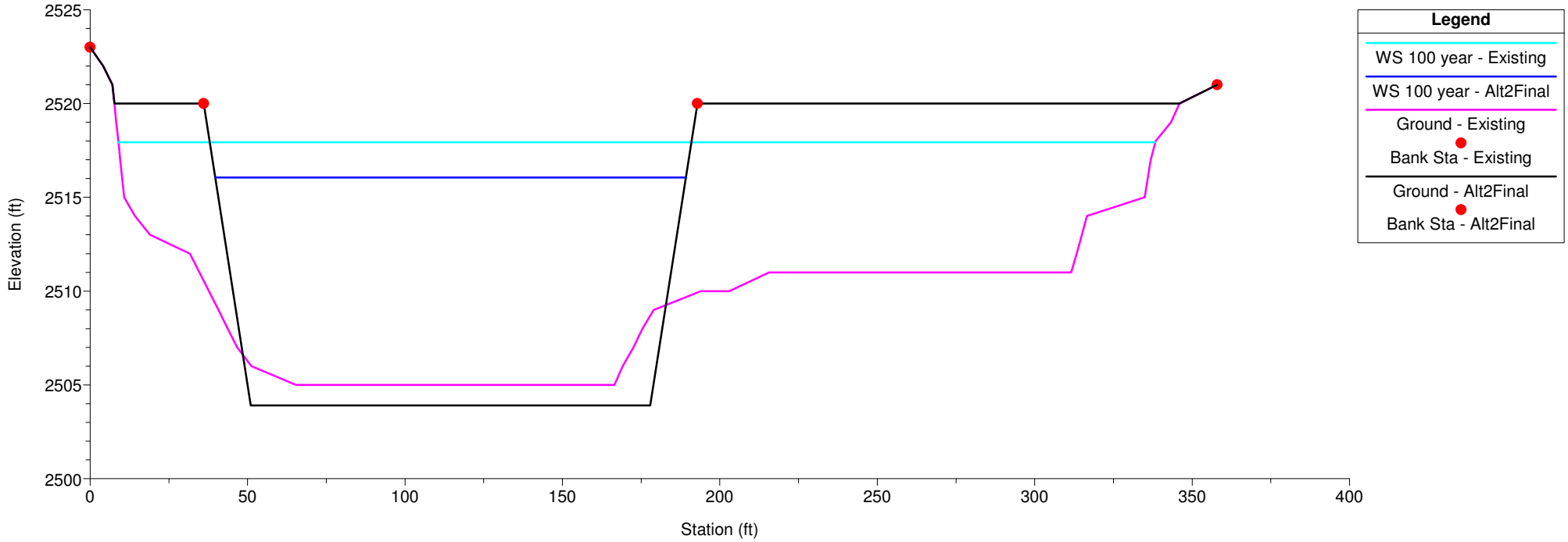
RS = 865 Alternative 2 vs. Existing Conditions

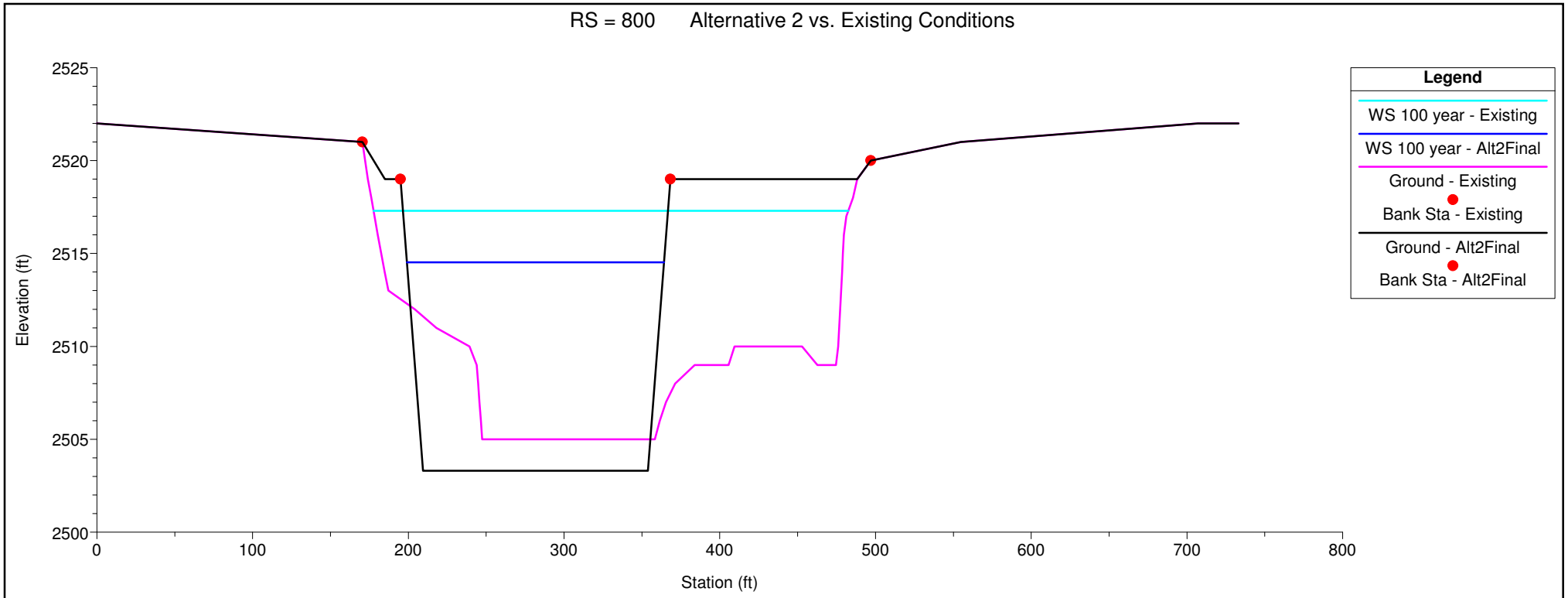


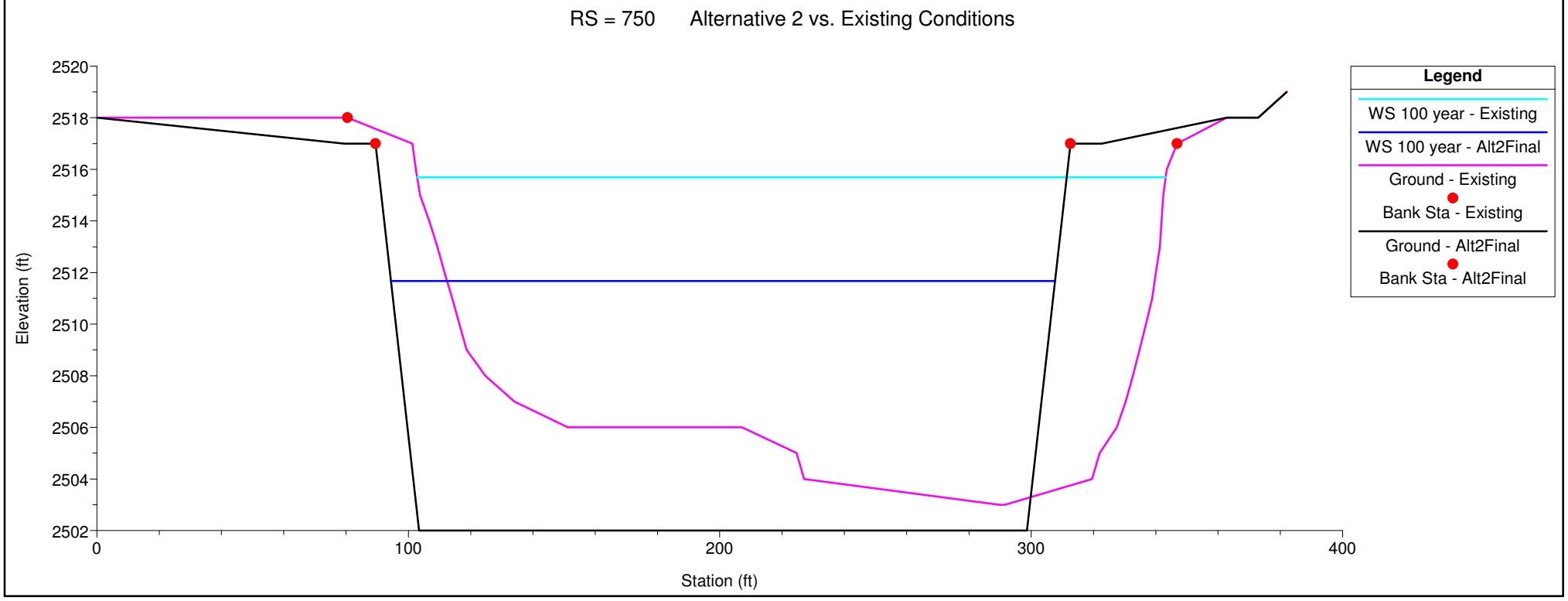
RS = 850 Alternative 2 vs. Existing Conditions

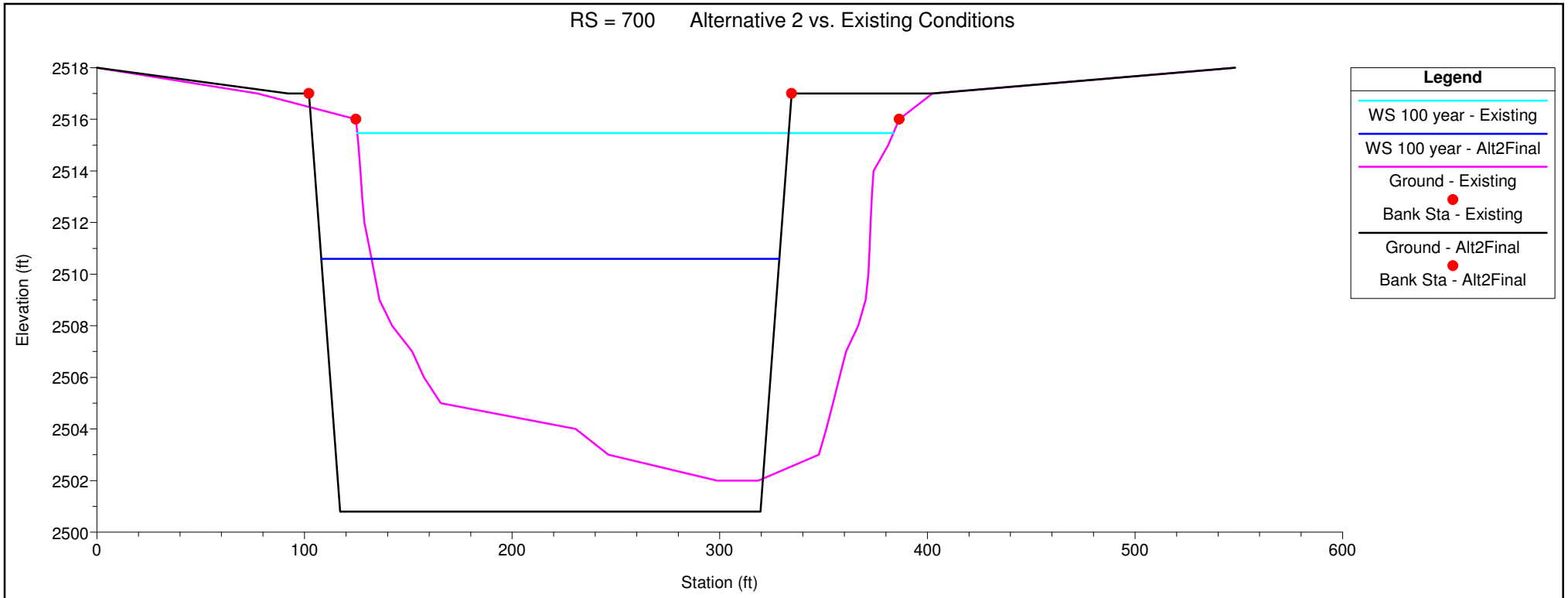


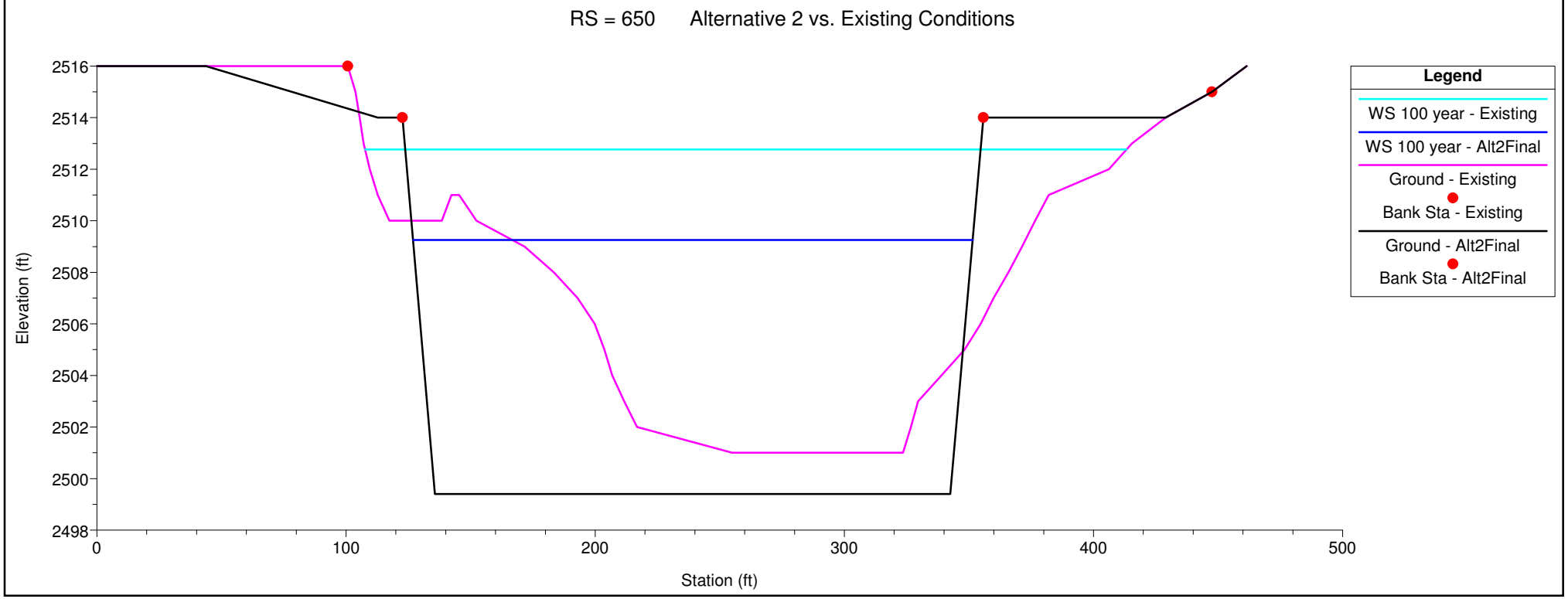
RS = 825 Alternative 2 vs. Existing Conditions

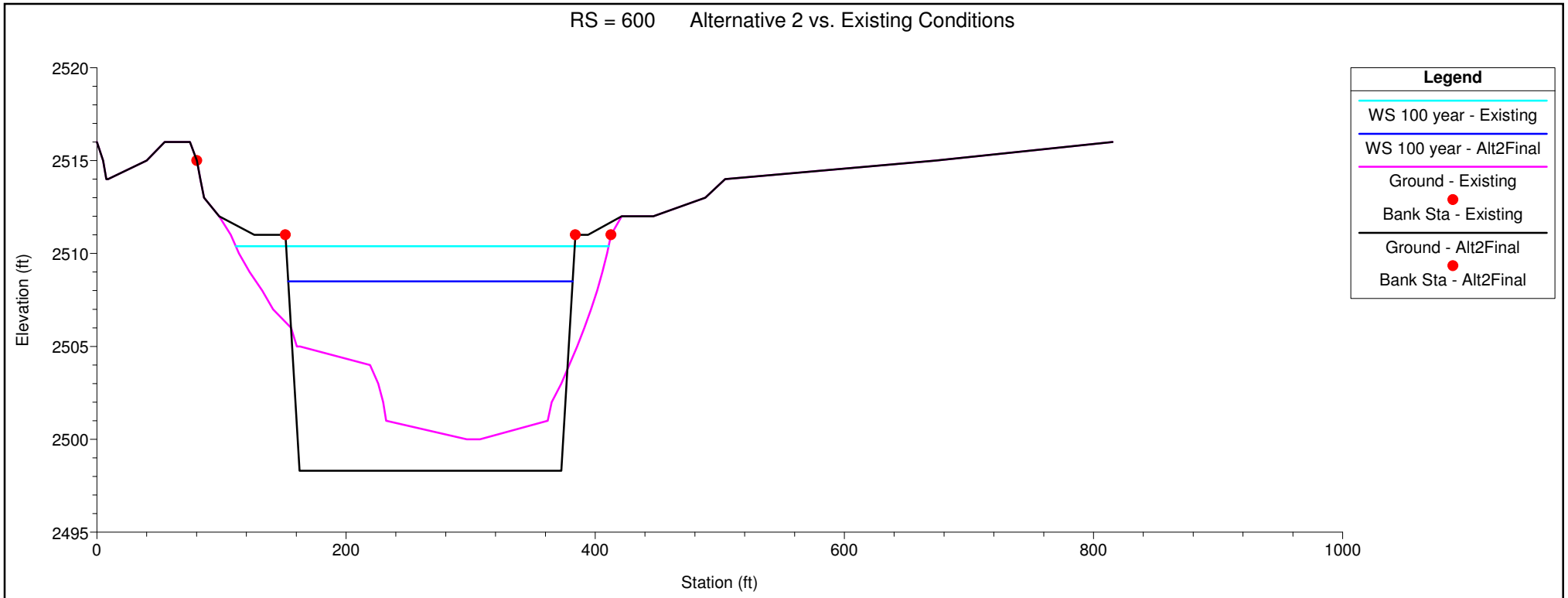


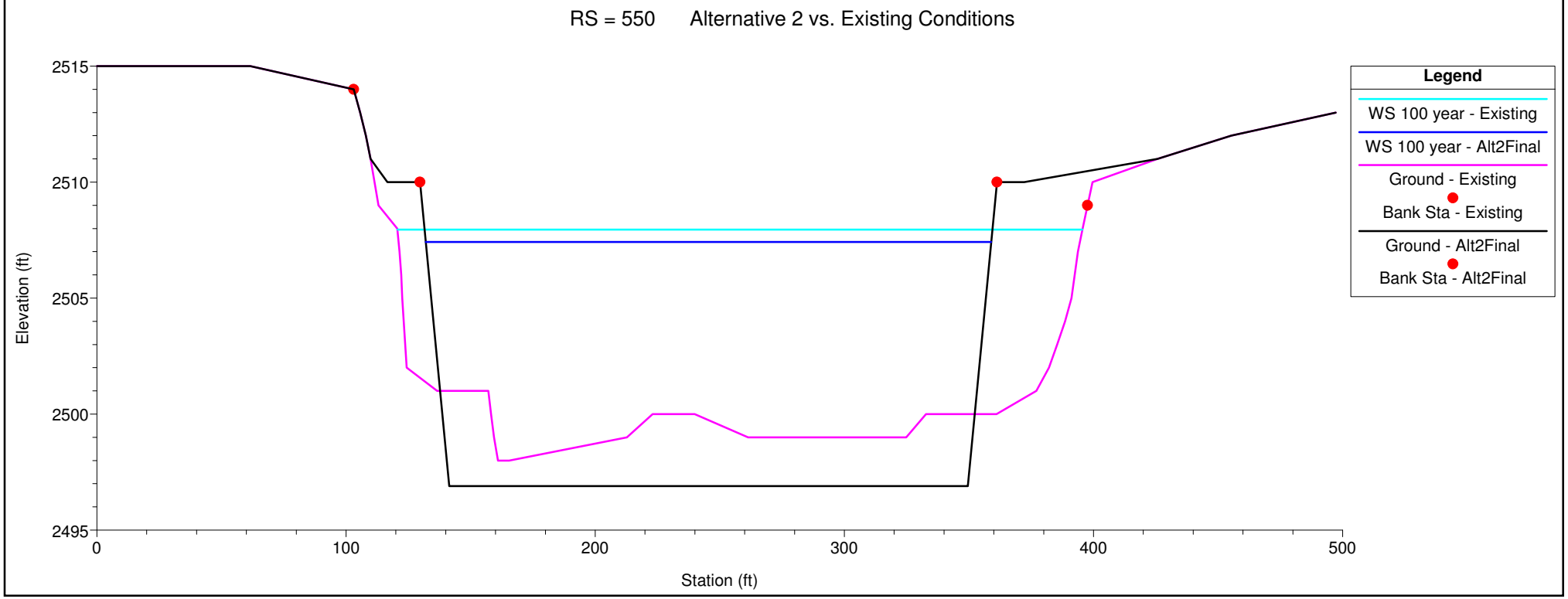

RS = 800 Alternative 2 vs. Existing Conditions
Elevation (ft)
Station (ft)
2525
2520
2515
2510
2505
2500
0
100
200
300
400
500
600
700
800
Legend
WS 100 year - Existing
WS 100 year - Alt2Final
Ground - Existing
Bank Sta - Existing
Ground - Alt2Final
Bank Sta - Alt2Final

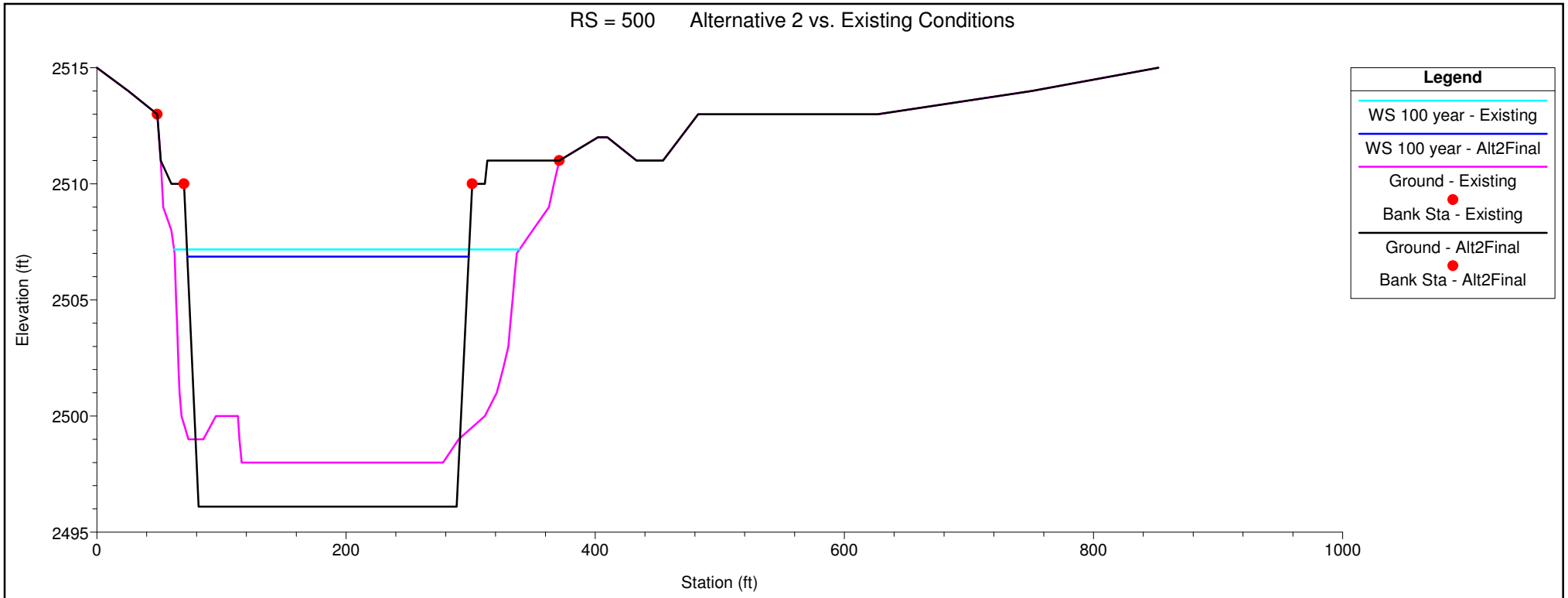

RS = 750 Alternative 2 vs. Existing Conditions
Elevation (ft)
Station (ft)
2520
2518
2516
2514
2512
2510
2508
2506
2504
2502
0
100
200
300
400
Legend
WS 100 year - Existing
WS 100 year - Alt2Final
Ground - Existing
Bank Sta - Existing
Ground - Alt2Final
Bank Sta - Alt2Final

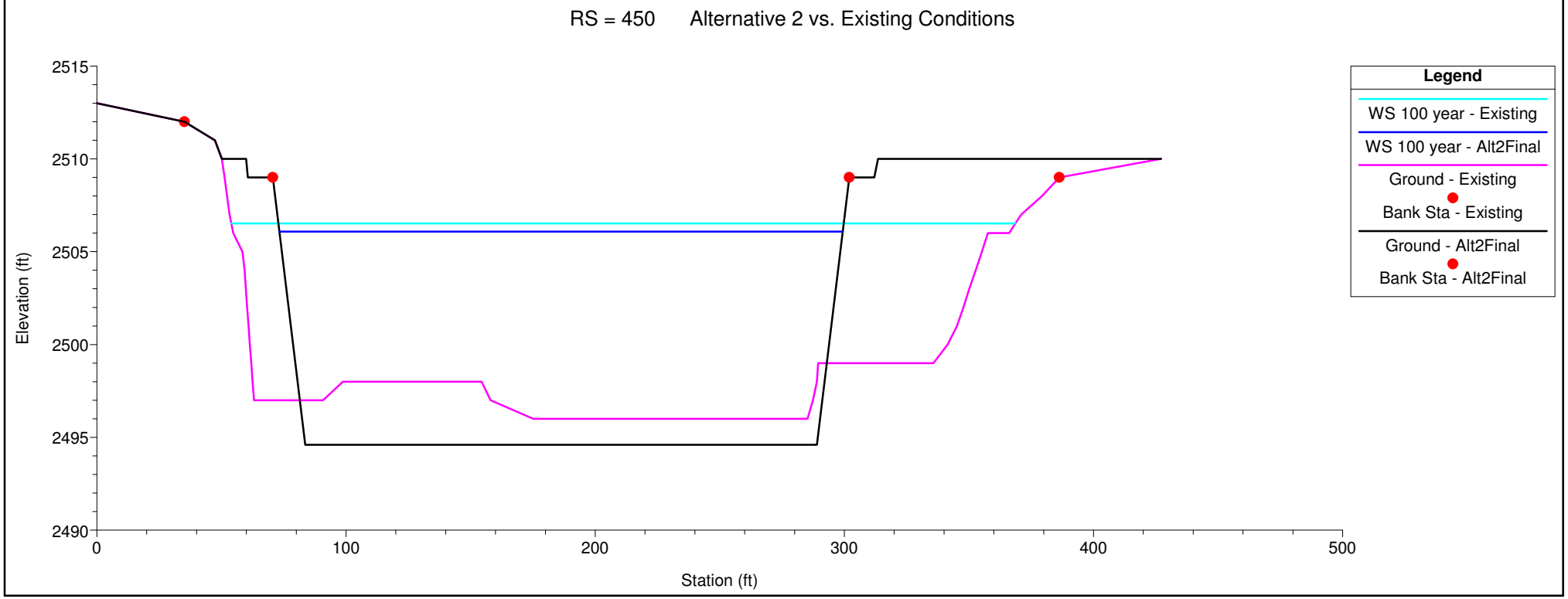

RS = 700 Alternative 2 vs. Existing Conditions
Elevation (ft)
Station (ft)
2518
2516
2514
2512
2510
2508
2506
2504
2502
2500
0
100
200
300
400
500
600
Legend
WS 100 year - Existing
WS 100 year - Alt2Final
Ground - Existing
Bank Sta - Existing
Ground - Alt2Final
Bank Sta - Alt2Final

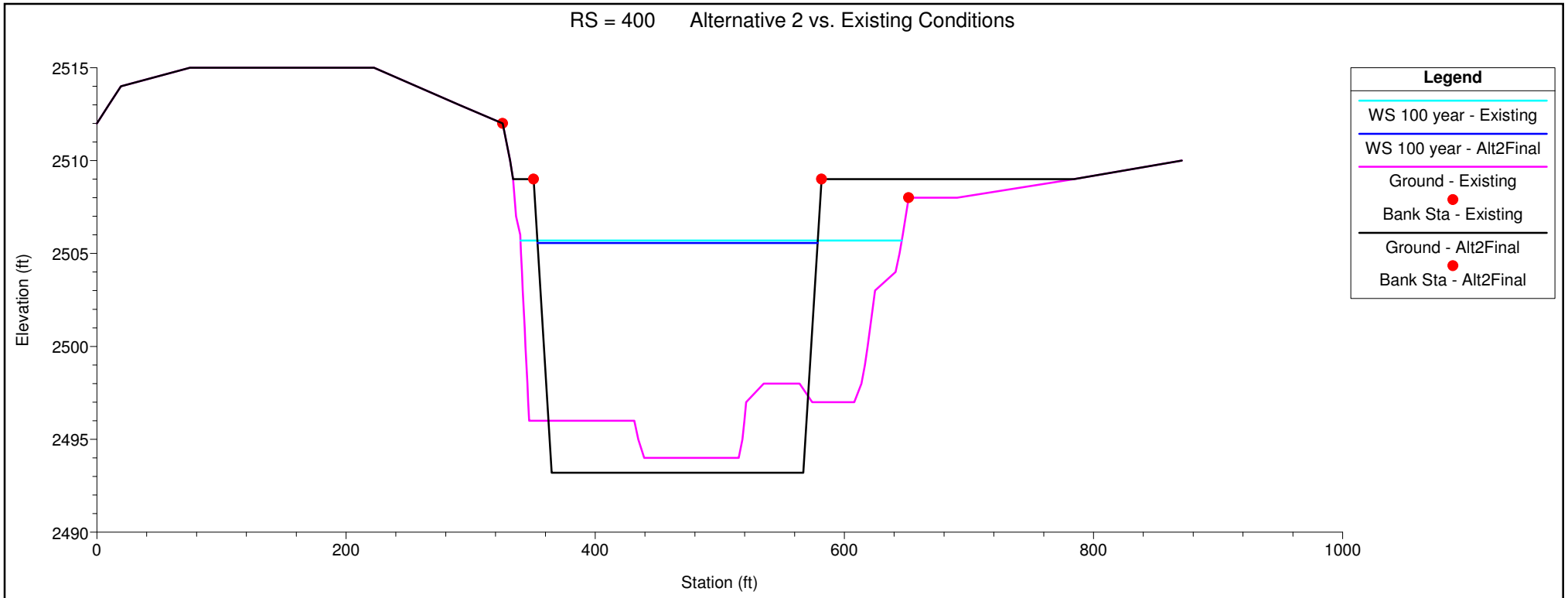

RS = 650 Alternative 2 vs. Existing Conditions
Elevation (ft)
Station (ft)
2516
2514
2512
2510
2508
2506
2504
2502
2500
2498
0
100
200
300
400
500
Legend
WS 100 year - Existing
WS 100 year - Alt2Final
Ground - Existing
Bank Sta - Existing
Ground - Alt2Final
Bank Sta - Alt2Final

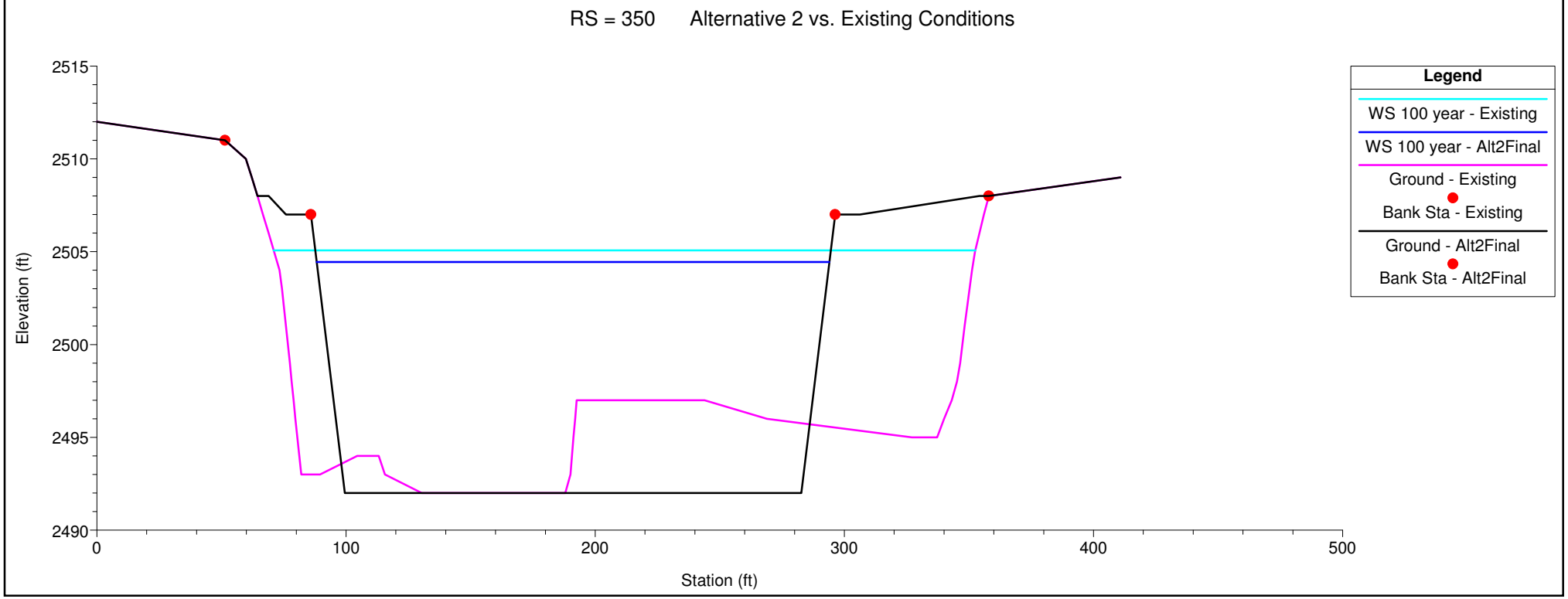

RS = 600 Alternative 2 vs. Existing Conditions
Elevation (ft)
Station (ft)
2520
2515
2510
2505
2500
2495
0
200
400
600
800
1000
Legend
WS 100 year - Existing
WS 100 year - Alt2Final
Ground - Existing
Bank Sta - Existing
Ground - Alt2Final
Bank Sta - Alt2Final


RS = 550 Alternative 2 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
0
100
200
300
400
500
Legend
WS 100 year - Existing
WS 100 year - Alt2Final
Ground - Existing
Bank Sta - Existing
Ground - Alt2Final
Bank Sta - Alt2Final

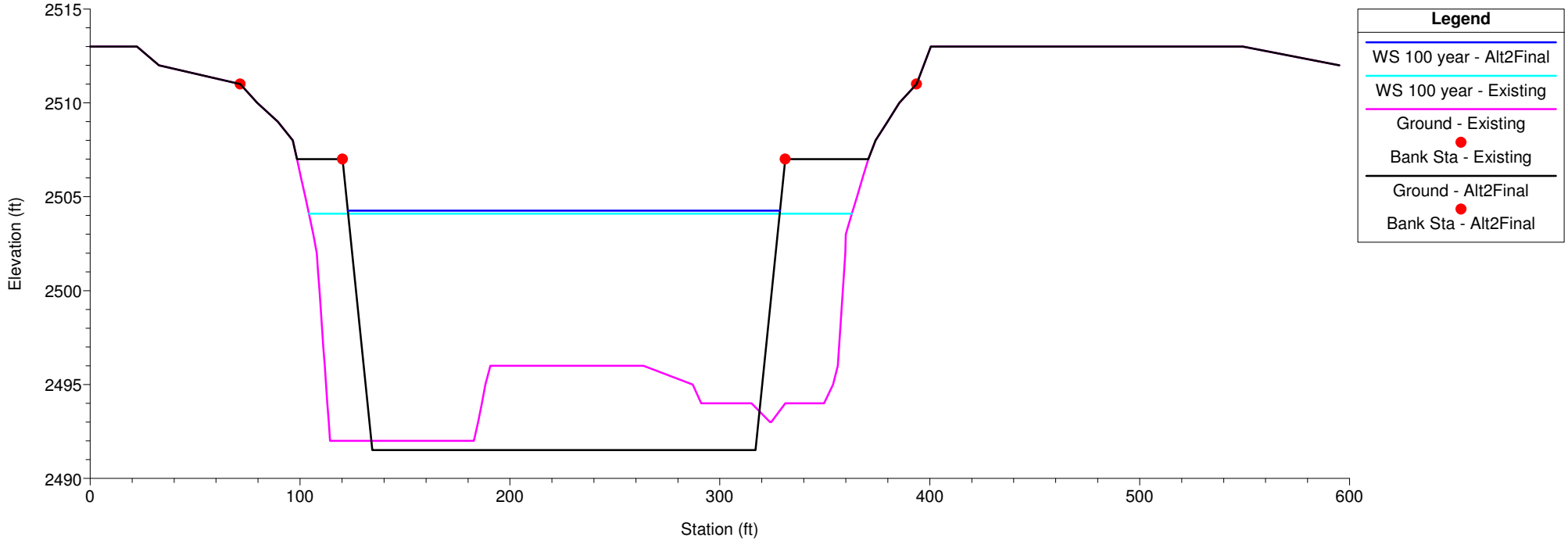

RS = 500 Alternative 2 vs. Existing Conditions
Elevation (ft)
2515
2510
2505
2500
2495
0
200
400
600
800
1000
Station (ft)
Legend
WS 100 year - Existing
WS 100 year - Alt2Final
Ground - Existing
Bank Sta - Existing
Ground - Alt2Final
Bank Sta - Alt2Final


RS = 450 Alternative 2 vs. Existing Conditions
Elevation (ft)
2515
2510
2505
2500
2495
2490
0
100
200
300
400
500
Station (ft)
Legend
WS 100 year - Existing
WS 100 year - Alt2Final
Ground - Existing
Bank Sta - Existing
Ground - Alt2Final
Bank Sta - Alt2Final

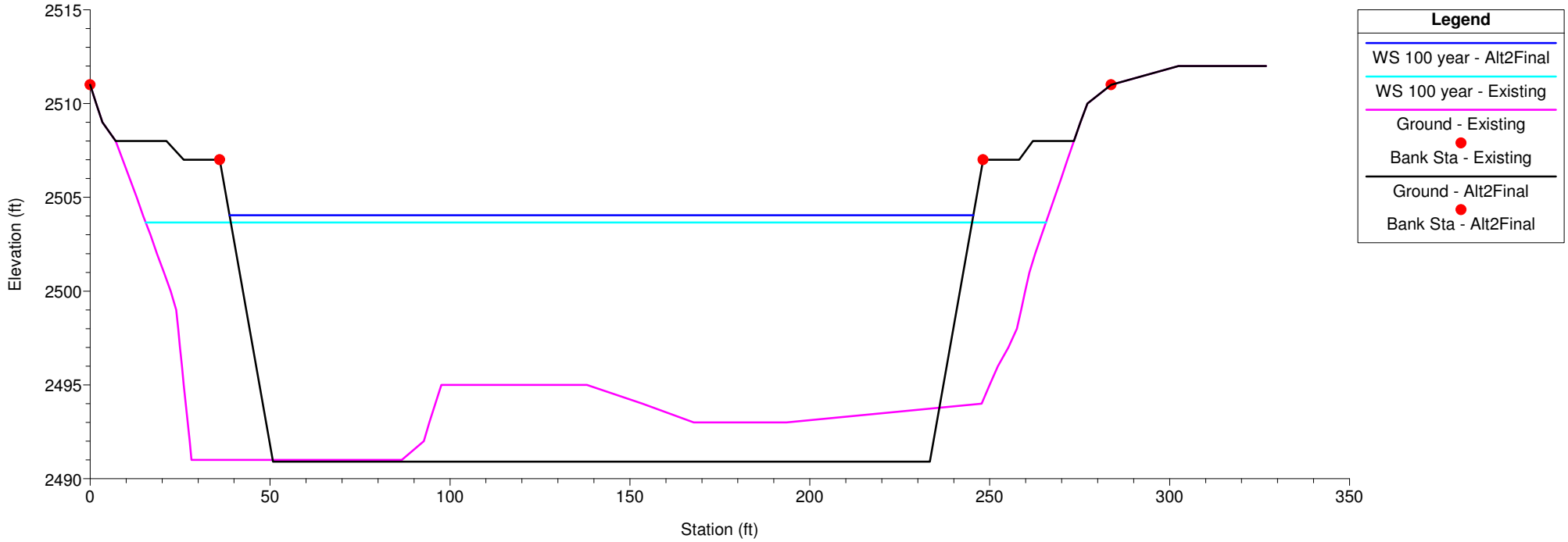

RS = 400 Alternative 2 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
2490
0
200
400
600
800
1000
Legend
WS 100 year - Existing
WS 100 year - Alt2Final
Ground - Existing
Bank Sta - Existing
Ground - Alt2Final
Bank Sta - Alt2Final


RS = 350 Alternative 2 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
2490
0
100
200
300
400
500
Legend
WS 100 year - Existing
WS 100 year - Alt2Final
Ground - Existing
Bank Sta - Existing
Ground - Alt2Final
Bank Sta - Alt2Final

RS = 325 Alternative 2 vs. Existing Conditions

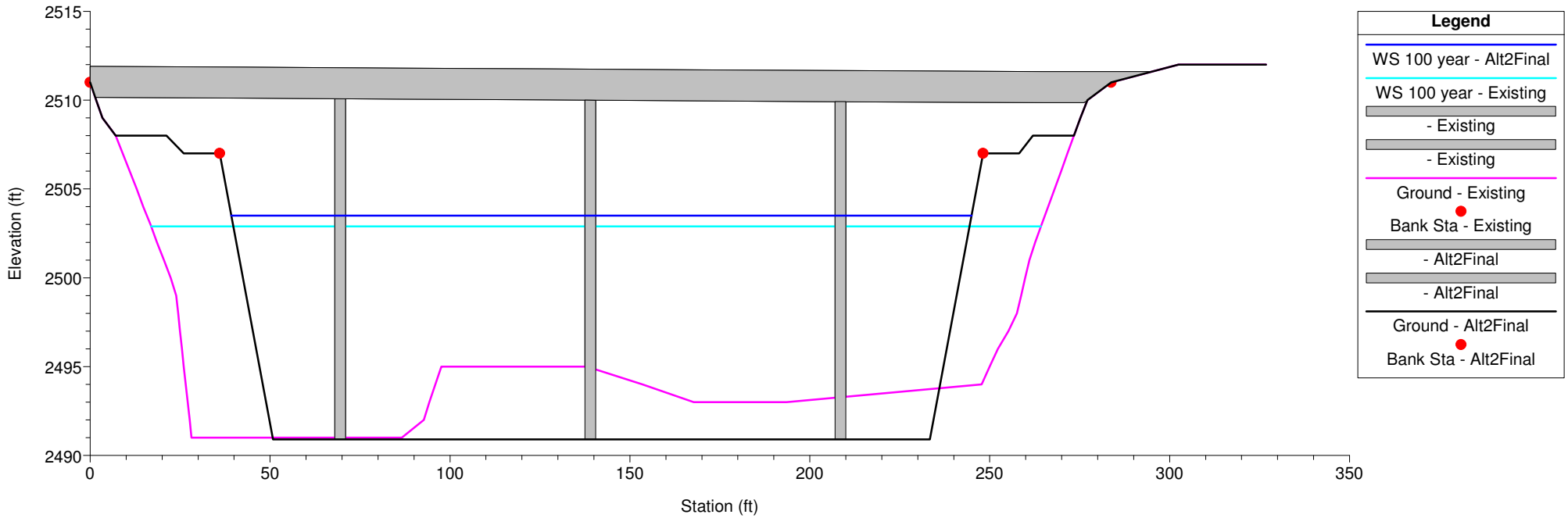


RS = 300 Alternative 2 vs. Existing Conditions



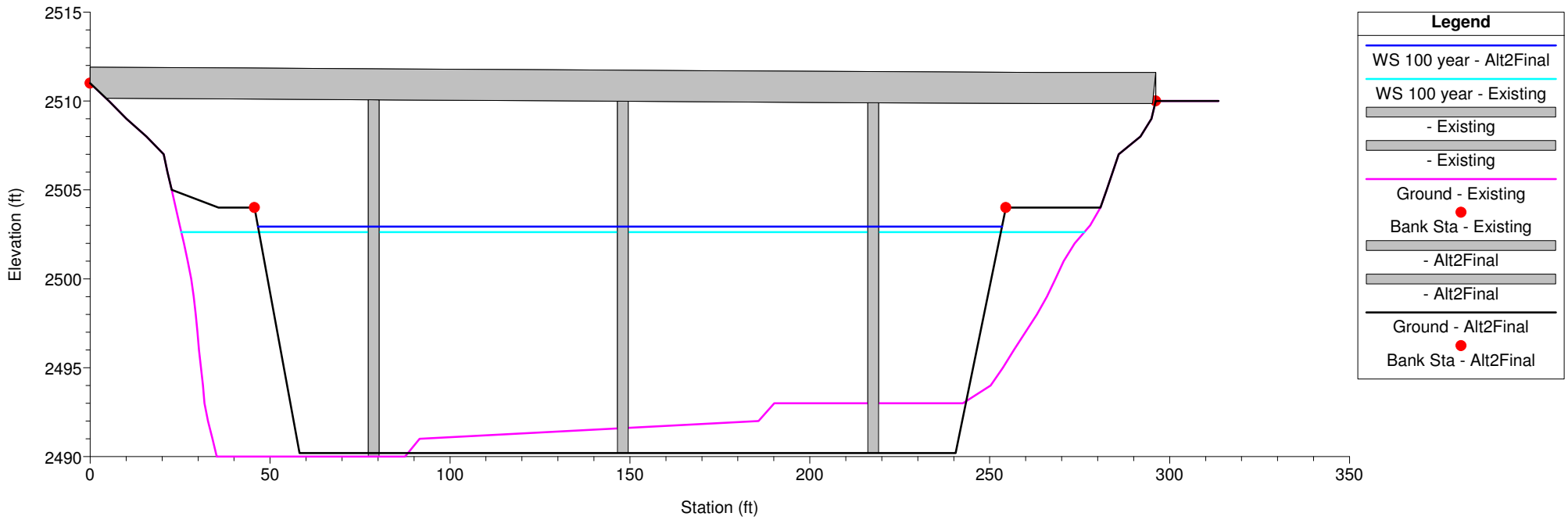
RS = 295 BR

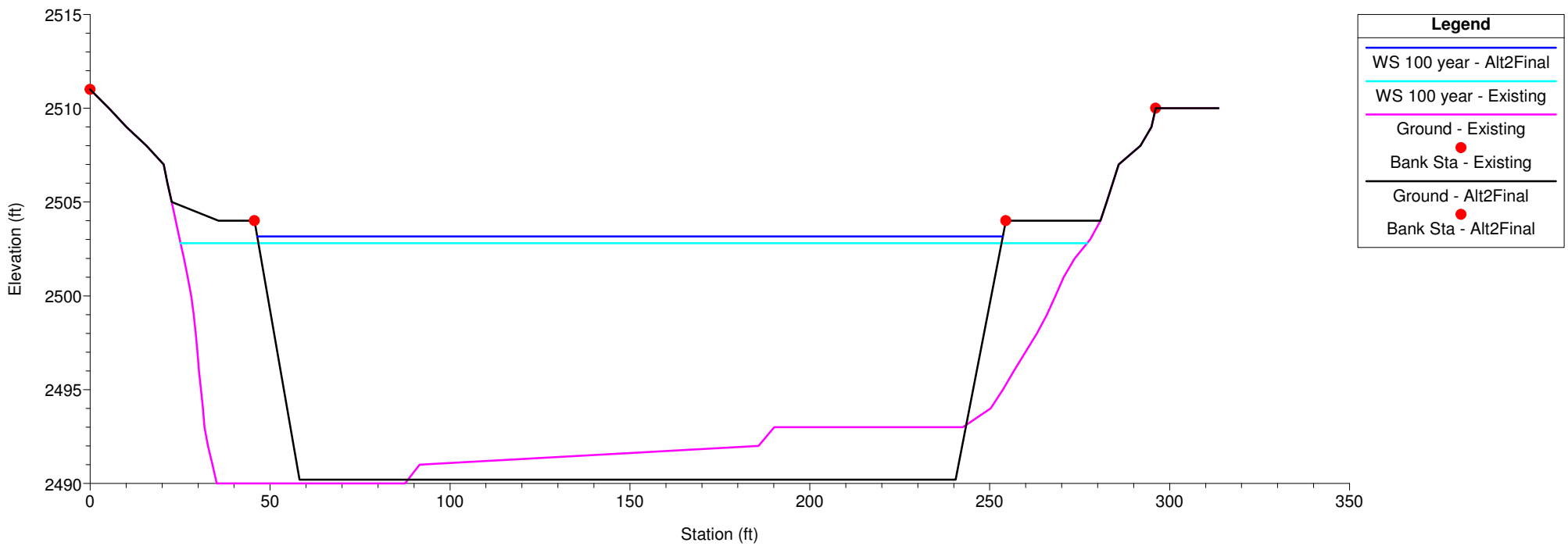
Alternative 2 vs. Existing Conditions

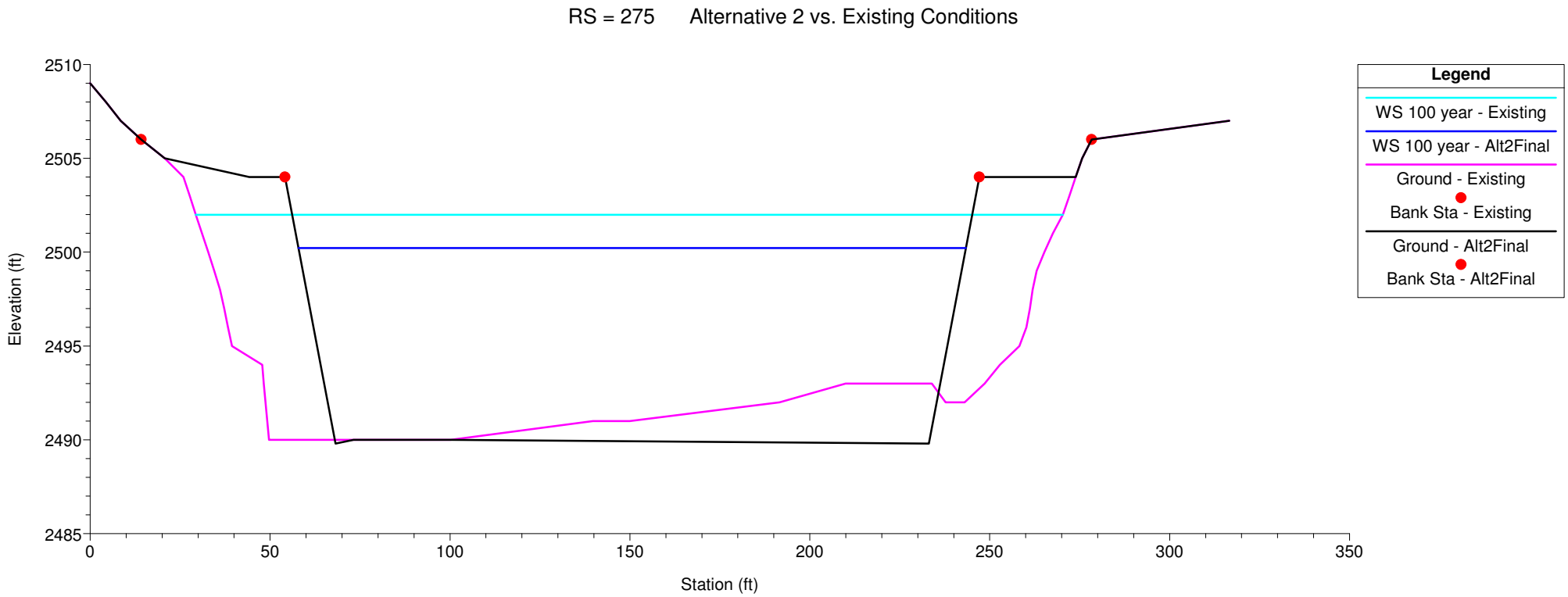


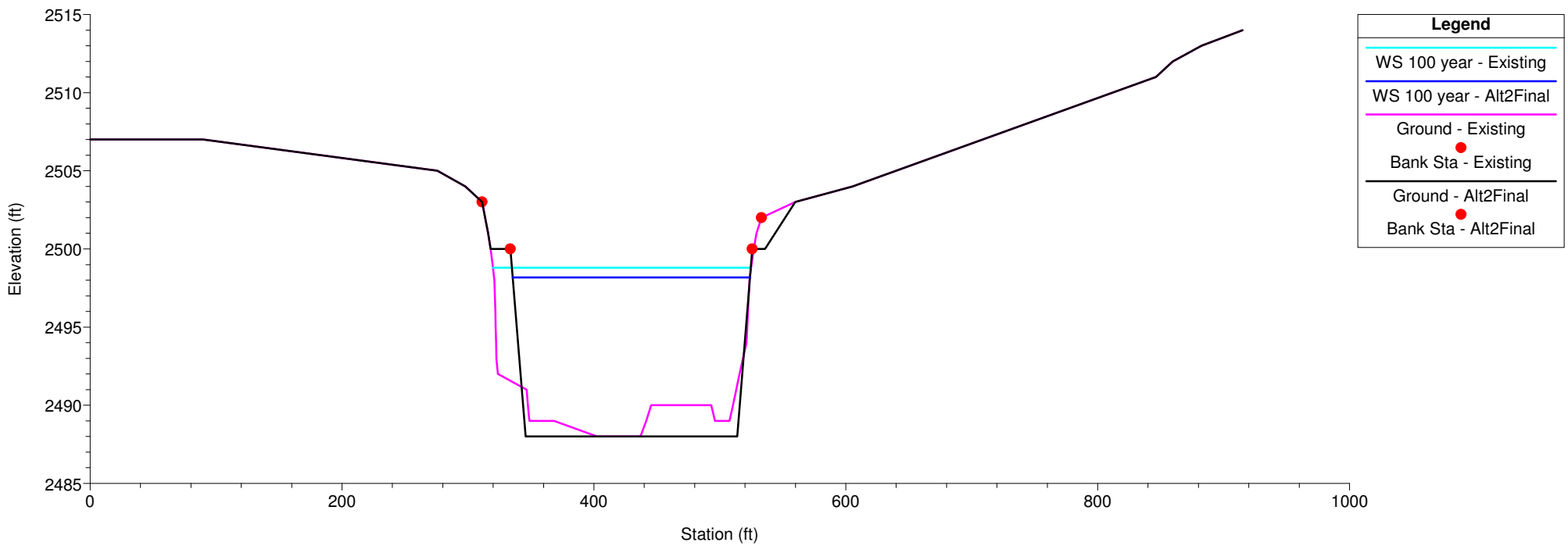
RS = 295 BR

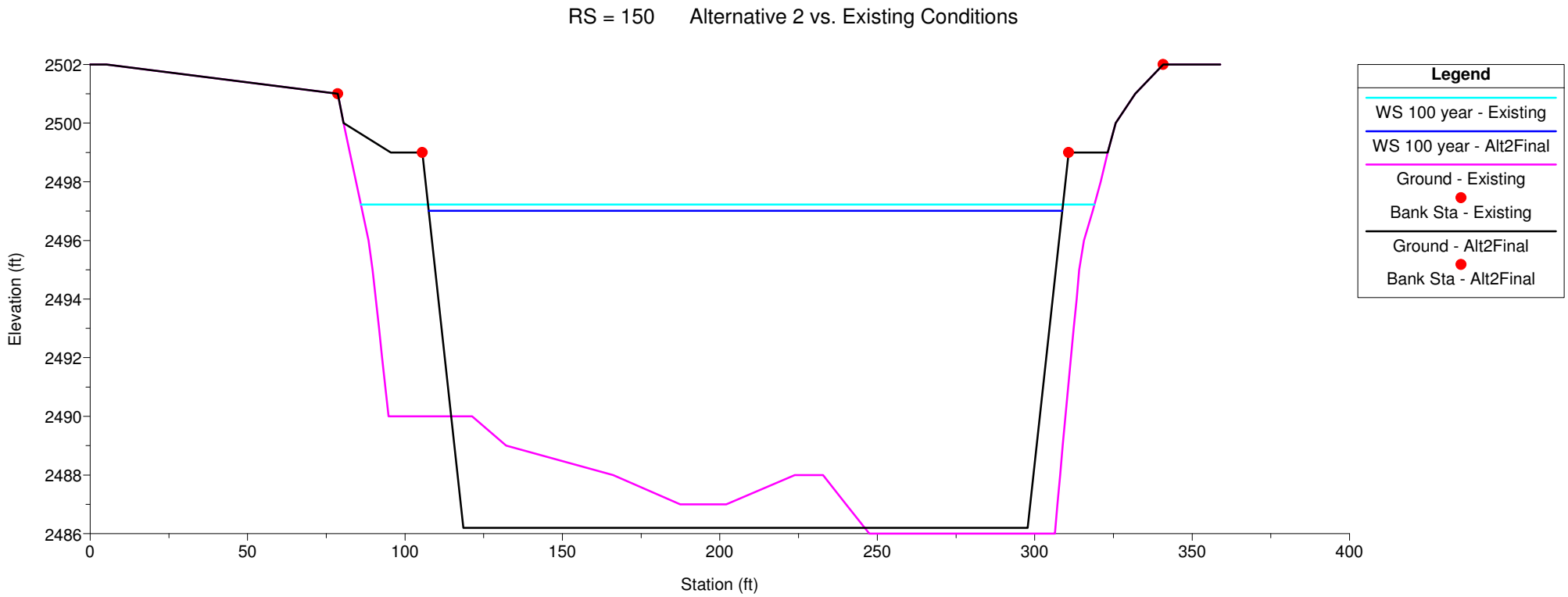
Alternative 2 vs. Existing Conditions



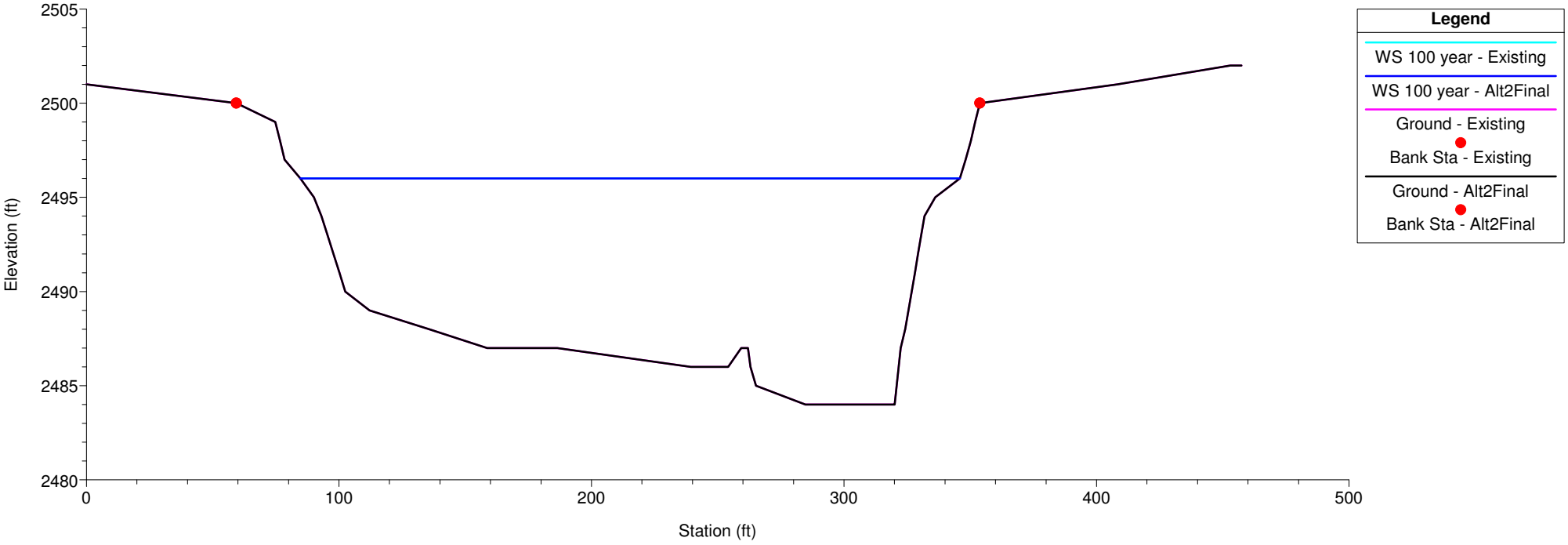

RS = 290 Alternative 2 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
2490
0
50
100
150
200
250
300
350
Legend
WS 100 year - Alt2Final
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt2Final
Bank Sta - Alt2Final


RS = 275 Alternative 2 vs. Existing Conditions
Elevation (ft)
Station (ft)
2510
2505
2500
2495
2490
2485
0
50
100
150
200
250
300
350
Legend
WS 100 year - Existing
WS 100 year - Alt2Final
Ground - Existing
Bank Sta - Existing
Ground - Alt2Final
Bank Sta - Alt2Final


RS = 200 Alternative 2 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
2490
2485
0
200
400
600
800
1000
Legend
WS 100 year - Existing
WS 100 year - Alt2Final
Ground - Existing
Bank Sta - Existing
Ground - Alt2Final
Bank Sta - Alt2Final


RS = 150 Alternative 2 vs. Existing Conditions
Elevation (ft)
Station (ft)
2502
2500
2498
2496
2494
2492
2490
2488
2486
0
50
100
150
200
250
300
350
400
Legend
WS 100 year - Existing
WS 100 year - Alt2Final
Ground - Existing
Bank Sta - Existing
Ground - Alt2Final
Bank Sta - Alt2Final

RS = 100 Alternative 2 vs. Existing Conditions



HEC-RAS Version 3.1.3 May 2005
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
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: Pantano-Sediment Transport
Project File : PantanoSediment.prj
Run Date and Time: 9/11/2008 4:02:50 PM

Project in English units

****

PLAN DATA

Plan Title: Alt2Final
Plan File : t:\07125\01\WATRES\GLBBASE\CALCS\Hydraulics\HEC-RAS (Sediment)\PantanoSediment.p15

Geometry Title: Alt2-Final
Geometry File : t:\07125\01\WATRES\GLBBASE\CALCS\Hydraulics\HEC-RAS (Sediment)\PantanoSediment.g15

Flow Title : 1 Flow Profiles
Flow File : t:\07125\01\WATRES\GLBBASE\CALCS\Hydraulics\HEC-RAS (Sediment)\PantanoSediment.F01

Plan Summary Information:
Number of: Cross Sections = 41 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 2 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
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: Subcritical Flow

****

FLOW DATA

Flow Title: 1 Flow Profiles
Flow File : t:\07125\01\WATRES\GLBBASE\CALCS\Hydraulics\HEC-RAS (Sediment)\PantanoSediment.F01

Flow Data (cfs)
****
* River Reach RS * 100 year 50 year 25 year 10 year *
* River #1 Reach #1 1600 * 32000 20000 14000 8700 *
****

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
River #1	Reach #1	100 year		Normal S = 0.005
River #1	Reach #1	50 year		Normal S = 0.005
River #1	Reach #1	25 year		Normal S = 0.005
River #1	Reach #1	10 year		Normal S = 0.005

GEOMETRY DATA

Geometry Title: Alt2-Final
Geometry File : t:\07125\01\WATRES\GLBBASE\CALCS\Hydraulics\HEC-RAS (Sediment)\PantanoSediment.g15

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1600

INPUT
Description:
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2560	6.4	2559	12.63	2558	18.96	2557	25.3	2556
31.64	2555	37.97	2554	44.38	2553	50.84	2552	57.29	2551
63.85	2550	70.23	2549	76.66	2548	83.12	2547	89.57	2546
96.03	2545	104.28	2544	113.13	2543	121.99	2542	130.94	2541
142.12	2540	202.75	2540	242.37	2540	320.07	2540	328.69	2541
337.31	2542	345.93	2543	354.55	2544	363.17	2545	371.79	2546
380.41	2547	389.03	2548	397.65	2549	406.22	2550	414.78	2551
423.34	2552	431.9	2553	440.46	2554	449.02	2555		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	6.4	.03	431.9	.55

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
6.4	431.9	714.82	679.46	667.01	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (ft)	2551.95	Element	Left OB	Channel / Right OB
Vel Head (ft)	3.41	Wt. n-Val.	0.030	
W.S. Elev (ft)	2548.54	Reach Len. (ft)	714.82	679.46 / 667.01
Crit W.S. (ft)	2548.54	Flow Area (sq ft)		2160.17
E.G. Slope (ft/ft)	0.007058	Area (sq ft)		2160.17
Q Total (cfs)	32000.00	Flow (cfs)		32000.00
Top Width (ft)	320.56	Top Width (ft)		320.56
Vel Total (ft/s)	14.81	Avg. Vel. (ft/s)		14.81
Max Chl Dpth (ft)	8.54	Hydr. Depth (ft)		6.74
Conv. Total (cfs)	380897.9	Conv. (cfs)		380897.9
Length Wtd. (ft)	679.46	Wetted Per. (ft)		321.60
Min Ch El (ft)	2540.00	Shear (lb/sq ft)		2.96
Alpha	1.00	Stream Power (lb/ft s)		43.84
Frctn Loss (ft)	2.99	Cum Volume (acre-ft)		471.96 / 0.14
C & E Loss (ft)	0.46	Cum SA (acres)		47.52 / 0.36

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
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: River #1
REACH: Reach #1 RS: 1500

INPUT
Description:
Station Elevation Data num= 55
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2552 44.32 2551 97.21 2550 217.4 2550 271.68 2550
341.92 2549 479.35 2544 480.31 2543 481.37 2542 482.2 2541
483.05 2540 483.78 2539 484.55 2538 486.23 2537 491.23 2536
494.37 2535 495.54 2534 510.31 2534 516.95 2535 524.67 2536
535.82 2536 537.4 2535 539.99 2534 542.3 2533 546.34 2532
578.5 2532 581.8 2533 584.65 2534 587.3 2535 591.8 2536
610.04 2537 650.01 2537 656.48 2537 682.04 2537 689 2536
696.1 2535 722.11 2535 724.8 2536 736.31 2537 742.79 2538
749.32 2539 750.68 2540 752.02 2541 753.35 2542 754.71 2543
760.8 2544 771.13 2545 776.07 2546 781.82 2547 788.07 2547
800.68 2547 825.75 2548 840.49 2549 847.09 2549 873.22 2550

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .055 341.92 .03 781.82 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
341.92 781.82 249.54 214.53 208.71 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2547.85 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 1.87 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2545.98 * Reach Len. (ft) * 249.54 * 214.53 * 208.71 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 2914.35 * *
* E.G. Slope (ft/ft) *0.003004 * Area (sq ft) * * 2914.35 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 350.97 * Top Width (ft) * * 350.97 * *
* Vel Total (ft/s) * 10.98 * Avg. Vel. (ft/s) * * 10.98 * *
* Max Chl Dpth (ft) * 13.98 * Hydr. Depth (ft) * * 8.30 * *
* Conv. Total (cfs) *583807.1 * Conv. (cfs) * *583807.1 * *
* Length Wtd. (ft) * 214.53 * Wetted Per. (ft) * * 358.31 * *
* Min Ch El (ft) * 2532.00 * Shear (lb/sq ft) * * 1.53 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 16.75 * *
* Frctn Loss (ft) * 0.61 * Cum Volume (acre-ft) * * 432.38 * 0.14 *
* C & E Loss (ft) * 0.01 * Cum SA (acres) * * 42.28 * 0.36 *
****

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1450

INPUT
Description:
Station Elevation Data num= 45
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2546 19 2546 51.63 2546 56.22 2545 59.92 2544

```
  69.95    2543   70.94    2542   71.97    2541   73.05    2540   74.14    2539
  75.29    2538   76.27    2537   77.42    2536   80.49    2535   81.02    2534
  84.75    2533   85.65    2532   86.57    2531  120.14    2531  122.76    2532
 130.25    2533  138.86    2534  141.33    2535  146.34    2535   175.1    2535
 179.28    2536  230.48    2537   236.4    2537  243.84    2536  245.96    2535
 248.93    2534  271.08    2534   291.6    2535  304.77    2536  338.54    2537
    340    2538  341.44    2539  342.85    2540  344.25    2541  345.61    2542
 348.41    2543  368.53    2544  376.03    2545  383.95    2546  391.36    2547

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***************************************************
      0    .055   51.63     .03  391.36    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        51.63  391.36          208.29  198.71  196.74            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2547.24  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.84  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2545.39  * Reach Len. (ft)        *  208.29  *  198.71  *  196.74  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)       *         * 2936.42  *         *
* E.G. Slope (ft/ft)     *0.002652  * Area (sq ft)           *         * 2936.42  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)         *  324.74  * Top Width (ft)         *         *  324.74  *         *
* Vel Total (ft/s)       *   10.90  * Avg. Vel. (ft/s)       *         *   10.90  *         *
* Max Chl Dpth (ft)      *   14.39  * Hydr. Depth (ft)       *         *    9.04  *         *
* Conv. Total (cfs)      *621343.3  * Conv. (cfs)            *         *621343.3  *         *
* Length Wtd. (ft)       *  198.71  * Wetted Per. (ft)       *         *  332.55  *         *
* Min Ch El (ft)         * 2531.00  * Shear (lb/sq ft)       *         *    1.46  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   15.93  *         *
* Frctn Loss (ft)        *    0.58  * Cum Volume (acre-ft)   *         *  417.97  *    0.14  *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)         *         *   40.62  *    0.36  *
*****************************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 1400

INPUT
Description:
Station Elevation Data    num=      58
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2547  146.64    2545  255.29    2545  278.69    2545  295.61    2544
  306.7    2543  307.96    2542  309.18    2541  310.32    2540  311.47    2539
 312.62    2538  313.79    2537  314.95    2536  316.94    2535  321.52    2534
 322.56    2533  323.65    2532  324.79    2531  346.78    2530  352.41    2530
 354.84    2531  356.53    2532  364.04    2532  367.65    2532  371.65    2533
 377.04    2533  380.29    2533  384.46    2534   389.3    2534  391.66    2534
 397.87    2534  405.78    2534  415.27    2535  416.31    2535  427.87    2535
 437.22    2535  446.39    2534  483.73    2533  497.25    2533  500.49    2534
 503.73    2535  537.05    2536  541.55    2536  556.55    2536  557.89    2537
 559.19    2538  560.53    2539  561.83    2540  563.15    2541  564.36    2542
 566.21    2543  583.98    2544  600.64    2545   606.2    2546  612.52    2547
 620.38    2548  628.23    2549  810.24    2548

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***************************************************
      0    .055  278.69     .03  600.64    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        278.69  600.64          208.05  211.15  211.03            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
```

```
* E.G. Elev (ft)        * 2546.63  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    2.17  * Wt. n-Val.            *        *   0.030  *        *
* W.S. Elev (ft)        * 2544.46  * Reach Len. (ft)       *  208.05  *  211.15  *  211.03  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)      *        * 2709.60  *        *
* E.G. Slope (ft/ft)    *0.003179  * Area (sq ft)          *        * 2709.60  *        *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *        *32000.00  *        *
* Top Width (ft)        *  303.95  * Top Width (ft)        *        *  303.95  *        *
* Vel Total (ft/s)      *   11.81  * Avg. Vel. (ft/s)      *        *   11.81  *        *
* Max Chl Dpth (ft)     *   14.46  * Hydr. Depth (ft)      *        *    8.91  *        *
* Conv. Total (cfs)     *567516.6  * Conv. (cfs)           *        *567516.6  *        *
* Length Wtd. (ft)      *  211.15  * Wetted Per. (ft)       *        *  311.61  *        *
* Min Ch El (ft)        * 2530.00  * Shear (lb/sq ft)       *        *    1.73  *        *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *   20.38  *        *
* Frctn Loss (ft)       *    0.58  * Cum Volume (acre-ft)   *        *  405.10  *    0.14  *
* C & E Loss (ft)       *    0.09  * Cum SA (acres)         *        *   39.19  *    0.36  *
*****************************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 1350

INPUT
Description:
Station Elevation Data    num=      42
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
       0    2544    9.54    2543   38.09    2542      39    2541   39.96    2540
   40.94    2539    41.9    2538   42.89    2537   43.85    2536   44.79    2535
   45.98    2534   52.23    2533   53.89    2532   55.61    2531    57.3    2530
   97.27    2530   100.2    2531  116.73    2532  164.32    2532  176.99    2532
  188.83    2532  193.69    2532     196    2533  199.44    2534  206.79    2534
  218.33    2534  283.32    2535     287    2536  288.24    2537  289.46    2538
   290.7    2539  291.93    2540  293.13    2541  294.37    2542  295.58    2543
  296.81    2544  322.32    2545  329.31    2546     335    2547  338.98    2548
  344.34    2549  348.11    2549

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
       0    .055       0     .03  296.81    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            0  296.81          267.52  277.24  286.29            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2545.96  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.86  * Wt. n-Val.            *        *   0.030  *   0.055  *
* W.S. Elev (ft)        * 2544.10  * Reach Len. (ft)       *   95.00  *   95.00  *   95.00  *
* Crit W.S. (ft)        * 2540.70  * Flow Area (sq ft)      *        * 2922.08  *    0.12  *
* E.G. Slope (ft/ft)    *0.002400  * Area (sq ft)          *        * 2922.08  *    0.12  *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *        *31999.98  *    0.02  *
* Top Width (ft)        *  299.25  * Top Width (ft)        *        *  296.81  *    2.44  *
* Vel Total (ft/s)      *   10.95  * Avg. Vel. (ft/s)      *        *   10.95  *    0.17  *
* Max Chl Dpth (ft)     *   14.10  * Hydr. Depth (ft)      *        *    9.84  *    0.05  *
* Conv. Total (cfs)     *653204.6  * Conv. (cfs)           *        *653204.1  *     0.4  *
* Length Wtd. (ft)      *   95.00  * Wetted Per. (ft)       *        *  304.77  *    2.44  *
* Min Ch El (ft)        * 2530.00  * Shear (lb/sq ft)       *        *    1.44  *    0.01  *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *   15.73  *    0.00  *
* Frctn Loss (ft)       *    0.34  * Cum Volume (acre-ft)   *        *  391.45  *    0.14  *
* C & E Loss (ft)       *    0.08  * Cum SA (acres)         *        *   37.73  *    0.35  *
*****************************************************************************************************

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.
```

BRIDGE

RIVER: River #1
REACH: Reach #1 RS: 1325

INPUT
Description:
Distance from Upstream XS = 95
Deck/Roadway Width = 136
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
****
0 2550 2545 700 2549 2545

Upstream Bridge Cross Section Data
Station Elevation Data num= 42
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2544 9.54 2543 38.09 2542 39 2541 39.96 2540
40.94 2539 41.9 2538 42.89 2537 43.85 2536 44.79 2535
45.98 2534 52.23 2533 53.89 2532 55.61 2531 57.3 2530
97.27 2530 100.2 2531 116.73 2532 164.32 2532 176.99 2532
188.83 2532 193.69 2532 196 2533 199.44 2534 206.79 2534
218.33 2534 283.32 2535 287 2536 288.24 2537 289.46 2538
290.7 2539 291.93 2540 293.13 2541 294.37 2542 295.58 2543
296.81 2544 322.32 2545 329.31 2546 335 2547 338.98 2548
344.34 2549 348.11 2549

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .055 0 .03 296.81 .055

Bank Sta: Left Right Coeff Contr. Expan.
0 296.81 .1 .3

Downstream Deck/Roadway Coordinates
num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
****
0 2550 2545 700 2549 2545

Downstream Bridge Cross Section Data
Station Elevation Data num= 46
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2545 1.19 2544 4.12 2543 18.6 2542 21.86 2541
22.76 2540 23.68 2539 24.75 2538 26.09 2537 27.41 2536
28.72 2535 30.14 2534 34.85 2533 39.94 2532 41.07 2531
41.99 2530 44.79 2529 57.58 2529 93.97 2530 97.18 2531
100.8 2532 177.85 2532 265.38 2533 268.07 2534 270.69 2535
273.27 2536 275.81 2537 278.31 2538 280.77 2539 283.19 2540
286.23 2541 288.55 2542 290.43 2543 292.26 2544 294.33 2545
297.09 2546 299.89 2547 303.97 2548 329.07 2548 360.23 2548
381.39 2549 436.21 2549 452.08 2548 467.95 2547 496.98 2546
506.55 2546

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .055 0 .03 303.97 .055

Bank Sta: Left Right Coeff Contr. Expan.
0 303.97 .1 .3

Upstream Embankment side slope = 1.5 horiz. to 1.0 vertical

Downstream Embankment side slope = 1.5 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 2550
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 5

Pier Data
Pier Station Upstream= 70 Downstream= 50
Upstream num= 2
Width Elev Width Elev
****
2.5 2525 2.5 2545
Downstream num= 2
Width Elev Width Elev
****
2.5 2525 2.5 2545

Pier Data
Pier Station Upstream= 117 Downstream= 97
Upstream num= 2
Width Elev Width Elev
****
2.5 2525 2.5 2545
Downstream num= 2
Width Elev Width Elev
****
2.5 2525 2.5 2545

Pier Data
Pier Station Upstream= 164 Downstream= 144
Upstream num= 2
Width Elev Width Elev
****
2.5 2529 2.5 2550
Downstream num= 2
Width Elev Width Elev
****
2.5 2529 2.5 2550

Pier Data
Pier Station Upstream= 211 Downstream= 191
Upstream num= 2
Width Elev Width Elev
****
2.5 2525 2.5 2545
Downstream num= 2
Width Elev Width Elev
****
2.5 2525 2.5 2545

Pier Data
Pier Station Upstream= 258 Downstream= 238
Upstream num= 2
Width Elev Width Elev
****
2.5 2525 2.5 2545
Downstream num= 2
Width Elev Width Elev
****
2.5 2525 2.5 2545

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #100 year
****
* E.G. US. (ft) * 2545.96 * Element *Inside BR US *Inside BR DS *
* W.S. US. (ft) * 2544.10 * E.G. Elev (ft) * 2545.53 * 2544.72 *
* Q Total (cfs) * 32000.00 * W.S. Elev (ft) * 2542.83 * 2542.19 *
* Q Bridge (cfs) * 32000.00 * Crit W.S. (ft) * 2541.04 * 2540.17 *
* Q Weir (cfs) * * Max Chl Dpth (ft) * 12.83 * 13.19 *
* Weir Sta Lft (ft) * * Vel Total (ft/s) * 13.20 * 12.77 *
* Weir Sta Rgt (ft) * * Flow Area (sq ft) * 2424.28 * 2505.85 *
* Weir Submerg * * Froude # Chl * 0.77 * 0.73 *
* Weir Max Depth (ft) * * Specif Force (cu ft) * 25667.56 * 25752.05 *
* Min El Weir Flow (ft) * 2550.00 * Hydr Depth (ft) * 9.03 * 9.62 *
* Min El Prs (ft) * 2545.00 * W.P. Total (ft) * 378.86 * 374.77 *
* Delta EG (ft) * 1.49 * Conv. Total (cfs) * 413864.2 * 440514.7 *
* Delta WS (ft) * 1.91 * Top Width (ft) * 268.37 * 260.52 *
* BR Open Area (sq ft) * 3047.30 * Frctn Loss (ft) * 0.76 * 0.18 *
* BR Open Vel (ft/s) * 13.20 * C & E Loss (ft) * 0.05 * 0.08 *
* Coef of Q * * Shear Total (lb/sq ft) * 2.39 * 2.20 *
* Br Sel Method *Energy only * Power Total (lb/ft s) * 31.52 * 28.13 *
****

Warning: Pier drag coefficient of 2.0 assumed for Class B flow.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1300

INPUT
Description:
Station Elevation Data num= 46
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2545 1.19 2544 4.12 2543 18.6 2542 21.86 2541
22.76 2540 23.68 2539 24.75 2538 26.09 2537 27.41 2536
28.72 2535 30.14 2534 34.85 2533 39.94 2532 41.07 2531
41.99 2530 44.79 2529 57.58 2529 93.97 2530 97.18 2531
100.8 2532 177.85 2532 265.38 2533 268.07 2534 270.69 2535
273.27 2536 275.81 2537 278.31 2538 280.77 2539 283.19 2540
286.23 2541 288.55 2542 290.43 2543 292.26 2544 294.33 2545
297.09 2546 299.89 2547 303.97 2548 329.07 2548 360.23 2548
381.39 2549 436.21 2549 452.08 2548 467.95 2547 496.98 2546
506.55 2546

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .055 0 .03 303.97 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 303.97 385.44 383.38 385.44 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2544.47 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 2.28 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2542.18 * Reach Len. (ft) * 385.44 * 383.38 * 385.44 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 2640.01 * *
* E.G. Slope (ft/ft) *0.002992 * Area (sq ft) * * 2640.01 * *

```
* Q Total (cfs)         *32000.00  * Flow (cfs)            *        *32000.00  *        *
* Top Width (ft)         *  272.95  * Top Width (ft)        *        *  272.95  *        *
* Vel Total (ft/s)       *   12.12  * Avg. Vel. (ft/s)      *        *   12.12  *        *
* Max Chl Dpth (ft)      *   13.18  * Hydr. Depth (ft)      *        *    9.67  *        *
* Conv. Total (cfs)      *585066.3  * Conv. (cfs)           *        *585066.3  *        *
* Length Wtd. (ft)       *  383.38  * Wetted Per. (ft)       *        *  278.94  *        *
* Min Ch El (ft)         * 2529.00  * Shear (lb/sq ft)       *        *    1.77  *        *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *        *   21.42  *        *
* Frctn Loss (ft)        *    1.65  * Cum Volume (acre-ft)   *        *  375.19  *    0.14  *
* C & E Loss (ft)        *    0.13  * Cum SA (acres)         *        *   36.00  *    0.35  *
*****************************************************************************************************

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: River #1
REACH: Reach #1          RS: 1230

INPUT
Description:
Station Elevation Data    num=      38
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0   2543   46.64    2542   85.37    2542  117.86    2543  136.81    2543
  138.42    2542  139.93    2541  141.48    2540  142.52    2539  143.32    2538
  144.03    2537  144.72    2536   145.4    2535  146.08    2534  147.48    2533
  148.88    2532  150.34    2531  151.74    2530   219.3    2529   293.5    2529
  295.33    2530  302.46    2530  328.97    2529  345.46    2529  352.73    2530
  353.86    2531  355.01    2532  356.16    2533   357.3    2534  358.41    2535
  359.57    2536  360.76    2537  361.92    2538  420.65    2539  441.25    2539
  471.42    2538  505.23    2540  522.09    2539

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0     .05  136.81     .03  420.65     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        136.81  420.65           47.48   47.44   47.31            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2542.68  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    3.62  * Wt. n-Val.            *         *   0.030  *   0.050  *
* W.S. Elev (ft)         * 2539.07  * Reach Len. (ft)       *   47.48  *   47.44  *   47.31  *
* Crit W.S. (ft)         * 2539.07  * Flow Area (sq ft)     *         * 2092.91  *   28.07  *
* E.G. Slope (ft/ft)     *0.006674  * Area (sq ft)          *         * 2092.91  *   28.07  *
* Q Total (cfs)          *32000.00  * Flow (cfs)            *         *31962.60  *   37.41  *
* Top Width (ft)         *  348.10  * Top Width (ft)        *         *  278.20  *   69.90  *
* Vel Total (ft/s)       *   15.09  * Avg. Vel. (ft/s)      *         *   15.27  *    1.33  *
* Max Chl Dpth (ft)      *   10.07  * Hydr. Depth (ft)      *         *    7.52  *    0.40  *
* Conv. Total (cfs)      *391711.8  * Conv. (cfs)           *         *391253.9  *   457.9  *
* Length Wtd. (ft)       *   47.44  * Wetted Per. (ft)       *         *  285.43  *   70.02  *
* Min Ch El (ft)         * 2529.00  * Shear (lb/sq ft)       *         *    3.05  *    0.17  *
* Alpha                  *    1.02  * Stream Power (lb/ft s) *         *   46.66  *    0.22  *
* Frctn Loss (ft)        *    0.29  * Cum Volume (acre-ft)   *         *  354.36  *    0.02  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)         *         *   33.58  *    0.04  *
*****************************************************************************************************

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: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
```

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: River #1
REACH: Reach #1 RS: 1220

INPUT
Description:
Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2542	18.62	2541	39.62	2541	45.78	2541	55.76	2541
61.41	2542	72.93	2542	74.08	2541	75.24	2540	76.4	2539
77.46	2538	78.36	2537	79.23	2536	80.14	2535	80.97	2534
81.91	2533	83.24	2532	84.71	2531	86.18	2530	87.71	2529
118.12	2528	120.9	2528	128.57	2528	156.62	2528	164.95	2528
178.24	2528	185.15	2528	189.77	2528	193.91	2528	201.47	2528
213.24	2528	215.78	2528	222	2528	227.84	2528	230.94	2528
234.18	2527	253.8	2527	258.2	2528	309.84	2529	310.87	2530
311.93	2531	313	2532	314.07	2533	315.14	2534	316.18	2535
317.25	2536	318.31	2537	319.41	2538	351.91	2538	355.9	2537
362.09	2536	387.7	2535	402.39	2534	437.07	2534	457.93	2541
469.62	2541	492.75	2540	514.1	2539				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	72.93	.03	319.41	.05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
72.93 319.41 415.98 411.79 408.49 .1 .3
Right Levee Station= 319.41 Elevation= 2538

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (ft)	2540.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.61	Wt. n-Val.		0.030	
W.S. Elev (ft)	2537.17	Reach Len. (ft)	415.98	411.79	408.49
Crit W.S. (ft)	2536.63	Flow Area (sq ft)		2099.44	
E.G. Slope (ft/ft)	0.005458	Area (sq ft)		2099.44	
Q Total (cfs)	32000.00	Flow (cfs)		32000.00	
Top Width (ft)	240.30	Top Width (ft)		240.30	
Vel Total (ft/s)	15.24	Avg. Vel. (ft/s)		15.24	
Max Chl Dpth (ft)	10.17	Hydr. Depth (ft)		8.74	
Conv. Total (cfs)	433141.3	Conv. (cfs)		433141.3	
Length Wtd. (ft)	411.79	Wetted Per. (ft)		246.96	
Min Ch El (ft)	2527.00	Shear (lb/sq ft)		2.90	
Alpha	1.00	Stream Power (lb/ft s)		44.15	
Frctn Loss (ft)	1.99	Cum Volume (acre-ft)		352.08	0.00
C & E Loss (ft)	0.21	Cum SA (acres)		33.30	0.00

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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1200

```
INPUT
Description:
Station Elevation Data    num=      40
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
       0    2540   68.09    2539  121.68    2541  128.69    2541  147.65    2534
   148.1    2533   148.5    2532  149.06    2531  149.92    2530  150.86    2529
   151.8    2528  153.39    2527  155.27    2526  248.74    2526  272.27    2527
  297.29    2527  305.15    2526  307.38    2526  310.49    2526  316.89    2526
  324.53    2527  349.28    2527  364.33    2526  392.42    2526  395.21    2527
  396.18    2528  397.09    2529  398.09    2530  398.98    2531  399.97    2532
   400.9    2533  401.85    2534  402.79    2535  403.76    2536   404.8    2537
  410.44    2537  422.02    2537  426.84    2538   429.8    2539  443.87    2539

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
       0     .05  128.69     .03   404.8     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        128.69   404.8            57.6   56.56   56.61             .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2538.59  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    2.92  * Wt. n-Val.             *          *   0.030  *          *
* W.S. Elev (ft)         * 2535.67  * Reach Len. (ft)        *   57.60  *   56.56  *   56.61  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)      *          * 2331.91  *          *
* E.G. Slope (ft/ft)     *0.004299  * Area (sq ft)           *          * 2331.91  *          *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *          *32000.00  *          *
* Top Width (ft)         *  260.29  * Top Width (ft)         *          *  260.29  *          *
* Vel Total (ft/s)       *   13.72  * Avg. Vel. (ft/s)       *          *   13.72  *          *
* Max Chl Dpth (ft)      *    9.66  * Hydr. Depth (ft)       *          *    8.96  *          *
* Conv. Total (cfs)      *488080.0  * Conv. (cfs)            *          *488080.0  *          *
* Length Wtd. (ft)       *   56.56  * Wetted Per. (ft)       *          *  268.44  *          *
* Min Ch El (ft)         * 2526.00  * Shear (lb/sq ft)       *          *    2.33  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *          *   31.99  *          *
* Frctn Loss (ft)        *    0.19  * Cum Volume (acre-ft)   *          *  331.13  *    0.00  *
* C & E Loss (ft)        *    0.23  * Cum SA (acres)         *          *   30.93  *    0.00  *
*****************************************************************************************************

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: River #1
REACH: Reach #1           RS: 1120

INPUT
Description:
Station Elevation Data    num=      47
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
       0    2539  336.05    2541  342.65    2534  343.23    2533  343.69    2532
  344.08    2531  345.04    2530  345.92    2529   346.9    2528  347.83    2527
  348.74    2526  349.76    2525  440.16    2525  445.47    2525  451.76    2525
  465.52    2525  467.89    2524  468.82    2524  477.19    2525  488.72    2526
  499.18    2527  503.32    2527  512.05    2526  517.81    2525  524.94    2525
   538.1    2525  550.62    2524  573.43    2524  573.77    2525  578.28    2526
  590.85    2527  591.77    2528  592.73    2529  593.66    2530  594.62    2531
  595.54    2532  596.52    2533  597.47    2534  598.38    2535  599.33    2536
  619.96    2537  622.38    2538  624.78    2539  638.13    2539  665.12    2538
  710.79    2534  868.76    2533

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

```
     0    .05  336.05     .03  599.33     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       336.05  599.33          440.13  443.73  447.38            .1       .3
Right Levee     Station=  624.78      Elevation=    2539

CROSS SECTION OUTPUT  Profile #100 year
*********************************************************************************************
* E.G. Elev (ft)        * 2538.17  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    2.16  * Wt. n-Val.            *         *   0.030  *   0.000  *
* W.S. Elev (ft)        * 2536.02  * Reach Len. (ft)       *  440.13  *  443.73  *  447.38  *
* Crit W.S. (ft)        * 2533.26  * Flow Area (sq ft)      *         * 2715.89  *    0.00  *
* E.G. Slope (ft/ft)    *0.002596  * Area (sq ft)          *         * 2715.89  *    0.00  *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *    0.00  *
* Top Width (ft)        *  258.96  * Top Width (ft)        *         *  258.58  *    0.38  *
* Vel Total (ft/s)      *   11.78  * Avg. Vel. (ft/s)      *         *   11.78  *    0.07  *
* Max Chl Dpth (ft)     *   12.02  * Hydr. Depth (ft)      *         *   10.50  *    0.01  *
* Conv. Total (cfs)     *628030.8  * Conv. (cfs)           *         *628030.8  *     0.0  *
* Length Wtd. (ft)      *  443.73  * Wetted Per. (ft)      *         *  269.23  *    0.38  *
* Min Ch El (ft)        * 2524.00  * Shear (lb/sq ft)      *         *    1.64  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   19.26  *         *
* Frctn Loss (ft)       *    1.75  * Cum Volume (acre-ft)   *         *  327.86  *    0.00  *
* C & E Loss (ft)       *    0.21  * Cum SA (acres)         *         *   30.59  *    0.00  *
*********************************************************************************************

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.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
       water surface was used.

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 1110

INPUT
Description:
Station Elevation Data    num=      46
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0   2538  104.77    2538  121.02    2538  172.26    2537  181.45    2536
  189.22    2535  192.95    2534   196.9    2533  198.01    2532  198.99    2531
  200.02    2530  200.72    2529  201.39    2528  202.12    2527  202.84    2526
  203.53    2525  204.37    2524  205.16    2523  280.28    2523  285.89    2523
  288.08    2523  311.08    2523  350.63    2523   417.4    2524  418.47    2525
  419.48    2526  420.52    2527  421.57    2528  422.55    2529  423.62    2530
  424.67    2531  425.68    2532  426.76    2533  427.88    2534  446.96    2535
  448.96    2536  450.96    2537  506.22    2537  509.54    2536  512.84    2535
  516.23    2534  519.47    2533   522.7    2532   525.9    2531  552.62    2533
  590.04    2532

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***************************************************
      0    .05  189.22     .03  427.88     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       189.22  427.88          46.86   36.39   42.45            .1       .3
Right Levee     Station=  450.96      Elevation=    2537

CROSS SECTION OUTPUT  Profile #100 year
*********************************************************************************************
* E.G. Elev (ft)        * 2536.22  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    4.22  * Wt. n-Val.            *         *   0.030  *         *
* W.S. Elev (ft)        * 2532.00  * Reach Len. (ft)       *   46.86  *   36.39  *   42.45  *
```

```
* Crit W.S. (ft)        * 2532.00  * Flow Area (sq ft)      *         * 1939.98  *         *
* E.G. Slope (ft/ft)     *0.006658  * Area (sq ft)          *         * 1939.98  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)         *  227.66  * Top Width (ft)        *         *  227.66  *         *
* Vel Total (ft/s)       *   16.50  * Avg. Vel. (ft/s)      *         *   16.50  *         *
* Max Chl Dpth (ft)      *    9.00  * Hydr. Depth (ft)      *         *    8.52  *         *
* Conv. Total (cfs)      *392178.2  * Conv. (cfs)           *         *392178.2  *         *
* Length Wtd. (ft)       *   36.39  * Wetted Per. (ft)      *         *  235.28  *         *
* Min Ch El (ft)         * 2523.00  * Shear (lb/sq ft)      *         *    3.43  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   56.53  *         *
* Frctn Loss (ft)        *    0.20  * Cum Volume (acre-ft)   *         *  304.14  *         *
* C & E Loss (ft)        *    0.24  * Cum SA (acres)         *         *   28.12  *         *
*****************************************************************************************************

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 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.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
         water surface was used.

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 1100

INPUT
Description:
Station Elevation Data    num=      33
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2538    7.97    2538    75.6    2537  183.84    2537  194.63    2537
  237.75    2537  254.58    2536  256.12    2535   257.6    2534   259.1    2533
  271.56    2533  281.56    2533 294.556    2520  324.84    2520  432.65    2521
  435.97    2522  448.45    2522  464.17    2522  493.16    2523   494.3    2524
   495.3    2525  496.31    2526  497.31    2527  498.31    2528  499.33    2529
  500.34    2530  501.37    2531  502.41    2532  503.41    2533  504.48    2534
  524.02    2535  525.94    2536  527.91    2537

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0     .05  237.75     .03  527.91     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       237.75  527.91             294     294     294            .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
      0  285.65    2520       F
  324.84  527.91    2520       F
Left Levee      Station=   78.35      Elevation=    2534

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2534.72  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    3.42  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2531.30  * Reach Len. (ft)        *  294.00  *  294.00  *  294.00  *
* Crit W.S. (ft)         * 2530.14  * Flow Area (sq ft)      *         * 2155.41  *         *
* E.G. Slope (ft/ft)     *0.004459  * Area (sq ft)           *         * 2155.41  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)         *  218.42  * Top Width (ft)         *         *  218.42  *         *
* Vel Total (ft/s)       *   14.85  * Avg. Vel. (ft/s)       *         *   14.85  *         *
* Max Chl Dpth (ft)      *   11.30  * Hydr. Depth (ft)       *         *    9.87  *         *
* Conv. Total (cfs)      *479214.0  * Conv. (cfs)            *         *479214.0  *         *
```

```
* Length Wtd. (ft)      *  294.00  * Wetted Per. (ft)      *        *  226.64  *        *
* Min Ch El (ft)        * 2520.00  * Shear (lb/sq ft)      *        *    2.65  *        *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *   39.30  *        *
* Frctn Loss (ft)       *    1.60  * Cum Volume (acre-ft)   *        *  302.43  *        *
* C & E Loss (ft)       *    0.07  * Cum SA (acres)         *        *   27.93  *        *
*****************************************************************************************
```

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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1050

INPUT
Description:
Station Elevation Data num= 56

```
    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev
*****************************************************************************
      0   2535   19.46   2535   47.69   2534   72.02   2534   155.9   2535
  219.33   2536  231.16   2536  232.43   2535  232.95   2534  233.46   2533
  233.85   2532  234.25   2531  234.58   2530  242.44   2530  252.44   2530
  262.44   2520  284.32   2520  335.05   2520  397.98   2520  404.81   2520
  435.94   2520   444.6   2521  474.12   2522  484.03   2523  485.53   2524
  486.59   2525  487.65   2526  488.72   2527  489.75   2528  490.87   2529
  492.17   2530  493.39   2531  494.65   2532  512.73   2533  515.72   2534
  517.96   2535  520.35   2536  525.36   2537  530.35   2538   535.6   2539
  542.47   2540  551.81   2540  564.09   2539  571.52   2538  608.38   2538
  635.45   2530  651.98   2531  667.79   2532  677.67   2533   685.8   2534
  704.45   2535  715.92   2536  728.92   2537  747.85   2538  786.05   2539
  813.15   2540
```

Manning's n Values num= 3

```
    Sta   n Val    Sta   n Val    Sta   n Val
***********************************************
      0    .05  252.44    .03  813.15    .05
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
252.44 813.15 162 162 162 .1 .3

CROSS SECTION OUTPUT Profile #100 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2533.04  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    4.16  * Wt. n-Val.           *        *   0.030  *        *
* W.S. Elev (ft)        * 2528.88  * Reach Len. (ft)       *  162.00  *  162.00  *  162.00  *
* Crit W.S. (ft)        * 2528.88  * Flow Area (sq ft)     *        * 1955.18  *        *
* E.G. Slope (ft/ft)    *0.006780  * Area (sq ft)          *        * 1955.18  *        *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *        *32000.00  *        *
* Top Width (ft)        *  237.18  * Top Width (ft)        *        *  237.18  *        *
* Vel Total (ft/s)      *   16.37  * Avg. Vel. (ft/s)      *        *   16.37  *        *
* Max Chl Dpth (ft)     *    8.88  * Hydr. Depth (ft)      *        *    8.24  *        *
* Conv. Total (cfs)     *388614.9  * Conv. (cfs)           *        *388614.9  *        *
* Length Wtd. (ft)      *  162.00  * Wetted Per. (ft)       *        *  243.22  *        *
* Min Ch El (ft)        * 2520.00  * Shear (lb/sq ft)      *        *    3.40  *        *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *   55.69  *        *
* Frctn Loss (ft)       *    1.12  * Cum Volume (acre-ft)   *        *  288.56  *        *
* C & E Loss (ft)       *    0.18  * Cum SA (acres)         *        *   26.39  *        *
*****************************************************************************************
```

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 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: River #1
REACH: Reach #1 RS: 1010

INPUT
Description:
Station Elevation Data num= 37
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2533 38.6 2533 39.06 2533 78.35 2534 116.92 2533
133.06 2532 147.06 2528 157.06 2528 166.06 2519 225.22 2519
319.11 2519 424.94 2520 448.16 2521 453.24 2522 454.76 2523
455.72 2524 456.73 2525 457.7 2526 458.85 2527 460.14 2528
461.47 2529 462.88 2530 464.32 2531 484.17 2532 485.92 2533
487.69 2534 489.54 2535 494.16 2536 499.81 2537 506.54 2538
512.26 2539 517.03 2540 535.74 2540 541.23 2539 573.19 2539
662.53 2537 733.3 2537

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 78.35 .03 517.03 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
78.35 517.03 111.18 71.92 89.39 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2530.13 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 3.54 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2526.58 * Reach Len. (ft) * 111.18 * 71.92 * 89.39 *
* Crit W.S. (ft) * 2526.58 * Flow Area (sq ft) * * 2118.14 * *
* E.G. Slope (ft/ft) *0.007020 * Area (sq ft) * * 2118.14 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 299.89 * Top Width (ft) * * 299.89 * *
* Vel Total (ft/s) * 15.11 * Avg. Vel. (ft/s) * * 15.11 * *
* Max Chl Dpth (ft) * 7.58 * Hydr. Depth (ft) * * 7.06 * *
* Conv. Total (cfs) *381941.5 * Conv. (cfs) * *381941.5 * *
* Length Wtd. (ft) * 71.92 * Wetted Per. (ft) * * 304.93 * *
* Min Ch El (ft) * 2519.00 * Shear (lb/sq ft) * * 3.04 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 45.99 * *
* Frctn Loss (ft) * 0.20 * Cum Volume (acre-ft) * * 280.99 * *
* C & E Loss (ft) * 0.64 * Cum SA (acres) * * 25.39 * *
****

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: River #1
REACH: Reach #1 RS: 1000

```
INPUT
Description:
Station Elevation Data    num=      42
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2530   72.47    2531  123.23    2532  127.39    2532  206.84    2532
  218.1    2528   228.1    2528   243.1  2510.9  436.36  2510.9  453.28    2514
 460.62    2515  469.34    2516  477.85    2517  486.46    2518  499.76    2519
 513.14    2520  516.43    2521  517.76    2522  519.14    2523  520.49    2524
 521.85    2525   523.2    2526  524.36    2527  525.49    2528  526.62    2529
 527.74    2530  528.86    2531  546.98    2532  548.95    2533  550.75    2534
 552.59    2535  557.43    2536  563.53    2537  569.55    2538  574.84    2539
 578.79    2540  582.76    2541   599.7    2541  604.88    2540  610.61    2539
 619.05    2539  655.41    2540

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0     .05  206.84     .03  528.86     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       206.84  528.86              147     147     147            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2525.87  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.42  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2524.45  * Reach Len. (ft)        *  147.00  *  147.00  *  147.00  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)       *         * 3347.50  *         *
* E.G. Slope (ft/ft)     *0.001480  * Area (sq ft)           *         * 3347.50  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)         *  289.89  * Top Width (ft)         *         *  289.89  *         *
* Vel Total (ft/s)       *    9.56  * Avg. Vel. (ft/s)        *         *    9.56  *         *
* Max Chl Dpth (ft)      *   13.55  * Hydr. Depth (ft)        *         *   11.55  *         *
* Conv. Total (cfs)      *831793.9  * Conv. (cfs)             *         *831793.9  *         *
* Length Wtd. (ft)       *  147.00  * Wetted Per. (ft)        *         *  297.91  *         *
* Min Ch El (ft)         * 2510.90  * Shear (lb/sq ft)        *         *    1.04  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *    9.92  *         *
* Frctn Loss (ft)        *    0.19  * Cum Volume (acre-ft)   *         *  276.47  *         *
* C & E Loss (ft)        *    0.04  * Cum SA (acres)         *         *   24.91  *         *
*****************************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1           RS: 990

INPUT
Description:
Station Elevation Data    num=      37
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2529   71.19    2531  149.22    2527  159.22    2527  175.02  2510.2
  408.82  2510.2  416.62    2519  420.58    2520  422.41    2521  423.44    2522
  424.47    2523  425.48    2524  426.54    2525  427.53    2526  428.54    2527
   429.6    2528   430.6    2529  431.56    2530  432.54    2531  449.79    2532
  452.84    2533  454.88    2534   456.9    2535  460.69    2536  464.69    2537
  469.64    2538  474.54    2539   478.3    2540  482.08    2541  499.22    2541
  504.31    2540   507.3    2539   549.1    2539  580.36    2537   661.7    2538
   705.6    2538  764.81    2538

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0     .05  159.22     .03  432.54     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       159.22  432.54              168     168     168            .1       .3
```

CROSS SECTION OUTPUT Profile #100 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2525.64  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.29  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2524.35  * Reach Len. (ft)       *  168.00  *  168.00  *  168.00  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         * 3510.72  *         *
* E.G. Slope (ft/ft)    *0.001140  * Area (sq ft)          *         * 3510.72  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  264.14  * Top Width (ft)        *         *  264.14  *         *
* Vel Total (ft/s)      *    9.11  * Avg. Vel. (ft/s)      *         *    9.11  *         *
* Max Chl Dpth (ft)     *   14.15  * Hydr. Depth (ft)      *         *   13.29  *         *
* Conv. Total (cfs)     *947628.6  * Conv. (cfs)           *         *947628.6  *         *
* Length Wtd. (ft)      *  168.00  * Wetted Per. (ft)       *         *  275.96  *         *
* Min Ch El (ft)        * 2510.20  * Shear (lb/sq ft)      *         *    0.91  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *    8.26  *         *
* Frctn Loss (ft)       *    0.20  * Cum Volume (acre-ft)   *         *  264.90  *         *
* C & E Loss (ft)       *    0.02  * Cum SA (acres)         *         *   23.97  *         *
*****************************************************************************************
```

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 975

INPUT
Description:
Station Elevation Data num= 35

```
    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev
*******************************************************************************
      0   2529   13.44   2530   73.64   2530   90.63   2526  100.63   2526
  116.13  2509.4  326.44  2509.4  334.94   2519  336.61   2520  338.04   2521
  339.21   2522   340.3   2523  341.46   2524  342.54   2525  343.49   2526
  344.41   2527  345.32   2528  346.26   2529   347.2   2530  354.36   2531
  356.86   2531  357.02   2531  368.19   2532  370.63   2533  373.14   2534
  377.42   2535  382.06   2536  387.37   2537  392.15   2538  396.09   2539
  399.58   2540  410.55   2540  418.34   2539  421.18   2538   462.2   2538
```

Manning's n Values num= 3

```
    Sta   n Val    Sta   n Val    Sta   n Val
***********************************************
      0    .05   73.64    .03  354.36    .05
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
73.64 354.36 151 151 151 .1 .3

CROSS SECTION OUTPUT Profile #100 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2525.42  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.51  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2523.91  * Reach Len. (ft)       *  151.00  *  151.00  *  151.00  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         * 3249.22  *         *
* E.G. Slope (ft/ft)    *0.001301  * Area (sq ft)          *         * 3249.22  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  238.77  * Top Width (ft)        *         *  238.77  *         *
* Vel Total (ft/s)      *    9.85  * Avg. Vel. (ft/s)      *         *    9.85  *         *
* Max Chl Dpth (ft)     *   14.51  * Hydr. Depth (ft)      *         *   13.61  *         *
* Conv. Total (cfs)     *887071.1  * Conv. (cfs)           *         *887071.1  *         *
* Length Wtd. (ft)      *  151.00  * Wetted Per. (ft)       *         *  251.08  *         *
* Min Ch El (ft)        * 2509.40  * Shear (lb/sq ft)      *         *    1.05  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   10.35  *         *
* Frctn Loss (ft)       *    0.20  * Cum Volume (acre-ft)   *         *  251.87  *         *
* C & E Loss (ft)       *    0.01  * Cum SA (acres)         *         *   23.00  *         *
*****************************************************************************************
```

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 965

```
INPUT
Description:
Station Elevation Data    num=      28
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
********************************************************************************
      0    2529   24.24    2529   44.28    2528   49.27    2527   56.18    2526
  66.18    2526   82.48  2508.7  280.69  2508.7  290.69    2518  292.01    2519
 293.41    2520  294.74    2521  295.97    2522  297.18    2523  298.34    2524
   299.3   2525   300.3    2526  301.26    2527  302.22    2528  303.24    2529
 304.18    2530  323.93    2531  325.91    2532  327.91    2533  329.91    2534
 335.04    2535  340.64    2536  347.99    2537

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***************************************************
      0     .05   44.28     .03  304.18     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        44.28  304.18              148     148     148            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2525.21  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.56  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2523.65  * Reach Len. (ft)        *  148.00  *  148.00  *  148.00  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)       *         * 3193.16  *         *
* E.G. Slope (ft/ft)     *0.001310  * Area (sq ft)           *         * 3193.16  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)         *  229.54  * Top Width (ft)         *         *  229.54  *         *
* Vel Total (ft/s)       *   10.02  * Avg. Vel. (ft/s)       *         *   10.02  *         *
* Max Chl Dpth (ft)      *   14.95  * Hydr. Depth (ft)       *         *   13.91  *         *
* Conv. Total (cfs)      *884106.6  * Conv. (cfs)            *         *884106.6  *         *
* Length Wtd. (ft)       *  148.00  * Wetted Per. (ft)       *         *  241.60  *         *
* Min Ch El (ft)         * 2508.70  * Shear (lb/sq ft)       *         *    1.08  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   10.83  *         *
* Frctn Loss (ft)        *    0.21  * Cum Volume (acre-ft)   *         *  240.70  *         *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)         *         *   22.19  *         *
*****************************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1           RS: 950

INPUT
Description:
Station Elevation Data    num=      39
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
********************************************************************************
      0    2527   30.62    2527  106.02    2527   113.3    2525  126.75    2525
  136.75    2525  152.75  2507.9  332.64  2507.9  340.64    2517  341.74    2518
  342.88    2519  344.04    2520  345.21    2521  346.36    2522  347.43    2523
  348.48    2524  349.49    2525  350.46    2526   351.5    2527  352.57    2528
  353.69    2529  373.26    2530  375.56    2531  377.95    2532  387.41    2532
  393.05    2531  400.12    2531  408.37    2532  412.67    2533  416.69    2534
  420.58    2535  424.63    2536   449.9    2536  455.61    2535  485.24    2532
  506.85    2533  526.58    2534  542.36    2535  586.79    2536

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***************************************************
      0     .05  106.02     .03  352.57     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       106.02  352.57            216.27  206.23   199.7            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
```

```
* E.G. Elev (ft)        * 2524.98  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.81  * Wt. n-Val.            *        *   0.030  *        *
* W.S. Elev (ft)        * 2523.17  * Reach Len. (ft)       *  216.27  *  206.23  *  199.70  *
* Crit W.S. (ft)        *          * Flow Area (sq ft)     *        * 2962.90  *        *
* E.G. Slope (ft/ft)    *0.001504  * Area (sq ft)          *        * 2962.90  *        *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *        *32000.00  *        *
* Top Width (ft)        *  209.14  * Top Width (ft)        *        *  209.14  *        *
* Vel Total (ft/s)      *   10.80  * Avg. Vel. (ft/s)      *        *   10.80  *        *
* Max Chl Dpth (ft)     *   15.27  * Hydr. Depth (ft)      *        *   14.17  *        *
* Conv. Total (cfs)     *825175.9  * Conv. (cfs)           *        *825175.9  *        *
* Length Wtd. (ft)      *  206.23  * Wetted Per. (ft)       *        *  222.22  *        *
* Min Ch El (ft)        * 2507.90  * Shear (lb/sq ft)       *        *    1.25  *        *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *   13.52  *        *
* Frctn Loss (ft)       *    0.39  * Cum Volume (acre-ft)   *        *  230.24  *        *
* C & E Loss (ft)       *    0.09  * Cum SA (acres)         *        *   21.45  *        *
*****************************************************************************************************

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: River #1
REACH: Reach #1          RS: 900

INPUT
Description:
Station Elevation Data    num=      41
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2526   38.53    2525   40.82    2524   52.48    2524   62.48    2524
  78.48  2506.9   227.2  2506.9  234.08    2515   235.2    2516  236.25    2517
 237.32    2518   238.4    2519  239.49    2520  240.52    2521  241.56    2522
 242.54    2523  243.58    2524  244.55    2525  245.52    2526  258.04    2527
 266.14    2528   268.5    2529  270.88    2530  275.59    2530  280.72    2529
 284.52    2528  287.88    2527  291.14    2526  294.14    2525  297.09    2524
 300.04    2523     303    2522  306.01    2521  309.04    2520  311.64    2519
 324.23    2518  378.07    2521  379.48    2521  403.99    2522  421.08    2523
 431.72    2524

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
************************************************
      0     .05   38.53     .03  245.52     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        38.53  245.52          159.29  151.89  152.98            .1       .3
Right Levee     Station=  245.52      Elevation=    2526

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2524.50  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    2.73  * Wt. n-Val.            *        *   0.030  *        *
* W.S. Elev (ft)        * 2521.77  * Reach Len. (ft)       *  159.29  *  151.89  *  152.98  *
* Crit W.S. (ft)        * 2517.96  * Flow Area (sq ft)     *        * 2414.55  *        *
* E.G. Slope (ft/ft)    *0.002408  * Area (sq ft)          *        * 2414.55  *        *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *        *32000.00  *        *
* Top Width (ft)        *  176.76  * Top Width (ft)        *        *  176.76  *        *
* Vel Total (ft/s)      *   13.25  * Avg. Vel. (ft/s)      *        *   13.25  *        *
* Max Chl Dpth (ft)     *   14.87  * Hydr. Depth (ft)      *        *   13.66  *        *
* Conv. Total (cfs)     *652118.4  * Conv. (cfs)           *        *652118.4  *        *
* Length Wtd. (ft)      *  151.89  * Wetted Per. (ft)       *        *  189.63  *        *
* Min Ch El (ft)        * 2506.90  * Shear (lb/sq ft)       *        *    1.91  *        *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *   25.37  *        *
* Frctn Loss (ft)       *    0.41  * Cum Volume (acre-ft)   *        *  217.51  *        *
* C & E Loss (ft)       *    0.06  * Cum SA (acres)         *        *   20.53  *        *
*****************************************************************************************************

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

additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 875

INPUT
Description:
Station Elevation Data num= 20
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2525 71.61 2526 118.17 2524 119.09 2523 120.35 2523
121.74 2523 123.1 2523 130.44 2525 140.44 2525 157.94 2506.2
295.43 2506.2 312.93 2525 322.93 2525 338.11 2525 339.93 2526
341.79 2527 343.82 2528 345.8 2529 348.47 2530 354.1 2530

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 71.61 .03 348.47 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
71.61 348.47 143 143 143 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2524.03 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 3.30 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2520.73 * Reach Len. (ft) * 143.00 * 143.00 * 143.00 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 2194.30 * *
* E.G. Slope (ft/ft) *0.003026 * Area (sq ft) * * 2194.30 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 164.54 * Top Width (ft) * * 164.54 * *
* Vel Total (ft/s) * 14.58 * Avg. Vel. (ft/s) * * 14.58 * *
* Max Chl Dpth (ft) * 14.53 * Hydr. Depth (ft) * * 13.34 * *
* Conv. Total (cfs) *581749.7 * Conv. (cfs) * *581749.7 * *
* Length Wtd. (ft) * 143.00 * Wetted Per. (ft) * * 177.19 * *
* Min Ch El (ft) * 2506.20 * Shear (lb/sq ft) * * 2.34 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 34.11 * *
* Frctn Loss (ft) * 0.46 * Cum Volume (acre-ft) * * 209.48 * *
* C & E Loss (ft) * 0.04 * Cum SA (acres) * * 19.94 * *
****

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 865

INPUT
Description:
Station Elevation Data num= 22
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2525 56.88 2524 75.16 2523 85.16 2523 101.66 2505.5
232.9 2505.5 249.4 2523 259.4 2523 315.34 2522 317.65 2523
319.58 2524 321.52 2525 323.5 2526 325.43 2527 328.41 2528
337.65 2528 342.68 2527 346.63 2526 349.83 2525 352.94 2524
355.98 2523 359.09 2522

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 56.88 .03 321.52 .05

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

```
      56.88  321.52            153     153     153            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)        * 2523.53  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    3.69  * Wt. n-Val.            *         *   0.030  *         *
* W.S. Elev (ft)        * 2519.84  * Reach Len. (ft)       *  153.00  *  153.00  *  153.00  *
* Crit W.S. (ft)        *          * Flow Area (sq ft)     *         * 2076.23  *         *
* E.G. Slope (ft/ft)    *0.003461  * Area (sq ft)          *         * 2076.23  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  158.29  * Top Width (ft)        *         *  158.29  *         *
* Vel Total (ft/s)      *   15.41  * Avg. Vel. (ft/s)      *         *   15.41  *         *
* Max Chl Dpth (ft)     *   14.34  * Hydr. Depth (ft)      *         *   13.12  *         *
* Conv. Total (cfs)     *543964.9  * Conv. (cfs)           *         *543964.9  *         *
* Length Wtd. (ft)      *  153.00  * Wetted Per. (ft)       *         *  170.66  *         *
* Min Ch El (ft)        * 2505.50  * Shear (lb/sq ft)       *         *    2.63  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   40.51  *         *
* Frctn Loss (ft)       *    0.59  * Cum Volume (acre-ft)   *         *  202.47  *         *
* C & E Loss (ft)       *    0.07  * Cum SA (acres)         *         *   19.41  *         *
*****************************************************************************************

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: River #1
REACH: Reach #1          RS: 850

INPUT
Description:
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2524   24.24    2523   28.38    2523   30.59    2522   36.83    2522
   46.83    2522   62.83  2504.8  189.34  2504.8  205.34    2522  215.34    2522
  337.23    2522  338.33    2522   346.1    2523

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0     .05   24.24     .03  338.33     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         24.24  338.33          199.44  201.98  207.35            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)        * 2522.87  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    4.36  * Wt. n-Val.            *         *   0.030  *         *
* W.S. Elev (ft)        * 2518.52  * Reach Len. (ft)       *  199.44  *  201.98  *  207.35  *
* Crit W.S. (ft)        * 2516.96  * Flow Area (sq ft)     *         * 1910.52  *         *
* E.G. Slope (ft/ft)    *0.004330  * Area (sq ft)          *         * 1910.52  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  152.03  * Top Width (ft)        *         *  152.03  *         *
* Vel Total (ft/s)      *   16.75  * Avg. Vel. (ft/s)      *         *   16.75  *         *
* Max Chl Dpth (ft)     *   13.72  * Hydr. Depth (ft)      *         *   12.57  *         *
* Conv. Total (cfs)     *486329.7  * Conv. (cfs)           *         *486329.7  *         *
* Length Wtd. (ft)      *  201.98  * Wetted Per. (ft)       *         *  163.98  *         *
* Min Ch El (ft)        * 2504.80  * Shear (lb/sq ft)       *         *    3.15  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   52.75  *         *
* Frctn Loss (ft)       *    1.06  * Cum Volume (acre-ft)   *         *  195.47  *         *
* C & E Loss (ft)       *    0.13  * Cum SA (acres)         *         *   18.86  *         *
*****************************************************************************************

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: River #1
REACH: Reach #1 RS: 825

INPUT
Description:
Station Elevation Data num= 15
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2523 4.12 2522 7.04 2521 7.67 2520 21.26 2520
26.03 2520 36.03 2520 51.03 2503.9 177.88 2503.9 192.88 2520
202.88 2520 320.44 2520 343.25 2520 345.95 2520 357.95 2521

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 0 .03 357.95 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 357.95 112.29 110.49 112.71 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2521.69 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 5.64 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2516.05 * Reach Len. (ft) * 112.29 * 110.49 * 112.71 *
* Crit W.S. (ft) * 2516.05 * Flow Area (sq ft) * * 1679.00 * *
* E.G. Slope (ft/ft) *0.006448 * Area (sq ft) * * 1679.00 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 149.49 * Top Width (ft) * * 149.49 * *
* Vel Total (ft/s) * 19.06 * Avg. Vel. (ft/s) * * 19.06 * *
* Max Chl Dpth (ft) * 12.15 * Hydr. Depth (ft) * * 11.23 * *
* Conv. Total (cfs) *398498.3 * Conv. (cfs) * *398498.3 * *
* Length Wtd. (ft) * 110.49 * Wetted Per. (ft) * * 160.07 * *
* Min Ch El (ft) * 2503.90 * Shear (lb/sq ft) * * 4.22 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 80.48 * *
* Frctn Loss (ft) * 0.71 * Cum Volume (acre-ft) * * 187.14 * *
* C & E Loss (ft) * 0.11 * Cum SA (acres) * * 18.16 * *
****

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 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: River #1
REACH: Reach #1 RS: 800

INPUT
Description:
Station Elevation Data num= 13
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2522 170.51 2521 185.01 2519 195.01 2519 209.41 2503.3
353.91 2503.3 368.31 2519 378.31 2519 488.24 2519 496.98 2520
554.82 2521 707.06 2522 733.08 2522

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 170.51 .03 496.98 .05

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       170.51  496.98          269.66  259.43  283.94            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)        * 2519.79  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    5.27  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2514.52  * Reach Len. (ft)       *  269.66  *  259.43  *  283.94  *
* Crit W.S. (ft)        * 2514.52  * Flow Area (sq ft)     *         * 1737.27  *         *
* E.G. Slope (ft/ft)    *0.006480  * Area (sq ft)          *         * 1737.27  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  165.09  * Top Width (ft)        *         *  165.09  *         *
* Vel Total (ft/s)      *   18.42  * Avg. Vel. (ft/s)      *         *   18.42  *         *
* Max Chl Dpth (ft)     *   11.22  * Hydr. Depth (ft)      *         *   10.52  *         *
* Conv. Total (cfs)     *397525.7  * Conv. (cfs)           *         *397525.7  *         *
* Length Wtd. (ft)      *  259.43  * Wetted Per. (ft)      *         *  174.96  *         *
* Min Ch El (ft)        * 2503.30  * Shear (lb/sq ft)      *         *    4.02  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   73.99  *         *
* Frctn Loss (ft)       *    1.59  * Cum Volume (acre-ft)  *         *  182.81  *         *
* C & E Loss (ft)       *    0.36  * Cum SA (acres)        *         *   17.76  *         *
*****************************************************************************************

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 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: River #1
REACH: Reach #1          RS: 750

INPUT
Description:
Station Elevation Data    num=      11
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0   2518   79.43    2517   89.43    2517  103.43    2502  298.61    2502
  312.61    2517  322.61    2517  362.84    2518  363.83    2518  372.89    2518
  382.01    2519

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
      0     .05   89.43     .03  312.61     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       89.43  312.61          249.08  245.16  242.37            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)        * 2515.75  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    4.07  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2511.68  * Reach Len. (ft)       *  249.08  *  245.16  *  242.37  *
* Crit W.S. (ft)        * 2511.27  * Flow Area (sq ft)     *         * 1975.69  *         *
* E.G. Slope (ft/ft)    *0.005786  * Area (sq ft)          *         * 1975.69  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  213.24  * Top Width (ft)        *         *  213.24  *         *
* Vel Total (ft/s)      *   16.20  * Avg. Vel. (ft/s)      *         *   16.20  *         *
* Max Chl Dpth (ft)     *    9.67  * Hydr. Depth (ft)      *         *    9.27  *         *
* Conv. Total (cfs)     *420690.4  * Conv. (cfs)           *         *420690.4  *         *
* Length Wtd. (ft)      *  245.16  * Wetted Per. (ft)      *         *  221.65  *         *
* Min Ch El (ft)        * 2502.00  * Shear (lb/sq ft)      *         *    3.22  *         *
```

```
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   52.15  *         *
* Frctn Loss (ft)        *    1.34  * Cum Volume (acre-ft)   *         *  171.75  *         *
* C & E Loss (ft)        *    0.11  * Cum SA (acres)         *         *   16.64  *         *
*****************************************************************************************************

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: River #1
REACH: Reach #1          RS: 700

INPUT
Description:
Station Elevation Data    num=      9
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2518   92.14    2517  102.14    2517  117.14  2500.8  319.62  2500.8
  334.67    2517  344.67    2517  402.46    2517  548.15    2518

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0     .05  102.14     .03  402.46     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        102.14  402.46          293.91  294.12  299.31            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2514.30  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    3.70  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2510.60  * Reach Len. (ft)        *  293.91  *  294.12  *  299.31  *
* Crit W.S. (ft)         * 2509.85  * Flow Area (sq ft)      *         * 2072.69  *         *
* E.G. Slope (ft/ft)     *0.005157  * Area (sq ft)           *         * 2072.69  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)         *  220.65  * Top Width (ft)         *         *  220.65  *         *
* Vel Total (ft/s)       *   15.44  * Avg. Vel. (ft/s)       *         *   15.44  *         *
* Max Chl Dpth (ft)      *    9.80  * Hydr. Depth (ft)       *         *    9.39  *         *
* Conv. Total (cfs)      *445604.5  * Conv. (cfs)            *         *445604.5  *         *
* Length Wtd. (ft)       *  294.12  * Wetted Per. (ft)       *         *  229.20  *         *
* Min Ch El (ft)         * 2500.80  * Shear (lb/sq ft)       *         *    2.91  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   44.95  *         *
* Frctn Loss (ft)        *    1.47  * Cum Volume (acre-ft)   *         *  160.36  *         *
* C & E Loss (ft)        *    0.05  * Cum SA (acres)         *         *   15.42  *         *
*****************************************************************************************************

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: River #1
REACH: Reach #1          RS: 650

INPUT
Description:
Station Elevation Data    num=      11
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2516    43.8    2516  112.67    2514  122.67    2514  135.67  2499.4
  342.54  2499.4  355.84    2514  365.85    2514  428.98    2514  447.53    2515
   461.5    2516

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

```
     0    .05  122.67    .03  447.53    .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       122.67  447.53          225.88  219.62  226.45            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
**********************************************************************************************
* E.G. Elev (ft)        * 2512.77  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    3.52  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2509.25  * Reach Len. (ft)       *  225.88  *  219.62  *  226.45  *
* Crit W.S. (ft)        * 2508.31  * Flow Area (sq ft)     *         * 2125.68  *         *
* E.G. Slope (ft/ft)    *0.004857  * Area (sq ft)          *         * 2125.68  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  224.62  * Top Width (ft)        *         *  224.62  *         *
* Vel Total (ft/s)      *   15.05  * Avg. Vel. (ft/s)      *         *   15.05  *         *
* Max Chl Dpth (ft)     *    9.85  * Hydr. Depth (ft)      *         *    9.46  *         *
* Conv. Total (cfs)     *459178.8  * Conv. (cfs)           *         *459178.8  *         *
* Length Wtd. (ft)      *  219.62  * Wetted Per. (ft)       *         *  233.39  *         *
* Min Ch El (ft)        * 2499.40  * Shear (lb/sq ft)      *         *    2.76  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   41.57  *         *
* Frctn Loss (ft)       *    0.99  * Cum Volume (acre-ft)   *         *  146.19  *         *
* C & E Loss (ft)       *    0.10  * Cum SA (acres)         *         *   13.91  *         *
**********************************************************************************************

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: River #1
REACH: Reach #1          RS: 600

INPUT
Description:
Station Elevation Data    num=      26
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
     0   2516    5.03    2515    7.53    2514    8.86    2514   39.93    2515
  54.49    2516   74.68    2516   80.26    2515   82.96    2514   86.05    2513
  98.03    2512  126.25    2511  136.25    2511  141.36    2511  151.36    2511
 162.66  2498.3  372.87  2498.3  384.17    2511  394.17    2511  421.34    2512
 423.01    2512  446.66    2512  488.33    2513  504.23    2514  673.38    2515
 815.39    2516

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
     0    .05   80.26    .03  421.34    .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        80.26  421.34          296.17  292.59  291.63            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
**********************************************************************************************
* E.G. Elev (ft)        * 2511.68  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    3.18  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2508.50  * Reach Len. (ft)       *  296.17  *  292.59  *  291.63  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         * 2236.65  *         *
* E.G. Slope (ft/ft)    *0.004196  * Area (sq ft)          *         * 2236.65  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  228.36  * Top Width (ft)        *         *  228.36  *         *
* Vel Total (ft/s)      *   14.31  * Avg. Vel. (ft/s)      *         *   14.31  *         *
* Max Chl Dpth (ft)     *   10.20  * Hydr. Depth (ft)      *         *    9.79  *         *
* Conv. Total (cfs)     *494016.7  * Conv. (cfs)           *         *494016.7  *         *
* Length Wtd. (ft)      *  292.59  * Wetted Per. (ft)       *         *  237.52  *         *
* Min Ch El (ft)        * 2498.30  * Shear (lb/sq ft)      *         *    2.47  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   35.29  *         *
* Frctn Loss (ft)       *    1.18  * Cum Volume (acre-ft)   *         *  135.19  *         *
* C & E Loss (ft)       *    0.04  * Cum SA (acres)         *         *   12.77  *         *
```

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

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: River #1
REACH: Reach #1          RS: 550

INPUT
Description:
Station Elevation Data    num=      17
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
      0    2515   61.52    2515  103.09    2514  105.64    2513  107.96    2512
   109.8    2511  116.57    2510   119.7    2510   129.7    2510   141.4  2496.9
  349.53  2496.9  361.23    2510  371.23    2510   372.2    2510  425.74    2511
  455.31    2512  497.23    2513

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
      0     .05  103.09     .03  361.23     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        103.09  361.23          174.17  170.22  169.02            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)         * 2510.46  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    3.03  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2507.43  * Reach Len. (ft)        *  174.17  *  170.22  *  169.02  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)       *         * 2289.54  *         *
* E.G. Slope (ft/ft)     *0.003856  * Area (sq ft)           *         * 2289.54  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)         *  226.93  * Top Width (ft)         *         *  226.93  *         *
* Vel Total (ft/s)       *   13.98  * Avg. Vel. (ft/s)       *         *   13.98  *         *
* Max Chl Dpth (ft)      *   10.53  * Hydr. Depth (ft)       *         *   10.09  *         *
* Conv. Total (cfs)      *515322.1  * Conv. (cfs)            *         *515322.1  *         *
* Length Wtd. (ft)       *  170.22  * Wetted Per. (ft)       *         *  236.35  *         *
* Min Ch El (ft)         * 2496.90  * Shear (lb/sq ft)       *         *    2.33  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   32.59  *         *
* Frctn Loss (ft)        *    0.64  * Cum Volume (acre-ft)   *         *  119.99  *         *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)         *         *   11.24  *         *
*****************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 500

INPUT
Description:
Station Elevation Data    num=      22
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
      0    2515   25.13    2514   48.43    2513   49.79    2512   51.21    2511
   59.88    2510   69.88    2510   81.58  2496.1  288.68  2496.1  301.38    2510
  311.38    2510  313.34    2511  371.25    2511  402.18    2512  409.65    2512
  433.25    2511   454.4    2511  482.62    2513  540.62    2513  626.61    2513
  750.39    2514  852.01    2515

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
      0     .05   48.43     .03  371.25     .05
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        48.43  371.25          312.56  311.97  314.78            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
**********************************************************************************************
* E.G. Elev (ft)        * 2509.79  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    2.93  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2506.86  * Reach Len. (ft)      *  312.56  *  311.97  *  314.78  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         * 2330.84  *         *
* E.G. Slope (ft/ft)    *0.003621  * Area (sq ft)         *         * 2330.84  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)           *         *32000.00  *         *
* Top Width (ft)        *  225.99  * Top Width (ft)       *         *  225.99  *         *
* Vel Total (ft/s)      *   13.73  * Avg. Vel. (ft/s)     *         *   13.73  *         *
* Max Chl Dpth (ft)     *   10.76  * Hydr. Depth (ft)     *         *   10.31  *         *
* Conv. Total (cfs)     *531817.4  * Conv. (cfs)          *         *531817.4  *         *
* Length Wtd. (ft)      *  311.97  * Wetted Per. (ft)     *         *  235.75  *         *
* Min Ch El (ft)        * 2496.10  * Shear (lb/sq ft)     *         *    2.23  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   30.68  *         *
* Frctn Loss (ft)       *    1.02  * Cum Volume (acre-ft)  *         *  110.96  *         *
* C & E Loss (ft)       *    0.10  * Cum SA (acres)        *         *   10.36  *         *
**********************************************************************************************

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: River #1
REACH: Reach #1          RS: 450

INPUT
Description:
Station Elevation Data    num=      13
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0   2513   35.18    2512   47.41    2511   50.12    2510   59.89    2510
   60.57    2509   70.57    2509   83.57  2494.6  289.02  2494.6  302.02    2509
  312.02    2509  313.47    2510  427.13    2510

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***************************************************
      0     .05   35.18     .03  313.47     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        35.18  313.47          276.48  275.96     282            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
**********************************************************************************************
* E.G. Elev (ft)        * 2508.67  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    2.59  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2506.08  * Reach Len. (ft)      *  276.48  *  275.96  *  282.00  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         * 2477.60  *         *
* E.G. Slope (ft/ft)    *0.002964  * Area (sq ft)         *         * 2477.60  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)           *         *32000.00  *         *
* Top Width (ft)        *  226.18  * Top Width (ft)       *         *  226.18  *         *
* Vel Total (ft/s)      *   12.92  * Avg. Vel. (ft/s)     *         *   12.92  *         *
* Max Chl Dpth (ft)     *   11.48  * Hydr. Depth (ft)     *         *   10.95  *         *
* Conv. Total (cfs)     *587733.4  * Conv. (cfs)          *         *587733.4  *         *
* Length Wtd. (ft)      *  275.96  * Wetted Per. (ft)     *         *  236.38  *         *
* Min Ch El (ft)        * 2494.60  * Shear (lb/sq ft)     *         *    1.94  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   25.05  *         *
* Frctn Loss (ft)       *    0.73  * Cum Volume (acre-ft)  *         *   93.74  *         *
* C & E Loss (ft)       *    0.09  * Cum SA (acres)        *         *    8.74  *         *
**********************************************************************************************

CROSS SECTION
```

RIVER: River #1
REACH: Reach #1 RS: 400

INPUT
Description:
Station Elevation Data num= 23
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2512 9.62 2513 19.24 2514 74.73 2515 222.35 2515
290.86 2513 325.73 2512 328.66 2511 331.67 2510 334.05 2509
335.22 2509 338.2 2509 340.45 2509 350.45 2509 364.95 2493.2
567.13 2493.2 581.63 2509 591.63 2509 594.37 2509 651.69 2509
690.61 2509 784.38 2509 870.86 2510

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 325.73 .03 651.69 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
325.73 651.69 248.4 246.38 244.38 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2507.85 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 2.28 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2505.56 * Reach Len. (ft) * 248.40 * 246.38 * 244.38 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 2640.10 * *
* E.G. Slope (ft/ft) *0.002390 * Area (sq ft) * * 2640.10 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 224.87 * Top Width (ft) * * 224.87 * *
* Vel Total (ft/s) * 12.12 * Avg. Vel. (ft/s) * * 12.12 * *
* Max Chl Dpth (ft) * 12.36 * Hydr. Depth (ft) * * 11.74 * *
* Conv. Total (cfs) *654558.6 * Conv. (cfs) * *654558.6 * *
* Length Wtd. (ft) * 246.38 * Wetted Per. (ft) * * 235.74 * *
* Min Ch El (ft) * 2493.20 * Shear (lb/sq ft) * * 1.67 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 20.25 * *
* Frctn Loss (ft) * 0.64 * Cum Volume (acre-ft) * * 77.53 * *
* C & E Loss (ft) * 0.04 * Cum SA (acres) * * 7.31 * *
****

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 350

INPUT
Description:
Station Elevation Data num= 17
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2512 51.45 2511 59.82 2510 62.17 2509 64.45 2508
66.67 2508 68.88 2508 75.87 2507 85.87 2507 99.47 2492
282.7 2492 296.3 2507 306.3 2507 354.2 2508 355.99 2508
357.95 2508 410.83 2509

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 51.45 .03 357.95 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
51.45 357.95 102 102 102 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2507.16 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 2.71 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2504.45 * Reach Len. (ft) * 102.00 * 102.00 * 102.00 *

```
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         * 2421.44  *         *
* E.G. Slope (ft/ft)    *0.002852  * Area (sq ft)          *         * 2421.44  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  205.80  * Top Width (ft)        *         *  205.80  *         *
* Vel Total (ft/s)      *   13.22  * Avg. Vel. (ft/s)      *         *   13.22  *         *
* Max Chl Dpth (ft)     *   12.45  * Hydr. Depth (ft)      *         *   11.77  *         *
* Conv. Total (cfs)     *599203.3  * Conv. (cfs)           *         *599203.3  *         *
* Length Wtd. (ft)      *  102.00  * Wetted Per. (ft)      *         *  216.84  *         *
* Min Ch El (ft)        * 2492.00  * Shear (lb/sq ft)      *         *    1.99  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   26.28  *         *
* Frctn Loss (ft)       *    0.28  * Cum Volume (acre-ft)   *         *   63.22  *         *
* C & E Loss (ft)       *    0.04  * Cum SA (acres)         *         *    6.09  *         *
*****************************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 325

INPUT
Description:
Station Elevation Data    num=      28
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2513   22.25    2513   32.72    2512   71.44    2511   79.59    2510
   89.4    2509   96.55    2508   98.58    2507  100.47    2507  110.19    2507
  120.19    2507  134.39  2491.5  317.01  2491.5  331.21    2507  341.21    2507
  343.09    2507  365.32    2507  368.01    2507   370.7    2507  374.19    2508
  379.86    2509  385.53    2510  393.68    2511  400.54    2513  440.52    2513
  445.44    2513  549.07    2513  595.08    2512

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
************************************************
      0     .05   71.44     .03  393.68     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        71.44  393.68             128     128     128            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2506.84  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    2.59  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)        * 2504.26  * Reach Len. (ft)       *  128.00  *  128.00  *  128.00  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)      *         * 2478.54  *         *
* E.G. Slope (ft/ft)    *0.002645  * Area (sq ft)          *         * 2478.54  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  205.99  * Top Width (ft)        *         *  205.99  *         *
* Vel Total (ft/s)      *   12.91  * Avg. Vel. (ft/s)      *         *   12.91  *         *
* Max Chl Dpth (ft)     *   12.76  * Hydr. Depth (ft)      *         *   12.03  *         *
* Conv. Total (cfs)     *622207.4  * Conv. (cfs)           *         *622207.4  *         *
* Length Wtd. (ft)      *  128.00  * Wetted Per. (ft)      *         *  217.22  *         *
* Min Ch El (ft)        * 2491.50  * Shear (lb/sq ft)      *         *    1.88  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   24.33  *         *
* Frctn Loss (ft)       *    0.32  * Cum Volume (acre-ft)   *         *   57.48  *         *
* C & E Loss (ft)       *    0.05  * Cum SA (acres)         *         *    5.61  *         *
*****************************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 300

INPUT
Description:
Station Elevation Data    num=      24
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
```

```
     0   2511     1.7    2510    3.44    2509    7.08    2508    9.07    2508
  10.95    2508   20.48    2508   21.21    2508   26.01    2507   36.01    2507
  50.81  2490.9  233.35  2490.9  248.15    2507  258.15    2507  261.99    2508
 268.02    2508  269.83    2508  271.59    2508  273.38    2508  275.21    2509
 277.12    2510  283.77    2511  302.46    2512  326.78    2512

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
**************************************************
     0     .05       0     .03  283.77     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           0  283.77          142.87  142.74  142.86            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2506.47  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    2.43  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2504.04  * Reach Len. (ft)        *    1.00  *    1.00  *    1.00  *
* Crit W.S. (ft)         * 2500.58  * Flow Area (sq ft)      *         * 2558.23  *         *
* E.G. Slope (ft/ft)     *0.002395  * Area (sq ft)           *         * 2558.23  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)         *  206.71  * Top Width (ft)         *         *  206.71  *         *
* Vel Total (ft/s)       *   12.51  * Avg. Vel. (ft/s)       *         *   12.51  *         *
* Max Chl Dpth (ft)      *   13.14  * Hydr. Depth (ft)       *         *   12.38  *         *
* Conv. Total (cfs)      *653840.5  * Conv. (cfs)            *         *653840.5  *         *
* Length Wtd. (ft)       *    1.00  * Wetted Per. (ft)       *         *  218.25  *         *
* Min Ch El (ft)         * 2490.90  * Shear (lb/sq ft)       *         *    1.75  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   21.93  *         *
* Frctn Loss (ft)        *    0.00  * Cum Volume (acre-ft)   *         *   50.08  *         *
* C & E Loss (ft)        *    0.05  * Cum SA (acres)         *         *    5.00  *         *
*****************************************************************************************************

BRIDGE


RIVER: River #1
REACH: Reach #1           RS: 295

INPUT
Description:
Distance from Upstream XS =       1
Deck/Roadway Width        =     136
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
   num=      10
    Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
***************************************************************************
  -45.78 2511.91 2511.91       0 2511.91 2510.16    42.5 2511.86 2510.11
     85 2511.81 2510.06   127.5 2511.76 2510.01     170 2511.71 2509.96
   212.5 2511.66 2509.91     265 2511.61 2509.86  276.12 2511.61 2509.86
  295.19 2511.61 2511.61

Upstream Bridge Cross Section Data
Station Elevation Data    num=      24
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
     0   2511     1.7    2510    3.44    2509    7.08    2508    9.07    2508
  10.95    2508   20.48    2508   21.21    2508   26.01    2507   36.01    2507
  50.81  2490.9  233.35  2490.9  248.15    2507  258.15    2507  261.99    2508
 268.02    2508  269.83    2508  271.59    2508  273.38    2508  275.21    2509
 277.12    2510  283.77    2511  302.46    2512  326.78    2512

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
**************************************************
     0     .05       0     .03  283.77     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
           0  283.77            .1       .3
```

Downstream Deck/Roadway Coordinates
num= 10
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
****
-17 2511.91 2511.91 0 2511.91 2510.16 42.5 2511.86 2510.11
85 2511.81 2510.06 127.5 2511.76 2510.01 170 2511.71 2509.96
212.5 2511.66 2509.91 265 2511.61 2509.86 295.19 2511.61 2509.86
296.11 2511.61 2511.61

Downstream Bridge Cross Section Data
Station Elevation Data num= 22
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2511 5.21 2510 10.08 2509 15.67 2508 20.42 2507
21.51 2506 22.64 2505 35.67 2504 45.67 2504 58.17 2490.2
240.5 2490.2 254.5 2504 264.5 2504 280.77 2504 282.48 2505
284.14 2506 285.85 2507 291.86 2508 294.96 2509 296.11 2510
308.44 2510 313.58 2510

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .045 0 .03 296.11 .04

Bank Sta: Left Right Coeff Contr. Expan.
0 296.11 .1 .3

Upstream Embankment side slope = 1.5 horiz. to 1.0 vertical
Downstream Embankment side slope = 1.5 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 2512.19
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 3

Pier Data
Pier Station Upstream= 69.45 Downstream= 78.8
Upstream num= 2
Width Elev Width Elev
****
3 2490 3 2511.91
Downstream num= 2
Width Elev Width Elev
****
3 2490 3 2511.91

Pier Data
Pier Station Upstream= 138.97 Downstream= 148.04
Upstream num= 2
Width Elev Width Elev
****
3 2490 3 2511.91
Downstream num= 2
Width Elev Width Elev
****
3 2490 3 2511.91

Pier Data
Pier Station Upstream= 208.52 Downstream= 217.6
Upstream num= 2
Width Elev Width Elev
****
3 2490 3 2511.91
Downstream num= 2
Width Elev Width Elev
****
3 2490 3 2511.91

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #100 year

```
*****************************************************************************************
* E.G. US. (ft)          *    2506.47  * Element              *Inside BR US *Inside BR DS *
* W.S. US. (ft)          *    2504.04  * E.G. Elev (ft)       *    2506.42  *    2505.78  *
* Q Total (cfs)          *   32000.00  * W.S. Elev (ft)       *    2503.50  *    2502.93  *
* Q Bridge (cfs)         *   32000.00  * Crit W.S. (ft)       *    2500.88  *    2500.20  *
* Q Weir (cfs)           *             * Max Chl Dpth (ft)     *      12.60  *      12.73  *
* Weir Sta Lft (ft)      *             * Vel Total (ft/s)      *      13.72  *      13.54  *
* Weir Sta Rgt (ft)      *             * Flow Area (sq ft)     *    2332.23  *    2362.95  *
* Weir Submerg           *             * Froude # Chl          *       0.70  *       0.69  *
* Weir Max Depth (ft)    *             * Specif Force (cu ft)  *   28020.36  *   28173.17  *
* Min El Weir Flow (ft)  *    2512.19  * Hydr Depth (ft)       *      11.86  *      11.95  *
* Min El Prs (ft)        *    2510.16  * W.P. Total (ft)       *     283.36  *     285.06  *
* Delta EG (ft)          *       0.82  * Conv. Total (cfs)     *  470909.6  *  479375.5  *
* Delta WS (ft)          *       0.88  * Top Width (ft)        *     196.70  *     197.78  *
* BR Open Area (sq ft)   *    3783.91  * Frctn Loss (ft)       *       0.62  *       0.02  *
* BR Open Vel (ft/s)     *      13.72  * C & E Loss (ft)       *       0.02  *       0.11  *
* Coef of Q              *             * Shear Total (lb/sq ft) *      2.37  *       2.31  *
* Br Sel Method          *Energy only  * Power Total (lb/ft s)  *     32.56  *      31.23  *
*****************************************************************************************
```

Warning: Pier drag coefficient of 2.0 assumed for Class B flow.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 290

INPUT
Description:
Station Elevation Data num= 22

```
   Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev
*******************************************************************************
     0   2511    5.21   2510   10.08   2509   15.67   2508   20.42   2507
  21.51   2506   22.64   2505   35.67   2504   45.67   2504   58.17  2490.2
  240.5  2490.2   254.5   2504   264.5   2504  280.77   2504  282.48   2505
 284.14   2506  285.85   2507  291.86   2508  294.96   2509  296.11   2510
 308.44   2510  313.58   2510
```

Manning's n Values num= 3

```
   Sta   n Val    Sta   n Val    Sta   n Val
***********************************************
     0   .045      0    .03  296.11    .04
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 296.11 85 85 85 .1 .3

CROSS SECTION OUTPUT Profile #100 year

```
*****************************************************************************************
* E.G. Elev (ft)         * 2505.66  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    2.49  * Wt. n-Val.           *          *    0.030  *          *
* W.S. Elev (ft)         * 2503.16  * Reach Len. (ft)      *   85.00  *   85.00  *   85.00  *
```

```
* Crit W.S. (ft)        *         * Flow Area (sq ft)      *         * 2524.81  *         *
* E.G. Slope (ft/ft)    *0.002503  * Area (sq ft)          *         * 2524.81  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  207.22  * Top Width (ft)         *         *  207.22  *         *
* Vel Total (ft/s)      *   12.67  * Avg. Vel. (ft/s)       *         *   12.67  *         *
* Max Chl Dpth (ft)     *   12.96  * Hydr. Depth (ft)       *         *   12.18  *         *
* Conv. Total (cfs)     *639597.0  * Conv. (cfs)            *         *639597.0  *         *
* Length Wtd. (ft)      *   85.00  * Wetted Per. (ft)       *         *  218.29  *         *
* Min Ch El (ft)        * 2490.20  * Shear (lb/sq ft)       *         *    1.81  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   22.91  *         *
* Frctn Loss (ft)       *    0.33  * Cum Volume (acre-ft)   *         *   42.37  *         *
* C & E Loss (ft)       *    0.24  * Cum SA (acres)         *         *    4.36  *         *
*****************************************************************************************************

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.

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 275

INPUT
Description:
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2509    4.38    2508    8.49    2507   14.17    2506   20.74    2505
   44.18    2504   54.18    2504   68.18  2489.8   73.17    2490  100.19    2490
   233.1  2489.8   247.1    2504   257.1    2504  273.91    2504  275.67    2505
  278.33    2506  316.55    2507

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
      0    .045   14.17     .03  278.33     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         14.17  278.33              264     264     264            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2505.09  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    4.88  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)        * 2500.21  * Reach Len. (ft)        *  264.00  *  264.00  *  264.00  *
* Crit W.S. (ft)        * 2500.21  * Flow Area (sq ft)      *         * 1805.18  *         *
* E.G. Slope (ft/ft)    *0.006552  * Area (sq ft)           *         * 1805.18  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)        *  185.45  * Top Width (ft)         *         *  185.45  *         *
* Vel Total (ft/s)      *   17.73  * Avg. Vel. (ft/s)       *         *   17.73  *         *
* Max Chl Dpth (ft)     *   10.41  * Hydr. Depth (ft)       *         *    9.73  *         *
* Conv. Total (cfs)     *395320.5  * Conv. (cfs)            *         *395320.5  *         *
* Length Wtd. (ft)      *  264.00  * Wetted Per. (ft)       *         *  194.17  *         *
* Min Ch El (ft)        * 2489.80  * Shear (lb/sq ft)       *         *    3.80  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   67.42  *         *
* Frctn Loss (ft)       *    1.73  * Cum Volume (acre-ft)   *         *   38.15  *         *
* C & E Loss (ft)       *    0.01  * Cum SA (acres)         *         *    3.97  *         *
*****************************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program selected the water surface that had the least amount of error between computed and
         assumed values.
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: River #1
REACH: Reach #1 RS: 200

INPUT
Description:
Station Elevation Data num= 22
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2507 89.5 2507 275.72 2505 298 2504 311.14 2503
313.65 2502 316.05 2501 317.97 2500 323.7 2500 333.7 2500
345.7 2488 402.4 2488 436.93 2488 513.81 2488 525.81 2500
535.81 2500 559.95 2503 605.45 2504 846.35 2511 859.53 2512
882.51 2513 914.95 2514

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .045 311.14 .03 559.95 .04

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
311.14 559.95 273.87 293.94 300.79 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2503.01 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 4.84 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2498.17 * Reach Len. (ft) * 273.87 * 293.94 * 300.79 *
* Crit W.S. (ft) * 2498.17 * Flow Area (sq ft) * * 1813.28 * *
* E.G. Slope (ft/ft) *0.006576 * Area (sq ft) * * 1813.28 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 188.45 * Top Width (ft) * * 188.45 * *
* Vel Total (ft/s) * 17.65 * Avg. Vel. (ft/s) * * 17.65 * *
* Max Chl Dpth (ft) * 10.17 * Hydr. Depth (ft) * * 9.62 * *
* Conv. Total (cfs) *394623.7 * Conv. (cfs) * *394623.7 * *
* Length Wtd. (ft) * 293.94 * Wetted Per. (ft) * * 196.88 * *
* Min Ch El (ft) * 2488.00 * Shear (lb/sq ft) * * 3.78 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 66.72 * *
* Frctn Loss (ft) * 1.62 * Cum Volume (acre-ft) * * 27.18 * *
* C & E Loss (ft) * 0.32 * Cum SA (acres) * * 2.84 * *
****

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
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.
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: River #1
REACH: Reach #1 RS: 150

INPUT
Description:
Station Elevation Data num= 16
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2502 5.17 2502 78.66 2501 80.48 2500 95.5 2499
105.5 2499 118.5 2486.2 297.77 2486.2 310.77 2499 320.77 2499
323.2 2499 325.71 2500 331.93 2501 340.78 2502 358.61 2502

```
  358.9    2502

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***************************************************
      0     .05   78.66     .03  340.78     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        78.66  340.78             283  287.45  289.16            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2500.77  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    3.76  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2497.01  * Reach Len. (ft)        *  283.00  *  287.45  *  289.16  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)       *         * 2057.34  *         *
* E.G. Slope (ft/ft)     *0.004707  * Area (sq ft)           *         * 2057.34  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)         *  201.24  * Top Width (ft)         *         *  201.24  *         *
* Vel Total (ft/s)       *   15.55  * Avg. Vel. (ft/s)       *         *   15.55  *         *
* Max Chl Dpth (ft)      *   10.81  * Hydr. Depth (ft)       *         *   10.22  *         *
* Conv. Total (cfs)      *466414.7  * Conv. (cfs)            *         *466414.7  *         *
* Length Wtd. (ft)       *  287.45  * Wetted Per. (ft)       *         *  210.10  *         *
* Min Ch El (ft)         * 2486.20  * Shear (lb/sq ft)       *         *    2.88  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   44.76  *         *
* Frctn Loss (ft)        *    1.39  * Cum Volume (acre-ft)   *         *   14.12  *         *
* C & E Loss (ft)        *    0.16  * Cum SA (acres)         *         *    1.53  *         *
*****************************************************************************************************

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: River #1
REACH: Reach #1          RS: 100

INPUT
Description:
Station Elevation Data    num=      44
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2501   59.43    2500   74.75    2499   76.67    2498    78.5    2497
   84.73    2496   90.07    2495   93.09    2494   95.46    2493   97.85    2492
  100.17    2491   102.5    2490  112.09    2489  135.78    2488  158.68    2487
  184.75    2487  186.54    2487  239.34    2486  254.14    2486   259.3    2487
  261.93    2487  262.97    2486   265.1    2485  284.74    2484  320.02    2484
  320.83    2485  321.62    2486  322.41    2487  324.25    2488  325.51    2489
  326.78    2490  328.08    2491  329.34    2492  330.57    2493  331.84    2494
  336.11    2495  345.88    2496  348.18    2497  350.24    2498  351.98    2499
  353.85    2500  408.32    2501     453    2502  457.38    2502

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***************************************************
      0    .045   59.43     .03  353.85     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
        59.43  353.85            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2499.21  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    3.22  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2496.00  * Reach Len. (ft)        *         *         *         *
* Crit W.S. (ft)         * 2495.07  * Flow Area (sq ft)      *         * 2223.50  *         *
* E.G. Slope (ft/ft)     *0.005001  * Area (sq ft)           *         * 2223.50  *         *
```

```
* Q Total (cfs)          *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)          *  261.12  * Top Width (ft)        *         *  261.12  *         *
* Vel Total (ft/s)        *   14.39  * Avg. Vel. (ft/s)      *         *   14.39  *         *
* Max Chl Dpth (ft)       *   12.00  * Hydr. Depth (ft)      *         *    8.52  *         *
* Conv. Total (cfs)       *452480.5  * Conv. (cfs)           *         *452480.5  *         *
* Length Wtd. (ft)        *          * Wetted Per. (ft)      *         *  267.00  *         *
* Min Ch El (ft)          * 2484.00  * Shear (lb/sq ft)      *         *    2.60  *         *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *         *   37.42  *         *
* Frctn Loss (ft)         *          * Cum Volume (acre-ft)  *         *         *         *
* C & E Loss (ft)         *          * Cum SA (acres)        *         *         *         *
*****************************************************************************************************

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

SUMMARY OF MANNING'S N VALUES

River:River #1
*****************************************************************
*     Reach      *   River Sta.   *   n1    *   n2    *   n3    *
*****************************************************************
*Reach #1        *   1600         *   .055*     .03*     .55*
*Reach #1        *   1500         *   .055*     .03*    .055*
*Reach #1        *   1450         *   .055*     .03*    .055*
*Reach #1        *   1400         *   .055*     .03*    .055*
*Reach #1        *   1350         *   .055*     .03*    .055*
*Reach #1        *   1325         *Bridge   *       *       *
*Reach #1        *   1300         *   .055*     .03*    .055*
*Reach #1        *   1230         *    .05*     .03*     .05*
*Reach #1        *   1220         *    .05*     .03*     .05*
*Reach #1        *   1200         *    .05*     .03*     .05*
*Reach #1        *   1120         *    .05*     .03*     .05*
*Reach #1        *   1110         *    .05*     .03*     .05*
*Reach #1        *   1100         *    .05*     .03*     .05*
*Reach #1        *   1050         *    .05*     .03*     .05*
*Reach #1        *   1010         *    .05*     .03*     .05*
*Reach #1        *   1000         *    .05*     .03*     .05*
*Reach #1        *   990          *    .05*     .03*     .05*
*Reach #1        *   975          *    .05*     .03*     .05*
*Reach #1        *   965          *    .05*     .03*     .05*
*Reach #1        *   950          *    .05*     .03*     .05*
*Reach #1        *   900          *    .05*     .03*     .05*
*Reach #1        *   875          *    .05*     .03*     .05*
*Reach #1        *   865          *    .05*     .03*     .05*
*Reach #1        *   850          *    .05*     .03*     .05*
*Reach #1        *   825          *    .05*     .03*     .05*
*Reach #1        *   800          *    .05*     .03*     .05*
*Reach #1        *   750          *    .05*     .03*     .05*
*Reach #1        *   700          *    .05*     .03*     .05*
*Reach #1        *   650          *    .05*     .03*     .05*
*Reach #1        *   600          *    .05*     .03*     .05*
*Reach #1        *   550          *    .05*     .03*     .05*
*Reach #1        *   500          *    .05*     .03*     .05*
*Reach #1        *   450          *    .05*     .03*     .05*
*Reach #1        *   400          *    .05*     .03*     .05*
*Reach #1        *   350          *    .05*     .03*     .05*
*Reach #1        *   325          *    .05*     .03*     .05*
*Reach #1        *   300          *    .05*     .03*     .05*
*Reach #1        *   295          *Bridge   *       *       *
*Reach #1        *   290          *   .045*     .03*     .04*
*Reach #1        *   275          *   .045*     .03*     .04*
*Reach #1        *   200          *   .045*     .03*     .04*
*Reach #1        *   150          *    .05*     .03*     .05*
*Reach #1        *   100          *   .045*     .03*     .04*
*****************************************************************

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

SUMMARY OF REACH LENGTHS

River: River #1
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Reach	River Sta.	Left	Channel	Right
Reach #1	1600	714.82	679.46	667.01
Reach #1	1500	249.54	214.53	208.71
Reach #1	1450	208.29	198.71	196.74
Reach #1	1400	208.05	211.15	211.03
Reach #1	1350	267.52	277.24	286.29
Reach #1	1325	Bridge		
Reach #1	1300	385.44	383.38	385.44
Reach #1	1230	47.48	47.44	47.31
Reach #1	1220	415.98	411.79	408.49
Reach #1	1200	57.6	56.56	56.61
Reach #1	1120	440.13	443.73	447.38
Reach #1	1110	46.86	36.39	42.45
Reach #1	1100	294	294	294
Reach #1	1050	162	162	162
Reach #1	1010	111.18	71.92	89.39
Reach #1	1000	147	147	147
Reach #1	990	168	168	168
Reach #1	975	151	151	151
Reach #1	965	148	148	148
Reach #1	950	216.27	206.23	199.7
Reach #1	900	159.29	151.89	152.98
Reach #1	875	143	143	143
Reach #1	865	153	153	153
Reach #1	850	199.44	201.98	207.35
Reach #1	825	112.29	110.49	112.71
Reach #1	800	269.66	259.43	283.94
Reach #1	750	249.08	245.16	242.37
Reach #1	700	293.91	294.12	299.31
Reach #1	650	225.88	219.62	226.45
Reach #1	600	296.17	292.59	291.63
Reach #1	550	174.17	170.22	169.02
Reach #1	500	312.56	311.97	314.78
Reach #1	450	276.48	275.96	282
Reach #1	400	248.4	246.38	244.38
Reach #1	350	102	102	102
Reach #1	325	128	128	128
Reach #1	300	142.87	142.74	142.86
Reach #1	295	Bridge		
Reach #1	290	85	85	85
Reach #1	275	264	264	264
Reach #1	200	273.87	293.94	300.79
Reach #1	150	283	287.45	289.16
Reach #1	100			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: River #1

Reach	River Sta.	Contr.	Expan.
Reach #1	1600	.1	.3
Reach #1	1500	.1	.3
Reach #1	1450	.1	.3
Reach #1	1400	.1	.3
Reach #1	1350	.1	.3
Reach #1	1325	Bridge	
Reach #1	1300	.1	.3
Reach #1	1230	.1	.3
Reach #1	1220	.1	.3
Reach #1	1200	.1	.3
Reach #1	1120	.1	.3
Reach #1	1110	.1	.3
Reach #1	1100	.1	.3
Reach #1	1050	.1	.3

```
*Reach #1      *   1010   *     .1*     .3*
*Reach #1      *   1000   *     .1*     .3*
*Reach #1      *   990    *     .1*     .3*
*Reach #1      *   975    *     .1*     .3*
*Reach #1      *   965    *     .1*     .3*
*Reach #1      *   950    *     .1*     .3*
*Reach #1      *   900    *     .1*     .3*
*Reach #1      *   875    *     .1*     .3*
*Reach #1      *   865    *     .1*     .3*
*Reach #1      *   850    *     .1*     .3*
*Reach #1      *   825    *     .1*     .3*
*Reach #1      *   800    *     .1*     .3*
*Reach #1      *   750    *     .1*     .3*
*Reach #1      *   700    *     .1*     .3*
*Reach #1      *   650    *     .1*     .3*
*Reach #1      *   600    *     .1*     .3*
*Reach #1      *   550    *     .1*     .3*
*Reach #1      *   500    *     .1*     .3*
*Reach #1      *   450    *     .1*     .3*
*Reach #1      *   400    *     .1*     .3*
*Reach #1      *   350    *     .1*     .3*
*Reach #1      *   325    *     .1*     .3*
*Reach #1      *   300    *     .1*     .3*
*Reach #1      *   295    *Bridge   *       *
*Reach #1      *   290    *     .1*     .3*
*Reach #1      *   275    *     .1*     .3*
*Reach #1      *   200    *     .1*     .3*
*Reach #1      *   150    *     .1*     .3*
*Reach #1      *   100    *     .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 *
*          *          *        *   (cfs) *     (ft) *     (ft) *     (ft) *     (ft) *   (ft/ft) *   (ft/s) *   (sq ft) *     (ft) *            *
*****************************************************************************************************************************************************************************************
* Reach #1   * 1600      * 100 year * 32000.00 *  2540.00 *  2548.54 *  2548.54 *  2551.95 *  0.007058 *   14.81 *  2160.17 *   320.56 *
1.01 *
* Reach #1   * 1500      * 100 year * 32000.00 *  2532.00 *  2545.98 *        *  2547.85 *  0.003004 *   10.98 *  2914.35 *   350.97 *       0.67
*
* Reach #1   * 1450      * 100 year * 32000.00 *  2531.00 *  2545.39 *        *  2547.24 *  0.002652 *   10.90 *  2936.42 *   324.74 *       0.64
*
* Reach #1   * 1400      * 100 year * 32000.00 *  2530.00 *  2544.46 *        *  2546.63 *  0.003179 *   11.81 *  2709.60 *   303.95 *       0.70
*
* Reach #1   * 1350      * 100 year * 32000.00 *  2530.00 *  2544.10 *  2540.70 *  2545.96 *  0.002400 *   10.95 *  2922.19 *   299.25 *
0.62 *
* Reach #1   * 1325      *        *   Bridge *        *        *        *        *        *        *        *        *        *
* Reach #1   * 1300      * 100 year * 32000.00 *  2529.00 *  2542.18 *        *  2544.47 *  0.002992 *   12.12 *  2640.01 *   272.95 *       0.69
*
* Reach #1   * 1230      * 100 year * 32000.00 *  2529.00 *  2539.07 *  2539.07 *  2542.68 *  0.006674 *   15.27 *  2120.98 *   348.10 *
0.98 *
* Reach #1   * 1220      * 100 year * 32000.00 *  2527.00 *  2537.17 *  2536.63 *  2540.78 *  0.005458 *   15.24 *  2099.44 *   240.30 *
0.91 *
* Reach #1   * 1200      * 100 year * 32000.00 *  2526.00 *  2535.67 *        *  2538.59 *  0.004299 *   13.72 *  2331.91 *   260.29 *       0.81
*
* Reach #1   * 1120      * 100 year * 32000.00 *  2524.00 *  2536.02 *  2533.26 *  2538.17 *  0.002596 *   11.78 *  2715.89 *   258.96 *
0.64 *
* Reach #1   * 1110      * 100 year * 32000.00 *  2523.00 *  2532.00 *  2532.00 *  2536.22 *  0.006658 *   16.50 *  1939.98 *   227.66 *
1.00 *
* Reach #1   * 1100      * 100 year * 32000.00 *  2520.00 *  2531.30 *  2530.14 *  2534.72 *  0.004459 *   14.85 *  2155.41 *   218.42 *
0.83 *
* Reach #1   * 1050      * 100 year * 32000.00 *  2520.00 *  2528.88 *  2528.88 *  2533.04 *  0.006780 *   16.37 *  1955.18 *   237.18 *
1.00 *
* Reach #1   * 1010      * 100 year * 32000.00 *  2519.00 *  2526.58 *  2526.58 *  2530.13 *  0.007020 *   15.11 *  2118.14 *   299.89 *
1.00 *
* Reach #1   * 1000      * 100 year * 32000.00 *  2510.90 *  2524.45 *        *  2525.87 *  0.001480 *    9.56 *  3347.50 *   289.89 *       0.50
*
```

```
* Reach #1    * 990       * 100 year * 32000.00 *   2510.20 *   2524.35 *         *   2525.64 *   0.001140 *    9.11 *   3510.72 *    264.14 *        0.44
*
* Reach #1    * 975       * 100 year * 32000.00 *   2509.40 *   2523.91 *         *   2525.42 *   0.001301 *    9.85 *   3249.22 *    238.77 *        0.47
*
* Reach #1    * 965       * 100 year * 32000.00 *   2508.70 *   2523.65 *         *   2525.21 *   0.001310 *   10.02 *   3193.16 *    229.54 *        0.47
*
* Reach #1    * 950       * 100 year * 32000.00 *   2507.90 *   2523.17 *         *   2524.98 *   0.001504 *   10.80 *   2962.90 *    209.14 *        0.51
*
* Reach #1    * 900       * 100 year * 32000.00 *   2506.90 *   2521.77 *   2517.96 *   2524.50 *   0.002408 *   13.25 *   2414.55 *    176.76 *
0.63 *
* Reach #1    * 875       * 100 year * 32000.00 *   2506.20 *   2520.73 *         *   2524.03 *   0.003026 *   14.58 *   2194.30 *    164.54 *        0.70
*
* Reach #1    * 865       * 100 year * 32000.00 *   2505.50 *   2519.84 *         *   2523.53 *   0.003461 *   15.41 *   2076.23 *    158.29 *        0.75
*
* Reach #1    * 850       * 100 year * 32000.00 *   2504.80 *   2518.52 *   2516.96 *   2522.87 *   0.004330 *   16.75 *   1910.52 *    152.03 *
0.83 *
* Reach #1    * 825       * 100 year * 32000.00 *   2503.90 *   2516.05 *   2516.05 *   2521.69 *   0.006448 *   19.06 *   1679.00 *    149.49 *
1.00 *
* Reach #1    * 800       * 100 year * 32000.00 *   2503.30 *   2514.52 *   2514.52 *   2519.79 *   0.006480 *   18.42 *   1737.27 *    165.09 *
1.00 *
* Reach #1    * 750       * 100 year * 32000.00 *   2502.00 *   2511.68 *   2511.27 *   2515.75 *   0.005786 *   16.20 *   1975.69 *    213.24 *
0.94 *
* Reach #1    * 700       * 100 year * 32000.00 *   2500.80 *   2510.60 *   2509.85 *   2514.30 *   0.005157 *   15.44 *   2072.69 *    220.65 *
0.89 *
* Reach #1    * 650       * 100 year * 32000.00 *   2499.40 *   2509.25 *   2508.31 *   2512.77 *   0.004857 *   15.05 *   2125.68 *    224.62 *
0.86 *
* Reach #1    * 600       * 100 year * 32000.00 *   2498.30 *   2508.50 *         *   2511.68 *   0.004196 *   14.31 *   2236.65 *    228.36 *        0.81
*
* Reach #1    * 550       * 100 year * 32000.00 *   2496.90 *   2507.43 *         *   2510.46 *   0.003856 *   13.98 *   2289.54 *    226.93 *        0.78
*
* Reach #1    * 500       * 100 year * 32000.00 *   2496.10 *   2506.86 *         *   2509.79 *   0.003621 *   13.73 *   2330.84 *    225.99 *        0.75
*
* Reach #1    * 450       * 100 year * 32000.00 *   2494.60 *   2506.08 *         *   2508.67 *   0.002964 *   12.92 *   2477.60 *    226.18 *        0.69
*
* Reach #1    * 400       * 100 year * 32000.00 *   2493.20 *   2505.56 *         *   2507.85 *   0.002390 *   12.12 *   2640.10 *    224.87 *        0.62
*
* Reach #1    * 350       * 100 year * 32000.00 *   2492.00 *   2504.45 *         *   2507.16 *   0.002852 *   13.22 *   2421.44 *    205.80 *        0.68
*
* Reach #1    * 325       * 100 year * 32000.00 *   2491.50 *   2504.26 *         *   2506.84 *   0.002645 *   12.91 *   2478.54 *    205.99 *        0.66
*
* Reach #1    * 300       * 100 year * 32000.00 *   2490.90 *   2504.04 *   2500.58 *   2506.47 *   0.002395 *   12.51 *   2558.23 *    206.71 *
0.63 *
* Reach #1    * 295       *         *   Bridge *         *         *         *         *         *         *         *         *
* Reach #1    * 290       * 100 year * 32000.00 *   2490.20 *   2503.16 *         *   2505.66 *   0.002503 *   12.67 *   2524.81 *    207.22 *        0.64
*
* Reach #1    * 275       * 100 year * 32000.00 *   2489.80 *   2500.21 *   2500.21 *   2505.09 *   0.006552 *   17.73 *   1805.18 *    185.45 *
1.00 *
* Reach #1    * 200       * 100 year * 32000.00 *   2488.00 *   2498.17 *   2498.17 *   2503.01 *   0.006576 *   17.65 *   1813.28 *    188.45 *
1.00 *
* Reach #1    * 150       * 100 year * 32000.00 *   2486.20 *   2497.01 *         *   2500.77 *   0.004707 *   15.55 *   2057.34 *    201.24 *        0.86
*
* Reach #1    * 100       * 100 year * 32000.00 *   2484.00 *   2496.00 *   2495.07 *   2499.21 *   0.005001 *   14.39 *   2223.50 *    261.12 *
0.87 *
*****************************************************************************************************************************************
*****************************************
```

Profile Output Table - Standard Table 2

```
*****************************************************************************************************************************************
************************
* Reach       * River Sta   * Profile  * E.G. Elev * W.S. Elev * Vel Head * Frctn Loss * C & E Loss * Q Left * Q Channel * Q Right * Top Width *
*           *           *         *      (ft) *      (ft) *      (ft) *       (ft) *       (ft) *  (cfs) *     (cfs) *   (cfs) *      (ft) *
*****************************************************************************************************************************************
************************
* Reach #1    * 1600      * 100 year *   2551.95 *   2548.54 *    3.41 *      2.99 *      0.46 *       *  32000.00 *         *   320.56 *
* Reach #1    * 1500      * 100 year *   2547.85 *   2545.98 *    1.87 *      0.61 *      0.01 *       *  32000.00 *         *   350.97 *
* Reach #1    * 1450      * 100 year *   2547.24 *   2545.39 *    1.84 *      0.58 *      0.03 *       *  32000.00 *         *   324.74 *
* Reach #1    * 1400      * 100 year *   2546.63 *   2544.46 *    2.17 *      0.58 *      0.09 *       *  32000.00 *         *   303.95 *
* Reach #1    * 1350      * 100 year *   2545.96 *   2544.10 *    1.86 *      0.34 *      0.08 *       *  31999.98 *      0.02 *   299.25 *
* Reach #1    * 1325      *         *   Bridge *         *         *         *         *         *         *         *         *
* Reach #1    * 1300      * 100 year *   2544.47 *   2542.18 *    2.28 *      1.65 *      0.13 *       *  32000.00 *         *   272.95 *
```

* Reach #1	* 1230	* 100 year *	2542.68 *	2539.07 *	3.62 *	0.29 *	0.00 *	* 31962.60 *	37.41 *	348.10 *	
* Reach #1	* 1220	* 100 year *	2540.78 *	2537.17 *	3.61 *	1.99 *	0.21 *	* 32000.00 *	*	240.30 *	
* Reach #1	* 1200	* 100 year *	2538.59 *	2535.67 *	2.92 *	0.19 *	0.23 *	* 32000.00 *	*	260.29 *	
* Reach #1	* 1120	* 100 year *	2538.17 *	2536.02 *	2.16 *	1.75 *	0.21 *	* 32000.00 *	0.00 *	258.96 *	
* Reach #1	* 1110	* 100 year *	2536.22 *	2532.00 *	4.22 *	0.20 *	0.24 *	* 32000.00 *	*	227.66 *	
* Reach #1	* 1100	* 100 year *	2534.72 *	2531.30 *	3.42 *	1.60 *	0.07 *	* 32000.00 *	*	218.42 *	
* Reach #1	* 1050	* 100 year *	2533.04 *	2528.88 *	4.16 *	1.12 *	0.18 *	* 32000.00 *	*	237.18 *	
* Reach #1	* 1010	* 100 year *	2530.13 *	2526.58 *	3.54 *	0.20 *	0.64 *	* 32000.00 *	*	299.89 *	
* Reach #1	* 1000	* 100 year *	2525.87 *	2524.45 *	1.42 *	0.19 *	0.04 *	* 32000.00 *	*	289.89 *	
* Reach #1	* 990	* 100 year *	2525.64 *	2524.35 *	1.29 *	0.20 *	0.02 *	* 32000.00 *	*	264.14 *	
* Reach #1	* 975	* 100 year *	2525.42 *	2523.91 *	1.51 *	0.20 *	0.01 *	* 32000.00 *	*	238.77 *	
* Reach #1	* 965	* 100 year *	2525.21 *	2523.65 *	1.56 *	0.21 *	0.03 *	* 32000.00 *	*	229.54 *	
* Reach #1	* 950	* 100 year *	2524.98 *	2523.17 *	1.81 *	0.39 *	0.09 *	* 32000.00 *	*	209.14 *	
* Reach #1	* 900	* 100 year *	2524.50 *	2521.77 *	2.73 *	0.41 *	0.06 *	* 32000.00 *	*	176.76 *	
* Reach #1	* 875	* 100 year *	2524.03 *	2520.73 *	3.30 *	0.46 *	0.04 *	* 32000.00 *	*	164.54 *	
* Reach #1	* 865	* 100 year *	2523.53 *	2519.84 *	3.69 *	0.59 *	0.07 *	* 32000.00 *	*	158.29 *	
* Reach #1	* 850	* 100 year *	2522.87 *	2518.52 *	4.36 *	1.06 *	0.13 *	* 32000.00 *	*	152.03 *	
* Reach #1	* 825	* 100 year *	2521.69 *	2516.05 *	5.64 *	0.71 *	0.11 *	* 32000.00 *	*	149.49 *	
* Reach #1	* 800	* 100 year *	2519.79 *	2514.52 *	5.27 *	1.59 *	0.36 *	* 32000.00 *	*	165.09 *	
* Reach #1	* 750	* 100 year *	2515.75 *	2511.68 *	4.07 *	1.34 *	0.11 *	* 32000.00 *	*	213.24 *	
* Reach #1	* 700	* 100 year *	2514.30 *	2510.60 *	3.70 *	1.47 *	0.05 *	* 32000.00 *	*	220.65 *	
* Reach #1	* 650	* 100 year *	2512.77 *	2509.25 *	3.52 *	0.99 *	0.10 *	* 32000.00 *	*	224.62 *	
* Reach #1	* 600	* 100 year *	2511.68 *	2508.50 *	3.18 *	1.18 *	0.04 *	* 32000.00 *	*	228.36 *	
* Reach #1	* 550	* 100 year *	2510.46 *	2507.43 *	3.03 *	0.64 *	0.03 *	* 32000.00 *	*	226.93 *	
* Reach #1	* 500	* 100 year *	2509.79 *	2506.86 *	2.93 *	1.02 *	0.10 *	* 32000.00 *	*	225.99 *	
* Reach #1	* 450	* 100 year *	2508.67 *	2506.08 *	2.59 *	0.73 *	0.09 *	* 32000.00 *	*	226.18 *	
* Reach #1	* 400	* 100 year *	2507.85 *	2505.56 *	2.28 *	0.64 *	0.04 *	* 32000.00 *	*	224.87 *	
* Reach #1	* 350	* 100 year *	2507.16 *	2504.45 *	2.71 *	0.28 *	0.04 *	* 32000.00 *	*	205.80 *	
* Reach #1	* 325	* 100 year *	2506.84 *	2504.26 *	2.59 *	0.32 *	0.05 *	* 32000.00 *	*	205.99 *	
* Reach #1	* 300	* 100 year *	2506.47 *	2504.04 *	2.43 *	0.00 *	0.05 *	* 32000.00 *	*	206.71 *	
* Reach #1	* 295	* *	Bridge *	* *	*	*	*	*	*	*	
* Reach #1	* 290	* 100 year *	2505.66 *	2503.16 *	2.49 *	0.33 *	0.24 *	* 32000.00 *	*	207.22 *	
* Reach #1	* 275	* 100 year *	2505.09 *	2500.21 *	4.88 *	1.73 *	0.01 *	* 32000.00 *	*	185.45 *	
* Reach #1	* 200	* 100 year *	2503.01 *	2498.17 *	4.84 *	1.62 *	0.32 *	* 32000.00 *	*	188.45 *	
* Reach #1	* 150	* 100 year *	2500.77 *	2497.01 *	3.76 *	1.39 *	0.16 *	* 32000.00 *	*	201.24 *	
* Reach #1	* 100	* 100 year *	2499.21 *	2496.00 *	3.22 *	*	*	* 32000.00 *	*	261.12 *	

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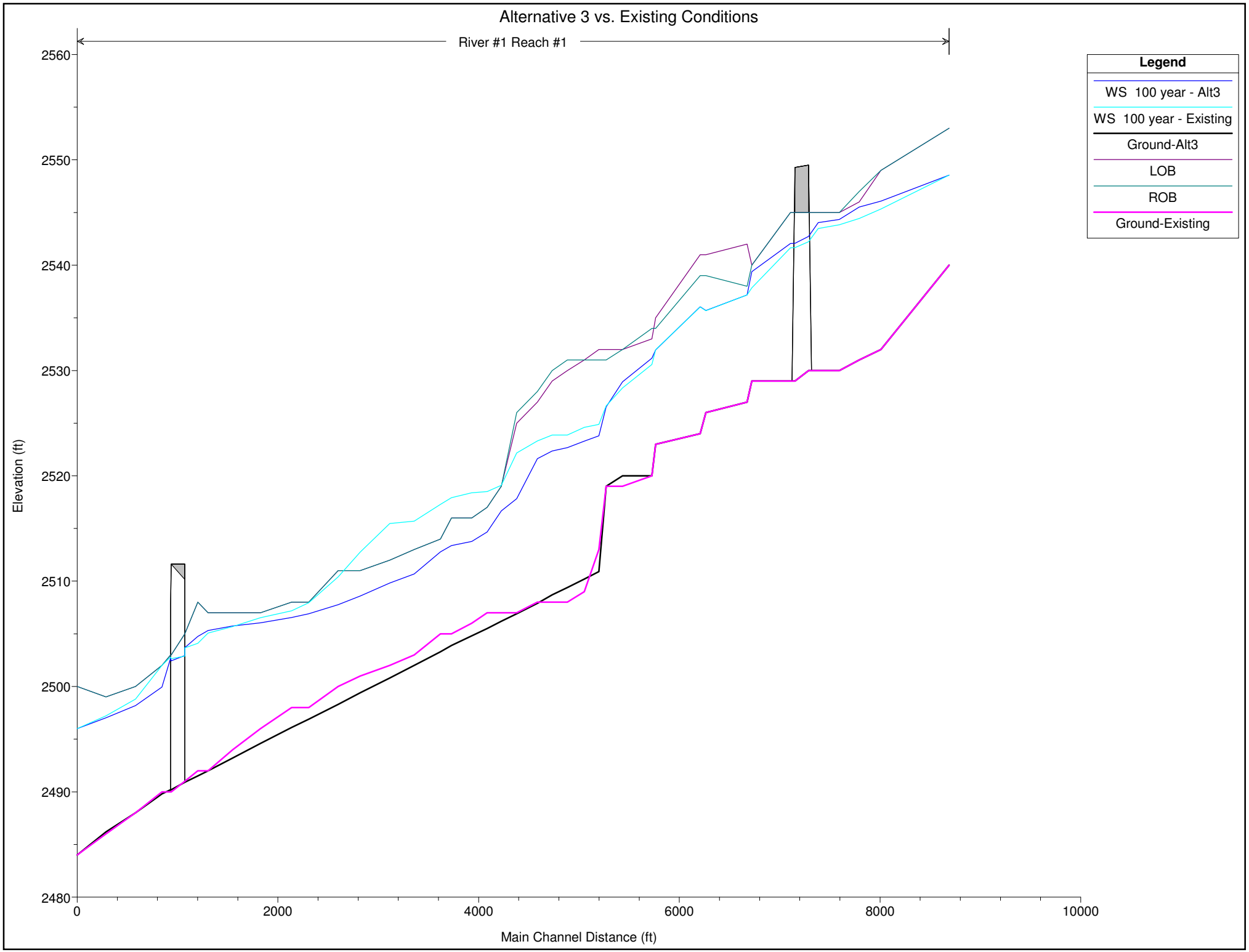
ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Alt2Final

River: River #1 Reach: Reach #1 RS: 1600 Profile: 100 year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
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.
River: River #1 Reach: Reach #1 RS: 1350 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 1325 Profile: 100 year
Warning:Pier drag coefficient of 2.0 assumed for Class B flow.
River: River #1 Reach: Reach #1 RS: 1300 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 1230 Profile: 100 year
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth

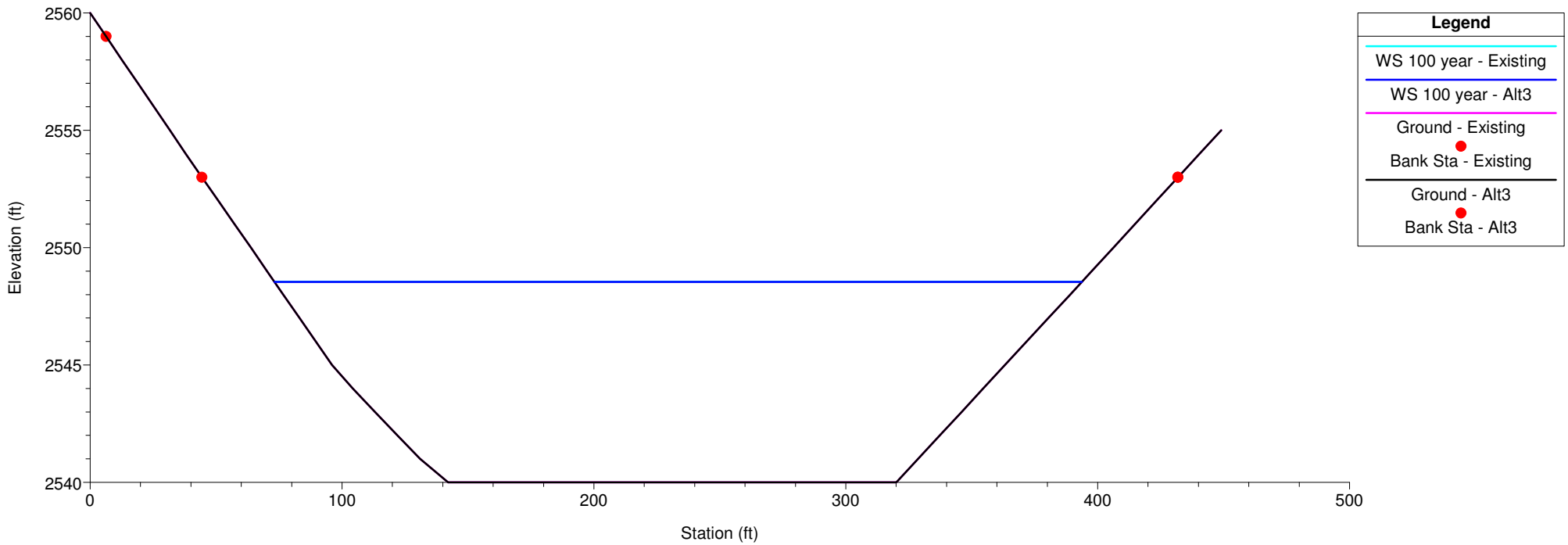
for the water surface and continued on with the calculations.
Warning:Divided flow computed for this cross-section.
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous 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.
River: River #1 Reach: Reach #1 RS: 1220 Profile: 100 year
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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: River #1 Reach: Reach #1 RS: 1200 Profile: 100 year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: River #1 Reach: Reach #1 RS: 1120 Profile: 100 year
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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: River #1 Reach: Reach #1 RS: 1110 Profile: 100 year
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 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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: River #1 Reach: Reach #1 RS: 1100 Profile: 100 year
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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: River #1 Reach: Reach #1 RS: 1050 Profile: 100 year
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 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.
River: River #1 Reach: Reach #1 RS: 1010 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 950 Profile: 100 year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: River #1 Reach: Reach #1 RS: 900 Profile: 100 year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.
River: River #1 Reach: Reach #1 RS: 865 Profile: 100 year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: River #1 Reach: Reach #1 RS: 850 Profile: 100 year

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.
River: River #1 Reach: Reach #1 RS: 825 Profile: 100 year
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 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.
River: River #1 Reach: Reach #1 RS: 800 Profile: 100 year
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 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.
River: River #1 Reach: Reach #1 RS: 750 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 700 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 650 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 600 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 500 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 295 Profile: 100 year
Warning:Pier drag coefficient of 2.0 assumed for Class B flow.
River: River #1 Reach: Reach #1 RS: 290 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 275 Profile: 100 year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
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.
River: River #1 Reach: Reach #1 RS: 200 Profile: 100 year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
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.
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.
River: River #1 Reach: Reach #1 RS: 150 Profile: 100 year
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.

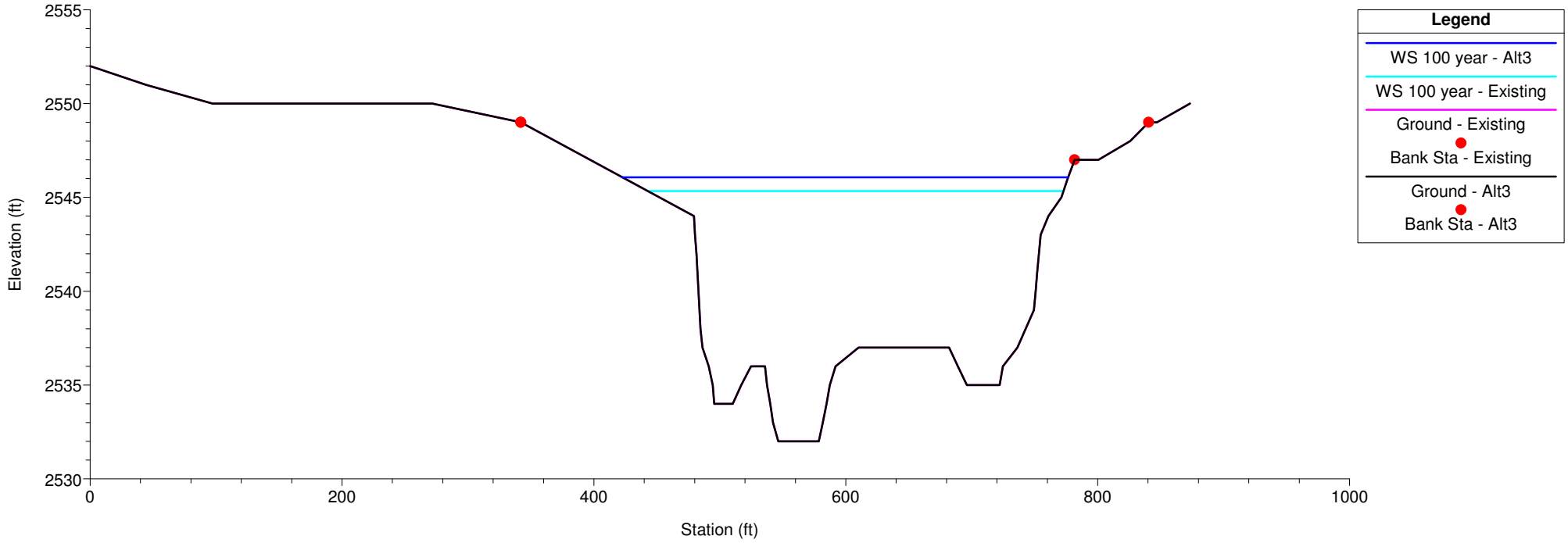
APPENDIX J.3
ALTERNATIVE 3 OUTPUT AND CROSS-SECTION AND PROFILE PLOTS

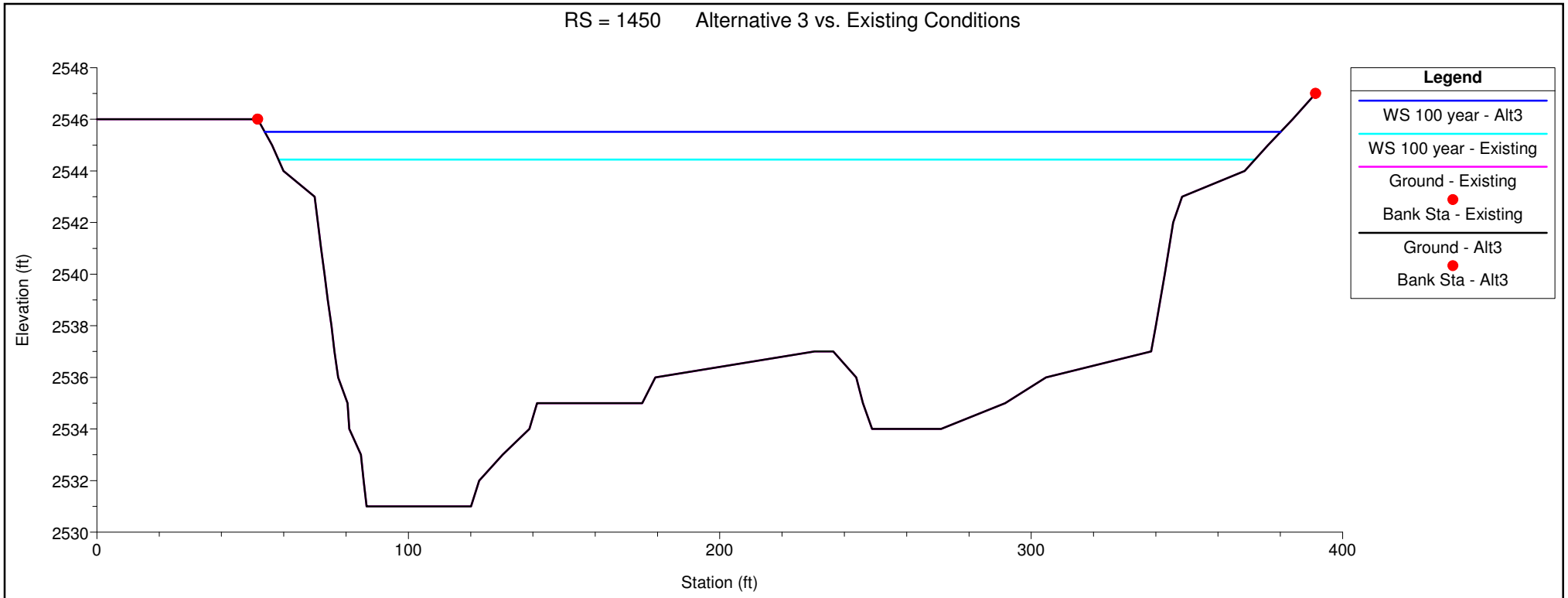

Alternative 3 vs. Existing Conditions
River #1 Reach #1
Legend
WS 100 year - Alt3
WS 100 year - Existing
Ground-Alt3
LOB
ROB
Ground-Existing
Elevation (ft)
2560
2550
2540
2530
2520
2510
2500
2490
2480
0
2000
4000
6000
8000
10000
Main Channel Distance (ft)

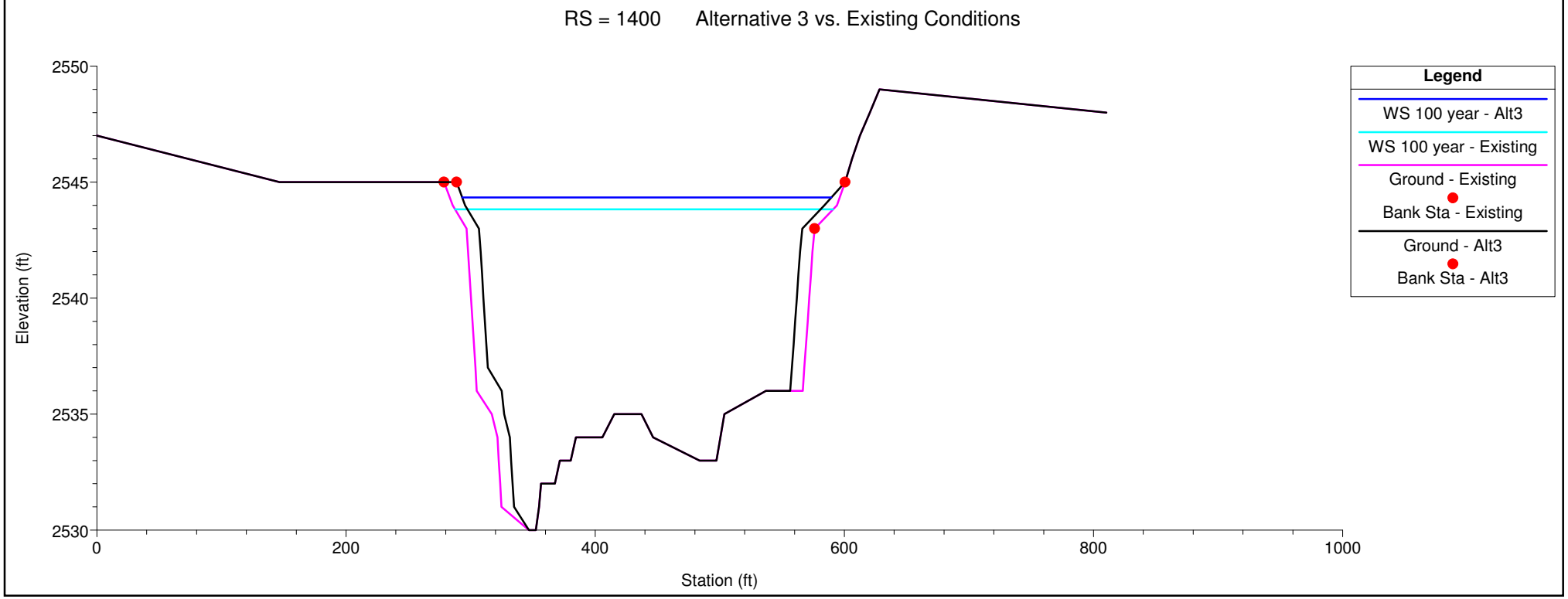
RS = 1600 Alternative 3 vs. Existing Conditions



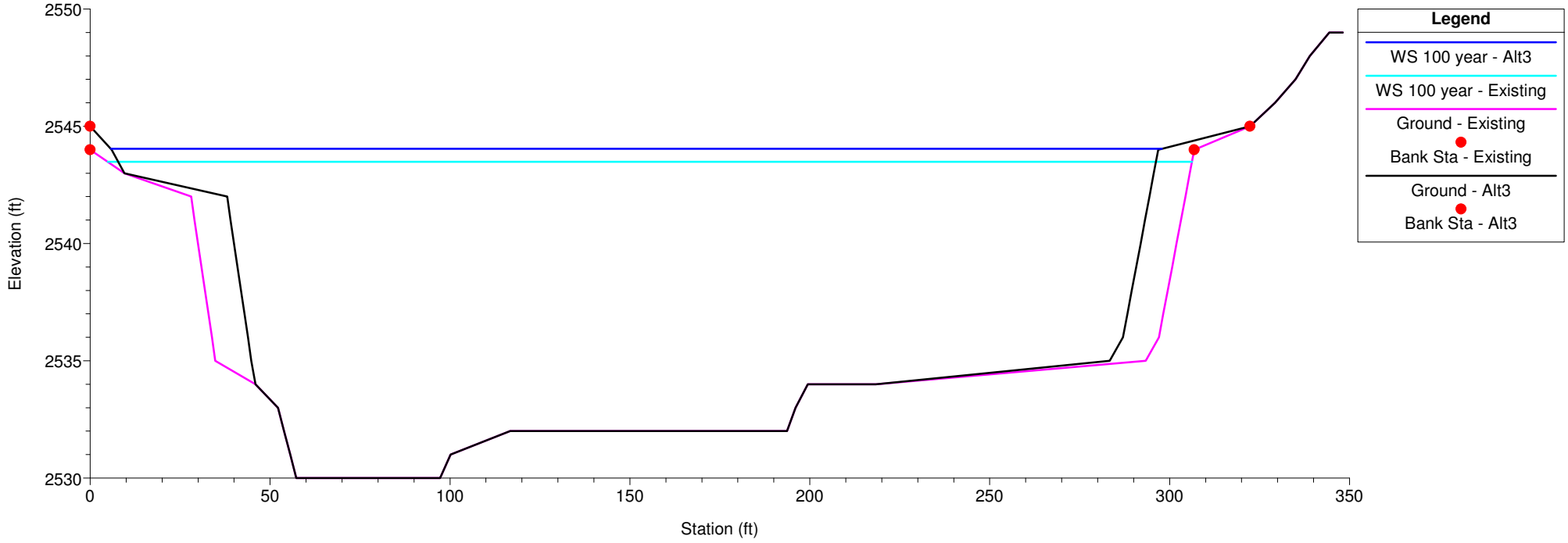
RS = 1500 Alternative 3 vs. Existing Conditions




RS = 1450 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2548
2546
2544
2542
2540
2538
2536
2534
2532
2530
0
100
200
300
400
Legend
WS 100 year - Alt3
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3

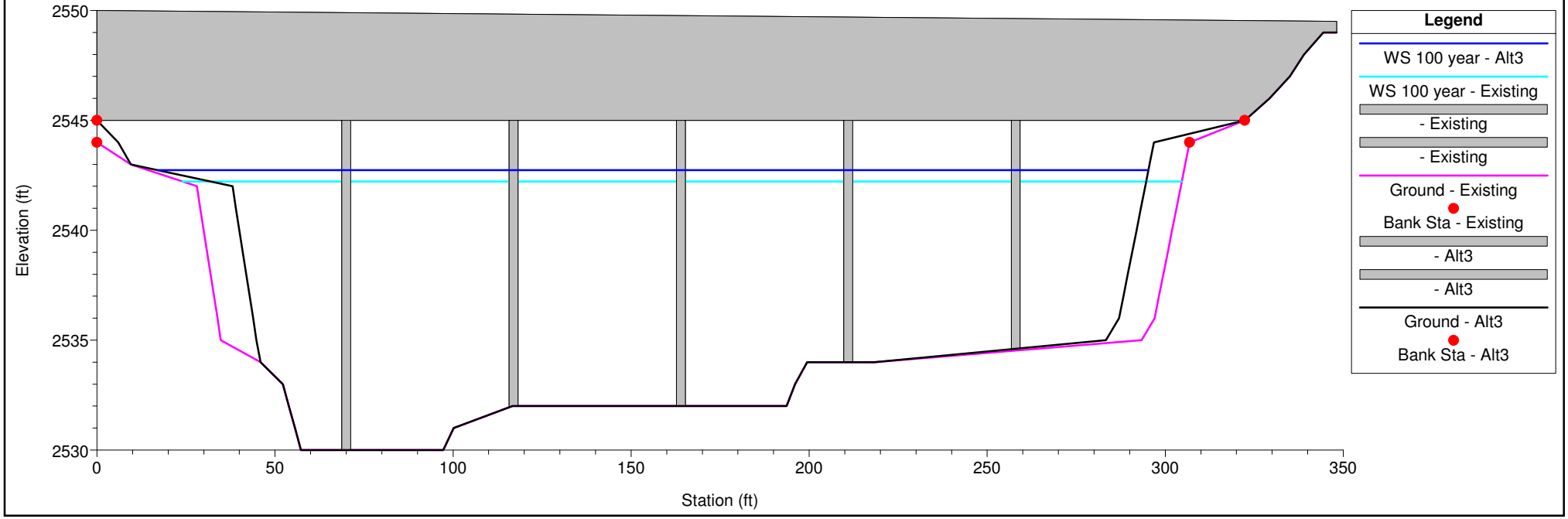

RS = 1400 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2550
2545
2540
2535
2530
0
200
400
600
800
1000
Legend
WS 100 year - Alt3
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3

RS = 1350 Alternative 3 vs. Existing Conditions



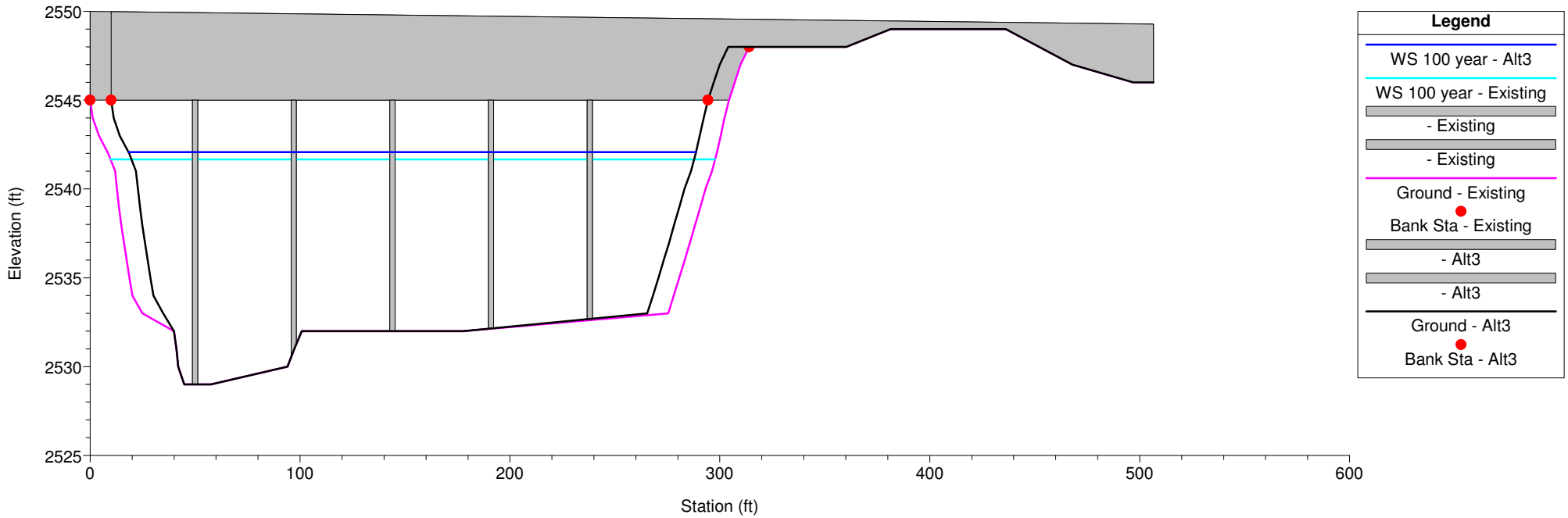
RS = 1325 BR

Alternative 3 vs. Existing Conditions

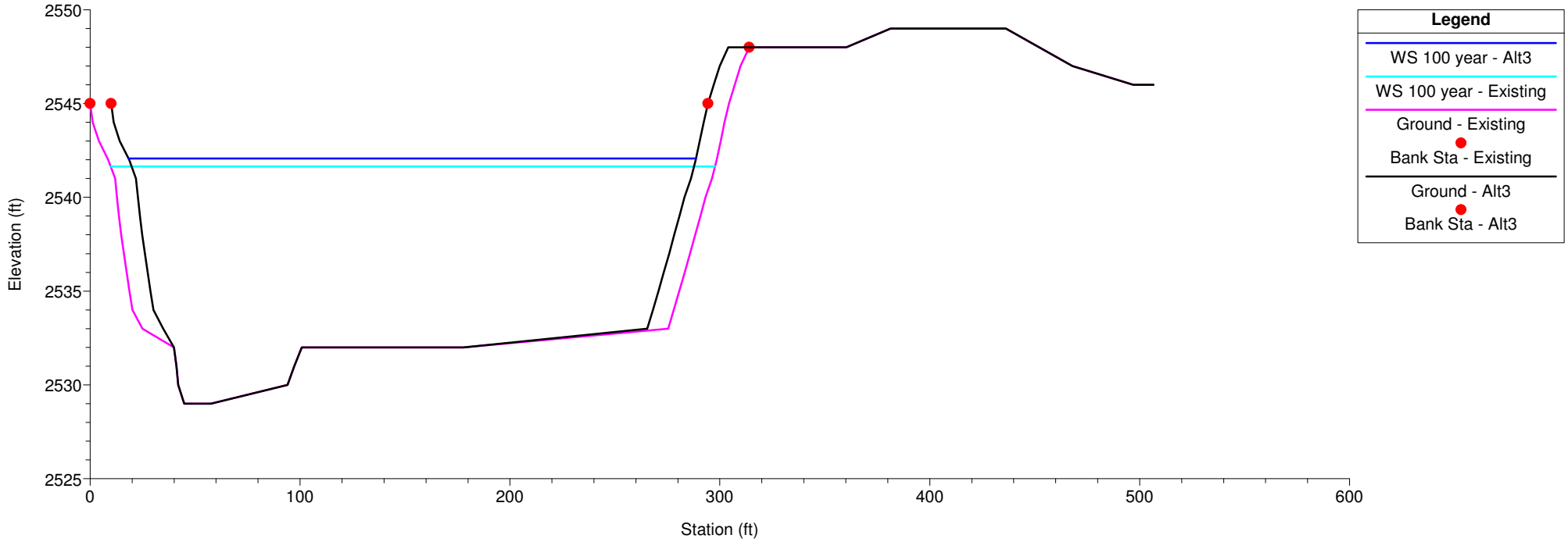


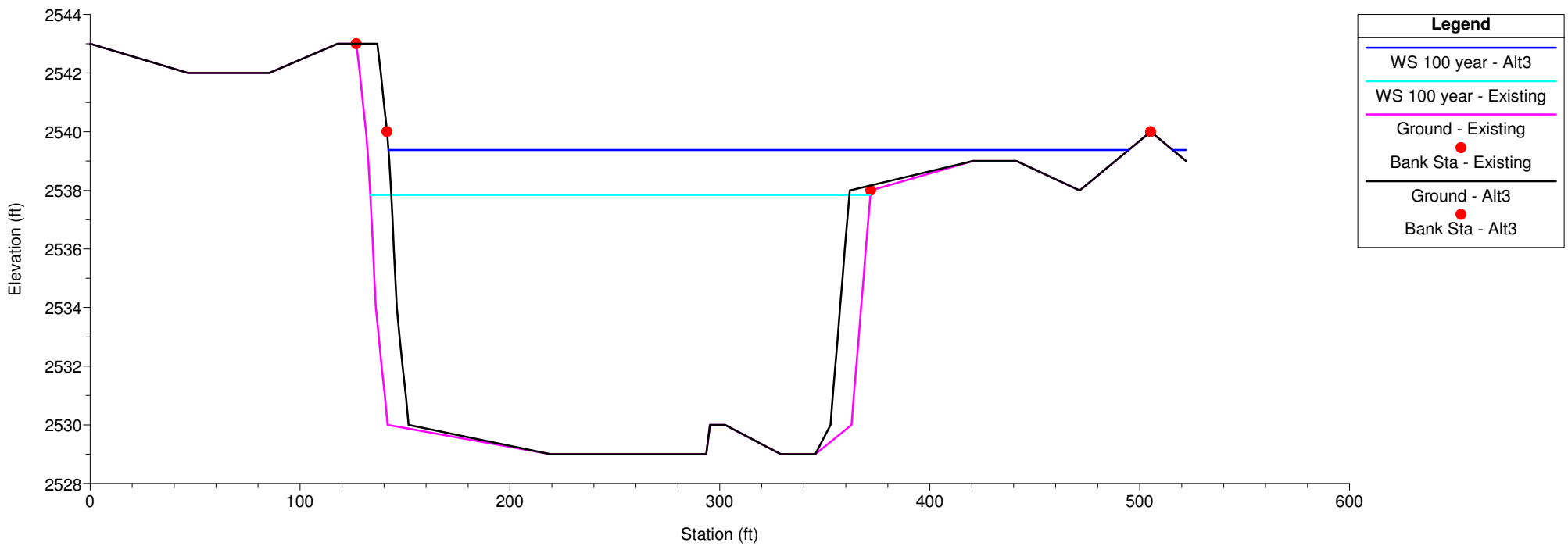
RS = 1325 BR

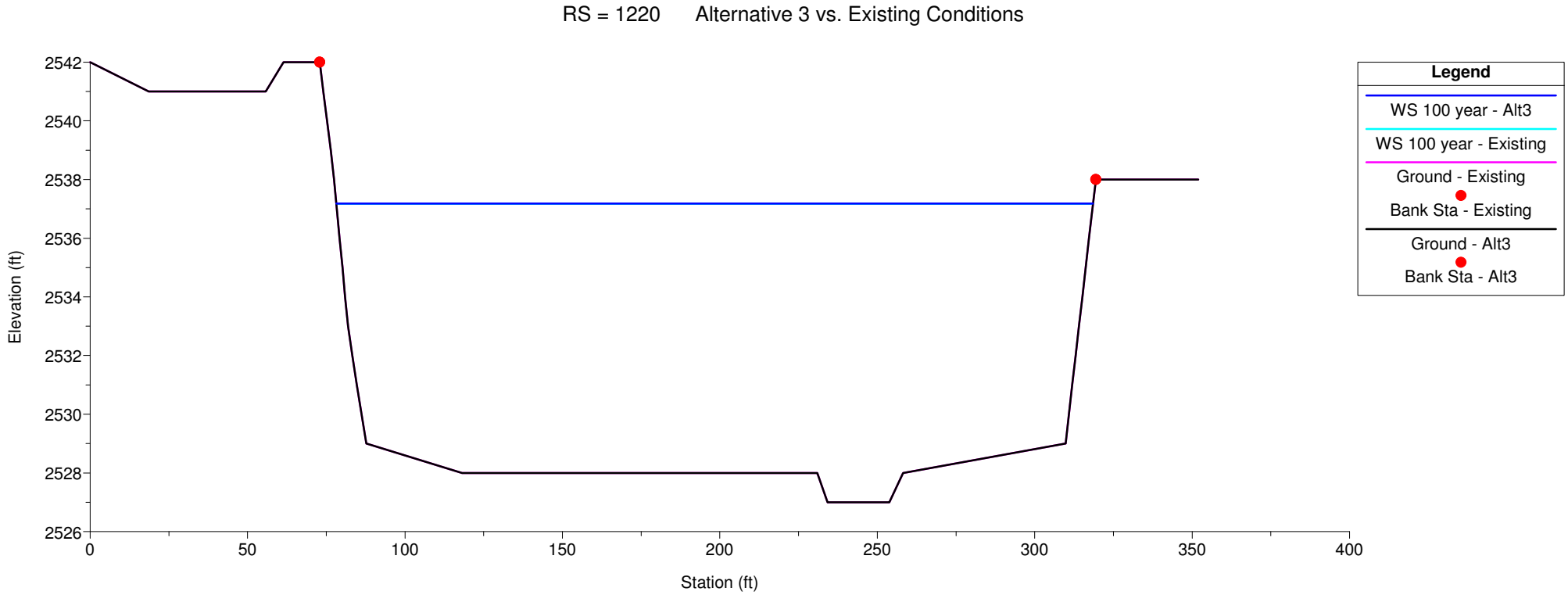
Alternative 3 vs. Existing Conditions

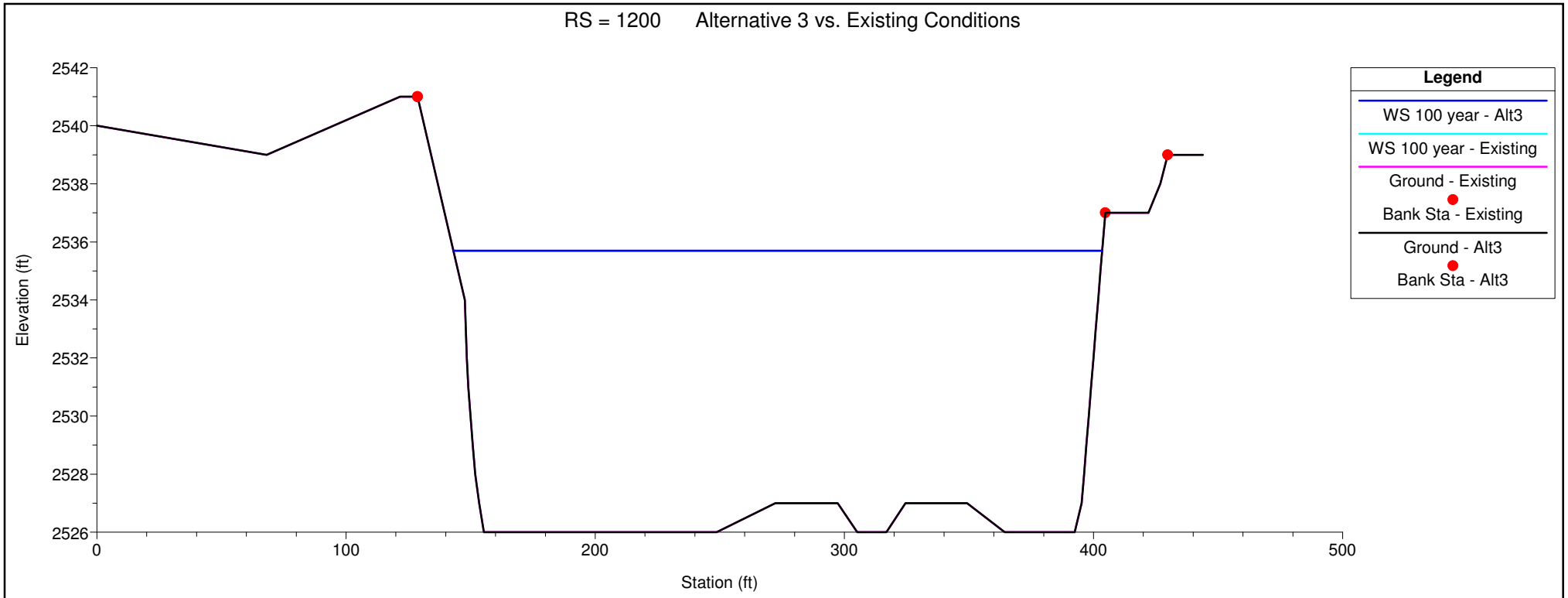


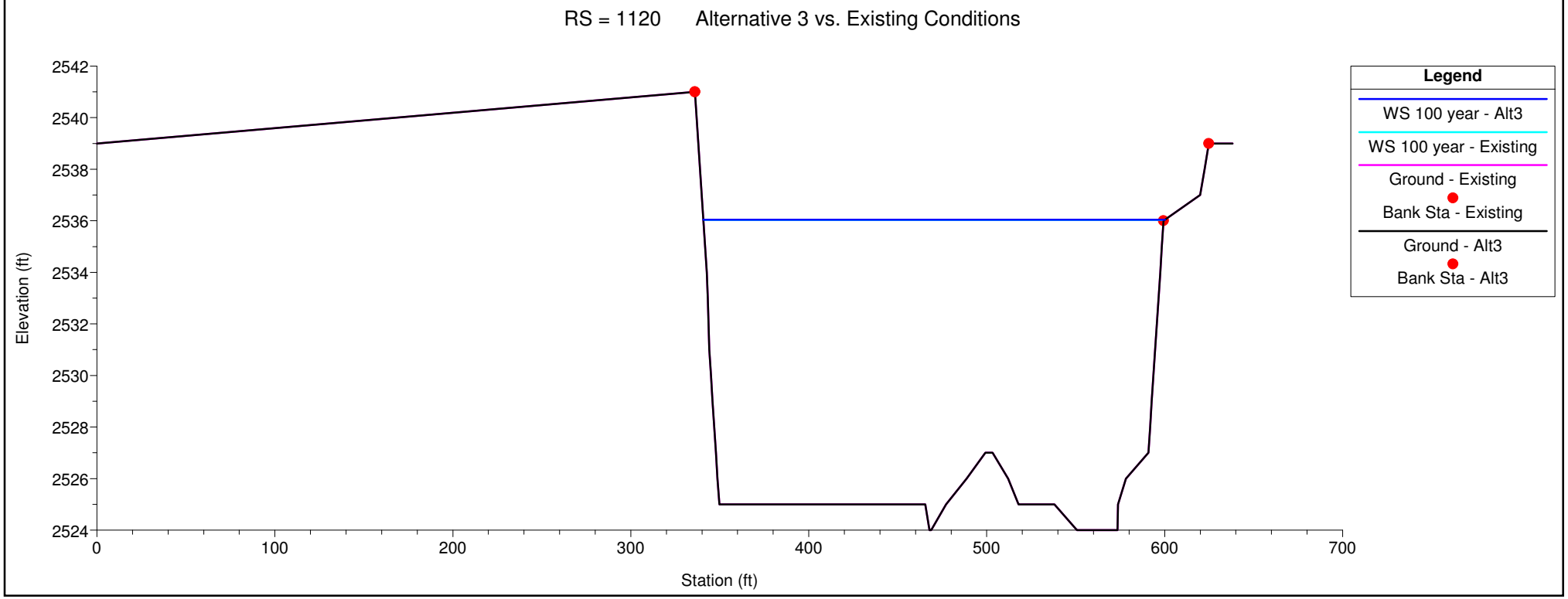
RS = 1300 Alternative 3 vs. Existing Conditions

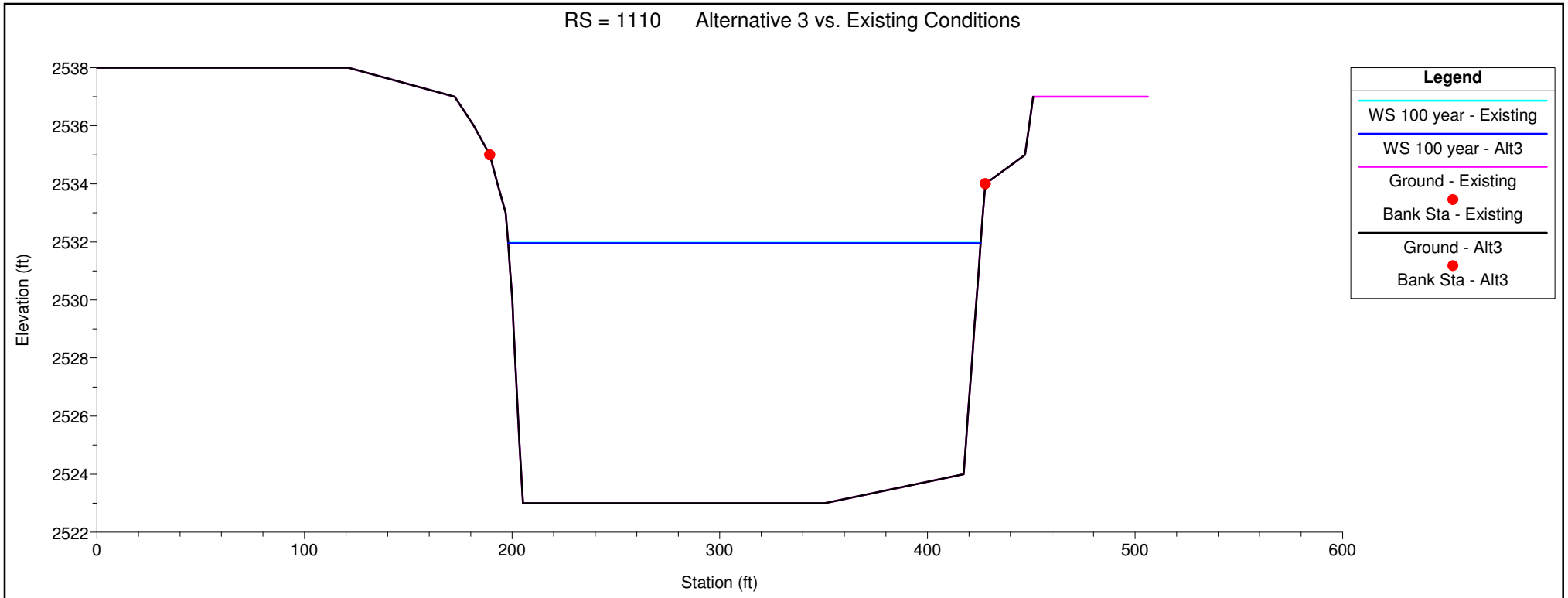


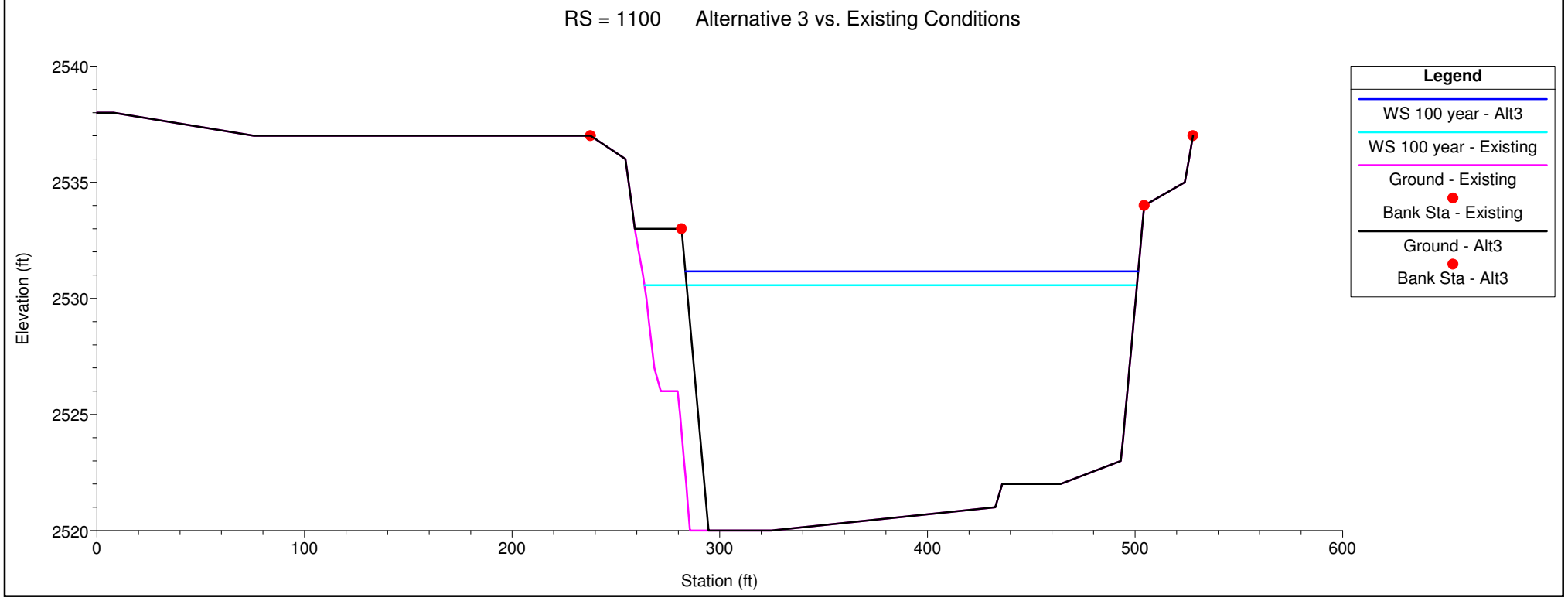

RS = 1230 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2544
2542
2540
2538
2536
2534
2532
2530
2528
0
100
200
300
400
500
600
Legend
WS 100 year - Alt3
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3

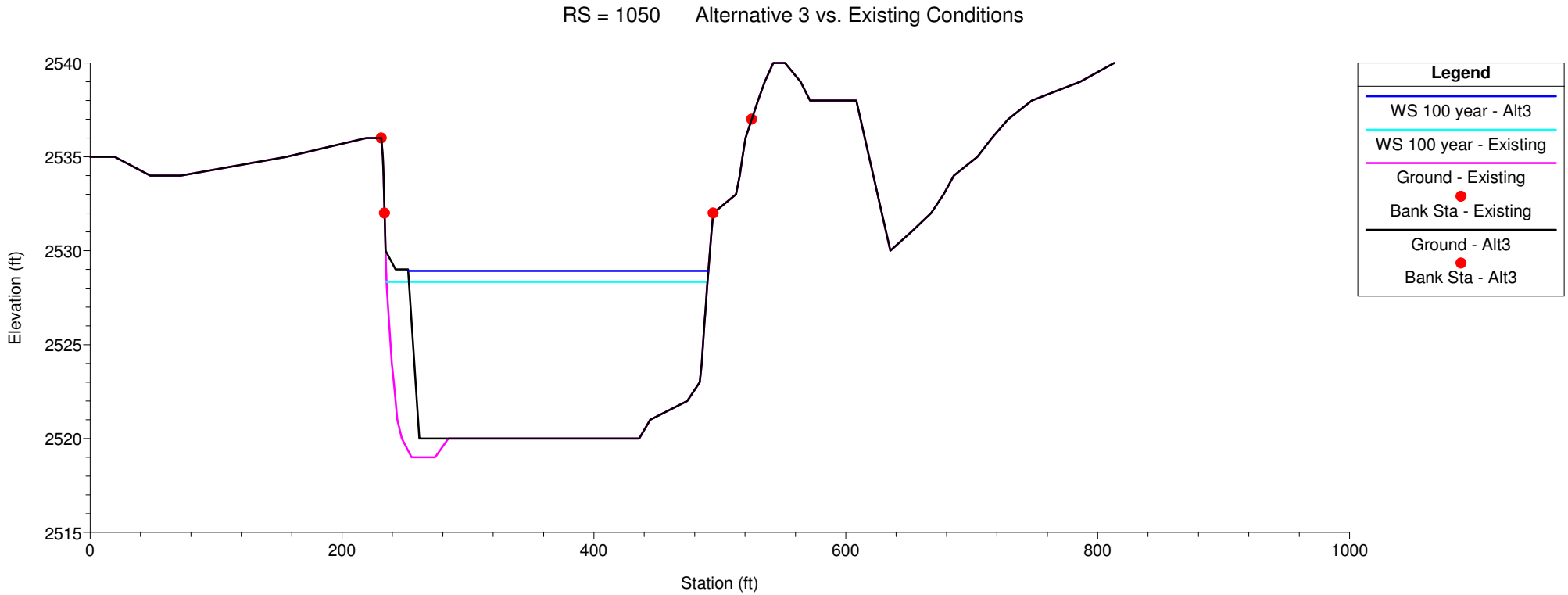

RS = 1220 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2542
2540
2538
2536
2534
2532
2530
2528
2526
0
50
100
150
200
250
300
350
400
Legend
WS 100 year - Alt3
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3

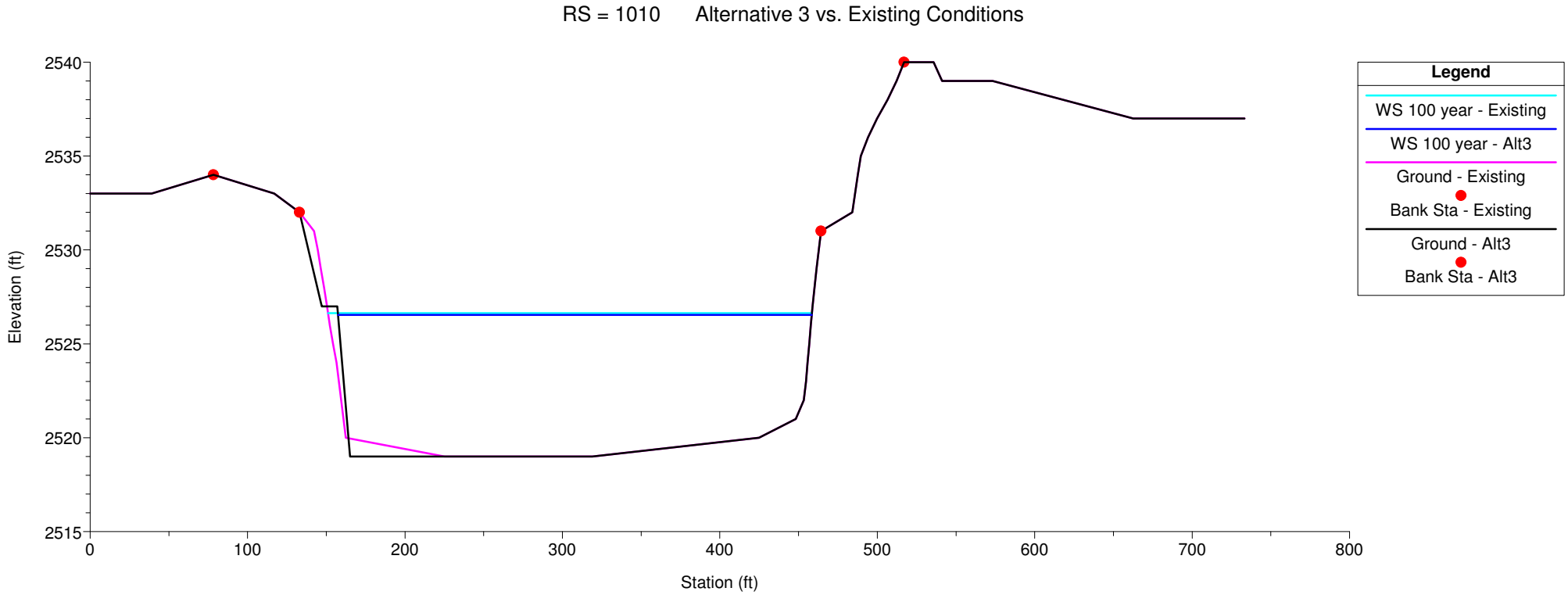

RS = 1200 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2542
2540
2538
2536
2534
2532
2530
2528
2526
0
100
200
300
400
500
Legend
WS 100 year - Alt3
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3

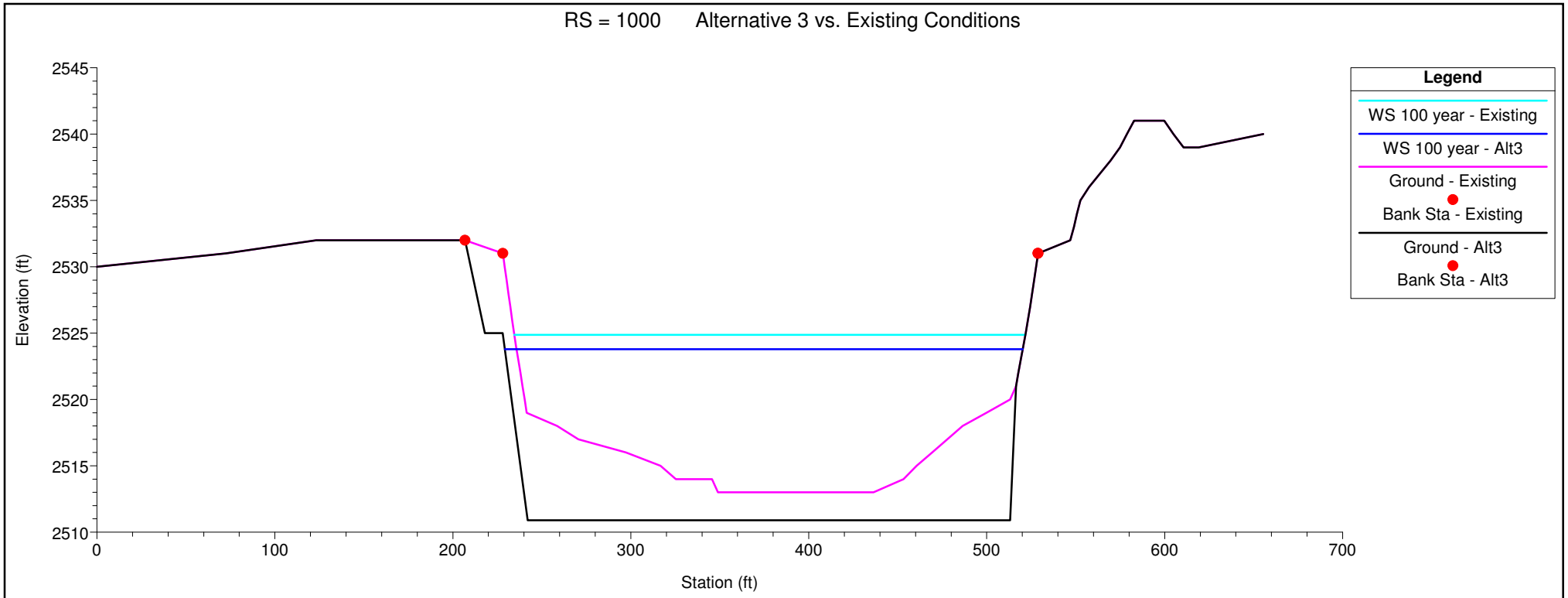

RS = 1120 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2542
2540
2538
2536
2534
2532
2530
2528
2526
2524
0
100
200
300
400
500
600
700
Legend
WS 100 year - Alt3
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3

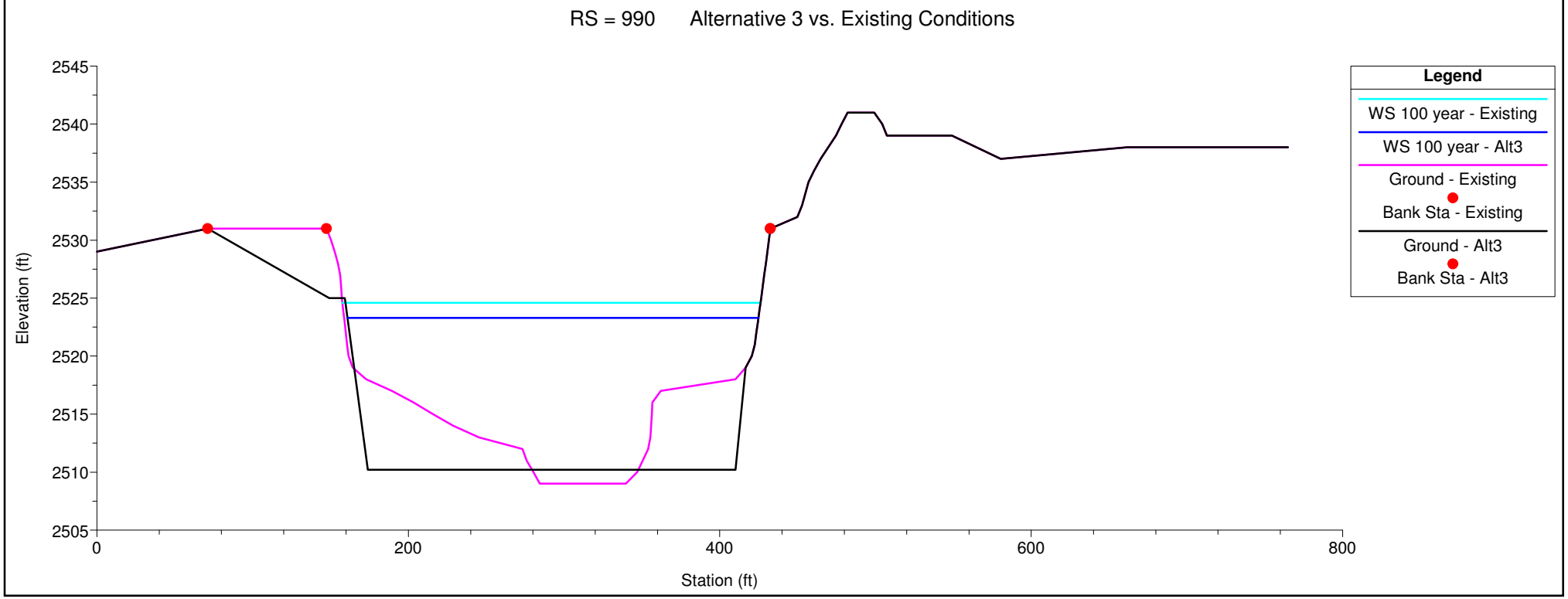

RS = 1110 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2538
2536
2534
2532
2530
2528
2526
2524
2522
0
100
200
300
400
500
600
Legend
WS 100 year - Existing
WS 100 year - Alt3
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3

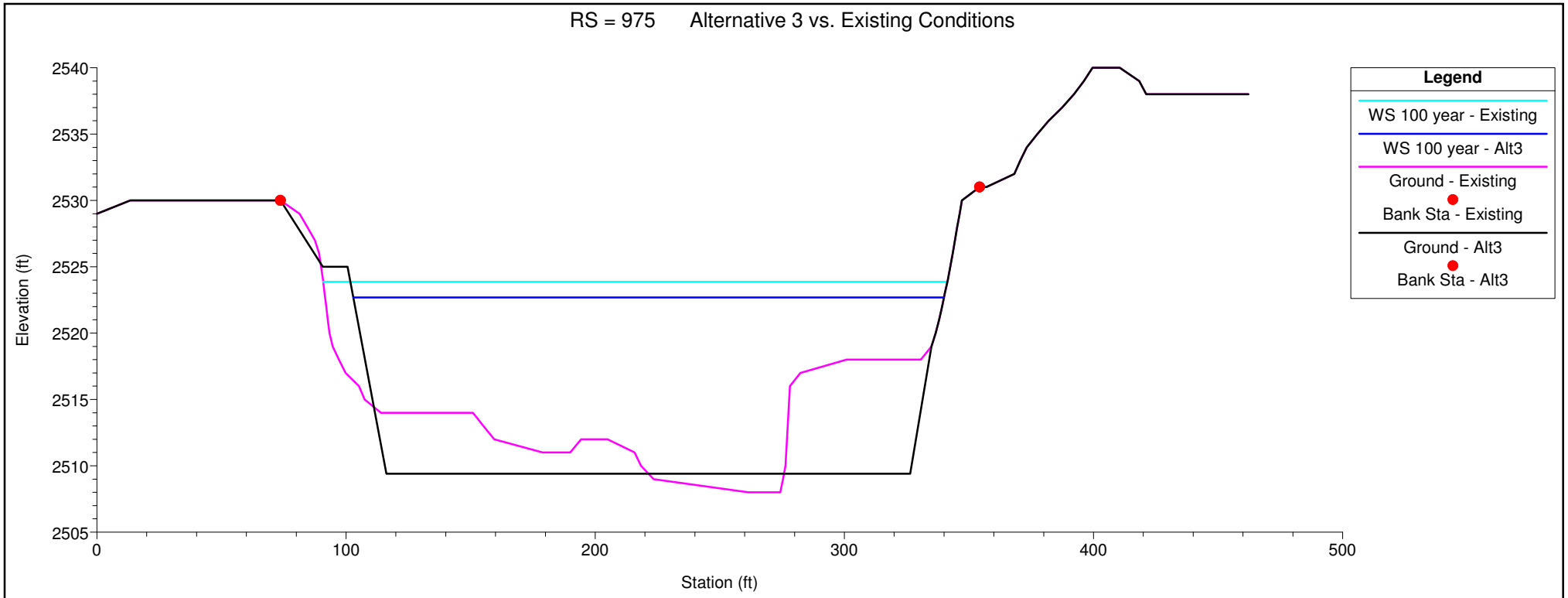

RS = 1100 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2540
2535
2530
2525
2520
0
100
200
300
400
500
600
Legend
WS 100 year - Alt3
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3

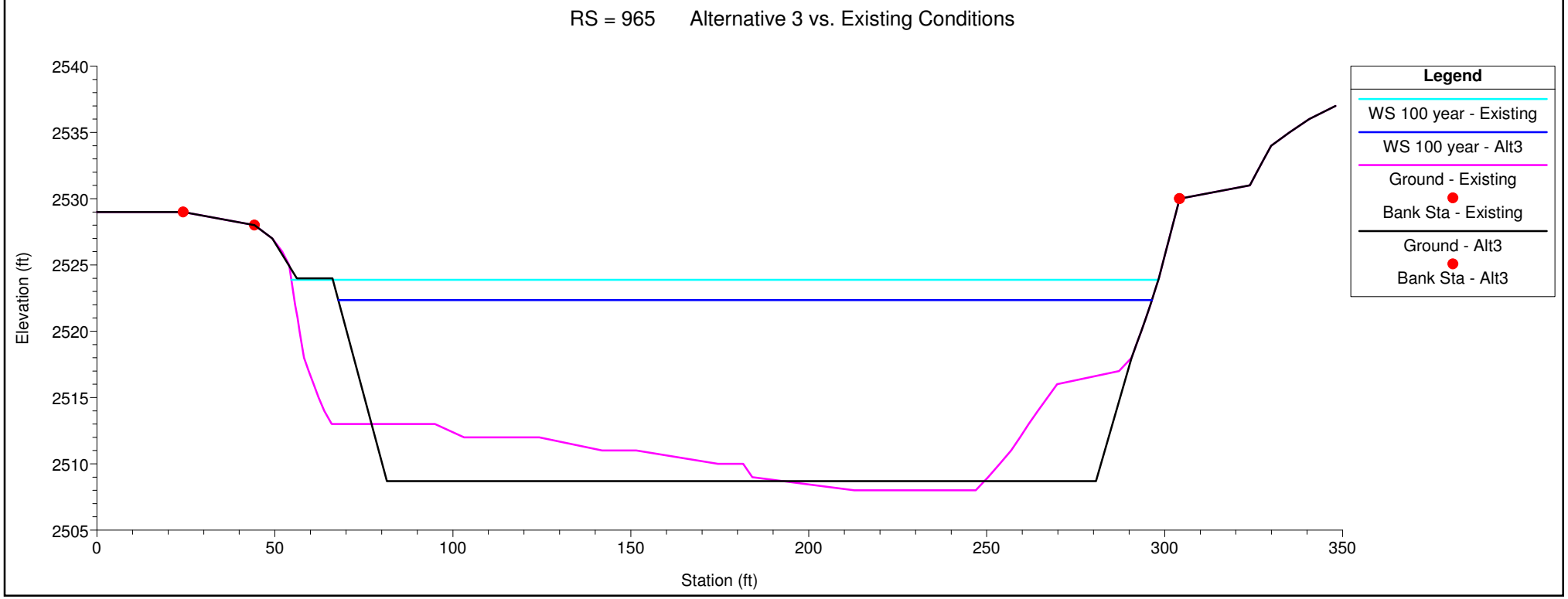

RS = 1050 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2540
2535
2530
2525
2520
2515
0
200
400
600
800
1000
Legend
WS 100 year - Alt3
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3

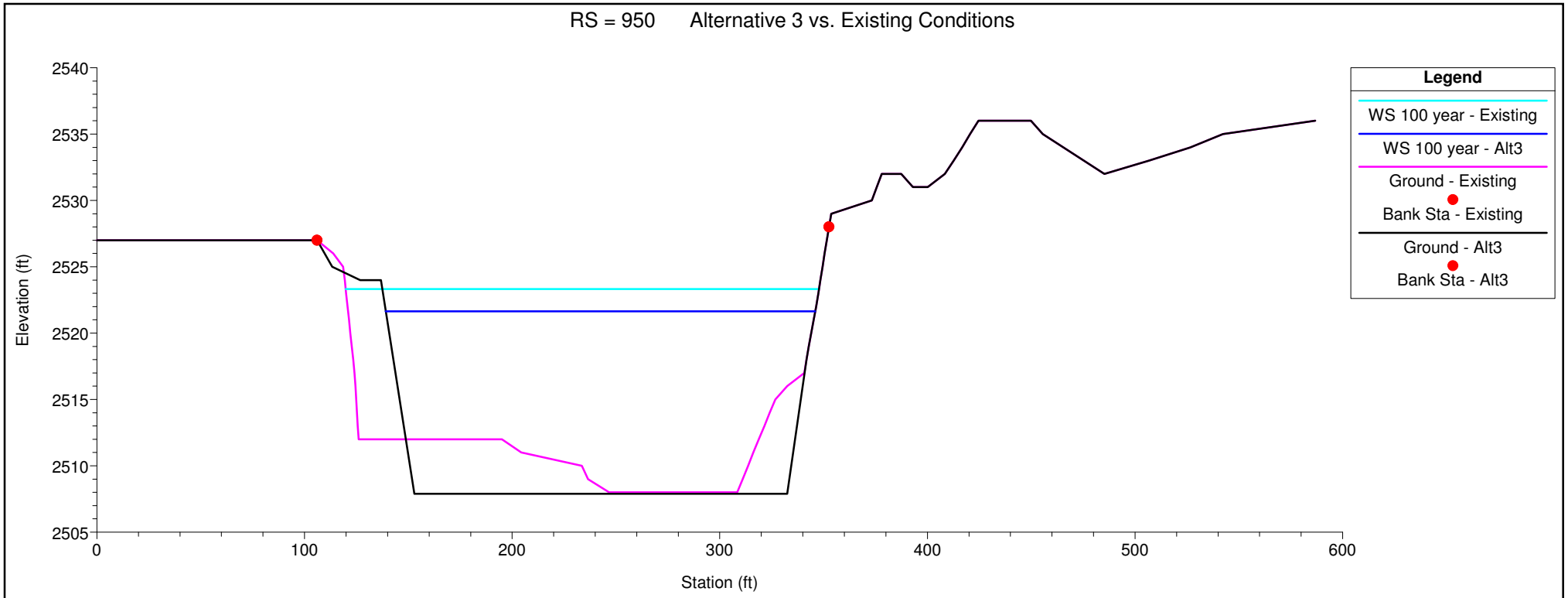

RS = 1010 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2540
2535
2530
2525
2520
2515
0
100
200
300
400
500
600
700
800
Legend
WS 100 year - Existing
WS 100 year - Alt3
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3

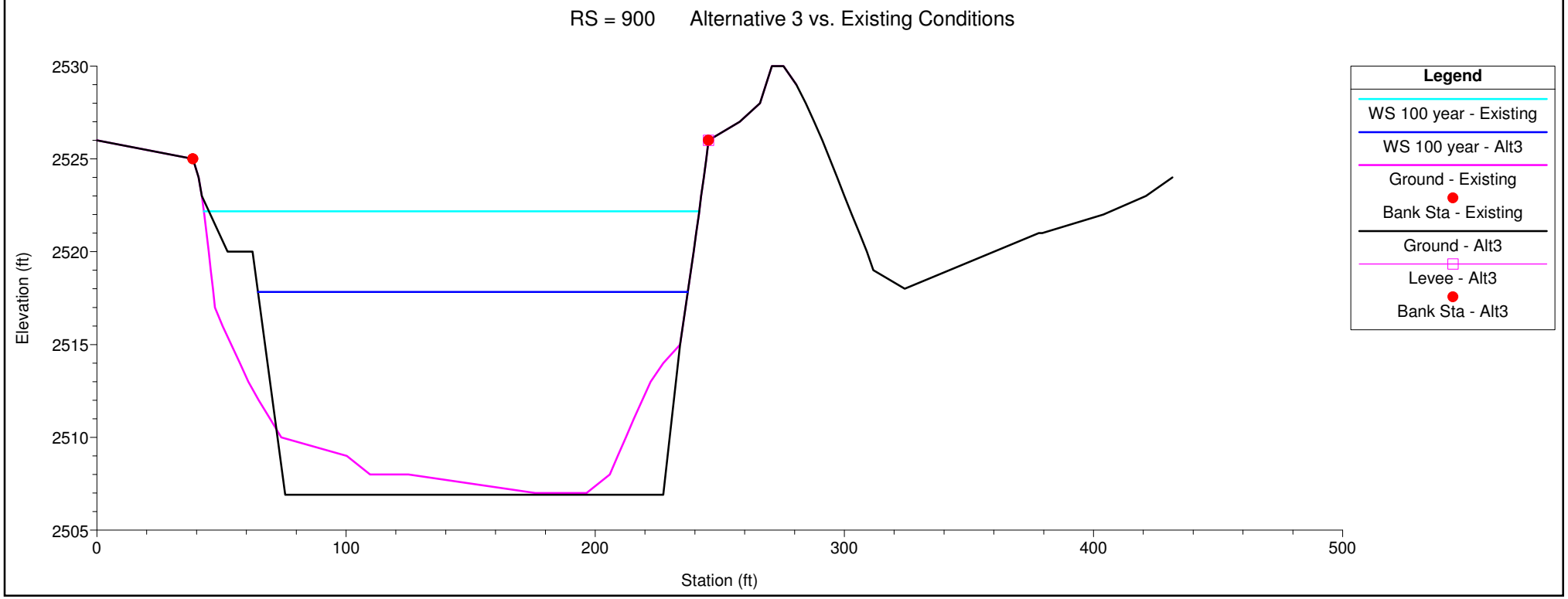

RS = 1000 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2545
2540
2535
2530
2525
2520
2515
2510
0
100
200
300
400
500
600
700
Legend
WS 100 year - Existing
WS 100 year - Alt3
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3

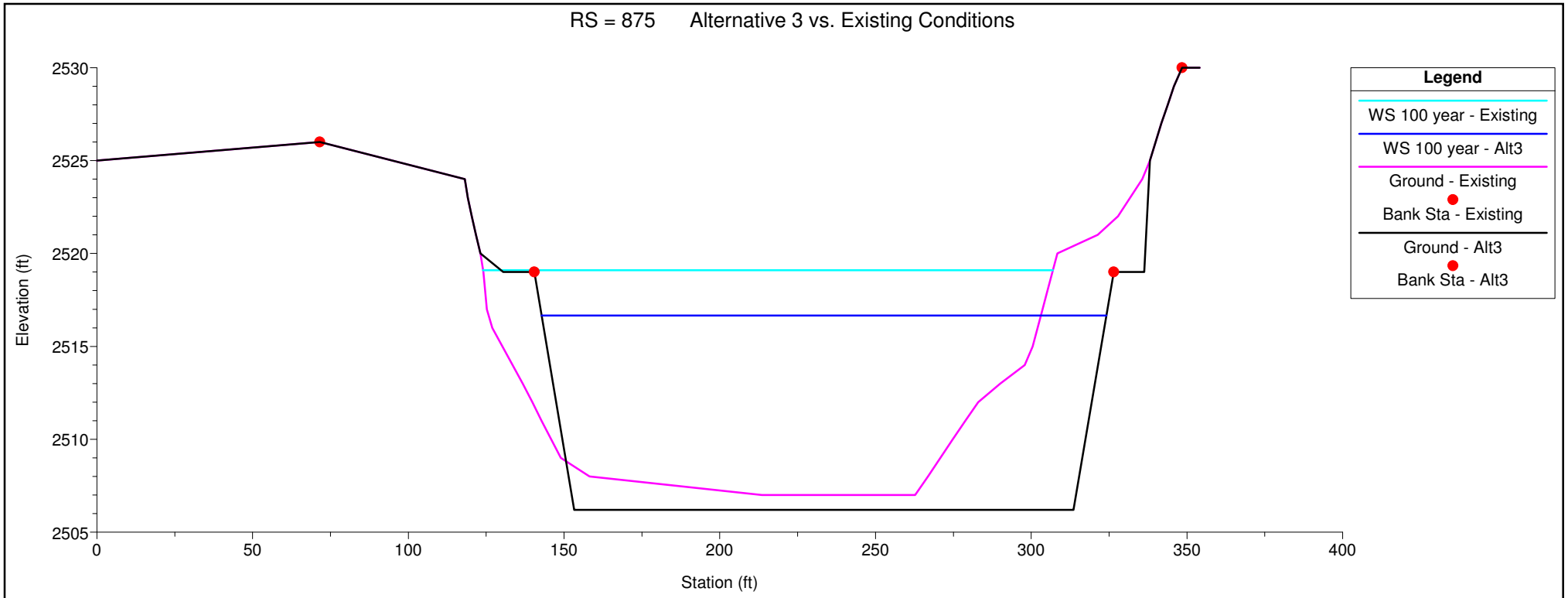

RS = 990 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2545
2540
2535
2530
2525
2520
2515
2510
2505
0
200
400
600
800
Legend
WS 100 year - Existing
WS 100 year - Alt3
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3

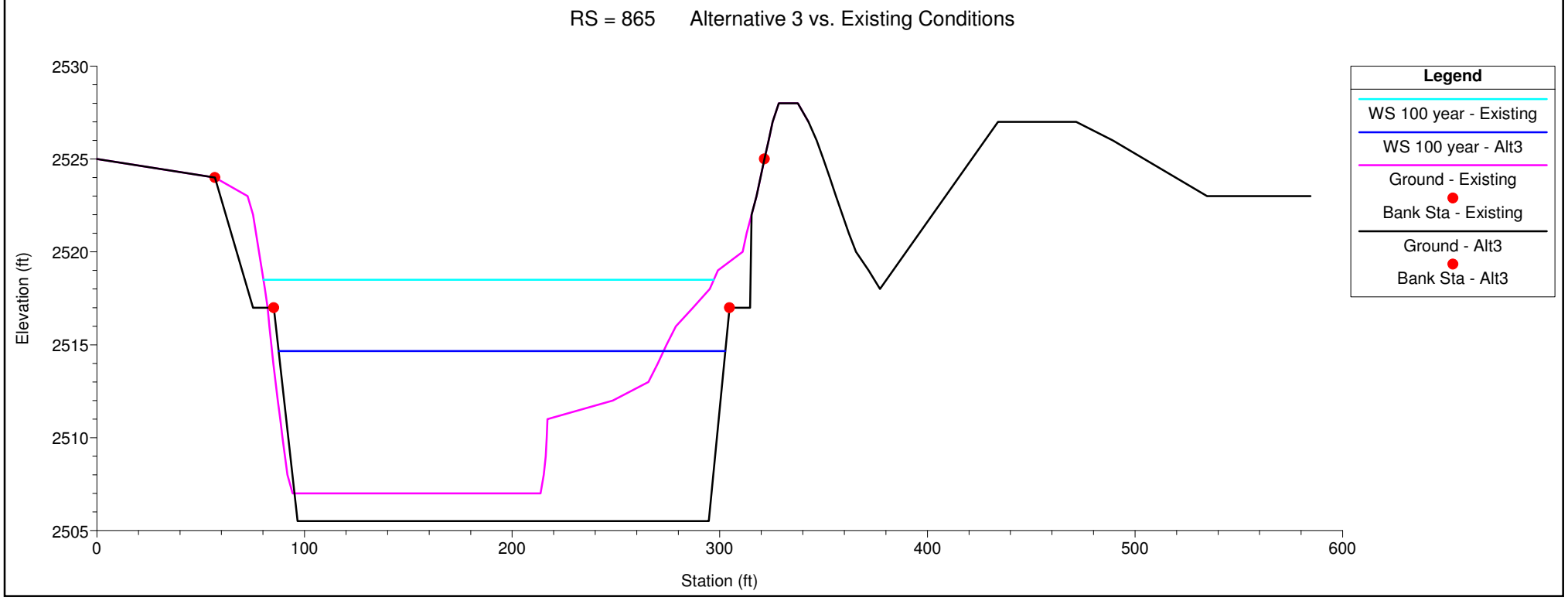

RS = 975 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2540
2535
2530
2525
2520
2515
2510
2505
0
100
200
300
400
500
Legend
WS 100 year - Existing
WS 100 year - Alt3
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3

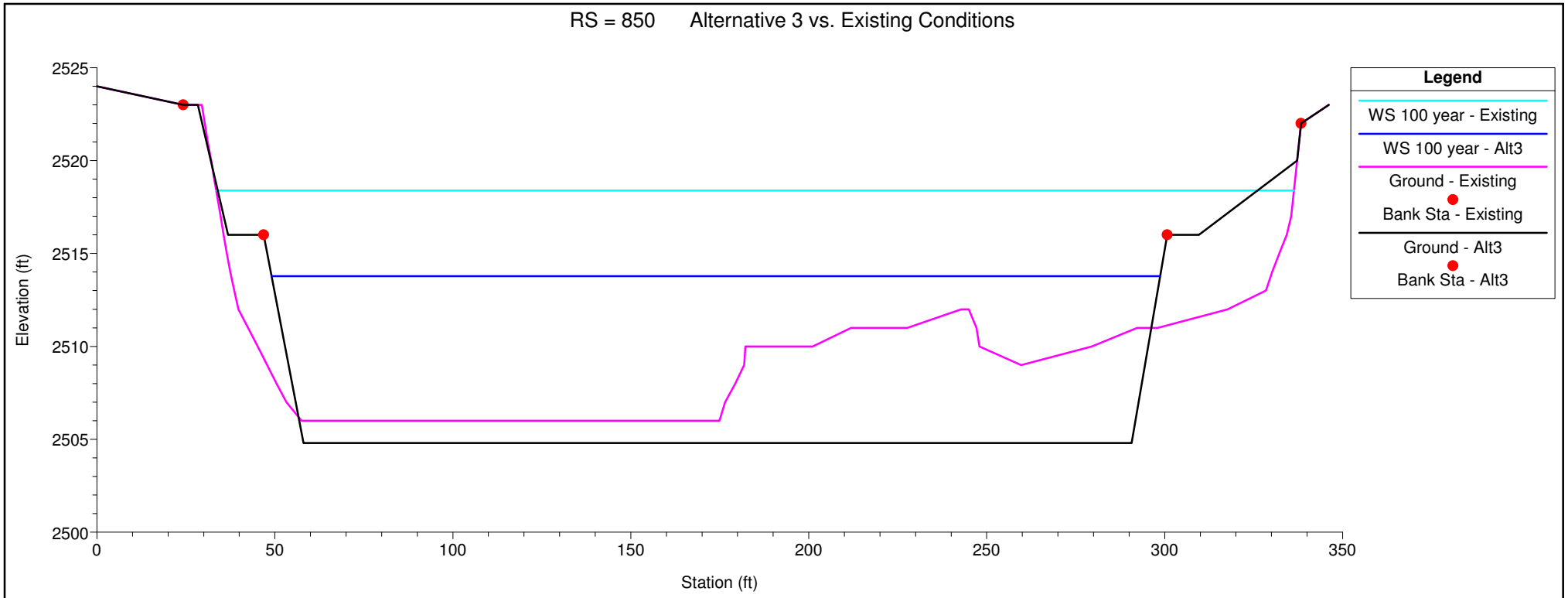

RS = 965 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2540
2535
2530
2525
2520
2515
2510
2505
0
50
100
150
200
250
300
350
Legend
WS 100 year - Existing
WS 100 year - Alt3
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3

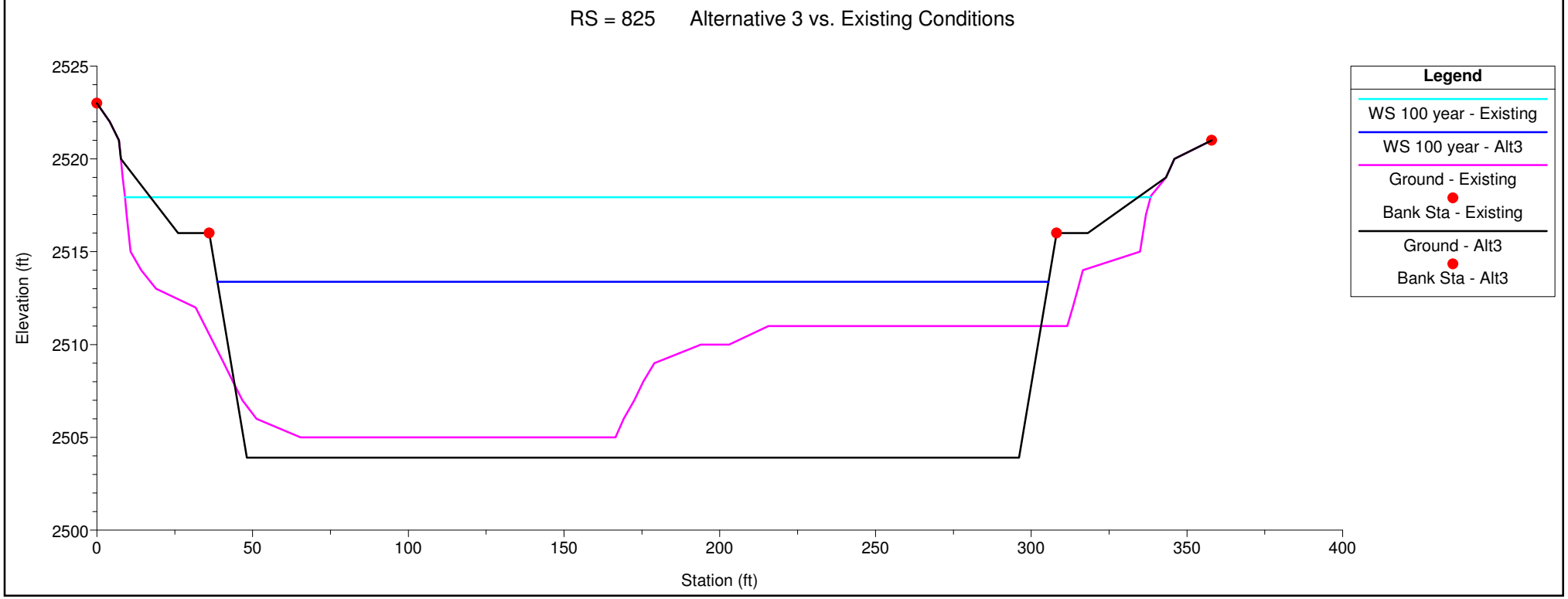

RS = 950 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2540
2535
2530
2525
2520
2515
2510
2505
0
100
200
300
400
500
600
Legend
WS 100 year - Existing
WS 100 year - Alt3
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3

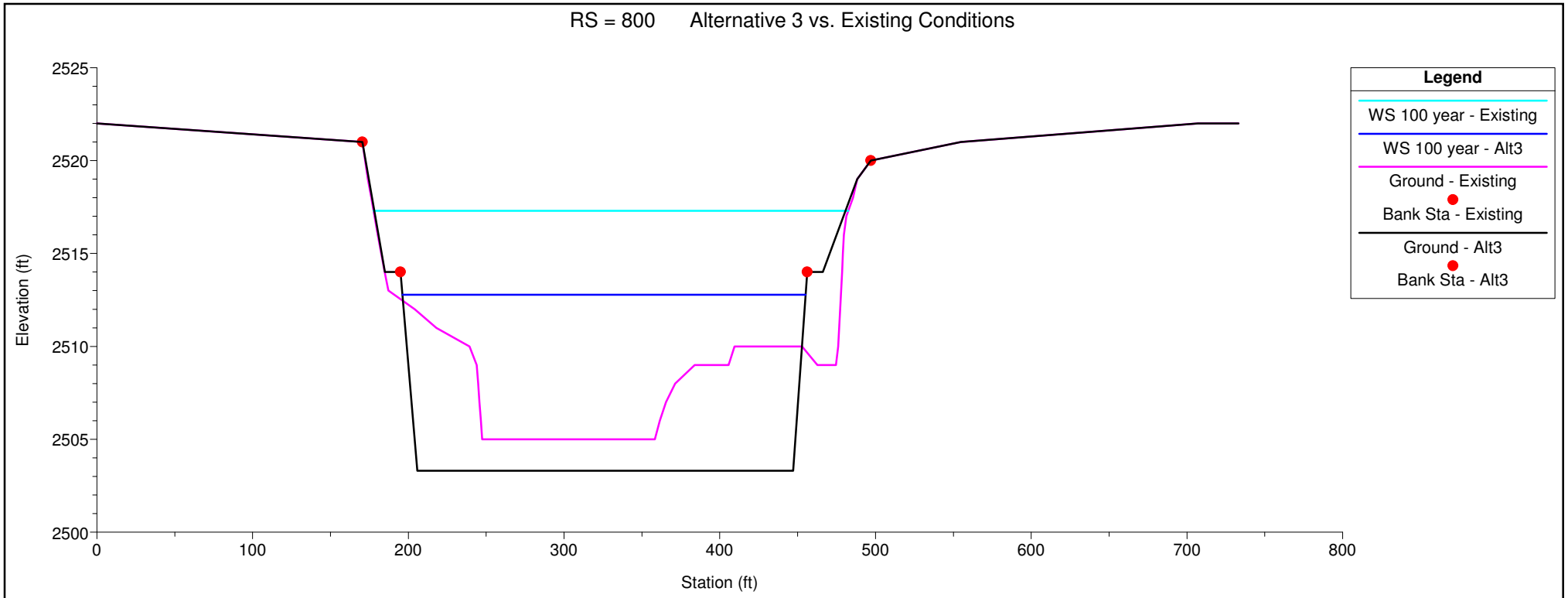

RS = 900 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2530
2525
2520
2515
2510
2505
0
100
200
300
400
500
Legend
WS 100 year - Existing
WS 100 year - Alt3
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Levee - Alt3
Bank Sta - Alt3

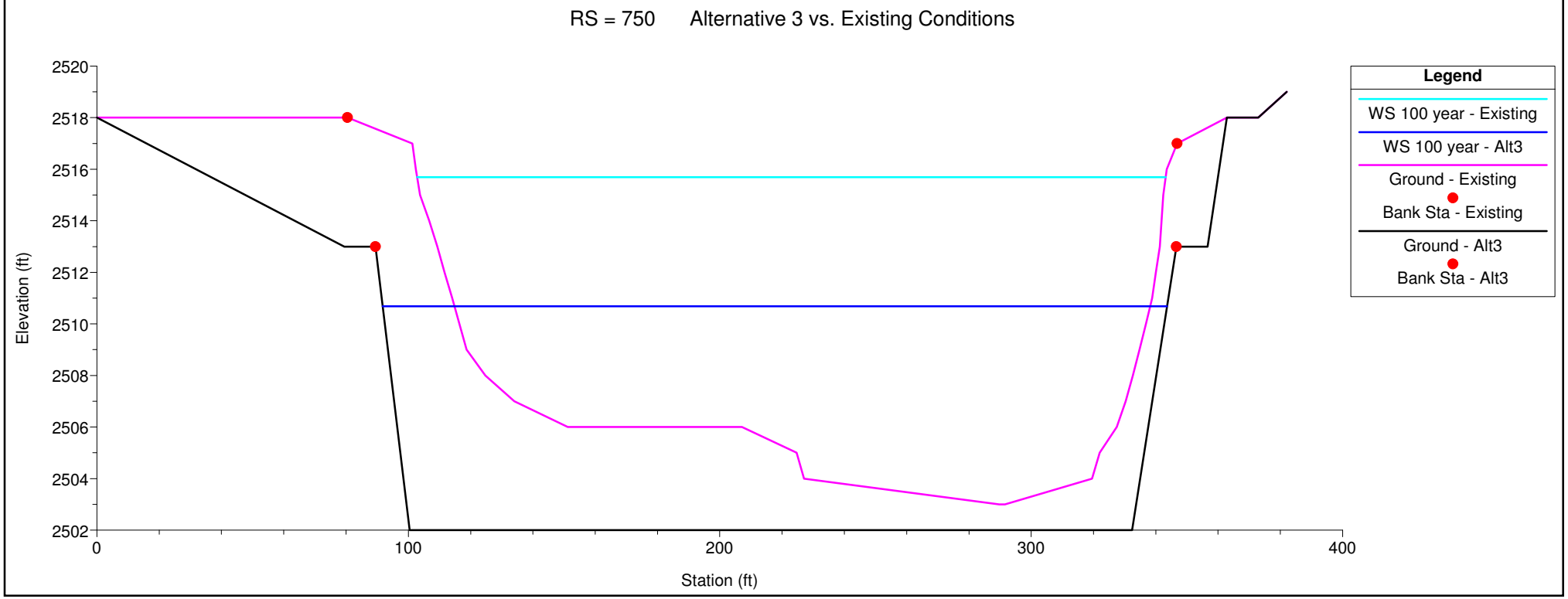

RS = 875 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2530
2525
2520
2515
2510
2505
0
50
100
150
200
250
300
350
400
Legend
WS 100 year - Existing
WS 100 year - Alt3
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3


RS = 865 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2530
2525
2520
2515
2510
2505
0
100
200
300
400
500
600
Legend
WS 100 year - Existing
WS 100 year - Alt3
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3

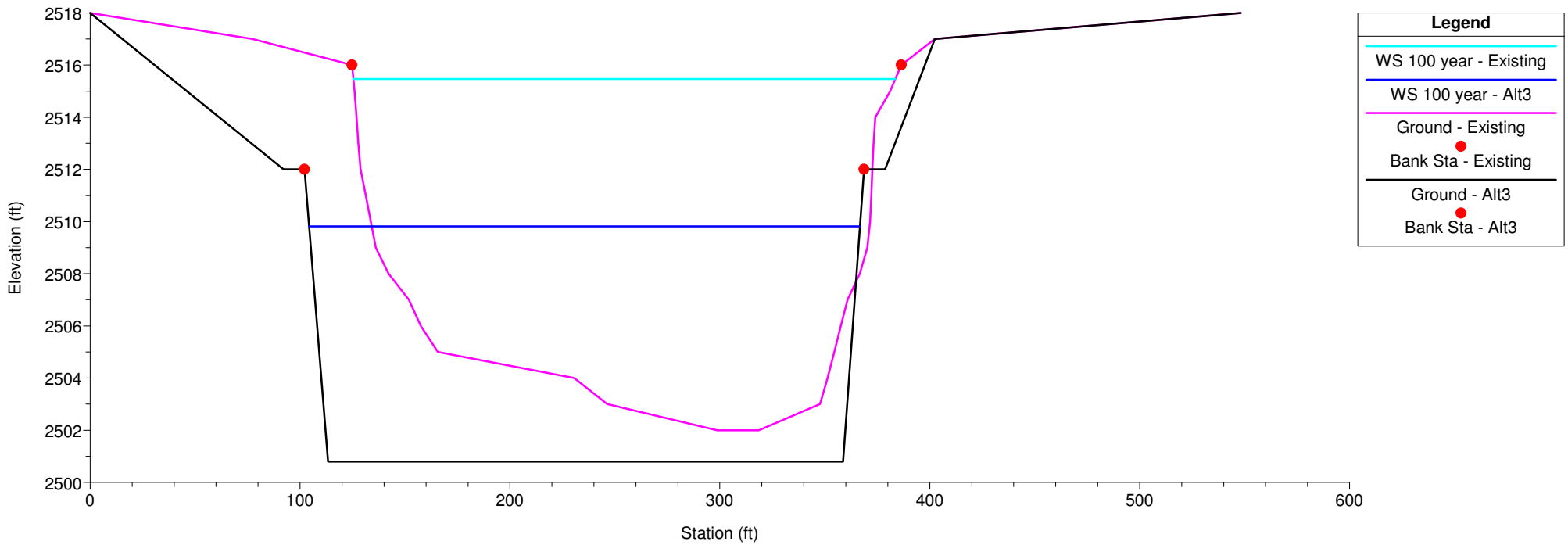

RS = 850 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2525
2520
2515
2510
2505
2500
0
50
100
150
200
250
300
350
Legend
WS 100 year - Existing
WS 100 year - Alt3
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3


RS = 825 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2525
2520
2515
2510
2505
2500
0
50
100
150
200
250
300
350
400
Legend
WS 100 year - Existing
WS 100 year - Alt3
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3

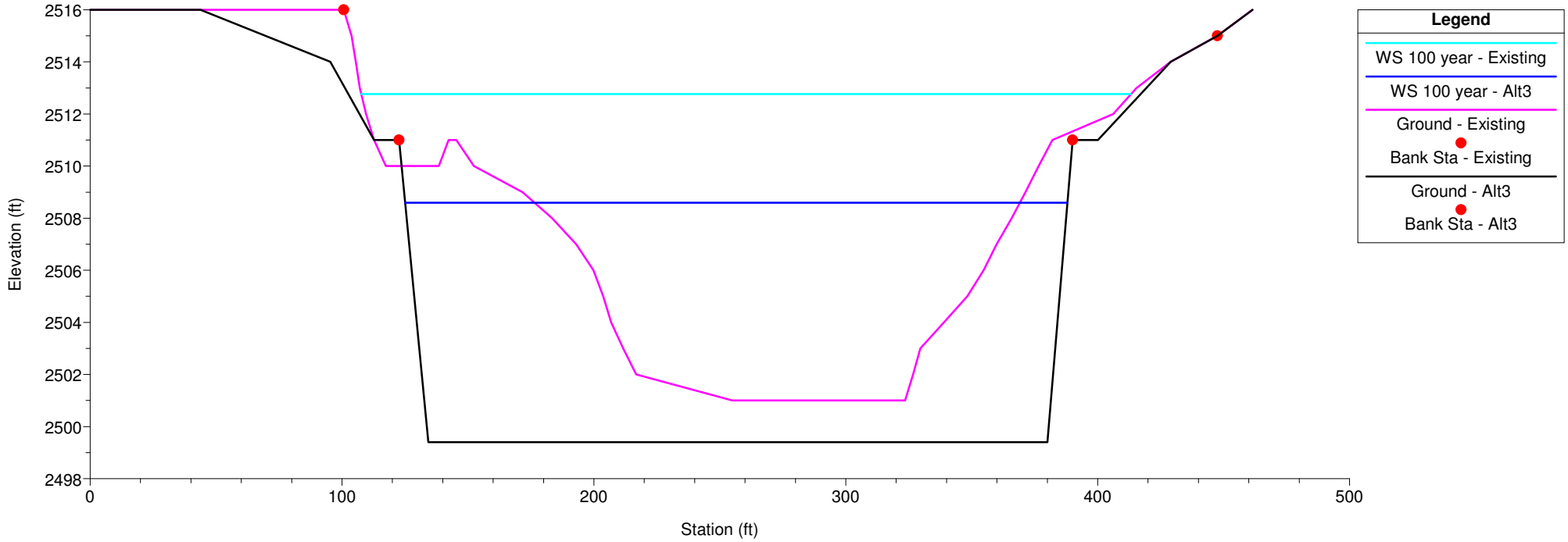

RS = 800 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2525
2520
2515
2510
2505
2500
0
100
200
300
400
500
600
700
800
Legend
WS 100 year - Existing
WS 100 year - Alt3
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3

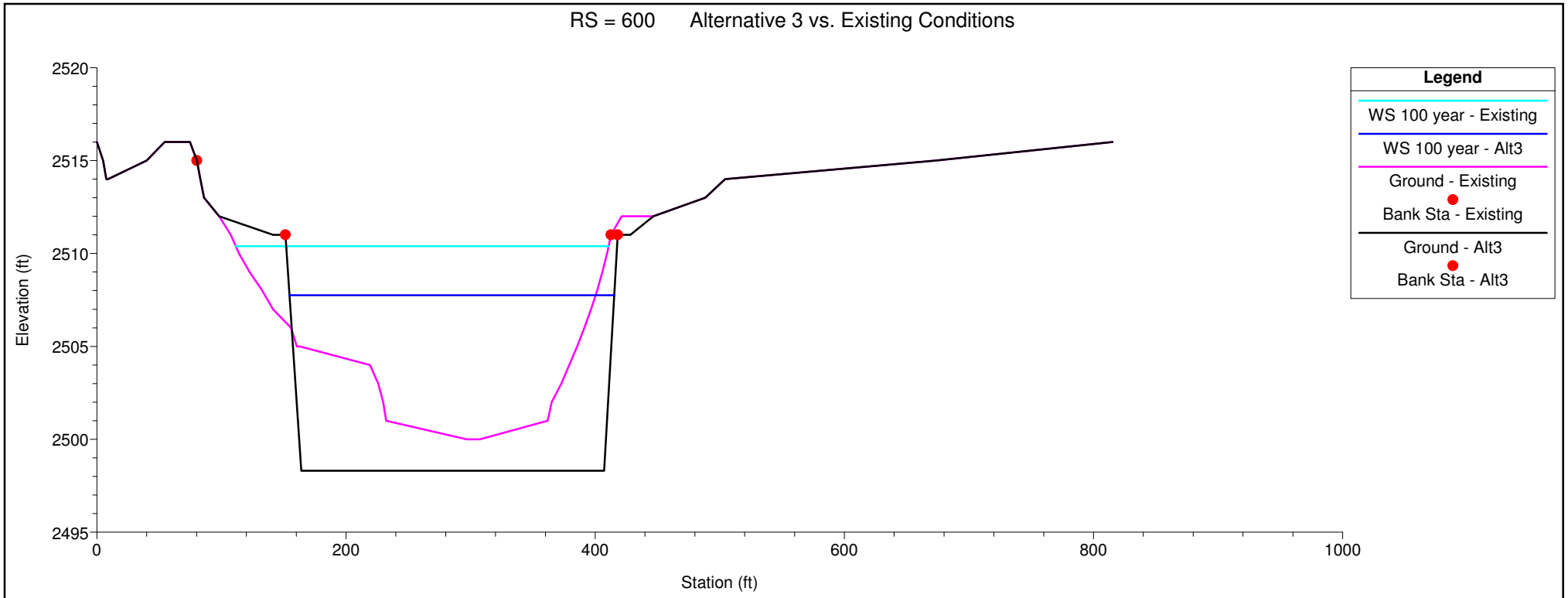

RS = 750 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2520
2518
2516
2514
2512
2510
2508
2506
2504
2502
0
100
200
300
400
Legend
WS 100 year - Existing
WS 100 year - Alt3
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3

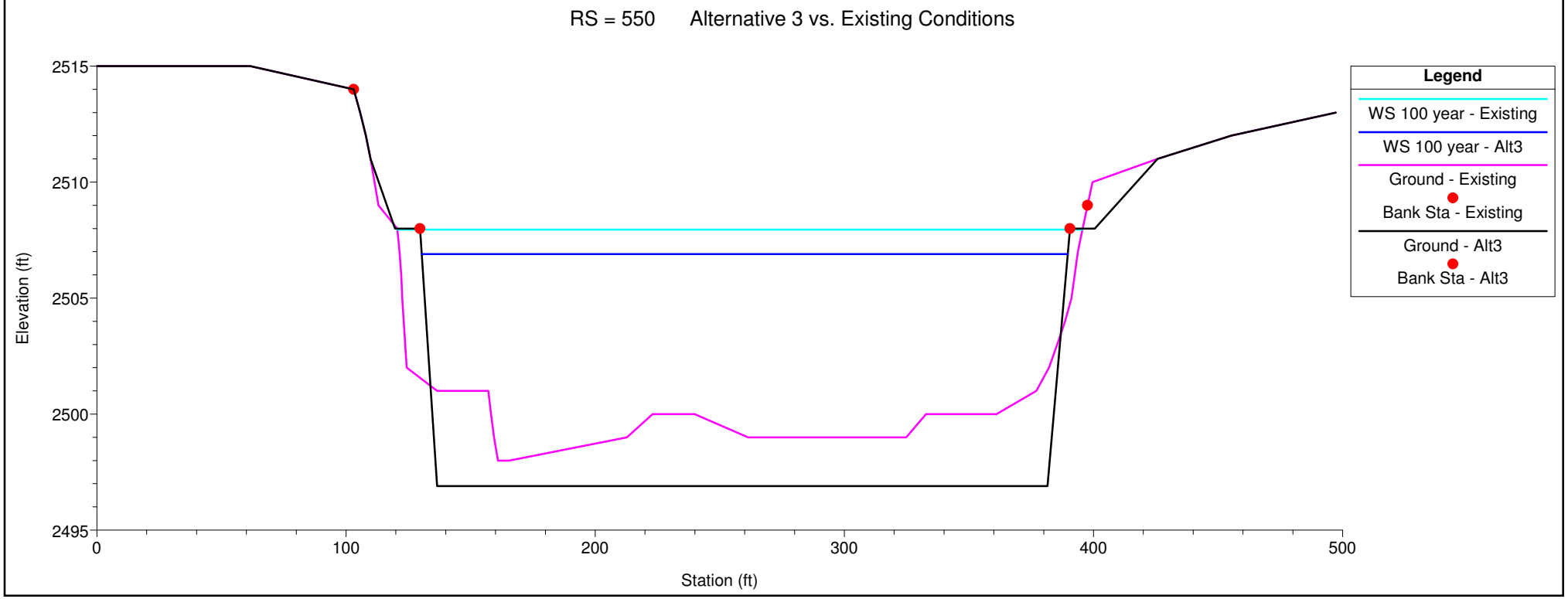
RS = 700 Alternative 3 vs. Existing Conditions

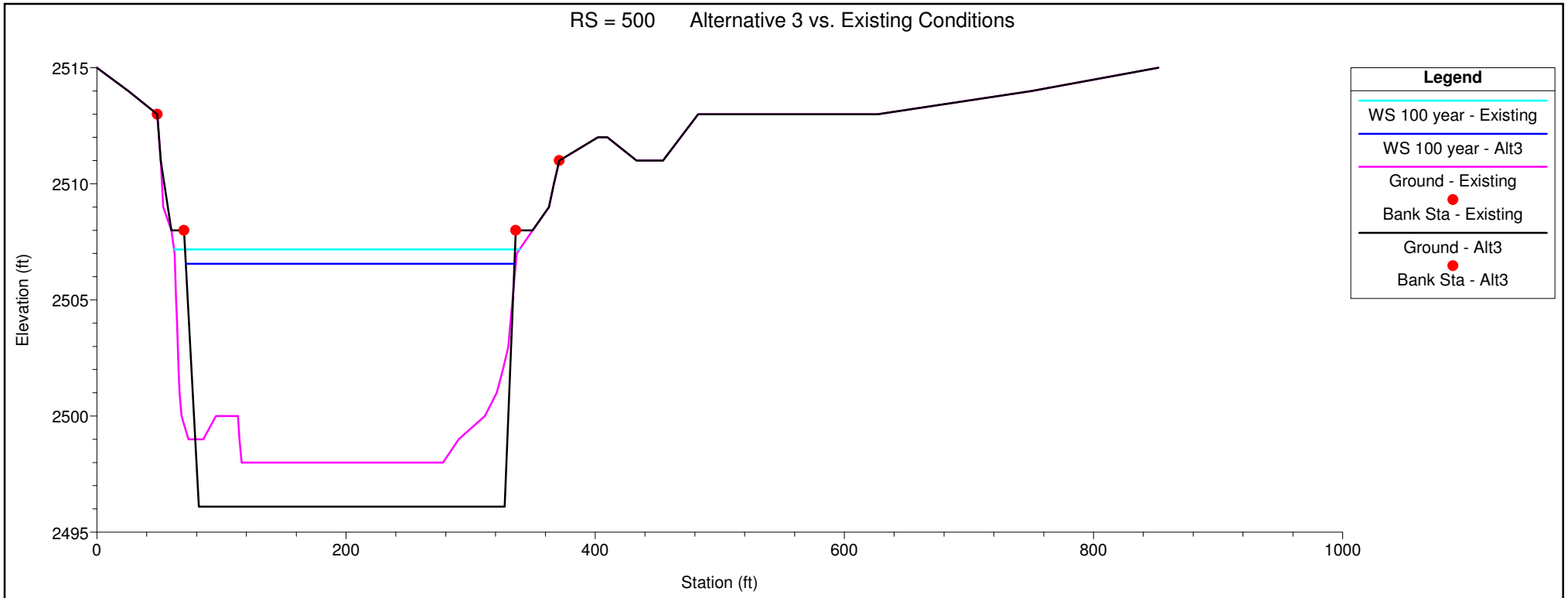


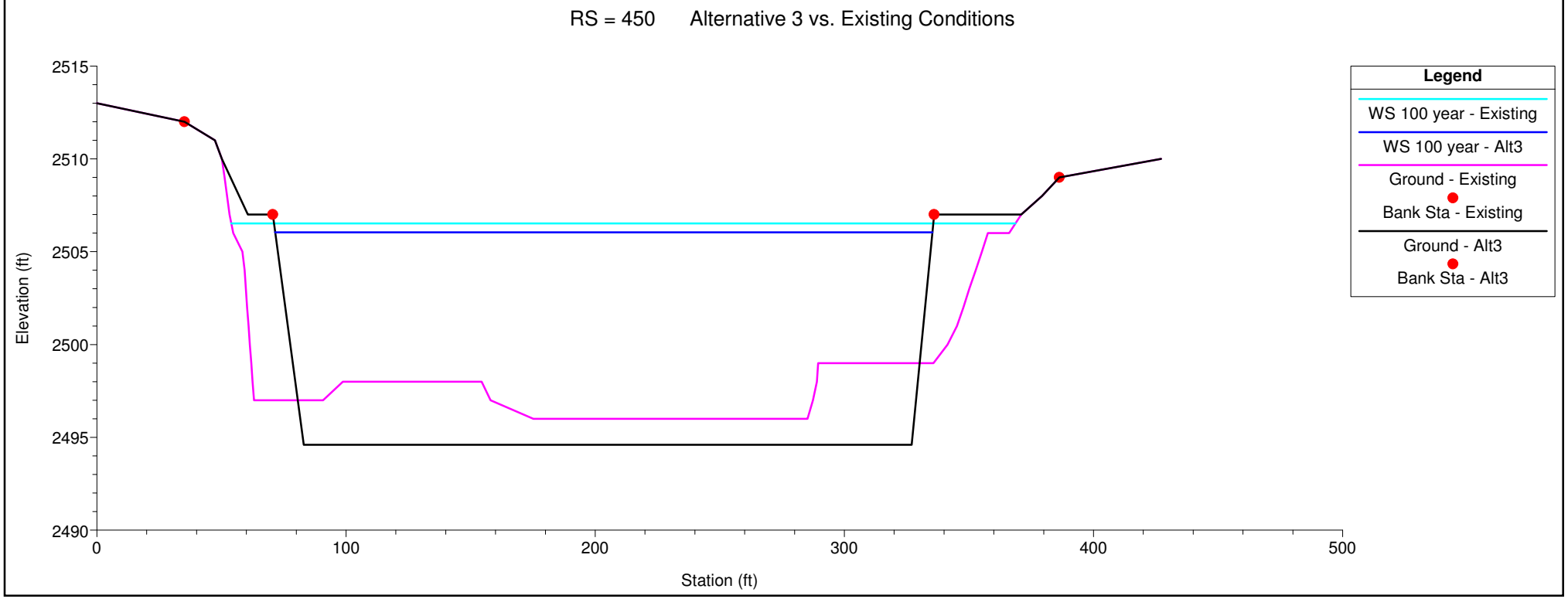
RS = 650 Alternative 3 vs. Existing Conditions

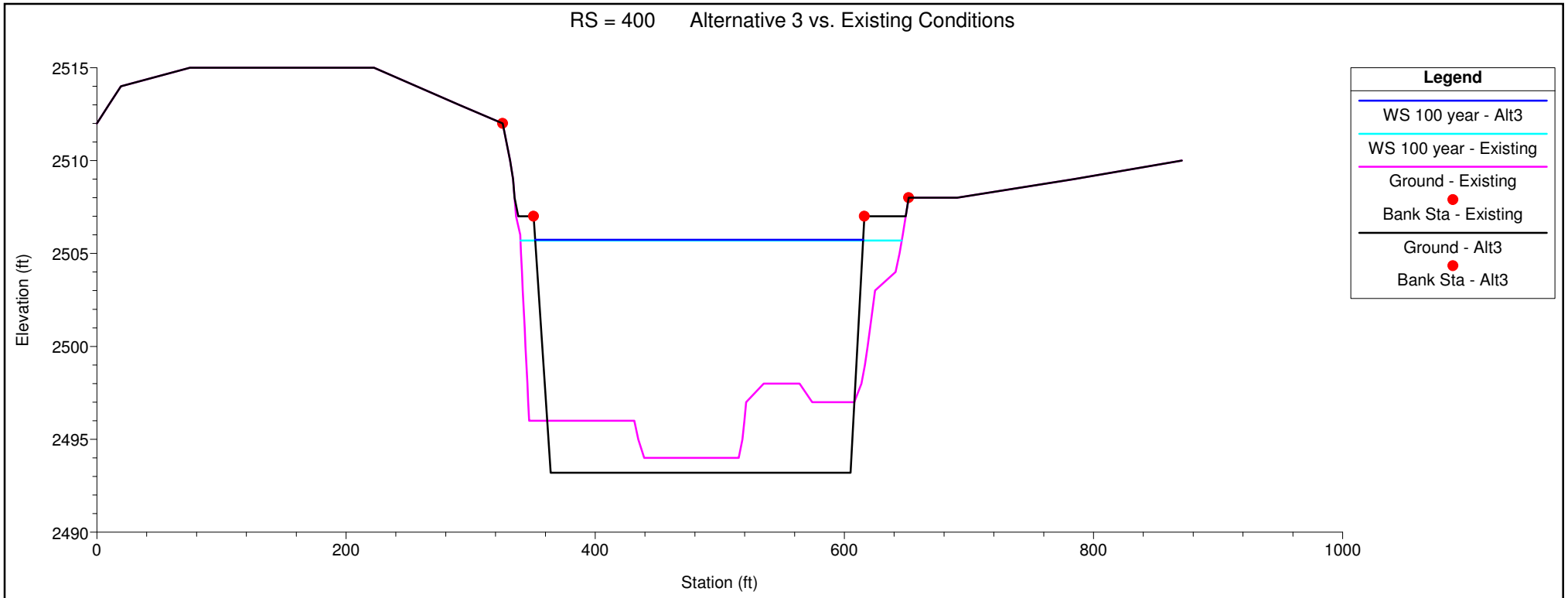


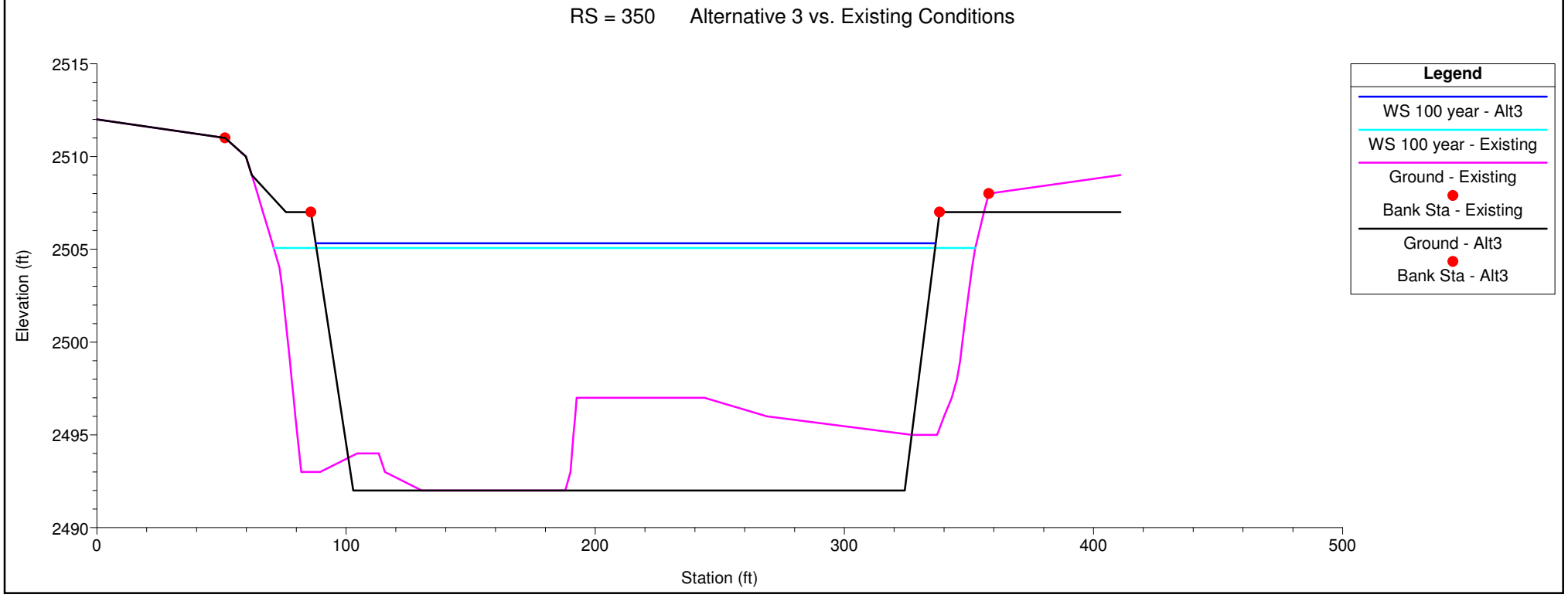

RS = 600 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2520
2515
2510
2505
2500
2495
0
200
400
600
800
1000
Legend
WS 100 year - Existing
WS 100 year - Alt3
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3

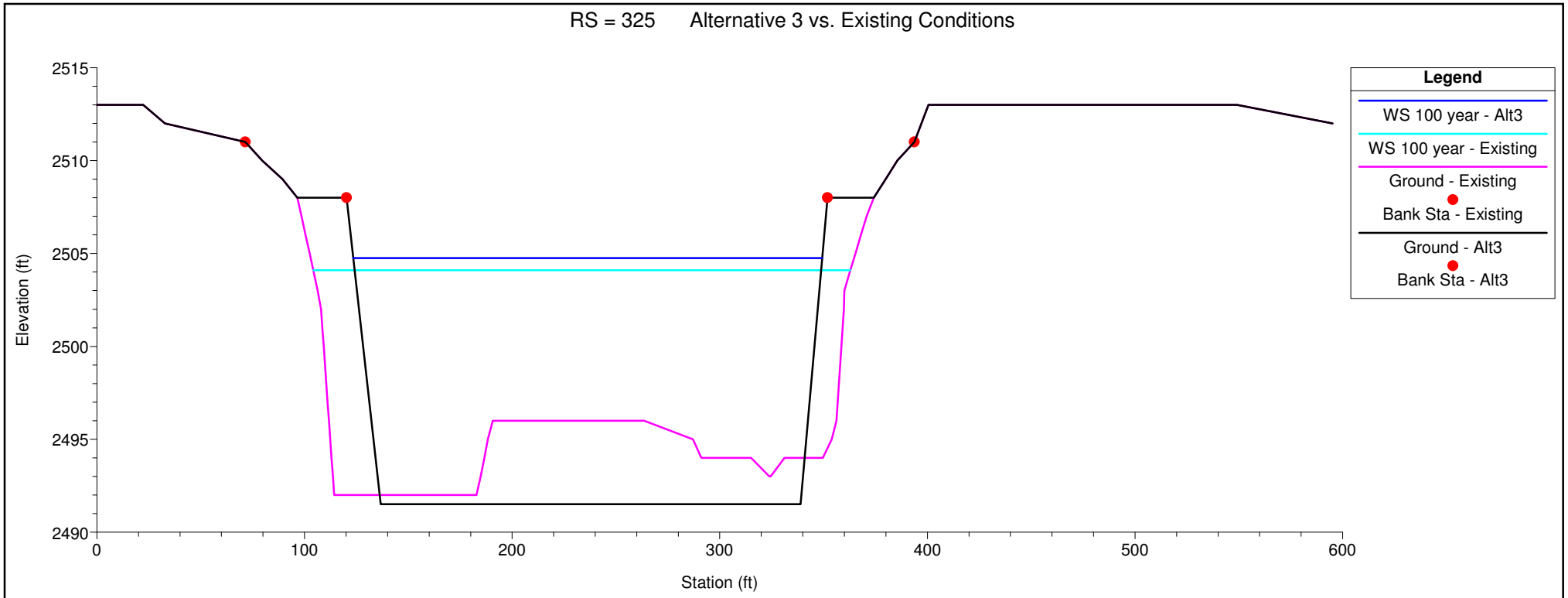

RS = 550 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
0
100
200
300
400
500
Legend
WS 100 year - Existing
WS 100 year - Alt3
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3

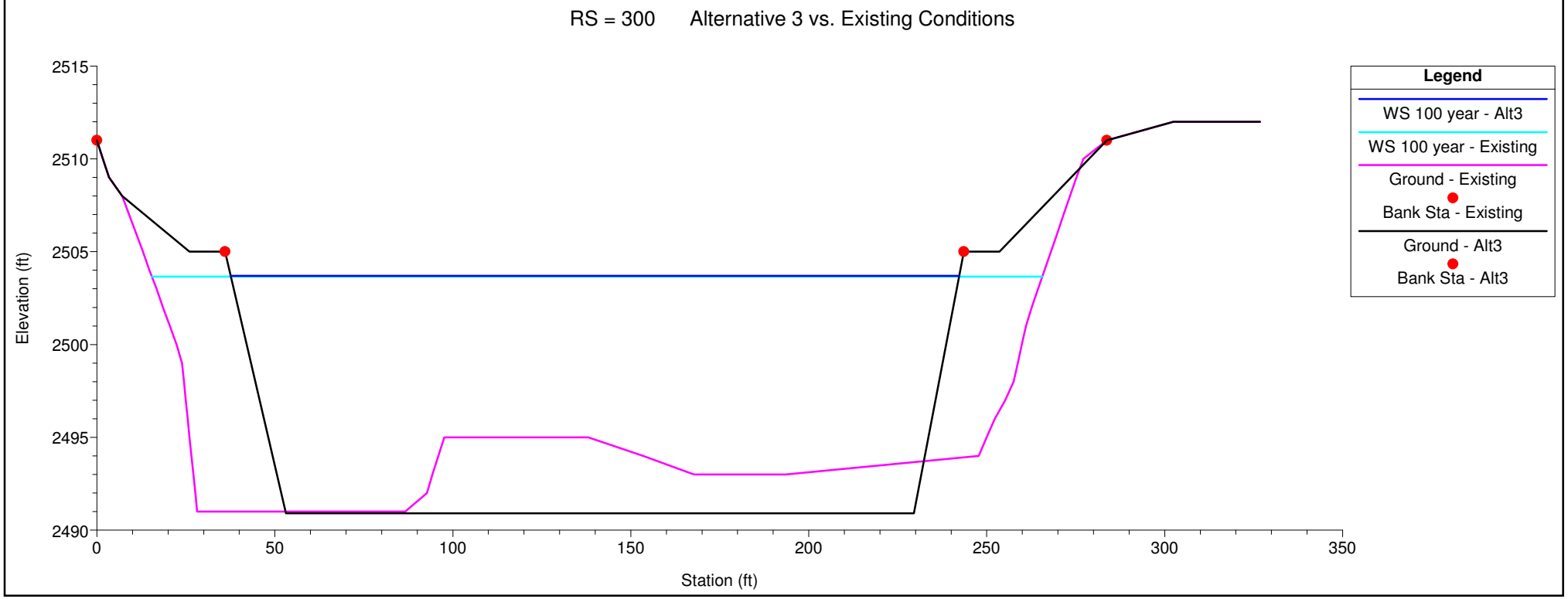

RS = 500 Alternative 3 vs. Existing Conditions
Elevation (ft)
2515
2510
2505
2500
2495
0
200
400
600
800
1000
Station (ft)
Legend
WS 100 year - Existing
WS 100 year - Alt3
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3


RS = 450 Alternative 3 vs. Existing Conditions
Elevation (ft)
2515
2510
2505
2500
2495
2490
0
100
200
300
400
500
Station (ft)
Legend
WS 100 year - Existing
WS 100 year - Alt3
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3


RS = 400 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
2490
0
200
400
600
800
1000
Legend
WS 100 year - Alt3
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3

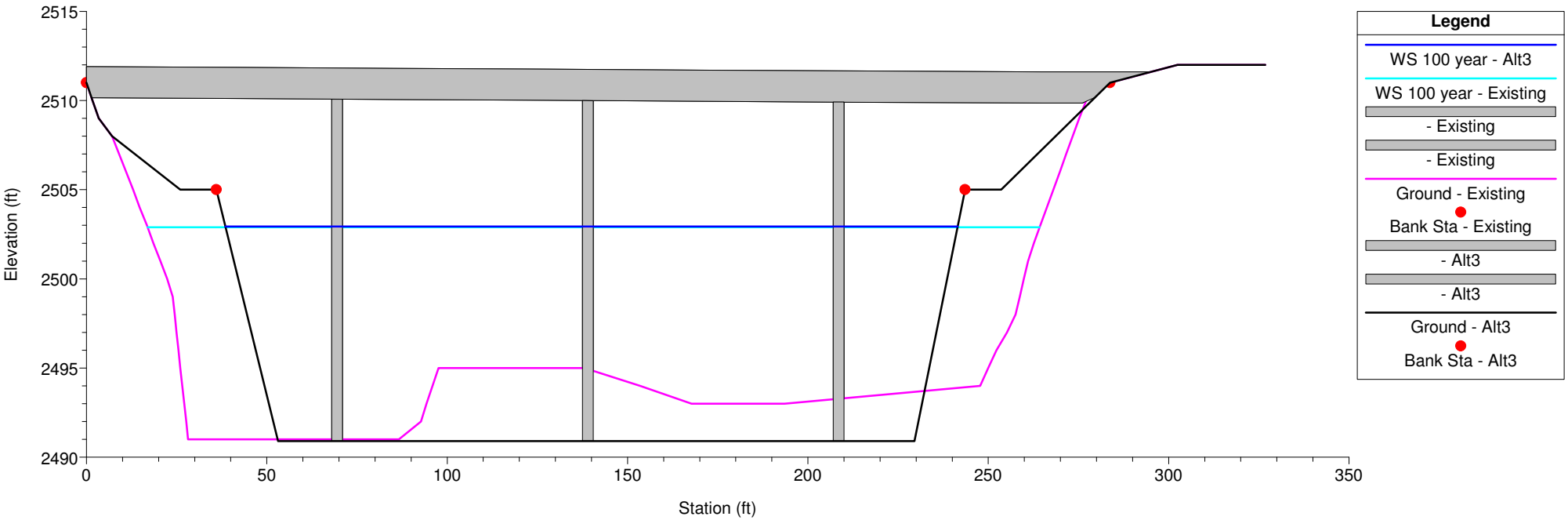

RS = 350 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
2490
0
100
200
300
400
500
Legend
WS 100 year - Alt3
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3


RS = 325 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
2490
0
100
200
300
400
500
600
Legend
WS 100 year - Alt3
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3


RS = 300 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
2490
0
50
100
150
200
250
300
350
Legend
WS 100 year - Alt3
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3

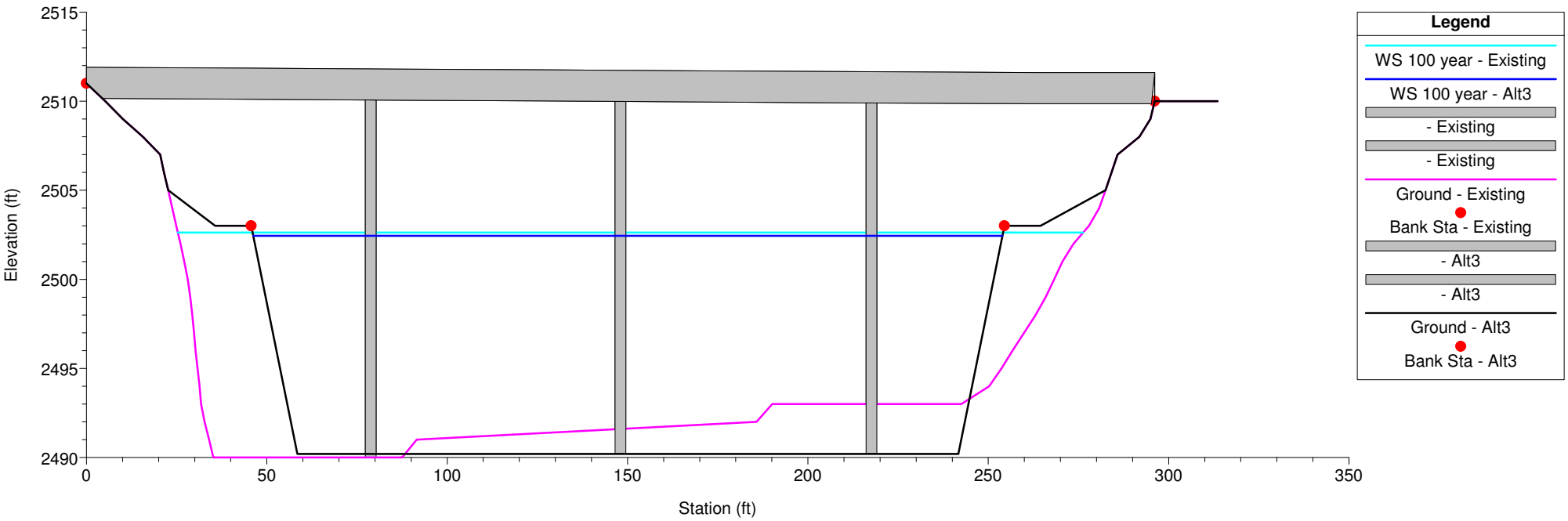
RS = 295 BR

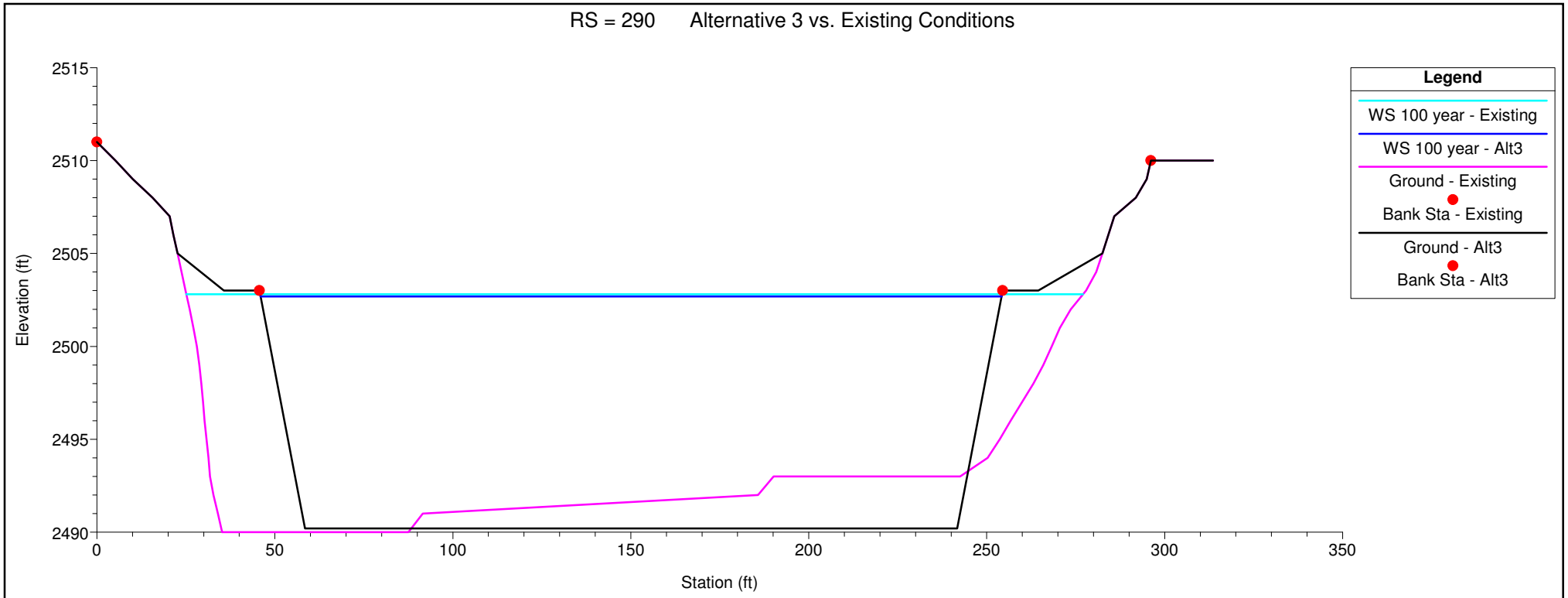
Alternative 3 vs. Existing Conditions

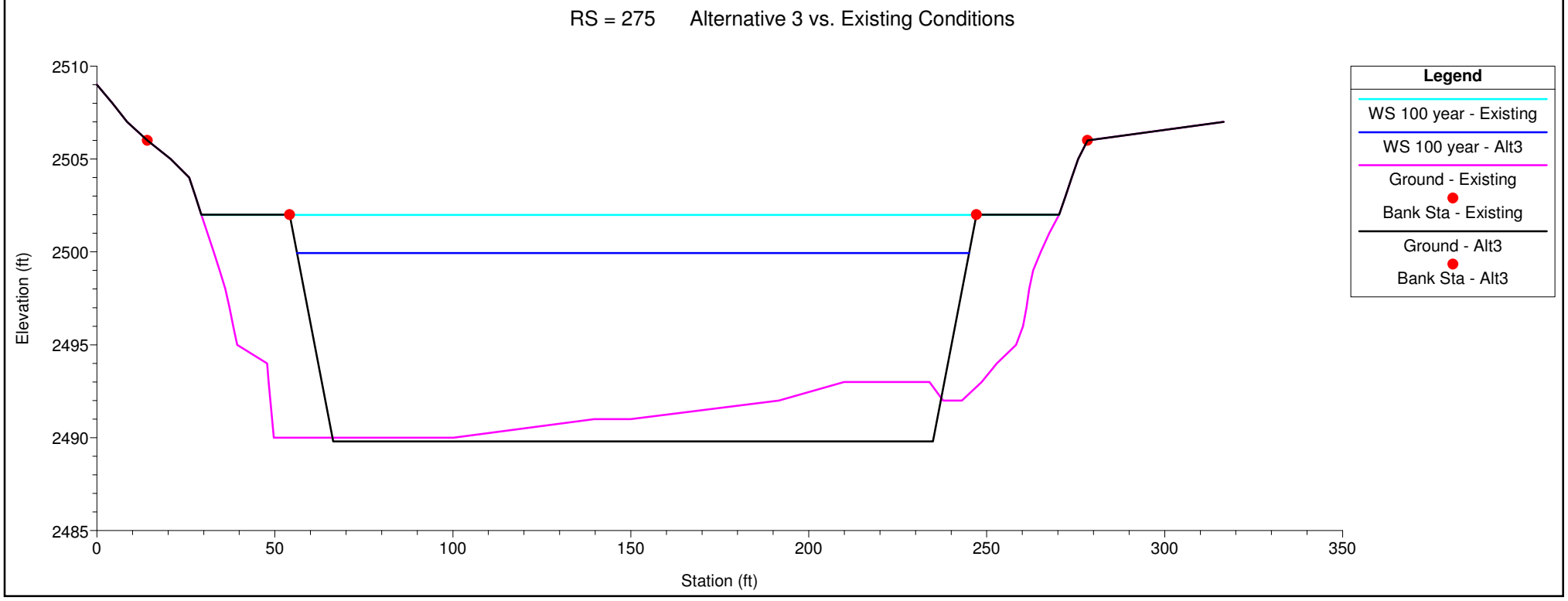


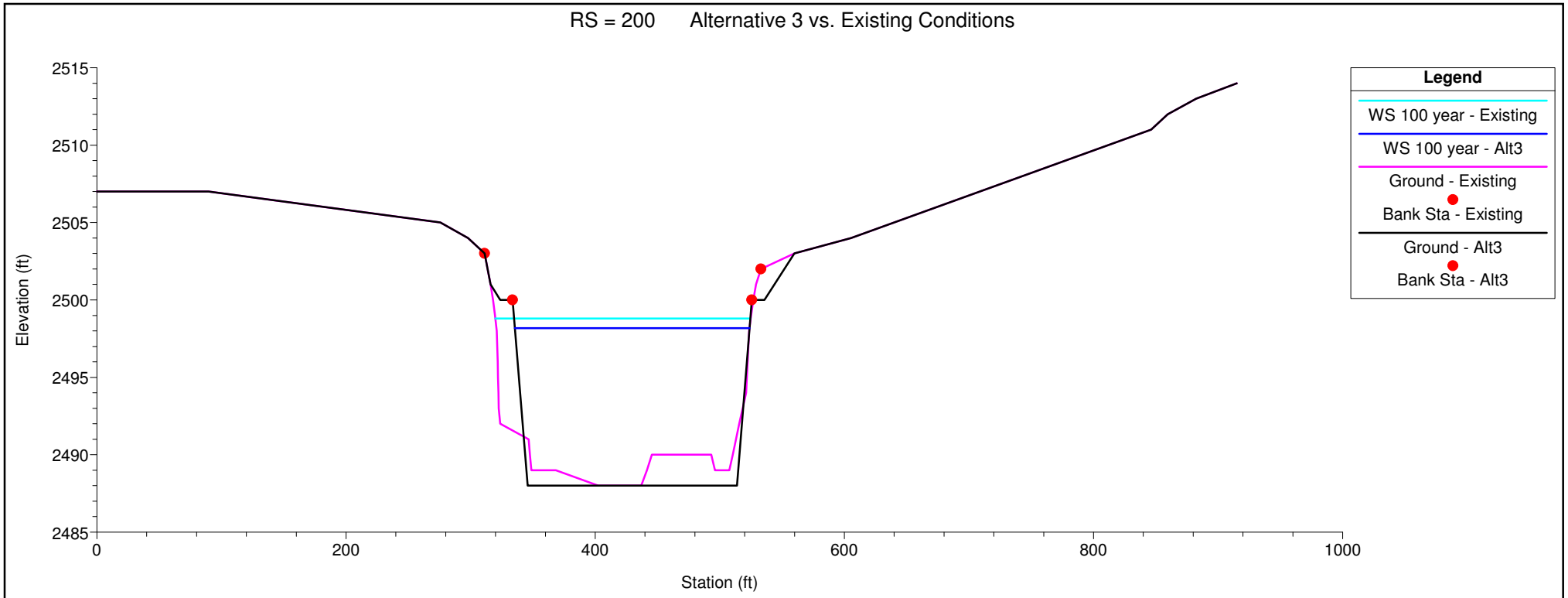
RS = 295 BR

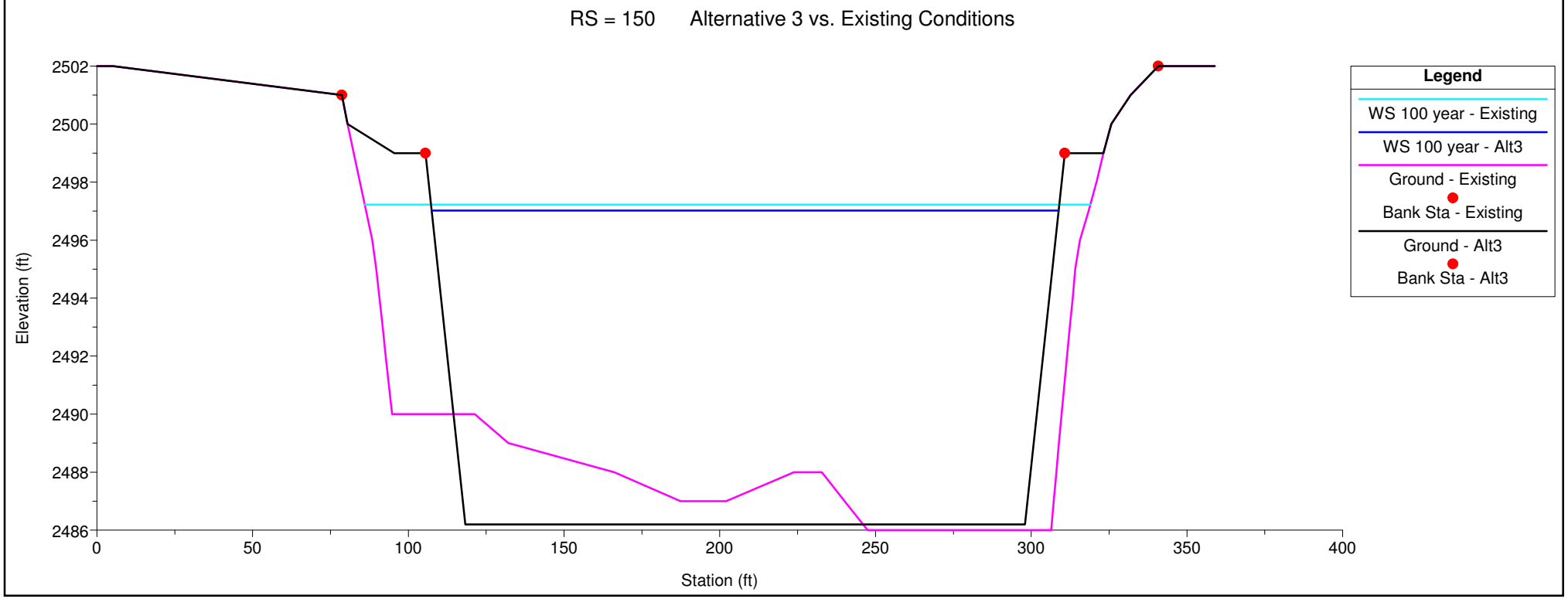
Alternative 3 vs. Existing Conditions



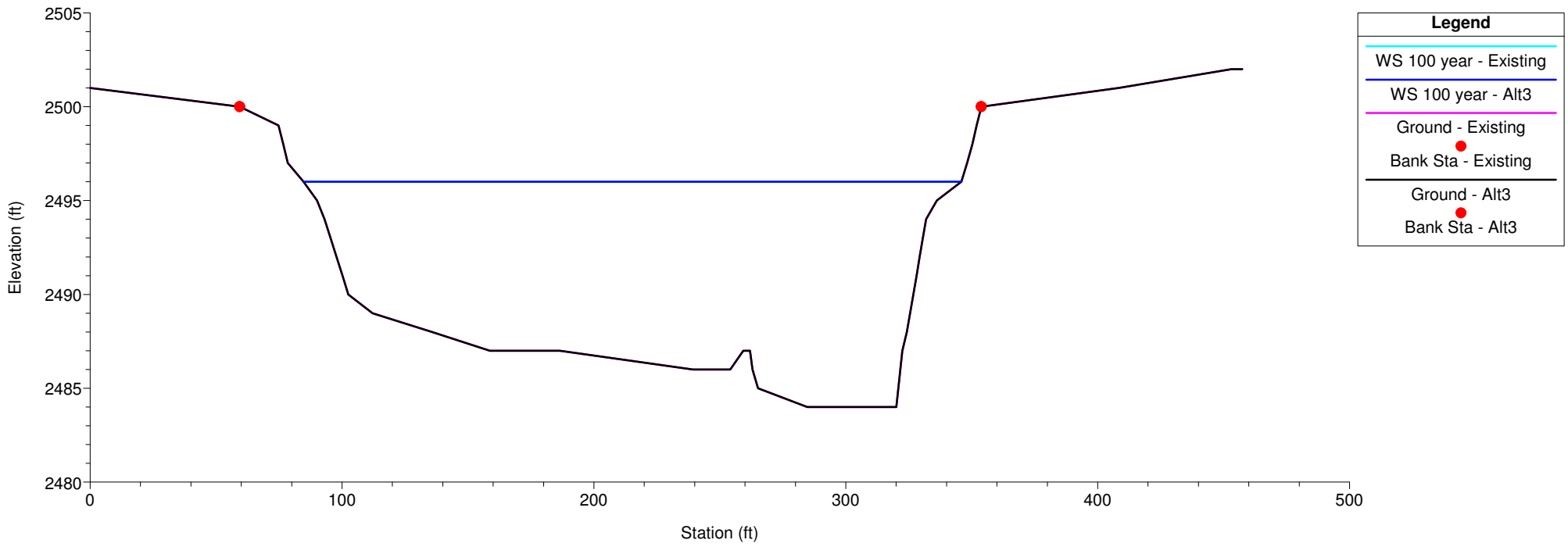

RS = 290 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
2490
0
50
100
150
200
250
300
350
Legend
WS 100 year - Existing
WS 100 year - Alt3
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3


RS = 275 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2510
2505
2500
2495
2490
2485
0
50
100
150
200
250
300
350
Legend
WS 100 year - Existing
WS 100 year - Alt3
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3


RS = 200 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
2490
2485
0
200
400
600
800
1000
Legend
WS 100 year - Existing
WS 100 year - Alt3
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3


RS = 150 Alternative 3 vs. Existing Conditions
Elevation (ft)
Station (ft)
2502
2500
2498
2496
2494
2492
2490
2488
2486
0
50
100
150
200
250
300
350
400
Legend
WS 100 year - Existing
WS 100 year - Alt3
Ground - Existing
Bank Sta - Existing
Ground - Alt3
Bank Sta - Alt3

RS = 100 Alternative 3 vs. Existing Conditions



HEC-RAS Version 3.1.3 May 2005
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
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: Pantano-Sediment Transport
Project File : PantanoSediment.prj
Run Date and Time: 9/19/2008 1:24:35 PM

Project in English units

****

PLAN DATA

Plan Title: Alt3
Plan File : t:\07125\01\WATRES\GLBBASE\CALCS\Hydraulics\HEC-RAS (Sediment)\PantanoSediment.p22

Geometry Title: Alternative3
Geometry File : t:\07125\01\WATRES\GLBBASE\CALCS\Hydraulics\HEC-RAS (Sediment)\PantanoSediment.g04

Flow Title : 1 Flow Profiles
Flow File : t:\07125\01\WATRES\GLBBASE\CALCS\Hydraulics\HEC-RAS (Sediment)\PantanoSediment.F01

Plan Summary Information:
Number of: Cross Sections = 41 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 2 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
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: Subcritical Flow

****

FLOW DATA

Flow Title: 1 Flow Profiles
Flow File : t:\07125\01\WATRES\GLBBASE\CALCS\Hydraulics\HEC-RAS (Sediment)\PantanoSediment.F01

Flow Data (cfs)
****
* River Reach RS * 100 year 50 year 25 year 10 year *
* River #1 Reach #1 1600 * 32000 20000 14000 8700 *
****

Boundary Conditions

* River	Reach	Profile	*	Upstream	Downstream	*
* River #1	Reach #1	100 year	*		Normal S = 0.005	*
* River #1	Reach #1	50 year	*		Normal S = 0.005	*
* River #1	Reach #1	25 year	*		Normal S = 0.005	*
* River #1	Reach #1	10 year	*		Normal S = 0.005	*

****

GEOMETRY DATA

Geometry Title: Alternative3
Geometry File : t:\07125\01\WATRES\GLBBASE\CALCS\Hydraulics\HEC-RAS (Sediment)\PantanoSediment.g04

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1600

INPUT
Description:
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2560	6.4	2559	12.63	2558	18.96	2557	25.3	2556
31.64	2555	37.97	2554	44.38	2553	50.84	2552	57.29	2551
63.85	2550	70.23	2549	76.66	2548	83.12	2547	89.57	2546
96.03	2545	104.28	2544	113.13	2543	121.99	2542	130.94	2541
142.12	2540	202.75	2540	242.37	2540	320.07	2540	328.69	2541
337.31	2542	345.93	2543	354.55	2544	363.17	2545	371.79	2546
380.41	2547	389.03	2548	397.65	2549	406.22	2550	414.78	2551
423.34	2552	431.9	2553	440.46	2554	449.02	2555		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	44.38	.03	431.9	.55

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
44.38	431.9	714.82	679.46	667.01	.1	.3

CROSS SECTION OUTPUT Profile #100 year

* E.G. Elev (ft)	* 2551.95	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 3.40	* Wt. n-Val.	*	* 0.030	*	*
* W.S. Elev (ft)	* 2548.55	* Reach Len. (ft)	* 714.82	* 679.46	* 667.01	*
* Crit W.S. (ft)	* 2548.55	* Flow Area (sq ft)	*	* 2161.11	*	*
* E.G. Slope (ft/ft)	*0.007049	* Area (sq ft)	*	* 2161.11	*	*
* Q Total (cfs)	*32000.00	* Flow (cfs)	*	*32000.00	*	*
* Top Width (ft)	* 320.60	* Top Width (ft)	*	* 320.60	*	*
* Vel Total (ft/s)	* 14.81	* Avg. Vel. (ft/s)	*	* 14.81	*	*
* Max Chl Dpth (ft)	* 8.55	* Hydr. Depth (ft)	*	* 6.74	*	*
* Conv. Total (cfs)	*381138.7	* Conv. (cfs)	*	*381138.7	*	*
* Length Wtd. (ft)	* 679.46	* Wetted Per. (ft)	*	* 321.64	*	*
* Min Ch El (ft)	* 2540.00	* Shear (lb/sq ft)	*	* 2.96	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 43.78	*	*
* Frctn Loss (ft)	* 2.92	* Cum Volume (acre-ft)	*	* 486.62	*	0.04 *
* C & E Loss (ft)	* 0.48	* Cum SA (acres)	*	* 50.70	*	0.23 *

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
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: River #1
REACH: Reach #1 RS: 1500

INPUT
Description:
Station Elevation Data num= 55
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2552 44.32 2551 97.21 2550 217.4 2550 271.68 2550
341.92 2549 479.35 2544 480.31 2543 481.37 2542 482.2 2541
483.05 2540 483.78 2539 484.55 2538 486.23 2537 491.23 2536
494.37 2535 495.54 2534 510.31 2534 516.95 2535 524.67 2536
535.82 2536 537.4 2535 539.99 2534 542.3 2533 546.34 2532
578.5 2532 581.8 2533 584.65 2534 587.3 2535 591.8 2536
610.04 2537 650.01 2537 656.48 2537 682.04 2537 689 2536
696.1 2535 722.11 2535 724.8 2536 736.31 2537 742.79 2538
749.32 2539 750.68 2540 752.02 2541 753.35 2542 754.71 2543
760.8 2544 771.13 2545 776.07 2546 781.82 2547 788.07 2547
800.68 2547 825.75 2548 840.49 2549 847.09 2549 873.22 2550

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .055 341.92 .03 781.82 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
341.92 781.82 249.54 214.53 208.71 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2547.93 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 1.81 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2546.12 * Reach Len. (ft) * 249.54 * 214.53 * 208.71 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 2963.77 * *
* E.G. Slope (ft/ft) *0.002890 * Area (sq ft) * * 2963.77 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 355.60 * Top Width (ft) * * 355.60 * *
* Vel Total (ft/s) * 10.80 * Avg. Vel. (ft/s) * * 10.80 * *
* Max Chl Dpth (ft) * 14.12 * Hydr. Depth (ft) * * 8.33 * *
* Conv. Total (cfs) *595265.4 * Conv. (cfs) * *595265.4 * *
* Length Wtd. (ft) * 214.53 * Wetted Per. (ft) * * 362.96 * *
* Min Ch El (ft) * 2532.00 * Shear (lb/sq ft) * * 1.47 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 15.91 * *
* Frctn Loss (ft) * 0.58 * Cum Volume (acre-ft) * * 446.65 * 0.04 *
* C & E Loss (ft) * 0.01 * Cum SA (acres) * * 45.43 * 0.23 *
****

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1450

INPUT
Description:
Station Elevation Data num= 45
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2546 19 2546 51.63 2546 56.22 2545 59.92 2544

```
  69.95    2543   70.94    2542   71.97    2541   73.05    2540   74.14    2539
  75.29    2538   76.27    2537   77.42    2536   80.49    2535   81.02    2534
  84.75    2533   85.65    2532   86.57    2531  120.14    2531  122.76    2532
 130.25    2533  138.86    2534  141.33    2535  146.34    2535   175.1    2535
 179.28    2536  230.48    2537   236.4    2537  243.84    2536  245.96    2535
 248.93    2534  271.08    2534   291.6    2535  304.77    2536  338.54    2537
    340    2538  341.44    2539  342.85    2540  344.25    2541  345.61    2542
 348.41    2543  368.53    2544  376.03    2545  383.95    2546  391.36    2547

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
**************************************************
      0    .055   51.63     .03  391.36    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        51.63  391.36          208.29  198.71  196.74            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
**********************************************************************************************
* E.G. Elev (ft)         * 2547.34  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.78  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2545.57  * Reach Len. (ft)        *  208.29  *  198.71  *  196.74  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)      *         * 2992.82  *         *
* E.G. Slope (ft/ft)     *0.002511  * Area (sq ft)           *         * 2992.82  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)         *  326.90  * Top Width (ft)         *         *  326.90  *         *
* Vel Total (ft/s)       *   10.69  * Avg. Vel. (ft/s)       *         *   10.69  *         *
* Max Chl Dpth (ft)      *   14.57  * Hydr. Depth (ft)       *         *    9.16  *         *
* Conv. Total (cfs)      *638553.1  * Conv. (cfs)            *         *638553.1  *         *
* Length Wtd. (ft)       *  198.71  * Wetted Per. (ft)       *         *  334.75  *         *
* Min Ch El (ft)         * 2531.00  * Shear (lb/sq ft)       *         *    1.40  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   14.99  *         *
* Frctn Loss (ft)        *    0.58  * Cum Volume (acre-ft)   *         *  431.98  *    0.04  *
* C & E Loss (ft)        *    0.05  * Cum SA (acres)         *         *   43.75  *    0.23  *
**********************************************************************************************

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

CROSS SECTION


RIVER: River #1
REACH: Reach #1           RS: 1400

INPUT
Description:
Station Elevation Data    num=      58
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
      0    2547  146.64    2545  255.29    2545  288.69    2545  295.61    2544
  306.7    2543  307.96    2542  309.18    2541  310.32    2540  311.47    2539
 312.62    2538  313.79    2537  324.95    2536  326.94    2535  331.52    2534
 332.56    2533  333.65    2532  334.79    2531  346.78    2530  352.41    2530
 354.84    2531  356.53    2532  364.04    2532  367.65    2532  371.65    2533
 377.04    2533  380.29    2533  384.46    2534   389.3    2534  391.66    2534
 397.87    2534  405.78    2534  415.27    2535  416.31    2535  427.87    2535
 437.22    2535  446.39    2534  483.73    2533  497.25    2533  500.49    2534
 503.73    2535  537.05    2536  541.55    2536  556.55    2536  557.89    2537
 559.19    2538  560.53    2539  561.82    2540  563.15    2541  564.36    2542
 566.21    2543  583.98    2544  600.64    2545   606.2    2546  612.52    2547
 620.38    2548  628.23    2549  810.24    2548

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
**************************************************
      0    .055  288.69     .03  600.64    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       288.69  600.64          208.05  211.15  211.03            .1       .3
```

CROSS SECTION OUTPUT Profile #100 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2546.72  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    2.28  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2544.43  * Reach Len. (ft)       *  208.05  *  211.15  *  211.03  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         * 2638.51  *         *
* E.G. Slope (ft/ft)    *0.003389  * Area (sq ft)          *         * 2638.51  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  298.53  * Top Width (ft)        *         *  298.53  *         *
* Vel Total (ft/s)      *   12.13  * Avg. Vel. (ft/s)      *         *   12.13  *         *
* Max Chl Dpth (ft)     *   14.43  * Hydr. Depth (ft)      *         *    8.84  *         *
* Conv. Total (cfs)     *549668.8  * Conv. (cfs)           *         *549668.8  *         *
* Length Wtd. (ft)      *  211.15  * Wetted Per. (ft)       *         *  305.88  *         *
* Min Ch El (ft)        * 2530.00  * Shear (lb/sq ft)      *         *    1.83  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   22.14  *         *
* Frctn Loss (ft)       *    0.59  * Cum Volume (acre-ft)   *         *  419.14  *    0.04  *
* C & E Loss (ft)       *    0.13  * Cum SA (acres)         *         *   42.32  *    0.23  *
*****************************************************************************************
```

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1350

INPUT
Description:
Station Elevation Data num= 42

```
    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev
*******************************************************************************
      0   2544   9.54   2543  38.09   2542     39   2541  39.96   2540
  40.94   2539   41.9   2538  42.89   2537  43.85   2536  44.79   2535
  45.98   2534  52.23   2533  53.89   2532  55.61   2531   57.3   2530
  97.27   2530  100.2   2531 116.73   2532 164.32   2532 176.99   2532
 188.83   2532 193.69   2532    196   2533 199.44   2534 206.79   2534
 218.33   2534 283.32   2535    287   2536 288.24   2537 289.46   2538
  290.7   2539 291.93   2540 293.13   2541 294.37   2542 295.58   2543
 296.81   2544 322.32   2545 329.31   2546    335   2547 338.98   2548
 344.34   2549 348.11   2549
```

Manning's n Values num= 3

```
    Sta   n Val    Sta   n Val    Sta   n Val
***********************************************
      0   .055      0    .03  296.81   .055
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 296.81 267.52 277.24 286.29 .1 .3

CROSS SECTION OUTPUT Profile #100 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2545.99  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.84  * Wt. n-Val.           *         *   0.030  *   0.055  *
* W.S. Elev (ft)        * 2544.15  * Reach Len. (ft)       *   95.00  *   95.00  *   95.00  *
* Crit W.S. (ft)        * 2540.70  * Flow Area (sq ft)     *         * 2937.01  *    0.27  *
* E.G. Slope (ft/ft)    *0.002360  * Area (sq ft)          *         * 2937.01  *    0.27  *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *31999.94  *    0.06  *
* Top Width (ft)        *  300.53  * Top Width (ft)        *         *  296.81  *    3.72  *
* Vel Total (ft/s)      *   10.89  * Avg. Vel. (ft/s)      *         *   10.90  *    0.23  *
* Max Chl Dpth (ft)     *   14.15  * Hydr. Depth (ft)      *         *    9.90  *    0.07  *
* Conv. Total (cfs)     *658703.9  * Conv. (cfs)           *         *658702.7  *     1.3  *
* Length Wtd. (ft)      *   95.00  * Wetted Per. (ft)       *         *  304.82  *    3.72  *
* Min Ch El (ft)        * 2530.00  * Shear (lb/sq ft)      *         *    1.42  *    0.01  *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   15.47  *    0.00  *
* Frctn Loss (ft)       *    0.34  * Cum Volume (acre-ft)   *         *  405.62  *    0.04  *
* C & E Loss (ft)       *    0.08  * Cum SA (acres)         *         *   40.88  *    0.22  *
*****************************************************************************************
```

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.

BRIDGE

RIVER: River #1
REACH: Reach #1 RS: 1325

INPUT
Description:
Distance from Upstream XS = 95
Deck/Roadway Width = 136
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
****
0 2550 2545 700 2549 2545

Upstream Bridge Cross Section Data
Station Elevation Data num= 42
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2544 9.54 2543 38.09 2542 39 2541 39.96 2540
40.94 2539 41.9 2538 42.89 2537 43.85 2536 44.79 2535
45.98 2534 52.23 2533 53.89 2532 55.61 2531 57.3 2530
97.27 2530 100.2 2531 116.73 2532 164.32 2532 176.99 2532
188.83 2532 193.69 2532 196 2533 199.44 2534 206.79 2534
218.33 2534 283.32 2535 287 2536 288.24 2537 289.46 2538
290.7 2539 291.93 2540 293.13 2541 294.37 2542 295.58 2543
296.81 2544 322.32 2545 329.31 2546 335 2547 338.98 2548
344.34 2549 348.11 2549

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .055 0 .03 296.81 .055

Bank Sta: Left Right Coeff Contr. Expan.
0 296.81 .1 .3

Downstream Deck/Roadway Coordinates
num= 2
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
****
0 2550 2545 700 2549 2545

Downstream Bridge Cross Section Data
Station Elevation Data num= 46
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
10 2545 11.19 2544 14.12 2543 18.6 2542 21.86 2541
22.76 2540 23.68 2539 24.75 2538 26.09 2537 27.41 2536
28.72 2535 30.14 2534 34.85 2533 39.94 2532 41.07 2531
41.99 2530 44.79 2529 57.58 2529 93.97 2530 97.18 2531
100.8 2532 177.85 2532 265.38 2533 268.07 2534 270.69 2535
273.27 2536 275.81 2537 278.31 2538 280.77 2539 283.19 2540
286.23 2541 288.55 2542 290.43 2543 292.26 2544 294.33 2545
297.09 2546 299.89 2547 303.97 2548 329.07 2548 360.23 2548
381.39 2549 436.21 2549 452.08 2548 467.95 2547 496.98 2546
506.55 2546

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
10 .055 10 .03 303.97 .055

Bank Sta: Left Right Coeff Contr. Expan.

10 303.97 .1 .3

Upstream Embankment side slope = 1.5 horiz. to 1.0 vertical
Downstream Embankment side slope = 1.5 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 2550
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 5

Pier Data
Pier Station Upstream= 70 Downstream= 50
Upstream num= 2
Width Elev Width Elev
****
2.5 2525 2.5 2545
Downstream num= 2
Width Elev Width Elev
****
2.5 2525 2.5 2545

Pier Data
Pier Station Upstream= 117 Downstream= 97
Upstream num= 2
Width Elev Width Elev
****
2.5 2525 2.5 2545
Downstream num= 2
Width Elev Width Elev
****
2.5 2525 2.5 2545

Pier Data
Pier Station Upstream= 164 Downstream= 144
Upstream num= 2
Width Elev Width Elev
****
2.5 2529 2.5 2550
Downstream num= 2
Width Elev Width Elev
****
2.5 2529 2.5 2550

Pier Data
Pier Station Upstream= 211 Downstream= 191
Upstream num= 2
Width Elev Width Elev
****
2.5 2525 2.5 2545
Downstream num= 2
Width Elev Width Elev
****
2.5 2525 2.5 2545

Pier Data
Pier Station Upstream= 258 Downstream= 238
Upstream num= 2
Width Elev Width Elev
****
2.5 2525 2.5 2545
Downstream num= 2
Width Elev Width Elev
****
2.5 2525 2.5 2545

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #100 year
```
*****************************************************************************************
* E.G. US. (ft)        *   2545.99  * Element              *Inside BR US *Inside BR DS *
* W.S. US. (ft)        *   2544.15  * E.G. Elev (ft)       *   2545.57  *   2544.78  *
* Q Total (cfs)        *  32000.00  * W.S. Elev (ft)       *   2542.93  *   2542.32  *
* Q Bridge (cfs)       *  32000.00  * Crit W.S. (ft)       *   2541.04  *   2540.17  *
* Q Weir (cfs)         *            * Max Chl Dpth (ft)     *     12.93  *     13.32  *
* Weir Sta Lft (ft)    *            * Vel Total (ft/s)      *     13.05  *     12.60  *
* Weir Sta Rgt (ft)    *            * Flow Area (sq ft)     *   2452.22  *   2539.07  *
* Weir Submerg         *            * Froude # Chl          *      0.77  *      0.71  *
* Weir Max Depth (ft)  *            * Specif Force (cu ft)  *  25770.49  *  25911.16  *
* Min El Weir Flow (ft) *   2550.00  * Hydr Depth (ft)      *      9.03  *      9.79  *
* Min El Prs (ft)      *   2545.00  * W.P. Total (ft)      *    383.02  *    375.06  *
* Delta EG (ft)        *      1.45  * Conv. Total (cfs)     *  418788.3  *  450056.3  *
* Delta WS (ft)        *      1.83  * Top Width (ft)        *    271.45  *    259.46  *
* BR Open Area (sq ft) *   3047.30  * Frctn Loss (ft)      *      0.74  *      0.17  *
* BR Open Vel (ft/s)   *     13.05  * C & E Loss (ft)       *      0.05  *      0.07  *
* Coef of Q            *            * Shear Total (lb/sq ft) *     2.33  *      2.14  *
* Br Sel Method        *Energy only  * Power Total (lb/ft s) *    30.45  *     26.93  *
*****************************************************************************************
```

Warning: Pier drag coefficient of 2.0 assumed for Class B flow.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1300

INPUT
Description:
Station Elevation Data num= 46

```
   Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev
*******************************************************************************
    10   2545   11.19   2544   14.12   2543   18.6   2542   21.86   2541
  22.76   2540   23.68   2539   24.75   2538   26.09   2537   27.41   2536
  28.72   2535   30.14   2534   34.85   2533   39.94   2532   41.07   2531
  41.99   2530   44.79   2529   57.58   2529   93.97   2530   97.18   2531
  100.8   2532  177.85   2532  265.38   2533  268.07   2534  270.69   2535
 273.27   2536  275.81   2537  278.31   2538  280.77   2539  283.19   2540
 286.23   2541  288.55   2542  290.43   2543  292.26   2544  294.33   2545
 297.09   2546  299.89   2547  303.97   2548  329.07   2548  360.23   2548
 381.39   2549  436.21   2549  452.08   2548  467.95   2547  496.98   2546
 506.55   2546
```

Manning's n Values num= 3

```
   Sta   n Val    Sta   n Val    Sta   n Val
***************************************************
    10   .055     10    .03  303.97   .055
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
10 303.97 385.44 383.38 385.44 .1 .3

CROSS SECTION OUTPUT Profile #100 year

```
*****************************************************************************************
* E.G. Elev (ft)       * 2544.54  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)        *    2.22  * Wt. n-Val.           *          *   0.030  *          *
```

```
* W.S. Elev (ft)        * 2542.32  * Reach Len. (ft)       *  385.44  *  383.38  *  385.44  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)     *         * 2676.17  *         *
* E.G. Slope (ft/ft)     *0.002846  * Area (sq ft)          *         * 2676.17  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)         *  271.97  * Top Width (ft)        *         *  271.97  *         *
* Vel Total (ft/s)       *   11.96  * Avg. Vel. (ft/s)      *         *   11.96  *         *
* Max Chl Dpth (ft)      *   13.32  * Hydr. Depth (ft)      *         *    9.84  *         *
* Conv. Total (cfs)      *599800.9  * Conv. (cfs)           *         *599800.9  *         *
* Length Wtd. (ft)       *  383.38  * Wetted Per. (ft)      *         *  278.03  *         *
* Min Ch El (ft)         * 2529.00  * Shear (lb/sq ft)      *         *    1.71  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   20.45  *         *
* Frctn Loss (ft)        *    1.59  * Cum Volume (acre-ft)   *         *  389.19  *    0.04  *
* C & E Loss (ft)        *    0.21  * Cum SA (acres)         *         *   39.15  *    0.22  *
*****************************************************************************************************

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: River #1
REACH: Reach #1          RS: 1230

INPUT
Description:
Station Elevation Data    num=      38
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2543   46.64    2542   85.37    2542  117.86    2543  136.81    2543
  138.42    2542  139.93    2541  141.48    2540  142.52    2539  143.32    2538
  144.03    2537  144.72    2536   145.4    2535  146.08    2534  147.46    2533
  148.88    2532  150.34    2531  151.74    2530   219.3    2529   293.5    2529
  295.33    2530  302.46    2530  328.97    2529  345.46    2529  352.73    2530
  353.86    2531  355.01    2532  356.16    2533   357.3    2534  358.41    2535
  359.57    2536  360.76    2537  361.92    2538  420.65    2539  441.25    2539
  471.42    2538  505.23    2540  522.09    2539

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
************************************************
      0     .05  136.81     .03  361.92     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        136.81  361.92           47.48   47.44   47.31           .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2542.74  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    4.33  * Wt. n-Val.             *         *   0.030  *   0.050  *
* W.S. Elev (ft)         * 2538.41  * Reach Len. (ft)        *   47.48  *   47.44  *   47.31  *
* Crit W.S. (ft)         * 2538.41  * Flow Area (sq ft)      *         * 1915.37  *    8.78  *
* E.G. Slope (ft/ft)     *0.006575  * Area (sq ft)           *         * 1915.37  *    8.78  *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *31992.67  *    7.33  *
* Top Width (ft)         *  262.04  * Top Width (ft)         *         *  218.93  *   43.11  *
* Vel Total (ft/s)       *   16.63  * Avg. Vel. (ft/s)       *         *   16.70  *    0.83  *
* Max Chl Dpth (ft)      *    9.41  * Hydr. Depth (ft)       *         *    8.75  *    0.20  *
* Conv. Total (cfs)      *394635.8  * Conv. (cfs)            *         *394545.4  *    90.3  *
* Length Wtd. (ft)       *   47.44  * Wetted Per. (ft)       *         *  225.84  *   43.13  *
* Min Ch El (ft)         * 2529.00  * Shear (lb/sq ft)       *         *    3.48  *    0.08  *
* Alpha                  *    1.01  * Stream Power (lb/ft s) *         *   58.15  *    0.07  *
* Frctn Loss (ft)        *    0.28  * Cum Volume (acre-ft)   *         *  368.98  *    0.00  *
* C & E Loss (ft)        *    0.22  * Cum SA (acres)         *         *   36.99  *    0.03  *
*****************************************************************************************************

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: Divided flow computed for this cross-section.
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.
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: River #1
REACH: Reach #1 RS: 1220

INPUT
Description:
Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2542	18.62	2541	39.62	2541	45.78	2541	55.76	2541
61.41	2542	72.93	2542	74.08	2541	75.24	2540	76.4	2539
77.46	2538	78.36	2537	79.23	2536	80.14	2535	80.97	2534
81.91	2533	83.24	2532	84.71	2531	86.18	2530	87.71	2529
118.12	2528	120.9	2528	128.57	2528	156.62	2528	164.95	2528
178.24	2528	185.15	2528	189.77	2528	193.91	2528	201.47	2528
213.24	2528	215.78	2528	222	2528	227.84	2528	230.94	2528
234.18	2527	253.8	2527	258.2	2528	309.84	2529	310.87	2530
311.93	2531	313	2532	314.07	2533	315.14	2534	316.18	2535
317.25	2536	318.31	2537	319.41	2538	351.91	2538		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	72.93	.03	319.41	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
72.93	319.41	415.98	411.79	408.49	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (ft)	2540.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.60	Wt. n-Val.		0.030	
W.S. Elev (ft)	2537.18	Reach Len. (ft)	415.98	411.79	408.49
Crit W.S. (ft)	2536.61	Flow Area (sq ft)		2100.79	
E.G. Slope (ft/ft)	0.005447	Area (sq ft)		2100.79	
Q Total (cfs)	32000.00	Flow (cfs)		32000.00	
Top Width (ft)	240.31	Top Width (ft)		240.31	
Vel Total (ft/s)	15.23	Avg. Vel. (ft/s)		15.23	
Max Chl Dpth (ft)	10.18	Hydr. Depth (ft)		8.74	
Conv. Total (cfs)	433586.9	Conv. (cfs)		433586.9	
Length Wtd. (ft)	411.79	Wetted Per. (ft)		246.98	
Min Ch El (ft)	2527.00	Shear (lb/sq ft)		2.89	
Alpha	1.00	Stream Power (lb/ft s)		44.06	
Frctn Loss (ft)	1.98	Cum Volume (acre-ft)		366.80	0.00
C & E Loss (ft)	0.21	Cum SA (acres)		36.73	0.00

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: River #1
REACH: Reach #1 RS: 1200

```
INPUT
Description:
Station Elevation Data    num=      40
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2540   68.09    2539  121.68    2541  128.69    2541  147.65    2534
  148.1    2533   148.5    2532  149.06    2531  149.92    2530  150.86    2529
  151.8    2528  153.39    2527  155.27    2526  248.74    2526  272.27    2527
 297.29    2527  305.15    2526  307.38    2526  310.49    2526  316.89    2526
 324.53    2527  349.28    2527  364.33    2526  392.42    2526  395.21    2527
 396.18    2528  397.09    2529  398.09    2530  398.98    2531  399.97    2532
  400.9    2533  401.85    2534  402.79    2535  403.76    2536   404.8    2537
 410.44    2537  422.02    2537  426.84    2538   429.8    2539  443.87    2539

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0     .05  128.69     .03   404.8     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        128.69   404.8            57.6   56.56   56.61            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2538.60  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    2.91  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2535.69  * Reach Len. (ft)        *   57.60  *   56.56  *   56.61  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)       *         * 2338.27  *         *
* E.G. Slope (ft/ft)     *0.004262  * Area (sq ft)           *         * 2338.27  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)         *  260.38  * Top Width (ft)         *         *  260.38  *         *
* Vel Total (ft/s)       *   13.69  * Avg. Vel. (ft/s)       *         *   13.69  *         *
* Max Chl Dpth (ft)      *    9.69  * Hydr. Depth (ft)       *         *    8.98  *         *
* Conv. Total (cfs)      *490172.0  * Conv. (cfs)            *         *490172.0  *         *
* Length Wtd. (ft)       *   56.56  * Wetted Per. (ft)       *         *  268.55  *         *
* Min Ch El (ft)         * 2526.00  * Shear (lb/sq ft)       *         *    2.32  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   31.70  *         *
* Frctn Loss (ft)        *    0.18  * Cum Volume (acre-ft)   *         *  345.81  *    0.00  *
* C & E Loss (ft)        *    0.23  * Cum SA (acres)         *         *   34.37  *    0.00  *
*****************************************************************************************************

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: River #1
REACH: Reach #1           RS: 1120

INPUT
Description:
Station Elevation Data    num=      44
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2539  336.05    2541  342.65    2534  343.23    2533  343.69    2532
 344.08    2531  345.04    2530  345.92    2529   346.9    2528  347.83    2527
 348.74    2526  349.76    2525  440.16    2525  445.47    2525  451.76    2525
 465.52    2525  467.89    2524  468.82    2524  477.19    2525  488.72    2526
 499.18    2527  503.32    2527  512.05    2526  517.81    2525  524.94    2525
  538.1    2525  550.62    2524  573.43    2524  573.77    2525  578.28    2526
 590.85    2527  591.77    2528  592.73    2529  593.66    2530  594.62    2531
 595.54    2532  596.52    2533  597.47    2534  598.38    2535  599.33    2536
 619.96    2537  622.38    2538  624.78    2539  638.13    2539

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0     .05  336.05     .03  599.33     .05
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       336.05  599.33          440.13  443.73  447.38            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*********************************************************************************************
* E.G. Elev (ft)        * 2538.19  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    2.15  * Wt. n-Val.           *         *   0.030  *   0.050  *
* W.S. Elev (ft)        * 2536.04  * Reach Len. (ft)       *  440.13  *  443.73  *  447.38  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         * 2721.19  *    0.02  *
* E.G. Slope (ft/ft)    *0.002580  * Area (sq ft)          *         * 2721.19  *    0.02  *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *    0.00  *
* Top Width (ft)        *  259.40  * Top Width (ft)        *         *  258.60  *    0.80  *
* Vel Total (ft/s)      *   11.76  * Avg. Vel. (ft/s)      *         *   11.76  *    0.11  *
* Max Chl Dpth (ft)     *   12.04  * Hydr. Depth (ft)      *         *   10.52  *    0.02  *
* Conv. Total (cfs)     *630032.4  * Conv. (cfs)           *         *630032.4  *     0.0  *
* Length Wtd. (ft)      *  443.73  * Wetted Per. (ft)      *         *  269.25  *    0.80  *
* Min Ch El (ft)        * 2524.00  * Shear (lb/sq ft)      *         *    1.63  *    0.00  *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   19.14  *    0.00  *
* Frctn Loss (ft)       *    1.75  * Cum Volume (acre-ft)   *         *  342.53  *    0.00  *
* C & E Loss (ft)       *    0.21  * Cum SA (acres)         *         *   34.03  *    0.00  *
*********************************************************************************************

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: River #1
REACH: Reach #1          RS: 1110

INPUT
Description:
Station Elevation Data    num=      37
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2538  104.77    2538  121.02    2538  172.26    2537  181.45    2536
  189.22    2535  192.95    2534   196.9    2533  198.01    2532  198.99    2531
  200.02    2530  200.72    2529  201.39    2528  202.12    2527  202.84    2526
  203.53    2525  204.37    2524  205.16    2523  280.28    2523  285.89    2523
  288.08    2523  311.08    2523  350.63    2523   417.4    2524  418.47    2525
  419.48    2526  420.52    2527  421.57    2528  422.55    2529  423.62    2530
  424.67    2531  425.68    2532  426.76    2533  427.88    2534  446.96    2535
  448.96    2536  450.96    2537

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
************************************************
      0     .05  189.22     .03  427.88     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       189.22  427.88          46.86   36.39   42.45            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*********************************************************************************************
* E.G. Elev (ft)        * 2536.22  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    4.28  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2531.95  * Reach Len. (ft)       *   46.86  *   36.39  *   42.45  *
* Crit W.S. (ft)        * 2531.95  * Flow Area (sq ft)     *         * 1928.26  *         *
* E.G. Slope (ft/ft)    *0.006788  * Area (sq ft)          *         * 1928.26  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  227.56  * Top Width (ft)        *         *  227.56  *         *
* Vel Total (ft/s)      *   16.60  * Avg. Vel. (ft/s)      *         *   16.60  *         *
* Max Chl Dpth (ft)     *    8.94  * Hydr. Depth (ft)      *         *    8.47  *         *
* Conv. Total (cfs)     *388395.6  * Conv. (cfs)           *         *388395.6  *         *
* Length Wtd. (ft)      *   36.39  * Wetted Per. (ft)      *         *  235.13  *         *
```

```
* Min Ch El (ft)        * 2523.00  * Shear (lb/sq ft)       *         *    3.48  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   57.67  *         *
* Frctn Loss (ft)       *    0.20  * Cum Volume (acre-ft)   *         *  318.85  *         *
* C & E Loss (ft)       *    0.24  * Cum SA (acres)         *         *   31.56  *         *
*****************************************************************************************************
```

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 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: River #1
REACH: Reach #1 RS: 1100

INPUT
Description:
Station Elevation Data num= 33

```
    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev
*******************************************************************************
      0   2538    7.97   2538    75.6   2537  183.84   2537  194.63   2537
  237.75   2537  254.58   2536  256.12   2535   257.6   2534   259.1   2533
  271.56   2533  281.56   2533  294.56   2520  324.84   2520  432.65   2521
  435.97   2522  448.45   2522  464.17   2522  493.16   2523   494.3   2524
   495.3   2525  496.31   2526  497.31   2527  498.31   2528  499.33   2529
  500.34   2530  501.37   2531  502.41   2532  503.41   2533  504.48   2534
  524.02   2535  525.94   2536  527.91   2537
```

Manning's n Values num= 3

```
    Sta   n Val    Sta   n Val    Sta   n Val
***************************************************
      0    .05  281.56    .03  504.48    .05
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
281.56 504.48 294 294 294 .1 .3

CROSS SECTION OUTPUT Profile #100 year

```
*****************************************************************************************************
* E.G. Elev (ft)        * 2534.69  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    3.48  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)        * 2531.21  * Reach Len. (ft)        *  294.00  *  294.00  *  294.00  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)       *         * 2136.04  *         *
* E.G. Slope (ft/ft)    *0.004588  * Area (sq ft)           *         * 2136.04  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)        *  218.24  * Top Width (ft)          *         *  218.24  *         *
* Vel Total (ft/s)      *   14.98  * Avg. Vel. (ft/s)        *         *   14.98  *         *
* Max Chl Dpth (ft)     *   11.21  * Hydr. Depth (ft)        *         *    9.79  *         *
* Conv. Total (cfs)     *472410.3  * Conv. (cfs)             *         *472410.3  *         *
* Length Wtd. (ft)      *  294.00  * Wetted Per. (ft)        *         *  226.39  *         *
* Min Ch El (ft)        * 2520.00  * Shear (lb/sq ft)        *         *    2.70  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   40.49  *         *
* Frctn Loss (ft)       *    1.62  * Cum Volume (acre-ft)   *         *  317.15  *         *
* C & E Loss (ft)       *    0.06  * Cum SA (acres)         *         *   31.37  *         *
*****************************************************************************************************
```

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: River #1
REACH: Reach #1 RS: 1050

INPUT
Description:
Station Elevation Data num= 56
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2535 19.46 2535 47.69 2534 72.02 2534 155.9 2535
219.33 2536 231.16 2536 232.43 2535 232.95 2534 233.46 2533
233.85 2532 234.25 2531 234.58 2530 242.44 2529 252.44 2529
261.44 2520 284.32 2520 335.05 2520 397.98 2520 404.81 2520
435.94 2520 444.6 2521 474.12 2522 484.03 2523 485.53 2524
486.59 2525 487.65 2526 488.72 2527 489.75 2528 490.87 2529
492.17 2530 493.39 2531 494.65 2532 512.73 2533 515.72 2534
517.96 2535 520.35 2536 525.36 2537 530.35 2538 535.6 2539
542.47 2540 551.81 2540 564.09 2539 571.52 2538 608.38 2538
635.45 2530 651.98 2531 667.79 2532 677.67 2533 685.8 2534
704.45 2535 715.92 2536 728.92 2537 747.85 2538 786.05 2539
813.15 2540

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 252.44 .03 494.65 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
252.44 494.65 162 162 162 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2533.01 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 4.13 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2528.87 * Reach Len. (ft) * 162.00 * 162.00 * 162.00 *
* Crit W.S. (ft) * 2528.87 * Flow Area (sq ft) * * 1961.45 * *
* E.G. Slope (ft/ft) *0.006744 * Area (sq ft) * * 1961.45 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 238.16 * Top Width (ft) * * 238.16 * *
* Vel Total (ft/s) * 16.31 * Avg. Vel. (ft/s) * * 16.31 * *
* Max Chl Dpth (ft) * 8.87 * Hydr. Depth (ft) * * 8.24 * *
* Conv. Total (cfs) *389659.9 * Conv. (cfs) * *389659.9 * *
* Length Wtd. (ft) * 162.00 * Wetted Per. (ft) * * 244.19 * *
* Min Ch El (ft) * 2520.00 * Shear (lb/sq ft) * * 3.38 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 55.18 * *
* Frctn Loss (ft) * 1.11 * Cum Volume (acre-ft) * * 303.32 * *
* C & E Loss (ft) * 0.18 * Cum SA (acres) * * 29.83 * *
****

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 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: River #1
REACH: Reach #1 RS: 1010

INPUT
Description:
Station Elevation Data num= 37
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2533 38.6 2533 39.06 2533 78.35 2534 116.92 2533

```
  133.06    2532  147.06    2527  157.06    2527  165.06    2519  225.22    2519
  319.11    2519  424.94    2520  448.16    2521  453.24    2522  454.76    2523
  455.72    2524  456.73    2525   457.7    2526  458.85    2527  460.14    2528
  461.47    2529  462.88    2530  464.32    2531  484.17    2532  485.92    2533
  487.69    2534  489.54    2535  494.16    2536  499.81    2537  506.54    2538
  512.26    2539  517.03    2540  535.74    2540  541.23    2539  573.19    2539
  662.53    2537   733.3    2537

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
**************************************************
      0     .05  157.06     .03  464.32     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       157.06  464.32          111.18   71.92   89.39           .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2530.10  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    3.53  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2526.57  * Reach Len. (ft)        *  111.18  *   71.92  *   89.39  *
* Crit W.S. (ft)         * 2526.57  * Flow Area (sq ft)      *         * 2122.35  *         *
* E.G. Slope (ft/ft)     *0.007003  * Area (sq ft)           *         * 2122.35  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)         *  300.87  * Top Width (ft)         *         *  300.87  *         *
* Vel Total (ft/s)       *   15.08  * Avg. Vel. (ft/s)       *         *   15.08  *         *
* Max Chl Dpth (ft)      *    7.57  * Hydr. Depth (ft)       *         *    7.05  *         *
* Conv. Total (cfs)      *382397.4  * Conv. (cfs)            *         *382397.4  *         *
* Length Wtd. (ft)       *   71.92  * Wetted Per. (ft)       *         *  305.90  *         *
* Min Ch El (ft)         * 2519.00  * Shear (lb/sq ft)       *         *    3.03  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   45.73  *         *
* Frctn Loss (ft)        *    0.17  * Cum Volume (acre-ft)   *         *  295.73  *         *
* C & E Loss (ft)        *    0.69  * Cum SA (acres)         *         *   28.83  *         *
*****************************************************************************************************

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: River #1
REACH: Reach #1          RS: 1000

INPUT
Description:
Station Elevation Data    num=      35
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0   2530   72.47    2531  123.23    2532  127.39    2532  206.84    2532
    218    2525     228    2525   242.1  2510.9  513.14  2510.9  516.43    2521
  517.76    2522  519.14    2523  520.49    2524  521.85    2525   523.2    2526
  524.36    2527  525.49    2528  526.62    2529  527.74    2530  528.86    2531
  546.98    2532  548.95    2533  550.75    2534  552.59    2535  557.43    2536
  563.53    2537  569.55    2538  574.84    2539  578.79    2540  582.76    2541
   599.7    2541  604.88    2540  610.61    2539  619.05    2539  655.41    2540

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
**************************************************
      0     .05     228     .03  528.86     .05
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          228  528.86              147     147     147            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*********************************************************************************************
* E.G. Elev (ft)        * 2525.01  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.22  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2523.79  * Reach Len. (ft)      *  147.00  *  147.00  *  147.00  *
* Crit W.S. (ft)        *          * Flow Area (sq ft)     *         * 3608.57  *         *
* E.G. Slope (ft/ft)    *0.001187  * Area (sq ft)         *         * 3608.57  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  291.00  * Top Width (ft)        *         *  291.00  *         *
* Vel Total (ft/s)      *    8.87  * Avg. Vel. (ft/s)      *         *    8.87  *         *
* Max Chl Dpth (ft)     *   12.89  * Hydr. Depth (ft)      *         *   12.40  *         *
* Conv. Total (cfs)     *928861.8  * Conv. (cfs)           *         *928861.8  *         *
* Length Wtd. (ft)      *  147.00  * Wetted Per. (ft)      *         *  304.59  *         *
* Min Ch El (ft)        * 2510.90  * Shear (lb/sq ft)      *         *    0.88  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *    7.78  *         *
* Frctn Loss (ft)       *    0.19  * Cum Volume (acre-ft)  *         *  291.00  *         *
* C & E Loss (ft)       *    0.03  * Cum SA (acres)        *         *   28.34  *         *
*********************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 990

INPUT
Description:
Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
      0    2529   71.19    2531  149.22    2525  159.22    2525  174.02  2510.2
  410.03  2510.2  416.62    2519  420.58    2520  422.41    2521  423.44    2522
  424.47    2523  425.48    2524  426.54    2525  427.53    2526  428.54    2527
   429.6    2528   430.6    2529  431.56    2530  432.54    2531  449.79    2532
  452.84    2533  454.88    2534   456.9    2535  460.69    2536  464.69    2537
  469.64    2538  474.54    2539   478.3    2540  482.08    2541  499.22    2541
  504.31    2540   507.3    2539   549.1    2539  580.36    2537   661.7    2538
   705.6    2538  764.81    2538

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**************************************************
      0     .05  159.22     .03  432.54     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        159.22  432.54              168     168     168            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*********************************************************************************************
* E.G. Elev (ft)        * 2524.79  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.50  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2523.29  * Reach Len. (ft)      *  168.00  *  168.00  *  168.00  *
* Crit W.S. (ft)        *          * Flow Area (sq ft)     *         * 3255.86  *         *
* E.G. Slope (ft/ft)    *0.001459  * Area (sq ft)         *         * 3255.86  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  263.84  * Top Width (ft)        *         *  263.84  *         *
* Vel Total (ft/s)      *    9.83  * Avg. Vel. (ft/s)      *         *    9.83  *         *
* Max Chl Dpth (ft)     *   13.09  * Hydr. Depth (ft)      *         *   12.34  *         *
* Conv. Total (cfs)     *837757.9  * Conv. (cfs)           *         *837757.9  *         *
* Length Wtd. (ft)      *  168.00  * Wetted Per. (ft)      *         *  274.98  *         *
* Min Ch El (ft)        * 2510.20  * Shear (lb/sq ft)      *         *    1.08  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   10.60  *         *
* Frctn Loss (ft)       *    0.27  * Cum Volume (acre-ft)  *         *  279.41  *         *
* C & E Loss (ft)       *    0.03  * Cum SA (acres)        *         *   27.40  *         *
*********************************************************************************************
```

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 975

INPUT
Description:
Station Elevation Data num= 35
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2529 13.44 2530 73.64 2530 90.63 2525 100.63 2525
116.23 2509.4 326.45 2509.4 334.94 2519 336.61 2520 338.04 2521
339.21 2522 340.3 2523 341.46 2524 342.54 2525 343.49 2526
344.41 2527 345.32 2528 346.26 2529 347.2 2530 354.36 2531
356.86 2531 357.02 2531 368.19 2532 370.63 2533 373.14 2534
377.42 2535 382.06 2536 387.37 2537 392.15 2538 396.09 2539
399.58 2540 410.55 2540 418.34 2539 421.18 2538 462.2 2538

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 100.63 .03 354.36 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
100.63 354.36 151 151 151 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2524.49 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 1.81 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2522.68 * Reach Len. (ft) * 151.00 * 151.00 * 151.00 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 2962.54 * *
* E.G. Slope (ft/ft) *0.001742 * Area (sq ft) * * 2962.54 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 237.01 * Top Width (ft) * * 237.01 * *
* Vel Total (ft/s) * 10.80 * Avg. Vel. (ft/s) * * 10.80 * *
* Max Chl Dpth (ft) * 13.28 * Hydr. Depth (ft) * * 12.50 * *
* Conv. Total (cfs) *766672.9 * Conv. (cfs) * *766672.9 * *
* Length Wtd. (ft) * 151.00 * Wetted Per. (ft) * * 248.06 * *
* Min Ch El (ft) * 2509.40 * Shear (lb/sq ft) * * 1.30 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 14.03 * *
* Frctn Loss (ft) * 0.26 * Cum Volume (acre-ft) * * 267.42 * *
* C & E Loss (ft) * 0.01 * Cum SA (acres) * * 26.44 * *
****

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 965

INPUT
Description:
Station Elevation Data num= 28
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2529 24.24 2529 44.28 2528 49.27 2527 56.18 2524
66.18 2524 81.48 2508.7 280.69 2508.7 290.69 2518 292.01 2519
293.41 2520 294.74 2521 295.97 2522 297.18 2523 298.34 2524
299.3 2525 300.3 2526 301.26 2527 302.22 2528 303.24 2529
304.18 2530 323.93 2531 325.91 2532 327.91 2533 329.91 2534
335.04 2535 340.64 2536 347.99 2537

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 66.18 .03 304.18 .05

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

```
      66.18  304.18            148     148     148           .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)        * 2524.22  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.87  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2522.35  * Reach Len. (ft)       *  148.00  *  148.00  *  148.00  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)      *         * 2915.90  *         *
* E.G. Slope (ft/ft)    *0.001751  * Area (sq ft)          *         * 2915.90  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  228.57  * Top Width (ft)        *         *  228.57  *         *
* Vel Total (ft/s)      *   10.97  * Avg. Vel. (ft/s)      *         *   10.97  *         *
* Max Chl Dpth (ft)     *   13.65  * Hydr. Depth (ft)      *         *   12.76  *         *
* Conv. Total (cfs)     *764653.5  * Conv. (cfs)           *         *764653.5  *         *
* Length Wtd. (ft)      *  148.00  * Wetted Per. (ft)       *         *  239.36  *         *
* Min Ch El (ft)        * 2508.70  * Shear (lb/sq ft)      *         *    1.33  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   14.62  *         *
* Frctn Loss (ft)       *    0.29  * Cum Volume (acre-ft)   *         *  257.23  *         *
* C & E Loss (ft)       *    0.04  * Cum SA (acres)         *         *   25.63  *         *
*****************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 950

INPUT
Description:
Station Elevation Data    num=      38
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
      0   2527   30.62    2527  106.02    2527   113.3    2525  126.75    2524
  136.75    2524  152.85  2507.9  332.49  2507.9  341.74    2518  342.88    2519
  344.04    2520  345.21    2521  346.36    2522  347.43    2523  348.48    2524
  349.49    2525  350.46    2526   351.5    2527  352.57    2528  353.69    2529
  373.26    2530  375.56    2531  377.95    2532  387.41    2532  393.05    2531
  400.12    2531  408.37    2532  412.67    2533  416.69    2534  420.58    2535
  424.63    2536   449.9    2536  455.61    2535  485.24    2532  506.85    2533
  526.58    2534  542.36    2535  586.79    2536

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
************************************************
      0     .05  136.75     .03  352.57     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        136.75  352.57          216.27  206.23   199.7           .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)        * 2523.90  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    2.27  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2521.63  * Reach Len. (ft)       *  216.27  *  206.23  *  199.70  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)      *         * 2649.40  *         *
* E.G. Slope (ft/ft)    *0.002132  * Area (sq ft)          *         * 2649.40  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  206.82  * Top Width (ft)        *         *  206.82  *         *
* Vel Total (ft/s)      *   12.08  * Avg. Vel. (ft/s)      *         *   12.08  *         *
* Max Chl Dpth (ft)     *   13.73  * Hydr. Depth (ft)      *         *   12.81  *         *
* Conv. Total (cfs)     *693001.6  * Conv. (cfs)           *         *693001.6  *         *
* Length Wtd. (ft)      *  206.23  * Wetted Per. (ft)       *         *  218.31  *         *
* Min Ch El (ft)        * 2507.90  * Shear (lb/sq ft)      *         *    1.62  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   19.51  *         *
* Frctn Loss (ft)       *    0.71  * Cum Volume (acre-ft)   *         *  247.78  *         *
* C & E Loss (ft)       *    0.28  * Cum SA (acres)         *         *   24.89  *         *
*****************************************************************************************

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.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 900

INPUT
Description:
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2526	38.53	2525	40.82	2524	42.06	2523	52.48	2520
62.48	2520	75.58	2506.9	227.35	2506.9	234.08	2515	235.2	2516
236.25	2517	237.32	2518	238.4	2519	239.49	2520	240.52	2521
241.56	2522	242.54	2523	243.58	2524	244.55	2525	245.52	2526
258.04	2527	266.14	2528	268.5	2529	270.88	2530	275.59	2530
280.72	2529	284.52	2528	287.88	2527	291.14	2526	294.14	2525
297.09	2524	300.04	2523	303	2522	306.01	2521	309.04	2520
311.64	2519	324.23	2518	378.07	2521	379.48	2521	403.99	2522
421.08	2523	431.72	2524						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	62.48	.03	245.52	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
62.48	245.52	159.29	151.89	152.98	.1	.3

Right Levee Station= 245.52 Elevation= 2526

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (ft)	2522.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.08	Wt. n-Val.		0.030	
W.S. Elev (ft)	2517.83	Reach Len. (ft)	159.29	151.89	152.98
Crit W.S. (ft)	2517.83	Flow Area (sq ft)		1769.07	
E.G. Slope (ft/ft)	0.006426	Area (sq ft)		1769.07	
Q Total (cfs)	32000.00	Flow (cfs)		32000.00	
Top Width (ft)	172.49	Top Width (ft)		172.49	
Vel Total (ft/s)	18.09	Avg. Vel. (ft/s)		18.09	
Max Chl Dpth (ft)	10.93	Hydr. Depth (ft)		10.26	
Conv. Total (cfs)	399202.6	Conv. (cfs)		399202.6	
Length Wtd. (ft)	151.89	Wetted Per. (ft)		181.92	
Min Ch El (ft)	2506.90	Shear (lb/sq ft)		3.90	
Alpha	1.00	Stream Power (lb/ft s)		70.56	
Frctn Loss (ft)	0.99	Cum Volume (acre-ft)		237.32	
C & E Loss (ft)	0.03	Cum SA (acres)		23.99	

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 875

INPUT

Description:
Station Elevation Data num= 20
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2525 71.61 2526 118.17 2524 119.09 2523 120.35 2522
121.74 2521 123.1 2520 130.44 2519 140.44 2519 153.24 2506.2
313.53 2506.2 326.53 2519 336.26 2519 338.11 2525 339.93 2526
341.79 2527 343.82 2528 345.8 2529 348.47 2530 354.1 2530

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 140.44 .03 326.53 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
140.44 326.53 143 143 143 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2521.64 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 4.97 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2516.67 * Reach Len. (ft) * 143.00 * 143.00 * 143.00 *
* Crit W.S. (ft) * 2516.67 * Flow Area (sq ft) * * 1787.96 * *
* E.G. Slope (ft/ft) *0.006572 * Area (sq ft) * * 1787.96 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 181.39 * Top Width (ft) * * 181.39 * *
* Vel Total (ft/s) * 17.90 * Avg. Vel. (ft/s) * * 17.90 * *
* Max Chl Dpth (ft) * 10.47 * Hydr. Depth (ft) * * 9.86 * *
* Conv. Total (cfs) *394718.3 * Conv. (cfs) * *394718.3 * *
* Length Wtd. (ft) * 143.00 * Wetted Per. (ft) * * 190.01 * *
* Min Ch El (ft) * 2506.20 * Shear (lb/sq ft) * * 3.86 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 69.10 * *
* Frctn Loss (ft) * 0.95 * Cum Volume (acre-ft) * * 231.12 * *
* C & E Loss (ft) * 0.16 * Cum SA (acres) * * 23.37 * *
****

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 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: River #1
REACH: Reach #1 RS: 865

INPUT
Description:
Station Elevation Data num= 34
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2525 56.88 2524 75.16 2517 85.16 2517 96.66 2505.5
294.65 2505.5 304.65 2517 314.65 2517 315.34 2522 317.65 2523
319.58 2524 321.52 2525 323.5 2526 325.43 2527 328.41 2528
337.65 2528 342.68 2527 346.63 2526 349.83 2525 352.94 2524
355.98 2523 359.09 2522 362.16 2521 365.61 2520 371.65 2519
377.12 2518 434.01 2527 452.14 2527 471.63 2527 489.27 2526
504.43 2525 519.54 2524 534.64 2523 584.46 2523

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 85.16 .03 304.65 .05

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        85.16  304.65              153     153     153            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2519.10  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    4.44  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2514.67  * Reach Len. (ft)       *  153.00  *  153.00  *  153.00  *
* Crit W.S. (ft)        * 2514.67  * Flow Area (sq ft)     *         * 1893.11  *         *
* E.G. Slope (ft/ft)    *0.006729  * Area (sq ft)          *         * 1893.11  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  215.12  * Top Width (ft)        *         *  215.12  *         *
* Vel Total (ft/s)      *   16.90  * Avg. Vel. (ft/s)      *         *   16.90  *         *
* Max Chl Dpth (ft)     *    9.17  * Hydr. Depth (ft)      *         *    8.80  *         *
* Conv. Total (cfs)     *390094.5  * Conv. (cfs)           *         *390094.5  *         *
* Length Wtd. (ft)      *  153.00  * Wetted Per. (ft)       *         *  223.10  *         *
* Min Ch El (ft)        * 2505.50  * Shear (lb/sq ft)       *         *    3.56  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   60.26  *         *
* Frctn Loss (ft)       *    0.90  * Cum Volume (acre-ft)   *         *  225.08  *         *
* C & E Loss (ft)       *    0.31  * Cum SA (acres)         *         *   22.72  *         *
*****************************************************************************************************

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 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: River #1
REACH: Reach #1          RS: 850

INPUT
Description:
Station Elevation Data    num=      13
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2524   24.24    2523   28.38    2523   36.83    2516   46.83    2516
   58.03  2504.8  290.73  2504.8  300.73    2516  309.62    2516  337.23    2520
  337.75    2521  338.33    2522   346.1    2523

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0     .05   46.83     .03  300.73     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        46.83  300.73          199.44  201.98  207.35            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2517.17  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    3.39  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2513.77  * Reach Len. (ft)       *  199.44  *  201.98  *  207.35  *
* Crit W.S. (ft)        * 2513.07  * Flow Area (sq ft)     *         * 2164.19  *         *
* E.G. Slope (ft/ft)    *0.005213  * Area (sq ft)          *         * 2164.19  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  249.68  * Top Width (ft)        *         *  249.68  *         *
* Vel Total (ft/s)      *   14.79  * Avg. Vel. (ft/s)      *         *   14.79  *         *
* Max Chl Dpth (ft)     *    8.97  * Hydr. Depth (ft)      *         *    8.67  *         *
* Conv. Total (cfs)     *443208.0  * Conv. (cfs)           *         *443208.0  *         *
* Length Wtd. (ft)      *  201.98  * Wetted Per. (ft)       *         *  257.42  *         *
* Min Ch El (ft)        * 2504.80  * Shear (lb/sq ft)       *         *    2.74  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   40.46  *         *
```

```
* Frctn Loss (ft)        *    0.89  * Cum Volume (acre-ft)   *         *  217.95  *         *
* C & E Loss (ft)        *    0.22  * Cum SA (acres)        *         *   21.91  *         *
*****************************************************************************************************

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: River #1
REACH: Reach #1          RS: 825

INPUT
Description:
Station Elevation Data    num=      13
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2523    4.12    2522    7.04    2521    7.67    2520   26.03    2516
   36.03    2516   48.13  2503.9  296.07  2503.9  308.17    2516  318.17    2516
  343.25    2519  345.95    2520  357.95    2521

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
************************************************
      0     .05   36.03     .03  308.17     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        36.03  308.17          112.29  110.49  112.71            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2516.05  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    2.67  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2513.39  * Reach Len. (ft)       *  112.29  *  110.49  *  112.71  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)      *         * 2441.64  *         *
* E.G. Slope (ft/ft)     *0.003804  * Area (sq ft)          *         * 2441.64  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)         *  266.91  * Top Width (ft)        *         *  266.91  *         *
* Vel Total (ft/s)       *   13.11  * Avg. Vel. (ft/s)       *         *   13.11  *         *
* Max Chl Dpth (ft)      *    9.48  * Hydr. Depth (ft)       *         *    9.15  *         *
* Conv. Total (cfs)      *518839.6  * Conv. (cfs)            *         *518839.6  *         *
* Length Wtd. (ft)       *  110.49  * Wetted Per. (ft)       *         *  274.77  *         *
* Min Ch El (ft)         * 2503.90  * Shear (lb/sq ft)       *         *    2.11  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   27.66  *         *
* Frctn Loss (ft)        *    0.43  * Cum Volume (acre-ft)   *         *  207.27  *         *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)         *         *   20.71  *         *
*****************************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 800

INPUT
Description:
Station Elevation Data    num=      13
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2522  170.51    2521  185.01    2514  195.01    2514  205.71  2503.3
  447.16  2503.3  456.16    2514  466.16    2514  488.24    2519  496.98    2520
  554.82    2521  707.06    2522  733.08    2522

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
************************************************
      0     .05  195.01     .03  456.16     .05
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
195.01 456.16 269.66 259.43 283.94 .1 .3

CROSS SECTION OUTPUT Profile #100 year
```
**********************************************************************************************
* E.G. Elev (ft)        * 2515.61  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    2.83  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2512.78  * Reach Len. (ft)      *  269.66  *  259.43  *  283.94  *
* Crit W.S. (ft)        *          * Flow Area (sq ft)    *         * 2371.29  *         *
* E.G. Slope (ft/ft)    *0.004041  * Area (sq ft)         *         * 2371.29  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)           *         *32000.00  *         *
* Top Width (ft)        *  258.90  * Top Width (ft)       *         *  258.90  *         *
* Vel Total (ft/s)      *   13.49  * Avg. Vel. (ft/s)     *         *   13.49  *         *
* Max Chl Dpth (ft)     *    9.48  * Hydr. Depth (ft)     *         *    9.16  *         *
* Conv. Total (cfs)     *503401.8  * Conv. (cfs)          *         *503401.8  *         *
* Length Wtd. (ft)      *  259.43  * Wetted Per. (ft)     *         *  267.24  *         *
* Min Ch El (ft)        * 2503.30  * Shear (lb/sq ft)     *         *    2.24  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *       *   30.21  *         *
* Frctn Loss (ft)       *    1.24  * Cum Volume (acre-ft)  *         *  201.17  *         *
* C & E Loss (ft)       *    0.08  * Cum SA (acres)        *         *   20.04  *         *
**********************************************************************************************
```

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: River #1
REACH: Reach #1 RS: 750

INPUT
Description:
Station Elevation Data num= 11
```
   Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev
*******************************************************************************
     0   2518  79.43   2513  89.43   2513 100.43   2502 332.42   2502
 346.61   2513 356.61   2513 362.84   2518 363.83   2518 372.89   2518
 382.01   2519
```

Manning's n Values num= 3
```
   Sta   n Val    Sta   n Val    Sta   n Val
*************************************************
     0    .05  89.43    .03 346.61    .05
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
89.43 346.61 249.08 245.16 242.37 .1 .3

CROSS SECTION OUTPUT Profile #100 year
```
**********************************************************************************************
* E.G. Elev (ft)        * 2514.29  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    3.60  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2510.68  * Reach Len. (ft)      *  249.08  *  245.16  *  242.37  *
* Crit W.S. (ft)        * 2510.27  * Flow Area (sq ft)    *         * 2100.66  *         *
* E.G. Slope (ft/ft)    *0.005788  * Area (sq ft)         *         * 2100.66  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)           *         *32000.00  *         *
* Top Width (ft)        *  251.87  * Top Width (ft)       *         *  251.87  *         *
* Vel Total (ft/s)      *   15.23  * Avg. Vel. (ft/s)     *         *   15.23  *         *
* Max Chl Dpth (ft)     *    8.68  * Hydr. Depth (ft)     *         *    8.34  *         *
* Conv. Total (cfs)     *420622.2  * Conv. (cfs)          *         *420622.2  *         *
* Length Wtd. (ft)      *  245.16  * Wetted Per. (ft)     *         *  258.44  *         *
* Min Ch El (ft)        * 2502.00  * Shear (lb/sq ft)     *         *    2.94  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *       *   44.74  *         *
* Frctn Loss (ft)       *    1.26  * Cum Volume (acre-ft)  *         *  187.85  *         *
* C & E Loss (ft)       *    0.17  * Cum SA (acres)        *         *   18.52  *         *
**********************************************************************************************
```

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: River #1
REACH: Reach #1 RS: 700

INPUT
Description:
Station Elevation Data num= 9
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2518 92.14 2512 102.14 2512 113.34 2500.8 358.68 2500.8
368.68 2512 378.68 2512 402.46 2517 548.15 2518

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 102.14 .03 368.68 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
102.14 368.68 293.91 294.12 299.31 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2512.85 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 3.03 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2509.82 * Reach Len. (ft) * 293.91 * 294.12 * 299.31 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 2289.14 * *
* E.G. Slope (ft/ft) *0.004612 * Area (sq ft) * * 2289.14 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 262.41 * Top Width (ft) * * 262.41 * *
* Vel Total (ft/s) * 13.98 * Avg. Vel. (ft/s) * * 13.98 * *
* Max Chl Dpth (ft) * 9.02 * Hydr. Depth (ft) * * 8.72 * *
* Conv. Total (cfs) *471222.9 * Conv. (cfs) * *471222.9 * *
* Length Wtd. (ft) * 294.12 * Wetted Per. (ft) * * 270.18 * *
* Min Ch El (ft) * 2500.80 * Shear (lb/sq ft) * * 2.44 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 34.10 * *
* Frctn Loss (ft) * 1.31 * Cum Volume (acre-ft) * * 175.50 * *
* C & E Loss (ft) * 0.04 * Cum SA (acres) * * 17.07 * *
****

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: River #1
REACH: Reach #1 RS: 650

INPUT
Description:
Station Elevation Data num= 12
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2516 43.8 2516 95.36 2514 112.67 2511 122.67 2511
134.27 2499.4 380.07 2499.4 390.07 2511 400.07 2511 428.98 2514
447.53 2515 461.5 2516

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 122.67 .03 390.07 .05

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

```
      122.67  390.07          225.88  219.62  226.45           .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*********************************************************************************************
* E.G. Elev (ft)        * 2511.50  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    2.91  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2508.60  * Reach Len. (ft)       *  225.88  *  219.62  *  226.45  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         * 2339.19  *         *
* E.G. Slope (ft/ft)    *0.004307  * Area (sq ft)          *         * 2339.19  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  262.92  * Top Width (ft)        *         *  262.92  *         *
* Vel Total (ft/s)      *   13.68  * Avg. Vel. (ft/s)      *         *   13.68  *         *
* Max Chl Dpth (ft)     *    9.20  * Hydr. Depth (ft)      *         *    8.90  *         *
* Conv. Total (cfs)     *487594.6  * Conv. (cfs)           *         *487594.6  *         *
* Length Wtd. (ft)      *  219.62  * Wetted Per. (ft)       *         *  270.95  *         *
* Min Ch El (ft)        * 2499.40  * Shear (lb/sq ft)      *         *    2.32  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   31.76  *         *
* Frctn Loss (ft)       *    0.91  * Cum Volume (acre-ft)   *         *  159.87  *         *
* C & E Loss (ft)       *    0.03  * Cum SA (acres)         *         *   15.30  *         *
*********************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 600

INPUT
Description:
Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0   2516    5.03    2515    7.53    2514    8.86    2514   39.93    2515
   54.49    2516   74.68    2516   80.26    2515   82.96    2514   86.05    2513
   98.03    2512  141.36    2511  151.36    2511  164.06  2498.3  407.17  2498.3
  418.17    2511  428.17    2511  446.66    2512  488.33    2513  504.23    2514
  673.38    2515  815.39    2516

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0     .05  151.36     .03  418.17     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       151.36  418.17          296.17  292.59  291.63           .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*********************************************************************************************
* E.G. Elev (ft)        * 2510.56  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    2.80  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2507.76  * Reach Len. (ft)       *  296.17  *  292.59  *  291.63  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         * 2382.55  *         *
* E.G. Slope (ft/ft)    *0.004012  * Area (sq ft)          *         * 2382.55  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  260.76  * Top Width (ft)        *         *  260.76  *         *
* Vel Total (ft/s)      *   13.43  * Avg. Vel. (ft/s)      *         *   13.43  *         *
* Max Chl Dpth (ft)     *    9.46  * Hydr. Depth (ft)      *         *    9.14  *         *
* Conv. Total (cfs)     *505180.8  * Conv. (cfs)           *         *505180.8  *         *
* Length Wtd. (ft)      *  292.59  * Wetted Per. (ft)       *         *  269.00  *         *
* Min Ch El (ft)        * 2498.30  * Shear (lb/sq ft)      *         *    2.22  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   29.80  *         *
* Frctn Loss (ft)       *    1.07  * Cum Volume (acre-ft)   *         *  147.97  *         *
* C & E Loss (ft)       *    0.09  * Cum SA (acres)         *         *   13.98  *         *
*********************************************************************************************

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: River #1
REACH: Reach #1 RS: 550

INPUT
Description:
Station Elevation Data num= 15
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2515 61.52 2515 103.09 2514 105.64 2513 107.96 2512
109.8 2511 119.7 2508 129.7 2508 136.57 2496.9 381.53 2496.9
390.53 2508 400.53 2508 425.74 2511 455.31 2512 497.23 2513

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 129.7 .03 390.53 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
129.7 390.53 174.17 170.22 169.02 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2509.40 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 2.50 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2506.90 * Reach Len. (ft) * 174.17 * 170.22 * 169.02 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 2519.95 * *
* E.G. Slope (ft/ft) *0.003338 * Area (sq ft) * * 2519.95 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 259.25 * Top Width (ft) * * 259.25 * *
* Vel Total (ft/s) * 12.70 * Avg. Vel. (ft/s) * * 12.70 * *
* Max Chl Dpth (ft) * 10.00 * Hydr. Depth (ft) * * 9.72 * *
* Conv. Total (cfs) *553856.4 * Conv. (cfs) * *553856.4 * *
* Length Wtd. (ft) * 170.22 * Wetted Per. (ft) * * 269.58 * *
* Min Ch El (ft) * 2496.90 * Shear (lb/sq ft) * * 1.95 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 24.74 * *
* Frctn Loss (ft) * 0.52 * Cum Volume (acre-ft) * * 131.51 * *
* C & E Loss (ft) * 0.08 * Cum SA (acres) * * 12.23 * *
****

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 500

INPUT
Description:
Station Elevation Data num= 24
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2515 25.13 2514 48.43 2513 49.79 2512 51.21 2511
59.88 2508 69.88 2508 81.78 2496.1 327.24 2496.1 336.24 2508
346.24 2508 349.82 2508 362.9 2509 366.79 2510 371.25 2511
402.18 2512 409.65 2512 433.25 2511 454.4 2511 482.62 2513
540.62 2513 626.61 2513 750.39 2514 852.01 2515

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 69.88 .03 336.24 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
69.88 336.24 312.56 311.97 314.78 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2508.80 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 2.24 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2506.55 * Reach Len. (ft) * 312.56 * 311.97 * 314.78 *

```
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         * 2661.97  *         *
* E.G. Slope (ft/ft)    *0.002832  * Area (sq ft)         *         * 2661.97  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  263.82  * Top Width (ft)        *         *  263.82  *         *
* Vel Total (ft/s)      *   12.02  * Avg. Vel. (ft/s)      *         *   12.02  *         *
* Max Chl Dpth (ft)     *   10.45  * Hydr. Depth (ft)      *         *   10.09  *         *
* Conv. Total (cfs)     *601264.8  * Conv. (cfs)           *         *601264.8  *         *
* Length Wtd. (ft)      *  311.97  * Wetted Per. (ft)       *         *  273.35  *         *
* Min Ch El (ft)        * 2496.10  * Shear (lb/sq ft)       *         *    1.72  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   20.70  *         *
* Frctn Loss (ft)       *    0.76  * Cum Volume (acre-ft)   *         *  121.38  *         *
* C & E Loss (ft)       *    0.11  * Cum SA (acres)         *         *   11.21  *         *
*****************************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 450

INPUT
Description:
Station Elevation Data    num=      14
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
      0    2513   35.18    2512   47.41    2511   50.12    2510   60.57    2507
   70.57    2507   82.97  2494.6  327.04  2494.6  336.04    2507  346.04    2507
  370.97    2507  379.33    2508  386.29    2509  427.13    2510

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
      0     .05   70.57     .03  336.04     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        70.57  336.04          276.48  275.96     282            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2507.93  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.88  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)        * 2506.04  * Reach Len. (ft)        *  276.48  *  275.96  *  282.00  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)      *         * 2906.24  *         *
* E.G. Slope (ft/ft)    *0.002125  * Area (sq ft)           *         * 2906.24  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  263.82  * Top Width (ft)        *         *  263.82  *         *
* Vel Total (ft/s)      *   11.01  * Avg. Vel. (ft/s)      *         *   11.01  *         *
* Max Chl Dpth (ft)     *   11.44  * Hydr. Depth (ft)      *         *   11.02  *         *
* Conv. Total (cfs)     *694236.1  * Conv. (cfs)           *         *694236.1  *         *
* Length Wtd. (ft)      *  275.96  * Wetted Per. (ft)       *         *  274.40  *         *
* Min Ch El (ft)        * 2494.60  * Shear (lb/sq ft)       *         *    1.40  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   15.47  *         *
* Frctn Loss (ft)       *    0.51  * Cum Volume (acre-ft)   *         *  101.44  *         *
* C & E Loss (ft)       *    0.09  * Cum SA (acres)         *         *    9.32  *         *
*****************************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 400

INPUT
Description:
Station Elevation Data    num=      23
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
      0    2512    9.62    2513   19.24    2514   74.73    2515  222.35    2515
  290.86    2513  325.73    2512  328.66    2511  331.67    2510  334.05    2509
  335.22    2508   338.2    2507  340.45    2507  350.45    2507  364.25  2493.2
```

605.02 2493.2 616.02 2507 626.02 2507 649.35 2507 651.69 2508
690.61 2508 784.38 2509 870.86 2510

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 350.45 .03 616.02 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
350.45 616.02 248.4 246.38 244.38 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2507.33 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 1.59 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2505.74 * Reach Len. (ft) * 248.40 * 246.38 * 244.38 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 3160.69 * *
* E.G. Slope (ft/ft) *0.001607 * Area (sq ft) * * 3160.69 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 263.31 * Top Width (ft) * * 263.31 * *
* Vel Total (ft/s) * 10.12 * Avg. Vel. (ft/s) * * 10.12 * *
* Max Chl Dpth (ft) * 12.54 * Hydr. Depth (ft) * * 12.00 * *
* Conv. Total (cfs) *798188.1 * Conv. (cfs) * *798188.1 * *
* Length Wtd. (ft) * 246.38 * Wetted Per. (ft) * * 274.54 * *
* Min Ch El (ft) * 2493.20 * Shear (lb/sq ft) * * 1.16 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 11.70 * *
* Frctn Loss (ft) * 0.39 * Cum Volume (acre-ft) * * 82.22 * *
* C & E Loss (ft) * 0.00 * Cum SA (acres) * * 7.65 * *
****

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 350

INPUT
Description:
Station Elevation Data num= 10
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2512 51.45 2511 59.82 2510 62.17 2509 75.87 2507
85.87 2507 102.87 2492 324.26 2492 338.26 2507 410.83 2507

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 85.87 .03 338.26 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
85.87 338.26 102 102 102 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2506.94 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 1.62 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2505.32 * Reach Len. (ft) * 102.00 * 102.00 * 102.00 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 3132.03 * *
* E.G. Slope (ft/ft) *0.001539 * Area (sq ft) * * 3132.03 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 248.92 * Top Width (ft) * * 248.92 * *
* Vel Total (ft/s) * 10.22 * Avg. Vel. (ft/s) * * 10.22 * *
* Max Chl Dpth (ft) * 13.32 * Hydr. Depth (ft) * * 12.58 * *
* Conv. Total (cfs) *815749.5 * Conv. (cfs) * *815749.5 * *
* Length Wtd. (ft) * 102.00 * Wetted Per. (ft) * * 259.74 * *
* Min Ch El (ft) * 2492.00 * Shear (lb/sq ft) * * 1.16 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 11.84 * *
* Frctn Loss (ft) * 0.17 * Cum Volume (acre-ft) * * 64.43 * *
* C & E Loss (ft) * 0.04 * Cum SA (acres) * * 6.20 * *
****

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 325

INPUT
Description:
Station Elevation Data num= 22
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2513 22.25 2513 32.72 2512 71.44 2511 79.59 2510
89.4 2509 96.55 2508 110.19 2508 120.19 2508 136.69 2491.5
338.94 2491.5 351.94 2508 361.94 2508 374.19 2508 379.86 2509
385.53 2510 393.68 2511 400.54 2513 440.52 2513 445.44 2513
549.07 2513 595.08 2512

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 120.19 .03 351.94 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
120.19 351.94 128 128 128 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2506.73 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 1.97 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2504.76 * Reach Len. (ft) * 128.00 * 128.00 * 128.00 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 2838.35 * *
* E.G. Slope (ft/ft) *0.001900 * Area (sq ft) * * 2838.35 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 225.95 * Top Width (ft) * * 225.95 * *
* Vel Total (ft/s) * 11.27 * Avg. Vel. (ft/s) * * 11.27 * *
* Max Chl Dpth (ft) * 13.26 * Hydr. Depth (ft) * * 12.56 * *
* Conv. Total (cfs) *734093.7 * Conv. (cfs) * *734093.7 * *
* Length Wtd. (ft) * 128.00 * Wetted Per. (ft) * * 237.88 * *
* Min Ch El (ft) * 2491.50 * Shear (lb/sq ft) * * 1.42 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 15.96 * *
* Frctn Loss (ft) * 0.29 * Cum Volume (acre-ft) * * 57.44 * *
* C & E Loss (ft) * 0.07 * Cum SA (acres) * * 5.65 * *
****

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: River #1
REACH: Reach #1 RS: 300

INPUT
Description:
Station Elevation Data num= 13
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2511 1.7 2510 3.44 2509 7.08 2508 26.01 2505
36.01 2505 53.11 2490.9 229.56 2490.9 243.56 2505 253.56 2505
283.77 2511 302.46 2512 326.78 2512

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 36.01 .03 243.56 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
36.01 243.56 142.87 142.74 142.86 .1 .3

CROSS SECTION OUTPUT Profile #100 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2506.37  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    2.68  * Wt. n-Val.            *         *   0.030  *         *
* W.S. Elev (ft)        * 2503.69  * Reach Len. (ft)       *    1.00  *    1.00  *    1.00  *
* Crit W.S. (ft)        * 2500.73  * Flow Area (sq ft)     *         * 2438.06  *         *
* E.G. Slope (ft/ft)    *0.002749  * Area (sq ft)          *         * 2438.06  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  204.67  * Top Width (ft)        *         *  204.67  *         *
* Vel Total (ft/s)      *   13.13  * Avg. Vel. (ft/s)      *         *   13.13  *         *
* Max Chl Dpth (ft)     *   12.79  * Hydr. Depth (ft)      *         *   11.91  *         *
* Conv. Total (cfs)     *610295.9  * Conv. (cfs)           *         *610295.9  *         *
* Length Wtd. (ft)      *    1.00  * Wetted Per. (ft)      *         *  214.59  *         *
* Min Ch El (ft)        * 2490.90  * Shear (lb/sq ft)      *         *    1.95  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   25.59  *         *
* Frctn Loss (ft)       *    0.00  * Cum Volume (acre-ft)  *         *   49.69  *         *
* C & E Loss (ft)       *    0.07  * Cum SA (acres)        *         *    5.02  *         *
*****************************************************************************************
```

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.

BRIDGE

RIVER: River #1
REACH: Reach #1 RS: 295

INPUT
Description:
Distance from Upstream XS = 1
Deck/Roadway Width = 136
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 10

```
    Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*************************************************************************
  -45.78 2511.91 2511.91       0 2511.91 2510.16    42.5 2511.86 2510.11
     85 2511.81 2510.06   127.5 2511.76 2510.01     170 2511.71 2509.96
   212.5 2511.66 2509.91     265 2511.61 2509.86  276.12 2511.61 2509.86
  295.19 2511.61 2511.61
```

Upstream Bridge Cross Section Data
Station Elevation Data num= 13

```
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
      0    2511     1.7    2510    3.44    2509    7.08    2508   26.01    2505
   36.01    2505   53.11  2490.9  229.56  2490.9  243.56    2505  253.56    2505
  283.77    2511  302.46    2512  326.78    2512
```

Manning's n Values num= 3

```
    Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0     .05   36.01     .03  243.56     .05
```

Bank Sta: Left Right Coeff Contr. Expan.
36.01 243.56 .1 .3

Downstream Deck/Roadway Coordinates
num= 10

```
    Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*************************************************************************
    -17 2511.91 2511.91       0 2511.91 2510.16    42.5 2511.86 2510.11
     85 2511.81 2510.06   127.5 2511.76 2510.01     170 2511.71 2509.96
   212.5 2511.66 2509.91     265 2511.61 2509.86  295.19 2511.61 2509.86
  296.11 2511.61 2511.61
```

Downstream Bridge Cross Section Data
Station Elevation Data num= 21
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2511 5.21 2510 10.08 2509 15.67 2508 20.42 2507
21.51 2506 22.64 2505 35.67 2503 45.67 2503 58.47 2490.2
241.7 2490.2 254.5 2503 264.5 2503 282.48 2505 284.14 2506
285.85 2507 291.86 2508 294.96 2509 296.11 2510 308.44 2510
313.58 2510

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .045 45.67 .03 254.5 .04

Bank Sta: Left Right Coeff Contr. Expan.
45.67 254.5 .1 .3

Upstream Embankment side slope = 1.5 horiz. to 1.0 vertical
Downstream Embankment side slope = 1.5 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 2512.19
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 3

Pier Data
Pier Station Upstream= 69.45 Downstream= 78.8
Upstream num= 2
Width Elev Width Elev
****
3 2490 3 2511.91
Downstream num= 2
Width Elev Width Elev
****
3 2490 3 2511.91

Pier Data
Pier Station Upstream= 138.97 Downstream= 148.04
Upstream num= 2
Width Elev Width Elev
****
3 2490 3 2511.91
Downstream num= 2
Width Elev Width Elev
****
3 2490 3 2511.91

Pier Data
Pier Station Upstream= 208.52 Downstream= 217.6
Upstream num= 2
Width Elev Width Elev
****
3 2490 3 2511.91
Downstream num= 2
Width Elev Width Elev
****
3 2490 3 2511.91

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #100 year

E.G. US. (ft)	2506.37	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	2503.69	E.G. Elev (ft)	2506.30	2505.49
Q Total (cfs)	32000.00	W.S. Elev (ft)	2502.94	2502.44
Q Bridge (cfs)	32000.00	Crit W.S. (ft)	2501.09	2500.18
Q Weir (cfs)		Max Chl Dpth (ft)	12.04	12.24
Weir Sta Lft (ft)		Vel Total (ft/s)	14.71	14.02
Weir Sta Rgt (ft)		Flow Area (sq ft)	2175.93	2281.91
Weir Submerg		Froude # Chl	0.77	0.73
Weir Max Depth (ft)		Specif Force (cu ft)	27393.11	27593.29
Min El Weir Flow (ft)	2512.19	Hydr Depth (ft)	11.22	11.48
Min El Prs (ft)	2510.19	W.P. Total (ft)	275.58	282.27
Delta EG (ft)	1.02	Conv. Total (cfs)	427348.3	455262.5
Delta WS (ft)	1.00	Top Width (ft)	194.01	198.71
BR Open Area (sq ft)	3808.20	Frctn Loss (ft)	0.72	0.02
BR Open Vel (ft/s)	14.71	C & E Loss (ft)	0.09	0.12
Coef of Q		Shear Total (lb/sq ft)	2.76	2.49
Br Sel Method	Energy only	Power Total (lb/ft s)	40.65	34.97

Warning: Pier drag coefficient of 2.0 assumed for Class B flow.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 290

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2511	5.21	2510	10.08	2509	15.67	2508	20.42	2507
21.51	2506	22.64	2505	35.67	2503	45.67	2503	58.47	2490.2
241.7	2490.2	254.5	2503	264.5	2503	282.48	2505	284.14	2506
285.85	2507	291.86	2508	294.96	2509	296.11	2510	308.44	2510
313.58	2510								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	45.67	.03	254.5	.04

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
45.67	254.5	85	85	85	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (ft)	2505.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.66	Wt. n-Val.		0.030	
W.S. Elev (ft)	2502.69	Reach Len. (ft)	85.00	85.00	85.00
Crit W.S. (ft)		Flow Area (sq ft)		2444.85	
E.G. Slope (ft/ft)	0.002791	Area (sq ft)		2444.85	
Q Total (cfs)	32000.00	Flow (cfs)		32000.00	
Top Width (ft)	208.21	Top Width (ft)		208.21	
Vel Total (ft/s)	13.09	Avg. Vel. (ft/s)		13.09	
Max Chl Dpth (ft)	12.49	Hydr. Depth (ft)		11.74	
Conv. Total (cfs)	605681.3	Conv. (cfs)		605681.3	
Length Wtd. (ft)	85.00	Wetted Per. (ft)		218.56	
Min Ch El (ft)	2490.20	Shear (lb/sq ft)		1.95	
Alpha	1.00	Stream Power (lb/ft s)		25.51	

```
* Frctn Loss (ft)       *    0.35  * Cum Volume (acre-ft)   *         *   42.36  *         *
* C & E Loss (ft)        *    0.22  * Cum SA (acres)         *         *    4.37  *         *
*****************************************************************************************************

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.

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 275

INPUT
Description:
Station Elevation Data    num=      20
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2509    4.38    2508    8.49    2507   14.17    2506   20.74    2505
  25.94    2504   27.67    2503   29.32    2502   44.18    2502   54.18    2502
  66.38  2489.8   234.9  2489.8   247.1    2502   257.1    2502  270.36    2502
 272.15    2503  273.91    2504  275.67    2505  278.33    2506  316.55    2507

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
************************************************
      0    .045   54.18     .03   247.1     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        54.18   247.1             264     264     264            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2504.79  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    4.84  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2499.95  * Reach Len. (ft)        *  264.00  *  264.00  *  264.00  *
* Crit W.S. (ft)         * 2499.95  * Flow Area (sq ft)      *         * 1812.47  *         *
* E.G. Slope (ft/ft)     *0.006600  * Area (sq ft)           *         * 1812.47  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)         *  188.81  * Top Width (ft)         *         *  188.81  *         *
* Vel Total (ft/s)       *   17.66  * Avg. Vel. (ft/s)       *         *   17.66  *         *
* Max Chl Dpth (ft)      *   10.14  * Hydr. Depth (ft)       *         *    9.60  *         *
* Conv. Total (cfs)      *393883.1  * Conv. (cfs)            *         *393883.1  *         *
* Length Wtd. (ft)       *  264.00  * Wetted Per. (ft)       *         *  197.21  *         *
* Min Ch El (ft)         * 2489.80  * Shear (lb/sq ft)       *         *    3.79  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   66.86  *         *
* Frctn Loss (ft)        *    1.74  * Cum Volume (acre-ft)   *         *   38.21  *         *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)         *         *    3.98  *         *
*****************************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
        program selected the water surface that had the least amount of error between computed and
        assumed values.
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: River #1
REACH: Reach #1          RS: 200

INPUT
Description:
Station Elevation Data    num=      19
```

```
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2507    89.5    2507  275.72    2505     298    2504  311.14    2503
  313.65    2502  316.05    2501   323.7    2500   333.7    2500   345.7    2488
  513.81    2488  525.81    2500  535.81    2500  559.95    2503  605.45    2504
  846.35    2511  859.53    2512  882.51    2513  914.95    2514

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***************************************************
      0    .045   333.7     .03  525.81     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        333.7  525.81          273.87  293.94  300.79            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)         * 2503.01  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    4.82  * Wt. n-Val.            *         *   0.030  *         *
* W.S. Elev (ft)         * 2498.18  * Reach Len. (ft)       *  273.87  *  293.94  *  300.79  *
* Crit W.S. (ft)         * 2498.18  * Flow Area (sq ft)     *         * 1815.39  *         *
* E.G. Slope (ft/ft)     *0.006551  * Area (sq ft)          *         * 1815.39  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)         *  188.47  * Top Width (ft)        *         *  188.47  *         *
* Vel Total (ft/s)       *   17.63  * Avg. Vel. (ft/s)      *         *   17.63  *         *
* Max Chl Dpth (ft)      *   10.18  * Hydr. Depth (ft)      *         *    9.63  *         *
* Conv. Total (cfs)      *395349.2  * Conv. (cfs)           *         *395349.2  *         *
* Length Wtd. (ft)       *  293.94  * Wetted Per. (ft)      *         *  196.91  *         *
* Min Ch El (ft)         * 2488.00  * Shear (lb/sq ft)      *         *    3.77  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   66.47  *         *
* Frctn Loss (ft)        *    1.62  * Cum Volume (acre-ft)   *         *   27.22  *         *
* C & E Loss (ft)        *    0.32  * Cum SA (acres)         *         *    2.84  *         *
*****************************************************************************************

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 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: River #1
REACH: Reach #1          RS: 150

INPUT
Description:
Station Elevation Data    num=      16
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2502    5.17    2502   78.66    2501   80.48    2500    95.5    2499
   105.5    2499   118.3  2486.2  297.97  2486.2  310.77    2499  320.77    2499
   323.2    2499  325.71    2500  331.93    2501  340.78    2502  358.61    2502
   358.9    2502

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***************************************************
      0     .05   105.5     .03  310.77     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        105.5  310.77             283  287.45  289.16            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
```

```
* E.G. Elev (ft)        * 2500.76  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    3.74  * Wt. n-Val.           *        *   0.030  *        *
* W.S. Elev (ft)        * 2497.02  * Reach Len. (ft)       *  283.00  *  287.45  *  289.16  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *        * 2061.02  *        *
* E.G. Slope (ft/ft)    *0.004684  * Area (sq ft)          *        * 2061.02  *        *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *        *32000.00  *        *
* Top Width (ft)        *  201.31  * Top Width (ft)        *        *  201.31  *        *
* Vel Total (ft/s)      *   15.53  * Avg. Vel. (ft/s)      *        *   15.53  *        *
* Max Chl Dpth (ft)     *   10.82  * Hydr. Depth (ft)      *        *   10.24  *        *
* Conv. Total (cfs)     *467543.1  * Conv. (cfs)           *        *467543.1  *        *
* Length Wtd. (ft)      *  287.45  * Wetted Per. (ft)      *        *  210.27  *        *
* Min Ch El (ft)        * 2486.20  * Shear (lb/sq ft)      *        *    2.87  *        *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *   44.51  *        *
* Frctn Loss (ft)       *    1.39  * Cum Volume (acre-ft)   *        *   14.14  *        *
* C & E Loss (ft)       *    0.16  * Cum SA (acres)         *        *    1.53  *        *
*****************************************************************************************************

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: River #1
REACH: Reach #1          RS: 100

INPUT
Description:
Station Elevation Data    num=      44
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
       0   2501   59.43    2500   74.75    2499   76.67    2498    78.5    2497
   84.73    2496   90.07    2495   93.09    2494   95.46    2493   97.85    2492
  100.17    2491   102.5    2490  112.09    2489  135.78    2488  158.68    2487
  184.75    2487  186.54    2487  239.34    2486  254.14    2486   259.3    2487
  261.93    2487  262.97    2486   265.1    2485  284.74    2484  320.02    2484
  320.83    2485  321.62    2486  322.41    2487  324.25    2488  325.51    2489
  326.78    2490  328.08    2491  329.34    2492  330.57    2493  331.84    2494
  336.11    2495  345.88    2496  348.18    2497  350.24    2498  351.98    2499
  353.85    2500  408.32    2501     453    2502  457.38    2502

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
       0    .045   59.43     .03  353.85     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
         59.43  353.85            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2499.21  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    3.22  * Wt. n-Val.           *        *   0.030  *        *
* W.S. Elev (ft)        * 2496.00  * Reach Len. (ft)       *        *        *        *
* Crit W.S. (ft)        * 2495.07  * Flow Area (sq ft)     *        * 2223.50  *        *
* E.G. Slope (ft/ft)    *0.005001  * Area (sq ft)          *        * 2223.50  *        *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *        *32000.00  *        *
* Top Width (ft)        *  261.12  * Top Width (ft)        *        *  261.12  *        *
* Vel Total (ft/s)      *   14.39  * Avg. Vel. (ft/s)      *        *   14.39  *        *
* Max Chl Dpth (ft)     *   12.00  * Hydr. Depth (ft)      *        *    8.52  *        *
* Conv. Total (cfs)     *452480.5  * Conv. (cfs)           *        *452480.5  *        *
* Length Wtd. (ft)      *         * Wetted Per. (ft)       *        *  267.00  *        *
* Min Ch El (ft)        * 2484.00  * Shear (lb/sq ft)      *        *    2.60  *        *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *   37.42  *        *
* Frctn Loss (ft)       *         * Cum Volume (acre-ft)   *        *        *        *
* C & E Loss (ft)       *         * Cum SA (acres)         *        *        *        *
*****************************************************************************************************
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SUMMARY OF MANNING'S N VALUES

River:River #1

Reach	River Sta.	n1	n2	n3
Reach #1	1600	.055	.03	.55
Reach #1	1500	.055	.03	.055
Reach #1	1450	.055	.03	.055
Reach #1	1400	.055	.03	.055
Reach #1	1350	.055	.03	.055
Reach #1	1325	Bridge		
Reach #1	1300	.055	.03	.055
Reach #1	1230	.05	.03	.05
Reach #1	1220	.05	.03	.05
Reach #1	1200	.05	.03	.05
Reach #1	1120	.05	.03	.05
Reach #1	1110	.05	.03	.05
Reach #1	1100	.05	.03	.05
Reach #1	1050	.05	.03	.05
Reach #1	1010	.05	.03	.05
Reach #1	1000	.05	.03	.05
Reach #1	990	.05	.03	.05
Reach #1	975	.05	.03	.05
Reach #1	965	.05	.03	.05
Reach #1	950	.05	.03	.05
Reach #1	900	.05	.03	.05
Reach #1	875	.05	.03	.05
Reach #1	865	.05	.03	.05
Reach #1	850	.05	.03	.05
Reach #1	825	.05	.03	.05
Reach #1	800	.05	.03	.05
Reach #1	750	.05	.03	.05
Reach #1	700	.05	.03	.05
Reach #1	650	.05	.03	.05
Reach #1	600	.05	.03	.05
Reach #1	550	.05	.03	.05
Reach #1	500	.05	.03	.05
Reach #1	450	.05	.03	.05
Reach #1	400	.05	.03	.05
Reach #1	350	.05	.03	.05
Reach #1	325	.05	.03	.05
Reach #1	300	.05	.03	.05
Reach #1	295	Bridge		
Reach #1	290	.045	.03	.04
Reach #1	275	.045	.03	.04
Reach #1	200	.045	.03	.04
Reach #1	150	.05	.03	.05
Reach #1	100	.045	.03	.04

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SUMMARY OF REACH LENGTHS

River: River #1

Reach	River Sta.	Left	Channel	Right
Reach #1	1600	714.82	679.46	667.01
Reach #1	1500	249.54	214.53	208.71
Reach #1	1450	208.29	198.71	196.74
Reach #1	1400	208.05	211.15	211.03
Reach #1	1350	267.52	277.24	286.29
Reach #1	1325	Bridge		
Reach #1	1300	385.44	383.38	385.44
Reach #1	1230	47.48	47.44	47.31
Reach #1	1220	415.98	411.79	408.49

*Reach #1	*	1200	* 57.6*	56.56*	56.61*
*Reach #1	*	1120	* 440.13*	443.73*	447.38*
*Reach #1	*	1110	* 46.86*	36.39*	42.45*
*Reach #1	*	1100	* 294*	294*	294*
*Reach #1	*	1050	* 162*	162*	162*
*Reach #1	*	1010	* 111.18*	71.92*	89.39*
*Reach #1	*	1000	* 147*	147*	147*
*Reach #1	*	990	* 168*	168*	168*
*Reach #1	*	975	* 151*	151*	151*
*Reach #1	*	965	* 148*	148*	148*
*Reach #1	*	950	* 216.27*	206.23*	199.7*
*Reach #1	*	900	* 159.29*	151.89*	152.98*
*Reach #1	*	875	* 143*	143*	143*
*Reach #1	*	865	* 153*	153*	153*
*Reach #1	*	850	* 199.44*	201.98*	207.35*
*Reach #1	*	825	* 112.29*	110.49*	112.71*
*Reach #1	*	800	* 269.66*	259.43*	283.94*
*Reach #1	*	750	* 249.08*	245.16*	242.37*
*Reach #1	*	700	* 293.91*	294.12*	299.31*
*Reach #1	*	650	* 225.88*	219.62*	226.45*
*Reach #1	*	600	* 296.17*	292.59*	291.63*
*Reach #1	*	550	* 174.17*	170.22*	169.02*
*Reach #1	*	500	* 312.56*	311.97*	314.78*
*Reach #1	*	450	* 276.48*	275.96*	282*
*Reach #1	*	400	* 248.4*	246.38*	244.38*
*Reach #1	*	350	* 102*	102*	102*
*Reach #1	*	325	* 128*	128*	128*
*Reach #1	*	300	* 142.87*	142.74*	142.86*
*Reach #1	*	295	*Bridge *	*	*
*Reach #1	*	290	* 85*	85*	85*
*Reach #1	*	275	* 264*	264*	264*
*Reach #1	*	200	* 273.87*	293.94*	300.79*
*Reach #1	*	150	* 283*	287.45*	289.16*
*Reach #1	*	100	* *	*	*

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SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: River #1

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* Reach	*	River Sta.	* Contr.	* Expan.	*
*Reach #1	*	1600	* .1*	.3*	
*Reach #1	*	1500	* .1*	.3*	
*Reach #1	*	1450	* .1*	.3*	
*Reach #1	*	1400	* .1*	.3*	
*Reach #1	*	1350	* .1*	.3*	
*Reach #1	*	1325	*Bridge *	*	
*Reach #1	*	1300	* .1*	.3*	
*Reach #1	*	1230	* .1*	.3*	
*Reach #1	*	1220	* .1*	.3*	
*Reach #1	*	1200	* .1*	.3*	
*Reach #1	*	1120	* .1*	.3*	
*Reach #1	*	1110	* .1*	.3*	
*Reach #1	*	1100	* .1*	.3*	
*Reach #1	*	1050	* .1*	.3*	
*Reach #1	*	1010	* .1*	.3*	
*Reach #1	*	1000	* .1*	.3*	
*Reach #1	*	990	* .1*	.3*	
*Reach #1	*	975	* .1*	.3*	
*Reach #1	*	965	* .1*	.3*	
*Reach #1	*	950	* .1*	.3*	
*Reach #1	*	900	* .1*	.3*	
*Reach #1	*	875	* .1*	.3*	
*Reach #1	*	865	* .1*	.3*	
*Reach #1	*	850	* .1*	.3*	
*Reach #1	*	825	* .1*	.3*	
*Reach #1	*	800	* .1*	.3*	

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*Reach #1      *   750    *      .1*      .3*
*Reach #1      *   700    *      .1*      .3*
*Reach #1      *   650    *      .1*      .3*
*Reach #1      *   600    *      .1*      .3*
*Reach #1      *   550    *      .1*      .3*
*Reach #1      *   500    *      .1*      .3*
*Reach #1      *   450    *      .1*      .3*
*Reach #1      *   400    *      .1*      .3*
*Reach #1      *   350    *      .1*      .3*
*Reach #1      *   325    *      .1*      .3*
*Reach #1      *   300    *      .1*      .3*
*Reach #1      *   295    *Bridge   *        *
*Reach #1      *   290    *      .1*      .3*
*Reach #1      *   275    *      .1*      .3*
*Reach #1      *   200    *      .1*      .3*
*Reach #1      *   150    *      .1*      .3*
*Reach #1      *   100    *      .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 *
*           *           *          *    (cfs) *      (ft) *      (ft) *      (ft) *      (ft) *    (ft/ft) *   (ft/s) *   (sq ft) *      (ft) *              *
*****************************************************************************************************************
*****************************************
* Reach #1    * 1600       * 100 year * 32000.00 *   2540.00 *   2548.55 *   2548.55 *   2551.95 *   0.007049 *    14.81 *   2161.11 *    320.60 *
1.01 *
* Reach #1    * 1500       * 100 year * 32000.00 *   2532.00 *   2546.12 *          *   2547.93 *   0.002890 *    10.80 *   2963.77 *    355.60 *        0.66
*
* Reach #1    * 1450       * 100 year * 32000.00 *   2531.00 *   2545.57 *          *   2547.34 *   0.002511 *    10.69 *   2992.82 *    326.90 *        0.62
*
* Reach #1    * 1400       * 100 year * 32000.00 *   2530.00 *   2544.43 *          *   2546.72 *   0.003389 *    12.13 *   2638.51 *    298.53 *        0.72
*
* Reach #1    * 1350       * 100 year * 32000.00 *   2530.00 *   2544.15 *   2540.70 *   2545.99 *   0.002360 *    10.90 *   2937.28 *    300.53 *
0.61 *
* Reach #1    * 1325       *          *   Bridge *          *          *          *          *          *          *          *          *
* Reach #1    * 1300       * 100 year * 32000.00 *   2529.00 *   2542.32 *          *   2544.54 *   0.002846 *    11.96 *   2676.17 *    271.97 *        0.67
*
* Reach #1    * 1230       * 100 year * 32000.00 *   2529.00 *   2538.41 *   2538.41 *   2542.74 *   0.006575 *    16.70 *   1924.15 *    262.04 *
1.00 *
* Reach #1    * 1220       * 100 year * 32000.00 *   2527.00 *   2537.18 *   2536.61 *   2540.78 *   0.005447 *    15.23 *   2100.79 *    240.31 *
0.91 *
* Reach #1    * 1200       * 100 year * 32000.00 *   2526.00 *   2535.69 *          *   2538.60 *   0.004262 *    13.69 *   2338.27 *    260.38 *        0.80
*
* Reach #1    * 1120       * 100 year * 32000.00 *   2524.00 *   2536.04 *          *   2538.19 *   0.002580 *    11.76 *   2721.21 *    259.40 *        0.64
*
* Reach #1    * 1110       * 100 year * 32000.00 *   2523.00 *   2531.95 *   2531.95 *   2536.22 *   0.006788 *    16.60 *   1928.26 *    227.56 *
1.00 *
* Reach #1    * 1100       * 100 year * 32000.00 *   2520.00 *   2531.21 *          *   2534.69 *   0.004588 *    14.98 *   2136.04 *    218.24 *        0.84
*
* Reach #1    * 1050       * 100 year * 32000.00 *   2520.00 *   2528.87 *   2528.87 *   2533.01 *   0.006744 *    16.31 *   1961.45 *    238.16 *
1.00 *
* Reach #1    * 1010       * 100 year * 32000.00 *   2519.00 *   2526.57 *   2526.57 *   2530.10 *   0.007003 *    15.08 *   2122.35 *    300.87 *
1.00 *
* Reach #1    * 1000       * 100 year * 32000.00 *   2510.90 *   2523.79 *          *   2525.01 *   0.001187 *     8.87 *   3608.57 *    291.00 *        0.44
*
* Reach #1    * 990        * 100 year * 32000.00 *   2510.20 *   2523.29 *          *   2524.79 *   0.001459 *     9.83 *   3255.86 *    263.84 *        0.49
*
* Reach #1    * 975        * 100 year * 32000.00 *   2509.40 *   2522.68 *          *   2524.49 *   0.001742 *    10.80 *   2962.54 *    237.01 *        0.54
*
* Reach #1    * 965        * 100 year * 32000.00 *   2508.70 *   2522.35 *          *   2524.22 *   0.001751 *    10.97 *   2915.90 *    228.57 *        0.54
*
* Reach #1    * 950        * 100 year * 32000.00 *   2507.90 *   2521.63 *          *   2523.90 *   0.002132 *    12.08 *   2649.40 *    206.82 *        0.59
*
* Reach #1    * 900        * 100 year * 32000.00 *   2506.90 *   2517.83 *   2517.83 *   2522.91 *   0.006426 *    18.09 *   1769.07 *    172.49 *
1.00 *
* Reach #1    * 875        * 100 year * 32000.00 *   2506.20 *   2516.67 *   2516.67 *   2521.64 *   0.006572 *    17.90 *   1787.96 *    181.39 *
1.00 *
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* Reach #1	* 865	* 100 year	* 32000.00	* 2505.50	* 2514.67	* 2514.67	* 2519.10	* 0.006729	* 16.90	* 1893.11	* 215.12	* 1.00	*
* Reach #1	* 850	* 100 year	* 32000.00	* 2504.80	* 2513.77	* 2513.07	* 2517.17	* 0.005213	* 14.79	* 2164.19	* 249.68	* 0.89	*
* Reach #1	* 825	* 100 year	* 32000.00	* 2503.90	* 2513.39	*	* 2516.05	* 0.003804	* 13.11	* 2441.64	* 266.91	* 0.76	*
* Reach #1	* 800	* 100 year	* 32000.00	* 2503.30	* 2512.78	*	* 2515.61	* 0.004041	* 13.49	* 2371.29	* 258.90	* 0.79	*
* Reach #1	* 750	* 100 year	* 32000.00	* 2502.00	* 2510.68	* 2510.27	* 2514.29	* 0.005788	* 15.23	* 2100.66	* 251.87	* 0.93	*
* Reach #1	* 700	* 100 year	* 32000.00	* 2500.80	* 2509.82	*	* 2512.85	* 0.004612	* 13.98	* 2289.14	* 262.41	* 0.83	*
* Reach #1	* 650	* 100 year	* 32000.00	* 2499.40	* 2508.60	*	* 2511.50	* 0.004307	* 13.68	* 2339.19	* 262.92	* 0.81	*
* Reach #1	* 600	* 100 year	* 32000.00	* 2498.30	* 2507.76	*	* 2510.56	* 0.004012	* 13.43	* 2382.55	* 260.76	* 0.78	*
* Reach #1	* 550	* 100 year	* 32000.00	* 2496.90	* 2506.90	*	* 2509.40	* 0.003338	* 12.70	* 2519.95	* 259.25	* 0.72	*
* Reach #1	* 500	* 100 year	* 32000.00	* 2496.10	* 2506.55	*	* 2508.80	* 0.002832	* 12.02	* 2661.97	* 263.82	* 0.67	*
* Reach #1	* 450	* 100 year	* 32000.00	* 2494.60	* 2506.04	*	* 2507.93	* 0.002125	* 11.01	* 2906.24	* 263.82	* 0.58	*
* Reach #1	* 400	* 100 year	* 32000.00	* 2493.20	* 2505.74	*	* 2507.33	* 0.001607	* 10.12	* 3160.69	* 263.31	* 0.51	*
* Reach #1	* 350	* 100 year	* 32000.00	* 2492.00	* 2505.32	*	* 2506.94	* 0.001539	* 10.22	* 3132.03	* 248.92	* 0.51	*
* Reach #1	* 325	* 100 year	* 32000.00	* 2491.50	* 2504.76	*	* 2506.73	* 0.001900	* 11.27	* 2838.35	* 225.95	* 0.56	*
* Reach #1	* 300	* 100 year	* 32000.00	* 2490.90	* 2503.69	* 2500.73	* 2506.37	* 0.002749	* 13.13	* 2438.06	* 204.67	* 0.67	*
* Reach #1	* 295	*	* Bridge	*	*	*	*	*	*	*	*	*	
* Reach #1	* 290	* 100 year	* 32000.00	* 2490.20	* 2502.69	*	* 2505.35	* 0.002791	* 13.09	* 2444.85	* 208.21	* 0.67	*
* Reach #1	* 275	* 100 year	* 32000.00	* 2489.80	* 2499.95	* 2499.95	* 2504.79	* 0.006600	* 17.66	* 1812.47	* 188.81	* 1.00	*
* Reach #1	* 200	* 100 year	* 32000.00	* 2488.00	* 2498.18	* 2498.18	* 2503.01	* 0.006551	* 17.63	* 1815.39	* 188.47	* 1.00	*
* Reach #1	* 150	* 100 year	* 32000.00	* 2486.20	* 2497.02	*	* 2500.76	* 0.004684	* 15.53	* 2061.02	* 201.31	* 0.86	*
* Reach #1	* 100	* 100 year	* 32000.00	* 2484.00	* 2496.00	* 2495.07	* 2499.21	* 0.005001	* 14.39	* 2223.50	* 261.12	* 0.87	*

Profile Output Table - Standard Table 2

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
* Reach #1	* 1600	* 100 year	* 2551.95	* 2548.55	* 3.40	* 2.92	* 0.48	*	* 32000.00	*	* 320.60 *
* Reach #1	* 1500	* 100 year	* 2547.93	* 2546.12	* 1.81	* 0.58	* 0.01	*	* 32000.00	*	* 355.60 *
* Reach #1	* 1450	* 100 year	* 2547.34	* 2545.57	* 1.78	* 0.58	* 0.05	*	* 32000.00	*	* 326.90 *
* Reach #1	* 1400	* 100 year	* 2546.72	* 2544.43	* 2.28	* 0.59	* 0.13	*	* 32000.00	*	* 298.53 *
* Reach #1	* 1350	* 100 year	* 2545.99	* 2544.15	* 1.84	* 0.34	* 0.08	*	* 31999.94	* 0.06	* 300.53 *
* Reach #1	* 1325	*	* Bridge	*	*	*	*	*	*	*	*
* Reach #1	* 1300	* 100 year	* 2544.54	* 2542.32	* 2.22	* 1.59	* 0.21	*	* 32000.00	*	* 271.97 *
* Reach #1	* 1230	* 100 year	* 2542.74	* 2538.41	* 4.33	* 0.28	* 0.22	*	* 31992.67	* 7.33	* 262.04 *
* Reach #1	* 1220	* 100 year	* 2540.78	* 2537.18	* 3.60	* 1.98	* 0.21	*	* 32000.00	*	* 240.31 *
* Reach #1	* 1200	* 100 year	* 2538.60	* 2535.69	* 2.91	* 0.18	* 0.23	*	* 32000.00	*	* 260.38 *
* Reach #1	* 1120	* 100 year	* 2538.19	* 2536.04	* 2.15	* 1.75	* 0.21	*	* 32000.00	* 0.00	* 259.40 *
* Reach #1	* 1110	* 100 year	* 2536.22	* 2531.95	* 4.28	* 0.20	* 0.24	*	* 32000.00	*	* 227.56 *
* Reach #1	* 1100	* 100 year	* 2534.69	* 2531.21	* 3.48	* 1.62	* 0.06	*	* 32000.00	*	* 218.24 *
* Reach #1	* 1050	* 100 year	* 2533.01	* 2528.87	* 4.13	* 1.11	* 0.18	*	* 32000.00	*	* 238.16 *
* Reach #1	* 1010	* 100 year	* 2530.10	* 2526.57	* 3.53	* 0.17	* 0.69	*	* 32000.00	*	* 300.87 *
* Reach #1	* 1000	* 100 year	* 2525.01	* 2523.79	* 1.22	* 0.19	* 0.03	*	* 32000.00	*	* 291.00 *
* Reach #1	* 990	* 100 year	* 2524.79	* 2523.29	* 1.50	* 0.27	* 0.03	*	* 32000.00	*	* 263.84 *
* Reach #1	* 975	* 100 year	* 2524.49	* 2522.68	* 1.81	* 0.26	* 0.01	*	* 32000.00	*	* 237.01 *
* Reach #1	* 965	* 100 year	* 2524.22	* 2522.35	* 1.87	* 0.29	* 0.04	*	* 32000.00	*	* 228.57 *

* Reach #1	* 950	* 100 year *	2523.90 *	2521.63 *	2.27 *	0.71 *	0.28 *	* 32000.00 *	*	206.82 *
* Reach #1	* 900	* 100 year *	2522.91 *	2517.83 *	5.08 *	0.99 *	0.03 *	* 32000.00 *	*	172.49 *
* Reach #1	* 875	* 100 year *	2521.64 *	2516.67 *	4.97 *	0.95 *	0.16 *	* 32000.00 *	*	181.39 *
* Reach #1	* 865	* 100 year *	2519.10 *	2514.67 *	4.44 *	0.90 *	0.31 *	* 32000.00 *	*	215.12 *
* Reach #1	* 850	* 100 year *	2517.17 *	2513.77 *	3.39 *	0.89 *	0.22 *	* 32000.00 *	*	249.68 *
* Reach #1	* 825	* 100 year *	2516.05 *	2513.39 *	2.67 *	0.43 *	0.02 *	* 32000.00 *	*	266.91 *
* Reach #1	* 800	* 100 year *	2515.61 *	2512.78 *	2.83 *	1.24 *	0.08 *	* 32000.00 *	*	258.90 *
* Reach #1	* 750	* 100 year *	2514.29 *	2510.68 *	3.60 *	1.26 *	0.17 *	* 32000.00 *	*	251.87 *
* Reach #1	* 700	* 100 year *	2512.85 *	2509.82 *	3.03 *	1.31 *	0.04 *	* 32000.00 *	*	262.41 *
* Reach #1	* 650	* 100 year *	2511.50 *	2508.60 *	2.91 *	0.91 *	0.03 *	* 32000.00 *	*	262.92 *
* Reach #1	* 600	* 100 year *	2510.56 *	2507.76 *	2.80 *	1.07 *	0.09 *	* 32000.00 *	*	260.76 *
* Reach #1	* 550	* 100 year *	2509.40 *	2506.90 *	2.50 *	0.52 *	0.08 *	* 32000.00 *	*	259.25 *
* Reach #1	* 500	* 100 year *	2508.80 *	2506.55 *	2.24 *	0.76 *	0.11 *	* 32000.00 *	*	263.82 *
* Reach #1	* 450	* 100 year *	2507.93 *	2506.04 *	1.88 *	0.51 *	0.09 *	* 32000.00 *	*	263.82 *
* Reach #1	* 400	* 100 year *	2507.33 *	2505.74 *	1.59 *	0.39 *	0.00 *	* 32000.00 *	*	263.31 *
* Reach #1	* 350	* 100 year *	2506.94 *	2505.32 *	1.62 *	0.17 *	0.04 *	* 32000.00 *	*	248.92 *
* Reach #1	* 325	* 100 year *	2506.73 *	2504.76 *	1.97 *	0.29 *	0.07 *	* 32000.00 *	*	225.95 *
* Reach #1	* 300	* 100 year *	2506.37 *	2503.69 *	2.68 *	0.00 *	0.07 *	* 32000.00 *	*	204.67 *
* Reach #1	* 295	* *	Bridge *	* *	*	*	*	*	*	
* Reach #1	* 290	* 100 year *	2505.35 *	2502.69 *	2.66 *	0.35 *	0.22 *	* 32000.00 *	*	208.21 *
* Reach #1	* 275	* 100 year *	2504.79 *	2499.95 *	4.84 *	1.74 *	0.00 *	* 32000.00 *	*	188.81 *
* Reach #1	* 200	* 100 year *	2503.01 *	2498.18 *	4.82 *	1.62 *	0.32 *	* 32000.00 *	*	188.47 *
* Reach #1	* 150	* 100 year *	2500.76 *	2497.02 *	3.74 *	1.39 *	0.16 *	* 32000.00 *	*	201.31 *
* Reach #1	* 100	* 100 year *	2499.21 *	2496.00 *	3.22 *	*	*	* 32000.00 *	*	261.12 *

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ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Alt3

River: River #1 Reach: Reach #1 RS: 1600 Profile: 100 year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
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.
River: River #1 Reach: Reach #1 RS: 1450 Profile: 100 year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: River #1 Reach: Reach #1 RS: 1350 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 1325 Profile: 100 year
Warning:Pier drag coefficient of 2.0 assumed for Class B flow.
River: River #1 Reach: Reach #1 RS: 1300 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 1230 Profile: 100 year
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:Divided flow computed for this cross-section.
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.
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.
River: River #1 Reach: Reach #1 RS: 1220 Profile: 100 year
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.

River: River #1 Reach: Reach #1 RS: 1200 Profile: 100 year

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

River: River #1 Reach: Reach #1 RS: 1120 Profile: 100 year

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.

River: River #1 Reach: Reach #1 RS: 1110 Profile: 100 year

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 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.

River: River #1 Reach: Reach #1 RS: 1100 Profile: 100 year

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.

River: River #1 Reach: Reach #1 RS: 1050 Profile: 100 year

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 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.

River: River #1 Reach: Reach #1 RS: 1010 Profile: 100 year

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.

River: River #1 Reach: Reach #1 RS: 950 Profile: 100 year

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.

River: River #1 Reach: Reach #1 RS: 900 Profile: 100 year

Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.

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.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

River: River #1 Reach: Reach #1 RS: 875 Profile: 100 year

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 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.

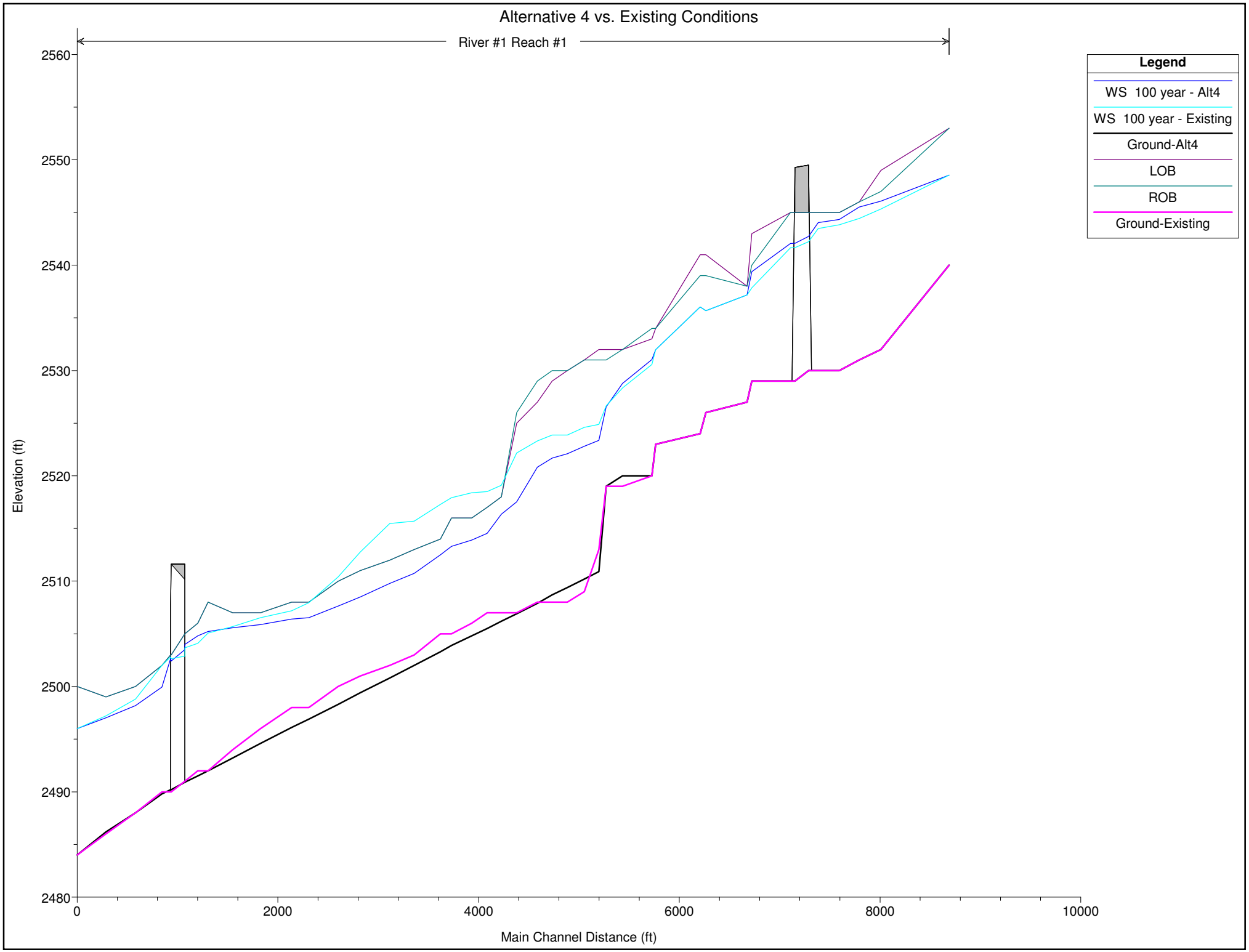
River: River #1 Reach: Reach #1 RS: 865 Profile: 100 year

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.

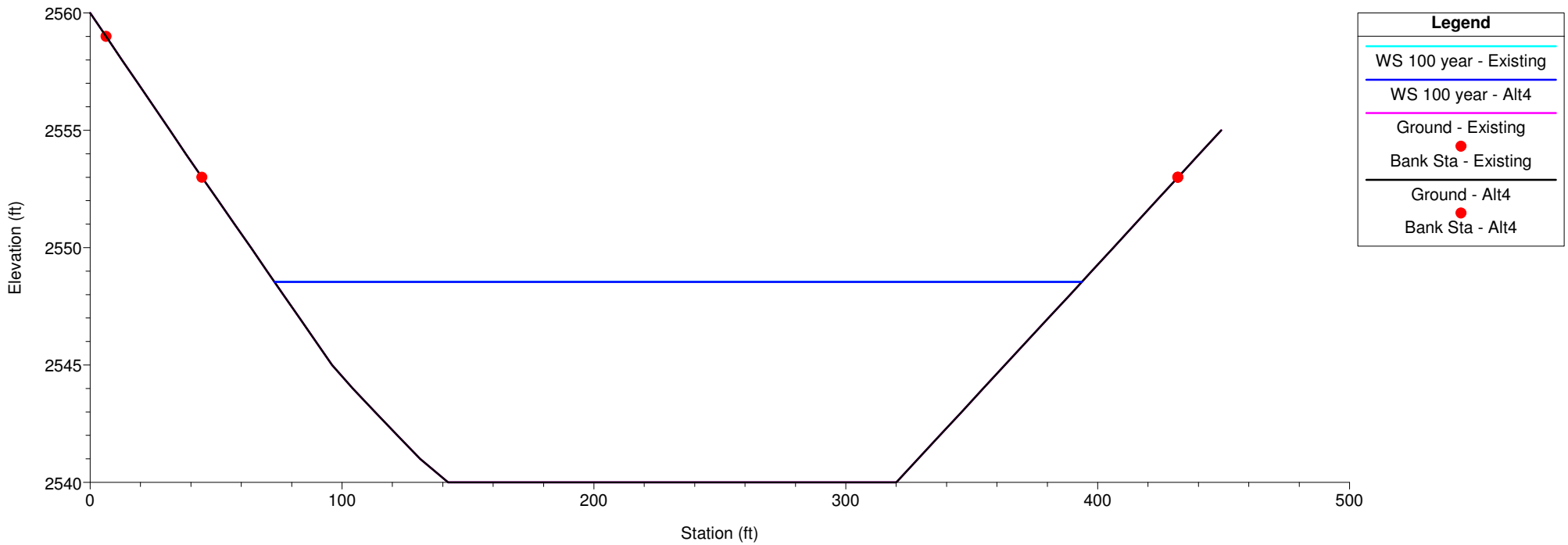
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning:The 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.
River: River #1 Reach: Reach #1 RS: 850 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 800 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 750 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 700 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 600 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 325 Profile: 100 year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: River #1 Reach: Reach #1 RS: 300 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 295 Profile: 100 year
Warning:Pier drag coefficient of 2.0 assumed for Class B flow.
River: River #1 Reach: Reach #1 RS: 290 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 275 Profile: 100 year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
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.
River: River #1 Reach: Reach #1 RS: 200 Profile: 100 year
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 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.
River: River #1 Reach: Reach #1 RS: 150 Profile: 100 year
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.

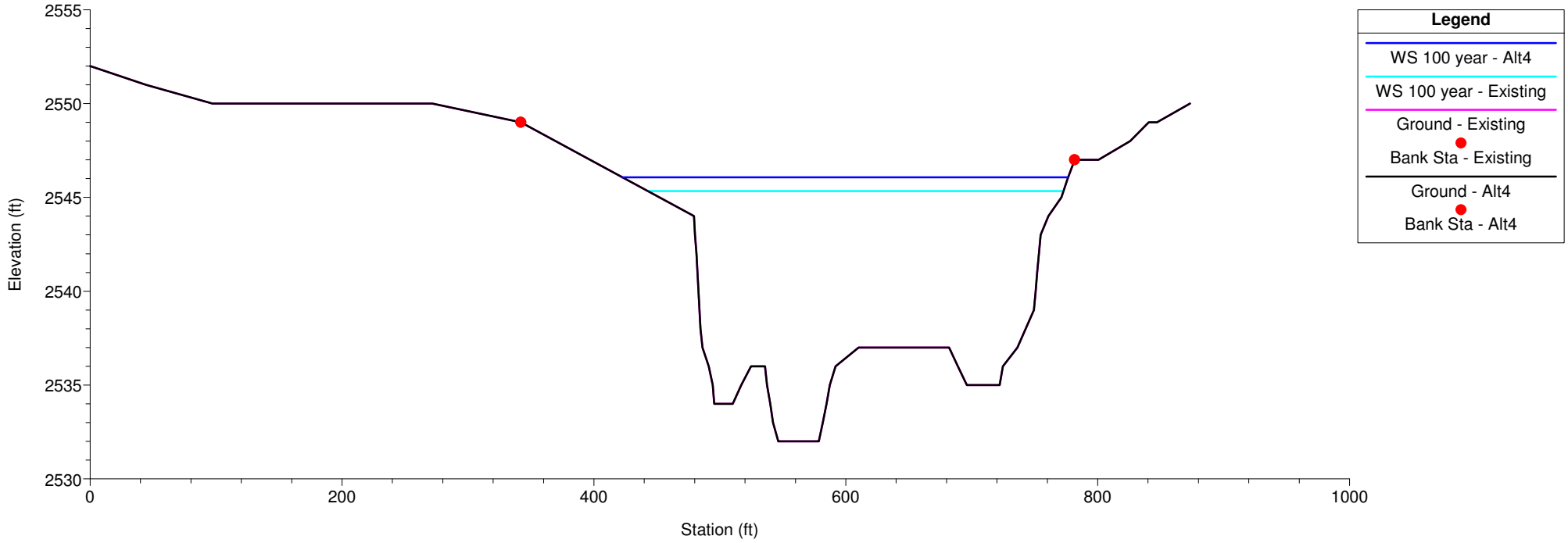
APPENDIX J.4
ALTERNATIVE 4 OUTPUT AND CROSS-SECTION AND PROFILE PLOTS


Alternative 4 vs. Existing Conditions
River #1 Reach #1
Legend
WS 100 year - Alt4
WS 100 year - Existing
Ground-Alt4
LOB
ROB
Ground-Existing
Elevation (ft)
2560
2550
2540
2530
2520
2510
2500
2490
2480
0
2000
4000
6000
8000
10000
Main Channel Distance (ft)

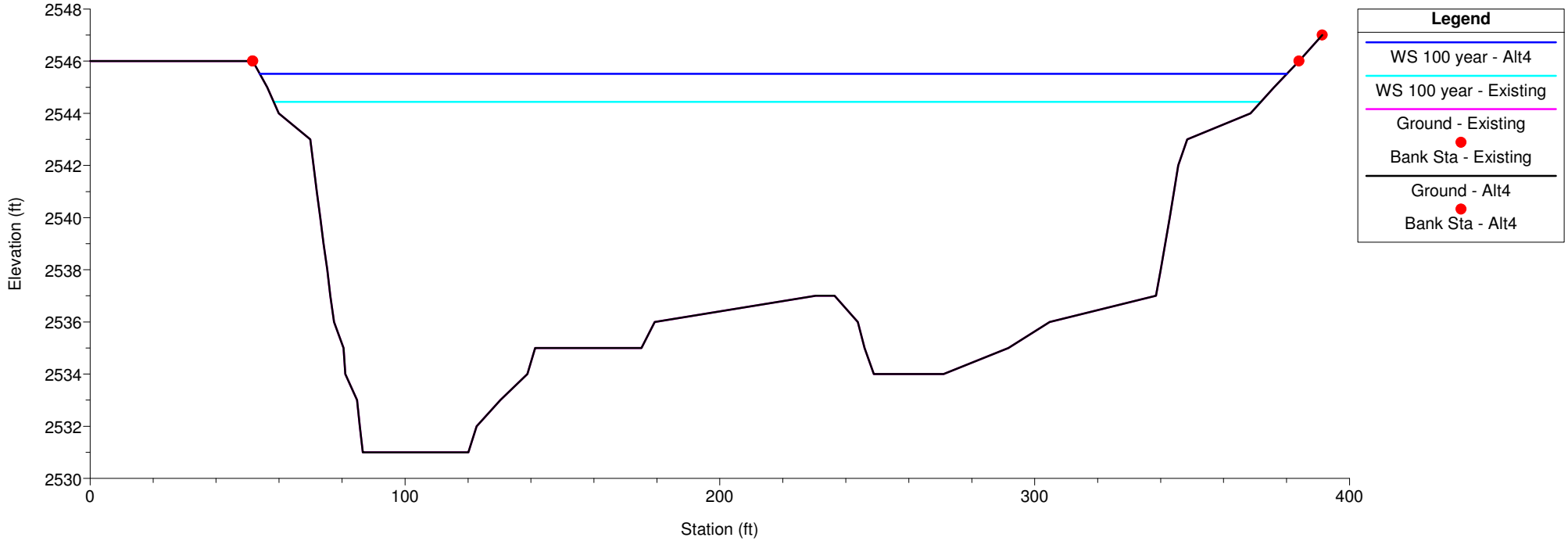
RS = 1600 Alternative 4 vs. Existing Conditions



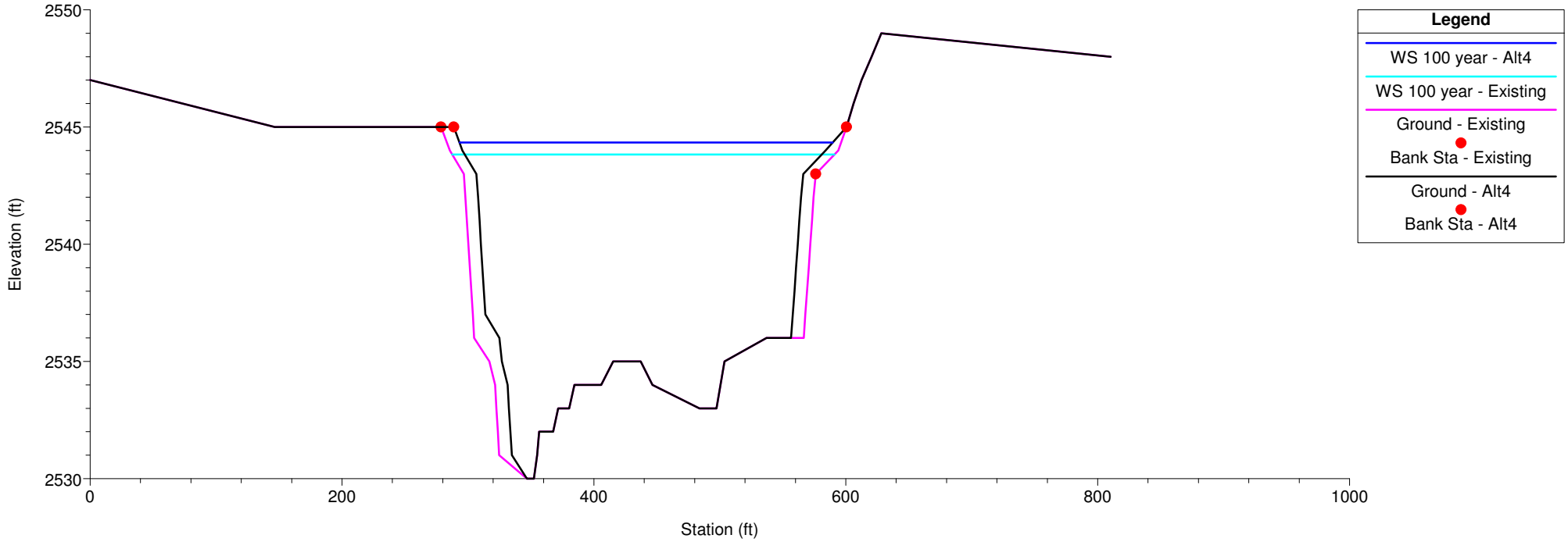
RS = 1500 Alternative 4 vs. Existing Conditions



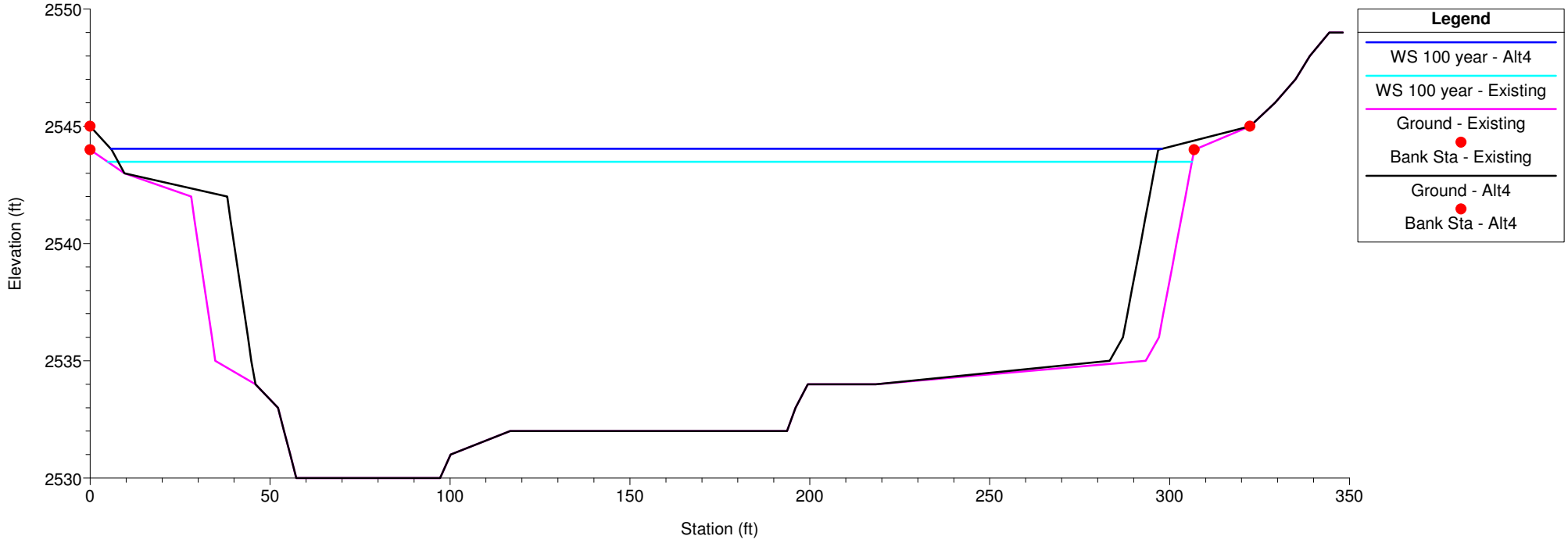
RS = 1450 Alternative 4 vs. Existing Conditions



RS = 1400 Alternative 4 vs. Existing Conditions

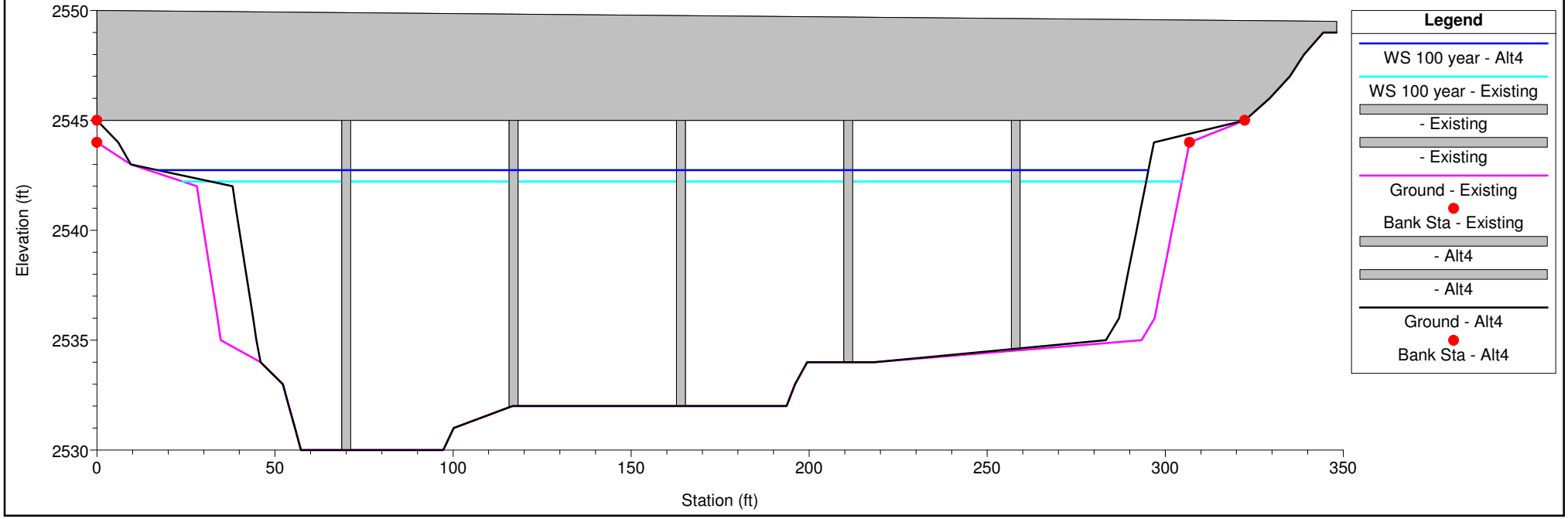


RS = 1350 Alternative 4 vs. Existing Conditions



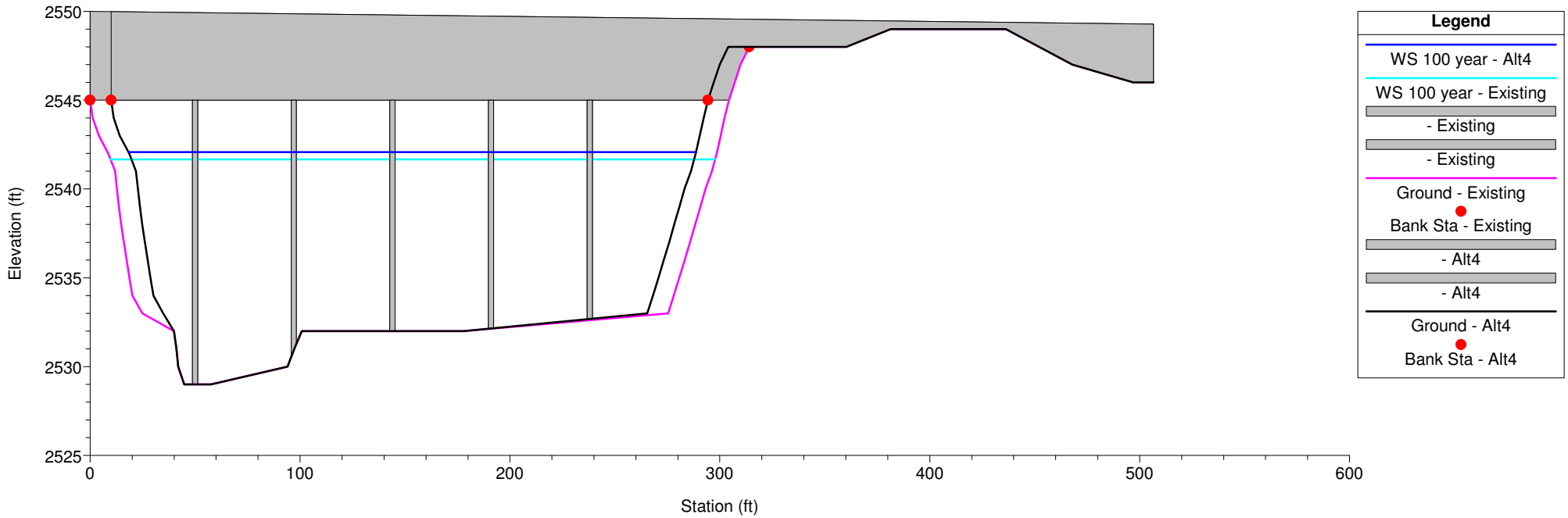
RS = 1325 BR

Alternative 4 vs. Existing Conditions

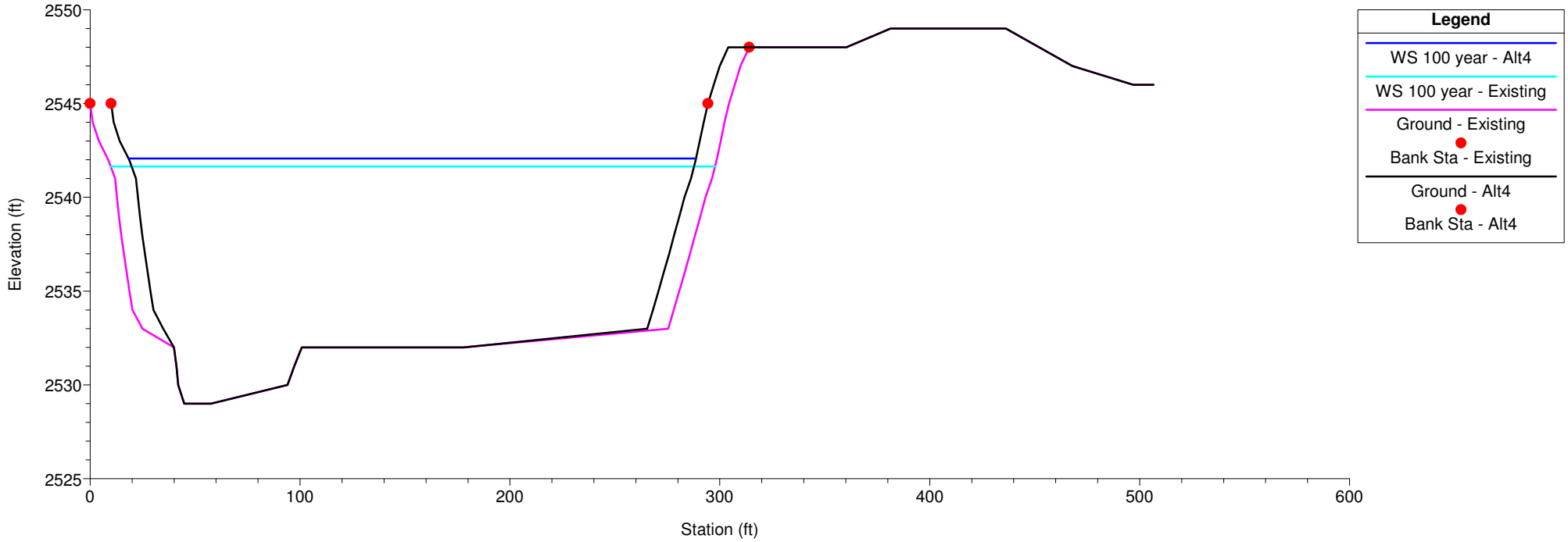


RS = 1325 BR

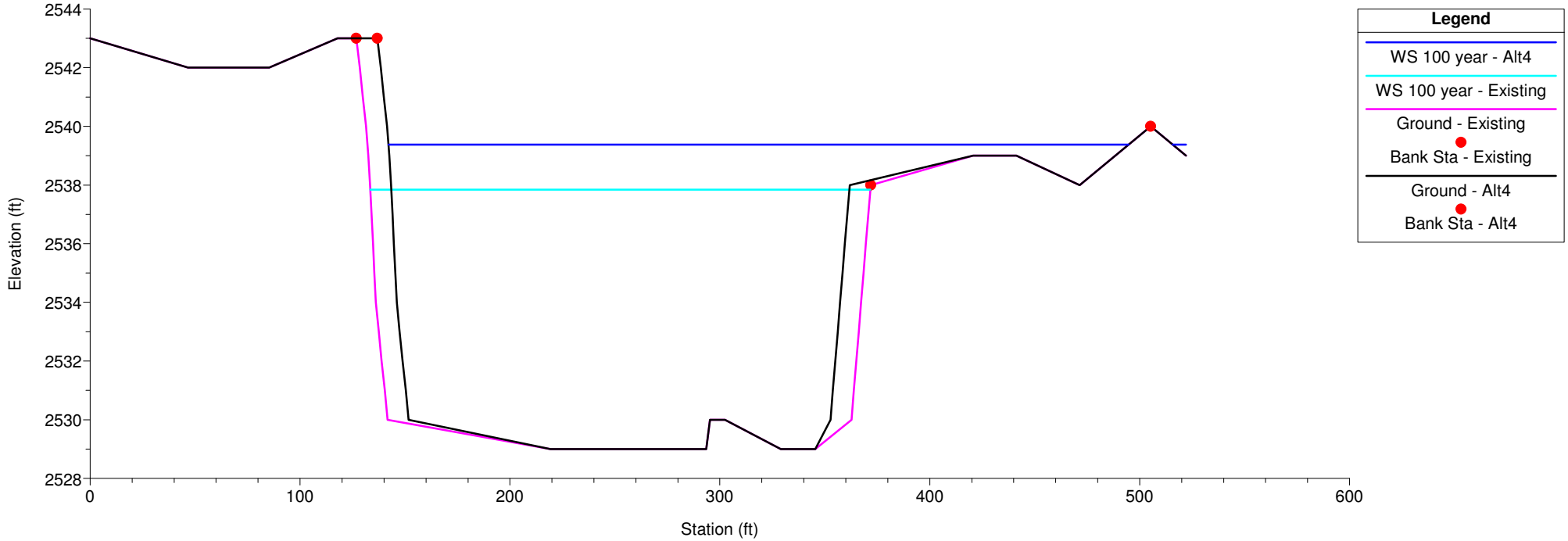
Alternative 4 vs. Existing Conditions



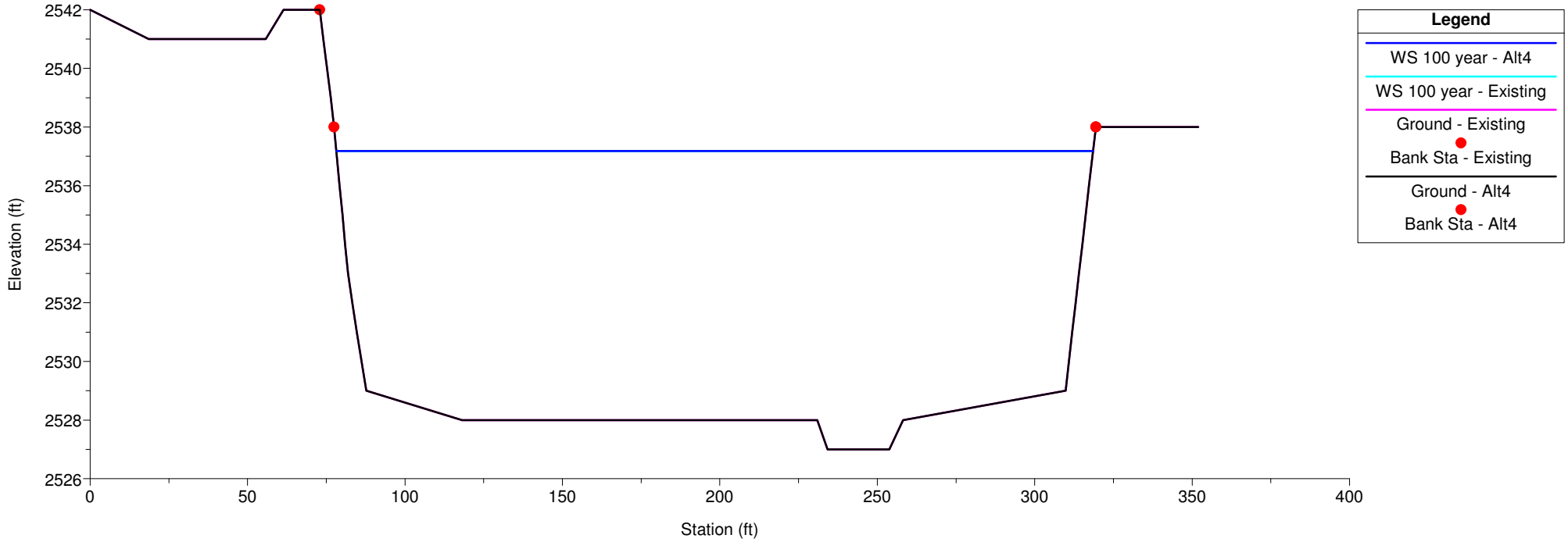
RS = 1300 Alternative 4 vs. Existing Conditions

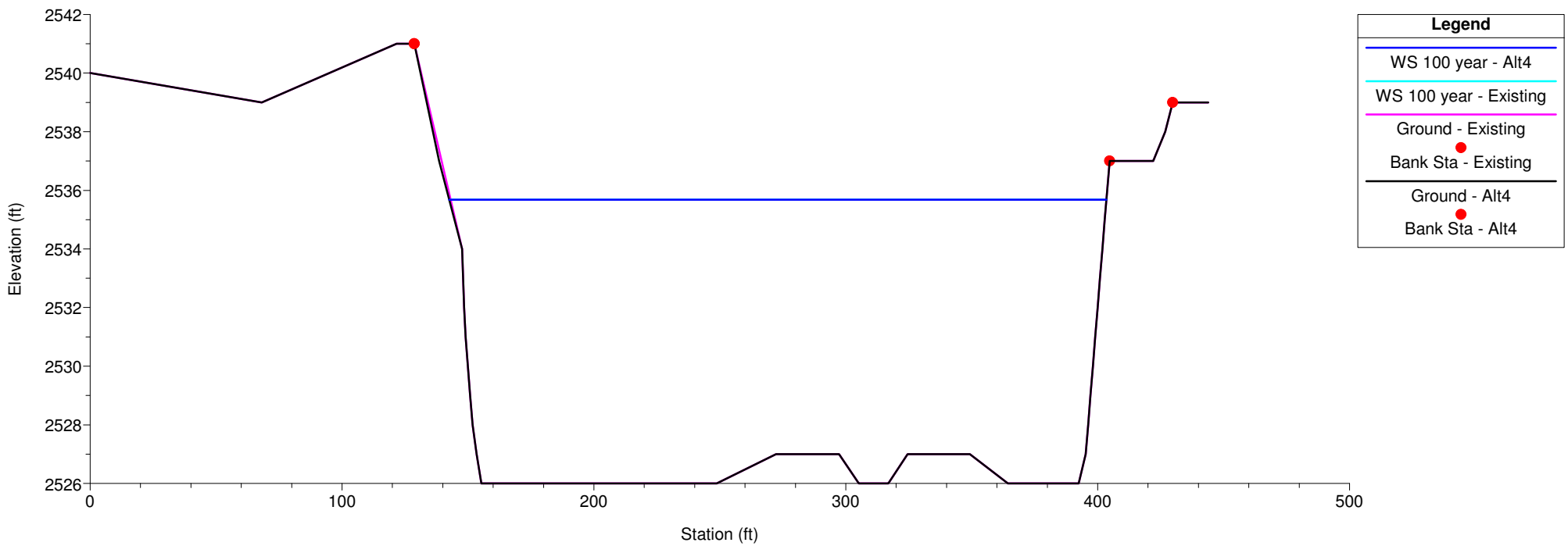


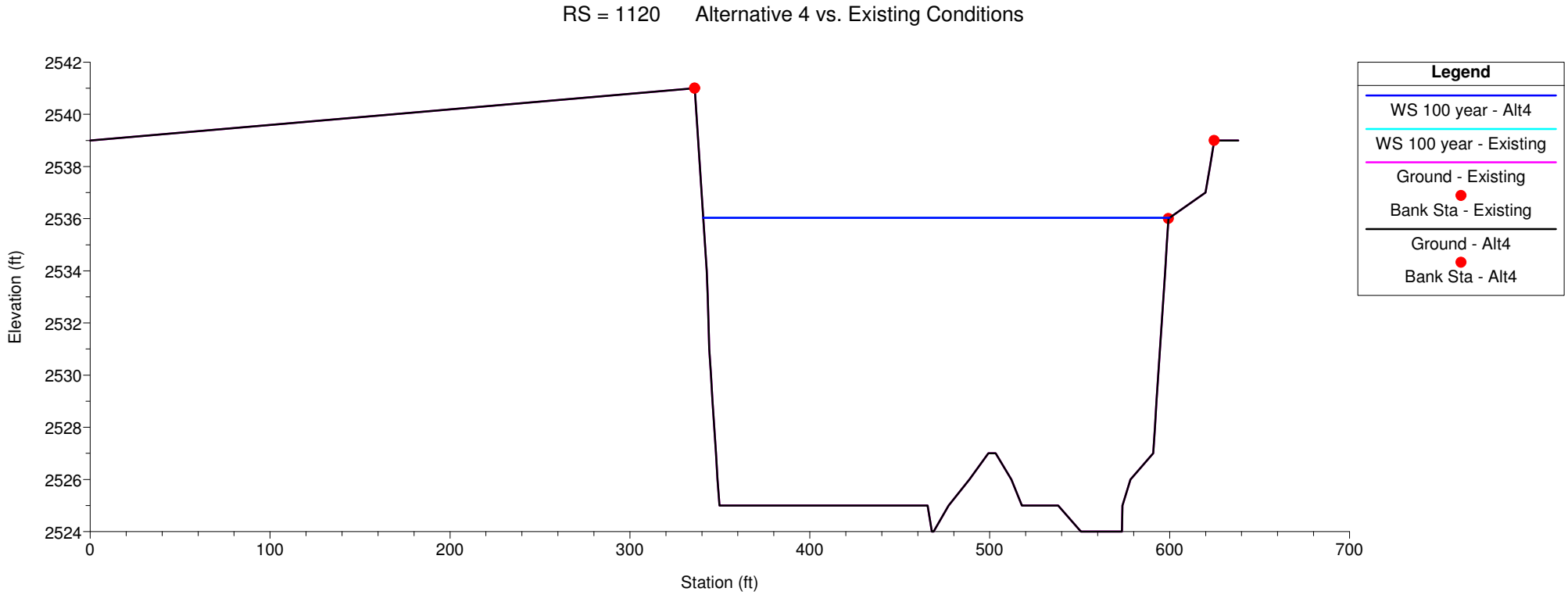
RS = 1230 Alternative 4 vs. Existing Conditions

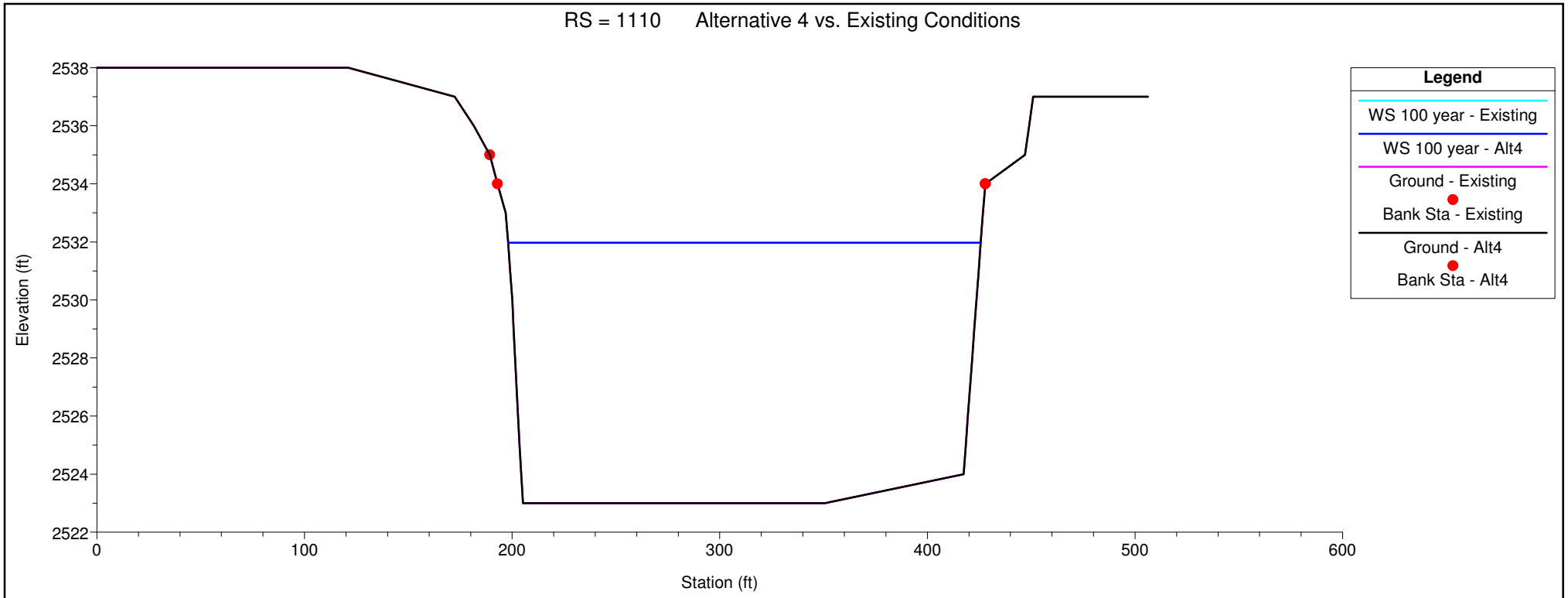


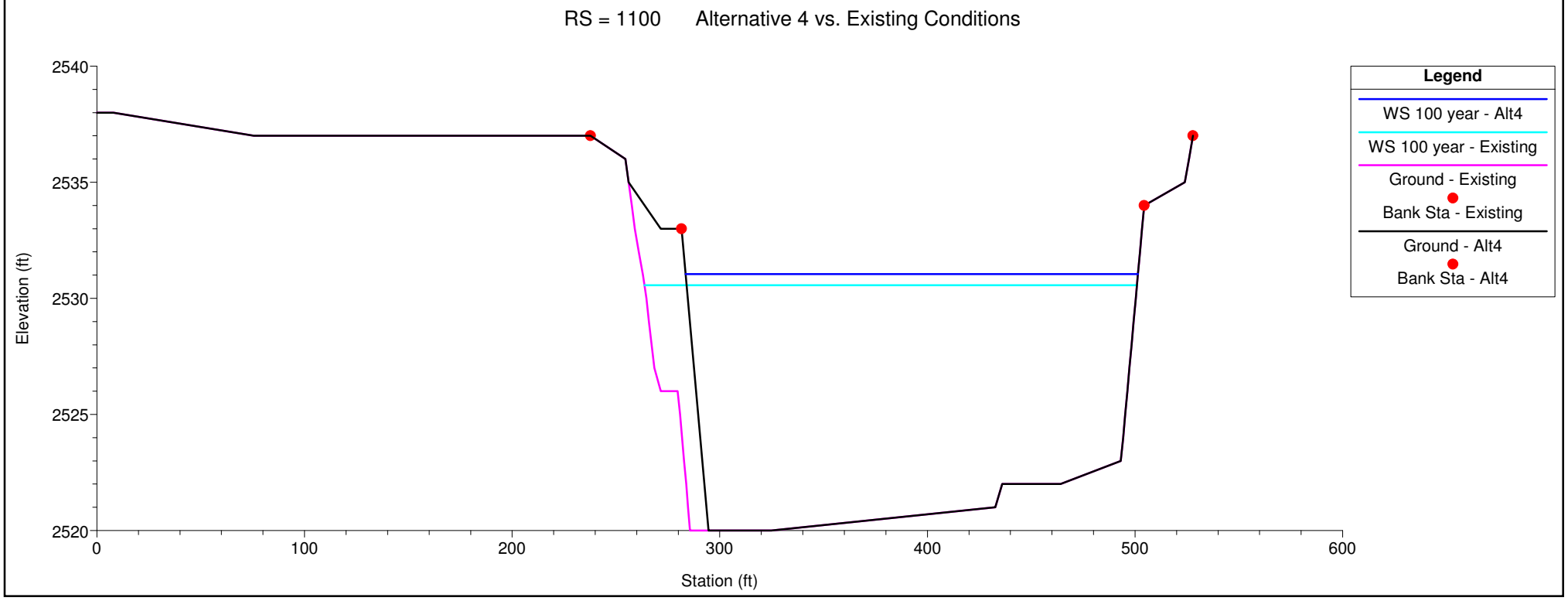
RS = 1220 Alternative 4 vs. Existing Conditions

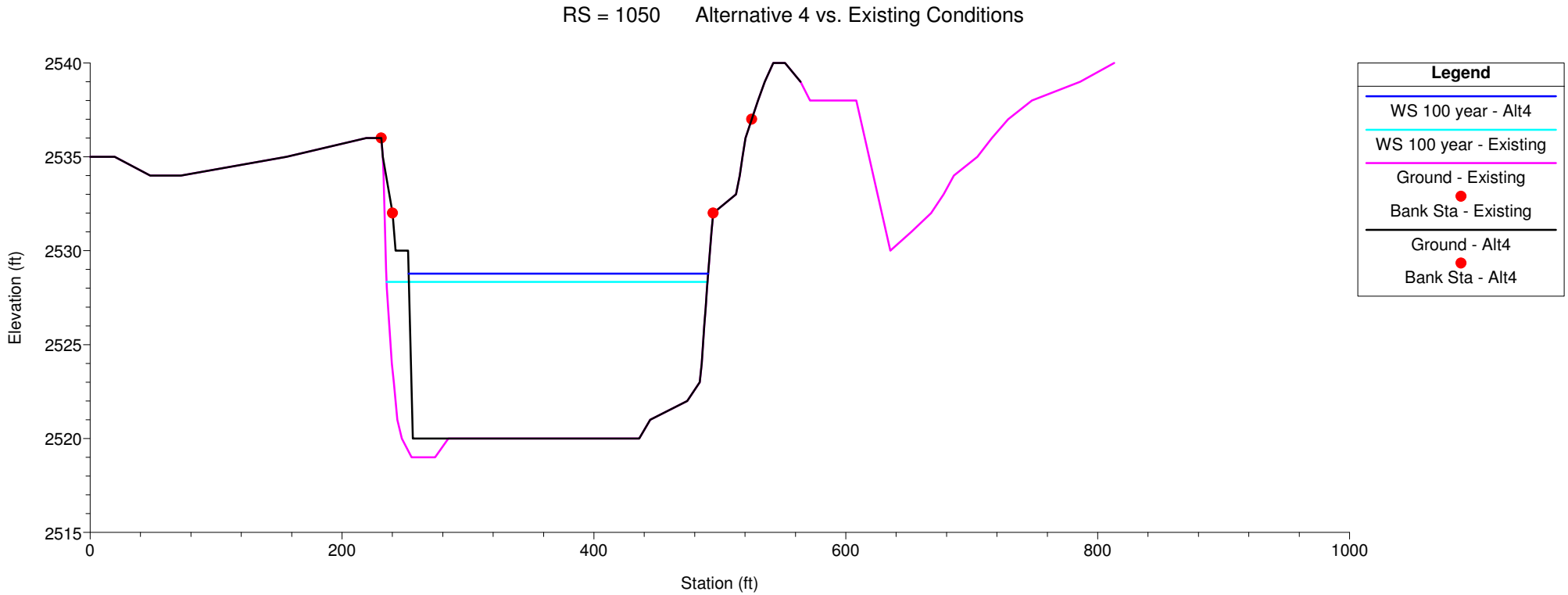


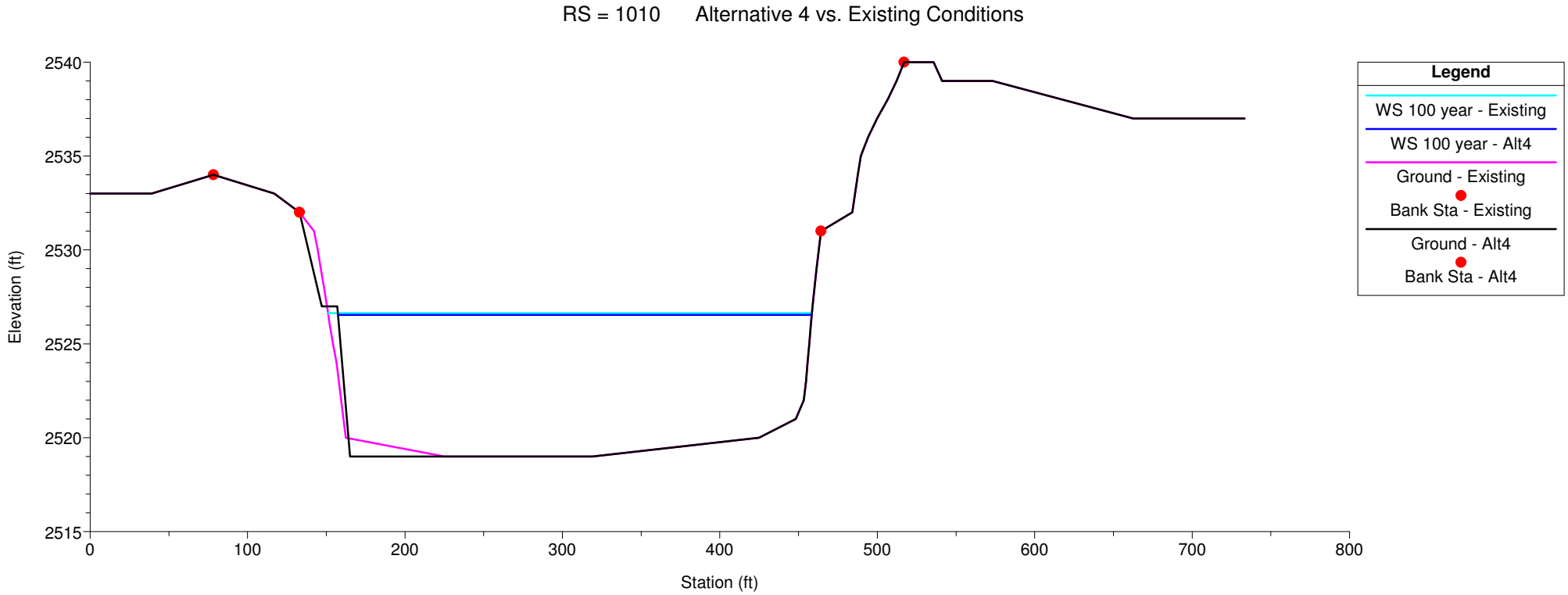

RS = 1200 Alternative 4 vs. Existing Conditions
Elevation (ft)
Station (ft)
2542
2540
2538
2536
2534
2532
2530
2528
2526
0
100
200
300
400
500
Legend
WS 100 year - Alt4
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt4
Bank Sta - Alt4

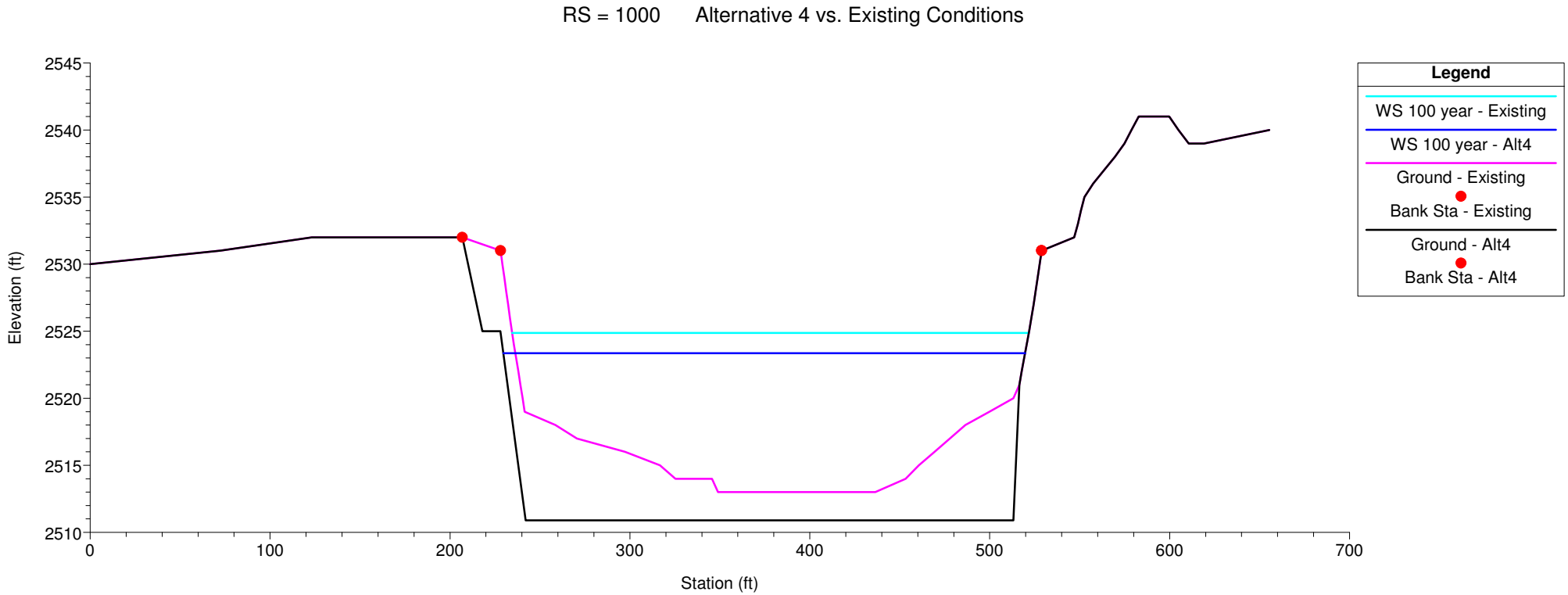

RS = 1120 Alternative 4 vs. Existing Conditions
Elevation (ft)
Station (ft)
2542
2540
2538
2536
2534
2532
2530
2528
2526
2524
0
100
200
300
400
500
600
700
Legend
WS 100 year - Alt4
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt4
Bank Sta - Alt4

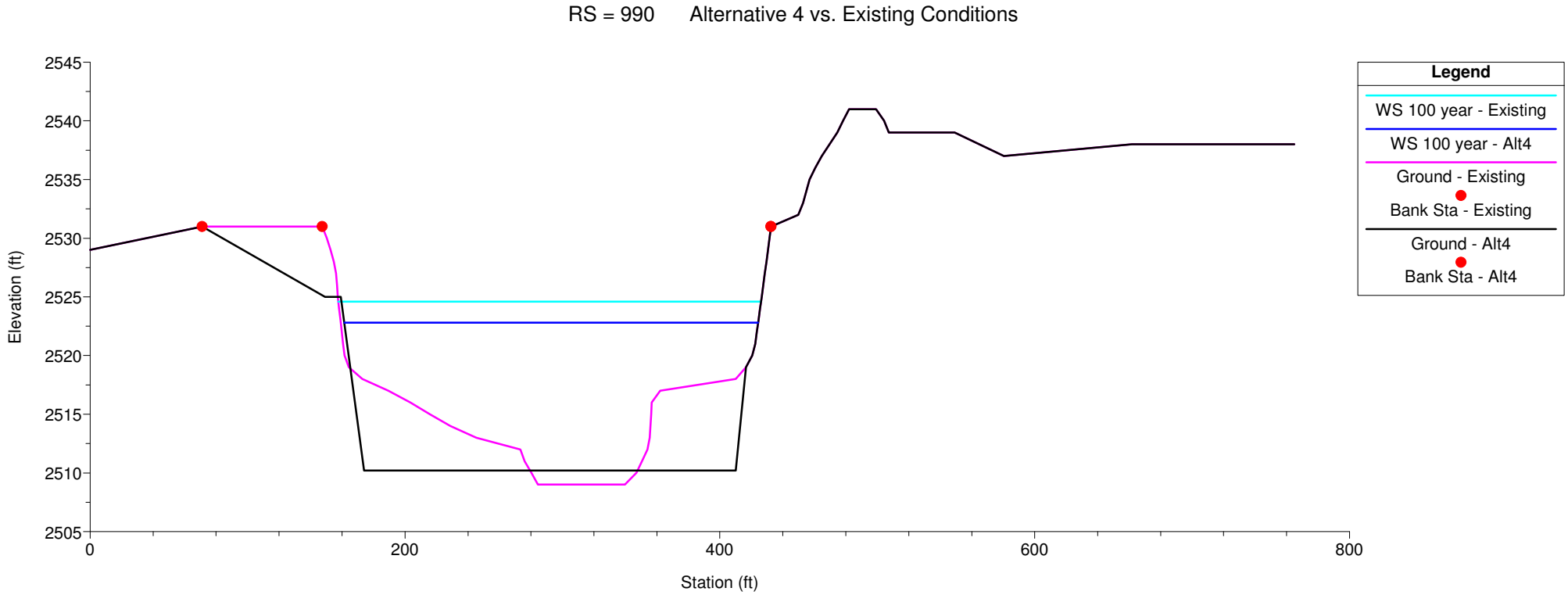

RS = 1110 Alternative 4 vs. Existing Conditions
Elevation (ft)
Station (ft)
2538
2536
2534
2532
2530
2528
2526
2524
2522
0
100
200
300
400
500
600
Legend
WS 100 year - Existing
WS 100 year - Alt4
Ground - Existing
Bank Sta - Existing
Ground - Alt4
Bank Sta - Alt4

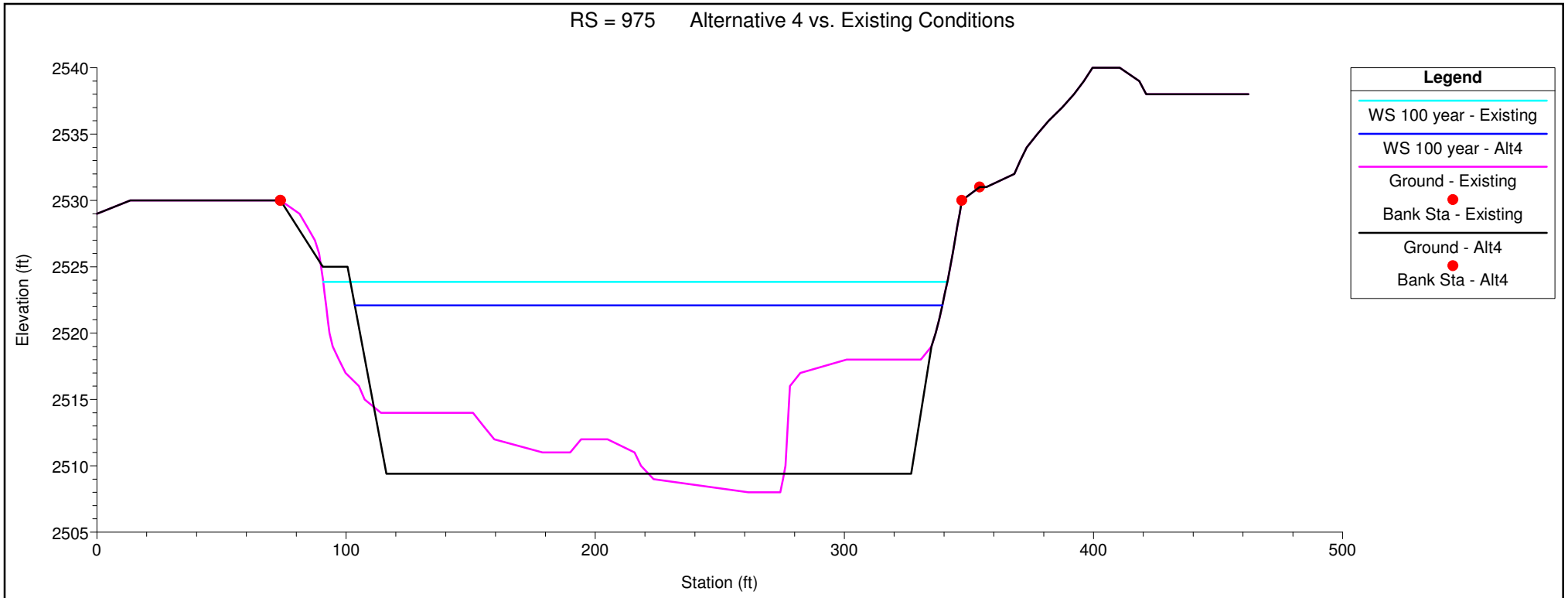

RS = 1100 Alternative 4 vs. Existing Conditions
Elevation (ft)
Station (ft)
2540
2535
2530
2525
2520
0
100
200
300
400
500
600
Legend
WS 100 year - Alt4
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt4
Bank Sta - Alt4

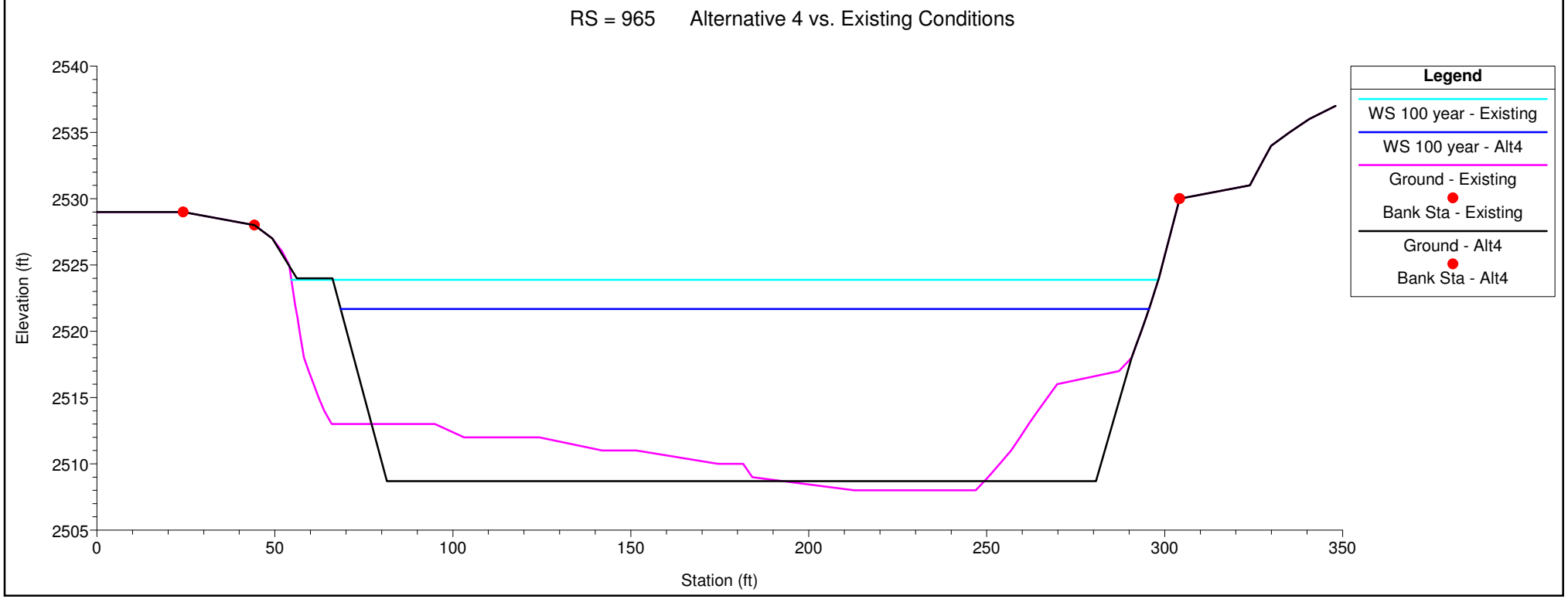

RS = 1050 Alternative 4 vs. Existing Conditions
Elevation (ft)
Station (ft)
2540
2535
2530
2525
2520
2515
0
200
400
600
800
1000
Legend
WS 100 year - Alt4
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt4
Bank Sta - Alt4

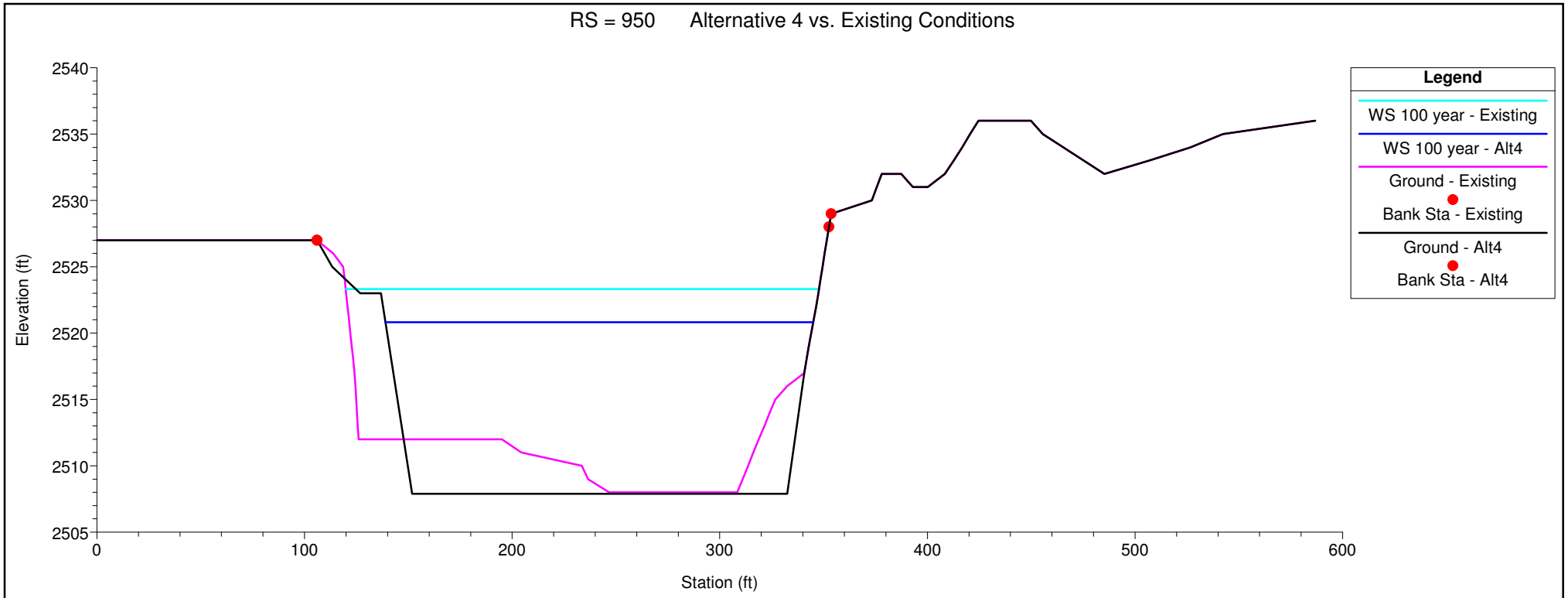

RS = 1010 Alternative 4 vs. Existing Conditions
Elevation (ft)
Station (ft)
2540
2535
2530
2525
2520
2515
0
100
200
300
400
500
600
700
800
Legend
WS 100 year - Existing
WS 100 year - Alt4
Ground - Existing
Bank Sta - Existing
Ground - Alt4
Bank Sta - Alt4

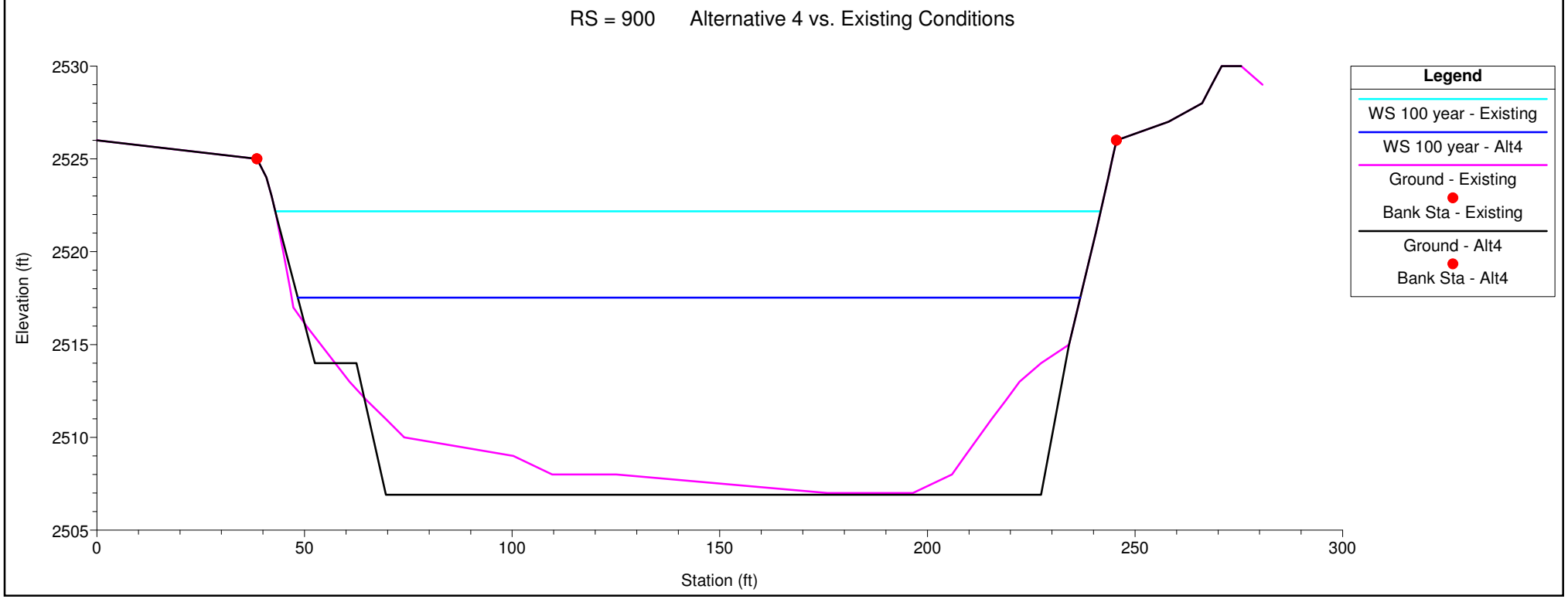

RS = 1000 Alternative 4 vs. Existing Conditions
Legend
WS 100 year - Existing
WS 100 year - Alt4
Ground - Existing
Bank Sta - Existing
Ground - Alt4
Bank Sta - Alt4
Elevation (ft)
Station (ft)
2545
2540
2535
2530
2525
2520
2515
2510
0
100
200
300
400
500
600
700

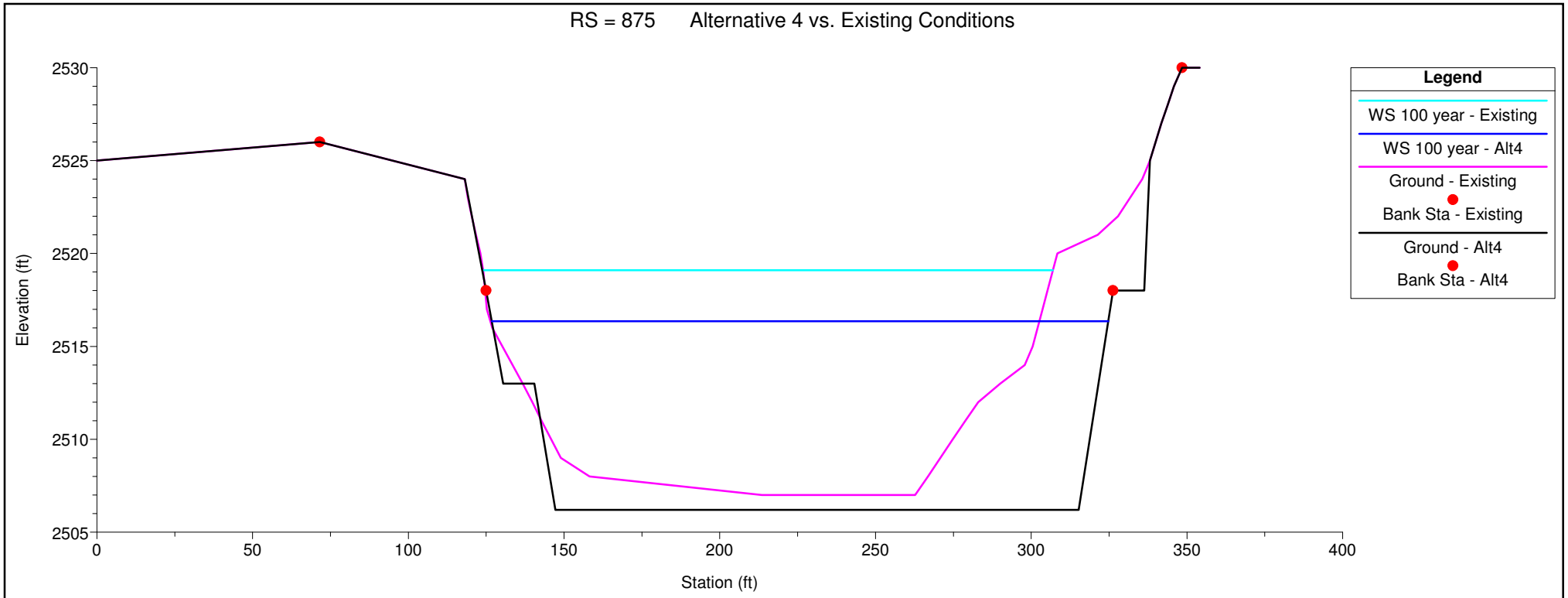

RS = 990 Alternative 4 vs. Existing Conditions
Legend
WS 100 year - Existing
WS 100 year - Alt4
Ground - Existing
Bank Sta - Existing
Ground - Alt4
Bank Sta - Alt4
Elevation (ft)
Station (ft)
2545
2540
2535
2530
2525
2520
2515
2510
2505
0
200
400
600
800

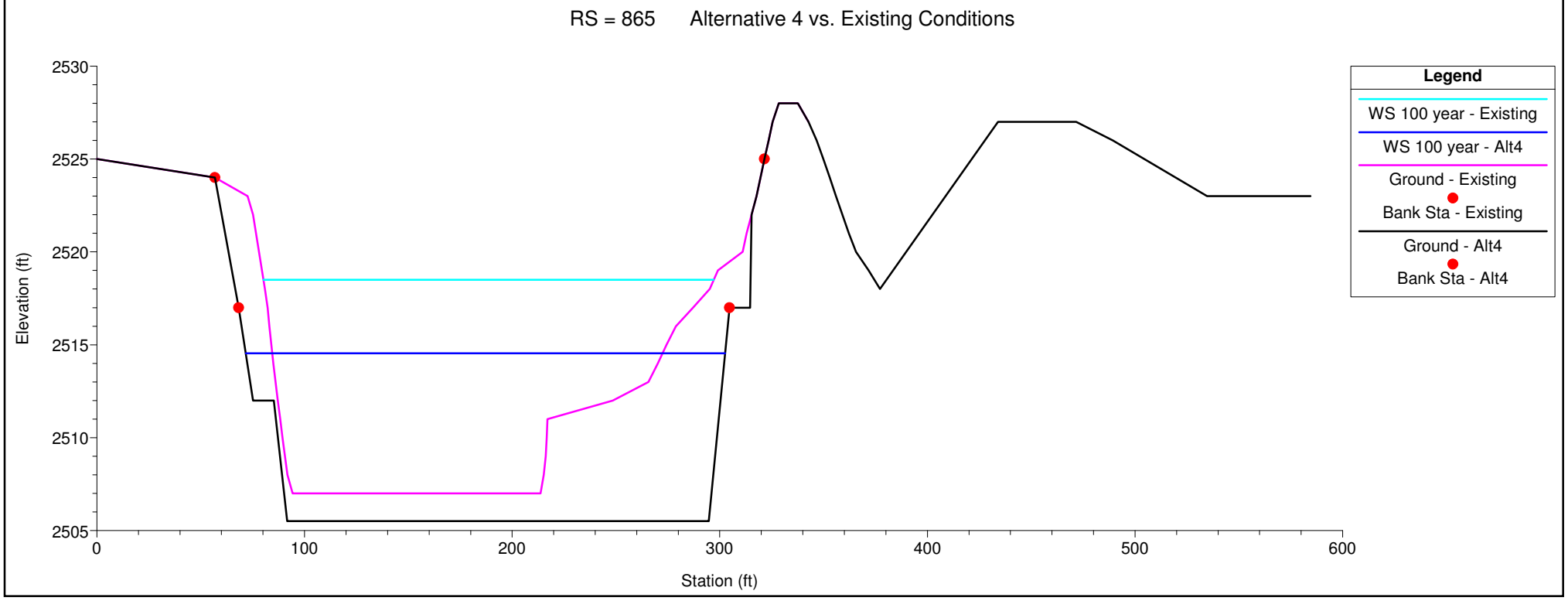

RS = 975 Alternative 4 vs. Existing Conditions
Elevation (ft)
Station (ft)
2540
2535
2530
2525
2520
2515
2510
2505
0
100
200
300
400
500
Legend
WS 100 year - Existing
WS 100 year - Alt4
Ground - Existing
Bank Sta - Existing
Ground - Alt4
Bank Sta - Alt4


RS = 965 Alternative 4 vs. Existing Conditions
Elevation (ft)
Station (ft)
2540
2535
2530
2525
2520
2515
2510
2505
0
50
100
150
200
250
300
350
Legend
WS 100 year - Existing
WS 100 year - Alt4
Ground - Existing
Bank Sta - Existing
Ground - Alt4
Bank Sta - Alt4

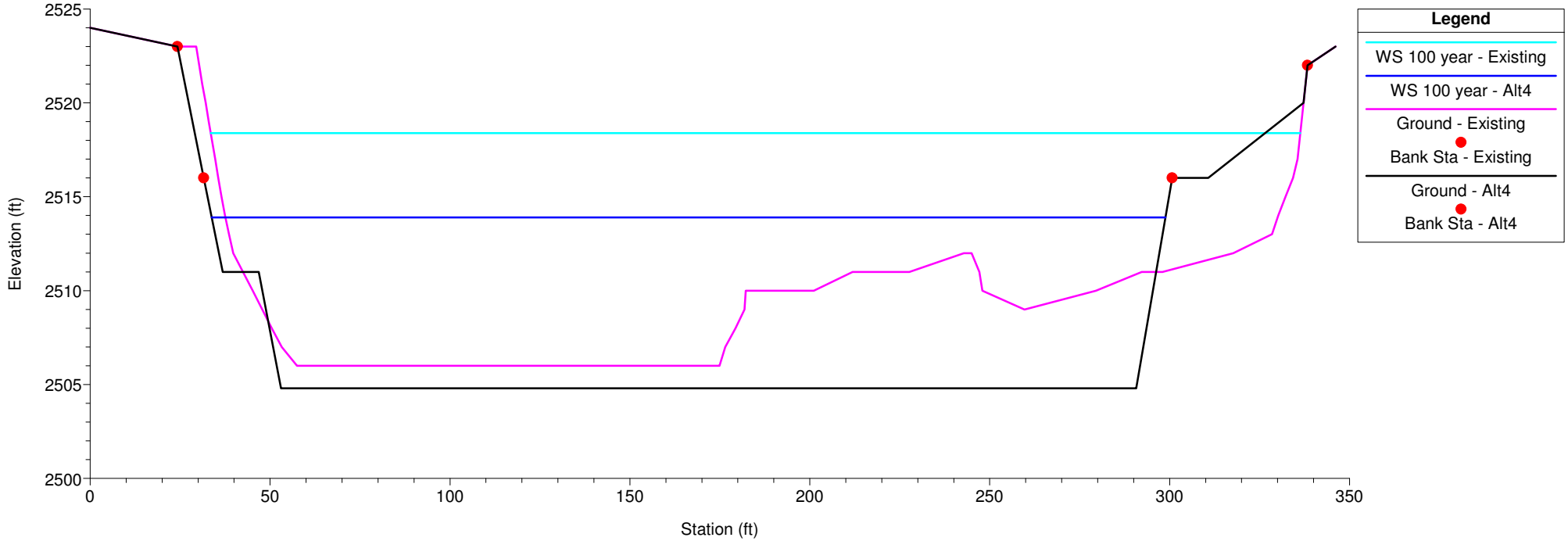

RS = 950 Alternative 4 vs. Existing Conditions
Elevation (ft)
Station (ft)
2540
2535
2530
2525
2520
2515
2510
2505
0
100
200
300
400
500
600
Legend
WS 100 year - Existing
WS 100 year - Alt4
Ground - Existing
Bank Sta - Existing
Ground - Alt4
Bank Sta - Alt4


RS = 900 Alternative 4 vs. Existing Conditions
Elevation (ft)
Station (ft)
2530
2525
2520
2515
2510
2505
0
50
100
150
200
250
300
Legend
WS 100 year - Existing
WS 100 year - Alt4
Ground - Existing
Bank Sta - Existing
Ground - Alt4
Bank Sta - Alt4

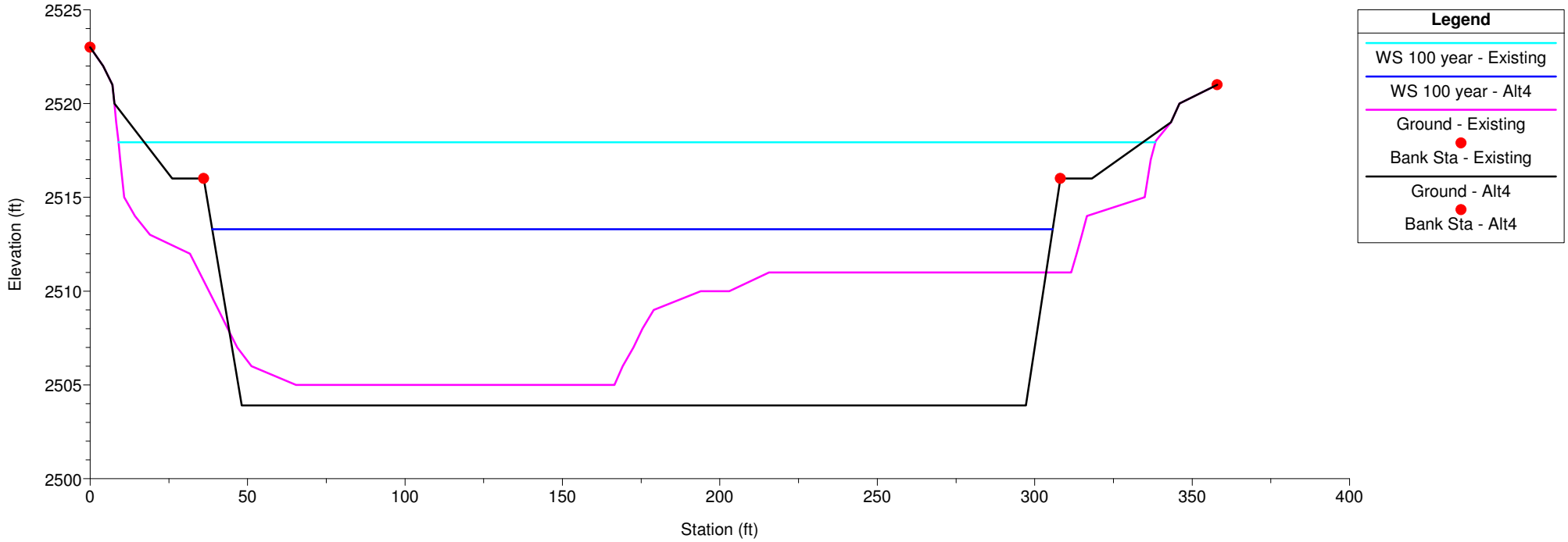

RS = 875 Alternative 4 vs. Existing Conditions
Elevation (ft)
Station (ft)
2530
2525
2520
2515
2510
2505
0
50
100
150
200
250
300
350
400
Legend
WS 100 year - Existing
WS 100 year - Alt4
Ground - Existing
Bank Sta - Existing
Ground - Alt4
Bank Sta - Alt4

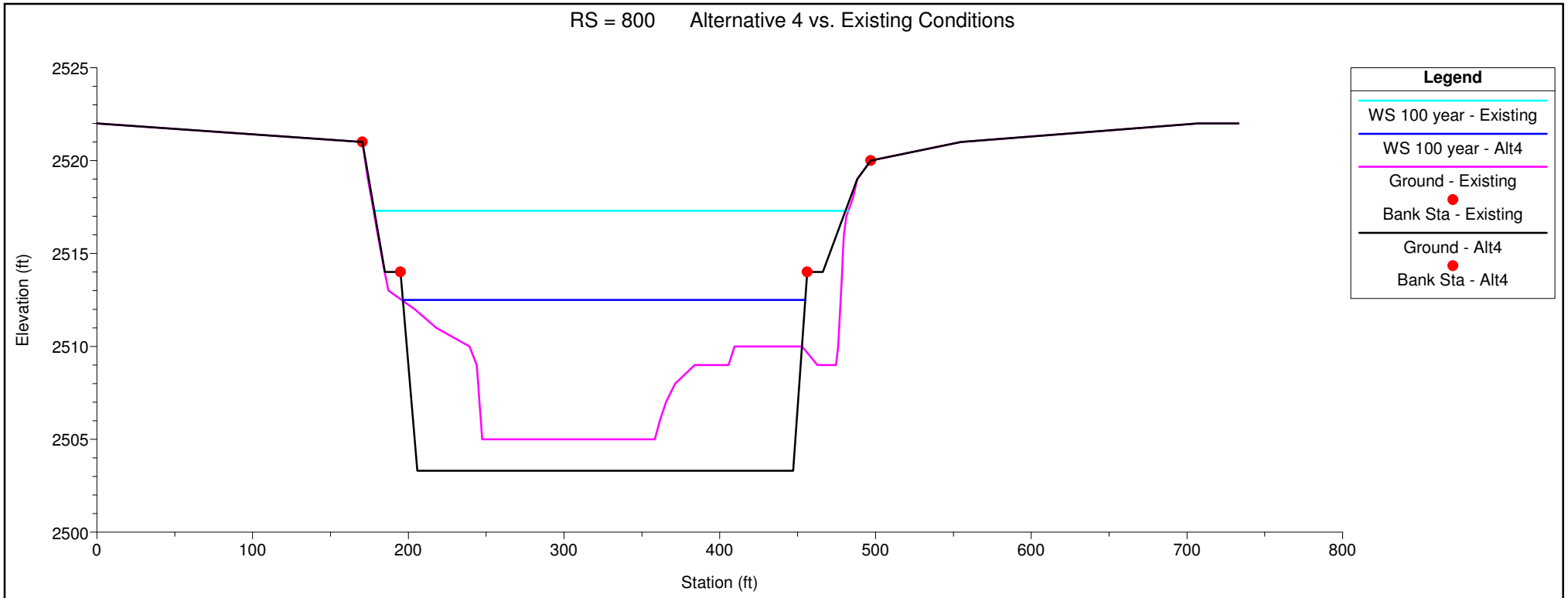

RS = 865 Alternative 4 vs. Existing Conditions
Elevation (ft)
Station (ft)
2530
2525
2520
2515
2510
2505
0
100
200
300
400
500
600
Legend
WS 100 year - Existing
WS 100 year - Alt4
Ground - Existing
Bank Sta - Existing
Ground - Alt4
Bank Sta - Alt4

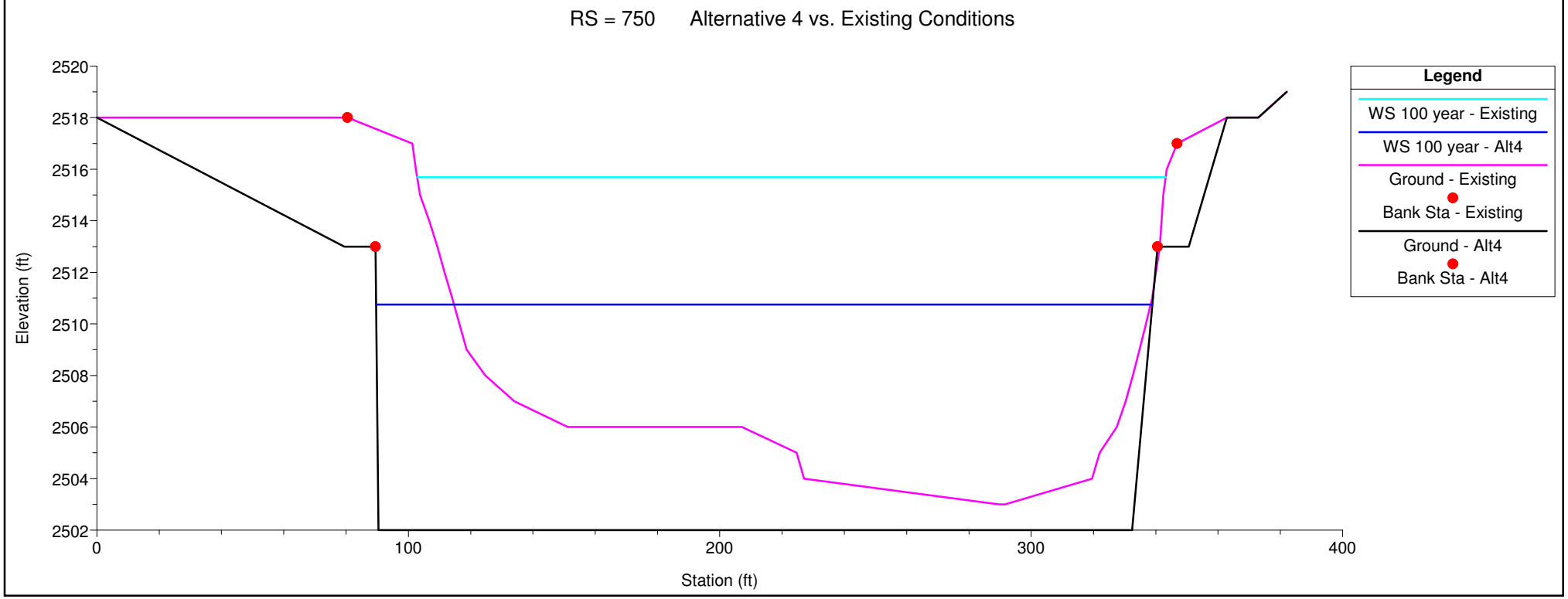
RS = 850 Alternative 4 vs. Existing Conditions



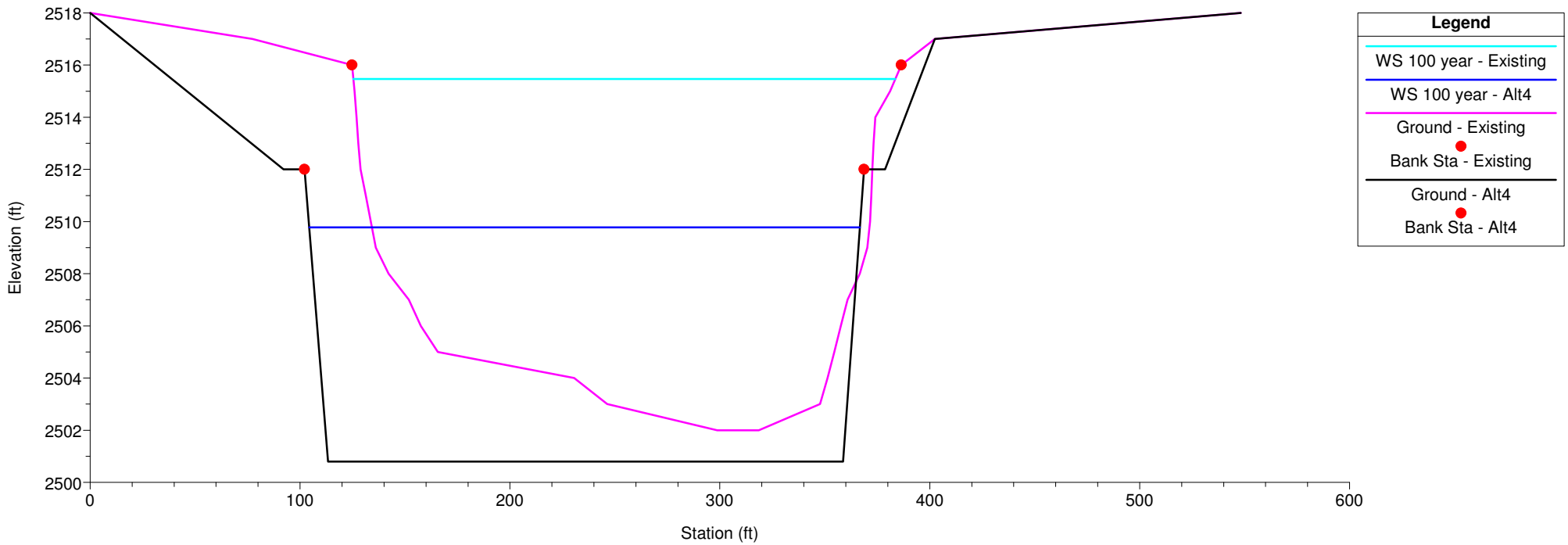
RS = 825 Alternative 4 vs. Existing Conditions



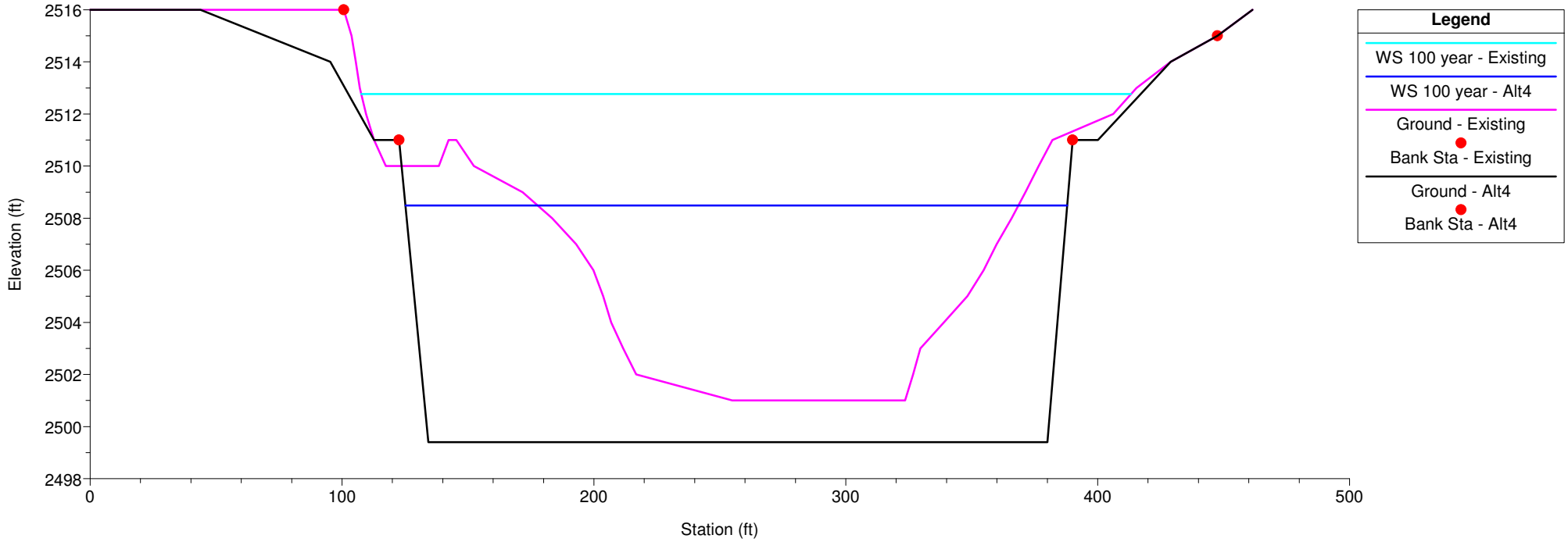

RS = 800 Alternative 4 vs. Existing Conditions
Elevation (ft)
Station (ft)
2525
2520
2515
2510
2505
2500
0
100
200
300
400
500
600
700
800
Legend
WS 100 year - Existing
WS 100 year - Alt4
Ground - Existing
Bank Sta - Existing
Ground - Alt4
Bank Sta - Alt4


RS = 750 Alternative 4 vs. Existing Conditions
Elevation (ft)
Station (ft)
2520
2518
2516
2514
2512
2510
2508
2506
2504
2502
0
100
200
300
400
Legend
WS 100 year - Existing
WS 100 year - Alt4
Ground - Existing
Bank Sta - Existing
Ground - Alt4
Bank Sta - Alt4

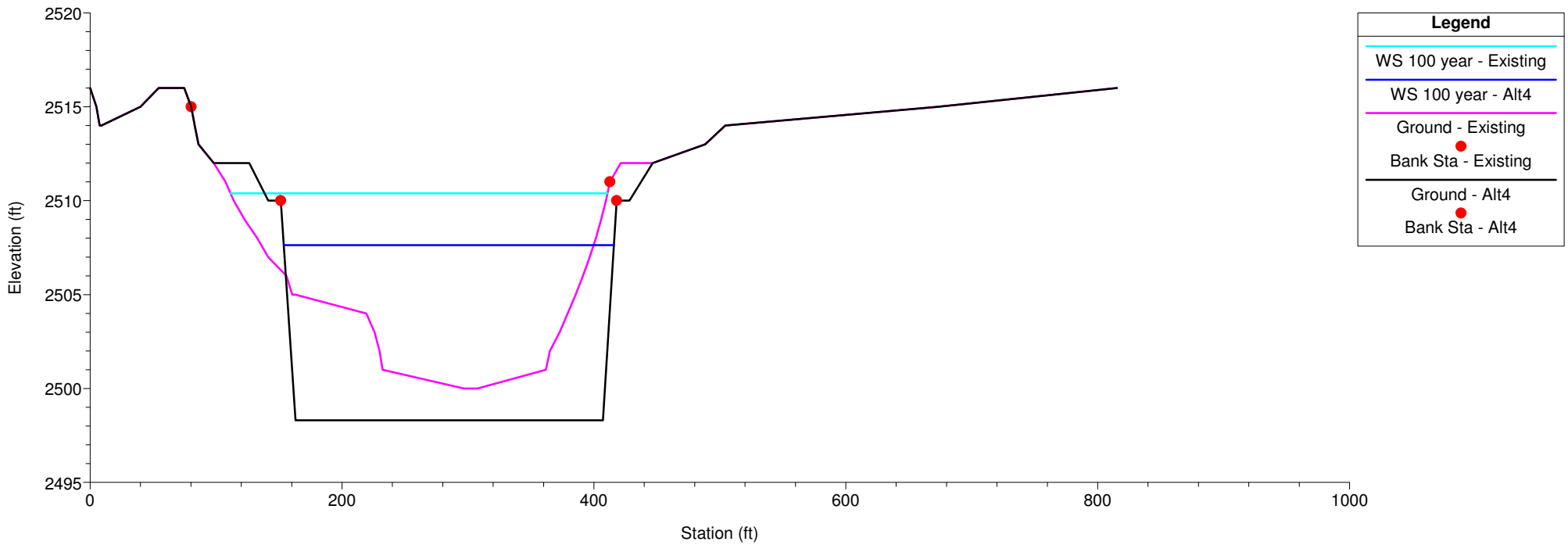
RS = 700 Alternative 4 vs. Existing Conditions



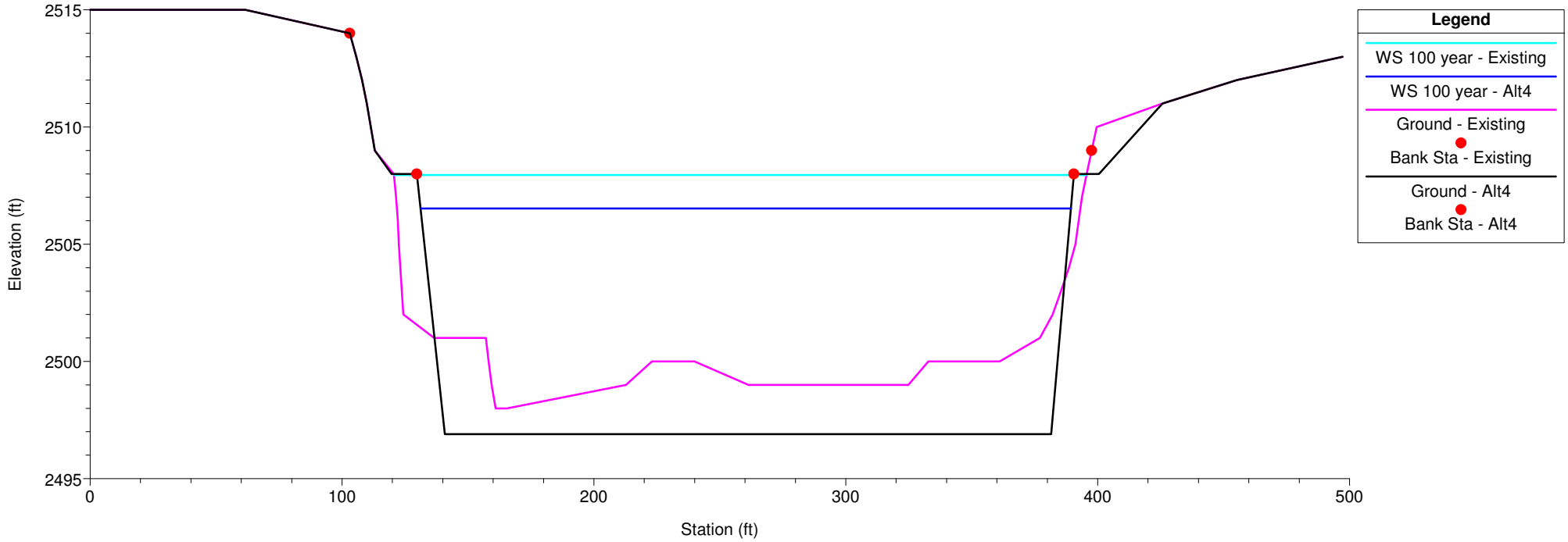
RS = 650 Alternative 4 vs. Existing Conditions

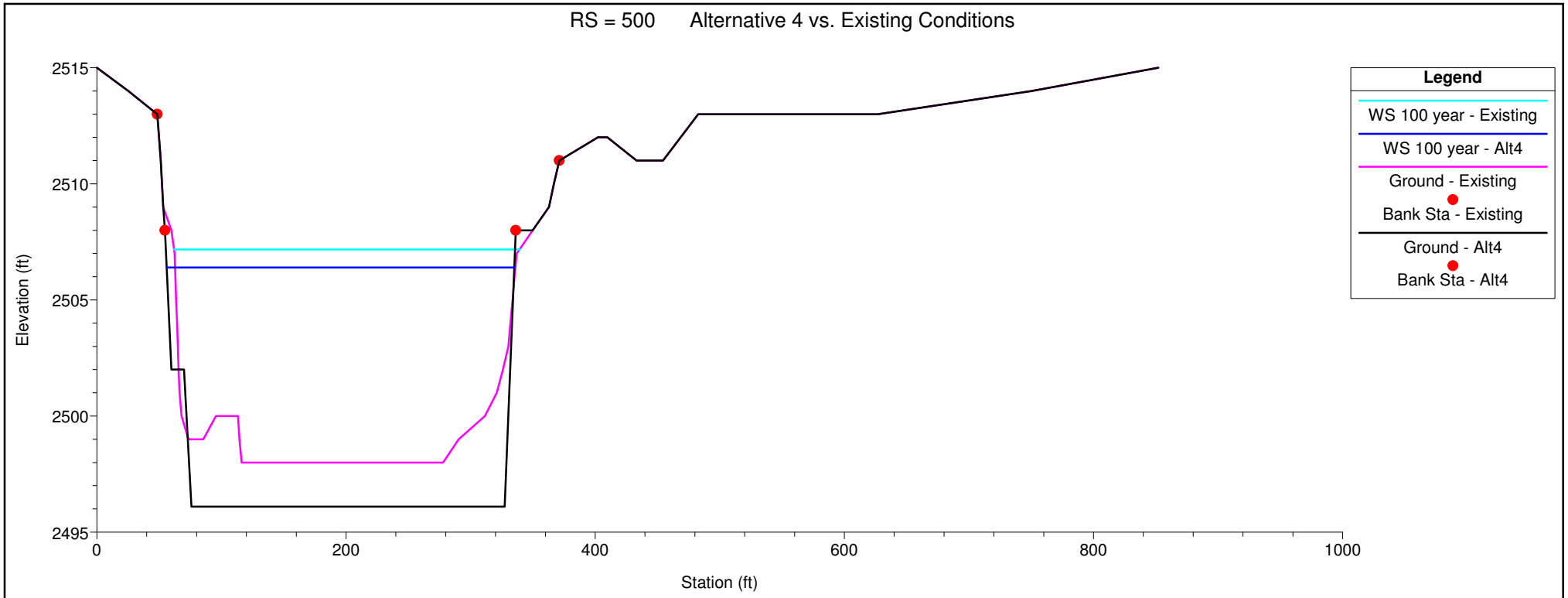


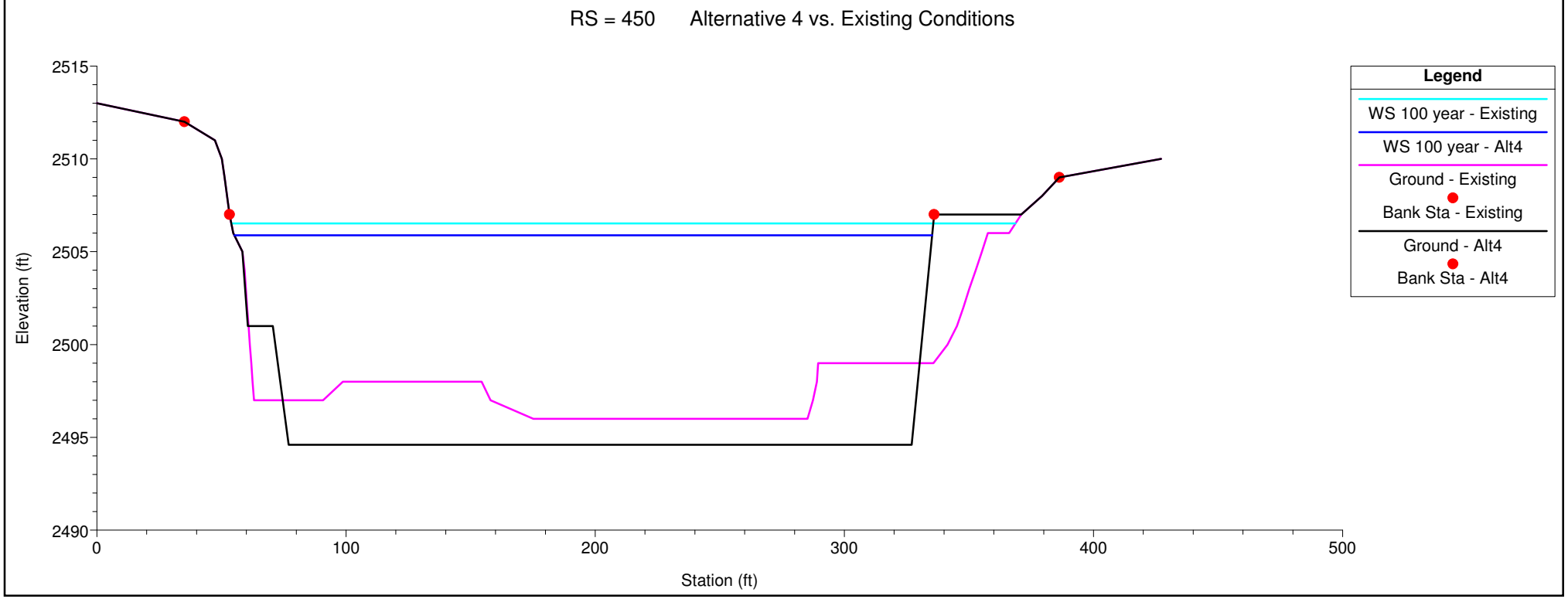
RS = 600 Alternative 4 vs. Existing Conditions

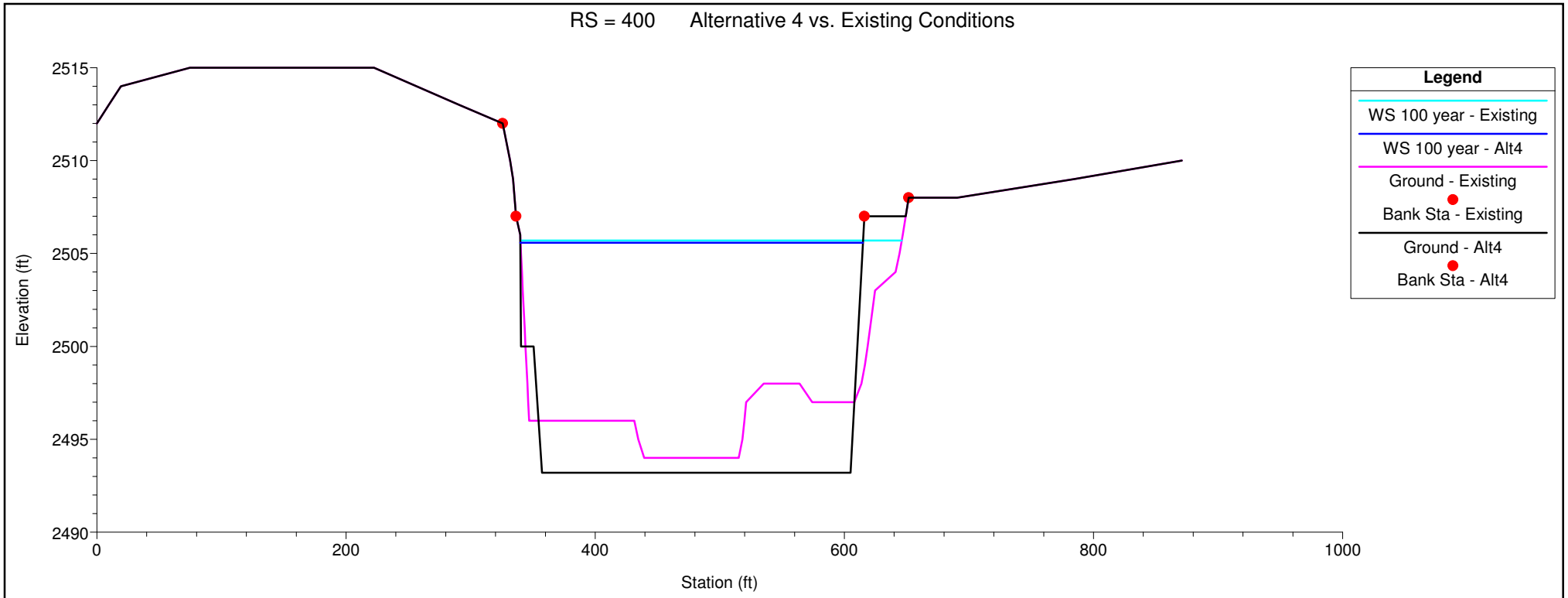


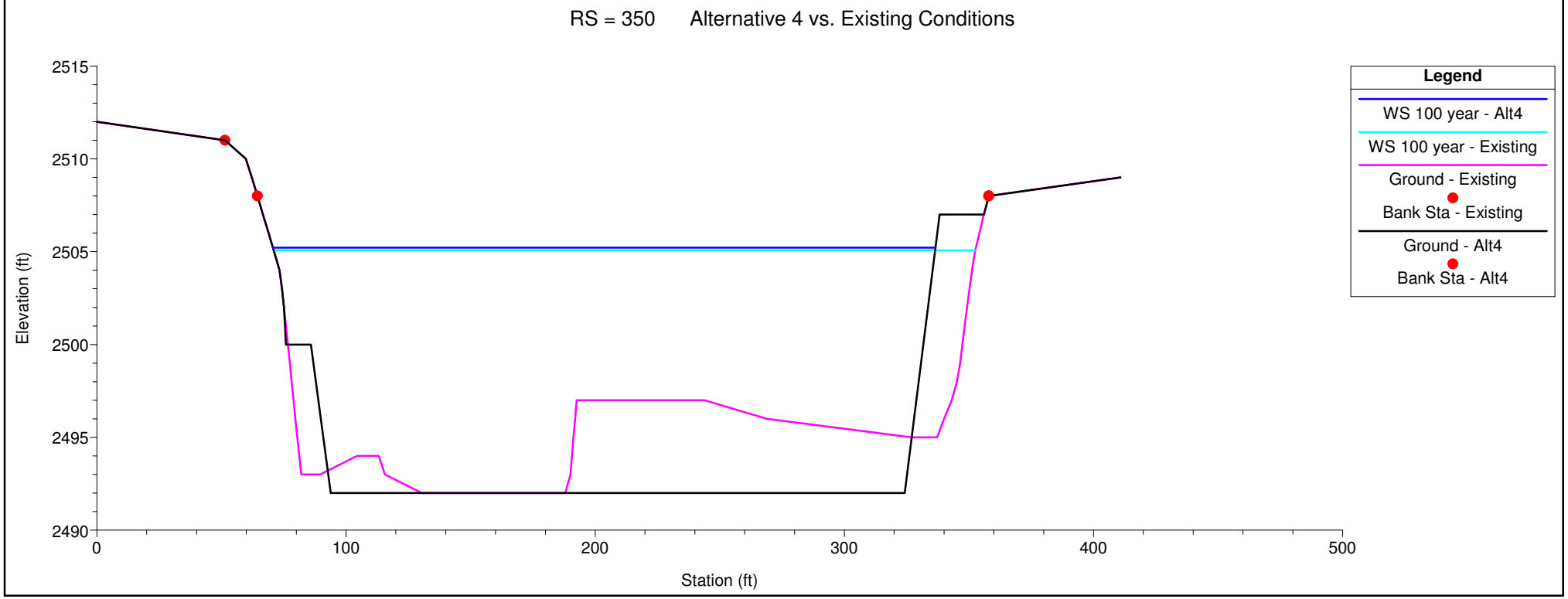
RS = 550 Alternative 4 vs. Existing Conditions

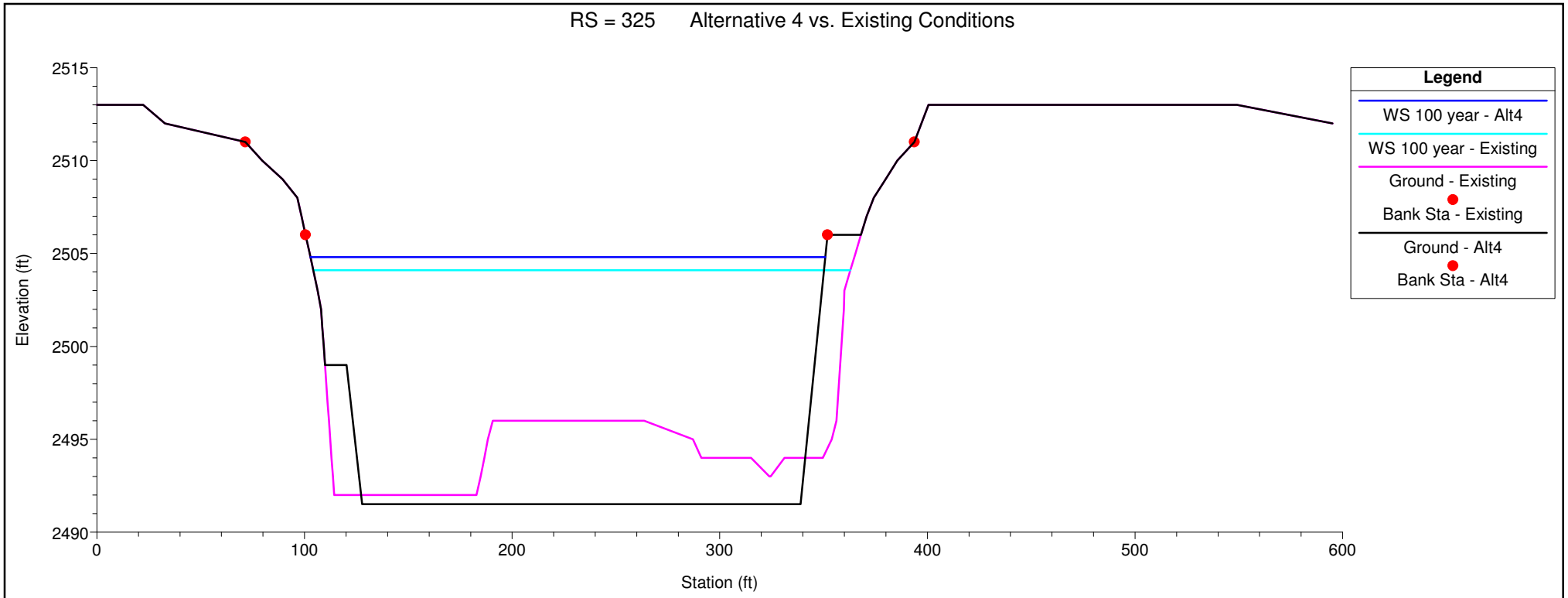


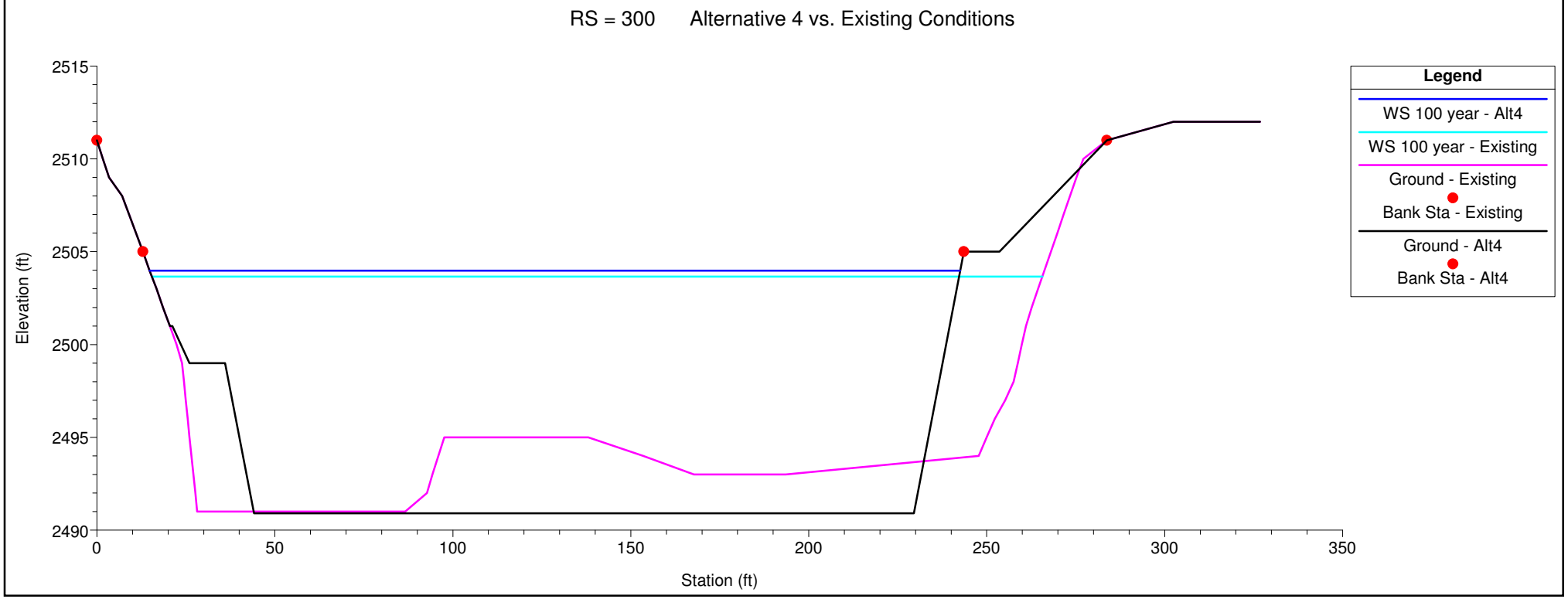

RS = 500 Alternative 4 vs. Existing Conditions
Elevation (ft)
2515
2510
2505
2500
2495
0
200
400
600
800
1000
Station (ft)
Legend
WS 100 year - Existing
WS 100 year - Alt4
Ground - Existing
Bank Sta - Existing
Ground - Alt4
Bank Sta - Alt4


RS = 450 Alternative 4 vs. Existing Conditions
Elevation (ft)
2515
2510
2505
2500
2495
2490
0
100
200
300
400
500
Station (ft)
Legend
WS 100 year - Existing
WS 100 year - Alt4
Ground - Existing
Bank Sta - Existing
Ground - Alt4
Bank Sta - Alt4


RS = 400 Alternative 4 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
2490
0
200
400
600
800
1000
Legend
WS 100 year - Existing
WS 100 year - Alt4
Ground - Existing
Bank Sta - Existing
Ground - Alt4
Bank Sta - Alt4

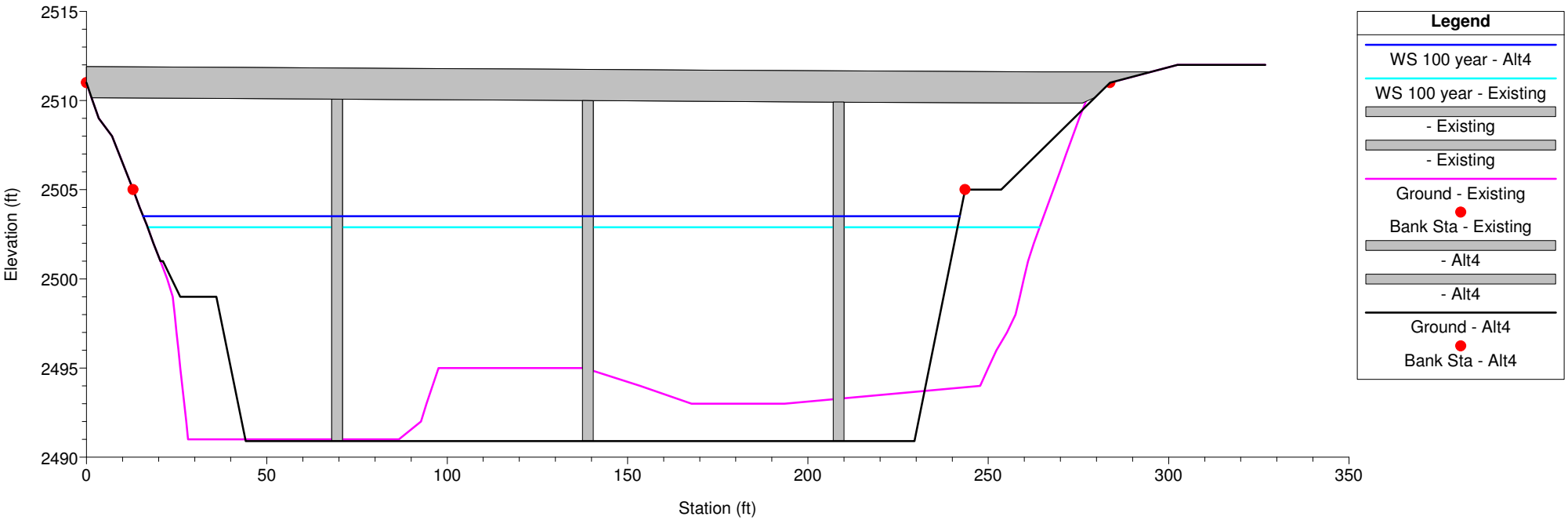

RS = 350 Alternative 4 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
2490
0
100
200
300
400
500
Legend
WS 100 year - Alt4
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt4
Bank Sta - Alt4


RS = 325 Alternative 4 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
2490
0
100
200
300
400
500
600
Legend
WS 100 year - Alt4
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt4
Bank Sta - Alt4


RS = 300 Alternative 4 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
2490
0
50
100
150
200
250
300
350
Legend
WS 100 year - Alt4
WS 100 year - Existing
Ground - Existing
Bank Sta - Existing
Ground - Alt4
Bank Sta - Alt4

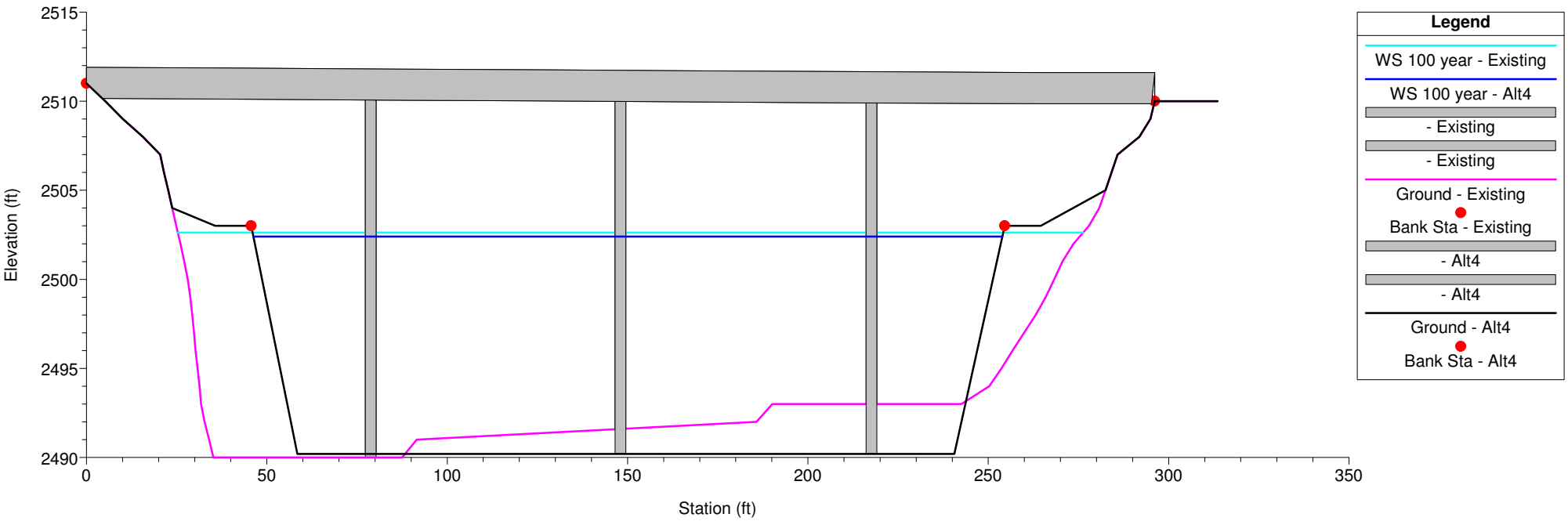
RS = 295 BR

Alternative 4 vs. Existing Conditions

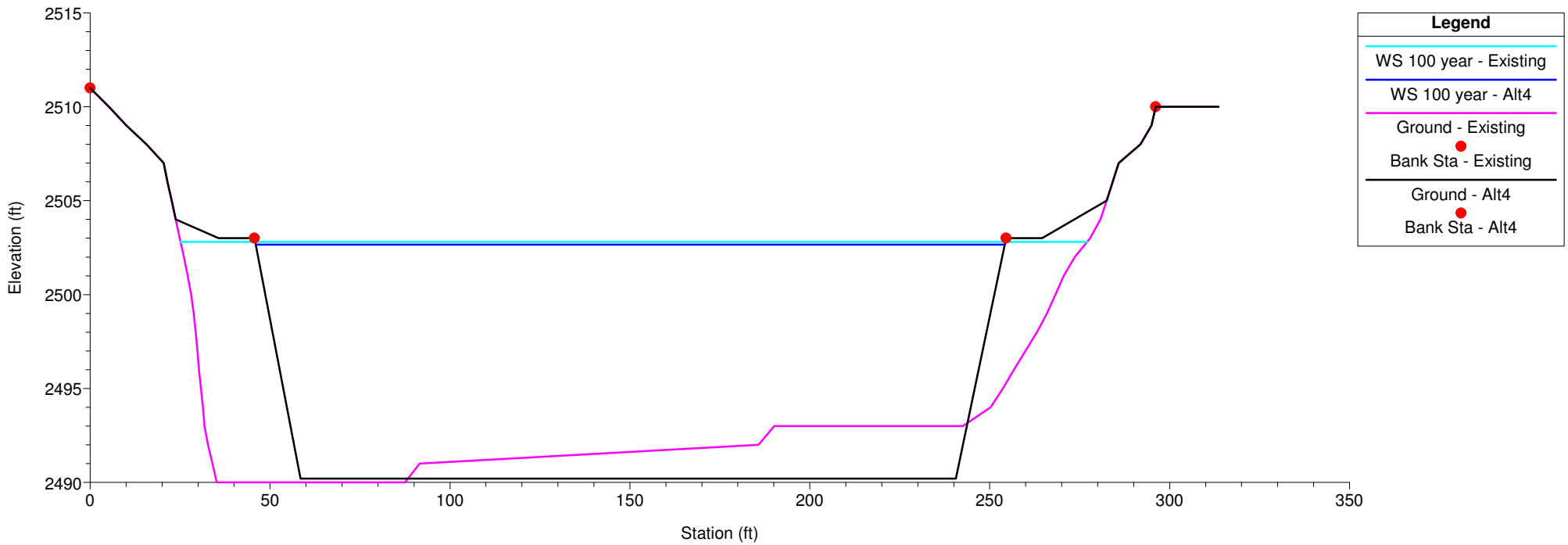


RS = 295 BR

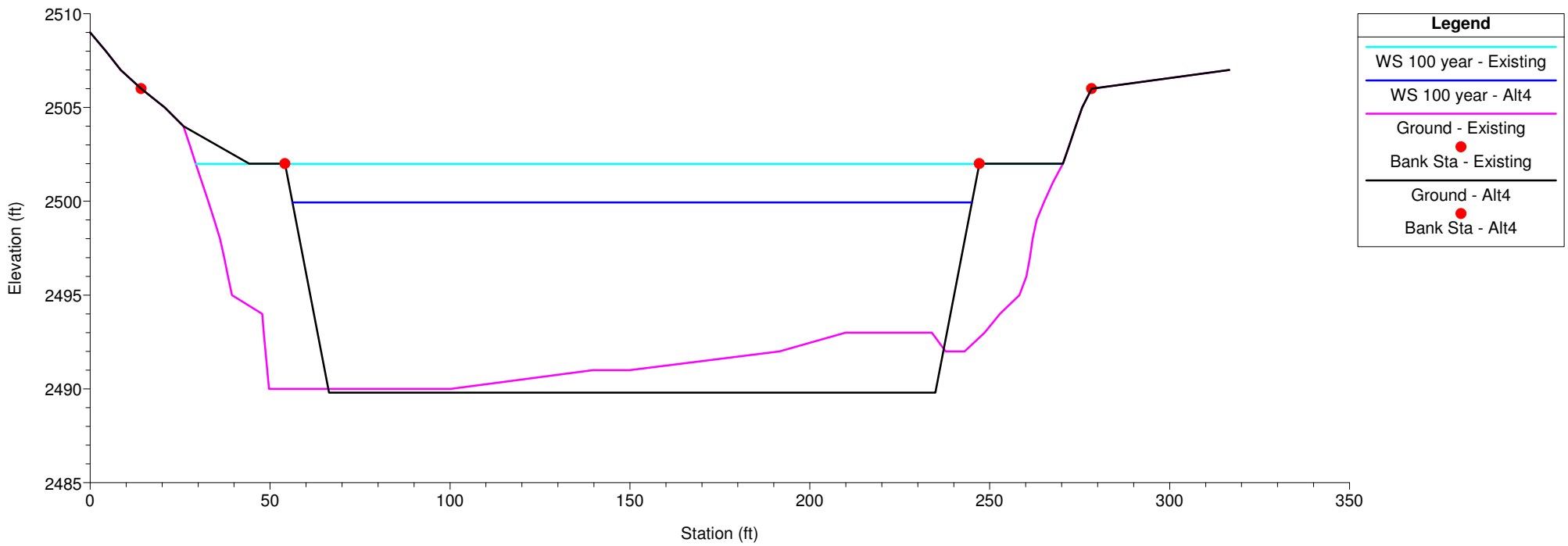
Alternative 4 vs. Existing Conditions

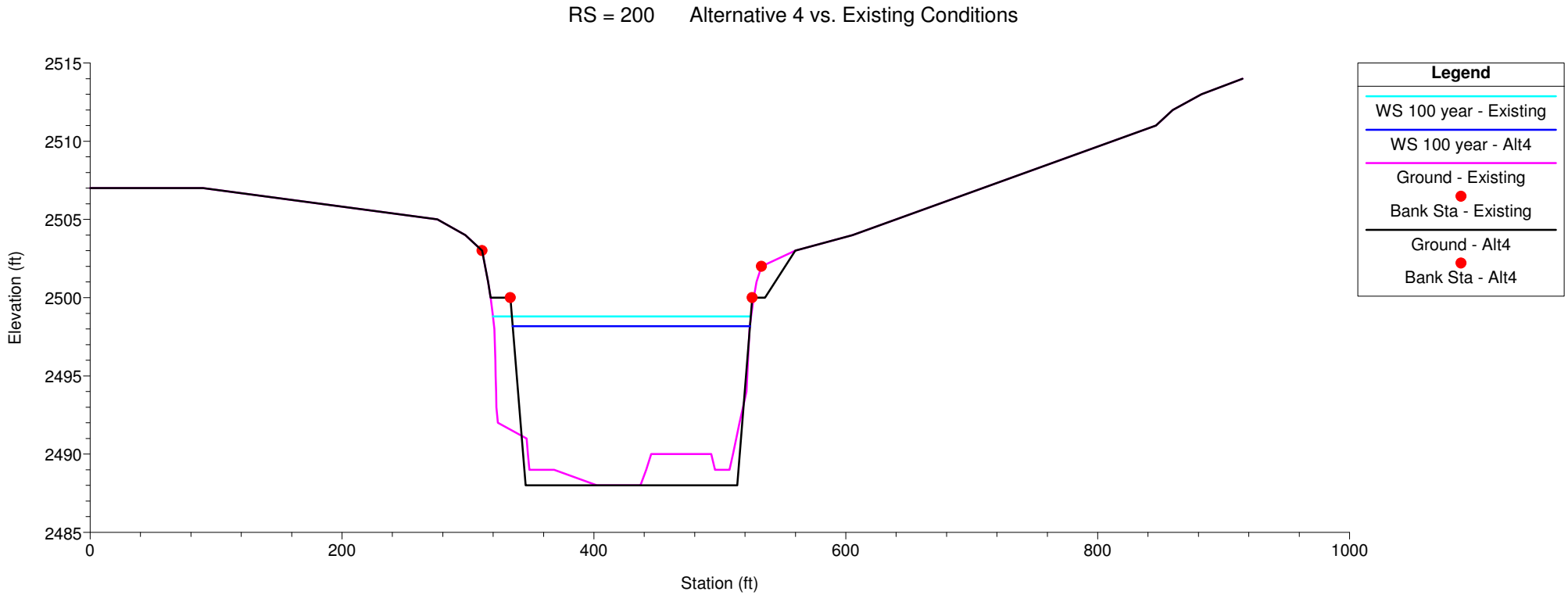


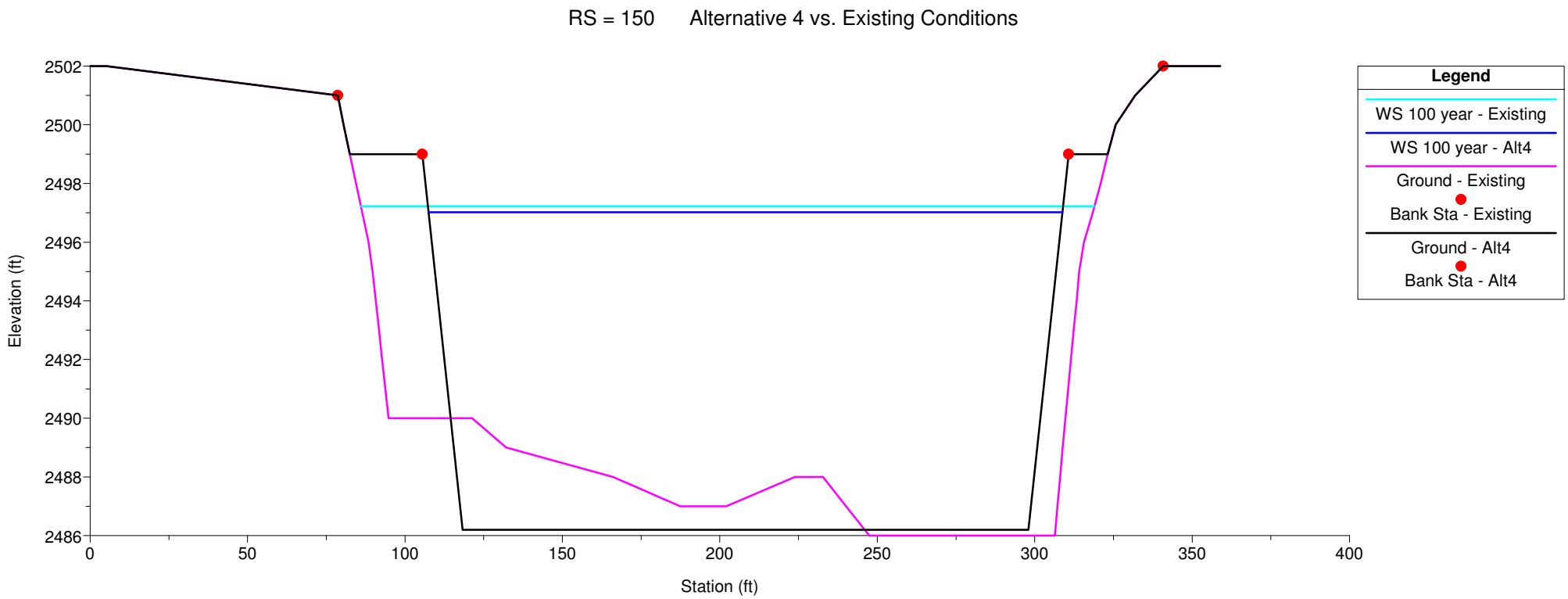
RS = 290 Alternative 4 vs. Existing Conditions



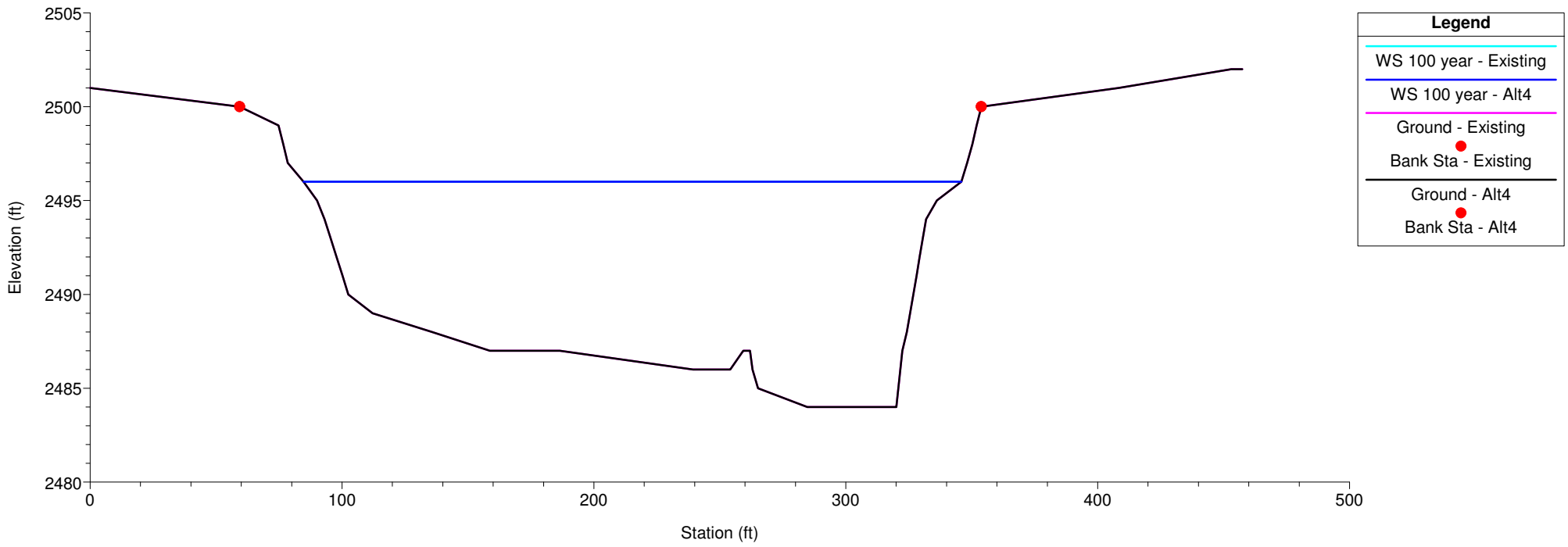
RS = 275 Alternative 4 vs. Existing Conditions




RS = 200 Alternative 4 vs. Existing Conditions
Elevation (ft)
Station (ft)
2515
2510
2505
2500
2495
2490
2485
0
200
400
600
800
1000
Legend
WS 100 year - Existing
WS 100 year - Alt4
Ground - Existing
Bank Sta - Existing
Ground - Alt4
Bank Sta - Alt4


RS = 150 Alternative 4 vs. Existing Conditions
Elevation (ft)
Station (ft)
2502
2500
2498
2496
2494
2492
2490
2488
2486
0
50
100
150
200
250
300
350
400
Legend
WS 100 year - Existing
WS 100 year - Alt4
Ground - Existing
Bank Sta - Existing
Ground - Alt4
Bank Sta - Alt4

RS = 100 Alternative 4 vs. Existing Conditions



HEC-RAS Version 3.1.3 May 2005
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
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: Pantano-Sediment Transport
Project File : PantanoSediment.prj
Run Date and Time: 9/19/2008 4:10:18 PM

Project in English units

****

PLAN DATA

Plan Title: Alt4
Plan File : t:\07125\01\WATRES\GLBBASE\CALCS\Hydraulics\HEC-RAS (Sediment)\PantanoSediment.p23

Geometry Title: Alternative4
Geometry File : t:\07125\01\WATRES\GLBBASE\CALCS\Hydraulics\HEC-RAS (Sediment)\PantanoSediment.g05

Flow Title : 1 Flow Profiles
Flow File : t:\07125\01\WATRES\GLBBASE\CALCS\Hydraulics\HEC-RAS (Sediment)\PantanoSediment.F01

Plan Summary Information:
Number of: Cross Sections = 41 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 2 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
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: Subcritical Flow

****

FLOW DATA

Flow Title: 1 Flow Profiles
Flow File : t:\07125\01\WATRES\GLBBASE\CALCS\Hydraulics\HEC-RAS (Sediment)\PantanoSediment.F01

Flow Data (cfs)
****
* River Reach RS * 100 year 50 year 25 year 10 year *
* River #1 Reach #1 1600 * 32000 20000 14000 8700 *
****

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
River #1	Reach #1	100 year		Normal S = 0.005
River #1	Reach #1	50 year		Normal S = 0.005
River #1	Reach #1	25 year		Normal S = 0.005
River #1	Reach #1	10 year		Normal S = 0.005

GEOMETRY DATA

Geometry Title: Alternative4
Geometry File : t:\07125\01\WATRES\GLBBASE\CALCS\Hydraulics\HEC-RAS (Sediment)\PantanoSediment.g05

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1600

INPUT
Description:
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2560	6.4	2559	12.63	2558	18.96	2557	25.3	2556
31.64	2555	37.97	2554	44.38	2553	50.84	2552	57.29	2551
63.85	2550	70.23	2549	76.66	2548	83.12	2547	89.57	2546
96.03	2545	104.28	2544	113.13	2543	121.99	2542	130.94	2541
142.12	2540	202.75	2540	242.37	2540	320.07	2540	328.69	2541
337.31	2542	345.93	2543	354.55	2544	363.17	2545	371.79	2546
380.41	2547	389.03	2548	397.65	2549	406.22	2550	414.78	2551
423.34	2552	431.9	2553	440.46	2554	449.02	2555		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	44.38	.03	431.9	.55

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
44.38	431.9	714.84	679.42	666.96	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (ft)	2551.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.40	Wt. n-Val.		0.030	
W.S. Elev (ft)	2548.55	Reach Len. (ft)	714.84	679.42	666.96
Crit W.S. (ft)	2548.55	Flow Area (sq ft)		2161.11	
E.G. Slope (ft/ft)	0.007049	Area (sq ft)		2161.11	
Q Total (cfs)	32000.00	Flow (cfs)		32000.00	
Top Width (ft)	320.60	Top Width (ft)		320.60	
Vel Total (ft/s)	14.81	Avg. Vel. (ft/s)		14.81	
Max Chl Dpth (ft)	8.55	Hydr. Depth (ft)		6.74	
Conv. Total (cfs)	381138.7	Conv. (cfs)		381138.7	
Length Wtd. (ft)	679.42	Wetted Per. (ft)		321.64	
Min Ch El (ft)	2540.00	Shear (lb/sq ft)		2.96	
Alpha	1.00	Stream Power (lb/ft s)		43.78	
Frctn Loss (ft)	2.92	Cum Volume (acre-ft)	2.22	484.66	0.04
C & E Loss (ft)	0.48	Cum SA (acres)	0.62	50.75	0.23

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
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 OUTPUT Profile #10 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2545.59  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.69  * Wt. n-Val.            *         *   0.030  *         *
* W.S. Elev (ft)        * 2543.90  * Reach Len. (ft)       *  714.84  *  679.42  *  666.96  *
* Crit W.S. (ft)        * 2543.90  * Flow Area (sq ft)     *         *  834.11  *         *
* E.G. Slope (ft/ft)    *0.008842  * Area (sq ft)          *         *  834.11  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  248.46  * Top Width (ft)        *         *  248.46  *         *
* Vel Total (ft/s)      *   10.43  * Avg. Vel. (ft/s)      *         *   10.43  *         *
* Max Chl Dpth (ft)     *    3.90  * Hydr. Depth (ft)      *         *    3.36  *         *
* Conv. Total (cfs)     * 92520.5  * Conv. (cfs)           *         * 92520.5  *         *
* Length Wtd. (ft)      *  679.42  * Wetted Per. (ft)      *         *  248.89  *         *
* Min Ch El (ft)        * 2540.00  * Shear (lb/sq ft)      *         *    1.85  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   19.30  *         *
* Frctn Loss (ft)       *    3.38  * Cum Volume (acre-ft)  *         *  201.27  *         *
* C & E Loss (ft)       *    0.25  * Cum SA (acres)        *         *   46.66  *         *
*****************************************************************************************
```

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: River #1
REACH: Reach #1 RS: 1500

INPUT
Description:
Station Elevation Data num= 55

```
   Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev
*******************************************************************************
     0   2552   44.32   2551   97.21   2550  217.4   2550  271.68   2550
  341.92   2549  479.35   2544  480.31   2543  481.37   2542   482.2   2541
  483.05   2540  483.78   2539  484.55   2538  486.23   2537  491.23   2536
  494.37   2535  495.54   2534  510.31   2534  516.95   2535  524.67   2536
  535.82   2536   537.4   2535  539.99   2534   542.3   2533  546.34   2532
   578.5   2532   581.8   2533  584.65   2534   587.3   2535   591.8   2536
  610.04   2537  650.01   2537  656.48   2537  682.04   2537     689   2536
   696.1   2535  722.11   2535   724.8   2536  736.31   2537  742.79   2538
  749.32   2539  750.68   2540  752.02   2541  753.35   2542  754.71   2543
   760.8   2544  771.13   2545  776.07   2546  781.82   2547  788.07   2547
  800.68   2547  825.75   2548  840.49   2549  847.09   2549  873.22   2550
```

Manning's n Values num= 3

```
   Sta   n Val    Sta   n Val    Sta   n Val
*************************************************
     0   .055  341.92    .03  781.82   .055
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
341.92 781.82 249.55 214.55 208.7 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2547.93 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 1.81 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2546.12 * Reach Len. (ft) * 249.55 * 214.55 * 208.70 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 2963.86 * *
* E.G. Slope (ft/ft) *0.002890 * Area (sq ft) * * 2963.86 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 355.61 * Top Width (ft) * * 355.61 * *
* Vel Total (ft/s) * 10.80 * Avg. Vel. (ft/s) * * 10.80 * *
* Max Chl Dpth (ft) * 14.12 * Hydr. Depth (ft) * * 8.33 * *
* Conv. Total (cfs) *595285.8 * Conv. (cfs) * *595285.8 * *
* Length Wtd. (ft) * 214.55 * Wetted Per. (ft) * * 362.97 * *
* Min Ch El (ft) * 2532.00 * Shear (lb/sq ft) * * 1.47 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 15.90 * *
* Frctn Loss (ft) * 0.58 * Cum Volume (acre-ft) * 2.22 * 444.69 * 0.04 *
* C & E Loss (ft) * 0.01 * Cum SA (acres) * 0.62 * 45.47 * 0.23 *
****

CROSS SECTION OUTPUT Profile #10 year
****
* E.G. Elev (ft) * 2540.77 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 0.85 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2539.92 * Reach Len. (ft) * 249.55 * 214.55 * 208.70 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 1173.50 * *
* E.G. Slope (ft/ft) *0.003185 * Area (sq ft) * * 1173.50 * *
* Q Total (cfs) * 8700.00 * Flow (cfs) * * 8700.00 * *
* Top Width (ft) * 267.46 * Top Width (ft) * * 267.46 * *
* Vel Total (ft/s) * 7.41 * Avg. Vel. (ft/s) * * 7.41 * *
* Max Chl Dpth (ft) * 7.92 * Hydr. Depth (ft) * * 4.39 * *
* Conv. Total (cfs) *154147.8 * Conv. (cfs) * *154147.8 * *
* Length Wtd. (ft) * 214.55 * Wetted Per. (ft) * * 271.72 * *
* Min Ch El (ft) * 2532.00 * Shear (lb/sq ft) * * 0.86 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 6.37 * *
* Frctn Loss (ft) * 0.68 * Cum Volume (acre-ft) * * 185.61 * *
* C & E Loss (ft) * 0.00 * Cum SA (acres) * * 42.63 * *
****

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1450

INPUT
Description:
Station Elevation Data num= 45
  Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
  0 2546 19 2546 51.63 2546 56.22 2545 59.92 2544
  69.95 2543 70.94 2542 71.97 2541 73.05 2540 74.14 2539
  75.29 2538 76.27 2537 77.42 2536 80.49 2535 81.02 2534
  84.75 2533 85.65 2532 86.57 2531 120.14 2531 122.76 2532
  130.25 2533 138.86 2534 141.33 2535 146.34 2535 175.1 2535
  179.28 2536 230.48 2537 236.4 2537 243.84 2536 245.96 2535
  248.93 2534 271.08 2534 291.6 2535 304.77 2536 338.54 2537
  340 2538 341.44 2539 342.85 2540 344.25 2541 345.61 2542
  348.41 2543 368.53 2544 376.03 2545 383.95 2546 391.36 2547

Manning's n Values num= 3
  Sta n Val Sta n Val Sta n Val
****
  0 .055 51.63 .03 391.36 .055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
  51.63 391.36 208.28 198.72 196.75 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2547.34 * Element * Left OB * Channel * Right OB *

```
* Vel Head (ft)         *    1.78  * Wt. n-Val.            *         *   0.030  *         *
* W.S. Elev (ft)        * 2545.57  * Reach Len. (ft)       *  208.28  *  198.72  *  196.75  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)      *         * 2992.82  *         *
* E.G. Slope (ft/ft)    *0.002511  * Area (sq ft)          *         * 2992.82  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  326.90  * Top Width (ft)        *         *  326.90  *         *
* Vel Total (ft/s)      *   10.69  * Avg. Vel. (ft/s)      *         *   10.69  *         *
* Max Chl Dpth (ft)     *   14.57  * Hydr. Depth (ft)      *         *    9.16  *         *
* Conv. Total (cfs)     *638553.1  * Conv. (cfs)           *         *638553.1  *         *
* Length Wtd. (ft)      *  198.72  * Wetted Per. (ft)      *         *  334.75  *         *
* Min Ch El (ft)        * 2531.00  * Shear (lb/sq ft)      *         *    1.40  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   14.99  *         *
* Frctn Loss (ft)       *    0.58  * Cum Volume (acre-ft)   *    2.22  *  430.02  *    0.04  *
* C & E Loss (ft)       *    0.05  * Cum SA (acres)         *    0.62  *   43.79  *    0.23  *
*****************************************************************************************************

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

CROSS SECTION OUTPUT  Profile #10 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2540.09  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    0.85  * Wt. n-Val.            *         *   0.030  *         *
* W.S. Elev (ft)        * 2539.24  * Reach Len. (ft)       *  208.28  *  198.72  *  196.75  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)      *         * 1175.18  *         *
* E.G. Slope (ft/ft)    *0.003187  * Area (sq ft)          *         * 1175.18  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  267.89  * Top Width (ft)        *         *  267.89  *         *
* Vel Total (ft/s)      *    7.40  * Avg. Vel. (ft/s)      *         *    7.40  *         *
* Max Chl Dpth (ft)     *    8.24  * Hydr. Depth (ft)      *         *    4.39  *         *
* Conv. Total (cfs)     *154110.6  * Conv. (cfs)           *         *154110.6  *         *
* Length Wtd. (ft)      *  198.72  * Wetted Per. (ft)      *         *  272.79  *         *
* Min Ch El (ft)        * 2531.00  * Shear (lb/sq ft)      *         *    0.86  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *    6.35  *         *
* Frctn Loss (ft)       *    0.78  * Cum Volume (acre-ft)   *         *  179.83  *         *
* C & E Loss (ft)       *    0.03  * Cum SA (acres)         *         *   41.32  *         *
*****************************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 1400

INPUT
Description:
Station Elevation Data    num=      58
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
       0    2547  146.64    2545  255.29    2545  288.69    2545  295.61    2544
   306.7    2543  307.96    2542  309.18    2541  310.32    2540  311.47    2539
  312.62    2538  313.79    2537  324.95    2536  326.94    2535  331.52    2534
  332.56    2533  333.65    2532  334.79    2531  346.78    2530  352.41    2530
  354.84    2531  356.53    2532  364.04    2532  367.65    2532  371.65    2533
  377.04    2533  380.29    2533  384.46    2534   389.3    2534  391.66    2534
  397.87    2534  405.78    2534  415.27    2535  416.31    2535  427.87    2535
  437.22    2535  446.39    2534  483.73    2533  497.25    2533  500.49    2534
  503.73    2535  537.05    2536  541.55    2536  556.55    2536  557.89    2537
  559.19    2538  560.53    2539  561.82    2540  563.15    2541  564.36    2542
  566.21    2543  583.98    2544  600.64    2545   606.2    2546  612.52    2547
  620.38    2548  628.23    2549  810.24    2548

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
       0    .055  288.69     .03  600.64    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        288.69  600.64           208.05  211.15  211.05            .1       .3
```

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (ft)	2546.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.28	Wt. n-Val.		0.030	
W.S. Elev (ft)	2544.43	Reach Len. (ft)	208.05	211.15	211.05
Crit W.S. (ft)		Flow Area (sq ft)		2638.51	
E.G. Slope (ft/ft)	0.003389	Area (sq ft)		2638.51	
Q Total (cfs)	32000.00	Flow (cfs)		32000.00	
Top Width (ft)	298.53	Top Width (ft)		298.53	
Vel Total (ft/s)	12.13	Avg. Vel. (ft/s)		12.13	
Max Chl Dpth (ft)	14.43	Hydr. Depth (ft)		8.84	
Conv. Total (cfs)	549668.8	Conv. (cfs)		549668.8	
Length Wtd. (ft)	211.15	Wetted Per. (ft)		305.88	
Min Ch El (ft)	2530.00	Shear (lb/sq ft)		1.83	
Alpha	1.00	Stream Power (lb/ft s)		22.14	
Frctn Loss (ft)	0.59	Cum Volume (acre-ft)	2.22	417.18	0.04
C & E Loss (ft)	0.13	Cum SA (acres)	0.62	42.36	0.23

CROSS SECTION OUTPUT Profile #10 year

E.G. Elev (ft)	2539.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.18	Wt. n-Val.		0.030	
W.S. Elev (ft)	2538.10	Reach Len. (ft)	208.05	211.15	211.05
Crit W.S. (ft)		Flow Area (sq ft)		998.80	
E.G. Slope (ft/ft)	0.004896	Area (sq ft)		998.80	
Q Total (cfs)	8700.00	Flow (cfs)		8700.00	
Top Width (ft)	246.82	Top Width (ft)		246.82	
Vel Total (ft/s)	8.71	Avg. Vel. (ft/s)		8.71	
Max Chl Dpth (ft)	8.10	Hydr. Depth (ft)		4.05	
Conv. Total (cfs)	124334.4	Conv. (cfs)		124334.4	
Length Wtd. (ft)	211.15	Wetted Per. (ft)		250.68	
Min Ch El (ft)	2530.00	Shear (lb/sq ft)		1.22	
Alpha	1.00	Stream Power (lb/ft s)		10.61	
Frctn Loss (ft)	0.68	Cum Volume (acre-ft)		174.87	
C & E Loss (ft)	0.13	Cum SA (acres)		40.14	

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: River #1
REACH: Reach #1 RS: 1350

INPUT
Description:
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2544	9.54	2543	38.09	2542	39	2541	39.96	2540
40.94	2539	41.9	2538	42.89	2537	43.85	2536	44.79	2535
45.98	2534	52.23	2533	53.89	2532	55.61	2531	57.3	2530
97.27	2530	100.2	2531	116.73	2532	164.32	2532	176.99	2532
188.83	2532	193.69	2532	196	2533	199.44	2534	206.79	2534
218.33	2534	283.32	2535	287	2536	288.24	2537	289.46	2538
290.7	2539	291.93	2540	293.13	2541	294.37	2542	295.58	2543
296.81	2544	322.32	2545	329.31	2546	335	2547	338.98	2548
344.34	2549	348.11	2549						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	0	.03	296.81	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	296.81	267.52	277.24	286.29	.1	.3

CROSS SECTION OUTPUT Profile #100 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2545.99  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.84  * Wt. n-Val.            *         *   0.030  *   0.055  *
* W.S. Elev (ft)        * 2544.15  * Reach Len. (ft)       *   95.00  *   95.00  *   95.00  *
* Crit W.S. (ft)        * 2540.70  * Flow Area (sq ft)     *         * 2937.01  *    0.27  *
* E.G. Slope (ft/ft)    *0.002360  * Area (sq ft)          *         * 2937.01  *    0.27  *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *31999.94  *    0.06  *
* Top Width (ft)        *  300.53  * Top Width (ft)        *         *  296.81  *    3.72  *
* Vel Total (ft/s)      *   10.89  * Avg. Vel. (ft/s)      *         *   10.90  *    0.23  *
* Max Chl Dpth (ft)     *   14.15  * Hydr. Depth (ft)      *         *    9.90  *    0.07  *
* Conv. Total (cfs)     *658703.9  * Conv. (cfs)           *         *658702.7  *     1.3  *
* Length Wtd. (ft)      *   95.00  * Wetted Per. (ft)      *         *  304.82  *    3.72  *
* Min Ch El (ft)        * 2530.00  * Shear (lb/sq ft)      *         *    1.42  *    0.01  *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   15.47  *    0.00  *
* Frctn Loss (ft)       *    0.34  * Cum Volume (acre-ft)  *    2.22  *  403.66  *    0.04  *
* C & E Loss (ft)       *    0.08  * Cum SA (acres)        *    0.62  *   40.92  *    0.22  *
*****************************************************************************************
```

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.

CROSS SECTION OUTPUT Profile #10 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2538.47  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    0.75  * Wt. n-Val.            *         *   0.030  *         *
* W.S. Elev (ft)        * 2537.72  * Reach Len. (ft)       *   95.00  *   95.00  *   95.00  *
* Crit W.S. (ft)        * 2535.97  * Flow Area (sq ft)     *         * 1253.24  *         *
* E.G. Slope (ft/ft)    *0.002298  * Area (sq ft)          *         * 1253.24  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  246.93  * Top Width (ft)        *         *  246.93  *         *
* Vel Total (ft/s)      *    6.94  * Avg. Vel. (ft/s)      *         *    6.94  *         *
* Max Chl Dpth (ft)     *    7.72  * Hydr. Depth (ft)      *         *    5.08  *         *
* Conv. Total (cfs)     *181502.7  * Conv. (cfs)           *         *181502.7  *         *
* Length Wtd. (ft)      *   95.00  * Wetted Per. (ft)      *         *  250.65  *         *
* Min Ch El (ft)        * 2530.00  * Shear (lb/sq ft)      *         *    0.72  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *    4.98  *         *
* Frctn Loss (ft)       *    0.32  * Cum Volume (acre-ft)  *         *  169.41  *         *
* C & E Loss (ft)       *    0.04  * Cum SA (acres)        *         *   38.94  *         *
*****************************************************************************************
```

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.

BRIDGE

RIVER: River #1
REACH: Reach #1 RS: 1325

INPUT
Description:
Distance from Upstream XS = 95
Deck/Roadway Width = 136
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

```
  Sta Hi Cord Lo Cord    Sta Hi Cord Lo Cord
**************************************************
     0   2550   2545    700   2549   2545
```

Upstream Bridge Cross Section Data
Station Elevation Data num= 42

```
   Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev
*****************************************************************************
     0   2544   9.54   2543  38.09   2542     39   2541  39.96   2540
  40.94   2539   41.9   2538  42.89   2537  43.85   2536  44.79   2535
```

```
  45.98    2534   52.23    2533   53.89    2532   55.61    2531    57.3    2530
  97.27    2530   100.2    2531  116.73    2532  164.32    2532  176.99    2532
 188.83    2532  193.69    2532     196    2533  199.44    2534  206.79    2534
 218.33    2534  283.32    2535     287    2536  288.24    2537  289.46    2538
   290.7   2539  291.93    2540  293.13    2541  294.37    2542  295.58    2543
 296.81    2544  322.32    2545  329.31    2546     335    2547  338.98    2548
 344.34    2549  348.11    2549

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
**************************************************
      0    .055       0     .03  296.81    .055

Bank Sta: Left   Right    Coeff Contr.   Expan.
           0  296.81             .1       .3

Downstream  Deck/Roadway Coordinates
   num=       2
    Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
**************************************************
      0    2550    2545     700    2549    2545

Downstream Bridge Cross Section Data
Station Elevation Data    num=      46
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
     10    2545   11.19    2544   14.12    2543    18.6    2542   21.86    2541
  22.76    2540   23.68    2539   24.75    2538   26.09    2537   27.41    2536
  28.72    2535   30.14    2534   34.85    2533   39.94    2532   41.07    2531
  41.99    2530   44.79    2529   57.58    2529   93.97    2530   97.18    2531
  100.8    2532  177.85    2532  265.38    2533  268.07    2534  270.69    2535
 273.27    2536  275.81    2537  278.31    2538  280.77    2539  283.19    2540
 286.23    2541  288.55    2542  290.43    2543  292.26    2544  294.33    2545
 297.09    2546  299.89    2547  303.97    2548  329.07    2548  360.23    2548
 381.39    2549  436.21    2549  452.08    2548  467.95    2547  496.98    2546
 506.55    2546

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
**************************************************
      0    .055      10     .03  303.97    .055

Bank Sta: Left   Right    Coeff Contr.   Expan.
          10  303.97             .1       .3

Upstream Embankment side slope              =     1.5 horiz. to 1.0 vertical
Downstream Embankment side slope            =     1.5 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =    2550
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  5

Pier Data
Pier Station     Upstream=      70    Downstream=      50
Upstream     num=       2
   Width   Elev    Width   Elev
********************************
    2.5    2525     2.5    2545
Downstream     num=       2
   Width   Elev    Width   Elev
********************************
    2.5    2525     2.5    2545

Pier Data
Pier Station     Upstream=     117    Downstream=      97
Upstream     num=       2
   Width   Elev    Width   Elev
```

```
********************************
    2.5    2525     2.5    2545
Downstream     num=       2
   Width   Elev    Width   Elev
********************************
    2.5    2525     2.5    2545

Pier Data
Pier Station     Upstream=     164    Downstream=     144
Upstream     num=       2
   Width   Elev    Width   Elev
********************************
    2.5    2529     2.5    2550
Downstream     num=       2
   Width   Elev    Width   Elev
********************************
    2.5    2529     2.5    2550

Pier Data
Pier Station     Upstream=     211    Downstream=     191
Upstream     num=       2
   Width   Elev    Width   Elev
********************************
    2.5    2525     2.5    2545
Downstream     num=       2
   Width   Elev    Width   Elev
********************************
    2.5    2525     2.5    2545

Pier Data
Pier Station     Upstream=     258    Downstream=     238
Upstream     num=       2
   Width   Elev    Width   Elev
********************************
    2.5    2525     2.5    2545
Downstream     num=       2
   Width   Elev    Width   Elev
********************************
    2.5    2525     2.5    2545

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
      Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
      Energy Only

Additional Bridge Parameters
      Add Friction component to Momentum
      Do not add Weight component to Momentum
      Class B flow critical depth computations use critical depth
         inside the bridge at the upstream end
      Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT  Profile #100 year
*********************************************************************************************
* E.G. US. (ft)          *    2545.99  * Element                *Inside BR US *Inside BR DS *
* W.S. US. (ft)          *    2544.15  * E.G. Elev (ft)         *    2545.57  *    2544.78  *
* Q Total (cfs)          *   32000.00  * W.S. Elev (ft)         *    2542.93  *    2542.32  *
* Q Bridge (cfs)         *   32000.00  * Crit W.S. (ft)         *    2541.04  *    2540.17  *
* Q Weir (cfs)           *             * Max Chl Dpth (ft)      *      12.93  *      13.32  *
* Weir Sta Lft (ft)      *             * Vel Total (ft/s)       *      13.05  *      12.60  *
* Weir Sta Rgt (ft)      *             * Flow Area (sq ft)      *    2452.22  *    2539.01  *
* Weir Submerg           *             * Froude # Chl           *       0.77  *       0.71  *
* Weir Max Depth (ft)    *             * Specif Force (cu ft)   *   25770.49  *   25910.85  *
* Min El Weir Flow (ft)  *    2550.00  * Hydr Depth (ft)        *       9.03  *       9.79  *
* Min El Prs (ft)        *    2545.00  * W.P. Total (ft)        *     383.02  *     375.05  *
* Delta EG (ft)          *       1.45  * Conv. Total (cfs)      *   418788.3  *   450040.8  *
```

```
* Delta WS (ft)          *       1.83  * Top Width (ft)         *     271.45  *     259.46  *
* BR Open Area (sq ft)   *    3047.30  * Frctn Loss (ft)        *       0.74  *       0.17  *
* BR Open Vel (ft/s)     *      13.05  * C & E Loss (ft)        *       0.05  *       0.07  *
* Coef of Q              *             * Shear Total (lb/sq ft) *       2.33  *       2.14  *
* Br Sel Method          *Energy only  * Power Total (lb/ft s)  *      30.45  *      26.93  *
*******************************************************************************************

Warning: Pier drag coefficient of 2.0 assumed for Class B flow.

BRIDGE OUTPUT  Profile #10 year
*******************************************************************************************
* E.G. US. (ft)          *    2538.47  * Element               *Inside BR US *Inside BR DS *
* W.S. US. (ft)          *    2537.72  * E.G. Elev (ft)         *    2538.10  *    2537.37  *
* Q Total (cfs)          *    8700.00  * W.S. Elev (ft)         *    2536.94  *    2536.35  *
* Q Bridge (cfs)         *    8700.00  * Crit W.S. (ft)         *    2536.13  *    2535.27  *
* Q Weir (cfs)           *             * Max Chl Dpth (ft)      *       6.94  *       7.35  *
* Weir Sta Lft (ft)      *             * Vel Total (ft/s)       *       8.63  *       8.13  *
* Weir Sta Rgt (ft)      *             * Flow Area (sq ft)      *    1007.73  *    1070.40  *
* Weir Submerg           *             * Froude # Chl           *       0.73  *       0.67  *
* Weir Max Depth (ft)    *             * Specif Force (cu ft)   *    4849.13  *    4878.03  *
* Min El Weir Flow (ft)  *    2550.00  * Hydr Depth (ft)        *       4.33  *       4.56  *
* Min El Prs (ft)        *    2545.00  * W.P. Total (ft)        *     280.11  *     287.43  *
* Delta EG (ft)          *       1.29  * Conv. Total (cfs)       *  117190.8  *  127379.6  *
* Delta WS (ft)          *       1.53  * Top Width (ft)          *     232.73  *     234.70  *
* BR Open Area (sq ft)   *    3047.30  * Frctn Loss (ft)        *       0.69  *       0.19  *
* BR Open Vel (ft/s)     *       8.63  * C & E Loss (ft)        *       0.04  *       0.01  *
* Coef of Q              *             * Shear Total (lb/sq ft) *       1.24  *       1.08  *
* Br Sel Method          *Energy only  * Power Total (lb/ft s)  *      10.69  *       8.82  *
*******************************************************************************************

Warning: Pier drag coefficient of 2.0 assumed for Class B flow.

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 1300

INPUT
Description:
Station Elevation Data    num=      46
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      10    2545   11.19    2544   14.12    2543    18.6    2542   21.86    2541
   22.76    2540   23.68    2539   24.75    2538   26.09    2537   27.41    2536
   28.72    2535   30.14    2534   34.85    2533   39.94    2532   41.07    2531
   41.99    2530   44.79    2529   57.58    2529   93.97    2530   97.18    2531
   100.8    2532  177.85    2532  265.38    2533  268.07    2534  270.69    2535
  273.27    2536  275.81    2537  278.31    2538  280.77    2539  283.19    2540
  286.23    2541  288.55    2542  290.43    2543  292.26    2544  294.33    2545
  297.09    2546  299.89    2547  303.97    2548  329.07    2548  360.23    2548
  381.39    2549  436.21    2549  452.08    2548  467.95    2547  496.98    2546
  506.55    2546

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
      0    .055      10     .03  303.97    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           10  303.97          385.44  383.36  385.44            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*******************************************************************************************
* E.G. Elev (ft)         * 2544.54  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    2.22  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2542.32  * Reach Len. (ft)        *  385.44  *  383.36  *  385.44  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)      *         * 2676.10  *         *
* E.G. Slope (ft/ft)     *0.002847  * Area (sq ft)           *         * 2676.10  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
```

```
* Top Width (ft)        *  271.96  * Top Width (ft)        *        *  271.96  *        *
* Vel Total (ft/s)      *   11.96  * Avg. Vel. (ft/s)      *        *   11.96  *        *
* Max Chl Dpth (ft)     *   13.32  * Hydr. Depth (ft)      *        *    9.84  *        *
* Conv. Total (cfs)     *599778.2  * Conv. (cfs)           *        *599778.2  *        *
* Length Wtd. (ft)      *  383.36  * Wetted Per. (ft)      *        *  278.02  *        *
* Min Ch El (ft)        * 2529.00  * Shear (lb/sq ft)      *        *    1.71  *        *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *   20.45  *        *
* Frctn Loss (ft)       *    1.59  * Cum Volume (acre-ft)   *    2.22  *  387.23  *    0.04  *
* C & E Loss (ft)       *    0.21  * Cum SA (acres)         *    0.62  *   39.19  *    0.22  *
*****************************************************************************************************

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 OUTPUT  Profile #10 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2537.17  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    0.98  * Wt. n-Val.            *        *   0.030  *        *
* W.S. Elev (ft)        * 2536.19  * Reach Len. (ft)       *  385.44  *  383.36  *  385.44  *
* Crit W.S. (ft)        * 2535.10  * Flow Area (sq ft)     *        * 1093.76  *        *
* E.G. Slope (ft/ft)    *0.003593  * Area (sq ft)          *        * 1093.76  *        *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *        * 8700.00  *        *
* Top Width (ft)        *  246.59  * Top Width (ft)        *        *  246.59  *        *
* Vel Total (ft/s)      *    7.95  * Avg. Vel. (ft/s)      *        *    7.95  *        *
* Max Chl Dpth (ft)     *    7.19  * Hydr. Depth (ft)      *        *    4.44  *        *
* Conv. Total (cfs)     *145150.0  * Conv. (cfs)           *        *145150.0  *        *
* Length Wtd. (ft)      *  383.36  * Wetted Per. (ft)      *        *  249.40  *        *
* Min Ch El (ft)        * 2529.00  * Shear (lb/sq ft)      *        *    0.98  *        *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *    7.82  *        *
* Frctn Loss (ft)       *    2.04  * Cum Volume (acre-ft)   *        *  162.55  *        *
* C & E Loss (ft)       *    0.09  * Cum SA (acres)         *        *   37.44  *        *
*****************************************************************************************************

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: River #1
REACH: Reach #1          RS: 1230

INPUT
Description:
Station Elevation Data    num=      38
    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev
*******************************************************************************
      0   2543   46.64   2542   85.37   2542  117.86   2543  136.81   2543
  138.42   2542  139.93   2541  141.48   2540  142.52   2539  143.32   2538
  144.03   2537  144.72   2536   145.4   2535  146.08   2534  147.46   2533
  148.88   2532  150.34   2531  151.74   2530   219.3   2529   293.5   2529
  295.33   2530  302.46   2530  328.97   2529  345.46   2529  352.73   2530
  353.86   2531  355.01   2532  356.16   2533   357.3   2534  358.41   2535
  359.57   2536  360.76   2537  361.92   2538  420.65   2539  441.25   2539
  471.42   2538  505.23   2540  522.09   2539

Manning's n Values        num=       3
    Sta   n Val    Sta   n Val    Sta   n Val
*************************************************
      0    .05  136.81    .03  361.92    .05

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

136.81 361.92 47.48 47.44 47.31 .1 .3

CROSS SECTION OUTPUT Profile #100 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2542.74  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    4.33  * Wt. n-Val.            *         *   0.030  *   0.050  *
* W.S. Elev (ft)        * 2538.41  * Reach Len. (ft)       *   47.48  *   47.44  *   47.31  *
* Crit W.S. (ft)        * 2538.41  * Flow Area (sq ft)     *         * 1915.37  *    8.78  *
* E.G. Slope (ft/ft)    *0.006575  * Area (sq ft)          *         * 1915.37  *    8.78  *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *31992.67  *    7.33  *
* Top Width (ft)        *  262.04  * Top Width (ft)        *         *  218.93  *   43.11  *
* Vel Total (ft/s)      *   16.63  * Avg. Vel. (ft/s)      *         *   16.70  *    0.83  *
* Max Chl Dpth (ft)     *    9.41  * Hydr. Depth (ft)      *         *    8.75  *    0.20  *
* Conv. Total (cfs)     *394635.8  * Conv. (cfs)           *         *394545.4  *    90.3  *
* Length Wtd. (ft)      *   47.44  * Wetted Per. (ft)      *         *  225.84  *   43.13  *
* Min Ch El (ft)        * 2529.00  * Shear (lb/sq ft)      *         *    3.48  *    0.08  *
* Alpha                 *    1.01  * Stream Power (lb/ft s) *         *   58.15  *    0.07  *
* Frctn Loss (ft)       *    0.28  * Cum Volume (acre-ft)  *    2.22  *  367.02  *    0.00  *
* C & E Loss (ft)       *    0.22  * Cum SA (acres)        *    0.62  *   37.03  *    0.03  *
*****************************************************************************************
```

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: Divided flow computed for this cross-section.
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.
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 OUTPUT Profile #10 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2535.04  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.90  * Wt. n-Val.            *         *   0.030  *         *
* W.S. Elev (ft)        * 2533.14  * Reach Len. (ft)       *   47.48  *   47.44  *   47.31  *
* Crit W.S. (ft)        * 2533.14  * Flow Area (sq ft)     *         *  786.55  *         *
* E.G. Slope (ft/ft)    *0.008660  * Area (sq ft)          *         *  786.55  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  209.06  * Top Width (ft)        *         *  209.06  *         *
* Vel Total (ft/s)      *   11.06  * Avg. Vel. (ft/s)      *         *   11.06  *         *
* Max Chl Dpth (ft)     *    4.14  * Hydr. Depth (ft)      *         *    3.76  *         *
* Conv. Total (cfs)     * 93490.0  * Conv. (cfs)           *         * 93490.0  *         *
* Length Wtd. (ft)      *   47.44  * Wetted Per. (ft)      *         *  211.58  *         *
* Min Ch El (ft)        * 2529.00  * Shear (lb/sq ft)      *         *    2.01  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   22.23  *         *
* Frctn Loss (ft)       *    0.26  * Cum Volume (acre-ft)  *         *  154.28  *         *
* C & E Loss (ft)       *    0.25  * Cum SA (acres)        *         *   35.43  *         *
*****************************************************************************************
```

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: River #1
REACH: Reach #1 RS: 1220

INPUT

Description:
Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2542	18.62	2541	39.62	2541	45.78	2541	55.76	2541
61.41	2542	72.93	2542	74.08	2541	75.24	2540	76.4	2539
77.46	2538	78.36	2537	79.23	2536	80.14	2535	80.97	2534
81.91	2533	83.24	2532	84.71	2531	86.18	2530	87.71	2529
118.12	2528	120.9	2528	128.57	2528	156.62	2528	164.95	2528
178.24	2528	185.15	2528	189.77	2528	193.91	2528	201.47	2528
213.24	2528	215.78	2528	222	2528	227.84	2528	230.94	2528
234.18	2527	253.8	2527	258.2	2528	309.84	2529	310.87	2530
311.93	2531	313	2532	314.07	2533	315.14	2534	316.18	2535
317.25	2536	318.31	2537	319.41	2538	351.91	2538		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	72.93	.03	319.41	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
72.93	319.41	415.98	411.75	408.51	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (ft)	2540.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.61	Wt. n-Val.		0.030	
W.S. Elev (ft)	2537.18	Reach Len. (ft)	415.98	411.75	408.51
Crit W.S. (ft)	2536.61	Flow Area (sq ft)		2100.09	
E.G. Slope (ft/ft)	0.005453	Area (sq ft)		2100.09	
Q Total (cfs)	32000.00	Flow (cfs)		32000.00	
Top Width (ft)	240.30	Top Width (ft)		240.30	
Vel Total (ft/s)	15.24	Avg. Vel. (ft/s)		15.24	
Max Chl Dpth (ft)	10.18	Hydr. Depth (ft)		8.74	
Conv. Total (cfs)	433354.3	Conv. (cfs)		433354.3	
Length Wtd. (ft)	411.75	Wetted Per. (ft)		246.97	
Min Ch El (ft)	2527.00	Shear (lb/sq ft)		2.89	
Alpha	1.00	Stream Power (lb/ft s)		44.11	
Frctn Loss (ft)	1.98	Cum Volume (acre-ft)	2.22	364.84	0.00
C & E Loss (ft)	0.21	Cum SA (acres)	0.62	36.78	0.00

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 OUTPUT Profile #10 year

E.G. Elev (ft)	2533.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.07	Wt. n-Val.		0.030	
W.S. Elev (ft)	2532.72	Reach Len. (ft)	415.98	411.75	408.51
Crit W.S. (ft)	2531.70	Flow Area (sq ft)		1049.40	
E.G. Slope (ft/ft)	0.003797	Area (sq ft)		1049.40	
Q Total (cfs)	8700.00	Flow (cfs)		8700.00	
Top Width (ft)	231.50	Top Width (ft)		231.50	
Vel Total (ft/s)	8.29	Avg. Vel. (ft/s)		8.29	
Max Chl Dpth (ft)	5.72	Hydr. Depth (ft)		4.53	
Conv. Total (cfs)	141180.5	Conv. (cfs)		141180.5	
Length Wtd. (ft)	411.75	Wetted Per. (ft)		234.43	
Min Ch El (ft)	2527.00	Shear (lb/sq ft)		1.06	
Alpha	1.00	Stream Power (lb/ft s)		8.80	
Frctn Loss (ft)	2.30	Cum Volume (acre-ft)		153.28	
C & E Loss (ft)	0.06	Cum SA (acres)		35.19	

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: River #1
REACH: Reach #1 RS: 1200

INPUT
Description:
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2540	68.09	2539	121.68	2541	128.69	2541	147.65	2534
148.1	2533	148.5	2532	149.06	2531	149.92	2530	150.86	2529
151.8	2528	153.39	2527	155.27	2526	248.74	2526	272.27	2527
297.29	2527	305.15	2526	307.38	2526	310.49	2526	316.89	2526
324.53	2527	349.28	2527	364.33	2526	392.42	2526	395.21	2527
396.18	2528	397.09	2529	398.09	2530	398.98	2531	399.97	2532
400.9	2533	401.85	2534	402.79	2535	403.76	2536	404.8	2537
410.44	2537	422.02	2537	426.84	2538	429.8	2539	443.87	2539

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	128.69	.03	404.8	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
128.69	404.8	57.6	56.56	56.62	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (ft)	2538.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.92	Wt. n-Val.		0.030	
W.S. Elev (ft)	2535.68	Reach Len. (ft)	57.60	56.56	56.62
Crit W.S. (ft)		Flow Area (sq ft)		2335.28	
E.G. Slope (ft/ft)	0.004279	Area (sq ft)		2335.28	
Q Total (cfs)	32000.00	Flow (cfs)		32000.00	
Top Width (ft)	260.34	Top Width (ft)		260.34	
Vel Total (ft/s)	13.70	Avg. Vel. (ft/s)		13.70	
Max Chl Dpth (ft)	9.68	Hydr. Depth (ft)		8.97	
Conv. Total (cfs)	489188.3	Conv. (cfs)		489188.3	
Length Wtd. (ft)	56.56	Wetted Per. (ft)		268.50	
Min Ch El (ft)	2526.00	Shear (lb/sq ft)		2.32	
Alpha	1.00	Stream Power (lb/ft s)		31.84	
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	2.22	343.87	0.00
C & E Loss (ft)	0.23	Cum SA (acres)	0.62	34.41	0.00

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 OUTPUT Profile #10 year

E.G. Elev (ft)	2531.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.70	Wt. n-Val.		0.030	
W.S. Elev (ft)	2529.73	Reach Len. (ft)	57.60	56.56	56.62
Crit W.S. (ft)	2529.73	Flow Area (sq ft)		832.01	
E.G. Slope (ft/ft)	0.008992	Area (sq ft)		832.01	
Q Total (cfs)	8700.00	Flow (cfs)		8700.00	
Top Width (ft)	247.65	Top Width (ft)		247.65	
Vel Total (ft/s)	10.46	Avg. Vel. (ft/s)		10.46	
Max Chl Dpth (ft)	3.73	Hydr. Depth (ft)		3.36	
Conv. Total (cfs)	91746.0	Conv. (cfs)		91746.0	
Length Wtd. (ft)	56.56	Wetted Per. (ft)		250.46	
Min Ch El (ft)	2526.00	Shear (lb/sq ft)		1.86	
Alpha	1.00	Stream Power (lb/ft s)		19.50	
Frctn Loss (ft)	0.26	Cum Volume (acre-ft)		144.39	
C & E Loss (ft)	0.26	Cum SA (acres)		32.93	

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

Warning: The energy equation could not be balanced within the specified number of iterations.  The
        program selected the water surface that had the least amount of error between computed and
        assumed values.
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: 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: River #1
REACH: Reach #1          RS: 1120

INPUT
Description:
Station Elevation Data    num=      44
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
      0    2539  336.05    2541  342.65    2534  343.23    2533  343.69    2532
  344.08    2531  345.04    2530  345.92    2529   346.9    2528  347.83    2527
  348.74    2526  349.76    2525  440.16    2525  445.47    2525  451.76    2525
  465.52    2525  467.89    2524  468.82    2524  477.19    2525  488.72    2526
  499.18    2527  503.32    2527  512.05    2526  517.81    2525  524.94    2525
   538.1    2525  550.62    2524  573.43    2524  573.77    2525  578.28    2526
  590.85    2527  591.77    2528  592.73    2529  593.66    2530  594.62    2531
  595.54    2532  596.52    2533  597.47    2534  598.38    2535  599.33    2536
  619.96    2537  622.38    2538  624.78    2539  638.13    2539

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
************************************************
      0     .05  336.05     .03  599.33     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        336.05  599.33           440.1   443.7  447.39            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)         * 2538.18  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    2.15  * Wt. n-Val.             *         *   0.030  *   0.050  *
* W.S. Elev (ft)         * 2536.03  * Reach Len. (ft)        *  440.10  *  443.70  *  447.39  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)      *         * 2718.73  *    0.01  *
* E.G. Slope (ft/ft)     *0.002587  * Area (sq ft)           *         * 2718.73  *    0.01  *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *    0.00  *
* Top Width (ft)         *  259.20  * Top Width (ft)         *         *  258.59  *    0.60  *
* Vel Total (ft/s)       *   11.77  * Avg. Vel. (ft/s)       *         *   11.77  *    0.09  *
* Max Chl Dpth (ft)      *   12.03  * Hydr. Depth (ft)       *         *   10.51  *    0.01  *
* Conv. Total (cfs)      *629102.6  * Conv. (cfs)            *         *629102.6  *     0.0  *
* Length Wtd. (ft)       *  443.70  * Wetted Per. (ft)       *         *  269.24  *    0.61  *
* Min Ch El (ft)         * 2524.00  * Shear (lb/sq ft)       *         *    1.63  *    0.00  *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   19.20  *    0.00  *
* Frctn Loss (ft)        *    1.75  * Cum Volume (acre-ft)   *    2.22  *  340.59  *    0.00  *
* C & E Loss (ft)        *    0.21  * Cum SA (acres)         *    0.62  *   34.08  *    0.00  *
*****************************************************************************************

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 OUTPUT  Profile #10 year
*****************************************************************************************
```

```
* E.G. Elev (ft)        * 2530.83  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    0.83  * Wt. n-Val.           *        *   0.030  *        *
* W.S. Elev (ft)        * 2530.00  * Reach Len. (ft)       *  440.10  *  443.70  *  447.39  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *        * 1190.51  *        *
* E.G. Slope (ft/ft)    *0.002768  * Area (sq ft)         *        * 1190.51  *        *
* Q Total (cfs)         * 8700.00  * Flow (cfs)           *        * 8700.00  *        *
* Top Width (ft)        *  248.62  * Top Width (ft)        *        *  248.62  *        *
* Vel Total (ft/s)      *    7.31  * Avg. Vel. (ft/s)      *        *    7.31  *        *
* Max Chl Dpth (ft)     *    6.00  * Hydr. Depth (ft)      *        *    4.79  *        *
* Conv. Total (cfs)     *165372.2  * Conv. (cfs)           *        *165372.2  *        *
* Length Wtd. (ft)      *  443.70  * Wetted Per. (ft)       *        *  253.48  *        *
* Min Ch El (ft)        * 2524.00  * Shear (lb/sq ft)       *        *    0.81  *        *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *    5.93  *        *
* Frctn Loss (ft)       *    2.01  * Cum Volume (acre-ft)   *        *  143.07  *        *
* C & E Loss (ft)       *    0.10  * Cum SA (acres)         *        *   32.60  *        *
*****************************************************************************************************

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: River #1
REACH: Reach #1          RS: 1110

INPUT
Description:
Station Elevation Data    num=      38
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2538  104.77    2538  121.02    2538  172.26    2537  181.45    2536
  189.22    2535  192.95    2534   196.9    2533  198.01    2532  198.99    2531
  200.02    2530  200.72    2529  201.39    2528  202.12    2527  202.84    2526
  203.53    2525  204.37    2524  205.16    2523  280.28    2523  285.89    2523
  288.08    2523  311.08    2523  350.63    2523   417.4    2524  418.47    2525
  419.48    2526  420.52    2527  421.57    2528  422.55    2529  423.62    2530
  424.67    2531  425.68    2532  426.76    2533  427.88    2534  446.96    2535
  448.96    2536  450.96    2537  506.22    2537

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***************************************************
      0     .05  189.22     .03  427.88     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       189.22  427.88            46.86   36.39   42.45            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2536.22  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    4.25  * Wt. n-Val.           *        *   0.030  *        *
* W.S. Elev (ft)        * 2531.97  * Reach Len. (ft)       *   46.86  *   36.39  *   42.45  *
* Crit W.S. (ft)        * 2531.97  * Flow Area (sq ft)     *        * 1933.48  *        *
* E.G. Slope (ft/ft)    *0.006730  * Area (sq ft)         *        * 1933.48  *        *
* Q Total (cfs)         *32000.00  * Flow (cfs)           *        *32000.00  *        *
* Top Width (ft)        *  227.61  * Top Width (ft)        *        *  227.61  *        *
* Vel Total (ft/s)      *   16.55  * Avg. Vel. (ft/s)      *        *   16.55  *        *
* Max Chl Dpth (ft)     *    8.97  * Hydr. Depth (ft)      *        *    8.49  *        *
* Conv. Total (cfs)     *390079.0  * Conv. (cfs)           *        *390079.0  *        *
* Length Wtd. (ft)      *   36.39  * Wetted Per. (ft)       *        *  235.20  *        *
* Min Ch El (ft)        * 2523.00  * Shear (lb/sq ft)       *        *    3.45  *        *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *   57.16  *        *
* Frctn Loss (ft)       *    0.21  * Cum Volume (acre-ft)   *    2.22  *  316.90  *        *
* C & E Loss (ft)       *    0.19  * Cum SA (acres)         *    0.62  *   31.60  *        *
*****************************************************************************************************
```

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 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 OUTPUT Profile #10 year

```
*********************************************************************************************
* E.G. Elev (ft)        * 2528.72  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.85  * Wt. n-Val.            *         *   0.030  *         *
* W.S. Elev (ft)        * 2526.87  * Reach Len. (ft)       *   46.86  *   36.39  *   42.45  *
* Crit W.S. (ft)        * 2526.87  * Flow Area (sq ft)     *         *  797.93  *         *
* E.G. Slope (ft/ft)    *0.008762  * Area (sq ft)          *         *  797.93  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  218.17  * Top Width (ft)        *         *  218.17  *         *
* Vel Total (ft/s)      *   10.90  * Avg. Vel. (ft/s)      *         *   10.90  *         *
* Max Chl Dpth (ft)     *    3.87  * Hydr. Depth (ft)      *         *    3.66  *         *
* Conv. Total (cfs)     * 92943.7  * Conv. (cfs)           *         * 92943.7  *         *
* Length Wtd. (ft)      *   36.39  * Wetted Per. (ft)      *         *  221.25  *         *
* Min Ch El (ft)        * 2523.00  * Shear (lb/sq ft)      *         *    1.97  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   21.51  *         *
* Frctn Loss (ft)       *    0.18  * Cum Volume (acre-ft)  *         *  132.95  *         *
* C & E Loss (ft)       *    0.24  * Cum SA (acres)        *         *   30.23  *         *
*********************************************************************************************
```

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: River #1
REACH: Reach #1 RS: 1100

INPUT
Description:
Station Elevation Data num= 31

```
    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev
*******************************************************************************
      0   2538    7.97   2538    75.6   2537  183.84   2537  194.63   2537
  237.75   2537  254.58   2536  256.12   2535  271.56   2533  281.56   2533
  294.56   2520  324.84   2520  432.65   2521  435.97   2522  448.45   2522
  464.17   2522  493.16   2523   494.3   2524   495.3   2525  496.31   2526
  497.31   2527  498.31   2528  499.33   2529  500.34   2530  501.37   2531
  502.41   2532  503.41   2533  504.48   2534  524.02   2535  525.94   2536
  527.91   2537
```

Manning's n Values num= 3

```
    Sta   n Val    Sta   n Val    Sta   n Val
***********************************************
      0    .05  281.56    .03  504.48    .05
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
281.56 504.48 294 294 294 .1 .3

CROSS SECTION OUTPUT Profile #100 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2534.65  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    3.61  * Wt. n-Val.            *         *   0.030  *         *
* W.S. Elev (ft)        * 2531.04  * Reach Len. (ft)       *  294.00  *  294.00  *  294.00  *
* Crit W.S. (ft)        * 2530.11  * Flow Area (sq ft)     *         * 2100.15  *         *
* E.G. Slope (ft/ft)    *0.004842  * Area (sq ft)          *         * 2100.15  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  217.90  * Top Width (ft)        *         *  217.90  *         *
* Vel Total (ft/s)      *   15.24  * Avg. Vel. (ft/s)      *         *   15.24  *         *
* Max Chl Dpth (ft)     *   11.04  * Hydr. Depth (ft)      *         *    9.64  *         *
* Conv. Total (cfs)     *459894.7  * Conv. (cfs)           *         *459894.7  *         *
* Length Wtd. (ft)      *  294.00  * Wetted Per. (ft)      *         *  225.92  *         *
* Min Ch El (ft)        * 2520.00  * Shear (lb/sq ft)      *         *    2.81  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   42.81  *         *
* Frctn Loss (ft)       *    1.68  * Cum Volume (acre-ft)   *    2.22  *  315.22  *         *
* C & E Loss (ft)       *    0.05  * Cum SA (acres)         *    0.62  *   31.42  *         *
*****************************************************************************************

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 OUTPUT  Profile #10 year
*****************************************************************************************
* E.G. Elev (ft)        * 2527.20  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.05  * Wt. n-Val.            *         *   0.030  *         *
* W.S. Elev (ft)        * 2526.16  * Reach Len. (ft)       *  294.00  *  294.00  *  294.00  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)      *         * 1059.23  *         *
* E.G. Slope (ft/ft)    *0.003220  * Area (sq ft)          *         * 1059.23  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  208.06  * Top Width (ft)        *         *  208.06  *         *
* Vel Total (ft/s)      *    8.21  * Avg. Vel. (ft/s)      *         *    8.21  *         *
* Max Chl Dpth (ft)     *    6.16  * Hydr. Depth (ft)      *         *    5.09  *         *
* Conv. Total (cfs)     *153308.9  * Conv. (cfs)           *         *153308.9  *         *
* Length Wtd. (ft)      *  294.00  * Wetted Per. (ft)      *         *  212.05  *         *
* Min Ch El (ft)        * 2520.00  * Shear (lb/sq ft)      *         *    1.00  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *    8.25  *         *
* Frctn Loss (ft)       *    1.48  * Cum Volume (acre-ft)   *         *  132.17  *         *
* C & E Loss (ft)       *    0.07  * Cum SA (acres)         *         *   30.05  *         *
*****************************************************************************************

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: River #1
REACH: Reach #1          RS: 1050

INPUT
Description:
Station Elevation Data    num=      38
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
      0    2535   19.46    2535   47.69    2534   72.02    2534   155.9    2535
  219.33    2536  231.16    2536  232.43    2535  242.44    2530  252.44    2530
  256.29    2520  284.32    2520  335.05    2520  397.98    2520  404.81    2520
  435.94    2520   444.6    2521  474.12    2522  484.03    2523  485.53    2524
  486.59    2525  487.65    2526  488.72    2527  489.75    2528  490.87    2529
  492.17    2530  493.39    2531  494.65    2532  512.73    2533  515.72    2534
  517.96    2535  520.35    2536  525.36    2537  530.35    2538   535.6    2539
  542.47    2540  551.81    2540  564.09    2539

Manning's n Values        num=       3
```

```
    Sta   n Val     Sta   n Val     Sta   n Val
**************************************************
      0     .05  252.44     .03  494.65     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       252.44  494.65             162     162     162            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2532.92  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    4.14  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2528.77  * Reach Len. (ft)       *  162.00  *  162.00  *  162.00  *
* Crit W.S. (ft)        * 2528.77  * Flow Area (sq ft)     *         * 1959.48  *         *
* E.G. Slope (ft/ft)    *0.006835  * Area (sq ft)          *         * 1959.48  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  237.70  * Top Width (ft)        *         *  237.70  *         *
* Vel Total (ft/s)      *   16.33  * Avg. Vel. (ft/s)      *         *   16.33  *         *
* Max Chl Dpth (ft)     *    8.77  * Hydr. Depth (ft)      *         *    8.24  *         *
* Conv. Total (cfs)     *387050.3  * Conv. (cfs)           *         *387050.3  *         *
* Length Wtd. (ft)      *  162.00  * Wetted Per. (ft)       *         *  246.04  *         *
* Min Ch El (ft)        * 2520.00  * Shear (lb/sq ft)      *         *    3.40  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   55.50  *         *
* Frctn Loss (ft)       *    1.12  * Cum Volume (acre-ft)   *    2.22  *  301.52  *         *
* C & E Loss (ft)       *    0.18  * Cum SA (acres)         *    0.62  *   29.88  *         *
*****************************************************************************************************

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 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 OUTPUT  Profile #10 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2525.66  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.78  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2523.87  * Reach Len. (ft)       *  162.00  *  162.00  *  162.00  *
* Crit W.S. (ft)        * 2523.87  * Flow Area (sq ft)     *         *  812.12  *         *
* E.G. Slope (ft/ft)    *0.008882  * Area (sq ft)          *         *  812.12  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  230.54  * Top Width (ft)        *         *  230.54  *         *
* Vel Total (ft/s)      *   10.71  * Avg. Vel. (ft/s)      *         *   10.71  *         *
* Max Chl Dpth (ft)     *    3.87  * Hydr. Depth (ft)      *         *    3.52  *         *
* Conv. Total (cfs)     * 92315.5  * Conv. (cfs)           *         * 92315.5  *         *
* Length Wtd. (ft)      *  162.00  * Wetted Per. (ft)       *         *  233.59  *         *
* Min Ch El (ft)        * 2520.00  * Shear (lb/sq ft)      *         *    1.93  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   20.65  *         *
* Frctn Loss (ft)       *    1.47  * Cum Volume (acre-ft)   *         *  125.86  *         *
* C & E Loss (ft)       *    0.08  * Cum SA (acres)         *         *   28.57  *         *
*****************************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
       program selected the water surface that had the least amount of error between computed and
       assumed values.
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: River #1
REACH: Reach #1          RS: 1010
```

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2533	38.6	2533	39.06	2533	78.35	2534	116.92	2533
133.06	2532	147.06	2527	157.06	2527	165.06	2519	225.22	2519
319.11	2519	424.94	2520	448.16	2521	453.24	2522	454.76	2523
455.72	2524	456.73	2525	457.7	2526	458.85	2527	460.14	2528
461.47	2529	462.88	2530	464.32	2531	484.17	2532	485.92	2533
487.69	2534	489.54	2535	494.16	2536	499.81	2537	506.54	2538
512.26	2539	517.03	2540	535.74	2540	541.23	2539	573.19	2539
662.53	2537	733.3	2537						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	157.06	.03	464.32	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
157.06	464.32	111.18	71.92	89.38	.1	.3

CROSS SECTION OUTPUT Profile #100 year

E.G. Elev (ft)	2530.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.53	Wt. n-Val.		0.030	
W.S. Elev (ft)	2526.57	Reach Len. (ft)	111.18	71.92	89.38
Crit W.S. (ft)	2526.57	Flow Area (sq ft)		2122.35	
E.G. Slope (ft/ft)	0.007003	Area (sq ft)		2122.35	
Q Total (cfs)	32000.00	Flow (cfs)		32000.00	
Top Width (ft)	300.87	Top Width (ft)		300.87	
Vel Total (ft/s)	15.08	Avg. Vel. (ft/s)		15.08	
Max Chl Dpth (ft)	7.57	Hydr. Depth (ft)		7.05	
Conv. Total (cfs)	382397.4	Conv. (cfs)		382397.4	
Length Wtd. (ft)	71.92	Wetted Per. (ft)		305.90	
Min Ch El (ft)	2519.00	Shear (lb/sq ft)		3.03	
Alpha	1.00	Stream Power (lb/ft s)		45.73	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	2.22	293.93	
C & E Loss (ft)	0.67	Cum SA (acres)	0.62	28.88	

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 OUTPUT Profile #10 year

E.G. Elev (ft)	2523.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.52	Wt. n-Val.		0.030	
W.S. Elev (ft)	2522.38	Reach Len. (ft)	111.18	71.92	89.38
Crit W.S. (ft)	2522.38	Flow Area (sq ft)		879.32	
E.G. Slope (ft/ft)	0.009250	Area (sq ft)		879.32	
Q Total (cfs)	8700.00	Flow (cfs)		8700.00	
Top Width (ft)	292.14	Top Width (ft)		292.14	
Vel Total (ft/s)	9.89	Avg. Vel. (ft/s)		9.89	
Max Chl Dpth (ft)	3.38	Hydr. Depth (ft)		3.01	
Conv. Total (cfs)	90457.2	Conv. (cfs)		90457.2	
Length Wtd. (ft)	71.92	Wetted Per. (ft)		293.77	
Min Ch El (ft)	2519.00	Shear (lb/sq ft)		1.73	
Alpha	1.00	Stream Power (lb/ft s)		17.10	
Frctn Loss (ft)	0.30	Cum Volume (acre-ft)		122.71	
C & E Loss (ft)	0.25	Cum SA (acres)		27.60	

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

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: River #1
REACH: Reach #1          RS: 1000

INPUT
Description:
Station Elevation Data    num=      35
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
      0    2530   72.47    2531  123.23    2532  127.39    2532  206.84    2532
    218    2525     228    2525   242.1  2510.9  513.14  2510.9  516.43    2521
  517.76    2522  519.14    2523  520.49    2524  521.85    2525   523.2    2526
  524.36    2527  525.49    2528  526.62    2529  527.74    2530  528.86    2531
  546.98    2532  548.95    2533  550.75    2534  552.59    2535  557.43    2536
  563.53    2537  569.55    2538  574.84    2539  578.79    2540  582.76    2541
   599.7    2541  604.88    2540  610.61    2539  619.05    2539  655.41    2540

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0     .05     228     .03  528.86     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          228  528.86             147     147     147            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*******************************************************************************************
* E.G. Elev (ft)         * 2524.75  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.29  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2523.46  * Reach Len. (ft)       *  147.00  *  147.00  *  147.00  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)      *         * 3511.87  *         *
* E.G. Slope (ft/ft)     *0.001293  * Area (sq ft)          *         * 3511.87  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)         *  290.22  * Top Width (ft)        *         *  290.22  *         *
* Vel Total (ft/s)       *    9.11  * Avg. Vel. (ft/s)      *         *    9.11  *         *
* Max Chl Dpth (ft)      *   12.56  * Hydr. Depth (ft)      *         *   12.10  *         *
* Conv. Total (cfs)      *889752.6  * Conv. (cfs)           *         *889752.6  *         *
* Length Wtd. (ft)       *  147.00  * Wetted Per. (ft)      *         *  303.57  *         *
* Min Ch El (ft)         * 2510.90  * Shear (lb/sq ft)      *         *    0.93  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *    8.51  *         *
* Frctn Loss (ft)        *    0.21  * Cum Volume (acre-ft)   *    2.22  *  289.27  *         *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)         *    0.62  *   28.39  *         *
*******************************************************************************************

CROSS SECTION OUTPUT  Profile #10 year
*******************************************************************************************
* E.G. Elev (ft)         * 2516.37  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.68  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2515.69  * Reach Len. (ft)       *  147.00  *  147.00  *  147.00  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)      *         * 1312.15  *         *
* E.G. Slope (ft/ft)     *0.002316  * Area (sq ft)          *         * 1312.15  *         *
* Q Total (cfs)          * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)         *  277.38  * Top Width (ft)        *         *  277.38  *         *
* Vel Total (ft/s)       *    6.63  * Avg. Vel. (ft/s)      *         *    6.63  *         *
```

```
* Max Chl Dpth (ft)      *    4.79  * Hydr. Depth (ft)       *         *    4.73  *         *
* Conv. Total (cfs)      *180780.3  * Conv. (cfs)           *         *180780.3  *         *
* Length Wtd. (ft)       *  147.00  * Wetted Per. (ft)       *         *  282.84  *         *
* Min Ch El (ft)         * 2510.90  * Shear (lb/sq ft)       *         *    0.67  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *    4.45  *         *
* Frctn Loss (ft)        *    0.37  * Cum Volume (acre-ft)   *         *  120.90  *         *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)         *         *   27.13  *         *
*****************************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 990

INPUT
Description:
Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0   2529   71.19    2531  149.22    2525  159.22    2525  174.02  2510.2
  410.03  2510.2  416.62    2519  420.58    2520  422.41    2521  423.44    2522
  424.47    2523  425.48    2524  426.54    2525  427.53    2526  428.54    2527
   429.6    2528   430.6    2529  431.56    2530  432.54    2531  449.79    2532
  452.84    2533  454.88    2534   456.9    2535  460.69    2536  464.69    2537
  469.64    2538  474.54    2539   478.3    2540  482.08    2541  499.22    2541
  504.31    2540   507.3    2539   549.1    2539  580.36    2537   661.7    2538
   705.6    2538  764.81    2538

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
************************************************
      0     .05  159.22     .03  432.54     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        159.22  432.54              168     168     168            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2524.51  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.60  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2522.91  * Reach Len. (ft)        *  168.00  *  168.00  *  168.00  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)       *         * 3154.68  *         *
* E.G. Slope (ft/ft)     *0.001612  * Area (sq ft)           *         * 3154.68  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)         *  263.06  * Top Width (ft)         *         *  263.06  *         *
* Vel Total (ft/s)       *   10.14  * Avg. Vel. (ft/s)       *         *   10.14  *         *
* Max Chl Dpth (ft)      *   12.71  * Hydr. Depth (ft)       *         *   11.99  *         *
* Conv. Total (cfs)      *796928.6  * Conv. (cfs)            *         *796928.6  *         *
* Length Wtd. (ft)       *  168.00  * Wetted Per. (ft)       *         *  273.89  *         *
* Min Ch El (ft)         * 2510.20  * Shear (lb/sq ft)       *         *    1.16  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   11.76  *         *
* Frctn Loss (ft)        *    0.30  * Cum Volume (acre-ft)   *    2.22  *  278.03  *         *
* C & E Loss (ft)        *    0.04  * Cum SA (acres)         *    0.62  *   27.45  *         *
*****************************************************************************************************

CROSS SECTION OUTPUT  Profile #10 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2515.99  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.83  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2515.16  * Reach Len. (ft)        *  168.00  *  168.00  *  168.00  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)       *         * 1191.87  *         *
* E.G. Slope (ft/ft)     *0.002695  * Area (sq ft)           *         * 1191.87  *         *
* Q Total (cfs)          * 8700.00  * Flow (cfs)             *         * 8700.00  *         *
* Top Width (ft)         *  244.68  * Top Width (ft)         *         *  244.68  *         *
* Vel Total (ft/s)       *    7.30  * Avg. Vel. (ft/s)       *         *    7.30  *         *
* Max Chl Dpth (ft)      *    4.96  * Hydr. Depth (ft)       *         *    4.87  *         *
* Conv. Total (cfs)      *167573.0  * Conv. (cfs)            *         *167573.0  *         *
* Length Wtd. (ft)       *  168.00  * Wetted Per. (ft)       *         *  249.22  *         *
* Min Ch El (ft)         * 2510.20  * Shear (lb/sq ft)       *         *    0.80  *         *
```

```
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *    5.87  *         *
* Frctn Loss (ft)        *    0.48  * Cum Volume (acre-ft)   *         *  116.68  *         *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)         *         *   26.25  *         *
*****************************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 975

INPUT
Description:
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
      0   2529   13.44    2530   73.64    2530   90.63    2525  100.63    2525
  116.23  2509.4  326.78  2509.4  334.94    2519  336.61    2520  338.04    2521
  339.21    2522   340.3    2523  341.46    2524  342.54    2525  343.49    2526
  344.41    2527  345.32    2528  346.26    2529   347.2    2530  354.36    2531
  356.86    2531  357.02    2531  368.19    2532  370.63    2533  373.14    2534
  377.42    2535  382.06    2536  387.37    2537  392.15    2538  396.09    2539
  399.58    2540  410.55    2540  418.34    2539  421.18    2538   462.2    2538

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
      0     .05  100.63     .03   347.2     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        100.63   347.2              151     151     151            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2524.17  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.95  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2522.22  * Reach Len. (ft)        *  151.00  *  151.00  *  151.00  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)       *         * 2855.56  *         *
* E.G. Slope (ft/ft)     *0.001957  * Area (sq ft)           *         * 2855.56  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)         *  236.05  * Top Width (ft)         *         *  236.05  *         *
* Vel Total (ft/s)       *   11.21  * Avg. Vel. (ft/s)        *         *   11.21  *         *
* Max Chl Dpth (ft)      *   12.82  * Hydr. Depth (ft)        *         *   12.10  *         *
* Conv. Total (cfs)      *723452.2  * Conv. (cfs)             *         *723452.2  *         *
* Length Wtd. (ft)       *  151.00  * Wetted Per. (ft)        *         *  246.85  *         *
* Min Ch El (ft)         * 2509.40  * Shear (lb/sq ft)        *         *    1.41  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   15.83  *         *
* Frctn Loss (ft)        *    0.30  * Cum Volume (acre-ft)   *    2.22  *  266.44  *         *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)         *    0.62  *   26.49  *         *
*****************************************************************************************************

CROSS SECTION OUTPUT  Profile #10 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2515.49  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.96  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2514.53  * Reach Len. (ft)        *  151.00  *  151.00  *  151.00  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)       *         * 1104.44  *         *
* E.G. Slope (ft/ft)     *0.003024  * Area (sq ft)           *         * 1104.44  *         *
* Q Total (cfs)          * 8700.00  * Flow (cfs)             *         * 8700.00  *         *
* Top Width (ft)         *  220.04  * Top Width (ft)         *         *  220.04  *         *
* Vel Total (ft/s)       *    7.88  * Avg. Vel. (ft/s)        *         *    7.88  *         *
* Max Chl Dpth (ft)      *    5.13  * Hydr. Depth (ft)        *         *    5.02  *         *
* Conv. Total (cfs)      *158216.1  * Conv. (cfs)             *         *158216.1  *         *
* Length Wtd. (ft)       *  151.00  * Wetted Per. (ft)        *         *  224.54  *         *
* Min Ch El (ft)         * 2509.40  * Shear (lb/sq ft)        *         *    0.93  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *    7.31  *         *
* Frctn Loss (ft)        *    0.45  * Cum Volume (acre-ft)   *         *  112.25  *         *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)         *         *   25.35  *         *
*****************************************************************************************************
```

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 965

INPUT
Description:
Station Elevation Data num= 28
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2529 24.24 2529 44.28 2528 49.27 2527 56.18 2524
66.18 2524 81.48 2508.7 280.69 2508.7 290.69 2518 292.01 2519
293.41 2520 294.74 2521 295.97 2522 297.18 2523 298.34 2524
299.3 2525 300.3 2526 301.26 2527 302.22 2528 303.24 2529
304.18 2530 323.93 2531 325.91 2532 327.91 2533 329.91 2534
335.04 2535 340.64 2536 347.99 2537

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 66.18 .03 304.18 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
66.18 304.18 148 148 148 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2523.87 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 2.03 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2521.84 * Reach Len. (ft) * 148.00 * 148.00 * 148.00 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 2797.61 * *
* E.G. Slope (ft/ft) *0.001993 * Area (sq ft) * * 2797.61 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 227.42 * Top Width (ft) * * 227.42 * *
* Vel Total (ft/s) * 11.44 * Avg. Vel. (ft/s) * * 11.44 * *
* Max Chl Dpth (ft) * 13.14 * Hydr. Depth (ft) * * 12.30 * *
* Conv. Total (cfs) *716756.9 * Conv. (cfs) * *716756.9 * *
* Length Wtd. (ft) * 148.00 * Wetted Per. (ft) * * 237.81 * *
* Min Ch El (ft) * 2508.70 * Shear (lb/sq ft) * * 1.46 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 16.74 * *
* Frctn Loss (ft) * 0.33 * Cum Volume (acre-ft) * 2.22 * 256.64 * *
* C & E Loss (ft) * 0.04 * Cum SA (acres) * 0.62 * 25.69 * *
****

CROSS SECTION OUTPUT Profile #10 year
****
* E.G. Elev (ft) * 2515.05 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 0.97 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2514.08 * Reach Len. (ft) * 148.00 * 148.00 * 148.00 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 1101.40 * *
* E.G. Slope (ft/ft) *0.002875 * Area (sq ft) * * 1101.40 * *
* Q Total (cfs) * 8700.00 * Flow (cfs) * * 8700.00 * *
* Top Width (ft) * 210.37 * Top Width (ft) * * 210.37 * *
* Vel Total (ft/s) * 7.90 * Avg. Vel. (ft/s) * * 7.90 * *
* Max Chl Dpth (ft) * 5.38 * Hydr. Depth (ft) * * 5.24 * *
* Conv. Total (cfs) *162259.2 * Conv. (cfs) * *162259.2 * *
* Length Wtd. (ft) * 148.00 * Wetted Per. (ft) * * 214.71 * *
* Min Ch El (ft) * 2508.70 * Shear (lb/sq ft) * * 0.92 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 7.27 * *
* Frctn Loss (ft) * 0.44 * Cum Volume (acre-ft) * * 108.42 * *
* C & E Loss (ft) * 0.01 * Cum SA (acres) * * 24.60 * *
****

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 950

```
INPUT
Description:
Station Elevation Data    num=      39
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2527   30.62    2527  106.02    2527   113.3    2525  126.75    2523
  136.75    2523  151.85  2507.9  332.49  2507.9  340.64    2517  341.74    2518
  342.88    2519  344.04    2520  345.21    2521  346.36    2522  347.43    2523
  348.48    2524  349.49    2525  350.46    2526   351.5    2527  352.57    2528
  353.69    2529  373.26    2530  375.56    2531  377.95    2532  387.41    2532
  393.05    2531  400.12    2531  408.37    2532  412.67    2533  416.69    2534
  420.58    2535  424.63    2536   449.9    2536  455.61    2535  485.24    2532
  506.85    2533  526.58    2534  542.36    2535  586.79    2536

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0     .05  136.75     .03  353.69     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        136.75  353.69          216.25  206.25   199.7            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2523.50  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    2.47  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2521.03  * Reach Len. (ft)        *  216.25  *  206.25  *  199.70  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)       *         * 2536.56  *         *
* E.G. Slope (ft/ft)     *0.002453  * Area (sq ft)           *         * 2536.56  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)         *  206.52  * Top Width (ft)         *         *  206.52  *         *
* Vel Total (ft/s)       *   12.62  * Avg. Vel. (ft/s)       *         *   12.62  *         *
* Max Chl Dpth (ft)      *   13.13  * Hydr. Depth (ft)       *         *   12.28  *         *
* Conv. Total (cfs)      *646043.1  * Conv. (cfs)            *         *646043.1  *         *
* Length Wtd. (ft)       *  206.28  * Wetted Per. (ft)       *         *  217.54  *         *
* Min Ch El (ft)         * 2507.90  * Shear (lb/sq ft)       *         *    1.79  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   22.53  *         *
* Frctn Loss (ft)        *    0.77  * Cum Volume (acre-ft)   *         *    2.22  *  247.58  *         *
* C & E Loss (ft)        *    0.25  * Cum SA (acres)         *         *    0.62  *   24.95  *         *
*****************************************************************************************************

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 OUTPUT  Profile #10 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2514.60  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.07  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2513.53  * Reach Len. (ft)        *  216.25  *  206.25  *  199.70  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)       *         * 1046.28  *         *
* E.G. Slope (ft/ft)     *0.003024  * Area (sq ft)           *         * 1046.28  *         *
* Q Total (cfs)          * 8700.00  * Flow (cfs)             *         * 8700.00  *         *
* Top Width (ft)         *  191.30  * Top Width (ft)         *         *  191.30  *         *
* Vel Total (ft/s)       *    8.32  * Avg. Vel. (ft/s)       *         *    8.32  *         *
* Max Chl Dpth (ft)      *    5.63  * Hydr. Depth (ft)       *         *    5.47  *         *
* Conv. Total (cfs)      *158207.5  * Conv. (cfs)            *         *158207.5  *         *
* Length Wtd. (ft)       *  206.25  * Wetted Per. (ft)       *         *  196.15  *         *
* Min Ch El (ft)         * 2507.90  * Shear (lb/sq ft)       *         *    1.01  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *    8.37  *         *
* Frctn Loss (ft)        *    0.82  * Cum Volume (acre-ft)   *         *  104.78  *         *
* C & E Loss (ft)        *    0.06  * Cum SA (acres)         *         *   23.92  *         *
*****************************************************************************************************

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: River #1
REACH: Reach #1 RS: 900

INPUT
Description:
Station Elevation Data num= 26
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2526 38.53 2525 40.82 2524 42.06 2523 43.14 2522
52.48 2514 62.48 2514 69.58 2506.9 227.35 2506.9 234.08 2515
235.2 2516 236.25 2517 237.32 2518 238.4 2519 239.49 2520
240.52 2521 241.56 2522 242.54 2523 243.58 2524 244.55 2525
245.52 2526 258.04 2527 266.14 2528 268.5 2529 270.88 2530
275.59 2530

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 62.48 .03 245.52 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
62.48 245.52 159.28 151.88 152.96 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2522.49 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 4.95 * Wt. n-Val. * 0.050 * 0.030 * *
* W.S. Elev (ft) * 2517.54 * Reach Len. (ft) * 159.28 * 151.88 * 152.96 *
* Crit W.S. (ft) * 2517.54 * Flow Area (sq ft) * 42.68 * 1776.45 * *
* E.G. Slope (ft/ft) *0.006266 * Area (sq ft) * 42.68 * 1776.45 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * 197.76 *31802.24 * *
* Top Width (ft) * 188.47 * Top Width (ft) * 14.13 * 174.35 * *
* Vel Total (ft/s) * 17.59 * Avg. Vel. (ft/s) * 4.63 * 17.90 * *
* Max Chl Dpth (ft) * 10.64 * Hydr. Depth (ft) * 3.02 * 10.19 * *
* Conv. Total (cfs) *404245.8 * Conv. (cfs) * 2498.3 *401747.6 * *
* Length Wtd. (ft) * 151.92 * Wetted Per. (ft) * 15.44 * 182.08 * *
* Min Ch El (ft) * 2506.90 * Shear (lb/sq ft) * 1.08 * 3.82 * *
* Alpha * 1.03 * Stream Power (lb/ft s) * 5.01 * 68.33 * *
* Frctn Loss (ft) * 0.96 * Cum Volume (acre-ft) * 2.11 * 237.36 * *
* C & E Loss (ft) * 0.05 * Cum SA (acres) * 0.59 * 24.05 * *
****

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
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 OUTPUT Profile #10 year
****
* E.G. Elev (ft) * 2513.71 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 1.71 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2512.00 * Reach Len. (ft) * 159.28 * 151.88 * 152.96 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 828.45 * *
* E.G. Slope (ft/ft) *0.005510 * Area (sq ft) * * 828.45 * *
* Q Total (cfs) * 8700.00 * Flow (cfs) * * 8700.00 * *
* Top Width (ft) * 167.11 * Top Width (ft) * * 167.11 * *
* Vel Total (ft/s) * 10.50 * Avg. Vel. (ft/s) * * 10.50 * *
* Max Chl Dpth (ft) * 5.10 * Hydr. Depth (ft) * * 4.96 * *
* Conv. Total (cfs) *117207.0 * Conv. (cfs) * *117207.0 * *
* Length Wtd. (ft) * 151.88 * Wetted Per. (ft) * * 171.61 * *
* Min Ch El (ft) * 2506.90 * Shear (lb/sq ft) * * 1.66 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 17.44 * *
* Frctn Loss (ft) * 1.02 * Cum Volume (acre-ft) * * 100.34 * *

```
* C & E Loss (ft)        *    0.04  * Cum SA (acres)        *         *   23.07  *         *
*****************************************************************************************************

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: River #1
REACH: Reach #1          RS: 875

INPUT
Description:
Station Elevation Data    num=      16
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
      0    2525   71.61    2526  118.17    2524  130.44    2513  140.44    2513
  147.24  2506.2  315.26  2506.2  326.26    2518  336.26    2518  338.11    2525
  339.93    2526  341.79    2527  343.82    2528   345.8    2529  348.47    2530
   354.1    2530

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
      0     .05  140.44     .03  326.26     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        140.44  326.26             143     143     143            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2521.18  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    4.78  * Wt. n-Val.           *   0.050  *   0.030  *         *
* W.S. Elev (ft)        * 2516.40  * Reach Len. (ft)       *  143.00  *  143.00  *  143.00  *
* Crit W.S. (ft)        * 2516.40  * Flow Area (sq ft)     *   40.49  * 1809.07  *         *
* E.G. Slope (ft/ft)    *0.006317  * Area (sq ft)          *   40.49  * 1809.07  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *  184.58  *31815.42  *         *
* Top Width (ft)        *  198.13  * Top Width (ft)        *   13.80  *  184.33  *         *
* Vel Total (ft/s)      *   17.30  * Avg. Vel. (ft/s)      *    4.56  *   17.59  *         *
* Max Chl Dpth (ft)     *   10.20  * Hydr. Depth (ft)      *    2.93  *    9.81  *         *
* Conv. Total (cfs)     *402627.2  * Conv. (cfs)           *  2322.4  *400304.8  *         *
* Length Wtd. (ft)      *  143.00  * Wetted Per. (ft)       *   15.10  *  191.59  *         *
* Min Ch El (ft)        * 2506.20  * Shear (lb/sq ft)      *    1.06  *    3.72  *         *
* Alpha                 *    1.03  * Stream Power (lb/ft s) *    4.82  *   65.49  *         *
* Frctn Loss (ft)       *    0.92  * Cum Volume (acre-ft)   *    1.96  *  231.11  *         *
* C & E Loss (ft)       *    0.14  * Cum SA (acres)         *    0.54  *   23.42  *         *
*****************************************************************************************************

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 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 OUTPUT  Profile #10 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2512.64  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    2.13  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2510.52  * Reach Len. (ft)       *  143.00  *  143.00  *  143.00  *
* Crit W.S. (ft)        * 2510.52  * Flow Area (sq ft)     *         *  743.03  *         *
* E.G. Slope (ft/ft)    *0.008441  * Area (sq ft)          *         *  743.03  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  176.36  * Top Width (ft)        *         *  176.36  *         *
* Vel Total (ft/s)      *   11.71  * Avg. Vel. (ft/s)      *         *   11.71  *         *
* Max Chl Dpth (ft)     *    4.32  * Hydr. Depth (ft)      *         *    4.21  *         *
* Conv. Total (cfs)     * 94695.9  * Conv. (cfs)           *         * 94695.9  *         *
* Length Wtd. (ft)      *  143.00  * Wetted Per. (ft)       *         *  180.02  *         *
```

```
* Min Ch El (ft)        * 2506.20  * Shear (lb/sq ft)       *         *    2.17  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   25.47  *         *
* Frctn Loss (ft)       *    1.16  * Cum Volume (acre-ft)   *         *   97.60  *         *
* C & E Loss (ft)       *    0.11  * Cum SA (acres)         *         *   22.47  *         *
*****************************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program selected the water surface that had the least amount of error between computed and
         assumed values.
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: River #1
REACH: Reach #1          RS: 865

INPUT
Description:
Station Elevation Data    num=      34
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2525   56.88    2524   75.16    2512   85.16    2512   91.66  2505.5
  294.65  2505.5  304.65    2517  314.65    2517  315.34    2522  317.65    2523
  319.58    2524  321.52    2525   323.5    2526  325.43    2527  328.41    2528
  337.65    2528  342.68    2527  346.63    2526  349.83    2525  352.94    2524
  355.98    2523  359.09    2522  362.16    2521  365.61    2520  371.65    2519
  377.12    2518  434.01    2527  452.14    2527  471.63    2527  489.27    2526
  504.43    2525  519.54    2524  534.64    2523  584.46    2523

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***************************************************
      0     .05   85.16     .03  304.65     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         85.16  304.65             153     153     153            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2518.86  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    4.30  * Wt. n-Val.             *   0.050  *   0.030  *         *
* W.S. Elev (ft)         * 2514.56  * Reach Len. (ft)        *  153.00  *  153.00  *  153.00  *
* Crit W.S. (ft)         * 2514.56  * Flow Area (sq ft)      *   30.53  * 1911.55  *         *
* E.G. Slope (ft/ft)     *0.006509  * Area (sq ft)           *   30.53  * 1911.55  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *  119.38  *31880.63  *         *
* Top Width (ft)         *  231.26  * Top Width (ft)         *   13.89  *  217.36  *         *
* Vel Total (ft/s)       *   16.48  * Avg. Vel. (ft/s)       *    3.91  *   16.68  *         *
* Max Chl Dpth (ft)      *    9.06  * Hydr. Depth (ft)       *    2.20  *    8.79  *         *
* Conv. Total (cfs)      *396647.0  * Conv. (cfs)            *  1479.7  *395167.3  *         *
* Length Wtd. (ft)       *  153.00  * Wetted Per. (ft)       *   14.66  *  224.18  *         *
* Min Ch El (ft)         * 2505.50  * Shear (lb/sq ft)       *    0.85  *    3.46  *         *
* Alpha                  *    1.02  * Stream Power (lb/ft s) *    3.31  *   57.78  *         *
* Frctn Loss (ft)        *    0.85  * Cum Volume (acre-ft)   *    1.85  *  225.01  *         *
* C & E Loss (ft)        *    0.33  * Cum SA (acres)         *    0.49  *   22.77  *         *
*****************************************************************************************************

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 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 OUTPUT Profile #10 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2511.21  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.77  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2509.44  * Reach Len. (ft)       *  153.00  *  153.00  *  153.00  *
* Crit W.S. (ft)        * 2509.32  * Flow Area (sq ft)     *         *  814.28  *         *
* E.G. Slope (ft/ft)    *0.007822  * Area (sq ft)          *         *  814.28  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  210.36  * Top Width (ft)        *         *  210.36  *         *
* Vel Total (ft/s)      *   10.68  * Avg. Vel. (ft/s)      *         *   10.68  *         *
* Max Chl Dpth (ft)     *    3.94  * Hydr. Depth (ft)      *         *    3.87  *         *
* Conv. Total (cfs)     * 98366.5  * Conv. (cfs)           *         * 98366.5  *         *
* Length Wtd. (ft)      *  153.00  * Wetted Per. (ft)      *         *  213.78  *         *
* Min Ch El (ft)        * 2505.50  * Shear (lb/sq ft)      *         *    1.86  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   19.87  *         *
* Frctn Loss (ft)       *    0.95  * Cum Volume (acre-ft)   *         *   95.04  *         *
* C & E Loss (ft)       *    0.17  * Cum SA (acres)         *         *   21.84  *         *
*****************************************************************************************
```

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: River #1
REACH: Reach #1 RS: 850

INPUT
Description:
Station Elevation Data num= 12

```
   Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev
*****************************************************************************
     0   2524   24.24   2523   36.83   2511   46.83   2511   53.03  2504.8
  290.73  2504.8  300.73   2516  310.73   2516  337.23   2520  337.75   2521
  338.33   2522   346.1   2523
```

Manning's n Values num= 3

```
   Sta   n Val    Sta   n Val    Sta   n Val
*************************************************
     0    .05   46.83    .03  300.73    .05
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
46.83 300.73 199.45 202 207.35 .1 .3

CROSS SECTION OUTPUT Profile #100 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2517.02  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    3.20  * Wt. n-Val.           *   0.050  *   0.030  *         *
* W.S. Elev (ft)        * 2513.82  * Reach Len. (ft)       *  199.45  *  202.00  *  207.35  *
* Crit W.S. (ft)        * 2512.96  * Flow Area (sq ft)     *   32.43  * 2218.19  *         *
* E.G. Slope (ft/ft)    *0.004795  * Area (sq ft)          *   32.43  * 2218.19  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *  116.32  *31883.68  *         *
* Top Width (ft)        *  264.92  * Top Width (ft)        *   12.96  *  251.96  *         *
* Vel Total (ft/s)      *   14.22  * Avg. Vel. (ft/s)      *    3.59  *   14.37  *         *
* Max Chl Dpth (ft)     *    9.02  * Hydr. Depth (ft)      *    2.50  *    8.80  *         *
* Conv. Total (cfs)     *462103.8  * Conv. (cfs)           *  1679.7  *460424.1  *         *
* Length Wtd. (ft)      *  202.00  * Wetted Per. (ft)      *   14.09  *  258.57  *         *
* Min Ch El (ft)        * 2504.80  * Shear (lb/sq ft)      *    0.69  *    2.57  *         *
* Alpha                 *    1.02  * Stream Power (lb/ft s) *    2.47  *   36.92  *         *
* Frctn Loss (ft)       *    0.87  * Cum Volume (acre-ft)   *    1.73  *  217.75  *         *
* C & E Loss (ft)       *    0.15  * Cum SA (acres)         *    0.44  *   21.94  *         *
*****************************************************************************************
```

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 OUTPUT Profile #10 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2510.09  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.21  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2508.89  * Reach Len. (ft)       *  199.45  *  202.00  *  207.35  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         *  986.67  *         *
* E.G. Slope (ft/ft)    *0.005053  * Area (sq ft)          *         *  986.67  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  245.43  * Top Width (ft)        *         *  245.43  *         *
* Vel Total (ft/s)      *    8.82  * Avg. Vel. (ft/s)      *         *    8.82  *         *
* Max Chl Dpth (ft)     *    4.08  * Hydr. Depth (ft)      *         *    4.02  *         *
* Conv. Total (cfs)     *122390.9  * Conv. (cfs)           *         *122390.9  *         *
* Length Wtd. (ft)      *  202.00  * Wetted Per. (ft)       *         *  248.95  *         *
* Min Ch El (ft)        * 2504.80  * Shear (lb/sq ft)       *         *    1.25  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   11.02  *         *
* Frctn Loss (ft)       *    0.97  * Cum Volume (acre-ft)   *         *   91.88  *         *
* C & E Loss (ft)       *    0.03  * Cum SA (acres)         *         *   21.04  *         *
*****************************************************************************************
```

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: River #1
REACH: Reach #1 RS: 825

INPUT
Description:
Station Elevation Data num= 13

```
    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev    Sta   Elev
*****************************************************************************
     0   2523   4.12   2522   7.04   2521   7.67   2520  26.03   2516
  36.03   2516  48.13  2503.9  297.17  2503.9  308.17   2516  318.17   2516
 343.25   2519  345.95   2520  357.95   2521
```

Manning's n Values num= 3

```
    Sta   n Val    Sta   n Val    Sta   n Val
*************************************************
     0    .05   36.03    .03  308.17    .05
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
36.03 308.17 112.29 110.49 112.71 .1 .3

CROSS SECTION OUTPUT Profile #100 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2516.00  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    2.71  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2513.30  * Reach Len. (ft)       *  112.29  *  110.49  *  112.71  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         * 2424.05  *         *
* E.G. Slope (ft/ft)    *0.003902  * Area (sq ft)          *         * 2424.05  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  266.98  * Top Width (ft)        *         *  266.98  *         *
* Vel Total (ft/s)      *   13.20  * Avg. Vel. (ft/s)      *         *   13.20  *         *
* Max Chl Dpth (ft)     *    9.40  * Hydr. Depth (ft)      *         *    9.08  *         *
* Conv. Total (cfs)     *512307.4  * Conv. (cfs)           *         *512307.4  *         *
* Length Wtd. (ft)      *  110.49  * Wetted Per. (ft)       *         *  275.02  *         *
* Min Ch El (ft)        * 2503.90  * Shear (lb/sq ft)       *         *    2.15  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   28.34  *         *
* Frctn Loss (ft)       *    0.46  * Cum Volume (acre-ft)   *    1.66  *  206.99  *         *
* C & E Loss (ft)       *    0.03  * Cum SA (acres)         *    0.41  *   20.74  *         *
*****************************************************************************************
```

CROSS SECTION OUTPUT Profile #10 year

```
*****************************************************************************************
* E.G. Elev (ft)        * 2509.09  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.10  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2507.99  * Reach Len. (ft)       *  112.29  *  110.49  *  112.71  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         * 1034.25  *         *
```

```
* E.G. Slope (ft/ft)     *0.004584  * Area (sq ft)          *         * 1034.25  *         *
* Q Total (cfs)          * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)         *  256.85  * Top Width (ft)        *         *  256.85  *         *
* Vel Total (ft/s)       *    8.41  * Avg. Vel. (ft/s)      *         *    8.41  *         *
* Max Chl Dpth (ft)      *    4.09  * Hydr. Depth (ft)      *         *    4.03  *         *
* Conv. Total (cfs)      *128493.2  * Conv. (cfs)           *         *128493.2  *         *
* Length Wtd. (ft)       *  110.49  * Wetted Per. (ft)      *         *  260.35  *         *
* Min Ch El (ft)         * 2503.90  * Shear (lb/sq ft)      *         *    1.14  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *    9.56  *         *
* Frctn Loss (ft)        *    0.52  * Cum Volume (acre-ft)   *         *   87.19  *         *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)         *         *   19.87  *         *
*****************************************************************************************************
```

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 800

INPUT
Description:
Station Elevation Data num= 13

```
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
      0    2522  170.51    2521  185.01    2514  195.01    2514  205.71  2503.3
  447.16  2503.3  456.16    2514  466.16    2514  488.24    2519  496.98    2520
  554.82    2521  707.06    2522  733.08    2522
```

Manning's n Values num= 3

```
    Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
      0     .05  195.01     .03  456.16     .05
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
195.01 456.16 269.64 259.44 283.92 .1 .3

CROSS SECTION OUTPUT Profile #100 year

```
*****************************************************************************************************
* E.G. Elev (ft)         * 2515.51  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    3.00  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2512.51  * Reach Len. (ft)        *  269.64  *  259.44  *  283.92  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)       *         * 2301.07  *         *
* E.G. Slope (ft/ft)     *0.004450  * Area (sq ft)           *         * 2301.07  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)         *  258.40  * Top Width (ft)         *         *  258.40  *         *
* Vel Total (ft/s)       *   13.91  * Avg. Vel. (ft/s)       *         *   13.91  *         *
* Max Chl Dpth (ft)      *    9.21  * Hydr. Depth (ft)       *         *    8.91  *         *
* Conv. Total (cfs)      *479687.2  * Conv. (cfs)            *         *479687.2  *         *
* Length Wtd. (ft)       *  259.44  * Wetted Per. (ft)       *         *  266.50  *         *
* Min Ch El (ft)         * 2503.30  * Shear (lb/sq ft)       *         *    2.40  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   33.36  *         *
* Frctn Loss (ft)        *    1.28  * Cum Volume (acre-ft)   *    1.66  *  201.00  *         *
* C & E Loss (ft)        *    0.04  * Cum SA (acres)         *    0.41  *   20.07  *         *
*****************************************************************************************************
```

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 OUTPUT Profile #10 year

```
*****************************************************************************************************
* E.G. Elev (ft)         * 2508.56  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.17  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2507.39  * Reach Len. (ft)        *  269.64  *  259.44  *  283.92  *
* Crit W.S. (ft)         *         * Flow Area (sq ft)       *         * 1002.59  *         *
* E.G. Slope (ft/ft)     *0.004884  * Area (sq ft)           *         * 1002.59  *         *
* Q Total (cfs)          * 8700.00  * Flow (cfs)             *         * 8700.00  *         *
* Top Width (ft)         *  248.98  * Top Width (ft)         *         *  248.98  *         *
* Vel Total (ft/s)       *    8.68  * Avg. Vel. (ft/s)       *         *    8.68  *         *
* Max Chl Dpth (ft)      *    4.09  * Hydr. Depth (ft)       *         *    4.03  *         *
* Conv. Total (cfs)      *124494.6  * Conv. (cfs)            *         *124494.6  *         *
```

```
* Length Wtd. (ft)      *  259.44  * Wetted Per. (ft)      *        *  252.57  *        *
* Min Ch El (ft)        * 2503.30  * Shear (lb/sq ft)      *        *    1.21  *        *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *   10.50  *        *
* Frctn Loss (ft)       *    1.30  * Cum Volume (acre-ft)   *        *   84.61  *        *
* C & E Loss (ft)       *    0.00  * Cum SA (acres)         *        *   19.23  *        *
*****************************************************************************************

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: River #1
REACH: Reach #1          RS: 750

INPUT
Description:
Station Elevation Data    num=      11
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2518   79.43    2513   89.43    2513   90.43    2502  332.42    2502
  340.61    2513  350.61    2513  362.84    2518  363.83    2518  372.89    2518
  382.01    2519

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***************************************************
      0     .05   89.43     .03  340.61     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        89.43  340.61           249.1  245.15  242.35            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)        * 2514.19  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    3.45  * Wt. n-Val.             *        *   0.030  *        *
* W.S. Elev (ft)        * 2510.75  * Reach Len. (ft)        *  249.10  *  245.15  *  242.35  *
* Crit W.S. (ft)        * 2510.10  * Flow Area (sq ft)      *        * 2148.30  *        *
* E.G. Slope (ft/ft)    *0.005461  * Area (sq ft)           *        * 2148.30  *        *
* Q Total (cfs)         *32000.00  * Flow (cfs)             *        *32000.00  *        *
* Top Width (ft)        *  249.30  * Top Width (ft)         *        *  249.30  *        *
* Vel Total (ft/s)      *   14.90  * Avg. Vel. (ft/s)       *        *   14.90  *        *
* Max Chl Dpth (ft)     *    8.75  * Hydr. Depth (ft)       *        *    8.62  *        *
* Conv. Total (cfs)     *433035.5  * Conv. (cfs)            *        *433035.5  *        *
* Length Wtd. (ft)      *  245.15  * Wetted Per. (ft)       *        *  261.68  *        *
* Min Ch El (ft)        * 2502.00  * Shear (lb/sq ft)       *        *    2.80  *        *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *   41.69  *        *
* Frctn Loss (ft)       *    1.24  * Cum Volume (acre-ft)   *    1.66  *  187.75  *        *
* C & E Loss (ft)       *    0.11  * Cum SA (acres)         *    0.41  *   18.56  *        *
*****************************************************************************************

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 OUTPUT  Profile #10 year
*****************************************************************************************
* E.G. Elev (ft)        * 2507.25  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.21  * Wt. n-Val.             *        *   0.030  *        *
* W.S. Elev (ft)        * 2506.04  * Reach Len. (ft)        *  249.10  *  245.15  *  242.35  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)       *        *  984.41  *        *
* E.G. Slope (ft/ft)    *0.005150  * Area (sq ft)           *        *  984.41  *        *
* Q Total (cfs)         * 8700.00  * Flow (cfs)             *        * 8700.00  *        *
* Top Width (ft)        *  245.37  * Top Width (ft)         *        *  245.37  *        *
* Vel Total (ft/s)      *    8.84  * Avg. Vel. (ft/s)       *        *    8.84  *        *
* Max Chl Dpth (ft)     *    4.04  * Hydr. Depth (ft)       *        *    4.01  *        *
* Conv. Total (cfs)     *121232.9  * Conv. (cfs)            *        *121232.9  *        *
* Length Wtd. (ft)      *  245.15  * Wetted Per. (ft)       *        *  251.08  *        *
* Min Ch El (ft)        * 2502.00  * Shear (lb/sq ft)       *        *    1.26  *        *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *        *   11.14  *        *
```

```
* Frctn Loss (ft)       *    1.21  * Cum Volume (acre-ft)   *         *   78.69  *         *
* C & E Loss (ft)       *    0.02  * Cum SA (acres)         *         *   17.76  *         *
*********************************************************************************************

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: River #1
REACH: Reach #1          RS: 700

INPUT
Description:
Station Elevation Data    num=       9
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
     0    2518   92.14    2512  102.14    2512  113.34  2500.8  358.68  2500.8
  368.68    2512  378.68    2512  402.46    2517  548.15    2518

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
     0     .05  102.14     .03  368.68     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        102.14  368.68          293.94  294.12  299.33            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*********************************************************************************************
* E.G. Elev (ft)        * 2512.84  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    3.07  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)        * 2509.77  * Reach Len. (ft)        *  293.94  *  294.12  *  299.33  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)      *         * 2277.36  *         *
* E.G. Slope (ft/ft)    *0.004689  * Area (sq ft)           *         * 2277.36  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)        *  262.32  * Top Width (ft)         *         *  262.32  *         *
* Vel Total (ft/s)      *   14.05  * Avg. Vel. (ft/s)       *         *   14.05  *         *
* Max Chl Dpth (ft)     *    8.97  * Hydr. Depth (ft)       *         *    8.68  *         *
* Conv. Total (cfs)     *467328.9  * Conv. (cfs)            *         *467328.9  *         *
* Length Wtd. (ft)      *  294.12  * Wetted Per. (ft)       *         *  270.06  *         *
* Min Ch El (ft)        * 2500.80  * Shear (lb/sq ft)       *         *    2.47  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   34.69  *         *
* Frctn Loss (ft)       *    1.35  * Cum Volume (acre-ft)   *    1.66  *  175.29  *         *
* C & E Loss (ft)       *    0.02  * Cum SA (acres)         *    0.41  *   17.12  *         *
*********************************************************************************************

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 OUTPUT  Profile #10 year
*********************************************************************************************
* E.G. Elev (ft)        * 2506.02  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.14  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)        * 2504.88  * Reach Len. (ft)        *  293.94  *  294.12  *  299.33  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)      *         * 1016.21  *         *
* E.G. Slope (ft/ft)    *0.004768  * Area (sq ft)           *         * 1016.21  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)             *         * 8700.00  *         *
* Top Width (ft)        *  253.06  * Top Width (ft)         *         *  253.06  *         *
* Vel Total (ft/s)      *    8.56  * Avg. Vel. (ft/s)       *         *    8.56  *         *
* Max Chl Dpth (ft)     *    4.08  * Hydr. Depth (ft)       *         *    4.02  *         *
* Conv. Total (cfs)     *125999.4  * Conv. (cfs)            *         *125999.4  *         *
* Length Wtd. (ft)      *  294.12  * Wetted Per. (ft)       *         *  256.57  *         *
* Min Ch El (ft)        * 2500.80  * Shear (lb/sq ft)       *         *    1.18  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   10.09  *         *
* Frctn Loss (ft)       *    1.41  * Cum Volume (acre-ft)   *         *   73.06  *         *
* C & E Loss (ft)       *    0.00  * Cum SA (acres)         *         *   16.36  *         *
*********************************************************************************************
```

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: River #1
REACH: Reach #1 RS: 650

INPUT
Description:
Station Elevation Data num= 12
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2516 43.8 2516 95.36 2514 112.67 2511 122.67 2511
134.27 2499.4 380.07 2499.4 390.07 2511 400.07 2511 428.98 2514
447.53 2515 461.5 2516

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 122.67 .03 390.07 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
122.67 390.07 225.9 219.6 226.45 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2511.46 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 2.98 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2508.48 * Reach Len. (ft) * 225.90 * 219.60 * 226.45 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 2308.58 * *
* E.G. Slope (ft/ft) *0.004493 * Area (sq ft) * * 2308.58 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 262.71 * Top Width (ft) * * 262.71 * *
* Vel Total (ft/s) * 13.86 * Avg. Vel. (ft/s) * * 13.86 * *
* Max Chl Dpth (ft) * 9.08 * Hydr. Depth (ft) * * 8.79 * *
* Conv. Total (cfs) *477382.3 * Conv. (cfs) * *477382.3 * *
* Length Wtd. (ft) * 219.60 * Wetted Per. (ft) * * 270.63 * *
* Min Ch El (ft) * 2499.40 * Shear (lb/sq ft) * * 2.39 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 33.17 * *
* Frctn Loss (ft) * 0.95 * Cum Volume (acre-ft) * 1.66 * 159.81 * *
* C & E Loss (ft) * 0.04 * Cum SA (acres) * 0.41 * 15.35 * *
****

CROSS SECTION OUTPUT Profile #10 year
****
* E.G. Elev (ft) * 2504.60 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 1.15 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2503.46 * Reach Len. (ft) * 225.90 * 219.60 * 226.45 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 1012.07 * *
* E.G. Slope (ft/ft) *0.004841 * Area (sq ft) * * 1012.07 * *
* Q Total (cfs) * 8700.00 * Flow (cfs) * * 8700.00 * *
* Top Width (ft) * 253.35 * Top Width (ft) * * 253.35 * *
* Vel Total (ft/s) * 8.60 * Avg. Vel. (ft/s) * * 8.60 * *
* Max Chl Dpth (ft) * 4.06 * Hydr. Depth (ft) * * 3.99 * *
* Conv. Total (cfs) *125044.1 * Conv. (cfs) * *125044.1 * *
* Length Wtd. (ft) * 219.60 * Wetted Per. (ft) * * 256.89 * *
* Min Ch El (ft) * 2499.40 * Shear (lb/sq ft) * * 1.19 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 10.23 * *
* Frctn Loss (ft) * 1.02 * Cum Volume (acre-ft) * * 66.22 * *
* C & E Loss (ft) * 0.01 * Cum SA (acres) * * 14.65 * *
****

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: River #1
REACH: Reach #1 RS: 600

INPUT
Description:
Station Elevation Data num= 23
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2516 5.03 2515 7.53 2514 8.86 2514 39.93 2515
54.49 2516 74.68 2516 80.26 2515 82.96 2514 86.05 2513
98.03 2512 126.25 2512 141.36 2510 151.36 2510 163.06 2498.3
407.17 2498.3 418.17 2510 428.17 2510 446.66 2512 488.33 2513
504.23 2514 673.38 2515 815.39 2516

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 151.36 .03 418.17 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
151.36 418.17 296.16 292.56 291.61 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2510.48 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 2.86 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2507.62 * Reach Len. (ft) * 296.16 * 292.56 * 291.61 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 2358.43 * *
* E.G. Slope (ft/ft) *0.004173 * Area (sq ft) * * 2358.43 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 262.19 * Top Width (ft) * * 262.19 * *
* Vel Total (ft/s) * 13.57 * Avg. Vel. (ft/s) * * 13.57 * *
* Max Chl Dpth (ft) * 9.32 * Hydr. Depth (ft) * * 9.00 * *
* Conv. Total (cfs) *495363.8 * Conv. (cfs) * *495363.8 * *
* Length Wtd. (ft) * 292.56 * Wetted Per. (ft) * * 270.07 * *
* Min Ch El (ft) * 2498.30 * Shear (lb/sq ft) * * 2.28 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 30.87 * *
* Frctn Loss (ft) * 1.18 * Cum Volume (acre-ft) * 1.66 * 148.05 * *
* C & E Loss (ft) * 0.02 * Cum SA (acres) * 0.41 * 14.02 * *
****

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 OUTPUT Profile #10 year
****
* E.G. Elev (ft) * 2503.57 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 1.10 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2502.47 * Reach Len. (ft) * 296.16 * 292.56 * 291.61 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 1033.74 * *
* E.G. Slope (ft/ft) *0.004483 * Area (sq ft) * * 1033.74 * *
* Q Total (cfs) * 8700.00 * Flow (cfs) * * 8700.00 * *
* Top Width (ft) * 252.19 * Top Width (ft) * * 252.19 * *
* Vel Total (ft/s) * 8.42 * Avg. Vel. (ft/s) * * 8.42 * *
* Max Chl Dpth (ft) * 4.17 * Hydr. Depth (ft) * * 4.10 * *
* Conv. Total (cfs) *129932.6 * Conv. (cfs) * *129932.6 * *
* Length Wtd. (ft) * 292.56 * Wetted Per. (ft) * * 255.72 * *
* Min Ch El (ft) * 2498.30 * Shear (lb/sq ft) * * 1.13 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 9.52 * *
* Frctn Loss (ft) * 1.42 * Cum Volume (acre-ft) * * 61.06 * *
* C & E Loss (ft) * 0.01 * Cum SA (acres) * * 13.37 * *
****

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: River #1

```
REACH: Reach #1          RS: 550

INPUT
Description:
Station Elevation Data    num=      17
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2515   61.52    2515  103.09    2514  105.64    2513  107.96    2512
  109.8    2511  111.38    2510  112.99    2509   119.7    2508   129.7    2508
  140.8  2496.9  381.53  2496.9  390.53    2508  400.53    2508  425.74    2511
 455.31    2512  497.23    2513

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***************************************************
      0     .05   129.7     .03  390.53     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        129.7  390.53          174.16  170.24  169.04            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*********************************************************************************************
* E.G. Elev (ft)         * 2509.27  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    2.78  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2506.49  * Reach Len. (ft)        *  174.16  *  170.24  *  169.04  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)      *         * 2391.77  *         *
* E.G. Slope (ft/ft)     *0.003915  * Area (sq ft)           *         * 2391.77  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)         *  258.09  * Top Width (ft)         *         *  258.09  *         *
* Vel Total (ft/s)       *   13.38  * Avg. Vel. (ft/s)       *         *   13.38  *         *
* Max Chl Dpth (ft)      *    9.59  * Hydr. Depth (ft)       *         *    9.27  *         *
* Conv. Total (cfs)      *511435.4  * Conv. (cfs)            *         *511435.4  *         *
* Length Wtd. (ft)       *  170.25  * Wetted Per. (ft)        *         *  266.64  *         *
* Min Ch El (ft)         * 2496.90  * Shear (lb/sq ft)       *         *    2.19  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   29.33  *         *
* Frctn Loss (ft)        *    0.56  * Cum Volume (acre-ft)   *    1.66  *  132.10  *         *
* C & E Loss (ft)        *    0.17  * Cum SA (acres)         *    0.41  *   12.28  *         *
*********************************************************************************************

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 OUTPUT  Profile #10 year
*********************************************************************************************
* E.G. Elev (ft)         * 2502.13  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.23  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)         * 2500.90  * Reach Len. (ft)        *  174.16  *  170.24  *  169.04  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)      *         *  976.92  *         *
* E.G. Slope (ft/ft)     *0.005295  * Area (sq ft)           *         *  976.92  *         *
* Q Total (cfs)          * 8700.00  * Flow (cfs)             *         * 8700.00  *         *
* Top Width (ft)         *  247.97  * Top Width (ft)         *         *  247.97  *         *
* Vel Total (ft/s)       *    8.91  * Avg. Vel. (ft/s)       *         *    8.91  *         *
* Max Chl Dpth (ft)      *    4.00  * Hydr. Depth (ft)       *         *    3.94  *         *
* Conv. Total (cfs)      *119558.2  * Conv. (cfs)            *         *119558.2  *         *
* Length Wtd. (ft)       *  170.24  * Wetted Per. (ft)        *         *  251.53  *         *
* Min Ch El (ft)         * 2496.90  * Shear (lb/sq ft)       *         *    1.28  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *   11.43  *         *
* Frctn Loss (ft)        *    0.85  * Cum Volume (acre-ft)   *         *   54.31  *         *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)         *         *   11.69  *         *
*********************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 500

INPUT
Description:
Station Elevation Data    num=      26
```

```
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2515   25.13    2514   48.43    2513   49.79    2512   51.21    2511
   52.21    2510    53.2    2509   59.88    2502   69.88    2502   75.78  2496.1
  327.24  2496.1  336.24    2508  346.24    2508  349.82    2508   362.9    2509
  366.79    2510  371.25    2511  402.18    2512  409.65    2512  433.25    2511
   454.4    2511  482.62    2513  540.62    2513  626.61    2513  750.39    2514
  852.01    2515

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
************************************************
      0     .05   69.88     .03  336.24     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        69.88  336.24          312.55  311.99  314.79            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2508.54  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    2.23  * Wt. n-Val.             *   0.050  *   0.030  *         *
* W.S. Elev (ft)        * 2506.31  * Reach Len. (ft)        *  312.55  *  311.99  *  314.79  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)      *   51.95  * 2649.33  *         *
* E.G. Slope (ft/ft)    *0.002835  * Area (sq ft)           *   51.95  * 2649.33  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)             *  180.56  *31819.44  *         *
* Top Width (ft)        *  279.19  * Top Width (ft)         *   14.11  *  265.08  *         *
* Vel Total (ft/s)      *   11.85  * Avg. Vel. (ft/s)       *    3.48  *   12.01  *         *
* Max Chl Dpth (ft)     *   10.21  * Hydr. Depth (ft)       *    3.68  *    9.99  *         *
* Conv. Total (cfs)     *600993.6  * Conv. (cfs)            *  3391.1  *597602.4  *         *
* Length Wtd. (ft)      *  311.99  * Wetted Per. (ft)       *   15.96  *  272.60  *         *
* Min Ch El (ft)        * 2496.10  * Shear (lb/sq ft)       *    0.58  *    1.72  *         *
* Alpha                 *    1.02  * Stream Power (lb/ft s) *    2.00  *   20.66  *         *
* Frctn Loss (ft)       *    0.76  * Cum Volume (acre-ft)   *    1.56  *  122.25  *         *
* C & E Loss (ft)       *    0.11  * Cum SA (acres)         *    0.39  *   11.26  *         *
*****************************************************************************************************

CROSS SECTION OUTPUT  Profile #10 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2501.24  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.12  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)        * 2500.13  * Reach Len. (ft)        *  312.55  *  311.99  *  314.79  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)      *         * 1026.45  *         *
* E.G. Slope (ft/ft)    *0.004746  * Area (sq ft)           *         * 1026.45  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)             *         * 8700.00  *         *
* Top Width (ft)        *  258.53  * Top Width (ft)         *         *  258.53  *         *
* Vel Total (ft/s)      *    8.48  * Avg. Vel. (ft/s)       *         *    8.48  *         *
* Max Chl Dpth (ft)     *    4.03  * Hydr. Depth (ft)       *         *    3.97  *         *
* Conv. Total (cfs)     *126285.0  * Conv. (cfs)            *         *126285.0  *         *
* Length Wtd. (ft)      *  311.99  * Wetted Per. (ft)       *         *  262.20  *         *
* Min Ch El (ft)        * 2496.10  * Shear (lb/sq ft)       *         *    1.16  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *    9.83  *         *
* Frctn Loss (ft)       *    1.43  * Cum Volume (acre-ft)   *         *   50.39  *         *
* C & E Loss (ft)       *    0.01  * Cum SA (acres)         *         *   10.70  *         *
*****************************************************************************************************

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: River #1
REACH: Reach #1          RS: 450

INPUT
Description:
Station Elevation Data    num=      19
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2513   35.18    2512   47.41    2511   50.12    2510   51.27    2509
```

```
  52.21    2508   53.19    2507   54.73    2506   58.43    2505   60.57    2501
  70.57    2501   76.97  2494.6  327.04  2494.6  336.04    2507  346.04    2507
 370.97    2507  379.33    2508  386.29    2509  427.13    2510

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0     .05   70.57     .03  336.04     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        70.57  336.04          276.48  275.94     282            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)        * 2507.67  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.86  * Wt. n-Val.           *   0.050  *   0.030  *         *
* W.S. Elev (ft)        * 2505.80  * Reach Len. (ft)      *  276.48  *  275.94  *  282.00  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *   55.24  * 2898.53  *         *
* E.G. Slope (ft/ft)    *0.002107  * Area (sq ft)         *   55.24  * 2898.53  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)           *  161.42  *31838.59  *         *
* Top Width (ft)        *  279.72  * Top Width (ft)        *   15.11  *  264.60  *         *
* Vel Total (ft/s)      *   10.83  * Avg. Vel. (ft/s)      *    2.92  *   10.98  *         *
* Max Chl Dpth (ft)     *   11.20  * Hydr. Depth (ft)      *    3.65  *   10.95  *         *
* Conv. Total (cfs)     *697099.5  * Conv. (cfs)           *  3516.3  *693583.2  *         *
* Length Wtd. (ft)      *  275.94  * Wetted Per. (ft)      *   17.62  *  272.96  *         *
* Min Ch El (ft)        * 2494.60  * Shear (lb/sq ft)      *    0.41  *    1.40  *         *
* Alpha                 *    1.02  * Stream Power (lb/ft s) *    1.21  *   15.34  *         *
* Frctn Loss (ft)       *    0.50  * Cum Volume (acre-ft)  *    1.17  *  102.38  *         *
* C & E Loss (ft)       *    0.09  * Cum SA (acres)        *    0.28  *    9.36  *         *
*****************************************************************************************

CROSS SECTION OUTPUT  Profile #10 year
*****************************************************************************************
* E.G. Elev (ft)        * 2499.80  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.08  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2498.72  * Reach Len. (ft)      *  276.48  *  275.94  *  282.00  *
* Crit W.S. (ft)        *         * Flow Area (sq ft)     *         * 1044.15  *         *
* E.G. Slope (ft/ft)    *0.004455  * Area (sq ft)         *         * 1044.15  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)           *         * 8700.00  *         *
* Top Width (ft)        *  257.18  * Top Width (ft)        *         *  257.18  *         *
* Vel Total (ft/s)      *    8.33  * Avg. Vel. (ft/s)      *         *    8.33  *         *
* Max Chl Dpth (ft)     *    4.12  * Hydr. Depth (ft)      *         *    4.06  *         *
* Conv. Total (cfs)     *130339.0  * Conv. (cfs)           *         *130339.0  *         *
* Length Wtd. (ft)      *  275.94  * Wetted Per. (ft)      *         *  260.98  *         *
* Min Ch El (ft)        * 2494.60  * Shear (lb/sq ft)      *         *    1.11  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *    9.27  *         *
* Frctn Loss (ft)       *    0.98  * Cum Volume (acre-ft)  *         *   42.98  *         *
* C & E Loss (ft)       *    0.07  * Cum SA (acres)        *         *    8.86  *         *
*****************************************************************************************

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: River #1
REACH: Reach #1          RS: 400

INPUT
Description:
Station Elevation Data    num=      24
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2512    9.62    2513   19.24    2514   74.73    2515  222.35    2515
  290.86    2513  325.73    2512  328.66    2511  331.67    2510  334.05    2509
  335.22    2508  336.46    2507  339.73    2506  340.45    2500  350.45    2500
  357.25  2493.2  605.02  2493.2  616.02    2507  626.02    2507  649.35    2507
  651.69    2508  690.61    2508  784.38    2509  870.86    2510
```

```
Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0     .05  350.45     .03  616.02     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        350.45  616.02            248.4   246.4   244.4            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)         * 2507.08  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.56  * Wt. n-Val.           *   0.050  *   0.030  *         *
* W.S. Elev (ft)         * 2505.52  * Reach Len. (ft)      *  248.40  *  246.40  *  244.40  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)    *   57.06  * 3174.47  *         *
* E.G. Slope (ft/ft)     *0.001558  * Area (sq ft)         *   57.06  * 3174.47  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)           *  159.14  *31840.86  *         *
* Top Width (ft)         *  275.06  * Top Width (ft)        *   10.66  *  264.39  *         *
* Vel Total (ft/s)       *    9.90  * Avg. Vel. (ft/s)      *    2.79  *   10.03  *         *
* Max Chl Dpth (ft)      *   12.32  * Hydr. Depth (ft)      *    5.35  *   12.01  *         *
* Conv. Total (cfs)      *810764.3  * Conv. (cfs)           *  4032.0  *806732.3  *         *
* Length Wtd. (ft)       *  246.41  * Wetted Per. (ft)      *   15.56  *  273.15  *         *
* Min Ch El (ft)         * 2493.20  * Shear (lb/sq ft)      *    0.36  *    1.13  *         *
* Alpha                  *    1.02  * Stream Power (lb/ft s) *    0.99  *   11.34  *         *
* Frctn Loss (ft)        *    0.37  * Cum Volume (acre-ft)  *    0.82  *   83.14  *         *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)        *    0.20  *    7.68  *         *
*****************************************************************************************

CROSS SECTION OUTPUT  Profile #10 year
*****************************************************************************************
* E.G. Elev (ft)         * 2498.74  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.84  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)         * 2497.90  * Reach Len. (ft)      *  248.40  *  246.40  *  244.40  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)    *         * 1185.17  *         *
* E.G. Slope (ft/ft)     *0.002913  * Area (sq ft)         *         * 1185.17  *         *
* Q Total (cfs)          * 8700.00  * Flow (cfs)           *         * 8700.00  *         *
* Top Width (ft)         *  256.22  * Top Width (ft)        *         *  256.22  *         *
* Vel Total (ft/s)       *    7.34  * Avg. Vel. (ft/s)      *         *    7.34  *         *
* Max Chl Dpth (ft)      *    4.70  * Hydr. Depth (ft)      *         *    4.63  *         *
* Conv. Total (cfs)      *161203.3  * Conv. (cfs)           *         *161203.3  *         *
* Length Wtd. (ft)       *  246.40  * Wetted Per. (ft)      *         *  260.44  *         *
* Min Ch El (ft)         * 2493.20  * Shear (lb/sq ft)      *         *    0.83  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *         *    6.07  *         *
* Frctn Loss (ft)        *    0.62  * Cum Volume (acre-ft)  *         *   35.92  *         *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)        *         *    7.23  *         *
*****************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1           RS: 350

INPUT
Description:
Station Elevation Data    num=      21
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0   2512   51.45    2511   59.82    2510   62.17    2509   64.45    2508
   66.67    2507   68.88    2506   71.09    2505   73.26    2504   74.24    2503
   75.08    2502   75.87    2500   85.87    2500   93.87    2492  324.26    2492
  338.26    2507  348.26    2507   354.2    2507  355.99    2507  357.95    2508
  410.83    2509

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0     .05   85.87     .03  357.95     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         85.87  357.95             102     102     102            .1       .3
```

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2506.71 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 1.54 * Wt. n-Val. * 0.050 * 0.030 * *
* W.S. Elev (ft) * 2505.16 * Reach Len. (ft) * 102.00 * 102.00 * 102.00 *
* Crit W.S. (ft) * * Flow Area (sq ft) * 60.23 * 3186.32 * *
* E.G. Slope (ft/ft) *0.001439 * Area (sq ft) * 60.23 * 3186.32 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * 153.96 *31846.04 * *
* Top Width (ft) * 265.81 * Top Width (ft) * 15.14 * 250.67 * *
* Vel Total (ft/s) * 9.86 * Avg. Vel. (ft/s) * 2.56 * 9.99 * *
* Max Chl Dpth (ft) * 13.16 * Hydr. Depth (ft) * 3.98 * 12.71 * *
* Conv. Total (cfs) *843583.1 * Conv. (cfs) * 4058.6 *839524.4 * *
* Length Wtd. (ft) * 102.00 * Wetted Per. (ft) * 17.64 * 259.71 * *
* Min Ch El (ft) * 2492.00 * Shear (lb/sq ft) * 0.31 * 1.10 * *
* Alpha * 1.02 * Stream Power (lb/ft s) * 0.78 * 11.02 * *
* Frctn Loss (ft) * 0.16 * Cum Volume (acre-ft) * 0.48 * 65.15 * *
* C & E Loss (ft) * 0.03 * Cum SA (acres) * 0.13 * 6.23 * *
****

CROSS SECTION OUTPUT Profile #10 year
****
* E.G. Elev (ft) * 2498.09 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 0.74 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2497.35 * Reach Len. (ft) * 102.00 * 102.00 * 102.00 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 1260.87 * *
* E.G. Slope (ft/ft) *0.002187 * Area (sq ft) * * 1260.87 * *
* Q Total (cfs) * 8700.00 * Flow (cfs) * * 8700.00 * *
* Top Width (ft) * 240.74 * Top Width (ft) * * 240.74 * *
* Vel Total (ft/s) * 6.90 * Avg. Vel. (ft/s) * * 6.90 * *
* Max Chl Dpth (ft) * 5.35 * Hydr. Depth (ft) * * 5.24 * *
* Conv. Total (cfs) *186014.1 * Conv. (cfs) * *186014.1 * *
* Length Wtd. (ft) * 102.00 * Wetted Per. (ft) * * 245.28 * *
* Min Ch El (ft) * 2492.00 * Shear (lb/sq ft) * * 0.70 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 4.84 * *
* Frctn Loss (ft) * 0.23 * Cum Volume (acre-ft) * * 29.00 * *
* C & E Loss (ft) * 0.01 * Cum SA (acres) * * 5.83 * *
****

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 325

INPUT
Description:
Station Elevation Data num= 34
  Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
  0 2513 22.25 2513 32.72 2512 71.44 2511 79.59 2510
  89.4 2509 96.55 2508 98.58 2507 100.47 2506 102.47 2505
  104.44 2504 106.33 2503 107.96 2502 108.57 2501 109.23 2500
  109.82 2499 110.19 2499 120.19 2499 127.69 2491.5 338.94 2491.5
  351.94 2506 361.94 2506 365.32 2506 368.01 2506 370.7 2507
  374.19 2508 379.86 2509 385.53 2510 393.68 2511 400.54 2513
  440.52 2513 445.44 2513 549.07 2513 595.08 2512

Manning's n Values num= 3
  Sta n Val Sta n Val Sta n Val
****
  0 .05 120.19 .03 351.94 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
  120.19 351.94 128 128 128 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2506.52 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 1.80 * Wt. n-Val. * 0.050 * 0.030 * *

```
* W.S. Elev (ft)        * 2504.72  * Reach Len. (ft)       *  128.00  *  128.00  *  128.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)      *   73.59  * 2942.26  *         *
* E.G. Slope (ft/ft)     *0.001679  * Area (sq ft)           *   73.59  * 2942.26  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *  216.91  *31783.09  *         *
* Top Width (ft)         *  247.77  * Top Width (ft)         *   17.17  *  230.60  *         *
* Vel Total (ft/s)       *   10.61  * Avg. Vel. (ft/s)       *    2.95  *   10.80  *         *
* Max Chl Dpth (ft)      *   13.22  * Hydr. Depth (ft)       *    4.29  *   12.76  *         *
* Conv. Total (cfs)      *780947.8  * Conv. (cfs)            *  5293.6  *775654.3  *         *
* Length Wtd. (ft)       *  128.00  * Wetted Per. (ft)       *   19.54  *  239.61  *         *
* Min Ch El (ft)         * 2491.50  * Shear (lb/sq ft)       *    0.39  *    1.29  *         *
* Alpha                  *    1.03  * Stream Power (lb/ft s) *    1.16  *   13.90  *         *
* Frctn Loss (ft)        *    0.25  * Cum Volume (acre-ft)   *    0.32  *   57.98  *         *
* C & E Loss (ft)        *    0.06  * Cum SA (acres)         *    0.09  *    5.66  *         *
*****************************************************************************************************

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 OUTPUT  Profile #10 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2497.85  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.82  * Wt. n-Val.             *          *   0.030  *         *
* W.S. Elev (ft)         * 2497.04  * Reach Len. (ft)        *  128.00  *  128.00  *  128.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)      *          * 1198.30  *         *
* E.G. Slope (ft/ft)     *0.002331  * Area (sq ft)           *          * 1198.30  *         *
* Q Total (cfs)          * 8700.00  * Flow (cfs)             *          * 8700.00  *         *
* Top Width (ft)         *  221.75  * Top Width (ft)         *          *  221.75  *         *
* Vel Total (ft/s)       *    7.26  * Avg. Vel. (ft/s)       *          *    7.26  *         *
* Max Chl Dpth (ft)      *    5.53  * Hydr. Depth (ft)       *          *    5.40  *         *
* Conv. Total (cfs)      *180201.0  * Conv. (cfs)            *          *180201.0  *         *
* Length Wtd. (ft)       *  128.00  * Wetted Per. (ft)       *          *  226.51  *         *
* Min Ch El (ft)         * 2491.50  * Shear (lb/sq ft)       *          *    0.77  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *          *    5.59  *         *
* Frctn Loss (ft)        *    0.34  * Cum Volume (acre-ft)   *          *   26.12  *         *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)         *          *    5.28  *         *
*****************************************************************************************************

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 300

INPUT
Description:
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0   2511     1.7    2510    3.44    2509    7.08    2508    9.07    2507
   10.95    2506    12.9    2505   14.77    2504   16.73    2503   18.58    2502
   20.48    2501   21.21    2501   26.01    2499   36.01    2499   44.11  2490.9
  229.56  2490.9  243.56    2505  253.56    2505  283.77    2511  302.46    2512
  326.78    2512

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0     .05   36.01     .03  243.56     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         36.01  243.56          142.87  142.74  142.86            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)         * 2506.21  * Element                *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    2.39  * Wt. n-Val.             *   0.050  *   0.030  *         *
* W.S. Elev (ft)         * 2503.82  * Reach Len. (ft)        *    1.00  *    1.00  *    1.00  *
* Crit W.S. (ft)         * 2500.50  * Flow Area (sq ft)      *   76.18  * 2551.52  *         *
* E.G. Slope (ft/ft)     *0.002333  * Area (sq ft)           *   76.18  * 2551.52  *         *
* Q Total (cfs)          *32000.00  * Flow (cfs)             *  250.36  *31749.63  *         *
```

```
* Top Width (ft)        *  227.28  * Top Width (ft)        *   20.89  *  206.38  *        *
* Vel Total (ft/s)      *   12.18  * Avg. Vel. (ft/s)      *    3.29  *   12.44  *        *
* Max Chl Dpth (ft)     *   12.92  * Hydr. Depth (ft)      *    3.65  *   12.36  *        *
* Conv. Total (cfs)     *662470.7  * Conv. (cfs)           *  5183.1  *657287.6  *        *
* Length Wtd. (ft)      *    1.00  * Wetted Per. (ft)      *   21.99  *  215.12  *        *
* Min Ch El (ft)        * 2490.90  * Shear (lb/sq ft)      *    0.50  *    1.73  *        *
* Alpha                 *    1.04  * Stream Power (lb/ft s) *    1.66  *   21.50  *        *
* Frctn Loss (ft)       *    0.00  * Cum Volume (acre-ft)  *    0.10  *   49.91  *        *
* C & E Loss (ft)       *    0.05  * Cum SA (acres)        *    0.03  *    5.02  *        *
*****************************************************************************************

CROSS SECTION OUTPUT  Profile #10 year
*****************************************************************************************
* E.G. Elev (ft)        * 2497.49  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.05  * Wt. n-Val.            *         *   0.030  *        *
* W.S. Elev (ft)        * 2496.44  * Reach Len. (ft)       *    1.00  *    1.00  *    1.00  *
* Crit W.S. (ft)        * 2494.95  * Flow Area (sq ft)     *         * 1058.37  *        *
* E.G. Slope (ft/ft)    *0.003009  * Area (sq ft)          *         * 1058.37  *        *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *        *
* Top Width (ft)        *  196.49  * Top Width (ft)        *         *  196.49  *        *
* Vel Total (ft/s)      *    8.22  * Avg. Vel. (ft/s)      *         *    8.22  *        *
* Max Chl Dpth (ft)     *    5.54  * Hydr. Depth (ft)      *         *    5.39  *        *
* Conv. Total (cfs)     *158609.9  * Conv. (cfs)           *         *158609.9  *        *
* Length Wtd. (ft)      *    1.00  * Wetted Per. (ft)      *         *  201.10  *        *
* Min Ch El (ft)        * 2490.90  * Shear (lb/sq ft)      *         *    0.99  *        *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *    8.13  *        *
* Frctn Loss (ft)       *    0.00  * Cum Volume (acre-ft)  *         *   22.80  *        *
* C & E Loss (ft)       *    0.02  * Cum SA (acres)        *         *    4.67  *        *
*****************************************************************************************

BRIDGE


RIVER: River #1
REACH: Reach #1          RS: 295

INPUT
Description:
Distance from Upstream XS =       1
Deck/Roadway Width        =     136
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
   num=      10
    Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*************************************************************************
  -45.78 2511.91 2511.91       0 2511.91 2510.16    42.5 2511.86 2510.11
     85 2511.81 2510.06   127.5 2511.76 2510.01     170 2511.71 2509.96
   212.5 2511.66 2509.91     265 2511.61 2509.86  276.12 2511.61 2509.86
  295.19 2511.61 2511.61

Upstream Bridge Cross Section Data
Station Elevation Data    num=      21
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2511     1.7    2510    3.44    2509    7.08    2508    9.07    2507
   10.95    2506    12.9    2505   14.77    2504   16.73    2503   18.58    2502
   20.48    2501   21.21    2501   26.01    2499   36.01    2499   44.11  2490.9
  229.56  2490.9  243.56    2505  253.56    2505  283.77    2511  302.46    2512
  326.78    2512

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
**************************************************
      0     .05   36.01     .03  243.56     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
        36.01  243.56            .1       .3

Downstream  Deck/Roadway Coordinates
   num=      10
```

```
    Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*************************************************************************
    -17 2511.91 2511.91       0 2511.91 2510.16    42.5 2511.86 2510.11
     85 2511.81 2510.06   127.5 2511.76 2510.01     170 2511.71 2509.96
  212.5 2511.66 2509.91     265 2511.61 2509.86  295.19 2511.61 2509.86
 296.11 2511.61 2511.61

Downstream Bridge Cross Section Data
Station Elevation Data    num=      22
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2511    5.21    2510   10.08    2509   15.67    2508   20.42    2507
  21.51    2506   22.64    2505    23.8    2504   35.67    2503   45.67    2503
  58.47  2490.2  240.56  2490.2  254.56    2503  264.56    2503  282.48    2505
 284.14    2506  285.85    2507  291.86    2508  294.96    2509  296.11    2510
 308.44    2510  313.58    2510

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
**************************************************
      0    .045   45.67     .03  254.56     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
        45.67  254.56            .1       .3

Upstream Embankment side slope              =     1.5 horiz. to 1.0 vertical
Downstream Embankment side slope            =     1.5 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         = 2512.19
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  3

Pier Data
Pier Station     Upstream=   69.45    Downstream=    78.8
Upstream     num=       2
   Width   Elev    Width   Elev
*********************************
      3    2490       3 2511.91
Downstream     num=       2
   Width   Elev    Width   Elev
*********************************
      3    2490       3 2511.91

Pier Data
Pier Station     Upstream=  138.97    Downstream=  148.04
Upstream     num=       2
   Width   Elev    Width   Elev
*********************************
      3    2490       3 2511.91
Downstream     num=       2
   Width   Elev    Width   Elev
*********************************
      3    2490       3 2511.91

Pier Data
Pier Station     Upstream=  208.52    Downstream=   217.6
Upstream     num=       2
   Width   Elev    Width   Elev
*********************************
      3    2490       3 2511.91
Downstream     num=       2
   Width   Elev    Width   Elev
*********************************
      3    2490       3 2511.91

Number of Bridge Coefficient Sets =  1
```

Low Flow Methods and Data
    Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
    Energy Only

Additional Bridge Parameters
    Add Friction component to Momentum
    Do not add Weight component to Momentum
    Class B flow critical depth computations use critical depth
      inside the bridge at the upstream end
    Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #100 year
```
*****************************************************************************************
* E.G. US. (ft)          *    2506.21  * Element               *Inside BR US *Inside BR DS *
* W.S. US. (ft)          *    2503.82  * E.G. Elev (ft)         *    2506.16  *    2505.49  *
* Q Total (cfs)          *   32000.00  * W.S. Elev (ft)         *    2503.32  *    2502.40  *
* Q Bridge (cfs)         *   32000.00  * Crit W.S. (ft)         *    2500.85  *    2500.23  *
* Q Weir (cfs)           *             * Max Chl Dpth (ft)      *      12.42  *      12.20  *
* Weir Sta Lft (ft)      *             * Vel Total (ft/s)       *      13.32  *      14.11  *
* Weir Sta Rgt (ft)      *             * Flow Area (sq ft)      *    2402.57  *    2268.38  *
* Weir Submerg           *             * Froude # Chl           *       0.69  *       0.74  *
* Weir Max Depth (ft)    *             * Specif Force (cu ft)   *   27776.48  *   27544.24  *
* Min El Weir Flow (ft)  *    2512.19  * Hydr Depth (ft)        *      11.08  *      11.42  *
* Min El Prs (ft)        *    2510.19  * W.P. Total (ft)        *     300.85  *     281.66  *
* Delta EG (ft)          *       0.86  * Conv. Total (cfs)      *   480418.1  *   451419.5  *
* Delta WS (ft)          *       1.16  * Top Width (ft)         *     216.80  *     198.64  *
* BR Open Area (sq ft)   *    4017.65  * Frctn Loss (ft)        *       0.64  *       0.02  *
* BR Open Vel (ft/s)     *      14.11  * C & E Loss (ft)        *       0.03  *       0.12  *
* Coef of Q              *             * Shear Total (lb/sq ft) *       2.21  *       2.53  *
* Br Sel Method          *Energy only  * Power Total (lb/ft s)  *      29.46  *      35.64  *
*****************************************************************************************
```

Warning: Pier drag coefficient of 2.0 assumed for Class B flow.

BRIDGE OUTPUT Profile #10 year
```
*****************************************************************************************
* E.G. US. (ft)          *    2497.49  * Element               *Inside BR US *Inside BR DS *
* W.S. US. (ft)          *    2496.44  * E.G. Elev (ft)         *    2497.46  *    2496.80  *
* Q Total (cfs)          *    8700.00  * W.S. Elev (ft)         *    2496.19  *    2495.47  *
* Q Bridge (cfs)         *    8700.00  * Crit W.S. (ft)         *    2495.11  *    2494.47  *
* Q Weir (cfs)           *             * Max Chl Dpth (ft)      *       5.29  *       5.27  *
* Weir Sta Lft (ft)      *             * Vel Total (ft/s)       *       9.05  *       9.24  *
* Weir Sta Rgt (ft)      *             * Flow Area (sq ft)      *     961.77  *     941.44  *
* Weir Submerg           *             * Froude # Chl           *       0.70  *       0.72  *
* Weir Max Depth (ft)    *             * Specif Force (cu ft)   *    4964.51  *    4952.45  *
* Min El Weir Flow (ft)  *    2512.19  * Hydr Depth (ft)        *       5.14  *       5.11  *
* Min El Prs (ft)        *    2510.19  * W.P. Total (ft)        *     223.15  *     219.98  *
* Delta EG (ft)          *       0.77  * Conv. Total (cfs)      *   126162.5  *   122915.2  *
* Delta WS (ft)          *       0.88  * Top Width (ft)         *     187.00  *     184.13  *
* BR Open Area (sq ft)   *    4017.65  * Frctn Loss (ft)        *       0.66  *       0.02  *
* BR Open Vel (ft/s)     *       9.24  * C & E Loss (ft)        *       0.01  *       0.05  *
* Coef of Q              *             * Shear Total (lb/sq ft) *       1.28  *       1.34  *
* Br Sel Method          *Energy only  * Power Total (lb/ft s)  *      11.57  *      12.37  *
*****************************************************************************************
```

Warning: Pier drag coefficient of 2.0 assumed for Class B flow.

CROSS SECTION

RIVER: River #1
REACH: Reach #1   RS: 290

INPUT
Description:
Station Elevation Data   num=   22
    Sta   Elev   Sta   Elev   Sta   Elev   Sta   Elev   Sta   Elev

```
*******************************************************************************
     0   2511    5.21    2510   10.08    2509   15.67    2508   20.42    2507
  21.51    2506   22.64    2505    23.8    2504   35.67    2503   45.67    2503
  58.47  2490.2  240.56  2490.2  254.56    2503  264.56    2503  282.48    2505
 284.14    2506  285.85    2507  291.86    2508  294.96    2509  296.11    2510
 308.44    2510  313.58    2510

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
     0    .045   45.67     .03  254.56     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        45.67  254.56              85      85      85            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2505.35  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    2.69  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2502.66  * Reach Len. (ft)      *   85.00  *   85.00  *   85.00  *
* Crit W.S. (ft)        *          * Flow Area (sq ft)    *         * 2432.23  *         *
* E.G. Slope (ft/ft)    *0.002833  * Area (sq ft)         *         * 2432.23  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)           *         *32000.00  *         *
* Top Width (ft)        *  208.19  * Top Width (ft)       *         *  208.19  *         *
* Vel Total (ft/s)      *   13.16  * Avg. Vel. (ft/s)     *         *   13.16  *         *
* Max Chl Dpth (ft)     *   12.46  * Hydr. Depth (ft)     *         *   11.68  *         *
* Conv. Total (cfs)     *601163.4  * Conv. (cfs)          *         *601163.4  *         *
* Length Wtd. (ft)      *   85.00  * Wetted Per. (ft)     *         *  218.19  *         *
* Min Ch El (ft)        * 2490.20  * Shear (lb/sq ft)     *         *    1.97  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   25.94  *         *
* Frctn Loss (ft)       *    0.35  * Cum Volume (acre-ft)  *         *   42.35  *         *
* C & E Loss (ft)       *    0.22  * Cum SA (acres)        *         *    4.37  *         *
*****************************************************************************************************

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.

CROSS SECTION OUTPUT  Profile #10 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2496.72  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.16  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2495.56  * Reach Len. (ft)      *   85.00  *   85.00  *   85.00  *
* Crit W.S. (ft)        *          * Flow Area (sq ft)    *         * 1006.76  *         *
* E.G. Slope (ft/ft)    *0.003473  * Area (sq ft)         *         * 1006.76  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)           *         * 8700.00  *         *
* Top Width (ft)        *  193.32  * Top Width (ft)       *         *  193.32  *         *
* Vel Total (ft/s)      *    8.64  * Avg. Vel. (ft/s)     *         *    8.64  *         *
* Max Chl Dpth (ft)     *    5.36  * Hydr. Depth (ft)     *         *    5.21  *         *
* Conv. Total (cfs)     *147635.6  * Conv. (cfs)          *         *147635.6  *         *
* Length Wtd. (ft)      *   85.00  * Wetted Per. (ft)     *         *  197.62  *         *
* Min Ch El (ft)        * 2490.20  * Shear (lb/sq ft)     *         *    1.10  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *    9.54  *         *
* Frctn Loss (ft)       *    0.40  * Cum Volume (acre-ft)  *         *   19.68  *         *
* C & E Loss (ft)       *    0.07  * Cum SA (acres)        *         *    4.06  *         *
*****************************************************************************************************

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.

CROSS SECTION


RIVER: River #1
REACH: Reach #1          RS: 275

INPUT
```

```
Description:
Station Elevation Data    num=      18
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0    2509    4.38    2508    8.49    2507   14.17    2506   20.74    2505
  25.94    2504   44.18    2502   54.18    2502   66.38  2489.8   234.9  2489.8
  247.1    2502   257.1    2502  270.36    2502  272.15    2503  273.91    2504
 275.67    2505  278.33    2506  316.55    2507

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***************************************************
      0    .045   54.18     .03   247.1     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        54.18   247.1             264     264     264            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2504.79  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    4.84  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)        * 2499.95  * Reach Len. (ft)        *  264.00  *  264.00  *  264.00  *
* Crit W.S. (ft)        * 2499.95  * Flow Area (sq ft)      *         * 1812.47  *         *
* E.G. Slope (ft/ft)    *0.006600  * Area (sq ft)           *         * 1812.47  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)             *         *32000.00  *         *
* Top Width (ft)        *  188.81  * Top Width (ft)         *         *  188.81  *         *
* Vel Total (ft/s)      *   17.66  * Avg. Vel. (ft/s)       *         *   17.66  *         *
* Max Chl Dpth (ft)     *   10.14  * Hydr. Depth (ft)       *         *    9.60  *         *
* Conv. Total (cfs)     *393883.1  * Conv. (cfs)            *         *393883.1  *         *
* Length Wtd. (ft)      *  264.00  * Wetted Per. (ft)       *         *  197.21  *         *
* Min Ch El (ft)        * 2489.80  * Shear (lb/sq ft)       *         *    3.79  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   66.86  *         *
* Frctn Loss (ft)       *    1.74  * Cum Volume (acre-ft)   *         *   38.21  *         *
* C & E Loss (ft)       *    0.00  * Cum SA (acres)         *         *    3.98  *         *
*****************************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
       program selected the water surface that had the least amount of error between computed and
       assumed values.
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 OUTPUT  Profile #10 year
*****************************************************************************************************
* E.G. Elev (ft)        * 2496.25  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.86  * Wt. n-Val.             *         *   0.030  *         *
* W.S. Elev (ft)        * 2494.39  * Reach Len. (ft)        *  264.00  *  264.00  *  264.00  *
* Crit W.S. (ft)        * 2494.11  * Flow Area (sq ft)      *         *  794.81  *         *
* E.G. Slope (ft/ft)    *0.006817  * Area (sq ft)           *         *  794.81  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)             *         * 8700.00  *         *
* Top Width (ft)        *  177.70  * Top Width (ft)         *         *  177.70  *         *
* Vel Total (ft/s)      *   10.95  * Avg. Vel. (ft/s)       *         *   10.95  *         *
* Max Chl Dpth (ft)     *    4.59  * Hydr. Depth (ft)       *         *    4.47  *         *
* Conv. Total (cfs)     *105369.8  * Conv. (cfs)            *         *105369.8  *         *
* Length Wtd. (ft)      *  264.00  * Wetted Per. (ft)       *         *  181.51  *         *
* Min Ch El (ft)        * 2489.80  * Shear (lb/sq ft)       *         *    1.86  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   20.40  *         *
* Frctn Loss (ft)       *    1.77  * Cum Volume (acre-ft)   *         *   17.92  *         *
* C & E Loss (ft)       *    0.01  * Cum SA (acres)         *         *    3.70  *         *
*****************************************************************************************************

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: River #1
REACH: Reach #1          RS: 200

INPUT
Description:
Station Elevation Data    num=      20
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
      0   2507    89.5    2507  275.72    2505     298    2504  311.14    2503
  313.65    2502  316.05    2501  317.97    2500   323.7    2500   333.7    2500
   345.7    2488  513.81    2488  525.81    2500  535.81    2500  559.95    2503
  605.45    2504  846.35    2511  859.53    2512  882.51    2513  914.95    2514

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
      0    .045   333.7     .03  525.81     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        333.7  525.81          273.89  293.94  300.78            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)        * 2503.01  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    4.82  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2498.18  * Reach Len. (ft)      *  273.89  *  293.94  *  300.78  *
* Crit W.S. (ft)        * 2498.18  * Flow Area (sq ft)    *         * 1815.39  *         *
* E.G. Slope (ft/ft)    *0.006551  * Area (sq ft)         *         * 1815.39  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)           *         *32000.00  *         *
* Top Width (ft)        *  188.47  * Top Width (ft)       *         *  188.47  *         *
* Vel Total (ft/s)      *   17.63  * Avg. Vel. (ft/s)     *         *   17.63  *         *
* Max Chl Dpth (ft)     *   10.18  * Hydr. Depth (ft)     *         *    9.63  *         *
* Conv. Total (cfs)     *395349.2  * Conv. (cfs)          *         *395349.2  *         *
* Length Wtd. (ft)      *  293.94  * Wetted Per. (ft)     *         *  196.91  *         *
* Min Ch El (ft)        * 2488.00  * Shear (lb/sq ft)     *         *    3.77  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   66.47  *         *
* Frctn Loss (ft)       *    1.62  * Cum Volume (acre-ft)  *         *   27.22  *         *
* C & E Loss (ft)       *    0.32  * Cum SA (acres)        *         *    2.84  *         *
*****************************************************************************************

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 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 OUTPUT  Profile #10 year
*****************************************************************************************
* E.G. Elev (ft)        * 2494.47  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.83  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2492.64  * Reach Len. (ft)      *  273.89  *  293.94  *  300.78  *
* Crit W.S. (ft)        * 2492.31  * Flow Area (sq ft)    *         *  801.15  *         *
* E.G. Slope (ft/ft)    *0.006625  * Area (sq ft)         *         *  801.15  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)           *         * 8700.00  *         *
* Top Width (ft)        *  177.39  * Top Width (ft)       *         *  177.39  *         *
* Vel Total (ft/s)      *   10.86  * Avg. Vel. (ft/s)     *         *   10.86  *         *
* Max Chl Dpth (ft)     *    4.64  * Hydr. Depth (ft)     *         *    4.52  *         *
* Conv. Total (cfs)     *106884.7  * Conv. (cfs)          *         *106884.7  *         *
* Length Wtd. (ft)      *  293.94  * Wetted Per. (ft)     *         *  181.23  *         *
* Min Ch El (ft)        * 2488.00  * Shear (lb/sq ft)     *         *    1.83  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   19.86  *         *
* Frctn Loss (ft)       *    1.18  * Cum Volume (acre-ft)  *         *   13.09  *         *
* C & E Loss (ft)       *    0.25  * Cum SA (acres)        *         *    2.62  *         *
*****************************************************************************************

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: River #1
REACH: Reach #1 RS: 150

INPUT
Description:
Station Elevation Data num= 17
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
****
0 2502 5.17 2502 78.66 2501 80.48 2500 82.44 2499
95.5 2499 105.5 2499 118.3 2486.2 297.97 2486.2 310.77 2499
320.77 2499 323.2 2499 325.71 2500 331.93 2501 340.78 2502
358.61 2502 358.9 2502

Manning's n Values num= 3
Sta n Val Sta n Val Sta n Val
****
0 .05 105.5 .03 310.77 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
105.5 310.77 283.02 287.46 289.14 .1 .3

CROSS SECTION OUTPUT Profile #100 year
****
* E.G. Elev (ft) * 2500.76 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 3.74 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2497.02 * Reach Len. (ft) * 283.02 * 287.46 * 289.14 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 2061.02 * *
* E.G. Slope (ft/ft) *0.004684 * Area (sq ft) * * 2061.02 * *
* Q Total (cfs) *32000.00 * Flow (cfs) * *32000.00 * *
* Top Width (ft) * 201.31 * Top Width (ft) * * 201.31 * *
* Vel Total (ft/s) * 15.53 * Avg. Vel. (ft/s) * * 15.53 * *
* Max Chl Dpth (ft) * 10.82 * Hydr. Depth (ft) * * 10.24 * *
* Conv. Total (cfs) *467543.1 * Conv. (cfs) * *467543.1 * *
* Length Wtd. (ft) * 287.46 * Wetted Per. (ft) * * 210.27 * *
* Min Ch El (ft) * 2486.20 * Shear (lb/sq ft) * * 2.87 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 44.51 * *
* Frctn Loss (ft) * 1.39 * Cum Volume (acre-ft) * * 14.14 * *
* C & E Loss (ft) * 0.16 * Cum SA (acres) * * 1.53 * *
****

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 OUTPUT Profile #10 year
****
* E.G. Elev (ft) * 2493.04 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 1.00 * Wt. n-Val. * * 0.030 * *
* W.S. Elev (ft) * 2492.03 * Reach Len. (ft) * 283.02 * 287.46 * 289.14 *
* Crit W.S. (ft) * * Flow Area (sq ft) * * 1081.76 * *
* E.G. Slope (ft/ft) *0.002706 * Area (sq ft) * * 1081.76 * *
* Q Total (cfs) * 8700.00 * Flow (cfs) * * 8700.00 * *
* Top Width (ft) * 191.33 * Top Width (ft) * * 191.33 * *
* Vel Total (ft/s) * 8.04 * Avg. Vel. (ft/s) * * 8.04 * *
* Max Chl Dpth (ft) * 5.83 * Hydr. Depth (ft) * * 5.65 * *
* Conv. Total (cfs) *167242.2 * Conv. (cfs) * *167242.2 * *
* Length Wtd. (ft) * 287.46 * Wetted Per. (ft) * * 196.16 * *
* Min Ch El (ft) * 2486.20 * Shear (lb/sq ft) * * 0.93 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * * 7.49 * *
* Frctn Loss (ft) * 1.03 * Cum Volume (acre-ft) * * 6.73 * *

```
* C & E Loss (ft)        *    0.03  * Cum SA (acres)        *         *    1.38  *         *
*****************************************************************************************

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: River #1
REACH: Reach #1          RS: 100

INPUT
Description:
Station Elevation Data    num=      44
    Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
      0    2501   59.43    2500   74.75    2499   76.67    2498    78.5    2497
   84.73    2496   90.07    2495   93.09    2494   95.46    2493   97.85    2492
  100.17    2491   102.5    2490  112.09    2489  135.78    2488  158.68    2487
  184.75    2487  186.54    2487  239.34    2486  254.14    2486   259.3    2487
  261.93    2487  262.97    2486   265.1    2485  284.74    2484  320.02    2484
  320.83    2485  321.62    2486  322.41    2487  324.25    2488  325.51    2489
  326.78    2490  328.08    2491  329.34    2492  330.57    2493  331.84    2494
  336.11    2495  345.88    2496  348.18    2497  350.24    2498  351.98    2499
  353.85    2500  408.32    2501     453    2502  457.38    2502

Manning's n Values        num=       3
    Sta   n Val     Sta   n Val     Sta   n Val
**************************************************
      0    .045   59.43     .03  353.85     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
        59.43  353.85            .1       .3

CROSS SECTION OUTPUT  Profile #100 year
*****************************************************************************************
* E.G. Elev (ft)        * 2499.21  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    3.22  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2496.00  * Reach Len. (ft)       *         *         *         *
* Crit W.S. (ft)        * 2495.07  * Flow Area (sq ft)     *         * 2223.50  *         *
* E.G. Slope (ft/ft)    *0.005001  * Area (sq ft)          *         * 2223.50  *         *
* Q Total (cfs)         *32000.00  * Flow (cfs)            *         *32000.00  *         *
* Top Width (ft)        *  261.12  * Top Width (ft)        *         *  261.12  *         *
* Vel Total (ft/s)      *   14.39  * Avg. Vel. (ft/s)      *         *   14.39  *         *
* Max Chl Dpth (ft)     *   12.00  * Hydr. Depth (ft)      *         *    8.52  *         *
* Conv. Total (cfs)     *452480.5  * Conv. (cfs)           *         *452480.5  *         *
* Length Wtd. (ft)      *         * Wetted Per. (ft)       *         *  267.00  *         *
* Min Ch El (ft)        * 2484.00  * Shear (lb/sq ft)      *         *    2.60  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   37.42  *         *
* Frctn Loss (ft)       *         * Cum Volume (acre-ft)   *         *         *         *
* C & E Loss (ft)       *         * Cum SA (acres)         *         *         *         *
*****************************************************************************************

CROSS SECTION OUTPUT  Profile #10 year
*****************************************************************************************
* E.G. Elev (ft)        * 2491.98  * Element              *  Left OB *  Channel * Right OB *
* Vel Head (ft)         *    1.28  * Wt. n-Val.           *         *   0.030  *         *
* W.S. Elev (ft)        * 2490.70  * Reach Len. (ft)       *         *         *         *
* Crit W.S. (ft)        * 2490.02  * Flow Area (sq ft)     *         *  959.09  *         *
* E.G. Slope (ft/ft)    *0.005010  * Area (sq ft)          *         *  959.09  *         *
* Q Total (cfs)         * 8700.00  * Flow (cfs)            *         * 8700.00  *         *
* Top Width (ft)        *  226.81  * Top Width (ft)        *         *  226.81  *         *
* Vel Total (ft/s)      *    9.07  * Avg. Vel. (ft/s)      *         *    9.07  *         *
* Max Chl Dpth (ft)     *    6.70  * Hydr. Depth (ft)      *         *    4.23  *         *
* Conv. Total (cfs)     *122915.1  * Conv. (cfs)           *         *122915.1  *         *
* Length Wtd. (ft)      *         * Wetted Per. (ft)       *         *  230.44  *         *
* Min Ch El (ft)        * 2484.00  * Shear (lb/sq ft)      *         *    1.30  *         *
* Alpha                 *    1.00  * Stream Power (lb/ft s) *         *   11.81  *         *
* Frctn Loss (ft)       *         * Cum Volume (acre-ft)   *         *         *         *
```

* C & E Loss (ft) * * Cum SA (acres) * * * *
****

****

SUMMARY OF MANNING'S N VALUES

River:River #1

Reach	River Sta.	n1	n2	n3
Reach #1	1600	.055	.03	.55
Reach #1	1500	.055	.03	.055
Reach #1	1450	.055	.03	.055
Reach #1	1400	.055	.03	.055
Reach #1	1350	.055	.03	.055
Reach #1	1325	Bridge		
Reach #1	1300	.055	.03	.055
Reach #1	1230	.05	.03	.05
Reach #1	1220	.05	.03	.05
Reach #1	1200	.05	.03	.05
Reach #1	1120	.05	.03	.05
Reach #1	1110	.05	.03	.05
Reach #1	1100	.05	.03	.05
Reach #1	1050	.05	.03	.05
Reach #1	1010	.05	.03	.05
Reach #1	1000	.05	.03	.05
Reach #1	990	.05	.03	.05
Reach #1	975	.05	.03	.05
Reach #1	965	.05	.03	.05
Reach #1	950	.05	.03	.05
Reach #1	900	.05	.03	.05
Reach #1	875	.05	.03	.05
Reach #1	865	.05	.03	.05
Reach #1	850	.05	.03	.05
Reach #1	825	.05	.03	.05
Reach #1	800	.05	.03	.05
Reach #1	750	.05	.03	.05
Reach #1	700	.05	.03	.05
Reach #1	650	.05	.03	.05
Reach #1	600	.05	.03	.05
Reach #1	550	.05	.03	.05
Reach #1	500	.05	.03	.05
Reach #1	450	.05	.03	.05
Reach #1	400	.05	.03	.05
Reach #1	350	.05	.03	.05
Reach #1	325	.05	.03	.05
Reach #1	300	.05	.03	.05
Reach #1	295	Bridge		
Reach #1	290	.045	.03	.04
Reach #1	275	.045	.03	.04
Reach #1	200	.045	.03	.04
Reach #1	150	.05	.03	.05
Reach #1	100	.045	.03	.04

****

SUMMARY OF REACH LENGTHS

River: River #1

Reach	River Sta.	Left	Channel	Right
Reach #1	1600	714.84	679.42	666.96
Reach #1	1500	249.55	214.55	208.7
Reach #1	1450	208.28	198.72	196.75
Reach #1	1400	208.05	211.15	211.05
Reach #1	1350	267.52	277.24	286.29
Reach #1	1325	Bridge		

*Reach #1	*	1300	* 385.44*	383.36*	385.44*
*Reach #1	*	1230	* 47.48*	47.44*	47.31*
*Reach #1	*	1220	* 415.98*	411.75*	408.51*
*Reach #1	*	1200	* 57.6*	56.56*	56.62*
*Reach #1	*	1120	* 440.1*	443.7*	447.39*
*Reach #1	*	1110	* 46.86*	36.39*	42.45*
*Reach #1	*	1100	* 294*	294*	294*
*Reach #1	*	1050	* 162*	162*	162*
*Reach #1	*	1010	* 111.18*	71.92*	89.38*
*Reach #1	*	1000	* 147*	147*	147*
*Reach #1	*	990	* 168*	168*	168*
*Reach #1	*	975	* 151*	151*	151*
*Reach #1	*	965	* 148*	148*	148*
*Reach #1	*	950	* 216.25*	206.25*	199.7*
*Reach #1	*	900	* 159.28*	151.88*	152.96*
*Reach #1	*	875	* 143*	143*	143*
*Reach #1	*	865	* 153*	153*	153*
*Reach #1	*	850	* 199.45*	202*	207.35*
*Reach #1	*	825	* 112.29*	110.49*	112.71*
*Reach #1	*	800	* 269.64*	259.44*	283.92*
*Reach #1	*	750	* 249.1*	245.15*	242.35*
*Reach #1	*	700	* 293.94*	294.12*	299.33*
*Reach #1	*	650	* 225.9*	219.6*	226.45*
*Reach #1	*	600	* 296.16*	292.56*	291.61*
*Reach #1	*	550	* 174.16*	170.24*	169.04*
*Reach #1	*	500	* 312.55*	311.99*	314.79*
*Reach #1	*	450	* 276.48*	275.94*	282*
*Reach #1	*	400	* 248.4*	246.4*	244.4*
*Reach #1	*	350	* 102*	102*	102*
*Reach #1	*	325	* 128*	128*	128*
*Reach #1	*	300	* 142.87*	142.74*	142.86*
*Reach #1	*	295	*Bridge *	*	*
*Reach #1	*	290	* 85*	85*	85*
*Reach #1	*	275	* 264*	264*	264*
*Reach #1	*	200	* 273.89*	293.94*	300.78*
*Reach #1	*	150	* 283.02*	287.46*	289.14*
*Reach #1	*	100	* *	*	*

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SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: River #1

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* Reach	*	River Sta.	* Contr.	* Expan.	*
*Reach #1	*	1600	* .1*	.3*	
*Reach #1	*	1500	* .1*	.3*	
*Reach #1	*	1450	* .1*	.3*	
*Reach #1	*	1400	* .1*	.3*	
*Reach #1	*	1350	* .1*	.3*	
*Reach #1	*	1325	*Bridge *	*	
*Reach #1	*	1300	* .1*	.3*	
*Reach #1	*	1230	* .1*	.3*	
*Reach #1	*	1220	* .1*	.3*	
*Reach #1	*	1200	* .1*	.3*	
*Reach #1	*	1120	* .1*	.3*	
*Reach #1	*	1110	* .1*	.3*	
*Reach #1	*	1100	* .1*	.3*	
*Reach #1	*	1050	* .1*	.3*	
*Reach #1	*	1010	* .1*	.3*	
*Reach #1	*	1000	* .1*	.3*	
*Reach #1	*	990	* .1*	.3*	
*Reach #1	*	975	* .1*	.3*	
*Reach #1	*	965	* .1*	.3*	
*Reach #1	*	950	* .1*	.3*	
*Reach #1	*	900	* .1*	.3*	
*Reach #1	*	875	* .1*	.3*	
*Reach #1	*	865	* .1*	.3*	

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*Reach #1      *  850   *     .1*     .3*
*Reach #1      *  825   *     .1*     .3*
*Reach #1      *  800   *     .1*     .3*
*Reach #1      *  750   *     .1*     .3*
*Reach #1      *  700   *     .1*     .3*
*Reach #1      *  650   *     .1*     .3*
*Reach #1      *  600   *     .1*     .3*
*Reach #1      *  550   *     .1*     .3*
*Reach #1      *  500   *     .1*     .3*
*Reach #1      *  450   *     .1*     .3*
*Reach #1      *  400   *     .1*     .3*
*Reach #1      *  350   *     .1*     .3*
*Reach #1      *  325   *     .1*     .3*
*Reach #1      *  300   *     .1*     .3*
*Reach #1      *  295   *Bridge  *       *
*Reach #1      *  290   *     .1*     .3*
*Reach #1      *  275   *     .1*     .3*
*Reach #1      *  200   *     .1*     .3*
*Reach #1      *  150   *     .1*     .3*
*Reach #1      *  100   *     .1*     .3*
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Profile Output Table - Standard Table 1
*****************************************************************************************************************************************************************
*********************************************************
* Reach      * River Sta  * Profile    * Plan        *  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 *
*          *          *          *          *   (cfs) *     (ft) *     (ft) *     (ft) *     (ft) *   (ft/ft) *   (ft/s) *   (sq ft) *     (ft) *          *
*****************************************************************************************************************************************************************
*********************************************************
* Reach #1   * 1600     * 100 year   * Alt4      * 32000.00 *  2540.00 *  2548.55 *  2548.55 *  2551.95 *  0.007049 *   14.81 *  2161.11 *
320.60 *      1.01 *
* Reach #1   * 1600     * 100 year   * Alt3      * 32000.00 *  2540.00 *  2548.55 *  2548.55 *  2551.95 *  0.007049 *   14.81 *  2161.11 *
320.60 *      1.01 *
* Reach #1   * 1600     * 10 year    * Alt4      *  8700.00 *  2540.00 *  2543.90 *  2543.90 *  2545.59 *  0.008842 *   10.43 *   834.11 *
248.46 *      1.00 *
* Reach #1   * 1600     * 10 year    * Alt3      *  8700.00 *  2540.00 *  2543.90 *  2543.90 *  2545.59 *  0.008852 *   10.43 *   833.80 *
248.44 *      1.00 *
*          *          *          *          *       *       *       *       *       *       *       *       *       *
* Reach #1   * 1500     * 100 year   * Alt4      * 32000.00 *  2532.00 *  2546.12 *       *  2547.93 *  0.002890 *   10.80 *  2963.86 *
355.61 *      0.66 *
* Reach #1   * 1500     * 100 year   * Alt3      * 32000.00 *  2532.00 *  2546.12 *       *  2547.93 *  0.002890 *   10.80 *  2963.77 *
355.60 *      0.66 *
* Reach #1   * 1500     * 10 year    * Alt4      *  8700.00 *  2532.00 *  2539.92 *       *  2540.77 *  0.003185 *    7.41 *  1173.50 *   267.46
*      0.62 *
* Reach #1   * 1500     * 10 year    * Alt3      *  8700.00 *  2532.00 *  2539.92 *       *  2540.77 *  0.003186 *    7.41 *  1173.44 *   267.46
*      0.62 *
*          *          *          *          *       *       *       *       *       *       *       *       *       *
* Reach #1   * 1450     * 100 year   * Alt4      * 32000.00 *  2531.00 *  2545.57 *       *  2547.34 *  0.002511 *   10.69 *  2992.82 *
326.90 *      0.62 *
* Reach #1   * 1450     * 100 year   * Alt3      * 32000.00 *  2531.00 *  2545.57 *       *  2547.34 *  0.002511 *   10.69 *  2992.82 *
326.90 *      0.62 *
* Reach #1   * 1450     * 10 year    * Alt4      *  8700.00 *  2531.00 *  2539.24 *       *  2540.09 *  0.003187 *    7.40 *  1175.18 *   267.89
*      0.62 *
* Reach #1   * 1450     * 10 year    * Alt3      *  8700.00 *  2531.00 *  2539.24 *       *  2540.09 *  0.003188 *    7.40 *  1175.11 *   267.89
*      0.62 *
*          *          *          *          *       *       *       *       *       *       *       *       *       *
* Reach #1   * 1400     * 100 year   * Alt4      * 32000.00 *  2530.00 *  2544.43 *       *  2546.72 *  0.003389 *   12.13 *  2638.51 *
298.53 *      0.72 *
* Reach #1   * 1400     * 100 year   * Alt3      * 32000.00 *  2530.00 *  2544.43 *       *  2546.72 *  0.003389 *   12.13 *  2638.51 *
298.53 *      0.72 *
* Reach #1   * 1400     * 10 year    * Alt4      *  8700.00 *  2530.00 *  2538.10 *       *  2539.28 *  0.004896 *    8.71 *   998.80 *   246.82
*      0.76 *
* Reach #1   * 1400     * 10 year    * Alt3      *  8700.00 *  2530.00 *  2538.10 *       *  2539.28 *  0.004895 *    8.71 *   998.86 *   246.82
*      0.76 *
*          *          *          *          *       *       *       *       *       *       *       *       *       *
* Reach #1   * 1350     * 100 year   * Alt4      * 32000.00 *  2530.00 *  2544.15 *  2540.70 *  2545.99 *  0.002360 *   10.90 *  2937.28 *
300.53 *      0.61 *
* Reach #1   * 1350     * 100 year   * Alt3      * 32000.00 *  2530.00 *  2544.15 *  2540.70 *  2545.99 *  0.002360 *   10.90 *  2937.28 *
300.53 *      0.61 *
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* Reach #1   * 1350     * 10 year   * Alt4      * 8700.00 *  2530.00 *  2537.72 *  2535.97 *  2538.47 *  0.002298 *   6.94 *  1253.24 *
246.93 *      0.54 *
* Reach #1   * 1350     * 10 year   * Alt3      * 8700.00 *  2530.00 *  2537.72 *  2535.97 *  2538.47 *  0.002297 *   6.94 *  1253.30 *
246.93 *      0.54 *
*          *          *          *          *       *       *       *       *       *       *       *       *       *       *
* Reach #1   * 1325     *          *          *  Bridge *       *       *       *       *       *       *       *       *       *
*          *          *          *          *       *       *       *       *       *       *       *       *       *
* Reach #1   * 1300     * 100 year  * Alt4      * 32000.00 *  2529.00 *  2542.32 *       *  2544.54 *  0.002847 *  11.96 *  2676.10 *
271.96 *      0.67 *
* Reach #1   * 1300     * 100 year  * Alt3      * 32000.00 *  2529.00 *  2542.32 *       *  2544.54 *  0.002846 *  11.96 *  2676.17 *
271.97 *      0.67 *
* Reach #1   * 1300     * 10 year   * Alt4      *  8700.00 *  2529.00 *  2536.19 *  2535.10 *  2537.17 *  0.003593 *   7.95 *  1093.76 *
246.59 *      0.67 *
* Reach #1   * 1300     * 10 year   * Alt3      *  8700.00 *  2529.00 *  2536.19 *  2535.10 *  2537.17 *  0.003589 *   7.95 *  1094.06 *
246.59 *      0.67 *
*          *          *          *          *       *       *       *       *       *       *       *       *       *       *
* Reach #1   * 1230     * 100 year  * Alt4      * 32000.00 *  2529.00 *  2538.41 *  2538.41 *  2542.74 *  0.006575 *  16.70 *  1924.15 *
262.04 *      1.00 *
* Reach #1   * 1230     * 100 year  * Alt3      * 32000.00 *  2529.00 *  2538.41 *  2538.41 *  2542.74 *  0.006575 *  16.70 *  1924.15 *
262.04 *      1.00 *
* Reach #1   * 1230     * 10 year   * Alt4      *  8700.00 *  2529.00 *  2533.14 *  2533.14 *  2535.04 *  0.008660 *  11.06 *   786.55 *
209.06 *      1.00 *
* Reach #1   * 1230     * 10 year   * Alt3      *  8700.00 *  2529.00 *  2533.14 *  2533.14 *  2535.04 *  0.008673 *  11.07 *   786.19 *
209.06 *      1.01 *
*          *          *          *          *       *       *       *       *       *       *       *       *       *       *
* Reach #1   * 1220     * 100 year  * Alt4      * 32000.00 *  2527.00 *  2537.18 *  2536.61 *  2540.78 *  0.005453 *  15.24 *  2100.09 *
240.30 *      0.91 *
* Reach #1   * 1220     * 100 year  * Alt3      * 32000.00 *  2527.00 *  2537.18 *  2536.61 *  2540.78 *  0.005447 *  15.23 *  2100.79 *
240.31 *      0.91 *
* Reach #1   * 1220     * 10 year   * Alt4      *  8700.00 *  2527.00 *  2532.72 *  2531.70 *  2533.79 *  0.003797 *   8.29 *  1049.40 *
231.50 *      0.69 *
* Reach #1   * 1220     * 10 year   * Alt3      *  8700.00 *  2527.00 *  2532.73 *  2531.70 *  2533.79 *  0.003794 *   8.29 *  1049.69 *
231.50 *      0.69 *
*          *          *          *          *       *       *       *       *       *       *       *       *       *       *
* Reach #1   * 1200     * 100 year  * Alt4      * 32000.00 *  2526.00 *  2535.68 *       *  2538.59 *  0.004279 *  13.70 *  2335.28 *
260.34 *      0.81 *
* Reach #1   * 1200     * 100 year  * Alt3      * 32000.00 *  2526.00 *  2535.69 *       *  2538.60 *  0.004262 *  13.69 *  2338.27 *
260.38 *      0.80 *
* Reach #1   * 1200     * 10 year   * Alt4      *  8700.00 *  2526.00 *  2529.73 *  2529.73 *  2531.43 *  0.008992 *  10.46 *   832.01 *
247.65 *      1.01 *
* Reach #1   * 1200     * 10 year   * Alt3      *  8700.00 *  2526.00 *  2529.73 *  2529.73 *  2531.43 *  0.009007 *  10.46 *   831.58 *
247.65 *      1.01 *
*          *          *          *          *       *       *       *       *       *       *       *       *       *       *
* Reach #1   * 1120     * 100 year  * Alt4      * 32000.00 *  2524.00 *  2536.03 *       *  2538.18 *  0.002587 *  11.77 *  2718.74 *
259.20 *      0.64 *
* Reach #1   * 1120     * 100 year  * Alt3      * 32000.00 *  2524.00 *  2536.04 *       *  2538.19 *  0.002580 *  11.76 *  2721.21 *
259.40 *      0.64 *
* Reach #1   * 1120     * 10 year   * Alt4      *  8700.00 *  2524.00 *  2530.00 *       *  2530.83 *  0.002768 *   7.31 *  1190.51 *   248.62
*       0.59 *
* Reach #1   * 1120     * 10 year   * Alt3      *  8700.00 *  2524.00 *  2530.00 *       *  2530.83 *  0.002766 *   7.31 *  1190.69 *   248.62
*       0.59 *
*          *          *          *          *       *       *       *       *       *       *       *       *       *       *
* Reach #1   * 1110     * 100 year  * Alt4      * 32000.00 *  2523.00 *  2531.97 *  2531.97 *  2536.22 *  0.006730 *  16.55 *  1933.48 *
227.61 *      1.00 *
* Reach #1   * 1110     * 100 year  * Alt3      * 32000.00 *  2523.00 *  2531.95 *  2531.95 *  2536.22 *  0.006788 *  16.60 *  1928.26 *
227.56 *      1.00 *
* Reach #1   * 1110     * 10 year   * Alt4      *  8700.00 *  2523.00 *  2526.87 *  2526.87 *  2528.72 *  0.008762 *  10.90 *   797.93 *
218.17 *      1.00 *
* Reach #1   * 1110     * 10 year   * Alt3      *  8700.00 *  2523.00 *  2526.87 *  2526.87 *  2528.72 *  0.008770 *  10.91 *   797.71 *
218.17 *      1.01 *
*          *          *          *          *       *       *       *       *       *       *       *       *       *       *
* Reach #1   * 1100     * 100 year  * Alt4      * 32000.00 *  2520.00 *  2531.04 *  2530.11 *  2534.65 *  0.004842 *  15.24 *  2100.15 *
217.90 *      0.86 *
* Reach #1   * 1100     * 100 year  * Alt3      * 32000.00 *  2520.00 *  2531.21 *       *  2534.69 *  0.004588 *  14.98 *  2136.04 *
218.24 *      0.84 *
* Reach #1   * 1100     * 10 year   * Alt4      *  8700.00 *  2520.00 *  2526.16 *       *  2527.20 *  0.003220 *   8.21 *  1059.23 *   208.06
*       0.64 *
* Reach #1   * 1100     * 10 year   * Alt3      *  8700.00 *  2520.00 *  2526.21 *       *  2527.24 *  0.003107 *   8.12 *  1071.02 *   208.18
*       0.63 *
*          *          *          *          *       *       *       *       *       *       *       *       *       *       *
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* Reach #1    * 1050      * 100 year    * Alt4       * 32000.00 *   2520.00 *   2528.77 *   2528.77 *   2532.92 *   0.006835 *    16.33 *   1959.48 *
237.70 *        1.00 *
* Reach #1    * 1050      * 100 year    * Alt3       * 32000.00 *   2520.00 *   2528.87 *   2528.87 *   2533.01 *   0.006744 *    16.31 *   1961.45 *
238.16 *        1.00 *
* Reach #1    * 1050      * 10 year     * Alt4       *  8700.00 *   2520.00 *   2523.87 *   2523.87 *   2525.66 *   0.008882 *    10.71 *    812.12 *
230.54 *        1.01 *
* Reach #1    * 1050      * 10 year     * Alt3       *  8700.00 *   2520.00 *   2523.93 *   2523.93 *   2525.72 *   0.008810 *    10.75 *    808.97 *
227.91 *        1.01 *
*           *           *           *           *           *           *           *           *           *           *           *           *
* Reach #1    * 1010      * 100 year    * Alt4       * 32000.00 *   2519.00 *   2526.57 *   2526.57 *   2530.10 *   0.007003 *    15.08 *   2122.35 *
300.87 *        1.00 *
* Reach #1    * 1010      * 100 year    * Alt3       * 32000.00 *   2519.00 *   2526.57 *   2526.57 *   2530.10 *   0.007003 *    15.08 *   2122.35 *
300.87 *        1.00 *
* Reach #1    * 1010      * 10 year     * Alt4       *  8700.00 *   2519.00 *   2522.38 *   2522.38 *   2523.90 *   0.009250 *     9.89 *    879.32 *
292.14 *        1.00 *
* Reach #1    * 1010      * 10 year     * Alt3       *  8700.00 *   2519.00 *   2522.38 *   2522.38 *   2523.90 *   0.009285 *     9.91 *    878.32 *
292.13 *        1.01 *
*           *           *           *           *           *           *           *           *           *           *           *           *
* Reach #1    * 1000      * 100 year    * Alt4       * 32000.00 *   2510.90 *   2523.46 *           *   2524.75 *   0.001293 *     9.11 *   3511.87 *
290.22 *        0.46 *
* Reach #1    * 1000      * 100 year    * Alt3       * 32000.00 *   2510.90 *   2523.79 *           *   2525.01 *   0.001187 *     8.87 *   3608.57 *
291.00 *        0.44 *
* Reach #1    * 1000      * 10 year     * Alt4       *  8700.00 *   2510.90 *   2515.69 *           *   2516.37 *   0.002316 *     6.63 *   1312.15 *    277.38
*        0.54 *
* Reach #1    * 1000      * 10 year     * Alt3       *  8700.00 *   2510.90 *   2515.72 *           *   2516.39 *   0.002258 *     6.58 *   1322.31 *    277.43
*        0.53 *
*           *           *           *           *           *           *           *           *           *           *           *           *
* Reach #1    * 990       * 100 year    * Alt4       * 32000.00 *   2510.20 *   2522.91 *           *   2524.51 *   0.001612 *    10.14 *   3154.68 *
263.06 *        0.52 *
* Reach #1    * 990       * 100 year    * Alt3       * 32000.00 *   2510.20 *   2523.29 *           *   2524.79 *   0.001459 *     9.83 *   3255.86 *
263.84 *        0.49 *
* Reach #1    * 990       * 10 year     * Alt4       *  8700.00 *   2510.20 *   2515.16 *           *   2515.99 *   0.002695 *     7.30 *   1191.87 *    244.68
*        0.58 *
* Reach #1    * 990       * 10 year     * Alt3       *  8700.00 *   2510.20 *   2515.22 *           *   2516.03 *   0.002594 *     7.21 *   1205.97 *    244.78
*        0.57 *
*           *           *           *           *           *           *           *           *           *           *           *           *
* Reach #1    * 975       * 100 year    * Alt4       * 32000.00 *   2509.40 *   2522.22 *           *   2524.17 *   0.001957 *    11.21 *   2855.56 *
236.05 *        0.57 *
* Reach #1    * 975       * 100 year    * Alt3       * 32000.00 *   2509.40 *   2522.68 *           *   2524.49 *   0.001742 *    10.80 *   2962.54 *
237.01 *        0.54 *
* Reach #1    * 975       * 10 year     * Alt4       *  8700.00 *   2509.40 *   2514.53 *           *   2515.49 *   0.003024 *     7.88 *   1104.44 *    220.04
*        0.62 *
* Reach #1    * 975       * 10 year     * Alt3       *  8700.00 *   2509.40 *   2514.63 *           *   2515.56 *   0.002849 *     7.74 *   1124.41 *    220.07
*        0.60 *
*           *           *           *           *           *           *           *           *           *           *           *           *
* Reach #1    * 965       * 100 year    * Alt4       * 32000.00 *   2508.70 *   2521.84 *           *   2523.87 *   0.001993 *    11.44 *   2797.61 *
227.42 *        0.57 *
* Reach #1    * 965       * 100 year    * Alt3       * 32000.00 *   2508.70 *   2522.35 *           *   2524.22 *   0.001751 *    10.97 *   2915.90 *
228.57 *        0.54 *
* Reach #1    * 965       * 10 year     * Alt4       *  8700.00 *   2508.70 *   2514.08 *           *   2515.05 *   0.002875 *     7.90 *   1101.40 *    210.37
*        0.61 *
* Reach #1    * 965       * 10 year     * Alt3       *  8700.00 *   2508.70 *   2514.22 *           *   2515.14 *   0.002635 *     7.69 *   1131.47 *    210.67
*        0.58 *
*           *           *           *           *           *           *           *           *           *           *           *           *
* Reach #1    * 950       * 100 year    * Alt4       * 32000.00 *   2507.90 *   2521.03 *           *   2523.50 *   0.002453 *    12.62 *   2536.56 *
206.52 *        0.63 *
* Reach #1    * 950       * 100 year    * Alt3       * 32000.00 *   2507.90 *   2521.63 *           *   2523.90 *   0.002132 *    12.08 *   2649.40 *
206.82 *        0.59 *
* Reach #1    * 950       * 10 year     * Alt4       *  8700.00 *   2507.90 *   2513.53 *           *   2514.60 *   0.003024 *     8.32 *   1046.28 *    191.30
*        0.63 *
* Reach #1    * 950       * 10 year     * Alt3       *  8700.00 *   2507.90 *   2513.72 *           *   2514.73 *   0.002729 *     8.07 *   1078.20 *    190.79
*        0.60 *
*           *           *           *           *           *           *           *           *           *           *           *           *
* Reach #1    * 900       * 100 year    * Alt4       * 32000.00 *   2506.90 *   2517.54 *   2517.54 *   2522.49 *   0.006266 *    17.90 *   1819.13 *
188.47 *        0.99 *
* Reach #1    * 900       * 100 year    * Alt3       * 32000.00 *   2506.90 *   2517.83 *   2517.83 *   2522.91 *   0.006426 *    18.09 *   1769.07 *
172.49 *        1.00 *
* Reach #1    * 900       * 10 year     * Alt4       *  8700.00 *   2506.90 *   2512.00 *           *   2513.71 *   0.005510 *    10.50 *    828.45 *    167.11
*        0.83 *
```

```
* Reach #1    * 900       * 10 year    * Alt3       *  8700.00 *   2506.90 *   2512.16 *   2511.51 *   2513.89 *   0.005388 *    10.57 *    823.09 *
161.39 *        0.82 *
*          *          *          *          *        *         *         *         *         *         *         *         *         *         *
* Reach #1    * 875       * 100 year   * Alt4       * 32000.00 *   2506.20 *   2516.40 *   2516.40 *   2521.18 *   0.006317 *    17.59 *   1849.55 *
198.13 *        0.99 *
* Reach #1    * 875       * 100 year   * Alt3       * 32000.00 *   2506.20 *   2516.67 *   2516.67 *   2521.64 *   0.006572 *    17.90 *   1787.96 *
181.39 *        1.00 *
* Reach #1    * 875       * 10 year    * Alt4       *  8700.00 *   2506.20 *   2510.52 *   2510.52 *   2512.64 *   0.008441 *    11.71 *    743.03 *
176.36 *        1.01 *
* Reach #1    * 875       * 10 year    * Alt3       *  8700.00 *   2506.20 *   2510.65 *   2510.65 *   2512.84 *   0.008365 *    11.87 *    733.16 *
169.26 *        1.00 *
*          *          *          *          *        *         *         *         *         *         *         *         *         *         *
* Reach #1    * 865       * 100 year   * Alt4       * 32000.00 *   2505.50 *   2514.56 *   2514.56 *   2518.86 *   0.006509 *    16.68 *   1942.08 *
231.26 *        0.99 *
* Reach #1    * 865       * 100 year   * Alt3       * 32000.00 *   2505.50 *   2514.67 *   2514.67 *   2519.10 *   0.006729 *    16.90 *   1893.11 *
215.12 *        1.00 *
* Reach #1    * 865       * 10 year    * Alt4       *  8700.00 *   2505.50 *   2509.44 *   2509.32 *   2511.21 *   0.007822 *    10.68 *    814.28 *
210.36 *        0.96 *
* Reach #1    * 865       * 10 year    * Alt3       *  8700.00 *   2505.50 *   2509.47 *   2509.38 *   2511.30 *   0.008045 *    10.88 *    799.94 *
205.40 *        0.97 *
*          *          *          *          *        *         *         *         *         *         *         *         *         *         *
* Reach #1    * 850       * 100 year   * Alt4       * 32000.00 *   2504.80 *   2513.82 *   2512.96 *   2517.02 *   0.004795 *    14.37 *   2250.62 *
264.92 *        0.85 *
* Reach #1    * 850       * 100 year   * Alt3       * 32000.00 *   2504.80 *   2513.77 *   2513.07 *   2517.17 *   0.005213 *    14.79 *   2164.19 *
249.68 *        0.89 *
* Reach #1    * 850       * 10 year    * Alt4       *  8700.00 *   2504.80 *   2508.89 *         *   2510.09 *   0.005053 *     8.82 *    986.67 *    245.43
*        0.77 *
* Reach #1    * 850       * 10 year    * Alt3       *  8700.00 *   2504.80 *   2508.88 *         *   2510.14 *   0.005274 *     9.00 *    966.19 *    240.43
*        0.79 *
*          *          *          *          *        *         *         *         *         *         *         *         *         *         *
* Reach #1    * 825       * 100 year   * Alt4       * 32000.00 *   2503.90 *   2513.30 *         *   2516.00 *   0.003902 *    13.20 *   2424.05 *
266.98 *        0.77 *
* Reach #1    * 825       * 100 year   * Alt3       * 32000.00 *   2503.90 *   2513.39 *         *   2516.05 *   0.003804 *    13.11 *   2441.64 *
266.91 *        0.76 *
* Reach #1    * 825       * 10 year    * Alt4       *  8700.00 *   2503.90 *   2507.99 *         *   2509.09 *   0.004584 *     8.41 *   1034.25 *    256.85
*        0.74 *
* Reach #1    * 825       * 10 year    * Alt3       *  8700.00 *   2503.90 *   2508.02 *         *   2509.11 *   0.004507 *     8.38 *   1038.33 *    256.18
*        0.73 *
*          *          *          *          *        *         *         *         *         *         *         *         *         *         *
* Reach #1    * 800       * 100 year   * Alt4       * 32000.00 *   2503.30 *   2512.51 *         *   2515.51 *   0.004450 *    13.91 *   2301.07 *
258.40 *        0.82 *
* Reach #1    * 800       * 100 year   * Alt3       * 32000.00 *   2503.30 *   2512.78 *         *   2515.61 *   0.004041 *    13.49 *   2371.29 *
258.90 *        0.79 *
* Reach #1    * 800       * 10 year    * Alt4       *  8700.00 *   2503.30 *   2507.39 *         *   2508.56 *   0.004884 *     8.68 *   1002.59 *    248.98
*        0.76 *
* Reach #1    * 800       * 10 year    * Alt3       *  8700.00 *   2503.30 *   2507.52 *         *   2508.62 *   0.004394 *     8.40 *   1035.49 *    249.22
*        0.73 *
*          *          *          *          *        *         *         *         *         *         *         *         *         *         *
* Reach #1    * 750       * 100 year   * Alt4       * 32000.00 *   2502.00 *   2510.75 *   2510.10 *   2514.19 *   0.005461 *    14.90 *   2148.30 *
249.30 *        0.89 *
* Reach #1    * 750       * 100 year   * Alt3       * 32000.00 *   2502.00 *   2510.68 *   2510.27 *   2514.29 *   0.005788 *    15.23 *   2100.66 *
251.87 *        0.93 *
* Reach #1    * 750       * 10 year    * Alt4       *  8700.00 *   2502.00 *   2506.04 *         *   2507.25 *   0.005150 *     8.84 *    984.41 *    245.37
*        0.78 *
* Reach #1    * 750       * 10 year    * Alt3       *  8700.00 *   2502.00 *   2506.03 *         *   2507.32 *   0.005539 *     9.13 *    952.58 *    241.21
*        0.81 *
*          *          *          *          *        *         *         *         *         *         *         *         *         *         *
* Reach #1    * 700       * 100 year   * Alt4       * 32000.00 *   2500.80 *   2509.77 *         *   2512.84 *   0.004689 *    14.05 *   2277.36 *
262.32 *        0.84 *
* Reach #1    * 700       * 100 year   * Alt3       * 32000.00 *   2500.80 *   2509.82 *         *   2512.85 *   0.004612 *    13.98 *   2289.14 *
262.41 *        0.83 *
* Reach #1    * 700       * 10 year    * Alt4       *  8700.00 *   2500.80 *   2504.88 *         *   2506.02 *   0.004768 *     8.56 *   1016.21 *    253.06
*        0.75 *
* Reach #1    * 700       * 10 year    * Alt3       *  8700.00 *   2500.80 *   2504.88 *         *   2506.02 *   0.004767 *     8.56 *   1016.27 *    253.06
*        0.75 *
*          *          *          *          *        *         *         *         *         *         *         *         *         *         *
* Reach #1    * 650       * 100 year   * Alt4       * 32000.00 *   2499.40 *   2508.48 *         *   2511.46 *   0.004493 *    13.86 *   2308.58 *
262.71 *        0.82 *
* Reach #1    * 650       * 100 year   * Alt3       * 32000.00 *   2499.40 *   2508.60 *         *   2511.50 *   0.004307 *    13.68 *   2339.19 *
262.92 *        0.81 *
```

Reach #1	650	10 year	Alt4	8700.00	2499.40	2503.46		2504.60	0.004841	8.60	1012.07	253.35	0.76
Reach #1	650	10 year	Alt3	8700.00	2499.40	2503.46		2504.60	0.004839	8.60	1012.20	253.35	0.76
Reach #1	600	100 year	Alt4	32000.00	2498.30	2507.62		2510.48	0.004173	13.57	2358.43	262.19	0.80
Reach #1	600	100 year	Alt3	32000.00	2498.30	2507.76		2510.56	0.004012	13.43	2382.55	260.76	0.78
Reach #1	600	10 year	Alt4	8700.00	2498.30	2502.47		2503.57	0.004483	8.42	1033.74	252.19	0.73
Reach #1	600	10 year	Alt3	8700.00	2498.30	2502.39		2503.54	0.004831	8.63	1008.60	250.73	0.76
Reach #1	550	100 year	Alt4	32000.00	2496.90	2506.49		2509.27	0.003915	13.38	2391.77	258.09	0.77
Reach #1	550	100 year	Alt3	32000.00	2496.90	2506.90		2509.40	0.003338	12.70	2519.95	259.25	0.72
Reach #1	550	10 year	Alt4	8700.00	2496.90	2500.90		2502.13	0.005295	8.91	976.92	247.97	0.79
Reach #1	550	10 year	Alt3	8700.00	2496.90	2500.99		2502.13	0.004768	8.58	1013.74	250.81	0.75
Reach #1	500	100 year	Alt4	32000.00	2496.10	2506.31		2508.54	0.002835	12.01	2701.27	279.19	0.67
Reach #1	500	100 year	Alt3	32000.00	2496.10	2506.55		2508.80	0.002832	12.02	2661.97	263.82	0.67
Reach #1	500	10 year	Alt4	8700.00	2496.10	2500.13		2501.24	0.004746	8.48	1026.45	258.53	0.75
Reach #1	500	10 year	Alt3	8700.00	2496.10	2500.19		2501.32	0.004736	8.55	1017.90	252.64	0.75
Reach #1	450	100 year	Alt4	32000.00	2494.60	2505.80		2507.67	0.002107	10.98	2953.76	279.72	0.58
Reach #1	450	100 year	Alt3	32000.00	2494.60	2506.04		2507.93	0.002125	11.01	2906.24	263.82	0.58
Reach #1	450	10 year	Alt4	8700.00	2494.60	2498.72		2499.80	0.004455	8.33	1044.15	257.18	0.73
Reach #1	450	10 year	Alt3	8700.00	2494.60	2498.81		2499.89	0.004338	8.34	1043.25	251.34	0.72
Reach #1	400	100 year	Alt4	32000.00	2493.20	2505.52		2507.08	0.001558	10.03	3231.53	275.06	0.51
Reach #1	400	100 year	Alt3	32000.00	2493.20	2505.74		2507.33	0.001607	10.12	3160.69	263.31	0.51
Reach #1	400	10 year	Alt4	8700.00	2493.20	2497.90		2498.74	0.002913	7.34	1185.17	256.22	0.60
Reach #1	400	10 year	Alt3	8700.00	2493.20	2498.02		2498.86	0.002844	7.36	1181.28	249.43	0.60
Reach #1	350	100 year	Alt4	32000.00	2492.00	2505.16		2506.71	0.001439	9.99	3246.54	265.81	0.49
Reach #1	350	100 year	Alt3	32000.00	2492.00	2505.32		2506.94	0.001539	10.22	3132.03	248.92	0.51
Reach #1	350	10 year	Alt4	8700.00	2492.00	2497.35		2498.09	0.002187	6.90	1260.87	240.74	0.53
Reach #1	350	10 year	Alt3	8700.00	2492.00	2497.46		2498.22	0.002218	7.02	1238.79	232.67	0.54
Reach #1	325	100 year	Alt4	32000.00	2491.50	2504.72		2506.52	0.001679	10.80	3015.85	247.77	0.53
Reach #1	325	100 year	Alt3	32000.00	2491.50	2504.76		2506.73	0.001900	11.27	2838.35	225.95	0.56
Reach #1	325	10 year	Alt4	8700.00	2491.50	2497.04		2497.85	0.002331	7.26	1198.30	221.75	0.55
Reach #1	325	10 year	Alt3	8700.00	2491.50	2497.10		2497.97	0.002450	7.49	1161.12	212.27	0.56
Reach #1	300	100 year	Alt4	32000.00	2490.90	2503.82	2500.50	2506.21	0.002333	12.44	2627.70	227.28	0.62

* Reach #1 * 300 * 100 year * Alt3 * 32000.00 * 2490.90 * 2503.69 * 2500.73 * 2506.37 * 0.002749 * 13.13 * 2438.06 * 204.67 * 0.67 *
* Reach #1 * 300 * 10 year * Alt4 * 8700.00 * 2490.90 * 2496.44 * 2494.95 * 2497.49 * 0.003009 * 8.22 * 1058.37 * 196.49 * 0.62 *
* Reach #1 * 300 * 10 year * Alt3 * 8700.00 * 2490.90 * 2496.43 * 2495.08 * 2497.58 * 0.003337 * 8.62 * 1009.09 * 188.64 * 0.66 *
* * * * * * * * * * * * * * *
* Reach #1 * 295 * * * Bridge * * * * * * * * * *
* * * * * * * * * * * * * * *
* Reach #1 * 290 * 100 year * Alt4 * 32000.00 * 2490.20 * 2502.66 * * 2505.35 * 0.002833 * 13.16 * 2432.23 * 208.19 * 0.68 *
* Reach #1 * 290 * 100 year * Alt3 * 32000.00 * 2490.20 * 2502.69 * * 2505.35 * 0.002791 * 13.09 * 2444.85 * 208.21 * 0.67 *
* Reach #1 * 290 * 10 year * Alt4 * 8700.00 * 2490.20 * 2495.56 * * 2496.72 * 0.003473 * 8.64 * 1006.76 * 193.32 * 0.67 *
* Reach #1 * 290 * 10 year * Alt3 * 8700.00 * 2490.20 * 2495.58 * * 2496.72 * 0.003406 * 8.58 * 1014.32 * 193.99 * 0.66 *
* * * * * * * * * * * * * * *
* Reach #1 * 275 * 100 year * Alt4 * 32000.00 * 2489.80 * 2499.95 * 2499.95 * 2504.79 * 0.006600 * 17.66 * 1812.47 * 188.81 * 1.00 *
* Reach #1 * 275 * 100 year * Alt3 * 32000.00 * 2489.80 * 2499.95 * 2499.95 * 2504.79 * 0.006600 * 17.66 * 1812.47 * 188.81 * 1.00 *
* Reach #1 * 275 * 10 year * Alt4 * 8700.00 * 2489.80 * 2494.39 * 2494.11 * 2496.25 * 0.006817 * 10.95 * 794.81 * 177.70 * 0.91 *
* Reach #1 * 275 * 10 year * Alt3 * 8700.00 * 2489.80 * 2494.39 * 2494.11 * 2496.25 * 0.006817 * 10.95 * 794.81 * 177.70 * 0.91 *
* * * * * * * * * * * * * * *
* Reach #1 * 200 * 100 year * Alt4 * 32000.00 * 2488.00 * 2498.18 * 2498.18 * 2503.01 * 0.006551 * 17.63 * 1815.39 * 188.47 * 1.00 *
* Reach #1 * 200 * 100 year * Alt3 * 32000.00 * 2488.00 * 2498.18 * 2498.18 * 2503.01 * 0.006551 * 17.63 * 1815.39 * 188.47 * 1.00 *
* Reach #1 * 200 * 10 year * Alt4 * 8700.00 * 2488.00 * 2492.64 * 2492.31 * 2494.47 * 0.006625 * 10.86 * 801.15 * 177.39 * 0.90 *
* Reach #1 * 200 * 10 year * Alt3 * 8700.00 * 2488.00 * 2492.64 * 2492.31 * 2494.47 * 0.006625 * 10.86 * 801.15 * 177.39 * 0.90 *
* * * * * * * * * * * * * * *
* Reach #1 * 150 * 100 year * Alt4 * 32000.00 * 2486.20 * 2497.02 * * 2500.76 * 0.004684 * 15.53 * 2061.02 * 201.31 * 0.86 *
* Reach #1 * 150 * 100 year * Alt3 * 32000.00 * 2486.20 * 2497.02 * * 2500.76 * 0.004684 * 15.53 * 2061.02 * 201.31 * 0.86 *
* Reach #1 * 150 * 10 year * Alt4 * 8700.00 * 2486.20 * 2492.03 * * 2493.04 * 0.002706 * 8.04 * 1081.76 * 191.33 * 0.60 *
* Reach #1 * 150 * 10 year * Alt3 * 8700.00 * 2486.20 * 2492.03 * * 2493.04 * 0.002706 * 8.04 * 1081.76 * 191.33 * 0.60 *
* * * * * * * * * * * * * * *
* Reach #1 * 100 * 100 year * Alt4 * 32000.00 * 2484.00 * 2496.00 * 2495.07 * 2499.21 * 0.005001 * 14.39 * 2223.50 * 261.12 * 0.87 *
* Reach #1 * 100 * 100 year * Alt3 * 32000.00 * 2484.00 * 2496.00 * 2495.07 * 2499.21 * 0.005001 * 14.39 * 2223.50 * 261.12 * 0.87 *
* Reach #1 * 100 * 10 year * Alt4 * 8700.00 * 2484.00 * 2490.70 * 2490.02 * 2491.98 * 0.005010 * 9.07 * 959.09 * 226.81 * 0.78 *
* Reach #1 * 100 * 10 year * Alt3 * 8700.00 * 2484.00 * 2490.70 * 2490.02 * 2491.98 * 0.005010 * 9.07 * 959.09 * 226.81 * 0.78 *
****

Profile Output Table - Standard Table 2
****
* Reach * River Sta * Profile * Plan * E.G. Elev * W.S. Elev * Vel Head * Frctn Loss * C & E Loss * Q Left * Q Channel * Q Right * Top Width *
* * * * * (ft) * (ft) * (ft) * (ft) * (ft) * (cfs) * (cfs) * (cfs) * (ft) *
****
* Reach #1 * 1600 * 100 year * Alt4 * 2551.95 * 2548.55 * 3.40 * 2.92 * 0.48 * * 32000.00 * * 320.60 *
* Reach #1 * 1600 * 100 year * Alt3 * 2551.95 * 2548.55 * 3.40 * 2.92 * 0.48 * * 32000.00 * * 320.60 *
* Reach #1 * 1600 * 10 year * Alt4 * 2545.59 * 2543.90 * 1.69 * 3.38 * 0.25 * * 8700.00 * * 248.46 *
* Reach #1 * 1600 * 10 year * Alt3 * 2545.59 * 2543.90 * 1.69 * 3.38 * 0.25 * * 8700.00 * * 248.44 *
* * * * * * * * * * * * * * *
* Reach #1 * 1500 * 100 year * Alt4 * 2547.93 * 2546.12 * 1.81 * 0.58 * 0.01 * * 32000.00 * * 355.61 *

* Reach #1	* 1500	* 100 year	* Alt3	*	2547.93 *	2546.12 *	1.81 *	0.58 *	0.01 *	* 32000.00 *	* 355.60 *
* Reach #1	* 1500	* 10 year	* Alt4	*	2540.77 *	2539.92 *	0.85 *	0.68 *	0.00 *	* 8700.00 *	* 267.46 *
* Reach #1	* 1500	* 10 year	* Alt3	*	2540.77 *	2539.92 *	0.85 *	0.68 *	0.00 *	* 8700.00 *	* 267.46 *
*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 1450	* 100 year	* Alt4	*	2547.34 *	2545.57 *	1.78 *	0.58 *	0.05 *	* 32000.00 *	* 326.90 *
* Reach #1	* 1450	* 100 year	* Alt3	*	2547.34 *	2545.57 *	1.78 *	0.58 *	0.05 *	* 32000.00 *	* 326.90 *
* Reach #1	* 1450	* 10 year	* Alt4	*	2540.09 *	2539.24 *	0.85 *	0.78 *	0.03 *	* 8700.00 *	* 267.89 *
* Reach #1	* 1450	* 10 year	* Alt3	*	2540.09 *	2539.24 *	0.85 *	0.78 *	0.03 *	* 8700.00 *	* 267.89 *
*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 1400	* 100 year	* Alt4	*	2546.72 *	2544.43 *	2.28 *	0.59 *	0.13 *	* 32000.00 *	* 298.53 *
* Reach #1	* 1400	* 100 year	* Alt3	*	2546.72 *	2544.43 *	2.28 *	0.59 *	0.13 *	* 32000.00 *	* 298.53 *
* Reach #1	* 1400	* 10 year	* Alt4	*	2539.28 *	2538.10 *	1.18 *	0.68 *	0.13 *	* 8700.00 *	* 246.82 *
* Reach #1	* 1400	* 10 year	* Alt3	*	2539.28 *	2538.10 *	1.18 *	0.68 *	0.13 *	* 8700.00 *	* 246.82 *
*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 1350	* 100 year	* Alt4	*	2545.99 *	2544.15 *	1.84 *	0.34 *	0.08 *	* 31999.94 *	0.06 * 300.53 *
* Reach #1	* 1350	* 100 year	* Alt3	*	2545.99 *	2544.15 *	1.84 *	0.34 *	0.08 *	* 31999.94 *	0.06 * 300.53 *
* Reach #1	* 1350	* 10 year	* Alt4	*	2538.47 *	2537.72 *	0.75 *	0.32 *	0.04 *	* 8700.00 *	* 246.93 *
* Reach #1	* 1350	* 10 year	* Alt3	*	2538.47 *	2537.72 *	0.75 *	0.32 *	0.04 *	* 8700.00 *	* 246.93 *
*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 1325	*	*	*	Bridge *	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 1300	* 100 year	* Alt4	*	2544.54 *	2542.32 *	2.22 *	1.59 *	0.21 *	* 32000.00 *	* 271.96 *
* Reach #1	* 1300	* 100 year	* Alt3	*	2544.54 *	2542.32 *	2.22 *	1.59 *	0.21 *	* 32000.00 *	* 271.97 *
* Reach #1	* 1300	* 10 year	* Alt4	*	2537.17 *	2536.19 *	0.98 *	2.04 *	0.09 *	* 8700.00 *	* 246.59 *
* Reach #1	* 1300	* 10 year	* Alt3	*	2537.17 *	2536.19 *	0.98 *	2.04 *	0.09 *	* 8700.00 *	* 246.59 *
*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 1230	* 100 year	* Alt4	*	2542.74 *	2538.41 *	4.33 *	0.28 *	0.22 *	* 31992.67 *	7.33 * 262.04 *
* Reach #1	* 1230	* 100 year	* Alt3	*	2542.74 *	2538.41 *	4.33 *	0.28 *	0.22 *	* 31992.67 *	7.33 * 262.04 *
* Reach #1	* 1230	* 10 year	* Alt4	*	2535.04 *	2533.14 *	1.90 *	0.26 *	0.25 *	* 8700.00 *	* 209.06 *
* Reach #1	* 1230	* 10 year	* Alt3	*	2535.04 *	2533.14 *	1.90 *	0.26 *	0.25 *	* 8700.00 *	* 209.06 *
*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 1220	* 100 year	* Alt4	*	2540.78 *	2537.18 *	3.61 *	1.98 *	0.21 *	* 32000.00 *	* 240.30 *
* Reach #1	* 1220	* 100 year	* Alt3	*	2540.78 *	2537.18 *	3.60 *	1.98 *	0.21 *	* 32000.00 *	* 240.31 *
* Reach #1	* 1220	* 10 year	* Alt4	*	2533.79 *	2532.72 *	1.07 *	2.30 *	0.06 *	* 8700.00 *	* 231.50 *
* Reach #1	* 1220	* 10 year	* Alt3	*	2533.79 *	2532.73 *	1.07 *	2.30 *	0.06 *	* 8700.00 *	* 231.50 *
*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 1200	* 100 year	* Alt4	*	2538.59 *	2535.68 *	2.92 *	0.19 *	0.23 *	* 32000.00 *	* 260.34 *
* Reach #1	* 1200	* 100 year	* Alt3	*	2538.60 *	2535.69 *	2.91 *	0.18 *	0.23 *	* 32000.00 *	* 260.38 *
* Reach #1	* 1200	* 10 year	* Alt4	*	2531.43 *	2529.73 *	1.70 *	0.26 *	0.26 *	* 8700.00 *	* 247.65 *
* Reach #1	* 1200	* 10 year	* Alt3	*	2531.43 *	2529.73 *	1.70 *	0.26 *	0.26 *	* 8700.00 *	* 247.65 *
*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 1120	* 100 year	* Alt4	*	2538.18 *	2536.03 *	2.15 *	1.75 *	0.21 *	* 32000.00 *	0.00 * 259.20 *
* Reach #1	* 1120	* 100 year	* Alt3	*	2538.19 *	2536.04 *	2.15 *	1.75 *	0.21 *	* 32000.00 *	0.00 * 259.40 *
* Reach #1	* 1120	* 10 year	* Alt4	*	2530.83 *	2530.00 *	0.83 *	2.01 *	0.10 *	* 8700.00 *	* 248.62 *
* Reach #1	* 1120	* 10 year	* Alt3	*	2530.83 *	2530.00 *	0.83 *	2.01 *	0.10 *	* 8700.00 *	* 248.62 *
*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 1110	* 100 year	* Alt4	*	2536.22 *	2531.97 *	4.25 *	0.21 *	0.19 *	* 32000.00 *	* 227.61 *
* Reach #1	* 1110	* 100 year	* Alt3	*	2536.22 *	2531.95 *	4.28 *	0.20 *	0.24 *	* 32000.00 *	* 227.56 *
* Reach #1	* 1110	* 10 year	* Alt4	*	2528.72 *	2526.87 *	1.85 *	0.18 *	0.24 *	* 8700.00 *	* 218.17 *
* Reach #1	* 1110	* 10 year	* Alt3	*	2528.72 *	2526.87 *	1.85 *	0.18 *	0.25 *	* 8700.00 *	* 218.17 *
*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 1100	* 100 year	* Alt4	*	2534.65 *	2531.04 *	3.61 *	1.68 *	0.05 *	* 32000.00 *	* 217.90 *
* Reach #1	* 1100	* 100 year	* Alt3	*	2534.69 *	2531.21 *	3.48 *	1.62 *	0.06 *	* 32000.00 *	* 218.24 *
* Reach #1	* 1100	* 10 year	* Alt4	*	2527.20 *	2526.16 *	1.05 *	1.48 *	0.07 *	* 8700.00 *	* 208.06 *
* Reach #1	* 1100	* 10 year	* Alt3	*	2527.24 *	2526.21 *	1.02 *	1.44 *	0.08 *	* 8700.00 *	* 208.18 *
*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 1050	* 100 year	* Alt4	*	2532.92 *	2528.77 *	4.14 *	1.12 *	0.18 *	* 32000.00 *	* 237.70 *
* Reach #1	* 1050	* 100 year	* Alt3	*	2533.01 *	2528.87 *	4.13 *	1.11 *	0.18 *	* 32000.00 *	* 238.16 *
* Reach #1	* 1050	* 10 year	* Alt4	*	2525.66 *	2523.87 *	1.78 *	1.47 *	0.08 *	* 8700.00 *	* 230.54 *
* Reach #1	* 1050	* 10 year	* Alt3	*	2525.72 *	2523.93 *	1.80 *	1.46 *	0.08 *	* 8700.00 *	* 227.91 *
*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 1010	* 100 year	* Alt4	*	2530.10 *	2526.57 *	3.53 *	0.18 *	0.67 *	* 32000.00 *	* 300.87 *
* Reach #1	* 1010	* 100 year	* Alt3	*	2530.10 *	2526.57 *	3.53 *	0.17 *	0.69 *	* 32000.00 *	* 300.87 *
* Reach #1	* 1010	* 10 year	* Alt4	*	2523.90 *	2522.38 *	1.52 *	0.30 *	0.25 *	* 8700.00 *	* 292.14 *
* Reach #1	* 1010	* 10 year	* Alt3	*	2523.90 *	2522.38 *	1.52 *	0.29 *	0.26 *	* 8700.00 *	* 292.13 *
*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 1000	* 100 year	* Alt4	*	2524.75 *	2523.46 *	1.29 *	0.21 *	0.03 *	* 32000.00 *	* 290.22 *
* Reach #1	* 1000	* 100 year	* Alt3	*	2525.01 *	2523.79 *	1.22 *	0.19 *	0.03 *	* 32000.00 *	* 291.00 *
* Reach #1	* 1000	* 10 year	* Alt4	*	2516.37 *	2515.69 *	0.68 *	0.37 *	0.01 *	* 8700.00 *	* 277.38 *
* Reach #1	* 1000	* 10 year	* Alt3	*	2516.39 *	2515.72 *	0.67 *	0.36 *	0.01 *	* 8700.00 *	* 277.43 *

*	*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 990	* 100 year	* Alt4	*	2524.51 *	2522.91 *	1.60 *	0.30 *	0.04 *	*	32000.00 *	* 263.06 *
* Reach #1	* 990	* 100 year	* Alt3	*	2524.79 *	2523.29 *	1.50 *	0.27 *	0.03 *	*	32000.00 *	* 263.84 *
* Reach #1	* 990	* 10 year	* Alt4	*	2515.99 *	2515.16 *	0.83 *	0.48 *	0.01 *	*	8700.00 *	* 244.68 *
* Reach #1	* 990	* 10 year	* Alt3	*	2516.03 *	2515.22 *	0.81 *	0.46 *	0.01 *	*	8700.00 *	* 244.78 *
*	*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 975	* 100 year	* Alt4	*	2524.17 *	2522.22 *	1.95 *	0.30 *	0.01 *	*	32000.00 *	* 236.05 *
* Reach #1	* 975	* 100 year	* Alt3	*	2524.49 *	2522.68 *	1.81 *	0.26 *	0.01 *	*	32000.00 *	* 237.01 *
* Reach #1	* 975	* 10 year	* Alt4	*	2515.49 *	2514.53 *	0.96 *	0.45 *	0.00 *	*	8700.00 *	* 220.04 *
* Reach #1	* 975	* 10 year	* Alt3	*	2515.56 *	2514.63 *	0.93 *	0.41 *	0.00 *	*	8700.00 *	* 220.07 *
*	*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 965	* 100 year	* Alt4	*	2523.87 *	2521.84 *	2.03 *	0.33 *	0.04 *	*	32000.00 *	* 227.42 *
* Reach #1	* 965	* 100 year	* Alt3	*	2524.22 *	2522.35 *	1.87 *	0.29 *	0.04 *	*	32000.00 *	* 228.57 *
* Reach #1	* 965	* 10 year	* Alt4	*	2515.05 *	2514.08 *	0.97 *	0.44 *	0.01 *	*	8700.00 *	* 210.37 *
* Reach #1	* 965	* 10 year	* Alt3	*	2515.14 *	2514.22 *	0.92 *	0.40 *	0.01 *	*	8700.00 *	* 210.67 *
*	*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 950	* 100 year	* Alt4	*	2523.50 *	2521.03 *	2.47 *	0.77 *	0.25 *	*	32000.00 *	* 206.52 *
* Reach #1	* 950	* 100 year	* Alt3	*	2523.90 *	2521.63 *	2.27 *	0.71 *	0.28 *	*	32000.00 *	* 206.82 *
* Reach #1	* 950	* 10 year	* Alt4	*	2514.60 *	2513.53 *	1.07 *	0.82 *	0.06 *	*	8700.00 *	* 191.30 *
* Reach #1	* 950	* 10 year	* Alt3	*	2514.73 *	2513.72 *	1.01 *	0.77 *	0.07 *	*	8700.00 *	* 190.79 *
*	*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 900	* 100 year	* Alt4	*	2522.49 *	2517.54 *	4.95 *	0.96 *	0.05 *	197.76 *	31802.24 *	* 188.47 *
* Reach #1	* 900	* 100 year	* Alt3	*	2522.91 *	2517.83 *	5.08 *	0.99 *	0.03 *	*	32000.00 *	* 172.49 *
* Reach #1	* 900	* 10 year	* Alt4	*	2513.71 *	2512.00 *	1.71 *	1.02 *	0.04 *	*	8700.00 *	* 167.11 *
* Reach #1	* 900	* 10 year	* Alt3	*	2513.89 *	2512.16 *	1.73 *	1.01 *	0.05 *	*	8700.00 *	* 161.39 *
*	*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 875	* 100 year	* Alt4	*	2521.18 *	2516.40 *	4.78 *	0.92 *	0.14 *	184.58 *	31815.42 *	* 198.13 *
* Reach #1	* 875	* 100 year	* Alt3	*	2521.64 *	2516.67 *	4.97 *	0.95 *	0.16 *	*	32000.00 *	* 181.39 *
* Reach #1	* 875	* 10 year	* Alt4	*	2512.64 *	2510.52 *	2.13 *	1.16 *	0.11 *	*	8700.00 *	* 176.36 *
* Reach #1	* 875	* 10 year	* Alt3	*	2512.84 *	2510.65 *	2.19 *	1.17 *	0.10 *	*	8700.00 *	* 169.26 *
*	*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 865	* 100 year	* Alt4	*	2518.86 *	2514.56 *	4.30 *	0.85 *	0.33 *	119.38 *	31880.63 *	* 231.26 *
* Reach #1	* 865	* 100 year	* Alt3	*	2519.10 *	2514.67 *	4.44 *	0.90 *	0.31 *	*	32000.00 *	* 215.12 *
* Reach #1	* 865	* 10 year	* Alt4	*	2511.21 *	2509.44 *	1.77 *	0.95 *	0.17 *	*	8700.00 *	* 210.36 *
* Reach #1	* 865	* 10 year	* Alt3	*	2511.30 *	2509.47 *	1.84 *	0.99 *	0.17 *	*	8700.00 *	* 205.40 *
*	*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 850	* 100 year	* Alt4	*	2517.02 *	2513.82 *	3.20 *	0.87 *	0.15 *	116.32 *	31883.68 *	* 264.92 *
* Reach #1	* 850	* 100 year	* Alt3	*	2517.17 *	2513.77 *	3.39 *	0.89 *	0.22 *	*	32000.00 *	* 249.68 *
* Reach #1	* 850	* 10 year	* Alt4	*	2510.09 *	2508.89 *	1.21 *	0.97 *	0.03 *	*	8700.00 *	* 245.43 *
* Reach #1	* 850	* 10 year	* Alt3	*	2510.14 *	2508.88 *	1.26 *	0.98 *	0.05 *	*	8700.00 *	* 240.43 *
*	*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 825	* 100 year	* Alt4	*	2516.00 *	2513.30 *	2.71 *	0.46 *	0.03 *	*	32000.00 *	* 266.98 *
* Reach #1	* 825	* 100 year	* Alt3	*	2516.05 *	2513.39 *	2.67 *	0.43 *	0.02 *	*	32000.00 *	* 266.91 *
* Reach #1	* 825	* 10 year	* Alt4	*	2509.09 *	2507.99 *	1.10 *	0.52 *	0.01 *	*	8700.00 *	* 256.85 *
* Reach #1	* 825	* 10 year	* Alt3	*	2509.11 *	2508.02 *	1.09 *	0.49 *	0.00 *	*	8700.00 *	* 256.18 *
*	*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 800	* 100 year	* Alt4	*	2515.51 *	2512.51 *	3.00 *	1.28 *	0.04 *	*	32000.00 *	* 258.40 *
* Reach #1	* 800	* 100 year	* Alt3	*	2515.61 *	2512.78 *	2.83 *	1.24 *	0.08 *	*	32000.00 *	* 258.90 *
* Reach #1	* 800	* 10 year	* Alt4	*	2508.56 *	2507.39 *	1.17 *	1.30 *	0.00 *	*	8700.00 *	* 248.98 *
* Reach #1	* 800	* 10 year	* Alt3	*	2508.62 *	2507.52 *	1.10 *	1.28 *	0.02 *	*	8700.00 *	* 249.22 *
*	*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 750	* 100 year	* Alt4	*	2514.19 *	2510.75 *	3.45 *	1.24 *	0.11 *	*	32000.00 *	* 249.30 *
* Reach #1	* 750	* 100 year	* Alt3	*	2514.29 *	2510.68 *	3.60 *	1.26 *	0.17 *	*	32000.00 *	* 251.87 *
* Reach #1	* 750	* 10 year	* Alt4	*	2507.25 *	2506.04 *	1.21 *	1.21 *	0.02 *	*	8700.00 *	* 245.37 *
* Reach #1	* 750	* 10 year	* Alt3	*	2507.32 *	2506.03 *	1.30 *	1.26 *	0.05 *	*	8700.00 *	* 241.21 *
*	*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 700	* 100 year	* Alt4	*	2512.84 *	2509.77 *	3.07 *	1.35 *	0.02 *	*	32000.00 *	* 262.32 *
* Reach #1	* 700	* 100 year	* Alt3	*	2512.85 *	2509.82 *	3.03 *	1.31 *	0.04 *	*	32000.00 *	* 262.41 *
* Reach #1	* 700	* 10 year	* Alt4	*	2506.02 *	2504.88 *	1.14 *	1.41 *	0.00 *	*	8700.00 *	* 253.06 *
* Reach #1	* 700	* 10 year	* Alt3	*	2506.02 *	2504.88 *	1.14 *	1.41 *	0.00 *	*	8700.00 *	* 253.06 *
*	*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 650	* 100 year	* Alt4	*	2511.46 *	2508.48 *	2.98 *	0.95 *	0.04 *	*	32000.00 *	* 262.71 *
* Reach #1	* 650	* 100 year	* Alt3	*	2511.50 *	2508.60 *	2.91 *	0.91 *	0.03 *	*	32000.00 *	* 262.92 *
* Reach #1	* 650	* 10 year	* Alt4	*	2504.60 *	2503.46 *	1.15 *	1.02 *	0.01 *	*	8700.00 *	* 253.35 *
* Reach #1	* 650	* 10 year	* Alt3	*	2504.60 *	2503.46 *	1.15 *	1.06 *	0.00 *	*	8700.00 *	* 253.35 *
*	*	*	*	*	*	*	*	*	*	*	*	*
* Reach #1	* 600	* 100 year	* Alt4	*	2510.48 *	2507.62 *	2.86 *	1.18 *	0.02 *	*	32000.00 *	* 262.19 *
* Reach #1	* 600	* 100 year	* Alt3	*	2510.56 *	2507.76 *	2.80 *	1.07 *	0.09 *	*	32000.00 *	* 260.76 *
* Reach #1	* 600	* 10 year	* Alt4	*	2503.57 *	2502.47 *	1.10 *	1.42 *	0.01 *	*	8700.00 *	* 252.19 *
* Reach #1	* 600	* 10 year	* Alt3	*	2503.54 *	2502.39 *	1.16 *	1.40 *	0.00 *	*	8700.00 *	* 250.73 *

* Reach #1	* 550	* 100 year	* Alt4	*	2509.27 *	2506.49 *	2.78 *	0.56 *	0.17 *	*	32000.00 *	* 258.09 *
* Reach #1	* 550	* 100 year	* Alt3	*	2509.40 *	2506.90 *	2.50 *	0.52 *	0.08 *	*	32000.00 *	* 259.25 *
* Reach #1	* 550	* 10 year	* Alt4	*	2502.13 *	2500.90 *	1.23 *	0.85 *	0.03 *	*	8700.00 *	* 247.97 *
* Reach #1	* 550	* 10 year	* Alt3	*	2502.13 *	2500.99 *	1.14 *	0.81 *	0.00 *	*	8700.00 *	* 250.81 *
* Reach #1	* 500	* 100 year	* Alt4	*	2508.54 *	2506.31 *	2.23 *	0.76 *	0.11 *	180.56 *	31819.44 *	* 279.19 *
* Reach #1	* 500	* 100 year	* Alt3	*	2508.80 *	2506.55 *	2.24 *	0.76 *	0.11 *	*	32000.00 *	* 263.82 *
* Reach #1	* 500	* 10 year	* Alt4	*	2501.24 *	2500.13 *	1.12 *	1.43 *	0.01 *	*	8700.00 *	* 258.53 *
* Reach #1	* 500	* 10 year	* Alt3	*	2501.32 *	2500.19 *	1.13 *	1.41 *	0.02 *	*	8700.00 *	* 252.64 *
* Reach #1	* 450	* 100 year	* Alt4	*	2507.67 *	2505.80 *	1.86 *	0.50 *	0.09 *	161.42 *	31838.59 *	* 279.72 *
* Reach #1	* 450	* 100 year	* Alt3	*	2507.93 *	2506.04 *	1.88 *	0.51 *	0.09 *	*	32000.00 *	* 263.82 *
* Reach #1	* 450	* 10 year	* Alt4	*	2499.80 *	2498.72 *	1.08 *	0.98 *	0.07 *	*	8700.00 *	* 257.18 *
* Reach #1	* 450	* 10 year	* Alt3	*	2499.89 *	2498.81 *	1.08 *	0.96 *	0.07 *	*	8700.00 *	* 251.34 *
* Reach #1	* 400	* 100 year	* Alt4	*	2507.08 *	2505.52 *	1.56 *	0.37 *	0.00 *	159.14 *	31840.86 *	* 275.06 *
* Reach #1	* 400	* 100 year	* Alt3	*	2507.33 *	2505.74 *	1.59 *	0.39 *	0.00 *	*	32000.00 *	* 263.31 *
* Reach #1	* 400	* 10 year	* Alt4	*	2498.74 *	2497.90 *	0.84 *	0.62 *	0.03 *	*	8700.00 *	* 256.22 *
* Reach #1	* 400	* 10 year	* Alt3	*	2498.86 *	2498.02 *	0.84 *	0.62 *	0.02 *	*	8700.00 *	* 249.43 *
* Reach #1	* 350	* 100 year	* Alt4	*	2506.71 *	2505.16 *	1.54 *	0.16 *	0.03 *	153.96 *	31846.04 *	* 265.81 *
* Reach #1	* 350	* 100 year	* Alt3	*	2506.94 *	2505.32 *	1.62 *	0.17 *	0.04 *	*	32000.00 *	* 248.92 *
* Reach #1	* 350	* 10 year	* Alt4	*	2498.09 *	2497.35 *	0.74 *	0.23 *	0.01 *	*	8700.00 *	* 240.74 *
* Reach #1	* 350	* 10 year	* Alt3	*	2498.22 *	2497.46 *	0.77 *	0.24 *	0.01 *	*	8700.00 *	* 232.67 *
* Reach #1	* 325	* 100 year	* Alt4	*	2506.52 *	2504.72 *	1.80 *	0.25 *	0.06 *	216.91 *	31783.09 *	* 247.77 *
* Reach #1	* 325	* 100 year	* Alt3	*	2506.73 *	2504.76 *	1.97 *	0.29 *	0.07 *	*	32000.00 *	* 225.95 *
* Reach #1	* 325	* 10 year	* Alt4	*	2497.85 *	2497.04 *	0.82 *	0.34 *	0.02 *	*	8700.00 *	* 221.75 *
* Reach #1	* 325	* 10 year	* Alt3	*	2497.97 *	2497.10 *	0.87 *	0.36 *	0.03 *	*	8700.00 *	* 212.27 *
* Reach #1	* 300	* 100 year	* Alt4	*	2506.21 *	2503.82 *	2.39 *	0.00 *	0.05 *	250.36 *	31749.63 *	* 227.28 *
* Reach #1	* 300	* 100 year	* Alt3	*	2506.37 *	2503.69 *	2.68 *	0.00 *	0.07 *	*	32000.00 *	* 204.67 *
* Reach #1	* 300	* 10 year	* Alt4	*	2497.49 *	2496.44 *	1.05 *	0.00 *	0.02 *	*	8700.00 *	* 196.49 *
* Reach #1	* 300	* 10 year	* Alt3	*	2497.58 *	2496.43 *	1.15 *	0.00 *	0.03 *	*	8700.00 *	* 188.64 *
* Reach #1	* 295	*	*	*	Bridge *	*	*	*	*	*	*	*
* Reach #1	* 290	* 100 year	* Alt4	*	2505.35 *	2502.66 *	2.69 *	0.35 *	0.22 *	*	32000.00 *	* 208.19 *
* Reach #1	* 290	* 100 year	* Alt3	*	2505.35 *	2502.69 *	2.66 *	0.35 *	0.22 *	*	32000.00 *	* 208.21 *
* Reach #1	* 290	* 10 year	* Alt4	*	2496.72 *	2495.56 *	1.16 *	0.40 *	0.07 *	*	8700.00 *	* 193.32 *
* Reach #1	* 290	* 10 year	* Alt3	*	2496.72 *	2495.58 *	1.14 *	0.40 *	0.07 *	*	8700.00 *	* 193.99 *
* Reach #1	* 275	* 100 year	* Alt4	*	2504.79 *	2499.95 *	4.84 *	1.74 *	0.00 *	*	32000.00 *	* 188.81 *
* Reach #1	* 275	* 100 year	* Alt3	*	2504.79 *	2499.95 *	4.84 *	1.74 *	0.00 *	*	32000.00 *	* 188.81 *
* Reach #1	* 275	* 10 year	* Alt4	*	2496.25 *	2494.39 *	1.86 *	1.77 *	0.01 *	*	8700.00 *	* 177.70 *
* Reach #1	* 275	* 10 year	* Alt3	*	2496.25 *	2494.39 *	1.86 *	1.77 *	0.01 *	*	8700.00 *	* 177.70 *
* Reach #1	* 200	* 100 year	* Alt4	*	2503.01 *	2498.18 *	4.82 *	1.62 *	0.32 *	*	32000.00 *	* 188.47 *
* Reach #1	* 200	* 100 year	* Alt3	*	2503.01 *	2498.18 *	4.82 *	1.62 *	0.32 *	*	32000.00 *	* 188.47 *
* Reach #1	* 200	* 10 year	* Alt4	*	2494.47 *	2492.64 *	1.83 *	1.18 *	0.25 *	*	8700.00 *	* 177.39 *
* Reach #1	* 200	* 10 year	* Alt3	*	2494.47 *	2492.64 *	1.83 *	1.18 *	0.25 *	*	8700.00 *	* 177.39 *
* Reach #1	* 150	* 100 year	* Alt4	*	2500.76 *	2497.02 *	3.74 *	1.39 *	0.16 *	*	32000.00 *	* 201.31 *
* Reach #1	* 150	* 100 year	* Alt3	*	2500.76 *	2497.02 *	3.74 *	1.39 *	0.16 *	*	32000.00 *	* 201.31 *
* Reach #1	* 150	* 10 year	* Alt4	*	2493.04 *	2492.03 *	1.00 *	1.03 *	0.03 *	*	8700.00 *	* 191.33 *
* Reach #1	* 150	* 10 year	* Alt3	*	2493.04 *	2492.03 *	1.00 *	1.03 *	0.03 *	*	8700.00 *	* 191.33 *
* Reach #1	* 100	* 100 year	* Alt4	*	2499.21 *	2496.00 *	3.22 *	*	*	*	32000.00 *	* 261.12 *
* Reach #1	* 100	* 100 year	* Alt3	*	2499.21 *	2496.00 *	3.22 *	*	*	*	32000.00 *	* 261.12 *
* Reach #1	* 100	* 10 year	* Alt4	*	2491.98 *	2490.70 *	1.28 *	*	*	*	8700.00 *	* 226.81 *
* Reach #1	* 100	* 10 year	* Alt3	*	2491.98 *	2490.70 *	1.28 *	*	*	*	8700.00 *	* 226.81 *

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ERRORS WARNINGS AND NOTES

Errors Warnings and Notes for Plan : Alt4

River: River #1 Reach: Reach #1 RS: 1600 Profile: 100 year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
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.
River: River #1 Reach: Reach #1 RS: 1600 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 1450 Profile: 100 year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: River #1 Reach: Reach #1 RS: 1400 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 1350 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 1350 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 1325 Profile: 100 year
Warning:Pier drag coefficient of 2.0 assumed for Class B flow.
River: River #1 Reach: Reach #1 RS: 1325 Profile: 10 year
Warning:Pier drag coefficient of 2.0 assumed for Class B flow.
River: River #1 Reach: Reach #1 RS: 1300 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 1300 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 1230 Profile: 100 year
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:Divided flow computed for this cross-section.
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.
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.
River: River #1 Reach: Reach #1 RS: 1230 Profile: 10 year
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.

River: River #1 Reach: Reach #1 RS: 1220 Profile: 100 year

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.

River: River #1 Reach: Reach #1 RS: 1220 Profile: 10 year

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.

River: River #1 Reach: Reach #1 RS: 1200 Profile: 100 year

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

River: River #1 Reach: Reach #1 RS: 1200 Profile: 10 year

Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.

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: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.

River: River #1 Reach: Reach #1 RS: 1120 Profile: 100 year

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.

River: River #1 Reach: Reach #1 RS: 1120 Profile: 10 year

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.

River: River #1 Reach: Reach #1 RS: 1110 Profile: 100 year

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 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.

River: River #1 Reach: Reach #1 RS: 1110 Profile: 10 year

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.

River: River #1 Reach: Reach #1 RS: 1100 Profile: 100 year

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.

River: River #1 Reach: Reach #1 RS: 1100 Profile: 10 year

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.

River: River #1 Reach: Reach #1 RS: 1050 Profile: 100 year

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 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.
River: River #1 Reach: Reach #1 RS: 1050 Profile: 10 year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
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.
River: River #1 Reach: Reach #1 RS: 1010 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 1010 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 950 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 950 Profile: 10 year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: River #1 Reach: Reach #1 RS: 900 Profile: 100 year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
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.
River: River #1 Reach: Reach #1 RS: 900 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 875 Profile: 100 year
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 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.
River: River #1 Reach: Reach #1 RS: 875 Profile: 10 year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
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.
River: River #1 Reach: Reach #1 RS: 865 Profile: 100 year

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 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.
River: River #1 Reach: Reach #1 RS: 865 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 850 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 850 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 800 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 800 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 750 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 750 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 700 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 700 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 650 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 600 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 600 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 550 Profile: 100 year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: River #1 Reach: Reach #1 RS: 500 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 450 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 325 Profile: 100 year
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
River: River #1 Reach: Reach #1 RS: 295 Profile: 100 year
Warning:Pier drag coefficient of 2.0 assumed for Class B flow.
River: River #1 Reach: Reach #1 RS: 295 Profile: 10 year
Warning:Pier drag coefficient of 2.0 assumed for Class B flow.
River: River #1 Reach: Reach #1 RS: 290 Profile: 100 year
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.
River: River #1 Reach: Reach #1 RS: 290 Profile: 10 year
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.
River: River #1 Reach: Reach #1 RS: 275 Profile: 100 year
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.

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.

River: River #1 Reach: Reach #1 RS: 275 Profile: 10 year

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.

River: River #1 Reach: Reach #1 RS: 200 Profile: 100 year

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 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.

River: River #1 Reach: Reach #1 RS: 200 Profile: 10 year

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.

River: River #1 Reach: Reach #1 RS: 150 Profile: 100 year

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.

River: River #1 Reach: Reach #1 RS: 150 Profile: 10 year

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.