Hydraulic and Hydrological Study
for
I-75 Reversible Lanes (Bridge #16 & #17)
over
Hope Creek & Rottenwood Creek

Project Number: NH000-0073-03(242)
P.I. No. 714130

<u>Community & FEMA Coordination Required</u>
City of Marietta & Cobb County, Georgia
Community No.: 130226 & 130052

November 2009

Prepared by

PBSJ

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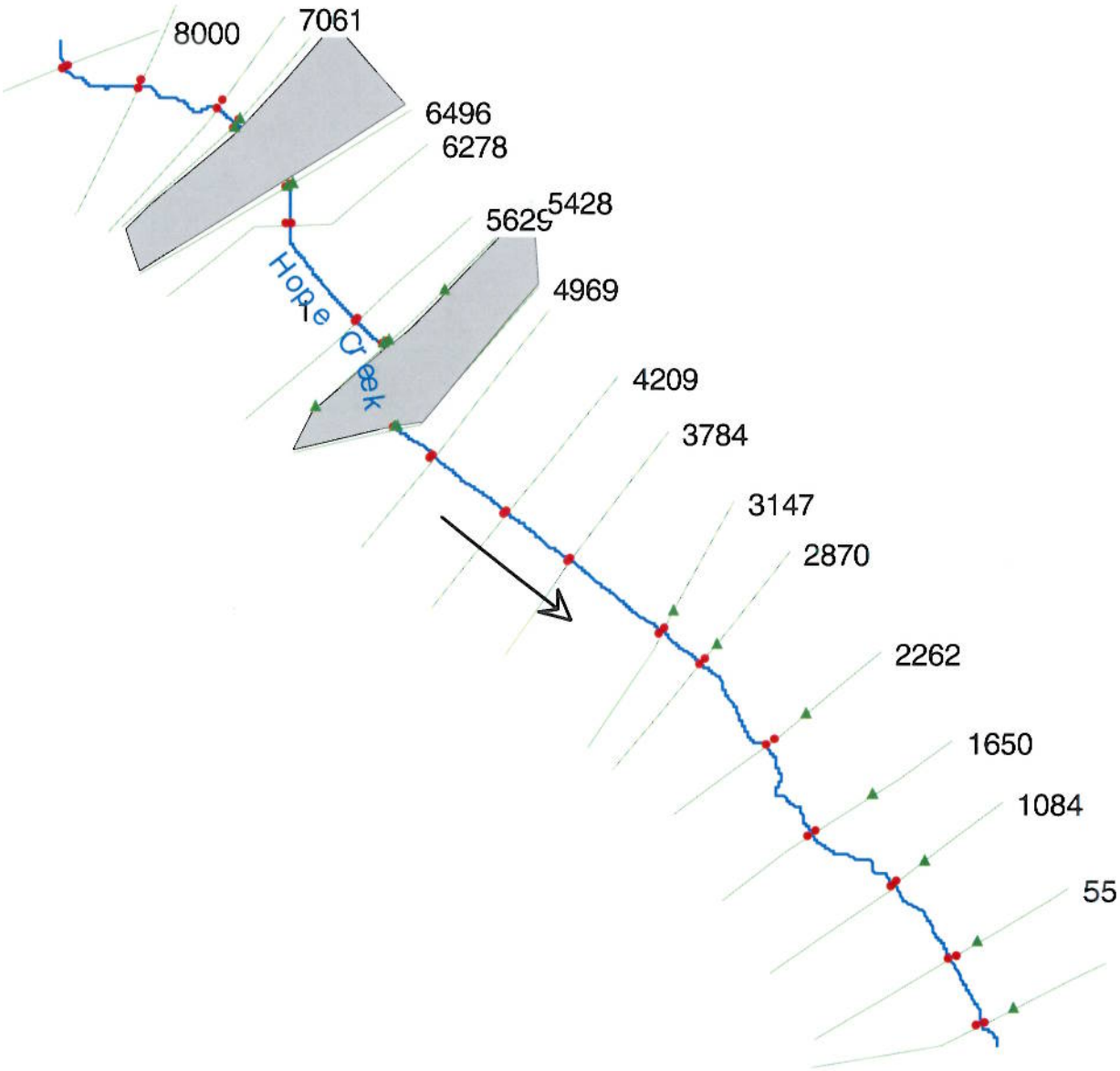
for

Georgia Transportation Partners
Atlanta, Georgia

Section 13: Computer Data

Duplicate Effective Model (HEC-RAS) FEMA Multi-Profiles



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                    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: HopeCreek_Br16-17
Project File : HopeCreek_Br16-17.prj
Run Date and Time: 11/30/2009 10:26:36 AM

Project in English units

Project Description:
Cobb County Priority Area 3 Flood Study - Modified to provide Base Model for
Bridges 16 & 17 of I-75 Corridor HOV Project
Hope Creek
Rottenwood Creek
Watershed

Model extends from confluence with Rottenwood Creek to 1180 feet
upstream of South Marietta Parkway WB to I-75 NB ramp


PLAN DATA

Plan Title: ex fp
Plan File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.p03

           Geometry Title: Existing
           Geometry File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.g01

           Flow Title    : ex fp
           Flow File     : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.f04

Plan Summary Information:
Number of:  Cross Sections =   19    Multiple Openings  =    0
            Culverts       =    2    Inline Structures  =    0
            Bridges        =    0    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: ex fp
Flow File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.f04

Flow Data (cfs)

  River          Reach          RS                 2yr            5yr            10yr           25yr           50yr           100yr          500yr
  Hope Creek     1              8000               540            690             860           1070           1240            1400           1790
  Hope Creek     1              7061               680            890            1100           1380           1590            1790           2300
```

Hope Creek	1	4718	920	1180	1450	1800	2060	2310	2930
Hope Creek	1	3147	1100	1340	1650	2110	2450	2800	3650

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Hope Creek	1	2yr		Normal S = 0.0095

GEOMETRY DATA

Geometry Title: Existing
Geometry File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.g01

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 8000

INPUT
Description:
Station Elevation Data num= 75

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9463.98	1030.38	9477.66	1030.09	9483.68	1029.62	9503.89	1027.75	9530.87	1023.72
9549.21	1022.8	9584.69	1018.61	9595.4	1017.38	9638.5	1013.13	9667.04	1011.39
9692.31	1010.32	9730.61	1006.96	9741.69	1006.28	9746.1	1006.09	9752.37	1005.9
9795.04	1003.98	9803.95	1003.91	9815.76	1003.7	9830.29	1003.2	9842.43	1003.29
9847.65	1003.23	9856.36	1002.52	9864.45	1002.02	9872.65	1001.42	9875.36	1001.23
9884.35	1001.84	9891.79	1002.43	9896.36	1002.67	9905.33	1003.01	9914.36	1002.76
9926.07	1002.62	9931.4	1003.14	9943.29	1002.52	9951.53	1002.22	9953.9	1002.17
9957.29	1001.98	9971.84	1001.7	9975.44	1001.76	9988.3	1000.04	10000	999.59
10008.8	999.78	10014.28	1003.13	10019.72	1003.11	10021.42	1003.27	10024.73	1003.59
10026.72	1003.7	10029.7	1003.89	10035.93	1004.29	10038.89	1004.52	10050.88	1004.82
10054.9	1004.92	10066.83	1005.64	10070.49	1006.39	10088.12	1013.63	10117.17	1024.76
10122.05	1026.46	10124.1	1027.24	10162.5	1042.53	10167.13	1044.34	10168.05	1044.34
10169.42	1044.3	10213.71	1043.72	10243.63	1043.14	10252.63	1042.94	10267.22	1042.59
10275.8	1043.43	10282.48	1044.18	10295.71	1045.67	10302.3	1046.11	10311.15	1046.67
10320.12	1047.07	10327.08	1047.31	10341.63	1047.51	10357.77	1047.67	10363.53	1047.72

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9463.98	.12	9975.44	.045	10014.28	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9975.44	10014.28	393.3	452.1	505.73	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	1003.06	Element			
Vel Head (ft)	0.49	Wt. n-Val.	0.120	0.045	
W.S. Elev (ft)	1002.58	Reach Len. (ft)	393.30	452.10	505.73
Crit W.S. (ft)	1002.22	Flow Area (sq ft)	43.73	85.64	
E.G. Slope (ft/ft)	0.010867	Area (sq ft)	43.73	85.64	
Q Total (cfs)	540.00	Flow (cfs)	40.63	499.37	
Top Width (ft)	109.98	Top Width (ft)	72.05	37.93	
Vel Total (ft/s)	4.17	Avg. Vel. (ft/s)	0.93	5.83	
Max Chl Dpth (ft)	2.98	Hydr. Depth (ft)	0.61	2.26	
Conv. Total (cfs)	5180.1	Conv. (cfs)	389.8	4790.3	
Length Wtd. (ft)	449.63	Wetted Per. (ft)	72.16	38.84	
Min Ch El (ft)	999.59	Shear (lb/sq ft)	0.41	1.50	
Alpha	1.81	Stream Power (lb/ft s)	0.38	8.72	
Frctn Loss (ft)	6.02	Cum Volume (acre-ft)	5.47	24.25	1.61
C & E Loss (ft)	0.02	Cum SA (acres)	6.10	6.15	2.32

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was 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 #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	1003.44	Element			
Vel Head (ft)	0.54	Wt. n-Val.	0.120	0.045	
W.S. Elev (ft)	1002.90	Reach Len. (ft)	393.30	452.10	505.73
Crit W.S. (ft)	1002.54	Flow Area (sq ft)	73.21	98.05	
E.G. Slope (ft/ft)	0.010661	Area (sq ft)	73.21	98.05	
Q Total (cfs)	690.00	Flow (cfs)	76.78	613.22	

Top Width (ft)	148.22	Top Width (ft)	109.76	38.46	
Vel Total (ft/s)	4.03	Avg. Vel. (ft/s)	1.05	6.25	
Max Chl Dpth (ft)	3.31	Hydr. Depth (ft)	0.67	2.55	
Conv. Total (cfs)	6682.6	Conv. (cfs)	743.6	5939.0	
Length Wtd. (ft)	448.19	Wetted Per. (ft)	109.91	39.47	
Min Ch El (ft)	999.59	Shear (lb/sq ft)	0.44	1.65	
Alpha	2.15	Stream Power (lb/ft s)	0.46	10.34	
Frctn Loss (ft)	5.95	Cum Volume (acre-ft)	12.30	28.16	3.56
C & E Loss (ft)	0.03	Cum SA (acres)	10.64	6.36	3.48

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was 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: Hope Creek
REACH: 1 RS: 7548

INPUT
Description:
Station Elevation Data num= 95

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9526.38	1019.36	9535.84	1020.99	9558.22	1023.46	9567.58	1024.26	9588.58	1026.67
9613.72	1030.04	9620.11	1031.25	9624.5	1031.34	9665.28	1031.25	9674.09	1030.87
9675.01	1030.8	9676.95	1030.74	9697.17	1030.46	9700.91	1030.37	9701.12	1030.35
9703.3	1030.19	9711.46	1029.38	9728.82	1028.34	9730.23	1028.23	9734.47	1027.41
9748.82	1024.57	9755.76	1022.99	9757.94	1022.53	9759.65	1022.23	9763.2	1022.13
9764.62	1022.09	9779.95	1021.68	9781.66	1021.28	9796.41	1018.78	9804.23	1017.43
9809.59	1016.6	9814.14	1016.28	9819.77	1015.61	9834.54	1013.19	9841.92	1012.25
9863.29	1009.3	9888.65	1003.16	9940.03	996.67	9975.44	995.68	9988.3	993.96
10000	993.51	10008.8	993.7	10014.28	997.05	10067.71	1007.38	10085.14	1008.78
10118.08	1016.92	10138.68	1018.74	10151.21	1024.73	10189.24	1028.02	10203.71	1031.8
10203.72	1031.81	10205.42	1032.54	10209.79	1032.82	10233.39	1034.19	10242.14	1032.96
10250.96	1031.61	10300.24	1026.71	10304.99	1026.24	10307.58	1026.11	10346.07	1025.26
10359.84	1025.09	10383.03	1025.81	10390.28	1026.04	10399.25	1026.35	10401.42	1026.58
10412.29	1027.99	10417.11	1028.14	10421.82	1028.31	10426.39	1028.46	10443.15	1029.02
10444.68	1030.12	10445.56	1030.78	10446.23	1030.91	10447.05	1031.11	10449.34	1031.13
10458.07	1031.32	10544.37	1032.53	10590.09	1033.15	10599.94	1033.28	10607	1033.36
10608.5	1033.29	10611.62	1033.16	10617.49	1032.89	10624.53	1032.13	10643.06	1030.23
10651.47	1031.77	10656.87	1032.71	10687.01	1037.24	10697.68	1038.79	10713.21	1041.42
10726.49	1044.12	10739.72	1047.29	10745.46	1047.21	10769.24	1046.73	10770.04	1046.49

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9526.38	.12	9975.44	.045	10014.28	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9975.44	10014.28	498.18	486.75	465.44	.1	.3

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	997.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.73	Wt. n-Val.	0.120	0.045	
W.S. Elev (ft)	996.29	Reach Len. (ft)	498.18	486.75	465.44
Crit W.S. (ft)	996.09	Flow Area (sq ft)	6.61	77.83	
E.G. Slope (ft/ft)	0.016930	Area (sq ft)	6.61	77.83	
Q Total (cfs)	540.00	Flow (cfs)	4.81	535.19	
Top Width (ft)	59.34	Top Width (ft)	21.75	37.59	
Vel Total (ft/s)	6.39	Avg. Vel. (ft/s)	0.73	6.88	
Max Chl Dpth (ft)	2.78	Hydr. Depth (ft)	0.30	2.07	
Conv. Total (cfs)	4150.1	Conv. (cfs)	37.0	4113.1	
Length Wtd. (ft)	486.80	Wetted Per. (ft)	21.75	38.45	
Min Ch El (ft)	993.51	Shear (lb/sq ft)	0.32	2.14	
Alpha	1.15	Stream Power (lb/ft s)	0.23	14.71	
Frctn Loss (ft)	10.00	Cum Volume (acre-ft)	5.24	23.40	1.61
C & E Loss (ft)	0.04	Cum SA (acres)	5.68	5.76	2.32

Warning: The energy loss was 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 #5yr

E.G. Elev (ft)	997.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.85	Wt. n-Val.	0.120	0.045	
W.S. Elev (ft)	996.61	Reach Len. (ft)	498.18	486.75	465.44
Crit W.S. (ft)	996.47	Flow Area (sq ft)	15.45	90.00	
E.G. Slope (ft/ft)	0.016953	Area (sq ft)	15.45	90.00	
Q Total (cfs)	690.00	Flow (cfs)	14.94	675.06	

Top Width (ft)	71.36	Top Width (ft)	33.24	38.12	
Vel Total (ft/s)	6.54	Avg. Vel. (ft/s)	0.97	7.50	
Max Chl Dpth (ft)	3.10	Hydr. Depth (ft)	0.46	2.36	
Conv. Total (cfs)	5299.3	Conv. (cfs)	114.7	5184.6	
Length Wtd. (ft)	486.86	Wetted Per. (ft)	33.26	39.06	
Min Ch El (ft)	993.51	Shear (lb/sq ft)	0.49	2.44	
Alpha	1.29	Stream Power (lb/ft s)	0.48	18.29	
Frctn Loss (ft)	9.81	Cum Volume (acre-ft)	11.90	27.19	3.56
C & E Loss (ft)	0.04	Cum SA (acres)	9.99	5.97	3.48

Warning: The energy loss was 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: Hope Creek
REACH: 1 RS: 7061

INPUT
Description:
Station Elevation Data num= 159

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9406	1029.59	9406.8	1029.58	9412.44	1029.48	9415	1029.37	9417.03	1029.31
9443.24	1029.43	9450.59	1029.25	9468.34	1027.91	9468.95	1027.89	9470.03	1027.82
9472.57	1027.76	9494.4	1027.17	9508.81	1026.74	9522.21	1026.14	9529.87	1025.78
9540.03	1025.26	9542.94	1025.1	9550.74	1023.78	9555.78	1022.7	9556.24	1022.73
9557.7	1022.87	9562.94	1023.44	9565.17	1023.61	9575.57	1023.5	9580.17	1023.42
9587.93	1023.32	9598.67	1023.07	9599.38	1023.06	9600.51	1023.04	9602.71	1022.64
9609.19	1021.54	9611.92	1021.7	9613.63	1021.89	9616.7	1022.15	9619.43	1021.93
9623.35	1021.65	9628.88	1021.43	9630.84	1021.08	9632.86	1021.02	9634.46	1021.01
9638.62	1020.9	9649.66	1020.23	9661.68	1020.21	9664.79	1020.14	9666.42	1019.98
9671.21	1019.76	9689.76	1019.47	9689.84	1019.47	9691.24	1019.36	9709.86	1017.89
9721.53	1016.9	9726.33	1016.72	9759.26	1014.81	9761.14	1014.75	9762.36	1014.68
9780.16	1013.98	9780.69	1013.92	9790.67	1013.21	9791.61	1013.08	9798.15	1013.16
9812.18	1012.5	9819.24	1012.06	9824.99	1011.66	9844.07	1010.18	9848.6	1009.99
9853.66	1009.49	9860.35	1008.71	9881.03	1005.77	9905.26	1001.98	9956.74	993.8
9957.4	993.7	9958.42	993.52	9971.13	990.89	9975.44	985.2	9988.3	983.48
10000	983.03	10008.8	983.22	10014.28	986.57	10018	989.04	10021.34	989.95
10025.25	991.08	10030.35	991.41	10047.87	992.47	10065.41	993.53	10087.95	996.31
10090.3	996.66	10098.54	997.89	10117.31	1004.01	10148.34	1010.17	10153.13	1011.17
10172.64	1021.28	10176.67	1023.16	10179.84	1023.15	10183.38	1023.12	10188.78	1023.36
10202.88	1023.99	10213.29	1024.42	10226.28	1022.18	10226.77	1022.09	10227.46	1022.28
10241.61	1026.02	10251.97	1025.35	10268.27	1024.31	10270.48	1023.9	10272.98	1023.47
10275.57	1023.05	10294.44	1022.5	10307.45	1022.13	10332.89	1020.66	10353.46	1019.53
10372.85	1018.67	10396.23	1018.12	10414.8	1017.86	10442.07	1017.3	10452.8	1017.31
10464.36	1017.22	10494.19	1017.02	10522.76	1017.21	10523.39	1017.21	10531.48	1017.85
10533.95	1018.04	10536.82	1018.12	10585.37	1019.39	10586.48	1020.42	10587.3	1021.24
10588.03	1021.41	10588.69	1021.51	10591.05	1021.36	10594.88	1021.25	10668.88	1021.37
10726.1	1021.52	10737.69	1021.07	10738.06	1021.06	10738.94	1020.95	10744.59	1019.98
10748.54	1018.93	10755.29	1017.78	10760.92	1020.36	10763.2	1021.24	10765.44	1022.19
10768.32	1022.95	10783.45	1026.44	10790.6	1027.96	10804.29	1029.79	10811.01	1031.68
10813.99	1032.27	10832.96	1037.39	10844.91	1040.77	10850.61	1040.95	10859.81	1041.33
10861.36	1041.64	10862.62	1042.42	10866.94	1044.75	10875.86	1050.61	10882.14	1050.7
10883.76	1050.71	10891.49	1050.78	10896.05	1050.88	10902.47	1050.95		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9406	.12	9971.13	.045	10025.25	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9971.13	10025.25	137.61	131.25	117.04	.3	.5

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	986.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.08	Wt. n-Val.		0.045	
W.S. Elev (ft)	985.90	Reach Len. (ft)	137.61	131.25	117.04
Crit W.S. (ft)	985.90	Flow Area (sq ft)		81.49	
E.G. Slope (ft/ft)	0.024317	Area (sq ft)		81.49	
Q Total (cfs)	680.00	Flow (cfs)		680.00	
Top Width (ft)	38.27	Top Width (ft)		38.27	
Vel Total (ft/s)	8.34	Avg. Vel. (ft/s)		8.34	
Max Chl Dpth (ft)	2.87	Hydr. Depth (ft)		2.13	
Conv. Total (cfs)	4360.7	Conv. (cfs)		4360.7	
Length Wtd. (ft)	131.25	Wetted Per. (ft)		39.50	
Min Ch El (ft)	983.03	Shear (lb/sq ft)		3.13	
Alpha	1.00	Stream Power (lb/ft s)		26.13	
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	5.20	22.51	1.61
C & E Loss (ft)	0.48	Cum SA (acres)	5.56	5.33	2.32

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 #5yr

E.G. Elev (ft)	987.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.27	Wt. n-Val.		0.045	
W.S. Elev (ft)	986.33	Reach Len. (ft)	137.61	131.25	117.04
Crit W.S. (ft)	986.33	Flow Area (sq ft)		98.34	
E.G. Slope (ft/ft)	0.023305	Area (sq ft)		98.34	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	39.31	Top Width (ft)		39.31	
Vel Total (ft/s)	9.05	Avg. Vel. (ft/s)		9.05	
Max Chl Dpth (ft)	3.30	Hydr. Depth (ft)		2.50	
Conv. Total (cfs)	5830.0	Conv. (cfs)		5830.0	
Length Wtd. (ft)	131.25	Wetted Per. (ft)		40.88	
Min Ch El (ft)	983.03	Shear (lb/sq ft)		3.50	
Alpha	1.00	Stream Power (lb/ft s)		31.68	
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)	11.81	26.14	3.56
C & E Loss (ft)	0.57	Cum SA (acres)	9.80	5.53	3.48

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: Hope Creek
REACH: 1 RS: 6930

INPUT
Description:
Station Elevation Data num= 160

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9220	1039.24	9220.1	1039.21	9222.3	1038.59	9223.89	1038.76	9226.19	1038.96
9239.4	1038.71	9244.14	1038.65	9247.01	1038.79	9248.23	1038.85	9258.34	1040.95
9259.41	1041.17	9259.97	1041.13	9260.21	1041.11	9284.32	1039.5	9289.32	1039.44
9295.51	1038.96	9299.93	1038.82	9324.87	1038	9327.78	1037.82	9334.25	1037.57
9341.53	1037.09	9360.57	1036.31	9389.67	1035.3	9394.12	1035.2	9404.89	1034.49
9413.09	1034.05	9418.75	1034.17	9419.3	1034.14	9419.39	1034.14	9421.23	1033.95
9422.44	1033.89	9422.97	1033.92	9442.04	1033.22	9451.3	1033.05	9457.37	1032.68
9465.07	1032.4	9467.85	1032.25	9470.3	1032.17	9479.1	1031.72	9481.1	1031.69
9482.89	1031.67	9484.29	1031.61	9493.48	1031.17	9504.14	1030.12	9510.79	1029.75
9527.7	1029.74	9531.72	1029.87	9536.61	1028.31	9543.39	1026.55	9544.62	1026.23
9551.01	1025.88	9555.77	1025.8	9558.6	1025.65	9559.65	1025.61	9561.42	1025.54
9562.87	1025.45	9576.95	1024.54	9583.58	1024.54	9603.83	1024.61	9605.06	1024.64
9614.13	1024.43	9629.3	1023.83	9635.17	1023.18	9677.72	1017.86	9690.68	1015.89
9705.62	1014.17	9743.92	1007.8	9761.59	1004.27	9781.95	1000.87	9799.86	997.76
9802.38	997.61	9935.39	995.4	9949.54	993.31	9968.55	984.36	9975.44	978.61
9988.3	976.89	10000	976.44	10008.8	976.63	10014.28	979.98	10020.97	984.41
10043.21	995.61	10048.18	997.11	10057.13	999.87	10068.66	1004.05	10077.53	1006.9
10095.99	1012.29	10096.38	1012.41	10100.94	1013.87	10118.32	1019.41	10120.85	1019.63
10125.47	1020.03	10129.66	1020.32	10130.85	1020.39	10137.04	1020.74	10149.87	1021.53
10162.24	1022.21	10172.48	1021.27	10188.19	1019.93	10191.33	1020.03	10216.37	1020.67
10223.77	102	10244.75	1021.98	10257.34	1024.52	10270.27	1027.04	10271.16	1027.21
10291.78	1026.15	10301.35	1025.67	10306.92	1025.51	10311.15	1025.45	10317.03	1025.33
10324.03	1025.31	10330.04	1024.72	10339.43	1024.21	10344.12	1023.87	10345.71	1023.78
10346.49	1020.59	10382.18	1018.84	10395.66	1018.78	10404.26	1018.34	10428.42	1016.1
10429.71	1016.26	10434.02	1016.71	10456.11	1017.31	10477.39	1017.88	10479.3	1019.58
10479.36	1019.63	10479.4	1019.63	10480.98	1019.74	10482.56	1019.69	10487.26	1019.48
10503.63	1027.77	10532.55	1030.39	10547.44	1033.97	10608.9	1028.59	10620.08	1020.12
10627.66	1020.05	10631.56	1019.98	10647.3	1018.68	10651.96	1018.49	10661.62	1032.78

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10670.53  1040.1 10689.1 1043.1110691.47 1043.8410693.34 1044.4510720.64 1048.67
10725.76 1048.8510725.97 1048.8610726.07 1048.8610727.91 1048.92 10755.6 1050.01
10755.97 1050.0210778.09 1050.6610778.67 1050.6610782.35 1050.7310783.08 1050.74
10786.63 1050.8110787.48 1050.82 10790.7 1050.8610793.36 1050.8910809.98 1051.08

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9220     .12 9968.55    .04510020.97      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9968.5510020.97           458.64  434.11  418.59            .3        .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    9220 9968.55 1012.94       F
10020.9710809.98 1013.06       F

CROSS SECTION OUTPUT  Profile #2yr

  E.G. Elev (ft)            983.09    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.12    Wt. n-Val.                            0.045
  W.S. Elev (ft)            982.97    Reach Len. (ft)            458.64     434.11     418.59
  Crit W.S. (ft)            979.33    Flow Area (sq ft)                     241.13
  E.G. Slope (ft/ft)      0.000946    Area (sq ft)                          241.13
  Q Total (cfs)             680.00    Flow (cfs)                            680.00
  Top Width (ft)             48.57    Top Width (ft)                         48.57
  Vel Total (ft/s)            2.82    Avg. Vel. (ft/s)                        2.82
  Max Chl Dpth (ft)           6.53    Hydr. Depth (ft)                        4.96
  Conv. Total (cfs)        22107.2    Conv. (cfs)                          22107.2
  Length Wtd. (ft)          434.11    Wetted Per. (ft)                       52.12
  Min Ch El (ft)            976.44    Shear (lb/sq ft)                        0.27
  Alpha                       1.00    Stream Power (lb/ft s)                  0.77
  Frctn Loss (ft)                     Cum Volume (acre-ft)        5.20      22.02       1.61
  C & E Loss (ft)                     Cum SA (acres)              5.56       5.20       2.32

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

CROSS SECTION OUTPUT  Profile #5yr

  E.G. Elev (ft)            984.23    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.14    Wt. n-Val.                            0.045
  W.S. Elev (ft)            984.09    Reach Len. (ft)            458.64     434.11     418.59
  Crit W.S. (ft)            979.77    Flow Area (sq ft)                     297.16
  E.G. Slope (ft/ft)      0.000887    Area (sq ft)                          297.16
  Q Total (cfs)             890.00    Flow (cfs)                            890.00
  Top Width (ft)             51.60    Top Width (ft)                         51.60
  Vel Total (ft/s)            2.99    Avg. Vel. (ft/s)                        2.99
  Max Chl Dpth (ft)           7.65    Hydr. Depth (ft)                        5.76
  Conv. Total (cfs)        29890.5    Conv. (cfs)                          29890.5
  Length Wtd. (ft)          434.11    Wetted Per. (ft)                       55.89
  Min Ch El (ft)            976.44    Shear (lb/sq ft)                        0.29
  Alpha                       1.00    Stream Power (lb/ft s)                  0.88
  Frctn Loss (ft)                     Cum Volume (acre-ft)       11.81      25.54       3.56
  C & E Loss (ft)                     Cum SA (acres)              9.80       5.40       3.48

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

CULVERT


RIVER: Hope Creek
REACH: 1                  RS: 6719

INPUT
Description: S. Marietta Pkwy, HC-6 2-10x8' Box Culvert
Distance from Upstream XS =     29.5
Deck/Roadway Width        =      375
Weir Coefficient          =      2.6
Upstream  Deck/Roadway Coordinates
    num=     109
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
 9224.89 1024.53           9228.8 1024.52          9256.11 1024.26
 9264.29 1024.22          9286.73 1024.05          9298.95 1024.01
 9302.27     1024         9327.78 1023.82          9338.47 1023.78
 9347.74 1023.76          9351.96 1023.75          9362.14 1023.67
 9389.96  1023.6          9393.38 1023.58          9417.65 1023.33
 9430.93 1023.07          9435.62 1022.98          9462.23  1022.7
 9478.58 1022.65           9492.7 1022.53          9508.71 1022.48
 9535.25 1022.25          9551.34 1022.16           9563.3 1021.96
```

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 9590.79  1021.8          9598.41 1021.72          9605.98 1021.65
 9626.95 1021.45          9631.92  1021.4          9636.71 1021.46
 9640.54 1021.51          9648.68 1021.46          9673.39  1021.3
 9690.21 1021.09           9699.9 1021.04          9711.48 1020.97
 9742.37 1020.82          9746.12 1020.79          9754.37 1020.71
 9764.06 1020.56          9788.93 1020.32          9798.43 1020.19
 9806.68 1020.19          9831.72  1020.2          9838.32  1020.1
 9854.25 1019.91          9864.96 1019.76           9890.5 1019.47
 9899.11 1019.48           9949.6 1017.97          9976.17 1017.97
 9979.69 1017.97          9980.07 1017.97         10003.19 1017.97
10075.41 1020.31         10090.03 1020.52         10109.94 1020.85
10130.24 1021.27         10140.15 1021.51         10161.25    1022
10174.98 1022.22         10182.64  1022.4         10205.31  1023.1
10227.98 1023.65          10237.1 1023.98         10257.17 1024.61
10278.59 1025.38         10286.05 1025.68          10300.3 1026.18
10311.54 1026.63         10322.75 1027.05         10334.05  1027.5
10346.61 1027.92         10358.01 1028.33          10370.6 1028.75
10381.28 1029.09         10389.18  1029.4         10394.55 1029.67
10406.41 1030.13         10408.67 1030.27         10411.49 1030.42
10423.81 1030.89         10441.47 1031.33         10468.74 1032.45
10472.78 1032.68          10477.2 1032.93         10481.87  1033.2
10503.95 1034.11         10843.01 1047.54         10866.03 1048.42
10873.74 1048.63         10877.47 1048.73         10926.33 1050.44
10934.63  1050.8         10936.31 1050.83         10943.63 1051.06
10945.29 1051.07         10946.54  1051.1         10948.45 1051.11
10949.63 1051.14          10951.6 1051.14         10952.66 1051.16
10953.56 1051.17         10973.73 1051.38          10990.8 1052.11
10992.49 1052.16          10994.6 1052.21         10997.14 1052.27
11008.41 1052.56

Upstream Bridge Cross Section Data
Station Elevation Data    num=      160
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9220 1039.24  9220.1 1039.21  9222.3 1038.59 9223.89 1038.76 9226.19 1038.96
  9239.4 1038.71 9244.14 1038.65 9247.01 1038.79 9248.23 1038.85 9258.34 1040.95
 9259.41 1041.17 9259.97 1041.13 9260.21 1041.11 9284.32  1039.5 9289.32 1039.44
 9295.51 1038.96 9299.93 1038.82 9324.87    1038 9327.78 1037.82 9334.25 1037.57
 9341.53 1037.09 9360.57 1036.31 9389.67  1035.3 9394.12  1035.2 9404.89 1034.49
 9413.09 1034.05 9418.75 1034.17  9419.3 1034.14 9419.39 1034.14 9421.23 1033.95
 9422.44 1033.89 9422.97 1033.92 9442.04 1033.22  9451.3 1033.05 9457.37 1032.68
 9465.07  1032.4 9467.85 1032.25  9470.3 1032.17  9479.1 1031.72  9481.1 1031.69
 9482.89 1031.67 9484.29 1031.61 9493.48 1031.17 9504.14 1030.12 9510.79 1029.75
  9527.7 1029.74 9531.72 1029.87 9536.61 1028.31 9543.39 1026.55 9544.62 1026.23
 9551.01 1025.88 9555.77  1025.8  9558.6 1025.65 9559.65 1025.61 9561.42 1025.54
 9562.87 1025.45 9576.95 1024.54 9583.58 1024.54 9603.83 1024.61 9605.06 1024.64
 9614.13 1024.43  9629.3 1023.83 9635.17 1023.18 9677.72 1017.86 9690.68 1015.89
 9705.62 1014.17 9743.92  1007.8 9761.59 1004.27 9781.95 1000.87 9799.86  997.76
 9802.38  997.61 9935.39   995.4 9949.54  993.31 9968.55  984.36 9975.44  978.61
  9988.3  976.89   10000  976.44 10008.8  976.6310014.28  979.9810020.97  984.41
10043.21   995.610048.18   997.110057.13  999.8710068.66 1004.0510077.53  1006.9
10095.99 1012.2910096.38 1012.4110100.94 1013.8710118.32  1019.410120.85 1019.63
10125.47 1020.0310129.66 1020.3210130.85 1020.3910137.04 1020.7410149.87 1021.53
10162.24 1022.2110172.48 1021.2710188.19 1019.9310191.33 1020.0310216.37 1020.67
10223.77    102110244.75 1021.9810257.34 1024.5210270.27 1027.0410271.16 1027.21
10291.78 1026.1510301.35 1025.6710306.92 1025.5110311.15 1025.4510317.03 1025.33
10324.03 1025.3110330.04 1024.7210339.43  1024.210344.12 1023.8710345.71 1023.78
10346.49 1020.5910382.18 1018.8410395.66 1018.7810404.26 1018.3410428.42  1016.1
10429.71 1016.2610434.02 1016.7110456.11  1017.310477.39 1017.88 10479.3 1019.58
10479.36 1019.63 10479.4 1019.6310480.98 1019.7410482.56 1019.6910487.26 1019.48
10503.63 1027.7710532.55 1030.3910547.44 1033.97 10608.9 1028.5910620.08 1020.12
10627.66 1020.0510631.56 1019.98 10647.3 1018.6810651.96 1018.4910661.62 1032.78
10670.53  1040.1 10689.1 1043.1110691.47 1043.8410693.34 1044.4510720.64 1048.67
10725.76 1048.8510725.97 1048.8610726.07 1048.8610727.91 1048.92 10755.6 1050.01
10755.97 1050.0210778.09 1050.6610778.67 1050.6610782.35 1050.7310783.08 1050.74
10786.63 1050.8110787.48 1050.82 10790.7 1050.8610793.36 1050.8910809.98 1051.08

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9220     .12 9968.55    .04510020.97      .1

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9968.5510020.97            .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    9220 9968.55 1012.94        F
10020.9710809.98 1013.06        F

Downstream  Deck/Roadway Coordinates
    num=     109
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
 9224.89 1024.53          9228.8 1024.52          9256.11 1024.26
 9264.29 1024.22         9286.73 1024.05          9298.95 1024.01
```

9302.27	1024	9327.78	1023.82	9338.47	1023.78
9347.74	1023.76	9351.96	1023.75	9362.14	1023.67
9389.96	1023.6	9393.38	1023.58	9417.65	1023.33
9430.93	1023.07	9435.62	1022.98	9462.23	1022.7
9478.58	1022.65	9492.7	1022.53	9508.71	1022.48
9535.25	1022.25	9551.34	1022.16	9563.3	1021.96
9590.79	1021.8	9598.41	1021.72	9605.98	1021.65
9626.95	1021.45	9631.92	1021.4	9636.71	1021.46
9640.54	1021.51	9648.68	1021.46	9673.39	1021.3
9690.21	1021.09	9699.9	1021.04	9711.48	1020.97
9742.37	1020.82	9746.12	1020.79	9754.37	1020.71
9764.06	1020.56	9788.93	1020.32	9798.43	1020.19
9806.68	1020.19	9831.72	1020.2	9838.32	1020.1
9854.25	1019.91	9864.96	1019.76	9890.5	1019.47
9899.11	1019.48	9949.6	1017.97	9976.17	1017.97
9979.69	1017.97	9980.07	1017.97	10003.19	1017.97
10075.41	1020.31	10090.03	1020.52	10109.94	1020.85
10130.24	1021.27	10140.15	1021.51	10161.25	1022
10174.98	1022.22	10182.64	1022.4	10205.31	1023.1
10227.98	1023.65	10237.1	1023.98	10257.17	1024.61
10278.59	1025.38	10286.05	1025.68	10300.3	1026.18
10311.54	1026.63	10322.75	1027.05	10334.05	1027.5
10346.61	1027.92	10358.01	1028.33	10370.6	1028.75
10381.28	1029.09	10389.18	1029.4	10394.55	1029.67
10406.41	1030.13	10408.67	1030.27	10411.49	1030.42
10423.81	1030.89	10441.47	1031.33	10468.74	1032.45
10472.78	1032.68	10477.2	1032.93	10481.87	1033.2
10503.95	1034.11	10843.01	1047.54	10866.03	1048.42
10873.74	1048.63	10877.47	1048.73	10926.33	1050.44
10934.63	1050.8	10936.31	1050.83	10943.63	1051.06
10945.29	1051.07	10946.54	1051.1	10948.45	1051.11
10949.63	1051.14	10951.6	1051.14	10952.66	1051.16
10953.56	1051.17	10973.73	1051.38	10990.8	1052.11
10992.49	1052.16	10994.6	1052.21	10997.14	1052.27
11008.41	1052.56				

Downstream Bridge Cross Section Data
Station Elevation Data num= 147

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9224	1008.24	9226.89	1008.36	9243.31	1013.37	9259.38	1018.43	9269.24	1022.55
9291.82	1026.54	9326	1029.62	9342.43	1029.72	9369.89	1027.86	9381.38	1027.38
9399.05	1026.89	9428.94	1026.38	9448.44	1025.93	9471.66	1025.89	9493.46	1024.97
9515.45	1024.01	9540.18	1022.27	9561.15	1020.37	9564.97	1019.88	9601.42	1018.3
9613.65	1017.66	9616.61	1017.6	9617.89	1017.55	9621.58	1017.36	9631.35	1016.92
9652.92	1015.71	9655.48	1015.68	9659.18	1015.83	9665.99	1015.83	9673.37	1015.14
9678.53	1014.49	9683.37	1013.87	9694.57	1012.4	9704.57	1011.18	9714.1	1010.28
9725.77	1009.05	9729.01	1008.76	9742.1	1007.7	9765.94	1005.12	9766.09	1005.1
9766.15	1005.1	9766.33	1005.08	9781.43	1001.6	9786.59	1000.58	9803.15	999.15
9822.62	997.34	9831.69	994.97	9835.33	994.23	9841.94	994.03	9853.73	993.5
9858.66	993.14	9876.56	991.06	9889.59	989.26	9904.06	987.96	9906.52	987.63
9911.03	987.08	9917.06	986.17	9942.39	982.91	9943.57	982.73	9949.25	981.79
9951.67	981.26	9953.81	980.93	9961.37	979.81	9963.73	979.2	9963.86	979.16
9963.96	979.13	9972.02	976.15	9986.26	970.21	9995.17	966.46	10000.01	966.25
10004.33	966.41	10012.02	970.35	10018.62	971.84	10018.77	971.87	10030.71	974.19
10038.9	976.25	10063.61	978.28	10071.74	979.31	10082.2	980.42	10082.83	980.67
10097.63	986.53	10112.06	991.58	10127.56	997.72	10144.44	1004.5	10151.56	1007.73
10163.21	1011.45	10169.32	1013.12	10188.77	1014.04	10211.26	1015.15	10214.29	1015.2
10224.2	1015.34	10237.58	1014.47	10250.81	1013.51	10264.06	1011.45	10285.12	1007.83
10299.84	1007.4	10310.22	1006.94	10321.5	1006.55	10336.04	1006.22	10366.82	1005.89
10400.17	1005.48	10412.19	1005.3	10420.54	1005.29	10426.73	1005.34	10445.35	1005.52
10468.51	1005.51	10473.15	1005.84	10490.06	1007.21	10495.91	1007.53	10499.5	1007.67
10514.26	1008.29	10535.05	1009.19	10539.13	1009.34	10539.53	1009.34	10540.45	1009.29
10540.68	1009.33	10542.23	1009.57	10548.52	1009.51	10549.84	1009.5	10550.24	1009.5
10550.96	1009.49	10632.64	1010.38	10692.76	1011.02	10693.53	1011	10704.22	1010.65
10706.54	1010.57	10706.66	1010.57	10707.3	1010.47	10727.5	1007.58	10733.15	1008.4
10736.43	1008.87	10738.34	1009.14	10743.67	1009.49	10751.9	1010.54	10768.19	1012.44
10779.79	1014.37	10785.54	1015.09	10796.61	1016.48	10828.95	1020.84	10836.88	1021.95
10841.48	1022.89	10897.62	1034.63	10900.87	1035.3	10901.07	1035.34	10901.55	1035.54
10920.18	1043.27	10937.78	1044.1						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9224	.12	9986.26	.035	10012.02	.08

Bank Sta: Left	Right	Coeff Contr.	Expan.
9986.26	10012.02	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
9224	9984.26	977.17	F
10012.12	10937.78	977.22	F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical

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

Number of Culverts =  1

Culvert Name      Shape      Rise    Span
Culvert #1            Box       8      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                29.5     375     .011     .011        0                  .5                 1
Number of Barrels =  2
Upstream   Elevation =  977.32
Centerline Stations
    Sta.    Sta.
  9994.5 10005.5
Downstream Elevation =  967.01
Centerline Stations
    Sta.    Sta.
  9994.5 10005.5

CROSS SECTION


RIVER: Hope Creek
REACH: 1                    RS: 6496

INPUT
Description:
Station Elevation Data    num=     147
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9224 1008.24 9226.89 1008.36 9243.31 1013.37 9259.38 1018.43 9269.24 1022.55
 9291.82 1026.54    9326 1029.62 9342.43 1029.72 9369.89 1027.86 9381.38 1027.38
 9399.05 1026.89 9428.94 1026.38 9448.44 1025.93 9471.66 1025.89 9493.46 1024.97
 9515.45 1024.01 9540.18 1022.27 9561.15 1020.37 9564.97 1019.88 9601.42  1018.3
 9613.65 1017.66 9616.61  1017.6 9617.89 1017.55 9621.58 1017.36 9631.35 1016.92
 9652.92 1015.71 9655.48 1015.68 9659.18 1015.83 9665.99 1015.83 9673.37 1015.14
 9678.53 1014.49 9683.37 1013.87 9694.57  1012.4 9704.57 1011.18  9714.1 1010.28
 9725.77 1009.05 9729.01 1008.76  9742.1  1007.7 9765.94 1005.12 9766.09  1005.1
 9766.15  1005.1 9766.33 1005.08 9781.43  1001.6 9786.59 1000.58 9803.15  999.15
 9822.62  997.34 9831.69  994.97 9835.33  994.23 9841.94  994.03 9853.73   993.5
 9858.66  993.14 9876.56  991.06 9889.59  989.26 9904.06  987.96 9906.52  987.63
 9911.03  987.08 9917.06  986.17 9942.39  982.91 9943.57  982.73 9949.25  981.79
 9951.67  981.26 9953.81  980.93 9961.37  979.81 9963.73   979.2 9963.86  979.16
 9963.96  979.13 9972.02  976.15 9986.26  970.21 9995.17  966.4610000.01  966.25
10004.33  966.4110012.02  970.3510018.62  971.8410018.77  971.8710030.71  974.19
 10038.9  976.2510063.61  978.2810071.74  979.31 10082.2  980.4210082.83  980.67
10097.63  986.5310112.06  991.5810127.56  997.7210144.44  1004.510151.56 1007.73
10163.21 1011.4510169.32 1013.1210188.77 1014.0410211.26 1015.1510214.29  1015.2
 10224.2 1015.3410237.58 1014.4710250.81 1013.5110264.06 1011.4510285.12 1007.83
10299.84  1007.410310.22 1006.94 10321.5 1006.5510336.04 1006.2210366.82 1005.89
10400.17 1005.4810412.19  1005.310420.54 1005.2910426.73 1005.3410445.35 1005.52
10468.51 1005.5110473.15 1005.8410490.06 1007.2110495.91 1007.53 10499.5 1007.67
10514.26 1008.2910535.05 1009.1910539.13 1009.3410539.53 1009.3410540.45 1009.29
10540.68 1009.3310542.23 1009.5710548.52 1009.5110549.84  1009.510550.24  1009.5
10550.96 1009.4910632.64 1010.3810692.76 1011.0210693.53    101110704.22 1010.65
10706.54 1010.5710706.66 1010.57 10707.3 1010.47 10727.5 1007.5810733.15  1008.4
10736.43 1008.8710738.34 1009.1410743.67 1009.49 10751.9 1010.5410768.19 1012.44
10779.79 1014.3710785.54 1015.0910796.61 1016.4810828.95 1020.8410836.88 1021.95
10841.48 1022.8910897.62 1034.6310900.87  1035.310901.07 1035.3410901.55 1035.54
10920.18 1043.2710937.78  1044.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9224     .12 9986.26    .03510012.02     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.2610012.02           261.27   218.1  177.15              .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    9224 9984.26  977.17       F
10012.1210937.78  977.22       F

CROSS SECTION OUTPUT  Profile #2yr

  E.G. Elev (ft)            972.62    Element                   Left OB    Channel   Right OB
  Vel Head (ft)               0.54    Wt. n-Val.                 0.120      0.035     0.080
```

W.S. Elev (ft)	972.08	Reach Len. (ft)	261.27	218.10	177.15
Crit W.S. (ft)	970.43	Flow Area (sq ft)	2.91	114.45	0.17
E.G. Slope (ft/ft)	0.002900	Area (sq ft)	4.21	114.45	6.67
Q Total (cfs)	680.00	Flow (cfs)	2.36	677.39	0.24
Top Width (ft)	38.10	Top Width (ft)	4.49	25.76	7.85
Vel Total (ft/s)	5.79	Avg. Vel. (ft/s)	0.81	5.92	1.41
Max Chl Dpth (ft)	5.83	Hydr. Depth (ft)	1.46	4.44	1.72
Conv. Total (cfs)	12627.4	Conv. (cfs)	43.9	12578.9	4.5
Length Wtd. (ft)	218.26	Wetted Per. (ft)	2.17	27.47	0.10
Min Ch El (ft)	966.25	Shear (lb/sq ft)	0.24	0.75	0.30
Alpha	1.04	Stream Power (lb/ft s)	0.20	4.46	0.43
Frctn Loss (ft)	0.89	Cum Volume (acre-ft)	5.18	20.25	1.58
C & E Loss (ft)	0.23	Cum SA (acres)	5.53	4.83	2.28

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

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	973.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.75	Wt. n-Val.	0.120	0.035	0.080
W.S. Elev (ft)	972.57	Reach Len. (ft)	261.27	218.10	177.15
Crit W.S. (ft)	970.98	Flow Area (sq ft)	3.88	126.90	0.22
E.G. Slope (ft/ft)	0.003511	Area (sq ft)	6.66	126.90	11.07
Q Total (cfs)	890.00	Flow (cfs)	4.20	885.40	0.41
Top Width (ft)	41.74	Top Width (ft)	5.65	25.76	10.33
Vel Total (ft/s)	6.79	Avg. Vel. (ft/s)	1.08	6.98	1.83
Max Chl Dpth (ft)	6.32	Hydr. Depth (ft)	1.94	4.93	2.21
Conv. Total (cfs)	15020.0	Conv. (cfs)	70.8	14942.3	6.9
Length Wtd. (ft)	219.02	Wetted Per. (ft)	2.17	27.47	0.10
Min Ch El (ft)	966.25	Shear (lb/sq ft)	0.39	1.01	0.47
Alpha	1.05	Stream Power (lb/ft s)	0.42	7.06	0.86
Frctn Loss (ft)	0.94	Cum Volume (acre-ft)	11.77	23.43	3.51
C & E Loss (ft)	0.18	Cum SA (acres)	9.77	5.01	3.43

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, energy was used.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 6278

INPUT
Description:
Station Elevation Data num= 152

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9081.15	996.06	9082.91	996.19	9096.24	998.98	9107.19	1000.88	9119.02	1003.07
9143.99	1007.08	9144.35	1007.14	9144.68	1007.2	9145.13	1007.29	9172.53	1010.79
9173.31	1010.9	9174.23	1010.96	9196.78	1011.79	9212.08	1011.9	9247.33	1012.66
9249.56	1012.63	9250.92	1012.63	9290.16	1012.37	9315.71	1013.53	9325.23	1013.48
9380.97	1011.7	9391.06	1010.99	9403.02	1010.86	9426.52	1009.83	9446.23	1009.82
9462.5	1008.74	9480.81	1008.85	9497.49	1007.9	9511.5	1007.76	9532.99	1005.61
9558.7	1005.74	9568.54	1005.34	9576.77	1005.16	9621.91	1002.46	9635.69	1001.59
9640.35	1001.15	9643.47	1000.74	9652.37	999.54	9671.6	997.1	9690.22	993.65
9696.46	992.75	9698.82	992.55	9712.91	991.1	9716.16	990.91	9717.9	990.73
9733.19	988.93	9767.04	986.29	9771.28	986.07	9775.09	985.6	9778.24	985.08
9803.29	982.33	9805.11	981.96	9806.14	981.81	9828.14	978.6	9841.13	976.27
9846.28	975.46	9849.85	974.52	9865.92	973.78	9894.36	972.39	9906.49	971.83
9923.4	970.83	9931	970.28	9963.22	969.91	9977.07	970.05	9978.95	970.05
9982.03	970.07	9986.44	969.88	9994.93	966.01	9999.92	965.79	10004.17	965.99
10012.01	970.73	10012.19	971.06	10013.67	971.78	10018.89	972.07	10035.15	972.95
10037.83	973.12	10061.54	984.92	10096.71	1003.17	10102.72	1005.57	10108.59	1007.99
10121.62	1008.58	10134.66	1009.23	10142.38	1009.62	10150.64	1009.92	10172.94	1009.57
10180.71	1009.25	10190.28	1008.5	10190.58	1008.47	10194.46	1008.18	10200.26	1007.74
10205.91	1007.27	10209.31	1007.02	10216.24	1006.4	10217.9	1006.28	10225.69	1005.61
10226.15	1005.58	10230.99	1005.18	10234.25	1004.87	10241.27	1004.25	10243.87	1004.09
10250.27	1003.6	10255.08	1003.45	10261.26	1003.05	10266.96	1002.77	10272.27	1002.66
10278.02	1002.54	10284.47	1002.43	10289.22	1002.29	10295.61	1002.23	10301.06	1002.21

```
10303.51 1002.2110303.89 1002.2210311.51  1002.310313.54 1002.3510319.77 1002.71
10323.95 1002.8410331.46 1003.1310335.32 1003.33 10345.2  1003.710348.19 1003.56
10363.59 1003.0410365.04 1003.2710375.03 1004.7810382.49 1004.9810387.53 1005.11
10403.75 1005.53   10404 1005.6310404.92 1005.9610405.86  1005.810407.19 1005.59
10408.05 1005.4710409.28 1005.4510418.18 1005.5410444.24 1005.7210513.05 1006.13
10543.78 1006.3210555.15 1006.3810557.12 1006.3410567.37 1006.0510568.27 1005.92
10594.52 1002.0210597.88 1002.4810604.11 1003.4510617.01 1004.4310644.31 1006.96
10672.77 1010.1510682.08 1011.4210698.91 1014.0910732.41 1019.24 10761.2 1026.39
10776.79 1030.5310796.04 1031.62

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
 9081.15     .12 9986.44    .02510012.01     .08

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9986.4410012.01            596.84  648.74  713.24              .1       .3

CROSS SECTION OUTPUT  Profile #2yr

  E.G. Elev (ft)            971.51    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               1.30    Wt. n-Val.                  0.120      0.025
  W.S. Elev (ft)            970.22    Reach Len. (ft)            596.84     648.74     713.24
  Crit W.S. (ft)            970.22    Flow Area (sq ft)            9.22      73.98
  E.G. Slope (ft/ft)      0.006108    Area (sq ft)                 9.22      73.98
  Q Total (cfs)             680.00    Flow (cfs)                   2.89     677.11
  Top Width (ft)             74.61    Top Width (ft)              49.89      24.72
  Vel Total (ft/s)            8.17    Avg. Vel. (ft/s)             0.31       9.15
  Max Chl Dpth (ft)           4.43    Hydr. Depth (ft)             0.18       2.99
  Conv. Total (cfs)         8700.9    Conv. (cfs)                 37.0     8663.9
  Length Wtd. (ft)          648.63    Wetted Per. (ft)            49.90      26.75
  Min Ch El (ft)            965.79    Shear (lb/sq ft)             0.07       1.05
  Alpha                       1.25    Stream Power (lb/ft s)       0.02       9.65
  Frctn Loss (ft)             4.30    Cum Volume (acre-ft)         5.14      19.78       1.57
  C & E Loss (ft)             0.01    Cum SA (acres)               5.37       4.71       2.26

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 #5yr

  E.G. Elev (ft)            972.20    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               1.35    Wt. n-Val.                  0.120      0.025      0.001
  W.S. Elev (ft)            970.85    Reach Len. (ft)            596.84     648.74     713.24
  Crit W.S. (ft)            970.85    Flow Area (sq ft)           46.52      90.01       0.00
  E.G. Slope (ft/ft)      0.005328    Area (sq ft)                46.52      90.01       0.00
  Q Total (cfs)             890.00    Flow (cfs)                  34.19     855.81       0.00
  Top Width (ft)             89.04    Top Width (ft)              63.41      25.57       0.07
  Vel Total (ft/s)            6.52    Avg. Vel. (ft/s)             0.74       9.51       0.13
  Max Chl Dpth (ft)           5.06    Hydr. Depth (ft)             0.73       3.52       0.06
  Conv. Total (cfs)        12192.9    Conv. (cfs)                 468.5    11724.5        0.0
  Length Wtd. (ft)          647.73    Wetted Per. (ft)            63.43      27.74       0.14
  Min Ch El (ft)            965.79    Shear (lb/sq ft)             0.24       1.08
  Alpha                       2.05    Stream Power (lb/ft s)       0.18      10.26
  Frctn Loss (ft)             3.87    Cum Volume (acre-ft)        11.61      22.88       3.48
  C & E Loss (ft)             0.03    Cum SA (acres)               9.57       4.88       3.41

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: Hope Creek
REACH: 1                    RS: 5629

INPUT
Description:
Station Elevation Data    num=     154
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9149.56 1005.63 9155.17 1005.09 9168.89  1003.2 9169.74 1003.12 9185.59 1002.37
```

9191.98	1002.32	9204.71	1002.57	9209.01	1002.94	9212.67	1002.91	9219.98	1002.65
9235.5	1002.63	9245.76	1003.69	9255.14	1002.66	9262.2	1002.38	9268.92	1001.62
9279.44	1000.89	9282.54	1000.81	9305.55	998.95	9307.5	998.93	9307.96	998.92
9308.15	998.93	9332.23	998.67	9333.52	998.58	9335.33	998.41	9347.98	997.98
9352.54	997.64	9360.38	997.02	9372.9	996.6	9391.41	996.7	9397.64	996.58
9408.85	996.16	9433.28	995.16	9445.2	994.42	9449.82	994.15	9485.07	991.83
9496.77	990.66	9498.38	990.55	9505.4	989.9	9517.62	988.64	9520.28	987.92
9522.28	986.53	9524.68	986.34	9529.57	986.01	9536.62	985.63	9541.32	985.27
9546.48	984.06	9548.46	983.57	9553.78	983.84	9553.88	983.83	9569	983.32
9570.72	983.25	9573.16	983.19	9579.43	983.15	9588.39	982.74	9592.04	982.61
9600.41	982.33	9601.96	982.04	9603.01	981.93	9611.43	980.44	9615.95	980.47
9621.37	980.19	9628.21	981.24	9631.12	981.2	9660.65	980.94	9662.18	980.92
9663.41	980.83	9680.64	976.68	9688.56	975.37	9694.14	974.48	9699.85	973.74
9703.1	973.44	9708.01	973.59	9714.45	973.49	9718.86	973.55	9729.39	973.45
9734.64	973.58	9737.31	973.56	9748.19	973.75	9749.7	973.74	9750.86	973.64
9761.28	973.99	9764.91	974	9779.35	973.41	9794.19	972.77	9796.98	972.65
9802.81	971.45	9811.56	970.63	9816.07	969.91	9823.25	969.22	9836.58	968.9
9852.51	968.61	9862.6	968.52	9876.71	968.56	9885.29	969.14	9892.29	969.46
9906.05	970.29	9910.69	970.53	9912.47	972.42	9950.99	971.68	9972.01	968.32
9986.25	962.38	9995.16	958.63	10000	958.42	10004.32	958.58	10012.01	962.52
10012.87	983.28	10081.79	980.68	10087.66	980.21	10106.13	978.58	10106.56	978.62
10121.64	980.21	10132.22	981.31	10136.37	981.48	10145.34	981.83	10251.81	981.77
10319.47	981.51	10326.03	981.52	10327.04	981.51	10327.53	981.41	10333.28	980.7
10335.22	980.24	10346.64	977.91	10350.14	978.24	10366.73	980.67	10378.74	982.27
10384.24	982.67	10390.68	983.16	10403.43	986.28	10406.08	988.01	10420.4	996.89
10421.8	996.92	10446.91	997.38	10456.42	997.46	10509.85	997.33	10515.45	997.17
10520.38	997.21	10548.49	997.62	10561.01	998.09	10567.5	997.92	10577.44	997.73
10598.03	998.24	10606.83	998.43	10629.41	998.41	10642.02	997.78	10651.67	997.53
10655.91	997.49	10666.52	997.52	10695.02	997.98	10709.97	998.02	10720.29	998.12
10727.97	998.42	10736.69	998.75	10786.94	1000.05	10801.76	1000.51		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9149.56	.12	9986.25	.025	10012.01	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9986.25	10012.01	205.65	201.08	200.99	.3	.5

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	963.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.41	Wt. n-Val.	0.120	0.025	
W.S. Elev (ft)	962.58	Reach Len. (ft)	205.65	201.08	200.99
Crit W.S. (ft)	962.58	Flow Area (sq ft)	0.05	71.27	
E.G. Slope (ft/ft)	0.007231	Area (sq ft)	0.05	71.27	0.00
Q Total (cfs)	680.00	Flow (cfs)	0.01	679.99	
Top Width (ft)	26.23	Top Width (ft)	0.47	25.76	
Vel Total (ft/s)	9.54	Avg. Vel. (ft/s)	0.21	9.54	
Max Chl Dpth (ft)	4.16	Hydr. Depth (ft)	0.10	2.77	
Conv. Total (cfs)	7996.6	Conv. (cfs)	0.1	7996.5	
Length Wtd. (ft)	201.09	Wetted Per. (ft)	0.51	27.47	
Min Ch El (ft)	958.42	Shear (lb/sq ft)	0.04	1.17	
Alpha	1.00	Stream Power (lb/ft s)	0.01	11.17	
Frctn Loss (ft)	0.65	Cum Volume (acre-ft)	5.08	18.70	1.57
C & E Loss (ft)	0.40	Cum SA (acres)	5.03	4.33	2.26

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 #5yr

E.G. Elev (ft)	964.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.68	Wt. n-Val.	0.120	0.025	0.001
W.S. Elev (ft)	963.13	Reach Len. (ft)	205.65	201.08	200.99
Crit W.S. (ft)	963.13	Flow Area (sq ft)	0.67	85.48	0.01
E.G. Slope (ft/ft)	0.006751	Area (sq ft)	0.67	85.48	0.01
Q Total (cfs)	890.00	Flow (cfs)	0.34	889.66	0.00
Top Width (ft)	27.58	Top Width (ft)	1.79	25.76	0.03
Vel Total (ft/s)	10.33	Avg. Vel. (ft/s)	0.50	10.41	0.08
Max Chl Dpth (ft)	4.71	Hydr. Depth (ft)	0.37	3.32	0.30
Conv. Total (cfs)	10831.7	Conv. (cfs)	4.1	10827.6	0.0
Length Wtd. (ft)	201.09	Wetted Per. (ft)	1.94	27.47	0.61

Min Ch El (ft)	958.42	Shear (lb/sq ft)	0.15	1.31	
Alpha	1.01	Stream Power (lb/ft s)	0.07	13.65	
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)	11.29	21.58	3.48
C & E Loss (ft)	0.53	Cum SA (acres)	9.12	4.50	3.41

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: Hope Creek
REACH: 1 RS: 5428

INPUT
Description:
Station Elevation Data num= 139

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8880	1017.68	8881.7	1017.62	8890.39	1017.27	8895.17	1017.13	8898.42	1016.88
8905.03	1016.67	8909.13	1016.75	8911.61	1016.71	8929.44	1016.27	8930.08	1016.26
8930.87	1016.22	8931.49	1016.2	8936.73	1016.03	8956.97	1015.02	8959.15	1015
8970.1	1015.14	8971.12	1015.12	8973.35	1015.09	8980.54	1015.08	8981.63	1015.03
8987.58	1014.87	8992.82	1014.7	8994.89	1014.63	8999.89	1014.6	9012.01	1014.2
9013.22	1014.16	9021.42	1013.62	9027.09	1013.57	9045.66	1012.91	9046.29	1012.88
9048.07	1012.81	9051.84	1012.62	9056.36	1012.36	9057.91	1012.26	9063.21	1011.8
9082.18	1009.56	9088.07	1008.78	9091.74	1008.25	9094.97	1007.92	9102.18	1007.27
9126.65	1006.06	9174.1	1001.47	9175.17	1001.36	9175.67	1001.31	9176.37	1001.26
9176.71	1001.21	9177.28	1001.16	9215.69	998.51	9224.02	997.57	9236.66	996.05
9236.79	996.05	9272.98	993.96	9295.37	992.45	9307.21	991.85	9325.97	990.47
9327.88	990.18	9328.69	990.11	9333.85	989.56	9352.23	987.68	9362.6	986.64
9383.62	985.48	9388.62	985.11	9391.91	984.83	9432.86	982.72	9444.36	981.97
9454.54	980.96	9469.63	979.5	9489.12	977.69	9492.06	977.07	9494.28	976.62
9507.56	973.91	9512.84	972.83	9514.96	972.42	9521.05	972.17	9524.88	972.02
9533.91	971.61	9541.48	971.31	9547.26	970.53	9547.7	970.49	9548.77	970.36
9550.44	970.24	9564.15	969.34	9564.53	969.32	9566.83	968.61	9581.36	965.46
9584.59	965.06	9587.25	964.84	9596.02	964.69	9606.43	964.53	9608.17	964.51
9613.93	964.43	9635.01	964.06	9645.73	962.26	9649.59	961.6	9659.69	961.41
9674.25	961.01	9682.31	960.85	9953.74	960.3	9966.04	960.04	9971.16	959.98
9974.67	959.83	9978.83	959.81	9986.25	959.32	9995.16	955.57	10000	955.36
10004.32	955.52	10012.01	959.46	10016.4	966.46	10019.39	973.97	10019.65	973.83
10020.43	973.45	10047.3	973.75	10054.63	973.87	10060.74	973.93	10065.85	973.68
10095.76	972.45	10108.5	973.81	10118.8	974.85	10124.9	975.16	10129.19	975.42
10132.75	975.61	10178.93	975.81	10208.91	975.93	10300.93	976.31	10307.69	976.33
10308.62	976.18	10312.59	975.44	10319.33	974.22	10323.96	975.27	10355.3	982.04
10359.11	983.97	10360.64	998.51	10398.32	998.15	10436.27	997.91	10461.02	998.2
10511.39	998.61	10520.87	998.62	10530.55	998.46	10531.68	998.43		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8880	.12	9986.25	.025	10012.01	.08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9986.25 10012.01 519.24 458.42 414.44 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
9575	9984.63	968.08	T
10013.39	10531.68	969.97	T

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	961.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.61	Wt. n-Val.	0.120	0.025	0.080
W.S. Elev (ft)	960.93	Reach Len. (ft)	519.24	458.42	414.44
Crit W.S. (ft)	959.54	Flow Area (sq ft)	2.52	107.60	0.68
E.G. Slope (ft/ft)	0.001820	Area (sq ft)	128.12	107.60	0.68
Q Total (cfs)	680.00	Flow (cfs)	1.78	677.93	0.29
Top Width (ft)	334.52	Top Width (ft)	307.84	25.76	0.92
Vel Total (ft/s)	6.14	Avg. Vel. (ft/s)	0.71	6.30	0.42
Max Chl Dpth (ft)	5.57	Hydr. Depth (ft)	1.55	4.18	0.73
Conv. Total (cfs)	15939.2	Conv. (cfs)	41.8	15890.7	6.7
Length Wtd. (ft)	458.42	Wetted Per. (ft)	1.62	27.47	1.73
Min Ch El (ft)	955.36	Shear (lb/sq ft)	0.18	0.45	0.04

Alpha	1.05	Stream Power (lb/ft s)	0.12	2.80	0.02
Frctn Loss (ft)		Cum Volume (acre-ft)	4.77	18.28	1.57
C & E Loss (ft)		Cum SA (acres)	4.30	4.21	2.26

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	962.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.63	Wt. n-Val.	0.120	0.025	0.080
W.S. Elev (ft)	962.13	Reach Len. (ft)	519.24	458.42	414.44
Crit W.S. (ft)	960.07	Flow Area (sq ft)	4.47	138.60	2.17
E.G. Slope (ft/ft)	0.001333	Area (sq ft)	523.90	138.60	2.24
Q Total (cfs)	890.00	Flow (cfs)	3.97	884.73	1.30
Top Width (ft)	367.20	Top Width (ft)	339.76	25.76	1.67
Vel Total (ft/s)	6.13	Avg. Vel. (ft/s)	0.89	6.38	0.60
Max Chl Dpth (ft)	6.77	Hydr. Depth (ft)	2.76	5.38	1.57
Conv. Total (cfs)	24375.0	Conv. (cfs)	108.6	24230.7	35.7
Length Wtd. (ft)	458.42	Wetted Per. (ft)	1.62	27.47	2.60
Min Ch El (ft)	955.36	Shear (lb/sq ft)	0.23	0.42	0.07
Alpha	1.08	Stream Power (lb/ft s)	0.20	2.68	0.04
Frctn Loss (ft)		Cum Volume (acre-ft)	10.05	21.06	3.48
C & E Loss (ft)		Cum SA (acres)	8.31	4.38	3.40

CULVERT

RIVER: Hope Creek
REACH: 1 RS: 5146

INPUT
Description: I-75, HC-4, 2-9x6 Box
Distance from Upstream XS = 17
Deck/Roadway Width = 425
Weir Coefficient = 2.8
Upstream Deck/Roadway Coordinates
num= 121

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
8877.88	1014.31		8885.17	1013.96		8907.41	1012.17	
8918.63	1011.43		8927.44	1011.13		8988.38	1009.03	
8991.01	1008.91		9024.72	1007.63		9048.71	1005.15	
9057.07	1004.18		9069.38	1003.06		9112.43	1000.94	
9115.2	1000.52		9117.04	1000.56		9119.51	1000.03	
9122.16	999.35		9146.05	998.39		9156.73	997.91	
9158.93	997.82		9159.77	997.79		9162.87	997.65	
9191.73	996.39		9198.48	996		9204.74	995.81	
9207.33	995.23		9217.31	992.96		9221.32	992.35	
9222.87	992.31		9247.33	991.25		9254.19	990.89	
9272.57	989.64		9274.57	989.5		9275.59	989.2	
9278.74	988.13		9281.27	987.27		9284.4	987.66	
9289.98	988.63		9296.13	988.18		9302.12	987.41	
9311.11	986.45		9320.01	985.63		9321.66	985.47	
9323.02	985.32		9331.13	984.28		9333.22	984.16	
9339.34	983.97		9343.65	983.55		9349.61	983.18	
9356.06	982.93		9359.01	982.82		9360.73	982.44	
9366.23	981.36		9375.12	980.54		9384.91	979.74	
9394.33	978.6		9410.5	976.7		9439.25	974.19	
9444.61	973.8		9474.25	970.91		9488.42	969.84	
9499.54	969.12		9516.33	968.51		9537.11	967.34	
9559.06	964.09		9562.99	963.52		9566.48	963.27	
9684.38	964.81		9685.32	965.09		9725.25	969.45	
9730.79	969.45		9737.49	969.45		9745.37	969.45	
9752.75	969.45		9765.99	969.45		9885.76	967.26	
9893.79	967.37		9944.35	968.44		9956.98	968.66	
9970.88	969.52		9982.88	969.52		10024.87	969.52	
10036.05	970.14		10041.11	970.23		10050.31	970.4	
10108.03	971.73		10118.43	972.04		10131.15	972.34	
10135.54	972.54		10189.34	974.07		10196.9	974.17	
10210.77	974.61		10297.86	974.86		10330.75	974.96	
10333.8	974.97		10337.4	974.35		10346.03	972.86	
10349.55	973.73		10381.62	981.42		10405.7	992.45	
10408.55	993.67		10409.29	993.72		10450.59	995.25	
10456.78	995.51		10462.41	995.54		10492.18	996.02	
10525.03	995.39		10527.38	995.31		10528.77	995.32	
10531.44	995.33		10565.96	995.33		10597.8	995.59	
10598.34	995.58		10598.94	995.61		10637.36	996.21	
10665.54	995.98		10673.12	995.92		10712.68	996.38	
10740.48	996.87		10764.42	997.25		10799.24	998.33	
10801.36	998.34							

Upstream Bridge Cross Section Data
Station Elevation Data num= 139

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8880	1017.68	8881.7	1017.62	8890.39	1017.27	8895.17	1017.13	8898.42	1016.88
8905.03	1016.67	8909.13	1016.75	8911.61	1016.71	8929.44	1016.27	8930.08	1016.26
8930.87	1016.22	8931.49	1016.2	8936.73	1016.03	8956.97	1015.02	8959.15	1015
8970.1	1015.14	8971.12	1015.12	8973.35	1015.09	8980.54	1015.08	8981.63	1015.03
8987.58	1014.87	8992.82	1014.7	8994.89	1014.63	8999.89	1014.6	9012.01	1014.2
9013.22	1014.16	9021.42	1013.62	9027.09	1013.57	9045.66	1012.91	9046.29	1012.88
9048.07	1012.81	9051.84	1012.62	9056.36	1012.36	9057.91	1012.26	9063.21	1011.8
9082.18	1009.56	9088.07	1008.78	9091.74	1008.25	9094.97	1007.92	9102.18	1007.27
9126.65	1006.06	9174.1	1001.47	9175.17	1001.36	9175.67	1001.31	9176.37	1001.26
9176.71	1001.21	9177.28	1001.16	9215.69	998.51	9224.02	997.57	9236.66	996.05
9236.79	996.05	9272.98	993.96	9295.37	992.45	9307.21	991.85	9325.97	990.47
9327.88	990.18	9328.69	990.11	9333.85	989.56	9352.23	987.68	9362.6	986.64
9383.62	985.48	9388.62	985.11	9391.91	984.83	9432.86	982.72	9444.36	981.97
9454.54	980.96	9469.63	979.5	9489.12	977.69	9492.06	977.07	9494.28	976.62
9507.56	973.91	9512.84	972.83	9514.96	972.42	9521.05	972.17	9524.88	972.02
9533.91	971.61	9541.48	971.31	9547.26	970.53	9547.7	970.49	9548.77	970.36
9550.44	970.24	9564.15	969.34	9564.53	969.32	9566.83	968.61	9581.36	965.46
9584.59	965.06	9587.25	964.84	9596.02	964.69	9606.43	964.53	9608.17	964.51
9613.93	964.43	9635.01	964.06	9645.73	962.26	9649.59	961.6	9659.69	961.41
9674.25	961.01	9682.31	960.85	9953.74	960.3	9966.04	960.04	9971.16	959.98
9974.67	959.83	9978.83	959.81	9986.25	959.32	9995.16	955.57	10000	955.36
10004.32	955.52	10012.01	959.46	10016.4	966.46	10019.39	973.97	10019.65	973.83
10020.43	973.45	10047.3	973.75	10054.63	973.87	10060.74	973.93	10065.85	973.68
10095.76	972.45	10108.5	973.81	10118.8	974.85	10124.9	975.16	10129.19	975.42
10132.75	975.61	10178.93	975.81	10208.91	975.93	10300.93	976.31	10307.69	976.33
10308.62	976.18	10312.59	975.44	10319.33	974.22	10323.96	975.27	10355.3	982.04
10359.11	983.97	10360.64	998.51	10398.32	998.15	10436.27	997.91	10461.02	998.2
10511.39	998.61	0520.87	998.62	10530.55	998.46	10531.68	998.43		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8880	.12	9986.25	.02	10012.01	.08

Bank Sta: Left Right Coeff Contr. Expan.

9986.25	10012.01	.3	.5	

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
9575	9984.63	968.08	T
10013.39	10531.68	969.97	T

Downstream Deck/Roadway Coordinates
num= 121

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
8877.88	1014.31		8885.17	1013.96		8907.41	1012.17	
8918.63	1011.43		8927.44	1011.13		8988.38	1009.03	
8991.01	1008.91		9024.72	1007.63		9048.71	1005.15	
9057.07	1004.18		9069.38	1003.06		9112.43	1000.94	
9115.2	1000.52		9117.04	1000.56		9119.51	1000.03	
9122.16	999.35		9146.05	998.39		9156.73	997.91	
9158.93	997.82		9159.77	997.79		9162.87	997.65	
9191.73	996.39		9198.48	996		9204.74	995.81	
9207.33	995.23		9217.31	992.96		9221.32	992.35	
9222.87	992.31		9247.33	991.25		9254.19	990.89	
9272.57	989.64		9274.57	989.5		9275.59	989.2	
9278.74	988.13		9281.27	987.27		9284.4	987.66	
9289.98	988.63		9296.13	988.18		9302.12	987.41	
9311.11	986.45		9320.01	985.63		9321.66	985.47	
9323.02	985.32		9331.13	984.28		9333.22	984.16	
9339.34	983.97		9343.65	983.55		9349.61	983.18	
9356.06	982.93		9359.01	982.82		9360.73	982.44	
9366.23	981.36		9375.12	980.54		9384.91	979.74	
9394.33	978.6		9410.5	976.7		9439.25	974.19	
9444.61	973.8		9474.25	970.91		9488.42	969.84	
9499.54	969.12		9516.33	968.51		9537.11	967.34	
9559.06	964.09		9562.99	963.52		9566.48	963.27	
9684.38	964.81		9685.32	965.09		9725.25	969.45	
9730.79	969.45		9737.49	969.45		9745.37	969.45	
9752.75	969.45		9765.99	969.45		9885.76	967.26	
9893.79	967.37		9944.35	968.44		9956.98	968.66	
9970.88	969.52		9982.88	969.52		10024.87	969.52	
10036.05	970.14		10041.11	970.23		10050.31	970.4	
10108.03	971.73		10118.43	972.04		10131.15	972.34	
10135.54	972.54		10189.34	974.07		10196.9	974.17	
10210.77	974.61		10297.86	974.86		10330.75	974.96	
10333.8	974.97		10337.4	974.35		10346.03	972.86	
10349.55	973.73		10381.62	981.42		10405.7	992.45	
10408.55	993.67		10409.29	993.72		10450.59	995.25	
10456.78	995.51		10462.41	995.54		10492.18	996.02	
10525.03	995.39		10527.38	995.31		10528.77	995.32	
10531.44	995.33		10565.96	995.33		10597.8	995.59	
10598.34	995.58		10598.94	995.61		10637.36	996.21	

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10665.54  995.98        10673.12  995.92        10712.68  996.38
10740.48  996.87        10764.42  997.25        10799.24  998.33
10801.36  998.34

Downstream Bridge Cross Section Data
Station Elevation Data    num=     157
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8866 1008.46 8866.04 1008.46 8873.96 1008.15 8877.18 1008.15 8881.58 1008.38
 8887.58 1008.13 8913.96 1007.31 8915.68 1007.26 8918.81 1007.23 8943.94 1006.18
 8945.71 1005.64 8954.99  1003.6 8964.49  1003.6 8995.86 1003.05 9001.03 1003.03
 9002.63 1003.02 9003.97 1002.98 9035.31 1001.44 9043.76 1001.21 9057.87 1000.36
 9058.85 1000.17  9059.8  1000.1 9074.56  999.25 9078.13  999.57 9091.88  999.16
  9102.7  998.95 9113.79  998.83 9129.67  998.73 9132.32  998.67 9140.97  998.73
 9149.13  998.47 9153.93  998.39 9155.08  998.03  9169.7  997.09 9175.48   996.5
 9185.46  995.69 9199.49  994.33 9205.58   993.7 9220.98  992.62 9226.09   991.8
 9233.83   991.5 9242.96  990.96 9258.56  989.48 9285.42  988.13 9292.34  987.76
 9311.69  987.02 9318.37  986.78 9320.74  986.53 9324.82  985.88 9328.08  985.18
 9341.88  982.47 9346.73  981.35 9351.23  980.08 9356.87  978.92 9360.72  979.07
 9363.48   979.3 9364.58  979.34 9372.37  978.75 9373.72  978.64 9385.58   977.7
 9387.52  977.54 9389.02   977.4 9391.34  977.03 9394.57  976.48 9396.36  976.36
 9397.25  976.29 9401.15  974.97 9403.55  974.96 9408.36  974.69 9412.31  974.63
 9436.96  972.17 9444.24  971.64 9453.17   971.3 9458.23  971.08 9462.77  970.88
 9478.62  970.03  9494.5  968.91 9501.94  968.72 9531.25  966.52 9539.45  966.14
  9540.4   966.1 9542.71  965.95 9554.53  965.29 9558.73  963.77 9569.43  960.61
  9600.4  959.56 9624.17  958.39 9638.99  957.84 9652.47  957.06 9663.72  960.71
 9674.97  964.74 9689.32  964.84 9715.02  964.97 9725.37  963.65 9727.61  963.32
 9732.87  963.41 9741.13  963.62 9751.88  965.94 9753.03  966.18 9753.65  966.19
 9769.43  966.59 9865.27  966.24 9876.54  966.29 9899.28   966.5 9925.28  966.52
 9938.13  966.58  9962.9  966.55 9966.34  966.58 9967.87  966.59 9968.35  966.59
 9970.14  966.43 9970.75  966.38 9974.46  962.41 9988.91  956.36 9990.74  950.63
   10000   950.610010.74  951.2210012.88  957.5110026.81  962.3210030.78  962.53
10033.08  963.2710048.84  968.2410053.37  969.8710062.18  972.2210098.75  980.36
10100.19  980.6410120.19  981.1610152.39  980.8210196.07  980.4710196.53  980.48
10236.47  976.9710238.26  976.8410240.25  976.5810262.15  976.2610263.03  976.24
 10276.5  976.2210302.84  976.1310311.44  976.1510346.55  976.1310362.69  976.28
10394.65  976.2310401.57  976.2410413.15  976.3910447.25  976.6210452.06  976.66
10458.13  976.7110466.41  977.1310495.79  977.5610505.74  978.2210515.78  978.64
10530.16  978.9610532.53  979.4910545.54  980.51 10546.7   980.810566.33  984.59
10570.96  985.4110575.33  984.42

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8866     .09 9988.91     .0410012.88     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9988.9110012.88             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    8866 9988.56     963       F
10013.5410575.33  969.81       F

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

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1          Box       6       9
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 17     425     .012     .012        0                   .5                1
Number of Barrels =  2
Upstream   Elevation =  955.35
Centerline Stations
    Sta.    Sta.
    9995   10005
Downstream Elevation =  950.84
Centerline Stations
    Sta.    Sta.
    9995   10005

CROSS SECTION


RIVER: Hope Creek
```

REACH: 1 RS: 4969

INPUT
Description:
Station Elevation Data num= 157

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8866	1008.46	8866.04	1008.46	8873.96	1008.15	8877.18	1008.15	8881.58	1008.38
8887.58	1008.13	8913.96	1007.31	8915.68	1007.26	8918.81	1007.23	8943.94	1006.18
8945.71	1005.64	8954.99	1003.6	8964.49	1003.6	8995.86	1003.05	9001.03	1003.03
9002.63	1003.02	9003.97	1002.98	9035.31	1001.44	9043.76	1001.21	9057.87	1000.36
9058.85	1000.17	9059.8	1000.1	9074.56	999.25	9078.13	999.57	9091.88	999.16
9102.7	998.95	9113.79	998.83	9129.67	998.73	9132.32	998.67	9140.97	998.73
9149.13	998.47	9153.93	998.39	9155.08	998.03	9169.7	997.09	9175.48	996.5
9185.46	995.69	9199.49	994.33	9205.58	993.7	9220.98	992.62	9226.09	991.8
9233.83	991.5	9242.96	990.96	9258.56	989.48	9285.42	988.13	9292.34	987.76
9311.69	987.02	9318.37	986.78	9320.74	986.53	9324.82	985.88	9328.08	985.18
9341.88	982.47	9346.73	981.35	9351.23	980.08	9356.87	978.92	9360.72	979.07
9363.48	979.3	9364.58	979.34	9372.37	978.75	9373.72	978.64	9385.58	977.7
9387.52	977.54	9389.02	977.4	9391.34	977.03	9394.57	976.48	9396.36	976.36
9397.25	976.29	9401.15	974.97	9403.55	974.96	9408.36	974.69	9412.31	974.63
9436.96	972.17	9444.24	971.64	9453.17	971.3	9458.23	971.08	9462.77	970.88
9478.62	970.03	9494.5	968.91	9501.94	968.72	9531.25	966.52	9539.45	966.14
9540.4	966.1	9542.71	965.95	9554.53	965.29	9558.73	963.77	9569.43	960.61
9600.4	959.56	9624.17	958.39	9638.99	957.84	9652.47	957.06	9663.72	960.71
9674.97	964.74	9689.32	964.84	9715.02	964.97	9725.37	963.65	9727.61	963.32
9732.87	963.41	9741.13	963.62	9751.88	965.94	9753.03	966.18	9753.65	966.19
9769.43	966.59	9865.27	966.24	9876.54	966.29	9899.28	966.5	9925.28	966.52
9938.13	966.58	9962.9	966.55	9966.34	966.58	9967.87	966.59	9968.35	966.59
9970.14	966.43	9970.75	966.38	9974.46	962.41	9988.91	956.36	9990.74	950.63
10000	950.6	10010.74	951.2	10012.88	957.5	10026.81	962.32	10030.78	962.53
10033.08	963.27	10048.84	968.24	10053.37	969.87	10062.18	972.22	10098.75	980.36
10100.19	980.64	10120.19	981.16	10152.39	980.82	10196.07	980.47	10196.53	980.48
10236.47	976.97	10238.26	976.84	10240.25	976.58	10262.15	976.26	10263.03	976.24
10276.5	976.22	10302.84	976.13	10311.44	976.15	10346.55	976.13	10362.69	976.28
10394.65	976.23	10401.57	976.24	10413.15	976.39	10447.25	976.62	10452.06	976.66
10458.13	976.71	10466.41	977.13	10495.79	977.56	10505.74	978.22	10515.78	978.64
10530.16	978.96	10532.53	979.49	10545.54	980.51	10546.7	980.8	10566.33	984.59
10570.96	985.41	10575.33	984.42						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8866	.09	9988.91	.04	10012.88	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9988.91	10012.88	170.27	251.19	305.99	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
8866	9988.56	963	F
10013.54	10575.33	969.81	F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	955.62	Element			
Vel Head (ft)	1.24	Wt. n-Val.		0.040	
W.S. Elev (ft)	954.38	Reach Len. (ft)	170.27	251.19	305.99
Crit W.S. (ft)	954.02	Flow Area (sq ft)		76.18	
E.G. Slope (ft/ft)	0.014700	Area (sq ft)		76.18	
Q Total (cfs)	680.00	Flow (cfs)		680.00	
Top Width (ft)	22.28	Top Width (ft)		22.28	
Vel Total (ft/s)	8.93	Avg. Vel. (ft/s)		8.93	
Max Chl Dpth (ft)	3.78	Hydr. Depth (ft)		3.42	
Conv. Total (cfs)	5608.5	Conv. (cfs)		5608.5	
Length Wtd. (ft)	251.19	Wetted Per. (ft)		27.30	
Min Ch El (ft)	950.60	Shear (lb/sq ft)		2.56	
Alpha	1.00	Stream Power (lb/ft s)		22.86	
Frctn Loss (ft)	3.15	Cum Volume (acre-ft)	4.01	17.32	1.56
C & E Loss (ft)	0.00	Cum SA (acres)	2.46	3.96	2.26

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, energy was used.

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	956.59	Element			
Vel Head (ft)	1.34	Wt. n-Val.		0.040	
W.S. Elev (ft)	955.25	Reach Len. (ft)	170.27	251.19	305.99
Crit W.S. (ft)	954.66	Flow Area (sq ft)		95.72	

E.G. Slope (ft/ft)	0.012820	Area (sq ft)		95.72		
Q Total (cfs)	890.00	Flow (cfs)		890.00		
Top Width (ft)	22.85	Top Width (ft)		22.85		
Vel Total (ft/s)	9.30	Avg. Vel. (ft/s)		9.30		
Max Chl Dpth (ft)	4.65	Hydr. Depth (ft)		4.19		
Conv. Total (cfs)	7860.6	Conv. (cfs)		7860.6		
Length Wtd. (ft)	251.19	Wetted Per. (ft)		29.13		
Min Ch El (ft)	950.60	Shear (lb/sq ft)		2.63		
Alpha	1.00	Stream Power (lb/ft s)		24.46		
Frctn Loss (ft)	3.08	Cum Volume (acre-ft)	6.93	19.83	3.47	
C & E Loss (ft)	0.05	Cum SA (acres)	6.29	4.13	3.40	

Warning: The energy loss was 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, energy was used.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4718

INPUT
Description:
Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8972	997.24	8976.78	997.33	8976.86	997.33	8986.2	997.18	8987.8	997.11
8990.79	996.91	8997.19	996.41	9002.09	996.28	9009.99	995.85	9012.04	995.76
9012.95	995.68	9013.37	995.66	9018.71	995.23	9027.24	994.69	9034.39	994.23
9038.61	993.95	9042.92	993.43	9048.77	992.92	9056.1	992.82	9063.1	992.39
9073.16	991.77	9104.51	990.62	9112.07	990.26	9115.62	989.85	9124.02	988.92
9130.94	988.72	9179.4	987.29	9185.64	987.11	9188.46	987.15	9231.45	988.38
9234.51	988.38	9238.93	988.53	9252.21	990.88	9255.3	991.41	9260.5	991.38
9283.34	990.89	9296.54	990.72	9306.63	989.97	9330.21	989.09	9360.22	986.39
9367.81	985.9	9369.04	985.9	9371.82	985.75	9385.95	985.64	9387.1	985.63
9417.48	981.81	9432.14	979	9434.11	978.58	9441.59	977.97	9453.79	976.84
9463.26	975.98	9482.19	973.68	9493.72	972.7	9497.08	972.48	9505.18	971.89
9518.75	971.62	9521.2	971.73	9521.25	971.73	9522.35	971.72	9525.77	971.06
9530.31	970.24	9531.11	970.07	9531.37	970.01	9532.72	969.71	9536.16	968.92
9544.42	967.21	9551.68	965.78	9570.08	962.74	9571.16	962.74	9572.95	962.78
9578.49	962.97	9581.77	962.74	9589.06	962.16	9599.87	961.46	9605.56	961.14
9608.83	961.05	9609.08	961.04	9613	960.97	9615.68	960.91	9618.08	960.86
9620.15	960.77	9622.72	960.73	9626.04	960.68	9626.15	960.67	9626.28	960.67
9632.28	960.48	9633.03	960.44	9639.08	959.97	9649.35	959.76	9651.2	959.73
9653.63	959.69	9656.99	959.64	9662.14	959.54	9669.56	959.37	9672.68	959.41
9674.07	959.46	9674.36	959.46	9677.89	959.32	9683.22	958.95	9691.6	957.28
9693.18	956.96	9694.12	957.18	9720.63	963.68	9745.02	963.86	9760.81	964.02
9769.56	963.2	9776.45	962.16	9785.52	964.06	9789.08	964.78	9794.69	964.96
9808.84	965.41	9973.88	966.79	9973.89	966.79	9974.46	958.08	9988.91	952.03
9990.74	946.3	10000	946.27	10010.74	946.89	10012.88	953.18	10026.81	957.99
10051.57	960.94	10074.18	969.01	10087.82	968.42	10102.32	968.53	10132.3	969.12
10149.37	969.88	10184.84	971.52	10186.62	971.55	10198.38	974.21	10209.57	976.64
10211.27	977.03	10213.32	977.38	10216.78	977.59	10230.18	978.32	10233.23	978.41
10243.31	978.68	10245.46	978.68	10254.91	977.71	10270.38	976.35	10271.31	976.42
10280.18	976.66	10325.82	979.26	10328.61	979.37	10360.67	980.12	10371.09	981.47
10405.25	982.88	10407.05	982.96	10409.18	983.05	10426.1	991.58	10430.76	995.77
10442.03	997.15	10459.18	999.23	10472.57	1000.52	10483.22	1001.12	10519.32	1003.74
10540.29	1006.48	10566.04	1007.25	10575.84	1007.25	10583.81	1007.85	10611.38	1010.11
10616.22	1010.47								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8972	.09	9988.91	.04	10012.88	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9988.91	10012.88	511.63	509.41	507.2	.1	.3

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	952.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.25	Wt. n-Val.		0.040	
W.S. Elev (ft)	951.21	Reach Len. (ft)	511.63	509.41	507.20
Crit W.S. (ft)		Flow Area (sq ft)		102.42	
E.G. Slope (ft/ft)	0.011245	Area (sq ft)		102.42	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	23.04	Top Width (ft)		23.04	
Vel Total (ft/s)	8.98	Avg. Vel. (ft/s)		8.98	
Max Chl Dpth (ft)	4.94	Hydr. Depth (ft)		4.45	
Conv. Total (cfs)	8675.8	Conv. (cfs)		8675.8	
Length Wtd. (ft)	509.32	Wetted Per. (ft)		29.74	

Min Ch El (ft)	946.27	Shear (lb/sq ft)		2.42	
Alpha	1.00	Stream Power (lb/ft s)		21.72	
Frctn Loss (ft)	2.26	Cum Volume (acre-ft)	4.01	16.80	1.56
C & E Loss (ft)	0.25	Cum SA (acres)	2.46	3.83	2.26

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 #5yr

E.G. Elev (ft)	953.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.52	Wt. n-Val.		0.040	
W.S. Elev (ft)	951.94	Reach Len. (ft)	511.63	509.41	507.20
Crit W.S. (ft)		Flow Area (sq ft)		119.33	
E.G. Slope (ft/ft)	0.011884	Area (sq ft)		119.33	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	23.52	Top Width (ft)		23.52	
Vel Total (ft/s)	9.89	Avg. Vel. (ft/s)		9.89	
Max Chl Dpth (ft)	5.67	Hydr. Depth (ft)		5.07	
Conv. Total (cfs)	10824.3	Conv. (cfs)		10824.3	
Length Wtd. (ft)	509.28	Wetted Per. (ft)		31.27	
Min Ch El (ft)	946.27	Shear (lb/sq ft)		2.83	
Alpha	1.00	Stream Power (lb/ft s)		28.00	
Frctn Loss (ft)	2.39	Cum Volume (acre-ft)	6.93	19.21	3.47
C & E Loss (ft)	0.31	Cum SA (acres)	6.29	3.99	3.40

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: Hope Creek
REACH: 1 RS: 4209

INPUT
Description:
Station Elevation Data num= 150

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9040.93	979.93	9048.16	980.07	9050.36	979.95	9065.17	979.55	9104.34	979.53
9121.05	979.89	9122.09	979.92	9122.56	979.99	9123.53	980.11	9127.7	980.58
9137.89	979.96	9150.4	979.37	9156.34	978.88	9165.39	978.22	9169.92	977.9
9172.32	977.73	9176.09	979.07	9178.86	980.03	9180.37	980.02	9184.34	979.99
9201.13	979.81	9202.05	979.65	9206.3	979.76	9215.68	979.7	9220.34	979.27
9227.49	979.01	9230.19	978.97	9232.96	978.93	9239.48	978.95	9242.94	979
9250.26	978.64	9255.19	978.5	9256.93	978.63	9261.47	978.33	9271.63	978.4
9296.92	977.8	9300.98	977.99	9302.16	978.05	9303.16	978.11	9304.53	978.22
9330.3	979.32	9355.47	979.08	9360.57	978.96	9384.05	979.01	9410.74	980.33
9423.98	980.48	9465.44	979.64	9474.8	979.59	9485.8	979.64	9499.99	979.49
9513.36	978.95	9528.96	978.69	9553.4	977.77	9554.05	977.75	9564.73	976.8
9572.65	976.43	9603.18	974.02	9620.95	972.01	9627.41	971.82	9638.67	971.05
9649.54	969.99	9657.14	969.07	9671.31	968.19	9702.4	966.21	9709.01	965.76
9728.92	963.87	9730.1	963.79	9744.35	959.86	9745.25	959.61	9745.48	959.62
9752.16	959.95	9754.05	960.08	9971.1	961.89	9974.09	961.91	9974.13	961.91
9974.24	961.92	9975.76	961.99	9977.52	955.93	9978.9	951.88	9979.63	951.56
9988.91	948.14	9990.74	942.41	10000	942.38	10010.74		94310012.88	947.23
10016.82	947.23	10019.5	947.29	10019.54	947.29	10063.39	948.42	10091.95	960.11
10105.25	964.91	10130.01	967.47	10130.79	967.54	10131.2	967.55	10163.66	968.26
10165.91	970.03	10175.58	976.21	10196.17	976.63	10220.22	976.91	10220.58	976.14
10222.54	971.83	10222.62	971.89	10225.59	973.42	10227.22	974.26	10228.82	972.01
10228.92	971.88	10229.52	971.39	10259.1	971.17	10259.7	971.17	10259.92	971.16
10261.08	971.19	10261.52	971.21	10297.44	972.35	10304.5	974.73	10309.84	977.11
10321.49	977.45	10327.35	977.41	10330.63	977.57	10364.56	979.44	10387.63	980.84
10389.51	980.96	10392.69	981.21	10396.43	981.48	10432.8	984.35	10439.03	984.97
10448.66	985.66	10466.2	987.08	10478.94	988.08	10487.56	988.95	10494.39	990.25
10498.74	990.54	10508.21	991.07	10521.53	991.31	10526.05	991.45	10538.67	991.82
10547.74	990.97	10552.09	990.75	10565.66	992.15	10569.26	994.94	10572.92	995.33
10579.81	995.18	10592.92	995.16	10596.72	995.07	10602.46	994.92	10619.3	995.09
10623.32	994.15	10629.07	994.06	10645.37	993.48	10661.82	994.64	10661.91	994.65

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

9040.93	.09	9988.91	.04	10012.88	.12						

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9988.91	10012.88	422.16	424.62	427.61	.1	.3

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	949.95	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.41	Reach Len. (ft)	422.16	424.62	427.61
W.S. Elev (ft)	949.54	Flow Area (sq ft)	2.68	157.12	90.97
Crit W.S. (ft)		Area (sq ft)	2.68	157.12	90.97
E.G. Slope (ft/ft)	0.002358	Flow (cfs)	1.63	840.43	77.94
Q Total (cfs)	920.00	Top Width (ft)	3.81	23.97	53.26
Top Width (ft)	81.04	Avg. Vel. (ft/s)	0.61	5.35	0.86
Vel Total (ft/s)	3.67	Hydr. Depth (ft)	0.70	6.55	1.71
Max Chl Dpth (ft)	7.16	Conv. (cfs)	33.5	17306.0	1605.0
Conv. Total (cfs)	18944.5	Wetted Per. (ft)	4.06	30.77	53.49
Length Wtd. (ft)	424.76	Shear (lb/sq ft)	0.10	0.75	0.25
Min Ch El (ft)	942.38	Stream Power (lb/ft s)	0.06	4.02	0.21
Alpha	1.95	Cum Volume (acre-ft)	3.99	15.28	1.03
Frctn Loss (ft)	0.73	Cum SA (acres)	2.44	3.55	1.95
C & E Loss (ft)	0.04				

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	950.75	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.48	Reach Len. (ft)	422.16	424.62	427.61
W.S. Elev (ft)	950.28	Flow Area (sq ft)	6.19	174.64	130.56
Crit W.S. (ft)		Area (sq ft)	6.19	174.64	130.56
E.G. Slope (ft/ft)	0.002499	Flow (cfs)	5.12	1031.81	143.08
Q Total (cfs)	1180.00	Top Width (ft)	5.80	23.97	55.04
Top Width (ft)	84.81	Avg. Vel. (ft/s)	0.83	5.91	1.10
Vel Total (ft/s)	3.79	Hydr. Depth (ft)	1.07	7.29	2.37
Max Chl Dpth (ft)	7.90	Conv. (cfs)	102.3	20641.1	2862.3
Conv. Total (cfs)	23605.7	Wetted Per. (ft)	6.18	30.77	55.42
Length Wtd. (ft)	424.86	Shear (lb/sq ft)	0.16	0.89	0.37
Min Ch El (ft)	942.38	Stream Power (lb/ft s)	0.13	5.23	0.40
Alpha	2.14	Cum Volume (acre-ft)	6.89	17.49	2.71
Frctn Loss (ft)	0.79	Cum SA (acres)	6.26	3.71	3.08
C & E Loss (ft)	0.04				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3784

INPUT
Description:
Station Elevation Data num= 124

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9121.12	992.2	9126.51	991.8	9134.62	991.34	9138.79	991.08	9147.61	991.95		
9150.34	992.11	9151.71	992.36	9161.08	991.89	9163.42	991.85	9169.38	991.54		
9171.44	991.51	9173.32	991.5	9178.09	991.29	9201.77	990.63	9202.62	990.62		
9206.08	990.61	9207.88	990.29	9209.94	990	9215.72	990.34	9226.43	990.07		
9241.9	989.66	9249.28	989.53	9252.87	989.47	9269.27	990.28	9282.92	990.88		
9291.56	990.77	9315.1	990.59	9321.64	990.48	9335	990.56	9347.34	990.4		
9350.53	989.47	9359.78	987.22	9361.46	987.12	9367.15	986.68	9376.13	985.75		
9408.12	984.82	9425.42	983.58	9433.04	983.34	9438.8	982.96	9480.16	982.64		
9501.46	982.38	9508.34	982.16	9564.15	979.13	9575.82	978.14	9591.25	977.01		
9626.84	973.37	9647.21	970.94	9674.17	966.4	9683.46	964.76	9694.4	965.18		
9716.69	966.54	9738.31	960.81	9742.03	959.7	9745.57	959.19	9765.39	956.21		
9770.73	957.06	9780.75	958.83	9965.74	959.19	9980.06	959.21	9980.84	959.21		
9981	959.16	9981.96	958.74	9982.02	958.55	9985.09	948.69	9990.71	942.87		
9991.86	940.46	10000	940.39	10009.75	940.96	10015.84	944.11	10017.26	948.06		
10020.05	948.11	10022.23	948.15	10066.34	948.62	10070.43	948.74	10072.57	948.8		
10090.32	948.74	10111.63	948.75	10126	948.75	10179.81	950.02	10184.63	950.22		
10186.29	950.23	10193.64	950.62	10213.97	951.72	10218.52	950.47	10225.65	948.77		
10225.78	948.82	10227.01	949.35	10232.44	951.7	10233.08	951.93	10242.64	952.08		
10249.17	952.05	10257.62	956.93	10263.7	959.33	10288.51	972.24	10288.53	972.24		
10288.55	972.24	10329.14	972.38	10336.73	972.31	10360.76	974.41	10362.61	974.46		
10365.54	974.69	10385.04	976.74	10386.66	976.82	10388.23	976.86	10395.8	977.54		
10410.67	978.12	10422.61	978.77	10449.82	979.63	10457.88	980.09	10477.94	980.33		
10522.77	981.5	10537.15	982.01	10539.99	982.15	10543.04	982.44	10546.55	982.77		
10573.17	984.59	10576.93	984.94	10593.23	986.32	10593.96	986.4	10594.34	986.61		
10602.24	989.78	10603.9	989.92	10617.48	990.41	10630.42	990.99				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9121.12	.09	9985.09	.04	10017.26	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9985.09	10017.26	629.04	636.89	643.21	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.18	Element			
Vel Head (ft)	0.27	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	948.91	Reach Len. (ft)	629.04	636.89	643.21
Crit W.S. (ft)		Flow Area (sq ft)	0.01	218.15	37.43
E.G. Slope (ft/ft)	0.001307	Area (sq ft)	0.01	218.15	37.43
Q Total (cfs)	920.00	Flow (cfs)	0.00	912.11	7.89
Top Width (ft)	148.74	Top Width (ft)	0.07	32.17	116.50
Vel Total (ft/s)	3.60	Avg. Vel. (ft/s)	0.06	4.18	0.21
Max Chl Dpth (ft)	8.52	Hydr. Depth (ft)	0.11	6.78	0.32
Conv. Total (cfs)	25443.8	Conv. (cfs)	0.0	25225.7	218.1
Length Wtd. (ft)	636.91	Wetted Per. (ft)	0.23	39.72	116.55
Min Ch El (ft)	940.39	Shear (lb/sq ft)	0.00	0.45	0.03
Alpha	1.34	Stream Power (lb/ft s)	0.00	1.87	0.01
Frctn Loss (ft)	2.02	Cum Volume (acre-ft)	3.98	13.46	0.40
C & E Loss (ft)	0.08	Cum SA (acres)	2.42	3.28	1.11

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 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 #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.91	Element			
Vel Head (ft)	0.33	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	949.59	Reach Len. (ft)	629.04	636.89	643.21
Crit W.S. (ft)		Flow Area (sq ft)	0.13	239.87	127.21
E.G. Slope (ft/ft)	0.001452	Area (sq ft)	0.13	239.87	127.21
Q Total (cfs)	1180.00	Flow (cfs)	0.02	1125.79	54.19
Top Width (ft)	181.94	Top Width (ft)	0.28	32.17	149.49
Vel Total (ft/s)	3.21	Avg. Vel. (ft/s)	0.16	4.69	0.43
Max Chl Dpth (ft)	9.20	Hydr. Depth (ft)	0.45	7.46	0.85
Conv. Total (cfs)	30971.2	Conv. (cfs)	0.5	29548.4	1422.3
Length Wtd. (ft)	637.03	Wetted Per. (ft)	0.94	39.72	149.77
Min Ch El (ft)	940.39	Shear (lb/sq ft)	0.01	0.55	0.08
Alpha	2.04	Stream Power (lb/ft s)	0.00	2.57	0.03
Frctn Loss (ft)	2.08	Cum Volume (acre-ft)	6.86	15.47	1.44
C & E Loss (ft)	0.08	Cum SA (acres)	6.23	3.44	2.07

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 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: Hope Creek
REACH: 1 RS: 3147

INPUT
Description:
Station Elevation Data num= 133

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9194.19	974.38	9198.06	974.29	9207.31	975.08	9211.28	975.88	9226.88	975.64
9230.77	975.33	9231.88	975.28	9233.31	975.24	9248.2	975.02	9257.9	974.71
9263.74	974.68	9266.86	974.57	9269.53	974.28	9274.53	972.61	9284.3	969.96
9285.48	970.18	9286.43	970.09	9305.11	970.09	9320.22	968.51	9336.64	968.14
9368.31	967.74	9371.48	967.57	9374.54	967.36	9384.64	967.22	9400.96	966.78
9411.2	966.28	9435.19	964.72	9439.06	964.71	9444.12	964.57	9448.93	964.41
9479.98	962.57	9491.13	962.12	9511.56	961.63	9517.76	961.28	9526.62	959.85
9560.45	955.28	9563.32	954.9	9565.54	954.46	9576.06	952.63	9595.9	951.8
9627.68	950.73	9643.51	948.28	9643.55	948.28	9649.41	948.15	9658.11	947.69
9669.42	947.15	9678.31	947.01	9689.98	946.9	9705.78	946.34	9716.75	946.11
9729	945.72	9741.8	944.64	9743.49	944.45	9774.8	955.04	9775.13	955.16
9859.56	955.55	9882.57	955.6	9885.18	955.8	9911.21	955.73	9935.01	955.47
9936.29	955.46	9963.11	955.95	9974.09	955.54	9975.96	947.63	9990.72	943.19
9991.87	940.78	10000.01	940.71	10009.76	941.28	10015.85	944.43	10021.07	946.63

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 10035.3  948.5210074.92  952.4610090.43  960.7410101.74  966.4710102.28  966.48
10109.48   966.710118.96  966.9510145.18  967.9510158.05  968.4810162.96  968.68
 10166.9  972.6110167.19  972.9210174.35  973.08 10236.6  973.92 10236.8  975.58
10238.39  987.5710256.96  986.9110302.34  987.2410311.99  987.4310312.28  987.43
10312.36  987.5410314.45  990.99 10318.4  991.7410342.41  996.5410342.78  995.25
10344.21  992.3510368.69  992.2210370.44  992.2110378.18  992.3310382.62   992.5
10402.41  993.2510403.62  994.7610404.18  995.6610437.28  995.7110438.31  995.71
10438.57  995.7210438.65  995.7210474.13  997.5510477.45  998.6110491.82 1003.16
10500.34 1003.9110504.83 1003.9610520.39 1004.6510533.09 1004.6410534.71 1004.22
10537.51 1004.6810543.09 1004.8410557.26 1005.2810570.67 1005.6110578.69  1005.2
10587.99 1004.8210592.42 1005.1210595.58 1005.1710612.29 1004.6710621.96 1004.27
10632.52 1003.8210652.12 1004.5810665.48 1005.2510671.09 1005.4110675.63 1005.47
10706.31 1005.8610735.24 1006.3510752.14 1006.83

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9194.19     .09 9975.96     .0410021.07     .12

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9975.9610021.07           288.86  277.25  266.63             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
 9194.19 9880.92   965.7       F

CROSS SECTION OUTPUT  Profile #2yr

  E.G. Elev (ft)            947.07    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               1.11    Wt. n-Val.                          0.040
  W.S. Elev (ft)            945.96    Reach Len. (ft)          288.86     277.25     266.63
  Crit W.S. (ft)            945.38    Flow Area (sq ft)                   129.96
  E.G. Slope (ft/ft)      0.011151    Area (sq ft)              16.71     129.96
  Q Total (cfs)            1100.00    Flow (cfs)                         1100.00
  Top Width (ft)             64.56    Top Width (ft)            26.58      37.98
  Vel Total (ft/s)            8.46    Avg. Vel. (ft/s)                     8.46
  Max Chl Dpth (ft)           5.25    Hydr. Depth (ft)                     3.42
  Conv. Total (cfs)        10416.9    Conv. (cfs)                       10416.9
  Length Wtd. (ft)          277.25    Wetted Per. (ft)                    41.00
  Min Ch El (ft)            940.71    Shear (lb/sq ft)                     2.21
  Alpha                       1.00    Stream Power (lb/ft s)              18.68
  Frctn Loss (ft)             1.90    Cum Volume (acre-ft)       3.86      10.91       0.13
  C & E Loss (ft)             0.14    Cum SA (acres)             2.23       2.77       0.25

Warning: Divided flow computed for this cross-section.
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 OUTPUT  Profile #5yr

  E.G. Elev (ft)            947.75    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               1.16    Wt. n-Val.                          0.040
  W.S. Elev (ft)            946.59    Reach Len. (ft)          288.86     277.25     266.63
  Crit W.S. (ft)            945.92    Flow Area (sq ft)                   154.80
  E.G. Slope (ft/ft)      0.010388    Area (sq ft)              41.29     154.80
  Q Total (cfs)            1340.00    Flow (cfs)                         1340.00
  Top Width (ft)             92.54    Top Width (ft)            51.00      41.54
  Vel Total (ft/s)            8.66    Avg. Vel. (ft/s)                     8.66
  Max Chl Dpth (ft)           5.88    Hydr. Depth (ft)                     3.73
  Conv. Total (cfs)        13147.5    Conv. (cfs)                       13147.5
  Length Wtd. (ft)          277.25    Wetted Per. (ft)                    44.78
  Min Ch El (ft)            940.71    Shear (lb/sq ft)                     2.24
  Alpha                       1.00    Stream Power (lb/ft s)              19.41
  Frctn Loss (ft)             1.89    Cum Volume (acre-ft)       6.56      12.58       0.50
  C & E Loss (ft)             0.12    Cum SA (acres)             5.86       2.90       0.97

Warning: Divided flow computed for this cross-section.
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: Hope Creek
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REACH: 1 RS: 2870

INPUT
Description:
Station Elevation Data num= 122

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9236.27	964.39	9237.82	963.98	9241.65	962.98	9270.6	961.43	9272.03	961.37
9272.49	961.33	9288.89	960.88	9289.43	960.87	9297.17	960.67	9322.78	958.97
9345.19	958.66	9368.09	957.27	9405.56	956.22	9415.84	955.92	9422.13	954.95
9427.86	953.28	9450.99	952.95	9461.28	952.78	9468.95	952.53	9474.83	952.47
9479.48	952.33	9508.86	950.9	9541.66	949.56	9544.61	949.42	9548.61	949.24
9580.37	947.87	9603.85	947.65	9616.13	947.53	9632.73	946.82	9651.88	945.72
9666.03	945.36	9687.63	945.07	9716.8	944.07	9720.31	943.95	9738.28	943.55
9756.67	951.2	9761.8	953.45	9766.35	955.54	9789.23	955.09	9869.35	953.46
9874.29	955.27	9874.5	955.35	9877.08	955.3	9944.26	953.82	9964.09	953.42
9971.37	949.36	9983.04	945.38	9990.71	940.29	9991.86	937.88	10000	937.81
10009.75	938.38	10015.84	941.53	10021.06	943.73	10021.35	945.93	10036.8	946.73
10048.77	947.36	10058.59	948.11	10081.01	955.41	10088.54	958	10118.76	966.14
10122.79	967.16	10127.17	968.25	10130.76	968.54	10156.95	968.45	10158.92	968.51
10159.06	968.77	10162.28	975.79	10170.01	976.04	10188.52	976.67	10189.98	976.34
10193.76	975.57	10200.98	973.99	10208.08	974.09	10230.91	974.53	10236.32	974.93
10242.31	975.17	10247.09	975.39	10254.76	975.83	10262.08	976.29	10272.18	980.56
10275.04	981.78	10286.28	982.42	10306.47	984.09	10310.58	984.36	10314.39	984.68
10320.26	984.83	10355.62	986.27	10368.52	986.87	10387.88	987.89	10399.66	988.34
10421.82	988.87	10435.65	989.18	10442.52	989.45	10463.79	990.66	10485.88	991.86
10501.57	992.71	10509.4	993.14	10529.16	993.99	10550.8	994.94	10561.39	995.53
10567.13	995.86	10576.83	996.35	10590.7	997.11	10608.32	998.41	10629.7	1000.43
10630.53	1000.48	10634.45	1000.79	10650	1003.41	10664.49	1005.58	10672.25	1006.82
10677.95	1008.14	10695.66	1009.99	10708.76	1011.29	10711.21	1010.99	10716.43	1010.32
10723.48	1009.54	10728.38	1008.92	10730.36	1008.74	10738.81	1008.92	10757.18	1009.03
10769.24	1009.21	10774.24	1009.31						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9236.27	.09	9983.04	.04	10021.35	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9983.04	10021.35	626.39	607.72	588.56	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
9236.27	9885.33	969.99	F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	945.04	Element			
Vel Head (ft)	0.66	Wt. n-Val.		0.040	
W.S. Elev (ft)	944.38	Reach Len. (ft)	626.39	607.72	588.56
Crit W.S. (ft)	942.51	Flow Area (sq ft)		169.30	
E.G. Slope (ft/ft)	0.004641	Area (sq ft)	14.87	169.30	
Q Total (cfs)	1100.00	Flow (cfs)		1100.00	
Top Width (ft)	69.14	Top width (ft)	32.54	36.60	
Vel Total (ft/s)	6.50	Avg. Vel. (ft/s)		6.50	
Max Chl Dpth (ft)	6.57	Hydr. Depth (ft)		4.63	
Conv. Total (cfs)	16146.9	Conv. (cfs)		16146.9	
Length Wtd. (ft)	609.01	Wetted Per. (ft)		41.15	
Min Ch El (ft)	937.81	Shear (lb/sq ft)		1.19	
Alpha	1.00	Stream Power (lb/ft s)		7.74	
Frctn Loss (ft)	3.86	Cum Volume (acre-ft)	3.76	9.96	0.13
C & E Loss (ft)	0.01	Cum SA (acres)	2.03	2.53	0.25

Warning: Divided flow computed for this cross-section.
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 OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	945.74	Element			
Vel Head (ft)	0.76	Wt. n-Val.		0.040	
W.S. Elev (ft)	944.98	Reach Len. (ft)	626.39	607.72	588.56
Crit W.S. (ft)	943.05	Flow Area (sq ft)		191.39	
E.G. Slope (ft/ft)	0.004826	Area (sq ft)	39.86	191.39	
Q Total (cfs)	1340.00	Flow (cfs)		1340.00	
Top Width (ft)	88.92	Top Width (ft)	51.35	37.58	
Vel Total (ft/s)	7.00	Avg. Vel. (ft/s)		7.00	
Max Chl Dpth (ft)	7.17	Hydr. Depth (ft)		5.09	
Conv. Total (cfs)	19289.9	Conv. (cfs)		19289.9	
Length Wtd. (ft)	608.66	Wetted Per. (ft)		42.83	

Min Ch El (ft)	937.81	Shear (lb/sq ft)		1.35	
Alpha	1.00	Stream Power (lb/ft s)		9.43	
Frctn Loss (ft)	3.86	Cum Volume (acre-ft)	6.30	11.48	0.50
C & E Loss (ft)	0.01	Cum SA (acres)	5.52	2.65	0.97

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was 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: Hope Creek
REACH: 1 RS: 2262

INPUT
Description:
Station Elevation Data num= 133

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9224	974.07	9227.31	974.01	9239.87	972.94	9249.96	971.88	9251.71	971.8
9264.77	970.91	9271.88	970.7	9282.18	970.31	9303.84	969.89	9308.29	969.16
9315.82	967.82	9325.01	966.15	9332.21	965.1	9346.52	963.95	9361.63	962.25
9368.69	960.91	9384.3	958.08	9394.37	956.16	9402.64	954.7	9409.67	954.3
9429.81	948.94	9433.84	948.9	9438.29	948.74	9461.46	948.26	9488.59	946.99
9494.4	946.81	9509.05	946.26	9518.02	944.82	9523.27	944.03	9531.14	942.78
9534.75	942.23	9547.2	944.33	9551.55	945.05	9559.73	946.23	9589.94	945.83
9603.48	945.69	9641.93	944.1	9642.2	944.09	9642.27	944.12	9656.03	952.55
9722.92	950.74	9759.74	949.85	9761.31	950.41	9763.17	951.88	9819.69	950.24
9854.03	949.41	9857.92	949.21	9868.23	945.53	9891.79	935.34	9906.36	939.83
9910.26	940.95	9915.27	940.87	9915.97	940.86	9947.68	940.58	9962.98	940.5
9978.64	940.7	9982.47	939.55	9990.71	937.82	9991.86	935.41	10000	935.34
10009.75	935.91	10015.84	939.06	10021.06	941.26	10026.41	940.91	10041.16	940.76
10047.88	940.69	10065.18	940.51	10073.25	952.26	10078.55	958.42	10084.66	960.88
10105.82	964.3	10114.5	965.82	10117.86	966.24	10123.67	972.67	10124.1	972.96
10131.52	972.51	10147.56	971.75	10154.63	970.17	10159.73	968.91	10161.7	968.93
10165.7	968.81	10182.5	968.42	10204.53	968.58	10213.84	968.8	10216.36	975.24
10217.27	977.11	10225.84	977.38	10230.74	977.69	10239.45	978.01	10246.44	978.26
10251.56	978.66	10257.72	978.92	10267.54	979.32	10277.97	979.47	10291.05	979.95
10298.32	980.02	10308.19	980.36	10316.67	980.39	10331.31	980.71	10334.94	980.9
10345.24	981.23	10351.93	979.09	10353.82	978.48	10356.77	978.6	10377.74	979.44
10399.46	980.57	10409.64	981.03	10420.41	981.5	10450.14	983.32	10456.81	983.95
10476.53	984.46	10478.99	984.54	10479.74	984.56	10491.1	984.69	10502.92	984.87
10503.76	984.88	10503.88	984.88	10529.97	985.22	10539.32	985.21	10566.58	985.27
10568.42	985.81	10576.74	988.11	10578.17	988.4	10583.08	989.44	10584.01	991.22
10587.43	997.6	10597.96	997.69	10623.19	998.04	10630.62	996.96	10631.81	996.79
10643.14	996.43	10655.81	996.04	10656.58	996.04				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9224	.12	9978.64	.04	10021.06	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9978.64	10021.06	588.24	612.35	580.92	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
9224	9756.4	970.05	F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	941.17	Element			
Vel Head (ft)	0.75	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	940.42	Reach Len. (ft)	588.24	612.35	580.92
Crit W.S. (ft)	939.63	Flow Area (sq ft)	71.71	127.78	
E.G. Slope (ft/ft)	0.009167	Area (sq ft)	71.71	127.78	
Q Total (cfs)	1100.00	Flow (cfs)	151.42	948.58	
Top Width (ft)	67.85	Top Width (ft)	28.36	39.49	
Vel Total (ft/s)	5.51	Avg. Vel. (ft/s)	2.11	7.42	
Max Chl Dpth (ft)	5.08	Hydr. Depth (ft)	2.53	3.24	
Conv. Total (cfs)	11488.8	Conv. (cfs)	1581.5	9907.3	
Length Wtd. (ft)	608.55	Wetted Per. (ft)	30.17	42.37	
Min Ch El (ft)	935.34	Shear (lb/sq ft)	1.36	1.73	
Alpha	1.58	Stream Power (lb/ft s)	2.87	12.81	
Frctn Loss (ft)	3.50	Cum Volume (acre-ft)	3.13	7.89	0.13
C & E Loss (ft)	0.11	Cum SA (acres)	1.60	2.00	0.25

Warning: Divided flow computed for this cross-section.
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 OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	941.87	Element			
Vel Head (ft)	0.85	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	941.02	Reach Len. (ft)	588.24	612.35	580.92
Crit W.S. (ft)	940.05	Flow Area (sq ft)	113.78	152.32	12.20
E.G. Slope (ft/ft)	0.008709	Area (sq ft)	113.78	152.32	12.20
Q Total (cfs)	1340.00	Flow (cfs)	141.43	1192.31	6.27
Top Width (ft)	182.71	Top Width (ft)	99.98	41.85	40.89
Vel Total (ft/s)	4.81	Avg. Vel. (ft/s)	1.24	7.83	0.51
Max Chl Dpth (ft)	5.68	Hydr. Depth (ft)	1.14	3.64	0.30
Conv. Total (cfs)	14359.1	Conv. (cfs)	1515.5	12776.4	67.2
Length Wtd. (ft)	609.09	Wetted Per. (ft)	101.99	44.90	41.16
Min Ch El (ft)	935.34	Shear (lb/sq ft)	0.61	1.84	0.16
Alpha	2.36	Stream Power (lb/ft s)	0.75	14.44	0.08
Frctn Loss (ft)	3.52	Cum Volume (acre-ft)	5.19	9.08	0.42
C & E Loss (ft)	0.12	Cum SA (acres)	4.43	2.10	0.69

Warning: Divided flow computed for this cross-section.
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: Hope Creek
REACH: 1 RS: 1650

INPUT
Description:
Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9080	959.23	9082.15	959.18	9094.24	957.23	9102.24	956	9122.23	956.6
9125.94	956.75	9129.02	956.73	9140.09	956.36	9141.56	956.33	9153.36	956.43
9162.15	956.28	9167.82	956.2	9174.93	955.92	9183.93	955.6	9189.87	955.16
9202.23	953.12	9224.19	949.43	9237.69	948.49	9239.55	948.36	9240.95	948.39
9262.4	948.93	9276.39	949.14	9276.56	949.14	9276.69	949.12	9276.9	949.1
9295.56	947.1	9303.07	947.2	9318.83	947.49	9327.37	944.83	9341.25	941.09
9347.98	940.69	9370.16	939.61	9396.69	938.92	9413.3	938.18	9423.83	937.71
9444.96	937.06	9447.49	937.01	9449.75	936.83	9463.08	935.6	9467.65	937.35
9489.63	945.62	9501.33	950.14	9587.45	947.74	9604.78	947.25	9605.57	947.71
9608.47	949.25	9667.6	947.47	9699.12	946.55	9700.22	946.4	9705.08	945.95
9714.21	942.09	9739.56	931.66	9751.74	933.46	9768.25	936.09	9779.24	936.5
9796.96	937.67	9842.73	937.21	9846.91	937.2	9875.65	937.26	9903.87	937.38
9917.41	937.36	9935.8	937.43	9969.46	938.91	9986.51	933.5	10000	932.05
10015.43	931.52	10016.49	938.23	10019.49	938.23	10021.58	938.33	10037.72	939.44
10047.02	941.4	10076.37	947.08	10086.91	953.86	10094.12	959.68	10116.73	960.88
10155.95	963.05	10157.8	966.09	10160.53	970.72	10160.92	971.4	10163.75	971.29
10200.81	968.95	10224.9	968.83	10250.81	968.5	10254.69	969.05	10258.13	971.09
10276.5	973.41	10297.75	976.5	10302.26	976.59	10315.25	976.67	10334.67	976.79
10343.39	976.96	10352.55	976.8	10375.13	978.14	10383.59	978.89	10398.41	979.26
10411.97	979.83	10416.24	979.99	10420.2	980.15	10426.32	982.67	10428.76	984.15
10430.91	984.83	10432.33	985.66	10436.58	985.34	10441.61	985.17	10456.16	985.61
10457.66	985.27	10472.25	982.74	10487.54	983.04	10506.66	983.6	10508.37	985.36
10509.49	986.97	10534.97	989.72	10549.8	990.62	10555.3	988.85	10569.74	985.02
10585.25	984.56	10603.18	984.49						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9080	.12	9969.46	.04	10016.49	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9969.46 10016.49 559.26 566 568.78 .1 .3
Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
9080	9607.63	960.22	F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	937.56	Element			
Vel Head (ft)	0.38	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	937.18	Reach Len. (ft)	559.26	566.00	568.78

Crit W.S. (ft)	935.38	Flow Area (sq ft)	146.18	166.50	
E.G. Slope (ft/ft)	0.003948	Area (sq ft)	163.47	166.50	
Q Total (cfs)	1100.00	Flow (cfs)	195.55	904.45	
Top Width (ft)	130.90	Top Width (ft)	89.50	41.41	
Vel Total (ft/s)	3.52	Avg. Vel. (ft/s)	1.34	5.43	
Max Chl Dpth (ft)	5.66	Hydr. Depth (ft)	2.31	4.02	
Conv. Total (cfs)	17505.9	Conv. (cfs)	3112.1	14393.8	
Length Wtd. (ft)	565.25	Wetted Per. (ft)	64.84	46.90	
Min Ch El (ft)	931.52	Shear (lb/sq ft)	0.56	0.88	
Alpha	1.99	Stream Power (lb/ft s)	0.74	4.75	
Frctn Loss (ft)	2.37	Cum Volume (acre-ft)	1.55	5.82	0.13
C & E Loss (ft)	0.01	Cum SA (acres)	0.80	1.43	0.25

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was 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 OUTPUT Profile #5yr

E.G. Elev (ft)	938.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.45	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	937.78	Reach Len. (ft)	559.26	566.00	568.78
Crit W.S. (ft)	935.78	Flow Area (sq ft)	247.61	191.88	
E.G. Slope (ft/ft)	0.004109	Area (sq ft)	286.80	191.88	
Q Total (cfs)	1340.00	Flow (cfs)	212.26	1127.74	
Top Width (ft)	308.88	Top Width (ft)	265.49	43.39	
Vel Total (ft/s)	3.05	Avg. Vel. (ft/s)	0.86	5.88	
Max Chl Dpth (ft)	6.26	Hydr. Depth (ft)	1.13	4.42	
Conv. Total (cfs)	20903.7	Conv. (cfs)	3311.2	17592.4	
Length Wtd. (ft)	565.30	Wetted Per. (ft)	220.62	49.49	
Min Ch El (ft)	931.52	Shear (lb/sq ft)	0.29	0.99	
Alpha	3.14	Stream Power (lb/ft s)	0.25	5.85	
Frctn Loss (ft)	2.38	Cum Volume (acre-ft)	2.49	6.66	0.34
C & E Loss (ft)	0.01	Cum SA (acres)	1.96	1.50	0.42

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was 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: Hope Creek
REACH: 1 RS: 1084

INPUT
Description:
Station Elevation Data num= 128

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9250	958.25	9262.04	958.16	9268.42	958.09	9276.11	957.76	9284.26	957.48
9296.08	956.24	9303.51	955.98	9315.31	955.22	9327.67	954.79	9329.51	954.71
9338.67	954.76	9339.11	954.72	9340.08	954.64	9348.68	954.46	9380.83	953.69
9396.6	952.95	9413	952.33	9420.43	951.7	9422.65	951.55	9436.55	951.64
9445.91	951.69	9458.46	951.73	9466.13	951.59	9470.28	951.59	9476.93	951.73
9486.65	951.99	9489.58	952.02	9490.32	952.04	9499.52	952.01	9500.06	952
9500.25	951.97	9514.85	951.41	9517.67	950.23	9523.85	948.6	9528.15	946.38
9533.02	946.42	9566.59	945.22	9571.72	944.92	9573.36	944.83	9585.41	943.65
9609.38	941.59	9628.55	941.31	9651.77	941.03	9659.2	942.62	9683.37	947.73
9728.82	946.31	9786.63	944.59	9789.58	946.9	9789.78	947.03	9798.3	946.76
9880.78	944.03	9883.94	943.77	9886.72	943.49	9888.86	943.22	9901.54	937.82
9918.64	930.25	9929.19	936.21	9944.64	944.64	9965.03	943.57	9966.47	943.52
9969.46	936.13	9986.51	930.72	10000	929.27	10015.43	928.74	10016.49	936.04
10039.68	937.17	10046.11	937.32	10058.02	937.33	10068.3	937.22	10081.55	935.09
10085.35	934.47	10102.41	934.71	10103.48	934.72	10103.74	934.76	10116.39	936.39
10132.81	936.69	10144.88	937	10150.02	937.04	10159.45	937.14	10204.66	938.24
10221.75	938.72	10230.9	939.25	10246.76	939.69	10273.56	940.69	10284.49	940.78
10290.34	942.2	10302.96	948.72	10325.54	949.61	10328.16	949.85	10332.16	950.03
10361.32	951.2	10386.75	952.91	10394.92	953.37	10406.47	957.55	10415.69	960.87
10420.18	960.78	10429.87	960.68	10454.39	960.68	10461.74	960.84	10474.08	960.7
10507.83	960.49	10517.08	960.54	10543.02	960.84	10564.5	960.79	10579.26	960.62
10586.65	960.06	10614.92	960.09	10615.53	960.17	10617.38	960.39	10633.52	962.29
10639.35	963.03	10650.41	962.99	10656.51	960.87	10663.36	959.68	10675.43	960.1
10707.61	960.16	10717.97	960.23	10725	960.32	10729.35	960.31	10764.05	960.54
10772.25	960.37	10775.89	960.24	10783.58	960.8	10790.72	961.51	10794.57	961.68
10801.45	961.95	10812.61	961.29	10816.76	960.85				

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Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9250     .12 9969.46     .0410016.49     .12

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.4610016.49           542.18   530.8  523.69              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    9250 9790.84  953.96       F
```

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	935.18	Element			
Vel Head (ft)	0.52	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	934.66	Reach Len. (ft)	542.18	530.80	523.69
Crit W.S. (ft)	932.96	Flow Area (sq ft)	39.24	177.33	1.44
E.G. Slope (ft/ft)	0.004442	Area (sq ft)	39.24	177.33	1.44
Q Total (cfs)	1100.00	Flow (cfs)	50.96	1048.79	0.25
Top Width (ft)	74.91	Top Width (ft)	17.78	42.21	14.92
Vel Total (ft/s)	5.05	Avg. Vel. (ft/s)	1.30	5.91	0.17
Max Chl Dpth (ft)	5.92	Hydr. Depth (ft)	2.21	4.20	0.10
Conv. Total (cfs)	16505.1	Conv. (cfs)	764.6	15736.7	3.8
Length Wtd. (ft)	531.06	Wetted Per. (ft)	19.87	48.03	14.94
Min Ch El (ft)	928.74	Shear (lb/sq ft)	0.55	1.02	0.03
Alpha	1.31	Stream Power (lb/ft s)	0.71	6.06	0.00
Frctn Loss (ft)	2.53	Cum Volume (acre-ft)	0.24	3.58	0.12
C & E Loss (ft)	0.01	Cum SA (acres)	0.11	0.89	0.16

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was 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 OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	935.84	Element			
Vel Head (ft)	0.56	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	935.28	Reach Len. (ft)	542.18	530.80	523.69
Crit W.S. (ft)	933.42	Flow Area (sq ft)	50.99	204.03	15.60
E.G. Slope (ft/ft)	0.004318	Area (sq ft)	50.99	204.03	15.60
Q Total (cfs)	1340.00	Flow (cfs)	71.24	1260.06	8.69
Top Width (ft)	91.93	Top Width (ft)	20.27	44.24	27.42
Vel Total (ft/s)	4.95	Avg. Vel. (ft/s)	1.40	6.18	0.56
Max Chl Dpth (ft)	6.54	Hydr. Depth (ft)	2.52	4.61	0.57
Conv. Total (cfs)	20393.0	Conv. (cfs)	1084.2	19176.4	132.3
Length Wtd. (ft)	531.08	Wetted Per. (ft)	22.66	50.70	27.52
Min Ch El (ft)	928.74	Shear (lb/sq ft)	0.61	1.08	0.15
Alpha	1.47	Stream Power (lb/ft s)	0.85	6.70	0.09
Frctn Loss (ft)	2.53	Cum Volume (acre-ft)	0.32	4.09	0.24
C & E Loss (ft)	0.02	Cum SA (acres)	0.13	0.93	0.24

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was 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: Hope Creek
REACH: 1 RS: 553

INPUT
Description:
Station Elevation Data num= 114

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9255	938.36	9260.19	938.23	9277.53	937.33	9292.28	937.24	9313.22	937.62
9338.68	937.68	9363.09	937.98	9391.99	938.45	9393.5	938.47	9393.78	938.47
9394.05	938.48	9394.89	938.49	9426.92	939.09	9439.13	939.23	9450.27	939.54
9466.89	939.99	9470.01	940.12	9472.69	940.16	9491.6	940.34	9493.69	940.38
9510.03	940.18	9517.27	940.22	9522.4	940.45	9547.85	941.5	9558.43	941.73
9567.22	941.99	9579.43	942.28	9580.49	942.28	9582.37	942.27	9586.32	942.36
9610.6	942.34	9619.18	942.45	9627	942.55	9664.09	942.92	9674.6	943.02
9680.22	943.2	9691.65	944.15	9694.43	944.38	9706.19	943.06	9708.32	942.82
9718.27	943.92	9730.49	945.14	9805.62	942.71	9832.31	941.91	9834.9	943.33
9836.59	944.19	9904.76	942.32	9928.41	941.69	9931.44	941.04	9934.78	940.47
9969.46	933.57	9986.51	928.16	10000	926.71	10015.43	926.18	10016.49	932.97
10023.06	932.97	10023.55	932.96	10044	932.91	10085.74	933.17	10093.48	933.19

```
 10097.4  933.15 10099.8  933.1910129.31  933.1710144.97  933.0110153.77  933.08
10179.02  934.0910191.87   934.210199.97  934.9710206.98  935.54 10238.7  935.43
10262.62  935.1710266.97  936.3210271.51  936.9810293.65  937.3610297.63  937.43
10300.55  937.5410302.53  937.5610334.03  938.0910338.67  939.0210379.66  938.09
10384.98  938.0510388.16  938.1110421.44  938.9710446.41  939.3110477.14     940
10504.66  940.4610530.82   940.810563.03  941.1410567.33  941.2110574.54  941.44
10603.74  942.3910623.45  942.5110643.69  942.5410644.19   942.610656.13  944.36
10658.49   944.310681.08  943.5710716.04  943.08 10719.7  943.0410724.47  943.07
10743.14  943.4910759.03   943.910760.44  943.4810769.84  941.4510776.71   944.3
10785.93  948.5410793.82  947.7810799.79  947.2410819.14   942.410822.81  941.03
10851.82  941.0210856.11  940.9310867.16  940.9310869.17  940.89

Manning's n Values          num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
     9255     .12 9969.46     .0410016.49     .12

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9969.4610016.49          411.44  402.61  393.59             .1       .3
Ineffective Flow      num=       1
    Sta L   Sta R    Elev  Permanent
     9255 9842.75  947.18        F

CROSS SECTION OUTPUT  Profile #2yr

  E.G. Elev (ft)            932.65    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.62    Wt. n-Val.                          0.040
  W.S. Elev (ft)            932.03    Reach Len. (ft)          411.44     402.61     393.59
  Crit W.S. (ft)            930.43    Flow Area (sq ft)                   174.52
  E.G. Slope (ft/ft)       0.005111   Area (sq ft)                        174.52
  Q Total (cfs)            1100.00    Flow (cfs)                         1100.00
  Top Width (ft)             42.04    Top Width (ft)                       42.04
  Vel Total (ft/s)            6.30    Avg. Vel. (ft/s)                      6.30
  Max Chl Dpth (ft)           5.85    Hydr. Depth (ft)                      4.15
  Conv. Total (cfs)        15386.6    Conv. (cfs)                       15386.6
  Length Wtd. (ft)          402.45    Wetted Per. (ft)                     47.73
  Min Ch El (ft)            926.18    Shear (lb/sq ft)                      1.17
  Alpha                       1.00    Stream Power (lb/ft s)                7.35
  Frctn Loss (ft)             2.74    Cum Volume (acre-ft)                  1.44       0.11
  C & E Loss (ft)             0.03    Cum SA (acres)                        0.37       0.07

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

CROSS SECTION OUTPUT  Profile #5yr

  E.G. Elev (ft)            933.30    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.71    Wt. n-Val.                          0.040
  W.S. Elev (ft)            932.59    Reach Len. (ft)          411.44     402.61     393.59
  Crit W.S. (ft)            930.89    Flow Area (sq ft)                   198.32
  E.G. Slope (ft/ft)       0.005287   Area (sq ft)                        198.32
  Q Total (cfs)            1340.00    Flow (cfs)                         1340.00
  Top Width (ft)             43.87    Top Width (ft)                       43.87
  Vel Total (ft/s)            6.76    Avg. Vel. (ft/s)                      6.76
  Max Chl Dpth (ft)           6.41    Hydr. Depth (ft)                      4.52
  Conv. Total (cfs)        18428.9    Conv. (cfs)                       18428.9
  Length Wtd. (ft)          402.42    Wetted Per. (ft)                     50.13
  Min Ch El (ft)            926.18    Shear (lb/sq ft)                      1.31
  Alpha                       1.00    Stream Power (lb/ft s)                8.82
  Frctn Loss (ft)             2.79    Cum Volume (acre-ft)                  1.64       0.14
  C & E Loss (ft)             0.03    Cum SA (acres)                        0.39       0.08

Warning: The energy loss was 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: Hope Creek
REACH: 1                    RS: 151

INPUT
Description:
Station Elevation Data     num=     115
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9244.2   937.1  9247.8  937.15 9253.15  933.38 9254.18  932.73 9261.37   936.2
 9262.65  936.69 9264.19  936.66    9291  935.79 9308.25  935.17  9312.9  935.08
```

9314.42	935.11	9328.02	935.45	9337.25	936.18	9344.7	936.8	9347.41	937.04
9351.82	937.39	9372.57	937.79	9381.35	938.01	9401.26	938.22	9402.33	938.26
9405.66	937.92	9414.42	937.02	9424.88	936.01	9437.14	935.35	9450.78	935.27
9457.8	935.26	9466.9	935.52	9477.33	935.69	9497.37	936.01	9526.12	936.3
9536.6	936.1	9545.03	935.78	9549.09	935.46	9590.44	933.05	9603.24	932.64
9603.71	932.63	9604.42	932.63	9620.2	932.51	9657.28	930.58	9664.96	930.21
9678.41	935.01	9698.16	942.13	9797	940.14	9800.28	940.08	9800.64	940.19
9804.24	941.22	9804.26	941.22	9875.82	939.9	9895.5	939.5	9899.44	939.02
9912.68	937.24	9915.54	937.57	9955.68	931.49	9969.45	931.44	9986.5	926.03
9999.99	924.5810015.42		924.0510016.48		931.3510027.71		932.0910037.99		926.62
10043.55	926.6410051.68		930.5	10081.7	930.610083.22		930.5910106.37		931.24
10133.58	931.4610138.68		931.4810159.29		931.2210196.65		931.0610209.72		931.15
10219.77	931.2210260.14		931.6910296.89		931.3910309.28		931.2310310.24		931.29
10310.9	931.2810355.57		931.9810360.96		931.9510398.06		932.2610416.03		932.18
10444.2	932.0910452.32		933.1610462.94		934.5910468.01		934.2510483.83		934.27
10507.11	93410516.99		933.910527.57		933.8610547.69		933.5910555.03		934.47
10565.13	935.610568.64		935.5210571.94		935.6310593.68		935.75	10613.1	935.51
10660.38	936.48	10663.5	936.5810684.25		936.5910714.61		936.8210717.98		937.01
10746.57	938.65	10750	938.1210756.23		937.5510757.17		937.4610772.82		938.92
10773.43	938.9710773.89		939.0210778.36		938.97	10815.7	938.8910824.65		938.93
10865.2	939.54	10888.8	939.41	10915.6	939.6210933.58		939.6810960.11		940.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9244.2	.12	9969.45	.0410016.48		.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9969.4510016.48		144.3	150.57	180.1	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
9244.2	9801.53	943.96	F

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	929.88	Wt. n-Val.		0.040	0.120
Vel Head (ft)	0.90	Reach Len. (ft)			
W.S. Elev (ft)	928.98	Flow Area (sq ft)		136.97	24.04
Crit W.S. (ft)	928.29	Area (sq ft)		136.97	24.04
E.G. Slope (ft/ft)	0.009506	Flow (cfs)		1061.97	38.03
Q Total (cfs)	1100.00	Top Width (ft)		38.93	14.92
Top Width (ft)	53.84	Avg. Vel. (ft/s)		7.75	1.58
Vel Total (ft/s)	6.83	Hydr. Depth (ft)		3.52	1.61
Max Chl Dpth (ft)	4.93	Conv. (cfs)		10892.0	390.0
Conv. Total (cfs)	11282.0	Wetted Per. (ft)		43.73	16.03
Length Wtd. (ft)		Shear (lb/sq ft)		1.86	0.89
Min Ch El (ft)	924.05	Stream Power (lb/ft s)		14.41	1.41
Alpha	1.25	Cum Volume (acre-ft)			
Frctn Loss (ft)		Cum SA (acres)			
C & E Loss (ft)					

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	930.47	Wt. n-Val.		0.040	0.120
Vel Head (ft)	1.00	Reach Len. (ft)			
W.S. Elev (ft)	929.47	Flow Area (sq ft)		156.46	31.84
Crit W.S. (ft)	928.74	Area (sq ft)		156.46	31.84
E.G. Slope (ft/ft)	0.009504	Flow (cfs)		1284.25	55.75
Q Total (cfs)	1340.00	Top Width (ft)		40.54	16.87
Top Width (ft)	57.42	Avg. Vel. (ft/s)		8.21	1.75
Vel Total (ft/s)	7.12	Hydr. Depth (ft)		3.86	1.89
Max Chl Dpth (ft)	5.42	Conv. (cfs)		13173.5	571.9
Conv. Total (cfs)	13745.4	Wetted Per. (ft)		45.85	18.22
Length Wtd. (ft)		Shear (lb/sq ft)		2.02	1.04
Min Ch El (ft)	924.05	Stream Power (lb/ft s)		16.62	1.82
Alpha	1.28	Cum Volume (acre-ft)			
Frctn Loss (ft)		Cum SA (acres)			
C & E Loss (ft)					

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

SUMMARY OF MANNING'S N VALUES

River:Hope Creek

Reach	River Sta.	n1	n2	n3
1	8000	.12	.045	.1
1	7548	.12	.045	.1
1	7061	.12	.045	.1
1	6930	.12	.045	.1
1	6719	Culvert		
1	6496	.12	.035	.08
1	6278	.12	.025	.08
1	5629	.12	.025	.08
1	5428	.12	.025	.08
1	5146	Culvert		
1	4969	.09	.04	.12
1	4718	.09	.04	.12
1	4209	.09	.04	.12
1	3784	.09	.04	.12
1	3147	.09	.04	.12
1	2870	.09	.04	.12
1	2262	.12	.04	.12
1	1650	.12	.04	.12
1	1084	.12	.04	.12
1	553	.12	.04	.12
1	151	.12	.04	.12

SUMMARY OF REACH LENGTHS

River: Hope Creek

Reach	River Sta.	Left	Channel	Right
1	8000	393.3	452.1	505.73
1	7548	498.18	486.75	465.44
1	7061	137.61	131.25	117.04
1	6930	458.64	434.11	418.59
1	6719	Culvert		
1	6496	261.27	218.1	177.15
1	6278	596.84	648.74	713.24
1	5629	205.65	201.08	200.99
1	5428	519.24	458.42	414.44
1	5146	Culvert		
1	4969	170.27	251.19	305.99
1	4718	511.63	509.41	507.2
1	4209	422.16	424.62	427.61
1	3784	629.04	636.89	643.21
1	3147	288.86	277.25	266.63
1	2870	626.39	607.72	588.56
1	2262	588.24	612.35	580.92
1	1650	559.26	566	568.78
1	1084	542.18	530.8	523.69
1	553	411.44	402.61	393.59
1	151	144.3	150.57	180.1

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Hope Creek

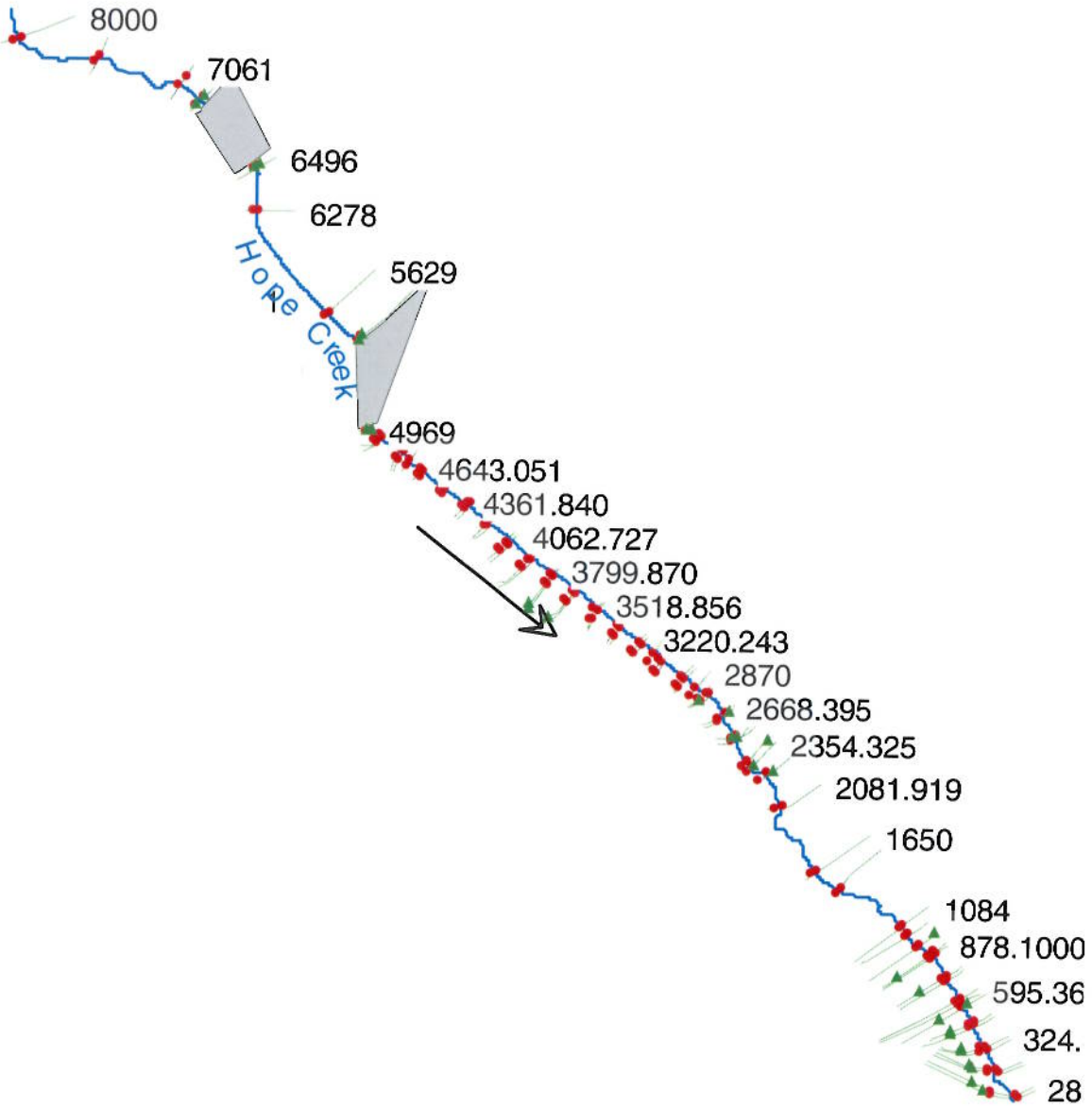
Reach	River Sta.	Contr.	Expan.
1	8000	.1	.3
1	7548	.1	.3
1	7061	.3	.5
1	6930	.3	.5
1	6719	Culvert	
1	6496	.3	.5
1	6278	.1	.3
1	5629	.3	.5
1	5428	.3	.5
1	5146	Culvert	
1	4969	.3	.5
1	4718	.1	.3
1	4209	.1	.3
1	3784	.1	.3
1	3147	.1	.3
1	2870	.1	.3

1	2262	.1	.3
1	1650	.1	.3
1	1084	.1	.3
1	553	.1	.3
1	151	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta		Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
1	8000		2yr	540.00	999.59	1002.58	1002.22	1003.06	0.010867	5.83	129.37	109.98	0.68
1	8000		5yr	690.00	999.59	1002.90	1002.54	1003.44	0.010661	6.25	171.25	148.22	0.69
1	7548		2yr	540.00	993.51	996.29	996.09	997.02	0.016930	6.88	84.45	59.34	0.84
1	7548		5yr	690.00	993.51	996.61	996.47	997.46	0.016953	7.50	105.45	71.36	0.86
1	7061		2yr	680.00	983.03	985.90	985.90	986.98	0.024317	8.34	81.49	38.27	1.01
1	7061		5yr	890.00	983.03	986.33	986.33	987.61	0.023305	9.05	98.34	39.31	1.01
1	6930		2yr	680.00	976.44	982.97	979.33	983.09	0.000946	2.82	241.13	48.57	0.22
1	6930		5yr	890.00	976.44	984.09	979.77	984.23	0.000887	2.99	297.16	51.60	0.22
1	6719	S. Marietta Pkwy		Culvert									
1	6496		2yr	680.00	966.25	972.08	970.43	972.62	0.002900	5.92	117.53	38.10	0.49
1	6496		5yr	890.00	966.25	972.57	970.98	973.32	0.003511	6.98	131.00	41.74	0.55
1	6278		2yr	680.00	965.79	970.22	970.22	971.51	0.006108	9.15	83.20	74.61	0.93
1	6278		5yr	890.00	965.79	970.85	970.85	972.20	0.005328	9.51	136.53	89.04	0.89
1	5629		2yr	680.00	958.42	962.58	962.58	963.99	0.007231	9.54	71.31	26.23	1.01
1	5629		5yr	890.00	958.42	963.13	963.13	964.81	0.006751	10.41	86.16	27.58	1.01
1	5428		2yr	680.00	955.36	960.93	959.54	961.54	0.001820	6.30	110.80	334.52	0.54
1	5428		5yr	890.00	955.36	962.13	960.07	962.76	0.001333	6.38	145.23	367.20	0.48
1	5146	I-75		Culvert									
1	4969		2yr	680.00	950.60	954.38	954.02	955.62	0.014700	8.93	76.18	22.28	0.85
1	4969		5yr	890.00	950.60	955.25	954.66	956.59	0.012820	9.30	95.72	22.85	0.80
1	4718		2yr	920.00	946.27	951.21		952.47	0.011245	8.98	102.42	23.04	0.75
1	4718		5yr	1180.00	946.27	951.94		953.46	0.011884	9.89	119.33	23.52	0.77
1	4209		2yr	920.00	942.38	949.54		949.95	0.002358	5.35	250.77	81.04	0.37
1	4209		5yr	1180.00	942.38	950.28		950.75	0.002499	5.91	311.39	84.81	0.39
1	3784		2yr	920.00	940.39	948.91		949.18	0.001307	4.18	255.59	148.74	0.28
1	3784		5yr	1180.00	940.39	949.59		949.91	0.001452	4.69	367.20	181.94	0.30
1	3147		2yr	1100.00	940.71	945.96	945.38	947.07	0.011151	8.46	129.96	64.56	0.81
1	3147		5yr	1340.00	940.71	946.59	945.92	947.75	0.010388	8.66	154.80	92.54	0.79
1	2870		2yr	1100.00	937.81	944.38	942.51	945.04	0.004641	6.50	169.30	69.14	0.53
1	2870		5yr	1340.00	937.81	944.98	943.05	945.74	0.004826	7.00	191.39	88.92	0.55
1	2262		2yr	1100.00	935.34	940.42	939.63	941.17	0.009167	7.42	199.49	67.85	0.73
1	2262		5yr	1340.00	935.34	941.02	940.05	941.87	0.008709	7.83	278.30	182.71	0.72
1	1650		2yr	1100.00	931.52	937.18	935.38	937.56	0.003948	5.43	312.68	130.90	0.48
1	1650		5yr	1340.00	931.52	937.78	935.78	938.23	0.004109	5.88	439.49	308.88	0.49
1	1084		2yr	1100.00	928.74	934.66	932.96	935.18	0.004442	5.91	218.01	74.91	0.51
1	1084		5yr	1340.00	928.74	935.28	933.42	935.84	0.004318	6.18	270.62	91.93	0.51
1	553		2yr	1100.00	926.18	932.03	930.43	932.65	0.005111	6.30	174.52	42.04	0.55
1	553		5yr	1340.00	926.18	932.59	930.89	933.30	0.005287	6.76	198.32	43.87	0.56
1	151		2yr	1100.00	924.05	928.98	928.29	929.88	0.009506	7.75	161.01	53.84	0.73
1	151		5yr	1340.00	924.05	929.47	928.74	930.47	0.009504	8.21	188.30	57.42	0.74

Corrected Effective Model (HEC-RAS) FEMA Multi-Profiles



```
                    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: HopeCreek_Br16-17
Project File : HopeCreek_Br16-17.prj
Run Date and Time: 11/30/2009 10:27:52 AM

Project in English units

Project Description:
Cobb County Priority Area 3 Flood Study - Modified to provide Base Model for
Bridges 16 & 17 of I-75 Corridor HOV Project
Hope Creek
Rottenwood Creek
Watershed

Model extends from confluence with Rottenwood Creek to 1180 feet
upstream of South Marietta Parkway WB to I-75 NB ramp


PLAN DATA

Plan Title: Corrected Effective ChanRealign - 5 Qs
Plan File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.p08

           Geometry Title: Corrected Effective Chan Realign
           Geometry File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.g02

           Flow Title    : ex fp - 5 Qs
           Flow File     : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.f01

Plan Summary Information:
Number of:  Cross Sections =   72    Multiple Openings  =    0
            Culverts       =    2    Inline Structures  =    0
            Bridges        =    0    Lateral Structures =    0

Computational Information
    Water surface calculation tolerance  =  0.01
    Critical depth calculation tolerance =  0.01
    Maximum number of iterations         =  40
    Maximum difference tolerance         =  0.1
    Flow tolerance factor                =  0.001

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

Encroachment Data
   Equal Conveyance = False
   Left Offset      =        0
   Right Offset     =        0

River = Hope Creek       Reach = 1
RS      Profile           Method  Value1  Value2
```

8000	5yr	1	9975.44	10014.28
7548	5yr	1	9975.44	10014.28
7061	5yr	1	9971.13	10025.25
6930	5yr	1	9968.55	10020.97
6496	5yr	1	9970	10030
6278	5yr	1	9960.02	10012.01
5629	5yr	1	9986.25	10012.01
5428	5yr	1	9986.25	10012.01
4969	5yr	1	9988.91	10012.88
4925.68	05yr	1	24.79	66.83
4907.86	75yr	1	26.77	66.58
4783.01	55yr	1	5.33	53.7
4764.38	85yr	1	9.98	57.59
4718	5yr	1	56.84	92.74
4643.05	15yr	1	19.65	50.52
4625.31	65yr	1	21.3	53.69
4503.70	85yr	1	23.18	63.68
4485.04	95yr	1	26.59	68.53
4361.84	05yr	1	15.31	66.76
4343.30	45yr	1	22.55	75.43
4222.47	35yr	1	47.12	109.32
4204.47	05yr	1	42.78	106.5
4080.46	35yr	1	67.6	120.16
4062.72	75yr	1	71.47	124.03
3940.90	35yr	1	72.89	125.39
3922.63	35yr	1	76.76	129.26
3799.87	05yr	1	48.58	98.54
3781.10	15yr	1	55.46	105.42
3659.61	25yr	1	52.29	102.25
3641.43	35yr	1	54.01	103.97
3518.85	65yr	1	49.46	102.1
3500.62	65yr	1	46.8	99.44
3378.48	95yr	1	49.79	100.69
3360.43	65yr	1	50.53	101.43
3238.30	45yr	1	47.19	102.95
3220.24	35yr	1	45.5	101.26
3147	5yr	1	89.92	145.68
3097.38	45yr	1	60.82	126.32
3079.07	85yr	1	68.21	133.71
2955.92	95yr	1	70.8	133.39
2937.88	45yr	1	72.94	133.78
2870	5yr	1	106.36	157.49
2813.97	95yr	1	39.47	90.6
2795.93	85yr	1	43.32	94.45
2668.39	55yr	1	38.44	108.59
2650.67	55yr	1	42.43	112.58
2537.86	25yr	1	64.72	151
2520.83	05yr	1	65.05	153.79
2390.93	45yr	1	101.31	208.81
2354.32	55yr	1	102.33	215.12
2262	5yr	1	124.78	250.9
2081.91	95yr	1	119.54	266.93
1650	5yr	1	163.15	361.56
1492.06	05yr	1	146.55	306.11
1084	5yr	1	158.76	205.79
1027.83	15yr	1	107.04	154.07
949.757	25yr	1	94.85	141.88
878.100	05yr	1	65.33	112.36
859.342	45yr	1	67.67	114.7
735.534	05yr	1	85.18	132.21
716.387	75yr	1	88.68	135.71
595.361	05yr	1	89.41	136.44
577.589	55yr	1	87.24	134.27
553	5yr	1	106.56	153.59
459.589	95yr	1	96.73	143.76
441.544	65yr	1	99.23	146.26
324.871	05yr	1	123.06	170.09
307.279	25yr	1	125.62	172.65
200.790	65yr	1	130.5	178.33
185.026	35yr	1	134.46	193.53
28.2214	45yr	1	92.56	221.55
12.1383	85yr	1	82.97	235.12

FLOW DATA

Flow Title: ex fp - 5 Qs
Flow File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.f01

Flow Data (cfs)

River	Reach	RS	2yr	5yr	10yr	25yr	50yr	100yr	500yr
Hope Creek	1	8000	540	690	860	1070	1240	1400	1790
Hope Creek	1	7061	680	890	1100	1380	1590	1790	2300
Hope Creek	1	4718	920	1180	1450	1800	2060	2310	2930
Hope Creek	1	3147	1100	1340	1650	2110	2450	2800	3650

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Hope Creek	1	2yr		Normal S = 0.003
Hope Creek	1	5yr		Normal S = 0.003
Hope Creek	1	10yr		Normal S = 0.003
Hope Creek	1	25yr		Normal S = 0.003
Hope Creek	1	50yr		Normal S = 0.003
Hope Creek	1	100yr		Normal S = 0.003
Hope Creek	1	500yr		Normal S = 0.003

GEOMETRY DATA

Geometry Title: Corrected Effective Chan Realign
Geometry File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.g02

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 8000

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9692.31	1010.32	9730.61	1006.96	9741.69	1006.28	9746.1	1006.09	9752.37	1005.9
9795.04	1003.98	9803.95	1003.91	9815.76	1003.7	9830.29	1003.2	9842.43	1003.29
9847.65	1003.23	9856.36	1002.52	9864.45	1002.02	9872.65	1001.42	9875.36	1001.23
9884.35	1001.84	9891.79	1002.43	9896.36	1002.67	9905.33	1003.01	9914.36	1002.76
9926.07	1002.62	9931.4	1003.14	9943.29	1002.52	9951.53	1002.22	9953.9	1002.17
9957.29	1001.98	9971.84	1001.7	9975.44	1001.76	9988.3	1000.04	10000	999.59
10008.8	999.78	10014.28	1003.13	10019.72	1003.11	10021.42	1003.27	10024.73	1003.59
10026.72	1003.7	10029.7	1003.89	10035.93	1004.29	10038.89	1004.52	10050.88	1004.82
10054.9	1004.92	10066.83	1005.64	10070.49	1006.39	10088.12	1013.63		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9692.31	.12	9975.44	.045	10014.28	.1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9975.44 10014.28 393.3 452.1 505.73 .1 .3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	1003.06	Element			
Vel Head (ft)	0.49	Wt. n-Val.	0.120	0.045	
W.S. Elev (ft)	1002.57	Reach Len. (ft)	393.30	452.10	505.73
Crit W.S. (ft)	1002.22	Flow Area (sq ft)	43.71	85.63	
E.G. Slope (ft/ft)	0.010873	Area (sq ft)	43.71	85.63	
Q Total (cfs)	540.00	Flow (cfs)	40.61	499.39	
Top Width (ft)	109.97	Top Width (ft)	72.04	37.93	
Vel Total (ft/s)	4.18	Avg. Vel. (ft/s)	0.93	5.83	
Max Chl Dpth (ft)	2.98	Hydr. Depth (ft)	0.61	2.26	
Conv. Total (cfs)	5178.6	Conv. (cfs)	389.5	4789.1	
Length Wtd. (ft)	449.63	Wetted Per. (ft)	72.15	38.84	
Min Ch El (ft)	999.59	Shear (lb/sq ft)	0.41	1.50	
Alpha	1.81	Stream Power (lb/ft s)	0.38	8.73	

Frctn Loss (ft)	6.03	Cum Volume (acre-ft)	4.72	26.57	1.48
C & E Loss (ft)	0.02	Cum SA (acres)	6.47	6.48	1.38

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was 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 #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	1003.77	Element			
Vel Head (ft)	0.66	Wt. n-Val.		0.045	
W.S. Elev (ft)	1003.11	Reach Len. (ft)	393.30	452.10	505.73
Crit W.S. (ft)	1002.48	Flow Area (sq ft)		106.12	
E.G. Slope (ft/ft)	0.010986	Area (sq ft)		106.12	
Q Total (cfs)	690.00	Flow (cfs)		690.00	
Top Width (ft)	38.80	Top Width (ft)		38.80	
Vel Total (ft/s)	6.50	Avg. Vel. (ft/s)		6.50	
Max Chl Dpth (ft)	3.52	Hydr. Depth (ft)		2.73	
Conv. Total (cfs)	6583.1	Conv. (cfs)		6583.1	
Length Wtd. (ft)	452.10	Wetted Per. (ft)		41.22	
Min Ch El (ft)	999.59	Shear (lb/sq ft)		1.77	
Alpha	1.00	Stream Power (lb/ft s)		11.48	
Frctn Loss (ft)	6.21	Cum Volume (acre-ft)	2.33	31.65	0.41
C & E Loss (ft)	0.02	Cum SA (acres)	2.11	6.75	0.32

Warning: The energy loss was 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: Hope Creek
REACH: 1 RS: 7548

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9863.29	1009.3	9888.65	1003.16	9940.03	996.67	9975.44	995.68	9988.3	993.96
10000	993.51	10008.8	993.71	10014.28	997.05	10067.71	1007.38	10085.14	1008.78

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9863.29	.12	9975.44	.045	10014.28	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9975.44	10014.28	498.18	486.75	465.44	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	997.02	Element			
Vel Head (ft)	0.73	Wt. n-Val.	0.120	0.045	
W.S. Elev (ft)	996.29	Reach Len. (ft)	498.18	486.75	465.44
Crit W.S. (ft)	996.09	Flow Area (sq ft)	6.62	77.85	
E.G. Slope (ft/ft)	0.016922	Area (sq ft)	6.62	77.85	
Q Total (cfs)	540.00	Flow (cfs)	4.82	535.18	
Top Width (ft)	59.35	Top Width (ft)	21.76	37.59	
Vel Total (ft/s)	6.39	Avg. Vel. (ft/s)	0.73	6.87	
Max Chl Dpth (ft)	2.78	Hydr. Depth (ft)	0.30	2.07	
Conv. Total (cfs)	4151.1	Conv. (cfs)	37.0	4114.0	
Length Wtd. (ft)	486.80	Wetted Per. (ft)	21.77	38.45	
Min Ch El (ft)	993.51	Shear (lb/sq ft)	0.32	2.14	
Alpha	1.15	Stream Power (lb/ft s)	0.23	14.71	
Frctn Loss (ft)	10.00	Cum Volume (acre-ft)	4.49	25.72	1.48
C & E Loss (ft)	0.04	Cum SA (acres)	6.04	6.09	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 OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	997.53	Element			
Vel Head (ft)	0.89	Wt. n-Val.		0.045	

W.S. Elev (ft)	996.64	Reach Len. (ft)	498.18	486.75	465.44
Crit W.S. (ft)	996.40	Flow Area (sq ft)		90.99	
E.G. Slope (ft/ft)	0.017668	Area (sq ft)		90.99	
Q Total (cfs)	690.00	Flow (cfs)		690.00	
Top Width (ft)	38.16	Top Width (ft)		38.16	
Vel Total (ft/s)	7.58	Avg. Vel. (ft/s)		7.58	
Max Chl Dpth (ft)	3.13	Hydr. Depth (ft)		2.38	
Conv. Total (cfs)	5191.1	Conv. (cfs)		5191.1	
Length Wtd. (ft)	486.75	Wetted Per. (ft)		40.07	
Min Ch El (ft)	993.51	Shear (lb/sq ft)		2.50	
Alpha	1.00	Stream Power (lb/ft s)		18.99	
Frctn Loss (ft)	9.88	Cum Volume (acre-ft)	2.33	30.62	0.41
C & E Loss (ft)	0.04	Cum SA (acres)	2.11	6.35	0.32

Warning: The energy loss was 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: Hope Creek
REACH: 1 RS: 7061

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9905.26	1001.98	9956.74	993.8	9957.4	993.7	9958.42	993.52	9971.13	990.89
9975.44	985.2	9988.3	983.48	10000	983.03	10008.8	983.22	10014.28	986.57
10018	989.04	10021.34	989.95	10025.25	991.08	10030.35	991.41	10047.87	992.47
10065.41	993.53	10087.95	996.31	10090.3	996.66	10098.54	997.89	10117.31	1004.01

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9905.26	.12	9971.13	.045	10025.25	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9971.13	10025.25	137.61	131.25	117.04	.3	.5

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	986.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.08	Wt. n-Val.		0.045	
W.S. Elev (ft)	985.90	Reach Len. (ft)	137.61	131.25	117.04
Crit W.S. (ft)	985.90	Flow Area (sq ft)		81.47	
E.G. Slope (ft/ft)	0.024332	Area (sq ft)		81.47	
Q Total (cfs)	680.00	Flow (cfs)		680.00	
Top Width (ft)	38.27	Top Width (ft)		38.27	
Vel Total (ft/s)	8.35	Avg. Vel. (ft/s)		8.35	
Max Chl Dpth (ft)	2.87	Hydr. Depth (ft)		2.13	
Conv. Total (cfs)	4359.3	Conv. (cfs)		4359.3	
Length Wtd. (ft)	131.25	Wetted Per. (ft)		39.50	
Min Ch El (ft)	983.03	Shear (lb/sq ft)		3.13	
Alpha	1.00	Stream Power (lb/ft s)		26.15	
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	4.45	24.83	1.48
C & E Loss (ft)	0.48	Cum SA (acres)	5.92	5.67	1.38

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 #5yr

E.G. Elev (ft)	987.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.25	Wt. n-Val.		0.045	
W.S. Elev (ft)	986.35	Reach Len. (ft)	137.61	131.25	117.04

Crit W.S. (ft)	986.35	Flow Area (sq ft)		99.07		
E.G. Slope (ft/ft)	0.022782	Area (sq ft)		99.07		
Q Total (cfs)	890.00	Flow (cfs)		890.00		
Top Width (ft)	39.36	Top Width (ft)		39.36		
Vel Total (ft/s)	8.98	Avg. Vel. (ft/s)		8.98		
Max Chl Dpth (ft)	3.32	Hydr. Depth (ft)		2.52		
Conv. Total (cfs)	5896.5	Conv. (cfs)		5896.5		
Length Wtd. (ft)	131.25	Wetted Per. (ft)		40.94		
Min Ch El (ft)	983.03	Shear (lb/sq ft)		3.44		
Alpha	1.00	Stream Power (lb/ft s)		30.92		
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	2.33	29.56	0.41	
C & E Loss (ft)	0.56	Cum SA (acres)	2.11	5.92	0.32	

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: Hope Creek
REACH: 1 RS: 6930

INPUT
Description:
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9781.95	1000.87	9799.86	997.76	9802.38	997.61	9935.39	995.4	9949.54	993.31
9968.55	984.36	9975.44	978.61	9988.3	976.89	10000	976.44	10008.8	976.63
10014.28	979.98	10020.97	984.41	10043.21	995.61	10048.18	997.11	10057.13	999.87

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9781.95	.12	9968.55	.045	10020.97	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9968.55	10020.97	458.64	434.11	418.59	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
9781.95	9968.55	1017.97	T
10020.97	10057.13	1017.97	T

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	983.09	Element			
Vel Head (ft)	0.12	Wt. n-Val.		0.045	
W.S. Elev (ft)	982.97	Reach Len. (ft)	458.64	434.11	418.59
Crit W.S. (ft)	979.31	Flow Area (sq ft)		241.13	
E.G. Slope (ft/ft)	0.000946	Area (sq ft)		241.13	
Q Total (cfs)	680.00	Flow (cfs)		680.00	
Top Width (ft)	48.57	Top Width (ft)		48.57	
Vel Total (ft/s)	2.82	Avg. Vel. (ft/s)		2.82	
Max Chl Dpth (ft)	6.53	Hydr. Depth (ft)		4.96	
Conv. Total (cfs)	22107.2	Conv. (cfs)		22107.2	
Length Wtd. (ft)	434.11	Wetted Per. (ft)		52.12	
Min Ch El (ft)	976.44	Shear (lb/sq ft)		0.27	
Alpha	1.00	Stream Power (lb/ft s)		0.77	
Frctn Loss (ft)		Cum Volume (acre-ft)	4.45	24.34	1.48
C & E Loss (ft)		Cum SA (acres)	5.92	5.54	1.38

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	984.23	Element			
Vel Head (ft)	0.14	Wt. n-Val.		0.045	
W.S. Elev (ft)	984.09	Reach Len. (ft)	458.64	434.11	418.59
Crit W.S. (ft)	979.76	Flow Area (sq ft)		297.16	

E.G. Slope (ft/ft)	0.000887	Area (sq ft)		297.16	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	51.60	Top Width (ft)		51.60	
Vel Total (ft/s)	2.99	Avg. Vel. (ft/s)		2.99	
Max Chl Dpth (ft)	7.65	Hydr. Depth (ft)		5.76	
Conv. Total (cfs)	29890.5	Conv. (cfs)		29890.5	
Length Wtd. (ft)	434.11	Wetted Per. (ft)		55.89	
Min Ch El (ft)	976.44	Shear (lb/sq ft)		0.29	
Alpha	1.00	Stream Power (lb/ft s)		0.88	
Frctn Loss (ft)		Cum Volume (acre-ft)	2.33	28.96	0.41
C & E Loss (ft)		Cum SA (acres)	2.11	5.78	0.32

CULVERT

RIVER: Hope Creek
REACH: 1 RS: 6719

INPUT
Description: S. Marietta Pkwy, HC-6 2-10x8' Box Culvert
Distance from Upstream XS = 29.5
Deck/Roadway Width = 375
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 109

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
9224.89	1024.53		9228.8	1024.52		9256.11	1024.26	
9264.29	1024.22		9286.73	1024.05		9298.95	1024.01	
9302.27	1024		9327.78	1023.82		9338.47	1023.78	
9347.74	1023.76		9351.96	1023.75		9362.14	1023.67	
9389.96	1023.6		9393.38	1023.58		9417.65	1023.33	
9430.93	1023.07		9435.62	1022.98		9462.23	1022.7	
9478.58	1022.65		9492.7	1022.53		9508.71	1022.48	
9535.25	1022.25		9551.34	1022.16		9563.3	1021.96	
9590.79	1021.8		9598.41	1021.72		9605.98	1021.65	
9626.95	1021.45		9631.92	1021.4		9636.71	1021.46	
9640.54	1021.51		9648.68	1021.46		9673.39	1021.3	
9690.21	1021.09		9699.9	1021.04		9711.48	1020.97	
9742.37	1020.82		9746.12	1020.79		9754.37	1020.71	
9764.06	1020.56		9788.93	1020.32		9798.43	1020.19	
9806.68	1020.19		9831.72	1020.2		9838.32	1020.1	
9854.25	1019.91		9864.96	1019.76		9890.5	1019.47	
9899.11	1019.48		9949.6	1017.97		9976.17	1017.97	
9979.69	1017.97		9980.07	1017.97		10003.19	1017.97	
10075.41	1020.31		10090.03	1020.52		10109.94	1020.85	
10130.24	1021.27		10140.15	1021.51		10161.25	1022	
10174.98	1022.22		10182.64	1022.4		10205.31	1023.1	
10227.98	1023.65		10237.1	1023.98		10257.17	1024.61	
10278.59	1025.38		10286.05	1025.68		10300.3	1026.18	
10311.54	1026.63		10322.75	1027.05		10334.05	1027.5	
10346.61	1027.92		10358.01	1028.33		10370.6	1028.75	
10381.28	1029.09		10389.18	1029.4		10394.55	1029.67	
10406.41	1030.13		10408.67	1030.27		10411.49	1030.42	
10423.81	1030.89		10441.47	1031.33		10468.74	1032.45	
10472.78	1032.68		10477.2	1032.93		10481.87	1033.2	
10503.95	1034.11		10843.01	1047.54		10866.03	1048.42	
10873.74	1048.63		10877.47	1048.73		10926.33	1050.44	
10934.63	1050.8		10936.31	1050.83		10943.63	1051.06	
10945.29	1051.07		10946.54	1051.1		10948.45	1051.11	
10949.63	1051.14		10951.6	1051.14		10952.66	1051.16	
10953.56	1051.17		10973.73	1051.38		10990.8	1052.11	
10992.49	1052.16		10994.6	1052.21		10997.14	1052.27	
11008.41	1052.56							

Upstream Bridge Cross Section Data
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9781.95	1000.87	9799.86	997.76	9802.38	997.61	9935.39	995.4	9949.54	993.31		
9968.55	984.36	9975.44	978.61	9988.3	976.89	10000	976.44	10012	976.63		
10014.28	979.98	10020.97	984.41	10043.21	995.61	10048.18	997.11	10057.13	999.87		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9781.95	.12	9968.55	.045	10020.97	.1

```
Bank Sta: Left   Right    Coeff Contr.   Expan.
       9968.5510020.97            .3        .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 9781.95 9968.55 1017.97        T
10020.9710057.13 1017.97        T

Downstream  Deck/Roadway Coordinates
    num=     109
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
 9224.89 1024.53          9228.8 1024.52          9256.11 1024.26
 9264.29 1024.22         9286.73 1024.05          9298.95 1024.01
 9302.27    1024         9327.78 1023.82          9338.47 1023.78
 9347.74 1023.76         9351.96 1023.75          9362.14 1023.67
 9389.96  1023.6         9393.38 1023.58          9417.65 1023.33
 9430.93 1023.07         9435.62 1022.98          9462.23  1022.7
 9478.58 1022.65          9492.7 1022.53          9508.71 1022.48
 9535.25 1022.25         9551.34 1022.16           9563.3 1021.96
 9590.79  1021.8         9598.41 1021.72          9605.98 1021.65
 9626.95 1021.45         9631.92  1021.4          9636.71 1021.46
 9640.54 1021.51         9648.68 1021.46          9673.39  1021.3
 9690.21 1021.09          9699.9 1021.04          9711.48 1020.97
 9742.37 1020.82         9746.12 1020.79          9754.37 1020.71
 9764.06 1020.56         9788.93 1020.32          9798.43 1020.19
 9806.68 1020.19         9831.72  1020.2          9838.32  1020.1
 9854.25 1019.91         9864.96 1019.76           9890.5 1019.47
 9899.11 1019.48          9949.6 1017.97          9976.17 1017.97
 9979.69 1017.97         9980.07 1017.97         10003.19 1017.97
10075.41 1020.31        10090.03 1020.52         10109.94 1020.85
10130.24 1021.27        10140.15 1021.51         10161.25    1022
10174.98 1022.22        10182.64  1022.4         10205.31  1023.1
10227.98 1023.65         10237.1 1023.98         10257.17 1024.61
10278.59 1025.38        10286.05 1025.68          10300.3 1026.18
10311.54 1026.63        10322.75 1027.05         10334.05  1027.5
10346.61 1027.92        10358.01 1028.33          10370.6 1028.75
10381.28 1029.09        10389.18  1029.4         10394.55 1029.67
10406.41 1030.13        10408.67 1030.27         10411.49 1030.42
10423.81 1030.89        10441.47 1031.33         10468.74 1032.45
10472.78 1032.68         10477.2 1032.93         10481.87  1033.2
10503.95 1034.11        10843.01 1047.54         10866.03 1048.42
10873.74 1048.63        10877.47 1048.73         10926.33 1050.44
10934.63  1050.8        10936.31 1050.83         10943.63 1051.06
10945.29 1051.07        10946.54  1051.1         10948.45 1051.11
10949.63 1051.14         10951.6 1051.14         10952.66 1051.16
10953.56 1051.17        10973.73 1051.38          10990.8 1052.11
10992.49 1052.16         10994.6 1052.21         10997.14 1052.27
11008.41 1052.56

Downstream Bridge Cross Section Data
Station Elevation Data    num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9889.59  989.26 9904.06  987.96 9906.52  987.63 9911.03  987.08 9917.06  986.17
 9942.39  982.91 9943.57  982.73 9949.25  981.79 9951.67  981.26 9953.81  980.93
 9961.37  979.81 9963.73   979.2 9963.86  979.16 9963.96  979.13 9972.02  976.15
 9986.26  970.21    9989 966.4610000.01  966.25   10011 966.4110012.02  970.35
10018.62 971.8410018.77 971.8710030.71  974.19 10038.9 976.2510063.61  978.28
10071.74  979.31 10082.2 980.4210082.83 980.6710097.63 986.5310112.06  991.58

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9889.59     .12 9986.26    .03510012.02     .08

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9986.2610012.02            .3        .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 9889.59 9984.26 1017.97        F
10012.1210112.06 1017.97        F

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

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Box	8	10

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

Culvert Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
29.5	375	.012	.012	0	.5	1

Number of Barrels = 2
Upstream Elevation = 977.32
Centerline Stations

Sta.	Sta.
9994.5	10005.5

Downstream Elevation = 967.01
Centerline Stations

Sta.	Sta.
9994.5	10005.5

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 6496

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9889.59	989.26	9904.06	987.96	9906.52	987.63	9911.03	987.08	9917.06	986.17
9942.39	982.91	9943.57	982.73	9949.25	981.79	9951.67	981.26	9953.81	980.93
9961.37	979.81	9963.73	979.2	9963.86	979.16	9963.96	979.13	9972.02	976.15
9986.26	970.21	9995.17	966.46	10000.01	966.25	10004.33	966.41	10012.02	970.35
10018.62	971.84	10018.77	971.87	10030.71	974.19	10038.9	976.25	10063.61	978.28
10071.74	979.31	10082.2	980.42	10082.83	980.67	10097.63	986.53	10112.06	991.58

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9889.59	.12	9986.26	.035	10012.02	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9986.26	10012.02	261.27	218.1	177.15	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
9889.59	9984.26	1017.97	F
10012.12	10112.06	1017.97	F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	972.62	Element			
Vel Head (ft)	0.54	Wt. n-Val.	0.120	0.035	0.080
W.S. Elev (ft)	972.08	Reach Len. (ft)	261.27	218.10	177.15
Crit W.S. (ft)	970.43	Flow Area (sq ft)	2.91	114.45	0.17
E.G. Slope (ft/ft)	0.002900	Area (sq ft)	4.21	114.45	6.67
Q Total (cfs)	680.00	Flow (cfs)	2.36	677.39	0.24
Top Width (ft)	38.10	Top Width (ft)	4.49	25.76	7.85
Vel Total (ft/s)	5.79	Avg. Vel. (ft/s)	0.81	5.92	1.41
Max Chl Dpth (ft)	5.83	Hydr. Depth (ft)	1.46	4.44	1.72
Conv. Total (cfs)	12627.4	Conv. (cfs)	43.9	12578.9	4.5
Length Wtd. (ft)	218.26	Wetted Per. (ft)	2.17	27.47	0.10
Min Ch El (ft)	966.25	Shear (lb/sq ft)	0.24	0.75	0.30
Alpha	1.04	Stream Power (lb/ft s)	0.20	4.46	0.43
Frctn Loss (ft)	0.89	Cum Volume (acre-ft)	4.43	22.57	1.45
C & E Loss (ft)	0.23	Cum SA (acres)	5.89	5.17	1.35

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

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	973.44	Wt. n-Val.	0.120	0.035	0.080
Vel Head (ft)	0.70	Reach Len. (ft)	261.27	218.10	177.15
W.S. Elev (ft)	972.74	Flow Area (sq ft)	4.22	131.28	0.24
Crit W.S. (ft)	970.98	Area (sq ft)	7.65	131.28	12.90
E.G. Slope (ft/ft)	0.003133	Flow (cfs)	4.56	885.01	0.43
Q Total (cfs)	890.00	Top Width (ft)	6.06	25.76	11.21
Top Width (ft)	43.03	Avg. Vel. (ft/s)	1.08	6.74	1.82
Vel Total (ft/s)	6.56	Hydr. Depth (ft)	2.11	5.10	2.38
Max Chl Dpth (ft)	6.49	Conv. (cfs)	81.4	15810.5	7.8
Conv. Total (cfs)	15899.8	Wetted Per. (ft)	2.17	27.47	0.10
Length Wtd. (ft)	218.60	Shear (lb/sq ft)	0.38	0.93	0.45
Min Ch El (ft)	966.25	Stream Power (lb/ft s)	0.41	6.30	0.82
Alpha	1.05	Cum Volume (acre-ft)	2.29	26.83	0.35
Frctn Loss (ft)	0.92	Cum SA (acres)	2.08	5.40	0.26
C & E Loss (ft)	0.24				

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, energy was used.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 6278

INPUT
Description:
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9803.29	982.33	9805.11	981.96	9806.14	981.81	9828.14	978.6	9841.13	976.27
9846.28	975.46	9849.85	974.52	9865.92	973.78	9894.36	972.39	9906.49	971.83
9923.4	970.83	9931	970.28	9963.22	969.91	9977.07	970.05	9978.95	970.05
9982.03	970.07	9986.44	969.88	9994.93	966.01	9999.92	965.79	10004.17	965.99
10012.01	970.73	10012.19	971.06	10013.67	971.78	10018.89	972.07	10035.15	972.95
10037.83	973.12	10061.54	984.92						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9803.29	.12	9986.44	.025	10012.01	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9986.44	10012.01	596.84	648.74	713.24	.1	.3

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	971.51	Wt. n-Val.	0.120	0.025	
Vel Head (ft)	1.30	Reach Len. (ft)	596.84	648.74	713.24
W.S. Elev (ft)	970.22	Flow Area (sq ft)	9.22	73.98	
Crit W.S. (ft)	970.22	Area (sq ft)	9.22	73.98	
E.G. Slope (ft/ft)	0.006108	Flow (cfs)	2.89	677.11	
Q Total (cfs)	680.00	Top Width (ft)	49.89	24.72	
Top Width (ft)	74.61	Avg. Vel. (ft/s)	0.31	9.15	
Vel Total (ft/s)	8.17	Hydr. Depth (ft)	0.18	2.99	
Max Chl Dpth (ft)	4.43	Conv. (cfs)	37.0	8663.9	
Conv. Total (cfs)	8700.9	Wetted Per. (ft)	49.90	26.75	
Length Wtd. (ft)	648.63	Shear (lb/sq ft)	0.07	1.05	
Min Ch El (ft)	965.79	Stream Power (lb/ft s)	0.02	9.65	
Alpha	1.25	Cum Volume (acre-ft)	4.39	22.10	1.43
Frctn Loss (ft)	4.30	Cum SA (acres)	5.73	5.04	1.33
C & E Loss (ft)	0.01				

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 #5yr

E.G. Elev (ft)	972.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.50	Wt. n-Val.	0.120	0.025	
W.S. Elev (ft)	970.77	Reach Len. (ft)	596.84	648.74	713.24
Crit W.S. (ft)	970.77	Flow Area (sq ft)	20.72	87.96	
E.G. Slope (ft/ft)	0.006004	Area (sq ft)	20.72	87.96	
Q Total (cfs)	890.00	Flow (cfs)	16.57	873.43	
Top Width (ft)	51.99	Top Width (ft)	26.42	25.57	
Vel Total (ft/s)	8.19	Avg. Vel. (ft/s)	0.80	9.93	
Max Chl Dpth (ft)	4.98	Hydr. Depth (ft)	0.78	3.44	
Conv. Total (cfs)	11486.2	Conv. (cfs)	213.8	11272.4	
Length Wtd. (ft)	648.26	Wetted Per. (ft)	27.25	27.78	
Min Ch El (ft)	965.79	Shear (lb/sq ft)	0.29	1.19	
Alpha	1.44	Stream Power (lb/ft s)	0.23	11.78	
Frctn Loss (ft)	4.22	Cum Volume (acre-ft)	2.20	26.28	0.33
C & E Loss (ft)	0.02	Cum SA (acres)	1.98	5.27	0.24

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The cross section had to be extended vertically during the critical depth 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.
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 5629

INPUT
Description:
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9663.41	980.83	9680.64	976.68	9688.56	975.37	9694.14	974.48	9699.85	973.74
9703.1	973.44	9708.01	973.59	9714.45	973.49	9718.86	973.55	9729.39	973.45
9734.64	973.58	9737.31	973.56	9748.19	973.75	9749.7	973.74	9750.86	973.64
9761.28	973.99	9764.91	974	9779.35	973.41	9794.19	972.77	9796.98	972.65
9802.81	971.45	9811.56	970.63	9816.07	969.91	9823.25	969.22	9836.58	968.9
9852.51	968.61	9862.6	968.52	9876.71	968.56	9885.29	969.14	9892.29	969.46
9906.05	970.29	9910.69	970.53	9912.47	972.42	9950.99	971.68	9972.01	968.32
9986.25	962.38	9995.16	958.63	10000	958.42	10004.32	958.58	10012.01	962.52
10012.87	983.28								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9663.41	.12	9986.25	.025	10012.01	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9986.25	10012.01	205.65	201.08	200.99	.3	.5

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	963.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.41	Wt. n-Val.	0.120	0.025	
W.S. Elev (ft)	962.58	Reach Len. (ft)	205.65	201.08	200.99
Crit W.S. (ft)	962.58	Flow Area (sq ft)	0.05	71.32	
E.G. Slope (ft/ft)	0.007214	Area (sq ft)	0.05	71.32	0.00
Q Total (cfs)	680.00	Flow (cfs)	0.01	679.99	
Top Width (ft)	26.24	Top Width (ft)	0.48	25.76	
Vel Total (ft/s)	9.53	Avg. Vel. (ft/s)	0.21	9.53	
Max Chl Dpth (ft)	4.16	Hydr. Depth (ft)	0.10	2.77	
Conv. Total (cfs)	8006.4	Conv. (cfs)	0.1	8006.2	
Length Wtd. (ft)	201.09	Wetted Per. (ft)	0.52	27.47	
Min Ch El (ft)	958.42	Shear (lb/sq ft)	0.04	1.17	
Alpha	1.00	Stream Power (lb/ft s)	0.01	11.15	
Frctn Loss (ft)	0.65	Cum Volume (acre-ft)	4.33	21.02	1.43
C & E Loss (ft)	0.40	Cum SA (acres)	5.39	4.66	1.33

```
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 #5yr

  E.G. Elev (ft)           964.81    Element                  Left OB    Channel   Right OB
  Vel Head (ft)              1.67    Wt. n-Val.                          0.025
  W.S. Elev (ft)           963.15    Reach Len. (ft)          205.65    201.08     200.99
  Crit W.S. (ft)           963.15    Flow Area (sq ft)                   85.91
  E.G. Slope (ft/ft)      0.007095   Area (sq ft)                        85.91
  Q Total (cfs)            890.00    Flow (cfs)                         890.00
  Top Width (ft)            25.76    Top Width (ft)                      25.76
  Vel Total (ft/s)          10.36    Avg. Vel. (ft/s)                    10.36
  Max Chl Dpth (ft)          4.73    Hydr. Depth (ft)                     3.34
  Conv. Total (cfs)       10566.1    Conv. (cfs)                       10566.1
  Length Wtd. (ft)         201.08    Wetted Per. (ft)                    28.87
  Min Ch El (ft)           958.42    Shear (lb/sq ft)                     1.32
  Alpha                      1.00    Stream Power (lb/ft s)              13.66
  Frctn Loss (ft)            0.62    Cum Volume (acre-ft)        2.06    24.99       0.33
  C & E Loss (ft)            0.51    Cum SA (acres)              1.80     4.88       0.24


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 cross section had to be extended vertically during the critical depth 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.
Warning: The parabolic search method failed to converge on critical depth.  The program will try the
         cross section slice/secant method to find critical depth.

CROSS SECTION


RIVER: Hope Creek
REACH: 1                  RS: 5428

INPUT
Description:
Station Elevation Data    num=      40
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9494.28  976.62 9507.56  973.91 9512.84  972.83 9514.96  972.42 9521.05  972.17
 9524.88  972.02 9533.91  971.61 9541.48  971.31 9547.26  970.53  9547.7  970.49
 9548.77  970.36 9550.44  970.24 9564.15  969.34 9564.53  969.32 9566.83  968.61
 9581.36  965.46 9584.59  965.06 9587.25  964.84 9596.02  964.69 9606.43  964.53
 9608.17  964.51 9613.93  964.43 9635.01  964.06 9645.73  962.26 9649.59   961.6
 9659.69  961.41 9674.25  961.01 9682.31  960.85 9953.74   960.3 9966.04  960.04
 9971.16  959.98 9974.67  959.83 9978.83  959.81 9986.25  959.32 9995.16  955.57
   10000  955.3610004.32  955.5210012.01  959.46 10016.4  966.4610019.39  973.97

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9494.28     .12 9986.25    .02510012.01     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.2510012.01           519.24  458.42  414.44             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 9494.28 9984.63  969.52       F
10013.3910019.39  969.52       F
```

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	961.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.61	Wt. n-Val.	0.120	0.025	0.080
W.S. Elev (ft)	960.93	Reach Len. (ft)	519.24	458.42	414.44
Crit W.S. (ft)	959.53	Flow Area (sq ft)	2.52	107.60	0.68
E.G. Slope (ft/ft)	0.001820	Area (sq ft)	128.10	107.60	0.68
Q Total (cfs)	680.00	Flow (cfs)	1.78	677.93	0.29
Top Width (ft)	334.51	Top Width (ft)	307.84	25.76	0.92
Vel Total (ft/s)	6.14	Avg. Vel. (ft/s)	0.71	6.30	0.42
Max Chl Dpth (ft)	5.57	Hydr. Depth (ft)	1.55	4.18	0.73
Conv. Total (cfs)	15938.8	Conv. (cfs)	41.8	15890.4	6.7
Length Wtd. (ft)	458.42	Wetted Per. (ft)	1.62	27.47	1.73
Min Ch El (ft)	955.36	Shear (lb/sq ft)	0.18	0.45	0.04
Alpha	1.05	Stream Power (lb/ft s)	0.12	2.80	0.02
Frctn Loss (ft)		Cum Volume (acre-ft)	4.03	20.60	1.43
C & E Loss (ft)		Cum SA (acres)	4.66	4.55	1.33

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

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	962.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.64	Wt. n-Val.		0.025	
W.S. Elev (ft)	962.12	Reach Len. (ft)	519.24	458.42	414.44
Crit W.S. (ft)	960.09	Flow Area (sq ft)		138.22	
E.G. Slope (ft/ft)	0.001733	Area (sq ft)		138.22	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	25.76	Top Width (ft)		25.76	
Vel Total (ft/s)	6.44	Avg. Vel. (ft/s)		6.44	
Max Chl Dpth (ft)	6.76	Hydr. Depth (ft)		5.37	
Conv. Total (cfs)	21377.8	Conv. (cfs)		21377.8	
Length Wtd. (ft)	458.42	Wetted Per. (ft)		32.93	
Min Ch El (ft)	955.36	Shear (lb/sq ft)		0.45	
Alpha	1.00	Stream Power (lb/ft s)		2.92	
Frctn Loss (ft)		Cum Volume (acre-ft)	2.06	24.47	0.33
C & E Loss (ft)		Cum SA (acres)	1.80	4.77	0.24

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

CULVERT

RIVER: Hope Creek
REACH: 1 RS: 5146

INPUT
Description: I-75, HC-4, 2-9x6 Box
Distance from Upstream XS = 17
Deck/Roadway Width = 425
Weir Coefficient = 2.8
Upstream Deck/Roadway Coordinates
num= 50

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
9439.25	969.45		9725.25	969.45		9730.79	969.45	
9737.49	969.45		9745.37	969.45		9752.75	969.45	
9765.99	969.45		9970.88	969.52		9982.88	969.52	
10024.87	969.52		10036.05	970.14		10041.11	970.23	
10050.31	970.4		10108.03	971.73		10118.43	972.04	
10131.15	972.34		10135.54	972.54		10189.34	974.07	
10196.9	974.17		10210.77	974.61		10297.86	974.86	
10330.75	974.96		10333.8	974.97		10337.4	974.35	
10346.03	972.86		10349.55	973.73		10381.62	981.42	
10405.7	992.45		10408.55	993.67		10409.29	993.72	
10450.59	995.25		10456.78	995.51		10462.41	995.54	
10492.18	996.02		10525.03	995.39		10527.38	995.31	
10528.77	995.32		10531.44	995.33		10565.96	995.33	
10597.8	995.59		10598.34	995.58		10598.94	995.61	
10637.36	996.21		10665.54	995.98		10673.12	995.92	
10712.68	996.38		10740.48	996.87		10764.42	997.25	
10799.24	998.33		10801.36	998.34				

```
Upstream Bridge Cross Section Data
Station Elevation Data    num=      40
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9494.28  976.62 9507.56  973.91 9512.84  972.83 9514.96  972.42 9521.05  972.17
 9524.88  972.02 9533.91  971.61 9541.48  971.31 9547.26  970.53  9547.7  970.49
 9548.77  970.36 9550.44  970.24 9564.15  969.34 9564.53  969.32 9566.83  968.61
 9581.36  965.46 9584.59  965.06 9587.25  964.84 9596.02  964.69 9606.43  964.53
 9608.17  964.51 9613.93  964.43 9635.01  964.06 9645.73  962.26 9649.59   961.6
 9659.69  961.41 9674.25  961.01 9682.31  960.85 9953.74   960.3 9966.04  960.04
 9971.16  959.98 9974.67  959.83 9978.83  959.81 9986.25  959.32    9990   955.3
   10000   955.3   10010   955.310012.01  959.46 10016.4  966.4610019.39  973.97

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9494.28     .12 9986.25    .02510012.01     .08

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9986.2510012.01            .3        .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 9494.28 9984.63  969.52       F
10013.3910019.39  969.52       F

Downstream  Deck/Roadway Coordinates
    num=      50
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
 9439.25  969.45         9725.25  969.45         9730.79  969.45
 9737.49  969.45         9745.37  969.45         9752.75  969.45
 9765.99  969.45         9970.88  969.52         9982.88  969.52
10024.87  969.52        10036.05  970.14        10041.11  970.23
10050.31   970.4        10108.03  971.73        10118.43  972.04
10131.15  972.34        10135.54  972.54        10189.34  974.07
 10196.9  974.17        10210.77  974.61        10297.86  974.86
10330.75  974.96         10333.8  974.97         10337.4  974.35
10346.03  972.86        10349.55  973.73        10381.62  981.42
 10405.7  992.45        10408.55  993.67        10409.29  993.72
10450.59  995.25        10456.78  995.51        10462.41  995.54
10492.18  996.02        10525.03  995.39        10527.38  995.31
10528.77  995.32        10531.44  995.33        10565.96  995.33
 10597.8  995.59        10598.34  995.58        10598.94  995.61
10637.36  996.21        10665.54  995.98        10673.12  995.92
10712.68  996.38        10740.48  996.87        10764.42  997.25
10799.24  998.33        10801.36  998.34

Downstream Bridge Cross Section Data
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9968.35  966.59 9970.14  966.43 9970.75  966.38 9974.46  962.41 9988.91  956.36
    9990  950.63   10000   950.610010.74   950.710012.88  957.5110026.81  962.32
10030.78  962.5310033.08  963.2710048.84  968.2410053.37  969.87

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9968.35     .09 9988.91    .0410012.88     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9988.9110012.88            .3        .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 9968.35 9988.56  969.52       F
10013.5410053.37  969.52       F

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

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1          Box       6       9
FHWA Chart # 8 - flared wingwalls
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FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 17     425     .012     .012        0                .5                  1
Number of Barrels =  2
Upstream   Elevation =  955.35
Centerline Stations
    Sta.    Sta.
    9995   10005
Downstream Elevation =  950.84
Centerline Stations
    Sta.    Sta.
    9995   10005

CROSS SECTION


RIVER: Hope Creek
REACH: 1                  RS: 4969

INPUT
Description:
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9968.35  966.59 9970.14  966.43 9970.75  966.38 9974.46  962.41 9988.91  956.36
 9990.74  950.63   10000  950.610010.74  951.2210012.88  957.5110026.81  962.32
10030.78  962.5310033.08  963.2710048.84  968.2410053.37  969.87

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9968.35     .12 9988.91     .0410012.88     .12

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9988.9110012.88           170.27  251.19  305.99              .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 9968.35 9988.56  969.52       F
10013.5410053.37  969.52       F

CROSS SECTION OUTPUT  Profile #2yr

  E.G. Elev (ft)            955.72    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               1.06    Wt. n-Val.                            0.040
  W.S. Elev (ft)            954.65    Reach Len. (ft)            170.27     251.19     305.99
  Crit W.S. (ft)            954.03    Flow Area (sq ft)                      82.21
  E.G. Slope (ft/ft)      0.011717    Area (sq ft)                           82.21
  Q Total (cfs)             680.00    Flow (cfs)                            680.00
  Top Width (ft)             22.45    Top Width (ft)                         22.45
  Vel Total (ft/s)            8.27    Avg. Vel. (ft/s)                        8.27
  Max Chl Dpth (ft)           4.05    Hydr. Depth (ft)                        3.66
  Conv. Total (cfs)         6282.1    Conv. (cfs)                           6282.1
  Length Wtd. (ft)          251.19    Wetted Per. (ft)                       27.87
  Min Ch El (ft)            950.60    Shear (lb/sq ft)                        2.16
  Alpha                       1.00    Stream Power (lb/ft s)                 17.85
  Frctn Loss (ft)             1.29    Cum Volume (acre-ft)        3.26       19.60       1.43
  C & E Loss (ft)             0.38    Cum SA (acres)              2.82        4.29       1.32


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,
         energy was used.

CROSS SECTION OUTPUT  Profile #5yr

  E.G. Elev (ft)            956.66    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               1.25    Wt. n-Val.                            0.040
  W.S. Elev (ft)            955.41    Reach Len. (ft)            170.27     251.19     305.99
  Crit W.S. (ft)            954.65    Flow Area (sq ft)                      99.34
  E.G. Slope (ft/ft)      0.011502    Area (sq ft)                           99.34
  Q Total (cfs)             890.00    Flow (cfs)                            890.00
  Top Width (ft)             22.95    Top Width (ft)                         22.95
```

Vel Total (ft/s)	8.96	Avg. Vel. (ft/s)		8.96		
Max Chl Dpth (ft)	4.81	Hydr. Depth (ft)		4.33		
Conv. Total (cfs)	8298.6	Conv. (cfs)		8298.6		
Length Wtd. (ft)	251.19	Wetted Per. (ft)		29.46		
Min Ch El (ft)	950.60	Shear (lb/sq ft)		2.42		
Alpha	1.00	Stream Power (lb/ft s)		21.69		
Frctn Loss (ft)	1.14	Cum Volume (acre-ft)	2.06	23.22	0.33	
C & E Loss (ft)	0.46	Cum SA (acres)	1.80	4.51	0.24	

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, energy was used.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4925.680

INPUT
Description: 1
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	966.05	.67	966.04	6.73	965.94	10.16	965.88	15.22	965.81
16.14	962	17.01	958.99	21.86	956.78	24.79	955.24	27.12	952.03
28.33	948.84	40.39	949.33	40.68	949.33	41.07	949.36	46.04	949.53
53.68	949.81	54.7	949.98	55.85	950.17	56.56	950.29	65.26	951.74
65.45	951.76	66.54	957.6	66.83	958.95	68.87	959.16	72.64	959.6
85.55	961.13	85.59	961.14	88	961.24	102.73	962.2	137.62	969.34

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.12	24.79	.04	66.83	.1	88	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
24.79	66.83	18.25	17.81	18.01	.1	.3

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	954.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.		0.040	
W.S. Elev (ft)	953.74	Reach Len. (ft)	18.25	17.81	18.01
Crit W.S. (ft)		Flow Area (sq ft)		151.86	
E.G. Slope (ft/ft)	0.002857	Area (sq ft)		151.86	
Q Total (cfs)	680.00	Flow (cfs)		680.00	
Top Width (ft)	39.94	Top Width (ft)		39.94	
Vel Total (ft/s)	4.48	Avg. Vel. (ft/s)		4.48	
Max Chl Dpth (ft)	4.90	Hydr. Depth (ft)		3.80	
Conv. Total (cfs)	12721.4	Conv. (cfs)		12721.4	
Length Wtd. (ft)	17.81	Wetted Per. (ft)		44.85	
Min Ch El (ft)	948.84	Shear (lb/sq ft)		0.60	
Alpha	1.00	Stream Power (lb/ft s)		2.70	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	3.26	18.93	1.43
C & E Loss (ft)	0.02	Cum SA (acres)	2.82	4.11	1.32

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	955.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.		0.040	
W.S. Elev (ft)	954.73	Reach Len. (ft)	18.25	17.81	18.01
Crit W.S. (ft)		Flow Area (sq ft)		191.50	
E.G. Slope (ft/ft)	0.002409	Area (sq ft)		191.50	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	40.84	Top Width (ft)		40.84	
Vel Total (ft/s)	4.65	Avg. Vel. (ft/s)		4.65	
Max Chl Dpth (ft)	5.89	Hydr. Depth (ft)		4.69	
Conv. Total (cfs)	18133.2	Conv. (cfs)		18133.2	
Length Wtd. (ft)	17.81	Wetted Per. (ft)		47.06	
Min Ch El (ft)	948.84	Shear (lb/sq ft)		0.61	

Alpha	1.00	Stream Power (lb/ft s)		2.84	
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	2.06	22.38	0.33
C & E Loss (ft)	0.01	Cum SA (acres)	1.80	4.33	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4907.867

INPUT
Description: 2
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	965.91	1.93	965.86	2.31	965.85	8.75	965.75	16.79	965.63
17.56	962.98	18.76	959.01	20.16	958.37	24.88	956.22	26.77	955.21
29.11	952.83	30.82	948.35	31.9	948.3	32.95	948.31	34.24	948.29
42.33	948.41	46.67	948.67	52.99	948.9	53.6	948.92	59.7	949.94
60.38	950.02	64.3	950.5	65.6	953.43	66.58	957.95	83.34	959.67
87.54	959.67	89.68	959.74	94.66	960.21	98.39	960.56	106.42	961.37
118.91	962.18	130.89	964.59	147.6	967.05				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.12	26.77	.04	66.58	.1	89.68	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
26.77	66.58	122.42	124.85	123.52	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	954.00	Element			
Vel Head (ft)	0.25	Wt. n-Val.		0.040	
W.S. Elev (ft)	953.75	Reach Len. (ft)	122.42	124.85	123.52
Crit W.S. (ft)		Flow Area (sq ft)		169.86	
E.G. Slope (ft/ft)	0.001873	Area (sq ft)		169.86	
Q Total (cfs)	680.00	Flow (cfs)		680.00	
Top Width (ft)	37.46	Top Width (ft)		37.46	
Vel Total (ft/s)	4.00	Avg. Vel. (ft/s)		4.00	
Max Chl Dpth (ft)	5.46	Hydr. Depth (ft)		4.53	
Conv. Total (cfs)	15713.5	Conv. (cfs)		15713.5	
Length Wtd. (ft)	124.85	Wetted Per. (ft)		43.22	
Min Ch El (ft)	948.29	Shear (lb/sq ft)		0.46	
Alpha	1.00	Stream Power (lb/ft s)		1.84	
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	3.26	18.86	1.43
C & E Loss (ft)	0.01	Cum SA (acres)	2.82	4.10	1.32

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	955.01	Element			
Vel Head (ft)	0.29	Wt. n-Val.		0.040	
W.S. Elev (ft)	954.72	Reach Len. (ft)	122.42	124.85	123.52
Crit W.S. (ft)		Flow Area (sq ft)		206.98	
E.G. Slope (ft/ft)	0.001782	Area (sq ft)		206.98	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	38.63	Top Width (ft)		38.63	
Vel Total (ft/s)	4.30	Avg. Vel. (ft/s)		4.30	
Max Chl Dpth (ft)	6.43	Hydr. Depth (ft)		5.36	
Conv. Total (cfs)	21081.7	Conv. (cfs)		21081.7	
Length Wtd. (ft)	124.85	Wetted Per. (ft)		45.59	
Min Ch El (ft)	948.29	Shear (lb/sq ft)		0.51	
Alpha	1.00	Stream Power (lb/ft s)		2.17	
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	2.06	22.30	0.33
C & E Loss (ft)	0.01	Cum SA (acres)	1.80	4.31	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4783.015

INPUT
Description: 3

Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	964.68	5.33	964.55	7.3	952.57	7.45	952.03	7.56	952.02
13.83	947.62	13.87	947.57	13.93	947.57	14.58	947.57	24.7	947.6
35.21	947.82	37.02	947.92	40.08	950.62	41.08	951.48	48.41	957.81
53.7	962.39	55.16	962.45	69.74	962.92	78.97	963.23	101.9	963.56
118.58	963.48	123.32	965.58	123.66	965.68	131.16	967.79		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	5.33	.04	53.7	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
5.33	53.7	18.84	18.63	18.24	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	953.78	Element			
Vel Head (ft)	0.23	Wt. n-Val.		0.040	
W.S. Elev (ft)	953.56	Reach Len. (ft)	18.84	18.63	18.24
Crit W.S. (ft)		Flow Area (sq ft)		178.63	
E.G. Slope (ft/ft)	0.001482	Area (sq ft)		178.63	
Q Total (cfs)	680.00	Flow (cfs)		680.00	
Top Width (ft)	36.35	Top Width (ft)		36.35	
Vel Total (ft/s)	3.81	Avg. Vel. (ft/s)		3.81	
Max Chl Dpth (ft)	5.99	Hydr. Depth (ft)		4.91	
Conv. Total (cfs)	17665.8	Conv. (cfs)		17665.8	
Length Wtd. (ft)	18.63	Wetted Per. (ft)		41.13	
Min Ch El (ft)	947.57	Shear (lb/sq ft)		0.40	
Alpha	1.00	Stream Power (lb/ft s)		1.53	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	3.26	18.36	1.43
C & E Loss (ft)	0.00	Cum SA (acres)	2.82	3.99	1.32

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	954.80	Element			
Vel Head (ft)	0.27	Wt. n-Val.		0.040	
W.S. Elev (ft)	954.53	Reach Len. (ft)	18.84	18.63	18.24
Crit W.S. (ft)		Flow Area (sq ft)		214.81	
E.G. Slope (ft/ft)	0.001484	Area (sq ft)		214.81	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	37.64	Top Width (ft)		37.64	
Vel Total (ft/s)	4.14	Avg. Vel. (ft/s)		4.14	
Max Chl Dpth (ft)	6.96	Hydr. Depth (ft)		5.71	
Conv. Total (cfs)	23100.8	Conv. (cfs)		23100.8	
Length Wtd. (ft)	18.63	Wetted Per. (ft)		43.61	
Min Ch El (ft)	947.57	Shear (lb/sq ft)		0.46	
Alpha	1.00	Stream Power (lb/ft s)		1.89	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	2.06	21.69	0.33
C & E Loss (ft)	0.01	Cum SA (acres)	1.80	4.20	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4764.388

INPUT
Description: 4
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	964.72	.67	964.7	3.11	964.62	8.15	964.45	9.43	964.42
9.98	964.41	10.09	963.74	12.09	956.3	12.11	956.3	13.5	955.32
19.84	947.39	27.28	947.67	29.8	947.68	33.36	947.75	42.54	947.68
46.01	951.35	51.62	956.18	57.59	961.35	62.45	961.5	83.83	962.2
86.85	962.24	104.71	962.48	113.01	962.43	123.42	967.06	124.17	967.27
127.91	968.33								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	9.98	.04	57.59	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9.98	57.59	48.37	45.95	44.99	.1	.3

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	953.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.		0.040	
W.S. Elev (ft)	953.48	Reach Len. (ft)	48.37	45.95	44.99
Crit W.S. (ft)		Flow Area (sq ft)		163.48	
E.G. Slope (ft/ft)	0.001843	Area (sq ft)		163.48	
Q Total (cfs)	680.00	Flow (cfs)		680.00	
Top Width (ft)	33.51	Top Width (ft)		33.51	
Vel Total (ft/s)	4.16	Avg. Vel. (ft/s)		4.16	
Max Chl Dpth (ft)	6.09	Hydr. Depth (ft)		4.88	
Conv. Total (cfs)	15838.9	Conv. (cfs)		15838.9	
Length Wtd. (ft)	45.95	Wetted Per. (ft)		38.81	
Min Ch El (ft)	947.39	Shear (lb/sq ft)		0.48	
Alpha	1.00	Stream Power (lb/ft s)		2.02	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	3.26	18.29	1.43
C & E Loss (ft)	0.04	Cum SA (acres)	2.82	3.98	1.32

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	954.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.		0.040	
W.S. Elev (ft)	954.45	Reach Len. (ft)	48.37	45.95	44.99
Crit W.S. (ft)		Flow Area (sq ft)		196.91	
E.G. Slope (ft/ft)	0.001859	Area (sq ft)		196.91	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	35.41	Top Width (ft)		35.41	
Vel Total (ft/s)	4.52	Avg. Vel. (ft/s)		4.52	
Max Chl Dpth (ft)	7.06	Hydr. Depth (ft)		5.56	
Conv. Total (cfs)	20640.8	Conv. (cfs)		20640.8	
Length Wtd. (ft)	45.95	Wetted Per. (ft)		41.54	
Min Ch El (ft)	947.39	Shear (lb/sq ft)		0.55	
Alpha	1.00	Stream Power (lb/ft s)		2.49	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	2.06	21.61	0.33
C & E Loss (ft)	0.04	Cum SA (acres)	1.80	4.18	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4718

INPUT
Description:
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	965.24	2.76	965.2	8.91	965.13	9.83	965.12	21.65	965.08
25.81	964.94	29	964.84	35.01	964.66	38.4	964.5	43.05	964.27
44.08	964.26	47.4	964.15	48.78	959.61	49.23	958.17	56.84	954.83
56.89	954.8	56.93	954.79	57.29	954.62	58.13	954.29	62.16	947.88
62.7	947.02	70.15	946.98	71.88	947	73.68	947	81.81	947.17
82.84	947.2	90.67	956.31	92.74	958.8	93.58	958.87	93.75	958.99
104.28	959.42	124.91	960.55	137.34	967.02	140.44	968.23		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	56.84	.04	92.74	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56.84	92.74	71.98	75.39	77.8	.1	.3

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	953.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.63	Wt. n-Val.		0.040	
W.S. Elev (ft)	952.94	Reach Len. (ft)	71.98	75.39	77.80
Crit W.S. (ft)		Flow Area (sq ft)		144.00	
E.G. Slope (ft/ft)	0.004437	Area (sq ft)		144.00	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	28.80	Top Width (ft)		28.80	
Vel Total (ft/s)	6.39	Avg. Vel. (ft/s)		6.39	
Max Chl Dpth (ft)	5.96	Hydr. Depth (ft)		5.00	
Conv. Total (cfs)	13811.1	Conv. (cfs)		13811.1	

Length Wtd. (ft)	75.38	Wetted Per. (ft)		34.71	
Min Ch El (ft)	946.98	Shear (lb/sq ft)		1.15	
Alpha	1.00	Stream Power (lb/ft s)		7.34	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	3.26	18.13	1.43
C & E Loss (ft)	0.02	Cum SA (acres)	2.82	3.94	1.32

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	954.59	Element			
Vel Head (ft)	0.74	Wt. n-Val.		0.040	
W.S. Elev (ft)	953.84	Reach Len. (ft)	71.98	75.39	77.80
Crit W.S. (ft)		Flow Area (sq ft)		170.59	
E.G. Slope (ft/ft)	0.004513	Area (sq ft)		170.59	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	30.14	Top Width (ft)		30.14	
Vel Total (ft/s)	6.92	Avg. Vel. (ft/s)		6.92	
Max Chl Dpth (ft)	6.86	Hydr. Depth (ft)		5.66	
Conv. Total (cfs)	17565.9	Conv. (cfs)		17565.9	
Length Wtd. (ft)	75.38	Wetted Per. (ft)		36.96	
Min Ch El (ft)	946.98	Shear (lb/sq ft)		1.30	
Alpha	1.00	Stream Power (lb/ft s)		8.99	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	2.06	21.41	0.33
C & E Loss (ft)	0.03	Cum SA (acres)	1.80	4.15	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4643.051

INPUT
Description: 5
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	963.92	1.83	963.85	2.78	960.82	3.65	958.04	5.06	957.49
8.02	956.63	17.07	952.9	17.88	952.59	23.27	950.51	24.64	947.3
24.8	946.95	26.35	946.82	36.34	946.11	42.31	946.56	42.77	946.6
42.83	946.6	45.12	949.85	49.15	955.57	50.52	958.85	54.97	959.06
70.87	959.95	70.9	959.95	75.43	961.27	80.72	962.42	88.01	966.04

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	23.27	.04	50.52	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
23.27	50.52	17.45	17.74	17.85	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	953.17	Element			
Vel Head (ft)	0.87	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	952.29	Reach Len. (ft)	17.45	17.74	17.85
Crit W.S. (ft)		Flow Area (sq ft)	4.11	122.01	
E.G. Slope (ft/ft)	0.005998	Area (sq ft)	4.11	122.01	
Q Total (cfs)	920.00	Flow (cfs)	3.49	916.51	
Top Width (ft)	28.19	Top Width (ft)	4.62	23.57	
Vel Total (ft/s)	7.29	Avg. Vel. (ft/s)	0.85	7.51	
Max Chl Dpth (ft)	6.18	Hydr. Depth (ft)	0.89	5.18	
Conv. Total (cfs)	11879.5	Conv. (cfs)	45.0	11834.4	
Length Wtd. (ft)	17.74	Wetted Per. (ft)	4.95	28.92	
Min Ch El (ft)	946.11	Shear (lb/sq ft)	0.31	1.58	
Alpha	1.06	Stream Power (lb/ft s)	0.26	11.87	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	3.26	17.90	1.43
C & E Loss (ft)	0.01	Cum SA (acres)	2.82	3.90	1.32

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	954.16	Element			
Vel Head (ft)	1.06	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	953.09	Reach Len. (ft)	17.45	17.74	17.85
Crit W.S. (ft)		Flow Area (sq ft)	6.82	141.08	
E.G. Slope (ft/ft)	0.006316	Area (sq ft)	6.82	141.08	
Q Total (cfs)	1180.00	Flow (cfs)	8.18	1171.82	

Top Width (ft)	27.75	Top Width (ft)	3.62	24.13	
Vel Total (ft/s)	7.98	Avg. Vel. (ft/s)	1.20	8.31	
Max Chl Dpth (ft)	6.98	Hydr. Depth (ft)	1.88	5.85	
Conv. Total (cfs)	14847.3	Conv. (cfs)	102.9	14744.4	
Length Wtd. (ft)	17.74	Wetted Per. (ft)	5.06	29.90	
Min Ch El (ft)	946.11	Shear (lb/sq ft)	0.53	1.86	
Alpha	1.08	Stream Power (lb/ft s)	0.64	15.46	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	2.06	21.14	0.33
C & E Loss (ft)	0.01	Cum SA (acres)	1.80	4.10	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4625.316

INPUT
Description: 6
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	964.02	3.82	963.89	5.47	963.83	7.13	963.78	8.55	959.13
8.93	957.85	10.27	957.35	15.55	955.47	25.27	951.64	28.72	950.24
29.88	947.6	30.48	946.86	31.89	946.84	36.51	946.48	40.58	946.16
44.1	946.29	48.98	946.41	49.55	948.43	49.78	949.23	53.69	958.56
61.71	959.08	62.79	959.18	65.52	959.41	73.53	962.91	78.07	964.82
78.68	965.16	80.01	965.19	80.52	965.21				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	28.72	.04	53.69	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
28.72	53.69	120.71	121.61	122.64	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	953.04	Element			
Vel Head (ft)	0.96	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	952.08	Reach Len. (ft)	120.71	121.61	122.64
Crit W.S. (ft)		Flow Area (sq ft)	4.17	116.08	
E.G. Slope (ft/ft)	0.006903	Area (sq ft)	4.17	116.08	
Q Total (cfs)	920.00	Flow (cfs)	3.85	916.15	
Top Width (ft)	26.82	Top Width (ft)	4.56	22.25	
Vel Total (ft/s)	7.65	Avg. Vel. (ft/s)	0.92	7.89	
Max Chl Dpth (ft)	5.92	Hydr. Depth (ft)	0.91	5.22	
Conv. Total (cfs)	11072.9	Conv. (cfs)	46.3	11026.6	
Length Wtd. (ft)	121.61	Wetted Per. (ft)	4.92	28.39	
Min Ch El (ft)	946.16	Shear (lb/sq ft)	0.37	1.76	
Alpha	1.06	Stream Power (lb/ft s)	0.34	13.91	
Frctn Loss (ft)	0.75	Cum Volume (acre-ft)	3.26	17.85	1.43
C & E Loss (ft)	0.06	Cum SA (acres)	2.82	3.89	1.32

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	954.02	Element			
Vel Head (ft)	1.20	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	952.83	Reach Len. (ft)	120.71	121.61	122.64
Crit W.S. (ft)		Flow Area (sq ft)	8.29	132.81	
E.G. Slope (ft/ft)	0.007461	Area (sq ft)	8.29	132.81	
Q Total (cfs)	1180.00	Flow (cfs)	9.96	1170.04	
Top Width (ft)	29.02	Top Width (ft)	6.46	22.57	
Vel Total (ft/s)	8.36	Avg. Vel. (ft/s)	1.20	8.81	
Max Chl Dpth (ft)	6.67	Hydr. Depth (ft)	1.28	5.89	
Conv. Total (cfs)	13660.7	Conv. (cfs)	115.3	13545.4	
Length Wtd. (ft)	121.61	Wetted Per. (ft)	6.96	29.20	
Min Ch El (ft)	946.16	Shear (lb/sq ft)	0.55	2.12	
Alpha	1.10	Stream Power (lb/ft s)	0.67	18.67	
Frctn Loss (ft)	0.81	Cum Volume (acre-ft)	2.05	21.09	0.33
C & E Loss (ft)	0.08	Cum SA (acres)	1.80	4.09	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4503.708

INPUT
Description: 7
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	963.51	.39	963.5	1.99	963.45	2.95	963.42	3.49	963.41
8.74	963.25	11.25	963.18	12.78	963.14	14.37	957.94	14.89	956.13
15.91	955.95	18.36	955.51	24.58	952.99	26.92	952.01	29.54	950.91
30.93	949.48	33.76	946.03	36.69	945.97	43.72	945.82	53.37	945.71
55.01	949.03	57.39	952.5	58.25	953.76	69.47	955	81.3	962.68
83.07	963.72								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	29.54	.04	58.25	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
29.54	58.25	19.61	18.66	18.24	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	952.23	Element			
Vel Head (ft)	0.76	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	951.46	Reach Len. (ft)	19.61	18.66	18.24
Crit W.S. (ft)		Flow Area (sq ft)	0.37	131.17	
E.G. Slope (ft/ft)	0.005597	Area (sq ft)	0.37	131.17	
Q Total (cfs)	920.00	Flow (cfs)	0.14	919.86	
Top Width (ft)	28.46	Top Width (ft)	1.32	27.14	
Vel Total (ft/s)	6.99	Avg. Vel. (ft/s)	0.37	7.01	
Max Chl Dpth (ft)	5.75	Hydr. Depth (ft)	0.28	4.83	
Conv. Total (cfs)	12297.0	Conv. (cfs)	1.8	12295.2	
Length Wtd. (ft)	18.66	Wetted Per. (ft)	1.43	32.72	
Min Ch El (ft)	945.71	Shear (lb/sq ft)	0.09	1.40	
Alpha	1.01	Stream Power (lb/ft s)	0.03	9.82	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	3.25	17.50	1.43
C & E Loss (ft)	0.03	Cum SA (acres)	2.81	3.82	1.32

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	953.14	Element			
Vel Head (ft)	0.94	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	952.20	Reach Len. (ft)	19.61	18.66	18.24
Crit W.S. (ft)		Flow Area (sq ft)	1.97	151.21	
E.G. Slope (ft/ft)	0.005928	Area (sq ft)	1.97	151.21	
Q Total (cfs)	1180.00	Flow (cfs)	1.33	1178.68	
Top Width (ft)	30.71	Top Width (ft)	3.06	27.64	
Vel Total (ft/s)	7.70	Avg. Vel. (ft/s)	0.67	7.79	
Max Chl Dpth (ft)	6.49	Hydr. Depth (ft)	0.64	5.47	
Conv. Total (cfs)	15325.6	Conv. (cfs)	17.2	15308.4	
Length Wtd. (ft)	18.66	Wetted Per. (ft)	3.32	33.61	
Min Ch El (ft)	945.71	Shear (lb/sq ft)	0.22	1.67	
Alpha	1.02	Stream Power (lb/ft s)	0.15	12.98	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	2.04	20.69	0.33
C & E Loss (ft)	0.03	Cum SA (acres)	1.78	4.02	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4485.049

INPUT
Description: 8
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	963.45	3.52	963.37	4.17	963.36	5.48	963.33	5.84	963.32
16.65	963.01	16.83	962.35	18.69	955.86	21.87	955.29	25.42	954.1
26.23	953.76	32.95	950.95	36.12	946.7	36.63	945.94	41.88	945.89
44.24	945.86	53.34	945.76	54.97	945.75	55.15	945.74	56.32	945.73
58.21	945.71	62.08	953.54	62.18	953.69	74.43	954.49	76.08	955.54
90.44	963.6								

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Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .12   32.95     .04   62.18      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         32.95   62.18            123.05  123.21  122.55            .1       .3

CROSS SECTION OUTPUT  Profile #2yr

  E.G. Elev (ft)            952.10    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.67    Wt. n-Val.                0.120      0.040
  W.S. Elev (ft)            951.43    Reach Len. (ft)          123.05     123.21    122.55
  Crit W.S. (ft)                      Flow Area (sq ft)          0.28     139.96
  E.G. Slope (ft/ft)      0.004779    Area (sq ft)               0.28     139.96
  Q Total (cfs)             920.00    Flow (cfs)                 0.09     919.91
  Top Width (ft)             29.24    Top Width (ft)             1.15      28.09
  Vel Total (ft/s)            6.56    Avg. Vel. (ft/s)           0.31       6.57
  Max Chl Dpth (ft)           5.72    Hydr. Depth (ft)           0.24       4.98
  Conv. Total (cfs)        13308.7    Conv. (cfs)                 1.3    13307.4
  Length Wtd. (ft)          123.21    Wetted Per. (ft)           1.25      34.18
  Min Ch El (ft)            945.71    Shear (lb/sq ft)           0.07       1.22
  Alpha                       1.00    Stream Power (lb/ft s)     0.02       8.03
  Frctn Loss (ft)             0.64    Cum Volume (acre-ft)       3.25      17.45       1.43
  C & E Loss (ft)             0.00    Cum SA (acres)             2.81       3.81       1.32

CROSS SECTION OUTPUT  Profile #5yr

  E.G. Elev (ft)            953.00    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.83    Wt. n-Val.                0.120      0.040
  W.S. Elev (ft)            952.17    Reach Len. (ft)          123.05     123.21    122.55
  Crit W.S. (ft)                      Flow Area (sq ft)          1.78     160.79
  E.G. Slope (ft/ft)      0.005102    Area (sq ft)               1.78     160.79
  Q Total (cfs)            1180.00    Flow (cfs)                 1.07    1178.93
  Top Width (ft)             31.37    Top Width (ft)             2.92      28.45
  Vel Total (ft/s)            7.26    Avg. Vel. (ft/s)           0.60       7.33
  Max Chl Dpth (ft)           6.46    Hydr. Depth (ft)           0.61       5.65
  Conv. Total (cfs)        16519.8    Conv. (cfs)                15.0    16504.8
  Length Wtd. (ft)          123.21    Wetted Per. (ft)           3.16      35.00
  Min Ch El (ft)            945.71    Shear (lb/sq ft)           0.18       1.46
  Alpha                       1.02    Stream Power (lb/ft s)     0.11      10.73
  Frctn Loss (ft)             0.68    Cum Volume (acre-ft)       2.04      20.62       0.33
  C & E Loss (ft)             0.00    Cum SA (acres)             1.78       4.01       0.24

CROSS SECTION


RIVER: Hope Creek
REACH: 1                    RS: 4361.840

INPUT
Description: 9
Station Elevation Data      num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  962.69    6.91  962.51    8.76  962.46   10.72  962.42    12.4   954.7
    12.5  954.31   12.67  954.25   13.15  954.08   14.04  953.78   14.58   953.6
   15.31  953.34   16.24  951.74   19.82   945.6   31.24  945.61   34.44  945.61
    40.9  945.67   44.56  947.95   46.06  948.99   48.39   950.6   51.59  952.81
    84.6  952.41   90.38  955.59  105.23  964.09  108.02  964.18  111.62  964.54

Manning's n Values          num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .12   15.31     .04   51.59      .1    84.6     .12

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         15.31   51.59                 19   18.54      18            .1       .3

CROSS SECTION OUTPUT  Profile #2yr

  E.G. Elev (ft)            951.46    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.71    Wt. n-Val.                          0.040
  W.S. Elev (ft)            950.74    Reach Len. (ft)           19.00     18.54      18.00
  Crit W.S. (ft)                      Flow Area (sq ft)                   135.83
  E.G. Slope (ft/ft)      0.005714    Area (sq ft)                        135.83
  Q Total (cfs)             920.00    Flow (cfs)                          920.00
```

Top Width (ft)	31.78	Top Width (ft)		31.78	
Vel Total (ft/s)	6.77	Avg. Vel. (ft/s)		6.77	
Max Chl Dpth (ft)	5.14	Hydr. Depth (ft)		4.27	
Conv. Total (cfs)	12170.8	Conv. (cfs)		12170.8	
Length Wtd. (ft)	18.54	Wetted Per. (ft)		36.26	
Min Ch El (ft)	945.60	Shear (lb/sq ft)		1.34	
Alpha	1.00	Stream Power (lb/ft s)		9.05	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	3.25	17.06	1.43
C & E Loss (ft)	0.00	Cum SA (acres)	2.81	3.72	1.32

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	952.33	Element			
Vel Head (ft)	0.85	Wt. n-Val.		0.040	
W.S. Elev (ft)	951.48	Reach Len. (ft)	19.00	18.54	18.00
Crit W.S. (ft)		Flow Area (sq ft)		159.76	
E.G. Slope (ft/ft)	0.005909	Area (sq ft)		159.76	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	33.27	Top Width (ft)		33.27	
Vel Total (ft/s)	7.39	Avg. Vel. (ft/s)		7.39	
Max Chl Dpth (ft)	5.88	Hydr. Depth (ft)		4.80	
Conv. Total (cfs)	15351.0	Conv. (cfs)		15351.0	
Length Wtd. (ft)	18.54	Wetted Per. (ft)		38.40	
Min Ch El (ft)	945.60	Shear (lb/sq ft)		1.53	
Alpha	1.00	Stream Power (lb/ft s)		11.33	
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	2.04	20.17	0.33
C & E Loss (ft)	0.00	Cum SA (acres)	1.78	3.92	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4343.304

INPUT
Description: 10
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	962.75	2.83	962.69	5.38	962.65	7.5	962.59	17.43	962.34
17.94	962.33	18.38	960.31	19.76	954.38	22.42	953.49	22.55	953.44
23.4	952.01	25.1	949.1	27.32	945.35	31.59	945.36	47.83	945.51
55.92	950.55	56.85	951.13	59.44	952.91	91.48	952.73	104.1	959.69
112.56	964.53	114.13	964.58	121.89	965.37				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.12	22.55	.04	59.44	.1	91.48	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
22.55	59.44	119.24	120.83	121.61	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	951.35	Element			
Vel Head (ft)	0.70	Wt. n-Val.		0.040	
W.S. Elev (ft)	950.65	Reach Len. (ft)	119.24	120.83	121.61
Crit W.S. (ft)		Flow Area (sq ft)		136.65	
E.G. Slope (ft/ft)	0.005623	Area (sq ft)		136.65	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	31.88	Top Width (ft)		31.88	
Vel Total (ft/s)	6.73	Avg. Vel. (ft/s)		6.73	
Max Chl Dpth (ft)	5.30	Hydr. Depth (ft)		4.29	
Conv. Total (cfs)	12269.2	Conv. (cfs)		12269.2	
Length Wtd. (ft)	120.83	Wetted Per. (ft)		36.37	
Min Ch El (ft)	945.35	Shear (lb/sq ft)		1.32	
Alpha	1.00	Stream Power (lb/ft s)		8.88	
Frctn Loss (ft)	0.59	Cum Volume (acre-ft)	3.25	17.00	1.43
C & E Loss (ft)	0.04	Cum SA (acres)	2.81	3.71	1.32

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	952.22	Element			
Vel Head (ft)	0.84	Wt. n-Val.		0.040	

W.S. Elev (ft)	951.38	Reach Len. (ft)	119.24	120.83	121.61
Crit W.S. (ft)		Flow Area (sq ft)		160.57	
E.G. Slope (ft/ft)	0.005844	Area (sq ft)		160.57	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	33.44	Top Width (ft)		33.44	
Vel Total (ft/s)	7.35	Avg. Vel. (ft/s)		7.35	
Max Chl Dpth (ft)	6.03	Hydr. Depth (ft)		4.80	
Conv. Total (cfs)	15435.8	Conv. (cfs)		15435.8	
Length Wtd. (ft)	120.83	Wetted Per. (ft)		38.57	
Min Ch El (ft)	945.35	Shear (lb/sq ft)		1.52	
Alpha	1.00	Stream Power (lb/ft s)		11.16	
Frctn Loss (ft)	0.62	Cum Volume (acre-ft)	2.04	20.10	0.33
C & E Loss (ft)	0.05	Cum SA (acres)	1.78	3.91	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4222.473

INPUT
Description: 11
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	962.49	5.38	962.43	12.33	962.3	17.83	962.21	25.34	962.02
31.08	961.87	36.85	961.65	37.69	961.61	43.31	961.38	44.12	957.35
45.03	953.38	45.83	953.06	47.12	952.47	48.19	951.2	48.86	950.4
52.74	944.93	60.13	944.92	70.85	944.9	72.54	944.9	74.62	944.89
76.22	944.89	77.09	945.5	85.57	951.55	87.81	952.34	122	952.05
141.61	951.88	143.22	952.51	143.95	952.88	145.07	953.51	155.2	959.17
163.34	964.05	164.81	964.57	166.55	964.78	177.49	965.36	179.37	965.75

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.12	47.12	.04	87.81	.1	122	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
47.12	87.81	17.55	18	17.71	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	950.72	Element			
Vel Head (ft)	0.57	Wt. n-Val.		0.040	
W.S. Elev (ft)	950.15	Reach Len. (ft)	17.55	18.00	17.71
Crit W.S. (ft)		Flow Area (sq ft)		152.05	
E.G. Slope (ft/ft)	0.004315	Area (sq ft)		152.05	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	34.57	Top Width (ft)		34.57	
Vel Total (ft/s)	6.05	Avg. Vel. (ft/s)		6.05	
Max Chl Dpth (ft)	5.26	Hydr. Depth (ft)		4.40	
Conv. Total (cfs)	14005.2	Conv. (cfs)		14005.2	
Length Wtd. (ft)	18.00	Wetted Per. (ft)		38.94	
Min Ch El (ft)	944.89	Shear (lb/sq ft)		1.05	
Alpha	1.00	Stream Power (lb/ft s)		6.36	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	3.25	16.60	1.43
C & E Loss (ft)	0.02	Cum SA (acres)	2.81	3.62	1.32

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	951.55	Element			
Vel Head (ft)	0.69	Wt. n-Val.		0.040	
W.S. Elev (ft)	950.86	Reach Len. (ft)	17.55	18.00	17.71
Crit W.S. (ft)		Flow Area (sq ft)		177.23	
E.G. Slope (ft/ft)	0.004574	Area (sq ft)		177.23	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	36.13	Top Width (ft)		36.13	
Vel Total (ft/s)	6.66	Avg. Vel. (ft/s)		6.66	
Max Chl Dpth (ft)	5.97	Hydr. Depth (ft)		4.91	
Conv. Total (cfs)	17448.0	Conv. (cfs)		17448.0	
Length Wtd. (ft)	18.00	Wetted Per. (ft)		41.08	
Min Ch El (ft)	944.89	Shear (lb/sq ft)		1.23	
Alpha	1.00	Stream Power (lb/ft s)		8.20	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	2.04	19.63	0.33
C & E Loss (ft)	0.03	Cum SA (acres)	1.78	3.81	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4204.470

INPUT
Description: 12
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	962.32	.81	962.31	12.72	962.09	13.15	962.08	13.23	962.08
13.34	962.08	15.34	962.03	25.81	961.75	26.55	961.73	38.57	961.27
38.73	961.26	40.2	953.99	40.42	952.86	42.13	952.18	42.78	951.91
46.47	947.57	47.12	946.81	47.93	945.86	48.93	944.81	52.39	944.78
53.79	944.78	73.57	944.78	73.66	944.84	74.92	945.73	82.68	951.95
117	951.46	135.9	951.19	143.86	955.94	167.53	964.49	178.33	965.76
180.52	966.11								

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.12	42.78	.04	82.68	.1	117	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
42.78	82.68	124.62	124.01	123.48	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	950.62	Element			
Vel Head (ft)	0.50	Wt. n-Val.		0.040	
W.S. Elev (ft)	950.13	Reach Len. (ft)	124.62	124.01	123.48
Crit W.S. (ft)		Flow Area (sq ft)		162.93	
E.G. Slope (ft/ft)	0.003597	Area (sq ft)		162.93	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	36.11	Top Width (ft)		36.11	
Vel Total (ft/s)	5.65	Avg. Vel. (ft/s)		5.65	
Max Chl Dpth (ft)	5.35	Hydr. Depth (ft)		4.51	
Conv. Total (cfs)	15340.1	Conv. (cfs)		15340.1	
Length Wtd. (ft)	124.01	Wetted Per. (ft)		40.38	
Min Ch El (ft)	944.78	Shear (lb/sq ft)		0.91	
Alpha	1.00	Stream Power (lb/ft s)		5.12	
Frctn Loss (ft)	0.52	Cum Volume (acre-ft)	3.25	16.53	1.43
C & E Loss (ft)	0.01	Cum SA (acres)	2.81	3.60	1.32

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	951.45	Element			
Vel Head (ft)	0.60	Wt. n-Val.		0.040	
W.S. Elev (ft)	950.84	Reach Len. (ft)	124.62	124.01	123.48
Crit W.S. (ft)		Flow Area (sq ft)		189.34	
E.G. Slope (ft/ft)	0.003835	Area (sq ft)		189.34	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	37.61	Top Width (ft)		37.61	
Vel Total (ft/s)	6.23	Avg. Vel. (ft/s)		6.23	
Max Chl Dpth (ft)	6.06	Hydr. Depth (ft)		5.03	
Conv. Total (cfs)	19053.5	Conv. (cfs)		19053.5	
Length Wtd. (ft)	124.01	Wetted Per. (ft)		42.46	
Min Ch El (ft)	944.78	Shear (lb/sq ft)		1.07	
Alpha	1.00	Stream Power (lb/ft s)		6.65	
Frctn Loss (ft)	0.54	Cum Volume (acre-ft)	2.04	19.56	0.33
C & E Loss (ft)	0.01	Cum SA (acres)	1.78	3.80	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4080.463

INPUT
Description: 13
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	961.33	9.34	961.1	11.62	960.98	11.79	960.97	21.38	960.45

```
   21.66  959.31      22  957.74   22.73  954.39   47.22  954.39    51.8   952.1
    59.8   952.1    62.6   953.5    67.6   953.5    85.6   944.5   105.6   944.5
  120.16  951.78     134  951.39  136.05  950.57  137.34  950.11   142.4  948.34
  143.51  948.64  147.54  950.75  157.32  954.87  163.92  957.65  167.25  959.05
  177.01  960.09  190.28  961.31  194.49  963.13

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .12    67.6     .04  120.16     .12

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          67.6  120.16             17.85   17.74   17.82              .1       .3

CROSS SECTION OUTPUT  Profile #2yr

  E.G. Elev (ft)            950.10    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.57    Wt. n-Val.                          0.040     0.120
  W.S. Elev (ft)            949.53    Reach Len. (ft)           17.85     17.74     17.82
  Crit W.S. (ft)                      Flow Area (sq ft)                  151.00      3.90
  E.G. Slope (ft/ft)      0.004931    Area (sq ft)                       151.00      3.90
  Q Total (cfs)             920.00    Flow (cfs)                         917.62      2.38
  Top Width (ft)             46.29    Top Width (ft)                      40.10      6.19
  Vel Total (ft/s)            5.94    Avg. Vel. (ft/s)                     6.08      0.61
  Max Chl Dpth (ft)           5.03    Hydr. Depth (ft)                     3.77      0.63
  Conv. Total (cfs)        13101.0    Conv. (cfs)                       13067.1      33.9
  Length Wtd. (ft)           17.74    Wetted Per. (ft)                    42.47      6.65
  Min Ch El (ft)            944.50    Shear (lb/sq ft)                     1.09      0.18
  Alpha                       1.04    Stream Power (lb/ft s)               6.65      0.11
  Frctn Loss (ft)             0.08    Cum Volume (acre-ft)      3.25      16.09      1.42
  C & E Loss (ft)             0.01    Cum SA (acres)            2.81       3.49      1.32

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT  Profile #5yr

  E.G. Elev (ft)            950.91    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.66    Wt. n-Val.                          0.040
  W.S. Elev (ft)            950.25    Reach Len. (ft)           17.85     17.74     17.82
  Crit W.S. (ft)                      Flow Area (sq ft)                  180.92
  E.G. Slope (ft/ft)      0.004922    Area (sq ft)                       180.92
  Q Total (cfs)            1180.00    Flow (cfs)                        1180.00
  Top Width (ft)             42.98    Top Width (ft)                      42.98
  Vel Total (ft/s)            6.52    Avg. Vel. (ft/s)                     6.52
  Max Chl Dpth (ft)           5.75    Hydr. Depth (ft)                     4.21
  Conv. Total (cfs)        16820.0    Conv. (cfs)                       16820.0
  Length Wtd. (ft)           17.74    Wetted Per. (ft)                    45.69
  Min Ch El (ft)            944.50    Shear (lb/sq ft)                     1.22
  Alpha                       1.00    Stream Power (lb/ft s)               7.93
  Frctn Loss (ft)             0.08    Cum Volume (acre-ft)      2.04      19.03      0.33
  C & E Loss (ft)             0.01    Cum SA (acres)            1.78       3.68      0.24

CROSS SECTION


RIVER: Hope Creek
REACH: 1                   RS: 4062.727

INPUT
Description: 14
Station Elevation Data     num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  961.35     .05  961.35    8.73  961.14   13.47  961.02   20.16  960.66
    21.8  960.57   22.24  960.55   24.06  960.45   24.86  960.41   25.56  960.37
   26.99  954.56   27.06  954.24   51.09  954.24   55.67  951.95   63.67  951.95
   66.47  953.35   71.47  953.35   89.47  944.35  109.47  944.35  124.03  951.63
  140.23  951.23  143.98  950.75  149.95  948.75  150.86  948.45  152.32  949.01
  155.42  950.92  159.93  952.82  190.27  956.12  191.91  956.42  192.39  956.67
  206.62  963.85

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .12   71.47     .04  124.03     .12

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

71.47 124.03 120.53 121.82 121.07 .1 .3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	950.01	Element			
Vel Head (ft)	0.55	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	949.46	Reach Len. (ft)	120.53	121.82	121.07
Crit W.S. (ft)		Flow Area (sq ft)		154.25	2.74
E.G. Slope (ft/ft)	0.004655	Area (sq ft)		154.25	2.74
Q Total (cfs)	920.00	Flow (cfs)		918.56	1.44
Top Width (ft)	45.62	Top Width (ft)		40.42	5.20
Vel Total (ft/s)	5.86	Avg. Vel. (ft/s)		5.95	0.53
Max Chl Dpth (ft)	5.11	Hydr. Depth (ft)		3.82	0.53
Conv. Total (cfs)	13483.6	Conv. (cfs)		13462.5	21.1
Length Wtd. (ft)	121.82	Wetted Per. (ft)		42.83	5.59
Min Ch El (ft)	944.35	Shear (lb/sq ft)		1.05	0.14
Alpha	1.03	Stream Power (lb/ft s)		6.23	0.07
Frctn Loss (ft)	0.64	Cum Volume (acre-ft)	3.25	16.02	1.42
C & E Loss (ft)	0.01	Cum SA (acres)	2.81	3.48	1.31

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	950.81	Element			
Vel Head (ft)	0.64	Wt. n-Val.		0.040	
W.S. Elev (ft)	950.18	Reach Len. (ft)	120.53	121.82	121.07
Crit W.S. (ft)		Flow Area (sq ft)		184.49	
E.G. Slope (ft/ft)	0.004661	Area (sq ft)		184.49	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	43.31	Top Width (ft)		43.31	
Vel Total (ft/s)	6.40	Avg. Vel. (ft/s)		6.40	
Max Chl Dpth (ft)	5.83	Hydr. Depth (ft)		4.26	
Conv. Total (cfs)	17283.8	Conv. (cfs)		17283.8	
Length Wtd. (ft)	121.82	Wetted Per. (ft)		46.06	
Min Ch El (ft)	944.35	Shear (lb/sq ft)		1.17	
Alpha	1.00	Stream Power (lb/ft s)		7.45	
Frctn Loss (ft)	0.63	Cum Volume (acre-ft)	2.04	18.96	0.33
C & E Loss (ft)	0.01	Cum SA (acres)	1.78	3.67	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3940.903

INPUT
Description: 15
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960.68	1.45	960.65	3.61	960.62	7.93	960.51	8.56	960.49
9.12	960.48	13.03	960.38	15.98	960.31	16.3	960.3	16.85	960.29
17.34	960.26	28.75	959.73	29.55	956.84	30.51	953.75	52.65	953.75
57.09	951.53	65.09	951.53	67.89	952.93	72.89	952.93	90.89	943.93
110.89	943.93	125.39	951.18	146.62	949.48	148.42	948.9	150.72	947.56
151.28	947.79	161.7	951.21	166.68	951.49	199.63	951.75	201.05	952.11
222.06	960.02	226.18	960.22	259	961.9	278.73	962.16		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	72.89	.04	125.39	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
72.89	125.39	18.03	18.27	18.28	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.35	Element			
Vel Head (ft)	0.66	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	948.69	Reach Len. (ft)	18.03	18.27	18.28
Crit W.S. (ft)		Flow Area (sq ft)		140.40	2.88
E.G. Slope (ft/ft)	0.006059	Area (sq ft)		140.40	2.88
Q Total (cfs)	920.00	Flow (cfs)		918.24	1.76
Top Width (ft)	44.26	Top Width (ft)		39.03	5.23

Vel Total (ft/s)	6.42	Avg. Vel. (ft/s)		6.54	0.61
Max Chl Dpth (ft)	4.76	Hydr. Depth (ft)		3.60	0.55
Conv. Total (cfs)	11819.2	Conv. (cfs)		11796.6	22.6
Length Wtd. (ft)	18.27	Wetted Per. (ft)		41.27	5.72
Min Ch El (ft)	943.93	Shear (lb/sq ft)		1.29	0.19
Alpha	1.04	Stream Power (lb/ft s)		8.42	0.12
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	3.25	15.61	1.41
C & E Loss (ft)	0.05	Cum SA (acres)	2.81	3.37	1.30

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	950.17	Element			
Vel Head (ft)	0.75	Wt. n-Val.		0.040	
W.S. Elev (ft)	949.42	Reach Len. (ft)	18.03	18.27	18.28
Crit W.S. (ft)		Flow Area (sq ft)		170.13	
E.G. Slope (ft/ft)	0.005841	Area (sq ft)		170.13	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	41.97	Top Width (ft)		41.97	
Vel Total (ft/s)	6.94	Avg. Vel. (ft/s)		6.94	
Max Chl Dpth (ft)	5.49	Hydr. Depth (ft)		4.05	
Conv. Total (cfs)	15439.6	Conv. (cfs)		15439.6	
Length Wtd. (ft)	18.27	Wetted Per. (ft)		44.56	
Min Ch El (ft)	943.93	Shear (lb/sq ft)		1.39	
Alpha	1.00	Stream Power (lb/ft s)		9.66	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	2.04	18.46	0.33
C & E Loss (ft)	0.05	Cum SA (acres)	1.78	3.55	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3922.633

INPUT
Description: 16
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960.65	3.73	960.57	7.7	960.51	14.77	960.32	20.96	960.17
26.91	959.9	28.47	959.83	29.14	959.8	30.44	959.74	30.97	959.72
31.02	959.71	32.86	959.63	32.98	959.2	34.75	953.55	35.63	953.25
56.52	953.25	60.96	951.03	68.96	951.03	71.76	952.43	76.76	952.43
94.76	943.43	114.76	943.43	129.26	950.68	131.48	950.67	140.73	950.24
149.3	947.46	149.86	947.13	154.31	948.95	157.61	950.04	184.55	951.51
203.92	951.67	218.45	955.37	230.11	959.75	230.6	959.77	250.05	960.78
261.18	960.9	295.23	962.45						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	76.76	.04	129.26	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
76.76	129.26	121.49	122.76	124.97	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.21	Element			
Vel Head (ft)	0.50	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	948.71	Reach Len. (ft)	121.49	122.76	124.97
Crit W.S. (ft)		Flow Area (sq ft)		161.38	6.26
E.G. Slope (ft/ft)	0.004081	Area (sq ft)		161.38	6.26
Q Total (cfs)	920.00	Flow (cfs)		916.08	3.92
Top Width (ft)	49.40	Top Width (ft)		41.12	8.28
Vel Total (ft/s)	5.49	Avg. Vel. (ft/s)		5.68	0.63
Max Chl Dpth (ft)	5.28	Hydr. Depth (ft)		3.92	0.76
Conv. Total (cfs)	14402.2	Conv. (cfs)		14340.8	61.4
Length Wtd. (ft)	122.76	Wetted Per. (ft)		43.61	8.88
Min Ch El (ft)	943.43	Shear (lb/sq ft)		0.94	0.18
Alpha	1.07	Stream Power (lb/ft s)		5.35	0.11
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	3.25	15.55	1.41
C & E Loss (ft)	0.03	Cum SA (acres)	2.81	3.35	1.30

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	950.03	Element			
Vel Head (ft)	0.58	Wt. n-Val.		0.040	
W.S. Elev (ft)	949.45	Reach Len. (ft)	121.49	122.76	124.97
Crit W.S. (ft)		Flow Area (sq ft)		192.70	
E.G. Slope (ft/ft)	0.004130	Area (sq ft)		192.70	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	44.06	Top Width (ft)		44.06	
Vel Total (ft/s)	6.12	Avg. Vel. (ft/s)		6.12	
Max Chl Dpth (ft)	6.02	Hydr. Depth (ft)		4.37	
Conv. Total (cfs)	18362.0	Conv. (cfs)		18362.0	
Length Wtd. (ft)	122.76	Wetted Per. (ft)		46.90	
Min Ch El (ft)	943.43	Shear (lb/sq ft)		1.06	
Alpha	1.00	Stream Power (lb/ft s)		6.49	
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	2.04	18.38	0.33
C & E Loss (ft)	0.04	Cum SA (acres)	1.78	3.53	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3799.870

INPUT
Description: 17
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	959.27	5.2	959.02	7.96	958.9	9.49	958.84	10.79	952.31
25.46	952.31	29.78	950.15	37.78	950.15	40.58	951.55	48.58	951.55
66.58	942.55	86.58	942.55	98.54	948.53	107.55	949.01	109.65	948.99
113.54	948.44	132.09	948.53	136.05	949.46	154.64	949.63	179.04	949.75
184.92	949.94	197.4	950.31	226.61	951.21	256.43	951.91	278.92	952.23
279.83	952.61	281.1	959.19						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	48.58	.04	98.54	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
48.58	98.54	19.61	18.77	18.18	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
235	281.1		F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	948.76	Element			
Vel Head (ft)	0.39	Wt. n-Val.		0.040	
W.S. Elev (ft)	948.37	Reach Len. (ft)	19.61	18.77	18.18
Crit W.S. (ft)		Flow Area (sq ft)		184.31	
E.G. Slope (ft/ft)	0.002841	Area (sq ft)		184.31	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	43.30	Top Width (ft)		43.30	
Vel Total (ft/s)	4.99	Avg. Vel. (ft/s)		4.99	
Max Chl Dpth (ft)	5.82	Hydr. Depth (ft)		4.26	
Conv. Total (cfs)	17260.7	Conv. (cfs)		17260.7	
Length Wtd. (ft)	18.77	Wetted Per. (ft)		46.04	
Min Ch El (ft)	942.55	Shear (lb/sq ft)		0.71	
Alpha	1.00	Stream Power (lb/ft s)		3.54	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	3.25	15.06	1.40
C & E Loss (ft)	0.01	Cum SA (acres)	2.81	3.23	1.28

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.57	Element			
Vel Head (ft)	0.46	Wt. n-Val.		0.040	
W.S. Elev (ft)	949.11	Reach Len. (ft)	19.61	18.77	18.18
Crit W.S. (ft)		Flow Area (sq ft)		216.84	
E.G. Slope (ft/ft)	0.002923	Area (sq ft)		216.84	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	45.08	Top Width (ft)		45.08	

Vel Total (ft/s)	5.44	Avg. Vel. (ft/s)		5.44	
Max Chl Dpth (ft)	6.56	Hydr. Depth (ft)		4.81	
Conv. Total (cfs)	21827.4	Conv. (cfs)		21827.4	
Length Wtd. (ft)	18.77	Wetted Per. (ft)		48.61	
Min Ch El (ft)	942.55	Shear (lb/sq ft)		0.81	
Alpha	1.00	Stream Power (lb/ft s)		4.43	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	2.04	17.81	0.33
C & E Loss (ft)	0.01	Cum SA (acres)	1.78	3.40	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3781.101

INPUT
Description: 18
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	959.29	1.65	959.25	3.76	959.16	4.12	959.14	13.32	958.75
13.54	957.59	14.46	952.92	14.62	952.11	32.34	952.11	36.66	949.95
44.66	949.95	47.46	951.35	55.46	951.35	73.46	942.35	93.46	942.35
105.42	948.33	115.26	948.84	135.98	949.23	139.96	949.2	149.09	949.27
173.47	949.38	190.53	949.93	226.75	951.01	237.46	951.34	248.38	951.6
266.11	951.56	284.21	959.15						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	55.46	.04	105.42	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
55.46	105.42	119.49	121.49	122.1	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
256	284.21		F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	948.70	Element			
Vel Head (ft)	0.36	Wt. n-Val.		0.040	0.000
W.S. Elev (ft)	948.34	Reach Len. (ft)	119.49	121.49	122.10
Crit W.S. (ft)		Flow Area (sq ft)		191.73	0.00
E.G. Slope (ft/ft)	0.002543	Area (sq ft)		191.73	0.00
Q Total (cfs)	920.00	Flow (cfs)		920.00	0.00
Top Width (ft)	44.22	Top Width (ft)		43.95	0.27
Vel Total (ft/s)	4.80	Avg. Vel. (ft/s)		4.80	0.02
Max Chl Dpth (ft)	5.99	Hydr. Depth (ft)		4.36	0.01
Conv. Total (cfs)	18242.5	Conv. (cfs)		18242.5	0.0
Length Wtd. (ft)	121.49	Wetted Per. (ft)		46.77	0.27
Min Ch El (ft)	942.35	Shear (lb/sq ft)		0.65	
Alpha	1.00	Stream Power (lb/ft s)		3.12	
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	3.25	14.98	1.40
C & E Loss (ft)	0.00	Cum SA (acres)	2.81	3.21	1.28

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.51	Element			
Vel Head (ft)	0.43	Wt. n-Val.		0.040	
W.S. Elev (ft)	949.08	Reach Len. (ft)	119.49	121.49	122.10
Crit W.S. (ft)		Flow Area (sq ft)		224.51	
E.G. Slope (ft/ft)	0.002642	Area (sq ft)		224.51	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	45.41	Top Width (ft)		45.41	
Vel Total (ft/s)	5.26	Avg. Vel. (ft/s)		5.26	
Max Chl Dpth (ft)	6.73	Hydr. Depth (ft)		4.94	
Conv. Total (cfs)	22956.3	Conv. (cfs)		22956.3	
Length Wtd. (ft)	121.49	Wetted Per. (ft)		49.16	
Min Ch El (ft)	942.35	Shear (lb/sq ft)		0.75	
Alpha	1.00	Stream Power (lb/ft s)		3.96	
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	2.04	17.71	0.33
C & E Loss (ft)	0.00	Cum SA (acres)	1.78	3.38	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3659.612

INPUT
Description: 19
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	958.56	1.96	958.5	9.17	958.21	9.55	958.2	11.04	958.14
12.46	958.08	13.47	958.04	14.61	951.91	29.17	951.91	33.49	949.75
41.49	949.75	44.29	951.15	52.29	951.15	70.29	942.15	90.29	942.15
102.25	948.13	123.09	948.32	146.41	948.84	146.75	948.96	147.21	948.95
148.2	948.93	150.32	949.33	166.85	950.26	169.53	950.34	175.61	950.53
187.64	950.88	213.53	951.16	213.96	951.17	222.01	951.3	223.95	951.47
253.44	954.12	256.95	954.23	257.56	954.27	257.9	954.8	259.28	955.3
272.54	960.14								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	52.29	.04	102.25	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
52.29	102.25	18.36	18.18	17.87	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	948.37	Element			
Vel Head (ft)	0.38	Wt. n-Val.		0.040	
W.S. Elev (ft)	947.99	Reach Len. (ft)	18.36	18.18	17.87
Crit W.S. (ft)		Flow Area (sq ft)		185.04	
E.G. Slope (ft/ft)	0.002810	Area (sq ft)		185.04	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	43.36	Top Width (ft)		43.36	
Vel Total (ft/s)	4.97	Avg. Vel. (ft/s)		4.97	
Max Chl Dpth (ft)	5.84	Hydr. Depth (ft)		4.27	
Conv. Total (cfs)	17355.9	Conv. (cfs)		17355.9	
Length Wtd. (ft)	18.18	Wetted Per. (ft)		46.12	
Min Ch El (ft)	942.15	Shear (lb/sq ft)		0.70	
Alpha	1.00	Stream Power (lb/ft s)		3.50	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	3.25	14.46	1.40
C & E Loss (ft)	0.00	Cum SA (acres)	2.81	3.09	1.28

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.17	Element			
Vel Head (ft)	0.46	Wt. n-Val.		0.040	
W.S. Elev (ft)	948.71	Reach Len. (ft)	18.36	18.18	17.87
Crit W.S. (ft)		Flow Area (sq ft)		216.76	
E.G. Slope (ft/ft)	0.002926	Area (sq ft)		216.76	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	45.07	Top Width (ft)		45.07	
Vel Total (ft/s)	5.44	Avg. Vel. (ft/s)		5.44	
Max Chl Dpth (ft)	6.56	Hydr. Depth (ft)		4.81	
Conv. Total (cfs)	21815.8	Conv. (cfs)		21815.8	
Length Wtd. (ft)	18.18	Wetted Per. (ft)		48.61	
Min Ch El (ft)	942.15	Shear (lb/sq ft)		0.81	
Alpha	1.00	Stream Power (lb/ft s)		4.43	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	2.04	17.10	0.33
C & E Loss (ft)	0.00	Cum SA (acres)	1.78	3.26	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3641.433

INPUT
Description: 20
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	958.43	.57	958.41	4.35	958.26	11.97	957.96	12.46	955.32
13.14	951.91	30.89	951.91	35.21	949.75	43.21	949.75	46.01	951.15
54.01	951.15	72.01	942.15	92.01	942.15	103.97	948.13	107.38	948.12

```
  121.11  948.22  143.34  949.11  153.55  949.68  168.39   950.1  189.55  950.77
  196.84  951.03   201.1  951.16  212.45   951.5  215.46  951.59  240.59  951.58
  260.58  953.21  263.83   953.7  273.43  957.88  280.47  960.45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .12   54.01     .04  103.97     .12

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         54.01  103.97           122.87  122.58  125.68             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
     238  280.47               F

CROSS SECTION OUTPUT  Profile #2yr

  E.G. Elev (ft)            948.32    Element                   Left OB    Channel   Right OB
  Vel Head (ft)               0.40    Wt. n-Val.                            0.040
  W.S. Elev (ft)            947.93    Reach Len. (ft)           122.87     122.58     125.68
  Crit W.S. (ft)                      Flow Area (sq ft)                    182.28
  E.G. Slope (ft/ft)      0.002930    Area (sq ft)                         182.28
  Q Total (cfs)             920.00    Flow (cfs)                           920.00
  Top Width (ft)             43.11    Top Width (ft)                        43.11
  Vel Total (ft/s)            5.05    Avg. Vel. (ft/s)                       5.05
  Max Chl Dpth (ft)           5.78    Hydr. Depth (ft)                       4.23
  Conv. Total (cfs)        16997.1    Conv. (cfs)                         16997.1
  Length Wtd. (ft)          122.58    Wetted Per. (ft)                      45.83
  Min Ch El (ft)            942.15    Shear (lb/sq ft)                       0.73
  Alpha                       1.00    Stream Power (lb/ft s)                 3.67
  Frctn Loss (ft)             0.38    Cum Volume (acre-ft)        3.25      14.38       1.40
  C & E Loss (ft)             0.00    Cum SA (acres)              2.81       3.07       1.28


CROSS SECTION OUTPUT  Profile #5yr

  E.G. Elev (ft)            949.11    Element                   Left OB    Channel   Right OB
  Vel Head (ft)               0.47    Wt. n-Val.                            0.040
  W.S. Elev (ft)            948.64    Reach Len. (ft)           122.87     122.58     125.68
  Crit W.S. (ft)                      Flow Area (sq ft)                    213.74
  E.G. Slope (ft/ft)      0.003048    Area (sq ft)                         213.74
  Q Total (cfs)            1180.00    Flow (cfs)                          1180.00
  Top Width (ft)             44.94    Top Width (ft)                        44.94
  Vel Total (ft/s)            5.52    Avg. Vel. (ft/s)                       5.52
  Max Chl Dpth (ft)           6.49    Hydr. Depth (ft)                       4.76
  Conv. Total (cfs)        21374.2    Conv. (cfs)                         21374.2
  Length Wtd. (ft)          122.58    Wetted Per. (ft)                      48.39
  Min Ch El (ft)            942.15    Shear (lb/sq ft)                       0.84
  Alpha                       1.00    Stream Power (lb/ft s)                 4.64
  Frctn Loss (ft)             0.40    Cum Volume (acre-ft)        2.04      17.01       0.33
  C & E Loss (ft)             0.01    Cum SA (acres)              1.78       3.24       0.24


CROSS SECTION


RIVER: Hope Creek
REACH: 1                  RS: 3518.856

INPUT
Description: 21
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  957.68       6  957.44     7.5  957.38    8.18  957.36    9.45  951.67
   29.38  951.67   33.66  949.53   41.66  949.53   44.46  950.93   49.46  950.93
   67.46  941.93   87.46  941.93   102.1  949.25  122.59  955.73  123.17  955.98
  125.06  956.77  128.58  957.77  135.97  958.03  151.56  958.19

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .12   49.46     .04   102.1     .12

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         49.46   102.1            18.65   18.23   18.01             .1       .3

CROSS SECTION OUTPUT  Profile #2yr
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E.G. Elev (ft)	947.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.44	Wt. n-Val.		0.040	
W.S. Elev (ft)	947.50	Reach Len. (ft)	18.65	18.23	18.01
Crit W.S. (ft)		Flow Area (sq ft)		173.26	
E.G. Slope (ft/ft)	0.003375	Area (sq ft)		173.26	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	42.26	Top Width (ft)		42.26	
Vel Total (ft/s)	5.31	Avg. Vel. (ft/s)		5.31	
Max Chl Dpth (ft)	5.57	Hydr. Depth (ft)		4.10	
Conv. Total (cfs)	15836.4	Conv. (cfs)		15836.4	
Length Wtd. (ft)	18.23	Wetted Per. (ft)		44.89	
Min Ch El (ft)	941.93	Shear (lb/sq ft)		0.81	
Alpha	1.00	Stream Power (lb/ft s)		4.32	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	3.25	13.88	1.40
C & E Loss (ft)	0.01	Cum SA (acres)	2.81	2.95	1.28

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	948.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.52	Wt. n-Val.		0.040	
W.S. Elev (ft)	948.18	Reach Len. (ft)	18.65	18.23	18.01
Crit W.S. (ft)		Flow Area (sq ft)		203.10	
E.G. Slope (ft/ft)	0.003569	Area (sq ft)		203.10	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	45.00	Top Width (ft)		45.00	
Vel Total (ft/s)	5.81	Avg. Vel. (ft/s)		5.81	
Max Chl Dpth (ft)	6.25	Hydr. Depth (ft)		4.51	
Conv. Total (cfs)	19751.6	Conv. (cfs)		19751.6	
Length Wtd. (ft)	18.23	Wetted Per. (ft)		47.95	
Min Ch El (ft)	941.93	Shear (lb/sq ft)		0.94	
Alpha	1.00	Stream Power (lb/ft s)		5.48	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	2.04	16.42	0.33
C & E Loss (ft)	0.01	Cum SA (acres)	1.78	3.11	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3500.626

INPUT
Description: 22
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	957.7	6.62	957.44	11.15	957.26	12.12	952.84	12.47	951.47
26.72	951.47	31	949.33	39	949.33	41.8	950.73	46.8	950.73
64.8	941.73	84.8	941.73	99.44	949.05	104.37	949.45	123.93	955.54
128.87	956.06	141.46	957	162.91	957.82				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	46.8	.04	99.44	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
46.8	99.44	121.15	122.14	120.16	.1	.3

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	947.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.40	Wt. n-Val.		0.040	
W.S. Elev (ft)	947.46	Reach Len. (ft)	121.15	122.14	120.16
Crit W.S. (ft)		Flow Area (sq ft)		180.30	
E.G. Slope (ft/ft)	0.003020	Area (sq ft)		180.30	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	42.92	Top Width (ft)		42.92	
Vel Total (ft/s)	5.10	Avg. Vel. (ft/s)		5.10	
Max Chl Dpth (ft)	5.73	Hydr. Depth (ft)		4.20	
Conv. Total (cfs)	16740.0	Conv. (cfs)		16740.0	
Length Wtd. (ft)	122.14	Wetted Per. (ft)		45.63	
Min Ch El (ft)	941.73	Shear (lb/sq ft)		0.75	
Alpha	1.00	Stream Power (lb/ft s)		3.80	
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)	3.25	13.80	1.40
C & E Loss (ft)	0.00	Cum SA (acres)	2.81	2.93	1.28

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	948.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.49	Wt. n-Val.		0.040	
W.S. Elev (ft)	948.14	Reach Len. (ft)	121.15	122.14	120.16
Crit W.S. (ft)		Flow Area (sq ft)		210.51	
E.G. Slope (ft/ft)	0.003232	Area (sq ft)		210.51	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	45.65	Top Width (ft)		45.65	
Vel Total (ft/s)	5.61	Avg. Vel. (ft/s)		5.61	
Max Chl Dpth (ft)	6.41	Hydr. Depth (ft)		4.61	
Conv. Total (cfs)	20756.6	Conv. (cfs)		20756.6	
Length Wtd. (ft)	122.14	Wetted Per. (ft)		48.68	
Min Ch El (ft)	941.73	Shear (lb/sq ft)		0.87	
Alpha	1.00	Stream Power (lb/ft s)		4.89	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	2.04	16.33	0.33
C & E Loss (ft)	0.00	Cum SA (acres)	1.78	3.09	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3378.489

INPUT
Description: 23
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	957.04	.25	957.03	1.37	957	3.95	956.78	12.8	956.34
13.18	956.37	13.59	954.68	14.48	951.09	29.81	951.09	34.03	948.98
42.03	948.98	44.79	950.36	49.79	950.36	67.75	941.38	87.75	941.38
100.69	947.85	127.05	947.75	148.26	958.69				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	49.79	.04	100.69	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
49.79	100.69	17.27	18.05	17.97	.1	.3

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	947.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.		0.040	
W.S. Elev (ft)	947.08	Reach Len. (ft)	17.27	18.05	17.97
Crit W.S. (ft)		Flow Area (sq ft)		179.09	
E.G. Slope (ft/ft)	0.003077	Area (sq ft)		179.09	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	42.81	Top Width (ft)		42.81	
Vel Total (ft/s)	5.14	Avg. Vel. (ft/s)		5.14	
Max Chl Dpth (ft)	5.70	Hydr. Depth (ft)		4.18	
Conv. Total (cfs)	16584.3	Conv. (cfs)		16584.3	
Length Wtd. (ft)	18.05	Wetted Per. (ft)		45.50	
Min Ch El (ft)	941.38	Shear (lb/sq ft)		0.76	
Alpha	1.00	Stream Power (lb/ft s)		3.88	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	3.25	13.30	1.40
C & E Loss (ft)	0.00	Cum SA (acres)	2.81	2.81	1.28

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	948.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.50	Wt. n-Val.		0.040	
W.S. Elev (ft)	947.72	Reach Len. (ft)	17.27	18.05	17.97
Crit W.S. (ft)		Flow Area (sq ft)		207.39	
E.G. Slope (ft/ft)	0.003368	Area (sq ft)		207.39	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	45.38	Top Width (ft)		45.38	
Vel Total (ft/s)	5.69	Avg. Vel. (ft/s)		5.69	
Max Chl Dpth (ft)	6.34	Hydr. Depth (ft)		4.57	
Conv. Total (cfs)	20332.3	Conv. (cfs)		20332.3	
Length Wtd. (ft)	18.05	Wetted Per. (ft)		48.37	
Min Ch El (ft)	941.38	Shear (lb/sq ft)		0.90	
Alpha	1.00	Stream Power (lb/ft s)		5.13	

Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	2.04	15.75	0.33
C & E Loss (ft)	0.00	Cum SA (acres)	1.78	2.97	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3360.436

INPUT
Description: 24
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.98	.17	956.98	2.4	956.91	8.85	956.38	12.64	956.16
14.21	956.28	15.49	951.03	30.55	951.03	34.77	948.92	42.77	948.92
45.53	950.3	50.53	950.3	68.49	941.32	88.49	941.32	101.43	947.79
125.06	947.87	136.02	953.73	143.9	957.74				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	50.53	.04	101.43	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
50.53	101.43	122.81	122.13	120.82	.1	.3

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	947.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.		0.040	
W.S. Elev (ft)	947.03	Reach Len. (ft)	122.81	122.13	120.82
Crit W.S. (ft)		Flow Area (sq ft)		179.29	
E.G. Slope (ft/ft)	0.003068	Area (sq ft)		179.29	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	42.83	Top Width (ft)		42.83	
Vel Total (ft/s)	5.13	Avg. Vel. (ft/s)		5.13	
Max Chl Dpth (ft)	5.71	Hydr. Depth (ft)		4.19	
Conv. Total (cfs)	16609.9	Conv. (cfs)		16609.9	
Length Wtd. (ft)	122.13	Wetted Per. (ft)		45.52	
Min Ch El (ft)	941.32	Shear (lb/sq ft)		0.75	
Alpha	1.00	Stream Power (lb/ft s)		3.87	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	3.25	13.23	1.40
C & E Loss (ft)	0.00	Cum SA (acres)	2.81	2.80	1.28

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	948.17	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.50	Wt. n-Val.		0.040	
W.S. Elev (ft)	947.66	Reach Len. (ft)	122.81	122.13	120.82
Crit W.S. (ft)		Flow Area (sq ft)		207.29	
E.G. Slope (ft/ft)	0.003373	Area (sq ft)		207.29	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	45.37	Top Width (ft)		45.37	
Vel Total (ft/s)	5.69	Avg. Vel. (ft/s)		5.69	
Max Chl Dpth (ft)	6.34	Hydr. Depth (ft)		4.57	
Conv. Total (cfs)	20318.7	Conv. (cfs)		20318.7	
Length Wtd. (ft)	122.13	Wetted Per. (ft)		48.36	
Min Ch El (ft)	941.32	Shear (lb/sq ft)		0.90	
Alpha	1.00	Stream Power (lb/ft s)		5.14	
Frctn Loss (ft)	0.45	Cum Volume (acre-ft)	2.04	15.66	0.33
C & E Loss (ft)	0.01	Cum SA (acres)	1.78	2.95	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3238.304

INPUT
Description: 25
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.42	.7	956.41	2.5	956.32	11.18	955.84	12.83	955.83
12.9	955.52	13.37	953.77	14.16	950.71	27.01	950.71	31.11	948.66

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   39.11  948.66   42.19   950.2   47.19   950.2   65.19  941.06   85.19  941.06
  102.95  949.94  118.62  951.21   132.5  958.49

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .12   47.19     .04  102.95     .12

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         47.19  102.95             18.33   18.06   18.17             .1       .3

CROSS SECTION OUTPUT  Profile #2yr

  E.G. Elev (ft)            947.03    Element                   Left OB    Channel   Right OB
  Vel Head (ft)               0.45    Wt. n-Val.                            0.040
  W.S. Elev (ft)            946.58    Reach Len. (ft)            18.33      18.06     18.17
  Crit W.S. (ft)                      Flow Area (sq ft)                    171.02
  E.G. Slope (ft/ft)      0.003489    Area (sq ft)                         171.02
  Q Total (cfs)             920.00    Flow (cfs)                           920.00
  Top Width (ft)             41.93    Top Width (ft)                        41.93
  Vel Total (ft/s)            5.38    Avg. Vel. (ft/s)                       5.38
  Max Chl Dpth (ft)           5.52    Hydr. Depth (ft)                       4.08
  Conv. Total (cfs)        15576.0    Conv. (cfs)                         15576.0
  Length Wtd. (ft)           18.06    Wetted Per. (ft)                      44.55
  Min Ch El (ft)            941.06    Shear (lb/sq ft)                       0.84
  Alpha                       1.00    Stream Power (lb/ft s)                 4.50
  Frctn Loss (ft)             0.06    Cum Volume (acre-ft)        3.25      12.73      1.40
  C & E Loss (ft)             0.01    Cum SA (acres)              2.81       2.68      1.28


CROSS SECTION OUTPUT  Profile #5yr

  E.G. Elev (ft)            947.71    Element                   Left OB    Channel   Right OB
  Vel Head (ft)               0.57    Wt. n-Val.                            0.040
  W.S. Elev (ft)            947.15    Reach Len. (ft)            18.33      18.06     18.17
  Crit W.S. (ft)                      Flow Area (sq ft)                    195.20
  E.G. Slope (ft/ft)      0.003972    Area (sq ft)                         195.20
  Q Total (cfs)            1180.00    Flow (cfs)                          1180.00
  Top Width (ft)             44.15    Top Width (ft)                        44.15
  Vel Total (ft/s)            6.05    Avg. Vel. (ft/s)                       6.05
  Max Chl Dpth (ft)           6.09    Hydr. Depth (ft)                       4.42
  Conv. Total (cfs)        18722.5    Conv. (cfs)                         18722.5
  Length Wtd. (ft)           18.06    Wetted Per. (ft)                      47.05
  Min Ch El (ft)            941.06    Shear (lb/sq ft)                       1.03
  Alpha                       1.00    Stream Power (lb/ft s)                 6.22
  Frctn Loss (ft)             0.07    Cum Volume (acre-ft)        2.04      15.10      0.33
  C & E Loss (ft)             0.01    Cum SA (acres)              1.78       2.82      0.24


CROSS SECTION


RIVER: Hope Creek
REACH: 1                    RS: 3220.243

INPUT
Description: 26
Station Elevation Data      num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  956.31    8.34  955.93   10.15  955.85   11.38   955.8   12.89  950.51
   25.32  950.51   29.42  948.46   37.42  948.46    40.5     950    45.5     950
    63.5  940.86    83.5  940.86  101.26  949.74  114.79  952.45  118.77   952.9
   124.5  957.46

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .12    45.5     .04  101.26     .12

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          45.5  101.26             73.32   73.11   72.78             .1       .3

CROSS SECTION OUTPUT  Profile #2yr

  E.G. Elev (ft)            946.96    Element                   Left OB    Channel   Right OB
  Vel Head (ft)               0.41    Wt. n-Val.                            0.040
  W.S. Elev (ft)            946.55    Reach Len. (ft)            73.32      73.11     72.78
  Crit W.S. (ft)                      Flow Area (sq ft)                    177.97
```

E.G. Slope (ft/ft)	0.003122	Area (sq ft)		177.97	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	42.58	Top Width (ft)		42.58	
Vel Total (ft/s)	5.17	Avg. Vel. (ft/s)		5.17	
Max Chl Dpth (ft)	5.69	Hydr. Depth (ft)		4.18	
Conv. Total (cfs)	16465.5	Conv. (cfs)		16465.5	
Length Wtd. (ft)	73.11	Wetted Per. (ft)		45.28	
Min Ch El (ft)	940.86	Shear (lb/sq ft)		0.77	
Alpha	1.00	Stream Power (lb/ft s)		3.96	
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)	3.25	12.66	1.40
C & E Loss (ft)	0.04	Cum SA (acres)	2.81	2.66	1.28

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	947.63	Element			
Vel Head (ft)	0.53	Wt. n-Val.		0.040	
W.S. Elev (ft)	947.10	Reach Len. (ft)	73.32	73.11	72.78
Crit W.S. (ft)		Flow Area (sq ft)		202.27	
E.G. Slope (ft/ft)	0.003599	Area (sq ft)		202.27	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	44.79	Top Width (ft)		44.79	
Vel Total (ft/s)	5.83	Avg. Vel. (ft/s)		5.83	
Max Chl Dpth (ft)	6.24	Hydr. Depth (ft)		4.52	
Conv. Total (cfs)	19669.9	Conv. (cfs)		19669.9	
Length Wtd. (ft)	73.11	Wetted Per. (ft)		47.75	
Min Ch El (ft)	940.86	Shear (lb/sq ft)		0.95	
Alpha	1.00	Stream Power (lb/ft s)		5.55	
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)	2.04	15.02	0.33
C & E Loss (ft)	0.04	Cum SA (acres)	1.78	2.80	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3147

INPUT
Description:
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.82	2.81	956.82	13.92	956.6	15.83	956.56	16.85	956.54
18.47	956.51	28.21	956.32	29.99	956.29	32.93	956.24	41.45	956.09
46.17	955.91	53.53	955.65	54.39	951.99	54.74	950.33	69.74	950.33
73.84	948.28	81.84	948.28	84.92	949.82	89.92	949.82	107.92	940.68
127.92	940.68	145.68	949.56	147.18	952.71	150.47	954.51	155.5	957.08

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	89.92	.04	145.68	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
89.92	145.68	46.78	49.75	49.66	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	946.60	Element			
Vel Head (ft)	0.78	Wt. n-Val.		0.040	
W.S. Elev (ft)	945.81	Reach Len. (ft)	46.78	49.75	49.66
Crit W.S. (ft)		Flow Area (sq ft)		154.95	
E.G. Slope (ft/ft)	0.006573	Area (sq ft)		154.95	
Q Total (cfs)	1100.00	Flow (cfs)		1100.00	
Top Width (ft)	40.37	Top Width (ft)		40.37	
Vel Total (ft/s)	7.10	Avg. Vel. (ft/s)		7.10	
Max Chl Dpth (ft)	5.13	Hydr. Depth (ft)		3.84	
Conv. Total (cfs)	13567.9	Conv. (cfs)		13567.9	
Length Wtd. (ft)	49.75	Wetted Per. (ft)		42.81	
Min Ch El (ft)	940.68	Shear (lb/sq ft)		1.49	
Alpha	1.00	Stream Power (lb/ft s)		10.54	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	3.25	12.38	1.40
C & E Loss (ft)	0.04	Cum SA (acres)	2.81	2.59	1.28

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	947.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.89	Wt. n-Val.		0.040	
W.S. Elev (ft)	946.35	Reach Len. (ft)	46.78	49.75	49.66
Crit W.S. (ft)		Flow Area (sq ft)		177.33	
E.G. Slope (ft/ft)	0.006690	Area (sq ft)		177.33	
Q Total (cfs)	1340.00	Flow (cfs)		1340.00	
Top Width (ft)	42.52	Top Width (ft)		42.52	
Vel Total (ft/s)	7.56	Avg. Vel. (ft/s)		7.56	
Max Chl Dpth (ft)	5.67	Hydr. Depth (ft)		4.17	
Conv. Total (cfs)	16383.2	Conv. (cfs)		16383.2	
Length Wtd. (ft)	49.75	Wetted Per. (ft)		45.22	
Min Ch El (ft)	940.68	Shear (lb/sq ft)		1.64	
Alpha	1.00	Stream Power (lb/ft s)		12.38	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	2.04	14.70	0.33
C & E Loss (ft)	0.04	Cum SA (acres)	1.78	2.73	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3097.384

INPUT
Description: 27
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.05	1.2	956.03	3.3	955.99	6.48	955.93	10.39	955.87
11.08	955.86	16.48	955.77	18.23	955.71	28.24	955.33	28.85	952.76
29.42	950.2	40.92	950.2	45	948.16	53	948.16	55.82	949.57
60.82	949.57	78.82	940.56	98.82	940.56	126.32	954.31	136.01	954.87

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	60.82	.04	126.32	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
60.82	126.32	19.08	18.31	18.45	.1	.3

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	946.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.17	Wt. n-Val.		0.040	
W.S. Elev (ft)	944.95	Reach Len. (ft)	19.08	18.31	18.45
Crit W.S. (ft)	944.52	Flow Area (sq ft)		126.49	
E.G. Slope (ft/ft)	0.011667	Area (sq ft)		126.49	
Q Total (cfs)	1100.00	Flow (cfs)		1100.00	
Top Width (ft)	37.57	Top Width (ft)		37.57	
Vel Total (ft/s)	8.70	Avg. Vel. (ft/s)		8.70	
Max Chl Dpth (ft)	4.39	Hydr. Depth (ft)		3.37	
Conv. Total (cfs)	10183.9	Conv. (cfs)		10183.9	
Length Wtd. (ft)	18.31	Wetted Per. (ft)		39.64	
Min Ch El (ft)	940.56	Shear (lb/sq ft)		2.32	
Alpha	1.00	Stream Power (lb/ft s)		20.21	
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	3.25	12.22	1.40
C & E Loss (ft)	0.03	Cum SA (acres)	2.81	2.55	1.28

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	946.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.32	Wt. n-Val.		0.040	
W.S. Elev (ft)	945.44	Reach Len. (ft)	19.08	18.31	18.45
Crit W.S. (ft)	944.98	Flow Area (sq ft)		145.10	
E.G. Slope (ft/ft)	0.011760	Area (sq ft)		145.10	
Q Total (cfs)	1340.00	Flow (cfs)		1340.00	
Top Width (ft)	39.50	Top Width (ft)		39.50	
Vel Total (ft/s)	9.24	Avg. Vel. (ft/s)		9.24	
Max Chl Dpth (ft)	4.88	Hydr. Depth (ft)		3.67	
Conv. Total (cfs)	12356.5	Conv. (cfs)		12356.5	
Length Wtd. (ft)	18.31	Wetted Per. (ft)		41.80	
Min Ch El (ft)	940.56	Shear (lb/sq ft)		2.55	
Alpha	1.00	Stream Power (lb/ft s)		23.54	
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	2.04	14.51	0.33
C & E Loss (ft)	0.02	Cum SA (acres)	1.78	2.68	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3079.078

INPUT
Description: 28
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.01	8.09	955.84	20.97	955.62	21.18	955.62	21.33	955.61
21.42	955.61	21.46	955.61	26.75	955.41	32.9	955.17	32.97	954.89
33.26	953.62	34.09	950	48.31	950	52.39	947.96	60.39	947.96
63.21	949.37	68.21	949.37	86.21	940.36	106.21	940.36	133.71	954.11
141.67	960.92								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	68.21	.04	133.71	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
68.21	133.71	124.18	123.15	120.49	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	945.86	Element			
Vel Head (ft)	1.44	Wt. n-Val.		0.040	
W.S. Elev (ft)	944.42	Reach Len. (ft)	124.18	123.15	120.49
Crit W.S. (ft)	944.32	Flow Area (sq ft)		114.06	
E.G. Slope (ft/ft)	0.015641	Area (sq ft)		114.06	
Q Total (cfs)	1100.00	Flow (cfs)		1100.00	
Top Width (ft)	36.22	Top Width (ft)		36.22	
Vel Total (ft/s)	9.64	Avg. Vel. (ft/s)		9.64	
Max Chl Dpth (ft)	4.06	Hydr. Depth (ft)		3.15	
Conv. Total (cfs)	8795.4	Conv. (cfs)		8795.4	
Length Wtd. (ft)	123.15	Wetted Per. (ft)		38.14	
Min Ch El (ft)	940.36	Shear (lb/sq ft)		2.92	
Alpha	1.00	Stream Power (lb/ft s)		28.16	
Frctn Loss (ft)	1.30	Cum Volume (acre-ft)	3.25	12.17	1.40
C & E Loss (ft)	0.17	Cum SA (acres)	2.81	2.53	1.28

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
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 #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	946.51	Element			
Vel Head (ft)	1.55	Wt. n-Val.		0.040	
W.S. Elev (ft)	944.96	Reach Len. (ft)	124.18	123.15	120.49
Crit W.S. (ft)	944.78	Flow Area (sq ft)		134.15	
E.G. Slope (ft/ft)	0.014667	Area (sq ft)		134.15	
Q Total (cfs)	1340.00	Flow (cfs)		1340.00	
Top Width (ft)	38.37	Top Width (ft)		38.37	
Vel Total (ft/s)	9.99	Avg. Vel. (ft/s)		9.99	
Max Chl Dpth (ft)	4.60	Hydr. Depth (ft)		3.50	
Conv. Total (cfs)	11064.6	Conv. (cfs)		11064.6	
Length Wtd. (ft)	123.15	Wetted Per. (ft)		40.55	
Min Ch El (ft)	940.36	Shear (lb/sq ft)		3.03	
Alpha	1.00	Stream Power (lb/ft s)		30.26	
Frctn Loss (ft)	1.19	Cum Volume (acre-ft)	2.04	14.45	0.33
C & E Loss (ft)	0.19	Cum SA (acres)	1.78	2.67	0.24

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: Hope Creek
REACH: 1 RS: 2955.929

INPUT
Description: 29
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	955.26	.17	955.25	1.58	955.22	2.96	955.19	14.47	954.91
17.42	954.86	25.81	954.68	27.73	954.63	33.41	954.44	36.59	954.3
39.27	954.26	40.35	951.43	41.26	949.16	44.7	948.06	51.26	948.06
55	946.19	63	946.19	65.8	947.59	70.8	947.59	88.8	938.59
108.8	938.59	131.64	950.01	133.39	950.95	146.19	951.77	159.02	958.89

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	70.8	.04	133.39	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
70.8	133.39	18	18.05	18.27	.1	.3

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	944.39	Wt. n-Val.		0.040	
Vel Head (ft)	0.87	Reach Len. (ft)	18.00	18.05	18.27
W.S. Elev (ft)	943.52	Flow Area (sq ft)		147.34	
Crit W.S. (ft)		Area (sq ft)		147.34	
E.G. Slope (ft/ft)	0.007593	Flow (cfs)		1100.00	
Q Total (cfs)	1100.00	Top Width (ft)		39.73	
Top Width (ft)	39.73	Avg. Vel. (ft/s)		7.47	
Vel Total (ft/s)	7.47	Hydr. Depth (ft)		3.71	
Max Chl Dpth (ft)	4.93	Conv. (cfs)		12623.8	
Conv. Total (cfs)	12623.8	Wetted Per. (ft)		42.06	
Length Wtd. (ft)	18.05	Shear (lb/sq ft)		1.66	
Min Ch El (ft)	938.59	Stream Power (lb/ft s)		12.40	
Alpha	1.00	Cum Volume (acre-ft)	3.25	11.80	1.40
Frctn Loss (ft)	0.13	Cum SA (acres)	2.81	2.42	1.28
C & E Loss (ft)	0.01				

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	945.12	Wt. n-Val.		0.040	
Vel Head (ft)	0.90	Reach Len. (ft)	18.00	18.05	18.27
W.S. Elev (ft)	944.22	Flow Area (sq ft)		175.78	
Crit W.S. (ft)		Area (sq ft)		175.78	
E.G. Slope (ft/ft)	0.006877	Flow (cfs)		1340.00	
Q Total (cfs)	1340.00	Top Width (ft)		42.50	
Top Width (ft)	42.50	Avg. Vel. (ft/s)		7.62	
Vel Total (ft/s)	7.62	Hydr. Depth (ft)		4.14	
Max Chl Dpth (ft)	5.62	Conv. (cfs)		16158.7	
Conv. Total (cfs)	16158.7	Wetted Per. (ft)		45.16	
Length Wtd. (ft)	18.05	Shear (lb/sq ft)		1.67	
Min Ch El (ft)	938.59	Stream Power (lb/ft s)		12.74	
Alpha	1.00	Cum Volume (acre-ft)	2.04	14.02	0.33
Frctn Loss (ft)	0.12	Cum SA (acres)	1.78	2.55	0.24
C & E Loss (ft)	0.01				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2937.884

INPUT
Description: 30
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	955.18	3.55	955.08	9.78	954.93	16.46	954.77	24.53	954.58
29.74	954.46	36.56	954.25	37.07	954.22	37.98	954.08	39.74	954.05
41.29	954.15	41.45	954.12	41.5	954.11	41.51	954.11	43.3	952.45
46.32	947.86	53.4	947.86	57.14	945.99	65.14	945.99	67.94	947.39
72.94	947.39	90.94	938.39	110.94	938.39	133.78	949.81	135.71	949.92

```
  149.06  950.76  158.64  952.74  171.31  955.98  171.63  956.08

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .12   72.94     .04  133.78     .12

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         72.94  133.78             68.38    65.3   63.65             .1       .3

CROSS SECTION OUTPUT  Profile #2yr

  E.G. Elev (ft)            944.24    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.82    Wt. n-Val.                            0.040
  W.S. Elev (ft)            943.42    Reach Len. (ft)             68.38     65.30     63.65
  Crit W.S. (ft)                      Flow Area (sq ft)                    151.30
  E.G. Slope (ft/ft)      0.007048    Area (sq ft)                         151.30
  Q Total (cfs)           1100.00     Flow (cfs)                          1100.00
  Top Width (ft)            40.13     Top Width (ft)                        40.13
  Vel Total (ft/s)           7.27     Avg. Vel. (ft/s)                       7.27
  Max Chl Dpth (ft)          5.03     Hydr. Depth (ft)                       3.77
  Conv. Total (cfs)        13102.4    Conv. (cfs)                         13102.4
  Length Wtd. (ft)          65.30     Wetted Per. (ft)                      42.51
  Min Ch El (ft)           938.39     Shear (lb/sq ft)                       1.57
  Alpha                      1.00     Stream Power (lb/ft s)                11.39
  Frctn Loss (ft)            0.39     Cum Volume (acre-ft)        3.25      11.74      1.40
  C & E Loss (ft)            0.05     Cum SA (acres)              2.81       2.41      1.28

CROSS SECTION OUTPUT  Profile #5yr

  E.G. Elev (ft)            944.98    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.85    Wt. n-Val.                            0.040
  W.S. Elev (ft)            944.13    Reach Len. (ft)             68.38     65.30     63.65
  Crit W.S. (ft)                      Flow Area (sq ft)                    180.65
  E.G. Slope (ft/ft)      0.006373    Area (sq ft)                         180.65
  Q Total (cfs)           1340.00     Flow (cfs)                          1340.00
  Top Width (ft)            42.96     Top Width (ft)                        42.96
  Vel Total (ft/s)           7.42     Avg. Vel. (ft/s)                       7.42
  Max Chl Dpth (ft)          5.74     Hydr. Depth (ft)                       4.21
  Conv. Total (cfs)        16785.8    Conv. (cfs)                         16785.8
  Length Wtd. (ft)          65.30     Wetted Per. (ft)                      45.67
  Min Ch El (ft)           938.39     Shear (lb/sq ft)                       1.57
  Alpha                      1.00     Stream Power (lb/ft s)                11.67
  Frctn Loss (ft)            0.36     Cum Volume (acre-ft)        2.04      13.94      0.33
  C & E Loss (ft)            0.05     Cum SA (acres)              1.78       2.53      0.24

CROSS SECTION


RIVER: Hope Creek
REACH: 1                    RS: 2870

INPUT
Description:
Station Elevation Data      num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  955.26    4.58  955.19    8.22  955.11   16.64  954.94    21.8  954.78
   27.44  954.62   29.41  954.56   37.45  954.37    42.1  954.26   47.85  954.08
   55.33  953.86   60.57  953.49      61  953.46   61.09  953.46   61.19  953.45
   62.63  953.36   63.31   953.3   64.12  953.24   64.61  953.34   65.63  953.54
   67.72  953.59   70.48  953.68   70.74  953.54    88.2  944.12   96.76  944.12
  101.36  944.97  106.36  944.97  121.79  937.72  141.79  937.72  157.49  945.57
  177.07   956.1

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .12  106.36     .04  157.49     .12

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        106.36  157.49             51.13    58.6   53.12             .1       .3

CROSS SECTION OUTPUT  Profile #2yr

  E.G. Elev (ft)            943.80    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               0.66    Wt. n-Val.                            0.040
```

W.S. Elev (ft)	943.14	Reach Len. (ft)	51.13	58.60	53.12
Crit W.S. (ft)		Flow Area (sq ft)		169.14	
E.G. Slope (ft/ft)	0.005225	Area (sq ft)		169.14	
Q Total (cfs)	1100.00	Flow (cfs)		1100.00	
Top Width (ft)	42.39	Top Width (ft)		42.39	
Vel Total (ft/s)	6.50	Avg. Vel. (ft/s)		6.50	
Max Chl Dpth (ft)	5.42	Hydr. Depth (ft)		3.99	
Conv. Total (cfs)	15217.6	Conv. (cfs)		15217.6	
Length Wtd. (ft)	58.60	Wetted Per. (ft)		44.88	
Min Ch El (ft)	937.72	Shear (lb/sq ft)		1.23	
Alpha	1.00	Stream Power (lb/ft s)		8.00	
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)	3.25	11.50	1.40
C & E Loss (ft)	0.03	Cum SA (acres)	2.81	2.34	1.28

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	944.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.68	Wt. n-Val.		0.040	
W.S. Elev (ft)	943.89	Reach Len. (ft)	51.13	58.60	53.12
Crit W.S. (ft)		Flow Area (sq ft)		202.06	
E.G. Slope (ft/ft)	0.004730	Area (sq ft)		202.06	
Q Total (cfs)	1340.00	Flow (cfs)		1340.00	
Top Width (ft)	45.48	Top Width (ft)		45.48	
Vel Total (ft/s)	6.63	Avg. Vel. (ft/s)		6.63	
Max Chl Dpth (ft)	6.17	Hydr. Depth (ft)		4.44	
Conv. Total (cfs)	19484.1	Conv. (cfs)		19484.1	
Length Wtd. (ft)	58.60	Wetted Per. (ft)		48.31	
Min Ch El (ft)	937.72	Shear (lb/sq ft)		1.23	
Alpha	1.00	Stream Power (lb/ft s)		8.19	
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	2.04	13.66	0.33
C & E Loss (ft)	0.03	Cum SA (acres)	1.78	2.47	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2813.979

INPUT
Description: 31
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	953.48	.06	953.48	2.49	953.29	3.09	953.25	3.7	953.2
7.87	952.9	8.48	952.85	8.93	952.81	9.33	952.77	9.65	952.83
10.23	952.94	10.72	953.03	10.86	953.05	11.85	952.98	15.25	953
21.18	949.56	29.14	944.99	31.53	943.62	32.77	943.62	34.47	944.47
39.47	944.47	54.9	937.22	74.9	937.22	90.6	945.07	96.4	947.04
101.45	948.25	107.6	949.81	135.51	952.27	160.01	962.86	163.64	963.94

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	39.47	.04	90.6	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
39.47	90.6	18.36	18.04	17.52	.1	.3

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	943.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.57	Wt. n-Val.		0.040	
W.S. Elev (ft)	942.92	Reach Len. (ft)	18.36	18.04	17.52
Crit W.S. (ft)		Flow Area (sq ft)		181.24	
E.G. Slope (ft/ft)	0.004310	Area (sq ft)		181.24	
Q Total (cfs)	1100.00	Flow (cfs)		1100.00	
Top Width (ft)	43.55	Top Width (ft)		43.55	
Vel Total (ft/s)	6.07	Avg. Vel. (ft/s)		6.07	
Max Chl Dpth (ft)	5.70	Hydr. Depth (ft)		4.16	
Conv. Total (cfs)	16755.2	Conv. (cfs)		16755.2	
Length Wtd. (ft)	18.04	Wetted Per. (ft)		46.17	
Min Ch El (ft)	937.22	Shear (lb/sq ft)		1.06	
Alpha	1.00	Stream Power (lb/ft s)		6.41	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	3.25	11.26	1.40
C & E Loss (ft)	0.00	Cum SA (acres)	2.81	2.29	1.28

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	944.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.60	Wt. n-Val.		0.040	
W.S. Elev (ft)	943.70	Reach Len. (ft)	18.36	18.04	17.52
Crit W.S. (ft)		Flow Area (sq ft)		216.31	
E.G. Slope (ft/ft)	0.003917	Area (sq ft)		216.31	
Q Total (cfs)	1340.00	Flow (cfs)		1340.00	
Top Width (ft)	46.75	Top Width (ft)		46.75	
Vel Total (ft/s)	6.19	Avg. Vel. (ft/s)		6.19	
Max Chl Dpth (ft)	6.48	Hydr. Depth (ft)		4.63	
Conv. Total (cfs)	21411.0	Conv. (cfs)		21411.0	
Length Wtd. (ft)	18.04	Wetted Per. (ft)		49.73	
Min Ch El (ft)	937.22	Shear (lb/sq ft)		1.06	
Alpha	1.00	Stream Power (lb/ft s)		6.59	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	2.04	13.37	0.33
C & E Loss (ft)	0.00	Cum SA (acres)	1.78	2.41	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2795.938

INPUT
Description: 32
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	953.58	3.89	953.46	4.62	953.43	5.85	953.34	6.68	953.28
8.37	953.15	11.2	952.93	12.39	952.84	12.66	952.82	12.83	952.81
13.46	952.76	13.76	952.74	13.9	952.73	14.47	952.83	15.17	952.96
15.43	953.01	17.08	952.9	17.54	952.86	18.04	952.83	19.53	952.83
29.59	947	29.6	946.99	31.58	945.68	34.45	943.62	36.62	943.62
38.32	944.47	43.32	944.47	58.75	937.22	78.75	937.22	94.45	945.07
112.31	945.8	119.38	947.31	128.36	948.22	144.59	949.65	155.19	954.238

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	43.32	.04	94.45	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
43.32	94.45	124.19	127.54	116.57	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
111	155.19		F

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	943.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.61	Wt. n-Val.		0.040	
W.S. Elev (ft)	942.81	Reach Len. (ft)	124.19	127.54	116.57
Crit W.S. (ft)		Flow Area (sq ft)		176.14	
E.G. Slope (ft/ft)	0.004667	Area (sq ft)		176.14	
Q Total (cfs)	1100.00	Flow (cfs)		1100.00	
Top Width (ft)	43.06	Top Width (ft)		43.06	
Vel Total (ft/s)	6.25	Avg. Vel. (ft/s)		6.25	
Max Chl Dpth (ft)	5.59	Hydr. Depth (ft)		4.09	
Conv. Total (cfs)	16101.9	Conv. (cfs)		16101.9	
Length Wtd. (ft)	127.54	Wetted Per. (ft)		45.63	
Min Ch El (ft)	937.22	Shear (lb/sq ft)		1.12	
Alpha	1.00	Stream Power (lb/ft s)		7.02	
Frctn Loss (ft)	0.50	Cum Volume (acre-ft)	3.25	11.19	1.40
C & E Loss (ft)	0.04	Cum SA (acres)	2.81	2.27	1.28

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	944.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.62	Wt. n-Val.		0.040	
W.S. Elev (ft)	943.60	Reach Len. (ft)	124.19	127.54	116.57
Crit W.S. (ft)		Flow Area (sq ft)		211.52	
E.G. Slope (ft/ft)	0.004167	Area (sq ft)		211.52	
Q Total (cfs)	1340.00	Flow (cfs)		1340.00	
Top Width (ft)	46.33	Top Width (ft)		46.33	

Vel Total (ft/s)	6.34	Avg. Vel. (ft/s)		6.34	
Max Chl Dpth (ft)	6.38	Hydr. Depth (ft)		4.57	
Conv. Total (cfs)	20758.3	Conv. (cfs)		20758.3	
Length Wtd. (ft)	127.54	Wetted Per. (ft)		49.26	
Min Ch El (ft)	937.22	Shear (lb/sq ft)		1.12	
Alpha	1.00	Stream Power (lb/ft s)		7.08	
Frctn Loss (ft)	0.45	Cum Volume (acre-ft)	2.04	13.29	0.33
C & E Loss (ft)	0.04	Cum SA (acres)	1.78	2.39	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2668.395

INPUT
Description: 33
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	952.46	1.6	952.36	7.95	951.95	8.9	951.78	9.26	951.73
9.97	951.88	10.34	951.95	10.72	952.03	11.82	951.86	15.46	951.45
15.64	951.37	15.78	951.31	18.59	950.06	19.04	950.44	19.56	950.3
25	948.99	42.35	944.71	50.89	945.72	69.51	936.34	90.01	936.34
104.67	943.59	121.45	944.37	156.85	945	164.98	945.37	182.47	953.43
188.26	956.05								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	50.89	.04	104.67	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
50.89	104.67	18.55	17.72	17.36	.1	.3

Ineffective Flow num= 0

Sta L	Sta R	Elev	Permanent

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	942.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.48	Wt. n-Val.		0.040	
W.S. Elev (ft)	942.39	Reach Len. (ft)	18.55	17.72	17.36
Crit W.S. (ft)		Flow Area (sq ft)		197.31	
E.G. Slope (ft/ft)	0.003382	Area (sq ft)		197.31	
Q Total (cfs)	1100.00	Flow (cfs)		1100.00	
Top Width (ft)	44.74	Top Width (ft)		44.74	
Vel Total (ft/s)	5.58	Avg. Vel. (ft/s)		5.58	
Max Chl Dpth (ft)	6.05	Hydr. Depth (ft)		4.41	
Conv. Total (cfs)	18915.8	Conv. (cfs)		18915.8	
Length Wtd. (ft)	17.72	Wetted Per. (ft)		47.59	
Min Ch El (ft)	936.34	Shear (lb/sq ft)		0.88	
Alpha	1.00	Stream Power (lb/ft s)		4.88	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	3.25	10.64	1.40
C & E Loss (ft)	0.02	Cum SA (acres)	2.81	2.14	1.28

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	943.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.50	Wt. n-Val.		0.040	
W.S. Elev (ft)	943.23	Reach Len. (ft)	18.55	17.72	17.36
Crit W.S. (ft)		Flow Area (sq ft)		236.57	
E.G. Slope (ft/ft)	0.003035	Area (sq ft)		236.57	
Q Total (cfs)	1340.00	Flow (cfs)		1340.00	
Top Width (ft)	48.13	Top Width (ft)		48.13	
Vel Total (ft/s)	5.66	Avg. Vel. (ft/s)		5.66	
Max Chl Dpth (ft)	6.89	Hydr. Depth (ft)		4.92	
Conv. Total (cfs)	24323.0	Conv. (cfs)		24323.0	
Length Wtd. (ft)	17.72	Wetted Per. (ft)		51.38	
Min Ch El (ft)	936.34	Shear (lb/sq ft)		0.87	
Alpha	1.00	Stream Power (lb/ft s)		4.94	
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	2.04	12.63	0.33
C & E Loss (ft)	0.02	Cum SA (acres)	1.78	2.25	0.24

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2650.675

INPUT
Description: 34
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	952.52	2.7	952.44	4	952.4	4.18	952.4	12.2	951.84
12.79	951.81	12.96	951.79	13.17	951.76	14.16	951.65	14.26	951.67
15.65	951.95	17.07	951.72	19.96	951.27	20.16	951.24	20.17	951.24
30.77	946.5	36.42	943.97	45.3	939.99	45.91	939.21	50.22	939.1
51.24	939.07	51.58	939.47	52.67	941.17	54.17	943.51	57.49	943.66
76.42	936.34	97.92	936.34	112.58	943.53	122.7	944.14	130.74	944.61
132.49	944.65	135.41	944.7	173.13	944.96	191.38	953.59		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	57.49	.04	112.58	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
57.49	112.58	124.24	112.8	97.76	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	57.49	943.66	F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	942.79	Element			
Vel Head (ft)	0.41	Wt. n-Val.		0.040	
W.S. Elev (ft)	942.39	Reach Len. (ft)	124.24	112.80	97.76
Crit W.S. (ft)	940.11	Flow Area (sq ft)		214.50	
E.G. Slope (ft/ft)	0.002880	Area (sq ft)	29.18	214.50	
Q Total (cfs)	1100.00	Flow (cfs)		1100.00	
Top Width (ft)	62.95	Top Width (ft)	13.49	49.46	
Vel Total (ft/s)	5.13	Avg. Vel. (ft/s)		5.13	
Max Chl Dpth (ft)	6.05	Hydr. Depth (ft)		4.34	
Conv. Total (cfs)	20496.7	Conv. (cfs)		20496.7	
Length Wtd. (ft)	113.18	Wetted Per. (ft)		51.99	
Min Ch El (ft)	936.34	Shear (lb/sq ft)		0.74	
Alpha	1.00	Stream Power (lb/ft s)		3.80	
Frctn Loss (ft)	0.47	Cum Volume (acre-ft)	3.24	10.56	1.40
C & E Loss (ft)	0.04	Cum SA (acres)	2.80	2.12	1.28

Warning: Divided flow computed for this cross-section.
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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	943.66	Element			
Vel Head (ft)	0.42	Wt. n-Val.		0.040	
W.S. Elev (ft)	943.24	Reach Len. (ft)	124.24	112.80	97.76
Crit W.S. (ft)	940.56	Flow Area (sq ft)		258.55	
E.G. Slope (ft/ft)	0.002551	Area (sq ft)	37.48	258.55	
Q Total (cfs)	1340.00	Flow (cfs)		1340.00	
Top Width (ft)	64.99	Top Width (ft)	11.57	53.42	
Vel Total (ft/s)	5.18	Avg. Vel. (ft/s)		5.18	
Max Chl Dpth (ft)	6.90	Hydr. Depth (ft)		4.84	
Conv. Total (cfs)	26532.9	Conv. (cfs)		26532.9	
Length Wtd. (ft)	112.80	Wetted Per. (ft)		56.31	
Min Ch El (ft)	936.34	Shear (lb/sq ft)		0.73	
Alpha	1.00	Stream Power (lb/ft s)		3.79	
Frctn Loss (ft)	0.50	Cum Volume (acre-ft)	2.03	12.53	0.33
C & E Loss (ft)	0.09	Cum SA (acres)	1.78	2.23	0.24

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

water surface was used.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2537.862

INPUT
Description: 35
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.57	1.68	951.52	5.06	951.33	7.62	951.19	10.6	951.03
11.7	950.9	11.87	950.88	12	950.91	12.29	950.97	12.64	951.03
13.02	951.11	13.52	951.21	14.36	951.15	17.81	950.89	18.02	950.79
24.82	947.51	36.7	941.84	42.07	939.73	44.05	938.98	47.25	938.91
55.82	938.83	58.75	939.7	59.89	940.18	64.72	942.21	74.58	942.62
86.01	942.94	86.62	942.94	105.3	943.01	110.95	943.14	112.96	941.41
119.14	935.6	126.05	935.54	137.81	935.66	139.43	939.26	143.82	943.94
147.5	944.04	163.97	943.74	166.25	943.69	175.41	944.27	205.66	948.76
230.07	953.39								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	110.95	.04	143.82	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
110.95	143.82	18.67	17.03	20.7	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
147.5	230.07	944.04	F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	942.28	Element			
Vel Head (ft)	0.82	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	941.46	Reach Len. (ft)	18.67	17.03	20.70
Crit W.S. (ft)	940.18	Flow Area (sq ft)	48.37	136.66	
E.G. Slope (ft/ft)	0.006460	Area (sq ft)	48.37	136.66	
Q Total (cfs)	1100.00	Flow (cfs)	72.40	1027.60	
Top Width (ft)	53.87	Top Width (ft)	25.27	28.59	
Vel Total (ft/s)	5.94	Avg. Vel. (ft/s)	1.50	7.52	
Max Chl Dpth (ft)	5.92	Hydr. Depth (ft)	1.91	4.78	
Conv. Total (cfs)	13685.7	Conv. (cfs)	900.8	12784.9	
Length Wtd. (ft)	17.08	Wetted Per. (ft)	26.22	34.20	
Min Ch El (ft)	935.54	Shear (lb/sq ft)	0.74	1.61	
Alpha	1.50	Stream Power (lb/ft s)	1.11	12.12	
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	3.13	10.11	1.40
C & E Loss (ft)	0.09	Cum SA (acres)	2.75	2.02	1.28

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

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	943.07	Element			
Vel Head (ft)	1.33	Wt. n-Val.		0.040	
W.S. Elev (ft)	941.74	Reach Len. (ft)	18.67	17.03	20.70
Crit W.S. (ft)	940.67	Flow Area (sq ft)		144.66	
E.G. Slope (ft/ft)	0.009375	Area (sq ft)		144.66	
Q Total (cfs)	1340.00	Flow (cfs)		1340.00	
Top Width (ft)	29.18	Top Width (ft)		29.18	
Vel Total (ft/s)	9.26	Avg. Vel. (ft/s)		9.26	
Max Chl Dpth (ft)	6.20	Hydr. Depth (ft)		4.96	
Conv. Total (cfs)	13839.2	Conv. (cfs)		13839.2	
Length Wtd. (ft)	17.03	Wetted Per. (ft)		35.00	
Min Ch El (ft)	935.54	Shear (lb/sq ft)		2.42	
Alpha	1.00	Stream Power (lb/ft s)		22.41	
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	1.97	12.01	0.33
C & E Loss (ft)	0.06	Cum SA (acres)	1.76	2.12	0.24

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: Hope Creek
REACH: 1 RS: 2520.830

INPUT
Description: 36
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.53	3.81	951.39	8.01	951.14	9.39	951.06	11.26	950.96
12.64	950.89	13.62	950.78	13.96	950.75	14.51	950.85	15.61	951.07
15.95	951.04	16.64	950.99	17.53	950.91	19.82	950.74	26.26	947.7
27.23	947.24	39.19	941.53	41.84	940.49	46.14	938.86	53.11	938.7
57.31	938.66	61.73	939.97	63.61	940.52	66.59	941.77	87.09	942.64
91.05	942.75	92.4	942.79	101.58	942.82	119.91	943.26	126.7	937.39
128.49	935.71	135.82	935.65	146.19	935.58	149.97	939.74	153.79	943.81
159.23	943.95	163.68	944.07	166.92	944.01	177.85	945.04	184.02	945.45
215.35	946.49	230.24	949.29						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	119.91	.04	153.79	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
119.91	153.79	97.79	129.85	152.46	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	119.91	943	F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	942.04	Element			
Vel Head (ft)	1.68	Wt. n-Val.		0.040	
W.S. Elev (ft)	940.35	Reach Len. (ft)	97.79	129.85	152.46
Crit W.S. (ft)	940.14	Flow Area (sq ft)		105.67	
E.G. Slope (ft/ft)	0.015406	Area (sq ft)	25.81	105.67	
Q Total (cfs)	1100.00	Flow (cfs)		1100.00	
Top Width (ft)	48.12	Top Width (ft)	20.85	27.28	
Vel Total (ft/s)	10.41	Avg. Vel. (ft/s)		10.41	
Max Chl Dpth (ft)	4.77	Hydr. Depth (ft)		3.87	
Conv. Total (cfs)	8862.4	Conv. (cfs)		8862.4	
Length Wtd. (ft)	129.42	Wetted Per. (ft)		31.15	
Min Ch El (ft)	935.58	Shear (lb/sq ft)		3.26	
Alpha	1.00	Stream Power (lb/ft s)		33.96	
Frctn Loss (ft)	0.73	Cum Volume (acre-ft)	3.12	10.06	1.40
C & E Loss (ft)	0.38	Cum SA (acres)	2.74	2.01	1.28

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 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 OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	942.80	Element			
Vel Head (ft)	1.97	Wt. n-Val.		0.040	
W.S. Elev (ft)	940.83	Reach Len. (ft)	97.79	129.85	152.46
Crit W.S. (ft)	940.73	Flow Area (sq ft)		119.01	
E.G. Slope (ft/ft)	0.016308	Area (sq ft)		119.01	
Q Total (cfs)	1340.00	Flow (cfs)		1340.00	
Top Width (ft)	28.28	Top Width (ft)		28.28	
Vel Total (ft/s)	11.26	Avg. Vel. (ft/s)		11.26	

Max Chl Dpth (ft)	5.25	Hydr. Depth (ft)			4.21	
Conv. Total (cfs)	10493.1	Conv. (cfs)			10493.1	
Length Wtd. (ft)	129.85	Wetted Per. (ft)			32.54	
Min Ch El (ft)	935.58	Shear (lb/sq ft)			3.72	
Alpha	1.00	Stream Power (lb/ft s)			41.92	
Frctn Loss (ft)	0.84	Cum Volume (acre-ft)		1.97	11.96	0.33
C & E Loss (ft)	0.42	Cum SA (acres)		1.76	2.11	0.24

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: Hope Creek
REACH: 1 RS: 2390.934

INPUT
Description: 37
Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.03	6.19	950.82	8.9	950.67	9.47	950.64	10.2	950.59
15.04	950.28	15.53	950.21	16	950.16	16.32	950.13	16.8	950.22
17.31	950.32	17.78	950.41	17.95	950.44	19.02	950.39	22.07	950.18
23.61	949.5	24.28	949.21	24.32	949.19	25.56	948.64	41.75	941.49
41.76	941.49	45.2	939.7	48.14	938.69	57.34	938.37	59.1	938.3
63.82	939.79	67.84	941.12	68.49	941.11	71.3	941.07	76.16	941.11
88.03	941.19	105.22	941.61	111.35	941.55	131.08	942.16	138.07	942.13
162.22	942.18	164.56	940.61	170.59	936.56	173.04	934.91	186.49	934.98
198.47	934.58	199.13	934.75	201.34	935.31	206.68	938.83	207.78	941.39
208.81	942.567	215.34	942.65	217	942.87	222.67	945.05	242.61	951.43

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	162.22	.04	208.81	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
162.22	208.81	38.36	36.6	36.24	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	26.75		F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	940.92	Element			
Vel Head (ft)	0.43	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	940.49	Reach Len. (ft)	38.36	36.60	36.24
Crit W.S. (ft)		Flow Area (sq ft)	33.89	201.08	
E.G. Slope (ft/ft)	0.002925	Area (sq ft)	33.89	201.08	
Q Total (cfs)	1100.00	Flow (cfs)	29.40	1070.60	
Top Width (ft)	64.94	Top Width (ft)	22.28	42.66	
Vel Total (ft/s)	4.68	Avg. Vel. (ft/s)	0.87	5.32	
Max Chl Dpth (ft)	5.91	Hydr. Depth (ft)	1.52	4.71	
Conv. Total (cfs)	20338.1	Conv. (cfs)	543.6	19794.5	
Length Wtd. (ft)	36.62	Wetted Per. (ft)	22.99	46.62	
Min Ch El (ft)	934.58	Shear (lb/sq ft)	0.27	0.79	
Alpha	1.26	Stream Power (lb/ft s)	0.23	4.19	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	3.05	9.60	1.40
C & E Loss (ft)	0.12	Cum SA (acres)	2.69	1.90	1.28

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 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 #5yr

E.G. Elev (ft)	941.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.57	Wt. n-Val.		0.040	
W.S. Elev (ft)	940.97	Reach Len. (ft)	38.36	36.60	36.24
Crit W.S. (ft)		Flow Area (sq ft)		221.70	
E.G. Slope (ft/ft)	0.003441	Area (sq ft)		221.70	
Q Total (cfs)	1340.00	Flow (cfs)		1340.00	
Top Width (ft)	43.58	Top Width (ft)		43.58	
Vel Total (ft/s)	6.04	Avg. Vel. (ft/s)		6.04	
Max Chl Dpth (ft)	6.39	Hydr. Depth (ft)		5.09	
Conv. Total (cfs)	22842.3	Conv. (cfs)		22842.3	
Length Wtd. (ft)	36.60	Wetted Per. (ft)		47.99	
Min Ch El (ft)	934.58	Shear (lb/sq ft)		0.99	
Alpha	1.00	Stream Power (lb/ft s)		6.00	
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	1.97	11.45	0.33
C & E Loss (ft)	0.10	Cum SA (acres)	1.76	2.00	0.24

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: Hope Creek
REACH: 1 RS: 2354.325

INPUT
Description: 38
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	950.98	8.41	950.7	10.08	950.64	14.97	950.4	19.05	950.2
19.65	950.08	20.19	949.97	20.48	950.04	21.7	950.31	22.09	950.29
23.1	950.24	26.03	950.14	29.08	948.8	35.51	945.97	44.01	941.89
45.94	941.26	50.97	938.64	60.58	938.33	63.26	938.14	65.6	938.8
66.38	939.08	69.25	940.09	71.32	940.83	74.66	940.97	83.9	941.07
98.21	941.17	111.56	941.14	122.01	941.41	137.61	942.17	165.54	942.63
166.02	942.63	166.41	942.45	170.87	939.22	176.77	939.11	179.78	938.78
180.22	938.74	184.11	936.62	185.71	934.95	189.75	935.02	192.94	934.72
193.39	934.67	193.87	934.63	204.88	934.22	213.31	940.87	215.12	942.7
221	948.64	229.13	950.8						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	166.02	.04	215.12	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
166.02	215.12	95.4	91.3	65.8	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	166.02	941.7	F

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	940.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.65	Wt. n-Val.		0.040	
W.S. Elev (ft)	938.93	Reach Len. (ft)	95.40	91.30	65.80
Crit W.S. (ft)	938.93	Flow Area (sq ft)		106.58	
E.G. Slope (ft/ft)	0.017731	Area (sq ft)	7.32	106.58	
Q Total (cfs)	1100.00	Flow (cfs)		1100.00	
Top Width (ft)	47.98	Top Width (ft)	15.55	32.44	
Vel Total (ft/s)	10.32	Avg. Vel. (ft/s)		10.32	
Max Chl Dpth (ft)	4.71	Hydr. Depth (ft)		3.29	
Conv. Total (cfs)	8260.8	Conv. (cfs)		8260.8	
Length Wtd. (ft)	91.30	Wetted Per. (ft)		35.36	
Min Ch El (ft)	934.22	Shear (lb/sq ft)		3.34	
Alpha	1.00	Stream Power (lb/ft s)		34.44	
Frctn Loss (ft)	0.48	Cum Volume (acre-ft)	3.03	9.47	1.40
C & E Loss (ft)	0.40	Cum SA (acres)	2.67	1.87	1.28

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

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

CROSS SECTION OUTPUT  Profile #5yr

  E.G. Elev (ft)          941.19   Element                  Left OB   Channel   Right OB
  Vel Head (ft)             1.60   Wt. n-Val.                         0.040
  W.S. Elev (ft)          939.60   Reach Len. (ft)           95.40    91.30     65.80
  Crit W.S. (ft)          939.60   Flow Area (sq ft)                 132.15
  E.G. Slope (ft/ft)    0.017527   Area (sq ft)                      132.15
  Q Total (cfs)         1340.00    Flow (cfs)                       1340.00
  Top Width (ft)          41.35    Top Width (ft)                     41.35
  Vel Total (ft/s)        10.14    Avg. Vel. (ft/s)                   10.14
  Max Chl Dpth (ft)        5.38    Hydr. Depth (ft)                    3.20
  Conv. Total (cfs)     10121.6    Conv. (cfs)                      10121.6
  Length Wtd. (ft)        91.30    Wetted Per. (ft)                   44.64
  Min Ch El (ft)         934.22    Shear (lb/sq ft)                    3.24
  Alpha                    1.00    Stream Power (lb/ft s)             32.85
  Frctn Loss (ft)          0.38    Cum Volume (acre-ft)       1.97    11.30      0.33
  C & E Loss (ft)          0.39    Cum SA (acres)             1.76     1.97      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: 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: Hope Creek
REACH: 1                  RS: 2262

INPUT
Description:
Station Elevation Data    num=      56
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  951.62    5.15  951.49    8.22  951.42   12.97  951.25   21.09  950.97
   22.98  950.92   27.51   950.8   33.65  950.65   42.91  950.41    45.1  950.35
   46.46  950.32   54.63  949.91   55.29  949.88   55.59  949.87   55.63  949.86
   55.67  949.86   55.76  949.85   57.19  949.76   57.25  949.78   57.29  949.79
   58.53  950.08   58.59  950.08   58.87  950.06   62.48  949.79   67.87  947.07
   83.07  939.46   87.32  938.02   88.88  937.59   96.84  937.77   99.16  937.77
  102.35  938.43  111.84  940.02  118.56  940.41  130.35  941.09  134.76  941.25
  141.69  941.42  164.65  941.97  168.26  941.86  184.57  941.35  186.95  939.71
  187.38  939.51  192.66  937.02  193.03  937.02  193.94  937.01  197.79  936.98
     203  935.44  205.45  933.97  214.56  934.01  214.74  934.01   214.8  934.01
  224.23  933.98  225.89     934  226.62     934  242.37  933.99   250.9  940.29
  260.27  950.25

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .12  184.57     .04   250.9     .12

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        184.57   250.9             220.4  181.12  126.56             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0  164.65     941        F
```

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	939.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.		0.040	
W.S. Elev (ft)	939.04	Reach Len. (ft)	220.40	181.12	126.56
Crit W.S. (ft)	936.91	Flow Area (sq ft)		243.60	
E.G. Slope (ft/ft)	0.002464	Area (sq ft)	21.30	243.60	
Q Total (cfs)	1100.00	Flow (cfs)		1100.00	
Top Width (ft)	82.49	Top Width (ft)	21.66	60.82	
Vel Total (ft/s)	4.52	Avg. Vel. (ft/s)		4.52	
Max Chl Dpth (ft)	5.07	Hydr. Depth (ft)		4.01	
Conv. Total (cfs)	22160.1	Conv. (cfs)		22160.1	
Length Wtd. (ft)	181.67	Wetted Per. (ft)		63.57	
Min Ch El (ft)	933.97	Shear (lb/sq ft)		0.59	
Alpha	1.00	Stream Power (lb/ft s)		2.66	
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)	3.00	9.10	1.40
C & E Loss (ft)	0.00	Cum SA (acres)	2.63	1.77	1.28

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	940.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.		0.040	
W.S. Elev (ft)	940.09	Reach Len. (ft)	220.40	181.12	126.56
Crit W.S. (ft)	937.33	Flow Area (sq ft)		309.39	
E.G. Slope (ft/ft)	0.001788	Area (sq ft)		309.39	
Q Total (cfs)	1340.00	Flow (cfs)		1340.00	
Top Width (ft)	64.23	Top Width (ft)		64.23	
Vel Total (ft/s)	4.33	Avg. Vel. (ft/s)		4.33	
Max Chl Dpth (ft)	6.12	Hydr. Depth (ft)		4.82	
Conv. Total (cfs)	31686.0	Conv. (cfs)		31686.0	
Length Wtd. (ft)	181.09	Wetted Per. (ft)		67.59	
Min Ch El (ft)	933.97	Shear (lb/sq ft)		0.51	
Alpha	1.00	Stream Power (lb/ft s)		2.21	
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)	1.97	10.84	0.33
C & E Loss (ft)	0.01	Cum SA (acres)	1.76	1.86	0.24

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

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2081.919

INPUT
Description: 39
Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	949.11	3.35	949.01	5.94	948.94	11.21	948.75	13.41	948.67
14.5	948.62	14.69	948.6	14.84	948.58	15.59	948.48	16.45	948.37
17.13	948.52	17.94	948.69	19.47	948.59	21.05	948.47	23.76	947.08
25.28	946.3	25.94	945.98	26.99	945.45	27.45	945.24	41.78	938.51
47.88	937.01	50.77	936.27	53.29	936.24	60.49	936.53	69.08	938.33
71.66	939.02	79.02	939.14	104.61	940.22	108.7	940.18	138.33	939.89
148.21	940.05	172.8	940.36	186.33	940.42	201.84	940.59	211.04	940.74
212.05	937.32	218.4	932.36	233.4	932.34	233.68	932.33	234.72	932.31
246.63	932.17	249.36	932.16	250.14	932.98	253.36	938.37	293.68	947.23
294.9	947.64								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	211.04	.04	253.36	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
211.04	253.36	293.59	431.27	483.25	.1	.3

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	938.98	Element	Left OB	Channel	Right OB

Vel Head (ft)	0.31	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	938.67	Reach Len. (ft)	293.59	431.27	483.25
Crit W.S. (ft)		Flow Area (sq ft)	44.78	236.41	0.20
E.G. Slope (ft/ft)	0.001761	Area (sq ft)	44.78	236.41	0.20
Q Total (cfs)	1100.00	Flow (cfs)	30.77	1069.20	0.03
Top Width (ft)	71.96	Top Width (ft)	28.90	41.71	1.35
Vel Total (ft/s)	3.91	Avg. Vel. (ft/s)	0.69	4.52	0.14
Max Chl Dpth (ft)	6.51	Hydr. Depth (ft)	1.55	5.67	0.15
Conv. Total (cfs)	26216.0	Conv. (cfs)	733.4	25481.9	0.7
Length Wtd. (ft)	424.92	Wetted Per. (ft)	29.45	47.83	1.39
Min Ch El (ft)	932.16	Shear (lb/sq ft)	0.17	0.54	0.02
Alpha	1.30	Stream Power (lb/ft s)	0.11	2.46	0.00
Frctn Loss (ft)	0.98	Cum Volume (acre-ft)	2.83	8.11	1.40
C & E Loss (ft)	0.02	Cum SA (acres)	2.51	1.56	1.28

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	940.07	Element			
Vel Head (ft)	0.35	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	939.71	Reach Len. (ft)	293.59	431.27	483.25
Crit W.S. (ft)		Flow Area (sq ft)		280.12	4.10
E.G. Slope (ft/ft)	0.001615	Area (sq ft)		280.12	4.10
Q Total (cfs)	1340.00	Flow (cfs)		1338.46	1.54
Top Width (ft)	48.12	Top Width (ft)		42.02	6.11
Vel Total (ft/s)	4.71	Avg. Vel. (ft/s)		4.78	0.38
Max Chl Dpth (ft)	7.55	Hydr. Depth (ft)		6.67	0.67
Conv. Total (cfs)	33341.9	Conv. (cfs)		33303.6	38.3
Length Wtd. (ft)	424.19	Wetted Per. (ft)		48.92	6.25
Min Ch El (ft)	932.16	Shear (lb/sq ft)		0.58	0.07
Alpha	1.03	Stream Power (lb/ft s)		2.76	0.02
Frctn Loss (ft)	0.81	Cum Volume (acre-ft)	1.97	9.61	0.32
C & E Loss (ft)	0.00	Cum SA (acres)	1.76	1.64	0.23

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 1650

INPUT
Description:
Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	947.97	8.57	947.7	15.97	947.48	20.94	947.33	30.35	947.1
33.5	947.02	37.49	946.8	42.51	946.54	43.35	946.45	43.97	946.41
44.24	946.46	44.85	946.58	45.45	946.71	46.61	946.57	48.4	946.37
48.92	946.1	57.93	941.44	69.76	935.78	74.41	934.97	78.9	934.04
83.2	934.02	86.21	933.96	91.89	935.14	93.2	935.42	99.64	936.77
118.18	936.99	130.57	937.27	146.24	937.35	160.01	937.29	180.62	937.1
195.16	937.27	208.74	937.19	233.59	937.16	249.38	937.33	274.35	937.85
290.71	938.08	318.17	938.79	327.4	938.97	328.11	936.62	329.84	931.52
350.77	931.34	356.16	931.18	357.3	932.64	361.56	939.27	400.23	949.052

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	327.4	.04	361.56	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
327.4	361.56	172.21	158.59	117.87	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	937.98	Element			
Vel Head (ft)	0.47	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	937.51	Reach Len. (ft)	172.21	158.59	117.87
Crit W.S. (ft)		Flow Area (sq ft)	131.20	180.98	
E.G. Slope (ft/ft)	0.003161	Area (sq ft)	131.20	180.98	
Q Total (cfs)	1100.00	Flow (cfs)	70.70	1029.30	
Top Width (ft)	224.41	Top Width (ft)	191.83	32.59	
Vel Total (ft/s)	3.52	Avg. Vel. (ft/s)	0.54	5.69	
Max Chl Dpth (ft)	6.33	Hydr. Depth (ft)	0.68	5.55	
Conv. Total (cfs)	19564.7	Conv. (cfs)	1257.4	18307.3	

Length Wtd. (ft)	159.53	Wetted Per. (ft)	192.69	40.28	
Min Ch El (ft)	931.18	Shear (lb/sq ft)	0.13	0.89	
Alpha	2.44	Stream Power (lb/ft s)	0.07	5.04	
Frctn Loss (ft)	0.47	Cum Volume (acre-ft)	2.24	6.04	1.40
C & E Loss (ft)	0.01	Cum SA (acres)	1.76	1.19	1.27

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	939.26	Element			
Vel Head (ft)	0.39	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	938.86	Reach Len. (ft)	172.21	158.59	117.87
Crit W.S. (ft)		Flow Area (sq ft)	201.59	225.92	
E.G. Slope (ft/ft)	0.002265	Area (sq ft)	201.59	225.92	
Q Total (cfs)	1340.00	Flow (cfs)	138.41	1201.59	
Top Width (ft)	192.55	Top Width (ft)	158.69	33.86	
Vel Total (ft/s)	3.13	Avg. Vel. (ft/s)	0.69	5.32	
Max Chl Dpth (ft)	7.68	Hydr. Depth (ft)	1.27	6.67	
Conv. Total (cfs)	28156.0	Conv. (cfs)	2908.3	25247.7	
Length Wtd. (ft)	159.66	Wetted Per. (ft)	160.31	43.30	
Min Ch El (ft)	931.18	Shear (lb/sq ft)	0.18	0.74	
Alpha	2.59	Stream Power (lb/ft s)	0.12	3.92	
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)	1.29	7.11	0.30
C & E Loss (ft)	0.01	Cum SA (acres)	1.23	1.26	0.20

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 1492.060

INPUT
Description: 40
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	947.11	1.01	947.08	7.6	946.91	15.69	946.73	18.31	946.67
20.06	946.63	25.46	946.36	27.56	946.25	28.5	946.2	28.63	946.19
28.78	946.17	29.03	946.14	29.9	946.06	30.11	946.1	30.8	946.24
31.37	946.35	31.59	946.4	32.55	946.32	32.87	946.29	34.6	946.14
37.57	944.74	47.66	939.52	56.35	935.28	61.94	934.08	65.24	933.18
69.15	933.28	71.78	933.31	78.43	934.33	86.31	936.11	104.05	936.36
116.38	936.71	139.22	936.79	148.69	936.76	176.16	937.14	182.14	937.1
190.67	937.2	215.26	937.54	217.72	937.58	219.11	937.6	229.9	937.67
257.57	937.8	258.24	937.82	263.89	938.01	275.91	938.2	278.03	932.99
280.19	929.74	298.34	930.09	302.2	930.11	305.63	938.13	306.11	939.26
306.15	939.36	306.5	939.45	327.57	944.61	334.09	947.58		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	275.91	.04	306.11	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
275.91	306.11	383.24	408.33	377.92	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	937.50	Element			
Vel Head (ft)	0.45	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	937.05	Reach Len. (ft)	383.24	408.33	377.92
Crit W.S. (ft)		Flow Area (sq ft)	121.88	182.29	
E.G. Slope (ft/ft)	0.002782	Area (sq ft)	121.88	182.29	
Q Total (cfs)	1100.00	Flow (cfs)	81.36	1018.64	
Top Width (ft)	145.80	Top Width (ft)	117.01	28.79	
Vel Total (ft/s)	3.62	Avg. Vel. (ft/s)	0.67	5.59	
Max Chl Dpth (ft)	7.31	Hydr. Depth (ft)	1.04	6.33	
Conv. Total (cfs)	20854.7	Conv. (cfs)	1542.5	19312.2	
Length Wtd. (ft)	406.17	Wetted Per. (ft)	117.95	37.85	
Min Ch El (ft)	929.74	Shear (lb/sq ft)	0.18	0.84	
Alpha	2.21	Stream Power (lb/ft s)	0.12	4.67	
Frctn Loss (ft)	1.58	Cum Volume (acre-ft)	1.74	5.38	1.40
C & E Loss (ft)	0.03	Cum SA (acres)	1.15	1.08	1.27

Warning: Divided flow computed for this cross-section.
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 #5yr

E.G. Elev (ft)	938.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.48	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	938.39	Reach Len. (ft)	383.24	408.33	377.92
Crit W.S. (ft)		Flow Area (sq ft)	121.90	221.51	
E.G. Slope (ft/ft)	0.002470	Area (sq ft)	121.90	221.51	
Q Total (cfs)	1340.00	Flow (cfs)	71.50	1268.50	
Top Width (ft)	159.19	Top Width (ft)	129.36	29.83	
Vel Total (ft/s)	3.90	Avg. Vel. (ft/s)	0.59	5.73	
Max Chl Dpth (ft)	8.65	Hydr. Depth (ft)	0.94	7.43	
Conv. Total (cfs)	26964.2	Conv. (cfs)	1438.8	25525.4	
Length Wtd. (ft)	407.66	Wetted Per. (ft)	130.99	40.54	
Min Ch El (ft)	929.74	Shear (lb/sq ft)	0.14	0.84	
Alpha	2.04	Stream Power (lb/ft s)	0.08	4.82	
Frctn Loss (ft)	1.56	Cum Volume (acre-ft)	0.66	6.29	0.30
C & E Loss (ft)	0.07	Cum SA (acres)	0.66	1.14	0.20

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: Hope Creek
REACH: 1 RS: 1084

INPUT
Description:
Station Elevation Data num= 78

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	945.77	6.53	945.57	8.72	945.51	16.09	945.25	21.62	945.07
23.39	945.02	26.38	944.93	34.11	944.72	37.58	944.63	46.83	944.39
53.05	943.99	54.98	943.87	55.18	943.86	55.43	943.84	56.41	943.76
57.64	944.01	58.03	944.09	58.45	944.06	60.29	943.95	60.98	943.9
61.87	943.86	63.74	942.23	70.08	937.9	77.53	935.1	80.47	934.2
83.94	932.99	87.76	931.67	88.37	931.65	97.89	931.8	98.61	932.06
105.54	934.29	105.82	934.48	107.48	935.19	108.69	935.84	122.78	944.89
123.54	944.91	140.5	943.47	143.22	943.24	151.87	942.5	152.11	942.48
153.69	941.64	158.76	938.95	163.27	931.15	165.26	927.83	171.38	927.95
179.7	928.36	180.1	928.97	184.02	934.85	185.26	936.47	190.08	936.81
200.52	937.5	205.47	937.81	234.77	937.49	239.69	937.23	252.04	935.07
255.74	934.97	266.1	935.92	281.92	936.14	285.32	937.32	298.44	936.84
314.41	936.61	318.92	936.96	319.24	937.17	331.15	937.25	343.81	938.19
348.75	938.37	354.27	938.82	368.05	939.02	372.86	939.09	376.25	939.13
389.22	939.15	401.38	940.22	439.05	942.05	442.12	942.33	451.19	944
454.27	944.78	460.3	945.41	467.41	946.72				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	158.76	.04	185.26	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
158.76	185.26	53.7	55.9	61.7	.1	.3

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	935.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.79	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	935.10	Reach Len. (ft)	53.70	55.90	61.70
Crit W.S. (ft)		Flow Area (sq ft)	67.49	132.58	0.37
E.G. Slope (ft/ft)	0.005844	Area (sq ft)	67.49	132.58	0.37
Q Total (cfs)	1100.00	Flow (cfs)	107.65	992.29	0.06

Top Width (ft)	58.14	Top Width (ft)	29.71	23.22	5.21
Vel Total (ft/s)	5.49	Avg. Vel. (ft/s)	1.60	7.48	0.16
Max Chl Dpth (ft)	7.27	Hydr. Depth (ft)	2.27	5.71	0.07
Conv. Total (cfs)	14389.1	Conv. (cfs)	1408.1	12980.2	0.8
Length Wtd. (ft)	55.70	Wetted Per. (ft)	30.86	30.98	5.22
Min Ch El (ft)	927.83	Shear (lb/sq ft)	0.80	1.56	0.03
Alpha	1.69	Stream Power (lb/ft s)	1.27	11.68	0.00
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	0.91	3.90	1.40
C & E Loss (ft)	0.00	Cum SA (acres)	0.51	0.84	1.25

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	937.24	Element			
Vel Head (ft)	1.14	Wt. n-Val.		0.040	
W.S. Elev (ft)	936.11	Reach Len. (ft)	53.70	55.90	61.70
Crit W.S. (ft)		Flow Area (sq ft)		156.73	
E.G. Slope (ft/ft)	0.006750	Area (sq ft)		156.73	
Q Total (cfs)	1340.00	Flow (cfs)		1340.00	
Top Width (ft)	24.58	Top Width (ft)		24.58	
Vel Total (ft/s)	8.55	Avg. Vel. (ft/s)		8.55	
Max Chl Dpth (ft)	8.28	Hydr. Depth (ft)		6.38	
Conv. Total (cfs)	16310.2	Conv. (cfs)		16310.2	
Length Wtd. (ft)	55.90	Wetted Per. (ft)		33.42	
Min Ch El (ft)	927.83	Shear (lb/sq ft)		1.98	
Alpha	1.00	Stream Power (lb/ft s)		16.89	
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)	0.12	4.52	0.30
C & E Loss (ft)	0.02	Cum SA (acres)	0.09	0.89	0.20

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 1027.831

INPUT
Description: 41
Station Elevation Data num= 78

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.64	.11	943.66	.26	943.69	.47	943.74	3.16	943.35
8.41	942.72	8.57	942.7	8.6	942.7	8.63	942.7	8.69	942.7
8.77	942.7	8.8	942.67	10.14	942.06	19.03	938.04	20.45	937.31
21.15	936.76	23.71	934.69	24.42	934.07	27.5	933.27	33.75	931.64
33.91	931.6	34.39	931.49	34.79	931.48	35.58	931.5	41.42	931.61
42.18	931.82	42.3	931.86	49.56	934.07	49.69	934.1	52.11	934.7
52.83	935.25	53.16	935.5	53.38	935.67	57.6	938.89	63.46	943.36
64.81	943.38	66.6	943.71	75.4	942.96	103.47	938.63	107.04	937.23
107.29	936.79	110.84	930.57	110.91	930.72	112.29	927.42	123.63	928.15
126.77	928.46	129.58	930.95	131.58	932.89	133.77	935	136.12	935.57
141.91	935.67	144.88	935.93	168.07	934.94	173.97	934.87	177.44	934.94
180.68	935.1	183.38	935.12	206.79	934.58	214.04	935.27	225.7	937.14
234.19	936.22	243.54	936.41	250.97	936.46	257.91	936.81	259.34	936.65
261.48	937.11	268.27	936.97	287.64	938.55	291.44	938.6	317.37	938.95
335.12	939.19	339.22	939.19	356.99	940.76	382.79	943.01	385.89	943.23
387.25	943.38	388.26	943.43	390.52	943.72				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	107.04	.04	136.12	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
107.04	136.12	76.72	78.07	78.34	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	935.54	Element			
Vel Head (ft)	0.82	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	934.72	Reach Len. (ft)	76.72	78.07	78.34
Crit W.S. (ft)		Flow Area (sq ft)	58.24	133.24	0.54
E.G. Slope (ft/ft)	0.006273	Area (sq ft)	58.24	133.24	0.54
Q Total (cfs)	1100.00	Flow (cfs)	89.92	1009.99	0.09
Top Width (ft)	61.07	Top Width (ft)	28.47	25.01	7.60
Vel Total (ft/s)	5.73	Avg. Vel. (ft/s)	1.54	7.58	0.17

Max Chl Dpth (ft)	7.30	Hydr. Depth (ft)	2.05	5.33	0.07
Conv. Total (cfs)	13888.1	Conv. (cfs)	1135.2	12751.7	1.1
Length Wtd. (ft)	77.97	Wetted Per. (ft)	29.49	32.22	7.61
Min Ch El (ft)	927.42	Shear (lb/sq ft)	0.77	1.62	0.03
Alpha	1.61	Stream Power (lb/ft s)	1.19	12.28	0.00
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	0.83	3.73	1.40
C & E Loss (ft)	0.08	Cum SA (acres)	0.47	0.81	1.24

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #Syr

			Left OB	Channel	Right OB
E.G. Elev (ft)	936.84	Element			
Vel Head (ft)	1.07	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	935.77	Reach Len. (ft)	76.72	78.07	78.34
Crit W.S. (ft)		Flow Area (sq ft)		161.19	1.56
E.G. Slope (ft/ft)	0.006845	Area (sq ft)		161.19	1.56
Q Total (cfs)	1340.00	Flow (cfs)		1339.60	0.40
Top Width (ft)	40.62	Top Width (ft)		28.25	12.37
Vel Total (ft/s)	8.23	Avg. Vel. (ft/s)		8.31	0.26
Max Chl Dpth (ft)	8.35	Hydr. Depth (ft)		5.71	0.13
Conv. Total (cfs)	16196.6	Conv. (cfs)		16191.8	4.8
Length Wtd. (ft)	78.06	Wetted Per. (ft)		36.25	12.61
Min Ch El (ft)	927.42	Shear (lb/sq ft)		1.90	0.05
Alpha	1.02	Stream Power (lb/ft s)		15.79	0.01
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	0.12	4.31	0.30
C & E Loss (ft)	0.13	Cum SA (acres)	0.09	0.85	0.19

Warning: Divided flow computed for this cross-section.
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: Hope Creek
REACH: 1 RS: 949.7572

INPUT
Description: 42
Station Elevation Data num= 101

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.79	1	943.76	5.16	943.66	8.7	943.48	12.91	943.23
13.26	943.23	13.55	943.2	13.92	943.17	14.75	943.09	15.36	943.21
16.27	943.41	18.16	943.24	20.55	943.08	26.6	940.19	28.03	939.5
29.65	938.73	34.6	936.52	35.78	935.8	38.74	933.98	39.11	933.76
41.67	933.23	49.84	931.54	51.38	931.5	58.31	931.32	66.73	933.85
67.61	934.12	69.32	934.16	71.76	934.21	86.6	933.94	86.82	933.94
86.85	933.94	104.1	933.96	104.52	933.45	105.52	932.83	110.64	929.65
115.12	926.86	121.54	926.93	127.95	926.93	131.57	931.93	132.62	933.46
133.76	933.42	135.15	933.49	150.91	934.25	174.08	935.44	175.6	935.45
177.91	935.79	197.28	935.53	215.59	935.97	216.91	936.01	218.12	936.06
228.46	936.33	231.16	936.23	233.14	936.15	240.03	935.92	247.58	936.52
254.49	936.95	261.34	937.02	267.28	937.63	267.72	937.68	268.03	937.68
268.29	937.69	268.42	937.69	268.63	937.69	272.47	937.76	273.62	937.79
317.79	938.07	322.25	938.15	344.92	938.59	356.38	938.81	360.75	938.9
366.67	939.01	371.41	939.32	371.47	939.45	371.6	939.7	371.71	939.91
371.84	939.91	372.29	939.94	375.27	940.02	386.37	940.98	386.77	940.98
386.87	940.97	387.07	940.53	387.12	940.41	394.7	940.52	394.76	940.52
394.79	940.52	394.93	940.52	395.94	940.56	396.62	940.6	400.62	940.81
405.48	941.1	405.49	941.13	405.72	941.51	405.75	941.51	406.22	941.51
406.51	941.51	411.8	942.01	412.47	942.37	415.9	942.45	418.57	942.52
424.64	943.1								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	104.1	.04	132.62	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
104.1	132.62	69.19	71.66	70.51	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	21.33		F

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	935.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.55	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	934.56	Reach Len. (ft)	69.19	71.66	70.51
Crit W.S. (ft)		Flow Area (sq ft)	84.47	165.79	14.73
E.G. Slope (ft/ft)	0.003331	Area (sq ft)	84.47	165.79	14.73
Q Total (cfs)	1100.00	Flow (cfs)	70.32	1022.17	7.51
Top Width (ft)	119.24	Top Width (ft)	66.31	28.52	24.41
Vel Total (ft/s)	4.15	Avg. Vel. (ft/s)	0.83	6.17	0.51
Max Chl Dpth (ft)	7.70	Hydr. Depth (ft)	1.27	5.81	0.60
Conv. Total (cfs)	19058.6	Conv. (cfs)	1218.4	17710.1	130.1
Length Wtd. (ft)	71.48	Wetted Per. (ft)	67.18	34.00	24.44
Min Ch El (ft)	926.86	Shear (lb/sq ft)	0.26	1.01	0.13
Alpha	2.05	Stream Power (lb/ft s)	0.22	6.25	0.06
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.70	3.46	1.38
C & E Loss (ft)	0.12	Cum SA (acres)	0.39	0.76	1.21

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 #5yr

E.G. Elev (ft)	936.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	935.73	Reach Len. (ft)	69.19	71.66	70.51
Crit W.S. (ft)		Flow Area (sq ft)	16.38	198.92	19.72
E.G. Slope (ft/ft)	0.002964	Area (sq ft)	16.38	198.92	19.72
Q Total (cfs)	1340.00	Flow (cfs)	14.38	1306.22	19.40
Top Width (ft)	47.03	Top Width (ft)	9.25	28.52	9.26
Vel Total (ft/s)	5.70	Avg. Vel. (ft/s)	0.88	6.57	0.98
Max Chl Dpth (ft)	8.87	Hydr. Depth (ft)	1.77	6.97	2.13
Conv. Total (cfs)	24612.7	Conv. (cfs)	264.2	23992.2	356.4
Length Wtd. (ft)	71.64	Wetted Per. (ft)	11.03	34.00	11.18
Min Ch El (ft)	926.86	Shear (lb/sq ft)	0.27	1.08	0.33
Alpha	1.29	Stream Power (lb/ft s)	0.24	7.11	0.32
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.10	3.99	0.28
C & E Loss (ft)	0.12	Cum SA (acres)	0.08	0.80	0.17

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

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 878.1000

INPUT
Description: 43
Station Elevation Data num= 79

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.4	4.62	943.27	12.24	942.85	13.31	942.79	14.12	942.73
14.71	942.68	15.15	942.76	16.29	942.99	18.76	942.58	19.41	942.47
19.52	942.46	19.72	942.51	19.97	942.47	22.77	941.14	26.12	939.56
30.92	937.28	33.11	936.24	35.42	935.49	37.97	934.62	41.46	933.43
44.51	932.73	51.56	931.08	56.54	930.66	57.07	930.61	59.4	931.43
63.04	933.05	64.33	933.1	65.33	933.15	67.44	930.19	69.77	926.96
78.74	927	89.85	926.71	97.65	926.93	98.25	927.28	106.61	932.18
108.09	933.66	119.52	933.66	124.63	933.55	125.69	932.83	131.34	930.43
144.19	930.77	157.15	930.94	160.97	932.4	165.06	933.66	165.68	933.94
165.79	933.97	174.11	934.07	174.39	934.08	181.48	934.3	181.53	934.3
181.95	934.31	196.47	934.26	196.85	934.27	200.03	934.36	213.22	934.59
219.4	934.83	226.87	934.97	231.24	935.18	246.06	935.99	247.45	936.14
248.28	936.23	248.84	936.24	259.76	936.54	281.28	936.87	295.4	937.26
295.55	937.26	295.62	937.26	306.15	937.47	307.19	937.49	307.21	937.49
307.24	937.49	327.79	938.51	333.23	938.62	333.32	938.62	333.5	938.62
339.82	938.76	347.5	939.48	382.45	942.32	384.11	942.43		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	65.33	.04	108.09	.12

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

```
          65.33  108.09            18.27   18.76   20.13              .1       .3
 Ineffective Flow     num=        1
    Sta L    Sta R    Elev  Permanent
      300  384.11                F
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CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	934.90	Element			
Vel Head (ft)	0.15	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	934.74	Reach Len. (ft)	18.27	18.76	20.13
Crit W.S. (ft)		Flow Area (sq ft)	70.59	289.06	182.69
E.G. Slope (ft/ft)	0.000745	Area (sq ft)	70.59	289.06	182.69
Q Total (cfs)	1100.00	Flow (cfs)	43.45	970.13	86.42
Top Width (ft)	179.51	Top Width (ft)	27.72	42.76	109.04
Vel Total (ft/s)	2.03	Avg. Vel. (ft/s)	0.62	3.36	0.47
Max Chl Dpth (ft)	8.03	Hydr. Depth (ft)	2.55	6.76	1.68
Conv. Total (cfs)	40310.6	Conv. (cfs)	1592.4	35551.3	3167.0
Length Wtd. (ft)	18.87	Wetted Per. (ft)	28.71	47.98	110.29
Min Ch El (ft)	926.71	Shear (lb/sq ft)	0.11	0.28	0.08
Alpha	2.42	Stream Power (lb/ft s)	0.07	0.94	0.04
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.58	3.09	1.22
C & E Loss (ft)	0.00	Cum SA (acres)	0.31	0.70	1.11

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	936.15	Element			
Vel Head (ft)	0.24	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	935.91	Reach Len. (ft)	18.27	18.76	20.13
Crit W.S. (ft)		Flow Area (sq ft)		338.92	9.60
E.G. Slope (ft/ft)	0.000894	Area (sq ft)		338.92	9.60
Q Total (cfs)	1340.00	Flow (cfs)		1335.40	4.60
Top Width (ft)	47.03	Top Width (ft)		42.76	4.27
Vel Total (ft/s)	3.84	Avg. Vel. (ft/s)		3.94	0.48
Max Chl Dpth (ft)	9.20	Hydr. Depth (ft)		7.93	2.25
Conv. Total (cfs)	44808.4	Conv. (cfs)		44654.6	153.8
Length Wtd. (ft)	18.77	Wetted Per. (ft)		50.74	6.52
Min Ch El (ft)	926.71	Shear (lb/sq ft)		0.37	0.08
Alpha	1.05	Stream Power (lb/ft s)		1.47	0.04
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.09	3.55	0.25
C & E Loss (ft)	0.01	Cum SA (acres)	0.07	0.75	0.16

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 859.3424

INPUT
Description: 44
Station Elevation Data num= 87

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.41	.75	943.39	8.78	943.16	16.47	942.73	17.59	942.66
17.89	942.64	18.96	942.54	19.36	942.61	19.82	942.7	20.56	942.84
21.51	942.7	22.04	942.63	22.72	942.53	24.27	942.34	28.56	940.3
37.18	936.24	42.05	934.65	45.51	933.56	47.73	933.04	50.65	932.34
55.86	931	59.41	930.79	61.27	930.62	65.35	932.15	67.41	933.01
67.55	933.07	67.67	933.12	68.71	932.94	70.18	932.77	70.85	931.04
76.45	926.88	90.47	926.97	97.43	927.06	100.48	929.02	108.35	933.25
115.62	933.37	118.97	933.37	121.95	931.29	123.63	930.3	127.08	930.49
136.35	930.27	138.36	930.22	144.5	930.28	146.07	930.87	147.83	931.37
154.58	933.5	156.91	932.77	157.16	932.69	166.32	933.67	166.43	933.67
172.14	933.75	177.28	933.56	186.03	933.78	189.81	933.66	191.49	933.6
194.87	933.42	201.39	933.89	205.36	934.05	211.79	934.38	213.69	934.47
220.86	934.83	223.53	935.11	232.87	935.51	236.51	935.73	245.35	935.94
247.96	936.01	258	936.3	258.09	936.3	258.14	936.3	260.1	936.33
268.67	936.56	270.38	936.57	285.85	936.82	305.53	937.12	306.54	937.15
306.56	937.15	307.32	937.16	307.4	937.16	333.26	938.45	333.47	938.46
333.48	938.46	333.73	938.46	334.71	938.55	349.59	939.43	372.72	940.92
382.06	941.37	387.77	942.2						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	67.67	.04	108.35	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
67.67	108.35	123.89	123.81	123.48	.1	.3

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	934.88	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.18	Reach Len. (ft)	123.89	123.81	123.48
W.S. Elev (ft)	934.70	Flow Area (sq ft)	65.97	249.16	208.57
Crit W.S. (ft)		Area (sq ft)	65.97	249.16	208.57
E.G. Slope (ft/ft)	0.001021	Flow (cfs)	47.68	927.02	125.31
Q Total (cfs)	1100.00	Top Width (ft)	25.76	40.68	109.84
Top Width (ft)	176.28	Avg. Vel. (ft/s)	0.72	3.72	0.60
Vel Total (ft/s)	2.10	Hydr. Depth (ft)	2.56	6.12	1.90
Max Chl Dpth (ft)	7.82	Conv. (cfs)	1491.8	29007.1	3920.9
Conv. Total (cfs)	34419.9	Wetted Per. (ft)	26.73	44.91	111.50
Length Wtd. (ft)	123.78	Shear (lb/sq ft)	0.16	0.35	0.12
Min Ch El (ft)	926.88	Stream Power (lb/ft s)	0.11	1.32	0.07
Alpha	2.66	Cum Volume (acre-ft)	0.55	2.97	1.13
Frctn Loss (ft)	0.17	Cum SA (acres)	0.30	0.68	1.06
C & E Loss (ft)	0.01				

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	936.12	Wt. n-Val.		0.040	0.120
Vel Head (ft)	0.31	Reach Len. (ft)	123.89	123.81	123.48
W.S. Elev (ft)	935.81	Flow Area (sq ft)		294.33	15.90
Crit W.S. (ft)		Area (sq ft)		294.33	15.90
E.G. Slope (ft/ft)	0.001302	Flow (cfs)		1329.46	10.54
Q Total (cfs)	1340.00	Top Width (ft)		40.68	6.35
Top Width (ft)	47.03	Avg. Vel. (ft/s)		4.52	0.66
Vel Total (ft/s)	4.32	Hydr. Depth (ft)		7.24	2.50
Max Chl Dpth (ft)	8.93	Conv. (cfs)		36837.5	292.0
Conv. Total (cfs)	37129.5	Wetted Per. (ft)		47.59	8.80
Length Wtd. (ft)	123.80	Shear (lb/sq ft)		0.50	0.15
Min Ch El (ft)	926.88	Stream Power (lb/ft s)		2.27	0.10
Alpha	1.09	Cum Volume (acre-ft)	0.09	3.41	0.25
Frctn Loss (ft)	0.22	Cum SA (acres)	0.07	0.73	0.16
C & E Loss (ft)	0.03				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 735.5340

INPUT
Description: 45
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.13	3.78	943.02	6.78	942.93	10.3	942.83	14.96	942.68
19.33	942.54	20.22	942.5	25.75	942.23	28.02	942.11	29.17	942.05
32.12	941.84	32.54	941.81	35.07	941.66	42.67	936.74	43.14	936.42
43.68	936.08	44.17	935.95	44.64	935.84	54.3	933.46	62.22	931.26
64.32	930.68	65.85	930.65	72.51	930.55	75.8	931.43	77.21	931.81
79.99	932.56	82.41	933.21	85.18	933.45	90.62	933.36	92.4	929.94
95.39	926.37	100.59	926.47	104.21	926.54	111.26	926.59	114.02	928.4
118.04	932.88	131.84	932.51	139.52	932.02	154.34	932	156.27	932
157.55	932.01	170.29	932.22	171.44	932.26	174.81	932.59	188.36	933.24
193.73	934.12	194.83	934.17	199.73	934.24	201.97	934.27	207.25	934.44
209.03	934.5	212.65	934.97	220.18	934.66	228.85	934.72	235.85	935.06
245.79	934.97	255.94	935.08	268.99	935.77	274.38	935.81	287.92	935.59
291.34	935.62	306	935.64	314.36	935.69	320.46	935.84	325.38	936.59
326.25	936.27	329.92	936.78	334.99	937.33	337.92	937.79	349.59	939.43
372.72	940.92	382.06	941.37	387.77	942.2				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	90.62	.04	118.04	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
90.62	118.04	19.18	19.15	18.15	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
266	387.77		F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	934.70	Element			
Vel Head (ft)	0.32	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	934.37	Reach Len. (ft)	19.18	19.15	18.15
Crit W.S. (ft)		Flow Area (sq ft)	88.43	182.31	144.74
E.G. Slope (ft/ft)	0.001904	Area (sq ft)	88.43	182.31	144.74
Q Total (cfs)	1100.00	Flow (cfs)	79.91	910.52	109.57
Top Width (ft)	154.57	Top Width (ft)	40.03	27.42	87.13
Vel Total (ft/s)	2.65	Avg. Vel. (ft/s)	0.90	4.99	0.76
Max Chl Dpth (ft)	8.00	Hydr. Depth (ft)	2.21	6.65	1.66
Conv. Total (cfs)	25212.5	Conv. (cfs)	1831.6	20869.4	2511.4
Length Wtd. (ft)	19.04	Wetted Per. (ft)	40.88	33.70	87.26
Min Ch El (ft)	926.37	Shear (lb/sq ft)	0.26	0.64	0.20
Alpha	2.96	Stream Power (lb/ft s)	0.23	3.21	0.15
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	0.33	2.36	0.63
C & E Loss (ft)	0.00	Cum SA (acres)	0.21	0.59	0.78

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	935.88	Element			
Vel Head (ft)	0.58	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	935.29	Reach Len. (ft)	19.18	19.15	18.15
Crit W.S. (ft)		Flow Area (sq ft)	10.27	207.55	36.89
E.G. Slope (ft/ft)	0.002495	Area (sq ft)	10.27	207.55	36.89
Q Total (cfs)	1340.00	Flow (cfs)	7.99	1293.74	38.27
Top Width (ft)	47.03	Top Width (ft)	5.44	27.42	14.17
Vel Total (ft/s)	5.26	Avg. Vel. (ft/s)	0.78	6.23	1.04
Max Chl Dpth (ft)	8.92	Hydr. Depth (ft)	1.89	7.57	2.60
Conv. Total (cfs)	26829.5	Conv. (cfs)	160.0	25903.3	766.2
Length Wtd. (ft)	19.12	Wetted Per. (ft)	7.28	33.70	16.98
Min Ch El (ft)	926.37	Shear (lb/sq ft)	0.22	0.96	0.34
Alpha	1.36	Stream Power (lb/ft s)	0.17	5.98	0.35
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	0.08	2.70	0.17
C & E Loss (ft)	0.01	Cum SA (acres)	0.06	0.63	0.13

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 716.3877

INPUT
Description: 46
Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.22	.67	943.2	3.63	943.11	12.92	942.84	23.8	942.52
25.43	942.46	31.56	942.19	32.74	942.13	35.68	942.01	37.39	941.88
40.89	941.61	41.23	941.59	41.33	941.58	41.39	941.57	41.49	941.51
50.2	935.92	60.57	933.2	60.72	933.16	69.81	930.64	69.89	930.59
78.25	930.41	78.54	930.4	78.75	930.55	88.68	933.22	98.57	933.05
99.37	933.11	102.75	927.07	103.13	926.38	103.28	926.18	116.97	926.46
118.4	926.47	118.91	926.88	124.26	932.85	124.52	932.86	138.12	931.94
138.33	931.88	139.89	931.87	143.44	931.9	157.74	932.15	162.63	932
171.95	932.04	179.1	932.19	180.24	932.2	180.65	932.23	181.58	932.33
191.38	933.33	194.71	933.96	198.87	934.53	200.85	935.39	204.37	936.28
211.1	936.47	217.68	936.47	227.54	936.55	245.88	936.7	251.73	936.8
257.2	936.93	290.84	937.32	295.8	937.44	303.59	937.23	328.94	937.49
340.6	937.6	349.59	939.43	372.72	940.92	382.06	941.37	387.77	942.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	99.37	.04	124.26	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
99.37	124.26	125.31	121.03	115.29	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	934.65	Element			
Vel Head (ft)	0.35	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	934.31	Reach Len. (ft)	125.31	121.03	115.29
Crit W.S. (ft)		Flow Area (sq ft)	95.00	166.51	141.90

E.G. Slope (ft/ft)	0.002215	Area (sq ft)	95.00	166.51	141.90
Q Total (cfs)	1100.00	Flow (cfs)	92.60	878.78	128.63
Top Width (ft)	140.88	Top Width (ft)	43.01	24.89	72.97
Vel Total (ft/s)	2.73	Avg. Vel. (ft/s)	0.97	5.28	0.91
Max Chl Dpth (ft)	8.13	Hydr. Depth (ft)	2.21	6.69	1.94
Conv. Total (cfs)	23371.1	Conv. (cfs)	1967.3	18670.9	2732.8
Length Wtd. (ft)	120.97	Wetted Per. (ft)	43.93	31.75	73.16
Min Ch El (ft)	926.18	Shear (lb/sq ft)	0.30	0.73	0.27
Alpha	3.02	Stream Power (lb/ft s)	0.29	3.83	0.24
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	0.29	2.29	0.57
C & E Loss (ft)	0.04	Cum SA (acres)	0.19	0.57	0.74

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 #5yr

E.G. Elev (ft)	935.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.71	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	935.10	Reach Len. (ft)	125.31	121.03	115.29
Crit W.S. (ft)		Flow Area (sq ft)	21.07	186.33	29.90
E.G. Slope (ft/ft)	0.003255	Area (sq ft)	21.07	186.33	29.90
Q Total (cfs)	1340.00	Flow (cfs)	20.99	1284.74	34.26
Top Width (ft)	47.03	Top Width (ft)	10.69	24.89	11.45
Vel Total (ft/s)	5.65	Avg. Vel. (ft/s)	1.00	6.90	1.15
Max Chl Dpth (ft)	8.92	Hydr. Depth (ft)	1.97	7.49	2.61
Conv. Total (cfs)	23486.7	Conv. (cfs)	367.9	22518.2	600.6
Length Wtd. (ft)	120.99	Wetted Per. (ft)	12.58	31.75	14.47
Min Ch El (ft)	926.18	Shear (lb/sq ft)	0.34	1.19	0.42
Alpha	1.43	Stream Power (lb/ft s)	0.34	8.22	0.48
Frctn Loss (ft)	0.52	Cum Volume (acre-ft)	0.07	2.61	0.16
C & E Loss (ft)	0.03	Cum SA (acres)	0.06	0.62	0.12

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 595.3610

INPUT
Description: 47
Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.8	.77	942.77	1.12	942.76	2.3	942.73	7.21	942.58
13.68	942.39	22.93	942.08	24.77	942.02	25.54	941.99	26.29	941.97
27.24	941.93	28.08	941.89	36.97	941.57	37.46	941.51	40.91	941.11
42.36	940.94	43.18	940.41	44.85	939.44	48.64	937.23	52.91	934.96
56.22	934.19	59.46	933.38	66.6	931.6	72.13	931.26	79.64	930.78
79.72	930.78	84.85	932.25	89.41	933.47	96.06	933.11	101.51	932.85
104.53	929.7	106.62	925.62	112.06	925.86	119.56	925.94	119.63	925.11
122.86	929.24	124.63	933.39	148.93	933.11	154.12	932.86	162.6	932.6
162.78	932.55	162.94	932.58	166.87	932.84	172.93	933.19	178.29	933.5
180.2	933.57	180.27	933.57	184.4	933.69	184.58	933.69	184.9	933.69
185.08	933.33	185.18	933.13	187.42	933.22	187.57	933.22	193.36	933.3
193.62	933.31	214.05	933.63	224.63	933.75	235.64	933.87	243.84	933.93
244.01	934.3	244.09	934.49	244.42	934.49	244.6	934.49	248.9	935.97
248.98	936	249.15	936.06	251.69	936.78	268.31	936.84	329.37	936.99
331.51	937.15	336.63	937.53	337.53	937.69	340.82	938.05	344	938.11
377.28	938.97	402.25	939.31	432.98	940	460.5	940.46	486.66	940.8
518.87	941.14	523.17	941.21	530.38	941.44	559.58	942.39		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	101.51	.04	124.63	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
101.51	124.63	18.02	17.77	17.42	.1	.3

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	934.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.76	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	933.46	Reach Len. (ft)	18.02	17.77	17.42
Crit W.S. (ft)		Flow Area (sq ft)	52.98	141.97	22.64

E.G. Slope (ft/ft)	0.005312	Area (sq ft)	52.98	141.97	22.64
Q Total (cfs)	1100.00	Flow (cfs)	62.36	1027.51	10.13
Top Width (ft)	135.95	Top Width (ft)	42.03	23.12	70.79
Vel Total (ft/s)	5.06	Avg. Vel. (ft/s)	1.18	7.24	0.45
Max Chl Dpth (ft)	8.35	Hydr. Depth (ft)	1.26	6.14	0.32
Conv. Total (cfs)	15093.0	Conv. (cfs)	855.6	14098.4	139.0
Length Wtd. (ft)	17.78	Wetted Per. (ft)	42.67	32.48	71.05
Min Ch El (ft)	925.11	Shear (lb/sq ft)	0.41	1.45	0.11
Alpha	1.92	Stream Power (lb/ft s)	0.48	10.49	0.05
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.08	1.86	0.36
C & E Loss (ft)	0.01	Cum SA (acres)	0.07	0.51	0.55

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	935.26	Element			
Vel Head (ft)	1.05	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	934.21	Reach Len. (ft)	18.02	17.77	17.42
Crit W.S. (ft)		Flow Area (sq ft)	12.80	159.36	10.46
E.G. Slope (ft/ft)	0.005955	Area (sq ft)	12.80	159.36	10.46
Q Total (cfs)	1340.00	Flow (cfs)	12.19	1319.05	8.76
Top Width (ft)	47.03	Top Width (ft)	12.10	23.12	11.81
Vel Total (ft/s)	7.34	Avg. Vel. (ft/s)	0.95	8.28	0.84
Max Chl Dpth (ft)	9.10	Hydr. Depth (ft)	1.06	6.89	0.89
Conv. Total (cfs)	17365.0	Conv. (cfs)	158.0	17093.5	113.5
Length Wtd. (ft)	17.77	Wetted Per. (ft)	12.85	32.48	12.76
Min Ch El (ft)	925.11	Shear (lb/sq ft)	0.37	1.82	0.30
Alpha	1.25	Stream Power (lb/ft s)	0.35	15.10	0.26
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.02	2.13	0.10
C & E Loss (ft)	0.01	Cum SA (acres)	0.03	0.55	0.09

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 577.5895

INPUT
Description: 48
Station Elevation Data num= 81

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.67	2.79	942.59	11.49	942.34	12.62	942.3	18.49	942.1
24.12	941.92	31.12	941.61	35.04	941.46	37.07	941.25	39.14	941.03
40.25	940.9	42.82	939.5	43.99	938.86	47.93	936.6	52.12	934.96
59.22	932.95	64.68	931.59	66.32	931.49	77.61	930.78	77.69	930.8
79.18	931.22	87.24	933.4	89.57	933.27	99.42	932.79	104.88	927.12
105.63	925.63	115.48	926.07	118.16	926.1	119.43	926.07	122.56	933.39
144.26	933.15	148.05	933.1	159.02	932.97	160.14	932.99	162.73	933.06
169.9	933.25	173.85	933.32	174.28	933.38	175.37	933.41	177.77	933.58
178.47	933.63	180.69	933.75	180.93	933.75	181.04	933.75	181.2	933.75
181.26	933.57	181.4	933.22	190.75	933.29	190.95	933.29	191.43	933.29
191.64	933.29	195.55	933.36	210.54	933.61	214.3	933.66	238.14	933.92
238.86	933.92	240.41	933.93	240.44	934	240.66	934.5	241.14	934.5
241.17	934.5	241.42	934.54	241.61	934.57	242	934.64	242.36	934.78
249.42	936.78	306.93	936.99	330.2	937.05	333.01	937.25	334.16	937.46
340.82	938.05	344	938.11	377.28	938.97	402.25	939.31	432.98	940
460.5	940.46	486.66	940.8	518.87	941.14	523.17	941.21	530.38	941.44
559.58	942.39								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	99.42	.04	122.56	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
99.42	122.56	27	24	22	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	934.10	Element			
Vel Head (ft)	0.89	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	933.21	Reach Len. (ft)	27.00	24.00	22.00
Crit W.S. (ft)		Flow Area (sq ft)	43.90	134.36	3.47
E.G. Slope (ft/ft)	0.006238	Area (sq ft)	43.90	134.36	3.47

Q Total (cfs)	1100.00	Flow (cfs)	53.72	1045.45	0.82
Top Width (ft)	88.96	Top Width (ft)	36.76	23.06	29.13
Vel Total (ft/s)	6.05	Avg. Vel. (ft/s)	1.22	7.78	0.24
Max Chl Dpth (ft)	7.58	Hydr. Depth (ft)	1.19	5.83	0.12
Conv. Total (cfs)	13927.4	Conv. (cfs)	680.2	13236.7	10.4
Length Wtd. (ft)	24.07	Wetted Per. (ft)	37.33	31.11	29.14
Min Ch El (ft)	925.63	Shear (lb/sq ft)	0.46	1.68	0.05
Alpha	1.57	Stream Power (lb/ft s)	0.56	13.09	0.01
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.06	1.80	0.35
C & E Loss (ft)	0.00	Cum SA (acres)	0.05	0.50	0.53

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	935.13	Element			
Vel Head (ft)	1.17	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	933.96	Reach Len. (ft)	27.00	24.00	22.00
Crit W.S. (ft)		Flow Area (sq ft)	10.61	151.78	7.43
E.G. Slope (ft/ft)	0.006733	Area (sq ft)	10.61	151.78	7.43
Q Total (cfs)	1340.00	Flow (cfs)	9.54	1325.10	5.36
Top Width (ft)	47.03	Top Width (ft)	12.18	23.14	11.71
Vel Total (ft/s)	7.89	Avg. Vel. (ft/s)	0.90	8.73	0.72
Max Chl Dpth (ft)	8.33	Hydr. Depth (ft)	0.87	6.56	0.63
Conv. Total (cfs)	16330.8	Conv. (cfs)	116.2	16149.2	65.3
Length Wtd. (ft)	24.01	Wetted Per. (ft)	12.75	31.31	12.41
Min Ch El (ft)	925.63	Shear (lb/sq ft)	0.35	2.04	0.25
Alpha	1.21	Stream Power (lb/ft s)	0.31	17.79	0.18
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.02	2.07	0.10
C & E Loss (ft)	0.06	Cum SA (acres)	0.02	0.54	0.09

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 553

INPUT
Description:
Station Elevation Data num= 85

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.21	2.4	943.12	6.36	942.98	13.48	942.79	19.11	942.64
22.44	942.54	31.48	942.28	33.25	942.21	44.05	941.88	48.99	941.65
55.18	941.34	56.78	941.17	58.79	940.99	60.66	940.82	62.2	939.91
72.86	935.45	74.1	934.97	75.9	934.46	77.96	933.86	86.02	931.51
93.37	931.04	97.35	930.89	100.07	931.83	106.56	933.56	110.67	933.3
119.1	932.89	123.55	927.81	124.88	925.33	131.29	925.53	139.83	926.12
142.45	931.2	142.73	931.18	143.98	933.31	163.33	933.44	178.73	933.42
197.98	933.36	203.22	933.34	225.79	933.68	226.8	933.69	226.94	933.69
227.11	933.69	244.72	933.87	254.26	933.92	256.72	933.94	256.77	934.05
256.97	934.5	257.07	934.5	257.47	934.5	259.03	934.87	259.23	934.92
259.64	935.01	263.5	935.73	267.34	936.78	269.11	936.78	276.34	936.48
303.15	936.45	348.71	936.47	352.44	936.66	376.44	936.68	377.37	936.68
377.43	936.68	383.04	936.67	386.76	936.55	387.41	936.52	388.31	936.5
389.32	936.48	390.19	936.48	390.86	936.48	397.94	936.4	410.57	936.44
410.71	936.43	411	936.41	411.9	936.35	411.98	936.53	412.16	936.97
412.44	936.97	412.51	936.97	412.66	936.97	421.59	937.53	425.35	937.77
425.46	937.78	425.67	937.79	455.16	938.95	474.04	939.27	488.61	939.39

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	119.1	.04	143.98	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
119.1 143.98 95.41 94 90.84 .1 .3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	106.56	933.56	F
267.34	488.61	936.78	F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	933.96	Element			
Vel Head (ft)	0.90	Wt. n-Val.	0.120	0.040	

W.S. Elev (ft)	933.05	Reach Len. (ft)	95.41	94.00	90.84
Crit W.S. (ft)	930.85	Flow Area (sq ft)	0.28	144.32	
E.G. Slope (ft/ft)	0.005817	Area (sq ft)	33.17	144.32	
Q Total (cfs)	1100.00	Flow (cfs)	0.05	1099.95	
Top Width (ft)	52.04	Top Width (ft)	27.31	24.73	
Vel Total (ft/s)	7.61	Avg. Vel. (ft/s)	0.18	7.62	
Max Chl Dpth (ft)	7.72	Hydr. Depth (ft)	0.08	5.84	
Conv. Total (cfs)	14423.2	Conv. (cfs)	0.6	14422.5	
Length Wtd. (ft)	93.94	Wetted Per. (ft)	3.37	32.71	
Min Ch El (ft)	925.33	Shear (lb/sq ft)	0.03	1.60	
Alpha	1.00	Stream Power (lb/ft s)	0.01	12.21	
Frctn Loss (ft)	0.48	Cum Volume (acre-ft)	0.04	1.72	0.35
C & E Loss (ft)	0.06	Cum SA (acres)	0.03	0.49	0.53

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	934.93	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.98	Reach Len. (ft)	95.41	94.00	90.84
W.S. Elev (ft)	933.95	Flow Area (sq ft)	9.31	166.54	5.82
Crit W.S. (ft)	931.53	Area (sq ft)	9.31	166.54	5.82
E.G. Slope (ft/ft)	0.005338	Flow (cfs)	6.76	1329.61	3.62
Q Total (cfs)	1340.00	Top Width (ft)	12.54	24.88	9.61
Top Width (ft)	47.03	Avg. Vel. (ft/s)	0.73	7.98	0.62
Vel Total (ft/s)	7.38	Hydr. Depth (ft)	0.74	6.69	0.61
Max Chl Dpth (ft)	8.62	Conv. (cfs)	92.6	18198.8	49.6
Conv. Total (cfs)	18341.0	Wetted Per. (ft)	12.95	33.01	10.18
Length Wtd. (ft)	93.97	Shear (lb/sq ft)	0.24	1.68	0.19
Min Ch El (ft)	925.33	Stream Power (lb/ft s)	0.17	13.42	0.12
Alpha	1.16	Cum Volume (acre-ft)	0.01	1.98	0.10
Frctn Loss (ft)	0.46	Cum SA (acres)	0.02	0.53	0.08
C & E Loss (ft)	0.04				

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

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 459.5899

INPUT
Description: 49
Station Elevation Data num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.04	6	941.89	8.93	941.82	15.34	941.67	21.48	941.52
26.59	941.3	32.67	941.04	33.89	940.94	39.92	940.63	78.79	937.03
89.54	935.58	92.61	935.24	96.73	934.77	99.98	932.13	101.87	927.67
102.96	925.06	110.59	925.16	113.71	925.32	113.97	925.32	118.8	925.57
122.68	929.97	125.04	931.97	162.19	932.73	163.5	932.72	168.1	931.01
171.56	930.73	175.66	930.99	177.87	932.06	180.07	932.04	192.5	931.76
198.2	931.75	203.57	932.23	210.31	932.81	214.9	933.24	217.65	933.51
223.36	934.07	224.57	934.15	228.71	934.44	229.09	934.46	229.28	934.48
231.3	934.63	231.71	934.63	232.08	934.63	247.46	934.45	250.39	934.42
260.6	934.46	260.79	934.73	261	935.03	261.16	935.04	261.37	935.04
261.82	935.05	270.31	935.39	282.06	935.49	283.48	935.51	290.77	935.6
299.06	935.69	312.31	935.83	321.87	936.05	323.66	936.09	324.11	936.1
324.14	936.1	324.15	936.1	324.39	936.14	324.4	936.14	324.71	936.19
324.74	936.19	326.12	936.43	340	938				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	96.73	.04	125.04	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
96.73 125.04 18.06 18.05 18.28 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
232.08	340	934.66	F

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	933.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.71	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	932.71	Reach Len. (ft)	18.06	18.05	18.28
Crit W.S. (ft)	930.23	Flow Area (sq ft)		154.02	56.04
E.G. Slope (ft/ft)	0.004479	Area (sq ft)		154.02	56.04
Q Total (cfs)	1100.00	Flow (cfs)		1060.80	39.21
Top Width (ft)	107.59	Top Width (ft)		25.77	81.82
Vel Total (ft/s)	5.24	Avg. Vel. (ft/s)		6.89	0.70
Max Chl Dpth (ft)	7.65	Hydr. Depth (ft)		5.98	0.68
Conv. Total (cfs)	16436.5	Conv. (cfs)		15850.7	585.8
Length Wtd. (ft)	18.06	Wetted Per. (ft)		33.40	82.44
Min Ch El (ft)	925.06	Shear (lb/sq ft)		1.29	0.19
Alpha	1.67	Stream Power (lb/ft s)		8.88	0.13
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)		1.40	0.29
C & E Loss (ft)	0.04	Cum SA (acres)		0.43	0.44

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	934.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.84	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	933.59	Reach Len. (ft)	18.06	18.05	18.28
Crit W.S. (ft)	930.88	Flow Area (sq ft)		177.09	26.69
E.G. Slope (ft/ft)	0.004550	Area (sq ft)		177.09	26.69
Q Total (cfs)	1340.00	Flow (cfs)		1312.95	27.05
Top Width (ft)	45.57	Top Width (ft)		26.85	18.72
Vel Total (ft/s)	6.58	Avg. Vel. (ft/s)		7.41	1.01
Max Chl Dpth (ft)	8.53	Hydr. Depth (ft)		6.59	1.43
Conv. Total (cfs)	19866.3	Conv. (cfs)		19465.3	401.1
Length Wtd. (ft)	18.06	Wetted Per. (ft)		34.79	19.96
Min Ch El (ft)	925.06	Shear (lb/sq ft)		1.45	0.38
Alpha	1.25	Stream Power (lb/ft s)		10.72	0.39
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.00	1.61	0.06
C & E Loss (ft)	0.00	Cum SA (acres)	0.00	0.47	0.05

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

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 441.5446

INPUT
Description: 50
Station Elevation Data num= 96

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.02	2.57	941.95	10.59	941.74	11.79	941.71	18.84	941.55
24.3	941.42	29.99	941.19	34.56	940.99	35.53	940.95	39.81	940.76
43.46	940.55	79.09	938.34	86.59	937.32	91.15	936.71	92.6	936.52
98.5	935.72	99.23	935.64	104.05	931.72	105.43	930.61	105.78	929.78
107.4	925.9	107.84	924.84	108.02	924.84	123.15	925.61	124.93	927.63
129.52	931.52	146.93	931.87	161.86	931.81	165.26	932.06	170.98	932.19
172.77	932.6	173.12	932.43	173.71	932.1	175.63	931.07	176.84	930.43
177.92	929.73	178.07	929.72	180.27	929.51	182.71	929.66	183.27	929.93
187.29	931.85	194.07	931.77	195.69	931.76	196.88	931.74	201.24	931.57
210.59	931.44	227.05	931.69	228.34	931.74	229.31	931.73	231.72	932.1
240.48	933.36	251.36	934.25	252.06	934.3	256.1	934.6	257.74	934.72
258.09	934.75	258.25	934.77	259.27	934.85	259.8	934.85	260.05	934.86
273.79	934.8	273.91	934.81	276.44	934.92	284.32	935.02	284.49	935.02
284.84	935.02	289.35	935	289.6	935.35	289.74	935.57	290.02	935.57
290.53	935.57	296.36	935.65	301.96	935.71	302.48	935.71	307.44	935.77
311.85	935.82	326.28	936.01	330.22	936.11	340.59	936.11	348.75	936.32
348.82	936.32	361.55	936.4	361.58	936.4	361.74	936.41	361.81	936.41
361.98	936.41	373.41	936.64	373.79	936.65	374.29	936.65	375.15	936.66
378.05	936.68	380.6	936.7	382.93	936.72	385.16	936.73	387.38	936.74
387.97	936.74								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

0	.12	99.23	.04	129.52	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
99.23	129.52	122.28	116.67	109.21	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
237	387.97		F

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	933.31	Element			
Vel Head (ft)	0.59	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	932.72	Reach Len. (ft)	122.28	116.67	109.21
Crit W.S. (ft)		Flow Area (sq ft)		154.83	118.48
E.G. Slope (ft/ft)	0.003962	Area (sq ft)		154.83	118.48
Q Total (cfs)	1100.00	Flow (cfs)		1001.71	98.29
Top Width (ft)	133.19	Top Width (ft)		26.70	106.49
Vel Total (ft/s)	4.02	Avg. Vel. (ft/s)		6.47	0.83
Max Chl Dpth (ft)	7.88	Hydr. Depth (ft)		5.80	1.11
Conv. Total (cfs)	17475.1	Conv. (cfs)		15913.6	1561.5
Length Wtd. (ft)	116.17	Wetted Per. (ft)		33.64	107.90
Min Ch El (ft)	924.84	Shear (lb/sq ft)		1.14	0.27
Alpha	2.36	Stream Power (lb/ft s)		7.36	0.23
Frctn Loss (ft)	0.79	Cum Volume (acre-ft)		1.34	0.26
C & E Loss (ft)	0.08	Cum SA (acres)		0.42	0.40

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 #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	934.34	Element			
Vel Head (ft)	0.83	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	933.51	Reach Len. (ft)	122.28	116.67	109.21
Crit W.S. (ft)		Flow Area (sq ft)		176.45	30.54
E.G. Slope (ft/ft)	0.004563	Area (sq ft)		176.45	30.54
Q Total (cfs)	1340.00	Flow (cfs)		1304.19	35.81
Top Width (ft)	44.41	Top Width (ft)		27.67	16.74
Vel Total (ft/s)	6.47	Avg. Vel. (ft/s)		7.39	1.17
Max Chl Dpth (ft)	8.67	Hydr. Depth (ft)		6.38	1.82
Conv. Total (cfs)	19837.1	Conv. (cfs)		19306.9	530.2
Length Wtd. (ft)	116.54	Wetted Per. (ft)		34.90	18.40
Min Ch El (ft)	924.84	Shear (lb/sq ft)		1.44	0.47
Alpha	1.27	Stream Power (lb/ft s)		10.64	0.55
Frctn Loss (ft)	0.90	Cum Volume (acre-ft)	0.00	1.54	0.05
C & E Loss (ft)	0.10	Cum SA (acres)	0.00	0.46	0.04

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 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: Hope Creek
REACH: 1 RS: 324.8710

INPUT
Description: 51
Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	941.99	3.04	941.9	10.67	941.67	19.8	941.44	23.34	941.34
25.09	941.3	35.5	940.99	43.83	940.76	47.91	940.66	57.91	940.24
59.16	940.19	60.58	940.18	66.71	940.17	74.73	939.87	94.55	939.79
102.5	937.82	103.29	937.61	117.83	934.16	121.6	933.79	125.43	932.15
127.9	931.09	134.64	928.98	138.5	924.9	147.78	924.63	154.52	929.76
155.65	930.58	156.97	930.74	165.65	930.74	186.81	931	194.51	930.91
197.26	930.82	218.13	930.34	221.67	930.73	224.45	931.33	227.69	929.63
228.26	928.77	231.6	928.83	232.18	928.84	234.6	928.96	235.55	929.77

237.23	930.43	239.4	931.19	264.08	930.55	264.8	930.53	266.87	930.51
275.43	930.72	284.3	930.93	285.4	930.99	305.92	931.62	306.95	931.63
307.82	931.8	315.89	932.88	316.36	932.92	317.36	932.96	325.11	933.38
329.89	933.5	339.85	933.8	341.24	933.83	347.01	934.23	356.66	934.88
357.61	934.96	358.56	935.05	358.67	935.06	358.73	935.06	363.29	935.52

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	127.9	.04	156.97	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
127.9	156.97	17.95	17.59	16.66	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
265	363.29		F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	932.43	Element			
Vel Head (ft)	1.43	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	931.00	Reach Len. (ft)	17.95	17.59	16.66
Crit W.S. (ft)	931.00	Flow Area (sq ft)		107.02	40.46
E.G. Slope (ft/ft)	0.014489	Area (sq ft)		107.02	46.21
Q Total (cfs)	1100.00	Flow (cfs)		1051.66	48.34
Top Width (ft)	146.99	Top Width (ft)		28.78	118.22
Vel Total (ft/s)	7.46	Avg. Vel. (ft/s)		9.83	1.19
Max Chl Dpth (ft)	6.37	Hydr. Depth (ft)		3.72	0.41
Conv. Total (cfs)	9138.5	Conv. (cfs)		8736.9	401.6
Length Wtd. (ft)	17.56	Wetted Per. (ft)		32.85	98.94
Min Ch El (ft)	924.63	Shear (lb/sq ft)		2.95	0.37
Alpha	1.66	Stream Power (lb/ft s)		28.96	0.44
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)		0.99	0.05
C & E Loss (ft)	0.03	Cum SA (acres)		0.35	0.12

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: Divided flow computed for this cross-section.
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 #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	933.33	Element			
Vel Head (ft)	1.87	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	931.46	Reach Len. (ft)	17.95	17.59	16.66
Crit W.S. (ft)	931.46	Flow Area (sq ft)	0.16	120.44	9.32
E.G. Slope (ft/ft)	0.015797	Area (sq ft)	0.16	120.44	9.32
Q Total (cfs)	1340.00	Flow (cfs)	0.08	1328.74	11.18
Top Width (ft)	43.05	Top Width (ft)	0.86	29.07	13.12
Vel Total (ft/s)	10.31	Avg. Vel. (ft/s)	0.48	11.03	1.20
Max Chl Dpth (ft)	6.83	Hydr. Depth (ft)	0.18	4.14	0.71
Conv. Total (cfs)	10661.4	Conv. (cfs)	0.6	10571.8	89.0
Length Wtd. (ft)	17.59	Wetted Per. (ft)	0.94	33.16	13.79
Min Ch El (ft)	924.63	Shear (lb/sq ft)	0.17	3.58	0.67
Alpha	1.13	Stream Power (lb/ft s)	0.08	39.52	0.80
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)	0.00	1.14	0.00
C & E Loss (ft)	0.09	Cum SA (acres)	0.00	0.39	0.01

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 307.2792

INPUT
Description: 52

Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.07	1.47	942.03	5.01	941.93	11.36	941.75	17.13	941.58
22.31	941.44	29.82	941.23	30.96	941.2	39.58	940.95	41.95	940.88
52.06	940.6	53.36	940.57	54.33	940.54	55.1	940.51	55.32	940.5
59.1	940.34	65.43	940.06	67.87	939.93	80.28	939.47	97.61	938.56
109.76	935.55	113.7	934.72	120.36	933.16	123.71	932.84	128.91	932.33
131.93	931.04	141.99	925.13	152.79	924.63	153.13	924.88	153.55	925.18
159.79	929.7	160.17	929.97	169.36	931.07	176.83	931.07	201.66	930.81
227.48	930.36	228.31	930.34	228.37	930.34	232.22	931.17	236.69	928.84
236.78	928.7	242.07	928.79	242.18	928.79	242.66	928.81	242.85	928.97
246.07	930.24	247.92	930.97	250.37	930.88	252.55	930.83	281.31	930.51
287.78	930.67	303.38	930.89	306.21	930.93	307.84	930.99	317.55	931.4
327.01	931.74	334.72	932.58	337.13	932.65	347.07	932.93	350.64	933.16
353.8	933.32	359.37	933.59	363.76	933.83	365.53	933.95	369.18	934.26
376.76	934.84	379.4	935.04	383.7	935.41	386.23	935.63	386.51	935.64

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	128.91	.04	169.36	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
128.91	169.36	125.45	106.5	91.3	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
281	386.51		F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	931.95	Element			
Vel Head (ft)	1.33	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	930.62	Reach Len. (ft)	125.45	106.50	91.30
Crit W.S. (ft)	930.37	Flow Area (sq ft)		113.76	20.69
E.G. Slope (ft/ft)	0.013896	Area (sq ft)		113.76	20.95
Q Total (cfs)	1100.00	Flow (cfs)		1069.05	30.95
Top Width (ft)	77.33	Top Width (ft)		32.92	44.42
Vel Total (ft/s)	8.18	Avg. Vel. (ft/s)		9.40	1.50
Max Chl Dpth (ft)	5.99	Hydr. Depth (ft)		3.46	0.52
Conv. Total (cfs)	9331.5	Conv. (cfs)		9069.0	262.5
Length Wtd. (ft)	106.28	Wetted Per. (ft)		36.19	40.74
Min Ch El (ft)	924.63	Shear (lb/sq ft)		2.73	0.44
Alpha	1.28	Stream Power (lb/ft s)		25.63	0.66
Frctn Loss (ft)	1.54	Cum Volume (acre-ft)		0.94	0.04
C & E Loss (ft)	0.00	Cum SA (acres)		0.33	0.09

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was 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 #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	932.73	Element			
Vel Head (ft)	1.57	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	931.16	Reach Len. (ft)	125.45	106.50	91.30
Crit W.S. (ft)	931.01	Flow Area (sq ft)		133.22	0.30
E.G. Slope (ft/ft)	0.015308	Area (sq ft)		133.22	0.30
Q Total (cfs)	1340.00	Flow (cfs)		1339.91	0.09
Top Width (ft)	41.01	Top Width (ft)		37.72	3.29
Vel Total (ft/s)	10.04	Avg. Vel. (ft/s)		10.06	0.31
Max Chl Dpth (ft)	6.53	Hydr. Depth (ft)		3.53	0.09
Conv. Total (cfs)	10830.4	Conv. (cfs)		10829.6	0.8
Length Wtd. (ft)	106.50	Wetted Per. (ft)		41.16	3.38
Min Ch El (ft)	924.63	Shear (lb/sq ft)		3.09	0.09
Alpha	1.00	Stream Power (lb/ft s)		31.11	0.03
Frctn Loss (ft)	1.70	Cum Volume (acre-ft)		1.09	0.00
C & E Loss (ft)	0.01	Cum SA (acres)		0.37	0.00

Warning: The cross section had to be extended vertically during the critical depth 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.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 200.7906

INPUT
Description: 53
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	940.82	3.68	940.71	6.23	940.64	8.91	940.57	13.51	940.45
18.78	940.31	27.5	940.06	30.84	939.98	34.35	939.87	37.16	939.79
43.56	939.6	48.35	939.4	54.12	939.15	63.12	938.33	68.38	937.88
93.35	933.59	99.54	932.77	104.36	932.32	109.58	931.82	113.35	931.73
121.96	931.63	130.5	931.44	135.54	929.12	146.37	925.36	149.82	924.99
165.46	924.92	166.69	924.6	176.09	930.77	176.22	930.86	176.87	931.26
178.33	931.31	184.24	931.37	191.89	931.3	207.99	930.36	234.49	930.85
236.49	931.18	242.42	932.01	251.94	929.4	254.2	928.96	262.71	928.67
264.66	928.73	268.78	930.12	272.34	931.16	284.42	930.75	285.45	930.73
307.43	930.12	311.92	929.96	315.13	930.06	337.63	930.5	346.55	930.65
347.42	930.67	347.67	930.66	348.24	930.66	360.75	930.78	370.77	930.96
375.96	931.23	378.68	931.13	379.9	931.13	386.05	931.23	387.76	931.29
390.4	931.32	397.39	931.61	407.88	931.77	409.47	931.86	418.29	932.46
424.54	932.95	427.39	933.09	440.16	934.12	441.03	934.29	448.03	934.92
451.94	935.08	452.63	935.1	456.19	935.65				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	130.5	.04	178.33	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
130.5	178.33	16.52	15.76	15.52	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
272.34	456.19		F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	930.41	Element			
Vel Head (ft)	1.37	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	929.04	Reach Len. (ft)	16.52	15.76	15.52
Crit W.S. (ft)	928.93	Flow Area (sq ft)		116.84	2.69
E.G. Slope (ft/ft)	0.015170	Area (sq ft)		116.84	2.69
Q Total (cfs)	1100.00	Flow (cfs)		1098.48	1.53
Top Width (ft)	49.42	Top Width (ft)		37.66	11.75
Vel Total (ft/s)	9.20	Avg. Vel. (ft/s)		9.40	0.57
Max Chl Dpth (ft)	4.44	Hydr. Depth (ft)		3.10	0.23
Conv. Total (cfs)	8931.0	Conv. (cfs)		8918.6	12.4
Length Wtd. (ft)	15.76	Wetted Per. (ft)		39.67	11.82
Min Ch El (ft)	924.60	Shear (lb/sq ft)		2.79	0.22
Alpha	1.04	Stream Power (lb/ft s)		26.22	0.12
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)		0.66	0.01
C & E Loss (ft)	0.13	Cum SA (acres)		0.25	0.03

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	931.03	Element			
Vel Head (ft)	1.65	Wt. n-Val.		0.040	
W.S. Elev (ft)	929.38	Reach Len. (ft)	16.52	15.76	15.52
Crit W.S. (ft)	929.37	Flow Area (sq ft)		130.08	
E.G. Slope (ft/ft)	0.016594	Area (sq ft)		130.08	
Q Total (cfs)	1340.00	Flow (cfs)		1340.00	
Top Width (ft)	39.00	Top Width (ft)		39.00	
Vel Total (ft/s)	10.30	Avg. Vel. (ft/s)		10.30	
Max Chl Dpth (ft)	4.78	Hydr. Depth (ft)		3.34	
Conv. Total (cfs)	10402.4	Conv. (cfs)		10402.4	
Length Wtd. (ft)	15.76	Wetted Per. (ft)		41.18	
Min Ch El (ft)	924.60	Shear (lb/sq ft)		3.27	
Alpha	1.00	Stream Power (lb/ft s)		33.71	
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)		0.77	
C & E Loss (ft)	0.16	Cum SA (acres)		0.28	

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

RIVER: Hope Creek
REACH: 1 RS: 185.0263

INPUT
Description: 54
Station Elevation Data num= 90

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	940.9	.23	940.89	4.79	940.75	12.43	940.54	19.61	940.33
24.97	940.18	28.01	940.1	37.1	939.87	46.81	939.57	49.79	939.48
54.76	939.27	60.03	939.05	62.74	938.8	74.73	937.76	101.6	932.71
106.32	932.08	107.47	931.97	124.1	931.54	134.46	931.42	139.14	930.34
142.76	928.76	145.19	928.18	148.08	927.48	164.97	924.66	165.64	924.46
168.13	924.43	181	924.31	181.54	925.82	184.27	929	186.31	931.36
191.21	931.72	193.53	931.75	220.16	931.48	228.64	930.98	242.69	931.24
246.95	931.93	249.99	930.58	251.61	930.2	257.54	928.82	259.05	928.74
266.32	928.71	270.08	928.64	270.46	928.84	271.16	929.07	273.91	930.17
277.06	931.05	278.85	930.84	284.22	930.81	296.25	930.4	302.44	930.26
315.31	929.9	328.78	929.94	339.43	930.15	351.48	930.13	361.37	930.36
372.01	930.6	377.94	930.67	381.65	930.81	386.53	930.84	391.74	930.93
396.69	930.93	399.56	930.9	404.99	930.97	407.46	931.14	409.66	931.22
410.64	931.23	411.34	931.28	418.16	931.31	427.92	931.6	434.01	931.74
437.77	931.92	449.6	932.25	453.05	932.43	459.98	932.57	463.01	932.75
463.56	932.78	464.29	932.92	469.22	934.56	469.42	934.62	469.43	934.62
469.46	934.63	469.8	934.65	476.37	935.06	476.91	935.11	477.32	935.16
480.63	935.18	481.34	935.33	481.48	935.36	481.55	935.37	484.57	935.92

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	134.46	.04	193.53	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
134.46 193.53 137.52 156.8 137.84 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
277.06	484.57		F

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	930.09	Wt. n-Val.		0.040	0.120
Vel Head (ft)	0.94	Reach Len. (ft)	137.52	156.80	137.84
W.S. Elev (ft)	929.15	Flow Area (sq ft)		140.90	5.95
Crit W.S. (ft)	928.52	Area (sq ft)		140.90	5.95
E.G. Slope (ft/ft)	0.009752	Flow (cfs)		1096.13	3.87
Q Total (cfs)	1100.00	Top Width (ft)		42.53	15.23
Top Width (ft)	57.76	Avg. Vel. (ft/s)		7.78	0.65
Vel Total (ft/s)	7.49	Hydr. Depth (ft)		3.31	0.39
Max Chl Dpth (ft)	4.84	Conv. (cfs)		11100.1	39.2
Conv. Total (cfs)	11139.3	Wetted Per. (ft)		45.62	15.37
Length Wtd. (ft)	156.77	Shear (lb/sq ft)		1.88	0.24
Min Ch El (ft)	924.31	Stream Power (lb/ft s)		14.63	0.15
Alpha	1.07	Cum Volume (acre-ft)		0.61	0.01
Frctn Loss (ft)	1.72	Cum SA (acres)		0.23	0.02
C & E Loss (ft)	0.05				

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was 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 #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	930.66	Wt. n-Val.		0.040	
Vel Head (ft)	1.12	Reach Len. (ft)	137.52	156.80	137.84
W.S. Elev (ft)	929.54	Flow Area (sq ft)		157.61	
Crit W.S. (ft)	928.93	Area (sq ft)		157.61	
E.G. Slope (ft/ft)	0.010465	Flow (cfs)		1340.00	
Q Total (cfs)	1340.00	Top Width (ft)		43.75	
Top Width (ft)	43.75	Avg. Vel. (ft/s)		8.50	
Vel Total (ft/s)	8.50	Hydr. Depth (ft)		3.60	
Max Chl Dpth (ft)	5.23	Conv. (cfs)		13098.7	
Conv. Total (cfs)	13098.7	Wetted Per. (ft)		47.10	
Length Wtd. (ft)	156.80	Shear (lb/sq ft)		2.19	
Min Ch El (ft)	924.31				

Alpha	1.00	Stream Power (lb/ft s)	18.59
Frctn Loss (ft)	1.80	Cum Volume (acre-ft)	0.71
C & E Loss (ft)	0.10	Cum SA (acres)	0.26

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: Hope Creek
REACH: 1 RS: 28.22144

INPUT
Description:
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	940.04	2.31	939.98	11.56	939.71	15.15	939.61	17.29	939.56
22.02	939.44	26.99	939.32	32.27	939.17	37.02	939.05	39.52	938.98
41.93	938.9	47.05	938.69	49.77	938.58	50.79	938.54	61.84	937.24
63.7	937.01	67.92	935.96	79.12	934.46	86.27	931.47	92.56	931.52
93.61	931.06	93.94	930.93	95.48	930.37	95.66	930.28	97.51	929.41
101.36	927.97	107.28	927.29	108.01	927.21	109.73	926.77	119.71	924.46
123.65	924.38	124.51	923.96	130.97	923.36	131.94	923.36	132.69	923.36
175.81	927.66	185.76	927.98	187.62	928.18	190.78	928.37	211.65	929.57
221.55	930.05	228.5	929.55	279.2	930.78	279.38	930.78	279.43	930.78
279.45	930.78	281.18	930.79	326.81	931.05	328.75	931.05	359.76	929.92
365.16	929.79	371.86	929.83	398.04	930.17	413.2	929.96	420.31	930.27
432.57	930.33	436.58	930.47	437.46	930.43	458.64	930.92	459.48	930.94
461.65	930.98	482.99	931.36	497.99	931.82	509.84	932.09	531.87	932.92
538.1	933.22	545.87	933.58	554.58	934.01	557.76	934.15	567.92	934.67
576.52	935.64	581.59	936.23	581.71	936.25				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	92.56	.04	221.55	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
92.56	221.55	18.33	16.08	17.35	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
328.75	581.71	931.05	F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	928.32	Element			
Vel Head (ft)	0.77	Wt. n-Val.		0.040	
W.S. Elev (ft)	927.55	Reach Len. (ft)	18.33	16.08	17.35
Crit W.S. (ft)	927.20	Flow Area (sq ft)		156.07	
E.G. Slope (ft/ft)	0.012425	Area (sq ft)		156.07	
Q Total (cfs)	1100.00	Flow (cfs)		1100.00	
Top Width (ft)	69.60	Top Width (ft)		69.60	
Vel Total (ft/s)	7.05	Avg. Vel. (ft/s)		7.05	
Max Chl Dpth (ft)	4.19	Hydr. Depth (ft)		2.24	
Conv. Total (cfs)	9868.3	Conv. (cfs)		9868.3	
Length Wtd. (ft)	16.08	Wetted Per. (ft)		70.28	
Min Ch El (ft)	923.36	Shear (lb/sq ft)		1.72	
Alpha	1.00	Stream Power (lb/ft s)		12.14	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		0.08	
C & E Loss (ft)	0.16	Cum SA (acres)		0.03	

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

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	928.75	Element			
Vel Head (ft)	0.79	Wt. n-Val.		0.040	
W.S. Elev (ft)	927.97	Reach Len. (ft)	18.33	16.08	17.35
Crit W.S. (ft)	927.57	Flow Area (sq ft)		187.94	

E.G. Slope (ft/ft)	0.012712	Area (sq ft)	187.94
Q Total (cfs)	1340.00	Flow (cfs)	1340.00
Top Width (ft)	83.91	Top Width (ft)	83.91
Vel Total (ft/s)	7.13	Avg. Vel. (ft/s)	7.13
Max Chl Dpth (ft)	4.61	Hydr. Depth (ft)	2.24
Conv. Total (cfs)	11884.9	Conv. (cfs)	11884.9
Length Wtd. (ft)	16.08	Wetted Per. (ft)	84.61
Min Ch El (ft)	923.36	Shear (lb/sq ft)	1.76
Alpha	1.00	Stream Power (lb/ft s)	12.57
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	0.09
C & E Loss (ft)	0.15	Cum SA (acres)	0.03

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

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 12.13838

INPUT
Description:
Station Elevation Data num= 76

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	940.07	.7	940.05	3.92	939.97	8.07	939.85	16.26	939.61
16.81	939.6	26.89	939.34	28.65	939.29	31.7	939.2	34.52	939.12
41.16	938.95	43.72	938.85	52.59	938.45	57.86	937.84	62.59	937.25
73.35	934.55	82.97	933.27	96.32	928.57	97.68	927.86	97.75	927.92
98.47	928.44	99.74	927.5	101.9	926.54	102	926.5	102.19	926.42
103.84	925.81	105.01	925.31	106.91	924.06	113.87	923.71	119.39	923.92
131.76	923.96	134.3	923.96	140.71	923.38	147.13	923.37	152.06	923.37
160.82	925.05	165.03	925.95	177.65	926.47	194.04	927.54	196.5	927.85
199.73	928.26	200.75	928.26	201.59	928.5	204.02	928.71	230.3	930.78
231.49	930.87	235.12	931.17	239.41	930.92	248.08	930.3	277.97	931.04
309.17	930.8	328.23	930.9	357.99	930.94	361.73	930.8	381.06	930.33
405.56	930.49	407.44	930.51	409.33	930.49	425.15	930.72	447.82	930.92
459.33	930.45	460.49	930.43	467.39	930.61	481.16	930.95	486.76	931.05
505.55	931.53	518.14	931.78	532.55	932.18	549.78	933.01	558.53	933.41
565.38	933.55	575.24	933.98	581.01	934.29	588.91	934.72	597.13	935.9
598.62	936.07								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	82.97	.04	235.12	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
82.97 235.12 16.79 12.14 12.8 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
277.97	598.62	931.04	F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	928.07	Element			
Vel Head (ft)	0.25	Wt. n-Val.		0.040	
W.S. Elev (ft)	927.82	Reach Len. (ft)			
Crit W.S. (ft)	926.22	Flow Area (sq ft)		273.33	
E.G. Slope (ft/ft)	0.002999	Area (sq ft)		273.33	
Q Total (cfs)	1100.00	Flow (cfs)		1100.00	
Top Width (ft)	96.95	Top Width (ft)		96.95	
Vel Total (ft/s)	4.02	Avg. Vel. (ft/s)		4.02	
Max Chl Dpth (ft)	4.45	Hydr. Depth (ft)		2.82	
Conv. Total (cfs)	20087.0	Conv. (cfs)		20087.0	
Length Wtd. (ft)		Wetted Per. (ft)		98.23	
Min Ch El (ft)	923.37	Shear (lb/sq ft)		0.52	
Alpha	1.00	Stream Power (lb/ft s)		2.10	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

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

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	928.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.		0.040	
W.S. Elev (ft)	928.23	Reach Len. (ft)			
Crit W.S. (ft)	926.56	Flow Area (sq ft)		314.30	
E.G. Slope (ft/ft)	0.003000	Area (sq ft)		314.30	
Q Total (cfs)	1340.00	Flow (cfs)		1340.00	
Top Width (ft)	101.97	Top Width (ft)		101.97	
Vel Total (ft/s)	4.26	Avg. Vel. (ft/s)		4.26	
Max Chl Dpth (ft)	4.86	Hydr. Depth (ft)		3.08	
Conv. Total (cfs)	24464.6	Conv. (cfs)		24464.6	
Length Wtd. (ft)		Wetted Per. (ft)		103.63	
Min Ch El (ft)	923.37	Shear (lb/sq ft)		0.57	
Alpha	1.00	Stream Power (lb/ft s)		2.42	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

SUMMARY OF MANNING'S N VALUES

River:Hope Creek

Reach	River Sta.	n1	n2	n3	n4
1	8000	.12	.045	.1	
1	7548	.12	.045	.1	
1	7061	.12	.045	.1	
1	6930	.12	.045	.1	
1	6719	Culvert			
1	6496	.12	.035	.08	
1	6278	.12	.025	.08	
1	5629	.12	.025	.08	
1	5428	.12	.025	.08	
1	5146	Culvert			
1	4969	.12	.04	.12	
1	4925.680	.12	.04	.1	.12
1	4907.867	.12	.04	.1	.12
1	4783.015	.12	.04	.12	
1	4764.388	.12	.04	.12	
1	4718	.12	.04	.12	
1	4643.051	.12	.04	.12	
1	4625.316	.12	.04	.12	
1	4503.708	.12	.04	.1	
1	4485.049	.12	.04	.1	
1	4361.840	.12	.04	.1	.12
1	4343.304	.12	.04	.1	.12
1	4222.473	.12	.04	.1	.12
1	4204.470	.12	.04	.1	.12
1	4080.463	.12	.04	.12	
1	4062.727	.12	.04	.12	
1	3940.903	.12	.04	.12	
1	3922.633	.12	.04	.12	
1	3799.870	.12	.04	.12	
1	3781.101	.12	.04	.12	
1	3659.612	.12	.04	.12	
1	3641.433	.12	.04	.12	
1	3518.856	.12	.04	.12	
1	3500.626	.12	.04	.12	
1	3378.489	.12	.04	.12	
1	3360.436	.12	.04	.12	
1	3238.304	.12	.04	.12	
1	3220.243	.12	.04	.12	
1	3147	.12	.04	.12	
1	3097.384	.12	.04	.12	
1	3079.078	.12	.04	.12	
1	2955.929	.12	.04	.12	

1	2937.884	.12	.04	.12
1	2870	.12	.04	.12
1	2813.979	.12	.04	.12
1	2795.938	.12	.04	.12
1	2668.395	.12	.04	.12
1	2650.675	.12	.04	.12
1	2537.862	.12	.04	.12
1	2520.830	.12	.04	.12
1	2390.934	.12	.04	.12
1	2354.325	.12	.04	.12
1	2262	.12	.04	.12
1	2081.919	.12	.04	.12
1	1650	.12	.04	.12
1	1492.060	.12	.04	.12
1	1084	.12	.04	.12
1	1027.831	.12	.04	.12
1	949.7572	.12	.04	.12
1	878.1000	.12	.04	.12
1	859.3424	.12	.04	.12
1	735.5340	.12	.04	.12
1	716.3877	.12	.04	.12
1	595.3610	.12	.04	.12
1	577.5895	.12	.04	.12
1	553	.12	.04	.12
1	459.5899	.12	.04	.12
1	441.5446	.12	.04	.12
1	324.8710	.12	.04	.12
1	307.2792	.12	.04	.12
1	200.7906	.12	.04	.12
1	185.0263	.12	.04	.12
1	28.22144	.12	.04	.12
1	12.13838	.12	.04	.12

SUMMARY OF REACH LENGTHS

River: Hope Creek

Reach	River Sta.	Left	Channel	Right
1	8000	393.3	452.1	505.73
1	7548	498.18	486.75	465.44
1	7061	137.61	131.25	117.04
1	6930	458.64	434.11	418.59
1	6719	Culvert		
1	6496	261.27	218.1	177.15
1	6278	596.84	648.74	713.24
1	5629	205.65	201.08	200.99
1	5428	519.24	458.42	414.44
1	5146	Culvert		
1	4969	170.27	251.19	305.99
1	4925.680	18.25	17.81	18.01
1	4907.867	122.42	124.85	123.52
1	4783.015	18.84	18.63	18.24
1	4764.388	48.37	45.95	44.99
1	4718	71.98	75.39	77.8
1	4643.051	17.45	17.74	17.85
1	4625.316	120.71	121.61	122.64
1	4503.708	19.61	18.66	18.24
1	4485.049	123.05	123.21	122.55
1	4361.840	19	18.54	18
1	4343.304	119.24	120.83	121.61
1	4222.473	17.55	18	17.71
1	4204.470	124.62	124.01	123.48
1	4080.463	17.85	17.74	17.82
1	4062.727	120.53	121.82	121.07
1	3940.903	18.03	18.27	18.28
1	3922.633	121.49	122.76	124.97
1	3799.870	19.61	18.77	18.18
1	3781.101	119.49	121.49	122.1
1	3659.612	18.36	18.18	17.87
1	3641.433	122.87	122.58	125.68
1	3518.856	18.65	18.23	18.01
1	3500.626	121.15	122.14	120.16

1	3378.489	17.27	18.05	17.97
1	3360.436	122.81	122.13	120.82
1	3238.304	18.33	18.06	18.17
1	3220.243	73.32	73.11	72.78
1	3147	46.78	49.75	49.66
1	3097.384	19.08	18.31	18.45
1	3079.078	124.18	123.15	120.49
1	2955.929	18	18.05	18.27
1	2937.884	68.38	65.3	63.65
1	2870	51.13	58.6	53.12
1	2813.979	18.36	18.04	17.52
1	2795.938	124.19	127.54	116.57
1	2668.395	18.55	17.72	17.36
1	2650.675	124.24	112.8	97.76
1	2537.862	18.67	17.03	20.7
1	2520.830	97.79	129.85	152.46
1	2390.934	38.36	36.6	36.24
1	2354.325	95.4	91.3	65.8
1	2262	220.4	181.12	126.56
1	2081.919	293.59	431.27	483.25
1	1650	172.21	158.59	117.87
1	1492.060	383.24	408.33	377.92
1	1084	53.7	55.9	61.7
1	1027.831	76.72	78.07	78.34
1	949.7572	69.19	71.66	70.51
1	878.1000	18.27	18.76	20.13
1	859.3424	123.89	123.81	123.48
1	735.5340	19.18	19.15	18.15
1	716.3877	125.31	121.03	115.29
1	595.3610	18.02	17.77	17.42
1	577.5895	27	24	22
1	553	95.41	94	90.84
1	459.5899	18.06	18.05	18.28
1	441.5446	122.28	116.67	109.21
1	324.8710	17.95	17.59	16.66
1	307.2792	125.45	106.5	91.3
1	200.7906	16.52	15.76	15.52
1	185.0263	137.52	156.8	137.84
1	28.22144	18.33	16.08	17.35
1	12.13838	16.79	12.14	12.8

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Hope Creek

Reach	River Sta.	Contr.	Expan.
1	8000	.1	.3
1	7548	.1	.3
1	7061	.3	.5
1	6930	.3	.5
1	6719	Culvert	
1	6496	.3	.5
1	6278	.1	.3
1	5629	.3	.5
1	5428	.3	.5
1	5146	Culvert	
1	4969	.3	.5
1	4925.680	.1	.3
1	4907.867	.1	.3
1	4783.015	.1	.3
1	4764.388	.1	.3
1	4718	.1	.3
1	4643.051	.1	.3
1	4625.316	.1	.3
1	4503.708	.1	.3
1	4485.049	.1	.3
1	4361.840	.1	.3
1	4343.304	.1	.3
1	4222.473	.1	.3
1	4204.470	.1	.3
1	4080.463	.1	.3
1	4062.727	.1	.3

1	3940.903	.1	.3
1	3922.633	.1	.3
1	3799.870	.1	.3
1	3781.101	.1	.3
1	3659.612	.1	.3
1	3641.433	.1	.3
1	3518.856	.1	.3
1	3500.626	.1	.3
1	3378.489	.1	.3
1	3360.436	.1	.3
1	3238.304	.1	.3
1	3220.243	.1	.3
1	3147	.1	.3
1	3097.384	.1	.3
1	3079.078	.1	.3
1	2955.929	.1	.3
1	2937.884	.1	.3
1	2870	.1	.3
1	2813.979	.1	.3
1	2795.938	.1	.3
1	2668.395	.1	.3
1	2650.675	.1	.3
1	2537.862	.1	.3
1	2520.830	.1	.3
1	2390.934	.1	.3
1	2354.325	.1	.3
1	2262	.1	.3
1	2081.919	.1	.3
1	1650	.1	.3
1	1492.060	.1	.3
1	1084	.1	.3
1	1027.831	.1	.3
1	949.7572	.1	.3
1	878.1000	.1	.3
1	859.3424	.1	.3
1	735.5340	.1	.3
1	716.3877	.1	.3
1	595.3610	.1	.3
1	577.5895	.1	.3
1	553	.1	.3
1	459.5899	.1	.3
1	441.5446	.1	.3
1	324.8710	.1	.3
1	307.2792	.1	.3
1	200.7906	.1	.3
1	185.0263	.1	.3
1	28.22144	.1	.3
1	12.13838	.1	.3

Profile Output Table - Standard Table 1

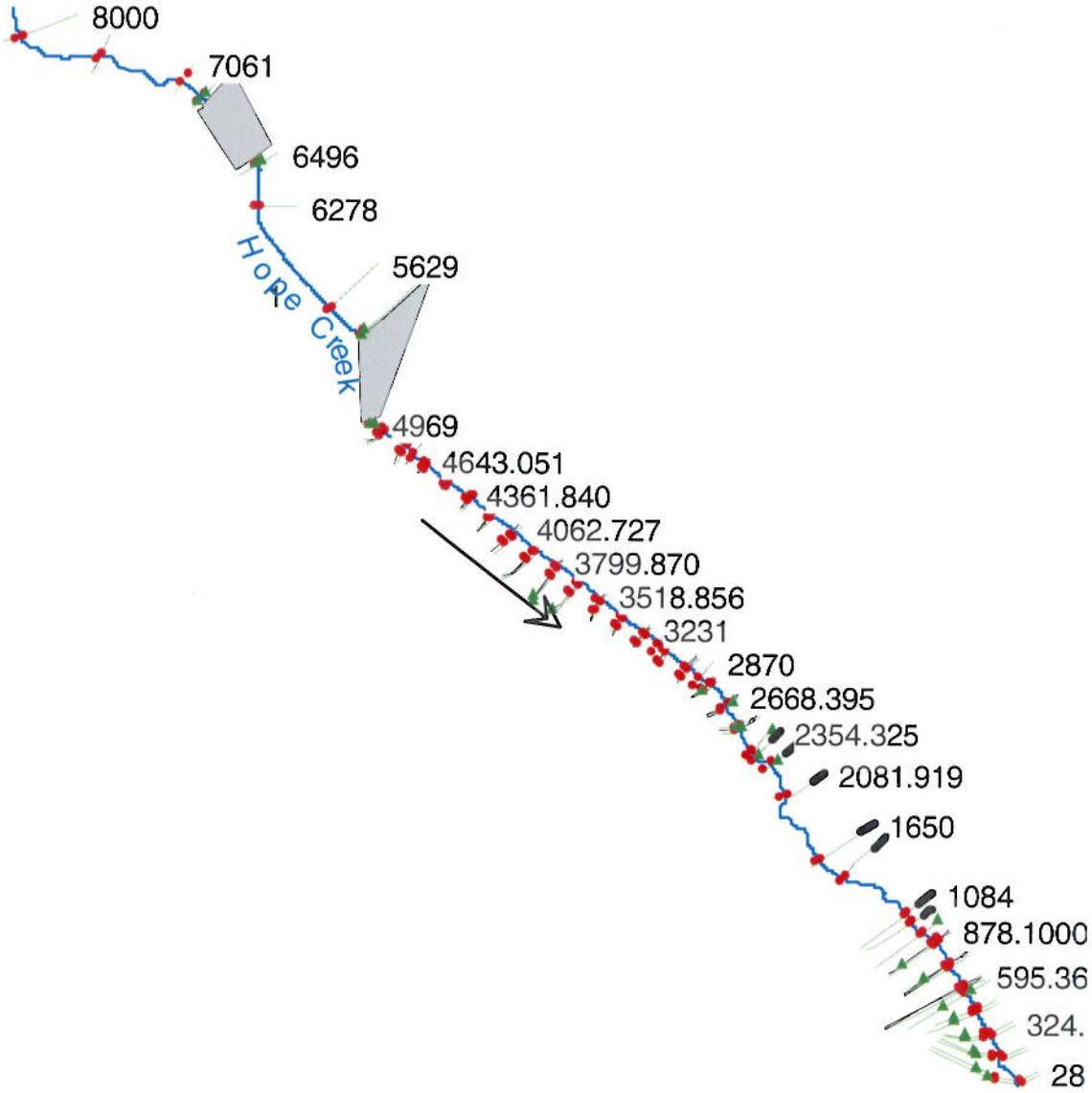
Reach	River Sta		Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
1	8000		2yr	540.00	999.59	1002.57	1002.22	1003.06	0.010873	5.83	129.33	109.97	0.68
1	8000		5yr	690.00	999.59	1003.11	1002.48	1003.77	0.010986	6.50	106.12	38.80	0.69
1	7548		2yr	540.00	993.51	996.29	996.09	997.02	0.016922	6.87	84.46	59.35	0.84
1	7548		5yr	690.00	993.51	996.64	996.40	997.53	0.017668	7.58	90.99	38.16	0.87
1	7061		2yr	680.00	983.03	985.90	985.90	986.98	0.024332	8.35	81.47	38.27	1.01
1	7061		5yr	890.00	983.03	986.35	986.35	987.61	0.022782	8.98	99.07	39.36	1.00
1	6930		2yr	680.00	976.44	982.97	979.31	983.09	0.000946	2.82	241.13	48.57	0.22
1	6930		5yr	890.00	976.44	984.09	979.76	984.23	0.000887	2.99	297.16	51.60	0.22
1	6719	S. Marietta Pkwy		Culvert									
1	6496		2yr	680.00	966.25	972.08	970.43	972.62	0.002900	5.92	117.53	38.10	0.49
1	6496		5yr	890.00	966.25	972.74	970.98	973.44	0.003133	6.74	135.73	43.03	0.53
1	6278		2yr	680.00	965.79	970.22	970.22	971.51	0.006108	9.15	83.20	74.61	0.93
1	6278		5yr	890.00	965.79	970.77	970.77	972.27	0.006004	9.93	108.68	51.99	0.94
1	5629		2yr	680.00	958.42	962.58	962.58	963.99	0.007214	9.53	71.37	26.24	1.01

1	5629		5yr	890.00	958.42	963.15	963.15	964.81	0.007095	10.36	85.91	25.76	1.00
1	5428		2yr	680.00	955.36	960.93	959.53	961.54	0.001820	6.30	110.79	334.51	0.54
1	5428		5yr	890.00	955.36	962.12	960.09	962.76	0.001733	6.44	138.22	25.76	0.49
1	5146	I-75		Culvert									
1	4969		2yr	680.00	950.60	954.65	954.03	955.72	0.011717	8.27	82.21	22.45	0.76
1	4969		5yr	890.00	950.60	955.41	954.65	956.66	0.011502	8.96	99.34	22.95	0.76
1	4925.680		2yr	680.00	948.84	953.74		954.06	0.002857	4.48	151.86	39.94	0.40
1	4925.680		5yr	890.00	948.84	954.73		955.06	0.002409	4.65	191.50	40.84	0.38
1	4907.867		2yr	680.00	948.29	953.75		954.00	0.001873	4.00	169.86	37.46	0.33
1	4907.867		5yr	890.00	948.29	954.72		955.01	0.001782	4.30	206.98	38.63	0.33
1	4783.015		2yr	680.00	947.57	953.56		953.78	0.001482	3.81	178.63	36.35	0.30
1	4783.015		5yr	890.00	947.57	954.53		954.80	0.001484	4.14	214.81	37.64	0.31
1	4764.388		2yr	680.00	947.39	953.48		953.75	0.001843	4.16	163.48	33.51	0.33
1	4764.388		5yr	890.00	947.39	954.45		954.76	0.001859	4.52	196.91	35.41	0.34
1	4718		2yr	920.00	946.98	952.94		953.58	0.004437	6.39	144.00	28.80	0.50
1	4718		5yr	1180.00	946.98	953.84		954.59	0.004513	6.92	170.59	30.14	0.51
1	4643.051		2yr	920.00	946.11	952.29		953.17	0.005998	7.51	126.12	28.19	0.58
1	4643.051		5yr	1180.00	946.11	953.09		954.16	0.006316	8.31	147.89	27.75	0.61
1	4625.316		2yr	920.00	946.16	952.08		953.04	0.006903	7.89	120.25	26.82	0.61
1	4625.316		5yr	1180.00	946.16	952.83		954.02	0.007461	8.81	141.10	29.02	0.64
1	4503.708		2yr	920.00	945.71	951.46		952.23	0.005597	7.01	131.53	28.46	0.56
1	4503.708		5yr	1180.00	945.71	952.20		953.14	0.005928	7.79	153.18	30.71	0.59
1	4485.049		2yr	920.00	945.71	951.43		952.10	0.004779	6.57	140.24	29.24	0.52
1	4485.049		5yr	1180.00	945.71	952.17		953.00	0.005102	7.33	162.57	31.37	0.54
1	4361.840		2yr	920.00	945.60	950.74		951.46	0.005714	6.77	135.83	31.78	0.58
1	4361.840		5yr	1180.00	945.60	951.48		952.33	0.005909	7.39	159.76	33.27	0.59
1	4343.304		2yr	920.00	945.35	950.65		951.35	0.005623	6.73	136.65	31.88	0.57
1	4343.304		5yr	1180.00	945.35	951.38		952.22	0.005844	7.35	160.57	33.44	0.59
1	4222.473		2yr	920.00	944.89	950.15		950.72	0.004315	6.05	152.05	34.57	0.51
1	4222.473		5yr	1180.00	944.89	950.86		951.55	0.004574	6.66	177.23	36.13	0.53
1	4204.470		2yr	920.00	944.78	950.13		950.62	0.003597	5.65	162.93	36.11	0.47
1	4204.470		5yr	1180.00	944.78	950.84		951.45	0.003835	6.23	189.34	37.61	0.49
1	4080.463		2yr	920.00	944.50	949.53		950.10	0.004931	6.08	154.91	46.29	0.55
1	4080.463		5yr	1180.00	944.50	950.25		950.91	0.004922	6.52	180.92	42.98	0.56
1	4062.727		2yr	920.00	944.35	949.46		950.01	0.004655	5.95	156.99	45.62	0.54
1	4062.727		5yr	1180.00	944.35	950.18		950.81	0.004661	6.40	184.49	43.31	0.55
1	3940.903		2yr	920.00	943.93	948.69		949.35	0.006059	6.54	143.28	44.26	0.61
1	3940.903		5yr	1180.00	943.93	949.42		950.17	0.005841	6.94	170.13	41.97	0.61
1	3922.633		2yr	920.00	943.43	948.71		949.21	0.004081	5.68	167.63	49.40	0.50
1	3922.633		5yr	1180.00	943.43	949.45		950.03	0.004130	6.12	192.70	44.06	0.52
1	3799.870		2yr	920.00	942.55	948.37		948.76	0.002841	4.99	184.31	43.30	0.43
1	3799.870		5yr	1180.00	942.55	949.11		949.57	0.002923	5.44	216.84	45.08	0.44
1	3781.101		2yr	920.00	942.35	948.34		948.70	0.002543	4.80	191.73	44.22	0.40
1	3781.101		5yr	1180.00	942.35	949.08		949.51	0.002642	5.26	224.51	45.41	0.42
1	3659.612		2yr	920.00	942.15	947.99		948.37	0.002810	4.97	185.04	43.36	0.42
1	3659.612		5yr	1180.00	942.15	948.71		949.17	0.002926	5.44	216.76	45.07	0.44
1	3641.433		2yr	920.00	942.15	947.93		948.32	0.002930	5.05	182.28	43.11	0.43
1	3641.433		5yr	1180.00	942.15	948.64		949.11	0.003048	5.52	213.74	44.94	0.45
1	3518.856		2yr	920.00	941.93	947.50		947.93	0.003375	5.31	173.26	42.26	0.46
1	3518.856		5yr	1180.00	941.93	948.18		948.70	0.003569	5.81	203.10	45.00	0.48

1	3500.626	2yr	920.00	941.73	947.46		947.87	0.003020	5.10	180.30	42.92	0.44
1	3500.626	5yr	1180.00	941.73	948.14		948.63	0.003232	5.61	210.51	45.65	0.46
1	3378.489	2yr	920.00	941.38	947.08		947.49	0.003077	5.14	179.09	42.81	0.44
1	3378.489	5yr	1180.00	941.38	947.72		948.23	0.003368	5.69	207.39	45.38	0.47
1	3360.436	2yr	920.00	941.32	947.03		947.44	0.003068	5.13	179.29	42.83	0.44
1	3360.436	5yr	1180.00	941.32	947.66		948.17	0.003373	5.69	207.29	45.37	0.47
1	3238.304	2yr	920.00	941.06	946.58		947.03	0.003489	5.38	171.02	41.93	0.47
1	3238.304	5yr	1180.00	941.06	947.15		947.71	0.003972	6.05	195.20	44.15	0.51
1	3220.243	2yr	920.00	940.86	946.55		946.96	0.003122	5.17	177.97	42.58	0.45
1	3220.243	5yr	1180.00	940.86	947.10		947.63	0.003599	5.83	202.27	44.79	0.48
1	3147	2yr	1100.00	940.68	945.81		946.60	0.006573	7.10	154.95	40.37	0.64
1	3147	5yr	1340.00	940.68	946.35		947.24	0.006690	7.56	177.33	42.52	0.65
1	3097.384	2yr	1100.00	940.56	944.95	944.52	946.13	0.011667	8.70	126.49	37.57	0.84
1	3097.384	5yr	1340.00	940.56	945.44	944.98	946.76	0.011760	9.24	145.10	39.50	0.85
1	3079.078	2yr	1100.00	940.36	944.42	944.32	945.86	0.015641	9.64	114.06	36.22	0.96
1	3079.078	5yr	1340.00	940.36	944.96	944.78	946.51	0.014667	9.99	134.15	38.37	0.94
1	2955.929	2yr	1100.00	938.59	943.52		944.39	0.007593	7.47	147.34	39.73	0.68
1	2955.929	5yr	1340.00	938.59	944.22		945.12	0.006877	7.62	175.78	42.50	0.66
1	2937.884	2yr	1100.00	938.39	943.42		944.24	0.007048	7.27	151.30	40.13	0.66
1	2937.884	5yr	1340.00	938.39	944.13		944.98	0.006373	7.42	180.65	42.96	0.64
1	2870	2yr	1100.00	937.72	943.14		943.80	0.005225	6.50	169.14	42.39	0.57
1	2870	5yr	1340.00	937.72	943.89		944.57	0.004730	6.63	202.06	45.48	0.55
1	2813.979	2yr	1100.00	937.22	942.92		943.50	0.004310	6.07	181.24	43.55	0.52
1	2813.979	5yr	1340.00	937.22	943.70		944.30	0.003917	6.19	216.31	46.75	0.51
1	2795.938	2yr	1100.00	937.22	942.81		943.41	0.004667	6.25	176.14	43.06	0.54
1	2795.938	5yr	1340.00	937.22	943.60		944.22	0.004167	6.34	211.52	46.33	0.52
1	2668.395	2yr	1100.00	936.34	942.39		942.87	0.003382	5.58	197.31	44.74	0.47
1	2668.395	5yr	1340.00	936.34	943.23		943.73	0.003035	5.66	236.57	48.13	0.45
1	2650.675	2yr	1100.00	936.34	942.39	940.11	942.79	0.002880	5.13	214.50	62.95	0.43
1	2650.675	5yr	1340.00	936.34	943.24	940.56	943.66	0.002551	5.18	258.55	64.99	0.42
1	2537.862	2yr	1100.00	935.54	941.46	940.18	942.28	0.006460	7.52	185.03	53.87	0.61
1	2537.862	5yr	1340.00	935.54	941.74	940.67	943.07	0.009375	9.26	144.66	29.18	0.73
1	2520.830	2yr	1100.00	935.58	940.35	940.14	942.04	0.015406	10.41	105.67	48.12	0.93
1	2520.830	5yr	1340.00	935.58	940.83	940.73	942.80	0.016308	11.26	119.01	28.28	0.97
1	2390.934	2yr	1100.00	934.58	940.49		940.92	0.002925	5.32	234.97	64.94	0.43
1	2390.934	5yr	1340.00	934.58	940.97		941.54	0.003441	6.04	221.70	43.58	0.47
1	2354.325 BR 17 - Bent01	2yr	1100.00	934.22	938.93	938.93	940.58	0.017731	10.32	106.58	47.98	1.00
1	2354.325 BR 17 - Bent01	5yr	1340.00	934.22	939.60	939.60	941.19	0.017527	10.14	132.15	41.35	1.00
1	2262	2yr	1100.00	933.97	939.04	936.91	939.35	0.002464	4.52	243.60	82.49	0.40
1	2262	5yr	1340.00	933.97	940.09	937.33	940.38	0.001788	4.33	309.39	64.23	0.35
1	2081.919	2yr	1100.00	932.16	938.67		938.98	0.001761	4.52	281.40	71.96	0.33
1	2081.919	5yr	1340.00	932.16	939.71		940.07	0.001615	4.78	284.21	48.12	0.33
1	1650	2yr	1100.00	931.18	937.51		937.98	0.003161	5.69	312.19	224.41	0.43
1	1650	5yr	1340.00	931.18	938.86		939.26	0.002265	5.32	427.52	192.55	0.36
1	1492.060	2yr	1100.00	929.74	937.05		937.50	0.002782	5.59	304.17	145.80	0.39
1	1492.060	5yr	1340.00	929.74	938.39		938.87	0.002470	5.73	343.41	159.19	0.37
1	1084	2yr	1100.00	927.83	935.10		935.88	0.005844	7.48	200.43	58.14	0.55
1	1084	5yr	1340.00	927.83	936.11		937.24	0.006750	8.55	156.73	24.58	0.60
1	1027.831	2yr	1100.00	927.42	934.72		935.54	0.006273	7.58	192.02	61.07	0.58
1	1027.831	5yr	1340.00	927.42	935.77		936.84	0.006845	8.31	162.74	40.62	0.61
1	949.7572	2yr	1100.00	926.86	934.56		935.11	0.003331	6.17	264.99	119.24	0.45

1	949.7572	5yr	1340.00	926.86	935.73		936.38	0.002964	6.57	235.02	47.03	0.44
1	878.1000	2yr	1100.00	926.71	934.74		934.90	0.000745	3.36	542.34	179.51	0.23
1	878.1000	5yr	1340.00	926.71	935.91		936.15	0.000894	3.94	348.52	47.03	0.25
1	859.3424	2yr	1100.00	926.88	934.70		934.88	0.001021	3.72	523.70	176.28	0.26
1	859.3424	5yr	1340.00	926.88	935.81		936.12	0.001302	4.52	310.23	47.03	0.30
1	735.5340	2yr	1100.00	926.37	934.37		934.70	0.001904	4.99	415.48	154.57	0.34
1	735.5340	5yr	1340.00	926.37	935.29		935.88	0.002495	6.23	254.72	47.03	0.40
1	716.3877	2yr	1100.00	926.18	934.31		934.65	0.002215	5.28	403.42	140.88	0.36
1	716.3877	5yr	1340.00	926.18	935.10		935.81	0.003255	6.90	237.29	47.03	0.44
1	595.3610	2yr	1100.00	925.11	933.46		934.22	0.005312	7.24	217.59	135.95	0.51
1	595.3610	5yr	1340.00	925.11	934.21		935.26	0.005955	8.28	182.63	47.03	0.56
1	577.5895	2yr	1100.00	925.63	933.21		934.10	0.006238	7.78	181.73	88.96	0.57
1	577.5895	5yr	1340.00	925.63	933.96		935.13	0.006733	8.73	169.82	47.03	0.60
1	553	2yr	1100.00	925.33	933.05	930.85	933.96	0.005817	7.62	144.60	52.04	0.56
1	553	5yr	1340.00	925.33	933.95	931.53	934.93	0.005338	7.98	181.66	47.03	0.54
1	459.5899	2yr	1100.00	925.06	932.71	930.23	933.42	0.004479	6.89	210.07	107.59	0.50
1	459.5899	5yr	1340.00	925.06	933.59	930.88	934.42	0.004550	7.41	203.78	45.57	0.51
1	441.5446	2yr	1100.00	924.84	932.72		933.31	0.003962	6.47	273.31	133.19	0.47
1	441.5446	5yr	1340.00	924.84	933.51		934.34	0.004563	7.39	206.99	44.41	0.52
1	324.8710	2yr	1100.00	924.63	931.00	931.00	932.43	0.014489	9.83	147.48	146.99	0.90
1	324.8710	5yr	1340.00	924.63	931.46	931.46	933.33	0.015797	11.03	129.92	43.05	0.96
1	307.2792	2yr	1100.00	924.63	930.62	930.37	931.95	0.013896	9.40	134.45	77.33	0.89
1	307.2792	5yr	1340.00	924.63	931.16	931.01	932.73	0.015308	10.06	133.53	41.01	0.94
1	200.7906	2yr	1100.00	924.60	929.04	928.93	930.41	0.015170	9.40	119.53	49.42	0.94
1	200.7906	5yr	1340.00	924.60	929.38	929.37	931.03	0.016594	10.30	130.08	39.00	0.99
1	185.0263	2yr	1100.00	924.31	929.15	928.52	930.09	0.009752	7.78	146.85	57.76	0.75
1	185.0263	5yr	1340.00	924.31	929.54	928.93	930.66	0.010465	8.50	157.61	43.75	0.79
1	28.22144	2yr	1100.00	923.36	927.55	927.20	928.32	0.012425	7.05	156.07	69.60	0.83
1	28.22144	5yr	1340.00	923.36	927.97	927.57	928.75	0.012712	7.13	187.94	83.91	0.84
1	12.13838	2yr	1100.00	923.37	927.82	926.22	928.07	0.002999	4.02	273.33	96.95	0.42
1	12.13838	5yr	1340.00	923.37	928.23	926.56	928.51	0.003000	4.26	314.30	101.97	0.43

Proposed Condition Model (HEC-RAS) FEMA Multi-Profiles



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                    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: HopeCreek_Br16-17
Project File : HopeCreek_Br16-17.prj
Run Date and Time: 11/29/2009 11:50:07 AM

Project in English units

Project Description:
Cobb County Priority Area 3 Flood Study - Modified to provide Base Model for
Bridges 16 & 17 of I-75 Corridor HOV Project
Hope Creek
Rottenwood Creek
Watershed

Model extends from confluence with Rottenwood Creek to 1180 feet
upstream of South Marietta Parkway WB to I-75 NB ramp

PLAN DATA

Plan Title: Proposed Struct - ChanRealign - 5 Qs
Plan File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.p06

Geometry Title: Proposed Structure Chan Realign
Geometry File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.g17

Flow Title : ex fp - 5 Qs
Flow File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.f01

Plan Description:
8' sq piers
Using momentum and energy methods for structure analysis

Plan Summary Information:
Number of: Cross Sections = 72 Multiple Openings = 0
Culverts = 2 Inline Structures = 0
Bridges = 21 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 40
Maximum difference tolerance = 0.1
Flow tolerance factor = 0.001

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

Encroachment Data
Equal Conveyance = False
Left Offset = 0
Right Offset = 0

River = Hope Creek Reach = 1
RS Profile Method Value1 Value2
8000 5yr 1 9975.4410014.28

7548	5yr	1	9975.44	10014.28
7061	5yr	1	9971.13	10025.25
6930	5yr	1	9968.55	10020.97
6496	5yr	1	9970	10030
6278	5yr	1	9960.02	10012.01
5629	5yr	1	9986.25	10012.01
5428	5yr	1	9986.25	10012.01
4969	5yr	1	9988.91	10012.88
4925.68	5yr	1	24.79	66.83
4907.86	75yr	1	26.77	66.58
4783.01	55yr	1	5.33	53.7
4764.38	85yr	1	9.98	57.59
4718	5yr	1	56.84	92.74
4643.05	15yr	1	19.65	50.52
4625.31	65yr	1	21.3	53.69
4503.70	85yr	1	23.18	63.68
4485.04	95yr	1	26.59	68.53
4361.84	05yr	1	15.31	66.76
4343.30	45yr	1	22.55	75.43
4222.47	35yr	1	47.12	109.32
4204.47	05yr	1	42.78	106.5
4080.46	35yr	1	67.6	120.16
4062.72	75yr	1	71.47	124.03
3940.90	35yr	1	72.89	125.39
3922.63	35yr	1	76.76	129.26
3799.87	05yr	1	48.58	98.54
3781.10	15yr	1	55.46	105.42
3659.61	25yr	1	52.29	102.25
3641.43	35yr	1	54.01	103.97
3518.85	65yr	1	49.46	102.1
3500.62	65yr	1	46.8	99.44
3378.48	95yr	1	49.79	100.69
3360.43	65yr	1	50.53	101.43
3238.30	45yr	1	47.19	102.95
3220.24	35yr	1	45.5	101.26
3147	5yr	1	89.92	145.68
3097.38	45yr	1	60.82	126.32
3079.07	85yr	1	68.21	133.71
2955.92	95yr	1	70.8	133.39
2937.88	45yr	1	72.94	133.78
2870	5yr	1	106.36	157.49
2813.97	95yr	1	39.47	90.6
2795.93	85yr	1	43.32	94.45
2668.39	55yr	1	38.44	108.59
2650.67	55yr	1	42.43	112.58
2537.86	25yr	1	64.72	151
2520.83	05yr	1	65.05	153.79
2390.93	45yr	1	101.31	208.81
2354.32	55yr	1	102.33	215.12
2262	5yr	1	124.78	250.9
2081.91	95yr	1	119.54	266.93
1650	5yr	1	163.15	361.56
1492.06	05yr	1	146.55	306.11
1084	5yr	1	158.76	205.79
1027.83	15yr	1	107.04	154.07
949.757	25yr	1	94.85	141.88
878.100	05yr	1	65.33	112.36
859.342	45yr	1	67.67	114.7
735.534	05yr	1	85.18	132.21
716.387	75yr	1	88.68	135.71
595.361	05yr	1	89.41	136.44
577.589	55yr	1	87.24	134.27
553	5yr	1	106.56	153.59
459.589	95yr	1	96.73	143.76
441.544	65yr	1	99.23	146.26
324.871	05yr	1	123.06	170.09
307.279	25yr	1	125.62	172.65
200.790	65yr	1	130.5	178.33
185.026	35yr	1	134.46	193.53
28.2214	45yr	1	92.56	221.55
12.1383	85yr	1	82.97	235.12

FLOW DATA

Flow Title: ex fp - 5 Qs
Flow File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.f01

Flow Data (cfs)

River	Reach	RS	2yr	5yr	10yr	25yr	50yr	100yr	500yr
Hope Creek	1	8000	540	690	860	1070	1240	1400	1790
Hope Creek	1	7061	680	890	1100	1380	1590	1790	2300
Hope Creek	1	4718	920	1180	1450	1800	2060	2310	2930
Hope Creek	1	3147	1100	1340	1650	2110	2450	2800	3650

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Hope Creek	1	2yr		Normal S = 0.003
Hope Creek	1	5yr		Normal S = 0.003
Hope Creek	1	10yr		Normal S = 0.003
Hope Creek	1	25yr		Normal S = 0.003
Hope Creek	1	50yr		Normal S = 0.003
Hope Creek	1	100yr		Normal S = 0.003
Hope Creek	1	500yr		Normal S = 0.003

GEOMETRY DATA

Geometry Title: Proposed Structure Chan Realign
Geometry File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.g17

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 8000

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9692.31	1010.32	9730.61	1006.96	9741.69	1006.28	9746.1	1006.09	9752.37	1005.9
9795.04	1003.98	9803.95	1003.91	9815.76	1003.7	9830.29	1003.2	9842.43	1003.29
9847.65	1003.23	9856.36	1002.52	9864.45	1002.02	9872.65	1001.42	9875.36	1001.23
9884.35	1001.84	9891.79	1002.43	9896.36	1002.67	9905.33	1003.01	9914.36	1002.76
9926.07	1002.62	9931.4	1003.14	9943.29	1002.52	9951.53	1002.22	9953.9	1002.17
9957.29	1001.98	9971.84	1001.7	9975.44	1001.76	9988.3	1000.04	10000	999.59
10008.8	999.78	10014.28	1003.13	10019.72	1003.11	10021.42	1003.27	10024.73	1003.59
10026.72	1003.7	10029.7	1003.89	10035.93	1004.29	10038.89	1004.52	10050.88	1004.82
10054.9	1004.92	10066.83	1005.64	10070.49	1006.39	10088.12	1013.63		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9692.31	.12	9975.44	.045	10014.28	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9975.44	10014.28	393.3	452.1	505.73	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	1003.06	Element			
Vel Head (ft)	0.49	Wt. n-Val.	0.120	0.045	
W.S. Elev (ft)	1002.57	Reach Len. (ft)	393.30	452.10	505.73
Crit W.S. (ft)	1002.22	Flow Area (sq ft)	43.71	85.63	
E.G. Slope (ft/ft)	0.010873	Area (sq ft)	43.71	85.63	
Q Total (cfs)	540.00	Flow (cfs)	40.61	499.39	
Top Width (ft)	109.97	Top Width (ft)	72.04	37.93	
Vel Total (ft/s)	4.18	Avg. Vel. (ft/s)	0.93	5.83	
Max Chl Dpth (ft)	2.98	Hydr. Depth (ft)	0.61	2.26	
Conv. Total (cfs)	5178.6	Conv. (cfs)	389.5	4789.1	
Length Wtd. (ft)	449.63	Wetted Per. (ft)	72.15	38.84	
Min Ch El (ft)	999.59	Shear (lb/sq ft)	0.41	1.50	
Alpha	1.81	Stream Power (lb/ft s)	0.38	8.73	
Frctn Loss (ft)	6.03	Cum Volume (acre-ft)	3.97	27.25	1.53
C & E Loss (ft)	0.02	Cum SA (acres)	6.17	6.52	1.44

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was 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 #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	1003.77	Element			
Vel Head (ft)	0.66	Wt. n-Val.		0.045	
W.S. Elev (ft)	1003.11	Reach Len. (ft)	393.30	452.10	505.73

Crit W.S. (ft)	1002.48	Flow Area (sq ft)		106.12	
E.G. Slope (ft/ft)	0.010986	Area (sq ft)		106.12	
Q Total (cfs)	690.00	Flow (cfs)		690.00	
Top Width (ft)	38.80	Top Width (ft)		38.80	
Vel Total (ft/s)	6.50	Avg. Vel. (ft/s)		6.50	
Max Chl Dpth (ft)	3.52	Hydr. Depth (ft)		2.73	
Conv. Total (cfs)	6583.1	Conv. (cfs)		6583.1	
Length Wtd. (ft)	452.10	Wetted Per. (ft)		41.22	
Min Ch El (ft)	999.59	Shear (lb/sq ft)		1.77	
Alpha	1.00	Stream Power (lb/ft s)		11.48	
Frctn Loss (ft)	6.21	Cum Volume (acre-ft)	2.35	32.23	0.42
C & E Loss (ft)	0.02	Cum SA (acres)	2.12	6.78	0.32

Warning: The energy loss was 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 #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	1003.80	Wt. n-Val.	0.120	0.045	0.100
Vel Head (ft)	0.57	Reach Len. (ft)	393.30	452.10	505.73
W.S. Elev (ft)	1003.23	Flow Area (sq ft)	113.22	110.73	0.66
Crit W.S. (ft)	1002.89	Area (sq ft)	113.22	110.73	0.66
E.G. Slope (ft/ft)	0.010206	Flow (cfs)	130.44	729.35	0.21
Q Total (cfs)	860.00	Top Width (ft)	132.20	38.84	6.68
Top Width (ft)	177.72	Avg. Vel. (ft/s)	1.15	6.59	0.32
Vel Total (ft/s)	3.83	Hydr. Depth (ft)	0.86	2.85	0.10
Max Chl Dpth (ft)	3.64	Conv. (cfs)	1291.2	7219.6	2.1
Conv. Total (cfs)	8512.9	Wetted Per. (ft)	132.39	39.91	6.69
Length Wtd. (ft)	446.51	Shear (lb/sq ft)	0.54	1.77	0.06
Min Ch El (ft)	999.59	Stream Power (lb/ft s)	0.63	11.64	0.02
Alpha	2.52	Cum Volume (acre-ft)	17.36	36.18	4.24
Frctn Loss (ft)	5.86	Cum SA (acres)	8.72	6.95	3.25
C & E Loss (ft)	0.04				

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was 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 #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	1004.17	Wt. n-Val.	0.120	0.045	0.100
Vel Head (ft)	0.63	Reach Len. (ft)	393.30	452.10	505.73
W.S. Elev (ft)	1003.54	Flow Area (sq ft)	159.55	122.80	3.24
Crit W.S. (ft)	1003.23	Area (sq ft)	159.55	122.80	3.24
E.G. Slope (ft/ft)	0.010162	Flow (cfs)	202.90	864.80	2.30
Q Total (cfs)	1070.00	Top Width (ft)	154.97	38.84	9.91
Top Width (ft)	203.72	Avg. Vel. (ft/s)	1.27	7.04	0.71
Vel Total (ft/s)	3.75	Hydr. Depth (ft)	1.03	3.16	0.33
Max Chl Dpth (ft)	3.95	Conv. (cfs)	2012.8	8578.7	22.8
Conv. Total (cfs)	10614.3	Wetted Per. (ft)	155.17	39.91	9.93
Length Wtd. (ft)	444.82	Shear (lb/sq ft)	0.65	1.95	0.21
Min Ch El (ft)	999.59	Stream Power (lb/ft s)	0.83	13.75	0.15
Alpha	2.88	Cum Volume (acre-ft)	25.84	41.80	7.20
Frctn Loss (ft)	5.74	Cum SA (acres)	10.24	7.12	4.74
C & E Loss (ft)	0.05				

Warning: The energy loss was 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 #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	1004.42	Wt. n-Val.	0.120	0.045	0.100
Vel Head (ft)	0.65	Reach Len. (ft)	393.30	452.10	505.73
W.S. Elev (ft)	1003.77	Flow Area (sq ft)	196.77	131.91	5.97
Crit W.S. (ft)	1003.54	Area (sq ft)	196.77	131.91	5.97
E.G. Slope (ft/ft)	0.009891	Flow (cfs)	273.66	961.25	5.09
Q Total (cfs)	1240.00	Top Width (ft)	163.76	38.84	13.58
Top Width (ft)	216.17	Avg. Vel. (ft/s)	1.39	7.29	0.85
Vel Total (ft/s)	3.71	Hydr. Depth (ft)	1.20	3.40	0.44
Max Chl Dpth (ft)	4.18	Conv. (cfs)	2751.6	9665.2	51.2
Conv. Total (cfs)	12467.9	Wetted Per. (ft)	163.96	39.91	13.60
Length Wtd. (ft)	443.57	Shear (lb/sq ft)	0.74	2.04	0.27
Min Ch El (ft)	999.59	Stream Power (lb/ft s)	1.03	14.87	0.23
Alpha	3.03	Cum Volume (acre-ft)	30.62	45.27	9.75
Frctn Loss (ft)	5.63	Cum SA (acres)	10.97	7.20	5.83
C & E Loss (ft)	0.06				

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 energy loss was 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 #100yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	1004.66	Element			
Vel Head (ft)	0.66	Wt. n-Val.	0.120	0.045	0.100
W.S. Elev (ft)	1003.99	Reach Len. (ft)	393.30	452.10	505.73
Crit W.S. (ft)	1003.67	Flow Area (sq ft)	234.19	140.41	9.32
E.G. Slope (ft/ft)	0.009634	Area (sq ft)	234.19	140.41	9.32
Q Total (cfs)	1400.00	Flow (cfs)	338.16	1052.76	9.09
Top Width (ft)	236.49	Top Width (ft)	180.65	38.84	17.00
Vel Total (ft/s)	3.65	Avg. Vel. (ft/s)	1.44	7.50	0.98
Max Chl Dpth (ft)	4.40	Hydr. Depth (ft)	1.30	3.62	0.55
Conv. Total (cfs)	14263.5	Conv. (cfs)	3445.2	10725.7	92.6
Length Wtd. (ft)	442.73	Wetted Per. (ft)	180.86	39.91	17.03
Min Ch El (ft)	999.59	Shear (lb/sq ft)	0.78	2.12	0.33
Alpha	3.22	Stream Power (lb/ft s)	1.12	15.87	0.32
Frctn Loss (ft)	5.55	Cum Volume (acre-ft)	43.96	49.85	13.32
C & E Loss (ft)	0.07	Cum SA (acres)	11.64	7.27	7.11

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 #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	1005.12	Element			
Vel Head (ft)	0.67	Wt. n-Val.	0.120	0.045	0.100
W.S. Elev (ft)	1004.45	Reach Len. (ft)	393.30	452.10	505.73
Crit W.S. (ft)		Flow Area (sq ft)	319.06	158.16	18.67
E.G. Slope (ft/ft)	0.008992	Area (sq ft)	319.06	158.16	18.67
Q Total (cfs)	1790.00	Flow (cfs)	527.38	1240.20	22.42
Top Width (ft)	253.34	Top Width (ft)	190.81	38.84	23.69
Vel Total (ft/s)	3.61	Avg. Vel. (ft/s)	1.65	7.84	1.20
Max Chl Dpth (ft)	4.86	Hydr. Depth (ft)	1.67	4.07	0.79
Conv. Total (cfs)	18877.1	Conv. (cfs)	5561.7	13078.9	236.5
Length Wtd. (ft)	440.74	Wetted Per. (ft)	191.02	39.91	23.74
Min Ch El (ft)	999.59	Shear (lb/sq ft)	0.94	2.22	0.44
Alpha	3.33	Stream Power (lb/ft s)	1.55	17.44	0.53
Frctn Loss (ft)	5.28	Cum Volume (acre-ft)	60.27	58.89	21.82
C & E Loss (ft)	0.08	Cum SA (acres)	13.46	7.41	9.16

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: Hope Creek
REACH: 1 RS: 7548

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9863.29	1009.3	9888.65	1003.16	9940.03	996.67	9975.44	995.68	9988.3	993.96
10000	993.51	10008.8	993.71	10014.28	997.05	10067.71	1007.38	10085.14	1008.78

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9863.29	.12	9975.44	.045	10014.28	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9975.44	10014.28	498.18	486.75	465.44	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	997.02	Element			
Vel Head (ft)	0.73	Wt. n-Val.	0.120	0.045	
W.S. Elev (ft)	996.29	Reach Len. (ft)	498.18	486.75	465.44
Crit W.S. (ft)	996.09	Flow Area (sq ft)	6.62	77.85	
E.G. Slope (ft/ft)	0.016922	Area (sq ft)	6.62	77.85	
Q Total (cfs)	540.00	Flow (cfs)	4.82	535.18	
Top Width (ft)	59.35	Top Width (ft)	21.76	37.59	
Vel Total (ft/s)	6.39	Avg. Vel. (ft/s)	0.73	6.87	

Max Chl Dpth (ft)	2.78	Hydr. Depth (ft)	0.30	2.07	
Conv. Total (cfs)	4151.1	Conv. (cfs)	37.0	4114.0	
Length Wtd. (ft)	486.80	Wetted Per. (ft)	21.77	38.45	
Min Ch El (ft)	993.51	Shear (lb/sq ft)	0.32	2.14	
Alpha	1.15	Stream Power (lb/ft s)	0.23	14.71	
Frctn Loss (ft)	10.00	Cum Volume (acre-ft)	3.74	26.40	1.53
C & E Loss (ft)	0.04	Cum SA (acres)	5.74	6.13	1.44

Warning: The energy loss was 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 #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	997.53	Element			
Vel Head (ft)	0.89	Wt. n-Val.		0.045	
W.S. Elev (ft)	996.64	Reach Len. (ft)	498.18	486.75	465.44
Crit W.S. (ft)	996.40	Flow Area (sq ft)		90.99	
E.G. Slope (ft/ft)	0.017668	Area (sq ft)		90.99	
Q Total (cfs)	690.00	Flow (cfs)		690.00	
Top Width (ft)	38.16	Top Width (ft)		38.16	
Vel Total (ft/s)	7.58	Avg. Vel. (ft/s)		7.58	
Max Chl Dpth (ft)	3.13	Hydr. Depth (ft)		2.38	
Conv. Total (cfs)	5191.1	Conv. (cfs)		5191.1	
Length Wtd. (ft)	486.75	Wetted Per. (ft)		40.07	
Min Ch El (ft)	993.51	Shear (lb/sq ft)		2.50	
Alpha	1.00	Stream Power (lb/ft s)		18.99	
Frctn Loss (ft)	9.88	Cum Volume (acre-ft)	2.35	31.20	0.42
C & E Loss (ft)	0.04	Cum SA (acres)	2.12	6.38	0.32

Warning: The energy loss was 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 #10yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	997.90	Element			
Vel Head (ft)	1.00	Wt. n-Val.	0.120	0.045	
W.S. Elev (ft)	996.90	Reach Len. (ft)	498.18	486.75	465.44
Crit W.S. (ft)	996.85	Flow Area (sq ft)	25.95	101.22	
E.G. Slope (ft/ft)	0.017514	Area (sq ft)	25.95	101.22	
Q Total (cfs)	860.00	Flow (cfs)	33.41	826.59	
Top Width (ft)	75.84	Top Width (ft)	37.25	38.60	
Vel Total (ft/s)	6.76	Avg. Vel. (ft/s)	1.29	8.17	
Max Chl Dpth (ft)	3.39	Hydr. Depth (ft)	0.70	2.62	
Conv. Total (cfs)	6498.4	Conv. (cfs)	252.4	6245.9	
Length Wtd. (ft)	486.94	Wetted Per. (ft)	37.27	39.62	
Min Ch El (ft)	993.51	Shear (lb/sq ft)	0.76	2.79	
Alpha	1.40	Stream Power (lb/ft s)	0.98	22.81	
Frctn Loss (ft)	9.68	Cum Volume (acre-ft)	16.73	35.08	4.23
C & E Loss (ft)	0.04	Cum SA (acres)	7.95	6.55	3.21

Warning: The energy loss was 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 #25yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	998.38	Element			
Vel Head (ft)	1.11	Wt. n-Val.	0.120	0.045	0.100
W.S. Elev (ft)	997.27	Reach Len. (ft)	498.18	486.75	465.44
Crit W.S. (ft)	997.21	Flow Area (sq ft)	40.04	115.35	0.12
E.G. Slope (ft/ft)	0.016931	Area (sq ft)	40.04	115.35	0.12
Q Total (cfs)	1070.00	Flow (cfs)	64.36	1005.59	0.05
Top Width (ft)	80.09	Top Width (ft)	40.13	38.84	1.12
Vel Total (ft/s)	6.88	Avg. Vel. (ft/s)	1.61	8.72	0.43
Max Chl Dpth (ft)	3.76	Hydr. Depth (ft)	1.00	2.97	0.11
Conv. Total (cfs)	8223.3	Conv. (cfs)	494.6	7728.3	0.4
Length Wtd. (ft)	487.05	Wetted Per. (ft)	40.18	39.91	1.14
Min Ch El (ft)	993.51	Shear (lb/sq ft)	1.05	3.06	0.11
Alpha	1.51	Stream Power (lb/ft s)	1.69	26.63	0.05
Frctn Loss (ft)	9.46	Cum Volume (acre-ft)	24.94	40.56	7.18
C & E Loss (ft)	0.05	Cum SA (acres)	9.35	6.71	4.68

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 #50yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	998.73	Element			
Vel Head (ft)	1.22	Wt. n-Val.	0.120	0.045	0.100
W.S. Elev (ft)	997.52	Reach Len. (ft)	498.18	486.75	465.44
Crit W.S. (ft)	997.46	Flow Area (sq ft)	50.33	125.07	0.56
E.G. Slope (ft/ft)	0.016865	Area (sq ft)	50.33	125.07	0.56
Q Total (cfs)	1240.00	Flow (cfs)	91.06	1148.54	0.41
Top Width (ft)	83.36	Top Width (ft)	42.11	38.84	2.41
Vel Total (ft/s)	7.05	Avg. Vel. (ft/s)	1.81	9.18	0.72
Max Chl Dpth (ft)	4.01	Hydr. Depth (ft)	1.20	3.22	0.23
Conv. Total (cfs)	9548.4	Conv. (cfs)	701.2	8844.1	3.1
Length Wtd. (ft)	487.11	Wetted Per. (ft)	42.18	39.91	2.46
Min Ch El (ft)	993.51	Shear (lb/sq ft)	1.26	3.30	0.24
Alpha	1.58	Stream Power (lb/ft s)	2.27	30.30	0.17
Frctn Loss (ft)	9.33	Cum Volume (acre-ft)	29.51	43.93	9.72
C & E Loss (ft)	0.06	Cum SA (acres)	10.04	6.80	5.73

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 #100yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	999.05	Element			
Vel Head (ft)	1.32	Wt. n-Val.	0.120	0.045	0.100
W.S. Elev (ft)	997.73	Reach Len. (ft)	498.18	486.75	465.44
Crit W.S. (ft)	997.69	Flow Area (sq ft)	59.44	133.31	1.19
E.G. Slope (ft/ft)	0.016973	Area (sq ft)	59.44	133.31	1.19
Q Total (cfs)	1400.00	Flow (cfs)	117.42	1281.48	1.11
Top Width (ft)	86.14	Top Width (ft)	43.79	38.84	3.51
Vel Total (ft/s)	7.22	Avg. Vel. (ft/s)	1.98	9.61	0.93
Max Chl Dpth (ft)	4.22	Hydr. Depth (ft)	1.36	3.43	0.34
Conv. Total (cfs)	10745.9	Conv. (cfs)	901.3	9836.2	8.5
Length Wtd. (ft)	487.16	Wetted Per. (ft)	43.87	39.91	3.57
Min Ch El (ft)	993.51	Shear (lb/sq ft)	1.44	3.54	0.35
Alpha	1.63	Stream Power (lb/ft s)	2.84	34.03	0.33
Frctn Loss (ft)	9.21	Cum Volume (acre-ft)	42.63	48.43	13.26
C & E Loss (ft)	0.06	Cum SA (acres)	10.62	6.87	6.99

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 #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	999.75	Element			
Vel Head (ft)	1.52	Wt. n-Val.	0.120	0.045	0.100
W.S. Elev (ft)	998.23	Reach Len. (ft)	498.18	486.75	465.44
Crit W.S. (ft)	998.23	Flow Area (sq ft)	82.19	152.61	3.57
E.G. Slope (ft/ft)	0.016776	Area (sq ft)	82.19	152.61	3.57
Q Total (cfs)	1790.00	Flow (cfs)	189.08	1596.15	4.77
Top Width (ft)	92.64	Top Width (ft)	47.72	38.84	6.08
Vel Total (ft/s)	7.51	Avg. Vel. (ft/s)	2.30	10.46	1.33
Max Chl Dpth (ft)	4.72	Hydr. Depth (ft)	1.72	3.93	0.59
Conv. Total (cfs)	13819.9	Conv. (cfs)	1459.8	12323.3	36.8
Length Wtd. (ft)	487.25	Wetted Per. (ft)	47.84	39.91	6.19
Min Ch El (ft)	993.51	Shear (lb/sq ft)	1.80	4.01	0.60
Alpha	1.74	Stream Power (lb/ft s)	4.14	41.89	0.81
Frctn Loss (ft)	4.24	Cum Volume (acre-ft)	58.46	57.28	21.69
C & E Loss (ft)	0.19	Cum SA (acres)	12.38	7.01	8.99

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: Hope Creek
REACH: 1 RS: 7061

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9905.26	1001.98	9956.74	993.8	9957.4	993.7	9958.42	993.52	9971.13	990.89
9975.44	985.2	9988.3	983.48	10000	983.03	10008.8	983.22	10014.28	986.57
10018	989.04	10021.34	989.95	10025.25	991.08	10030.35	991.41	10047.87	992.47
10065.41	993.53	10087.95	996.31	10090.3	996.66	10098.54	997.89	10117.31	1004.01

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9905.26	.12	9971.13	.045	10025.25	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9971.13	10025.25	137.61	131.25	117.04	.3	.5

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	986.98	Element			
Vel Head (ft)	1.08	Wt. n-Val.		0.045	
W.S. Elev (ft)	985.90	Reach Len. (ft)	137.61	131.25	117.04
Crit W.S. (ft)	985.90	Flow Area (sq ft)		81.47	
E.G. Slope (ft/ft)	0.024332	Area (sq ft)		81.47	
Q Total (cfs)	680.00	Flow (cfs)		680.00	
Top Width (ft)	38.27	Top Width (ft)		38.27	
Vel Total (ft/s)	8.35	Avg. Vel. (ft/s)		8.35	
Max Chl Dpth (ft)	2.87	Hydr. Depth (ft)		2.13	
Conv. Total (cfs)	4359.3	Conv. (cfs)		4359.3	
Length Wtd. (ft)	131.25	Wetted Per. (ft)		39.50	
Min Ch El (ft)	983.03	Shear (lb/sq ft)		3.13	
Alpha	1.00	Stream Power (lb/ft s)		26.15	
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	3.71	25.51	1.53
C & E Loss (ft)	0.48	Cum SA (acres)	5.62	5.70	1.44

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 #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	987.61	Element			
Vel Head (ft)	1.25	Wt. n-Val.		0.045	
W.S. Elev (ft)	986.35	Reach Len. (ft)	137.61	131.25	117.04
Crit W.S. (ft)	986.35	Flow Area (sq ft)		99.07	
E.G. Slope (ft/ft)	0.022782	Area (sq ft)		99.07	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	39.36	Top Width (ft)		39.36	
Vel Total (ft/s)	8.98	Avg. Vel. (ft/s)		8.98	
Max Chl Dpth (ft)	3.32	Hydr. Depth (ft)		2.52	
Conv. Total (cfs)	5896.5	Conv. (cfs)		5896.5	
Length Wtd. (ft)	131.25	Wetted Per. (ft)		40.94	
Min Ch El (ft)	983.03	Shear (lb/sq ft)		3.44	
Alpha	1.00	Stream Power (lb/ft s)		30.92	
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	2.35	30.14	0.42
C & E Loss (ft)	0.56	Cum SA (acres)	2.12	5.95	0.32

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 #10yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	988.17	Element			

Vel Head (ft)	1.42	Wt. n-Val.		0.045	
W.S. Elev (ft)	986.75	Reach Len. (ft)	137.61	131.25	117.04
Crit W.S. (ft)	986.75	Flow Area (sq ft)		114.94	
E.G. Slope (ft/ft)	0.022072	Area (sq ft)		114.94	
Q Total (cfs)	1100.00	Flow (cfs)		1100.00	
Top Width (ft)	40.29	Top Width (ft)		40.29	
Vel Total (ft/s)	9.57	Avg. Vel. (ft/s)		9.57	
Max Chl Dpth (ft)	3.72	Hydr. Depth (ft)		2.85	
Conv. Total (cfs)	7404.0	Conv. (cfs)		7404.0	
Length Wtd. (ft)	131.25	Wetted Per. (ft)		42.18	
Min Ch El (ft)	983.03	Shear (lb/sq ft)		3.75	
Alpha	1.00	Stream Power (lb/ft s)		35.93	
Frctn Loss (ft)	0.29	Cum Volume (acre-ft)	16.59	33.88	4.23
C & E Loss (ft)	0.63	Cum SA (acres)	7.74	6.11	3.21

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 #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	988.87	Wt. n-Val.		0.045	
Vel Head (ft)	1.64	Reach Len. (ft)	137.61	131.25	117.04
W.S. Elev (ft)	987.22	Flow Area (sq ft)		134.08	
Crit W.S. (ft)	987.22	Area (sq ft)		134.08	
E.G. Slope (ft/ft)	0.021738	Flow (cfs)		1380.00	
Q Total (cfs)	1380.00	Top Width (ft)		41.35	
Top Width (ft)	41.35	Avg. Vel. (ft/s)		10.29	
Vel Total (ft/s)	10.29	Hydr. Depth (ft)		3.24	
Max Chl Dpth (ft)	4.19	Conv. (cfs)		9359.9	
Conv. Total (cfs)	9359.9	Wetted Per. (ft)		43.62	
Length Wtd. (ft)	131.25	Shear (lb/sq ft)		4.17	
Min Ch El (ft)	983.03	Stream Power (lb/ft s)		42.94	
Alpha	1.00	Cum Volume (acre-ft)	24.71	39.17	7.18
Frctn Loss (ft)	0.26	Cum SA (acres)	9.12	6.26	4.67
C & E Loss (ft)	0.74				

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 #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	989.35	Wt. n-Val.		0.045	
Vel Head (ft)	1.78	Reach Len. (ft)	137.61	131.25	117.04
W.S. Elev (ft)	987.56	Flow Area (sq ft)		148.33	
Crit W.S. (ft)	987.56	Area (sq ft)		148.33	
E.G. Slope (ft/ft)	0.021267	Flow (cfs)		1590.00	
Q Total (cfs)	1590.00	Top Width (ft)		42.12	
Top Width (ft)	42.12	Avg. Vel. (ft/s)		10.72	
Vel Total (ft/s)	10.72	Hydr. Depth (ft)		3.52	
Max Chl Dpth (ft)	4.53	Conv. (cfs)		10903.0	
Conv. Total (cfs)	10903.0	Wetted Per. (ft)		44.66	
Length Wtd. (ft)	131.25	Shear (lb/sq ft)		4.41	
Min Ch El (ft)	983.03	Stream Power (lb/ft s)		47.26	
Alpha	1.00	Cum Volume (acre-ft)	29.22	42.41	9.71
Frctn Loss (ft)	0.25	Cum SA (acres)	9.80	6.34	5.72
C & E Loss (ft)	0.80				

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 #100yr

E.G. Elev (ft)	989.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.89	Wt. n-Val.		0.045	
W.S. Elev (ft)	987.89	Reach Len. (ft)	137.61	131.25	117.04
Crit W.S. (ft)	987.89	Flow Area (sq ft)		162.11	
E.G. Slope (ft/ft)	0.020645	Area (sq ft)		162.11	
Q Total (cfs)	1790.00	Flow (cfs)		1790.00	
Top Width (ft)	42.86	Top Width (ft)		42.86	
Vel Total (ft/s)	11.04	Avg. Vel. (ft/s)		11.04	
Max Chl Dpth (ft)	4.86	Hydr. Depth (ft)		3.78	
Conv. Total (cfs)	12457.9	Conv. (cfs)		12457.9	
Length Wtd. (ft)	131.25	Wetted Per. (ft)		45.66	
Min Ch El (ft)	983.03	Shear (lb/sq ft)		4.58	
Alpha	1.00	Stream Power (lb/ft s)		50.53	
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	42.29	46.78	13.25
C & E Loss (ft)	0.85	Cum SA (acres)	10.37	6.41	6.97

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 #500yr

E.G. Elev (ft)	991.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.90	Wt. n-Val.		0.045	
W.S. Elev (ft)	990.86	Reach Len. (ft)	137.61	131.25	117.04
Crit W.S. (ft)		Flow Area (sq ft)		302.83	
E.G. Slope (ft/ft)	0.005866	Area (sq ft)		302.83	
Q Total (cfs)	2300.00	Flow (cfs)		2300.00	
Top Width (ft)	53.32	Top Width (ft)		53.32	
Vel Total (ft/s)	7.59	Avg. Vel. (ft/s)		7.59	
Max Chl Dpth (ft)	7.83	Hydr. Depth (ft)		5.68	
Conv. Total (cfs)	30029.4	Conv. (cfs)		30029.4	
Length Wtd. (ft)	131.25	Wetted Per. (ft)		58.19	
Min Ch El (ft)	983.03	Shear (lb/sq ft)		1.91	
Alpha	1.00	Stream Power (lb/ft s)		14.48	
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	57.99	54.73	21.67
C & E Loss (ft)	0.35	Cum SA (acres)	12.11	6.49	8.96

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: Hope Creek
REACH: 1 RS: 6930

INPUT
Description:
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9781.95	1000.87	9799.86	997.76	9802.38	997.61	9935.39	995.4	9949.54	993.31
9968.55	984.36	9975.44	978.61	9988.3	976.89	10000	976.44	10008.8	976.63
10014.28	979.98	10020.97	984.41	10043.21	995.61	10048.18	997.11	10057.13	999.87

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9781.95	.12	9968.55	.04	10020.97	.1

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

```
      9968.5510020.97          458.64  434.11  418.59            .3       .5
Ineffective Flow     num=       2
   Sta L    Sta R    Elev  Permanent
 9781.95 9968.55 1017.97       T
10020.9710057.13 1017.97       T
```

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	983.09	Element			
Vel Head (ft)	0.12	Wt. n-Val.		0.045	
W.S. Elev (ft)	982.97	Reach Len. (ft)	458.64	434.11	418.59
Crit W.S. (ft)	979.31	Flow Area (sq ft)		241.13	
E.G. Slope (ft/ft)	0.000946	Area (sq ft)		241.13	
Q Total (cfs)	680.00	Flow (cfs)		680.00	
Top Width (ft)	48.57	Top Width (ft)		48.57	
Vel Total (ft/s)	2.82	Avg. Vel. (ft/s)		2.82	
Max Chl Dpth (ft)	6.53	Hydr. Depth (ft)		4.96	
Conv. Total (cfs)	22107.2	Conv. (cfs)		22107.2	
Length Wtd. (ft)	434.11	Wetted Per. (ft)		52.12	
Min Ch El (ft)	976.44	Shear (lb/sq ft)		0.27	
Alpha	1.00	Stream Power (lb/ft s)		0.77	
Frctn Loss (ft)		Cum Volume (acre-ft)	3.71	25.02	1.53
C & E Loss (ft)		Cum SA (acres)	5.62	5.57	1.44

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	984.23	Element			
Vel Head (ft)	0.14	Wt. n-Val.		0.045	
W.S. Elev (ft)	984.09	Reach Len. (ft)	458.64	434.11	418.59
Crit W.S. (ft)	979.76	Flow Area (sq ft)		297.16	
E.G. Slope (ft/ft)	0.000887	Area (sq ft)		297.16	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	51.60	Top Width (ft)		51.60	
Vel Total (ft/s)	2.99	Avg. Vel. (ft/s)		2.99	
Max Chl Dpth (ft)	7.65	Hydr. Depth (ft)		5.76	
Conv. Total (cfs)	29890.5	Conv. (cfs)		29890.5	
Length Wtd. (ft)	434.11	Wetted Per. (ft)		55.89	
Min Ch El (ft)	976.44	Shear (lb/sq ft)		0.29	
Alpha	1.00	Stream Power (lb/ft s)		0.88	
Frctn Loss (ft)		Cum Volume (acre-ft)	2.35	29.54	0.42
C & E Loss (ft)		Cum SA (acres)	2.12	5.81	0.32

CROSS SECTION OUTPUT Profile #10yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	985.27	Element			
Vel Head (ft)	0.15	Wt. n-Val.		0.045	
W.S. Elev (ft)	985.12	Reach Len. (ft)	458.64	434.11	418.59
Crit W.S. (ft)	980.16	Flow Area (sq ft)		351.28	
E.G. Slope (ft/ft)	0.000794	Area (sq ft)	0.62	351.28	0.50
Q Total (cfs)	1100.00	Flow (cfs)		1100.00	
Top Width (ft)	55.45	Top Width (ft)	1.62	52.42	1.41
Vel Total (ft/s)	3.13	Avg. Vel. (ft/s)		3.13	
Max Chl Dpth (ft)	8.68	Hydr. Depth (ft)		6.70	
Conv. Total (cfs)	39033.6	Conv. (cfs)		39033.6	
Length Wtd. (ft)	434.11	Wetted Per. (ft)		56.91	
Min Ch El (ft)	976.44	Shear (lb/sq ft)		0.31	
Alpha	1.00	Stream Power (lb/ft s)		0.96	
Frctn Loss (ft)		Cum Volume (acre-ft)	16.58	33.17	4.23
C & E Loss (ft)		Cum SA (acres)	7.74	5.97	3.21

CROSS SECTION OUTPUT Profile #25yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	986.57	Element			
Vel Head (ft)	0.17	Wt. n-Val.		0.045	
W.S. Elev (ft)	986.40	Reach Len. (ft)	458.64	434.11	418.59
Crit W.S. (ft)	980.64	Flow Area (sq ft)		418.47	
E.G. Slope (ft/ft)	0.000697	Area (sq ft)	4.43	418.47	3.95
Q Total (cfs)	1380.00	Flow (cfs)		1380.00	
Top Width (ft)	60.72	Top Width (ft)	4.34	52.42	3.96
Vel Total (ft/s)	3.30	Avg. Vel. (ft/s)		3.30	
Max Chl Dpth (ft)	9.96	Hydr. Depth (ft)		7.98	
Conv. Total (cfs)	52253.4	Conv. (cfs)		52253.4	
Length Wtd. (ft)	434.11	Wetted Per. (ft)		56.91	
Min Ch El (ft)	976.44	Shear (lb/sq ft)		0.32	
Alpha	1.00	Stream Power (lb/ft s)		1.06	
Frctn Loss (ft)		Cum Volume (acre-ft)	24.71	38.34	7.18
C & E Loss (ft)		Cum SA (acres)	9.12	6.12	4.67

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	987.49	Wt. n-Val.		0.045	
Vel Head (ft)	0.18	Reach Len. (ft)	458.64	434.11	418.59
W.S. Elev (ft)	987.31	Flow Area (sq ft)		465.88	
Crit W.S. (ft)	980.97	Area (sq ft)	9.23	465.88	8.34
E.G. Slope (ft/ft)	0.000647	Flow (cfs)		1590.00	
Q Total (cfs)	1590.00	Top Width (ft)	6.26	52.42	5.76
Top Width (ft)	64.44	Avg. Vel. (ft/s)		3.41	
Vel Total (ft/s)	3.41	Hydr. Depth (ft)		8.89	
Max Chl Dpth (ft)	10.87	Conv. (cfs)		62488.1	
Conv. Total (cfs)	62488.1	Wetted Per. (ft)		56.91	
Length Wtd. (ft)	434.11	Shear (lb/sq ft)		0.33	
Min Ch El (ft)	976.44	Stream Power (lb/ft s)		1.13	
Alpha	1.00	Cum Volume (acre-ft)	29.20	41.48	9.70
Frctn Loss (ft)		Cum SA (acres)	9.79	6.20	5.71
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	988.34	Wt. n-Val.		0.045	
Vel Head (ft)	0.19	Reach Len. (ft)	458.64	434.11	418.59
W.S. Elev (ft)	988.15	Flow Area (sq ft)		510.24	
Crit W.S. (ft)	981.29	Area (sq ft)	15.29	510.24	13.93
E.G. Slope (ft/ft)	0.000606	Flow (cfs)		1790.00	
Q Total (cfs)	1790.00	Top Width (ft)	8.06	52.42	7.44
Top Width (ft)	67.92	Avg. Vel. (ft/s)		3.51	
Vel Total (ft/s)	3.51	Hydr. Depth (ft)		9.73	
Max Chl Dpth (ft)	11.71	Conv. (cfs)		72717.2	
Conv. Total (cfs)	72717.2	Wetted Per. (ft)		56.91	
Length Wtd. (ft)	434.11	Shear (lb/sq ft)		0.34	
Min Ch El (ft)	976.44	Stream Power (lb/ft s)		1.19	
Alpha	1.00	Cum Volume (acre-ft)	42.27	45.76	13.23
Frctn Loss (ft)		Cum SA (acres)	10.36	6.27	6.96
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	991.26	Wt. n-Val.		0.045	
Vel Head (ft)	0.19	Reach Len. (ft)	458.64	434.11	418.59
W.S. Elev (ft)	991.07	Flow Area (sq ft)		663.24	
Crit W.S. (ft)	982.02	Area (sq ft)	47.85	663.24	44.11
E.G. Slope (ft/ft)	0.000417	Flow (cfs)		2300.00	
Q Total (cfs)	2300.00	Top Width (ft)	14.26	52.42	13.24
Top Width (ft)	79.92	Avg. Vel. (ft/s)		3.47	
Vel Total (ft/s)	3.47	Hydr. Depth (ft)		12.65	
Max Chl Dpth (ft)	14.63	Conv. (cfs)		112580.2	
Conv. Total (cfs)	112580.2	Wetted Per. (ft)		56.91	
Length Wtd. (ft)	434.11	Shear (lb/sq ft)		0.30	
Min Ch El (ft)	976.44	Stream Power (lb/ft s)		1.05	
Alpha	1.00	Cum Volume (acre-ft)	57.91	53.28	21.61
Frctn Loss (ft)		Cum SA (acres)	12.09	6.33	8.94
C & E Loss (ft)					

CULVERT

RIVER: Hope Creek
REACH: 1 RS: 6719

INPUT
Description: S. Marietta Pkwy, HC-6 2-10x8' Box Culvert
Distance from Upstream XS = 29.5
Deck/Roadway Width = 375
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 109

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
9224.89	1024.53		9228.8	1024.52		9256.11	1024.26	
9264.29	1024.22		9286.73	1024.05		9298.95	1024.01	
9302.27	1024		9327.78	1023.82		9338.47	1023.78	
9347.74	1023.76		9351.96	1023.75		9362.14	1023.67	
9389.96	1023.6		9393.38	1023.58		9417.65	1023.33	
9430.93	1023.07		9435.62	1022.98		9462.23	1022.7	
9478.58	1022.65		9492.7	1022.53		9508.71	1022.48	
9535.25	1022.25		9551.34	1022.16		9563.3	1021.96	
9590.79	1021.8		9598.41	1021.72		9605.98	1021.65	
9626.95	1021.45		9631.92	1021.4		9636.71	1021.46	
9640.54	1021.51		9648.68	1021.46		9673.39	1021.3	

9690.21	1021.09	9699.9	1021.04	9711.48	1020.97
9742.37	1020.82	9746.12	1020.79	9754.37	1020.71
9764.06	1020.56	9788.93	1020.32	9798.43	1020.19
9806.68	1020.19	9831.72	1020.2	9838.32	1020.1
9854.25	1019.91	9864.96	1019.76	9890.5	1019.47
9899.11	1019.48	9949.6	1017.97	9976.17	1017.97
9979.69	1017.97	9980.07	1017.97	10003.19	1017.97
10075.41	1020.31	10090.03	1020.52	10109.94	1020.85
10130.24	1021.27	10140.15	1021.51	10161.25	1022
10174.98	1022.22	10182.64	1022.4	10205.31	1023.1
10227.98	1023.65	10237.1	1023.98	10257.17	1024.61
10278.59	1025.38	10286.05	1025.68	10300.3	1026.18
10311.54	1026.63	10322.75	1027.05	10334.05	1027.5
10346.61	1027.92	10358.01	1028.33	10370.6	1028.75
10381.28	1029.09	10389.18	1029.4	10394.55	1029.67
10406.41	1030.13	10408.67	1030.27	10411.49	1030.42
10423.81	1030.89	10441.47	1031.33	10468.74	1032.45
10472.78	1032.68	10477.2	1032.93	10481.87	1033.2
10503.95	1034.11	10843.01	1047.54	10866.03	1048.42
10873.74	1048.63	10877.47	1048.73	10926.33	1050.44
10934.63	1050.8	10936.31	1050.83	10943.63	1051.06
10945.29	1051.07	10946.54	1051.1	10948.45	1051.11
10949.63	1051.14	10951.6	1051.14	10952.66	1051.16
10953.56	1051.17	10973.73	1051.38	10990.8	1052.11
10992.49	1052.16	10994.6	1052.21	10997.14	1052.27
11008.41	1052.56				

Upstream Bridge Cross Section Data
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9781.95	1000.87	9799.86	997.76	9802.38	997.61	9935.39	995.4	9949.54	993.31		
9968.55	984.36	9975.44	978.61	9988.3	976.89	10000	976.44	10012	976.63		
10014.28	979.98	10020.97	984.41	10043.21	995.61	10048.18	997.11	10057.13	999.87		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9781.95	.12	9968.55	.045	10020.97	.1

Bank Sta: Left Right Coeff Contr. Expan.
9968.55 10020.97 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
9781.95	9968.55	1017.97	T
10020.97	10057.13	1017.97	T

Downstream Deck/Roadway Coordinates
num= 109

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
9224.89	1024.53		9228.8	1024.52		9256.11	1024.26	
9264.29	1024.22		9286.73	1024.05		9298.95	1024.01	
9302.27	1024		9327.78	1023.82		9338.47	1023.78	
9347.74	1023.76		9351.96	1023.75		9362.14	1023.67	
9389.96	1023.6		9393.38	1023.58		9417.65	1023.33	
9430.93	1023.07		9435.62	1022.98		9462.23	1022.7	
9478.58	1022.65		9492.7	1022.53		9508.71	1022.48	
9535.25	1022.25		9551.34	1022.16		9563.3	1021.96	
9590.79	1021.8		9598.41	1021.72		9605.98	1021.65	
9626.95	1021.45		9631.92	1021.4		9636.71	1021.46	
9640.54	1021.51		9648.68	1021.46		9673.39	1021.3	
9690.21	1021.09		9699.9	1021.04		9711.48	1020.97	
9742.37	1020.82		9746.12	1020.79		9754.37	1020.71	
9764.06	1020.56		9788.93	1020.32		9798.43	1020.19	
9806.68	1020.19		9831.72	1020.2		9838.32	1020.1	
9854.25	1019.91		9864.96	1019.76		9890.5	1019.47	
9899.11	1019.48		9949.6	1017.97		9976.17	1017.97	
9979.69	1017.97		9980.07	1017.97		10003.19	1017.97	
10075.41	1020.31		10090.03	1020.52		10109.94	1020.85	
10130.24	1021.27		10140.15	1021.51		10161.25	1022	
10174.98	1022.22		10182.64	1022.4		10205.31	1023.1	
10227.98	1023.65		10237.1	1023.98		10257.17	1024.61	
10278.59	1025.38		10286.05	1025.68		10300.3	1026.18	
10311.54	1026.63		10322.75	1027.05		10334.05	1027.5	
10346.61	1027.92		10358.01	1028.33		10370.6	1028.75	
10381.28	1029.09		10389.18	1029.4		10394.55	1029.67	
10406.41	1030.13		10408.67	1030.27		10411.49	1030.42	
10423.81	1030.89		10441.47	1031.33		10468.74	1032.45	
10472.78	1032.68		10477.2	1032.93		10481.87	1033.2	
10503.95	1034.11		10843.01	1047.54		10866.03	1048.42	
10873.74	1048.63		10877.47	1048.73		10926.33	1050.44	
10934.63	1050.8		10936.31	1050.83		10943.63	1051.06	
10945.29	1051.07		10946.54	1051.1		10948.45	1051.11	
10949.63	1051.14		10951.6	1051.14		10952.66	1051.16	

```
10953.56 1051.17        10973.73 1051.38        10990.8 1052.11
10992.49 1052.16         10994.6 1052.21       10997.14 1052.27
11008.41 1052.56

Downstream Bridge Cross Section Data
Station Elevation Data    num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9889.59  989.26 9904.06  987.96 9906.52  987.63 9911.03  987.08 9917.06  986.17
 9942.39  982.91 9943.57  982.73 9949.25  981.79 9951.67  981.26 9953.81  980.93
 9961.37  979.81 9963.73   979.2 9963.86  979.16 9963.96  979.13 9972.02  976.15
 9986.26  970.21    9989  966.4610000.01  966.25   10011  966.4110012.02  970.35
10018.62  971.8410018.77  971.8710030.71  974.19 10038.9  976.2510063.61  978.28
10071.74  979.31 10082.2  980.4210082.83  980.6710097.63  986.5310112.06  991.58

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9889.59     .12 9986.26    .03510012.02     .08

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9986.2610012.02             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 9889.59 9984.26 1017.97       F
10012.1210112.06 1017.97       F

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

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box       8      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
              29.5     375     .012     .012        0                   .5                1
Number of Barrels =  2
Upstream   Elevation =  977.32
Centerline Stations
    Sta.    Sta.
  9994.5 10005.5
Downstream Elevation =  967.01
Centerline Stations
    Sta.    Sta.
  9994.5 10005.5

CROSS SECTION


RIVER: Hope Creek
REACH: 1                  RS: 6496

INPUT
Description:
Station Elevation Data    num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9889.59  989.26 9904.06  987.96 9906.52  987.63 9911.03  987.08 9917.06  986.17
 9942.39  982.91 9943.57  982.73 9949.25  981.79 9951.67  981.26 9953.81  980.93
 9961.37  979.81 9963.73   979.2 9963.86  979.16 9963.96  979.13 9972.02  976.15
 9986.26  970.21 9995.17  966.4610000.01  966.2510004.33  966.4110012.02  970.35
10018.62  971.8410018.77  971.8710030.71  974.19 10038.9  976.2510063.61  978.28
10071.74  979.31 10082.2  980.4210082.83  980.6710097.63  986.5310112.06  991.58

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9889.59     .12 9986.26    .03510012.02     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.2610012.02            261.27   218.1  177.15             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 9889.59 9984.26 1017.97       F
10012.1210112.06 1017.97       F

CROSS SECTION OUTPUT  Profile #2yr
```

			Left OB	Channel	Right OB
E.G. Elev (ft)	972.62	Element			
Vel Head (ft)	0.54	Wt. n-Val.	0.120	0.035	0.080
W.S. Elev (ft)	972.08	Reach Len. (ft)	261.27	218.10	177.15
Crit W.S. (ft)	970.43	Flow Area (sq ft)	2.91	114.45	0.17
E.G. Slope (ft/ft)	0.002900	Area (sq ft)	4.21	114.45	6.67
Q Total (cfs)	680.00	Flow (cfs)	2.36	677.39	0.24
Top Width (ft)	38.10	Top Width (ft)	4.49	25.76	7.85
Vel Total (ft/s)	5.79	Avg. Vel. (ft/s)	0.81	5.92	1.41
Max Chl Dpth (ft)	5.83	Hydr. Depth (ft)	1.46	4.44	1.72
Conv. Total (cfs)	12627.4	Conv. (cfs)	43.9	12578.9	4.5
Length Wtd. (ft)	218.26	Wetted Per. (ft)	2.17	27.47	0.10
Min Ch El (ft)	966.25	Shear (lb/sq ft)	0.24	0.75	0.30
Alpha	1.04	Stream Power (lb/ft s)	0.20	4.46	0.43
Frctn Loss (ft)	0.89	Cum Volume (acre-ft)	3.68	23.25	1.50
C & E Loss (ft)	0.23	Cum SA (acres)	5.60	5.20	1.40

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, energy was used.

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	973.44	Element			
Vel Head (ft)	0.70	Wt. n-Val.	0.120	0.035	0.080
W.S. Elev (ft)	972.74	Reach Len. (ft)	261.27	218.10	177.15
Crit W.S. (ft)	970.98	Flow Area (sq ft)	4.22	131.28	0.24
E.G. Slope (ft/ft)	0.003133	Area (sq ft)	7.65	131.28	12.90
Q Total (cfs)	890.00	Flow (cfs)	4.56	885.01	0.43
Top Width (ft)	43.03	Top Width (ft)	6.06	25.76	11.21
Vel Total (ft/s)	6.56	Avg. Vel. (ft/s)	1.08	6.74	1.82
Max Chl Dpth (ft)	6.49	Hydr. Depth (ft)	2.11	5.10	2.38
Conv. Total (cfs)	15899.8	Conv. (cfs)	81.4	15810.5	7.8
Length Wtd. (ft)	218.60	Wetted Per. (ft)	2.17	27.47	0.10
Min Ch El (ft)	966.25	Shear (lb/sq ft)	0.38	0.93	0.45
Alpha	1.05	Stream Power (lb/ft s)	0.41	6.30	0.82
Frctn Loss (ft)	0.92	Cum Volume (acre-ft)	2.31	27.41	0.36
C & E Loss (ft)	0.24	Cum SA (acres)	2.09	5.43	0.27

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, energy was used.

CROSS SECTION OUTPUT Profile #10yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	973.93	Element			
Vel Head (ft)	0.99	Wt. n-Val.	0.120	0.035	0.080
W.S. Elev (ft)	972.95	Reach Len. (ft)	261.27	218.10	177.15
Crit W.S. (ft)	971.50	Flow Area (sq ft)	4.64	136.71	0.26
E.G. Slope (ft/ft)	0.004177	Area (sq ft)	8.98	136.71	15.38
Q Total (cfs)	1100.00	Flow (cfs)	6.17	1093.25	0.58
Top Width (ft)	44.62	Top Width (ft)	6.56	25.76	12.29
Vel Total (ft/s)	7.77	Avg. Vel. (ft/s)	1.33	8.00	2.22
Max Chl Dpth (ft)	6.70	Hydr. Depth (ft)	2.32	5.31	2.59
Conv. Total (cfs)	17021.0	Conv. (cfs)	95.5	16916.6	9.0
Length Wtd. (ft)	219.66	Wetted Per. (ft)	2.17	27.47	0.10
Min Ch El (ft)	966.25	Shear (lb/sq ft)	0.56	1.30	0.66
Alpha	1.05	Stream Power (lb/ft s)	0.74	10.38	1.46
Frctn Loss (ft)	1.00	Cum Volume (acre-ft)	16.53	30.74	4.15
C & E Loss (ft)	0.14	Cum SA (acres)	7.70	5.58	3.15

Warning: The energy loss was 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, energy was used.

CROSS SECTION OUTPUT Profile #25yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	974.69	Element			
Vel Head (ft)	1.34	Wt. n-Val.	0.120	0.035	0.080
W.S. Elev (ft)	973.34	Reach Len. (ft)	261.27	218.10	177.15
Crit W.S. (ft)	972.12	Flow Area (sq ft)	5.44	146.95	0.30

E.G. Slope (ft/ft)	0.005157	Area (sq ft)	11.78	146.95	20.67
Q Total (cfs)	1380.00	Flow (cfs)	8.92	1370.26	0.82
Top Width (ft)	47.62	Top Width (ft)	7.52	25.76	14.34
Vel Total (ft/s)	9.04	Avg. Vel. (ft/s)	1.64	9.32	2.72
Max Chl Dpth (ft)	7.09	Hydr. Depth (ft)	2.72	5.70	2.98
Conv. Total (cfs)	19216.6	Conv. (cfs)	124.3	19081.0	11.4
Length Wtd. (ft)	220.30	Wetted Per. (ft)	2.17	27.47	0.10
Min Ch El (ft)	966.25	Shear (lb/sq ft)	0.81	1.72	0.94
Alpha	1.06	Stream Power (lb/ft s)	1.33	16.06	2.55
Frctn Loss (ft)	1.11	Cum Volume (acre-ft)	24.62	35.52	7.06
C & E Loss (ft)	0.09	Cum SA (acres)	9.06	5.73	4.58

Warning: The energy loss was 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, energy was used.

CROSS SECTION OUTPUT Profile #50yr

E.G. Elev (ft)	975.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.69	Wt. n-Val.	0.120	0.035	0.080
W.S. Elev (ft)	973.49	Reach Len. (ft)	261.27	218.10	177.15
Crit W.S. (ft)	972.55	Flow Area (sq ft)	5.72	150.63	0.31
E.G. Slope (ft/ft)	0.006301	Area (sq ft)	12.88	150.63	22.77
Q Total (cfs)	1590.00	Flow (cfs)	10.74	1578.28	0.97
Top Width (ft)	48.69	Top Width (ft)	7.86	25.76	15.08
Vel Total (ft/s)	10.15	Avg. Vel. (ft/s)	1.88	10.48	3.10
Max Chl Dpth (ft)	7.24	Hydr. Depth (ft)	2.86	5.85	3.13
Conv. Total (cfs)	20030.7	Conv. (cfs)	135.3	19883.1	12.3
Length Wtd. (ft)	220.69	Wetted Per. (ft)	2.17	27.47	0.10
Min Ch El (ft)	966.25	Shear (lb/sq ft)	1.04	2.16	1.20
Alpha	1.06	Stream Power (lb/ft s)	1.95	22.60	3.72
Frctn Loss (ft)	1.21	Cum Volume (acre-ft)	29.09	38.41	9.55
C & E Loss (ft)	0.01	Cum SA (acres)	9.72	5.81	5.61

Warning: The energy loss was 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, energy was used.

CROSS SECTION OUTPUT Profile #100yr

E.G. Elev (ft)	975.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.98	Wt. n-Val.	0.120	0.035	0.080
W.S. Elev (ft)	973.73	Reach Len. (ft)	261.27	218.10	177.15
Crit W.S. (ft)	972.96	Flow Area (sq ft)	6.20	156.79	0.34
E.G. Slope (ft/ft)	0.006980	Area (sq ft)	14.82	156.79	26.52
Q Total (cfs)	1790.00	Flow (cfs)	12.92	1775.92	1.16
Top Width (ft)	50.50	Top Width (ft)	8.43	25.76	16.31
Vel Total (ft/s)	10.96	Avg. Vel. (ft/s)	2.08	11.33	3.43
Max Chl Dpth (ft)	7.48	Hydr. Depth (ft)	3.10	6.09	3.37
Conv. Total (cfs)	21425.3	Conv. (cfs)	154.7	21256.7	13.9
Length Wtd. (ft)	221.03	Wetted Per. (ft)	2.17	27.47	0.10
Min Ch El (ft)	966.25	Shear (lb/sq ft)	1.25	2.49	1.43
Alpha	1.06	Stream Power (lb/ft s)	2.60	28.17	4.90
Frctn Loss (ft)	1.23	Cum Volume (acre-ft)	42.11	42.44	13.04
C & E Loss (ft)	0.10	Cum SA (acres)	10.27	5.88	6.85

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

CROSS SECTION OUTPUT Profile #500yr

E.G. Elev (ft)	977.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.75	Wt. n-Val.	0.120	0.035	0.080
W.S. Elev (ft)	974.26	Reach Len. (ft)	261.27	218.10	177.15
Crit W.S. (ft)	973.90	Flow Area (sq ft)	7.27	170.61	0.39
E.G. Slope (ft/ft)	0.008678	Area (sq ft)	19.69	170.61	36.01
Q Total (cfs)	2300.00	Flow (cfs)	18.80	2279.54	1.66
Top Width (ft)	54.46	Top Width (ft)	9.72	25.76	18.98
Vel Total (ft/s)	12.90	Avg. Vel. (ft/s)	2.59	13.36	4.22
Max Chl Dpth (ft)	8.01	Hydr. Depth (ft)	3.64	6.62	3.90
Conv. Total (cfs)	24690.4	Conv. (cfs)	201.9	24470.8	17.8
Length Wtd. (ft)	221.58	Wetted Per. (ft)	2.17	27.47	0.10
Min Ch El (ft)	966.25	Shear (lb/sq ft)	1.82	3.36	2.06
Alpha	1.06	Stream Power (lb/ft s)	4.70	44.95	8.70
Frctn Loss (ft)	1.30	Cum Volume (acre-ft)	57.56	49.12	21.22

C & E Loss (ft)	0.43	Cum SA (acres)	11.96	5.94	8.78

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

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 6278

INPUT
Description:
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9803.29	982.33	9805.11	981.96	9806.14	981.81	9828.14	978.6	9841.13	976.27
9846.28	975.46	9849.85	974.52	9865.92	973.78	9894.36	972.39	9906.49	971.83
9923.4	970.83	9931	970.28	9963.22	969.91	9977.07	970.05	9978.95	970.05
9982.03	970.07	9986.44	969.88	9994.93	966.01	9999.92	965.79	10004.17	965.99
10012.01	970.73	10012.19	971.06	10013.67	971.78	10018.89	972.07	10035.15	972.95
10037.83	973.12	10061.54	984.92						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9803.29	.12	9986.44	.025	10012.01	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9986.44	10012.01	596.84	648.74	713.24	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	971.51	Element			
Vel Head (ft)	1.30	Wt. n-Val.	0.120	0.025	
W.S. Elev (ft)	970.22	Reach Len. (ft)	596.84	648.74	713.24
Crit W.S. (ft)	970.22	Flow Area (sq ft)	9.22	73.98	
E.G. Slope (ft/ft)	0.006108	Area (sq ft)	9.22	73.98	
Q Total (cfs)	680.00	Flow (cfs)	2.89	677.11	
Top Width (ft)	74.61	Top Width (ft)	49.89	24.72	
Vel Total (ft/s)	8.17	Avg. Vel. (ft/s)	0.31	9.15	
Max Chl Dpth (ft)	4.43	Hydr. Depth (ft)	0.18	2.99	
Conv. Total (cfs)	8700.9	Conv. (cfs)	37.0	8663.9	
Length Wtd. (ft)	648.63	Wetted Per. (ft)	49.90	26.75	
Min Ch El (ft)	965.79	Shear (lb/sq ft)	0.07	1.05	
Alpha	1.25	Stream Power (lb/ft s)	0.02	9.65	
Frctn Loss (ft)	4.30	Cum Volume (acre-ft)	3.64	22.78	1.49
C & E Loss (ft)	0.01	Cum SA (acres)	5.43	5.08	1.39

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 energy loss was 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 #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	972.27	Element			
Vel Head (ft)	1.50	Wt. n-Val.	0.120	0.025	
W.S. Elev (ft)	970.77	Reach Len. (ft)	596.84	648.74	713.24
Crit W.S. (ft)	970.77	Flow Area (sq ft)	20.72	87.96	
E.G. Slope (ft/ft)	0.006004	Area (sq ft)	20.72	87.96	
Q Total (cfs)	890.00	Flow (cfs)	16.57	873.43	
Top Width (ft)	51.99	Top Width (ft)	26.42	25.57	
Vel Total (ft/s)	8.19	Avg. Vel. (ft/s)	0.80	9.93	
Max Chl Dpth (ft)	4.98	Hydr. Depth (ft)	0.78	3.44	
Conv. Total (cfs)	11486.2	Conv. (cfs)	213.8	11272.4	
Length Wtd. (ft)	648.26	Wetted Per. (ft)	27.25	27.78	
Min Ch El (ft)	965.79	Shear (lb/sq ft)	0.29	1.19	
Alpha	1.44	Stream Power (lb/ft s)	0.23	11.78	
Frctn Loss (ft)	4.22	Cum Volume (acre-ft)	2.23	26.86	0.33
C & E Loss (ft)	0.02	Cum SA (acres)	1.99	5.30	0.24

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The cross section had to be extended vertically during the critical depth 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.
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION OUTPUT Profile #10yr

E.G. Elev (ft)	972.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.46	Wt. n-Val.	0.120	0.025	0.080
W.S. Elev (ft)	971.33	Reach Len. (ft)	596.84	648.74	713.24
Crit W.S. (ft)	971.33	Flow Area (sq ft)	79.01	102.32	0.16
E.G. Slope (ft/ft)	0.004996	Area (sq ft)	79.01	102.32	0.16
Q Total (cfs)	1100.00	Flow (cfs)	73.85	1026.09	0.06
Top Width (ft)	97.86	Top Width (ft)	71.55	25.57	0.74
Vel Total (ft/s)	6.06	Avg. Vel. (ft/s)	0.93	10.03	0.38
Max Chl Dpth (ft)	5.54	Hydr. Depth (ft)	1.10	4.00	0.21
Conv. Total (cfs)	15563.2	Conv. (cfs)	1044.9	14517.5	0.8
Length Wtd. (ft)	646.97	Wetted Per. (ft)	71.59	27.74	1.00
Min Ch El (ft)	965.79	Shear (lb/sq ft)	0.34	1.15	0.05
Alpha	2.56	Stream Power (lb/ft s)	0.32	11.54	0.02
Frctn Loss (ft)	3.61	Cum Volume (acre-ft)	16.27	30.14	4.12
C & E Loss (ft)	0.04	Cum SA (acres)	7.46	5.45	3.12

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 energy loss was 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 #25yr

E.G. Elev (ft)	973.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.64	Wt. n-Val.	0.120	0.025	0.080
W.S. Elev (ft)	971.85	Reach Len. (ft)	596.84	648.74	713.24
Crit W.S. (ft)	971.85	Flow Area (sq ft)	118.25	115.53	0.85
E.G. Slope (ft/ft)	0.004919	Area (sq ft)	118.25	115.53	0.85
Q Total (cfs)	1380.00	Flow (cfs)	132.78	1246.76	0.45
Top Width (ft)	108.87	Top Width (ft)	80.38	25.57	2.92
Vel Total (ft/s)	5.88	Avg. Vel. (ft/s)	1.12	10.79	0.53
Max Chl Dpth (ft)	6.06	Hydr. Depth (ft)	1.47	4.52	0.29
Conv. Total (cfs)	19675.4	Conv. (cfs)	1893.2	17775.8	6.4
Length Wtd. (ft)	646.18	Wetted Per. (ft)	80.44	27.74	3.28
Min Ch El (ft)	965.79	Shear (lb/sq ft)	0.45	1.28	0.08
Alpha	3.05	Stream Power (lb/ft s)	0.51	13.80	0.04
Frctn Loss (ft)	3.48	Cum Volume (acre-ft)	24.23	34.86	7.01
C & E Loss (ft)	0.06	Cum SA (acres)	8.79	5.61	4.55

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 #50yr

E.G. Elev (ft)	973.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.74	Wt. n-Val.	0.120	0.025	0.080
W.S. Elev (ft)	972.22	Reach Len. (ft)	596.84	648.74	713.24
Crit W.S. (ft)	972.22	Flow Area (sq ft)	149.85	125.10	3.21
E.G. Slope (ft/ft)	0.004796	Area (sq ft)	149.85	125.10	3.21
Q Total (cfs)	1590.00	Flow (cfs)	182.47	1405.60	1.92
Top Width (ft)	123.79	Top Width (ft)	88.49	25.57	9.73
Vel Total (ft/s)	5.72	Avg. Vel. (ft/s)	1.22	11.24	0.60
Max Chl Dpth (ft)	6.43	Hydr. Depth (ft)	1.69	4.89	0.33
Conv. Total (cfs)	22958.6	Conv. (cfs)	2634.8	20296.0	27.8
Length Wtd. (ft)	645.69	Wetted Per. (ft)	88.55	27.74	10.10
Min Ch El (ft)	965.79	Shear (lb/sq ft)	0.51	1.35	0.10
Alpha	3.42	Stream Power (lb/ft s)	0.62	15.17	0.06

Frctn Loss (ft)	3.39	Cum Volume (acre-ft)	28.60	37.72	9.50
C & E Loss (ft)	0.07	Cum SA (acres)	9.43	5.68	5.56

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 OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	974.37				
Vel Head (ft)	1.78	Wt. n-Val.	0.120	0.025	0.080
W.S. Elev (ft)	972.60	Reach Len. (ft)	596.84	648.74	713.24
Crit W.S. (ft)	972.60	Flow Area (sq ft)	184.14	134.59	8.09
E.G. Slope (ft/ft)	0.004553	Area (sq ft)	184.14	134.59	8.09
Q Total (cfs)	1790.00	Flow (cfs)	236.94	1546.87	6.19
Top Width (ft)	138.43	Top Width (ft)	96.28	25.57	16.58
Vel Total (ft/s)	5.48	Avg. Vel. (ft/s)	1.29	11.49	0.77
Max Chl Dpth (ft)	6.81	Hydr. Depth (ft)	1.91	5.26	0.49
Conv. Total (cfs)	26528.9	Conv. (cfs)	3511.5	22925.6	91.8
Length Wtd. (ft)	644.99	Wetted Per. (ft)	96.35	27.74	16.97
Min Ch El (ft)	965.79	Shear (lb/sq ft)	0.54	1.38	0.14
Alpha	3.81	Stream Power (lb/ft s)	0.70	15.85	0.10
Frctn Loss (ft)	1.54	Cum Volume (acre-ft)	41.51	41.71	12.97
C & E Loss (ft)	0.19	Cum SA (acres)	9.96	5.75	6.78

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 #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	975.28				
Vel Head (ft)	1.88	Wt. n-Val.	0.120	0.025	0.080
W.S. Elev (ft)	973.40	Reach Len. (ft)	596.84	648.74	713.24
Crit W.S. (ft)	973.40	Flow Area (sq ft)	268.10	155.13	26.57
E.G. Slope (ft/ft)	0.004209	Area (sq ft)	268.10	155.13	26.57
Q Total (cfs)	2300.00	Flow (cfs)	383.55	1884.64	31.81
Top Width (ft)	164.67	Top Width (ft)	112.72	25.57	26.38
Vel Total (ft/s)	5.11	Avg. Vel. (ft/s)	1.43	12.15	1.20
Max Chl Dpth (ft)	7.61	Hydr. Depth (ft)	2.38	6.07	1.01
Conv. Total (cfs)	35451.7	Conv. (cfs)	5912.0	29049.5	490.2
Length Wtd. (ft)	644.12	Wetted Per. (ft)	112.81	27.74	26.84
Min Ch El (ft)	965.79	Shear (lb/sq ft)	0.62	1.47	0.26
Alpha	4.64	Stream Power (lb/ft s)	0.89	17.85	0.31
Frctn Loss (ft)	1.34	Cum Volume (acre-ft)	56.69	48.31	21.10
C & E Loss (ft)	0.20	Cum SA (acres)	11.60	5.82	8.69

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: Hope Creek
REACH: 1 RS: 5629

```
INPUT
Description:
Station Elevation Data    num=      41
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9663.41  980.83 9680.64  976.68 9688.56  975.37 9694.14  974.48 9699.85  973.74
  9703.1  973.44 9708.01  973.59 9714.45  973.49 9718.86  973.55 9729.39  973.45
 9734.64  973.58 9737.31  973.56 9748.19  973.75  9749.7  973.74 9750.86  973.64
 9761.28  973.99 9764.91     974 9779.35  973.41 9794.19  972.77 9796.98  972.65
 9802.81  971.45 9811.56  970.63 9816.07  969.91 9823.25  969.22 9836.58   968.9
 9852.51  968.61  9862.6  968.52 9876.71  968.56 9885.29  969.14 9892.29  969.46
 9906.05  970.29 9910.69  970.53 9912.47  972.42 9950.99  971.68 9972.01  968.32
 9986.25  962.38 9995.16  958.63   10000  958.4210004.32  958.5810012.01  962.52
10012.87  983.28

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9663.41     .12 9986.25    .02510012.01     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.2510012.01           205.65  201.08  200.99              .3       .5

CROSS SECTION OUTPUT  Profile #2yr

  E.G. Elev (ft)            963.99    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               1.41    Wt. n-Val.                  0.120      0.025
  W.S. Elev (ft)            962.58    Reach Len. (ft)            205.65     201.08     200.99
  Crit W.S. (ft)            962.58    Flow Area (sq ft)            0.05      71.32
  E.G. Slope (ft/ft)      0.007214    Area (sq ft)                 0.05      71.32       0.00
  Q Total (cfs)             680.00    Flow (cfs)                   0.01     679.99
  Top Width (ft)             26.24    Top Width (ft)               0.48      25.76
  Vel Total (ft/s)            9.53    Avg. Vel. (ft/s)             0.21       9.53
  Max Chl Dpth (ft)           4.16    Hydr. Depth (ft)             0.10       2.77
  Conv. Total (cfs)         8006.4    Conv. (cfs)                   0.1     8006.2
  Length Wtd. (ft)          201.09    Wetted Per. (ft)             0.52      27.47
  Min Ch El (ft)            958.42    Shear (lb/sq ft)             0.04       1.17
  Alpha                       1.00    Stream Power (lb/ft s)       0.01      11.15
  Frctn Loss (ft)             0.65    Cum Volume (acre-ft)         3.58      21.70       1.49
  C & E Loss (ft)             0.40    Cum SA (acres)               5.09       4.70       1.39

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 OUTPUT  Profile #5yr

  E.G. Elev (ft)            964.81    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               1.67    Wt. n-Val.                            0.025
  W.S. Elev (ft)            963.15    Reach Len. (ft)            205.65     201.08     200.99
  Crit W.S. (ft)            963.15    Flow Area (sq ft)                      85.91
  E.G. Slope (ft/ft)      0.007095    Area (sq ft)                           85.91
  Q Total (cfs)             890.00    Flow (cfs)                            890.00
  Top Width (ft)             25.76    Top Width (ft)                         25.76
  Vel Total (ft/s)           10.36    Avg. Vel. (ft/s)                       10.36
  Max Chl Dpth (ft)           4.73    Hydr. Depth (ft)                        3.34
  Conv. Total (cfs)        10566.1    Conv. (cfs)                          10566.1
  Length Wtd. (ft)          201.08    Wetted Per. (ft)                       28.87
  Min Ch El (ft)            958.42    Shear (lb/sq ft)                        1.32
  Alpha                       1.00    Stream Power (lb/ft s)                 13.66
  Frctn Loss (ft)             0.62    Cum Volume (acre-ft)         2.08      25.56       0.33
  C & E Loss (ft)             0.51    Cum SA (acres)               1.81       4.92       0.24

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 cross section had to be extended vertically during the critical depth 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.
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION OUTPUT Profile #10yr

E.G. Elev (ft)	965.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.90	Wt. n-Val.	0.120	0.025	0.080
W.S. Elev (ft)	963.66	Reach Len. (ft)	205.65	201.08	200.99
Crit W.S. (ft)	963.66	Flow Area (sq ft)	1.96	99.17	0.03
E.G. Slope (ft/ft)	0.006274	Area (sq ft)	1.96	99.17	0.03
Q Total (cfs)	1100.00	Flow (cfs)	1.36	1098.64	0.00
Top Width (ft)	28.88	Top Width (ft)	3.07	25.76	0.05
Vel Total (ft/s)	10.87	Avg. Vel. (ft/s)	0.69	11.08	0.12
Max Chl Dpth (ft)	5.24	Hydr. Depth (ft)	0.64	3.85	0.57
Conv. Total (cfs)	13887.2	Conv. (cfs)	17.1	13870.1	0.0
Length Wtd. (ft)	201.10	Wetted Per. (ft)	3.32	27.47	1.13
Min Ch El (ft)	958.42	Shear (lb/sq ft)	0.23	1.41	0.01
Alpha	1.04	Stream Power (lb/ft s)	0.16	15.66	0.00
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	15.72	28.64	4.12
C & E Loss (ft)	0.65	Cum SA (acres)	6.95	5.07	3.11

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

CROSS SECTION OUTPUT Profile #25yr

E.G. Elev (ft)	966.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.20	Wt. n-Val.	0.120	0.025	0.080
W.S. Elev (ft)	964.29	Reach Len. (ft)	205.65	201.08	200.99
Crit W.S. (ft)	964.29	Flow Area (sq ft)	4.38	115.41	0.06
E.G. Slope (ft/ft)	0.005937	Area (sq ft)	4.38	115.41	0.06
Q Total (cfs)	1380.00	Flow (cfs)	3.84	1376.15	0.01
Top Width (ft)	30.41	Top Width (ft)	4.58	25.76	0.07
Vel Total (ft/s)	11.51	Avg. Vel. (ft/s)	0.88	11.92	0.16
Max Chl Dpth (ft)	5.87	Hydr. Depth (ft)	0.96	4.48	0.89
Conv. Total (cfs)	17909.4	Conv. (cfs)	49.8	17859.4	0.1
Length Wtd. (ft)	201.10	Wetted Per. (ft)	4.96	27.47	1.77
Min Ch El (ft)	958.42	Shear (lb/sq ft)	0.33	1.56	0.01
Alpha	1.07	Stream Power (lb/ft s)	0.29	18.57	0.00
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)	23.39	33.14	7.01
C & E Loss (ft)	0.75	Cum SA (acres)	8.21	5.22	4.52

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 #50yr

E.G. Elev (ft)	967.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.42	Wt. n-Val.	0.120	0.025	0.080
W.S. Elev (ft)	964.73	Reach Len. (ft)	205.65	201.08	200.99
Crit W.S. (ft)	964.73	Flow Area (sq ft)	6.60	126.65	0.10
E.G. Slope (ft/ft)	0.005767	Area (sq ft)	6.60	126.65	0.10
Q Total (cfs)	1590.00	Flow (cfs)	6.55	1583.44	0.02
Top Width (ft)	31.48	Top Width (ft)	5.63	25.76	0.09
Vel Total (ft/s)	11.92	Avg. Vel. (ft/s)	0.99	12.50	0.18
Max Chl Dpth (ft)	6.31	Hydr. Depth (ft)	1.17	4.92	1.10
Conv. Total (cfs)	20936.5	Conv. (cfs)	86.2	20850.1	0.2
Length Wtd. (ft)	201.11	Wetted Per. (ft)	6.10	27.47	2.22
Min Ch El (ft)	958.42	Shear (lb/sq ft)	0.39	1.66	0.02
Alpha	1.09	Stream Power (lb/ft s)	0.39	20.75	0.00

Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	27.53	35.84	9.47
C & E Loss (ft)	0.78	Cum SA (acres)	8.78	5.30	5.48

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 #100yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	968.86	Element			
Vel Head (ft)	1.14	Wt. n-Val.	0.120	0.025	0.080
W.S. Elev (ft)	967.71	Reach Len. (ft)	205.65	201.08	200.99
Crit W.S. (ft)		Flow Area (sq ft)	34.09	203.57	0.56
E.G. Slope (ft/ft)	0.001465	Area (sq ft)	34.09	203.57	0.56
Q Total (cfs)	1790.00	Flow (cfs)	29.46	1760.45	0.09
Top Width (ft)	38.76	Top Width (ft)	12.79	25.76	0.21
Vel Total (ft/s)	7.51	Avg. Vel. (ft/s)	0.86	8.65	0.16
Max Chl Dpth (ft)	9.29	Hydr. Depth (ft)	2.67	7.90	2.60
Conv. Total (cfs)	46758.8	Conv. (cfs)	769.5	45987.0	2.3
Length Wtd. (ft)	201.14	Wetted Per. (ft)	13.85	27.47	5.19
Min Ch El (ft)	958.42	Shear (lb/sq ft)	0.23	0.68	0.01
Alpha	1.30	Stream Power (lb/ft s)	0.19	5.86	0.00
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	40.02	39.19	12.90
C & E Loss (ft)	0.28	Cum SA (acres)	9.21	5.37	6.64

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 #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	970.64	Element			
Vel Head (ft)	1.23	Wt. n-Val.	0.120	0.025	0.080
W.S. Elev (ft)	969.41	Reach Len. (ft)	205.65	201.08	200.99
Crit W.S. (ft)		Flow Area (sq ft)	103.11	247.26	0.98
E.G. Slope (ft/ft)	0.001235	Area (sq ft)	103.11	247.26	0.98
Q Total (cfs)	2300.00	Flow (cfs)	65.40	2234.42	0.18
Top Width (ft)	116.98	Top Width (ft)	90.94	25.76	0.29
Vel Total (ft/s)	6.55	Avg. Vel. (ft/s)	0.63	9.04	0.18
Max Chl Dpth (ft)	10.99	Hydr. Depth (ft)	1.13	9.60	3.45
Conv. Total (cfs)	65450.7	Conv. (cfs)	1861.2	63584.5	5.0
Length Wtd. (ft)	202.58	Wetted Per. (ft)	92.25	27.47	6.89
Min Ch El (ft)	958.42	Shear (lb/sq ft)	0.09	0.69	0.01
Alpha	1.85	Stream Power (lb/ft s)	0.05	6.27	0.00
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	54.15	45.31	20.87
C & E Loss (ft)	0.60	Cum SA (acres)	10.20	5.43	8.47

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 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: Hope Creek
REACH: 1 RS: 5428

INPUT
Description:
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9494.28	976.62	9507.56	973.91	9512.84	972.83	9514.96	972.42	9521.05	972.17
9524.88	972.02	9533.91	971.61	9541.48	971.31	9547.26	970.53	9547.7	970.49
9548.77	970.36	9550.44	970.24	9564.15	969.34	9564.53	969.32	9566.83	968.61
9581.36	965.46	9584.59	965.06	9587.25	964.84	9596.02	964.69	9606.43	964.53
9608.17	964.51	9613.93	964.43	9635.01	964.06	9645.73	962.26	9649.59	961.6
9659.69	961.41	9674.25	961.01	9682.31	960.85	9953.74	960.3	9966.04	960.04
9971.16	959.98	9974.67	959.83	9978.83	959.81	9986.25	959.32	9995.16	955.57

```
   10000  955.3610004.32  955.5210012.01  959.46 10016.4  966.4610019.39  973.97

Manning's n Values          num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
 9494.28      .12 9986.25     .02510012.01      .08

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9986.2510012.01            519.24  458.42  414.44              .3       .5
Ineffective Flow      num=        2
   Sta L    Sta R     Elev  Permanent
 9494.28 9984.63  969.52        F
10013.3910019.39  969.52        F
```

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	961.54	Wt. n-Val.	0.120	0.025	0.080
Vel Head (ft)	0.61	Reach Len. (ft)	519.24	458.42	414.44
W.S. Elev (ft)	960.93	Flow Area (sq ft)	2.52	107.60	0.68
Crit W.S. (ft)	959.53	Area (sq ft)	128.10	107.60	0.68
E.G. Slope (ft/ft)	0.001820	Flow (cfs)	1.78	677.93	0.29
Q Total (cfs)	680.00	Top Width (ft)	307.84	25.76	0.92
Top Width (ft)	334.51	Avg. Vel. (ft/s)	0.71	6.30	0.42
Vel Total (ft/s)	6.14	Hydr. Depth (ft)	1.55	4.18	0.73
Max Chl Dpth (ft)	5.57	Conv. (cfs)	41.8	15890.4	6.7
Conv. Total (cfs)	15938.8	Wetted Per. (ft)	1.62	27.47	1.73
Length Wtd. (ft)	458.42	Shear (lb/sq ft)	0.18	0.45	0.04
Min Ch El (ft)	955.36	Stream Power (lb/ft s)	0.12	2.80	0.02
Alpha	1.05	Cum Volume (acre-ft)	3.28	21.28	1.49
Frctn Loss (ft)		Cum SA (acres)	4.36	4.58	1.38
C & E Loss (ft)					

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

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	962.76	Wt. n-Val.		0.025	
Vel Head (ft)	0.64	Reach Len. (ft)	519.24	458.42	414.44
W.S. Elev (ft)	962.12	Flow Area (sq ft)		138.22	
Crit W.S. (ft)	960.09	Area (sq ft)		138.22	
E.G. Slope (ft/ft)	0.001733	Flow (cfs)		890.00	
Q Total (cfs)	890.00	Top Width (ft)		25.76	
Top Width (ft)	25.76	Avg. Vel. (ft/s)		6.44	
Vel Total (ft/s)	6.44	Hydr. Depth (ft)		5.37	
Max Chl Dpth (ft)	6.76	Conv. (cfs)		21377.8	
Conv. Total (cfs)	21377.8	Wetted Per. (ft)		32.93	
Length Wtd. (ft)	458.42	Shear (lb/sq ft)		0.45	
Min Ch El (ft)	955.36	Stream Power (lb/ft s)		2.92	
Alpha	1.00	Cum Volume (acre-ft)	2.08	25.05	0.33
Frctn Loss (ft)		Cum SA (acres)	1.81	4.80	0.24
C & E Loss (ft)					

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

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	964.08	Wt. n-Val.	0.120	0.025	0.080
Vel Head (ft)	0.61	Reach Len. (ft)	519.24	458.42	414.44
W.S. Elev (ft)	963.47	Flow Area (sq ft)	6.63	173.00	4.01
Crit W.S. (ft)	960.60	Area (sq ft)	982.93	173.00	5.03
E.G. Slope (ft/ft)	0.000967	Flow (cfs)	6.52	1090.38	3.09
Q Total (cfs)	1100.00	Top Width (ft)	347.70	25.76	2.51
Top Width (ft)	375.98	Avg. Vel. (ft/s)	0.98	6.30	0.77
Vel Total (ft/s)	5.99	Hydr. Depth (ft)	4.09	6.72	2.91
Max Chl Dpth (ft)	8.11	Conv. (cfs)	209.8	35062.4	99.5
Conv. Total (cfs)	35371.7	Wetted Per. (ft)	1.62	27.47	2.60
Length Wtd. (ft)	458.42	Shear (lb/sq ft)	0.25	0.38	0.09
Min Ch El (ft)	955.36	Stream Power (lb/ft s)	0.24	2.40	0.07
Alpha	1.10	Cum Volume (acre-ft)	13.39	28.02	4.11
Frctn Loss (ft)		Cum SA (acres)	6.12	4.95	3.11
C & E Loss (ft)					

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

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	965.28				

Vel Head (ft)	0.71	Wt. n-Val.	0.120	0.025	0.080
W.S. Elev (ft)	964.57	Reach Len. (ft)	519.24	458.42	414.44
Crit W.S. (ft)	961.22	Flow Area (sq ft)	8.42	201.46	5.53
E.G. Slope (ft/ft)	0.000913	Area (sq ft)	1377.57	201.46	8.19
Q Total (cfs)	1380.00	Flow (cfs)	9.44	1365.42	5.14
Top Width (ft)	411.45	Top Width (ft)	382.49	25.76	3.21
Vel Total (ft/s)	6.41	Avg. Vel. (ft/s)	1.12	6.78	0.93
Max Chl Dpth (ft)	9.21	Hydr. Depth (ft)	5.20	7.82	4.01
Conv. Total (cfs)	45677.4	Conv. (cfs)	312.4	45194.8	170.3
Length Wtd. (ft)	458.42	Wetted Per. (ft)	1.62	27.47	2.60
Min Ch El (ft)	955.36	Shear (lb/sq ft)	0.30	0.42	0.12
Alpha	1.11	Stream Power (lb/ft s)	0.33	2.83	0.11
Frctn Loss (ft)		Cum Volume (acre-ft)	20.13	32.41	6.99
C & E Loss (ft)		Cum SA (acres)	7.30	5.10	4.51

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

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	965.78	Wt. n-Val.	0.120	0.025	0.080
Vel Head (ft)	0.86	Reach Len. (ft)	519.24	458.42	414.44
W.S. Elev (ft)	964.93	Flow Area (sq ft)	9.00	210.68	6.03
Crit W.S. (ft)	961.66	Area (sq ft)	1518.24	210.68	9.38
E.G. Slope (ft/ft)	0.001043	Flow (cfs)	11.27	1572.39	6.34
Q Total (cfs)	1590.00	Top Width (ft)	400.07	25.76	3.43
Top Width (ft)	429.26	Avg. Vel. (ft/s)	1.25	7.46	1.05
Vel Total (ft/s)	7.04	Hydr. Depth (ft)	5.56	8.18	4.37
Max Chl Dpth (ft)	9.57	Conv. (cfs)	349.1	48693.6	196.3
Conv. Total (cfs)	49239.0	Wetted Per. (ft)	1.62	27.47	2.60
Length Wtd. (ft)	458.42	Shear (lb/sq ft)	0.36	0.50	0.15
Min Ch El (ft)	955.36	Stream Power (lb/ft s)	0.45	3.73	0.16
Alpha	1.11	Cum Volume (acre-ft)	23.93	35.07	9.45
Frctn Loss (ft)		Cum SA (acres)	7.83	5.18	5.47
C & E Loss (ft)					

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

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	968.42	Wt. n-Val.	0.120	0.025	0.080
Vel Head (ft)	0.58	Reach Len. (ft)	519.24	458.42	414.44
W.S. Elev (ft)	967.84	Flow Area (sq ft)	13.71	285.59	10.04
Crit W.S. (ft)	962.07	Area (sq ft)	2707.45	285.59	21.79
E.G. Slope (ft/ft)	0.000476	Flow (cfs)	15.37	1764.60	10.03
Q Total (cfs)	1790.00	Top Width (ft)	415.85	25.76	4.94
Top Width (ft)	446.55	Avg. Vel. (ft/s)	1.12	6.18	1.00
Vel Total (ft/s)	5.79	Hydr. Depth (ft)	8.46	11.09	7.28
Max Chl Dpth (ft)	12.48	Conv. (cfs)	704.1	80846.1	459.4
Conv. Total (cfs)	82009.6	Wetted Per. (ft)	1.62	27.47	2.60
Length Wtd. (ft)	458.42	Shear (lb/sq ft)	0.25	0.31	0.11
Min Ch El (ft)	955.36	Stream Power (lb/ft s)	0.28	1.91	0.11
Alpha	1.12	Cum Volume (acre-ft)	33.54	38.06	12.85
Frctn Loss (ft)		Cum SA (acres)	8.20	5.25	6.63
C & E Loss (ft)					

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

CROSS SECTION OUTPUT Profile #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	970.01	Wt. n-Val.	0.120	0.025	0.080
Vel Head (ft)	0.04	Reach Len. (ft)	519.24	458.42	414.44
W.S. Elev (ft)	969.97	Flow Area (sq ft)	3607.55	340.61	33.25
Crit W.S. (ft)	963.02	Area (sq ft)	3607.55	340.61	33.25
E.G. Slope (ft/ft)	0.000061	Flow (cfs)	1440.37	850.11	9.53
Q Total (cfs)	2300.00	Top Width (ft)	431.74	25.76	5.79
Top Width (ft)	463.29	Avg. Vel. (ft/s)	0.40	2.50	0.29
Vel Total (ft/s)	0.58	Hydr. Depth (ft)	8.36	13.22	5.74
Max Chl Dpth (ft)	14.61	Conv. (cfs)	183734.1	108440.1	1215.1
Conv. Total (cfs)	293389.3	Wetted Per. (ft)	432.48	27.47	12.04
Length Wtd. (ft)	458.42	Shear (lb/sq ft)	0.03	0.05	0.01
Min Ch El (ft)	955.36	Stream Power (lb/ft s)	0.01	0.12	0.00
Alpha	7.20	Cum Volume (acre-ft)	45.39	43.95	20.79
Frctn Loss (ft)		Cum SA (acres)	8.97	5.31	8.46
C & E Loss (ft)					

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

CULVERT

RIVER: Hope Creek
REACH: 1 RS: 5146

INPUT
Description: I-75, HC-4, 2-9x6 Box
Distance from Upstream XS = 17
Deck/Roadway Width = 425
Weir Coefficient = 2.8
Upstream Deck/Roadway Coordinates
num= 50

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
9439.25	969.45		9725.25	969.45		9730.79	969.45	
9737.49	969.45		9745.37	969.45		9752.75	969.45	
9765.99	969.45		9970.88	969.52		9982.88	969.52	
10024.87	969.52		10036.05	970.14		10041.11	970.23	
10050.31	970.4		10108.03	971.73		10118.43	972.04	
10131.15	972.34		10135.54	972.54		10189.34	974.07	
10196.9	974.17		10210.77	974.61		10297.86	974.86	
10330.75	974.96		10333.8	974.97		10337.4	974.35	
10346.03	972.86		10349.55	973.73		10381.62	981.42	
10405.7	992.45		10408.55	993.67		10409.29	993.72	
10450.59	995.25		10456.78	995.51		10462.41	995.54	
10492.18	996.02		10525.03	995.39		10527.38	995.31	
10528.77	995.32		10531.44	995.33		10565.96	995.33	
10597.8	995.59		10598.34	995.58		10598.94	995.61	
10637.36	996.21		10665.54	995.98		10673.12	995.92	
10712.68	996.38		10740.48	996.87		10764.42	997.25	
10799.24	998.33		10801.36	998.34				

Upstream Bridge Cross Section Data
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9494.28	976.62	9507.56	973.91	9512.84	972.83	9514.96	972.42	9521.05	972.17		
9524.88	972.02	9533.91	971.61	9541.48	971.31	9547.26	970.53	9547.7	970.49		
9548.77	970.36	9550.44	970.24	9564.15	969.34	9564.53	969.32	9566.83	968.61		
9581.36	965.46	9584.59	965.06	9587.25	964.84	9596.02	964.69	9606.43	964.53		
9608.17	964.51	9613.93	964.43	9635.01	964.06	9645.73	962.26	9649.59	961.6		
9659.69	961.41	9674.25	961.01	9682.31	960.85	9953.74	960.3	9966.04	960.04		
9971.16	959.98	9974.67	959.83	9978.83	959.81	9986.25	959.32	9990	955.3		
10000	955.3	10010	955.3	10012.01	959.46	10016.4	966.4	10019.39	973.97		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9494.28	.12	9986.25	.02	10012.01	.08

Bank Sta: Left	Right	Coeff Contr.	Expan.
9986.25	10012.01	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
9494.28	9984.63	969.52	F
10013.39	10019.39	969.52	F

Downstream Deck/Roadway Coordinates
num= 50

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
9439.25	969.45		9725.25	969.45		9730.79	969.45	
9737.49	969.45		9745.37	969.45		9752.75	969.45	
9765.99	969.45		9970.88	969.52		9982.88	969.52	
10024.87	969.52		10036.05	970.14		10041.11	970.23	
10050.31	970.4		10108.03	971.73		10118.43	972.04	
10131.15	972.34		10135.54	972.54		10189.34	974.07	
10196.9	974.17		10210.77	974.61		10297.86	974.86	
10330.75	974.96		10333.8	974.97		10337.4	974.35	
10346.03	972.86		10349.55	973.73		10381.62	981.42	
10405.7	992.45		10408.55	993.67		10409.29	993.72	
10450.59	995.25		10456.78	995.51		10462.41	995.54	
10492.18	996.02		10525.03	995.39		10527.38	995.31	
10528.77	995.32		10531.44	995.33		10565.96	995.33	
10597.8	995.59		10598.34	995.58		10598.94	995.61	
10637.36	996.21		10665.54	995.98		10673.12	995.92	
10712.68	996.38		10740.48	996.87		10764.42	997.25	
10799.24	998.33		10801.36	998.34				

Downstream Bridge Cross Section Data
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
 9968.35  966.59 9970.14  966.43 9970.75  966.38 9974.46  962.41 9988.91  956.36
    9990  950.63   10000   950.610010.74   950.710012.88  957.5110026.81  962.32
10030.78  962.5310033.08  963.2710048.84  968.2410053.37  969.87

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9968.35     .09 9988.91     .0410012.88     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9988.9110012.88            .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 9968.35 9988.56  969.52       F
10013.5410053.37  969.52       F

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

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box       6       9
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 17     425     .012     .012        0                  .5                  1
Number of Barrels =  2
Upstream   Elevation =  955.35
Centerline Stations
    Sta.    Sta.
    9995   10005
Downstream Elevation =  950.84
Centerline Stations
    Sta.    Sta.
    9995   10005

CROSS SECTION


RIVER: Hope Creek
REACH: 1                    RS: 4969

INPUT
Description:
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9968.35  966.59 9970.14  966.43 9970.75  966.38 9974.46  962.41 9988.91  956.36
 9990.74  950.63   10000   950.610010.74  951.2210012.88  957.5110026.81  962.32
10030.78  962.5310033.08  963.2710048.84  968.2410053.37  969.87

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9968.35     .09 9988.91     .0410012.88     .12

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9988.9110012.88            170.27  251.19  305.99            .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 9968.35 9988.56  969.52       F
10013.5410053.37  969.52       F

CROSS SECTION OUTPUT  Profile #2yr

  E.G. Elev (ft)          955.81    Element                  Left OB    Channel   Right OB
  Vel Head (ft)             0.95    Wt. n-Val.                           0.040
  W.S. Elev (ft)          954.86    Reach Len. (ft)          170.27     251.19    305.99
  Crit W.S. (ft)          954.03    Flow Area (sq ft)                    86.90
  E.G. Slope (ft/ft)     0.009944   Area (sq ft)                         86.90
  Q Total (cfs)           680.00    Flow (cfs)                          680.00
  Top Width (ft)           22.59    Top Width (ft)                       22.59
  Vel Total (ft/s)          7.82    Avg. Vel. (ft/s)                      7.82
  Max Chl Dpth (ft)         4.26    Hydr. Depth (ft)                      3.85
  Conv. Total (cfs)       6819.0    Conv. (cfs)                         6819.0
  Length Wtd. (ft)        251.19    Wetted Per. (ft)                     28.31
  Min Ch El (ft)          950.60    Shear (lb/sq ft)                      1.91
  Alpha                     1.00    Stream Power (lb/ft s)               14.91
```

Frctn Loss (ft)	0.91	Cum Volume (acre-ft)	2.52	20.26	1.48
C & E Loss (ft)	0.36	Cum SA (acres)	2.53	4.33	1.38

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

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	956.80	Wt. n-Val.		0.040	
Vel Head (ft)	1.09	Reach Len. (ft)	170.27	251.19	305.99
W.S. Elev (ft)	955.71	Flow Area (sq ft)		106.23	
Crit W.S. (ft)	954.65	Area (sq ft)		106.23	
E.G. Slope (ft/ft)	0.009462	Flow (cfs)		890.00	
Q Total (cfs)	890.00	Top Width (ft)		23.15	
Top Width (ft)	23.15	Avg. Vel. (ft/s)		8.38	
Vel Total (ft/s)	8.38	Hydr. Depth (ft)		4.59	
Max Chl Dpth (ft)	5.11	Conv. (cfs)		9149.3	
Conv. Total (cfs)	9149.3	Wetted Per. (ft)		30.09	
Length Wtd. (ft)	251.19	Shear (lb/sq ft)		2.09	
Min Ch El (ft)	950.60	Stream Power (lb/ft s)		17.47	
Alpha	1.00	Cum Volume (acre-ft)	2.08	23.76	0.33
Frctn Loss (ft)	0.85	Cum SA (acres)	1.81	4.54	0.24
C & E Loss (ft)	0.41				

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

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	957.69	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	1.22	Reach Len. (ft)	170.27	251.19	305.99
W.S. Elev (ft)	956.47	Flow Area (sq ft)	0.01	123.99	
Crit W.S. (ft)	955.23	Area (sq ft)	0.01	123.99	
E.G. Slope (ft/ft)	0.009207	Flow (cfs)	0.00	1100.00	
Q Total (cfs)	1100.00	Top Width (ft)	0.25	23.62	
Top Width (ft)	23.87	Avg. Vel. (ft/s)	0.21	8.87	
Vel Total (ft/s)	8.87	Hydr. Depth (ft)	0.05	5.25	
Max Chl Dpth (ft)	5.87	Conv. (cfs)	0.0	11463.7	
Conv. Total (cfs)	11463.7	Wetted Per. (ft)	0.28	31.58	
Length Wtd. (ft)	251.18	Shear (lb/sq ft)	0.03	2.26	
Min Ch El (ft)	950.60	Stream Power (lb/ft s)	0.01	20.02	
Alpha	1.00	Cum Volume (acre-ft)	7.53	26.45	4.09
Frctn Loss (ft)	0.81	Cum SA (acres)	4.05	4.69	3.10
C & E Loss (ft)	0.46				

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, energy was used.

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	958.77	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	1.39	Reach Len. (ft)	170.27	251.19	305.99
W.S. Elev (ft)	957.38	Flow Area (sq ft)	0.33	145.74	
Crit W.S. (ft)	955.92	Area (sq ft)	1.25	145.74	
E.G. Slope (ft/ft)	0.008795	Flow (cfs)	0.47	1379.53	
Q Total (cfs)	1380.00	Top Width (ft)	2.44	23.93	
Top Width (ft)	26.37	Avg. Vel. (ft/s)	1.42	9.47	
Vel Total (ft/s)	9.45	Hydr. Depth (ft)	0.95	6.09	
Max Chl Dpth (ft)	6.78	Conv. (cfs)	5.0	14709.8	
Conv. Total (cfs)	14714.9	Wetted Per. (ft)	0.38	32.54	
Length Wtd. (ft)	251.12				

Min Ch El (ft)	950.60	Shear (lb/sq ft)	0.48	2.46	
Alpha	1.00	Stream Power (lb/ft s)	0.68	23.28	
Frctn Loss (ft)	0.78	Cum Volume (acre-ft)	11.91	30.59	6.95
C & E Loss (ft)	0.52	Cum SA (acres)	5.00	4.84	4.50

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, energy was used.

CROSS SECTION OUTPUT Profile #50yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	959.52	Element			
Vel Head (ft)	1.52	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	957.99	Reach Len. (ft)	170.27	251.19	305.99
Crit W.S. (ft)	956.40	Flow Area (sq ft)	0.55	160.38	0.24
E.G. Slope (ft/ft)	0.008526	Area (sq ft)	3.18	160.38	0.34
Q Total (cfs)	1590.00	Flow (cfs)	1.06	1588.80	0.14
Top Width (ft)	29.27	Top Width (ft)	3.90	23.97	1.40
Vel Total (ft/s)	9.87	Avg. Vel. (ft/s)	1.94	9.91	0.57
Max Chl Dpth (ft)	7.39	Hydr. Depth (ft)	1.56	6.69	0.37
Conv. Total (cfs)	17219.4	Conv. (cfs)	11.5	17206.4	1.5
Length Wtd. (ft)	251.05	Wetted Per. (ft)	0.38	32.68	0.70
Min Ch El (ft)	950.60	Shear (lb/sq ft)	0.77	2.61	0.19
Alpha	1.01	Stream Power (lb/ft s)	1.49	25.88	0.11
Frctn Loss (ft)	0.76	Cum Volume (acre-ft)	14.86	33.11	9.40
C & E Loss (ft)	0.57	Cum SA (acres)	5.42	4.92	5.45

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

CROSS SECTION OUTPUT Profile #100yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	960.19	Element			
Vel Head (ft)	1.64	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	958.55	Reach Len. (ft)	170.27	251.19	305.99
Crit W.S. (ft)	956.86	Flow Area (sq ft)	0.74	173.63	0.61
E.G. Slope (ft/ft)	0.008284	Area (sq ft)	5.71	173.63	1.55
Q Total (cfs)	1790.00	Flow (cfs)	1.74	1787.64	0.63
Top Width (ft)	32.19	Top Width (ft)	5.22	23.97	3.00
Vel Total (ft/s)	10.23	Avg. Vel. (ft/s)	2.34	10.30	1.03
Max Chl Dpth (ft)	7.95	Hydr. Depth (ft)	2.11	7.24	0.92
Conv. Total (cfs)	19667.1	Conv. (cfs)	19.1	19641.2	6.9
Length Wtd. (ft)	250.98	Wetted Per. (ft)	0.38	32.68	0.70
Min Ch El (ft)	950.60	Shear (lb/sq ft)	1.01	2.75	0.45
Alpha	1.01	Stream Power (lb/ft s)	2.36	28.29	0.46
Frctn Loss (ft)	0.75	Cum Volume (acre-ft)	17.37	35.65	12.74
C & E Loss (ft)	0.61	Cum SA (acres)	5.69	4.99	6.59

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, energy was used.

CROSS SECTION OUTPUT Profile #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	961.76	Element			
Vel Head (ft)	1.97	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	959.79	Reach Len. (ft)	170.27	251.19	305.99
Crit W.S. (ft)	957.90	Flow Area (sq ft)	1.18	203.42	1.43
E.G. Slope (ft/ft)	0.008045	Area (sq ft)	14.04	203.42	7.52
Q Total (cfs)	2300.00	Flow (cfs)	3.70	2293.74	2.56
Top Width (ft)	38.76	Top Width (ft)	8.19	23.97	6.60
Vel Total (ft/s)	11.16	Avg. Vel. (ft/s)	3.14	11.28	1.79
Max Chl Dpth (ft)	9.19	Hydr. Depth (ft)	3.36	8.49	2.16

Conv. Total (cfs)	25642.2	Conv. (cfs)	41.2	25572.5	28.5
Length Wtd. (ft)	250.78	Wetted Per. (ft)	0.38	32.68	0.70
Min Ch El (ft)	950.60	Shear (lb/sq ft)	1.55	3.13	1.03
Alpha	1.02	Stream Power (lb/ft s)	4.89	35.26	1.84
Frctn Loss (ft)	0.74	Cum Volume (acre-ft)	23.81	41.09	20.60
C & E Loss (ft)	0.74	Cum SA (acres)	6.34	5.05	8.40

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, energy was used.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4925.680

INPUT
Description: 1
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	966.05	.67	966.04	6.73	965.94	10.16	965.88	15.22	965.81
16.14	962	17.01	958.99	21.86	956.78	24.79	955.24	27.12	952.03
28.33	948.84	40.39	949.33	40.68	949.33	41.07	949.36	46.04	949.53
53.68	949.81	54.7	949.98	55.85	950.17	56.56	950.29	65.26	951.74
65.45	951.76	66.54	957.6	66.83	958.95	68.87	959.16	72.64	959.6
85.55	961.13	85.59	961.14	88	961.24	102.73	962.2	137.62	969.34

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.09	24.79	.04	66.83	.1	88	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
24.79	66.83	18.25	17.81	18.01	.1	.3

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	954.54	Wt. n-Val.		0.040	
Vel Head (ft)	0.24	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	954.31	Flow Area (sq ft)		174.53	
Crit W.S. (ft)	951.94	Area (sq ft)		174.53	
E.G. Slope (ft/ft)	0.001865	Flow (cfs)		680.00	
Q Total (cfs)	680.00	Top Width (ft)		40.46	
Top Width (ft)	40.46	Avg. Vel. (ft/s)		3.90	
Vel Total (ft/s)	3.90	Hydr. Depth (ft)		4.31	
Max Chl Dpth (ft)	5.47	Conv. (cfs)		15745.5	
Conv. Total (cfs)	15745.5	Wetted Per. (ft)		46.12	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		0.44	
Min Ch El (ft)	948.84	Stream Power (lb/ft s)		1.72	
Alpha	1.00	Cum Volume (acre-ft)	2.52	19.51	1.48
Frctn Loss (ft)		Cum SA (acres)	2.53	4.14	1.38
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	955.53	Wt. n-Val.		0.040	
Vel Head (ft)	0.27	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	955.27	Flow Area (sq ft)		213.69	
Crit W.S. (ft)	952.39	Area (sq ft)		213.69	
E.G. Slope (ft/ft)	0.001729	Flow (cfs)		890.00	
Q Total (cfs)	890.00	Top Width (ft)		41.31	
Top Width (ft)	41.31	Avg. Vel. (ft/s)		4.16	
Vel Total (ft/s)	4.16	Hydr. Depth (ft)		5.17	
Max Chl Dpth (ft)	6.43	Conv. (cfs)		21402.8	
Conv. Total (cfs)	21402.8	Wetted Per. (ft)		48.27	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		0.48	
Min Ch El (ft)	948.84	Stream Power (lb/ft s)		1.99	
Alpha	1.00	Cum Volume (acre-ft)	2.08	22.84	0.33
Frctn Loss (ft)		Cum SA (acres)	1.81	4.35	0.24
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	956.42				

Vel Head (ft)	0.30	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	956.12	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	952.76	Flow Area (sq ft)	0.73	248.96	
E.G. Slope (ft/ft)	0.001624	Area (sq ft)	0.73	248.96	
Q Total (cfs)	1100.00	Flow (cfs)	0.26	1099.74	
Top Width (ft)	43.14	Top Width (ft)	1.67	41.47	
Vel Total (ft/s)	4.41	Avg. Vel. (ft/s)	0.35	4.42	
Max Chl Dpth (ft)	7.28	Hydr. Depth (ft)	0.44	6.00	
Conv. Total (cfs)	27298.7	Conv. (cfs)	6.4	27292.3	
Length Wtd. (ft)	4.00	Wetted Per. (ft)	1.89	49.11	
Min Ch El (ft)	948.84	Shear (lb/sq ft)	0.04	0.51	
Alpha	1.01	Stream Power (lb/ft s)	0.01	2.27	
Frctn Loss (ft)		Cum Volume (acre-ft)	7.53	25.38	4.09
C & E Loss (ft)		Cum SA (acres)	4.04	4.50	3.10

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	957.48	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	0.35	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	957.13	Flow Area (sq ft)	3.41	290.97	
Crit W.S. (ft)	953.26	Area (sq ft)	3.41	290.97	
E.G. Slope (ft/ft)	0.001559	Flow (cfs)	1.95	1378.05	
Q Total (cfs)	1380.00	Top Width (ft)	3.69	41.66	
Top Width (ft)	45.36	Avg. Vel. (ft/s)	0.57	4.74	
Vel Total (ft/s)	4.69	Hydr. Depth (ft)	0.92	6.98	
Max Chl Dpth (ft)	8.29	Conv. (cfs)	49.3	34905.7	
Conv. Total (cfs)	34955.0	Wetted Per. (ft)	4.15	50.14	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.08	0.56	
Min Ch El (ft)	948.84	Stream Power (lb/ft s)	0.05	2.67	
Alpha	1.02	Cum Volume (acre-ft)	11.90	29.33	6.95
Frctn Loss (ft)		Cum SA (acres)	4.99	4.65	4.50
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	958.18	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	0.38	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	957.80	Flow Area (sq ft)	6.38	318.96	
Crit W.S. (ft)	953.60	Area (sq ft)	6.38	318.96	
E.G. Slope (ft/ft)	0.001547	Flow (cfs)	4.43	1585.57	
Q Total (cfs)	1590.00	Top Width (ft)	5.17	41.79	
Top Width (ft)	46.96	Avg. Vel. (ft/s)	0.69	4.97	
Vel Total (ft/s)	4.89	Hydr. Depth (ft)	1.24	7.63	
Max Chl Dpth (ft)	8.96	Conv. (cfs)	112.7	40315.2	
Conv. Total (cfs)	40427.9	Wetted Per. (ft)	5.77	50.82	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.11	0.61	
Min Ch El (ft)	948.84	Stream Power (lb/ft s)	0.07	3.01	
Alpha	1.03	Cum Volume (acre-ft)	14.84	31.73	9.40
Frctn Loss (ft)		Cum SA (acres)	5.40	4.73	5.45
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	958.82	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	0.41	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	958.41	Flow Area (sq ft)	9.92	344.41	
Crit W.S. (ft)	953.91	Area (sq ft)	9.92	344.41	
E.G. Slope (ft/ft)	0.001538	Flow (cfs)	7.93	1782.07	
Q Total (cfs)	1790.00	Top Width (ft)	6.50	41.92	
Top Width (ft)	48.42	Avg. Vel. (ft/s)	0.80	5.17	
Vel Total (ft/s)	5.05	Hydr. Depth (ft)	1.53	8.22	
Max Chl Dpth (ft)	9.57	Conv. (cfs)	202.3	45445.9	
Conv. Total (cfs)	45648.3	Wetted Per. (ft)	7.23	51.44	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.13	0.64	
Min Ch El (ft)	948.84	Stream Power (lb/ft s)	0.11	3.33	
Alpha	1.04	Cum Volume (acre-ft)	17.34	34.15	12.73
Frctn Loss (ft)		Cum SA (acres)	5.67	4.80	6.58
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	960.28	Wt. n-Val.	0.090	0.040	0.100
Vel Head (ft)	0.49	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	959.79	Flow Area (sq ft)	20.39	402.42	3.18
Crit W.S. (ft)	954.63	Area (sq ft)	20.39	402.42	3.18
E.G. Slope (ft/ft)	0.001516	Flow (cfs)	21.85	2277.11	1.04
Q Total (cfs)	2300.00	Top Width (ft)	8.01	42.04	7.39
Top Width (ft)	57.44				

Vel Total (ft/s)	5.40	Avg. Vel. (ft/s)	1.07	5.66	0.33
Max Chl Dpth (ft)	10.95	Hydr. Depth (ft)	2.54	9.57	0.43
Conv. Total (cfs)	59077.1	Conv. (cfs)	561.2	58489.1	26.8
Length Wtd. (ft)	4.00	Wetted Per. (ft)	9.47	52.00	7.44
Min Ch El (ft)	948.84	Shear (lb/sq ft)	0.20	0.73	0.04
Alpha	1.09	Stream Power (lb/ft s)	0.22	4.14	0.01
Frctn Loss (ft)		Cum Volume (acre-ft)	23.74	39.34	20.56
C & E Loss (ft)		Cum SA (acres)	6.31	4.86	8.35

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 4918

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	970	967	200	970	967

Upstream Bridge Cross Section Data
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	965.93	.67	965.92	6.73	965.82	10.16	965.76	15.22	965.69
16.14	961.88	17.01	958.87	21.86	956.66	24.79	955.12	27.12	951.91
28.33	948.72	40.39	949.21	40.68	949.21	41.07	949.24	46.04	949.41
53.68	949.69	54.7	949.86	55.85	950.05	56.56	950.17	65.26	951.62
65.45	951.64	66.54	957.48	66.83	958.83	68.87	959.04	72.64	959.48
85.55	961.01	85.59	961.02	88	961.12	102.73	962.08	137.62	969.22

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.09	24.79	.04	66.83	.1	88	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
24.79	66.83	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	970	967	200	970	967

Downstream Bridge Cross Section Data
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	966.15	1.93	966.1	2.31	966.09	8.75	965.99	16.79	965.87
17.56	963.22	18.76	959.25	20.16	958.61	24.88	956.46	26.77	955.45
29.11	953.07	30.82	948.59	31.9	948.54	32.95	948.55	34.24	948.53
42.33	948.65	46.67	948.91	52.99	949.14	53.6	949.16	59.7	950.18
60.38	950.26	64.3	950.74	65.6	953.67	66.58	958.19	83.34	959.91
87.54	959.91	89.68	959.98	94.66	960.45	98.39	960.8	106.42	961.61
118.91	962.42	130.89	964.83	147.6	967.29				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.09	26.77	.04	66.58	.1	89.68	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
26.77	66.58	.1	.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data
Pier Station Upstream= 68.3 Downstream= 68.3
Upstream num= 2

Width	Elev	Width	Elev
8	945	8	970

Downstream num= 2

Width	Elev	Width	Elev
8	945	8	970

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Momentum Cd = 2
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 #2yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	954.54	E.G. Elev (ft)	954.41	954.12
W.S. US. (ft)	954.31	W.S. Elev (ft)	954.16	953.84
Q Total (cfs)	680.00	Crit W.S. (ft)	951.83	951.47
Q Bridge (cfs)	680.00	Max Chl Dpth (ft)	5.44	5.31
Q Weir (cfs)		Vel Total (ft/s)	4.01	4.19
Weir Sta Lft (ft)		Flow Area (sq ft)	169.70	162.40
Weir Sta Rgt (ft)		Froude # Chl	0.34	0.35
Weir Submerg		Specif Force (cu ft)	474.99	472.94
Weir Max Depth (ft)		Hydr Depth (ft)	4.37	4.52
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	45.02	42.60
Min El Prs (ft)	967.00	Conv. Total (cfs)	15267.9	14722.6
Delta EG (ft)	0.44	Top Width (ft)	38.81	35.95
Delta WS (ft)	0.45	Frctn Loss (ft)		
BR Open Area (sq ft)	1024.02	C & E Loss (ft)		
BR Open Vel (ft/s)	4.19	Shear Total (lb/sq ft)	0.47	0.51
Coef of Q		Power Total (lb/ft s)	1.87	2.13
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #5yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	955.53	E.G. Elev (ft)	955.39	955.14
W.S. US. (ft)	955.27	W.S. Elev (ft)	955.10	954.82
Q Total (cfs)	890.00	Crit W.S. (ft)	952.26	951.93
Q Bridge (cfs)	890.00	Max Chl Dpth (ft)	6.38	6.29
Q Weir (cfs)		Vel Total (ft/s)	4.30	4.49
Weir Sta Lft (ft)		Flow Area (sq ft)	206.82	198.05
Weir Sta Rgt (ft)		Froude # Chl	0.33	0.34
Weir Submerg		Specif Force (cu ft)	687.74	684.98
Weir Max Depth (ft)		Hydr Depth (ft)	5.24	5.37
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	47.14	44.95
Min El Prs (ft)	967.00	Conv. Total (cfs)	20589.8	19772.6
Delta EG (ft)	0.42	Top Width (ft)	39.50	36.91
Delta WS (ft)	0.42	Frctn Loss (ft)		
BR Open Area (sq ft)	654.87	C & E Loss (ft)		
BR Open Vel (ft/s)	4.49	Shear Total (lb/sq ft)	0.51	0.56
Coef of Q		Power Total (lb/ft s)	2.20	2.50
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #10yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	956.42	E.G. Elev (ft)	956.28	956.06
W.S. US. (ft)	956.12	W.S. Elev (ft)	955.95	955.70
Q Total (cfs)	1100.00	Crit W.S. (ft)	952.66	952.35
Q Bridge (cfs)	1100.00	Max Chl Dpth (ft)	7.23	7.17
Q Weir (cfs)		Vel Total (ft/s)	4.56	4.76
Weir Sta Lft (ft)		Flow Area (sq ft)	240.98	230.93
Weir Sta Rgt (ft)		Froude # Chl	0.33	0.34
Weir Submerg		Specif Force (cu ft)	914.87	912.18
Weir Max Depth (ft)		Hydr Depth (ft)	5.86	6.08
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	49.80	47.24
Min El Prs (ft)	967.00	Conv. Total (cfs)	26130.6	24886.7
Delta EG (ft)	0.38	Top Width (ft)	41.09	38.00
Delta WS (ft)	0.39	Frctn Loss (ft)		
BR Open Area (sq ft)	1024.02	C & E Loss (ft)		
BR Open Vel (ft/s)	4.76	Shear Total (lb/sq ft)	0.54	0.60
Coef of Q		Power Total (lb/ft s)	2.44	2.84
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #25yr

E.G. US. (ft)	957.48
W.S. US. (ft)	957.13
Q Total (cfs)	1380.00
Q Bridge (cfs)	1380.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	970.01
Min El Prs (ft)	967.00
Delta EG (ft)	0.35
Delta WS (ft)	0.36
BR Open Area (sq ft)	1024.02
BR Open Vel (ft/s)	5.09
Coef of Q	
Br Sel Method	Momentum

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	957.33	957.14
W.S. Elev (ft)	956.95	956.74
Crit W.S. (ft)	953.16	952.87
Max Chl Dpth (ft)	8.23	8.21
Vel Total (ft/s)	4.88	5.09
Flow Area (sq ft)	283.06	271.25
Froude # Chl	0.33	0.34
Specif Force (cu ft)	1231.36	1228.01
Hydr Depth (ft)	6.57	6.78
W.P. Total (ft)	53.02	50.55
Conv. Total (cfs)	33259.0	31793.6
Top Width (ft)	43.08	40.03
Frctn Loss (ft)		
C & E Loss (ft)		
Shear Total (lb/sq ft)	0.57	0.63
Power Total (lb/ft s)	2.80	3.21

BRIDGE OUTPUT Profile #50yr

E.G. US. (ft)	958.18
W.S. US. (ft)	957.80
Q Total (cfs)	1590.00
Q Bridge (cfs)	1590.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	970.01
Min El Prs (ft)	967.00
Delta EG (ft)	0.33
Delta WS (ft)	0.34
BR Open Area (sq ft)	1024.02
BR Open Vel (ft/s)	5.31
Coef of Q	
Br Sel Method	Momentum

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	958.03	957.87
W.S. Elev (ft)	957.62	957.42
Crit W.S. (ft)	953.50	953.24
Max Chl Dpth (ft)	8.90	8.89
Vel Total (ft/s)	5.09	5.31
Flow Area (sq ft)	312.13	299.23
Froude # Chl	0.33	0.34
Specif Force (cu ft)	1473.17	1469.53
Hydr Depth (ft)	7.01	7.20
W.P. Total (ft)	55.29	52.89
Conv. Total (cfs)	38319.8	36697.0
Top Width (ft)	44.54	41.53
Frctn Loss (ft)		
C & E Loss (ft)		
Shear Total (lb/sq ft)	0.61	0.66
Power Total (lb/ft s)	3.09	3.52

BRIDGE OUTPUT Profile #100yr

E.G. US. (ft)	958.82
W.S. US. (ft)	958.41
Q Total (cfs)	1790.00
Q Bridge (cfs)	1790.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	970.01
Min El Prs (ft)	967.00
Delta EG (ft)	0.31
Delta WS (ft)	0.32
BR Open Area (sq ft)	1024.02
BR Open Vel (ft/s)	5.50
Coef of Q	
Br Sel Method	Momentum

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	958.67	958.53
W.S. Elev (ft)	958.22	958.04
Crit W.S. (ft)	953.82	953.58
Max Chl Dpth (ft)	9.50	9.51
Vel Total (ft/s)	5.28	5.50
Flow Area (sq ft)	339.29	325.45
Froude # Chl	0.33	0.34
Specif Force (cu ft)	1712.91	1709.03
Hydr Depth (ft)	7.40	7.59
W.P. Total (ft)	57.34	55.01
Conv. Total (cfs)	43127.0	41353.5
Top Width (ft)	45.86	42.90
Frctn Loss (ft)		
C & E Loss (ft)		
Shear Total (lb/sq ft)	0.64	0.69
Power Total (lb/ft s)	3.36	3.81

BRIDGE OUTPUT Profile #500yr

E.G. US. (ft)	960.28
W.S. US. (ft)	959.79
Q Total (cfs)	2300.00
Q Bridge (cfs)	2300.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	970.01
Min El Prs (ft)	967.00
Delta EG (ft)	0.27
Delta WS (ft)	0.29
BR Open Area (sq ft)	1024.02
BR Open Vel (ft/s)	5.90
Coef of Q	

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	960.12	960.02
W.S. Elev (ft)	959.57	959.44
Crit W.S. (ft)	954.56	954.38
Max Chl Dpth (ft)	10.85	10.91
Vel Total (ft/s)	5.71	5.90
Flow Area (sq ft)	403.09	389.71
Froude # Chl	0.34	0.34
Specif Force (cu ft)	2337.67	2333.30
Hydr Depth (ft)	8.29	7.48
W.P. Total (ft)	62.27	66.70
Conv. Total (cfs)	54738.8	52586.2
Top Width (ft)	48.62	52.08
Frctn Loss (ft)		
C & E Loss (ft)		
Shear Total (lb/sq ft)	0.71	0.70

Br Sel Method	Momentum	Power Total (lb/ft s)	4.07	4.12

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4907.867

INPUT
Description: 2
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	965.91	1.93	965.86	2.31	965.85	8.75	965.75	16.79	965.63
17.56	962.98	18.76	959.01	20.16	958.37	24.88	956.22	26.77	955.21
29.11	952.83	30.82	948.35	31.9	948.3	32.95	948.31	34.24	948.29
42.33	948.41	46.67	948.67	52.99	948.9	53.6	948.92	59.7	949.94
60.38	950.02	64.3	950.5	65.6	953.43	66.58	957.95	83.34	959.67
87.54	959.67	89.68	959.74	94.66	960.21	98.39	960.56	106.42	961.37
118.91	962.18	130.89	964.59	147.6	967.05				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.09	26.77	.04	66.58	.1	89.68	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
26.77	66.58	122.42	124.85	123.52	.1	.3

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	954.10	Wt. n-Val.		0.040	
Vel Head (ft)	0.24	Reach Len. (ft)	122.42	124.85	123.52
W.S. Elev (ft)	953.86	Flow Area (sq ft)		174.21	
Crit W.S. (ft)		Area (sq ft)		174.21	
E.G. Slope (ft/ft)	0.001736	Flow (cfs)		680.00	
Q Total (cfs)	680.00	Top Width (ft)		37.60	
Top Width (ft)	37.60	Avg. Vel. (ft/s)		3.90	
Vel Total (ft/s)	3.90	Hydr. Depth (ft)		4.63	
Max Chl Dpth (ft)	5.57	Conv. (cfs)		16319.5	
Conv. Total (cfs)	16319.5	Wetted Per. (ft)		43.50	
Length Wtd. (ft)	124.85	Shear (lb/sq ft)		0.43	
Min Ch El (ft)	948.29	Stream Power (lb/ft s)		1.69	
Alpha	1.00	Cum Volume (acre-ft)	2.52	19.44	1.48
Frctn Loss (ft)	0.19	Cum SA (acres)	2.53	4.13	1.38
C & E Loss (ft)	0.01				

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	955.12	Wt. n-Val.		0.040	
Vel Head (ft)	0.27	Reach Len. (ft)	122.42	124.85	123.52
W.S. Elev (ft)	954.85	Flow Area (sq ft)		211.73	
Crit W.S. (ft)		Area (sq ft)		211.73	
E.G. Slope (ft/ft)	0.001667	Flow (cfs)		890.00	
Q Total (cfs)	890.00	Top Width (ft)		38.78	
Top Width (ft)	38.78	Avg. Vel. (ft/s)		4.20	
Vel Total (ft/s)	4.20	Hydr. Depth (ft)		5.46	
Max Chl Dpth (ft)	6.56	Conv. (cfs)		21798.7	
Conv. Total (cfs)	21798.7	Wetted Per. (ft)		45.89	
Length Wtd. (ft)	124.85	Shear (lb/sq ft)		0.48	
Min Ch El (ft)	948.29	Stream Power (lb/ft s)		2.02	
Alpha	1.00	Cum Volume (acre-ft)	2.08	22.76	0.33
Frctn Loss (ft)	0.19	Cum SA (acres)	1.81	4.34	0.24
C & E Loss (ft)	0.01				

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	956.04	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	0.31	Reach Len. (ft)	122.42	124.85	123.52
W.S. Elev (ft)	955.73	Flow Area (sq ft)	0.25	246.44	
Crit W.S. (ft)		Area (sq ft)	0.25	246.44	
E.G. Slope (ft/ft)	0.001599	Flow (cfs)	0.06	1099.94	
Q Total (cfs)	1100.00	Top Width (ft)	0.98	39.33	
Top Width (ft)	40.30	Avg. Vel. (ft/s)	0.25	4.46	
Vel Total (ft/s)	4.46	Hydr. Depth (ft)	0.26	6.27	
Max Chl Dpth (ft)	7.44	Conv. (cfs)	1.6	27510.2	
Conv. Total (cfs)	27511.8	Wetted Per. (ft)	1.11	47.31	
Length Wtd. (ft)	124.85	Shear (lb/sq ft)	0.02	0.52	
Min Ch El (ft)	948.29	Stream Power (lb/ft s)	0.01	2.32	
Alpha	1.00	Cum Volume (acre-ft)	7.53	25.28	4.09
Frctn Loss (ft)	0.19				

C & E Loss (ft)	0.01	Cum SA (acres)	4.04	4.48	3.10

CROSS SECTION OUTPUT Profile #25yr

E.G. Elev (ft)	957.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.36	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	956.77	Reach Len. (ft)	122.42	124.85	123.52
Crit W.S. (ft)		Flow Area (sq ft)	2.33	287.39	
E.G. Slope (ft/ft)	0.001550	Area (sq ft)	2.33	287.39	
Q Total (cfs)	1380.00	Flow (cfs)	1.16	1378.84	
Top Width (ft)	42.65	Top Width (ft)	3.10	39.55	
Vel Total (ft/s)	4.76	Avg. Vel. (ft/s)	0.50	4.80	
Max Chl Dpth (ft)	8.48	Hydr. Depth (ft)	0.75	7.27	
Conv. Total (cfs)	35051.9	Conv. (cfs)	29.4	35022.5	
Length Wtd. (ft)	124.85	Wetted Per. (ft)	3.47	48.37	
Min Ch El (ft)	948.29	Shear (lb/sq ft)	0.06	0.57	
Alpha	1.01	Stream Power (lb/ft s)	0.03	2.76	
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	11.90	29.21	6.95
C & E Loss (ft)	0.01	Cum SA (acres)	4.99	4.64	4.50

CROSS SECTION OUTPUT Profile #50yr

E.G. Elev (ft)	957.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.39	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	957.46	Reach Len. (ft)	122.42	124.85	123.52
Crit W.S. (ft)		Flow Area (sq ft)	4.99	314.76	
E.G. Slope (ft/ft)	0.001545	Area (sq ft)	4.99	314.76	
Q Total (cfs)	1590.00	Flow (cfs)	3.18	1586.83	
Top Width (ft)	44.32	Top Width (ft)	4.61	39.70	
Vel Total (ft/s)	4.97	Avg. Vel. (ft/s)	0.64	5.04	
Max Chl Dpth (ft)	9.17	Hydr. Depth (ft)	1.08	7.93	
Conv. Total (cfs)	40445.3	Conv. (cfs)	80.8	40364.5	
Length Wtd. (ft)	124.85	Wetted Per. (ft)	5.14	49.08	
Min Ch El (ft)	948.29	Shear (lb/sq ft)	0.09	0.62	
Alpha	1.03	Stream Power (lb/ft s)	0.06	3.12	
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	14.84	31.61	9.40
C & E Loss (ft)	0.01	Cum SA (acres)	5.40	4.72	5.45

CROSS SECTION OUTPUT Profile #100yr

E.G. Elev (ft)	958.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.43	Wt. n-Val.	0.090	0.040	0.100
W.S. Elev (ft)	958.09	Reach Len. (ft)	122.42	124.85	123.52
Crit W.S. (ft)		Flow Area (sq ft)	8.31	339.65	0.09
E.G. Slope (ft/ft)	0.001536	Area (sq ft)	8.31	339.65	0.09
Q Total (cfs)	1790.00	Flow (cfs)	6.24	1783.76	0.01
Top Width (ft)	47.13	Top Width (ft)	5.99	39.81	1.33
Vel Total (ft/s)	5.14	Avg. Vel. (ft/s)	0.75	5.25	0.10
Max Chl Dpth (ft)	9.80	Hydr. Depth (ft)	1.39	8.53	0.07
Conv. Total (cfs)	45673.3	Conv. (cfs)	159.1	45514.0	0.2
Length Wtd. (ft)	124.85	Wetted Per. (ft)	6.65	49.58	1.34
Min Ch El (ft)	948.29	Shear (lb/sq ft)	0.12	0.66	0.01
Alpha	1.04	Stream Power (lb/ft s)	0.09	3.45	0.00
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	17.34	34.02	12.73
C & E Loss (ft)	0.01	Cum SA (acres)	5.67	4.78	6.58

CROSS SECTION OUTPUT Profile #500yr

E.G. Elev (ft)	960.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.51	Wt. n-Val.	0.090	0.040	0.100
W.S. Elev (ft)	959.50	Reach Len. (ft)	122.42	124.85	123.52
Crit W.S. (ft)		Flow Area (sq ft)	18.72	395.88	11.69
E.G. Slope (ft/ft)	0.001500	Area (sq ft)	18.72	395.88	11.69
Q Total (cfs)	2300.00	Flow (cfs)	18.98	2275.37	5.65
Top Width (ft)	63.06	Top Width (ft)	8.16	39.81	15.09
Vel Total (ft/s)	5.40	Avg. Vel. (ft/s)	1.01	5.75	0.48
Max Chl Dpth (ft)	11.21	Hydr. Depth (ft)	2.30	9.94	0.77
Conv. Total (cfs)	59389.1	Conv. (cfs)	490.0	58753.2	145.9
Length Wtd. (ft)	124.84	Wetted Per. (ft)	9.38	49.58	15.17
Min Ch El (ft)	948.29	Shear (lb/sq ft)	0.19	0.75	0.07
Alpha	1.12	Stream Power (lb/ft s)	0.19	4.30	0.03
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	23.73	39.19	20.56
C & E Loss (ft)	0.01	Cum SA (acres)	6.31	4.85	8.35

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4783.015

INPUT
Description: 3
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	964.68	5.33	964.55	7.3	952.57	7.45	952.03	7.56	952.02
13.83	947.62	13.87	947.57	13.93	947.57	14.58	947.57	24.7	947.6
35.21	947.82	37.02	947.92	40.08	950.62	41.08	951.48	48.41	957.81
53.7	962.39	55.16	962.45	69.74	962.92	78.97	963.23	101.9	963.56
118.58	963.48	123.32	965.58	123.66	965.68	131.16	967.79		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	5.33	.04	53.7	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
5.33	53.7	18.84	18.63	18.24	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	953.90	Element			
Vel Head (ft)	0.21	Wt. n-Val.		0.040	
W.S. Elev (ft)	953.69	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	950.50	Flow Area (sq ft)		183.39	
E.G. Slope (ft/ft)	0.001372	Area (sq ft)		183.39	
Q Total (cfs)	680.00	Flow (cfs)		680.00	
Top Width (ft)	36.52	Top Width (ft)		36.52	
Vel Total (ft/s)	3.71	Avg. Vel. (ft/s)		3.71	
Max Chl Dpth (ft)	6.12	Hydr. Depth (ft)		5.02	
Conv. Total (cfs)	18358.6	Conv. (cfs)		18358.6	
Length Wtd. (ft)	4.00	Wetted Per. (ft)		41.46	
Min Ch El (ft)	947.57	Shear (lb/sq ft)		0.38	
Alpha	1.00	Stream Power (lb/ft s)		1.40	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	2.52	18.92	1.48
C & E Loss (ft)	0.00	Cum SA (acres)	2.53	4.02	1.38

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	954.92	Element			
Vel Head (ft)	0.25	Wt. n-Val.		0.040	
W.S. Elev (ft)	954.67	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	951.02	Flow Area (sq ft)		219.93	
E.G. Slope (ft/ft)	0.001387	Area (sq ft)		219.93	
Q Total (cfs)	890.00	Flow (cfs)		890.00	
Top Width (ft)	37.82	Top Width (ft)		37.82	
Vel Total (ft/s)	4.05	Avg. Vel. (ft/s)		4.05	
Max Chl Dpth (ft)	7.10	Hydr. Depth (ft)		5.82	
Conv. Total (cfs)	23898.6	Conv. (cfs)		23898.6	
Length Wtd. (ft)	4.00	Wetted Per. (ft)		43.96	
Min Ch El (ft)	947.57	Shear (lb/sq ft)		0.43	
Alpha	1.00	Stream Power (lb/ft s)		1.75	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	2.08	22.14	0.33
C & E Loss (ft)	0.00	Cum SA (acres)	1.81	4.23	0.24

CROSS SECTION OUTPUT Profile #10yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	955.85	Element			
Vel Head (ft)	0.29	Wt. n-Val.		0.040	
W.S. Elev (ft)	955.56	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	951.49	Flow Area (sq ft)		254.03	
E.G. Slope (ft/ft)	0.001401	Area (sq ft)		254.03	
Q Total (cfs)	1100.00	Flow (cfs)		1100.00	
Top Width (ft)	38.99	Top Width (ft)		38.99	
Vel Total (ft/s)	4.33	Avg. Vel. (ft/s)		4.33	
Max Chl Dpth (ft)	7.99	Hydr. Depth (ft)		6.51	
Conv. Total (cfs)	29390.3	Conv. (cfs)		29390.3	
Length Wtd. (ft)	4.00	Wetted Per. (ft)		46.22	
Min Ch El (ft)	947.57	Shear (lb/sq ft)		0.48	
Alpha	1.00	Stream Power (lb/ft s)		2.08	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	7.53	24.56	4.09
C & E Loss (ft)	0.00	Cum SA (acres)	4.04	4.37	3.10

CROSS SECTION OUTPUT Profile #25yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	956.94	Element			
Vel Head (ft)	0.34	Wt. n-Val.		0.040	
W.S. Elev (ft)	956.60	Reach Len. (ft)	4.00	4.00	4.00

Crit W.S. (ft)	952.07	Flow Area (sq ft)		295.23	
E.G. Slope (ft/ft)	0.001439	Area (sq ft)		295.23	
Q Total (cfs)	1380.00	Flow (cfs)		1380.00	
Top Width (ft)	40.37	Top Width (ft)		40.37	
Vel Total (ft/s)	4.67	Avg. Vel. (ft/s)		4.67	
Max Chl Dpth (ft)	9.03	Hydr. Depth (ft)		7.31	
Conv. Total (cfs)	36384.8	Conv. (cfs)		36384.8	
Length Wtd. (ft)	4.00	Wetted Per. (ft)		48.86	
Min Ch El (ft)	947.57	Shear (lb/sq ft)		0.54	
Alpha	1.00	Stream Power (lb/ft s)		2.54	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	11.90	28.38	6.95
C & E Loss (ft)	0.00	Cum SA (acres)	4.98	4.52	4.50

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	957.66	Wt. n-Val.		0.040	
Vel Head (ft)	0.38	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	957.28	Flow Area (sq ft)		323.35	
Crit W.S. (ft)	952.45	Area (sq ft)		323.35	
E.G. Slope (ft/ft)	0.001478	Flow (cfs)		1590.00	
Q Total (cfs)	1590.00	Top Width (ft)		41.28	
Top Width (ft)	41.28	Avg. Vel. (ft/s)		4.92	
Vel Total (ft/s)	4.92	Hydr. Depth (ft)		7.83	
Max Chl Dpth (ft)	9.71	Conv. (cfs)		41359.2	
Conv. Total (cfs)	41359.2	Wetted Per. (ft)		50.61	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		0.59	
Min Ch El (ft)	947.57	Stream Power (lb/ft s)		2.90	
Alpha	1.00	Cum Volume (acre-ft)	14.83	30.69	9.40
Frctn Loss (ft)	0.01	Cum SA (acres)	5.39	4.60	5.45
C & E Loss (ft)	0.00				

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	958.32	Wt. n-Val.		0.040	
Vel Head (ft)	0.41	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	957.91	Flow Area (sq ft)		349.42	
Crit W.S. (ft)	952.80	Area (sq ft)		349.42	
E.G. Slope (ft/ft)	0.001507	Flow (cfs)		1790.00	
Q Total (cfs)	1790.00	Top Width (ft)		42.10	
Top Width (ft)	42.10	Avg. Vel. (ft/s)		5.12	
Vel Total (ft/s)	5.12	Hydr. Depth (ft)		8.30	
Max Chl Dpth (ft)	10.34	Conv. (cfs)		46103.0	
Conv. Total (cfs)	46103.0	Wetted Per. (ft)		52.20	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		0.63	
Min Ch El (ft)	947.57	Stream Power (lb/ft s)		3.23	
Alpha	1.00	Cum Volume (acre-ft)	17.33	33.03	12.73
Frctn Loss (ft)	0.01	Cum SA (acres)	5.66	4.66	6.58
C & E Loss (ft)	0.00				

CROSS SECTION OUTPUT Profile #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	959.81	Wt. n-Val.		0.040	
Vel Head (ft)	0.49	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	959.32	Flow Area (sq ft)		410.07	
Crit W.S. (ft)	953.62	Area (sq ft)		410.07	
E.G. Slope (ft/ft)	0.001595	Flow (cfs)		2300.00	
Q Total (cfs)	2300.00	Top Width (ft)		43.96	
Top Width (ft)	43.96	Avg. Vel. (ft/s)		5.61	
Vel Total (ft/s)	5.61	Hydr. Depth (ft)		9.33	
Max Chl Dpth (ft)	11.75	Conv. (cfs)		57593.3	
Conv. Total (cfs)	57593.3	Wetted Per. (ft)		55.78	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		0.73	
Min Ch El (ft)	947.57	Stream Power (lb/ft s)		4.11	
Alpha	1.00	Cum Volume (acre-ft)	23.71	38.03	20.54
Frctn Loss (ft)	0.01	Cum SA (acres)	6.30	4.73	8.33
C & E Loss (ft)	0.00				

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 4775

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6

```
Upstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0     970     967     200     970     967

Upstream Bridge Cross Section Data
Station Elevation Data     num=       24
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
       0   964.64    5.33   964.51     7.3   952.53    7.45   951.99    7.56   951.98
   13.83   947.58   13.87   947.53   13.93   947.53   14.58   947.53    24.7   947.56
   35.21   947.78   37.02   947.88   40.08   950.58   41.08   951.44   48.41   957.77
    53.7   962.35   55.16   962.41   69.74   962.88   78.97   963.19   101.9   963.52
  118.58   963.44  123.32   965.54  123.66   965.64  131.16   967.75

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09    5.33     .04    53.7     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
          5.33    53.7              .1       .3

Downstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0     970     967     200     970     967

Downstream Bridge Cross Section Data
Station Elevation Data     num=       26
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
       0    964.8     .67   964.78    3.11    964.7    8.15   964.53    9.43    964.5
    9.98   964.49   10.09   963.82   12.09   956.38   12.11   956.38    13.5    955.4
   19.84   947.47   27.28   947.75    29.8   947.76   33.36   947.83   42.54   947.76
   46.01   951.43   51.62   956.26   57.59   961.43   62.45   961.58   83.83   962.28
   86.85   962.32  104.71   962.56  113.01   962.51  123.42   967.14  124.17   967.35
  127.91   968.41

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09    9.98     .04   57.59     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9.98   57.59              .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=   59.29    Downstream=   64.19
Upstream     num=       2
    Width   Elev    Width   Elev
        8    945        8    970
Downstream     num=       2
    Width   Elev    Width   Elev
        8    945        8    970

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                  Cd   =       2
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 #2yr

  E.G. US. (ft)                953.90    Element                 Inside BR US  Inside BR DS
```

W.S. US. (ft)	953.69	E.G. Elev (ft)	953.89	953.88
Q Total (cfs)	680.00	W.S. Elev (ft)	953.68	953.62
Q Bridge (cfs)	680.00	Crit W.S. (ft)	950.47	950.64
Q Weir (cfs)		Max Chl Dpth (ft)	6.15	6.15
Weir Sta Lft (ft)		Vel Total (ft/s)	3.68	4.11
Weir Sta Rgt (ft)		Flow Area (sq ft)	184.74	165.51
Weir Submerg		Froude # Chl	0.29	0.33
Weir Max Depth (ft)		Specif Force (cu ft)	593.92	543.40
Min El Weir Flow (ft)	970.01	Hydr Depth (ft)	5.05	4.92
Min El Prs (ft)	967.00	W.P. Total (ft)	41.55	38.98
Delta EG (ft)	0.04	Conv. Total (cfs)	18555.4	16121.4
Delta WS (ft)	0.08	Top Width (ft)	36.57	33.63
BR Open Area (sq ft)	1017.88	Frctn Loss (ft)	0.01	0.02
BR Open Vel (ft/s)	4.11	C & E Loss (ft)	0.01	0.00
Coef of Q		Shear Total (lb/sq ft)	0.37	0.47
Br Sel Method	Energy only	Power Total (lb/ft s)	1.37	1.94

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #5yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	954.92	E.G. Elev (ft)	954.92	954.90
W.S. US. (ft)	954.67	W.S. Elev (ft)	954.67	954.59
Q Total (cfs)	890.00	Crit W.S. (ft)	951.00	951.18
Q Bridge (cfs)	890.00	Max Chl Dpth (ft)	7.14	7.12
Q Weir (cfs)		Vel Total (ft/s)	4.02	4.47
Weir Sta Lft (ft)		Flow Area (sq ft)	221.31	199.22
Weir Sta Rgt (ft)		Froude # Chl	0.29	0.33
Weir Submerg		Specif Force (cu ft)	826.77	757.73
Weir Max Depth (ft)		Hydr Depth (ft)	5.84	5.61
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	44.05	41.72
Min El Prs (ft)	967.00	Conv. Total (cfs)	24116.5	20984.7
Delta EG (ft)	0.04	Top Width (ft)	37.87	35.54
Delta WS (ft)	0.09	Frctn Loss (ft)	0.01	0.02
BR Open Area (sq ft)	748.76	C & E Loss (ft)	0.01	0.00
BR Open Vel (ft/s)	4.47	Shear Total (lb/sq ft)	0.43	0.54
Coef of Q		Power Total (lb/ft s)	1.72	2.40
Br Sel Method	Energy only			

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #10yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	955.85	E.G. Elev (ft)	955.84	955.83
W.S. US. (ft)	955.56	W.S. Elev (ft)	955.55	955.48
Q Total (cfs)	1100.00	Crit W.S. (ft)	951.45	951.67
Q Bridge (cfs)	1100.00	Max Chl Dpth (ft)	8.02	8.01
Q Weir (cfs)		Vel Total (ft/s)	4.31	4.75
Weir Sta Lft (ft)		Flow Area (sq ft)	255.46	231.38
Weir Sta Rgt (ft)		Froude # Chl	0.30	0.34
Weir Submerg		Specif Force (cu ft)	1074.30	986.72
Weir Max Depth (ft)		Hydr Depth (ft)	6.54	6.20
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	46.31	44.24
Min El Prs (ft)	967.00	Conv. Total (cfs)	29627.0	25896.6
Delta EG (ft)	0.04	Top Width (ft)	39.04	37.32
Delta WS (ft)	0.09	Frctn Loss (ft)	0.01	0.02
BR Open Area (sq ft)	1017.88	C & E Loss (ft)	0.01	0.00
BR Open Vel (ft/s)	4.75	Shear Total (lb/sq ft)	0.47	0.59
Coef of Q		Power Total (lb/ft s)	2.04	2.80
Br Sel Method	Energy only			

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #25yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	956.94	E.G. Elev (ft)	956.93	956.91
W.S. US. (ft)	956.60	W.S. Elev (ft)	956.59	956.51
Q Total (cfs)	1380.00	Crit W.S. (ft)	952.04	952.28
Q Bridge (cfs)	1380.00	Max Chl Dpth (ft)	9.06	9.04
Q Weir (cfs)		Vel Total (ft/s)	4.65	5.08
Weir Sta Lft (ft)		Flow Area (sq ft)	296.71	271.40
Weir Sta Rgt (ft)		Froude # Chl	0.30	0.34
Weir Submerg				

Weir Max Depth (ft)		Specif Force (cu ft)	1413.09	1302.31
Min El Weir Flow (ft)	970.01	Hydr Depth (ft)	7.34	6.81
Min El Prs (ft)	967.00	W.P. Total (ft)	48.95	47.55
Delta EG (ft)	0.04	Conv. Total (cfs)	36642.6	32197.3
Delta WS (ft)	0.09	Top Width (ft)	40.41	39.86
BR Open Area (sq ft)	1017.88	Frctn Loss (ft)	0.01	0.02
BR Open Vel (ft/s)	5.08	C & E Loss (ft)	0.01	0.00
Coef of Q		Shear Total (lb/sq ft)	0.54	0.65
Br Sel Method	Energy only	Power Total (lb/ft s)	2.50	3.33

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #50yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	957.66	E.G. Elev (ft)	957.65	957.64
W.S. US. (ft)	957.28	W.S. Elev (ft)	957.28	957.20
Q Total (cfs)	1590.00	Crit W.S. (ft)	952.43	952.71
Q Bridge (cfs)	1590.00	Max Chl Dpth (ft)	9.75	9.73
Q Weir (cfs)		Vel Total (ft/s)	4.89	5.32
Weir Sta Lft (ft)		Flow Area (sq ft)	324.86	299.13
Weir Sta Rgt (ft)		Froude # Chl	0.31	0.35
Weir Submerg		Specif Force (cu ft)	1669.47	1542.91
Weir Max Depth (ft)		Hydr Depth (ft)	7.86	7.33
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	50.70	49.32
Min El Prs (ft)	967.00	Conv. Total (cfs)	41630.7	36958.2
Delta EG (ft)	0.04	Top Width (ft)	41.33	40.83
Delta WS (ft)	0.10	Frctn Loss (ft)	0.01	0.02
BR Open Area (sq ft)	1017.88	C & E Loss (ft)	0.01	0.00
BR Open Vel (ft/s)	5.32	Shear Total (lb/sq ft)	0.58	0.70
Coef of Q		Power Total (lb/ft s)	2.86	3.73
Br Sel Method	Energy only			

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #100yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	958.32	E.G. Elev (ft)	958.31	958.29
W.S. US. (ft)	957.91	W.S. Elev (ft)	957.91	957.82
Q Total (cfs)	1790.00	Crit W.S. (ft)	952.79	953.10
Q Bridge (cfs)	1790.00	Max Chl Dpth (ft)	10.38	10.35
Q Weir (cfs)		Vel Total (ft/s)	5.10	5.51
Weir Sta Lft (ft)		Flow Area (sq ft)	350.95	324.90
Weir Sta Rgt (ft)		Froude # Chl	0.31	0.35
Weir Submerg		Specif Force (cu ft)	1922.52	1781.50
Weir Max Depth (ft)		Hydr Depth (ft)	8.33	7.79
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	52.29	50.92
Min El Prs (ft)	967.00	Conv. Total (cfs)	46386.8	41523.1
Delta EG (ft)	0.04	Top Width (ft)	42.15	41.72
Delta WS (ft)	0.10	Frctn Loss (ft)	0.01	0.02
BR Open Area (sq ft)	1017.88	C & E Loss (ft)	0.01	0.00
BR Open Vel (ft/s)	5.51	Shear Total (lb/sq ft)	0.62	0.74
Coef of Q		Power Total (lb/ft s)	3.18	4.08
Br Sel Method	Energy only			

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #500yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	959.81	E.G. Elev (ft)	959.80	959.78
W.S. US. (ft)	959.32	W.S. Elev (ft)	959.32	959.23
Q Total (cfs)	2300.00	Crit W.S. (ft)	953.60	953.98
Q Bridge (cfs)	2300.00	Max Chl Dpth (ft)	11.79	11.76
Q Weir (cfs)		Vel Total (ft/s)	5.59	5.97
Weir Sta Lft (ft)		Flow Area (sq ft)	411.66	385.00
Weir Sta Rgt (ft)		Froude # Chl	0.32	0.35
Weir Submerg		Specif Force (cu ft)	2575.10	2400.88
Weir Max Depth (ft)		Hydr Depth (ft)	9.35	8.80
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	55.87	54.52
Min El Prs (ft)	967.00	Conv. Total (cfs)	57903.4	52640.8
Delta EG (ft)	0.04	Top Width (ft)	44.01	43.73
Delta WS (ft)	0.10	Frctn Loss (ft)	0.01	0.02
BR Open Area (sq ft)	1017.88	C & E Loss (ft)	0.01	0.00
BR Open Vel (ft/s)	5.97			

Coef of Q		Shear Total (lb/sq ft)	0.73	0.84
Br Sel Method	Energy only	Power Total (lb/ft s)	4.05	5.03

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4764.388

INPUT
Description: 4
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	964.72	.67	964.7	3.11	964.62	8.15	964.45	9.43	964.42
9.98	964.41	10.09	963.74	12.09	956.3	12.11	956.3	13.5	955.32
19.84	947.39	27.28	947.67	29.8	947.68	33.36	947.75	42.54	947.68
46.01	951.35	51.62	956.18	57.59	961.35	62.45	961.5	83.83	962.2
86.85	962.24	104.71	962.48	113.01	962.43	123.42	967.06	124.17	967.27
127.91	968.33								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	9.98	.04	57.59	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9.98	57.59	48.37	45.95	44.99	.1	.3

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	953.86	Wt. n-Val.		0.040	
Vel Head (ft)	0.25	Reach Len. (ft)	48.37	45.95	44.99
W.S. Elev (ft)	953.61	Flow Area (sq ft)		167.87	
Crit W.S. (ft)		Area (sq ft)		167.87	
E.G. Slope (ft/ft)	0.001709	Flow (cfs)		680.00	
Q Total (cfs)	680.00	Top Width (ft)		33.76	
Top Width (ft)	33.76	Avg. Vel. (ft/s)		4.05	
Vel Total (ft/s)	4.05	Hydr. Depth (ft)		4.97	
Max Chl Dpth (ft)	6.22	Conv. (cfs)		16451.3	
Conv. Total (cfs)	16451.3	Wetted Per. (ft)		39.18	
Length Wtd. (ft)	45.95	Shear (lb/sq ft)		0.46	
Min Ch El (ft)	947.39	Stream Power (lb/ft s)		1.85	
Alpha	1.00	Cum Volume (acre-ft)	2.52	18.85	1.48
Frctn Loss (ft)	0.12	Cum SA (acres)	2.53	4.01	1.38
C & E Loss (ft)	0.03				

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	954.89	Wt. n-Val.		0.040	
Vel Head (ft)	0.30	Reach Len. (ft)	48.37	45.95	44.99
W.S. Elev (ft)	954.58	Flow Area (sq ft)		201.72	
Crit W.S. (ft)		Area (sq ft)		201.72	
E.G. Slope (ft/ft)	0.001737	Flow (cfs)		890.00	
Q Total (cfs)	890.00	Top Width (ft)		35.68	
Top Width (ft)	35.68	Avg. Vel. (ft/s)		4.41	
Vel Total (ft/s)	4.41	Hydr. Depth (ft)		5.65	
Max Chl Dpth (ft)	7.19	Conv. (cfs)		21357.3	
Conv. Total (cfs)	21357.3	Wetted Per. (ft)		41.92	
Length Wtd. (ft)	45.95	Shear (lb/sq ft)		0.52	
Min Ch El (ft)	947.39	Stream Power (lb/ft s)		2.30	
Alpha	1.00	Cum Volume (acre-ft)	2.08	22.05	0.33
Frctn Loss (ft)	0.12	Cum SA (acres)	1.81	4.21	0.24
C & E Loss (ft)	0.04				

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	955.81	Wt. n-Val.		0.040	
Vel Head (ft)	0.34	Reach Len. (ft)	48.37	45.95	44.99
W.S. Elev (ft)	955.47	Flow Area (sq ft)		234.00	
Crit W.S. (ft)		Area (sq ft)		234.00	
E.G. Slope (ft/ft)	0.001750	Flow (cfs)		1100.00	
Q Total (cfs)	1100.00	Top Width (ft)		37.50	
Top Width (ft)	37.50	Avg. Vel. (ft/s)		4.70	
Vel Total (ft/s)	4.70	Hydr. Depth (ft)		6.24	
Max Chl Dpth (ft)	8.08	Conv. (cfs)		26297.4	
Conv. Total (cfs)	26297.4				

Length Wtd. (ft)	45.95	Wetted Per. (ft)		44.47	
Min Ch El (ft)	947.39	Shear (lb/sq ft)		0.57	
Alpha	1.00	Stream Power (lb/ft s)		2.70	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	7.53	24.46	4.09
C & E Loss (ft)	0.05	Cum SA (acres)	4.04	4.36	3.10

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	956.90	Wt. n-Val.		0.040	
Vel Head (ft)	0.39	Reach Len. (ft)	48.37	45.95	44.99
W.S. Elev (ft)	956.50	Flow Area (sq ft)		274.19	
Crit W.S. (ft)		Area (sq ft)		274.19	
E.G. Slope (ft/ft)	0.001784	Flow (cfs)		1380.00	
Q Total (cfs)	1380.00	Top Width (ft)		39.96	
Top Width (ft)	39.96	Avg. Vel. (ft/s)		5.03	
Vel Total (ft/s)	5.03	Hydr. Depth (ft)		6.86	
Max Chl Dpth (ft)	9.11	Conv. (cfs)		32669.8	
Conv. Total (cfs)	32669.8	Wetted Per. (ft)		47.73	
Length Wtd. (ft)	45.95	Shear (lb/sq ft)		0.64	
Min Ch El (ft)	947.39	Stream Power (lb/ft s)		3.22	
Alpha	1.00	Cum Volume (acre-ft)	11.90	28.26	6.95
Frctn Loss (ft)	0.13	Cum SA (acres)	4.98	4.51	4.50
C & E Loss (ft)	0.05				

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

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	957.62	Wt. n-Val.		0.040	
Vel Head (ft)	0.43	Reach Len. (ft)	48.37	45.95	44.99
W.S. Elev (ft)	957.19	Flow Area (sq ft)		301.99	
Crit W.S. (ft)		Area (sq ft)		301.99	
E.G. Slope (ft/ft)	0.001802	Flow (cfs)		1590.00	
Q Total (cfs)	1590.00	Top Width (ft)		40.93	
Top Width (ft)	40.93	Avg. Vel. (ft/s)		5.26	
Vel Total (ft/s)	5.26	Hydr. Depth (ft)		7.38	
Max Chl Dpth (ft)	9.80	Conv. (cfs)		37459.0	
Conv. Total (cfs)	37459.0	Wetted Per. (ft)		49.50	
Length Wtd. (ft)	45.95	Shear (lb/sq ft)		0.69	
Min Ch El (ft)	947.39	Stream Power (lb/ft s)		3.61	
Alpha	1.00	Cum Volume (acre-ft)	14.83	30.56	9.40
Frctn Loss (ft)	0.13	Cum SA (acres)	5.39	4.58	5.45
C & E Loss (ft)	0.06				

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

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	958.28	Wt. n-Val.		0.040	
Vel Head (ft)	0.46	Reach Len. (ft)	48.37	45.95	44.99
W.S. Elev (ft)	957.81	Flow Area (sq ft)		327.83	
Crit W.S. (ft)		Area (sq ft)		327.83	
E.G. Slope (ft/ft)	0.001812	Flow (cfs)		1790.00	
Q Total (cfs)	1790.00	Top Width (ft)		41.82	
Top Width (ft)	41.82	Avg. Vel. (ft/s)		5.46	
Vel Total (ft/s)	5.46	Hydr. Depth (ft)		7.84	
Max Chl Dpth (ft)	10.42	Conv. (cfs)		42049.6	
Conv. Total (cfs)	42049.6	Wetted Per. (ft)		51.10	
Length Wtd. (ft)	45.95	Shear (lb/sq ft)		0.73	
Min Ch El (ft)	947.39	Stream Power (lb/ft s)		3.96	
Alpha	1.00	Cum Volume (acre-ft)	17.33	32.89	12.73
Frctn Loss (ft)	0.13	Cum SA (acres)	5.66	4.65	6.58
C & E Loss (ft)	0.06				

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

CROSS SECTION OUTPUT Profile #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	959.77	Wt. n-Val.		0.040	
Vel Head (ft)	0.55	Reach Len. (ft)	48.37	45.95	44.99
W.S. Elev (ft)	959.22	Flow Area (sq ft)		388.05	
Crit W.S. (ft)		Area (sq ft)		388.05	
E.G. Slope (ft/ft)	0.001868	Flow (cfs)		2300.00	
Q Total (cfs)	2300.00	Top Width (ft)		43.83	
Top Width (ft)	43.83				

Vel Total (ft/s)	5.93	Avg. Vel. (ft/s)		5.93	
Max Chl Dpth (ft)	11.83	Hydr. Depth (ft)		8.85	
Conv. Total (cfs)	53222.8	Conv. (cfs)		53222.8	
Length Wtd. (ft)	45.96	Wetted Per. (ft)		54.70	
Min Ch El (ft)	947.39	Shear (lb/sq ft)		0.83	
Alpha	1.00	Stream Power (lb/ft s)		4.90	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	23.71	37.86	20.54
C & E Loss (ft)	0.07	Cum SA (acres)	6.30	4.71	8.33

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: Hope Creek
REACH: 1 RS: 4718

INPUT
Description:
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	965.24	2.76	965.2	8.91	965.13	9.83	965.12	21.65	965.08
25.81	964.94	29	964.84	35.01	964.66	38.4	964.5	43.05	964.27
44.08	964.26	47.4	964.15	48.78	959.61	49.23	958.17	56.84	954.83
56.89	954.8	56.93	954.79	57.29	954.62	58.13	954.29	62.16	947.88
62.7	947.02	70.15	946.98	71.88	947	73.68	947	81.81	947.17
82.84	947.2	90.67	956.31	92.74	958.8	93.58	958.87	93.75	958.99
104.28	959.42	124.91	960.55	137.34	967.02	140.44	968.23		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	56.84	.04	92.74	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56.84	92.74	71.98	75.39	77.8	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	953.71	Element			
Vel Head (ft)	0.59	Wt. n-Val.		0.040	
W.S. Elev (ft)	953.11	Reach Len. (ft)	71.98	75.39	77.80
Crit W.S. (ft)		Flow Area (sq ft)		148.98	
E.G. Slope (ft/ft)	0.004027	Area (sq ft)		148.98	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	29.05	Top Width (ft)		29.05	
Vel Total (ft/s)	6.18	Avg. Vel. (ft/s)		6.18	
Max Chl Dpth (ft)	6.13	Hydr. Depth (ft)		5.13	
Conv. Total (cfs)	14497.3	Conv. (cfs)		14497.3	
Length Wtd. (ft)	75.38	Wetted Per. (ft)		35.14	
Min Ch El (ft)	946.98	Shear (lb/sq ft)		1.07	
Alpha	1.00	Stream Power (lb/ft s)		6.58	
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	2.52	18.68	1.48
C & E Loss (ft)	0.02	Cum SA (acres)	2.53	3.98	1.38

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	954.72	Element			
Vel Head (ft)	0.70	Wt. n-Val.		0.040	
W.S. Elev (ft)	954.02	Reach Len. (ft)	71.98	75.39	77.80
Crit W.S. (ft)		Flow Area (sq ft)		175.98	
E.G. Slope (ft/ft)	0.004133	Area (sq ft)		175.98	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	30.41	Top Width (ft)		30.41	
Vel Total (ft/s)	6.71	Avg. Vel. (ft/s)		6.71	
Max Chl Dpth (ft)	7.04	Hydr. Depth (ft)		5.79	
Conv. Total (cfs)	18354.2	Conv. (cfs)		18354.2	
Length Wtd. (ft)	75.37	Wetted Per. (ft)		37.41	
Min Ch El (ft)	946.98	Shear (lb/sq ft)		1.21	
Alpha	1.00	Stream Power (lb/ft s)		8.14	
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	2.08	21.85	0.33
C & E Loss (ft)	0.03	Cum SA (acres)	1.81	4.18	0.24

CROSS SECTION OUTPUT Profile #10yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	955.63	Element			
Vel Head (ft)	0.81	Wt. n-Val.		0.040	
W.S. Elev (ft)	954.83	Reach Len. (ft)	71.98	75.39	77.80
Crit W.S. (ft)		Flow Area (sq ft)		201.23	

E.G. Slope (ft/ft)	0.004392	Area (sq ft)		201.23	
Q Total (cfs)	1450.00	Flow (cfs)		1450.00	
Top Width (ft)	32.55	Top Width (ft)		32.55	
Vel Total (ft/s)	7.21	Avg. Vel. (ft/s)		7.21	
Max Chl Dpth (ft)	7.85	Hydr. Depth (ft)		6.18	
Conv. Total (cfs)	21879.7	Conv. (cfs)		21879.7	
Length Wtd. (ft)	75.36	Wetted Per. (ft)		40.18	
Min Ch El (ft)	946.98	Shear (lb/sq ft)		1.37	
Alpha	1.00	Stream Power (lb/ft s)		9.89	
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)	7.53	24.23	4.09
C & E Loss (ft)	0.03	Cum SA (acres)	4.04	4.32	3.10

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	956.71	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	0.93	Reach Len. (ft)	71.98	75.39	77.80
W.S. Elev (ft)	955.78	Flow Area (sq ft)	1.04	232.77	
Crit W.S. (ft)		Area (sq ft)	1.04	232.77	
E.G. Slope (ft/ft)	0.004338	Flow (cfs)	0.65	1799.35	
Q Total (cfs)	1800.00	Top Width (ft)	2.18	33.38	
Top Width (ft)	35.55	Avg. Vel. (ft/s)	0.63	7.73	
Vel Total (ft/s)	7.70	Hydr. Depth (ft)	0.48	6.97	
Max Chl Dpth (ft)	8.80	Conv. (cfs)	9.9	27319.4	
Conv. Total (cfs)	27329.3	Wetted Per. (ft)	2.38	41.45	
Length Wtd. (ft)	75.34	Shear (lb/sq ft)	0.12	1.52	
Min Ch El (ft)	946.98	Stream Power (lb/ft s)	0.07	11.76	
Alpha	1.01	Cum Volume (acre-ft)	11.90	27.99	6.95
Frctn Loss (ft)	0.38	Cum SA (acres)	4.98	4.47	4.50
C & E Loss (ft)	0.04				

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	957.43	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	1.02	Reach Len. (ft)	71.98	75.39	77.80
W.S. Elev (ft)	956.41	Flow Area (sq ft)	2.85	253.87	
Crit W.S. (ft)		Area (sq ft)	2.85	253.87	
E.G. Slope (ft/ft)	0.004360	Flow (cfs)	2.51	2057.49	
Q Total (cfs)	2060.00	Top Width (ft)	3.60	33.91	
Top Width (ft)	37.52	Avg. Vel. (ft/s)	0.88	8.10	
Vel Total (ft/s)	8.02	Hydr. Depth (ft)	0.79	7.49	
Max Chl Dpth (ft)	9.43	Conv. (cfs)	38.0	31158.5	
Conv. Total (cfs)	31196.5	Wetted Per. (ft)	3.94	42.27	
Length Wtd. (ft)	75.33	Shear (lb/sq ft)	0.20	1.63	
Min Ch El (ft)	946.98	Stream Power (lb/ft s)	0.17	13.25	
Alpha	1.02	Cum Volume (acre-ft)	14.83	30.27	9.40
Frctn Loss (ft)	0.39	Cum SA (acres)	5.39	4.54	5.45
C & E Loss (ft)	0.04				

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	958.08	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	1.10	Reach Len. (ft)	71.98	75.39	77.80
W.S. Elev (ft)	956.98	Flow Area (sq ft)	5.27	273.30	
Crit W.S. (ft)		Area (sq ft)	5.27	273.30	
E.G. Slope (ft/ft)	0.004378	Flow (cfs)	5.70	2304.30	
Q Total (cfs)	2310.00	Top Width (ft)	4.90	34.39	
Top Width (ft)	39.29	Avg. Vel. (ft/s)	1.08	8.43	
Vel Total (ft/s)	8.29	Hydr. Depth (ft)	1.08	7.95	
Max Chl Dpth (ft)	10.00	Conv. (cfs)	86.1	34827.4	
Conv. Total (cfs)	34913.5	Wetted Per. (ft)	5.35	43.01	
Length Wtd. (ft)	75.31	Shear (lb/sq ft)	0.27	1.74	
Min Ch El (ft)	946.98	Stream Power (lb/ft s)	0.29	14.64	
Alpha	1.03	Cum Volume (acre-ft)	17.33	32.57	12.73
Frctn Loss (ft)	0.39	Cum SA (acres)	5.65	4.61	6.58
C & E Loss (ft)	0.05				

CROSS SECTION OUTPUT Profile #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	959.56	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	1.29	Reach Len. (ft)	71.98	75.39	77.80
W.S. Elev (ft)	958.27	Flow Area (sq ft)	13.46	318.27	
Crit W.S. (ft)		Area (sq ft)	13.46	318.27	
E.G. Slope (ft/ft)	0.004420	Flow (cfs)	20.21	2909.79	
Q Total (cfs)	2930.00	Top Width (ft)	7.64	35.46	
Top Width (ft)	43.10	Avg. Vel. (ft/s)	1.50	9.14	
Vel Total (ft/s)	8.83	Hydr. Depth (ft)	1.76	8.98	
Max Chl Dpth (ft)	11.29	Conv. (cfs)	304.0	43765.8	
Conv. Total (cfs)	44069.8				

Length Wtd. (ft)	75.28	Wetted Per. (ft)	8.41	44.69	
Min Ch El (ft)	946.98	Shear (lb/sq ft)	0.44	1.97	
Alpha	1.06	Stream Power (lb/ft s)	0.66	17.97	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	23.70	37.49	20.54
C & E Loss (ft)	0.05	Cum SA (acres)	6.29	4.67	8.33

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: Hope Creek
REACH: 1 RS: 4643.051

INPUT
Description: 5
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	963.92	1.83	963.85	2.78	960.82	3.65	958.04	5.06	957.49
8.02	956.63	17.07	952.9	17.88	952.59	23.27	950.51	24.64	947.3
24.8	946.95	26.35	946.82	36.34	946.11	42.31	946.56	42.77	946.6
42.83	946.6	45.12	949.85	49.15	955.57	50.52	958.85	54.97	959.06
70.87	959.95	70.9	959.95	75.43	961.27	80.72	962.42	88.01	966.04

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	23.27	.04	50.52	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
23.27	50.52	17.45	17.74	17.85	.1	.3

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	953.35	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	0.78	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	952.57	Flow Area (sq ft)	5.49	128.54	
Crit W.S. (ft)	950.61	Area (sq ft)	5.49	128.54	
E.G. Slope (ft/ft)	0.005089	Flow (cfs)	6.29	913.71	
Q Total (cfs)	920.00	Top Width (ft)	5.33	23.76	
Top Width (ft)	29.10	Avg. Vel. (ft/s)	1.15	7.11	
Vel Total (ft/s)	6.86	Hydr. Depth (ft)	1.03	5.41	
Max Chl Dpth (ft)	6.46	Conv. (cfs)	88.2	12808.8	
Conv. Total (cfs)	12897.0	Wetted Per. (ft)	5.72	29.25	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.30	1.40	
Min Ch El (ft)	946.11	Stream Power (lb/ft s)	0.35	9.92	
Alpha	1.07	Cum Volume (acre-ft)	2.51	18.44	1.48
Frctn Loss (ft)		Cum SA (acres)	2.52	3.93	1.38
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	954.34	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	0.95	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	953.39	Flow Area (sq ft)	7.88	148.23	
Crit W.S. (ft)	951.33	Area (sq ft)	7.88	148.23	
E.G. Slope (ft/ft)	0.005404	Flow (cfs)	12.38	1167.62	
Q Total (cfs)	1180.00	Top Width (ft)	3.62	24.34	
Top Width (ft)	27.96	Avg. Vel. (ft/s)	1.57	7.88	
Vel Total (ft/s)	7.56	Hydr. Depth (ft)	2.18	6.09	
Max Chl Dpth (ft)	7.28	Conv. (cfs)	168.4	15883.0	
Conv. Total (cfs)	16051.3	Wetted Per. (ft)	5.36	30.26	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.50	1.65	
Min Ch El (ft)	946.11	Stream Power (lb/ft s)	0.78	13.02	
Alpha	1.08	Cum Volume (acre-ft)	2.08	21.57	0.33
Frctn Loss (ft)		Cum SA (acres)	1.81	4.13	0.24
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	955.23	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	1.11	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	954.12	Flow Area (sq ft)	16.75	166.20	
Crit W.S. (ft)	952.04	Area (sq ft)	16.75	166.20	
E.G. Slope (ft/ft)	0.005676	Flow (cfs)	29.69	1420.31	
Q Total (cfs)	1450.00	Top Width (ft)	9.15	24.86	
Top Width (ft)	34.01	Avg. Vel. (ft/s)	1.77	8.55	
Vel Total (ft/s)	7.93	Hydr. Depth (ft)	1.83	6.69	
Max Chl Dpth (ft)	8.01				

Conv. Total (cfs)	19246.1	Conv. (cfs)	394.1	18851.9	
Length Wtd. (ft)	4.00	Wetted Per. (ft)	9.84	31.15	
Min Ch El (ft)	946.11	Shear (lb/sq ft)	0.60	1.89	
Alpha	1.14	Stream Power (lb/ft s)	1.07	16.16	
Frctn Loss (ft)		Cum Volume (acre-ft)	7.52	23.91	4.09
C & E Loss (ft)		Cum SA (acres)	4.03	4.27	3.10

CROSS SECTION OUTPUT Profile #25yr

E.G. Elev (ft)	956.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.29	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	955.00	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	952.86	Flow Area (sq ft)	25.79	188.47	
E.G. Slope (ft/ft)	0.005904	Area (sq ft)	25.79	188.47	
Q Total (cfs)	1800.00	Flow (cfs)	54.02	1745.98	
Top Width (ft)	36.78	Top Width (ft)	11.30	25.48	
Vel Total (ft/s)	8.40	Avg. Vel. (ft/s)	2.09	9.26	
Max Chl Dpth (ft)	8.89	Hydr. Depth (ft)	2.28	7.40	
Conv. Total (cfs)	23426.6	Conv. (cfs)	703.1	22723.6	
Length Wtd. (ft)	4.00	Wetted Per. (ft)	12.16	32.23	
Min Ch El (ft)	946.11	Shear (lb/sq ft)	0.78	2.16	
Alpha	1.18	Stream Power (lb/ft s)	1.64	19.96	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	11.87	27.63	6.95
C & E Loss (ft)	0.00	Cum SA (acres)	4.97	4.42	4.50

CROSS SECTION OUTPUT Profile #50yr

E.G. Elev (ft)	957.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.43	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	955.57	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	953.41	Flow Area (sq ft)	32.62	203.09	
E.G. Slope (ft/ft)	0.006119	Area (sq ft)	32.62	203.09	
Q Total (cfs)	2060.00	Flow (cfs)	75.28	1984.72	
Top Width (ft)	38.56	Top Width (ft)	12.68	25.88	
Vel Total (ft/s)	8.74	Avg. Vel. (ft/s)	2.31	9.77	
Max Chl Dpth (ft)	9.46	Hydr. Depth (ft)	2.57	7.85	
Conv. Total (cfs)	26334.7	Conv. (cfs)	962.4	25372.2	
Length Wtd. (ft)	4.00	Wetted Per. (ft)	13.65	32.93	
Min Ch El (ft)	946.11	Shear (lb/sq ft)	0.91	2.36	
Alpha	1.21	Stream Power (lb/ft s)	2.11	23.02	
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	14.80	29.87	9.40
C & E Loss (ft)	0.00	Cum SA (acres)	5.38	4.49	5.45

CROSS SECTION OUTPUT Profile #100yr

E.G. Elev (ft)	957.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.55	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	956.10	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	953.94	Flow Area (sq ft)	39.60	216.71	
E.G. Slope (ft/ft)	0.006259	Area (sq ft)	39.60	216.71	
Q Total (cfs)	2310.00	Flow (cfs)	98.67	2211.33	
Top Width (ft)	40.05	Top Width (ft)	13.95	26.10	
Vel Total (ft/s)	9.01	Avg. Vel. (ft/s)	2.49	10.20	
Max Chl Dpth (ft)	9.99	Hydr. Depth (ft)	2.84	8.30	
Conv. Total (cfs)	29198.8	Conv. (cfs)	1247.2	27951.6	
Length Wtd. (ft)	4.00	Wetted Per. (ft)	15.03	33.50	
Min Ch El (ft)	946.11	Shear (lb/sq ft)	1.03	2.53	
Alpha	1.23	Stream Power (lb/ft s)	2.57	25.80	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	17.29	32.15	12.73
C & E Loss (ft)	0.00	Cum SA (acres)	5.64	4.55	6.58

CROSS SECTION OUTPUT Profile #500yr

E.G. Elev (ft)	959.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.84	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	957.26	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	955.11	Flow Area (sq ft)	57.73	247.43	
E.G. Slope (ft/ft)	0.006612	Area (sq ft)	57.73	247.43	
Q Total (cfs)	2930.00	Flow (cfs)	164.32	2765.68	
Top Width (ft)	44.01	Top Width (ft)	17.42	26.59	
Vel Total (ft/s)	9.60	Avg. Vel. (ft/s)	2.85	11.18	
Max Chl Dpth (ft)	11.15	Hydr. Depth (ft)	3.31	9.31	
Conv. Total (cfs)	36033.9	Conv. (cfs)	2020.8	34013.1	
Length Wtd. (ft)	4.00	Wetted Per. (ft)	18.70	34.76	
Min Ch El (ft)	946.11	Shear (lb/sq ft)	1.27	2.94	
Alpha	1.28	Stream Power (lb/ft s)	3.63	32.84	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	23.64	37.00	20.54
C & E Loss (ft)	0.00	Cum SA (acres)	6.27	4.61	8.33

```
BRIDGE


RIVER: Hope Creek
REACH: 1                    RS: 4636

INPUT
Description:
Distance from Upstream XS =       4
Deck/Roadway Width        =       6
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0     970     967     200     970     967

Upstream Bridge Cross Section Data
Station Elevation Data    num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  963.93    1.83  963.86    2.78  960.83    3.65  958.05    5.06   957.5
    8.02  956.64   17.07  952.91   17.88   952.6   23.27  950.52   24.64  947.31
    24.8  946.96   26.35  946.83   36.34  946.12   42.31  946.57   42.77  946.61
   42.83  946.61   45.12  949.86   49.15  955.58   50.52  958.86   54.97  959.07
   70.87  959.96    70.9  959.96   75.43  961.28   80.72  962.43   88.01  966.05

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09   23.27     .04   50.52     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
         23.27   50.52             .1       .3

Downstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0     970     967     200     970     967

Downstream Bridge Cross Section Data
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     964    3.82  963.87    5.47  963.81    7.13  963.76    8.55  959.11
    8.93  957.83   10.27  957.33   15.55  955.45   25.27  951.62   28.72  950.22
   29.88  947.58   30.48  946.84   31.89  946.82   36.51  946.46   40.58  946.14
    44.1  946.27   48.98  946.39   49.55  948.41   49.78  949.21   53.69  958.54
   61.71  959.06   62.79  959.16   65.52  959.39   73.53  962.89   78.07   964.8
   78.68  965.14   80.01  965.17   80.52  965.19

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09   28.72     .04   53.69     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
         28.72   53.69             .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=   55.79    Downstream=   60.85
Upstream     num=        2
    Width   Elev    Width   Elev
        8    945        8    970
Downstream     num=        2
    Width   Elev    Width   Elev
        8    945        8    970

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
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 #2yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	953.35	E.G. Elev (ft)	953.33	953.23
W.S. US. (ft)	952.57	W.S. Elev (ft)	952.54	952.39
Q Total (cfs)	920.00	Crit W.S. (ft)	950.63	950.54
Q Bridge (cfs)	920.00	Max Chl Dpth (ft)	6.42	6.25
Q Weir (cfs)		Vel Total (ft/s)	6.93	7.11
Weir Sta Lft (ft)		Flow Area (sq ft)	132.78	129.32
Weir Sta Rgt (ft)		Froude # Chl	0.54	0.55
Weir Submerg		Specif Force (cu ft)	575.43	571.08
Weir Max Depth (ft)		Hydr Depth (ft)	4.59	4.65
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	34.80	34.57
Min El Prs (ft)	967.00	Conv. Total (cfs)	12738.7	12219.1
Delta EG (ft)	0.14	Top Width (ft)	28.96	27.80
Delta WS (ft)	0.22	Frctn Loss (ft)		
BR Open Area (sq ft)	866.18	C & E Loss (ft)		
BR Open Vel (ft/s)	7.11	Shear Total (lb/sq ft)	1.24	1.32
Coef of Q		Power Total (lb/ft s)	8.61	9.42
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #5yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	954.34	E.G. Elev (ft)	954.32	954.23
W.S. US. (ft)	953.39	W.S. Elev (ft)	953.36	953.20
Q Total (cfs)	1180.00	Crit W.S. (ft)	951.36	951.27
Q Bridge (cfs)	1180.00	Max Chl Dpth (ft)	7.24	7.06
Q Weir (cfs)		Vel Total (ft/s)	7.61	7.73
Weir Sta Lft (ft)		Flow Area (sq ft)	155.07	152.70
Weir Sta Rgt (ft)		Froude # Chl	0.57	0.58
Weir Submerg		Specif Force (cu ft)	777.07	771.96
Weir Max Depth (ft)		Hydr Depth (ft)	5.55	5.06
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	34.09	37.61
Min El Prs (ft)	967.00	Conv. Total (cfs)	15940.7	15168.1
Delta EG (ft)	0.14	Top Width (ft)	27.94	30.15
Delta WS (ft)	0.24	Frctn Loss (ft)		
BR Open Area (sq ft)	569.13	C & E Loss (ft)		
BR Open Vel (ft/s)	7.73	Shear Total (lb/sq ft)	1.56	1.53
Coef of Q		Power Total (lb/ft s)	11.84	11.85
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #10yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	955.23	E.G. Elev (ft)	955.21	955.13
W.S. US. (ft)	954.12	W.S. Elev (ft)	954.08	953.91
Q Total (cfs)	1450.00	Crit W.S. (ft)	952.05	951.99
Q Bridge (cfs)	1450.00	Max Chl Dpth (ft)	7.96	7.77
Q Weir (cfs)		Vel Total (ft/s)	8.00	8.29
Weir Sta Lft (ft)		Flow Area (sq ft)	181.31	174.93
Weir Sta Rgt (ft)		Froude # Chl	0.59	0.60
Weir Submerg		Specif Force (cu ft)	994.93	988.48
Weir Max Depth (ft)		Hydr Depth (ft)	5.35	5.42
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	40.80	40.36
Min El Prs (ft)	967.00	Conv. Total (cfs)	19029.7	18006.9
Delta EG (ft)	0.13	Top Width (ft)	33.86	32.29
Delta WS (ft)	0.27	Frctn Loss (ft)		
BR Open Area (sq ft)	866.18	C & E Loss (ft)		
BR Open Vel (ft/s)	8.29	Shear Total (lb/sq ft)	1.61	1.75
Coef of Q		Power Total (lb/ft s)	12.88	14.54
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #25yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	956.30	E.G. Elev (ft)	956.27	956.22
W.S. US. (ft)	955.00	W.S. Elev (ft)	954.96	954.79
Q Total (cfs)	1800.00	Crit W.S. (ft)	952.87	952.84
Q Bridge (cfs)	1800.00	Max Chl Dpth (ft)	8.84	8.65
Q Weir (cfs)		Vel Total (ft/s)	8.48	8.80
Weir Sta Lft (ft)		Flow Area (sq ft)	212.29	204.52
Weir Sta Rgt (ft)				

Weir Submerg		Froude # Chl	0.61	0.62
Weir Max Depth (ft)		Specif Force (cu ft)	1296.20	1290.36
Min El Weir Flow (ft)	970.01	Hydr Depth (ft)	5.80	5.86
Min El Prs (ft)	967.00	W.P. Total (ft)	44.19	43.72
Delta EG (ft)	0.13	Conv. Total (cfs)	23160.5	21838.1
Delta WS (ft)	0.34	Top Width (ft)	36.61	34.89
BR Open Area (sq ft)	866.18	Frctn Loss (ft)	0.04	0.05
BR Open Vel (ft/s)	8.80	C & E Loss (ft)	0.01	0.01
Coef of Q		Shear Total (lb/sq ft)	1.81	1.98
Br Sel Method	Energy only	Power Total (lb/ft s)	15.36	17.46

BRIDGE OUTPUT Profile #50yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	957.00	E.G. Elev (ft)	956.98	956.92
W.S. US. (ft)	955.57	W.S. Elev (ft)	955.52	955.31
Q Total (cfs)	2060.00	Crit W.S. (ft)	953.45	953.40
Q Bridge (cfs)	2060.00	Max Chl Dpth (ft)	9.40	9.17
Q Weir (cfs)		Vel Total (ft/s)	8.82	9.23
Weir Sta Lft (ft)		Flow Area (sq ft)	233.52	223.14
Weir Sta Rgt (ft)		Froude # Chl	0.62	0.64
Weir Submerg		Specif Force (cu ft)	1525.20	1514.34
Weir Max Depth (ft)		Hydr Depth (ft)	6.08	6.12
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	46.37	45.71
Min El Prs (ft)	967.00	Conv. Total (cfs)	26036.8	24273.6
Delta EG (ft)	0.15	Top Width (ft)	38.38	36.44
Delta WS (ft)	0.40	Frctn Loss (ft)	0.04	0.06
BR Open Area (sq ft)	866.18	C & E Loss (ft)	0.02	0.01
BR Open Vel (ft/s)	9.23	Shear Total (lb/sq ft)	1.97	2.20
Coef of Q		Power Total (lb/ft s)	17.36	20.26
Br Sel Method	Energy only			

BRIDGE OUTPUT Profile #100yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	957.65	E.G. Elev (ft)	957.62	957.56
W.S. US. (ft)	956.10	W.S. Elev (ft)	956.04	955.79
Q Total (cfs)	2310.00	Crit W.S. (ft)	953.97	953.94
Q Bridge (cfs)	2310.00	Max Chl Dpth (ft)	9.92	9.65
Q Weir (cfs)		Vel Total (ft/s)	9.10	9.60
Weir Sta Lft (ft)		Flow Area (sq ft)	253.83	240.73
Weir Sta Rgt (ft)		Froude # Chl	0.63	0.66
Weir Submerg		Specif Force (cu ft)	1753.36	1736.74
Weir Max Depth (ft)		Hydr Depth (ft)	6.37	6.35
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	48.30	47.60
Min El Prs (ft)	967.00	Conv. Total (cfs)	28852.2	26586.0
Delta EG (ft)	0.16	Top Width (ft)	39.88	37.93
Delta WS (ft)	0.47	Frctn Loss (ft)	0.04	0.06
BR Open Area (sq ft)	866.18	C & E Loss (ft)	0.02	0.01
BR Open Vel (ft/s)	9.60	Shear Total (lb/sq ft)	2.10	2.38
Coef of Q		Power Total (lb/ft s)	19.14	22.87
Br Sel Method	Energy only			

BRIDGE OUTPUT Profile #500yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	959.10	E.G. Elev (ft)	959.07	959.00
W.S. US. (ft)	957.26	W.S. Elev (ft)	957.20	956.84
Q Total (cfs)	2930.00	Crit W.S. (ft)	955.13	955.14
Q Bridge (cfs)	2930.00	Max Chl Dpth (ft)	11.08	10.70
Q Weir (cfs)		Vel Total (ft/s)	9.70	10.37
Weir Sta Lft (ft)		Flow Area (sq ft)	302.20	282.52
Weir Sta Rgt (ft)		Froude # Chl	0.65	0.70
Weir Submerg		Specif Force (cu ft)	2344.05	2310.33
Weir Max Depth (ft)		Hydr Depth (ft)	6.91	6.84
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	53.14	51.88
Min El Prs (ft)	967.00	Conv. Total (cfs)	35620.1	32116.7
Delta EG (ft)	0.19	Top Width (ft)	43.75	41.33
Delta WS (ft)	0.64	Frctn Loss (ft)	0.04	0.07
BR Open Area (sq ft)	866.18	C & E Loss (ft)	0.03	0.01
BR Open Vel (ft/s)	10.37	Shear Total (lb/sq ft)	2.40	2.83
Coef of Q		Power Total (lb/ft s)	23.29	29.34
Br Sel Method	Energy only			

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4625.316

INPUT

Description: 6

Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	964.02	3.82	963.89	5.47	963.83	7.13	963.78	8.55	959.13
8.93	957.85	10.27	957.35	15.55	955.47	25.27	951.64	28.72	950.24
29.88	947.6	30.48	946.86	31.89	946.84	36.51	946.48	40.58	946.16
44.1	946.29	48.98	946.41	49.55	948.43	49.78	949.23	53.69	958.56
61.71	959.08	62.79	959.18	65.52	959.41	73.53	962.91	78.07	964.82
78.68	965.16	80.01	965.19	80.52	965.21				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	28.72	.04	53.69	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
28.72	53.69	120.71	121.61	122.64	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	953.21	Element			
Vel Head (ft)	0.86	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	952.35	Reach Len. (ft)	120.71	121.61	122.64
Crit W.S. (ft)		Flow Area (sq ft)	5.50	122.12	
E.G. Slope (ft/ft)	0.005871	Area (sq ft)	5.50	122.12	
Q Total (cfs)	920.00	Flow (cfs)	6.83	913.17	
Top Width (ft)	27.62	Top Width (ft)	5.25	22.37	
Vel Total (ft/s)	7.21	Avg. Vel. (ft/s)	1.24	7.48	
Max Chl Dpth (ft)	6.19	Hydr. Depth (ft)	1.05	5.46	
Conv. Total (cfs)	12007.2	Conv. (cfs)	89.1	11918.0	
Length Wtd. (ft)	121.61	Wetted Per. (ft)	5.66	28.68	
Min Ch El (ft)	946.16	Shear (lb/sq ft)	0.36	1.56	
Alpha	1.07	Stream Power (lb/ft s)	0.44	11.67	
Frctn Loss (ft)	0.61	Cum Volume (acre-ft)	2.51	18.39	1.48
C & E Loss (ft)	0.07	Cum SA (acres)	2.52	3.92	1.38

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	954.20	Element			
Vel Head (ft)	1.06	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	953.15	Reach Len. (ft)	120.71	121.61	122.64
Crit W.S. (ft)		Flow Area (sq ft)	10.49	140.09	
E.G. Slope (ft/ft)	0.006273	Area (sq ft)	10.49	140.09	
Q Total (cfs)	1180.00	Flow (cfs)	16.68	1163.32	
Top Width (ft)	29.98	Top Width (ft)	7.27	22.70	
Vel Total (ft/s)	7.84	Avg. Vel. (ft/s)	1.59	8.30	
Max Chl Dpth (ft)	6.99	Hydr. Depth (ft)	1.44	6.17	
Conv. Total (cfs)	14898.3	Conv. (cfs)	210.6	14687.7	
Length Wtd. (ft)	121.60	Wetted Per. (ft)	7.83	29.54	
Min Ch El (ft)	946.16	Shear (lb/sq ft)	0.52	1.86	
Alpha	1.11	Stream Power (lb/ft s)	0.83	15.42	
Frctn Loss (ft)	0.64	Cum Volume (acre-ft)	2.07	21.51	0.33
C & E Loss (ft)	0.08	Cum SA (acres)	1.80	4.12	0.24

CROSS SECTION OUTPUT Profile #10yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	955.10	Element			
Vel Head (ft)	1.26	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	953.85	Reach Len. (ft)	120.71	121.61	122.64
Crit W.S. (ft)		Flow Area (sq ft)	16.20	156.07	
E.G. Slope (ft/ft)	0.006738	Area (sq ft)	16.20	156.07	
Q Total (cfs)	1450.00	Flow (cfs)	30.82	1419.18	
Top Width (ft)	32.04	Top Width (ft)	9.05	22.99	
Vel Total (ft/s)	8.42	Avg. Vel. (ft/s)	1.90	9.09	
Max Chl Dpth (ft)	7.69	Hydr. Depth (ft)	1.79	6.79	
Conv. Total (cfs)	17665.1	Conv. (cfs)	375.5	17289.7	
Length Wtd. (ft)	121.60	Wetted Per. (ft)	9.74	30.30	
Min Ch El (ft)	946.16	Shear (lb/sq ft)	0.70	2.17	
Alpha	1.14	Stream Power (lb/ft s)	1.33	19.70	
Frctn Loss (ft)	0.69	Cum Volume (acre-ft)	7.51	23.85	4.09
C & E Loss (ft)	0.09	Cum SA (acres)	4.03	4.26	3.10

CROSS SECTION OUTPUT Profile #25yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	956.16	Element			
Vel Head (ft)	1.50	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	954.67	Reach Len. (ft)	120.71	121.61	122.64
Crit W.S. (ft)		Flow Area (sq ft)	24.47	175.04	
E.G. Slope (ft/ft)	0.007219	Area (sq ft)	24.47	175.04	
Q Total (cfs)	1800.00	Flow (cfs)	55.26	1744.74	

Top Width (ft)	34.47	Top Width (ft)	11.13	23.34	
Vel Total (ft/s)	9.02	Avg. Vel. (ft/s)	2.26	9.97	
Max Chl Dpth (ft)	8.51	Hydr. Depth (ft)	2.20	7.50	
Conv. Total (cfs)	21185.2	Conv. (cfs)	650.3	20534.9	
Length Wtd. (ft)	121.59	Wetted Per. (ft)	11.98	31.19	
Min Ch El (ft)	946.16	Shear (lb/sq ft)	0.92	2.53	
Alpha	1.18	Stream Power (lb/ft s)	2.08	25.21	
Frctn Loss (ft)	0.73	Cum Volume (acre-ft)	11.86	27.55	6.95
C & E Loss (ft)	0.11	Cum SA (acres)	4.97	4.41	4.50

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	956.86	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	1.69	Reach Len. (ft)	120.71	121.61	122.64
W.S. Elev (ft)	955.17	Flow Area (sq ft)	30.38	186.84	
Crit W.S. (ft)		Area (sq ft)	30.38	186.84	
E.G. Slope (ft/ft)	0.007686	Flow (cfs)	76.11	1983.89	
Q Total (cfs)	2060.00	Top Width (ft)	12.40	23.55	
Top Width (ft)	35.95	Avg. Vel. (ft/s)	2.50	10.62	
Vel Total (ft/s)	9.48	Hydr. Depth (ft)	2.45	7.93	
Max Chl Dpth (ft)	9.01	Conv. (cfs)	868.1	22629.3	
Conv. Total (cfs)	23497.4	Wetted Per. (ft)	13.35	31.74	
Length Wtd. (ft)	121.59	Shear (lb/sq ft)	1.09	2.82	
Min Ch El (ft)	946.16	Stream Power (lb/ft s)	2.74	29.99	
Alpha	1.21	Cum Volume (acre-ft)	14.79	29.79	9.40
Frctn Loss (ft)	0.76	Cum SA (acres)	5.37	4.48	5.45
C & E Loss (ft)	0.12				

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	957.49	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	1.87	Reach Len. (ft)	120.71	121.61	122.64
W.S. Elev (ft)	955.62	Flow Area (sq ft)	36.29	197.60	
Crit W.S. (ft)		Area (sq ft)	36.29	197.60	
E.G. Slope (ft/ft)	0.008088	Flow (cfs)	98.77	2211.23	
Q Total (cfs)	2310.00	Top Width (ft)	13.60	23.74	
Top Width (ft)	37.34	Avg. Vel. (ft/s)	2.72	11.19	
Vel Total (ft/s)	9.88	Hydr. Depth (ft)	2.67	8.32	
Max Chl Dpth (ft)	9.46	Conv. (cfs)	1098.2	24588.0	
Conv. Total (cfs)	25686.3	Wetted Per. (ft)	14.63	32.23	
Length Wtd. (ft)	121.58	Shear (lb/sq ft)	1.25	3.10	
Min Ch El (ft)	946.16	Stream Power (lb/ft s)	3.41	34.64	
Alpha	1.23	Cum Volume (acre-ft)	17.27	32.06	12.73
Frctn Loss (ft)	0.79	Cum SA (acres)	5.63	4.54	6.58
C & E Loss (ft)	0.14				

CROSS SECTION OUTPUT Profile #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	958.91	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	2.30	Reach Len. (ft)	120.71	121.61	122.64
W.S. Elev (ft)	956.62	Flow Area (sq ft)	51.23	221.44	
Crit W.S. (ft)		Area (sq ft)	51.23	221.44	
E.G. Slope (ft/ft)	0.009045	Flow (cfs)	164.00	2766.00	
Q Total (cfs)	2930.00	Top Width (ft)	16.40	24.16	
Top Width (ft)	40.55	Avg. Vel. (ft/s)	3.20	12.49	
Vel Total (ft/s)	10.75	Hydr. Depth (ft)	3.12	9.17	
Max Chl Dpth (ft)	10.46	Conv. (cfs)	1724.4	29083.0	
Conv. Total (cfs)	30807.4	Wetted Per. (ft)	17.60	33.31	
Length Wtd. (ft)	121.58	Shear (lb/sq ft)	1.64	3.75	
Min Ch El (ft)	946.16	Stream Power (lb/ft s)	5.26	46.89	
Alpha	1.28	Cum Volume (acre-ft)	23.62	36.91	20.54
Frctn Loss (ft)	0.86	Cum SA (acres)	6.27	4.60	8.33
C & E Loss (ft)	0.17				

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: Hope Creek
REACH: 1 RS: 4503.708

INPUT
Description: 7
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	963.51	.39	963.5	1.99	963.45	2.95	963.42	3.49	963.41
8.74	963.25	11.25	963.18	12.78	963.14	14.37	957.94	14.89	956.13
15.91	955.95	18.36	955.51	24.58	952.99	26.92	952.01	29.54	950.91
30.93	949.48	33.76	946.03	36.69	945.97	43.72	945.82	53.37	945.71
55.01	949.03	57.39	952.5	58.25	953.76	69.47	955	81.3	962.68
83.07	963.72								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	29.54	.04	58.25	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
29.54	58.25	19.61	18.66	18.24	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	952.54	Element			
Vel Head (ft)	0.64	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	951.90	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	949.75	Flow Area (sq ft)	1.16	143.01	
E.G. Slope (ft/ft)	0.004281	Area (sq ft)	1.16	143.01	
Q Total (cfs)	920.00	Flow (cfs)	0.74	919.26	
Top Width (ft)	29.79	Top Width (ft)	2.35	27.44	
Vel Total (ft/s)	6.38	Avg. Vel. (ft/s)	0.64	6.43	
Max Chl Dpth (ft)	6.19	Hydr. Depth (ft)	0.49	5.21	
Conv. Total (cfs)	14061.2	Conv. (cfs)	11.4	14049.9	
Length Wtd. (ft)	4.00	Wetted Per. (ft)	2.55	33.25	
Min Ch El (ft)	945.71	Shear (lb/sq ft)	0.12	1.15	
Alpha	1.01	Stream Power (lb/ft s)	0.08	7.39	
Frctn Loss (ft)		Cum Volume (acre-ft)	2.50	18.02	1.48
C & E Loss (ft)		Cum SA (acres)	2.51	3.85	1.38

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	953.48	Element			
Vel Head (ft)	0.79	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	952.69	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	950.43	Flow Area (sq ft)	3.78	165.01	
E.G. Slope (ft/ft)	0.004519	Area (sq ft)	3.78	165.01	
Q Total (cfs)	1180.00	Flow (cfs)	3.68	1176.32	
Top Width (ft)	32.23	Top Width (ft)	4.25	27.98	
Vel Total (ft/s)	6.99	Avg. Vel. (ft/s)	0.97	7.13	
Max Chl Dpth (ft)	6.98	Hydr. Depth (ft)	0.89	5.90	
Conv. Total (cfs)	17553.5	Conv. (cfs)	54.8	17498.7	
Length Wtd. (ft)	4.00	Wetted Per. (ft)	4.61	34.21	
Min Ch El (ft)	945.71	Shear (lb/sq ft)	0.23	1.36	
Alpha	1.04	Stream Power (lb/ft s)	0.23	9.70	
Frctn Loss (ft)		Cum Volume (acre-ft)	2.05	21.08	0.33
C & E Loss (ft)		Cum SA (acres)	1.79	4.05	0.24

CROSS SECTION OUTPUT Profile #10yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	954.32	Element			
Vel Head (ft)	0.94	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	953.38	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	951.06	Flow Area (sq ft)	7.26	184.31	
E.G. Slope (ft/ft)	0.004842	Area (sq ft)	7.26	184.31	
Q Total (cfs)	1450.00	Flow (cfs)	9.06	1440.95	
Top Width (ft)	34.36	Top Width (ft)	5.91	28.45	
Vel Total (ft/s)	7.57	Avg. Vel. (ft/s)	1.25	7.82	
Max Chl Dpth (ft)	7.67	Hydr. Depth (ft)	1.23	6.48	
Conv. Total (cfs)	20838.3	Conv. (cfs)	130.1	20708.1	
Length Wtd. (ft)	4.00	Wetted Per. (ft)	6.41	35.04	
Min Ch El (ft)	945.71	Shear (lb/sq ft)	0.34	1.59	
Alpha	1.06	Stream Power (lb/ft s)	0.43	12.43	
Frctn Loss (ft)		Cum Volume (acre-ft)	7.48	23.37	4.09
C & E Loss (ft)		Cum SA (acres)	4.01	4.19	3.10

CROSS SECTION OUTPUT Profile #25yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	955.32	Element			
Vel Head (ft)	1.13	Wt. n-Val.	0.090	0.040	0.100
W.S. Elev (ft)	954.20	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	951.81	Flow Area (sq ft)	12.95	207.85	0.87
E.G. Slope (ft/ft)	0.005036	Area (sq ft)	12.95	207.85	0.87
Q Total (cfs)	1800.00	Flow (cfs)	19.93	1779.74	0.33
Top Width (ft)	40.61	Top Width (ft)	7.94	28.71	3.96
Vel Total (ft/s)	8.12	Avg. Vel. (ft/s)	1.54	8.56	0.38

Max Chl Dpth (ft)	8.49	Hydr. Depth (ft)	1.63	7.24	0.22
Conv. Total (cfs)	25365.9	Conv. (cfs)	280.9	25080.3	4.7
Length Wtd. (ft)	4.00	Wetted Per. (ft)	8.60	35.51	3.99
Min Ch El (ft)	945.71	Shear (lb/sq ft)	0.47	1.84	0.07
Alpha	1.10	Stream Power (lb/ft s)	0.73	15.76	0.03
Frctn Loss (ft)		Cum Volume (acre-ft)	11.81	27.02	6.95
C & E Loss (ft)		Cum SA (acres)	4.94	4.33	4.49

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	955.97	Wt. n-Val.	0.090	0.040	0.100
Vel Head (ft)	1.28	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	954.69	Flow Area (sq ft)	17.18	222.07	3.94
Crit W.S. (ft)	952.31	Area (sq ft)	17.18	222.07	3.94
E.G. Slope (ft/ft)	0.005243	Flow (cfs)	29.64	2027.82	2.54
Q Total (cfs)	2060.00	Top Width (ft)	9.16	28.71	8.44
Top Width (ft)	46.32	Avg. Vel. (ft/s)	1.72	9.13	0.64
Vel Total (ft/s)	8.47	Hydr. Depth (ft)	1.88	7.73	0.47
Max Chl Dpth (ft)	8.98	Conv. (cfs)	409.3	28004.0	35.1
Conv. Total (cfs)	28448.5	Wetted Per. (ft)	9.91	35.51	8.50
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.57	2.05	0.15
Min Ch El (ft)	945.71	Stream Power (lb/ft s)	0.98	18.70	0.10
Alpha	1.14	Cum Volume (acre-ft)	14.72	29.22	9.40
Frctn Loss (ft)		Cum SA (acres)	5.34	4.41	5.43
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	956.56	Wt. n-Val.	0.090	0.040	0.100
Vel Head (ft)	1.41	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	955.15	Flow Area (sq ft)	21.64	235.21	8.67
Crit W.S. (ft)	952.81	Area (sq ft)	21.64	235.21	8.67
E.G. Slope (ft/ft)	0.005384	Flow (cfs)	40.82	2261.39	7.79
Q Total (cfs)	2310.00	Top Width (ft)	10.29	28.71	11.45
Top Width (ft)	50.46	Avg. Vel. (ft/s)	1.89	9.61	0.90
Vel Total (ft/s)	8.70	Hydr. Depth (ft)	2.10	8.19	0.76
Max Chl Dpth (ft)	9.44	Conv. (cfs)	556.3	30819.6	106.2
Conv. Total (cfs)	31482.1	Wetted Per. (ft)	11.13	35.51	11.57
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.65	2.23	0.25
Min Ch El (ft)	945.71	Stream Power (lb/ft s)	1.23	21.41	0.23
Alpha	1.20	Cum Volume (acre-ft)	17.19	31.46	12.72
Frctn Loss (ft)		Cum SA (acres)	5.60	4.47	6.56
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	957.88	Wt. n-Val.	0.090	0.040	0.100
Vel Head (ft)	1.72	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	956.16	Flow Area (sq ft)	33.92	264.16	21.00
Crit W.S. (ft)	953.89	Area (sq ft)	33.92	264.16	21.00
E.G. Slope (ft/ft)	0.005716	Flow (cfs)	70.93	2827.28	31.79
Q Total (cfs)	2930.00	Top Width (ft)	14.66	28.71	13.01
Top Width (ft)	56.37	Avg. Vel. (ft/s)	2.09	10.70	1.51
Vel Total (ft/s)	9.18	Hydr. Depth (ft)	2.31	9.20	1.61
Max Chl Dpth (ft)	10.45	Conv. (cfs)	938.2	37397.0	420.5
Conv. Total (cfs)	38755.7	Wetted Per. (ft)	15.64	35.51	13.42
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.77	2.65	0.56
Min Ch El (ft)	945.71	Stream Power (lb/ft s)	1.62	28.41	0.85
Alpha	1.31	Cum Volume (acre-ft)	23.50	36.23	20.51
Frctn Loss (ft)		Cum SA (acres)	6.22	4.53	8.31
C & E Loss (ft)					

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 4496

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	970	967	200	970	967

```
Upstream Bridge Cross Section Data
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  963.51     .39   963.5    1.99  963.45    2.95  963.42    3.49  963.41
    8.74  963.25   11.25  963.18   12.78  963.14   14.37  957.94   14.89  956.13
   15.91  955.95   18.36  955.51   24.58  952.99   26.92  952.01   29.54  950.91
   30.93  949.48   33.76  946.03   36.69  945.97   43.72  945.82   53.37  945.71
   55.01  949.03   57.39   952.5   58.25  953.76   69.47     955    81.3  962.68
   83.07  963.72

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09   29.54     .04   58.25      .1

Bank Sta: Left   Right    Coeff Contr.   Expan.
         29.54   58.25             .1       .3

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0     970     967     200     970     967

Downstream Bridge Cross Section Data
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  963.45    3.52  963.37    4.17  963.36    5.48  963.33    5.84  963.32
   16.65  963.01   16.83  962.35   18.69  955.86   21.87  955.29   25.42   954.1
   26.23  953.76   32.95  950.95   36.12   946.7   36.63  945.94   41.88  945.89
   44.24  945.86   53.34  945.76   54.97  945.75   55.15  945.74   56.32  945.73
   58.21  945.71   62.08  953.54   62.18  953.69   74.43  954.49   76.08  955.54
   90.44   963.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09   32.95     .04   62.18      .1

Bank Sta: Left   Right    Coeff Contr.   Expan.
         32.95   62.18             .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=   64.66    Downstream=   68.25
Upstream     num=       2
    Width   Elev    Width   Elev
        8    945        8    970
Downstream     num=       2
    Width   Elev    Width   Elev
        8    945        8    970

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
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 #2yr

  E.G. US. (ft)                952.54    Element                  Inside BR US  Inside BR DS
  W.S. US. (ft)                951.90    E.G. Elev (ft)               952.52        952.26
  Q Total (cfs)                920.00    W.S. Elev (ft)               951.88        951.64
  Q Bridge (cfs)               920.00    Crit W.S. (ft)               949.78        949.54
  Q Weir (cfs)                           Max Chl Dpth (ft)              6.16          5.93
```

Weir Sta Lft (ft)		Vel Total (ft/s)	6.41	6.29
Weir Sta Rgt (ft)		Flow Area (sq ft)	143.48	146.36
Weir Submerg		Froude # Chl	0.50	0.49
Weir Max Depth (ft)		Specif Force (cu ft)	588.65	584.42
Min El Weir Flow (ft)	970.01	Hydr Depth (ft)	4.83	4.90
Min El Prs (ft)	967.00	W.P. Total (ft)	35.71	36.20
Delta EG (ft)	0.32	Conv. Total (cfs)	13964.7	14183.4
Delta WS (ft)	0.31	Top Width (ft)	29.72	29.84
BR Open Area (sq ft)	975.20	Frctn Loss (ft)		
BR Open Vel (ft/s)	6.41	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	1.09	1.06
Br Sel Method	Momentum	Power Total (lb/ft s)	6.98	6.68

BRIDGE OUTPUT Profile #5yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	953.48	E.G. Elev (ft)	953.46	953.19
W.S. US. (ft)	952.69	W.S. Elev (ft)	952.67	952.42
Q Total (cfs)	1180.00	Crit W.S. (ft)	950.45	950.17
Q Bridge (cfs)	1180.00	Max Chl Dpth (ft)	6.96	6.71
Q Weir (cfs)		Vel Total (ft/s)	7.03	6.92
Weir Sta Lft (ft)		Flow Area (sq ft)	167.96	170.63
Weir Sta Rgt (ft)		Froude # Chl	0.52	0.51
Weir Submerg		Specif Force (cu ft)	789.10	784.79
Weir Max Depth (ft)		Hydr Depth (ft)	5.22	5.32
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	38.72	39.11
Min El Prs (ft)	967.00	Conv. Total (cfs)	17433.1	17701.3
Delta EG (ft)	0.33	Top Width (ft)	32.15	32.10
Delta WS (ft)	0.32	Frctn Loss (ft)		
BR Open Area (sq ft)	700.85	C & E Loss (ft)		
BR Open Vel (ft/s)	7.03	Shear Total (lb/sq ft)	1.24	1.21
Coef of Q		Power Total (lb/ft s)	8.72	8.37
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #10yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	954.32	E.G. Elev (ft)	954.30	954.01
W.S. US. (ft)	953.38	W.S. Elev (ft)	953.35	953.09
Q Total (cfs)	1450.00	Crit W.S. (ft)	951.08	950.77
Q Bridge (cfs)	1450.00	Max Chl Dpth (ft)	7.64	7.38
Q Weir (cfs)		Vel Total (ft/s)	7.61	7.52
Weir Sta Lft (ft)		Flow Area (sq ft)	190.64	192.70
Weir Sta Rgt (ft)		Froude # Chl	0.54	0.53
Weir Submerg		Specif Force (cu ft)	1001.53	995.52
Weir Max Depth (ft)		Hydr Depth (ft)	5.56	5.66
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	41.34	41.58
Min El Prs (ft)	967.00	Conv. Total (cfs)	20704.1	20953.4
Delta EG (ft)	0.35	Top Width (ft)	34.28	34.03
Delta WS (ft)	0.34	Frctn Loss (ft)		
BR Open Area (sq ft)	975.20	C & E Loss (ft)		
BR Open Vel (ft/s)	7.61	Shear Total (lb/sq ft)	1.41	1.39
Coef of Q		Power Total (lb/ft s)	10.74	10.43
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #25yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	955.32	E.G. Elev (ft)	955.30	955.00
W.S. US. (ft)	954.20	W.S. Elev (ft)	954.16	953.90
Q Total (cfs)	1800.00	Crit W.S. (ft)	951.82	951.50
Q Bridge (cfs)	1800.00	Max Chl Dpth (ft)	8.45	8.19
Q Weir (cfs)		Vel Total (ft/s)	8.17	8.13
Weir Sta Lft (ft)		Flow Area (sq ft)	220.24	221.28
Weir Sta Rgt (ft)		Froude # Chl	0.56	0.56
Weir Submerg		Specif Force (cu ft)	1293.61	1286.23
Weir Max Depth (ft)		Hydr Depth (ft)	5.65	5.77
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	46.58	46.49
Min El Prs (ft)	967.00	Conv. Total (cfs)	25166.2	25285.9
Delta EG (ft)	0.37	Top Width (ft)	38.98	38.34
Delta WS (ft)	0.37	Frctn Loss (ft)		
BR Open Area (sq ft)	975.20	C & E Loss (ft)		
BR Open Vel (ft/s)	8.17	Shear Total (lb/sq ft)	1.51	1.51
Coef of Q		Power Total (lb/ft s)	12.34	12.25
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #50yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	955.97	E.G. Elev (ft)	955.93	955.62
W.S. US. (ft)	954.69	W.S. Elev (ft)	954.63	954.35
Q Total (cfs)	2060.00			

Q Bridge (cfs)	2060.00	Crit W.S. (ft)	952.32	952.01
Q Weir (cfs)		Max Chl Dpth (ft)	8.92	8.64
Weir Sta Lft (ft)		Vel Total (ft/s)	8.64	8.61
Weir Sta Rgt (ft)		Flow Area (sq ft)	238.49	239.15
Weir Submerg		Froude # Chl	0.59	0.58
Weir Max Depth (ft)		Specif Force (cu ft)	1505.70	1497.56
Min El Weir Flow (ft)	970.01	Hydr Depth (ft)	5.94	6.03
Min El Prs (ft)	967.00	W.P. Total (ft)	48.27	48.39
Delta EG (ft)	0.39	Conv. Total (cfs)	28009.7	28109.8
Delta WS (ft)	0.41	Top Width (ft)	40.12	39.69
BR Open Area (sq ft)	975.20	Frctn Loss (ft)		
BR Open Vel (ft/s)	8.64	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	1.67	1.66
Br Sel Method	Momentum	Power Total (lb/ft s)	14.41	14.27

BRIDGE OUTPUT Profile #100yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	956.56	E.G. Elev (ft)	956.49	956.18
W.S. US. (ft)	955.15	W.S. Elev (ft)	955.02	954.75
Q Total (cfs)	2310.00	Crit W.S. (ft)	952.81	952.47
Q Bridge (cfs)	2310.00	Max Chl Dpth (ft)	9.31	9.04
Q Weir (cfs)		Vel Total (ft/s)	9.07	9.03
Weir Sta Lft (ft)		Flow Area (sq ft)	254.66	255.70
Weir Sta Rgt (ft)		Froude # Chl	0.61	0.60
Weir Submerg		Specif Force (cu ft)	1713.35	1704.03
Weir Max Depth (ft)		Hydr Depth (ft)	6.07	5.90
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	50.69	52.97
Min El Prs (ft)	967.00	Conv. Total (cfs)	30570.9	30644.3
Delta EG (ft)	0.43	Top Width (ft)	41.94	43.34
Delta WS (ft)	0.47	Frctn Loss (ft)		
BR Open Area (sq ft)	975.20	C & E Loss (ft)		
BR Open Vel (ft/s)	9.07	Shear Total (lb/sq ft)	1.79	1.71
Coef of Q		Power Total (lb/ft s)	16.24	15.47
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #500yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	957.88	E.G. Elev (ft)	957.75	957.43
W.S. US. (ft)	956.16	W.S. Elev (ft)	955.86	955.58
Q Total (cfs)	2930.00	Crit W.S. (ft)	953.91	953.54
Q Bridge (cfs)	2930.00	Max Chl Dpth (ft)	10.15	9.87
Q Weir (cfs)		Vel Total (ft/s)	10.06	9.98
Weir Sta Lft (ft)		Flow Area (sq ft)	291.17	293.50
Weir Sta Rgt (ft)		Froude # Chl	0.66	0.65
Weir Submerg		Specif Force (cu ft)	2245.30	2233.62
Weir Max Depth (ft)		Hydr Depth (ft)	6.28	6.13
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	57.14	59.55
Min El Prs (ft)	967.00	Conv. Total (cfs)	36259.1	36362.1
Delta EG (ft)	0.50	Top Width (ft)	46.35	47.90
Delta WS (ft)	0.61	Frctn Loss (ft)		
BR Open Area (sq ft)	975.20	C & E Loss (ft)		
BR Open Vel (ft/s)	10.06	Shear Total (lb/sq ft)	2.08	2.00
Coef of Q		Power Total (lb/ft s)	20.90	19.94
Br Sel Method	Momentum			

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4485.049

INPUT
Description: 8
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	963.45	3.52	963.37	4.17	963.36	5.48	963.33	5.84	963.32
16.65	963.01	16.83	962.35	18.69	955.86	21.87	955.29	25.42	954.1
26.23	953.76	32.95	950.95	36.12	946.7	36.63	945.94	41.88	945.89
44.24	945.86	53.34	945.76	54.97	945.75	55.15	945.74	56.32	945.73
58.21	945.71	62.08	953.54	62.18	953.69	74.43	954.49	76.08	955.54
90.44	963.6								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	32.95	.04	62.18	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
32.95	62.18	123.05	123.21	122.55	.1	.3

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	952.22	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	0.63	Reach Len. (ft)	123.05	123.21	122.55
W.S. Elev (ft)	951.59	Flow Area (sq ft)	0.49	144.44	
Crit W.S. (ft)		Area (sq ft)	0.49	144.44	
E.G. Slope (ft/ft)	0.004331	Flow (cfs)	0.24	919.76	
Q Total (cfs)	920.00	Top Width (ft)	1.54	28.17	
Top Width (ft)	29.70	Avg. Vel. (ft/s)	0.48	6.37	
Vel Total (ft/s)	6.35	Hydr. Depth (ft)	0.32	5.13	
Max Chl Dpth (ft)	5.88	Conv. (cfs)	3.6	13975.6	
Conv. Total (cfs)	13979.2	Wetted Per. (ft)	1.66	34.36	
Length Wtd. (ft)	123.21	Shear (lb/sq ft)	0.08	1.14	
Min Ch El (ft)	945.71	Stream Power (lb/ft s)	0.04	7.24	
Alpha	1.01	Cum Volume (acre-ft)	2.50	17.96	1.48
Frctn Loss (ft)	0.56	Cum SA (acres)	2.51	3.84	1.38
C & E Loss (ft)	0.00				

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	953.15	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	0.78	Reach Len. (ft)	123.05	123.21	122.55
W.S. Elev (ft)	952.37	Flow Area (sq ft)	2.42	166.58	
Crit W.S. (ft)		Area (sq ft)	2.42	166.58	
E.G. Slope (ft/ft)	0.004567	Flow (cfs)	2.04	1177.96	
Q Total (cfs)	1180.00	Top Width (ft)	3.40	28.55	
Top Width (ft)	31.95	Avg. Vel. (ft/s)	0.84	7.07	
Vel Total (ft/s)	6.98	Hydr. Depth (ft)	0.71	5.83	
Max Chl Dpth (ft)	6.66	Conv. (cfs)	30.2	17431.7	
Conv. Total (cfs)	17461.9	Wetted Per. (ft)	3.69	35.23	
Length Wtd. (ft)	123.21	Shear (lb/sq ft)	0.19	1.35	
Min Ch El (ft)	945.71	Stream Power (lb/ft s)	0.16	9.53	
Alpha	1.02	Cum Volume (acre-ft)	2.05	21.01	0.33
Frctn Loss (ft)	0.58	Cum SA (acres)	1.79	4.04	0.24
C & E Loss (ft)	0.01				

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	953.97	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	0.94	Reach Len. (ft)	123.05	123.21	122.55
W.S. Elev (ft)	953.03	Flow Area (sq ft)	5.19	185.56	
Crit W.S. (ft)		Area (sq ft)	5.19	185.56	
E.G. Slope (ft/ft)	0.004924	Flow (cfs)	5.86	1444.14	
Q Total (cfs)	1450.00	Top Width (ft)	4.98	28.88	
Top Width (ft)	33.86	Avg. Vel. (ft/s)	1.13	7.78	
Vel Total (ft/s)	7.60	Hydr. Depth (ft)	1.04	6.43	
Max Chl Dpth (ft)	7.32	Conv. (cfs)	83.5	20580.4	
Conv. Total (cfs)	20663.9	Wetted Per. (ft)	5.40	35.97	
Length Wtd. (ft)	123.21	Shear (lb/sq ft)	0.30	1.59	
Min Ch El (ft)	945.71	Stream Power (lb/ft s)	0.33	12.34	
Alpha	1.04	Cum Volume (acre-ft)	7.47	23.29	4.09
Frctn Loss (ft)	0.62	Cum SA (acres)	4.01	4.18	3.10
C & E Loss (ft)	0.02				

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	954.96	Wt. n-Val.	0.090	0.040	0.100
Vel Head (ft)	1.13	Reach Len. (ft)	123.05	123.21	122.55
W.S. Elev (ft)	953.83	Flow Area (sq ft)	9.91	208.70	0.15
Crit W.S. (ft)		Area (sq ft)	9.91	208.70	0.15
E.G. Slope (ft/ft)	0.005229	Flow (cfs)	14.30	1785.67	0.03
Q Total (cfs)	1800.00	Top Width (ft)	6.89	29.23	2.14
Top Width (ft)	38.25	Avg. Vel. (ft/s)	1.44	8.56	0.18
Vel Total (ft/s)	8.23	Hydr. Depth (ft)	1.44	7.14	0.07
Max Chl Dpth (ft)	8.12	Conv. (cfs)	197.8	24694.3	0.4
Conv. Total (cfs)	24892.4	Wetted Per. (ft)	7.46	36.71	2.14
Length Wtd. (ft)	123.21	Shear (lb/sq ft)	0.43	1.86	0.02
Min Ch El (ft)	945.71	Stream Power (lb/ft s)	0.63	15.88	0.00
Alpha	1.07	Cum Volume (acre-ft)	11.81	26.93	6.95
Frctn Loss (ft)	0.63	Cum SA (acres)	4.94	4.32	4.49
C & E Loss (ft)	0.05				

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	955.58	Wt. n-Val.	0.090	0.040	0.100
Vel Head (ft)	1.29	Reach Len. (ft)	123.05	123.21	122.55
W.S. Elev (ft)	954.28	Flow Area (sq ft)	13.29	221.94	2.69
Crit W.S. (ft)					

E.G. Slope (ft/ft)	0.005544	Area (sq ft)	13.29	221.94	2.69
Q Total (cfs)	2060.00	Flow (cfs)	21.60	2037.08	1.32
Top Width (ft)	46.37	Top Width (ft)	8.07	29.23	9.07
Vel Total (ft/s)	8.66	Avg. Vel. (ft/s)	1.63	9.18	0.49
Max Chl Dpth (ft)	8.57	Hydr. Depth (ft)	1.65	7.59	0.30
Conv. Total (cfs)	27666.7	Conv. (cfs)	290.1	27358.9	17.7
Length Wtd. (ft)	123.20	Wetted Per. (ft)	8.74	36.71	9.09
Min Ch El (ft)	945.71	Shear (lb/sq ft)	0.53	2.09	0.10
Alpha	1.11	Stream Power (lb/ft s)	0.86	19.20	0.05
Frctn Loss (ft)	0.65	Cum Volume (acre-ft)	14.72	29.13	9.40
C & E Loss (ft)	0.07	Cum SA (acres)	5.34	4.40	5.43

CROSS SECTION OUTPUT Profile #100yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	956.13	Element			
Vel Head (ft)	1.45	Wt. n-Val.	0.090	0.040	0.100
W.S. Elev (ft)	954.68	Reach Len. (ft)	123.05	123.21	122.55
Crit W.S. (ft)		Flow Area (sq ft)	16.72	233.51	7.23
E.G. Slope (ft/ft)	0.005835	Area (sq ft)	16.72	233.51	7.23
Q Total (cfs)	2310.00	Flow (cfs)	29.73	2274.60	5.66
Top Width (ft)	51.03	Top Width (ft)	9.26	29.23	12.55
Vel Total (ft/s)	8.97	Avg. Vel. (ft/s)	1.78	9.74	0.78
Max Chl Dpth (ft)	8.97	Hydr. Depth (ft)	1.81	7.99	0.58
Conv. Total (cfs)	30242.0	Conv. (cfs)	389.2	29778.5	74.2
Length Wtd. (ft)	123.20	Wetted Per. (ft)	9.98	36.71	12.63
Min Ch El (ft)	945.71	Shear (lb/sq ft)	0.61	2.32	0.21
Alpha	1.16	Stream Power (lb/ft s)	1.08	22.57	0.16
Frctn Loss (ft)	0.66	Cum Volume (acre-ft)	17.18	31.36	12.72
C & E Loss (ft)	0.10	Cum SA (acres)	5.60	4.46	6.56

CROSS SECTION OUTPUT Profile #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	957.38	Element			
Vel Head (ft)	1.83	Wt. n-Val.	0.090	0.040	0.100
W.S. Elev (ft)	955.55	Reach Len. (ft)	123.05	123.21	122.55
Crit W.S. (ft)		Flow Area (sq ft)	26.04	259.08	18.81
E.G. Slope (ft/ft)	0.006474	Area (sq ft)	26.04	259.08	18.81
Q Total (cfs)	2930.00	Flow (cfs)	53.89	2849.07	27.05
Top Width (ft)	55.70	Top Width (ft)	12.55	29.23	13.92
Vel Total (ft/s)	9.64	Avg. Vel. (ft/s)	2.07	11.00	1.44
Max Chl Dpth (ft)	9.84	Hydr. Depth (ft)	2.08	8.86	1.35
Conv. Total (cfs)	36413.7	Conv. (cfs)	669.7	35407.8	336.1
Length Wtd. (ft)	123.19	Wetted Per. (ft)	13.40	36.71	14.26
Min Ch El (ft)	945.71	Shear (lb/sq ft)	0.79	2.85	0.53
Alpha	1.27	Stream Power (lb/ft s)	1.63	31.37	0.77
Frctn Loss (ft)	0.68	Cum Volume (acre-ft)	23.49	36.12	20.51
C & E Loss (ft)	0.17	Cum SA (acres)	6.22	4.52	8.30

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: Hope Creek
REACH: 1 RS: 4361.840

INPUT
Description: 9
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	962.69	6.91	962.51	8.76	962.46	10.72	962.42	12.4	954.7
12.5	954.31	12.67	954.25	13.15	954.08	14.04	953.78	14.58	953.6
15.31	953.34	16.24	951.74	19.82	945.6	31.24	945.61	34.44	945.61
40.9	945.67	44.56	947.95	46.06	948.99	48.39	950.6	51.59	952.81
84.6	952.41	90.38	955.59	105.23	964.09	108.02	964.18	111.62	964.54

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.09	15.31	.04	51.59	.1	84.6	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
15.31	51.59	19	18.54	18	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	951.66	Element			
Vel Head (ft)	0.62	Wt. n-Val.		0.040	
W.S. Elev (ft)	951.04	Reach Len. (ft)	4.00	4.00	4.00

Crit W.S. (ft)	949.27	Flow Area (sq ft)		145.38	
E.G. Slope (ft/ft)	0.004701	Area (sq ft)		145.38	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	32.38	Top Width (ft)		32.38	
Vel Total (ft/s)	6.33	Avg. Vel. (ft/s)		6.33	
Max Chl Dpth (ft)	5.44	Hydr. Depth (ft)		4.49	
Conv. Total (cfs)	13417.5	Conv. (cfs)		13417.5	
Length Wtd. (ft)	4.00	Wetted Per. (ft)		37.13	
Min Ch El (ft)	945.60	Shear (lb/sq ft)		1.15	
Alpha	1.00	Stream Power (lb/ft s)		7.27	
Frctn Loss (ft)		Cum Volume (acre-ft)	2.50	17.55	1.48
C & E Loss (ft)		Cum SA (acres)	2.51	3.75	1.38

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	952.56	Wt. n-Val.		0.040	
Vel Head (ft)	0.74	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	951.82	Flow Area (sq ft)		171.15	
Crit W.S. (ft)	949.88	Area (sq ft)		171.15	
E.G. Slope (ft/ft)	0.004859	Flow (cfs)		1180.00	
Q Total (cfs)	1180.00	Top Width (ft)		33.96	
Top Width (ft)	33.96	Avg. Vel. (ft/s)		6.89	
Vel Total (ft/s)	6.89	Hydr. Depth (ft)		5.04	
Max Chl Dpth (ft)	6.22	Conv. (cfs)		16928.4	
Conv. Total (cfs)	16928.4	Wetted Per. (ft)		39.39	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		1.32	
Min Ch El (ft)	945.60	Stream Power (lb/ft s)		9.09	
Alpha	1.00	Cum Volume (acre-ft)	2.05	20.53	0.33
Frctn Loss (ft)		Cum SA (acres)	1.78	3.95	0.24
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	953.33	Wt. n-Val.		0.040	0.098
Vel Head (ft)	0.88	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	952.45	Flow Area (sq ft)		193.07	0.07
Crit W.S. (ft)	950.46	Area (sq ft)		193.07	0.07
E.G. Slope (ft/ft)	0.005219	Flow (cfs)		1449.99	0.01
Q Total (cfs)	1450.00	Top Width (ft)		35.24	3.52
Top Width (ft)	38.77	Avg. Vel. (ft/s)		7.51	0.08
Vel Total (ft/s)	7.51	Hydr. Depth (ft)		5.48	0.02
Max Chl Dpth (ft)	6.85	Conv. (cfs)		20071.4	0.1
Conv. Total (cfs)	20071.5	Wetted Per. (ft)		41.24	3.53
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		1.53	0.01
Min Ch El (ft)	945.60	Stream Power (lb/ft s)		11.46	0.00
Alpha	1.00	Cum Volume (acre-ft)	7.47	22.76	4.09
Frctn Loss (ft)		Cum SA (acres)	4.00	4.09	3.09
C & E Loss (ft)					

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	954.28	Wt. n-Val.		0.040	0.100
Vel Head (ft)	0.97	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	953.30	Flow Area (sq ft)		223.59	23.57
Crit W.S. (ft)	951.14	Area (sq ft)		223.59	23.57
E.G. Slope (ft/ft)	0.005079	Flow (cfs)		1780.73	19.27
Q Total (cfs)	1800.00	Top Width (ft)		36.26	34.63
Top Width (ft)	70.89	Avg. Vel. (ft/s)		7.96	0.82
Vel Total (ft/s)	7.28	Hydr. Depth (ft)		6.17	0.68
Max Chl Dpth (ft)	7.70	Conv. (cfs)		24987.0	270.3
Conv. Total (cfs)	25257.3	Wetted Per. (ft)		42.85	34.86
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		1.65	0.21
Min Ch El (ft)	945.60	Stream Power (lb/ft s)		13.18	0.18
Alpha	1.18	Cum Volume (acre-ft)	11.79	26.32	6.91
Frctn Loss (ft)		Cum SA (acres)	4.93	4.23	4.44
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	954.86	Wt. n-Val.	0.090	0.040	0.100
Vel Head (ft)	1.05	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	953.80	Flow Area (sq ft)	0.31	241.82	41.19
Crit W.S. (ft)	951.61	Area (sq ft)	0.31	241.82	41.19
E.G. Slope (ft/ft)	0.005001	Flow (cfs)	0.13	2012.12	47.75
Q Total (cfs)	2060.00	Top Width (ft)	1.34	36.28	35.54
Top Width (ft)	73.17				

Vel Total (ft/s)	7.27	Avg. Vel. (ft/s)	0.42	8.32	1.16
Max Chl Dpth (ft)	8.20	Hydr. Depth (ft)	0.23	6.67	1.16
Conv. Total (cfs)	29130.6	Conv. (cfs)	1.8	28453.5	675.2
Length Wtd. (ft)	4.00	Wetted Per. (ft)	1.42	42.90	35.91
Min Ch El (ft)	945.60	Shear (lb/sq ft)	0.07	1.76	0.36
Alpha	1.28	Stream Power (lb/ft s)	0.03	14.64	0.42
Frctn Loss (ft)		Cum Volume (acre-ft)	14.70	28.47	9.33
C & E Loss (ft)		Cum SA (acres)	5.32	4.30	5.37

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	955.37	Wt. n-Val.	0.090	0.040	0.101
Vel Head (ft)	1.12	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	954.25	Flow Area (sq ft)	1.20	258.04	57.27
Crit W.S. (ft)	952.03	Area (sq ft)	1.20	258.04	57.27
E.G. Slope (ft/ft)	0.004939	Flow (cfs)	0.79	2228.15	81.06
Q Total (cfs)	2310.00	Top Width (ft)	2.64	36.28	36.36
Top Width (ft)	75.28	Avg. Vel. (ft/s)	0.66	8.63	1.42
Vel Total (ft/s)	7.30	Hydr. Depth (ft)	0.45	7.11	1.58
Max Chl Dpth (ft)	8.65	Conv. (cfs)	11.3	31705.5	1153.5
Conv. Total (cfs)	32870.3	Wetted Per. (ft)	2.80	42.90	36.83
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.13	1.85	0.48
Min Ch El (ft)	945.60	Stream Power (lb/ft s)	0.09	16.02	0.68
Alpha	1.35	Cum Volume (acre-ft)	17.16	30.66	12.63
Frctn Loss (ft)		Cum SA (acres)	5.58	4.37	6.49
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	956.53	Wt. n-Val.	0.090	0.040	0.101
Vel Head (ft)	1.27	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	955.26	Flow Area (sq ft)	4.15	294.71	94.94
Crit W.S. (ft)	953.33	Area (sq ft)	4.15	294.71	94.94
E.G. Slope (ft/ft)	0.004813	Flow (cfs)	4.91	2744.81	180.28
Q Total (cfs)	2930.00	Top Width (ft)	3.03	36.28	38.19
Top Width (ft)	77.51	Avg. Vel. (ft/s)	1.18	9.31	1.90
Vel Total (ft/s)	7.44	Hydr. Depth (ft)	1.37	8.12	2.49
Max Chl Dpth (ft)	9.66	Conv. (cfs)	70.7	39564.2	2598.6
Conv. Total (cfs)	42233.5	Wetted Per. (ft)	3.95	42.90	38.93
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.32	2.06	0.73
Min Ch El (ft)	945.60	Stream Power (lb/ft s)	0.37	19.23	1.39
Alpha	1.47	Cum Volume (acre-ft)	23.45	35.33	20.35
Frctn Loss (ft)	0.02	Cum SA (acres)	6.20	4.42	8.23
C & E Loss (ft)	0.01				

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 4354

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
0 970	967	200 970	967

Upstream Bridge Cross Section Data
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	962.64	6.91	962.46	8.76	962.41	10.72	962.37	12.4	954.65
12.5	954.26	12.67	954.2	13.15	954.03	14.04	953.73	14.58	953.55
15.31	953.29	16.24	951.69	19.82	945.55	31.24	945.56	34.44	945.56
40.9	945.62	44.56	947.9	46.06	948.94	48.39	950.55	51.59	952.76
84.6	952.36	90.38	955.54	105.23	964.04	108.02	964.13	111.62	964.49

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.09	15.31	.04	51.59	.1	84.6	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
15.31	51.59	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	970	967	200	970	967

Downstream Bridge Cross Section Data
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	962.87	2.83	962.81	5.38	962.77	7.5	962.71	17.43	962.46
17.94	962.45	18.38	960.43	19.76	954.5	22.42	953.61	22.55	953.56
23.4	952.13	25.1	949.22	27.32	945.47	31.59	945.48	47.83	945.63
55.92	950.67	56.85	951.25	59.44	953.03	91.48	952.85	104.1	959.81
112.56	964.65	114.13	964.7	121.89	965.49				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.09	22.55	.04	59.44	.1	91.48	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
22.55	59.44	.1	.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data
Pier Station Upstream= 60.58 Downstream= 67.63
Upstream num= 2

Width	Elev	Width	Elev
8	945	8	970

Downstream num= 2

Width	Elev	Width	Elev
8	945	8	970

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Momentum Cd = 2
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 #2yr

			Inside BR US	Inside BR DS
E.G. US. (ft)	951.66	Element		
W.S. US. (ft)	951.04	E.G. Elev (ft)	951.59	951.59
Q Total (cfs)	920.00	W.S. Elev (ft)	950.97	950.94
Q Bridge (cfs)	920.00	Crit W.S. (ft)	949.21	949.25
Q Weir (cfs)		Max Chl Dpth (ft)	5.42	5.47
Weir Sta Lft (ft)		Vel Total (ft/s)	6.36	6.46
Weir Sta Rgt (ft)		Flow Area (sq ft)	144.55	142.37
Weir Submerg		Froude # Chl	0.53	0.54
Weir Max Depth (ft)		Specif Force (cu ft)	544.64	540.54
Min El Weir Flow (ft)	970.01	Hydr Depth (ft)	4.47	4.41
Min El Prs (ft)	967.00	W.P. Total (ft)	37.05	36.91
Delta EG (ft)	0.12	Conv. Total (cfs)	13307.2	13007.1
Delta WS (ft)	0.11	Top Width (ft)	32.33	32.26
BR Open Area (sq ft)	1385.47	Frctn Loss (ft)		
BR Open Vel (ft/s)	6.46	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	1.16	1.20
Br Sel Method	Momentum	Power Total (lb/ft s)	7.41	7.78

BRIDGE OUTPUT Profile #5yr

			Inside BR US	Inside BR DS
E.G. US. (ft)	952.56	Element		
W.S. US. (ft)	951.82	E.G. Elev (ft)	952.49	952.48
Q Total (cfs)	1180.00	W.S. Elev (ft)	951.74	951.71
Q Bridge (cfs)	1180.00	Crit W.S. (ft)	949.82	949.86

Q Weir (cfs)		Max Chl Dpth (ft)	6.19	6.24
Weir Sta Lft (ft)		Vel Total (ft/s)	6.93	7.03
Weir Sta Rgt (ft)		Flow Area (sq ft)	170.17	167.87
Weir Submerg		Froude # Chl	0.55	0.56
Weir Max Depth (ft)		Specif Force (cu ft)	738.57	732.98
Min El Weir Flow (ft)	970.01	Hydr Depth (ft)	5.02	4.95
Min El Prs (ft)	967.00	W.P. Total (ft)	39.31	39.20
Delta EG (ft)	0.12	Conv. Total (cfs)	16791.2	16444.1
Delta WS (ft)	0.11	Top Width (ft)	33.90	33.88
BR Open Area (sq ft)	824.99	Frctn Loss (ft)		
BR Open Vel (ft/s)	7.03	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	1.33	1.38
Br Sel Method	Momentum	Power Total (lb/ft s)	9.26	9.68

BRIDGE OUTPUT Profile #10yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	953.33	E.G. Elev (ft)	953.26	953.25
W.S. US. (ft)	952.45	W.S. Elev (ft)	952.37	952.35
Q Total (cfs)	1450.00	Crit W.S. (ft)	950.41	950.46
Q Bridge (cfs)	1450.00	Max Chl Dpth (ft)	6.82	6.88
Q Weir (cfs)		Vel Total (ft/s)	7.55	7.64
Weir Sta Lft (ft)		Flow Area (sq ft)	192.00	189.73
Weir Sta Rgt (ft)		Froude # Chl	0.57	0.58
Weir Submerg		Specif Force (cu ft)	938.94	932.69
Weir Max Depth (ft)		Hydr Depth (ft)	5.31	5.39
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	42.11	41.06
Min El Prs (ft)	967.00	Conv. Total (cfs)	19914.8	19554.4
Delta EG (ft)	0.12	Top Width (ft)	36.14	35.18
Delta WS (ft)	0.11	Frctn Loss (ft)		
BR Open Area (sq ft)	1385.47	C & E Loss (ft)		
BR Open Vel (ft/s)	7.64	Shear Total (lb/sq ft)	1.51	1.59
Coef of Q		Power Total (lb/ft s)	11.40	12.12
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #25yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	954.28	E.G. Elev (ft)	954.17	954.18
W.S. US. (ft)	953.30	W.S. Elev (ft)	953.15	953.13
Q Total (cfs)	1800.00	Crit W.S. (ft)	951.10	951.14
Q Bridge (cfs)	1800.00	Max Chl Dpth (ft)	7.60	7.66
Q Weir (cfs)		Vel Total (ft/s)	7.62	8.09
Weir Sta Lft (ft)		Flow Area (sq ft)	236.10	222.57
Weir Sta Rgt (ft)		Froude # Chl	0.58	0.60
Weir Submerg		Specif Force (cu ft)	1216.21	1208.69
Weir Max Depth (ft)		Hydr Depth (ft)	3.77	3.64
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	70.40	68.06
Min El Prs (ft)	967.00	Conv. Total (cfs)	24532.1	23809.2
Delta EG (ft)	0.14	Top Width (ft)	62.65	61.17
Delta WS (ft)	0.18	Frctn Loss (ft)		
BR Open Area (sq ft)	1385.47	C & E Loss (ft)		
BR Open Vel (ft/s)	8.09	Shear Total (lb/sq ft)	1.13	1.17
Coef of Q		Power Total (lb/ft s)	8.59	9.44
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #50yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	954.86	E.G. Elev (ft)	954.73	954.76
W.S. US. (ft)	953.80	W.S. Elev (ft)	953.61	953.59
Q Total (cfs)	2060.00	Crit W.S. (ft)	951.57	951.61
Q Bridge (cfs)	2060.00	Max Chl Dpth (ft)	8.06	8.12
Q Weir (cfs)		Vel Total (ft/s)	7.78	8.20
Weir Sta Lft (ft)		Flow Area (sq ft)	264.88	251.34
Weir Sta Rgt (ft)		Froude # Chl	0.59	0.61
Weir Submerg		Specif Force (cu ft)	1420.34	1411.94
Weir Max Depth (ft)		Hydr Depth (ft)	4.11	4.03
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	73.36	70.55
Min El Prs (ft)	967.00	Conv. Total (cfs)	27821.5	26955.2
Delta EG (ft)	0.14	Top Width (ft)	64.45	62.35
Delta WS (ft)	0.20	Frctn Loss (ft)		
BR Open Area (sq ft)	1385.47	C & E Loss (ft)		
BR Open Vel (ft/s)	8.20	Shear Total (lb/sq ft)	1.24	1.30
Coef of Q		Power Total (lb/ft s)	9.61	10.65
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #100yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	955.37	E.G. Elev (ft)	955.24	955.28
W.S. US. (ft)	954.25			

Q Total (cfs)	2310.00	W.S. Elev (ft)	954.01	954.00
Q Bridge (cfs)	2310.00	Crit W.S. (ft)	952.00	952.03
Q Weir (cfs)		Max Chl Dpth (ft)	8.46	8.53
Weir Sta Lft (ft)		Vel Total (ft/s)	7.92	8.32
Weir Sta Rgt (ft)		Flow Area (sq ft)	291.58	277.51
Weir Submerg		Froude # Chl	0.60	0.62
Weir Max Depth (ft)		Specif Force (cu ft)	1624.01	1613.41
Min El Weir Flow (ft)	970.01	Hydr Depth (ft)	4.39	4.31
Min El Prs (ft)	967.00	W.P. Total (ft)	76.30	73.52
Delta EG (ft)	0.14	Conv. Total (cfs)	31032.1	30131.5
Delta WS (ft)	0.21	Top Width (ft)	66.41	64.33
BR Open Area (sq ft)	1385.47	Frctn Loss (ft)		
BR Open Vel (ft/s)	8.32	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	1.32	1.38
Br Sel Method	Momentum	Power Total (lb/ft s)	10.47	11.53

BRIDGE OUTPUT Profile #500yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	956.53	E.G. Elev (ft)	956.50	956.45
W.S. US. (ft)	955.26	W.S. Elev (ft)	955.13	954.95
Q Total (cfs)	2930.00	Crit W.S. (ft)	953.20	953.18
Q Bridge (cfs)	2930.00	Max Chl Dpth (ft)	9.58	9.48
Q Weir (cfs)		Vel Total (ft/s)	7.98	8.61
Weir Sta Lft (ft)		Flow Area (sq ft)	367.26	340.29
Weir Sta Rgt (ft)		Froude # Chl	0.60	0.63
Weir Submerg		Specif Force (cu ft)	2200.02	2143.97
Weir Max Depth (ft)		Hydr Depth (ft)	5.30	5.03
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	82.45	79.40
Min El Prs (ft)	967.00	Conv. Total (cfs)	40654.7	38112.2
Delta EG (ft)	0.16	Top Width (ft)	69.33	67.63
Delta WS (ft)	0.27	Frctn Loss (ft)	0.03	0.05
BR Open Area (sq ft)	1385.47	C & E Loss (ft)	0.01	0.04
BR Open Vel (ft/s)	8.61	Shear Total (lb/sq ft)	1.44	1.58
Coef of Q		Power Total (lb/ft s)	11.52	13.62
Br Sel Method	Energy only			

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4343.304

INPUT
Description: 10
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	962.75	2.83	962.69	5.38	962.65	7.5	962.59	17.43	962.34
17.94	962.33	18.38	960.31	19.76	954.38	22.42	953.49	22.55	953.44
23.4	952.01	25.1	949.1	27.32	945.35	31.59	945.36	47.83	945.51
55.92	950.55	56.85	951.13	59.44	952.91	91.48	952.73	104.1	959.69
112.56	964.53	114.13	964.58	121.89	965.37				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.09	22.55	.04	59.44	.1	91.48	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
22.55	59.44	119.24	120.83	121.61	.1	.3

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	951.55	Wt. n-Val.		0.040	
Vel Head (ft)	0.62	Reach Len. (ft)	119.24	120.83	121.61
W.S. Elev (ft)	950.93	Flow Area (sq ft)		145.79	
Crit W.S. (ft)		Area (sq ft)		145.79	
E.G. Slope (ft/ft)	0.004676	Flow (cfs)		920.00	
Q Total (cfs)	920.00	Top Width (ft)		32.50	
Top Width (ft)	32.50	Avg. Vel. (ft/s)		6.31	
Vel Total (ft/s)	6.31	Hydr. Depth (ft)		4.49	
Max Chl Dpth (ft)	5.58	Conv. (cfs)		13453.6	
Conv. Total (cfs)	13453.6	Wetted Per. (ft)		37.23	
Length Wtd. (ft)	120.83	Shear (lb/sq ft)		1.14	
Min Ch El (ft)	945.35	Stream Power (lb/ft s)		7.21	
Alpha	1.00	Cum Volume (acre-ft)	2.50	17.49	1.48
Frctn Loss (ft)	0.47	Cum SA (acres)	2.51	3.74	1.38
C & E Loss (ft)	0.04				

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	952.44	Wt. n-Val.		0.040	
Vel Head (ft)	0.73	Reach Len. (ft)	119.24	120.83	121.61
W.S. Elev (ft)	951.71	Flow Area (sq ft)		171.66	
Crit W.S. (ft)		Area (sq ft)		171.66	
E.G. Slope (ft/ft)	0.004833	Flow (cfs)		1180.00	
Q Total (cfs)	1180.00	Top Width (ft)		34.11	
Top Width (ft)	34.11	Avg. Vel. (ft/s)		6.87	
Vel Total (ft/s)	6.87	Hydr. Depth (ft)		5.03	
Max Chl Dpth (ft)	6.36	Conv. (cfs)		16973.7	
Conv. Total (cfs)	16973.7	Wetted Per. (ft)		39.53	
Length Wtd. (ft)	120.83	Shear (lb/sq ft)		1.31	
Min Ch El (ft)	945.35	Stream Power (lb/ft s)		9.01	
Alpha	1.00	Cum Volume (acre-ft)	2.05	20.46	0.33
Frctn Loss (ft)	0.50	Cum SA (acres)	1.78	3.94	0.24
C & E Loss (ft)	0.05				

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	953.21	Wt. n-Val.		0.040	
Vel Head (ft)	0.87	Reach Len. (ft)	119.24	120.83	121.61
W.S. Elev (ft)	952.34	Flow Area (sq ft)		193.74	
Crit W.S. (ft)		Area (sq ft)		193.74	
E.G. Slope (ft/ft)	0.005184	Flow (cfs)		1450.00	
Q Total (cfs)	1450.00	Top Width (ft)		35.41	
Top Width (ft)	35.41	Avg. Vel. (ft/s)		7.48	
Vel Total (ft/s)	7.48	Hydr. Depth (ft)		5.47	
Max Chl Dpth (ft)	6.99	Conv. (cfs)		20139.8	
Conv. Total (cfs)	20139.8	Wetted Per. (ft)		41.39	
Length Wtd. (ft)	120.83	Shear (lb/sq ft)		1.51	
Min Ch El (ft)	945.35	Stream Power (lb/ft s)		11.34	
Alpha	1.00	Cum Volume (acre-ft)	7.47	22.68	4.09
Frctn Loss (ft)	0.54	Cum SA (acres)	4.00	4.07	3.09
C & E Loss (ft)	0.05				

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	954.13	Wt. n-Val.		0.040	0.100
Vel Head (ft)	1.01	Reach Len. (ft)	119.24	120.83	121.61
W.S. Elev (ft)	953.12	Flow Area (sq ft)		221.83	9.67
Crit W.S. (ft)		Area (sq ft)		221.83	9.67
E.G. Slope (ft/ft)	0.005374	Flow (cfs)		1795.33	4.67
Q Total (cfs)	1800.00	Top Width (ft)		36.70	32.74
Top Width (ft)	69.44	Avg. Vel. (ft/s)		8.09	0.48
Vel Total (ft/s)	7.78	Hydr. Depth (ft)		6.04	0.30
Max Chl Dpth (ft)	7.77	Conv. (cfs)		24491.2	63.7
Conv. Total (cfs)	24554.8	Wetted Per. (ft)		43.30	32.84
Length Wtd. (ft)	120.84	Shear (lb/sq ft)		1.72	0.10
Min Ch El (ft)	945.35	Stream Power (lb/ft s)		13.91	0.05
Alpha	1.08	Cum Volume (acre-ft)	11.79	26.22	6.91
Frctn Loss (ft)	0.55	Cum SA (acres)	4.93	4.21	4.43
C & E Loss (ft)	0.07				

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	954.71	Wt. n-Val.	0.090	0.040	0.100
Vel Head (ft)	1.11	Reach Len. (ft)	119.24	120.83	121.61
W.S. Elev (ft)	953.60	Flow Area (sq ft)	0.04	239.74	25.80
Crit W.S. (ft)		Area (sq ft)	0.04	239.74	25.80
E.G. Slope (ft/ft)	0.005399	Flow (cfs)	0.01	2036.35	23.64
Q Total (cfs)	2060.00	Top Width (ft)	0.47	36.89	33.62
Top Width (ft)	70.98	Avg. Vel. (ft/s)	0.22	8.49	0.92
Vel Total (ft/s)	7.76	Hydr. Depth (ft)	0.08	6.50	0.77
Max Chl Dpth (ft)	8.25	Conv. (cfs)	0.1	27713.4	321.7
Conv. Total (cfs)	28035.3	Wetted Per. (ft)	0.50	43.67	33.85
Length Wtd. (ft)	120.85	Shear (lb/sq ft)	0.03	1.85	0.26
Min Ch El (ft)	945.35	Stream Power (lb/ft s)	0.01	15.72	0.24
Alpha	1.19	Cum Volume (acre-ft)	14.70	28.37	9.32
Frctn Loss (ft)	0.54	Cum SA (acres)	5.32	4.29	5.36
C & E Loss (ft)	0.09				

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	955.23	Wt. n-Val.	0.090	0.040	0.100
Vel Head (ft)	1.19	Reach Len. (ft)	119.24	120.83	121.61
W.S. Elev (ft)	954.04	Flow Area (sq ft)	0.53	255.80	40.61
Crit W.S. (ft)		Area (sq ft)	0.53	255.80	40.61
E.G. Slope (ft/ft)	0.005359	Flow (cfs)	0.27	2260.27	49.46
Q Total (cfs)	2310.00				

Top Width (ft)	73.07	Top Width (ft)	1.77	36.89	34.41
Vel Total (ft/s)	7.78	Avg. Vel. (ft/s)	0.52	8.84	1.22
Max Chl Dpth (ft)	8.69	Hydr. Depth (ft)	0.30	6.93	1.18
Conv. Total (cfs)	31555.2	Conv. (cfs)	3.7	30875.9	675.6
Length Wtd. (ft)	120.86	Wetted Per. (ft)	1.87	43.67	34.75
Min Ch El (ft)	945.35	Shear (lb/sq ft)	0.09	1.96	0.39
Alpha	1.26	Stream Power (lb/ft s)	0.05	17.32	0.48
Frctn Loss (ft)	0.53	Cum Volume (acre-ft)	17.16	30.55	12.61
C & E Loss (ft)	0.10	Cum SA (acres)	5.58	4.35	6.48

CROSS SECTION OUTPUT Profile #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	956.36	Wt. n-Val.	0.090	0.040	0.101
Vel Head (ft)	1.37	Reach Len. (ft)	119.24	120.83	121.61
W.S. Elev (ft)	954.99	Flow Area (sq ft)	3.06	291.01	74.29
Crit W.S. (ft)		Area (sq ft)	3.06	291.01	74.29
E.G. Slope (ft/ft)	0.005334	Flow (cfs)	3.32	2795.69	130.99
Q Total (cfs)	2930.00	Top Width (ft)	2.93	36.89	36.14
Top Width (ft)	75.97	Avg. Vel. (ft/s)	1.09	9.61	1.76
Vel Total (ft/s)	7.95	Hydr. Depth (ft)	1.04	7.89	2.06
Max Chl Dpth (ft)	9.64	Conv. (cfs)	45.5	38280.1	1793.6
Conv. Total (cfs)	40119.2	Wetted Per. (ft)	3.57	43.67	36.73
Length Wtd. (ft)	120.88	Shear (lb/sq ft)	0.28	2.22	0.67
Min Ch El (ft)	945.35	Stream Power (lb/ft s)	0.31	21.32	1.19
Alpha	1.39	Cum Volume (acre-ft)	23.44	35.21	20.32
Frctn Loss (ft)	0.51	Cum SA (acres)	6.19	4.41	8.22
C & E Loss (ft)	0.13				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4222.473

INPUT
Description: 11
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	962.49	5.38	962.43	12.33	962.3	17.83	962.21	25.34	962.02
31.08	961.87	36.85	961.65	37.69	961.61	43.31	961.38	44.12	957.35
45.03	953.38	45.83	953.06	47.12	952.47	48.19	951.2	48.86	950.4
52.74	944.93	60.13	944.92	70.85	944.9	72.54	944.9	74.62	944.89
76.22	944.89	77.09	945.5	85.57	951.55	87.81	952.34	122	952.05
141.61	951.88	143.22	952.51	143.95	952.88	145.07	953.51	155.2	959.17
163.34	964.05	164.81	964.57	166.55	964.78	177.49	965.36	179.37	965.75

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.09	47.12	.04	87.81	.1	122	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
47.12	87.81	17.55	18	17.71	.1	.3

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	951.03	Wt. n-Val.		0.040	
Vel Head (ft)	0.48	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	950.56	Flow Area (sq ft)		166.33	
Crit W.S. (ft)	948.33	Area (sq ft)		166.33	
E.G. Slope (ft/ft)	0.003333	Flow (cfs)		920.00	
Q Total (cfs)	920.00	Top Width (ft)		35.45	
Top Width (ft)	35.45	Avg. Vel. (ft/s)		5.53	
Vel Total (ft/s)	5.53	Hydr. Depth (ft)		4.69	
Max Chl Dpth (ft)	5.67	Conv. (cfs)		15935.5	
Conv. Total (cfs)	15935.5	Wetted Per. (ft)		40.16	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		0.86	
Min Ch El (ft)	944.89	Stream Power (lb/ft s)		4.77	
Alpha	1.00	Cum Volume (acre-ft)	2.50	17.06	1.48
Frctn Loss (ft)		Cum SA (acres)	2.51	3.64	1.38
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	951.90	Wt. n-Val.		0.040	
Vel Head (ft)	0.57	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	951.32	Flow Area (sq ft)		194.14	
Crit W.S. (ft)	948.91	Area (sq ft)		194.14	
E.G. Slope (ft/ft)	0.003529	Flow (cfs)		1180.00	
Q Total (cfs)	1180.00				

Top Width (ft)	37.16	Top Width (ft)		37.16	
Vel Total (ft/s)	6.08	Avg. Vel. (ft/s)		6.08	
Max Chl Dpth (ft)	6.43	Hydr. Depth (ft)		5.22	
Conv. Total (cfs)	19862.7	Conv. (cfs)		19862.7	
Length Wtd. (ft)	4.00	Wetted Per. (ft)		42.48	
Min Ch El (ft)	944.89	Shear (lb/sq ft)		1.01	
Alpha	1.00	Stream Power (lb/ft s)		6.12	
Frctn Loss (ft)		Cum Volume (acre-ft)	2.05	19.95	0.33
C & E Loss (ft)		Cum SA (acres)	1.78	3.84	0.24

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	952.61	Wt. n-Val.		0.040	0.120
Vel Head (ft)	0.69	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	951.92	Flow Area (sq ft)		216.85	0.09
Crit W.S. (ft)	949.46	Area (sq ft)		216.85	0.09
E.G. Slope (ft/ft)	0.003952	Flow (cfs)		1450.00	0.01
Q Total (cfs)	1450.00	Top Width (ft)		39.03	4.63
Top Width (ft)	43.66	Avg. Vel. (ft/s)		6.69	0.06
Vel Total (ft/s)	6.68	Hydr. Depth (ft)		5.56	0.02
Max Chl Dpth (ft)	7.03	Conv. (cfs)		23063.9	0.1
Conv. Total (cfs)	23063.9	Wetted Per. (ft)		44.76	4.64
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		1.20	0.00
Min Ch El (ft)	944.89	Stream Power (lb/ft s)		7.99	0.00
Alpha	1.00	Cum Volume (acre-ft)	7.47	22.11	4.09
Frctn Loss (ft)		Cum SA (acres)	4.00	3.97	3.08
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	953.51	Wt. n-Val.	0.090	0.040	0.109
Vel Head (ft)	0.78	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	952.73	Flow Area (sq ft)	0.07	249.33	34.02
Crit W.S. (ft)	950.11	Area (sq ft)	0.07	249.33	34.02
E.G. Slope (ft/ft)	0.003958	Flow (cfs)	0.02	1778.86	21.12
Q Total (cfs)	1800.00	Top Width (ft)	0.56	40.69	55.84
Top Width (ft)	97.09	Avg. Vel. (ft/s)	0.25	7.13	0.62
Vel Total (ft/s)	6.35	Hydr. Depth (ft)	0.13	6.13	0.61
Max Chl Dpth (ft)	7.84	Conv. (cfs)	0.3	28274.1	335.7
Conv. Total (cfs)	28610.1	Wetted Per. (ft)	0.62	46.75	56.01
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.03	1.32	0.15
Min Ch El (ft)	944.89	Stream Power (lb/ft s)	0.01	9.40	0.09
Alpha	1.25	Cum Volume (acre-ft)	11.79	25.57	6.85
Frctn Loss (ft)		Cum SA (acres)	4.93	4.11	4.31
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	954.08	Wt. n-Val.	0.090	0.040	0.108
Vel Head (ft)	0.82	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	953.26	Flow Area (sq ft)	0.69	271.06	64.12
Crit W.S. (ft)	950.56	Area (sq ft)	0.69	271.06	64.12
E.G. Slope (ft/ft)	0.003790	Flow (cfs)	0.35	2000.95	58.70
Q Total (cfs)	2060.00	Top Width (ft)	1.79	40.69	56.82
Top Width (ft)	99.30	Avg. Vel. (ft/s)	0.51	7.38	0.92
Vel Total (ft/s)	6.13	Hydr. Depth (ft)	0.39	6.66	1.13
Max Chl Dpth (ft)	8.37	Conv. (cfs)	5.7	32500.5	953.4
Conv. Total (cfs)	33459.5	Wetted Per. (ft)	1.96	46.75	57.13
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.08	1.37	0.27
Min Ch El (ft)	944.89	Stream Power (lb/ft s)	0.04	10.13	0.24
Alpha	1.41	Cum Volume (acre-ft)	14.70	27.66	9.20
Frctn Loss (ft)		Cum SA (acres)	5.32	4.18	5.23
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	954.60	Wt. n-Val.	0.090	0.040	0.108
Vel Head (ft)	0.85	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	953.74	Flow Area (sq ft)	1.69	290.63	91.65
Crit W.S. (ft)	950.98	Area (sq ft)	1.69	290.63	91.65
E.G. Slope (ft/ft)	0.003649	Flow (cfs)	1.25	2205.25	103.50
Q Total (cfs)	2310.00	Top Width (ft)	2.17	40.69	57.68
Top Width (ft)	100.54	Avg. Vel. (ft/s)	0.74	7.59	1.13
Vel Total (ft/s)	6.02	Hydr. Depth (ft)	0.78	7.14	1.59
Max Chl Dpth (ft)	8.85	Conv. (cfs)	20.7	36505.2	1713.4
Conv. Total (cfs)	38239.3	Wetted Per. (ft)	2.65	46.75	58.11
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.15	1.42	0.36
Min Ch El (ft)	944.89				

Alpha	1.52	Stream Power (lb/ft s)	0.11	10.75	0.41
Frctn Loss (ft)		Cum Volume (acre-ft)	17.16	29.80	12.43
C & E Loss (ft)		Cum SA (acres)	5.57	4.24	6.35

CROSS SECTION OUTPUT Profile #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	955.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.94	Wt. n-Val.	0.090	0.040	0.107
W.S. Elev (ft)	954.78	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	952.04	Flow Area (sq ft)	4.07	332.92	152.55
E.G. Slope (ft/ft)	0.003465	Area (sq ft)	4.07	332.92	152.55
Q Total (cfs)	2930.00	Flow (cfs)	4.21	2694.85	230.94
Top Width (ft)	102.64	Top Width (ft)	2.41	40.69	59.53
Vel Total (ft/s)	5.99	Avg. Vel. (ft/s)	1.03	8.09	1.51
Max Chl Dpth (ft)	9.89	Hydr. Depth (ft)	1.69	8.18	2.56
Conv. Total (cfs)	49773.8	Conv. (cfs)	71.5	45779.2	3923.1
Length Wtd. (ft)	4.00	Wetted Per. (ft)	3.72	46.75	60.24
Min Ch El (ft)	944.89	Shear (lb/sq ft)	0.24	1.54	0.55
Alpha	1.69	Stream Power (lb/ft s)	0.24	12.47	0.83
Frctn Loss (ft)		Cum Volume (acre-ft)	23.43	34.35	20.00
C & E Loss (ft)		Cum SA (acres)	6.19	4.30	8.08

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 4215

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	970	967	200	970	967

Upstream Bridge Cross Section Data
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	962.47	5.38	962.41	12.33	962.28	17.83	962.19	25.34	962
31.08	961.85	36.85	961.63	37.69	961.59	43.31	961.36	44.12	957.33
45.03	953.36	45.83	953.04	47.12	952.45	48.19	951.18	48.86	950.38
52.74	944.91	60.13	944.9	70.85	944.88	72.54	944.88	74.62	944.87
76.22	944.87	77.09	945.48	85.57	951.53	87.81	952.32	122	952.03
141.61	951.86	143.22	952.49	143.95	952.86	145.07	953.49	155.2	959.15
163.34	964.03	164.81	964.55	166.55	964.76	177.49	965.34	179.37	965.73

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.09	47.12	.04	87.81	.1	122	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
47.12	87.81	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	970	967	200	970	967

Downstream Bridge Cross Section Data
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	962.37	.81	962.36	12.72	962.14	13.15	962.13	13.23	962.13
13.34	962.13	15.34	962.08	25.81	961.8	26.55	961.78	38.57	961.32
38.73	961.31	40.2	954.04	40.42	952.91	42.13	952.23	42.78	951.96
46.47	947.62	47.12	946.86	47.93	945.91	48.93	944.86	52.39	944.83
53.79	944.83	73.57	944.83	73.66	944.89	74.92	945.78	82.68	952
117	951.41	135.9	951.24	143.86	955.99	167.53	964.54	178.33	965.81
180.52	966.16								

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.09	42.78	.04	82.68	.1	117	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
42.78	82.68	.1	.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical

```
Downstream Embankment side slope            =      0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=   91.37    Downstream=   86.56
Upstream     num=       2
    Width   Elev    Width   Elev
       8     945       8     970
Downstream     num=       2
    Width   Elev    Width   Elev
       8     945       8     970

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
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 #2yr

			Inside BR US	Inside BR DS
E.G. US. (ft)	951.03	Element		
W.S. US. (ft)	950.56	E.G. Elev (ft)	951.00	950.79
Q Total (cfs)	920.00	W.S. Elev (ft)	950.52	950.33
Q Bridge (cfs)	920.00	Crit W.S. (ft)	948.33	948.15
Q Weir (cfs)		Max Chl Dpth (ft)	5.65	5.50
Weir Sta Lft (ft)		Vel Total (ft/s)	5.55	5.46
Weir Sta Rgt (ft)		Flow Area (sq ft)	165.74	168.48
Weir Submerg		Froude # Chl	0.45	0.45
Weir Max Depth (ft)		Specif Force (cu ft)	593.58	589.84
Min El Weir Flow (ft)	970.01	Hydr Depth (ft)	4.68	4.62
Min El Prs (ft)	967.00	W.P. Total (ft)	40.11	40.82
Delta EG (ft)	0.26	Conv. Total (cfs)	15854.8	16103.0
Delta WS (ft)	0.24	Top Width (ft)	35.41	36.43
BR Open Area (sq ft)	2010.71	Frctn Loss (ft)		
BR Open Vel (ft/s)	5.55	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.87	0.84
Br Sel Method	Momentum	Power Total (lb/ft s)	4.82	4.59

BRIDGE OUTPUT Profile #5yr

			Inside BR US	Inside BR DS
E.G. US. (ft)	951.90	Element		
W.S. US. (ft)	951.32	E.G. Elev (ft)	951.86	951.64
Q Total (cfs)	1180.00	W.S. Elev (ft)	951.28	951.08
Q Bridge (cfs)	1180.00	Crit W.S. (ft)	948.92	948.73
Q Weir (cfs)		Max Chl Dpth (ft)	6.41	6.25
Weir Sta Lft (ft)		Vel Total (ft/s)	6.10	6.01
Weir Sta Rgt (ft)		Flow Area (sq ft)	193.43	196.44
Weir Submerg		Froude # Chl	0.47	0.47
Weir Max Depth (ft)		Specif Force (cu ft)	795.59	790.92
Min El Weir Flow (ft)	970.01	Hydr Depth (ft)	5.21	5.17
Min El Prs (ft)	967.00	W.P. Total (ft)	42.42	43.01
Delta EG (ft)	0.28	Conv. Total (cfs)	19759.4	20086.9
Delta WS (ft)	0.26	Top Width (ft)	37.12	38.01
BR Open Area (sq ft)	1030.93	Frctn Loss (ft)		
BR Open Vel (ft/s)	6.10	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	1.02	0.98
Br Sel Method	Momentum	Power Total (lb/ft s)	6.19	5.91

BRIDGE OUTPUT Profile #10yr

			Inside BR US	Inside BR DS
E.G. US. (ft)	952.61	Element		
W.S. US. (ft)	951.92	E.G. Elev (ft)	952.58	952.35
Q Total (cfs)	1450.00	W.S. Elev (ft)	951.88	951.67

Q Bridge (cfs)	1450.00	Crit W.S. (ft)	949.47	949.26
Q Weir (cfs)		Max Chl Dpth (ft)	7.01	6.84
Weir Sta Lft (ft)		Vel Total (ft/s)	6.71	6.36
Weir Sta Rgt (ft)		Flow Area (sq ft)	215.99	228.07
Weir Submerg		Froude # Chl	0.50	0.49
Weir Max Depth (ft)		Specif Force (cu ft)	995.99	991.68
Min El Weir Flow (ft)	970.01	Hydr Depth (ft)	5.27	3.07
Min El Prs (ft)	967.00	W.P. Total (ft)	46.67	79.84
Delta EG (ft)	0.30	Conv. Total (cfs)	22942.8	23556.9
Delta WS (ft)	0.27	Top Width (ft)	40.95	74.23
BR Open Area (sq ft)	2010.71	Frctn Loss (ft)		
BR Open Vel (ft/s)	6.71	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	1.15	0.68
Br Sel Method	Momentum	Power Total (lb/ft s)	7.75	4.30

BRIDGE OUTPUT Profile #25yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	953.51	E.G. Elev (ft)	953.46	953.18
W.S. US. (ft)	952.73	W.S. Elev (ft)	952.66	952.41
Q Total (cfs)	1800.00	Crit W.S. (ft)	950.12	949.91
Q Bridge (cfs)	1800.00	Max Chl Dpth (ft)	7.79	7.58
Q Weir (cfs)		Vel Total (ft/s)	6.53	6.20
Weir Sta Lft (ft)		Flow Area (sq ft)	275.55	290.43
Weir Sta Rgt (ft)		Froude # Chl	0.51	0.50
Weir Submerg		Specif Force (cu ft)	1282.56	1275.82
Weir Max Depth (ft)		Hydr Depth (ft)	3.10	3.29
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	96.00	95.32
Min El Prs (ft)	967.00	Conv. Total (cfs)	28112.4	28917.3
Delta EG (ft)	0.36	Top Width (ft)	88.88	88.16
Delta WS (ft)	0.35	Frctn Loss (ft)		
BR Open Area (sq ft)	2010.71	C & E Loss (ft)		
BR Open Vel (ft/s)	6.53	Shear Total (lb/sq ft)	0.73	0.74
Coef of Q		Power Total (lb/ft s)	4.80	4.57
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #50yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	954.08	E.G. Elev (ft)	954.02	953.72
W.S. US. (ft)	953.26	W.S. Elev (ft)	953.17	952.89
Q Total (cfs)	2060.00	Crit W.S. (ft)	950.57	950.34
Q Bridge (cfs)	2060.00	Max Chl Dpth (ft)	8.30	8.06
Q Weir (cfs)		Vel Total (ft/s)	6.41	6.18
Weir Sta Lft (ft)		Flow Area (sq ft)	321.38	333.53
Weir Sta Rgt (ft)		Froude # Chl	0.51	0.51
Weir Submerg		Specif Force (cu ft)	1505.90	1498.33
Weir Max Depth (ft)		Hydr Depth (ft)	3.53	3.70
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	99.36	98.53
Min El Prs (ft)	967.00	Conv. Total (cfs)	32329.1	32999.4
Delta EG (ft)	0.39	Top Width (ft)	90.98	90.19
Delta WS (ft)	0.39	Frctn Loss (ft)		
BR Open Area (sq ft)	2010.71	C & E Loss (ft)		
BR Open Vel (ft/s)	6.41	Shear Total (lb/sq ft)	0.82	0.82
Coef of Q		Power Total (lb/ft s)	5.26	5.09
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #100yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	954.60	E.G. Elev (ft)	954.53	954.22
W.S. US. (ft)	953.74	W.S. Elev (ft)	953.63	953.33
Q Total (cfs)	2310.00	Crit W.S. (ft)	950.98	950.74
Q Bridge (cfs)	2310.00	Max Chl Dpth (ft)	8.76	8.50
Q Weir (cfs)		Vel Total (ft/s)	6.34	6.18
Weir Sta Lft (ft)		Flow Area (sq ft)	364.12	373.52
Weir Sta Rgt (ft)		Froude # Chl	0.51	0.51
Weir Submerg		Specif Force (cu ft)	1733.63	1723.95
Weir Max Depth (ft)		Hydr Depth (ft)	3.94	4.10
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	102.04	100.76
Min El Prs (ft)	967.00	Conv. Total (cfs)	36477.8	36976.6
Delta EG (ft)	0.42	Top Width (ft)	92.36	91.06
Delta WS (ft)	0.43	Frctn Loss (ft)		
BR Open Area (sq ft)	2010.71	C & E Loss (ft)		
BR Open Vel (ft/s)	6.34	Shear Total (lb/sq ft)	0.89	0.90
Coef of Q		Power Total (lb/ft s)	5.67	5.59
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #500yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	955.72			

W.S. US. (ft)	954.78	E.G. Elev (ft)	955.65	955.32
Q Total (cfs)	2930.00	W.S. Elev (ft)	954.64	954.32
Q Bridge (cfs)	2930.00	Crit W.S. (ft)	951.97	951.99
Q Weir (cfs)		Max Chl Dpth (ft)	9.77	9.48
Weir Sta Lft (ft)		Vel Total (ft/s)	6.39	6.31
Weir Sta Rgt (ft)		Flow Area (sq ft)	458.34	464.14
Weir Submerg		Froude # Chl	0.52	0.52
Weir Max Depth (ft)		Specif Force (cu ft)	2327.53	2317.56
Min El Weir Flow (ft)	970.01	Hydr Depth (ft)	4.86	5.00
Min El Prs (ft)	967.00	W.P. Total (ft)	107.17	105.66
Delta EG (ft)	0.43	Conv. Total (cfs)	46318.8	46618.7
Delta WS (ft)	0.46	Top Width (ft)	94.39	92.91
BR Open Area (sq ft)	2010.71	Frctn Loss (ft)		
BR Open Vel (ft/s)	6.39	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	1.07	1.08
Br Sel Method	Momentum	Power Total (lb/ft s)	6.83	6.84

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4204.470

INPUT
Description: 12
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	962.32	.81	962.31	12.72	962.09	13.15	962.08	13.23	962.08
13.34	962.08	15.34	962.03	25.81	961.75	26.55	961.73	38.57	961.27
38.73	961.26	40.2	953.99	40.42	952.86	42.13	952.18	42.78	951.91
46.47	947.57	47.12	946.81	47.93	945.86	48.93	944.81	52.39	944.78
53.79	944.78	73.57	944.78	73.66	944.84	74.92	945.73	82.68	951.95
117	951.46	135.9	951.19	143.86	955.94	167.53	964.49	178.33	965.76
180.52	966.11								

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.09	42.78	.04	82.68	.1	117	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
42.78	82.68	124.62	124.01	123.48	.1	.3

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	950.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.46	Wt. n-Val.		0.040	
W.S. Elev (ft)	950.31	Reach Len. (ft)	124.62	124.01	123.48
Crit W.S. (ft)		Flow Area (sq ft)		169.68	
E.G. Slope (ft/ft)	0.003198	Area (sq ft)		169.68	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	36.50	Top Width (ft)		36.50	
Vel Total (ft/s)	5.42	Avg. Vel. (ft/s)		5.42	
Max Chl Dpth (ft)	5.53	Hydr. Depth (ft)		4.65	
Conv. Total (cfs)	16269.4	Conv. (cfs)		16269.4	
Length Wtd. (ft)	124.01	Wetted Per. (ft)		40.92	
Min Ch El (ft)	944.78	Shear (lb/sq ft)		0.83	
Alpha	1.00	Stream Power (lb/ft s)		4.49	
Frctn Loss (ft)	0.44	Cum Volume (acre-ft)	2.50	16.99	1.48
C & E Loss (ft)	0.00	Cum SA (acres)	2.51	3.63	1.38

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	951.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.55	Wt. n-Val.		0.040	
W.S. Elev (ft)	951.06	Reach Len. (ft)	124.62	124.01	123.48
Crit W.S. (ft)		Flow Area (sq ft)		197.56	
E.G. Slope (ft/ft)	0.003395	Area (sq ft)		197.56	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	38.07	Top Width (ft)		38.07	
Vel Total (ft/s)	5.97	Avg. Vel. (ft/s)		5.97	
Max Chl Dpth (ft)	6.28	Hydr. Depth (ft)		5.19	
Conv. Total (cfs)	20251.8	Conv. (cfs)		20251.8	
Length Wtd. (ft)	124.01	Wetted Per. (ft)		43.10	
Min Ch El (ft)	944.78	Shear (lb/sq ft)		0.97	
Alpha	1.00	Stream Power (lb/ft s)		5.80	
Frctn Loss (ft)	0.45	Cum Volume (acre-ft)	2.05	19.87	0.33
C & E Loss (ft)	0.00	Cum SA (acres)	1.78	3.82	0.24

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	952.32	Wt. n-Val.		0.040	0.118
Vel Head (ft)	0.67	Reach Len. (ft)	124.62	124.01	123.48
W.S. Elev (ft)	951.65	Flow Area (sq ft)		220.17	7.46
Crit W.S. (ft)		Area (sq ft)		220.17	7.46
E.G. Slope (ft/ft)	0.003749	Flow (cfs)		1447.58	2.42
Q Total (cfs)	1450.00	Top Width (ft)		39.30	32.71
Top Width (ft)	72.01	Avg. Vel. (ft/s)		6.57	0.32
Vel Total (ft/s)	6.37	Hydr. Depth (ft)		5.60	0.23
Max Chl Dpth (ft)	6.87	Conv. (cfs)		23642.3	39.6
Conv. Total (cfs)	23681.9	Wetted Per. (ft)		44.80	32.84
Length Wtd. (ft)	124.01	Shear (lb/sq ft)		1.15	0.05
Min Ch El (ft)	944.78	Stream Power (lb/ft s)		7.56	0.02
Alpha	1.06	Cum Volume (acre-ft)	7.47	22.02	4.08
Frctn Loss (ft)	0.48	Cum SA (acres)	4.00	3.95	3.08
C & E Loss (ft)	0.01				

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	953.15	Wt. n-Val.	0.090	0.040	0.110
Vel Head (ft)	0.77	Reach Len. (ft)	124.62	124.01	123.48
W.S. Elev (ft)	952.38	Flow Area (sq ft)	0.27	249.37	44.31
Crit W.S. (ft)		Area (sq ft)	0.27	249.37	44.31
E.G. Slope (ft/ft)	0.003782	Flow (cfs)	0.10	1767.56	32.35
Q Total (cfs)	1800.00	Top Width (ft)	1.15	39.90	55.21
Top Width (ft)	96.27	Avg. Vel. (ft/s)	0.36	7.09	0.73
Vel Total (ft/s)	6.12	Hydr. Depth (ft)	0.23	6.25	0.80
Max Chl Dpth (ft)	7.60	Conv. (cfs)	1.6	28741.3	526.0
Conv. Total (cfs)	29268.9	Wetted Per. (ft)	1.25	45.63	55.55
Length Wtd. (ft)	124.00	Shear (lb/sq ft)	0.05	1.29	0.19
Min Ch El (ft)	944.78	Stream Power (lb/ft s)	0.02	9.15	0.14
Alpha	1.32	Cum Volume (acre-ft)	11.79	25.47	6.83
Frctn Loss (ft)	0.48	Cum SA (acres)	4.93	4.09	4.28
C & E Loss (ft)	0.02				

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	953.69	Wt. n-Val.	0.090	0.040	0.109
Vel Head (ft)	0.82	Reach Len. (ft)	124.62	124.01	123.48
W.S. Elev (ft)	952.87	Flow Area (sq ft)	1.13	268.90	71.53
Crit W.S. (ft)		Area (sq ft)	1.13	268.90	71.53
E.G. Slope (ft/ft)	0.003725	Flow (cfs)	0.67	1989.03	70.30
Q Total (cfs)	2060.00	Top Width (ft)	2.36	39.90	56.03
Top Width (ft)	98.30	Avg. Vel. (ft/s)	0.59	7.40	0.98
Vel Total (ft/s)	6.03	Hydr. Depth (ft)	0.48	6.74	1.28
Max Chl Dpth (ft)	8.09	Conv. (cfs)	10.9	32589.7	1151.9
Conv. Total (cfs)	33752.5	Wetted Per. (ft)	2.55	45.63	56.50
Length Wtd. (ft)	123.99	Shear (lb/sq ft)	0.10	1.37	0.29
Min Ch El (ft)	944.78	Stream Power (lb/ft s)	0.06	10.14	0.29
Alpha	1.45	Cum Volume (acre-ft)	14.70	27.55	9.17
Frctn Loss (ft)	0.47	Cum SA (acres)	5.32	4.16	5.21
C & E Loss (ft)	0.02				

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	954.18	Wt. n-Val.	0.090	0.040	0.108
Vel Head (ft)	0.87	Reach Len. (ft)	124.62	124.01	123.48
W.S. Elev (ft)	953.31	Flow Area (sq ft)	2.20	286.64	96.61
Crit W.S. (ft)		Area (sq ft)	2.20	286.64	96.61
E.G. Slope (ft/ft)	0.003664	Flow (cfs)	1.79	2194.18	114.03
Q Total (cfs)	2310.00	Top Width (ft)	2.45	39.90	56.78
Top Width (ft)	99.13	Avg. Vel. (ft/s)	0.81	7.65	1.18
Vel Total (ft/s)	5.99	Hydr. Depth (ft)	0.90	7.18	1.70
Max Chl Dpth (ft)	8.53	Conv. (cfs)	29.6	36251.0	1883.9
Conv. Total (cfs)	38164.5	Wetted Per. (ft)	3.01	45.63	57.37
Length Wtd. (ft)	123.99	Shear (lb/sq ft)	0.17	1.44	0.39
Min Ch El (ft)	944.78	Stream Power (lb/ft s)	0.14	11.00	0.45
Alpha	1.55	Cum Volume (acre-ft)	17.15	29.68	12.39
Frctn Loss (ft)	0.46	Cum SA (acres)	5.57	4.23	6.33
C & E Loss (ft)	0.03				

CROSS SECTION OUTPUT Profile #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	955.29	Wt. n-Val.	0.090	0.040	0.107
Vel Head (ft)	0.96	Reach Len. (ft)	124.62	124.01	123.48
W.S. Elev (ft)	954.32				

Crit W.S. (ft)		Flow Area (sq ft)	4.78	326.93	154.80
E.G. Slope (ft/ft)	0.003535	Area (sq ft)	4.78	326.93	154.80
Q Total (cfs)	2930.00	Flow (cfs)	5.24	2683.63	241.13
Top Width (ft)	101.02	Top Width (ft)	2.65	39.90	58.47
Vel Total (ft/s)	6.02	Avg. Vel. (ft/s)	1.10	8.21	1.56
Max Chl Dpth (ft)	9.54	Hydr. Depth (ft)	1.80	8.19	2.65
Conv. Total (cfs)	49279.6	Conv. (cfs)	88.2	45135.9	4055.5
Length Wtd. (ft)	123.98	Wetted Per. (ft)	4.04	45.63	59.34
Min Ch El (ft)	944.78	Shear (lb/sq ft)	0.26	1.58	0.58
Alpha	1.71	Stream Power (lb/ft s)	0.29	12.98	0.90
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	23.43	34.21	19.95
C & E Loss (ft)	0.04	Cum SA (acres)	6.19	4.28	8.06

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4080.463

INPUT
Description: 13
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	961.33	9.34	961.1	11.62	960.98	11.79	960.97	21.38	960.45
21.66	959.31	22	957.74	22.73	954.39	47.22	954.39	51.8	952.1
59.8	952.1	62.6	953.5	67.6	953.5	85.6	944.5	105.6	944.5
120.16	951.78	134	951.39	136.05	950.57	137.34	950.11	142.4	948.34
143.51	948.64	147.54	950.75	157.32	954.87	163.92	957.65	167.25	959.05
177.01	960.09	190.28	961.31	194.49	963.13				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	67.6	.04	120.16	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
67.6	120.16	17.85	17.74	17.82	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	950.33	Element			
Vel Head (ft)	0.48	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	949.85	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	948.06	Flow Area (sq ft)		164.32	6.18
E.G. Slope (ft/ft)	0.003879	Area (sq ft)		164.32	6.18
Q Total (cfs)	920.00	Flow (cfs)		916.10	3.90
Top Width (ft)	49.15	Top Width (ft)		41.41	7.75
Vel Total (ft/s)	5.40	Avg. Vel. (ft/s)		5.58	0.63
Max Chl Dpth (ft)	5.35	Hydr. Depth (ft)		3.97	0.80
Conv. Total (cfs)	14770.9	Conv. (cfs)		14708.2	62.7
Length Wtd. (ft)	4.00	Wetted Per. (ft)		43.93	8.34
Min Ch El (ft)	944.50	Shear (lb/sq ft)		0.91	0.18
Alpha	1.06	Stream Power (lb/ft s)		5.05	0.11
Frctn Loss (ft)		Cum Volume (acre-ft)	2.50	16.51	1.47
C & E Loss (ft)		Cum SA (acres)	2.51	3.52	1.37

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	951.16	Element			
Vel Head (ft)	0.56	Wt. n-Val.		0.040	
W.S. Elev (ft)	950.61	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	948.62	Flow Area (sq ft)		196.65	
E.G. Slope (ft/ft)	0.003903	Area (sq ft)		196.65	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	44.42	Top Width (ft)		44.42	
Vel Total (ft/s)	6.00	Avg. Vel. (ft/s)		6.00	
Max Chl Dpth (ft)	6.11	Hydr. Depth (ft)		4.43	
Conv. Total (cfs)	18887.7	Conv. (cfs)		18887.7	
Length Wtd. (ft)	4.00	Wetted Per. (ft)		47.30	
Min Ch El (ft)	944.50	Shear (lb/sq ft)		1.01	
Alpha	1.00	Stream Power (lb/ft s)		6.08	
Frctn Loss (ft)		Cum Volume (acre-ft)	2.05	19.31	0.33
C & E Loss (ft)		Cum SA (acres)	1.78	3.70	0.24

CROSS SECTION OUTPUT Profile #10yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	951.82	Element			
Vel Head (ft)	0.63	Wt. n-Val.		0.040	0.120

W.S. Elev (ft)	951.20	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	949.16	Flow Area (sq ft)		223.58	20.85
E.G. Slope (ft/ft)	0.004017	Area (sq ft)		223.58	20.85
Q Total (cfs)	1450.00	Flow (cfs)		1429.85	20.15
Top Width (ft)	60.90	Top Width (ft)		46.78	14.11
Vel Total (ft/s)	5.93	Avg. Vel. (ft/s)		6.40	0.97
Max Chl Dpth (ft)	6.70	Hydr. Depth (ft)		4.78	1.48
Conv. Total (cfs)	22878.1	Conv. (cfs)		22560.1	317.9
Length Wtd. (ft)	4.00	Wetted Per. (ft)		49.94	15.26
Min Ch El (ft)	944.50	Shear (lb/sq ft)		1.12	0.34
Alpha	1.15	Stream Power (lb/ft s)		7.18	0.33
Frctn Loss (ft)		Cum Volume (acre-ft)	7.47	21.38	4.04
C & E Loss (ft)		Cum SA (acres)	4.00	3.83	3.01

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #25yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	952.64	Element			
Vel Head (ft)	0.71	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	951.94	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	949.78	Flow Area (sq ft)		259.26	37.11
E.G. Slope (ft/ft)	0.004046	Area (sq ft)		259.26	37.11
Q Total (cfs)	1800.00	Flow (cfs)		1767.43	32.57
Top Width (ft)	79.63	Top Width (ft)		49.43	30.19
Vel Total (ft/s)	6.07	Avg. Vel. (ft/s)		6.82	0.88
Max Chl Dpth (ft)	7.44	Hydr. Depth (ft)		5.24	1.23
Conv. Total (cfs)	28298.5	Conv. (cfs)		27786.4	512.1
Length Wtd. (ft)	4.00	Wetted Per. (ft)		52.90	31.54
Min Ch El (ft)	944.50	Shear (lb/sq ft)		1.24	0.30
Alpha	1.24	Stream Power (lb/ft s)		8.44	0.26
Frctn Loss (ft)		Cum Volume (acre-ft)	11.79	24.74	6.72
C & E Loss (ft)		Cum SA (acres)	4.93	3.96	4.16

CROSS SECTION OUTPUT Profile #50yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	953.20	Element			
Vel Head (ft)	0.75	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	952.45	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	950.20	Flow Area (sq ft)	3.04	284.95	52.95
E.G. Slope (ft/ft)	0.003900	Area (sq ft)	3.04	284.95	52.95
Q Total (cfs)	2060.00	Flow (cfs)	1.46	2002.26	56.27
Top Width (ft)	91.27	Top Width (ft)	9.40	50.46	31.42
Vel Total (ft/s)	6.04	Avg. Vel. (ft/s)	0.48	7.03	1.06
Max Chl Dpth (ft)	7.95	Hydr. Depth (ft)	0.32	5.65	1.69
Conv. Total (cfs)	32986.1	Conv. (cfs)	23.4	32061.6	901.1
Length Wtd. (ft)	4.00	Wetted Per. (ft)	9.56	54.05	32.86
Min Ch El (ft)	944.50	Shear (lb/sq ft)	0.08	1.28	0.39
Alpha	1.32	Stream Power (lb/ft s)	0.04	9.02	0.42
Frctn Loss (ft)		Cum Volume (acre-ft)	14.69	26.76	9.00
C & E Loss (ft)		Cum SA (acres)	5.30	4.03	5.09

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	953.69	Element			
Vel Head (ft)	0.77	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	952.92	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	950.57	Flow Area (sq ft)	7.87	308.74	67.88
E.G. Slope (ft/ft)	0.003772	Area (sq ft)	7.87	308.74	67.88
Q Total (cfs)	2310.00	Flow (cfs)	6.14	2222.11	81.75
Top Width (ft)	95.19	Top Width (ft)	11.27	51.39	32.52
Vel Total (ft/s)	6.01	Avg. Vel. (ft/s)	0.78	7.20	1.20
Max Chl Dpth (ft)	8.42	Hydr. Depth (ft)	0.70	6.01	2.09
Conv. Total (cfs)	37612.7	Conv. (cfs)	100.0	36181.5	1331.1
Length Wtd. (ft)	4.00	Wetted Per. (ft)	11.65	55.10	34.06
Min Ch El (ft)	944.50	Shear (lb/sq ft)	0.16	1.32	0.47
Alpha	1.38	Stream Power (lb/ft s)	0.12	9.50	0.57
Frctn Loss (ft)		Cum Volume (acre-ft)	17.14	28.83	12.16
C & E Loss (ft)		Cum SA (acres)	5.55	4.10	6.20

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	954.82	Element			
Vel Head (ft)	0.84	Wt. n-Val.	0.090	0.040	0.120

W.S. Elev (ft)	953.98	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	951.36	Flow Area (sq ft)	24.28	364.28	103.80
E.G. Slope (ft/ft)	0.003441	Area (sq ft)	24.28	364.28	103.80
Q Total (cfs)	2930.00	Flow (cfs)	26.47	2753.01	150.52
Top Width (ft)	107.17	Top Width (ft)	19.56	52.56	35.05
Vel Total (ft/s)	5.95	Avg. Vel. (ft/s)	1.09	7.56	1.45
Max Chl Dpth (ft)	9.48	Hydr. Depth (ft)	1.24	6.93	2.96
Conv. Total (cfs)	49946.9	Conv. (cfs)	451.2	46929.8	2565.8
Length Wtd. (ft)	4.00	Wetted Per. (ft)	20.33	56.40	36.80
Min Ch El (ft)	944.50	Shear (lb/sq ft)	0.26	1.39	0.61
Alpha	1.52	Stream Power (lb/ft s)	0.28	10.49	0.88
Frctn Loss (ft)		Cum Volume (acre-ft)	23.39	33.23	19.58
C & E Loss (ft)		Cum SA (acres)	6.15	4.15	7.93

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 4074

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	965	962	500	965	962

Upstream Bridge Cross Section Data
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	961.3	9.34	961.07	11.62	960.95	11.79	960.94	21.38	960.42
21.66	959.28	22	957.71	22.73	954.36	47.22	954.36	51.8	952.07
59.8	952.07	62.6	953.47	67.6	953.47	85.6	944.47	105.6	944.47
120.16	951.75	134	951.36	136.05	950.54	137.34	950.08	142.4	948.31
143.51	948.61	147.54	950.72	157.32	954.84	163.92	957.62	167.25	959.02
177.01	960.06	190.28	961.28	194.49	963.1				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	67.6	.04	120.16	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
67.6	120.16	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	965	962	500	965	962

Downstream Bridge Cross Section Data
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	961.42	.05	961.42	8.73	961.21	13.47	961.09	20.16	960.73
21.8	960.64	22.24	960.62	24.06	960.52	24.86	960.48	25.56	960.44
26.99	954.63	27.06	954.31	51.09	954.31	55.67	952.02	63.67	952.02
66.47	953.42	71.47	953.42	89.47	944.42	109.47	944.42	124.03	951.7
140.23	951.3	143.98	950.82	149.95	948.82	150.86	948.52	152.32	949.08
155.42	950.99	159.93	952.89	190.27	956.19	191.91	956.49	192.39	956.74
206.62	963.92								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	71.47	.04	124.03	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
71.47	124.03	.1	.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data

```
Pier Station     Upstream=    67.6    Downstream=   71.47
Upstream     num=        2
    Width   Elev    Width   Elev
      8     940       8     965
Downstream     num=        2
    Width   Elev    Width   Elev
      8     940       8     965

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
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 #2yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	950.33	E.G. Elev (ft)	950.29	950.22
W.S. US. (ft)	949.85	W.S. Elev (ft)	949.80	949.73
Q Total (cfs)	920.00	Crit W.S. (ft)	948.02	947.99
Q Bridge (cfs)	920.00	Max Chl Dpth (ft)	5.33	5.31
Q Weir (cfs)		Vel Total (ft/s)	5.43	5.53
Weir Sta Lft (ft)		Flow Area (sq ft)	169.43	166.34
Weir Sta Rgt (ft)		Froude # Chl	0.50	0.50
Weir Submerg		Specif Force (cu ft)	547.74	543.94
Weir Max Depth (ft)		Hydr Depth (ft)	3.46	3.51
Min El Weir Flow (ft)	965.01	W.P. Total (ft)	52.06	50.34
Min El Prs (ft)	962.00	Conv. Total (cfs)	14655.4	14509.6
Delta EG (ft)	0.14	Top Width (ft)	48.96	47.35
Delta WS (ft)	0.15	Frctn Loss (ft)		
BR Open Area (sq ft)	1613.86	C & E Loss (ft)		
BR Open Vel (ft/s)	5.53	Shear Total (lb/sq ft)	0.80	0.83
Coef of Q		Power Total (lb/ft s)	4.35	4.59
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #5yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	951.16	E.G. Elev (ft)	951.12	951.05
W.S. US. (ft)	950.61	W.S. Elev (ft)	950.56	950.47
Q Total (cfs)	1180.00	Crit W.S. (ft)	948.59	948.54
Q Bridge (cfs)	1180.00	Max Chl Dpth (ft)	6.09	6.05
Q Weir (cfs)		Vel Total (ft/s)	6.03	6.07
Weir Sta Lft (ft)		Flow Area (sq ft)	195.76	194.36
Weir Sta Rgt (ft)		Froude # Chl	0.51	0.51
Weir Submerg		Specif Force (cu ft)	741.39	736.82
Weir Max Depth (ft)		Hydr Depth (ft)	4.41	4.40
Min El Weir Flow (ft)	965.01	W.P. Total (ft)	47.21	47.07
Min El Prs (ft)	962.00	Conv. Total (cfs)	18768.3	18582.3
Delta EG (ft)	0.15	Top Width (ft)	44.34	44.21
Delta WS (ft)	0.15	Frctn Loss (ft)		
BR Open Area (sq ft)	749.26	C & E Loss (ft)		
BR Open Vel (ft/s)	6.07	Shear Total (lb/sq ft)	1.02	1.04
Coef of Q		Power Total (lb/ft s)	6.17	6.31
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #10yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	951.82	E.G. Elev (ft)	951.78	951.72
W.S. US. (ft)	951.20	W.S. Elev (ft)	951.15	951.08
Q Total (cfs)	1450.00	Crit W.S. (ft)	949.14	949.08
Q Bridge (cfs)	1450.00	Max Chl Dpth (ft)	6.68	6.66
Q Weir (cfs)		Vel Total (ft/s)	5.96	6.08
Weir Sta Lft (ft)		Flow Area (sq ft)	243.18	238.40
Weir Sta Rgt (ft)		Froude # Chl	0.52	0.52
Weir Submerg		Specif Force (cu ft)	949.80	943.55
Weir Max Depth (ft)		Hydr Depth (ft)	4.01	3.95
Min El Weir Flow (ft)	965.01	W.P. Total (ft)	65.01	64.51
Min El Prs (ft)	962.00	Conv. Total (cfs)	22737.6	22541.4
Delta EG (ft)	0.13	Top Width (ft)	60.71	60.31
Delta WS (ft)	0.13			

BR Open Area (sq ft)	1613.86	Frctn Loss (ft)		
BR Open Vel (ft/s)	6.08	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.95	0.95
Br Sel Method	Momentum	Power Total (lb/ft s)	5.66	5.81

BRIDGE OUTPUT Profile #25yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	952.64	E.G. Elev (ft)	952.60	952.55
W.S. US. (ft)	951.94	W.S. Elev (ft)	951.88	951.83
Q Total (cfs)	1800.00	Crit W.S. (ft)	949.76	949.71
Q Bridge (cfs)	1800.00	Max Chl Dpth (ft)	7.41	7.41
Q Weir (cfs)		Vel Total (ft/s)	6.12	6.18
Weir Sta Lft (ft)		Flow Area (sq ft)	294.14	291.36
Weir Sta Rgt (ft)		Froude # Chl	0.52	0.53
Weir Submerg		Specif Force (cu ft)	1237.78	1230.93
Weir Max Depth (ft)		Hydr Depth (ft)	3.74	3.56
Min El Weir Flow (ft)	965.01	W.P. Total (ft)	83.81	86.93
Min El Prs (ft)	962.00	Conv. Total (cfs)	28221.0	28099.4
Delta EG (ft)	0.13	Top Width (ft)	78.69	81.93
Delta WS (ft)	0.13	Frctn Loss (ft)		
BR Open Area (sq ft)	1613.86	C & E Loss (ft)		
BR Open Vel (ft/s)	6.18	Shear Total (lb/sq ft)	0.89	0.86
Coef of Q		Power Total (lb/ft s)	5.45	5.30
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #50yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	953.20	E.G. Elev (ft)	953.15	953.10
W.S. US. (ft)	952.45	W.S. Elev (ft)	952.39	952.34
Q Total (cfs)	2060.00	Crit W.S. (ft)	950.18	950.13
Q Bridge (cfs)	2060.00	Max Chl Dpth (ft)	7.92	7.92
Q Weir (cfs)		Vel Total (ft/s)	6.11	6.12
Weir Sta Lft (ft)		Flow Area (sq ft)	337.25	336.47
Weir Sta Rgt (ft)		Froude # Chl	0.52	0.52
Weir Submerg		Specif Force (cu ft)	1463.87	1456.81
Weir Max Depth (ft)		Hydr Depth (ft)	3.78	3.64
Min El Weir Flow (ft)	965.01	W.P. Total (ft)	95.05	98.19
Min El Prs (ft)	962.00	Conv. Total (cfs)	32982.8	32908.5
Delta EG (ft)	0.12	Top Width (ft)	89.17	92.42
Delta WS (ft)	0.12	Frctn Loss (ft)		
BR Open Area (sq ft)	1613.86	C & E Loss (ft)		
BR Open Vel (ft/s)	6.12	Shear Total (lb/sq ft)	0.86	0.84
Coef of Q		Power Total (lb/ft s)	5.28	5.13
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #100yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	953.69	E.G. Elev (ft)	953.64	953.60
W.S. US. (ft)	952.92	W.S. Elev (ft)	952.85	952.80
Q Total (cfs)	2310.00	Crit W.S. (ft)	950.57	950.49
Q Bridge (cfs)	2310.00	Max Chl Dpth (ft)	8.38	8.38
Q Weir (cfs)		Vel Total (ft/s)	6.10	6.09
Weir Sta Lft (ft)		Flow Area (sq ft)	378.79	379.47
Weir Sta Rgt (ft)		Froude # Chl	0.51	0.51
Weir Submerg		Specif Force (cu ft)	1692.14	1684.43
Weir Max Depth (ft)		Hydr Depth (ft)	4.11	3.98
Min El Weir Flow (ft)	965.01	W.P. Total (ft)	98.74	101.88
Min El Prs (ft)	962.00	Conv. Total (cfs)	37585.2	37527.0
Delta EG (ft)	0.13	Top Width (ft)	92.10	95.34
Delta WS (ft)	0.13	Frctn Loss (ft)		
BR Open Area (sq ft)	1613.86	C & E Loss (ft)		
BR Open Vel (ft/s)	6.10	Shear Total (lb/sq ft)	0.90	0.88
Coef of Q		Power Total (lb/ft s)	5.52	5.36
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #500yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	954.82	E.G. Elev (ft)	954.76	954.71
W.S. US. (ft)	953.98	W.S. Elev (ft)	953.88	953.81
Q Total (cfs)	2930.00	Crit W.S. (ft)	951.35	951.29
Q Bridge (cfs)	2930.00	Max Chl Dpth (ft)	9.41	9.39
Q Weir (cfs)		Vel Total (ft/s)	6.13	6.07
Weir Sta Lft (ft)		Flow Area (sq ft)	477.70	482.77
Weir Sta Rgt (ft)		Froude # Chl	0.51	0.51
Weir Submerg		Specif Force (cu ft)	2299.50	2289.15
Weir Max Depth (ft)		Hydr Depth (ft)	4.83	4.46
Min El Weir Flow (ft)	965.01	W.P. Total (ft)	107.56	116.72
Min El Prs (ft)	962.00			

Delta EG (ft)	0.15	Conv. Total (cfs)	48977.9	48661.2
Delta WS (ft)	0.15	Top Width (ft)	98.87	108.32
BR Open Area (sq ft)	1613.86	Frctn Loss (ft)		
BR Open Vel (ft/s)	6.13	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.99	0.94
Br Sel Method	Momentum	Power Total (lb/ft s)	6.09	5.68

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4062.727

INPUT
Description: 14
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	961.35	.05	961.35	8.73	961.14	13.47	961.02	20.16	960.66
21.8	960.57	22.24	960.55	24.06	960.45	24.86	960.41	25.56	960.37
26.99	954.56	27.06	954.24	51.09	954.24	55.67	951.95	63.67	951.95
66.47	953.35	71.47	953.35	89.47	944.35	109.47	944.35	124.03	951.63
140.23	951.23	143.98	950.75	149.95	948.75	150.86	948.45	152.32	949.01
155.42	950.92	159.93	952.82	190.27	956.12	191.91	956.42	192.39	956.67
206.62	963.85								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	71.47	.04	124.03	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
71.47	124.03	120.53	121.82	121.07	.1	.3

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	950.19	Wt. n-Val.		0.040	0.120
Vel Head (ft)	0.48	Reach Len. (ft)	120.53	121.82	121.07
W.S. Elev (ft)	949.71	Flow Area (sq ft)		164.50	4.19
Crit W.S. (ft)		Area (sq ft)		164.50	4.19
E.G. Slope (ft/ft)	0.003881	Flow (cfs)		917.67	2.33
Q Total (cfs)	920.00	Top Width (ft)		41.43	6.35
Top Width (ft)	47.78	Avg. Vel. (ft/s)		5.58	0.56
Vel Total (ft/s)	5.45	Hydr. Depth (ft)		3.97	0.66
Max Chl Dpth (ft)	5.36	Conv. (cfs)		14731.0	37.4
Conv. Total (cfs)	14768.3	Wetted Per. (ft)		43.95	6.86
Length Wtd. (ft)	121.82	Shear (lb/sq ft)		0.91	0.15
Min Ch El (ft)	944.35	Stream Power (lb/ft s)		5.06	0.08
Alpha	1.04	Cum Volume (acre-ft)	2.50	16.44	1.47
Frctn Loss (ft)	0.49	Cum SA (acres)	2.51	3.50	1.36
C & E Loss (ft)	0.00				

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	951.02	Wt. n-Val.		0.040	
Vel Head (ft)	0.56	Reach Len. (ft)	120.53	121.82	121.07
W.S. Elev (ft)	950.46	Flow Area (sq ft)		196.76	
Crit W.S. (ft)		Area (sq ft)		196.76	
E.G. Slope (ft/ft)	0.003897	Flow (cfs)		1180.00	
Q Total (cfs)	1180.00	Top Width (ft)		44.43	
Top Width (ft)	44.43	Avg. Vel. (ft/s)		6.00	
Vel Total (ft/s)	6.00	Hydr. Depth (ft)		4.43	
Max Chl Dpth (ft)	6.11	Conv. (cfs)		18902.2	
Conv. Total (cfs)	18902.2	Wetted Per. (ft)		47.31	
Length Wtd. (ft)	121.82	Shear (lb/sq ft)		1.01	
Min Ch El (ft)	944.35	Stream Power (lb/ft s)		6.07	
Alpha	1.00	Cum Volume (acre-ft)	2.05	19.23	0.33
Frctn Loss (ft)	0.49	Cum SA (acres)	1.78	3.69	0.24
C & E Loss (ft)	0.00				

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	951.69	Wt. n-Val.		0.040	0.120
Vel Head (ft)	0.63	Reach Len. (ft)	120.53	121.82	121.07
W.S. Elev (ft)	951.06	Flow Area (sq ft)		224.34	17.28
Crit W.S. (ft)		Area (sq ft)		224.34	17.28
E.G. Slope (ft/ft)	0.004010	Flow (cfs)		1435.29	14.71
Q Total (cfs)	1450.00	Top Width (ft)		46.85	14.21
Top Width (ft)	61.06				

Vel Total (ft/s)	6.00	Avg. Vel. (ft/s)		6.40	0.85
Max Chl Dpth (ft)	6.71	Hydr. Depth (ft)		4.79	1.22
Conv. Total (cfs)	22898.1	Conv. (cfs)		22665.8	232.3
Length Wtd. (ft)	121.81	Wetted Per. (ft)		50.02	15.28
Min Ch El (ft)	944.35	Shear (lb/sq ft)		1.12	0.28
Alpha	1.13	Stream Power (lb/ft s)		7.18	0.24
Frctn Loss (ft)	0.50	Cum Volume (acre-ft)	7.47	21.29	4.04
C & E Loss (ft)	0.00	Cum SA (acres)	4.00	3.81	3.00

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	952.52	Wt. n-Val.		0.040	0.120
Vel Head (ft)	0.71	Reach Len. (ft)	120.53	121.82	121.07
W.S. Elev (ft)	951.81	Flow Area (sq ft)		260.41	35.57
Crit W.S. (ft)		Area (sq ft)		260.41	35.57
E.G. Slope (ft/ft)	0.004011	Flow (cfs)		1771.67	28.34
Q Total (cfs)	1800.00	Top Width (ft)		49.48	33.50
Top Width (ft)	82.98	Avg. Vel. (ft/s)		6.80	0.80
Vel Total (ft/s)	6.08	Hydr. Depth (ft)		5.26	1.06
Max Chl Dpth (ft)	7.46	Conv. (cfs)		27973.9	447.4
Conv. Total (cfs)	28421.3	Wetted Per. (ft)		52.96	34.73
Length Wtd. (ft)	121.80	Shear (lb/sq ft)		1.23	0.26
Min Ch El (ft)	944.35	Stream Power (lb/ft s)		8.38	0.20
Alpha	1.23	Cum Volume (acre-ft)	11.79	24.64	6.70
Frctn Loss (ft)	0.49	Cum SA (acres)	4.93	3.94	4.15
C & E Loss (ft)	0.00				

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	953.07	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.74	Reach Len. (ft)	120.53	121.82	121.07
W.S. Elev (ft)	952.33	Flow Area (sq ft)	3.36	286.61	53.45
Crit W.S. (ft)		Area (sq ft)	3.36	286.61	53.45
E.G. Slope (ft/ft)	0.003843	Flow (cfs)	1.69	2005.01	53.30
Q Total (cfs)	2060.00	Top Width (ft)	9.53	50.53	34.74
Top Width (ft)	94.80	Avg. Vel. (ft/s)	0.50	7.00	1.00
Vel Total (ft/s)	6.00	Hydr. Depth (ft)	0.35	5.67	1.54
Max Chl Dpth (ft)	7.98	Conv. (cfs)	27.3	32344.9	859.9
Conv. Total (cfs)	33232.1	Wetted Per. (ft)	9.71	54.13	36.08
Length Wtd. (ft)	121.80	Shear (lb/sq ft)	0.08	1.27	0.36
Min Ch El (ft)	944.35	Stream Power (lb/ft s)	0.04	8.89	0.35
Alpha	1.32	Cum Volume (acre-ft)	14.69	26.65	8.97
Frctn Loss (ft)	0.47	Cum SA (acres)	5.30	4.01	5.07
C & E Loss (ft)	0.00				

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	953.56	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.77	Reach Len. (ft)	120.53	121.82	121.07
W.S. Elev (ft)	952.79	Flow Area (sq ft)	8.15	310.03	69.65
Crit W.S. (ft)		Area (sq ft)	8.15	310.03	69.65
E.G. Slope (ft/ft)	0.003730	Flow (cfs)	6.44	2223.64	79.92
Q Total (cfs)	2310.00	Top Width (ft)	11.37	51.44	35.83
Top Width (ft)	98.65	Avg. Vel. (ft/s)	0.79	7.17	1.15
Vel Total (ft/s)	5.96	Hydr. Depth (ft)	0.72	6.03	1.94
Max Chl Dpth (ft)	8.44	Conv. (cfs)	105.4	36408.6	1308.6
Conv. Total (cfs)	37822.6	Wetted Per. (ft)	11.77	55.16	37.27
Length Wtd. (ft)	121.78	Shear (lb/sq ft)	0.16	1.31	0.44
Min Ch El (ft)	944.35	Stream Power (lb/ft s)	0.13	9.39	0.50
Alpha	1.40	Cum Volume (acre-ft)	17.14	28.71	12.13
Frctn Loss (ft)	0.44	Cum SA (acres)	5.55	4.08	6.19
C & E Loss (ft)	0.01				

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	954.67	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.84	Reach Len. (ft)	120.53	121.82	121.07
W.S. Elev (ft)	953.83	Flow Area (sq ft)	24.27	364.26	111.59
Crit W.S. (ft)		Area (sq ft)	24.27	364.26	111.59
E.G. Slope (ft/ft)	0.003455	Flow (cfs)	26.51	2758.27	145.22
Q Total (cfs)	2930.00	Top Width (ft)	19.56	52.56	45.18
Top Width (ft)	117.30				

Vel Total (ft/s)	5.86	Avg. Vel. (ft/s)	1.09	7.57	1.30
Max Chl Dpth (ft)	9.48	Hydr. Depth (ft)	1.24	6.93	2.47
Conv. Total (cfs)	49848.1	Conv. (cfs)	451.0	46926.4	2470.6
Length Wtd. (ft)	121.75	Wetted Per. (ft)	20.33	56.40	46.68
Min Ch El (ft)	944.35	Shear (lb/sq ft)	0.26	1.39	0.52
Alpha	1.58	Stream Power (lb/ft s)	0.28	10.55	0.67
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	23.38	33.08	19.54
C & E Loss (ft)	0.04	Cum SA (acres)	6.15	4.13	7.91

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3940.903

INPUT
Description: 15
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960.68	1.45	960.65	3.61	960.62	7.93	960.51	8.56	960.49
9.12	960.48	13.03	960.38	15.98	960.31	16.3	960.3	16.85	960.29
17.34	960.26	28.75	959.73	29.55	956.84	30.51	953.75	52.65	953.75
57.09	951.53	65.09	951.53	67.89	952.93	72.89	952.93	90.89	943.93
110.89	943.93	125.39	951.18	146.62	949.48	148.42	948.9	150.72	947.56
151.28	947.79	161.7	951.21	166.68	951.49	199.63	951.75	201.05	952.11
222.06	960.02	226.18	960.22	259	961.9	278.73	962.16		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	72.89	.04	125.39	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
72.89	125.39	18.03	18.27	18.28	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.70	Element			
Vel Head (ft)	0.50	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	949.20	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	947.48	Flow Area (sq ft)		160.87	6.24
E.G. Slope (ft/ft)	0.004116	Area (sq ft)		160.87	6.24
Q Total (cfs)	920.00	Flow (cfs)		916.05	3.95
Top Width (ft)	49.15	Top Width (ft)		41.07	8.08
Vel Total (ft/s)	5.51	Avg. Vel. (ft/s)		5.69	0.63
Max Chl Dpth (ft)	5.27	Hydr. Depth (ft)		3.92	0.77
Conv. Total (cfs)	14339.9	Conv. (cfs)		14278.2	61.6
Length Wtd. (ft)	4.00	Wetted Per. (ft)		43.56	8.76
Min Ch El (ft)	943.93	Shear (lb/sq ft)		0.95	0.18
Alpha	1.07	Stream Power (lb/ft s)		5.40	0.12
Frctn Loss (ft)		Cum Volume (acre-ft)	2.50	15.99	1.46
C & E Loss (ft)		Cum SA (acres)	2.51	3.39	1.34

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	950.52	Element			
Vel Head (ft)	0.58	Wt. n-Val.		0.040	
W.S. Elev (ft)	949.94	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	948.04	Flow Area (sq ft)		192.46	
E.G. Slope (ft/ft)	0.004144	Area (sq ft)		192.46	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	44.04	Top Width (ft)		44.04	
Vel Total (ft/s)	6.13	Avg. Vel. (ft/s)		6.13	
Max Chl Dpth (ft)	6.01	Hydr. Depth (ft)		4.37	
Conv. Total (cfs)	18331.0	Conv. (cfs)		18331.0	
Length Wtd. (ft)	4.00	Wetted Per. (ft)		46.88	
Min Ch El (ft)	943.93	Shear (lb/sq ft)		1.06	
Alpha	1.00	Stream Power (lb/ft s)		6.51	
Frctn Loss (ft)		Cum Volume (acre-ft)	2.05	18.69	0.33
C & E Loss (ft)		Cum SA (acres)	1.78	3.56	0.24

CROSS SECTION OUTPUT Profile #10yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	951.19	Element			
Vel Head (ft)	0.64	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	950.55	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	948.58	Flow Area (sq ft)		219.89	28.06
E.G. Slope (ft/ft)	0.004190	Area (sq ft)		219.89	28.06

Q Total (cfs)	1450.00	Flow (cfs)		1427.13	22.87
Top Width (ft)	72.84	Top Width (ft)		46.47	26.38
Vel Total (ft/s)	5.85	Avg. Vel. (ft/s)		6.49	0.82
Max Chl Dpth (ft)	6.62	Hydr. Depth (ft)		4.73	1.06
Conv. Total (cfs)	22399.7	Conv. (cfs)		22046.4	353.3
Length Wtd. (ft)	4.00	Wetted Per. (ft)		49.59	27.36
Min Ch El (ft)	943.93	Shear (lb/sq ft)		1.16	0.27
Alpha	1.21	Stream Power (lb/ft s)		7.53	0.22
Frctn Loss (ft)		Cum Volume (acre-ft)	7.47	20.67	3.97
C & E Loss (ft)		Cum SA (acres)	4.00	3.68	2.95

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	952.02	Wt. n-Val.		0.040	0.120
Vel Head (ft)	0.70	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	951.33	Flow Area (sq ft)		257.27	53.28
Crit W.S. (ft)	949.20	Area (sq ft)		257.27	53.28
E.G. Slope (ft/ft)	0.004048	Flow (cfs)		1748.74	51.26
Q Total (cfs)	1800.00	Top Width (ft)		49.29	38.36
Top Width (ft)	87.65	Avg. Vel. (ft/s)		6.80	0.96
Vel Total (ft/s)	5.80	Hydr. Depth (ft)		5.22	1.39
Max Chl Dpth (ft)	7.40	Conv. (cfs)		27486.1	805.7
Conv. Total (cfs)	28291.7	Wetted Per. (ft)		52.75	39.48
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		1.23	0.34
Min Ch El (ft)	943.93	Stream Power (lb/ft s)		8.38	0.33
Alpha	1.34	Cum Volume (acre-ft)	11.79	23.91	6.58
Frctn Loss (ft)		Cum SA (acres)	4.93	3.80	4.05
C & E Loss (ft)					

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	952.60	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.74	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	951.87	Flow Area (sq ft)	2.91	284.20	83.47
Crit W.S. (ft)	949.63	Area (sq ft)	2.91	284.20	83.47
E.G. Slope (ft/ft)	0.003877	Flow (cfs)	1.36	1990.03	68.61
Q Total (cfs)	2060.00	Top Width (ft)	9.34	50.37	74.70
Top Width (ft)	134.41	Avg. Vel. (ft/s)	0.47	7.00	0.82
Vel Total (ft/s)	5.56	Hydr. Depth (ft)	0.31	5.64	1.12
Max Chl Dpth (ft)	7.94	Conv. (cfs)	21.8	31959.8	1101.9
Conv. Total (cfs)	33083.5	Wetted Per. (ft)	9.50	53.96	75.83
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.07	1.27	0.27
Min Ch El (ft)	943.93	Stream Power (lb/ft s)	0.03	8.93	0.22
Alpha	1.53	Cum Volume (acre-ft)	14.68	25.85	8.78
Frctn Loss (ft)		Cum SA (acres)	5.27	3.87	4.92
C & E Loss (ft)					

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	953.10	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.73	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	952.38	Flow Area (sq ft)	8.23	310.29	122.24
Crit W.S. (ft)	950.03	Area (sq ft)	8.23	310.29	122.24
E.G. Slope (ft/ft)	0.003574	Flow (cfs)	6.39	2181.08	122.53
Q Total (cfs)	2310.00	Top Width (ft)	11.39	51.40	76.37
Top Width (ft)	139.16	Avg. Vel. (ft/s)	0.78	7.03	1.00
Vel Total (ft/s)	5.24	Hydr. Depth (ft)	0.72	6.04	1.60
Max Chl Dpth (ft)	8.45	Conv. (cfs)	106.8	36483.1	2049.6
Conv. Total (cfs)	38639.5	Wetted Per. (ft)	11.79	55.10	77.59
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.16	1.26	0.35
Min Ch El (ft)	943.93	Stream Power (lb/ft s)	0.12	8.83	0.35
Alpha	1.70	Cum Volume (acre-ft)	17.11	27.84	11.86
Frctn Loss (ft)		Cum SA (acres)	5.52	3.93	6.03
C & E Loss (ft)					

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	954.24	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.70	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	953.54				

Crit W.S. (ft)	950.95	Flow Area (sq ft)	26.78	370.81	212.52
E.G. Slope (ft/ft)	0.002953	Area (sq ft)	26.78	370.81	212.52
Q Total (cfs)	2930.00	Flow (cfs)	28.60	2629.09	272.30
Top Width (ft)	151.76	Top Width (ft)	19.81	52.50	79.45
Vel Total (ft/s)	4.80	Avg. Vel. (ft/s)	1.07	7.09	1.28
Max Chl Dpth (ft)	9.61	Hydr. Depth (ft)	1.35	7.06	2.67
Conv. Total (cfs)	53917.1	Conv. (cfs)	526.4	48379.9	5010.9
Length Wtd. (ft)	4.00	Wetted Per. (ft)	20.62	56.34	80.88
Min Ch El (ft)	943.93	Shear (lb/sq ft)	0.24	1.21	0.48
Alpha	1.96	Stream Power (lb/ft s)	0.26	8.60	0.62
Frctn Loss (ft)		Cum Volume (acre-ft)	23.31	32.05	19.09
C & E Loss (ft)		Cum SA (acres)	6.09	3.98	7.74

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 3934

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	965	962	500	965	962

Upstream Bridge Cross Section Data
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960.57	1.45	960.54	3.61	960.51	7.93	960.4	8.56	960.38
9.12	960.37	13.03	960.27	15.98	960.2	16.3	960.19	16.85	960.18
17.34	960.15	28.75	959.62	29.55	956.73	30.51	953.64	52.65	953.64
57.09	951.42	65.09	951.42	67.89	952.82	72.89	952.82	90.89	943.82
110.89	943.82	125.39	951.07	146.62	949.37	148.42	948.79	150.72	947.45
151.28	947.68	161.7	951.1	166.68	951.38	199.63	951.64	201.05	952
222.06	959.91	226.18	960.11	259	961.79	278.73	962.05		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	72.89	.04	125.39	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
72.89	125.39	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	965	962	500	965	962

Downstream Bridge Cross Section Data
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960.87	3.73	960.79	7.7	960.73	14.77	960.54	20.96	960.39
26.91	960.12	28.47	960.05	29.14	960.02	30.44	959.96	30.97	959.94
31.02	959.93	32.86	959.85	32.98	959.42	34.75	953.77	35.63	953.47
56.52	953.47	60.96	951.25	68.96	951.25	71.76	952.65	76.76	952.65
94.76	943.65	114.76	943.65	129.26	950.9	131.48	950.89	140.73	950.46
149.3	947.68	149.86	947.35	154.31	949.17	157.61	950.26	184.55	951.73
203.92	951.89	218.45	955.59	230.11	959.97	230.6	959.99	250.05	961
261.18	961.12	295.23	962.67						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	76.76	.04	129.26	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
76.76	129.26	.1	.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 1

```
Pier Data
Pier Station     Upstream=   72.89    Downstream=   76.76
Upstream     num=        2
    Width   Elev    Width   Elev
       8     940       8     965
Downstream     num=        2
    Width   Elev    Width   Elev
       8     940       8     965

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
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 #2yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	949.70	E.G. Elev (ft)	949.57	949.38
W.S. US. (ft)	949.20	W.S. Elev (ft)	949.07	948.86
Q Total (cfs)	920.00	Crit W.S. (ft)	947.38	947.21
Q Bridge (cfs)	920.00	Max Chl Dpth (ft)	5.25	5.21
Q Weir (cfs)		Vel Total (ft/s)	5.54	5.60
Weir Sta Lft (ft)		Flow Area (sq ft)	166.04	164.25
Weir Sta Rgt (ft)		Froude # Chl	0.51	0.52
Weir Submerg		Specif Force (cu ft)	537.72	533.30
Weir Max Depth (ft)		Hydr Depth (ft)	3.39	3.37
Min El Weir Flow (ft)	965.01	W.P. Total (ft)	52.08	51.78
Min El Prs (ft)	962.00	Conv. Total (cfs)	14226.5	14044.9
Delta EG (ft)	0.36	Top Width (ft)	48.93	48.74
Delta WS (ft)	0.31	Frctn Loss (ft)		
BR Open Area (sq ft)	2220.43	C & E Loss (ft)		
BR Open Vel (ft/s)	5.60	Shear Total (lb/sq ft)	0.83	0.85
Coef of Q		Power Total (lb/ft s)	4.61	4.76
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #5yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	950.52	E.G. Elev (ft)	950.40	950.20
W.S. US. (ft)	949.94	W.S. Elev (ft)	949.81	949.60
Q Total (cfs)	1180.00	Crit W.S. (ft)	947.94	947.78
Q Bridge (cfs)	1180.00	Max Chl Dpth (ft)	5.99	5.95
Q Weir (cfs)		Vel Total (ft/s)	6.16	6.21
Weir Sta Lft (ft)		Flow Area (sq ft)	191.41	189.92
Weir Sta Rgt (ft)		Froude # Chl	0.52	0.53
Weir Submerg		Specif Force (cu ft)	727.35	722.64
Weir Max Depth (ft)		Hydr Depth (ft)	4.36	4.34
Min El Weir Flow (ft)	965.01	W.P. Total (ft)	46.77	46.62
Min El Prs (ft)	962.00	Conv. Total (cfs)	18192.3	17995.6
Delta EG (ft)	0.35	Top Width (ft)	43.95	43.81
Delta WS (ft)	0.31	Frctn Loss (ft)		
BR Open Area (sq ft)	780.17	C & E Loss (ft)		
BR Open Vel (ft/s)	6.21	Shear Total (lb/sq ft)	1.07	1.09
Coef of Q		Power Total (lb/ft s)	6.63	6.79
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #10yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	951.19	E.G. Elev (ft)	951.06	950.88
W.S. US. (ft)	950.55	W.S. Elev (ft)	950.41	950.22
Q Total (cfs)	1450.00	Crit W.S. (ft)	948.48	948.32
Q Bridge (cfs)	1450.00	Max Chl Dpth (ft)	6.59	6.57
Q Weir (cfs)		Vel Total (ft/s)	5.89	6.06
Weir Sta Lft (ft)		Flow Area (sq ft)	246.20	239.30
Weir Sta Rgt (ft)		Froude # Chl	0.53	0.53
Weir Submerg		Specif Force (cu ft)	938.33	932.04
Weir Max Depth (ft)		Hydr Depth (ft)	3.40	3.84
Min El Weir Flow (ft)	965.01	W.P. Total (ft)	76.46	66.37
Min El Prs (ft)	962.00	Conv. Total (cfs)	22235.2	22036.8
Delta EG (ft)	0.35			

Delta WS (ft)	0.30	Top Width (ft)	72.37	62.25
BR Open Area (sq ft)	2220.43	Frctn Loss (ft)		
BR Open Vel (ft/s)	6.06	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.85	0.97
Br Sel Method	Momentum	Power Total (lb/ft s)	5.03	5.91

BRIDGE OUTPUT Profile #25yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	952.02	E.G. Elev (ft)	951.90	951.73
W.S. US. (ft)	951.33	W.S. Elev (ft)	951.19	951.00
Q Total (cfs)	1800.00	Crit W.S. (ft)	949.11	948.95
Q Bridge (cfs)	1800.00	Max Chl Dpth (ft)	7.37	7.35
Q Weir (cfs)		Vel Total (ft/s)	5.84	6.04
Weir Sta Lft (ft)		Flow Area (sq ft)	308.36	297.96
Weir Sta Rgt (ft)		Froude # Chl	0.52	0.53
Weir Submerg		Specif Force (cu ft)	1236.77	1229.26
Weir Max Depth (ft)		Hydr Depth (ft)	3.57	3.30
Min El Weir Flow (ft)	965.01	W.P. Total (ft)	91.30	95.19
Min El Prs (ft)	962.00	Conv. Total (cfs)	28222.4	27774.6
Delta EG (ft)	0.33	Top Width (ft)	86.44	90.38
Delta WS (ft)	0.29	Frctn Loss (ft)		
BR Open Area (sq ft)	2220.43	C & E Loss (ft)		
BR Open Vel (ft/s)	6.04	Shear Total (lb/sq ft)	0.86	0.82
Coef of Q		Power Total (lb/ft s)	5.01	4.96
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #50yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	952.60	E.G. Elev (ft)	952.48	952.32
W.S. US. (ft)	951.87	W.S. Elev (ft)	951.73	951.57
Q Total (cfs)	2060.00	Crit W.S. (ft)	949.52	949.36
Q Bridge (cfs)	2060.00	Max Chl Dpth (ft)	7.91	7.92
Q Weir (cfs)		Vel Total (ft/s)	5.63	5.80
Weir Sta Lft (ft)		Flow Area (sq ft)	365.66	354.99
Weir Sta Rgt (ft)		Froude # Chl	0.52	0.52
Weir Submerg		Specif Force (cu ft)	1481.60	1472.74
Weir Max Depth (ft)		Hydr Depth (ft)	2.76	3.23
Min El Weir Flow (ft)	965.01	W.P. Total (ft)	137.84	115.60
Min El Prs (ft)	962.00	Conv. Total (cfs)	33062.4	33144.2
Delta EG (ft)	0.33	Top Width (ft)	132.30	110.06
Delta WS (ft)	0.27	Frctn Loss (ft)		
BR Open Area (sq ft)	2220.43	C & E Loss (ft)		
BR Open Vel (ft/s)	5.80	Shear Total (lb/sq ft)	0.64	0.74
Coef of Q		Power Total (lb/ft s)	3.62	4.30
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #100yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	953.10	E.G. Elev (ft)	952.98	952.84
W.S. US. (ft)	952.38	W.S. Elev (ft)	952.23	952.06
Q Total (cfs)	2310.00	Crit W.S. (ft)	949.93	949.74
Q Bridge (cfs)	2310.00	Max Chl Dpth (ft)	8.41	8.41
Q Weir (cfs)		Vel Total (ft/s)	5.33	5.55
Weir Sta Lft (ft)		Flow Area (sq ft)	433.32	416.50
Weir Sta Rgt (ft)		Froude # Chl	0.50	0.51
Weir Submerg		Specif Force (cu ft)	1731.83	1722.90
Weir Max Depth (ft)		Hydr Depth (ft)	3.19	3.08
Min El Weir Flow (ft)	965.01	W.P. Total (ft)	142.37	141.40
Min El Prs (ft)	962.00	Conv. Total (cfs)	38582.1	38194.8
Delta EG (ft)	0.32	Top Width (ft)	136.01	135.10
Delta WS (ft)	0.27	Frctn Loss (ft)		
BR Open Area (sq ft)	2220.43	C & E Loss (ft)		
BR Open Vel (ft/s)	5.55	Shear Total (lb/sq ft)	0.68	0.67
Coef of Q		Power Total (lb/ft s)	3.63	3.73
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #500yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	954.24	E.G. Elev (ft)	954.12	954.00
W.S. US. (ft)	953.54	W.S. Elev (ft)	953.37	953.24
Q Total (cfs)	2930.00	Crit W.S. (ft)	950.82	950.46
Q Bridge (cfs)	2930.00	Max Chl Dpth (ft)	9.55	9.59
Q Weir (cfs)		Vel Total (ft/s)	4.94	5.04
Weir Sta Lft (ft)		Flow Area (sq ft)	593.65	581.45
Weir Sta Rgt (ft)		Froude # Chl	0.47	0.47
Weir Submerg		Specif Force (cu ft)	2437.87	2427.86
Weir Max Depth (ft)		Hydr Depth (ft)	4.14	4.03
Min El Weir Flow (ft)	965.01			

Min El Prs (ft)	962.00	W.P. Total (ft)	152.20	152.89
Delta EG (ft)	0.29	Conv. Total (cfs)	52858.7	52688.6
Delta WS (ft)	0.25	Top Width (ft)	143.52	144.26
BR Open Area (sq ft)	2220.43	Frctn Loss (ft)		
BR Open Vel (ft/s)	5.04	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.75	0.73
Br Sel Method	Momentum	Power Total (lb/ft s)	3.69	3.70

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3922.633

INPUT
Description: 16
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960.65	3.73	960.57	7.7	960.51	14.77	960.32	20.96	960.17
26.91	959.9	28.47	959.83	29.14	959.8	30.44	959.74	30.97	959.72
31.02	959.71	32.86	959.63	32.98	959.2	34.75	953.55	35.63	953.25
56.52	953.25	60.96	951.03	68.96	951.03	71.76	952.43	76.76	952.43
94.76	943.43	114.76	943.43	129.26	950.68	131.48	950.67	140.73	950.24
149.3	947.46	149.86	947.13	154.31	948.95	157.61	950.04	184.55	951.51
203.92	951.67	218.45	955.37	230.11	959.75	230.6	959.77	250.05	960.78
261.18	960.9	295.23	962.45						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	76.76	.04	129.26	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
76.76	129.26	121.49	122.76	124.97	.1	.3

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	949.34	Wt. n-Val.		0.040	0.120
Vel Head (ft)	0.45	Reach Len. (ft)	121.49	122.76	124.97
W.S. Elev (ft)	948.89	Flow Area (sq ft)		168.79	7.83
Crit W.S. (ft)		Area (sq ft)		168.79	7.83
E.G. Slope (ft/ft)	0.003591	Flow (cfs)		915.05	4.95
Q Total (cfs)	920.00	Top Width (ft)		41.84	9.27
Top Width (ft)	51.10	Avg. Vel. (ft/s)		5.42	0.63
Vel Total (ft/s)	5.21	Hydr. Depth (ft)		4.03	0.84
Max Chl Dpth (ft)	5.46	Conv. (cfs)		15270.2	82.7
Conv. Total (cfs)	15352.8	Wetted Per. (ft)		44.41	9.93
Length Wtd. (ft)	122.77	Shear (lb/sq ft)		0.85	0.18
Min Ch El (ft)	943.43	Stream Power (lb/ft s)		4.62	0.11
Alpha	1.08	Cum Volume (acre-ft)	2.50	15.92	1.45
Frctn Loss (ft)	0.36	Cum SA (acres)	2.51	3.37	1.34
C & E Loss (ft)	0.03				

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	950.17	Wt. n-Val.		0.040	
Vel Head (ft)	0.53	Reach Len. (ft)	121.49	122.76	124.97
W.S. Elev (ft)	949.64	Flow Area (sq ft)		201.12	
Crit W.S. (ft)		Area (sq ft)		201.12	
E.G. Slope (ft/ft)	0.003667	Flow (cfs)		1180.00	
Q Total (cfs)	1180.00	Top Width (ft)		44.82	
Top Width (ft)	44.82	Avg. Vel. (ft/s)		5.87	
Vel Total (ft/s)	5.87	Hydr. Depth (ft)		4.49	
Max Chl Dpth (ft)	6.21	Conv. (cfs)		19485.7	
Conv. Total (cfs)	19485.7	Wetted Per. (ft)		47.75	
Length Wtd. (ft)	122.76	Shear (lb/sq ft)		0.96	
Min Ch El (ft)	943.43	Stream Power (lb/ft s)		5.66	
Alpha	1.00	Cum Volume (acre-ft)	2.05	18.61	0.33
Frctn Loss (ft)	0.37	Cum SA (acres)	1.78	3.54	0.24
C & E Loss (ft)	0.04				

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	950.84	Wt. n-Val.		0.040	0.120
Vel Head (ft)	0.59	Reach Len. (ft)	121.49	122.76	124.97
W.S. Elev (ft)	950.24	Flow Area (sq ft)		229.07	26.23
Crit W.S. (ft)		Area (sq ft)		229.07	26.23
E.G. Slope (ft/ft)	0.003744				

Q Total (cfs)	1450.00	Flow (cfs)		1427.46	22.54
Top Width (ft)	67.89	Top Width (ft)		47.25	20.64
Vel Total (ft/s)	5.68	Avg. Vel. (ft/s)		6.23	0.86
Max Chl Dpth (ft)	6.81	Hydr. Depth (ft)		4.85	1.27
Conv. Total (cfs)	23696.2	Conv. (cfs)		23327.8	368.4
Length Wtd. (ft)	122.80	Wetted Per. (ft)		50.47	21.71
Min Ch El (ft)	943.43	Shear (lb/sq ft)		1.06	0.28
Alpha	1.19	Stream Power (lb/ft s)		6.61	0.24
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)	7.47	20.58	3.96
C & E Loss (ft)	0.04	Cum SA (acres)	4.00	3.66	2.94

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	951.69	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.65	Reach Len. (ft)	121.49	122.76	124.97
W.S. Elev (ft)	951.04	Flow Area (sq ft)	0.07	267.86	54.66
Crit W.S. (ft)		Area (sq ft)	0.07	267.86	54.66
E.G. Slope (ft/ft)	0.003609	Flow (cfs)	0.00	1755.50	44.49
Q Total (cfs)	1800.00	Top Width (ft)	8.04	49.72	46.66
Top Width (ft)	104.42	Avg. Vel. (ft/s)	0.04	6.55	0.81
Vel Total (ft/s)	5.58	Hydr. Depth (ft)	0.01	5.39	1.17
Max Chl Dpth (ft)	7.61	Conv. (cfs)	0.1	29220.7	740.6
Conv. Total (cfs)	29961.4	Wetted Per. (ft)	8.04	53.23	47.76
Length Wtd. (ft)	122.85	Shear (lb/sq ft)	0.00	1.13	0.26
Min Ch El (ft)	943.43	Stream Power (lb/ft s)	0.00	7.43	0.21
Alpha	1.35	Cum Volume (acre-ft)	11.79	23.81	6.56
Frctn Loss (ft)	0.35	Cum SA (acres)	4.92	3.78	4.03
C & E Loss (ft)	0.05				

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	952.27	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.67	Reach Len. (ft)	121.49	122.76	124.97
W.S. Elev (ft)	951.60	Flow Area (sq ft)	5.19	295.95	83.99
Crit W.S. (ft)		Area (sq ft)	5.19	295.95	83.99
E.G. Slope (ft/ft)	0.003418	Flow (cfs)	3.12	1986.22	70.66
Q Total (cfs)	2060.00	Top Width (ft)	10.27	50.84	65.93
Top Width (ft)	127.04	Avg. Vel. (ft/s)	0.60	6.71	0.84
Vel Total (ft/s)	5.35	Hydr. Depth (ft)	0.51	5.82	1.27
Max Chl Dpth (ft)	8.17	Conv. (cfs)	53.4	33974.5	1208.6
Conv. Total (cfs)	35236.5	Wetted Per. (ft)	10.54	54.48	67.05
Length Wtd. (ft)	122.89	Shear (lb/sq ft)	0.11	1.16	0.27
Min Ch El (ft)	943.43	Stream Power (lb/ft s)	0.06	7.78	0.22
Alpha	1.52	Cum Volume (acre-ft)	14.68	25.73	8.75
Frctn Loss (ft)	0.33	Cum SA (acres)	5.27	3.85	4.89
C & E Loss (ft)	0.06				

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	952.79	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.67	Reach Len. (ft)	121.49	122.76	124.97
W.S. Elev (ft)	952.11	Flow Area (sq ft)	11.01	322.41	122.53
Crit W.S. (ft)		Area (sq ft)	11.01	322.41	122.53
E.G. Slope (ft/ft)	0.003195	Flow (cfs)	9.28	2184.39	116.33
Q Total (cfs)	2310.00	Top Width (ft)	12.33	51.87	76.40
Top Width (ft)	140.60	Avg. Vel. (ft/s)	0.84	6.78	0.95
Vel Total (ft/s)	5.07	Hydr. Depth (ft)	0.89	6.22	1.60
Max Chl Dpth (ft)	8.68	Conv. (cfs)	164.1	38644.0	2058.0
Conv. Total (cfs)	40866.1	Wetted Per. (ft)	12.84	55.63	77.57
Length Wtd. (ft)	122.94	Shear (lb/sq ft)	0.17	1.16	0.32
Min Ch El (ft)	943.43	Stream Power (lb/ft s)	0.14	7.83	0.30
Alpha	1.69	Cum Volume (acre-ft)	17.11	27.71	11.81
Frctn Loss (ft)	0.30	Cum SA (acres)	5.51	3.91	6.00
C & E Loss (ft)	0.07				

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	953.95	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.67	Reach Len. (ft)	121.49	122.76	124.97
W.S. Elev (ft)	953.28				

Crit W.S. (ft)		Flow Area (sq ft)	32.41	383.73	214.61
E.G. Slope (ft/ft)	0.002670	Area (sq ft)	32.41	383.73	214.61
Q Total (cfs)	2930.00	Flow (cfs)	23.23	2646.65	260.12
Top Width (ft)	174.72	Top Width (ft)	41.23	52.50	81.00
Vel Total (ft/s)	4.65	Avg. Vel. (ft/s)	0.72	6.90	1.21
Max Chl Dpth (ft)	9.85	Hydr. Depth (ft)	0.79	7.31	2.65
Conv. Total (cfs)	56706.5	Conv. (cfs)	449.6	51222.6	5034.3
Length Wtd. (ft)	123.04	Wetted Per. (ft)	42.09	56.34	82.31
Min Ch El (ft)	943.43	Shear (lb/sq ft)	0.13	1.14	0.43
Alpha	2.00	Stream Power (lb/ft s)	0.09	7.83	0.53
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	23.30	31.90	19.00
C & E Loss (ft)	0.08	Cum SA (acres)	6.08	3.96	7.71

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3799.870

INPUT
Description: 17
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	959.27	5.2	959.02	7.96	958.9	9.49	958.84	10.79	952.31
25.46	952.31	29.78	950.15	37.78	950.15	40.58	951.55	48.58	951.55
66.58	942.55	86.58	942.55	98.54	948.53	107.55	949.01	109.65	948.99
113.54	948.44	132.09	948.53	136.05	949.46	154.64	949.63	179.04	949.75
184.92	949.94	197.4	950.31	226.61	951.21	256.43	951.91	278.92	952.23
279.83	952.61	281.1	959.19						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	48.58	.04	98.54	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
48.58 98.54 19.61 18.77 18.18 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
235	281.1		F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	948.95	Element			
Vel Head (ft)	0.35	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	948.60	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	946.11	Flow Area (sq ft)		194.37	2.36
E.G. Slope (ft/ft)	0.002438	Area (sq ft)		194.37	2.36
Q Total (cfs)	920.00	Flow (cfs)		919.66	0.34
Top Width (ft)	65.48	Top Width (ft)		44.07	21.41
Vel Total (ft/s)	4.68	Avg. Vel. (ft/s)		4.73	0.14
Max Chl Dpth (ft)	6.05	Hydr. Depth (ft)		4.41	0.11
Conv. Total (cfs)	18634.4	Conv. (cfs)		18627.5	6.9
Length Wtd. (ft)	4.00	Wetted Per. (ft)		46.91	21.43
Min Ch El (ft)	942.55	Shear (lb/sq ft)		0.63	0.02
Alpha	1.02	Stream Power (lb/ft s)		2.98	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	2.50	15.41	1.44
C & E Loss (ft)		Cum SA (acres)	2.51	3.25	1.30

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.76	Element			
Vel Head (ft)	0.42	Wt. n-Val.		0.040	
W.S. Elev (ft)	949.35	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	946.67	Flow Area (sq ft)		227.62	
E.G. Slope (ft/ft)	0.002539	Area (sq ft)		227.62	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	45.55	Top Width (ft)		45.55	
Vel Total (ft/s)	5.18	Avg. Vel. (ft/s)		5.18	
Max Chl Dpth (ft)	6.80	Hydr. Depth (ft)		5.00	
Conv. Total (cfs)	23418.8	Conv. (cfs)		23418.8	
Length Wtd. (ft)	4.00	Wetted Per. (ft)		49.38	
Min Ch El (ft)	942.55	Shear (lb/sq ft)		0.73	
Alpha	1.00	Stream Power (lb/ft s)		3.79	
Frctn Loss (ft)		Cum Volume (acre-ft)	2.05	18.00	0.33
C & E Loss (ft)		Cum SA (acres)	1.78	3.42	0.24

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	950.42	Wt. n-Val.		0.040	0.120
Vel Head (ft)	0.47	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	949.96	Flow Area (sq ft)		255.88	63.57
Crit W.S. (ft)	947.19	Area (sq ft)		255.88	63.57
E.G. Slope (ft/ft)	0.002519	Flow (cfs)		1417.99	32.02
Q Total (cfs)	1450.00	Top Width (ft)		46.78	86.99
Top Width (ft)	133.76	Avg. Vel. (ft/s)		5.54	0.50
Vel Total (ft/s)	4.54	Hydr. Depth (ft)		5.47	0.73
Max Chl Dpth (ft)	7.41	Conv. (cfs)		28251.3	637.9
Conv. Total (cfs)	28889.2	Wetted Per. (ft)		49.94	87.15
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		0.81	0.11
Min Ch El (ft)	942.55	Stream Power (lb/ft s)		4.47	0.06
Alpha	1.46	Cum Volume (acre-ft)	7.47	19.90	3.83
Frctn Loss (ft)		Cum SA (acres)	4.00	3.53	2.78
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	951.29	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.47	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	950.81	Flow Area (sq ft)	6.18	296.58	150.07
Crit W.S. (ft)	947.81	Area (sq ft)	6.18	296.58	150.07
E.G. Slope (ft/ft)	0.002301	Flow (cfs)	3.34	1690.43	106.23
Q Total (cfs)	1800.00	Top Width (ft)	10.65	48.49	115.17
Top Width (ft)	174.31	Avg. Vel. (ft/s)	0.54	5.70	0.71
Vel Total (ft/s)	3.98	Hydr. Depth (ft)	0.58	6.12	1.30
Max Chl Dpth (ft)	8.26	Conv. (cfs)	69.6	35239.0	2214.5
Conv. Total (cfs)	37523.1	Wetted Per. (ft)	10.96	51.85	115.35
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.08	0.82	0.19
Min Ch El (ft)	942.55	Stream Power (lb/ft s)	0.04	4.68	0.13
Alpha	1.93	Cum Volume (acre-ft)	11.78	23.01	6.26
Frctn Loss (ft)		Cum SA (acres)	4.90	3.65	3.80
C & E Loss (ft)					

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	951.88	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.46	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	951.42	Flow Area (sq ft)	13.38	326.38	226.18
Crit W.S. (ft)	948.23	Area (sq ft)	13.38	326.38	226.18
E.G. Slope (ft/ft)	0.002118	Flow (cfs)	10.02	1869.64	180.34
Q Total (cfs)	2060.00	Top Width (ft)	13.08	49.70	137.00
Top Width (ft)	199.78	Avg. Vel. (ft/s)	0.75	5.73	0.80
Vel Total (ft/s)	3.64	Hydr. Depth (ft)	1.02	6.57	1.66
Max Chl Dpth (ft)	8.87	Conv. (cfs)	217.7	40630.0	3919.0
Conv. Total (cfs)	44766.7	Wetted Per. (ft)	13.68	53.20	136.65
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.13	0.81	0.22
Min Ch El (ft)	942.55	Stream Power (lb/ft s)	0.10	4.65	0.17
Alpha	2.25	Cum Volume (acre-ft)	14.65	24.85	8.31
Frctn Loss (ft)		Cum SA (acres)	5.24	3.71	4.60
C & E Loss (ft)					

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	952.42	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.44	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	951.98	Flow Area (sq ft)	24.59	354.36	302.64
Crit W.S. (ft)	948.67	Area (sq ft)	24.59	354.36	309.70
E.G. Slope (ft/ft)	0.001884	Flow (cfs)	18.31	2015.31	276.38
Q Total (cfs)	2310.00	Top Width (ft)	22.46	49.96	162.81
Top Width (ft)	235.23	Avg. Vel. (ft/s)	0.74	5.69	0.91
Vel Total (ft/s)	3.39	Hydr. Depth (ft)	1.09	7.09	2.22
Max Chl Dpth (ft)	9.43	Conv. (cfs)	421.8	46429.2	6367.4
Conv. Total (cfs)	53218.3	Wetted Per. (ft)	23.22	53.50	136.65
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.12	0.78	0.26
Min Ch El (ft)	942.55	Stream Power (lb/ft s)	0.09	4.43	0.24
Alpha	2.47	Cum Volume (acre-ft)	17.06	26.75	11.19
Frctn Loss (ft)	0.01	Cum SA (acres)	5.46	3.77	5.66
C & E Loss (ft)	0.00				

CROSS SECTION OUTPUT Profile #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	953.63				

Vel Head (ft)	0.40	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	953.23	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	949.46	Flow Area (sq ft)	66.97	416.82	473.25
E.G. Slope (ft/ft)	0.001493	Area (sq ft)	66.97	416.82	533.80
Q Total (cfs)	2930.00	Flow (cfs)	60.67	2351.09	518.24
Top Width (ft)	269.34	Top Width (ft)	37.97	49.96	181.41
Vel Total (ft/s)	3.06	Avg. Vel. (ft/s)	0.91	5.64	1.10
Max Chl Dpth (ft)	10.68	Hydr. Depth (ft)	1.76	8.34	3.47
Conv. Total (cfs)	75840.3	Conv. (cfs)	1570.3	60855.8	13414.2
Length Wtd. (ft)	4.00	Wetted Per. (ft)	39.57	53.50	136.65
Min Ch El (ft)	942.55	Shear (lb/sq ft)	0.16	0.73	0.32
Alpha	2.75	Stream Power (lb/ft s)	0.14	4.10	0.35
Frctn Loss (ft)		Cum Volume (acre-ft)	23.16	30.77	17.93
C & E Loss (ft)		Cum SA (acres)	5.97	3.82	7.33

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 3792

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	965	962	500	965	962

Upstream Bridge Cross Section Data
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	959.23	5.2	958.98	7.96	958.86	9.49	958.8	10.79	952.27
25.46	952.27	29.78	950.11	37.78	950.11	40.58	951.51	48.58	951.51
66.58	942.51	86.58	942.51	98.54	948.49	107.55	948.97	109.65	948.95
113.54	948.4	132.09	948.49	136.05	949.42	154.64	949.59	179.04	949.71
184.92	949.9	197.4	950.27	226.61	951.17	256.43	951.87	278.92	952.19
279.83	952.57	281.1	959.15						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	48.58	.04	98.54	.12

Bank Sta: Left Right Coeff Contr. Expan.
48.58 98.54 .1 .3
Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
235	281.1		F

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	965	962	500	965	962

Downstream Bridge Cross Section Data
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	959.38	1.65	959.34	3.76	959.25	4.12	959.23	13.32	958.84
13.54	957.68	14.46	953.01	14.62	952.2	32.34	952.2	36.66	950.04
44.66	950.04	47.46	951.44	55.46	951.44	73.46	942.44	93.46	942.44
105.42	948.42	115.26	948.93	135.98	949.32	139.96	949.29	149.09	949.36
173.47	949.47	190.53	950.02	226.75	951.1	237.46	951.43	248.38	951.69
266.11	951.65	284.21	959.24						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	55.46	.04	105.42	.12

Bank Sta: Left Right Coeff Contr. Expan.
55.46 105.42 .1 .3
Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
256	284.21		F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Energy head used in spillway design =

```
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=   48.58    Downstream=   55.46
Upstream     num=        2
    Width   Elev    Width   Elev
       8     940       8     965
Downstream     num=        2
    Width   Elev    Width   Elev
       8     940       8     965

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                 Cd   =       2
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 #2yr

  E.G. US. (ft)                 948.95    Element                 Inside BR US  Inside BR DS
  W.S. US. (ft)                 948.60    E.G. Elev (ft)               948.90        948.82
  Q Total (cfs)                 920.00    W.S. Elev (ft)               948.55        948.47
  Q Bridge (cfs)                920.00    Crit W.S. (ft)               946.06        946.00
  Q Weir (cfs)                            Max Chl Dpth (ft)              6.04          6.03
  Weir Sta Lft (ft)                       Vel Total (ft/s)               4.69          4.76
  Weir Sta Rgt (ft)                       Flow Area (sq ft)            196.07        193.14
  Weir Submerg                            Froude # Chl                   0.40          0.40
  Weir Max Depth (ft)                     Specif Force (cu ft)         648.01        645.03
  Min El Weir Flow (ft)         965.01    Hydr Depth (ft)                3.01          4.30
  Min El Prs (ft)               962.00    W.P. Total (ft)               68.01         47.73
  Delta EG (ft)                   0.15    Conv. Total (cfs)          18567.4       18445.4
  Delta WS (ft)                   0.14    Top Width (ft)                65.15         44.89
  BR Open Area (sq ft)         2881.10    Frctn Loss (ft)
  BR Open Vel (ft/s)              4.76    C & E Loss (ft)
  Coef of Q                               Shear Total (lb/sq ft)         0.44          0.63
  Br Sel Method               Momentum    Power Total (lb/ft s)          2.07          2.99


BRIDGE OUTPUT  Profile #5yr

  E.G. US. (ft)                 949.76    Element                 Inside BR US  Inside BR DS
  W.S. US. (ft)                 949.35    E.G. Elev (ft)               949.71        949.63
  Q Total (cfs)                1180.00    W.S. Elev (ft)               949.29        949.21
  Q Bridge (cfs)               1180.00    Crit W.S. (ft)               946.64        946.57
  Q Weir (cfs)                            Max Chl Dpth (ft)              6.78          6.77
  Weir Sta Lft (ft)                       Vel Total (ft/s)               5.20          5.22
  Weir Sta Rgt (ft)                       Flow Area (sq ft)            227.11        226.27
  Weir Submerg                            Froude # Chl                   0.41          0.41
  Weir Max Depth (ft)                     Specif Force (cu ft)         858.75        855.27
  Min El Weir Flow (ft)         965.01    Hydr Depth (ft)                4.99          4.97
  Min El Prs (ft)               962.00    W.P. Total (ft)               48.54         48.50
  Delta EG (ft)                   0.16    Conv. Total (cfs)          23600.0       23467.7
  Delta WS (ft)                   0.15    Top Width (ft)                45.53         45.49
  BR Open Area (sq ft)          811.00    Frctn Loss (ft)
  BR Open Vel (ft/s)              5.22    C & E Loss (ft)
  Coef of Q                               Shear Total (lb/sq ft)         0.73          0.74
  Br Sel Method               Momentum    Power Total (lb/ft s)          3.79          3.84


BRIDGE OUTPUT  Profile #10yr

  E.G. US. (ft)                 950.42    Element                 Inside BR US  Inside BR DS
  W.S. US. (ft)                 949.96    E.G. Elev (ft)               950.37        950.35
  Q Total (cfs)                1450.00    W.S. Elev (ft)               949.90        949.87
  Q Bridge (cfs)               1450.00    Crit W.S. (ft)               947.16        947.07
  Q Weir (cfs)                            Max Chl Dpth (ft)              7.39          7.43
  Weir Sta Lft (ft)                       Vel Total (ft/s)               4.57          4.75
  Weir Sta Rgt (ft)                       Flow Area (sq ft)            317.28        305.10
```

Weir Submerg		Froude # Chl	0.42	0.41
Weir Max Depth (ft)		Specif Force (cu ft)	1094.81	1090.38
Min El Weir Flow (ft)	965.01	Hydr Depth (ft)	2.40	2.41
Min El Prs (ft)	962.00	W.P. Total (ft)	136.06	130.03
Delta EG (ft)	0.10	Conv. Total (cfs)	28908.5	29040.8
Delta WS (ft)	0.09	Top Width (ft)	132.44	126.51
BR Open Area (sq ft)	2881.10	Frctn Loss (ft)		
BR Open Vel (ft/s)	4.75	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.37	0.37
Br Sel Method	Momentum	Power Total (lb/ft s)	1.67	1.74

BRIDGE OUTPUT Profile #25yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	951.29	E.G. Elev (ft)	951.24	951.24
W.S. US. (ft)	950.81	W.S. Elev (ft)	950.76	950.75
Q Total (cfs)	1800.00	Crit W.S. (ft)	947.77	947.70
Q Bridge (cfs)	1800.00	Max Chl Dpth (ft)	8.25	8.31
Q Weir (cfs)		Vel Total (ft/s)	4.01	4.14
Weir Sta Lft (ft)		Flow Area (sq ft)	448.32	435.17
Weir Sta Rgt (ft)		Froude # Chl	0.40	0.40
Weir Submerg		Specif Force (cu ft)	1478.04	1472.17
Weir Max Depth (ft)		Hydr Depth (ft)	2.62	2.62
Min El Weir Flow (ft)	965.01	W.P. Total (ft)	175.95	171.10
Min El Prs (ft)	962.00	Conv. Total (cfs)	37734.2	37965.5
Delta EG (ft)	0.07	Top Width (ft)	171.16	166.36
Delta WS (ft)	0.06	Frctn Loss (ft)		
BR Open Area (sq ft)	2881.10	C & E Loss (ft)		
BR Open Vel (ft/s)	4.14	Shear Total (lb/sq ft)	0.36	0.36
Coef of Q		Power Total (lb/ft s)	1.45	1.48
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #50yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	951.88	E.G. Elev (ft)	951.84	951.85
W.S. US. (ft)	951.42	W.S. Elev (ft)	951.36	951.36
Q Total (cfs)	2060.00	Crit W.S. (ft)	948.20	948.12
Q Bridge (cfs)	2060.00	Max Chl Dpth (ft)	8.85	8.92
Q Weir (cfs)		Vel Total (ft/s)	3.69	3.78
Weir Sta Lft (ft)		Flow Area (sq ft)	557.87	544.48
Weir Sta Rgt (ft)		Froude # Chl	0.39	0.39
Weir Submerg		Specif Force (cu ft)	1818.21	1811.24
Weir Max Depth (ft)		Hydr Depth (ft)	2.86	2.88
Min El Weir Flow (ft)	965.01	W.P. Total (ft)	200.63	194.80
Min El Prs (ft)	962.00	Conv. Total (cfs)	44937.2	45281.1
Delta EG (ft)	0.06	Top Width (ft)	194.95	189.14
Delta WS (ft)	0.05	Frctn Loss (ft)		
BR Open Area (sq ft)	2881.10	C & E Loss (ft)		
BR Open Vel (ft/s)	3.78	Shear Total (lb/sq ft)	0.36	0.36
Coef of Q		Power Total (lb/ft s)	1.35	1.37
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #100yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	952.42	E.G. Elev (ft)	952.41	952.40
W.S. US. (ft)	951.98	W.S. Elev (ft)	951.96	951.92
Q Total (cfs)	2310.00	Crit W.S. (ft)	948.63	948.49
Q Bridge (cfs)	2310.00	Max Chl Dpth (ft)	9.45	9.48
Q Weir (cfs)		Vel Total (ft/s)	3.41	3.50
Weir Sta Lft (ft)		Flow Area (sq ft)	678.06	659.09
Weir Sta Rgt (ft)		Froude # Chl	0.37	0.37
Weir Submerg		Specif Force (cu ft)	2215.34	2180.05
Weir Max Depth (ft)		Hydr Depth (ft)	3.37	3.06
Min El Weir Flow (ft)	965.01	W.P. Total (ft)	207.83	221.95
Min El Prs (ft)	962.00	Conv. Total (cfs)	53450.5	52685.6
Delta EG (ft)	0.05	Top Width (ft)	228.63	225.86
Delta WS (ft)	0.05	Frctn Loss (ft)	0.01	0.02
BR Open Area (sq ft)	2881.10	C & E Loss (ft)	0.00	0.01
BR Open Vel (ft/s)	3.50	Shear Total (lb/sq ft)	0.38	0.36
Coef of Q		Power Total (lb/ft s)	1.30	1.25
Br Sel Method	Energy only			

BRIDGE OUTPUT Profile #500yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	953.63	E.G. Elev (ft)	953.59	953.60
W.S. US. (ft)	953.23	W.S. Elev (ft)	953.17	953.18
Q Total (cfs)	2930.00	Crit W.S. (ft)	949.42	949.59
Q Bridge (cfs)	2930.00	Max Chl Dpth (ft)	10.66	10.74
Q Weir (cfs)				

Weir Sta Lft (ft)		Vel Total (ft/s)	3.14	3.09
Weir Sta Rgt (ft)		Flow Area (sq ft)	934.25	946.91
Weir Submerg		Froude # Chl	0.34	0.34
Weir Max Depth (ft)		Specif Force (cu ft)	3259.41	3249.68
Min El Weir Flow (ft)	965.01	Hydr Depth (ft)	4.32	4.05
Min El Prs (ft)	962.00	W.P. Total (ft)	226.52	243.80
Delta EG (ft)	0.06	Conv. Total (cfs)	73191.6	73468.6
Delta WS (ft)	0.05	Top Width (ft)	261.33	247.32
BR Open Area (sq ft)	2881.10	Frctn Loss (ft)		
BR Open Vel (ft/s)	3.14	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.41	0.39
Br Sel Method	Momentum	Power Total (lb/ft s)	1.29	1.19

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3781.101

INPUT
Description: 18
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	959.29	1.65	959.25	3.76	959.16	4.12	959.14	13.32	958.75
13.54	957.59	14.46	952.92	14.62	952.11	32.34	952.11	36.66	949.95
44.66	949.95	47.46	951.35	55.46	951.35	73.46	942.35	93.46	942.35
105.42	948.33	115.26	948.84	135.98	949.23	139.96	949.2	149.09	949.27
173.47	949.38	190.53	949.93	226.75	951.01	237.46	951.34	248.38	951.6
266.11	951.56	284.21	959.15						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	55.46	.04	105.42	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
55.46	105.42	119.49	121.49	122.1	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
256	284.21		F

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	948.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	948.46	Reach Len. (ft)	119.49	121.49	122.10
Crit W.S. (ft)		Flow Area (sq ft)		196.81	0.16
E.G. Slope (ft/ft)	0.002348	Area (sq ft)		196.81	0.16
Q Total (cfs)	920.00	Flow (cfs)		919.98	0.02
Top Width (ft)	46.67	Top Width (ft)		44.18	2.49
Vel Total (ft/s)	4.67	Avg. Vel. (ft/s)		4.67	0.10
Max Chl Dpth (ft)	6.11	Hydr. Depth (ft)		4.45	0.06
Conv. Total (cfs)	18986.2	Conv. (cfs)		18985.9	0.3
Length Wtd. (ft)	121.49	Wetted Per. (ft)		47.03	2.50
Min Ch El (ft)	942.35	Shear (lb/sq ft)		0.61	0.01
Alpha	1.00	Stream Power (lb/ft s)		2.87	0.00
Frctn Loss (ft)	0.30	Cum Volume (acre-ft)	2.50	15.33	1.44
C & E Loss (ft)	0.00	Cum SA (acres)	2.51	3.23	1.29

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	949.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.		0.040	
W.S. Elev (ft)	949.20	Reach Len. (ft)	119.49	121.49	122.10
Crit W.S. (ft)		Flow Area (sq ft)		230.01	
E.G. Slope (ft/ft)	0.002463	Area (sq ft)		230.01	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	45.66	Top Width (ft)		45.66	
Vel Total (ft/s)	5.13	Avg. Vel. (ft/s)		5.13	
Max Chl Dpth (ft)	6.85	Hydr. Depth (ft)		5.04	
Conv. Total (cfs)	23775.4	Conv. (cfs)		23775.4	
Length Wtd. (ft)	121.49	Wetted Per. (ft)		49.55	
Min Ch El (ft)	942.35	Shear (lb/sq ft)		0.71	
Alpha	1.00	Stream Power (lb/ft s)		3.66	
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)	2.05	17.91	0.33
C & E Loss (ft)	0.00	Cum SA (acres)	1.78	3.40	0.24

CROSS SECTION OUTPUT Profile #10yr

E.G. Elev (ft)	950.32	Element	Left OB	Channel	Right OB

Vel Head (ft)	0.45	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	949.87	Reach Len. (ft)	119.49	121.49	122.10
Crit W.S. (ft)		Flow Area (sq ft)		261.10	55.31
E.G. Slope (ft/ft)	0.002392	Area (sq ft)		261.10	55.31
Q Total (cfs)	1450.00	Flow (cfs)		1424.49	25.51
Top Width (ft)	130.23	Top Width (ft)		47.00	83.23
Vel Total (ft/s)	4.58	Avg. Vel. (ft/s)		5.46	0.46
Max Chl Dpth (ft)	7.52	Hydr. Depth (ft)		5.56	0.66
Conv. Total (cfs)	29644.6	Conv. (cfs)		29123.1	521.5
Length Wtd. (ft)	121.50	Wetted Per. (ft)		50.19	83.26
Min Ch El (ft)	942.35	Shear (lb/sq ft)		0.78	0.10
Alpha	1.39	Stream Power (lb/ft s)		4.24	0.05
Frctn Loss (ft)	0.30	Cum Volume (acre-ft)	7.47	19.79	3.81
C & E Loss (ft)	0.00	Cum SA (acres)	4.00	3.51	2.75

CROSS SECTION OUTPUT Profile #25yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	951.21	Element			
Vel Head (ft)	0.46	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	950.75	Reach Len. (ft)	119.49	121.49	122.10
Crit W.S. (ft)		Flow Area (sq ft)	7.71	303.42	141.83
E.G. Slope (ft/ft)	0.002175	Area (sq ft)	7.71	303.42	141.83
Q Total (cfs)	1800.00	Flow (cfs)	4.53	1700.04	95.43
Top Width (ft)	172.69	Top Width (ft)	11.21	48.77	112.71
Vel Total (ft/s)	3.97	Avg. Vel. (ft/s)	0.59	5.60	0.67
Max Chl Dpth (ft)	8.40	Hydr. Depth (ft)	0.69	6.22	1.26
Conv. Total (cfs)	38599.2	Conv. (cfs)	97.1	36455.7	2046.4
Length Wtd. (ft)	121.52	Wetted Per. (ft)	11.59	52.16	112.75
Min Ch El (ft)	942.35	Shear (lb/sq ft)	0.09	0.79	0.17
Alpha	1.88	Stream Power (lb/ft s)	0.05	4.42	0.11
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)	11.78	22.88	6.20
C & E Loss (ft)	0.00	Cum SA (acres)	4.89	3.63	3.75

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #50yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	951.82	Element			
Vel Head (ft)	0.45	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	951.37	Reach Len. (ft)	119.49	121.49	122.10
Crit W.S. (ft)		Flow Area (sq ft)	15.47	333.68	217.15
E.G. Slope (ft/ft)	0.002012	Area (sq ft)	15.47	333.68	217.15
Q Total (cfs)	2060.00	Flow (cfs)	8.98	1883.95	167.07
Top Width (ft)	204.72	Top Width (ft)	21.63	49.96	133.13
Vel Total (ft/s)	3.64	Avg. Vel. (ft/s)	0.58	5.65	0.77
Max Chl Dpth (ft)	9.02	Hydr. Depth (ft)	0.71	6.68	1.63
Conv. Total (cfs)	45927.2	Conv. (cfs)	200.1	42002.2	3724.8
Length Wtd. (ft)	121.52	Wetted Per. (ft)	22.30	53.50	133.18
Min Ch El (ft)	942.35	Shear (lb/sq ft)	0.09	0.78	0.20
Alpha	2.21	Stream Power (lb/ft s)	0.05	4.42	0.16
Frctn Loss (ft)	0.26	Cum Volume (acre-ft)	14.65	24.71	8.21
C & E Loss (ft)	0.00	Cum SA (acres)	5.23	3.69	4.54

CROSS SECTION OUTPUT Profile #100yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	952.37	Element			
Vel Head (ft)	0.44	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	951.93	Reach Len. (ft)	119.49	121.49	122.10
Crit W.S. (ft)		Flow Area (sq ft)	28.01	361.92	299.38
E.G. Slope (ft/ft)	0.001798	Area (sq ft)	28.01	361.92	303.19
Q Total (cfs)	2310.00	Flow (cfs)	22.01	2039.47	248.52
Top Width (ft)	234.30	Top Width (ft)	22.76	49.96	161.58
Vel Total (ft/s)	3.35	Avg. Vel. (ft/s)	0.79	5.64	0.83
Max Chl Dpth (ft)	9.58	Hydr. Depth (ft)	1.23	7.24	1.99
Conv. Total (cfs)	54471.0	Conv. (cfs)	519.0	48091.6	5860.3
Length Wtd. (ft)	121.53	Wetted Per. (ft)	23.56	53.50	150.63
Min Ch El (ft)	942.35	Shear (lb/sq ft)	0.13	0.76	0.22
Alpha	2.50	Stream Power (lb/ft s)	0.10	4.28	0.19
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	17.05	26.60	11.07
C & E Loss (ft)	0.01	Cum SA (acres)	5.45	3.75	5.59

CROSS SECTION OUTPUT Profile #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	953.57	Element			
Vel Head (ft)	0.39	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	953.18	Reach Len. (ft)	119.49	121.49	122.10
Crit W.S. (ft)		Flow Area (sq ft)	75.93	424.31	487.43
E.G. Slope (ft/ft)	0.001421	Area (sq ft)	75.93	424.31	506.83

Q Total (cfs)	2930.00	Flow (cfs)	69.28	2362.98	497.74
Top Width (ft)	255.56	Top Width (ft)	41.05	49.96	164.55
Vel Total (ft/s)	2.97	Avg. Vel. (ft/s)	0.91	5.57	1.02
Max Chl Dpth (ft)	10.83	Hydr. Depth (ft)	1.85	8.49	3.24
Conv. Total (cfs)	77731.7	Conv. (cfs)	1837.9	62689.0	13204.8
Length Wtd. (ft)	121.54	Wetted Per. (ft)	42.77	53.50	150.63
Min Ch El (ft)	942.35	Shear (lb/sq ft)	0.16	0.70	0.29
Alpha	2.86	Stream Power (lb/ft s)	0.14	3.92	0.29
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	23.13	30.59	17.71
C & E Loss (ft)	0.01	Cum SA (acres)	5.96	3.80	7.26

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3659.612

INPUT
Description: 19
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	958.56	1.96	958.5	9.17	958.21	9.55	958.2	11.04	958.14
12.46	958.08	13.47	958.04	14.61	951.91	29.17	951.91	33.49	949.75
41.49	949.75	44.29	951.15	52.29	951.15	70.29	942.15	90.29	942.15
102.25	948.13	123.09	948.32	146.41	948.84	146.75	948.96	147.21	948.95
148.2	948.93	150.32	949.33	166.85	950.26	169.53	950.34	175.61	950.53
187.64	950.88	213.53	951.16	213.96	951.17	222.01	951.3	223.95	951.47
253.44	954.12	256.95	954.23	257.56	954.27	257.9	954.8	259.28	955.3
272.54	960.14								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	52.29	.04	102.25	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
52.29	102.25	18.36	18.18	17.87	.1	.3

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	948.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.36	Wt. n-Val.		0.040	0.000
W.S. Elev (ft)	948.14	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	945.70	Flow Area (sq ft)		191.66	0.01
E.G. Slope (ft/ft)	0.002546	Area (sq ft)		191.66	0.01
Q Total (cfs)	920.00	Flow (cfs)		920.00	0.00
Top Width (ft)	45.29	Top Width (ft)		43.94	1.35
Vel Total (ft/s)	4.80	Avg. Vel. (ft/s)		4.80	0.02
Max Chl Dpth (ft)	5.99	Hydr. Depth (ft)		4.36	0.01
Conv. Total (cfs)	18232.0	Conv. (cfs)		18232.0	0.0
Length Wtd. (ft)	4.00	Wetted Per. (ft)		46.77	1.35
Min Ch El (ft)	942.15	Shear (lb/sq ft)		0.65	
Alpha	1.00	Stream Power (lb/ft s)		3.13	
Frctn Loss (ft)		Cum Volume (acre-ft)	2.50	14.78	1.44
C & E Loss (ft)		Cum SA (acres)	2.51	3.11	1.29

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	949.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.43	Wt. n-Val.		0.040	
W.S. Elev (ft)	948.86	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	946.26	Flow Area (sq ft)		223.81	
E.G. Slope (ft/ft)	0.002666	Area (sq ft)		223.81	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	45.38	Top Width (ft)		45.38	
Vel Total (ft/s)	5.27	Avg. Vel. (ft/s)		5.27	
Max Chl Dpth (ft)	6.71	Hydr. Depth (ft)		4.93	
Conv. Total (cfs)	22853.3	Conv. (cfs)		22853.3	
Length Wtd. (ft)	4.00	Wetted Per. (ft)		49.11	
Min Ch El (ft)	942.15	Shear (lb/sq ft)		0.76	
Alpha	1.00	Stream Power (lb/ft s)		4.00	
Frctn Loss (ft)		Cum Volume (acre-ft)	2.05	17.27	0.33
C & E Loss (ft)		Cum SA (acres)	1.78	3.27	0.24

CROSS SECTION OUTPUT Profile #10yr

E.G. Elev (ft)	950.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.46	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	949.56	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	946.78	Flow Area (sq ft)		256.00	53.21

E.G. Slope (ft/ft)	0.002510	Area (sq ft)		256.00	53.21
Q Total (cfs)	1450.00	Flow (cfs)		1416.58	33.42
Top Width (ft)	98.95	Top Width (ft)		46.78	52.17
Vel Total (ft/s)	4.69	Avg. Vel. (ft/s)		5.53	0.63
Max Chl Dpth (ft)	7.41	Hydr. Depth (ft)		5.47	1.02
Conv. Total (cfs)	28939.7	Conv. (cfs)		28272.7	667.0
Length Wtd. (ft)	4.00	Wetted Per. (ft)		49.94	52.24
Min Ch El (ft)	942.15	Shear (lb/sq ft)		0.80	0.16
Alpha	1.36	Stream Power (lb/ft s)		4.45	0.10
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	7.47	19.06	3.66
C & E Loss (ft)	0.00	Cum SA (acres)	4.00	3.38	2.56

CROSS SECTION OUTPUT Profile #25yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	950.94	Element			
Vel Head (ft)	0.49	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	950.45	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	947.39	Flow Area (sq ft)	6.62	298.58	107.18
E.G. Slope (ft/ft)	0.002314	Area (sq ft)	6.62	298.58	107.18
Q Total (cfs)	1800.00	Flow (cfs)	3.72	1712.28	84.00
Top Width (ft)	130.30	Top Width (ft)	10.82	48.57	70.92
Vel Total (ft/s)	4.36	Avg. Vel. (ft/s)	0.56	5.73	0.78
Max Chl Dpth (ft)	8.30	Hydr. Depth (ft)	0.61	6.15	1.51
Conv. Total (cfs)	37417.1	Conv. (cfs)	77.2	35593.7	1746.1
Length Wtd. (ft)	4.00	Wetted Per. (ft)	11.15	51.94	71.01
Min Ch El (ft)	942.15	Shear (lb/sq ft)	0.09	0.83	0.22
Alpha	1.64	Stream Power (lb/ft s)	0.05	4.76	0.17
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	11.76	22.04	5.85
C & E Loss (ft)	0.00	Cum SA (acres)	4.86	3.49	3.50

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #50yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	951.56	Element			
Vel Head (ft)	0.50	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	951.06	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	947.82	Flow Area (sq ft)	13.87	328.23	156.99
E.G. Slope (ft/ft)	0.002213	Area (sq ft)	13.87	328.23	156.99
Q Total (cfs)	2060.00	Flow (cfs)	10.78	1927.19	122.03
Top Width (ft)	164.73	Top Width (ft)	13.23	49.77	101.73
Vel Total (ft/s)	4.13	Avg. Vel. (ft/s)	0.78	5.87	0.78
Max Chl Dpth (ft)	8.91	Hydr. Depth (ft)	1.05	6.59	1.54
Conv. Total (cfs)	43794.0	Conv. (cfs)	229.2	40970.6	2594.2
Length Wtd. (ft)	4.00	Wetted Per. (ft)	13.84	53.29	101.83
Min Ch El (ft)	942.15	Shear (lb/sq ft)	0.14	0.85	0.21
Alpha	1.90	Stream Power (lb/ft s)	0.11	5.00	0.17
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	14.61	23.79	7.69
C & E Loss (ft)	0.00	Cum SA (acres)	5.18	3.55	4.21

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	952.13	Element			
Vel Head (ft)	0.49	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	951.64	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	948.19	Flow Area (sq ft)	26.00	357.47	225.80
E.G. Slope (ft/ft)	0.001993	Area (sq ft)	26.00	357.47	225.80
Q Total (cfs)	2310.00	Flow (cfs)	20.57	2103.04	186.39
Top Width (ft)	196.16	Top Width (ft)	22.58	49.96	123.62
Vel Total (ft/s)	3.79	Avg. Vel. (ft/s)	0.79	5.88	0.83
Max Chl Dpth (ft)	9.49	Hydr. Depth (ft)	1.15	7.16	1.83
Conv. Total (cfs)	51747.4	Conv. (cfs)	460.9	47111.1	4175.5
Length Wtd. (ft)	4.00	Wetted Per. (ft)	23.36	53.50	123.74
Min Ch El (ft)	942.15	Shear (lb/sq ft)	0.14	0.83	0.23
Alpha	2.20	Stream Power (lb/ft s)	0.11	4.89	0.19
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	16.98	25.60	10.32
C & E Loss (ft)	0.00	Cum SA (acres)	5.39	3.61	5.19

CROSS SECTION OUTPUT Profile #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	953.38	Element			
Vel Head (ft)	0.45	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	952.93	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	949.24	Flow Area (sq ft)	70.73	421.92	394.52
E.G. Slope (ft/ft)	0.001582	Area (sq ft)	70.73	421.92	394.52
Q Total (cfs)	2930.00	Flow (cfs)	68.43	2470.40	391.17

Top Width (ft)	225.80	Top Width (ft)	37.87	49.96	137.97
Vel Total (ft/s)	3.30	Avg. Vel. (ft/s)	0.97	5.86	0.99
Max Chl Dpth (ft)	10.78	Hydr. Depth (ft)	1.87	8.45	2.86
Conv. Total (cfs)	73654.1	Conv. (cfs)	1720.1	62100.8	9833.2
Length Wtd. (ft)	4.00	Wetted Per. (ft)	39.56	53.50	138.15
Min Ch El (ft)	942.15	Shear (lb/sq ft)	0.18	0.78	0.28
Alpha	2.66	Stream Power (lb/ft s)	0.17	4.56	0.28
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	22.93	29.41	16.44
C & E Loss (ft)	0.00	Cum SA (acres)	5.85	3.66	6.83

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 3652

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	960	957	500	960	957

Upstream Bridge Cross Section Data
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	958.56	1.96	958.5	9.17	958.21	9.55	958.2	11.04	958.14
12.46	958.08	13.47	958.04	14.61	951.91	29.17	951.91	33.49	949.75
41.49	949.75	44.29	951.15	52.29	951.15	70.29	942.15	90.29	942.15
102.25	948.13	123.09	948.32	146.41	948.84	146.75	948.96	147.21	948.95
148.2	948.93	150.32	949.33	166.85	950.26	169.53	950.34	175.61	950.53
187.64	950.88	213.53	951.16	213.96	951.17	222.01	951.3	223.95	951.47
253.44	954.12	256.95	954.23	257.56	954.27	257.9	954.8	259.28	955.3
272.54	960.14								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	52.29	.04	102.25	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
52.29	102.25	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	960	957	500	960	957

Downstream Bridge Cross Section Data
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	958.43	.57	958.41	4.35	958.26	11.97	957.96	12.46	955.32
13.14	951.91	30.89	951.91	35.21	949.75	43.21	949.75	46.01	951.15
54.01	951.15	72.01	942.15	92.01	942.15	103.97	948.13	107.38	948.12
121.11	948.22	143.34	949.11	153.55	949.68	168.39	950.1	189.55	950.77
196.84	951.03	201.1	951.16	212.45	951.5	215.46	951.59	240.59	951.58
260.58	953.21	263.83	953.7	273.43	957.88	280.47	960.45		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	54.01	.04	103.97	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
54.01	103.97	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
238	280.47		F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data

```
Pier Station     Upstream=   52.29    Downstream=   54.01
Upstream     num=       2
    Width   Elev    Width   Elev
       8     940       8     960
Downstream     num=       2
    Width   Elev    Width   Elev
       8     940       8     960

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd    =       2
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 #2yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	948.50	E.G. Elev (ft)	948.49	948.47
W.S. US. (ft)	948.14	W.S. Elev (ft)	948.13	948.11
Q Total (cfs)	920.00	Crit W.S. (ft)	945.70	945.71
Q Bridge (cfs)	920.00	Max Chl Dpth (ft)	5.98	5.96
Q Weir (cfs)		Vel Total (ft/s)	4.81	4.84
Weir Sta Lft (ft)		Flow Area (sq ft)	191.18	190.27
Weir Sta Rgt (ft)		Froude # Chl	0.41	0.41
Weir Submerg		Specif Force (cu ft)	637.91	634.63
Weir Max Depth (ft)		Hydr Depth (ft)	4.34	4.34
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	46.89	46.66
Min El Prs (ft)	957.00	Conv. Total (cfs)	18162.3	18042.2
Delta EG (ft)	0.05	Top Width (ft)	44.07	43.84
Delta WS (ft)	0.06	Frctn Loss (ft)		
BR Open Area (sq ft)	1748.35	C & E Loss (ft)		
BR Open Vel (ft/s)	4.84	Shear Total (lb/sq ft)	0.65	0.66
Coef of Q		Power Total (lb/ft s)	3.14	3.20
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #5yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	949.29	E.G. Elev (ft)	949.28	949.27
W.S. US. (ft)	948.86	W.S. Elev (ft)	948.85	948.83
Q Total (cfs)	1180.00	Crit W.S. (ft)	946.27	946.27
Q Bridge (cfs)	1180.00	Max Chl Dpth (ft)	6.70	6.68
Q Weir (cfs)		Vel Total (ft/s)	5.29	5.31
Weir Sta Lft (ft)		Flow Area (sq ft)	223.18	222.26
Weir Sta Rgt (ft)		Froude # Chl	0.42	0.42
Weir Submerg		Specif Force (cu ft)	842.65	838.90
Weir Max Depth (ft)		Hydr Depth (ft)	4.92	4.90
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	48.35	48.30
Min El Prs (ft)	957.00	Conv. Total (cfs)	22984.7	22840.3
Delta EG (ft)	0.05	Top Width (ft)	45.36	45.32
Delta WS (ft)	0.06	Frctn Loss (ft)		
BR Open Area (sq ft)	597.74	C & E Loss (ft)		
BR Open Vel (ft/s)	5.31	Shear Total (lb/sq ft)	0.76	0.77
Coef of Q		Power Total (lb/ft s)	4.02	4.07
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #10yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	950.03	E.G. Elev (ft)	950.02	950.00
W.S. US. (ft)	949.56	W.S. Elev (ft)	949.55	949.52
Q Total (cfs)	1450.00	Crit W.S. (ft)	946.80	946.80
Q Bridge (cfs)	1450.00	Max Chl Dpth (ft)	7.40	7.37
Q Weir (cfs)		Vel Total (ft/s)	4.71	4.87
Weir Sta Lft (ft)		Flow Area (sq ft)	307.75	298.03
Weir Sta Rgt (ft)		Froude # Chl	0.42	0.42
Weir Submerg		Specif Force (cu ft)	1091.18	1083.05
Weir Max Depth (ft)		Hydr Depth (ft)	3.14	3.21
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	101.43	96.19
Min El Prs (ft)	957.00	Conv. Total (cfs)	28982.3	28648.3
Delta EG (ft)	0.05	Top Width (ft)	97.90	92.72
Delta WS (ft)	0.06			

BR Open Area (sq ft)	1748.35	Frctn Loss (ft)	0.02	0.02
BR Open Vel (ft/s)	4.87	C & E Loss (ft)	0.00	0.00
Coef of Q		Shear Total (lb/sq ft)	0.47	0.50
Br Sel Method	Energy only	Power Total (lb/ft s)	2.23	2.41

BRIDGE OUTPUT Profile #25yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	950.94	E.G. Elev (ft)	950.93	950.92
W.S. US. (ft)	950.45	W.S. Elev (ft)	950.44	950.41
Q Total (cfs)	1800.00	Crit W.S. (ft)	947.40	947.40
Q Bridge (cfs)	1800.00	Max Chl Dpth (ft)	8.29	8.26
Q Weir (cfs)		Vel Total (ft/s)	4.41	4.53
Weir Sta Lft (ft)		Flow Area (sq ft)	408.36	397.31
Weir Sta Rgt (ft)		Froude # Chl	0.40	0.41
Weir Submerg		Specif Force (cu ft)	1472.53	1455.06
Weir Max Depth (ft)		Hydr Depth (ft)	3.21	3.04
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	131.81	135.31
Min El Prs (ft)	957.00	Conv. Total (cfs)	37639.8	37072.0
Delta EG (ft)	0.04	Top Width (ft)	127.04	130.64
Delta WS (ft)	0.07	Frctn Loss (ft)	0.01	0.02
BR Open Area (sq ft)	1748.35	C & E Loss (ft)	0.00	0.00
BR Open Vel (ft/s)	4.53	Shear Total (lb/sq ft)	0.44	0.43
Coef of Q		Power Total (lb/ft s)	1.95	1.96
Br Sel Method	Energy only			

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the energy inside of the bridge deck. This is not physically possible. Please review your bridge data and results for reasonableness.

BRIDGE OUTPUT Profile #50yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	951.56	E.G. Elev (ft)	951.55	951.54
W.S. US. (ft)	951.06	W.S. Elev (ft)	951.03	951.01
Q Total (cfs)	2060.00	Crit W.S. (ft)	947.84	947.82
Q Bridge (cfs)	2060.00	Max Chl Dpth (ft)	8.88	8.86
Q Weir (cfs)		Vel Total (ft/s)	4.19	4.26
Weir Sta Lft (ft)		Flow Area (sq ft)	491.26	483.12
Weir Sta Rgt (ft)		Froude # Chl	0.40	0.40
Weir Submerg		Specif Force (cu ft)	1789.69	1768.45
Weir Max Depth (ft)		Hydr Depth (ft)	3.10	3.19
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	164.04	156.96
Min El Prs (ft)	957.00	Conv. Total (cfs)	43990.0	43743.5
Delta EG (ft)	0.04	Top Width (ft)	158.38	151.39
Delta WS (ft)	0.06	Frctn Loss (ft)	0.01	0.02
BR Open Area (sq ft)	1748.35	C & E Loss (ft)	0.00	0.00
BR Open Vel (ft/s)	4.26	Shear Total (lb/sq ft)	0.41	0.43
Coef of Q		Power Total (lb/ft s)	1.72	1.82
Br Sel Method	Energy only			

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the energy inside of the bridge deck. This is not physically possible. Please review your bridge data and results for reasonableness.

BRIDGE OUTPUT Profile #100yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	952.13	E.G. Elev (ft)	952.12	952.11
W.S. US. (ft)	951.64	W.S. Elev (ft)	951.61	951.59
Q Total (cfs)	2310.00	Crit W.S. (ft)	948.21	948.24
Q Bridge (cfs)	2310.00	Max Chl Dpth (ft)	9.46	9.44
Q Weir (cfs)		Vel Total (ft/s)	3.88	3.99
Weir Sta Lft (ft)		Flow Area (sq ft)	595.32	578.32
Weir Sta Rgt (ft)		Froude # Chl	0.38	0.39
Weir Submerg		Specif Force (cu ft)	2142.33	2114.72
Weir Max Depth (ft)		Hydr Depth (ft)	3.17	2.92
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	194.61	204.62
Min El Prs (ft)	957.00	Conv. Total (cfs)	51161.9	50734.1
Delta EG (ft)	0.04	Top Width (ft)	187.74	200.56
Delta WS (ft)	0.06	Frctn Loss (ft)	0.01	0.02
BR Open Area (sq ft)	1748.35	C & E Loss (ft)	0.00	0.00
BR Open Vel (ft/s)	3.99	Shear Total (lb/sq ft)	0.39	0.37
Coef of Q		Power Total (lb/ft s)	1.51	1.46
Br Sel Method	Energy only			

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the energy inside of the bridge deck. This is not physically possible. Please review your bridge data and results for reasonableness.

BRIDGE OUTPUT Profile #500yr

E.G. US. (ft)	953.38	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	952.93	E.G. Elev (ft)	953.37	953.36
Q Total (cfs)	2930.00	W.S. Elev (ft)	952.89	952.88
Q Bridge (cfs)	2930.00	Crit W.S. (ft)	949.26	949.20
Q Weir (cfs)		Max Chl Dpth (ft)	10.74	10.73
Weir Sta Lft (ft)		Vel Total (ft/s)	3.40	3.44
Weir Sta Rgt (ft)		Flow Area (sq ft)	860.63	852.08
Weir Submerg		Froude # Chl	0.36	0.36
Weir Max Depth (ft)		Specif Force (cu ft)	3151.42	3111.28
Min El Weir Flow (ft)	960.01	Hydr Depth (ft)	3.96	3.93
Min El Prs (ft)	957.00	W.P. Total (ft)	227.76	227.27
Delta EG (ft)	0.04	Conv. Total (cfs)	70601.2	70196.9
Delta WS (ft)	0.05	Top Width (ft)	217.37	235.57
BR Open Area (sq ft)	1748.35	Frctn Loss (ft)	0.01	0.01
BR Open Vel (ft/s)	3.44	C & E Loss (ft)	0.00	0.01
Coef of Q		Shear Total (lb/sq ft)	0.41	0.41
Br Sel Method	Energy only	Power Total (lb/ft s)	1.38	1.40

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3641.433

INPUT
Description: 20
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	958.43	.57	958.41	4.35	958.26	11.97	957.96	12.46	955.32
13.14	951.91	30.89	951.91	35.21	949.75	43.21	949.75	46.01	951.15
54.01	951.15	72.01	942.15	92.01	942.15	103.97	948.13	107.38	948.12
121.11	948.22	143.34	949.11	153.55	949.68	168.39	950.1	189.55	950.77
196.84	951.03	201.1	951.16	212.45	951.5	215.46	951.59	240.59	951.58
260.58	953.21	263.83	953.7	273.43	957.88	280.47	960.45		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	54.01	.04	103.97	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
54.01	103.97	122.87	122.58	125.68	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
238	280.47		F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	948.45	Element			
Vel Head (ft)	0.37	Wt. n-Val.		0.040	
W.S. Elev (ft)	948.08	Reach Len. (ft)	122.87	122.58	125.68
Crit W.S. (ft)		Flow Area (sq ft)		189.06	
E.G. Slope (ft/ft)	0.002647	Area (sq ft)		189.06	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	43.73	Top Width (ft)		43.73	
Vel Total (ft/s)	4.87	Avg. Vel. (ft/s)		4.87	
Max Chl Dpth (ft)	5.93	Hydr. Depth (ft)		4.32	
Conv. Total (cfs)	17882.5	Conv. (cfs)		17882.5	
Length Wtd. (ft)	122.58	Wetted Per. (ft)		46.53	
Min Ch El (ft)	942.15	Shear (lb/sq ft)		0.67	
Alpha	1.00	Stream Power (lb/ft s)		3.27	
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	2.50	14.71	1.44
C & E Loss (ft)	0.00	Cum SA (acres)	2.51	3.09	1.29

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.24	Element			
Vel Head (ft)	0.44	Wt. n-Val.		0.040	
W.S. Elev (ft)	948.80	Reach Len. (ft)	122.87	122.58	125.68
Crit W.S. (ft)		Flow Area (sq ft)		220.99	
E.G. Slope (ft/ft)	0.002766	Area (sq ft)		220.99	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	45.26	Top Width (ft)		45.26	
Vel Total (ft/s)	5.34	Avg. Vel. (ft/s)		5.34	
Max Chl Dpth (ft)	6.65	Hydr. Depth (ft)		4.88	
Conv. Total (cfs)	22436.6	Conv. (cfs)		22436.6	

Length Wtd. (ft)	122.58	Wetted Per. (ft)		48.91	
Min Ch El (ft)	942.15	Shear (lb/sq ft)		0.78	
Alpha	1.00	Stream Power (lb/ft s)		4.17	
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)	2.05	17.18	0.33
C & E Loss (ft)	0.00	Cum SA (acres)	1.78	3.25	0.24

CROSS SECTION OUTPUT Profile #10yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.98	Element			
Vel Head (ft)	0.48	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	949.50	Reach Len. (ft)	122.87	122.58	125.68
Crit W.S. (ft)		Flow Area (sq ft)		253.02	42.72
E.G. Slope (ft/ft)	0.002629	Area (sq ft)		253.02	42.72
Q Total (cfs)	1450.00	Flow (cfs)		1424.30	25.70
Top Width (ft)	92.95	Top Width (ft)		46.65	46.30
Vel Total (ft/s)	4.90	Avg. Vel. (ft/s)		5.63	0.60
Max Chl Dpth (ft)	7.35	Hydr. Depth (ft)		5.42	0.92
Conv. Total (cfs)	28279.1	Conv. (cfs)		27777.9	501.3
Length Wtd. (ft)	122.61	Wetted Per. (ft)		49.80	46.33
Min Ch El (ft)	942.15	Shear (lb/sq ft)		0.83	0.15
Alpha	1.30	Stream Power (lb/ft s)		4.69	0.09
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)	7.47	18.96	3.64
C & E Loss (ft)	0.01	Cum SA (acres)	4.00	3.36	2.54

CROSS SECTION OUTPUT Profile #25yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	950.90	Element			
Vel Head (ft)	0.51	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	950.39	Reach Len. (ft)	122.87	122.58	125.68
Crit W.S. (ft)		Flow Area (sq ft)	5.90	295.32	95.20
E.G. Slope (ft/ft)	0.002435	Area (sq ft)	5.90	295.32	95.20
Q Total (cfs)	1800.00	Flow (cfs)	3.20	1727.69	69.11
Top Width (ft)	132.45	Top Width (ft)	10.55	48.43	73.47
Vel Total (ft/s)	4.54	Avg. Vel. (ft/s)	0.54	5.85	0.73
Max Chl Dpth (ft)	8.24	Hydr. Depth (ft)	0.56	6.10	1.30
Conv. Total (cfs)	36480.6	Conv. (cfs)	64.9	35015.1	1400.6
Length Wtd. (ft)	122.64	Wetted Per. (ft)	10.85	51.79	73.51
Min Ch El (ft)	942.15	Shear (lb/sq ft)	0.08	0.87	0.20
Alpha	1.59	Stream Power (lb/ft s)	0.04	5.07	0.14
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)	11.76	21.92	5.81
C & E Loss (ft)	0.01	Cum SA (acres)	4.86	3.47	3.46

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #50yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	951.51	Element			
Vel Head (ft)	0.51	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	951.00	Reach Len. (ft)	122.87	122.58	125.68
Crit W.S. (ft)		Flow Area (sq ft)	13.12	325.38	146.07
E.G. Slope (ft/ft)	0.002283	Area (sq ft)	13.12	325.38	146.07
Q Total (cfs)	2060.00	Flow (cfs)	10.11	1932.34	117.55
Top Width (ft)	154.67	Top Width (ft)	13.00	49.66	92.01
Vel Total (ft/s)	4.25	Avg. Vel. (ft/s)	0.77	5.94	0.80
Max Chl Dpth (ft)	8.85	Hydr. Depth (ft)	1.01	6.55	1.59
Conv. Total (cfs)	43116.4	Conv. (cfs)	211.5	40444.5	2460.4
Length Wtd. (ft)	122.67	Wetted Per. (ft)	13.59	53.16	92.07
Min Ch El (ft)	942.15	Shear (lb/sq ft)	0.14	0.87	0.23
Alpha	1.83	Stream Power (lb/ft s)	0.11	5.18	0.18
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	14.60	23.65	7.63
C & E Loss (ft)	0.01	Cum SA (acres)	5.18	3.53	4.18

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	952.09	Element			
Vel Head (ft)	0.51	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	951.58	Reach Len. (ft)	122.87	122.58	125.68
Crit W.S. (ft)		Flow Area (sq ft)	24.68	354.55	205.42
E.G. Slope (ft/ft)	0.002074	Area (sq ft)	24.68	354.55	205.43
Q Total (cfs)	2310.00	Flow (cfs)	19.32	2116.44	174.24
Top Width (ft)	193.26	Top Width (ft)	22.47	49.96	120.83
Vel Total (ft/s)	3.95	Avg. Vel. (ft/s)	0.78	5.97	0.85
Max Chl Dpth (ft)	9.43	Hydr. Depth (ft)	1.10	7.10	1.74
Conv. Total (cfs)	50721.3	Conv. (cfs)	424.2	46471.3	3825.9
Length Wtd. (ft)	122.70	Wetted Per. (ft)	23.23	53.50	118.26
Min Ch El (ft)	942.15	Shear (lb/sq ft)	0.14	0.86	0.22

Alpha	2.10	Stream Power (lb/ft s)	0.11	5.12	0.19
Frctn Loss (ft)	0.29	Cum Volume (acre-ft)	16.97	25.45	10.24
C & E Loss (ft)	0.02	Cum SA (acres)	5.38	3.59	5.14

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	953.34	Element			
Vel Head (ft)	0.46	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	952.88	Reach Len. (ft)	122.87	122.58	125.68
Crit W.S. (ft)		Flow Area (sq ft)	71.81	419.26	378.97
E.G. Slope (ft/ft)	0.001633	Area (sq ft)	71.81	419.26	392.68
Q Total (cfs)	2930.00	Flow (cfs)	67.76	2483.19	379.05
Top Width (ft)	243.57	Top Width (ft)	41.06	49.96	152.55
Vel Total (ft/s)	3.37	Avg. Vel. (ft/s)	0.94	5.92	1.00
Max Chl Dpth (ft)	10.73	Hydr. Depth (ft)	1.75	8.39	2.83
Conv. Total (cfs)	72507.7	Conv. (cfs)	1676.8	61450.6	9380.3
Length Wtd. (ft)	122.79	Wetted Per. (ft)	42.70	53.50	134.09
Min Ch El (ft)	942.15	Shear (lb/sq ft)	0.17	0.80	0.29
Alpha	2.63	Stream Power (lb/ft s)	0.16	4.73	0.29
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	22.90	29.24	16.28
C & E Loss (ft)	0.03	Cum SA (acres)	5.83	3.64	6.77

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3518.856

INPUT
Description: 21
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	957.68	6	957.44	7.5	957.38	8.18	957.36	9.45	951.67
29.38	951.67	33.66	949.53	41.66	949.53	44.46	950.93	49.46	950.93
67.46	941.93	87.46	941.93	102.1	949.25	122.59	955.73	123.17	955.98
125.06	956.77	128.58	957.77	135.97	958.03	151.56	958.19		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	49.46	.04	102.1	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
49.46	102.1	18.65	18.23	18.01	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	948.11	Element			
Vel Head (ft)	0.39	Wt. n-Val.		0.040	
W.S. Elev (ft)	947.71	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	945.48	Flow Area (sq ft)		182.54	
E.G. Slope (ft/ft)	0.002918	Area (sq ft)		182.54	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	43.13	Top Width (ft)		43.13	
Vel Total (ft/s)	5.04	Avg. Vel. (ft/s)		5.04	
Max Chl Dpth (ft)	5.78	Hydr. Depth (ft)		4.23	
Conv. Total (cfs)	17030.2	Conv. (cfs)		17030.2	
Length Wtd. (ft)	4.00	Wetted Per. (ft)		45.86	
Min Ch El (ft)	941.93	Shear (lb/sq ft)		0.73	
Alpha	1.00	Stream Power (lb/ft s)		3.65	
Frctn Loss (ft)		Cum Volume (acre-ft)	2.50	14.18	1.44
C & E Loss (ft)		Cum SA (acres)	2.51	2.97	1.29

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	948.88	Element			
Vel Head (ft)	0.48	Wt. n-Val.		0.040	
W.S. Elev (ft)	948.40	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	946.04	Flow Area (sq ft)		213.32	
E.G. Slope (ft/ft)	0.003115	Area (sq ft)		213.32	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	45.90	Top Width (ft)		45.90	
Vel Total (ft/s)	5.53	Avg. Vel. (ft/s)		5.53	
Max Chl Dpth (ft)	6.47	Hydr. Depth (ft)		4.65	
Conv. Total (cfs)	21141.8	Conv. (cfs)		21141.8	
Length Wtd. (ft)	4.00	Wetted Per. (ft)		48.95	
Min Ch El (ft)	941.93	Shear (lb/sq ft)		0.85	
Alpha	1.00	Stream Power (lb/ft s)		4.69	

Frctn Loss (ft)	Cum Volume (acre-ft)	2.05	16.57	0.33
C & E Loss (ft)	Cum SA (acres)	1.78	3.12	0.24

CROSS SECTION OUTPUT Profile #10yr

E.G. Elev (ft)	949.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.54	Wt. n-Val.		0.040	
W.S. Elev (ft)	949.08	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	946.56	Flow Area (sq ft)		245.04	
E.G. Slope (ft/ft)	0.003208	Area (sq ft)		245.04	
Q Total (cfs)	1450.00	Flow (cfs)		1450.00	
Top Width (ft)	48.58	Top Width (ft)		48.58	
Vel Total (ft/s)	5.92	Avg. Vel. (ft/s)		5.92	
Max Chl Dpth (ft)	7.15	Hydr. Depth (ft)		5.04	
Conv. Total (cfs)	25599.9	Conv. (cfs)		25599.9	
Length Wtd. (ft)	4.00	Wetted Per. (ft)		51.96	
Min Ch El (ft)	941.93	Shear (lb/sq ft)		0.94	
Alpha	1.00	Stream Power (lb/ft s)		5.59	
Frctn Loss (ft)		Cum Volume (acre-ft)	7.47	18.26	3.58
C & E Loss (ft)		Cum SA (acres)	4.00	3.22	2.47

CROSS SECTION OUTPUT Profile #25yr

E.G. Elev (ft)	950.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.60	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	949.95	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	947.19	Flow Area (sq ft)	3.76	288.79	0.79
E.G. Slope (ft/ft)	0.003026	Area (sq ft)	3.76	288.79	0.79
Q Total (cfs)	1800.00	Flow (cfs)	1.79	1797.95	0.26
Top Width (ft)	62.62	Top Width (ft)	9.70	50.69	2.23
Vel Total (ft/s)	6.14	Avg. Vel. (ft/s)	0.48	6.23	0.33
Max Chl Dpth (ft)	8.02	Hydr. Depth (ft)	0.39	5.70	0.35
Conv. Total (cfs)	32719.2	Conv. (cfs)	32.5	32682.0	4.7
Length Wtd. (ft)	4.00	Wetted Per. (ft)	9.90	54.31	2.34
Min Ch El (ft)	941.93	Shear (lb/sq ft)	0.07	1.00	0.06
Alpha	1.03	Stream Power (lb/ft s)	0.03	6.25	0.02
Frctn Loss (ft)		Cum Volume (acre-ft)	11.74	21.10	5.67
C & E Loss (ft)		Cum SA (acres)	4.83	3.33	3.36

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #50yr

E.G. Elev (ft)	951.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.64	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	950.55	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	947.61	Flow Area (sq ft)	10.22	319.23	2.66
E.G. Slope (ft/ft)	0.002912	Area (sq ft)	10.22	319.23	2.66
Q Total (cfs)	2060.00	Flow (cfs)	7.94	2050.77	1.29
Top Width (ft)	68.05	Top Width (ft)	12.07	51.88	4.11
Vel Total (ft/s)	6.20	Avg. Vel. (ft/s)	0.78	6.42	0.49
Max Chl Dpth (ft)	8.62	Hydr. Depth (ft)	0.85	6.15	0.65
Conv. Total (cfs)	38177.2	Conv. (cfs)	147.1	38006.2	24.0
Length Wtd. (ft)	4.00	Wetted Per. (ft)	12.55	55.64	4.31
Min Ch El (ft)	941.93	Shear (lb/sq ft)	0.15	1.04	0.11
Alpha	1.07	Stream Power (lb/ft s)	0.11	6.70	0.05
Frctn Loss (ft)		Cum Volume (acre-ft)	14.57	22.74	7.41
C & E Loss (ft)		Cum SA (acres)	5.14	3.39	4.04

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100yr

E.G. Elev (ft)	951.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.66	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	951.12	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	947.96	Flow Area (sq ft)	18.73	349.29	5.54
E.G. Slope (ft/ft)	0.002747	Area (sq ft)	18.73	349.29	5.54
Q Total (cfs)	2310.00	Flow (cfs)	15.68	2290.99	3.33
Top Width (ft)	77.54	Top Width (ft)	18.98	52.64	5.92
Vel Total (ft/s)	6.18	Avg. Vel. (ft/s)	0.84	6.56	0.60
Max Chl Dpth (ft)	9.19	Hydr. Depth (ft)	0.99	6.64	0.94
Conv. Total (cfs)	44073.4	Conv. (cfs)	299.1	43710.7	63.6
Length Wtd. (ft)	4.00	Wetted Per. (ft)	19.69	56.49	6.21
Min Ch El (ft)	941.93	Shear (lb/sq ft)	0.16	1.06	0.15
Alpha	1.12	Stream Power (lb/ft s)	0.14	6.95	0.09
Frctn Loss (ft)		Cum Volume (acre-ft)	16.91	24.46	9.93
C & E Loss (ft)		Cum SA (acres)	5.33	3.44	4.95

CROSS SECTION OUTPUT Profile #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	953.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.72	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	952.35	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	948.83	Flow Area (sq ft)	56.67	413.90	15.19
E.G. Slope (ft/ft)	0.002434	Area (sq ft)	56.67	413.90	15.19
Q Total (cfs)	2930.00	Flow (cfs)	56.77	2861.20	12.04
Top Width (ft)	102.60	Top Width (ft)	40.16	52.64	9.80
Vel Total (ft/s)	6.03	Avg. Vel. (ft/s)	1.00	6.91	0.79
Max Chl Dpth (ft)	10.42	Hydr. Depth (ft)	1.41	7.86	1.55
Conv. Total (cfs)	59394.6	Conv. (cfs)	1150.7	57999.8	244.0
Length Wtd. (ft)	4.00	Wetted Per. (ft)	41.54	56.49	10.28
Min Ch El (ft)	941.93	Shear (lb/sq ft)	0.21	1.11	0.22
Alpha	1.28	Stream Power (lb/ft s)	0.21	7.69	0.18
Frctn Loss (ft)		Cum Volume (acre-ft)	22.72	28.07	15.69
C & E Loss (ft)		Cum SA (acres)	5.72	3.50	6.54

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 3512

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	960	957	500	960	957

Upstream Bridge Cross Section Data
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	957.64	6	957.4	7.5	957.34	8.18	957.32	9.45	951.63
29.38	951.63	33.66	949.49	41.66	949.49	44.46	950.89	49.46	950.89
67.46	941.89	87.46	941.89	102.1	949.21	122.59	955.69	123.17	955.94
125.06	956.73	128.58	957.73	135.97	957.99	151.56	958.15		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	49.46	.04	102.1	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
49.46	102.1	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	960	957	500	960	957

Downstream Bridge Cross Section Data
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	957.79	6.62	957.53	11.15	957.35	12.12	952.93	12.47	951.56
26.72	951.56	31	949.42	39	949.42	41.8	950.82	46.8	950.82
64.8	941.82	84.8	941.82	99.44	949.14	104.37	949.54	123.93	955.63
128.87	956.15	141.46	957.09	162.91	957.91				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	46.8	.04	99.44	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
46.8	99.44	.1	.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 1

```
Pier Data
Pier Station     Upstream=   49.46    Downstream=    46.8
Upstream     num=        2
    Width   Elev    Width   Elev
       8     940       8     960
Downstream     num=        2
    Width   Elev    Width   Elev
       8     940       8     960

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
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 #2yr

  E.G. US. (ft)                 948.11    Element                  Inside BR US  Inside BR DS
  W.S. US. (ft)                 947.71    E.G. Elev (ft)               948.05        947.97
  Q Total (cfs)                 920.00    W.S. Elev (ft)               947.66        947.57
  Q Bridge (cfs)                920.00    Crit W.S. (ft)               945.45        945.39
  Q Weir (cfs)                            Max Chl Dpth (ft)              5.77          5.75
  Weir Sta Lft (ft)                       Vel Total (ft/s)               5.06          5.08
  Weir Sta Rgt (ft)                       Flow Area (sq ft)            181.88        180.96
  Weir Submerg                            Froude # Chl                   0.43          0.44
  Weir Max Depth (ft)                     Specif Force (cu ft)         605.06        601.93
  Min El Weir Flow (ft)         960.01    Hydr Depth (ft)                4.22          4.21
  Min El Prs (ft)               957.00    W.P. Total (ft)               45.79         45.70
  Delta EG (ft)                   0.16    Conv. Total (cfs)           16944.5       16825.8
  Delta WS (ft)                   0.15    Top Width (ft)                43.07         42.98
  BR Open Area (sq ft)          950.73    Frctn Loss (ft)
  BR Open Vel (ft/s)              5.08    C & E Loss (ft)
  Coef of Q                               Shear Total (lb/sq ft)         0.73          0.74
  Br Sel Method               Momentum    Power Total (lb/ft s)          3.70          3.76


BRIDGE OUTPUT  Profile #5yr

  E.G. US. (ft)                 948.88    Element                  Inside BR US  Inside BR DS
  W.S. US. (ft)                 948.40    E.G. Elev (ft)               948.83        948.74
  Q Total (cfs)                1180.00    W.S. Elev (ft)               948.35        948.25
  Q Bridge (cfs)               1180.00    Crit W.S. (ft)               946.01        945.94
  Q Weir (cfs)                            Max Chl Dpth (ft)              6.46          6.43
  Weir Sta Lft (ft)                       Vel Total (ft/s)               5.55          5.58
  Weir Sta Rgt (ft)                       Flow Area (sq ft)            212.57        211.44
  Weir Submerg                            Froude # Chl                   0.45          0.46
  Weir Max Depth (ft)                     Specif Force (cu ft)         800.04        795.88
  Min El Weir Flow (ft)         960.01    Hydr Depth (ft)                4.64          4.62
  Min El Prs (ft)               957.00    W.P. Total (ft)               48.88         48.77
  Delta EG (ft)                   0.17    Conv. Total (cfs)           21038.6       20883.4
  Delta WS (ft)                   0.16    Top Width (ft)                45.83         45.73
  BR Open Area (sq ft)          632.37    Frctn Loss (ft)
  BR Open Vel (ft/s)              5.58    C & E Loss (ft)
  Coef of Q                               Shear Total (lb/sq ft)         0.85          0.86
  Br Sel Method               Momentum    Power Total (lb/ft s)          4.74          4.82


BRIDGE OUTPUT  Profile #10yr

  E.G. US. (ft)                 949.62    Element                  Inside BR US  Inside BR DS
  W.S. US. (ft)                 949.08    E.G. Elev (ft)               949.57        949.48
  Q Total (cfs)                1450.00    W.S. Elev (ft)               949.02        948.93
  Q Bridge (cfs)               1450.00    Crit W.S. (ft)               946.54        946.46
  Q Weir (cfs)                            Max Chl Dpth (ft)              7.13          7.11
  Weir Sta Lft (ft)                       Vel Total (ft/s)               5.94          5.96
  Weir Sta Rgt (ft)                       Flow Area (sq ft)            244.18        243.10
  Weir Submerg                            Froude # Chl                   0.47          0.47
  Weir Max Depth (ft)                     Specif Force (cu ft)        1017.04       1012.75
  Min El Weir Flow (ft)         960.01    Hydr Depth (ft)                5.06          5.04
  Min El Prs (ft)               957.00    W.P. Total (ft)               51.72         51.65
  Delta EG (ft)                   0.17    Conv. Total (cfs)           25528.1       25363.0
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Delta WS (ft)	0.16	Top Width (ft)	48.26	48.21
BR Open Area (sq ft)	950.73	Frctn Loss (ft)		
BR Open Vel (ft/s)	5.96	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.95	0.96
Br Sel Method	Momentum	Power Total (lb/ft s)	5.65	5.73

BRIDGE OUTPUT Profile #25yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	950.56	E.G. Elev (ft)	950.50	950.41
W.S. US. (ft)	949.95	W.S. Elev (ft)	949.89	949.79
Q Total (cfs)	1800.00	Crit W.S. (ft)	947.15	947.08
Q Bridge (cfs)	1800.00	Max Chl Dpth (ft)	8.00	7.97
Q Weir (cfs)		Vel Total (ft/s)	6.19	6.19
Weir Sta Lft (ft)		Flow Area (sq ft)	290.62	290.84
Weir Sta Rgt (ft)		Froude # Chl	0.46	0.46
Weir Submerg		Specif Force (cu ft)	1331.57	1326.28
Weir Max Depth (ft)		Hydr Depth (ft)	4.81	4.55
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	65.04	68.46
Min El Prs (ft)	957.00	Conv. Total (cfs)	32788.4	32585.3
Delta EG (ft)	0.17	Top Width (ft)	60.37	63.88
Delta WS (ft)	0.16	Frctn Loss (ft)		
BR Open Area (sq ft)	950.73	C & E Loss (ft)		
BR Open Vel (ft/s)	6.19	Shear Total (lb/sq ft)	0.84	0.81
Coef of Q		Power Total (lb/ft s)	5.21	5.01
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #50yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	951.19	E.G. Elev (ft)	951.12	951.03
W.S. US. (ft)	950.55	W.S. Elev (ft)	950.47	950.37
Q Total (cfs)	2060.00	Crit W.S. (ft)	947.57	947.50
Q Bridge (cfs)	2060.00	Max Chl Dpth (ft)	8.58	8.55
Q Weir (cfs)		Vel Total (ft/s)	6.30	6.26
Weir Sta Lft (ft)		Flow Area (sq ft)	326.81	328.89
Weir Sta Rgt (ft)		Froude # Chl	0.45	0.45
Weir Submerg		Specif Force (cu ft)	1575.36	1569.57
Weir Max Depth (ft)		Hydr Depth (ft)	5.07	4.83
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	70.13	73.56
Min El Prs (ft)	957.00	Conv. Total (cfs)	38184.7	37974.3
Delta EG (ft)	0.18	Top Width (ft)	64.52	68.04
Delta WS (ft)	0.17	Frctn Loss (ft)		
BR Open Area (sq ft)	950.73	C & E Loss (ft)		
BR Open Vel (ft/s)	6.30	Shear Total (lb/sq ft)	0.85	0.82
Coef of Q		Power Total (lb/ft s)	5.34	5.14
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #100yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	951.78	E.G. Elev (ft)	951.72	951.62
W.S. US. (ft)	951.12	W.S. Elev (ft)	951.02	950.92
Q Total (cfs)	2310.00	Crit W.S. (ft)	947.95	947.86
Q Bridge (cfs)	2310.00	Max Chl Dpth (ft)	9.13	9.10
Q Weir (cfs)		Vel Total (ft/s)	6.35	6.28
Weir Sta Lft (ft)		Flow Area (sq ft)	363.88	367.55
Weir Sta Rgt (ft)		Froude # Chl	0.45	0.45
Weir Submerg		Specif Force (cu ft)	1829.19	1822.97
Weir Max Depth (ft)		Hydr Depth (ft)	5.26	5.05
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	75.85	79.30
Min El Prs (ft)	957.00	Conv. Total (cfs)	43682.3	43453.0
Delta EG (ft)	0.19	Top Width (ft)	69.24	72.81
Delta WS (ft)	0.19	Frctn Loss (ft)		
BR Open Area (sq ft)	950.73	C & E Loss (ft)		
BR Open Vel (ft/s)	6.35	Shear Total (lb/sq ft)	0.84	0.82
Coef of Q		Power Total (lb/ft s)	5.32	5.14
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #500yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	953.07	E.G. Elev (ft)	952.99	952.88
W.S. US. (ft)	952.35	W.S. Elev (ft)	952.20	952.09
Q Total (cfs)	2930.00	Crit W.S. (ft)	948.79	948.72
Q Bridge (cfs)	2930.00	Max Chl Dpth (ft)	10.31	10.27
Q Weir (cfs)		Vel Total (ft/s)	6.36	6.32
Weir Sta Lft (ft)		Flow Area (sq ft)	460.40	463.36
Weir Sta Rgt (ft)		Froude # Chl	0.44	0.45
Weir Submerg		Specif Force (cu ft)	2478.00	2470.47
Weir Max Depth (ft)		Hydr Depth (ft)	4.89	5.02
Min El Weir Flow (ft)	960.01			

Min El Prs (ft)	957.00	W.P. Total (ft)	104.01	101.79
Delta EG (ft)	0.22	Conv. Total (cfs)	56448.1	56123.9
Delta WS (ft)	0.22	Top Width (ft)	94.24	92.22
BR Open Area (sq ft)	950.73	Frctn Loss (ft)		
BR Open Vel (ft/s)	6.36	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.74	0.77
Br Sel Method	Momentum	Power Total (lb/ft s)	4.74	4.90

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3500.626

INPUT
Description: 22
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	957.7	6.62	957.44	11.15	957.26	12.12	952.84	12.47	951.47
26.72	951.47	31	949.33	39	949.33	41.8	950.73	46.8	950.73
64.8	941.73	84.8	941.73	99.44	949.05	104.37	949.45	123.93	955.54
128.87	956.06	141.46	957	162.91	957.82				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	46.8	.04	99.44	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
46.8	99.44	121.15	122.14	120.16	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	947.94	Element			
Vel Head (ft)	0.39	Wt. n-Val.		0.040	
W.S. Elev (ft)	947.56	Reach Len. (ft)	121.15	122.14	120.16
Crit W.S. (ft)		Flow Area (sq ft)		184.53	
E.G. Slope (ft/ft)	0.002832	Area (sq ft)		184.53	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	43.32	Top Width (ft)		43.32	
Vel Total (ft/s)	4.99	Avg. Vel. (ft/s)		4.99	
Max Chl Dpth (ft)	5.83	Hydr. Depth (ft)		4.26	
Conv. Total (cfs)	17289.0	Conv. (cfs)		17289.0	
Length Wtd. (ft)	122.14	Wetted Per. (ft)		46.07	
Min Ch El (ft)	941.73	Shear (lb/sq ft)		0.71	
Alpha	1.00	Stream Power (lb/ft s)		3.53	
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	2.50	14.11	1.44
C & E Loss (ft)	0.00	Cum SA (acres)	2.51	2.95	1.29

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	948.71	Element			
Vel Head (ft)	0.47	Wt. n-Val.		0.040	
W.S. Elev (ft)	948.24	Reach Len. (ft)	121.15	122.14	120.16
Crit W.S. (ft)		Flow Area (sq ft)		215.12	
E.G. Slope (ft/ft)	0.003044	Area (sq ft)		215.12	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	46.05	Top Width (ft)		46.05	
Vel Total (ft/s)	5.49	Avg. Vel. (ft/s)		5.49	
Max Chl Dpth (ft)	6.51	Hydr. Depth (ft)		4.67	
Conv. Total (cfs)	21388.5	Conv. (cfs)		21388.5	
Length Wtd. (ft)	122.14	Wetted Per. (ft)		49.13	
Min Ch El (ft)	941.73	Shear (lb/sq ft)		0.83	
Alpha	1.00	Stream Power (lb/ft s)		4.56	
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)	2.05	16.48	0.33
C & E Loss (ft)	0.00	Cum SA (acres)	1.78	3.10	0.24

CROSS SECTION OUTPUT Profile #10yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.45	Element			
Vel Head (ft)	0.53	Wt. n-Val.		0.040	
W.S. Elev (ft)	948.92	Reach Len. (ft)	121.15	122.14	120.16
Crit W.S. (ft)		Flow Area (sq ft)		247.17	
E.G. Slope (ft/ft)	0.003133	Area (sq ft)		247.17	
Q Total (cfs)	1450.00	Flow (cfs)		1450.00	
Top Width (ft)	48.76	Top Width (ft)		48.76	
Vel Total (ft/s)	5.87	Avg. Vel. (ft/s)		5.87	
Max Chl Dpth (ft)	7.19	Hydr. Depth (ft)		5.07	
Conv. Total (cfs)	25906.8	Conv. (cfs)		25906.8	
Length Wtd. (ft)	122.13	Wetted Per. (ft)		52.15	

Min Ch El (ft)	941.73	Shear (lb/sq ft)		0.93	
Alpha	1.00	Stream Power (lb/ft s)		5.44	
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)	7.47	18.16	3.58
C & E Loss (ft)	0.00	Cum SA (acres)	4.00	3.20	2.47

CROSS SECTION OUTPUT Profile #25yr

E.G. Elev (ft)	950.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.59	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	949.79	Reach Len. (ft)	121.15	122.14	120.16
Crit W.S. (ft)		Flow Area (sq ft)	4.12	290.66	2.86
E.G. Slope (ft/ft)	0.002964	Area (sq ft)	4.12	290.66	2.86
Q Total (cfs)	1800.00	Flow (cfs)	2.04	1796.80	1.16
Top Width (ft)	66.64	Top Width (ft)	9.85	50.76	6.03
Vel Total (ft/s)	6.05	Avg. Vel. (ft/s)	0.50	6.18	0.41
Max Chl Dpth (ft)	8.06	Hydr. Depth (ft)	0.42	5.73	0.47
Conv. Total (cfs)	33061.0	Conv. (cfs)	37.5	33002.1	21.4
Length Wtd. (ft)	122.12	Wetted Per. (ft)	10.06	54.39	6.10
Min Ch El (ft)	941.73	Shear (lb/sq ft)	0.08	0.99	0.09
Alpha	1.04	Stream Power (lb/ft s)	0.04	6.11	0.04
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	11.74	20.98	5.67
C & E Loss (ft)	0.01	Cum SA (acres)	4.83	3.31	3.35

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #50yr

E.G. Elev (ft)	951.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.63	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	950.38	Reach Len. (ft)	121.15	122.14	120.16
Crit W.S. (ft)		Flow Area (sq ft)	10.57	320.73	6.94
E.G. Slope (ft/ft)	0.002862	Area (sq ft)	10.57	320.73	6.94
Q Total (cfs)	2060.00	Flow (cfs)	8.27	2047.58	4.16
Top Width (ft)	72.03	Top Width (ft)	12.19	51.93	7.91
Vel Total (ft/s)	6.09	Avg. Vel. (ft/s)	0.78	6.38	0.60
Max Chl Dpth (ft)	8.65	Hydr. Depth (ft)	0.87	6.18	0.88
Conv. Total (cfs)	38507.2	Conv. (cfs)	154.6	38275.0	77.7
Length Wtd. (ft)	122.10	Wetted Per. (ft)	12.68	55.70	8.07
Min Ch El (ft)	941.73	Shear (lb/sq ft)	0.15	1.03	0.15
Alpha	1.09	Stream Power (lb/ft s)	0.12	6.57	0.09
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)	14.56	22.61	7.41
C & E Loss (ft)	0.02	Cum SA (acres)	5.14	3.37	4.03

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100yr

E.G. Elev (ft)	951.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.66	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	950.94	Reach Len. (ft)	121.15	122.14	120.16
Crit W.S. (ft)		Flow Area (sq ft)	18.99	350.01	11.86
E.G. Slope (ft/ft)	0.002715	Area (sq ft)	18.99	350.01	11.86
Q Total (cfs)	2310.00	Flow (cfs)	15.93	2285.47	8.60
Top Width (ft)	81.35	Top Width (ft)	19.01	52.64	9.70
Vel Total (ft/s)	6.07	Avg. Vel. (ft/s)	0.84	6.53	0.73
Max Chl Dpth (ft)	9.21	Hydr. Depth (ft)	1.00	6.65	1.22
Conv. Total (cfs)	44332.4	Conv. (cfs)	305.8	43861.6	165.1
Length Wtd. (ft)	122.09	Wetted Per. (ft)	19.72	56.49	9.94
Min Ch El (ft)	941.73	Shear (lb/sq ft)	0.16	1.05	0.20
Alpha	1.15	Stream Power (lb/ft s)	0.14	6.86	0.15
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)	16.90	24.32	9.93
C & E Loss (ft)	0.02	Cum SA (acres)	5.32	3.42	4.95

CROSS SECTION OUTPUT Profile #500yr

E.G. Elev (ft)	952.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.72	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	952.13	Reach Len. (ft)	121.15	122.14	120.16
Crit W.S. (ft)		Flow Area (sq ft)	52.06	412.75	25.70
E.G. Slope (ft/ft)	0.002440	Area (sq ft)	52.06	412.75	25.70
Q Total (cfs)	2930.00	Flow (cfs)	54.46	2851.92	23.62
Top Width (ft)	100.67	Top Width (ft)	34.50	52.64	13.53
Vel Total (ft/s)	5.97	Avg. Vel. (ft/s)	1.05	6.91	0.92
Max Chl Dpth (ft)	10.40	Hydr. Depth (ft)	1.51	7.84	1.90
Conv. Total (cfs)	59312.0	Conv. (cfs)	1102.4	57731.5	478.2
Length Wtd. (ft)	122.06	Wetted Per. (ft)	35.84	56.49	13.95
Min Ch El (ft)	941.73	Shear (lb/sq ft)	0.22	1.11	0.28
Alpha	1.30	Stream Power (lb/ft s)	0.23	7.69	0.26

Frctn Loss (ft)	0.27	Cum Volume (acre-ft)	22.70	27.90	15.68
C & E Loss (ft)	0.03	Cum SA (acres)	5.70	3.47	6.53

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3378.489

INPUT
Description: 23
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	957.04	.25	957.03	1.37	957	3.95	956.78	12.8	956.34
13.18	956.37	13.59	954.68	14.48	951.09	29.81	951.09	34.03	948.98
42.03	948.98	44.79	950.36	49.79	950.36	67.75	941.38	87.75	941.38
100.69	947.85	127.05	947.75	148.26	958.69				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	49.79	.04	100.69	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
49.79	100.69	17.27	18.05	17.97	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	947.60	Element			
Vel Head (ft)	0.39	Wt. n-Val.		0.040	
W.S. Elev (ft)	947.21	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	944.93	Flow Area (sq ft)		184.75	
E.G. Slope (ft/ft)	0.002822	Area (sq ft)		184.75	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	43.34	Top Width (ft)		43.34	
Vel Total (ft/s)	4.98	Avg. Vel. (ft/s)		4.98	
Max Chl Dpth (ft)	5.83	Hydr. Depth (ft)		4.26	
Conv. Total (cfs)	17318.3	Conv. (cfs)		17318.3	
Length Wtd. (ft)	4.00	Wetted Per. (ft)		46.09	
Min Ch El (ft)	941.38	Shear (lb/sq ft)		0.71	
Alpha	1.00	Stream Power (lb/ft s)		3.52	
Frctn Loss (ft)		Cum Volume (acre-ft)	2.50	13.59	1.44
C & E Loss (ft)		Cum SA (acres)	2.51	2.83	1.29

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	948.33	Element			
Vel Head (ft)	0.47	Wt. n-Val.		0.040	
W.S. Elev (ft)	947.86	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	945.49	Flow Area (sq ft)		213.59	
E.G. Slope (ft/ft)	0.003104	Area (sq ft)		213.59	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	45.90	Top Width (ft)		45.90	
Vel Total (ft/s)	5.52	Avg. Vel. (ft/s)		5.52	
Max Chl Dpth (ft)	6.48	Hydr. Depth (ft)		4.65	
Conv. Total (cfs)	21181.2	Conv. (cfs)		21181.2	
Length Wtd. (ft)	4.00	Wetted Per. (ft)		48.97	
Min Ch El (ft)	941.38	Shear (lb/sq ft)		0.85	
Alpha	1.00	Stream Power (lb/ft s)		4.67	
Frctn Loss (ft)		Cum Volume (acre-ft)	2.05	15.88	0.33
C & E Loss (ft)		Cum SA (acres)	1.78	2.97	0.24

CROSS SECTION OUTPUT Profile #10yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.08	Element			
Vel Head (ft)	0.53	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	948.55	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	946.01	Flow Area (sq ft)		245.63	20.33
E.G. Slope (ft/ft)	0.003017	Area (sq ft)		245.63	20.33
Q Total (cfs)	1450.00	Flow (cfs)		1438.85	11.15
Top Width (ft)	75.18	Top Width (ft)		47.28	27.91
Vel Total (ft/s)	5.45	Avg. Vel. (ft/s)		5.86	0.55
Max Chl Dpth (ft)	7.17	Hydr. Depth (ft)		5.20	0.73
Conv. Total (cfs)	26399.4	Conv. (cfs)		26196.4	202.9
Length Wtd. (ft)	4.00	Wetted Per. (ft)		50.50	28.10
Min Ch El (ft)	941.38	Shear (lb/sq ft)		0.92	0.14
Alpha	1.15	Stream Power (lb/ft s)		5.37	0.07
Frctn Loss (ft)		Cum Volume (acre-ft)	7.47	17.46	3.55
C & E Loss (ft)		Cum SA (acres)	4.00	3.07	2.43

CROSS SECTION OUTPUT Profile #25yr

E.G. Elev (ft)	950.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.56	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	949.47	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	946.62	Flow Area (sq ft)	4.39	290.02	46.86
E.G. Slope (ft/ft)	0.002728	Area (sq ft)	4.39	290.02	46.86
Q Total (cfs)	1800.00	Flow (cfs)	2.16	1757.15	40.69
Top Width (ft)	88.77	Top Width (ft)	9.96	49.12	29.69
Vel Total (ft/s)	5.27	Avg. Vel. (ft/s)	0.49	6.06	0.87
Max Chl Dpth (ft)	8.09	Hydr. Depth (ft)	0.44	5.90	1.58
Conv. Total (cfs)	34463.8	Conv. (cfs)	41.3	33643.3	779.1
Length Wtd. (ft)	4.00	Wetted Per. (ft)	10.19	52.55	30.11
Min Ch El (ft)	941.38	Shear (lb/sq ft)	0.07	0.94	0.27
Alpha	1.29	Stream Power (lb/ft s)	0.04	5.69	0.23
Frctn Loss (ft)		Cum Volume (acre-ft)	11.73	20.16	5.61
C & E Loss (ft)		Cum SA (acres)	4.80	3.17	3.30

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #50yr

E.G. Elev (ft)	950.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.57	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	950.09	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	947.04	Flow Area (sq ft)	11.28	320.66	65.52
E.G. Slope (ft/ft)	0.002576	Area (sq ft)	11.28	320.66	65.52
Q Total (cfs)	2060.00	Flow (cfs)	8.63	1984.21	67.16
Top Width (ft)	93.66	Top Width (ft)	12.42	50.35	30.89
Vel Total (ft/s)	5.18	Avg. Vel. (ft/s)	0.76	6.19	1.03
Max Chl Dpth (ft)	8.70	Hydr. Depth (ft)	0.91	6.37	2.12
Conv. Total (cfs)	40586.6	Conv. (cfs)	170.0	39093.4	1323.2
Length Wtd. (ft)	4.00	Wetted Per. (ft)	12.94	53.93	31.45
Min Ch El (ft)	941.38	Shear (lb/sq ft)	0.14	0.96	0.33
Alpha	1.37	Stream Power (lb/ft s)	0.11	5.92	0.34
Frctn Loss (ft)		Cum Volume (acre-ft)	14.53	21.71	7.31
C & E Loss (ft)		Cum SA (acres)	5.10	3.22	3.98

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100yr

E.G. Elev (ft)	951.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.58	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	950.68	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	947.42	Flow Area (sq ft)	20.84	350.78	84.18
E.G. Slope (ft/ft)	0.002378	Area (sq ft)	20.84	350.78	84.18
Q Total (cfs)	2310.00	Flow (cfs)	17.32	2197.30	95.38
Top Width (ft)	102.09	Top Width (ft)	19.16	50.90	32.04
Vel Total (ft/s)	5.07	Avg. Vel. (ft/s)	0.83	6.26	1.13
Max Chl Dpth (ft)	9.30	Hydr. Depth (ft)	1.09	6.89	2.63
Conv. Total (cfs)	47372.9	Conv. (cfs)	355.1	45061.7	1956.1
Length Wtd. (ft)	4.00	Wetted Per. (ft)	19.88	54.55	32.75
Min Ch El (ft)	941.38	Shear (lb/sq ft)	0.16	0.95	0.38
Alpha	1.46	Stream Power (lb/ft s)	0.13	5.98	0.43
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	16.84	23.34	9.79
C & E Loss (ft)	0.00	Cum SA (acres)	5.27	3.28	4.89

CROSS SECTION OUTPUT Profile #500yr

E.G. Elev (ft)	952.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.61	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	951.93	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	948.40	Flow Area (sq ft)	58.67	414.52	125.82
E.G. Slope (ft/ft)	0.002066	Area (sq ft)	58.67	414.52	125.82
Q Total (cfs)	2930.00	Flow (cfs)	59.87	2705.44	164.69
Top Width (ft)	120.88	Top Width (ft)	35.52	50.90	34.47
Vel Total (ft/s)	4.89	Avg. Vel. (ft/s)	1.02	6.53	1.31
Max Chl Dpth (ft)	10.55	Hydr. Depth (ft)	1.65	8.14	3.65
Conv. Total (cfs)	64460.6	Conv. (cfs)	1317.1	59520.3	3623.2
Length Wtd. (ft)	4.00	Wetted Per. (ft)	37.00	54.55	35.48
Min Ch El (ft)	941.38	Shear (lb/sq ft)	0.20	0.98	0.46
Alpha	1.65	Stream Power (lb/ft s)	0.21	6.40	0.60
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	22.55	26.74	15.47
C & E Loss (ft)	0.00	Cum SA (acres)	5.61	3.33	6.46

BRIDGE

```
RIVER: Hope Creek
REACH: 1                    RS: 3371

INPUT
Description:
Distance from Upstream XS =       4
Deck/Roadway Width        =       6
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0     960     957     500     960     957

Upstream Bridge Cross Section Data
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  957.03     .25  957.02    1.37  956.99    3.95  956.77    12.8  956.33
   13.18  956.36   13.59  954.67   14.48  951.08   29.81  951.08   34.03  948.97
   42.03  948.97   44.79  950.35   49.79  950.35   67.75  941.37   87.75  941.37
  100.69  947.84  127.05  947.74  148.26  958.68

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09   49.79     .04  100.69     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
         49.79  100.69             .1       .3

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0     960     957     500     960     957

Downstream Bridge Cross Section Data
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  957.01     .17  957.01     2.4  956.94    8.85  956.41   12.64  956.19
   14.21  956.31   15.49  951.06   30.55  951.06   34.77  948.95   42.77  948.95
   45.53  950.33   50.53  950.33   68.49  941.35   88.49  941.35  101.43  947.82
  125.06   947.9  136.02  953.76   143.9  957.77

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09   50.53     .04  101.43     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
         50.53  101.43             .1       .3

Upstream Embankment side slope              =      0 horiz. to 1.0 vertical
Downstream Embankment side slope            =      0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=   49.79    Downstream=   50.53
Upstream     num=       2
    Width   Elev    Width   Elev
        8    940        8    960
Downstream     num=       2
    Width   Elev    Width   Elev
        8    940        8    960

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                 Cd   =       2
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 #2yr

E.G. US. (ft)	947.60	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	947.21	E.G. Elev (ft)	947.58	947.54
Q Total (cfs)	920.00	W.S. Elev (ft)	947.19	947.15
Q Bridge (cfs)	920.00	Crit W.S. (ft)	944.93	944.91
Q Weir (cfs)		Max Chl Dpth (ft)	5.82	5.80
Weir Sta Lft (ft)		Vel Total (ft/s)	5.00	5.02
Weir Sta Rgt (ft)		Flow Area (sq ft)	184.12	183.35
Weir Submerg		Froude # Chl	0.43	0.43
Weir Max Depth (ft)		Specif Force (cu ft)	612.79	610.14
Min El Weir Flow (ft)	960.01	Hydr Depth (ft)	4.25	4.24
Min El Prs (ft)	957.00	W.P. Total (ft)	46.02	45.95
Delta EG (ft)	0.08	Conv. Total (cfs)	17235.6	17136.0
Delta WS (ft)	0.08	Top Width (ft)	43.28	43.21
BR Open Area (sq ft)	1157.91	Frctn Loss (ft)		
BR Open Vel (ft/s)	5.02	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.71	0.72
Br Sel Method	Momentum	Power Total (lb/ft s)	3.56	3.60

BRIDGE OUTPUT Profile #5yr

E.G. US. (ft)	948.33	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	947.86	E.G. Elev (ft)	948.31	948.27
Q Total (cfs)	1180.00	W.S. Elev (ft)	947.83	947.79
Q Bridge (cfs)	1180.00	Crit W.S. (ft)	945.49	945.47
Q Weir (cfs)		Max Chl Dpth (ft)	6.46	6.44
Weir Sta Lft (ft)		Vel Total (ft/s)	5.54	5.57
Weir Sta Rgt (ft)		Flow Area (sq ft)	212.83	211.71
Weir Submerg		Froude # Chl	0.45	0.46
Weir Max Depth (ft)		Specif Force (cu ft)	801.01	796.87
Min El Weir Flow (ft)	960.01	Hydr Depth (ft)	4.64	4.63
Min El Prs (ft)	957.00	W.P. Total (ft)	48.91	48.80
Delta EG (ft)	0.09	Conv. Total (cfs)	21074.7	20920.4
Delta WS (ft)	0.10	Top Width (ft)	45.85	45.76
BR Open Area (sq ft)	642.47	Frctn Loss (ft)		
BR Open Vel (ft/s)	5.57	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.85	0.86
Br Sel Method	Momentum	Power Total (lb/ft s)	4.72	4.80

BRIDGE OUTPUT Profile #10yr

E.G. US. (ft)	949.08	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	948.55	E.G. Elev (ft)	949.05	949.03
Q Total (cfs)	1450.00	W.S. Elev (ft)	948.52	948.49
Q Bridge (cfs)	1450.00	Crit W.S. (ft)	946.02	945.99
Q Weir (cfs)		Max Chl Dpth (ft)	7.15	7.14
Weir Sta Lft (ft)		Vel Total (ft/s)	5.48	5.59
Weir Sta Rgt (ft)		Flow Area (sq ft)	264.66	259.16
Weir Submerg		Froude # Chl	0.45	0.46
Weir Max Depth (ft)		Specif Force (cu ft)	1025.22	1020.82
Min El Weir Flow (ft)	960.01	Hydr Depth (ft)	3.54	3.62
Min El Prs (ft)	957.00	W.P. Total (ft)	78.31	75.10
Delta EG (ft)	0.07	Conv. Total (cfs)	26330.2	26144.0
Delta WS (ft)	0.08	Top Width (ft)	74.77	71.62
BR Open Area (sq ft)	1157.91	Frctn Loss (ft)		
BR Open Vel (ft/s)	5.59	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.64	0.66
Br Sel Method	Momentum	Power Total (lb/ft s)	3.51	3.71

BRIDGE OUTPUT Profile #25yr

E.G. US. (ft)	950.03	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	949.47	E.G. Elev (ft)	950.00	949.99
Q Total (cfs)	1800.00	W.S. Elev (ft)	949.43	949.41
Q Bridge (cfs)	1800.00	Crit W.S. (ft)	946.63	946.61
Q Weir (cfs)		Max Chl Dpth (ft)	8.06	8.06
Weir Sta Lft (ft)		Vel Total (ft/s)	5.33	5.44
Weir Sta Rgt (ft)		Flow Area (sq ft)	337.92	330.66
Weir Submerg		Froude # Chl	0.44	0.44
Weir Max Depth (ft)		Specif Force (cu ft)	1371.32	1366.29
Min El Weir Flow (ft)	960.01	Hydr Depth (ft)	3.91	3.97
Min El Prs (ft)	957.00	W.P. Total (ft)	91.29	88.08
Delta EG (ft)	0.06	Conv. Total (cfs)	34583.9	34439.4
Delta WS (ft)	0.07	Top Width (ft)	86.40	83.22

BR Open Area (sq ft)	1157.91	Frctn Loss (ft)		
BR Open Vel (ft/s)	5.44	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.63	0.64
Br Sel Method	Momentum	Power Total (lb/ft s)	3.33	3.49

BRIDGE OUTPUT Profile #50yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	950.66	E.G. Elev (ft)	950.63	950.63
W.S. US. (ft)	950.09	W.S. Elev (ft)	950.04	950.03
Q Total (cfs)	2060.00	Crit W.S. (ft)	947.05	947.03
Q Bridge (cfs)	2060.00	Max Chl Dpth (ft)	8.67	8.68
Q Weir (cfs)		Vel Total (ft/s)	5.26	5.38
Weir Sta Lft (ft)		Flow Area (sq ft)	391.44	382.99
Weir Sta Rgt (ft)		Froude # Chl	0.43	0.43
Weir Submerg		Specif Force (cu ft)	1647.49	1641.39
Weir Max Depth (ft)		Hydr Depth (ft)	4.35	4.41
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	95.94	92.75
Min El Prs (ft)	957.00	Conv. Total (cfs)	40680.1	40552.9
Delta EG (ft)	0.05	Top Width (ft)	90.01	86.83
Delta WS (ft)	0.06	Frctn Loss (ft)		
BR Open Area (sq ft)	1157.91	C & E Loss (ft)		
BR Open Vel (ft/s)	5.38	Shear Total (lb/sq ft)	0.65	0.67
Coef of Q		Power Total (lb/ft s)	3.44	3.58
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #100yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	951.26	E.G. Elev (ft)	951.25	951.23
W.S. US. (ft)	950.68	W.S. Elev (ft)	950.65	950.62
Q Total (cfs)	2310.00	Crit W.S. (ft)	947.42	947.40
Q Bridge (cfs)	2310.00	Max Chl Dpth (ft)	9.28	9.27
Q Weir (cfs)		Vel Total (ft/s)	5.17	5.31
Weir Sta Lft (ft)		Flow Area (sq ft)	447.21	435.41
Weir Sta Rgt (ft)		Froude # Chl	0.41	0.42
Weir Submerg		Specif Force (cu ft)	1950.58	1934.34
Weir Max Depth (ft)		Hydr Depth (ft)	4.76	4.80
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	101.20	97.87
Min El Prs (ft)	957.00	Conv. Total (cfs)	47213.6	46835.8
Delta EG (ft)	0.05	Top Width (ft)	94.01	90.71
Delta WS (ft)	0.06	Frctn Loss (ft)	0.01	0.02
BR Open Area (sq ft)	1157.91	C & E Loss (ft)	0.00	0.01
BR Open Vel (ft/s)	5.31	Shear Total (lb/sq ft)	0.66	0.68
Coef of Q		Power Total (lb/ft s)	3.41	3.58
Br Sel Method	Energy only			

BRIDGE OUTPUT Profile #500yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	952.54	E.G. Elev (ft)	952.53	952.52
W.S. US. (ft)	951.93	W.S. Elev (ft)	951.88	951.84
Q Total (cfs)	2930.00	Crit W.S. (ft)	948.40	948.36
Q Bridge (cfs)	2930.00	Max Chl Dpth (ft)	10.51	10.49
Q Weir (cfs)		Vel Total (ft/s)	5.07	5.23
Weir Sta Lft (ft)		Flow Area (sq ft)	577.47	560.62
Weir Sta Rgt (ft)		Froude # Chl	0.41	0.41
Weir Submerg		Specif Force (cu ft)	2714.09	2681.37
Weir Max Depth (ft)		Hydr Depth (ft)	5.12	5.14
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	123.47	119.77
Min El Prs (ft)	957.00	Conv. Total (cfs)	61907.3	61241.8
Delta EG (ft)	0.06	Top Width (ft)	112.79	109.14
Delta WS (ft)	0.08	Frctn Loss (ft)	0.01	0.02
BR Open Area (sq ft)	1157.91	C & E Loss (ft)	0.00	0.01
BR Open Vel (ft/s)	5.23	Shear Total (lb/sq ft)	0.65	0.67
Coef of Q		Power Total (lb/ft s)	3.32	3.50
Br Sel Method	Energy only			

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3360.436

INPUT
Description: 24
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.98	.17	956.98	2.4	956.91	8.85	956.38	12.64	956.16
14.21	956.28	15.49	951.03	30.55	951.03	34.77	948.92	42.77	948.92
45.53	950.3	50.53	950.3	68.49	941.32	88.49	941.32	101.43	947.79

125.06 947.87 136.02 953.73 143.9 957.74

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	50.53	.04	101.43	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
50.53	101.43	122.81	122.13	120.82	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	947.52	Element			
Vel Head (ft)	0.39	Wt. n-Val.		0.040	
W.S. Elev (ft)	947.13	Reach Len. (ft)	122.81	122.13	120.82
Crit W.S. (ft)		Flow Area (sq ft)		183.87	
E.G. Slope (ft/ft)	0.002860	Area (sq ft)		183.87	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	43.25	Top Width (ft)		43.25	
Vel Total (ft/s)	5.00	Avg. Vel. (ft/s)		5.00	
Max Chl Dpth (ft)	5.81	Hydr. Depth (ft)		4.25	
Conv. Total (cfs)	17204.0	Conv. (cfs)		17204.0	
Length Wtd. (ft)	122.13	Wetted Per. (ft)		46.00	
Min Ch El (ft)	941.32	Shear (lb/sq ft)		0.71	
Alpha	1.00	Stream Power (lb/ft s)		3.57	
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)	2.50	13.51	1.44
C & E Loss (ft)	0.00	Cum SA (acres)	2.51	2.81	1.29

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	948.25	Element			
Vel Head (ft)	0.48	Wt. n-Val.		0.040	
W.S. Elev (ft)	947.76	Reach Len. (ft)	122.81	122.13	120.82
Crit W.S. (ft)		Flow Area (sq ft)		211.91	
E.G. Slope (ft/ft)	0.003173	Area (sq ft)		211.91	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	45.77	Top Width (ft)		45.77	
Vel Total (ft/s)	5.57	Avg. Vel. (ft/s)		5.57	
Max Chl Dpth (ft)	6.44	Hydr. Depth (ft)		4.63	
Conv. Total (cfs)	20948.0	Conv. (cfs)		20948.0	
Length Wtd. (ft)	122.13	Wetted Per. (ft)		48.82	
Min Ch El (ft)	941.32	Shear (lb/sq ft)		0.86	
Alpha	1.00	Stream Power (lb/ft s)		4.79	
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	2.05	15.79	0.33
C & E Loss (ft)	0.00	Cum SA (acres)	1.78	2.96	0.24

CROSS SECTION OUTPUT Profile #10yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.00	Element			
Vel Head (ft)	0.54	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	948.46	Reach Len. (ft)	122.81	122.13	120.82
Crit W.S. (ft)		Flow Area (sq ft)		244.54	15.33
E.G. Slope (ft/ft)	0.003073	Area (sq ft)		244.54	15.33
Q Total (cfs)	1450.00	Flow (cfs)		1442.38	7.62
Top Width (ft)	71.97	Top Width (ft)		47.23	24.74
Vel Total (ft/s)	5.58	Avg. Vel. (ft/s)		5.90	0.50
Max Chl Dpth (ft)	7.14	Hydr. Depth (ft)		5.18	0.62
Conv. Total (cfs)	26157.7	Conv. (cfs)		26020.2	137.4
Length Wtd. (ft)	122.13	Wetted Per. (ft)		50.44	24.89
Min Ch El (ft)	941.32	Shear (lb/sq ft)		0.93	0.12
Alpha	1.11	Stream Power (lb/ft s)		5.49	0.06
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	7.47	17.36	3.54
C & E Loss (ft)	0.01	Cum SA (acres)	4.00	3.05	2.42

CROSS SECTION OUTPUT Profile #25yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.97	Element			
Vel Head (ft)	0.57	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	949.40	Reach Len. (ft)	122.81	122.13	120.82
Crit W.S. (ft)		Flow Area (sq ft)	4.32	289.69	39.35
E.G. Slope (ft/ft)	0.002761	Area (sq ft)	4.32	289.69	39.35
Q Total (cfs)	1800.00	Flow (cfs)	2.12	1764.87	33.01
Top Width (ft)	85.53	Top Width (ft)	9.93	49.10	26.50
Vel Total (ft/s)	5.40	Avg. Vel. (ft/s)	0.49	6.09	0.84
Max Chl Dpth (ft)	8.08	Hydr. Depth (ft)	0.44	5.90	1.48
Conv. Total (cfs)	34254.5	Conv. (cfs)	40.4	33586.0	628.1
Length Wtd. (ft)	122.12	Wetted Per. (ft)	10.16	52.54	26.88
Min Ch El (ft)	941.32	Shear (lb/sq ft)	0.07	0.95	0.25
Alpha	1.25	Stream Power (lb/ft s)	0.04	5.79	0.21
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)	11.73	20.04	5.59

C & E Loss (ft)	0.01	Cum SA (acres)	4.80	3.15	3.29

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #50yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	950.61	Element			
Vel Head (ft)	0.58	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	950.02	Reach Len. (ft)	122.81	122.13	120.82
Crit W.S. (ft)		Flow Area (sq ft)	11.26	320.56	56.16
E.G. Slope (ft/ft)	0.002607	Area (sq ft)	11.26	320.56	56.16
Q Total (cfs)	2060.00	Flow (cfs)	8.65	1995.14	56.21
Top Width (ft)	90.42	Top Width (ft)	12.41	50.35	27.66
Vel Total (ft/s)	5.31	Avg. Vel. (ft/s)	0.77	6.22	1.00
Max Chl Dpth (ft)	8.70	Hydr. Depth (ft)	0.91	6.37	2.03
Conv. Total (cfs)	40347.0	Conv. (cfs)	169.5	39076.7	1100.8
Length Wtd. (ft)	122.11	Wetted Per. (ft)	12.93	53.93	28.20
Min Ch El (ft)	941.32	Shear (lb/sq ft)	0.14	0.97	0.32
Alpha	1.33	Stream Power (lb/ft s)	0.11	6.02	0.32
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	14.53	21.58	7.29
C & E Loss (ft)	0.01	Cum SA (acres)	5.10	3.20	3.97

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	951.21	Element			
Vel Head (ft)	0.59	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	950.61	Reach Len. (ft)	122.81	122.13	120.82
Crit W.S. (ft)		Flow Area (sq ft)	20.78	350.60	72.85
E.G. Slope (ft/ft)	0.002413	Area (sq ft)	20.78	350.60	72.85
Q Total (cfs)	2310.00	Flow (cfs)	17.36	2211.60	81.04
Top Width (ft)	98.81	Top Width (ft)	19.15	50.90	28.76
Vel Total (ft/s)	5.20	Avg. Vel. (ft/s)	0.84	6.31	1.11
Max Chl Dpth (ft)	9.29	Hydr. Depth (ft)	1.09	6.89	2.53
Conv. Total (cfs)	47027.1	Conv. (cfs)	353.3	45023.8	1649.9
Length Wtd. (ft)	122.11	Wetted Per. (ft)	19.88	54.55	29.45
Min Ch El (ft)	941.32	Shear (lb/sq ft)	0.16	0.97	0.37
Alpha	1.41	Stream Power (lb/ft s)	0.13	6.11	0.41
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)	16.83	23.19	9.76
C & E Loss (ft)	0.01	Cum SA (acres)	5.26	3.26	4.88

CROSS SECTION OUTPUT Profile #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	952.49	Element			
Vel Head (ft)	0.63	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	951.86	Reach Len. (ft)	122.81	122.13	120.82
Crit W.S. (ft)		Flow Area (sq ft)	57.91	413.76	109.98
E.G. Slope (ft/ft)	0.002114	Area (sq ft)	57.91	413.76	109.98
Q Total (cfs)	2930.00	Flow (cfs)	59.57	2728.09	142.34
Top Width (ft)	117.23	Top Width (ft)	35.24	50.90	31.08
Vel Total (ft/s)	5.04	Avg. Vel. (ft/s)	1.03	6.59	1.29
Max Chl Dpth (ft)	10.54	Hydr. Depth (ft)	1.64	8.13	3.54
Conv. Total (cfs)	63729.1	Conv. (cfs)	1295.6	59337.5	3096.1
Length Wtd. (ft)	122.11	Wetted Per. (ft)	36.71	54.55	32.08
Min Ch El (ft)	941.32	Shear (lb/sq ft)	0.21	1.00	0.45
Alpha	1.60	Stream Power (lb/ft s)	0.21	6.60	0.59
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)	22.53	26.57	15.43
C & E Loss (ft)	0.01	Cum SA (acres)	5.59	3.31	6.45

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3238.304

INPUT
Description: 25
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.42	.7	956.41	2.5	956.32	11.18	955.84	12.83	955.83
12.9	955.52	13.37	953.77	14.16	950.71	27.01	950.71	31.11	948.66
39.11	948.66	42.19	950.2	47.19	950.2	65.19	941.06	85.19	941.06
102.95	949.94	118.62	951.21	132.5	958.49				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	47.19	.04	102.95	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
47.19	102.95	18.33	18.06	18.17	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	947.15	Element			
Vel Head (ft)	0.42	Wt. n-Val.		0.040	
W.S. Elev (ft)	946.74	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	944.61	Flow Area (sq ft)		177.44	
E.G. Slope (ft/ft)	0.003148	Area (sq ft)		177.44	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	42.53	Top Width (ft)		42.53	
Vel Total (ft/s)	5.18	Avg. Vel. (ft/s)		5.18	
Max Chl Dpth (ft)	5.68	Hydr. Depth (ft)		4.17	
Conv. Total (cfs)	16396.2	Conv. (cfs)		16396.2	
Length Wtd. (ft)	4.00	Wetted Per. (ft)		45.23	
Min Ch El (ft)	941.06	Shear (lb/sq ft)		0.77	
Alpha	1.00	Stream Power (lb/ft s)		4.00	
Frctn Loss (ft)		Cum Volume (acre-ft)	2.50	13.01	1.44
C & E Loss (ft)		Cum SA (acres)	2.51	2.69	1.29

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	947.83	Element			
Vel Head (ft)	0.53	Wt. n-Val.		0.040	
W.S. Elev (ft)	947.30	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	945.18	Flow Area (sq ft)		201.89	
E.G. Slope (ft/ft)	0.003617	Area (sq ft)		201.89	
Q Total (cfs)	1180.00	Flow (cfs)		1180.00	
Top Width (ft)	44.75	Top Width (ft)		44.75	
Vel Total (ft/s)	5.84	Avg. Vel. (ft/s)		5.84	
Max Chl Dpth (ft)	6.24	Hydr. Depth (ft)		4.51	
Conv. Total (cfs)	19619.1	Conv. (cfs)		19619.1	
Length Wtd. (ft)	4.00	Wetted Per. (ft)		47.72	
Min Ch El (ft)	941.06	Shear (lb/sq ft)		0.96	
Alpha	1.00	Stream Power (lb/ft s)		5.58	
Frctn Loss (ft)		Cum Volume (acre-ft)	2.05	15.21	0.33
C & E Loss (ft)		Cum SA (acres)	1.78	2.83	0.24

CROSS SECTION OUTPUT Profile #10yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	948.59	Element			
Vel Head (ft)	0.60	Wt. n-Val.		0.040	
W.S. Elev (ft)	947.99	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	945.71	Flow Area (sq ft)		234.08	
E.G. Slope (ft/ft)	0.003628	Area (sq ft)		234.08	
Q Total (cfs)	1450.00	Flow (cfs)		1450.00	
Top Width (ft)	47.52	Top Width (ft)		47.52	
Vel Total (ft/s)	6.19	Avg. Vel. (ft/s)		6.19	
Max Chl Dpth (ft)	6.93	Hydr. Depth (ft)		4.93	
Conv. Total (cfs)	24073.4	Conv. (cfs)		24073.4	
Length Wtd. (ft)	4.00	Wetted Per. (ft)		50.82	
Min Ch El (ft)	941.06	Shear (lb/sq ft)		1.04	
Alpha	1.00	Stream Power (lb/ft s)		6.46	
Frctn Loss (ft)		Cum Volume (acre-ft)	7.47	16.69	3.52
C & E Loss (ft)		Cum SA (acres)	4.00	2.92	2.39

CROSS SECTION OUTPUT Profile #25yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.59	Element			
Vel Head (ft)	0.63	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	948.96	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	946.32	Flow Area (sq ft)	2.56	281.77	
E.G. Slope (ft/ft)	0.003353	Area (sq ft)	2.56	281.77	
Q Total (cfs)	1800.00	Flow (cfs)	1.04	1798.97	
Top Width (ft)	60.54	Top Width (ft)	9.19	51.35	
Vel Total (ft/s)	6.33	Avg. Vel. (ft/s)	0.40	6.38	
Max Chl Dpth (ft)	7.90	Hydr. Depth (ft)	0.28	5.49	
Conv. Total (cfs)	31084.3	Conv. (cfs)	17.9	31066.5	
Length Wtd. (ft)	4.00	Wetted Per. (ft)	9.33	55.11	
Min Ch El (ft)	941.06	Shear (lb/sq ft)	0.06	1.07	
Alpha	1.02	Stream Power (lb/ft s)	0.02	6.83	
Frctn Loss (ft)		Cum Volume (acre-ft)	11.72	19.24	5.53
C & E Loss (ft)		Cum SA (acres)	4.77	3.01	3.26

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #50yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	950.25	Element			
Vel Head (ft)	0.66	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	949.59	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	946.72	Flow Area (sq ft)	9.17	315.00	
E.G. Slope (ft/ft)	0.003218	Area (sq ft)	9.17	315.00	
Q Total (cfs)	2060.00	Flow (cfs)	7.11	2052.89	
Top Width (ft)	65.58	Top Width (ft)	11.72	53.86	
Vel Total (ft/s)	6.35	Avg. Vel. (ft/s)	0.78	6.52	
Max Chl Dpth (ft)	8.53	Hydr. Depth (ft)	0.78	5.85	
Conv. Total (cfs)	36316.2	Conv. (cfs)	125.4	36190.8	
Length Wtd. (ft)	4.00	Wetted Per. (ft)	12.16	57.91	
Min Ch El (ft)	941.06	Shear (lb/sq ft)	0.15	1.09	
Alpha	1.05	Stream Power (lb/ft s)	0.12	7.12	
Frctn Loss (ft)		Cum Volume (acre-ft)	14.50	20.69	7.21
C & E Loss (ft)		Cum SA (acres)	5.06	3.06	3.93

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	950.87	Element			
Vel Head (ft)	0.67	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	950.20	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	947.10	Flow Area (sq ft)	17.13	348.73	0.43
E.G. Slope (ft/ft)	0.003008	Area (sq ft)	17.13	348.73	0.43
Q Total (cfs)	2310.00	Flow (cfs)	14.04	2295.88	0.08
Top Width (ft)	78.18	Top Width (ft)	19.17	55.76	3.25
Vel Total (ft/s)	6.31	Avg. Vel. (ft/s)	0.82	6.58	0.18
Max Chl Dpth (ft)	9.14	Hydr. Depth (ft)	0.89	6.25	0.13
Conv. Total (cfs)	42115.4	Conv. (cfs)	256.0	41858.0	1.4
Length Wtd. (ft)	4.00	Wetted Per. (ft)	19.90	60.04	3.26
Min Ch El (ft)	941.06	Shear (lb/sq ft)	0.16	1.09	0.02
Alpha	1.08	Stream Power (lb/ft s)	0.13	7.18	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	16.78	22.21	9.66
C & E Loss (ft)		Cum SA (acres)	5.20	3.11	4.84

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	952.20	Element			
Vel Head (ft)	0.70	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	951.50	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	947.95	Flow Area (sq ft)	53.15	420.83	14.52
E.G. Slope (ft/ft)	0.002501	Area (sq ft)	53.15	420.83	14.52
Q Total (cfs)	2930.00	Flow (cfs)	58.33	2863.36	8.31
Top Width (ft)	105.21	Top Width (ft)	33.23	55.76	16.22
Vel Total (ft/s)	6.00	Avg. Vel. (ft/s)	1.10	6.80	0.57
Max Chl Dpth (ft)	10.44	Hydr. Depth (ft)	1.60	7.55	0.90
Conv. Total (cfs)	58584.9	Conv. (cfs)	1166.4	57252.4	166.2
Length Wtd. (ft)	4.00	Wetted Per. (ft)	34.69	60.04	16.34
Min Ch El (ft)	941.06	Shear (lb/sq ft)	0.24	1.09	0.14
Alpha	1.26	Stream Power (lb/ft s)	0.26	7.45	0.08
Frctn Loss (ft)		Cum Volume (acre-ft)	22.37	25.40	15.25
C & E Loss (ft)		Cum SA (acres)	5.50	3.16	6.39

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 3231

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	960	957	500	960	957

Upstream Bridge Cross Section Data
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.38	.7	956.37	2.5	956.28	11.18	955.8	12.83	955.79
12.9	955.48	13.37	953.73	14.16	950.67	27.01	950.67	31.11	948.62

```
   39.11  948.62   42.19  950.16   47.19  950.16   65.19  941.02   85.19  941.02
  102.95   949.9  118.62  951.17   132.5  958.45

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09   47.19     .04  102.95     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
          47.19  102.95              .1       .3

Downstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0     960     957     500     960     957

Downstream Bridge Cross Section Data
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   956.4    8.34  956.02   10.15  955.94   11.38  955.89   12.89   950.6
   25.32   950.6   29.42  948.55   37.42  948.55    40.5  950.09    45.5  950.09
    63.5  940.95    83.5  940.95  101.26  949.83  114.79  952.54  118.77  952.99
   124.5  957.55

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09    45.5     .04  101.26     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
           45.5  101.26              .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=   47.19    Downstream=    45.5
Upstream     num=       2
    Width   Elev    Width   Elev
        8    940        8    960
Downstream     num=       2
    Width   Elev    Width   Elev
        8    940        8    960

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
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 #2yr

  E.G. US. (ft)                947.15    Element                  Inside BR US  Inside BR DS
  W.S. US. (ft)                946.74    E.G. Elev (ft)               947.10        947.01
  Q Total (cfs)                920.00    W.S. Elev (ft)               946.68        946.58
  Q Bridge (cfs)               920.00    Crit W.S. (ft)               944.59        944.52
  Q Weir (cfs)                           Max Chl Dpth (ft)              5.66          5.63
  Weir Sta Lft (ft)                      Vel Total (ft/s)               5.21          5.24
  Weir Sta Rgt (ft)                      Flow Area (sq ft)            176.73        175.59
  Weir Submerg                           Froude # Chl                   0.45          0.45
  Weir Max Depth (ft)                    Specif Force (cu ft)         588.84        585.08
  Min El Weir Flow (ft)        960.01    Hydr Depth (ft)                4.16          4.15
  Min El Prs (ft)              957.00    W.P. Total (ft)               45.15         45.03
  Delta EG (ft)                  0.17    Conv. Total (cfs)           16305.5       16159.6
  Delta WS (ft)                  0.17    Top Width (ft)                42.46         42.36
  BR Open Area (sq ft)        1031.37    Frctn Loss (ft)
```

BR Open Vel (ft/s)	5.24	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.78	0.79
Br Sel Method	Momentum	Power Total (lb/ft s)	4.05	4.13

BRIDGE OUTPUT Profile #5yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	947.83	E.G. Elev (ft)	947.77	947.68
W.S. US. (ft)	947.30	W.S. Elev (ft)	947.24	947.14
Q Total (cfs)	1180.00	Crit W.S. (ft)	945.15	945.08
Q Bridge (cfs)	1180.00	Max Chl Dpth (ft)	6.22	6.19
Q Weir (cfs)		Vel Total (ft/s)	5.87	5.91
Weir Sta Lft (ft)		Flow Area (sq ft)	201.01	199.75
Weir Sta Rgt (ft)		Froude # Chl	0.49	0.49
Weir Submerg		Specif Force (cu ft)	760.44	756.11
Weir Max Depth (ft)		Hydr Depth (ft)	4.50	4.48
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	47.63	47.50
Min El Prs (ft)	957.00	Conv. Total (cfs)	19501.2	19331.0
Delta EG (ft)	0.17	Top Width (ft)	44.67	44.56
Delta WS (ft)	0.17	Frctn Loss (ft)		
BR Open Area (sq ft)	698.51	C & E Loss (ft)		
BR Open Vel (ft/s)	5.91	Shear Total (lb/sq ft)	0.96	0.98
Coef of Q		Power Total (lb/ft s)	5.66	5.78
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #10yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	948.59	E.G. Elev (ft)	948.53	948.44
W.S. US. (ft)	947.99	W.S. Elev (ft)	947.93	947.84
Q Total (cfs)	1450.00	Crit W.S. (ft)	945.68	945.60
Q Bridge (cfs)	1450.00	Max Chl Dpth (ft)	6.91	6.89
Q Weir (cfs)		Vel Total (ft/s)	6.22	6.25
Weir Sta Lft (ft)		Flow Area (sq ft)	233.18	231.91
Weir Sta Rgt (ft)		Froude # Chl	0.49	0.50
Weir Submerg		Specif Force (cu ft)	976.82	972.12
Weir Max Depth (ft)		Hydr Depth (ft)	4.91	4.90
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	50.73	50.61
Min El Prs (ft)	957.00	Conv. Total (cfs)	23944.8	23765.0
Delta EG (ft)	0.17	Top Width (ft)	47.45	47.34
Delta WS (ft)	0.16	Frctn Loss (ft)		
BR Open Area (sq ft)	1031.37	C & E Loss (ft)		
BR Open Vel (ft/s)	6.25	Shear Total (lb/sq ft)	1.05	1.06
Coef of Q		Power Total (lb/ft s)	6.54	6.66
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #25yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	949.59	E.G. Elev (ft)	949.53	949.45
W.S. US. (ft)	948.96	W.S. Elev (ft)	948.89	948.80
Q Total (cfs)	1800.00	Crit W.S. (ft)	946.29	946.22
Q Bridge (cfs)	1800.00	Max Chl Dpth (ft)	7.87	7.85
Q Weir (cfs)		Vel Total (ft/s)	6.38	6.41
Weir Sta Lft (ft)		Flow Area (sq ft)	282.19	280.80
Weir Sta Rgt (ft)		Froude # Chl	0.48	0.48
Weir Submerg		Specif Force (cu ft)	1301.83	1296.71
Weir Max Depth (ft)		Hydr Depth (ft)	4.80	4.78
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	63.29	63.10
Min El Prs (ft)	957.00	Conv. Total (cfs)	31125.1	30933.7
Delta EG (ft)	0.17	Top Width (ft)	58.83	58.69
Delta WS (ft)	0.16	Frctn Loss (ft)		
BR Open Area (sq ft)	1031.37	C & E Loss (ft)		
BR Open Vel (ft/s)	6.41	Shear Total (lb/sq ft)	0.93	0.94
Coef of Q		Power Total (lb/ft s)	5.94	6.03
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #50yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	950.25	E.G. Elev (ft)	950.19	950.10
W.S. US. (ft)	949.59	W.S. Elev (ft)	949.51	949.42
Q Total (cfs)	2060.00	Crit W.S. (ft)	946.71	946.63
Q Bridge (cfs)	2060.00	Max Chl Dpth (ft)	8.49	8.47
Q Weir (cfs)		Vel Total (ft/s)	6.44	6.47
Weir Sta Lft (ft)		Flow Area (sq ft)	319.76	318.16
Weir Sta Rgt (ft)		Froude # Chl	0.47	0.47
Weir Submerg		Specif Force (cu ft)	1549.98	1543.68
Weir Max Depth (ft)		Hydr Depth (ft)	5.11	5.10
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	68.06	67.86
Min El Prs (ft)	957.00	Conv. Total (cfs)	36325.0	36101.5
Delta EG (ft)	0.18			

Delta WS (ft)	0.17	Top Width (ft)	62.55	62.39
BR Open Area (sq ft)	1031.37	Frctn Loss (ft)		
BR Open Vel (ft/s)	6.47	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.94	0.95
Br Sel Method	Momentum	Power Total (lb/ft s)	6.08	6.17

BRIDGE OUTPUT Profile #100yr

E.G. US. (ft)	950.87	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	950.20	E.G. Elev (ft)	950.81	950.72
Q Total (cfs)	2310.00	W.S. Elev (ft)	950.12	950.02
Q Bridge (cfs)	2310.00	Crit W.S. (ft)	947.08	947.01
Q Weir (cfs)		Max Chl Dpth (ft)	9.09	9.07
Weir Sta Lft (ft)		Vel Total (ft/s)	6.44	6.47
Weir Sta Rgt (ft)		Flow Area (sq ft)	358.86	357.14
Weir Submerg		Froude # Chl	0.46	0.46
Weir Max Depth (ft)		Specif Force (cu ft)	1811.62	1805.15
Min El Weir Flow (ft)	960.01	Hydr Depth (ft)	5.25	5.36
Min El Prs (ft)	957.00	W.P. Total (ft)	74.89	73.08
Delta EG (ft)	0.18	Conv. Total (cfs)	42006.5	41765.7
Delta WS (ft)	0.17	Top Width (ft)	68.39	66.61
BR Open Area (sq ft)	1031.37	Frctn Loss (ft)		
BR Open Vel (ft/s)	6.47	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.90	0.93
Br Sel Method	Momentum	Power Total (lb/ft s)	5.82	6.04

BRIDGE OUTPUT Profile #500yr

E.G. US. (ft)	952.20	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	951.50	E.G. Elev (ft)	952.12	952.04
Q Total (cfs)	2930.00	W.S. Elev (ft)	951.36	951.27
Q Bridge (cfs)	2930.00	Crit W.S. (ft)	947.93	947.86
Q Weir (cfs)		Max Chl Dpth (ft)	10.34	10.32
Weir Sta Lft (ft)		Vel Total (ft/s)	6.31	6.44
Weir Sta Rgt (ft)		Flow Area (sq ft)	464.51	455.21
Weir Submerg		Froude # Chl	0.44	0.45
Weir Max Depth (ft)		Specif Force (cu ft)	2473.41	2465.76
Min El Weir Flow (ft)	960.01	Hydr Depth (ft)	4.79	5.19
Min El Prs (ft)	957.00	W.P. Total (ft)	106.70	97.45
Delta EG (ft)	0.19	Conv. Total (cfs)	55883.6	55604.8
Delta WS (ft)	0.19	Top Width (ft)	97.00	87.76
BR Open Area (sq ft)	1031.37	Frctn Loss (ft)		
BR Open Vel (ft/s)	6.44	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.75	0.81
Br Sel Method	Momentum	Power Total (lb/ft s)	4.71	5.21

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3220.243

INPUT
Description: 26
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.31	8.34	955.93	10.15	955.85	11.38	955.8	12.89	950.51
25.32	950.51	29.42	948.46	37.42	948.46	40.5	950	45.5	950
63.5	940.86	83.5	940.86	101.26	949.74	114.79	952.45	118.77	952.9
124.5	957.46								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	45.5	.04	101.26	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
45.5	101.26	73.32	73.11	72.78	.1	.3

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	946.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.		0.040	
W.S. Elev (ft)	946.57	Reach Len. (ft)	73.32	73.11	72.78
Crit W.S. (ft)		Flow Area (sq ft)		178.92	
E.G. Slope (ft/ft)	0.003076	Area (sq ft)		178.92	
Q Total (cfs)	920.00	Flow (cfs)		920.00	
Top Width (ft)	42.67	Top Width (ft)		42.67	
Vel Total (ft/s)	5.14	Avg. Vel. (ft/s)		5.14	
Max Chl Dpth (ft)	5.71	Hydr. Depth (ft)		4.19	

Conv. Total (cfs)	16587.3	Conv. (cfs)		16587.3	
Length Wtd. (ft)	73.11	Wetted Per. (ft)		45.38	
Min Ch El (ft)	940.86	Shear (lb/sq ft)		0.76	
Alpha	1.00	Stream Power (lb/ft s)		3.89	
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	2.50	12.93	1.44
C & E Loss (ft)	0.04	Cum SA (acres)	2.51	2.67	1.29

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	947.65	Wt. n-Val.		0.040	
Vel Head (ft)	0.52	Reach Len. (ft)	73.32	73.11	72.78
W.S. Elev (ft)	947.13	Flow Area (sq ft)		203.35	
Crit W.S. (ft)		Area (sq ft)		203.35	
E.G. Slope (ft/ft)	0.003546	Flow (cfs)		1180.00	
Q Total (cfs)	1180.00	Top Width (ft)		44.88	
Top Width (ft)	44.88	Avg. Vel. (ft/s)		5.80	
Vel Total (ft/s)	5.80	Hydr. Depth (ft)		4.53	
Max Chl Dpth (ft)	6.27	Conv. (cfs)		19816.5	
Conv. Total (cfs)	19816.5	Wetted Per. (ft)		47.86	
Length Wtd. (ft)	73.11	Shear (lb/sq ft)		0.94	
Min Ch El (ft)	940.86	Stream Power (lb/ft s)		5.46	
Alpha	1.00	Cum Volume (acre-ft)	2.05	15.13	0.33
Frctn Loss (ft)	0.35	Cum SA (acres)	1.78	2.81	0.24
C & E Loss (ft)	0.03				

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	948.42	Wt. n-Val.		0.040	
Vel Head (ft)	0.59	Reach Len. (ft)	73.32	73.11	72.78
W.S. Elev (ft)	947.83	Flow Area (sq ft)		235.85	
Crit W.S. (ft)		Area (sq ft)		235.85	
E.G. Slope (ft/ft)	0.003554	Flow (cfs)		1450.00	
Q Total (cfs)	1450.00	Top Width (ft)		47.67	
Top Width (ft)	47.67	Avg. Vel. (ft/s)		6.15	
Vel Total (ft/s)	6.15	Hydr. Depth (ft)		4.95	
Max Chl Dpth (ft)	6.97	Conv. (cfs)		24323.8	
Conv. Total (cfs)	24323.8	Wetted Per. (ft)		50.98	
Length Wtd. (ft)	73.11	Shear (lb/sq ft)		1.03	
Min Ch El (ft)	940.86	Stream Power (lb/ft s)		6.31	
Alpha	1.00	Cum Volume (acre-ft)	7.47	16.60	3.52
Frctn Loss (ft)	0.35	Cum SA (acres)	4.00	2.90	2.39
C & E Loss (ft)	0.04				

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	949.42	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	0.62	Reach Len. (ft)	73.32	73.11	72.78
W.S. Elev (ft)	948.80	Flow Area (sq ft)	2.92	283.78	
Crit W.S. (ft)		Area (sq ft)	2.92	283.78	
E.G. Slope (ft/ft)	0.003288	Flow (cfs)	1.26	1798.74	
Q Total (cfs)	1800.00	Top Width (ft)	9.35	51.51	
Top Width (ft)	60.85	Avg. Vel. (ft/s)	0.43	6.34	
Vel Total (ft/s)	6.28	Hydr. Depth (ft)	0.31	5.51	
Max Chl Dpth (ft)	7.94	Conv. (cfs)	22.0	31370.6	
Conv. Total (cfs)	31392.6	Wetted Per. (ft)	9.51	55.28	
Length Wtd. (ft)	73.11	Shear (lb/sq ft)	0.06	1.05	
Min Ch El (ft)	940.86	Stream Power (lb/ft s)	0.03	6.68	
Alpha	1.02	Cum Volume (acre-ft)	11.72	19.13	5.53
Frctn Loss (ft)	0.34	Cum SA (acres)	4.76	2.99	3.26
C & E Loss (ft)	0.05				

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	950.07	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	0.65	Reach Len. (ft)	73.32	73.11	72.78
W.S. Elev (ft)	949.42	Flow Area (sq ft)	9.51	316.57	
Crit W.S. (ft)		Area (sq ft)	9.51	316.57	
E.G. Slope (ft/ft)	0.003173	Flow (cfs)	7.46	2052.54	
Q Total (cfs)	2060.00	Top Width (ft)	11.84	53.97	
Top Width (ft)	65.81	Avg. Vel. (ft/s)	0.78	6.48	
Vel Total (ft/s)	6.32	Hydr. Depth (ft)	0.80	5.87	
Max Chl Dpth (ft)	8.56	Conv. (cfs)	132.4	36438.1	
Conv. Total (cfs)	36570.5	Wetted Per. (ft)	12.29	58.04	
Length Wtd. (ft)	73.11	Shear (lb/sq ft)	0.15	1.08	
Min Ch El (ft)	940.86	Stream Power (lb/ft s)	0.12	7.01	
Alpha	1.05				

Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	14.50	20.56	7.21
C & E Loss (ft)	0.06	Cum SA (acres)	5.06	3.04	3.93

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.

CROSS SECTION OUTPUT Profile #100yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	950.69	Element			
Vel Head (ft)	0.66	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	950.03	Reach Len. (ft)	73.32	73.11	72.78
Crit W.S. (ft)		Flow Area (sq ft)	17.68	350.32	0.21
E.G. Slope (ft/ft)	0.002962	Area (sq ft)	17.68	350.32	0.21
Q Total (cfs)	2310.00	Flow (cfs)	14.65	2295.31	0.04
Top Width (ft)	76.44	Top Width (ft)	19.22	55.76	1.46
Vel Total (ft/s)	6.27	Avg. Vel. (ft/s)	0.83	6.55	0.18
Max Chl Dpth (ft)	9.17	Hydr. Depth (ft)	0.92	6.28	0.15
Conv. Total (cfs)	42446.4	Conv. (cfs)	269.2	42176.4	0.7
Length Wtd. (ft)	73.11	Wetted Per. (ft)	19.96	60.04	1.49
Min Ch El (ft)	940.86	Shear (lb/sq ft)	0.16	1.08	0.03
Alpha	1.08	Stream Power (lb/ft s)	0.14	7.07	0.00
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	16.77	22.07	9.66
C & E Loss (ft)	0.07	Cum SA (acres)	5.20	3.09	4.83

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 #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	952.01	Element			
Vel Head (ft)	0.70	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	951.31	Reach Len. (ft)	73.32	73.11	72.78
Crit W.S. (ft)		Flow Area (sq ft)	53.28	421.58	6.15
E.G. Slope (ft/ft)	0.002494	Area (sq ft)	53.28	421.58	6.15
Q Total (cfs)	2930.00	Flow (cfs)	58.93	2867.88	3.20
Top Width (ft)	96.44	Top Width (ft)	32.84	55.76	7.84
Vel Total (ft/s)	6.09	Avg. Vel. (ft/s)	1.11	6.80	0.52
Max Chl Dpth (ft)	10.45	Hydr. Depth (ft)	1.62	7.56	0.79
Conv. Total (cfs)	58667.7	Conv. (cfs)	1179.9	57423.8	64.0
Length Wtd. (ft)	73.11	Wetted Per. (ft)	34.29	60.04	7.99
Min Ch El (ft)	940.86	Shear (lb/sq ft)	0.24	1.09	0.12
Alpha	1.22	Stream Power (lb/ft s)	0.27	7.44	0.06
Frctn Loss (ft)	0.29	Cum Volume (acre-ft)	22.35	25.23	15.25
C & E Loss (ft)	0.08	Cum SA (acres)	5.48	3.14	6.38

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

RIVER: Hope Creek
REACH: 1 RS: 3147

INPUT
Description:
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.82	2.81	956.82	13.92	956.6	15.83	956.56	16.85	956.54
18.47	956.51	28.21	956.32	29.99	956.29	32.93	956.24	41.45	956.09
46.17	955.91	53.53	955.65	54.39	951.99	54.74	950.33	69.74	950.33
73.84	948.28	81.84	948.28	84.92	949.82	89.92	949.82	107.92	940.68
127.92	940.68	145.68	949.56	147.18	952.71	150.47	954.51	155.5	957.08

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	89.92	.04	145.68	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
89.92	145.68	46.78	49.75	49.66	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	946.62	Element			
Vel Head (ft)	0.76	Wt. n-Val.		0.040	
W.S. Elev (ft)	945.86	Reach Len. (ft)	46.78	49.75	49.66
Crit W.S. (ft)		Flow Area (sq ft)		156.74	
E.G. Slope (ft/ft)	0.006365	Area (sq ft)		156.74	

Q Total (cfs)	1100.00	Flow (cfs)		1100.00	
Top Width (ft)	40.55	Top Width (ft)		40.55	
Vel Total (ft/s)	7.02	Avg. Vel. (ft/s)		7.02	
Max Chl Dpth (ft)	5.18	Hydr. Depth (ft)		3.87	
Conv. Total (cfs)	13788.3	Conv. (cfs)		13788.3	
Length Wtd. (ft)	49.75	Wetted Per. (ft)		43.01	
Min Ch El (ft)	940.68	Shear (lb/sq ft)		1.45	
Alpha	1.00	Stream Power (lb/ft s)		10.16	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	2.50	12.65	1.44
C & E Loss (ft)	0.03	Cum SA (acres)	2.51	2.60	1.29

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	947.27	Element			
Vel Head (ft)	0.87	Wt. n-Val.		0.040	
W.S. Elev (ft)	946.40	Reach Len. (ft)	46.78	49.75	49.66
Crit W.S. (ft)		Flow Area (sq ft)		179.39	
E.G. Slope (ft/ft)	0.006478	Area (sq ft)		179.39	
Q Total (cfs)	1340.00	Flow (cfs)		1340.00	
Top Width (ft)	42.71	Top Width (ft)		42.71	
Vel Total (ft/s)	7.47	Avg. Vel. (ft/s)		7.47	
Max Chl Dpth (ft)	5.72	Hydr. Depth (ft)		4.20	
Conv. Total (cfs)	16648.3	Conv. (cfs)		16648.3	
Length Wtd. (ft)	49.75	Wetted Per. (ft)		45.43	
Min Ch El (ft)	940.68	Shear (lb/sq ft)		1.60	
Alpha	1.00	Stream Power (lb/ft s)		11.93	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	2.05	14.81	0.33
C & E Loss (ft)	0.03	Cum SA (acres)	1.78	2.74	0.24

CROSS SECTION OUTPUT Profile #10yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	948.03	Element			
Vel Head (ft)	0.98	Wt. n-Val.		0.040	
W.S. Elev (ft)	947.05	Reach Len. (ft)	46.78	49.75	49.66
Crit W.S. (ft)		Flow Area (sq ft)		207.92	
E.G. Slope (ft/ft)	0.006519	Area (sq ft)		207.92	
Q Total (cfs)	1650.00	Flow (cfs)		1650.00	
Top Width (ft)	45.28	Top Width (ft)		45.28	
Vel Total (ft/s)	7.94	Avg. Vel. (ft/s)		7.94	
Max Chl Dpth (ft)	6.37	Hydr. Depth (ft)		4.59	
Conv. Total (cfs)	20435.2	Conv. (cfs)		20435.2	
Length Wtd. (ft)	49.75	Wetted Per. (ft)		48.31	
Min Ch El (ft)	940.68	Shear (lb/sq ft)		1.75	
Alpha	1.00	Stream Power (lb/ft s)		13.90	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	7.47	16.22	3.52
C & E Loss (ft)	0.03	Cum SA (acres)	4.00	2.82	2.39

CROSS SECTION OUTPUT Profile #25yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.03	Element			
Vel Head (ft)	1.12	Wt. n-Val.		0.040	
W.S. Elev (ft)	947.91	Reach Len. (ft)	46.78	49.75	49.66
Crit W.S. (ft)		Flow Area (sq ft)		248.53	
E.G. Slope (ft/ft)	0.006513	Area (sq ft)		248.53	
Q Total (cfs)	2110.00	Flow (cfs)		2110.00	
Top Width (ft)	48.71	Top Width (ft)		48.71	
Vel Total (ft/s)	8.49	Avg. Vel. (ft/s)		8.49	
Max Chl Dpth (ft)	7.23	Hydr. Depth (ft)		5.10	
Conv. Total (cfs)	26145.3	Conv. (cfs)		26145.3	
Length Wtd. (ft)	49.75	Wetted Per. (ft)		52.15	
Min Ch El (ft)	940.68	Shear (lb/sq ft)		1.94	
Alpha	1.00	Stream Power (lb/ft s)		16.45	
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)	11.72	18.68	5.53
C & E Loss (ft)	0.03	Cum SA (acres)	4.76	2.90	3.26

CROSS SECTION OUTPUT Profile #50yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.68	Element			
Vel Head (ft)	1.23	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	948.44	Reach Len. (ft)	46.78	49.75	49.66
Crit W.S. (ft)		Flow Area (sq ft)	1.35	274.80	
E.G. Slope (ft/ft)	0.006659	Area (sq ft)	1.35	274.80	
Q Total (cfs)	2450.00	Flow (cfs)	0.52	2449.48	
Top Width (ft)	59.46	Top Width (ft)	8.65	50.81	
Vel Total (ft/s)	8.87	Avg. Vel. (ft/s)	0.39	8.91	
Max Chl Dpth (ft)	7.76	Hydr. Depth (ft)	0.16	5.41	
Conv. Total (cfs)	30024.1	Conv. (cfs)	6.4	30017.7	
Length Wtd. (ft)	49.75	Wetted Per. (ft)	8.72	54.50	

Min Ch El (ft)	940.68	Shear (lb/sq ft)	0.06	2.10	
Alpha	1.01	Stream Power (lb/ft s)	0.02	18.68	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	14.49	20.06	7.21
C & E Loss (ft)	0.03	Cum SA (acres)	5.04	2.95	3.93

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	950.31	Element			
Vel Head (ft)	1.31	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	948.99	Reach Len. (ft)	46.78	49.75	49.66
Crit W.S. (ft)		Flow Area (sq ft)	6.69	303.27	
E.G. Slope (ft/ft)	0.006610	Area (sq ft)	6.69	303.27	
Q Total (cfs)	2800.00	Flow (cfs)	6.38	2793.62	
Top Width (ft)	63.83	Top Width (ft)	10.84	52.99	
Vel Total (ft/s)	9.03	Avg. Vel. (ft/s)	0.95	9.21	
Max Chl Dpth (ft)	8.31	Hydr. Depth (ft)	0.62	5.72	
Conv. Total (cfs)	34439.0	Conv. (cfs)	78.5	34360.5	
Length Wtd. (ft)	49.75	Wetted Per. (ft)	11.18	56.94	
Min Ch El (ft)	940.68	Shear (lb/sq ft)	0.25	2.20	
Alpha	1.04	Stream Power (lb/ft s)	0.24	20.25	
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)	16.75	21.52	9.66
C & E Loss (ft)	0.03	Cum SA (acres)	5.17	2.99	4.83

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	951.64	Element			
Vel Head (ft)	1.50	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	950.15	Reach Len. (ft)	46.78	49.75	49.66
Crit W.S. (ft)		Flow Area (sq ft)	23.47	366.86	0.08
E.G. Slope (ft/ft)	0.006304	Area (sq ft)	23.47	366.86	0.08
Q Total (cfs)	3650.00	Flow (cfs)	33.54	3616.44	0.02
Top Width (ft)	75.86	Top Width (ft)	19.82	55.76	0.28
Vel Total (ft/s)	9.35	Avg. Vel. (ft/s)	1.43	9.86	0.25
Max Chl Dpth (ft)	9.47	Hydr. Depth (ft)	1.18	6.58	0.29
Conv. Total (cfs)	45969.9	Conv. (cfs)	422.4	45547.3	0.3
Length Wtd. (ft)	49.73	Wetted Per. (ft)	20.62	60.04	0.65
Min Ch El (ft)	940.68	Shear (lb/sq ft)	0.45	2.40	0.05
Alpha	1.10	Stream Power (lb/ft s)	0.64	23.71	0.01
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)	22.29	24.57	15.25
C & E Loss (ft)	0.03	Cum SA (acres)	5.44	3.04	6.37

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3097.384

INPUT
Description: 27
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.05	1.2	956.03	3.3	955.99	6.48	955.93	10.39	955.87
11.08	955.86	16.48	955.77	18.23	955.71	28.24	955.33	28.85	952.76
29.42	950.2	40.92	950.2	45	948.16	53	948.16	55.82	949.57
60.82	949.57	78.82	940.56	98.82	940.56	126.32	954.31	136.01	954.87

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	60.82	.04	126.32	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
60.82	126.32	19.08	18.31	18.45	.1	.3

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	946.21	Element			
Vel Head (ft)	1.03	Wt. n-Val.		0.040	
W.S. Elev (ft)	945.18	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	944.50	Flow Area (sq ft)		134.88	
E.G. Slope (ft/ft)	0.009733	Area (sq ft)		134.88	
Q Total (cfs)	1100.00	Flow (cfs)		1100.00	
Top Width (ft)	38.45	Top Width (ft)		38.45	
Vel Total (ft/s)	8.16	Avg. Vel. (ft/s)		8.16	
Max Chl Dpth (ft)	4.62	Hydr. Depth (ft)		3.51	
Conv. Total (cfs)	11150.1	Conv. (cfs)		11150.1	

Length Wtd. (ft)	4.00	Wetted Per. (ft)		40.63	
Min Ch El (ft)	940.56	Shear (lb/sq ft)		2.02	
Alpha	1.00	Stream Power (lb/ft s)		16.45	
Frctn Loss (ft)		Cum Volume (acre-ft)	2.50	12.48	1.44
C & E Loss (ft)		Cum SA (acres)	2.51	2.56	1.29

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	946.85	Wt. n-Val.		0.040	
Vel Head (ft)	1.16	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	945.69	Flow Area (sq ft)		155.18	
Crit W.S. (ft)	944.98	Area (sq ft)		155.18	
E.G. Slope (ft/ft)	0.009739	Flow (cfs)		1340.00	
Q Total (cfs)	1340.00	Top Width (ft)		40.51	
Top Width (ft)	40.51	Avg. Vel. (ft/s)		8.63	
Vel Total (ft/s)	8.63	Hydr. Depth (ft)		3.83	
Max Chl Dpth (ft)	5.13	Conv. (cfs)		13578.0	
Conv. Total (cfs)	13578.0	Wetted Per. (ft)		42.93	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		2.20	
Min Ch El (ft)	940.56	Stream Power (lb/ft s)		18.98	
Alpha	1.00	Cum Volume (acre-ft)	2.05	14.62	0.33
Frctn Loss (ft)		Cum SA (acres)	1.78	2.69	0.24
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	947.61	Wt. n-Val.		0.040	
Vel Head (ft)	1.27	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	946.34	Flow Area (sq ft)		182.49	
Crit W.S. (ft)	945.55	Area (sq ft)		182.49	
E.G. Slope (ft/ft)	0.009392	Flow (cfs)		1650.00	
Q Total (cfs)	1650.00	Top Width (ft)		43.12	
Top Width (ft)	43.12	Avg. Vel. (ft/s)		9.04	
Vel Total (ft/s)	9.04	Hydr. Depth (ft)		4.23	
Max Chl Dpth (ft)	5.78	Conv. (cfs)		17025.6	
Conv. Total (cfs)	17025.6	Wetted Per. (ft)		45.85	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		2.33	
Min Ch El (ft)	940.56	Stream Power (lb/ft s)		21.10	
Alpha	1.00	Cum Volume (acre-ft)	7.47	16.00	3.52
Frctn Loss (ft)		Cum SA (acres)	4.00	2.77	2.39
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	948.63	Wt. n-Val.		0.040	
Vel Head (ft)	1.40	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	947.23	Flow Area (sq ft)		222.28	
Crit W.S. (ft)	946.29	Area (sq ft)		222.28	
E.G. Slope (ft/ft)	0.008888	Flow (cfs)		2110.00	
Q Total (cfs)	2110.00	Top Width (ft)		46.66	
Top Width (ft)	46.66	Avg. Vel. (ft/s)		9.49	
Vel Total (ft/s)	9.49	Hydr. Depth (ft)		4.76	
Max Chl Dpth (ft)	6.67	Conv. (cfs)		22380.7	
Conv. Total (cfs)	22380.7	Wetted Per. (ft)		49.81	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		2.48	
Min Ch El (ft)	940.56	Stream Power (lb/ft s)		23.51	
Alpha	1.00	Cum Volume (acre-ft)	11.72	18.41	5.53
Frctn Loss (ft)		Cum SA (acres)	4.76	2.85	3.26
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	949.25	Wt. n-Val.		0.040	
Vel Head (ft)	1.56	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	947.69	Flow Area (sq ft)		244.43	
Crit W.S. (ft)	946.79	Area (sq ft)		244.43	
E.G. Slope (ft/ft)	0.009221	Flow (cfs)		2450.00	
Q Total (cfs)	2450.00	Top Width (ft)		48.52	
Top Width (ft)	48.52	Avg. Vel. (ft/s)		10.02	
Vel Total (ft/s)	10.02	Hydr. Depth (ft)		5.04	
Max Chl Dpth (ft)	7.13	Conv. (cfs)		25514.6	
Conv. Total (cfs)	25514.6	Wetted Per. (ft)		51.89	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		2.71	
Min Ch El (ft)	940.56	Stream Power (lb/ft s)		27.18	
Alpha	1.00	Cum Volume (acre-ft)	14.49	19.77	7.21
Frctn Loss (ft)		Cum SA (acres)	5.04	2.89	3.93
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #100yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.89	Element			
Vel Head (ft)	1.66	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	948.23	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	947.27	Flow Area (sq ft)	0.53	270.74	
E.G. Slope (ft/ft)	0.009090	Area (sq ft)	0.53	270.74	
Q Total (cfs)	2800.00	Flow (cfs)	0.13	2799.87	
Top Width (ft)	58.90	Top Width (ft)	8.26	50.64	
Vel Total (ft/s)	10.32	Avg. Vel. (ft/s)	0.25	10.34	
Max Chl Dpth (ft)	7.67	Hydr. Depth (ft)	0.06	5.35	
Conv. Total (cfs)	29367.9	Conv. (cfs)	1.4	29366.5	
Length Wtd. (ft)	4.00	Wetted Per. (ft)	8.29	54.26	
Min Ch El (ft)	940.56	Shear (lb/sq ft)	0.04	2.83	
Alpha	1.00	Stream Power (lb/ft s)	0.01	29.28	
Frctn Loss (ft)		Cum Volume (acre-ft)	16.75	21.19	9.66
C & E Loss (ft)		Cum SA (acres)	5.16	2.94	4.83

CROSS SECTION OUTPUT Profile #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	951.25	Element			
Vel Head (ft)	1.81	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	949.43	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	948.36	Flow Area (sq ft)	13.43	334.83	
E.G. Slope (ft/ft)	0.008539	Area (sq ft)	13.43	334.83	
Q Total (cfs)	3650.00	Flow (cfs)	20.21	3629.79	
Top Width (ft)	68.56	Top Width (ft)	13.09	55.47	
Vel Total (ft/s)	10.48	Avg. Vel. (ft/s)	1.51	10.84	
Max Chl Dpth (ft)	8.87	Hydr. Depth (ft)	1.03	6.04	
Conv. Total (cfs)	39499.0	Conv. (cfs)	218.8	39280.2	
Length Wtd. (ft)	4.00	Wetted Per. (ft)	13.69	59.66	
Min Ch El (ft)	940.56	Shear (lb/sq ft)	0.52	2.99	
Alpha	1.06	Stream Power (lb/ft s)	0.79	32.43	
Frctn Loss (ft)		Cum Volume (acre-ft)	22.27	24.17	15.24
C & E Loss (ft)		Cum SA (acres)	5.42	2.98	6.37

Warning: Divided flow computed for this cross-section.

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 3090

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	960	957	500	960	957

Upstream Bridge Cross Section Data
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.01	1.2	955.99	3.3	955.95	6.48	955.89	10.39	955.83
11.08	955.82	16.48	955.73	18.23	955.67	28.24	955.29	28.85	952.72
29.42	950.16	40.92	950.16	45	948.12	53	948.12	55.82	949.53
60.82	949.53	78.82	940.52	98.82	940.52	126.32	954.27		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	60.82	.04	126.32	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
60.82	126.32	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	960	957	500	960	957

Downstream Bridge Cross Section Data
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.1	8.09	955.93	20.97	955.71	21.18	955.71	21.33	955.7
21.42	955.7	21.46	955.7	26.75	955.5	32.9	955.26	32.97	954.98

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   33.26  953.71   34.09  950.09   48.31  950.09   52.39  948.05   60.39  948.05
   63.21  949.46   68.21  949.46   86.21  940.45  106.21  940.45  133.71   954.2
  141.67  961.01

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09   68.21     .04  133.71     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
         68.21  133.71             .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=   60.82    Downstream=   68.21
Upstream     num=        2
    Width   Elev    Width   Elev
        8    940        8    960
Downstream     num=        2
    Width   Elev    Width   Elev
        8    940        8    960

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
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 #2yr

  E.G. US. (ft)                946.21    Element                  Inside BR US  Inside BR DS
  W.S. US. (ft)                945.18    E.G. Elev (ft)               946.13        945.99
  Q Total (cfs)               1100.00    W.S. Elev (ft)               945.03        944.72
  Q Bridge (cfs)              1100.00    Crit W.S. (ft)               944.48        944.40
  Q Weir (cfs)                           Max Chl Dpth (ft)              4.51          4.27
  Weir Sta Lft (ft)                      Vel Total (ft/s)               8.41          9.02
  Weir Sta Rgt (ft)                      Flow Area (sq ft)            130.79        121.89
  Weir Submerg                           Froude # Chl                   0.80          0.88
  Weir Max Depth (ft)                    Specif Force (cu ft)         551.61        542.64
  Min El Weir Flow (ft)        960.01    Hydr Depth (ft)                3.44          3.29
  Min El Prs (ft)              957.00    W.P. Total (ft)               40.15         39.09
  Delta EG (ft)                  0.34    Conv. Total (cfs)           10676.6        9664.3
  Delta WS (ft)                  0.71    Top Width (ft)                38.02         37.08
  BR Open Area (sq ft)        1028.86    Frctn Loss (ft)
  BR Open Vel (ft/s)             9.02    C & E Loss (ft)
  Coef of Q                              Shear Total (lb/sq ft)         2.16          2.52
  Br Sel Method              Momentum    Power Total (lb/ft s)         18.15         22.76


BRIDGE OUTPUT  Profile #5yr

  E.G. US. (ft)                946.85    Element                  Inside BR US  Inside BR DS
  W.S. US. (ft)                945.69    E.G. Elev (ft)               946.77        946.63
  Q Total (cfs)               1340.00    W.S. Elev (ft)               945.54        945.24
  Q Bridge (cfs)              1340.00    Crit W.S. (ft)               944.96        944.90
  Q Weir (cfs)                           Max Chl Dpth (ft)              5.02          4.79
  Weir Sta Lft (ft)                      Vel Total (ft/s)               8.88          9.45
  Weir Sta Rgt (ft)                      Flow Area (sq ft)            150.83        141.80
  Weir Submerg                           Froude # Chl                   0.81          0.88
  Weir Max Depth (ft)                    Specif Force (cu ft)         706.23        696.42
  Min El Weir Flow (ft)        960.01    Hydr Depth (ft)                3.76          3.62
  Min El Prs (ft)              957.00    W.P. Total (ft)               42.45         41.43
  Delta EG (ft)                  0.33    Conv. Total (cfs)           13047.9       11963.3
```

Delta WS (ft)	0.63	Top Width (ft)	40.08	39.16
BR Open Area (sq ft)	775.40	Frctn Loss (ft)		
BR Open Vel (ft/s)	9.45	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	2.34	2.68
Br Sel Method	Momentum	Power Total (lb/ft s)	20.79	25.34

BRIDGE OUTPUT Profile #10yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	947.61	E.G. Elev (ft)	947.53	947.40
W.S. US. (ft)	946.34	W.S. Elev (ft)	946.20	945.93
Q Total (cfs)	1650.00	Crit W.S. (ft)	945.52	945.45
Q Bridge (cfs)	1650.00	Max Chl Dpth (ft)	5.68	5.48
Q Weir (cfs)		Vel Total (ft/s)	9.26	9.72
Weir Sta Lft (ft)		Flow Area (sq ft)	178.16	169.71
Weir Sta Rgt (ft)		Froude # Chl	0.80	0.85
Weir Submerg		Specif Force (cu ft)	919.59	908.49
Weir Max Depth (ft)		Hydr Depth (ft)	4.17	4.05
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	45.40	44.51
Min El Prs (ft)	957.00	Conv. Total (cfs)	16465.8	15388.1
Delta EG (ft)	0.31	Top Width (ft)	42.71	41.92
Delta WS (ft)	0.53	Frctn Loss (ft)		
BR Open Area (sq ft)	1028.86	C & E Loss (ft)		
BR Open Vel (ft/s)	9.72	Shear Total (lb/sq ft)	2.46	2.74
Coef of Q		Power Total (lb/ft s)	22.78	26.61
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #25yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	948.63	E.G. Elev (ft)	948.55	948.42
W.S. US. (ft)	947.23	W.S. Elev (ft)	947.10	946.86
Q Total (cfs)	2110.00	Crit W.S. (ft)	946.27	946.21
Q Bridge (cfs)	2110.00	Max Chl Dpth (ft)	6.58	6.41
Q Weir (cfs)		Vel Total (ft/s)	9.68	10.03
Weir Sta Lft (ft)		Flow Area (sq ft)	218.05	210.39
Weir Sta Rgt (ft)		Froude # Chl	0.79	0.82
Weir Submerg		Specif Force (cu ft)	1256.44	1243.83
Weir Max Depth (ft)		Hydr Depth (ft)	4.71	4.61
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	49.40	48.66
Min El Prs (ft)	957.00	Conv. Total (cfs)	21795.1	20743.2
Delta EG (ft)	0.29	Top Width (ft)	46.30	45.63
Delta WS (ft)	0.44	Frctn Loss (ft)		
BR Open Area (sq ft)	1028.86	C & E Loss (ft)		
BR Open Vel (ft/s)	10.03	Shear Total (lb/sq ft)	2.58	2.79
Coef of Q		Power Total (lb/ft s)	24.99	28.01
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #50yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	949.25	E.G. Elev (ft)	949.18	949.05
W.S. US. (ft)	947.69	W.S. Elev (ft)	947.55	947.29
Q Total (cfs)	2450.00	Crit W.S. (ft)	946.77	946.71
Q Bridge (cfs)	2450.00	Max Chl Dpth (ft)	7.03	6.84
Q Weir (cfs)		Vel Total (ft/s)	10.23	10.64
Weir Sta Lft (ft)		Flow Area (sq ft)	239.51	230.18
Weir Sta Rgt (ft)		Froude # Chl	0.81	0.85
Weir Submerg		Specif Force (cu ft)	1504.62	1490.27
Weir Max Depth (ft)		Hydr Depth (ft)	4.98	4.86
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	51.41	50.56
Min El Prs (ft)	957.00	Conv. Total (cfs)	24819.1	23487.7
Delta EG (ft)	0.30	Top Width (ft)	48.06	47.33
Delta WS (ft)	0.50	Frctn Loss (ft)		
BR Open Area (sq ft)	1028.86	C & E Loss (ft)		
BR Open Vel (ft/s)	10.64	Shear Total (lb/sq ft)	2.83	3.09
Coef of Q		Power Total (lb/ft s)	28.99	32.91
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #100yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	949.89	E.G. Elev (ft)	949.80	949.67
W.S. US. (ft)	948.23	W.S. Elev (ft)	948.06	947.79
Q Total (cfs)	2800.00	Crit W.S. (ft)	947.24	947.18
Q Bridge (cfs)	2800.00	Max Chl Dpth (ft)	7.54	7.34
Q Weir (cfs)		Vel Total (ft/s)	10.61	11.01
Weir Sta Lft (ft)		Flow Area (sq ft)	263.94	254.28
Weir Sta Rgt (ft)		Froude # Chl	0.81	0.85
Weir Submerg		Specif Force (cu ft)	1775.38	1759.22
Weir Max Depth (ft)		Hydr Depth (ft)	5.38	5.22
Min El Weir Flow (ft)	960.01			

Min El Prs (ft)	957.00	W.P. Total (ft)	53.03	52.39
Delta EG (ft)	0.30	Conv. Total (cfs)	28580.5	27077.2
Delta WS (ft)	0.52	Top Width (ft)	49.07	48.68
BR Open Area (sq ft)	1028.86	Frctn Loss (ft)		
BR Open Vel (ft/s)	11.01	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	2.98	3.24
Br Sel Method	Momentum	Power Total (lb/ft s)	31.64	35.68

BRIDGE OUTPUT Profile #500yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	951.25	E.G. Elev (ft)	951.14	951.01
W.S. US. (ft)	949.43	W.S. Elev (ft)	949.08	948.78
Q Total (cfs)	3650.00	Crit W.S. (ft)	948.27	948.22
Q Bridge (cfs)	3650.00	Max Chl Dpth (ft)	8.56	8.33
Q Weir (cfs)		Vel Total (ft/s)	11.23	11.76
Weir Sta Lft (ft)		Flow Area (sq ft)	325.06	310.40
Weir Sta Rgt (ft)		Froude # Chl	0.82	0.86
Weir Submerg		Specif Force (cu ft)	2457.69	2437.49
Weir Max Depth (ft)		Hydr Depth (ft)	5.16	5.04
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	68.68	66.86
Min El Prs (ft)	957.00	Conv. Total (cfs)	37080.2	35034.9
Delta EG (ft)	0.33	Top Width (ft)	62.99	61.57
Delta WS (ft)	0.63	Frctn Loss (ft)		
BR Open Area (sq ft)	1028.86	C & E Loss (ft)		
BR Open Vel (ft/s)	11.76	Shear Total (lb/sq ft)	2.86	3.15
Coef of Q		Power Total (lb/ft s)	32.15	36.99
Br Sel Method	Momentum			

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3079.078

INPUT
Description: 28
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.01	8.09	955.84	20.97	955.62	21.18	955.62	21.33	955.61
21.42	955.61	21.46	955.61	26.75	955.41	32.9	955.17	32.97	954.89
33.26	953.62	34.09	950	48.31	950	52.39	947.96	60.39	947.96
63.21	949.37	68.21	949.37	86.21	940.36	106.21	940.36	133.71	954.11
141.67	960.92								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	68.21	.04	133.71	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
68.21	133.71	124.18	123.15	120.49	.1	.3

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	945.87	Wt. n-Val.		0.040	
Vel Head (ft)	1.40	Reach Len. (ft)	124.18	123.15	120.49
W.S. Elev (ft)	944.47	Flow Area (sq ft)		115.85	
Crit W.S. (ft)	944.30	Area (sq ft)		115.85	
E.G. Slope (ft/ft)	0.014964	Flow (cfs)		1100.00	
Q Total (cfs)	1100.00	Top Width (ft)		36.42	
Top Width (ft)	36.42	Avg. Vel. (ft/s)		9.49	
Vel Total (ft/s)	9.49	Hydr. Depth (ft)		3.18	
Max Chl Dpth (ft)	4.11	Conv. (cfs)		8992.2	
Conv. Total (cfs)	8992.2	Wetted Per. (ft)		38.36	
Length Wtd. (ft)	123.15	Shear (lb/sq ft)		2.82	
Min Ch El (ft)	940.36	Stream Power (lb/ft s)		26.79	
Alpha	1.00	Cum Volume (acre-ft)	2.50	12.43	1.44
Frctn Loss (ft)	1.14	Cum SA (acres)	2.51	2.54	1.29
C & E Loss (ft)	0.19				

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 OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	946.52				

Vel Head (ft)	1.46	Wt. n-Val.		0.040	
W.S. Elev (ft)	945.06	Reach Len. (ft)	124.18	123.15	120.49
Crit W.S. (ft)	944.78	Flow Area (sq ft)		138.10	
E.G. Slope (ft/ft)	0.013515	Area (sq ft)		138.10	
Q Total (cfs)	1340.00	Flow (cfs)		1340.00	
Top Width (ft)	38.78	Top Width (ft)		38.78	
Vel Total (ft/s)	9.70	Avg. Vel. (ft/s)		9.70	
Max Chl Dpth (ft)	4.70	Hydr. Depth (ft)		3.56	
Conv. Total (cfs)	11526.5	Conv. (cfs)		11526.5	
Length Wtd. (ft)	123.15	Wetted Per. (ft)		41.00	
Min Ch El (ft)	940.36	Shear (lb/sq ft)		2.84	
Alpha	1.00	Stream Power (lb/ft s)		27.57	
Frctn Loss (ft)	1.04	Cum Volume (acre-ft)	2.05	14.55	0.33
C & E Loss (ft)	0.20	Cum SA (acres)	1.78	2.67	0.24

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 #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	947.30	Wt. n-Val.		0.040	
Vel Head (ft)	1.49	Reach Len. (ft)	124.18	123.15	120.49
W.S. Elev (ft)	945.81	Flow Area (sq ft)		168.55	
Crit W.S. (ft)	945.35	Area (sq ft)		168.55	
E.G. Slope (ft/ft)	0.011720	Flow (cfs)		1650.00	
Q Total (cfs)	1650.00	Top Width (ft)		41.81	
Top Width (ft)	41.81	Avg. Vel. (ft/s)		9.79	
Vel Total (ft/s)	9.79	Hydr. Depth (ft)		4.03	
Max Chl Dpth (ft)	5.45	Conv. (cfs)		15241.6	
Conv. Total (cfs)	15241.6	Wetted Per. (ft)		44.38	
Length Wtd. (ft)	123.15	Shear (lb/sq ft)		2.78	
Min Ch El (ft)	940.36	Stream Power (lb/ft s)		27.20	
Alpha	1.00	Cum Volume (acre-ft)	7.47	15.93	3.52
Frctn Loss (ft)	0.91	Cum SA (acres)	4.00	2.75	2.39
C & E Loss (ft)	0.20				

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 #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	948.34	Wt. n-Val.		0.040	
Vel Head (ft)	1.55	Reach Len. (ft)	124.18	123.15	120.49
W.S. Elev (ft)	946.78	Flow Area (sq ft)		210.98	
Crit W.S. (ft)		Area (sq ft)		210.98	
E.G. Slope (ft/ft)	0.010267	Flow (cfs)		2110.00	
Q Total (cfs)	2110.00	Top Width (ft)		45.68	
Top Width (ft)	45.68	Avg. Vel. (ft/s)		10.00	
Vel Total (ft/s)	10.00	Hydr. Depth (ft)		4.62	
Max Chl Dpth (ft)	6.42	Conv. (cfs)		20823.5	
Conv. Total (cfs)	20823.5	Wetted Per. (ft)		48.72	
Length Wtd. (ft)	123.15	Shear (lb/sq ft)		2.78	
Min Ch El (ft)	940.36	Stream Power (lb/ft s)		27.76	
Alpha	1.00	Cum Volume (acre-ft)	11.72	18.32	5.53
Frctn Loss (ft)	0.83	Cum SA (acres)	4.76	2.83	3.26
C & E Loss (ft)	0.20				

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 #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	948.96	Wt. n-Val.		0.040	
Vel Head (ft)	1.76	Reach Len. (ft)	124.18	123.15	120.49
W.S. Elev (ft)	947.20	Flow Area (sq ft)		230.13	
Crit W.S. (ft)	946.59	Area (sq ft)		230.13	
E.G. Slope (ft/ft)	0.010887				

Q Total (cfs)	2450.00	Flow (cfs)		2450.00	
Top Width (ft)	47.33	Top Width (ft)		47.33	
Vel Total (ft/s)	10.65	Avg. Vel. (ft/s)		10.65	
Max Chl Dpth (ft)	6.84	Hydr. Depth (ft)		4.86	
Conv. Total (cfs)	23480.4	Conv. (cfs)		23480.4	
Length Wtd. (ft)	123.15	Wetted Per. (ft)		50.56	
Min Ch El (ft)	940.36	Shear (lb/sq ft)		3.09	
Alpha	1.00	Stream Power (lb/ft s)		32.94	
Frctn Loss (ft)	0.91	Cum Volume (acre-ft)	14.49	19.67	7.21
C & E Loss (ft)	0.22	Cum SA (acres)	5.04	2.87	3.93

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 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 #100yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.58	Element			
Vel Head (ft)	1.88	Wt. n-Val.		0.040	
W.S. Elev (ft)	947.70	Reach Len. (ft)	124.18	123.15	120.49
Crit W.S. (ft)	947.07	Flow Area (sq ft)		254.71	
E.G. Slope (ft/ft)	0.010751	Area (sq ft)		254.71	
Q Total (cfs)	2800.00	Flow (cfs)		2800.00	
Top Width (ft)	49.36	Top Width (ft)		49.36	
Vel Total (ft/s)	10.99	Avg. Vel. (ft/s)		10.99	
Max Chl Dpth (ft)	7.34	Hydr. Depth (ft)		5.16	
Conv. Total (cfs)	27003.9	Conv. (cfs)		27003.9	
Length Wtd. (ft)	123.15	Wetted Per. (ft)		52.83	
Min Ch El (ft)	940.36	Shear (lb/sq ft)		3.24	
Alpha	1.00	Stream Power (lb/ft s)		35.57	
Frctn Loss (ft)	0.91	Cum Volume (acre-ft)	16.75	21.08	9.66
C & E Loss (ft)	0.23	Cum SA (acres)	5.16	2.91	4.83

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 #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	950.92	Element			
Vel Head (ft)	2.11	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	948.80	Reach Len. (ft)	124.18	123.15	120.49
Crit W.S. (ft)	948.16	Flow Area (sq ft)	8.18	311.40	
E.G. Slope (ft/ft)	0.010466	Area (sq ft)	8.18	311.40	
Q Total (cfs)	3650.00	Flow (cfs)	10.83	3639.17	
Top Width (ft)	65.13	Top Width (ft)	11.38	53.76	
Vel Total (ft/s)	11.42	Avg. Vel. (ft/s)	1.32	11.69	
Max Chl Dpth (ft)	8.44	Hydr. Depth (ft)	0.72	5.79	
Conv. Total (cfs)	35679.0	Conv. (cfs)	105.9	35573.2	
Length Wtd. (ft)	123.16	Wetted Per. (ft)	11.77	57.75	
Min Ch El (ft)	940.36	Shear (lb/sq ft)	0.45	3.52	
Alpha	1.04	Stream Power (lb/ft s)	0.60	41.18	
Frctn Loss (ft)	0.88	Cum Volume (acre-ft)	22.26	24.04	15.24
C & E Loss (ft)	0.25	Cum SA (acres)	5.42	2.96	6.37

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.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2955.929

INPUT
Description: 29
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	955.26	.17	955.25	1.58	955.22	2.96	955.19	14.47	954.91
17.42	954.86	25.81	954.68	27.73	954.63	33.41	954.44	36.59	954.3
39.27	954.26	40.35	951.43	41.26	949.16	44.7	948.06	51.26	948.06
55	946.19	63	946.19	65.8	947.59	70.8	947.59	88.8	938.59

108.8 938.59 131.64 950.01 133.39 950.95 146.19 951.77 159.02 958.89

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	70.8	.04	133.39	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
70.8	133.39	18	18.05	18.27	.1	.3

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	944.53	Wt. n-Val.		0.040	
Vel Head (ft)	0.76	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	943.77	Flow Area (sq ft)		157.32	
Crit W.S. (ft)	942.54	Area (sq ft)		157.32	
E.G. Slope (ft/ft)	0.006318	Flow (cfs)		1100.00	
Q Total (cfs)	1100.00	Top Width (ft)		40.73	
Top Width (ft)	40.73	Avg. Vel. (ft/s)		6.99	
Vel Total (ft/s)	6.99	Hydr. Depth (ft)		3.86	
Max Chl Dpth (ft)	5.18	Conv. (cfs)		13838.7	
Conv. Total (cfs)	13838.7	Wetted Per. (ft)		43.17	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		1.44	
Min Ch El (ft)	938.59	Stream Power (lb/ft s)		10.05	
Alpha	1.00	Cum Volume (acre-ft)	2.50	12.05	1.44
Frctn Loss (ft)		Cum SA (acres)	2.51	2.43	1.29
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	945.28	Wt. n-Val.		0.040	
Vel Head (ft)	0.79	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	944.49	Flow Area (sq ft)		187.70	
Crit W.S. (ft)	943.02	Area (sq ft)		187.70	
E.G. Slope (ft/ft)	0.005729	Flow (cfs)		1340.00	
Q Total (cfs)	1340.00	Top Width (ft)		43.61	
Top Width (ft)	43.61	Avg. Vel. (ft/s)		7.14	
Vel Total (ft/s)	7.14	Hydr. Depth (ft)		4.30	
Max Chl Dpth (ft)	5.90	Conv. (cfs)		17703.7	
Conv. Total (cfs)	17703.7	Wetted Per. (ft)		46.39	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		1.45	
Min Ch El (ft)	938.59	Stream Power (lb/ft s)		10.33	
Alpha	1.00	Cum Volume (acre-ft)	2.05	14.09	0.33
Frctn Loss (ft)		Cum SA (acres)	1.78	2.56	0.24
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	946.19	Wt. n-Val.		0.040	
Vel Head (ft)	0.82	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	945.37	Flow Area (sq ft)		227.72	
Crit W.S. (ft)	943.58	Area (sq ft)		227.72	
E.G. Slope (ft/ft)	0.005085	Flow (cfs)		1650.00	
Q Total (cfs)	1650.00	Top Width (ft)		47.14	
Top Width (ft)	47.14	Avg. Vel. (ft/s)		7.25	
Vel Total (ft/s)	7.25	Hydr. Depth (ft)		4.83	
Max Chl Dpth (ft)	6.78	Conv. (cfs)		23138.9	
Conv. Total (cfs)	23138.9	Wetted Per. (ft)		50.34	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		1.44	
Min Ch El (ft)	938.59	Stream Power (lb/ft s)		10.41	
Alpha	1.00	Cum Volume (acre-ft)	7.47	15.37	3.52
Frctn Loss (ft)		Cum SA (acres)	4.00	2.62	2.39
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	947.31	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	0.88	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	946.43	Flow Area (sq ft)	1.99	279.47	
Crit W.S. (ft)	944.32	Area (sq ft)	1.99	279.47	
E.G. Slope (ft/ft)	0.004729	Flow (cfs)	0.82	2109.18	
Q Total (cfs)	2110.00	Top Width (ft)	8.94	51.34	
Top Width (ft)	60.28	Avg. Vel. (ft/s)	0.41	7.55	
Vel Total (ft/s)	7.50	Hydr. Depth (ft)	0.22	5.44	
Max Chl Dpth (ft)	7.83	Conv. (cfs)	12.0	30670.4	
Conv. Total (cfs)	30682.4	Wetted Per. (ft)	9.05	55.04	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.06	1.50	
Min Ch El (ft)	938.59	Stream Power (lb/ft s)	0.03	11.31	
Alpha	1.01	Cum Volume (acre-ft)	11.71	17.63	5.53
Frctn Loss (ft)					

C & E Loss (ft)	Cum SA (acres)	4.74	2.69	3.26

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #50yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	947.83	Element			
Vel Head (ft)	1.04	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	946.79	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	944.82	Flow Area (sq ft)	5.56	298.66	
E.G. Slope (ft/ft)	0.005300	Area (sq ft)	5.56	298.66	
Q Total (cfs)	2450.00	Flow (cfs)	4.32	2445.69	
Top Width (ft)	63.23	Top Width (ft)	10.41	52.81	
Vel Total (ft/s)	8.05	Avg. Vel. (ft/s)	0.78	8.19	
Max Chl Dpth (ft)	8.20	Hydr. Depth (ft)	0.53	5.66	
Conv. Total (cfs)	33652.4	Conv. (cfs)	59.3	33593.2	
Length Wtd. (ft)	4.00	Wetted Per. (ft)	10.70	56.69	
Min Ch El (ft)	938.59	Shear (lb/sq ft)	0.17	1.74	
Alpha	1.03	Stream Power (lb/ft s)	0.13	14.28	
Frctn Loss (ft)		Cum Volume (acre-ft)	14.48	18.92	7.21
C & E Loss (ft)		Cum SA (acres)	5.02	2.73	3.93

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	948.45	Element			
Vel Head (ft)	1.12	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	947.33	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	945.30	Flow Area (sq ft)	11.67	327.36	
E.G. Slope (ft/ft)	0.005355	Area (sq ft)	11.67	327.36	
Q Total (cfs)	2800.00	Flow (cfs)	13.07	2786.93	
Top Width (ft)	67.49	Top Width (ft)	12.54	54.94	
Vel Total (ft/s)	8.26	Avg. Vel. (ft/s)	1.12	8.51	
Max Chl Dpth (ft)	8.74	Hydr. Depth (ft)	0.93	5.96	
Conv. Total (cfs)	38261.6	Conv. (cfs)	178.6	38083.1	
Length Wtd. (ft)	4.00	Wetted Per. (ft)	13.08	59.07	
Min Ch El (ft)	938.59	Shear (lb/sq ft)	0.30	1.85	
Alpha	1.06	Stream Power (lb/ft s)	0.33	15.77	
Frctn Loss (ft)		Cum Volume (acre-ft)	16.73	20.26	9.66
C & E Loss (ft)		Cum SA (acres)	5.14	2.77	4.83

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.79	Element			
Vel Head (ft)	1.27	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	948.51	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	946.39	Flow Area (sq ft)	36.24	394.57	
E.G. Slope (ft/ft)	0.005148	Area (sq ft)	36.24	394.57	
Q Total (cfs)	3650.00	Flow (cfs)	50.56	3599.44	
Top Width (ft)	85.37	Top Width (ft)	27.52	57.85	
Vel Total (ft/s)	8.47	Avg. Vel. (ft/s)	1.39	9.12	
Max Chl Dpth (ft)	9.92	Hydr. Depth (ft)	1.32	6.82	
Conv. Total (cfs)	50871.5	Conv. (cfs)	704.6	50166.9	
Length Wtd. (ft)	4.00	Wetted Per. (ft)	28.36	62.31	
Min Ch El (ft)	938.59	Shear (lb/sq ft)	0.41	2.04	
Alpha	1.14	Stream Power (lb/ft s)	0.57	18.56	
Frctn Loss (ft)		Cum Volume (acre-ft)	22.20	23.04	15.24
C & E Loss (ft)		Cum SA (acres)	5.36	2.80	6.37

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 2949

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	960	955	500	960	955

```
Upstream Bridge Cross Section Data
Station Elevation Data     num=       25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  955.22     .17  955.21    1.58  955.18    2.96  955.15   14.47  954.87
   17.42  954.82   25.81  954.64   27.73  954.59   33.41   954.4   36.59  954.26
   39.27  954.22   40.35  951.39   41.26  949.12    44.7  948.02   51.26  948.02
      55  946.15      63  946.15    65.8  947.55    70.8  947.55    88.8  938.55
   108.8  938.55  131.64  949.97  133.39  950.91  146.19  951.73  159.02  958.85

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09    70.8     .04  133.39     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
          70.8  133.39             .1       .3

Downstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0     960     955     500     960     955

Downstream Bridge Cross Section Data
Station Elevation Data     num=       29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  955.27    3.55  955.17    9.78  955.02   16.46  954.86   24.53  954.67
   29.74  954.55   36.56  954.34   37.07  954.31   37.98  954.17   39.74  954.14
   41.29  954.24   41.45  954.21    41.5   954.2   41.51   954.2    43.3  952.54
   46.32  947.95    53.4  947.95   57.14  946.08   65.14  946.08   67.94  947.48
   72.94  947.48   90.94  938.48  110.94  938.48  133.78   949.9  135.71  950.01
  149.06  950.85  158.64  952.83  171.31  956.07  171.63  956.17

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09   72.94     .04  133.78     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
         72.94  133.78             .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=    70.8    Downstream=   72.94
Upstream     num=        2
    Width   Elev    Width   Elev
        8    935        8    955
Downstream     num=        2
    Width   Elev    Width   Elev
        8    935        8    955

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                 Cd   =       2
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 #2yr

  E.G. US. (ft)                 944.53    Element                  Inside BR US  Inside BR DS
  W.S. US. (ft)                 943.77    E.G. Elev (ft)               944.46        944.35
  Q Total (cfs)                1100.00    W.S. Elev (ft)               943.69        943.55
  Q Bridge (cfs)               1100.00    Crit W.S. (ft)               942.51        942.43
  Q Weir (cfs)                            Max Chl Dpth (ft)              5.14          5.07
  Weir Sta Lft (ft)                       Vel Total (ft/s)               7.07          7.20
```

Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	960.01
Min El Prs (ft)	955.00
Delta EG (ft)	0.23
Delta WS (ft)	0.25
BR Open Area (sq ft)	1036.43
BR Open Vel (ft/s)	7.20
Coef of Q	
Br Sel Method	Momentum

Flow Area (sq ft)	155.51	152.76
Froude # Chl	0.64	0.65
Specif Force (cu ft)	595.88	589.74
Hydr Depth (ft)	3.84	3.79
W.P. Total (ft)	42.97	42.67
Conv. Total (cfs)	13617.1	13280.9
Top Width (ft)	40.55	40.28
Frctn Loss (ft)		
C & E Loss (ft)		
Shear Total (lb/sq ft)	1.47	1.53
Power Total (lb/ft s)	10.43	11.04

BRIDGE OUTPUT Profile #5yr

E.G. US. (ft)	945.28
W.S. US. (ft)	944.49
Q Total (cfs)	1340.00
Q Bridge (cfs)	1340.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	960.01
Min El Prs (ft)	955.00
Delta EG (ft)	0.22
Delta WS (ft)	0.23
BR Open Area (sq ft)	759.58
BR Open Vel (ft/s)	7.30
Coef of Q	
Br Sel Method	Momentum

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	945.22	945.11
W.S. Elev (ft)	944.41	944.29
Crit W.S. (ft)	942.99	942.92
Max Chl Dpth (ft)	5.86	5.81
Vel Total (ft/s)	7.20	7.30
Flow Area (sq ft)	186.00	183.60
Froude # Chl	0.61	0.62
Specif Force (cu ft)	777.87	771.57
Hydr Depth (ft)	4.28	4.25
W.P. Total (ft)	46.22	45.97
Conv. Total (cfs)	17481.4	17168.9
Top Width (ft)	43.45	43.23
Frctn Loss (ft)		
C & E Loss (ft)		
Shear Total (lb/sq ft)	1.48	1.52
Power Total (lb/ft s)	10.63	11.08

BRIDGE OUTPUT Profile #10yr

E.G. US. (ft)	946.19
W.S. US. (ft)	945.37
Q Total (cfs)	1650.00
Q Bridge (cfs)	1650.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	960.01
Min El Prs (ft)	955.00
Delta EG (ft)	0.20
Delta WS (ft)	0.20
BR Open Area (sq ft)	1036.43
BR Open Vel (ft/s)	7.36
Coef of Q	
Br Sel Method	Momentum

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	946.13	946.03
W.S. Elev (ft)	945.30	945.19
Crit W.S. (ft)	943.56	943.49
Max Chl Dpth (ft)	6.75	6.71
Vel Total (ft/s)	7.29	7.36
Flow Area (sq ft)	226.32	224.20
Froude # Chl	0.59	0.59
Specif Force (cu ft)	1035.19	1028.55
Hydr Depth (ft)	4.81	4.79
W.P. Total (ft)	50.21	50.00
Conv. Total (cfs)	22942.9	22646.6
Top Width (ft)	47.02	46.84
Frctn Loss (ft)		
C & E Loss (ft)		
Shear Total (lb/sq ft)	1.46	1.49
Power Total (lb/ft s)	10.61	10.94

BRIDGE OUTPUT Profile #25yr

E.G. US. (ft)	947.31
W.S. US. (ft)	946.43
Q Total (cfs)	2110.00
Q Bridge (cfs)	2110.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	960.01
Min El Prs (ft)	955.00
Delta EG (ft)	0.20
Delta WS (ft)	0.21
BR Open Area (sq ft)	1036.43
BR Open Vel (ft/s)	7.65
Coef of Q	
Br Sel Method	Momentum

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	947.25	947.15
W.S. Elev (ft)	946.34	946.23
Crit W.S. (ft)	944.31	944.24
Max Chl Dpth (ft)	7.79	7.75
Vel Total (ft/s)	7.58	7.65
Flow Area (sq ft)	278.42	275.74
Froude # Chl	0.57	0.58
Specif Force (cu ft)	1422.59	1414.08
Hydr Depth (ft)	4.77	4.75
W.P. Total (ft)	62.75	62.39
Conv. Total (cfs)	30621.6	30255.0
Top Width (ft)	58.37	58.09
Frctn Loss (ft)		
C & E Loss (ft)		
Shear Total (lb/sq ft)	1.32	1.34
Power Total (lb/ft s)	9.97	10.27

BRIDGE OUTPUT Profile #50yr

E.G. US. (ft)	947.83
W.S. US. (ft)	946.79
Q Total (cfs)	2450.00
Q Bridge (cfs)	2450.00

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	947.76	947.66
W.S. Elev (ft)	946.69	946.56
Crit W.S. (ft)	944.81	944.71

Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	960.01
Min El Prs (ft)	955.00
Delta EG (ft)	0.22
Delta WS (ft)	0.23
BR Open Area (sq ft)	1036.43
BR Open Vel (ft/s)	8.29
Coef of Q	
Br Sel Method	Momentum

Max Chl Dpth (ft)	8.14	8.08
Vel Total (ft/s)	8.20	8.29
Flow Area (sq ft)	298.85	295.51
Froude # Chl	0.61	0.61
Specif Force (cu ft)	1654.95	1644.81
Hydr Depth (ft)	4.95	4.92
W.P. Total (ft)	65.40	64.97
Conv. Total (cfs)	33433.7	32972.4
Top Width (ft)	60.43	60.10
Frctn Loss (ft)		
C & E Loss (ft)		
Shear Total (lb/sq ft)	1.53	1.57
Power Total (lb/ft s)	12.56	13.00

BRIDGE OUTPUT Profile #100yr

E.G. US. (ft)	948.45
W.S. US. (ft)	947.33
Q Total (cfs)	2800.00
Q Bridge (cfs)	2800.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	960.01
Min El Prs (ft)	955.00
Delta EG (ft)	0.23
Delta WS (ft)	0.25
BR Open Area (sq ft)	1036.43
BR Open Vel (ft/s)	8.58
Coef of Q	
Br Sel Method	Momentum

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	948.37	948.27
W.S. Elev (ft)	947.19	947.06
Crit W.S. (ft)	945.28	945.21
Max Chl Dpth (ft)	8.64	8.58
Vel Total (ft/s)	8.50	8.58
Flow Area (sq ft)	329.60	326.33
Froude # Chl	0.62	0.62
Specif Force (cu ft)	1935.67	1925.47
Hydr Depth (ft)	5.20	5.17
W.P. Total (ft)	69.23	68.83
Conv. Total (cfs)	37716.9	37258.4
Top Width (ft)	63.41	63.10
Frctn Loss (ft)		
C & E Loss (ft)		
Shear Total (lb/sq ft)	1.64	1.67
Power Total (lb/ft s)	13.92	14.34

BRIDGE OUTPUT Profile #500yr

E.G. US. (ft)	949.79
W.S. US. (ft)	948.51
Q Total (cfs)	3650.00
Q Bridge (cfs)	3650.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	960.01
Min El Prs (ft)	955.00
Delta EG (ft)	0.27
Delta WS (ft)	0.33
BR Open Area (sq ft)	1036.43
BR Open Vel (ft/s)	9.20
Coef of Q	
Br Sel Method	Momentum

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	949.67	949.57
W.S. Elev (ft)	948.24	948.11
Crit W.S. (ft)	946.31	946.26
Max Chl Dpth (ft)	9.69	9.63
Vel Total (ft/s)	9.09	9.20
Flow Area (sq ft)	401.63	396.85
Froude # Chl	0.64	0.65
Specif Force (cu ft)	2647.77	2633.70
Hydr Depth (ft)	5.27	5.22
W.P. Total (ft)	84.31	84.02
Conv. Total (cfs)	47626.6	46984.0
Top Width (ft)	76.18	75.98
Frctn Loss (ft)		
C & E Loss (ft)		
Shear Total (lb/sq ft)	1.75	1.78
Power Total (lb/ft s)	15.87	16.37

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2937.884

INPUT
Description: 30
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	955.18	3.55	955.08	9.78	954.93	16.46	954.77	24.53	954.58
29.74	954.46	36.56	954.25	37.07	954.22	37.98	954.08	39.74	954.05
41.29	954.15	41.45	954.12	41.5	954.11	41.51	954.11	43.3	952.45
46.32	947.86	53.4	947.86	57.14	945.99	65.14	945.99	67.94	947.39
72.94	947.39	90.94	938.39	110.94	938.39	133.78	949.81	135.71	949.92
149.06	950.76	158.64	952.74	171.31	955.98	171.63	956.08		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	72.94	.04	133.78	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
72.94	133.78	68.38	65.3	63.65	.1	.3

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	944.30	Wt. n-Val.		0.040	
Vel Head (ft)	0.78	Reach Len. (ft)	68.38	65.30	63.65
W.S. Elev (ft)	943.52	Flow Area (sq ft)		155.11	
Crit W.S. (ft)		Area (sq ft)		155.11	
E.G. Slope (ft/ft)	0.006573	Flow (cfs)		1100.00	
Q Total (cfs)	1100.00	Top Width (ft)		40.51	
Top Width (ft)	40.51	Avg. Vel. (ft/s)		7.09	
Vel Total (ft/s)	7.09	Hydr. Depth (ft)		3.83	
Max Chl Dpth (ft)	5.13	Conv. (cfs)		13567.7	
Conv. Total (cfs)	13567.7	Wetted Per. (ft)		42.93	
Length Wtd. (ft)	65.30	Shear (lb/sq ft)		1.48	
Min Ch El (ft)	938.39	Stream Power (lb/ft s)		10.52	
Alpha	1.00	Cum Volume (acre-ft)	2.50	11.98	1.44
Frctn Loss (ft)	0.36	Cum SA (acres)	2.51	2.41	1.29
C & E Loss (ft)	0.05				

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	945.06	Wt. n-Val.		0.040	
Vel Head (ft)	0.80	Reach Len. (ft)	68.38	65.30	63.65
W.S. Elev (ft)	944.26	Flow Area (sq ft)		186.36	
Crit W.S. (ft)		Area (sq ft)		186.36	
E.G. Slope (ft/ft)	0.005844	Flow (cfs)		1340.00	
Q Total (cfs)	1340.00	Top Width (ft)		43.48	
Top Width (ft)	43.48	Avg. Vel. (ft/s)		7.19	
Vel Total (ft/s)	7.19	Hydr. Depth (ft)		4.29	
Max Chl Dpth (ft)	5.87	Conv. (cfs)		17528.6	
Conv. Total (cfs)	17528.6	Wetted Per. (ft)		46.26	
Length Wtd. (ft)	65.30	Shear (lb/sq ft)		1.47	
Min Ch El (ft)	938.39	Stream Power (lb/ft s)		10.57	
Alpha	1.00	Cum Volume (acre-ft)	2.05	14.02	0.33
Frctn Loss (ft)	0.32	Cum SA (acres)	1.78	2.54	0.24
C & E Loss (ft)	0.05				

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	945.99	Wt. n-Val.		0.040	
Vel Head (ft)	0.82	Reach Len. (ft)	68.38	65.30	63.65
W.S. Elev (ft)	945.17	Flow Area (sq ft)		227.55	
Crit W.S. (ft)		Area (sq ft)		227.55	
E.G. Slope (ft/ft)	0.005095	Flow (cfs)		1650.00	
Q Total (cfs)	1650.00	Top Width (ft)		47.12	
Top Width (ft)	47.12	Avg. Vel. (ft/s)		7.25	
Vel Total (ft/s)	7.25	Hydr. Depth (ft)		4.83	
Max Chl Dpth (ft)	6.78	Conv. (cfs)		23115.1	
Conv. Total (cfs)	23115.1	Wetted Per. (ft)		50.32	
Length Wtd. (ft)	65.31	Shear (lb/sq ft)		1.44	
Min Ch El (ft)	938.39	Stream Power (lb/ft s)		10.43	
Alpha	1.00	Cum Volume (acre-ft)	7.47	15.27	3.52
Frctn Loss (ft)	0.28	Cum SA (acres)	4.00	2.60	2.39
C & E Loss (ft)	0.05				

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	947.11	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	0.89	Reach Len. (ft)	68.38	65.30	63.65
W.S. Elev (ft)	946.22	Flow Area (sq ft)	1.94	279.21	
Crit W.S. (ft)		Area (sq ft)	1.94	279.21	
E.G. Slope (ft/ft)	0.004742	Flow (cfs)	0.79	2109.21	
Q Total (cfs)	2110.00	Top Width (ft)	8.92	51.32	
Top Width (ft)	60.24	Avg. Vel. (ft/s)	0.41	7.55	
Vel Total (ft/s)	7.50	Hydr. Depth (ft)	0.22	5.44	
Max Chl Dpth (ft)	7.83	Conv. (cfs)	11.5	30630.8	
Conv. Total (cfs)	30642.4	Wetted Per. (ft)	9.03	55.02	
Length Wtd. (ft)	65.33	Shear (lb/sq ft)	0.06	1.50	
Min Ch El (ft)	938.39	Stream Power (lb/ft s)	0.03	11.35	
Alpha	1.01	Cum Volume (acre-ft)	11.71	17.51	5.53
Frctn Loss (ft)	0.25	Cum SA (acres)	4.74	2.67	3.26
C & E Loss (ft)	0.06				

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	947.61	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	1.05	Reach Len. (ft)	68.38	65.30	63.65
W.S. Elev (ft)	946.56				

Crit W.S. (ft)		Flow Area (sq ft)	5.23	297.00	
E.G. Slope (ft/ft)	0.005384	Area (sq ft)	5.23	297.00	
Q Total (cfs)	2450.00	Flow (cfs)	3.97	2446.03	
Top Width (ft)	62.98	Top Width (ft)	10.29	52.69	
Vel Total (ft/s)	8.11	Avg. Vel. (ft/s)	0.76	8.24	
Max Chl Dpth (ft)	8.17	Hydr. Depth (ft)	0.51	5.64	
Conv. Total (cfs)	33391.1	Conv. (cfs)	54.1	33337.1	
Length Wtd. (ft)	65.34	Wetted Per. (ft)	10.56	56.55	
Min Ch El (ft)	938.39	Shear (lb/sq ft)	0.17	1.77	
Alpha	1.03	Stream Power (lb/ft s)	0.13	14.54	
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)	14.48	18.80	7.21
C & E Loss (ft)	0.08	Cum SA (acres)	5.02	2.71	3.93

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100yr

E.G. Elev (ft)	948.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.14	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	947.08	Reach Len. (ft)	68.38	65.30	63.65
Crit W.S. (ft)		Flow Area (sq ft)	11.08	324.74	
E.G. Slope (ft/ft)	0.005477	Area (sq ft)	11.08	324.74	
Q Total (cfs)	2800.00	Flow (cfs)	12.25	2787.75	
Top Width (ft)	67.11	Top Width (ft)	12.35	54.75	
Vel Total (ft/s)	8.34	Avg. Vel. (ft/s)	1.11	8.58	
Max Chl Dpth (ft)	8.69	Hydr. Depth (ft)	0.90	5.93	
Conv. Total (cfs)	37833.1	Conv. (cfs)	165.5	37667.7	
Length Wtd. (ft)	65.35	Wetted Per. (ft)	12.87	58.86	
Min Ch El (ft)	938.39	Shear (lb/sq ft)	0.29	1.89	
Alpha	1.06	Stream Power (lb/ft s)	0.33	16.20	
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)	16.73	20.13	9.66
C & E Loss (ft)	0.08	Cum SA (acres)	5.14	2.75	4.83

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #500yr

E.G. Elev (ft)	949.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.33	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	948.19	Reach Len. (ft)	68.38	65.30	63.65
Crit W.S. (ft)		Flow Area (sq ft)	32.80	387.22	
E.G. Slope (ft/ft)	0.005465	Area (sq ft)	32.80	387.22	
Q Total (cfs)	3650.00	Flow (cfs)	44.72	3605.28	
Top Width (ft)	84.43	Top Width (ft)	26.83	57.59	
Vel Total (ft/s)	8.69	Avg. Vel. (ft/s)	1.36	9.31	
Max Chl Dpth (ft)	9.80	Hydr. Depth (ft)	1.22	6.72	
Conv. Total (cfs)	49373.0	Conv. (cfs)	605.0	48768.0	
Length Wtd. (ft)	65.39	Wetted Per. (ft)	27.78	62.03	
Min Ch El (ft)	938.39	Shear (lb/sq ft)	0.40	2.13	
Alpha	1.13	Stream Power (lb/ft s)	0.55	19.83	
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)	22.19	22.88	15.24
C & E Loss (ft)	0.08	Cum SA (acres)	5.35	2.78	6.37

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2870

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	955.26	4.58	955.19	8.22	955.11	16.64	954.94	21.8	954.78
27.44	954.62	29.41	954.56	37.45	954.37	42.1	954.26	47.85	954.08
55.33	953.86	60.57	953.49	61	953.46	61.09	953.46	61.19	953.45
62.63	953.36	63.31	953.3	64.12	953.24	64.61	953.34	65.63	953.54
67.72	953.59	70.48	953.68	70.74	953.54	88.2	944.12	96.76	944.12
101.36	944.97	106.36	944.97	121.79	937.72	141.79	937.72	157.49	945.57
177.07	956.1								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	106.36	.04	157.49	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
106.36	157.49	51.13	58.6	53.12	.1	.3

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	943.88
Vel Head (ft)	0.62
W.S. Elev (ft)	943.27
Crit W.S. (ft)	
E.G. Slope (ft/ft)	0.004796
Q Total (cfs)	1100.00
Top Width (ft)	42.90
Vel Total (ft/s)	6.31
Max Chl Dpth (ft)	5.55
Conv. Total (cfs)	15883.2
Length Wtd. (ft)	58.60
Min Ch El (ft)	937.72
Alpha	1.00
Frctn Loss (ft)	0.25
C & E Loss (ft)	0.03

Element	Left OB	Channel	Right OB
Wt. n-Val.		0.040	
Reach Len. (ft)	51.13	58.60	53.12
Flow Area (sq ft)		174.42	
Area (sq ft)		174.42	
Flow (cfs)		1100.00	
Top Width (ft)		42.90	
Avg. Vel. (ft/s)		6.31	
Hydr. Depth (ft)		4.07	
Conv. (cfs)		15883.2	
Wetted Per. (ft)		45.44	
Shear (lb/sq ft)		1.15	
Stream Power (lb/ft s)		7.25	
Cum Volume (acre-ft)	2.50	11.73	1.44
Cum SA (acres)	2.51	2.35	1.29

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	944.69
Vel Head (ft)	0.64
W.S. Elev (ft)	944.05
Crit W.S. (ft)	
E.G. Slope (ft/ft)	0.004283
Q Total (cfs)	1340.00
Top Width (ft)	46.14
Vel Total (ft/s)	6.40
Max Chl Dpth (ft)	6.33
Conv. Total (cfs)	20475.3
Length Wtd. (ft)	58.60
Min Ch El (ft)	937.72
Alpha	1.00
Frctn Loss (ft)	0.23
C & E Loss (ft)	0.03

Element	Left OB	Channel	Right OB
Wt. n-Val.		0.040	
Reach Len. (ft)	51.13	58.60	53.12
Flow Area (sq ft)		209.43	
Area (sq ft)		209.43	
Flow (cfs)		1340.00	
Top Width (ft)		46.14	
Avg. Vel. (ft/s)		6.40	
Hydr. Depth (ft)		4.54	
Conv. (cfs)		20475.3	
Wetted Per. (ft)		49.05	
Shear (lb/sq ft)		1.14	
Stream Power (lb/ft s)		7.30	
Cum Volume (acre-ft)	2.05	13.72	0.33
Cum SA (acres)	1.78	2.47	0.24

CROSS SECTION OUTPUT Profile #10yr

E.G. Elev (ft)	945.65
Vel Head (ft)	0.64
W.S. Elev (ft)	945.01
Crit W.S. (ft)	
E.G. Slope (ft/ft)	0.003708
Q Total (cfs)	1650.00
Top Width (ft)	69.83
Vel Total (ft/s)	6.20
Max Chl Dpth (ft)	7.29
Conv. Total (cfs)	27097.7
Length Wtd. (ft)	58.57
Min Ch El (ft)	937.72
Alpha	1.07
Frctn Loss (ft)	0.20
C & E Loss (ft)	0.02

Element	Left OB	Channel	Right OB
Wt. n-Val.	0.090	0.040	
Reach Len. (ft)	51.13	58.60	53.12
Flow Area (sq ft)	10.73	255.59	
Area (sq ft)	10.73	255.59	
Flow (cfs)	7.09	1642.91	
Top Width (ft)	19.81	50.01	
Avg. Vel. (ft/s)	0.66	6.43	
Hydr. Depth (ft)	0.54	5.11	
Conv. (cfs)	116.5	26981.2	
Wetted Per. (ft)	20.12	53.35	
Shear (lb/sq ft)	0.12	1.11	
Stream Power (lb/ft s)	0.08	7.13	
Cum Volume (acre-ft)	7.46	14.91	3.52
Cum SA (acres)	3.99	2.53	2.39

CROSS SECTION OUTPUT Profile #25yr

E.G. Elev (ft)	946.79
Vel Head (ft)	0.67
W.S. Elev (ft)	946.12
Crit W.S. (ft)	
E.G. Slope (ft/ft)	0.003118
Q Total (cfs)	2110.00
Top Width (ft)	74.03
Vel Total (ft/s)	6.10
Max Chl Dpth (ft)	8.40
Conv. Total (cfs)	37785.0
Length Wtd. (ft)	58.49
Min Ch El (ft)	937.72
Alpha	1.16
Frctn Loss (ft)	0.17
C & E Loss (ft)	0.02

Element	Left OB	Channel	Right OB
Wt. n-Val.	0.090	0.040	0.120
Reach Len. (ft)	51.13	58.60	53.12
Flow Area (sq ft)	33.86	312.02	0.28
Area (sq ft)	33.86	312.02	0.28
Flow (cfs)	41.05	2068.88	0.08
Top Width (ft)	21.87	51.13	1.03
Avg. Vel. (ft/s)	1.21	6.63	0.27
Hydr. Depth (ft)	1.55	6.10	0.28
Conv. (cfs)	735.1	37048.6	1.4
Wetted Per. (ft)	22.45	54.60	1.16
Shear (lb/sq ft)	0.29	1.11	0.05
Stream Power (lb/ft s)	0.36	7.38	0.01
Cum Volume (acre-ft)	11.68	17.07	5.53
Cum SA (acres)	4.72	2.60	3.26

CROSS SECTION OUTPUT Profile #50yr

E.G. Elev (ft)	947.26
Vel Head (ft)	0.80
W.S. Elev (ft)	946.46
Crit W.S. (ft)	
E.G. Slope (ft/ft)	0.003483

Element	Left OB	Channel	Right OB
Wt. n-Val.	0.090	0.040	0.120
Reach Len. (ft)	51.13	58.60	53.12
Flow Area (sq ft)	41.30	329.19	0.73
Area (sq ft)	41.30	329.19	0.73

Q Total (cfs)	2450.00	Flow (cfs)	59.18	2390.53	0.29
Top Width (ft)	75.27	Top Width (ft)	22.49	51.13	1.65
Vel Total (ft/s)	6.60	Avg. Vel. (ft/s)	1.43	7.26	0.39
Max Chl Dpth (ft)	8.74	Hydr. Depth (ft)	1.84	6.44	0.44
Conv. Total (cfs)	41514.9	Conv. (cfs)	1002.9	40507.2	4.8
Length Wtd. (ft)	58.46	Wetted Per. (ft)	23.16	54.60	1.87
Min Ch El (ft)	937.72	Shear (lb/sq ft)	0.39	1.31	0.08
Alpha	1.18	Stream Power (lb/ft s)	0.56	9.52	0.03
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	14.44	18.33	7.21
C & E Loss (ft)	0.02	Cum SA (acres)	4.99	2.63	3.93

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	947.86	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.87	Reach Len. (ft)	51.13	58.60	53.12
W.S. Elev (ft)	946.98	Flow Area (sq ft)	53.36	356.02	1.85
Crit W.S. (ft)		Area (sq ft)	53.36	356.02	1.85
E.G. Slope (ft/ft)	0.003451	Flow (cfs)	87.52	2711.49	0.98
Q Total (cfs)	2800.00	Top Width (ft)	23.47	51.13	2.63
Top Width (ft)	77.22	Avg. Vel. (ft/s)	1.64	7.62	0.53
Vel Total (ft/s)	6.81	Hydr. Depth (ft)	2.27	6.96	0.71
Max Chl Dpth (ft)	9.26	Conv. (cfs)	1490.0	46159.0	16.7
Conv. Total (cfs)	47665.7	Wetted Per. (ft)	24.27	54.60	2.98
Length Wtd. (ft)	58.42	Shear (lb/sq ft)	0.47	1.40	0.13
Min Ch El (ft)	937.72	Stream Power (lb/ft s)	0.78	10.70	0.07
Alpha	1.21	Cum Volume (acre-ft)	16.68	19.62	9.66
Frctn Loss (ft)	0.19	Cum SA (acres)	5.11	2.67	4.83
C & E Loss (ft)	0.01				

CROSS SECTION OUTPUT Profile #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	949.15	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	1.06	Reach Len. (ft)	51.13	58.60	53.12
W.S. Elev (ft)	948.10	Flow Area (sq ft)	80.63	412.94	5.93
Crit W.S. (ft)		Area (sq ft)	80.63	412.94	5.93
E.G. Slope (ft/ft)	0.003469	Flow (cfs)	164.20	3481.16	4.64
Q Total (cfs)	3650.00	Top Width (ft)	25.53	51.13	4.70
Top Width (ft)	81.35	Avg. Vel. (ft/s)	2.04	8.43	0.78
Vel Total (ft/s)	7.31	Hydr. Depth (ft)	3.16	8.08	1.26
Max Chl Dpth (ft)	10.38	Conv. (cfs)	2787.7	59102.1	78.8
Conv. Total (cfs)	61968.6	Wetted Per. (ft)	26.61	54.60	5.33
Length Wtd. (ft)	58.34	Shear (lb/sq ft)	0.66	1.64	0.24
Min Ch El (ft)	937.72	Stream Power (lb/ft s)	1.34	13.81	0.19
Alpha	1.27	Cum Volume (acre-ft)	22.10	22.28	15.24
Frctn Loss (ft)	0.19	Cum SA (acres)	5.31	2.70	6.37
C & E Loss (ft)	0.00				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2813.979

INPUT
Description: 31
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	953.48	.06	953.48	2.49	953.29	3.09	953.25	3.7	953.2
7.87	952.9	8.48	952.85	8.93	952.81	9.33	952.77	9.65	952.83
10.23	952.94	10.72	953.03	10.86	953.05	11.85	952.98	15.25	953
21.18	949.56	29.14	944.99	31.53	943.62	32.77	943.62	34.47	944.47
39.47	944.47	54.9	937.22	74.9	937.22	90.6	945.07	96.4	947.04
101.45	948.25	107.6	949.81	135.51	952.27	160.01	962.86	163.64	963.94

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	39.47	.04	90.6	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
39.47	90.6	18.36	18.04	17.52	.1	.3

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	943.61	Wt. n-Val.		0.040	
Vel Head (ft)	0.53	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	943.07	Flow Area (sq ft)		187.73	
Crit W.S. (ft)	941.15	Area (sq ft)		187.73	
E.G. Slope (ft/ft)	0.003909	Flow (cfs)		1100.00	
Q Total (cfs)	1100.00				

Top Width (ft)	44.16	Top Width (ft)		44.16	
Vel Total (ft/s)	5.86	Avg. Vel. (ft/s)		5.86	
Max Chl Dpth (ft)	5.85	Hydr. Depth (ft)		4.25	
Conv. Total (cfs)	17594.4	Conv. (cfs)		17594.4	
Length Wtd. (ft)	4.00	Wetted Per. (ft)		46.85	
Min Ch El (ft)	937.22	Shear (lb/sq ft)		0.98	
Alpha	1.00	Stream Power (lb/ft s)		5.73	
Frctn Loss (ft)		Cum Volume (acre-ft)	2.50	11.49	1.44
C & E Loss (ft)		Cum SA (acres)	2.51	2.29	1.29

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	944.44	Wt. n-Val.		0.040	
Vel Head (ft)	0.55	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	943.89	Flow Area (sq ft)		225.00	
Crit W.S. (ft)	941.63	Area (sq ft)		225.00	
E.G. Slope (ft/ft)	0.003513	Flow (cfs)		1340.00	
Q Total (cfs)	1340.00	Top Width (ft)		47.52	
Top Width (ft)	47.52	Avg. Vel. (ft/s)		5.96	
Vel Total (ft/s)	5.96	Hydr. Depth (ft)		4.74	
Max Chl Dpth (ft)	6.67	Conv. (cfs)		22608.7	
Conv. Total (cfs)	22608.7	Wetted Per. (ft)		50.58	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		0.98	
Min Ch El (ft)	937.22	Stream Power (lb/ft s)		5.81	
Alpha	1.00	Cum Volume (acre-ft)	2.05	13.43	0.33
Frctn Loss (ft)		Cum SA (acres)	1.78	2.41	0.24
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	945.43	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	0.56	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	944.87	Flow Area (sq ft)	6.33	273.71	
Crit W.S. (ft)	942.18	Area (sq ft)	6.33	273.71	
E.G. Slope (ft/ft)	0.003021	Flow (cfs)	4.06	1645.94	
Q Total (cfs)	1650.00	Top Width (ft)	10.12	50.73	
Top Width (ft)	60.86	Avg. Vel. (ft/s)	0.64	6.01	
Vel Total (ft/s)	5.89	Hydr. Depth (ft)	0.63	5.40	
Max Chl Dpth (ft)	7.65	Conv. (cfs)	73.9	29943.6	
Conv. Total (cfs)	30017.5	Wetted Per. (ft)	10.66	54.16	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.11	0.95	
Min Ch El (ft)	937.22	Stream Power (lb/ft s)	0.07	5.73	
Alpha	1.04	Cum Volume (acre-ft)	7.45	14.56	3.52
Frctn Loss (ft)		Cum SA (acres)	3.97	2.46	2.39
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	946.61	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.61	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	946.00	Flow Area (sq ft)	18.82	331.18	1.26
Crit W.S. (ft)	942.93	Area (sq ft)	18.82	331.18	1.26
E.G. Slope (ft/ft)	0.002607	Flow (cfs)	20.39	2089.15	0.46
Q Total (cfs)	2110.00	Top Width (ft)	12.08	51.13	2.73
Top Width (ft)	65.94	Avg. Vel. (ft/s)	1.08	6.31	0.36
Vel Total (ft/s)	6.01	Hydr. Depth (ft)	1.56	6.48	0.46
Max Chl Dpth (ft)	8.78	Conv. (cfs)	399.4	40917.6	9.0
Conv. Total (cfs)	41326.0	Wetted Per. (ft)	12.92	54.60	2.88
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.24	0.99	0.07
Min Ch El (ft)	937.22	Stream Power (lb/ft s)	0.26	6.23	0.03
Alpha	1.09	Cum Volume (acre-ft)	11.65	16.64	5.53
Frctn Loss (ft)		Cum SA (acres)	4.70	2.53	3.25
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	947.05	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.75	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	946.31	Flow Area (sq ft)	22.67	347.12	2.26
Crit W.S. (ft)	943.42	Area (sq ft)	22.67	347.12	2.26
E.G. Slope (ft/ft)	0.002991	Flow (cfs)	28.86	2420.07	1.07
Q Total (cfs)	2450.00	Top Width (ft)	12.63	51.13	3.65
Top Width (ft)	67.40	Avg. Vel. (ft/s)	1.27	6.97	0.47
Vel Total (ft/s)	6.59	Hydr. Depth (ft)	1.80	6.79	0.62
Max Chl Dpth (ft)	9.09	Conv. (cfs)	527.7	44251.8	19.6
Conv. Total (cfs)	44799.1	Wetted Per. (ft)	13.54	54.60	3.85
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.31	1.19	0.11
Min Ch El (ft)	937.22				

Alpha	1.11	Stream Power (lb/ft s)	0.40	8.28	0.05
Frctn Loss (ft)		Cum Volume (acre-ft)	14.40	17.88	7.21
C & E Loss (ft)		Cum SA (acres)	4.97	2.56	3.93

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	947.65	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.83	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	946.82	Flow Area (sq ft)	29.40	373.42	4.52
Crit W.S. (ft)	943.92	Area (sq ft)	29.40	373.42	4.52
E.G. Slope (ft/ft)	0.003037	Flow (cfs)	42.70	2754.58	2.72
Q Total (cfs)	2800.00	Top Width (ft)	13.52	51.13	5.16
Top Width (ft)	69.81	Avg. Vel. (ft/s)	1.45	7.38	0.60
Vel Total (ft/s)	6.87	Hydr. Depth (ft)	2.17	7.30	0.88
Max Chl Dpth (ft)	9.60	Conv. (cfs)	774.8	49980.1	49.4
Conv. Total (cfs)	50804.3	Wetted Per. (ft)	14.58	54.60	5.45
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.38	1.30	0.16
Min Ch El (ft)	937.22	Stream Power (lb/ft s)	0.56	9.57	0.09
Alpha	1.13	Cum Volume (acre-ft)	16.63	19.13	9.66
Frctn Loss (ft)		Cum SA (acres)	5.09	2.60	4.83
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	948.95	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	1.04	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	947.91	Flow Area (sq ft)	45.15	429.07	12.35
Crit W.S. (ft)	944.98	Area (sq ft)	45.15	429.07	12.35
E.G. Slope (ft/ft)	0.003190	Flow (cfs)	81.50	3558.47	10.03
Q Total (cfs)	3650.00	Top Width (ft)	15.42	51.13	9.43
Top Width (ft)	75.98	Avg. Vel. (ft/s)	1.81	8.29	0.81
Vel Total (ft/s)	7.50	Hydr. Depth (ft)	2.93	8.39	1.31
Max Chl Dpth (ft)	10.69	Conv. (cfs)	1442.9	63001.5	177.6
Conv. Total (cfs)	64622.0	Wetted Per. (ft)	16.76	54.60	9.86
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.54	1.57	0.25
Min Ch El (ft)	937.22	Stream Power (lb/ft s)	0.97	12.98	0.20
Alpha	1.19	Cum Volume (acre-ft)	22.02	21.72	15.23
Frctn Loss (ft)		Cum SA (acres)	5.29	2.63	6.36
C & E Loss (ft)					

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 2807

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	960	955	500	960	955

Upstream Bridge Cross Section Data
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	953.48	.06	953.48	2.49	953.29	3.09	953.25	3.7	953.2
7.87	952.9	8.48	952.85	8.93	952.81	9.33	952.77	9.65	952.83
10.23	952.94	10.72	953.03	10.86	953.05	11.85	952.98	15.25	953
21.18	949.56	29.14	944.99	31.53	943.62	32.77	943.62	34.47	944.47
39.47	944.47	54.9	937.22	74.9	937.22	90.6	945.07	96.4	947.04
101.45	948.25	107.6	949.81	135.51	952.27	160.01	962.86	163.64	963.94

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	39.47	.04	90.6	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
39.47	90.6	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	960	955	500	960	955

Downstream Bridge Cross Section Data

```
Station Elevation Data     num=       35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  953.58    3.89  953.46    4.62  953.43    5.85  953.34    6.68  953.28
    8.37  953.15    11.2  952.93   12.39  952.84   12.66  952.82   12.83  952.81
   13.46  952.76   13.76  952.74    13.9  952.73   14.47  952.83   15.17  952.96
   15.43  953.01   17.08   952.9   17.54  952.86   18.04  952.83   19.53  952.83
   29.59     947    29.6  946.99   31.58  945.68   34.45  943.62   36.62  943.62
   38.32  944.47   43.32  944.47   58.75  937.22   78.75  937.22   94.45  945.07
  112.31   945.8  119.38  947.31  128.36  948.22  144.59  949.65  155.19 954.238

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09   43.32     .04   94.45     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
          43.32   94.45            .1       .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev  Permanent
     111  155.19                F

Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=   39.47    Downstream=   43.32
Upstream     num=        2
    Width   Elev    Width   Elev
        8    935        8    955
Downstream     num=        2
    Width   Elev    Width   Elev
        8    935        8    955

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                  Cd   =       2
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 #2yr

 E.G. US. (ft)                 943.61   Element                  Inside BR US  Inside BR DS
 W.S. US. (ft)                 943.07   E.G. Elev (ft)               943.59        943.56
 Q Total (cfs)                1100.00   W.S. Elev (ft)               943.05        943.02
 Q Bridge (cfs)               1100.00   Crit W.S. (ft)               941.17        941.16
 Q Weir (cfs)                           Max Chl Dpth (ft)              5.83          5.80
 Weir Sta Lft (ft)                      Vel Total (ft/s)               5.90          5.94
 Weir Sta Rgt (ft)                      Flow Area (sq ft)            186.44        185.05
 Weir Submerg                           Froude # Chl                  0.50          0.51
 Weir Max Depth (ft)                    Specif Force (cu ft)         677.33        672.86
 Min El Weir Flow (ft)         960.01   Hydr Depth (ft)                4.33          4.30
 Min El Prs (ft)               955.00   W.P. Total (ft)               46.12         46.01
 Delta EG (ft)                   0.07   Conv. Total (cfs)          17575.6       17384.4
 Delta WS (ft)                   0.10   Top Width (ft)                43.09         43.02
 BR Open Area (sq ft)         1092.98   Frctn Loss (ft)
 BR Open Vel (ft/s)              5.94   C & E Loss (ft)
 Coef of Q                              Shear Total (lb/sq ft)         0.99          1.01
 Br Sel Method               Momentum   Power Total (lb/ft s)          5.83          5.98

BRIDGE OUTPUT  Profile #5yr

 E.G. US. (ft)                 944.44   Element                  Inside BR US  Inside BR DS
 W.S. US. (ft)                 943.89   E.G. Elev (ft)               944.41        944.39
 Q Total (cfs)                1340.00   W.S. Elev (ft)               943.84        943.82
```

Q Bridge (cfs)	1340.00	Crit W.S. (ft)	941.65	941.64
Q Weir (cfs)		Max Chl Dpth (ft)	6.62	6.60
Weir Sta Lft (ft)		Vel Total (ft/s)	6.05	6.09
Weir Sta Rgt (ft)		Flow Area (sq ft)	221.37	220.18
Weir Submerg		Froude # Chl	0.48	0.48
Weir Max Depth (ft)		Specif Force (cu ft)	889.93	885.38
Min El Weir Flow (ft)	960.01	Hydr Depth (ft)	4.95	4.93
Min El Prs (ft)	955.00	W.P. Total (ft)	48.69	48.61
Delta EG (ft)	0.07	Conv. Total (cfs)	22568.0	22391.7
Delta WS (ft)	0.09	Top Width (ft)	44.68	44.62
BR Open Area (sq ft)	745.66	Frctn Loss (ft)		
BR Open Vel (ft/s)	6.09	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	1.00	1.01
Br Sel Method	Momentum	Power Total (lb/ft s)	6.06	6.16

BRIDGE OUTPUT Profile #10yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	945.43	E.G. Elev (ft)	945.39	945.37
W.S. US. (ft)	944.87	W.S. Elev (ft)	944.79	944.77
Q Total (cfs)	1650.00	Crit W.S. (ft)	942.17	942.20
Q Bridge (cfs)	1650.00	Max Chl Dpth (ft)	7.57	7.55
Q Weir (cfs)		Vel Total (ft/s)	6.14	6.15
Weir Sta Lft (ft)		Flow Area (sq ft)	268.84	268.39
Weir Sta Rgt (ft)		Froude # Chl	0.46	0.46
Weir Submerg		Specif Force (cu ft)	1188.47	1183.58
Weir Max Depth (ft)		Hydr Depth (ft)	5.12	5.06
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	58.58	59.01
Min El Prs (ft)	955.00	Conv. Total (cfs)	29219.7	29052.2
Delta EG (ft)	0.08	Top Width (ft)	52.56	52.99
Delta WS (ft)	0.11	Frctn Loss (ft)		
BR Open Area (sq ft)	1092.98	C & E Loss (ft)		
BR Open Vel (ft/s)	6.15	Shear Total (lb/sq ft)	0.91	0.92
Coef of Q		Power Total (lb/ft s)	5.61	5.63
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #25yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	946.61	E.G. Elev (ft)	946.55	946.52
W.S. US. (ft)	946.00	W.S. Elev (ft)	945.86	945.83
Q Total (cfs)	2110.00	Crit W.S. (ft)	942.92	942.91
Q Bridge (cfs)	2110.00	Max Chl Dpth (ft)	8.64	8.61
Q Weir (cfs)		Vel Total (ft/s)	6.44	6.33
Weir Sta Lft (ft)		Flow Area (sq ft)	327.62	333.26
Weir Sta Rgt (ft)		Froude # Chl	0.45	0.46
Weir Submerg		Specif Force (cu ft)	1623.47	1617.25
Weir Max Depth (ft)		Hydr Depth (ft)	5.72	4.65
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	65.96	80.23
Min El Prs (ft)	955.00	Conv. Total (cfs)	38403.2	38199.8
Delta EG (ft)	0.11	Top Width (ft)	57.32	73.12
Delta WS (ft)	0.14	Frctn Loss (ft)		
BR Open Area (sq ft)	1092.98	C & E Loss (ft)		
BR Open Vel (ft/s)	6.44	Shear Total (lb/sq ft)	0.94	0.79
Coef of Q		Power Total (lb/ft s)	6.03	5.01
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #50yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	947.05	E.G. Elev (ft)	946.98	946.94
W.S. US. (ft)	946.31	W.S. Elev (ft)	946.13	946.09
Q Total (cfs)	2450.00	Crit W.S. (ft)	943.39	943.39
Q Bridge (cfs)	2450.00	Max Chl Dpth (ft)	8.91	8.87
Q Weir (cfs)		Vel Total (ft/s)	7.15	6.97
Weir Sta Lft (ft)		Flow Area (sq ft)	342.88	351.59
Weir Sta Rgt (ft)		Froude # Chl	0.50	0.50
Weir Submerg		Specif Force (cu ft)	1839.58	1831.87
Weir Max Depth (ft)		Hydr Depth (ft)	5.86	4.88
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	67.84	81.20
Min El Prs (ft)	955.00	Conv. Total (cfs)	40871.1	40640.0
Delta EG (ft)	0.14	Top Width (ft)	58.55	74.70
Delta WS (ft)	0.18	Frctn Loss (ft)		
BR Open Area (sq ft)	1092.98	C & E Loss (ft)		
BR Open Vel (ft/s)	7.15	Shear Total (lb/sq ft)	1.13	0.98
Coef of Q		Power Total (lb/ft s)	8.10	6.85
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #100yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	947.65			

W.S. US. (ft)	946.82	E.G. Elev (ft)	947.57	947.51
Q Total (cfs)	2800.00	W.S. Elev (ft)	946.60	946.55
Q Bridge (cfs)	2800.00	Crit W.S. (ft)	943.86	943.86
Q Weir (cfs)		Max Chl Dpth (ft)	9.38	9.33
Weir Sta Lft (ft)		Vel Total (ft/s)	7.55	7.28
Weir Sta Rgt (ft)		Flow Area (sq ft)	370.85	384.79
Weir Submerg		Froude # Chl	0.51	0.52
Weir Max Depth (ft)		Specif Force (cu ft)	2129.71	2120.96
Min El Weir Flow (ft)	960.01	Hydr Depth (ft)	6.10	5.29
Min El Prs (ft)	955.00	W.P. Total (ft)	71.18	82.95
Delta EG (ft)	0.18	Conv. Total (cfs)	45412.6	45195.6
Delta WS (ft)	0.22	Top Width (ft)	60.75	77.54
BR Open Area (sq ft)	1092.98	Frctn Loss (ft)		
BR Open Vel (ft/s)	7.55	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	1.24	1.11
Br Sel Method	Momentum	Power Total (lb/ft s)	9.34	8.09

BRIDGE OUTPUT Profile #500yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	948.95	E.G. Elev (ft)	948.84	948.75
W.S. US. (ft)	947.91	W.S. Elev (ft)	947.58	947.50
Q Total (cfs)	3650.00	Crit W.S. (ft)	944.93	944.92
Q Bridge (cfs)	3650.00	Max Chl Dpth (ft)	10.36	10.28
Q Weir (cfs)		Vel Total (ft/s)	8.43	8.02
Weir Sta Lft (ft)		Flow Area (sq ft)	433.11	454.99
Weir Sta Rgt (ft)		Froude # Chl	0.55	0.55
Weir Submerg		Specif Force (cu ft)	2857.34	2845.99
Weir Max Depth (ft)		Hydr Depth (ft)	6.56	6.13
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	78.82	86.68
Min El Prs (ft)	955.00	Conv. Total (cfs)	55535.6	55339.4
Delta EG (ft)	0.25	Top Width (ft)	66.03	84.55
Delta WS (ft)	0.31	Frctn Loss (ft)		
BR Open Area (sq ft)	1092.98	C & E Loss (ft)		
BR Open Vel (ft/s)	8.43	Shear Total (lb/sq ft)	1.48	1.43
Coef of Q		Power Total (lb/ft s)	12.49	11.44
Br Sel Method	Momentum			

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2795.938

INPUT
Description: 32
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	953.58	3.89	953.46	4.62	953.43	5.85	953.34	6.68	953.28
8.37	953.15	11.2	952.93	12.39	952.84	12.66	952.82	12.83	952.81
13.46	952.76	13.76	952.74	13.9	952.73	14.47	952.83	15.17	952.96
15.43	953.01	17.08	952.9	17.54	952.86	18.04	952.83	19.53	952.83
29.59	947	29.6	946.99	31.58	945.68	34.45	943.62	36.62	943.62
38.32	944.47	43.32	944.47	58.75	937.22	78.75	937.22	94.45	945.07
112.31	945.8	119.38	947.31	128.36	948.22	144.59	949.65	155.19	954.238

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	43.32	.04	94.45	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
43.32	94.45	124.19	127.54	116.57	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
111	155.19		F

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	943.53	Wt. n-Val.		0.040	
Vel Head (ft)	0.56	Reach Len. (ft)	124.19	127.54	116.57
W.S. Elev (ft)	942.97	Flow Area (sq ft)		183.40	
Crit W.S. (ft)		Area (sq ft)		183.40	
E.G. Slope (ft/ft)	0.004171	Flow (cfs)		1100.00	
Q Total (cfs)	1100.00	Top Width (ft)		43.75	
Top Width (ft)	43.75	Avg. Vel. (ft/s)		6.00	
Vel Total (ft/s)	6.00	Hydr. Depth (ft)		4.19	
Max Chl Dpth (ft)	5.75	Conv. (cfs)		17033.3	
Conv. Total (cfs)	17033.3	Wetted Per. (ft)		46.40	
Length wtd. (ft)	127.54	Shear (lb/sq ft)		1.03	
Min Ch El (ft)	937.22	Stream Power (lb/ft s)		6.17	
Alpha	1.00				

Frctn Loss (ft)	0.44	Cum Volume (acre-ft)	2.50	11.41	1.44
C & E Loss (ft)	0.04	Cum SA (acres)	2.51	2.28	1.29

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	944.36	Wt. n-Val.		0.040	
Vel Head (ft)	0.57	Reach Len. (ft)	124.19	127.54	116.57
W.S. Elev (ft)	943.79	Flow Area (sq ft)		220.53	
Crit W.S. (ft)		Area (sq ft)		220.53	
E.G. Slope (ft/ft)	0.003713	Flow (cfs)		1340.00	
Q Total (cfs)	1340.00	Top Width (ft)		47.13	
Top Width (ft)	47.13	Avg. Vel. (ft/s)		6.08	
Vel Total (ft/s)	6.08	Hydr. Depth (ft)		4.68	
Max Chl Dpth (ft)	6.57	Conv. (cfs)		21991.1	
Conv. Total (cfs)	21991.1	Wetted Per. (ft)		50.14	
Length Wtd. (ft)	127.54	Shear (lb/sq ft)		1.02	
Min Ch El (ft)	937.22	Stream Power (lb/ft s)		6.19	
Alpha	1.00	Cum Volume (acre-ft)	2.05	13.34	0.33
Frctn Loss (ft)	0.40	Cum SA (acres)	1.78	2.39	0.24
C & E Loss (ft)	0.04				

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	945.35	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	0.58	Reach Len. (ft)	124.19	127.54	116.57
W.S. Elev (ft)	944.76	Flow Area (sq ft)	6.08	268.25	
Crit W.S. (ft)		Area (sq ft)	6.08	268.25	
E.G. Slope (ft/ft)	0.003213	Flow (cfs)	3.83	1646.17	
Q Total (cfs)	1650.00	Top Width (ft)	10.46	50.52	
Top Width (ft)	60.98	Avg. Vel. (ft/s)	0.63	6.14	
Vel Total (ft/s)	6.01	Hydr. Depth (ft)	0.58	5.31	
Max Chl Dpth (ft)	7.54	Conv. (cfs)	67.5	29041.5	
Conv. Total (cfs)	29109.0	Wetted Per. (ft)	11.03	53.92	
Length Wtd. (ft)	127.53	Shear (lb/sq ft)	0.11	1.00	
Min Ch El (ft)	937.22	Stream Power (lb/ft s)	0.07	6.12	
Alpha	1.04	Cum Volume (acre-ft)	7.45	14.44	3.52
Frctn Loss (ft)	0.34	Cum SA (acres)	3.96	2.44	2.39
C & E Loss (ft)	0.03				

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	946.49	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.64	Reach Len. (ft)	124.19	127.54	116.57
W.S. Elev (ft)	945.86	Flow Area (sq ft)	18.36	324.07	7.43
Crit W.S. (ft)		Area (sq ft)	18.36	324.07	7.55
E.G. Slope (ft/ft)	0.002796	Flow (cfs)	20.26	2086.89	2.85
Q Total (cfs)	2110.00	Top Width (ft)	12.01	51.13	18.13
Top Width (ft)	81.27	Avg. Vel. (ft/s)	1.10	6.44	0.38
Vel Total (ft/s)	6.03	Hydr. Depth (ft)	1.53	6.34	0.45
Max Chl Dpth (ft)	8.64	Conv. (cfs)	383.1	39463.6	53.9
Conv. Total (cfs)	39900.7	Wetted Per. (ft)	12.92	54.60	16.56
Length Wtd. (ft)	127.41	Shear (lb/sq ft)	0.25	1.04	0.08
Min Ch El (ft)	937.22	Stream Power (lb/ft s)	0.27	6.67	0.03
Alpha	1.13	Cum Volume (acre-ft)	11.65	16.50	5.53
Frctn Loss (ft)	0.31	Cum SA (acres)	4.69	2.51	3.25
C & E Loss (ft)	0.04				

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	946.91	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.78	Reach Len. (ft)	124.19	127.54	116.57
W.S. Elev (ft)	946.13	Flow Area (sq ft)	21.66	337.87	11.90
Crit W.S. (ft)		Area (sq ft)	21.66	337.87	12.61
E.G. Slope (ft/ft)	0.003259	Flow (cfs)	28.09	2415.16	6.75
Q Total (cfs)	2450.00	Top Width (ft)	12.42	51.13	19.39
Top Width (ft)	82.94	Avg. Vel. (ft/s)	1.30	7.15	0.57
Vel Total (ft/s)	6.60	Hydr. Depth (ft)	1.74	6.61	0.72
Max Chl Dpth (ft)	8.91	Conv. (cfs)	492.1	42303.3	118.2
Conv. Total (cfs)	42913.6	Wetted Per. (ft)	13.41	54.60	16.56
Length Wtd. (ft)	127.37	Shear (lb/sq ft)	0.33	1.26	0.15
Min Ch El (ft)	937.22	Stream Power (lb/ft s)	0.43	9.00	0.08
Alpha	1.16	Cum Volume (acre-ft)	14.40	17.74	7.20
Frctn Loss (ft)	0.36	Cum SA (acres)	4.97	2.54	3.92
C & E Loss (ft)	0.05				

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	947.48	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.87	Reach Len. (ft)	124.19	127.54	116.57
W.S. Elev (ft)	946.60	Flow Area (sq ft)	27.75	362.26	19.79
Crit W.S. (ft)		Area (sq ft)	27.75	362.26	22.40
E.G. Slope (ft/ft)	0.003332	Flow (cfs)	41.19	2742.88	15.93
Q Total (cfs)	2800.00	Top Width (ft)	13.14	51.13	21.63
Top Width (ft)	85.89	Avg. Vel. (ft/s)	1.48	7.57	0.80
Vel Total (ft/s)	6.83	Hydr. Depth (ft)	2.11	7.09	1.20
Max Chl Dpth (ft)	9.38	Conv. (cfs)	713.6	47514.9	276.0
Conv. Total (cfs)	48504.4	Wetted Per. (ft)	14.28	54.60	16.56
Length Wtd. (ft)	127.28	Shear (lb/sq ft)	0.40	1.38	0.25
Min Ch El (ft)	937.22	Stream Power (lb/ft s)	0.60	10.45	0.20
Alpha	1.20	Cum Volume (acre-ft)	16.62	18.98	9.65
Frctn Loss (ft)	0.37	Cum SA (acres)	5.09	2.58	4.82
C & E Loss (ft)	0.06				

CROSS SECTION OUTPUT Profile #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	948.70	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	1.09	Reach Len. (ft)	124.19	127.54	116.57
W.S. Elev (ft)	947.61	Flow Area (sq ft)	41.70	413.45	36.36
Crit W.S. (ft)		Area (sq ft)	41.70	413.45	46.62
E.G. Slope (ft/ft)	0.003548	Flow (cfs)	77.02	3527.68	45.30
Q Total (cfs)	3650.00	Top Width (ft)	14.77	51.13	27.85
Top Width (ft)	93.75	Avg. Vel. (ft/s)	1.85	8.53	1.25
Vel Total (ft/s)	7.43	Hydr. Depth (ft)	2.82	8.09	2.20
Max Chl Dpth (ft)	10.39	Conv. (cfs)	1293.1	59225.0	760.6
Conv. Total (cfs)	61278.6	Wetted Per. (ft)	16.20	54.60	16.56
Length Wtd. (ft)	127.10	Shear (lb/sq ft)	0.57	1.68	0.49
Min Ch El (ft)	937.22	Stream Power (lb/ft s)	1.05	14.31	0.61
Alpha	1.28	Cum Volume (acre-ft)	22.01	21.55	15.22
Frctn Loss (ft)	0.38	Cum SA (acres)	5.28	2.61	6.35
C & E Loss (ft)	0.09				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2668.395

INPUT
Description: 33
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	952.46	1.6	952.36	7.95	951.95	8.9	951.78	9.26	951.73
9.97	951.88	10.34	951.95	10.72	952.03	11.82	951.86	15.46	951.45
15.64	951.37	15.78	951.31	18.59	950.06	19.04	950.44	19.56	950.3
25	948.99	42.35	944.71	50.89	945.72	69.51	936.34	90.01	936.34
104.67	943.59	121.45	944.37	156.85	945	164.98	945.37	182.47	953.43
188.26	956.05								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	50.89	.04	104.67	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
50.89 104.67 18.55 17.72 17.36 .1 .3
Ineffective Flow num= 0
Sta L Sta R Elev Permanent

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	943.05	Wt. n-Val.		0.040	
Vel Head (ft)	0.44	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	942.62	Flow Area (sq ft)		207.59	
Crit W.S. (ft)	940.23	Area (sq ft)		207.59	
E.G. Slope (ft/ft)	0.002937	Flow (cfs)		1100.00	
Q Total (cfs)	1100.00	Top Width (ft)		45.65	
Top Width (ft)	45.65	Avg. Vel. (ft/s)		5.30	
Vel Total (ft/s)	5.30	Hydr. Depth (ft)		4.55	
Max Chl Dpth (ft)	6.28	Conv. (cfs)		20298.6	
Conv. Total (cfs)	20298.6	Wetted Per. (ft)		48.61	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		0.78	
Min Ch El (ft)	936.34	Stream Power (lb/ft s)		4.15	
Alpha	1.00	Cum Volume (acre-ft)	2.50	10.84	1.44
Frctn Loss (ft)		Cum SA (acres)	2.51	2.14	1.29
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	943.93	Wt. n-Val.		0.040	
Vel Head (ft)	0.45	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	943.48	Flow Area (sq ft)		248.42	
Crit W.S. (ft)	940.73	Area (sq ft)		248.42	
E.G. Slope (ft/ft)	0.002652	Flow (cfs)		1340.00	
Q Total (cfs)	1340.00	Top Width (ft)		49.10	
Top Width (ft)	49.10	Avg. Vel. (ft/s)		5.39	
Vel Total (ft/s)	5.39	Hydr. Depth (ft)		5.06	
Max Chl Dpth (ft)	7.14	Conv. (cfs)		26020.3	
Conv. Total (cfs)	26020.3	Wetted Per. (ft)		52.47	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		0.78	
Min Ch El (ft)	936.34	Stream Power (lb/ft s)		4.23	
Alpha	1.00	Cum Volume (acre-ft)	2.05	12.65	0.33
Frctn Loss (ft)		Cum SA (acres)	1.78	2.25	0.24
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	944.97	Wt. n-Val.		0.040	0.120
Vel Head (ft)	0.47	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	944.50	Flow Area (sq ft)		299.98	9.26
Crit W.S. (ft)	941.27	Area (sq ft)		299.98	9.26
E.G. Slope (ft/ft)	0.002275	Flow (cfs)		1647.12	2.88
Q Total (cfs)	1650.00	Top Width (ft)		51.36	24.23
Top Width (ft)	75.59	Avg. Vel. (ft/s)		5.49	0.31
Vel Total (ft/s)	5.34	Hydr. Depth (ft)		5.84	0.38
Max Chl Dpth (ft)	8.16	Conv. (cfs)		34529.5	60.4
Conv. Total (cfs)	34589.9	Wetted Per. (ft)		55.00	24.24
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		0.77	0.05
Min Ch El (ft)	936.34	Stream Power (lb/ft s)		4.25	0.02
Alpha	1.06	Cum Volume (acre-ft)	7.44	13.61	3.51
Frctn Loss (ft)		Cum SA (acres)	3.95	2.29	2.35
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	946.15	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.50	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	945.65	Flow Area (sq ft)	5.47	359.98	65.77
Crit W.S. (ft)	942.03	Area (sq ft)	5.47	359.98	65.77
E.G. Slope (ft/ft)	0.002077	Flow (cfs)	1.84	2069.14	39.02
Q Total (cfs)	2110.00	Top Width (ft)	11.70	53.63	60.91
Top Width (ft)	126.24	Avg. Vel. (ft/s)	0.34	5.75	0.59
Vel Total (ft/s)	4.89	Hydr. Depth (ft)	0.47	6.71	1.08
Max Chl Dpth (ft)	9.31	Conv. (cfs)	40.4	45403.7	856.3
Conv. Total (cfs)	46300.4	Wetted Per. (ft)	11.87	57.54	61.00
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.06	0.81	0.14
Min Ch El (ft)	936.34	Stream Power (lb/ft s)	0.02	4.66	0.08
Alpha	1.35	Cum Volume (acre-ft)	11.61	15.50	5.43
Frctn Loss (ft)		Cum SA (acres)	4.66	2.35	3.14
C & E Loss (ft)					

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	946.50	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.62	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	945.88	Flow Area (sq ft)	8.44	372.55	80.08
Crit W.S. (ft)	942.53	Area (sq ft)	8.44	372.55	80.08
E.G. Slope (ft/ft)	0.002475	Flow (cfs)	3.81	2387.41	58.79
Q Total (cfs)	2450.00	Top Width (ft)	13.28	53.78	61.42
Top Width (ft)	128.48	Avg. Vel. (ft/s)	0.45	6.41	0.73
Vel Total (ft/s)	5.31	Hydr. Depth (ft)	0.64	6.93	1.30
Max Chl Dpth (ft)	9.54	Conv. (cfs)	76.6	47986.0	1181.6
Conv. Total (cfs)	49244.1	Wetted Per. (ft)	13.48	57.70	61.56
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.10	1.00	0.20
Min Ch El (ft)	936.34	Stream Power (lb/ft s)	0.04	6.39	0.15
Alpha	1.42	Cum Volume (acre-ft)	14.35	16.70	7.08
Frctn Loss (ft)		Cum SA (acres)	4.93	2.39	3.81
C & E Loss (ft)					

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100yr

E.G. Elev (ft) 947.05 Element Left OB Channel Right OB

Vel Head (ft)	0.68	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	946.37	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	942.98	Flow Area (sq ft)	15.52	399.19	110.76
E.G. Slope (ft/ft)	0.002497	Area (sq ft)	15.52	399.19	110.76
Q Total (cfs)	2800.00	Flow (cfs)	9.59	2690.31	100.10
Top Width (ft)	131.56	Top Width (ft)	15.29	53.78	62.49
Vel Total (ft/s)	5.33	Avg. Vel. (ft/s)	0.62	6.74	0.90
Max Chl Dpth (ft)	10.03	Hydr. Depth (ft)	1.02	7.42	1.77
Conv. Total (cfs)	56033.8	Conv. (cfs)	191.9	53838.7	2003.2
Length Wtd. (ft)	4.00	Wetted Per. (ft)	15.55	57.70	62.74
Min Ch El (ft)	936.34	Shear (lb/sq ft)	0.16	1.08	0.28
Alpha	1.54	Stream Power (lb/ft s)	0.10	7.27	0.25
Frctn Loss (ft)		Cum Volume (acre-ft)	16.56	17.87	9.47
C & E Loss (ft)		Cum SA (acres)	5.04	2.42	4.71

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	948.23	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.81	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	947.42	Flow Area (sq ft)	33.76	455.55	177.43
Crit W.S. (ft)	944.03	Area (sq ft)	33.76	455.55	177.43
E.G. Slope (ft/ft)	0.002572	Flow (cfs)	30.14	3402.77	217.09
Q Total (cfs)	3650.00	Top Width (ft)	19.54	53.78	64.76
Top Width (ft)	138.08	Avg. Vel. (ft/s)	0.89	7.47	1.22
Vel Total (ft/s)	5.47	Hydr. Depth (ft)	1.73	8.47	2.74
Max Chl Dpth (ft)	11.08	Conv. (cfs)	594.3	67094.0	4280.6
Conv. Total (cfs)	71968.8	Wetted Per. (ft)	19.92	57.70	65.25
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.27	1.27	0.44
Min Ch El (ft)	936.34	Stream Power (lb/ft s)	0.24	9.47	0.53
Alpha	1.74	Cum Volume (acre-ft)	21.90	20.28	14.92
Frctn Loss (ft)		Cum SA (acres)	5.23	2.45	6.23
C & E Loss (ft)					

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 2662

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	955	950	500	955	950

Upstream Bridge Cross Section Data
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	952.46	1.6	952.36	7.95	951.95	8.9	951.78	9.26	951.73
9.97	951.88	10.34	951.95	10.72	952.03	11.82	951.86	15.46	951.45
15.64	951.37	15.78	951.31	18.59	950.06	19.04	950.44	19.56	950.3
25	948.99	42.35	944.71	50.89	945.72	69.51	936.34	90.01	936.34
104.67	943.59	121.45	944.37	156.85	945	164.98	945.37	182.47	953.43
188.26	956.05								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	50.89	.04	104.67	.12

Bank Sta: Left Right Coeff Contr. Expan.
50.89 104.67 .1 .3
Ineffective Flow num= 0

Sta L	Sta R	Elev	Permanent

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	955	950	500	955	950

Downstream Bridge Cross Section Data
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	952.52	2.7	952.44	4	952.4	4.18	952.4	12.2	951.84
12.79	951.81	12.96	951.79	13.17	951.76	14.16	951.65	14.26	951.67

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   15.65  951.95   17.07  951.72   19.96  951.27   20.16  951.24   20.17  951.24
   30.77   946.5   36.42  943.97    45.3  939.99   45.91  939.21   50.22   939.1
   51.24  939.07   51.58  939.47   52.67  941.17   54.17  943.51   57.49  943.66
   76.42  936.34   97.92  936.34  112.58  943.53   122.7  944.14  130.74  944.61
  132.49  944.65  135.41   944.7  173.13  944.96  191.38  953.59

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .12   57.49     .04  112.58     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
          57.49  112.58          .1        .3
Ineffective Flow      num=        1
   Sta L   Sta R    Elev  Permanent
       0   57.49  943.66        F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=   38.09    Downstream=   43.35
Upstream     num=       2
    Width   Elev    Width   Elev
        8    935        8    950
Downstream     num=       2
    Width   Elev    Width   Elev
        8    935        8    950

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
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 #2yr

  E.G. US. (ft)                 943.05    Element                  Inside BR US  Inside BR DS
  W.S. US. (ft)                 942.62    E.G. Elev (ft)               943.04        942.82
  Q Total (cfs)                1100.00    W.S. Elev (ft)               942.60        942.42
  Q Bridge (cfs)               1100.00    Crit W.S. (ft)               940.26        940.11
  Q Weir (cfs)                            Max Chl Dpth (ft)              6.26          6.08
  Weir Sta Lft (ft)                       Vel Total (ft/s)               5.32          5.09
  Weir Sta Rgt (ft)                       Flow Area (sq ft)            206.88        216.06
  Weir Submerg                            Froude # Chl                   0.44          0.43
  Weir Max Depth (ft)                     Specif Force (cu ft)         747.32        743.93
  Min El Weir Flow (ft)         955.01    Hydr Depth (ft)                4.54          4.36
  Min El Prs (ft)               950.00    W.P. Total (ft)               48.54         52.15
  Delta EG (ft)                   0.26    Conv. Total (cfs)          20203.1       20704.0
  Delta WS (ft)                   0.23    Top Width (ft)               45.59         55.73
  BR Open Area (sq ft)         1009.46    Frctn Loss (ft)
  BR Open Vel (ft/s)              5.32    C & E Loss (ft)
  Coef of Q                               Shear Total (lb/sq ft)        0.79          0.73
  Br Sel Method               Momentum    Power Total (lb/ft s)         4.19          3.72

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

BRIDGE OUTPUT  Profile #5yr

  E.G. US. (ft)                 943.93    Element                  Inside BR US  Inside BR DS
  W.S. US. (ft)                 943.48    E.G. Elev (ft)               943.92        943.67
  Q Total (cfs)                1340.00    W.S. Elev (ft)               943.46        943.25
  Q Bridge (cfs)               1340.00    Crit W.S. (ft)               940.72        940.56
```

Q Weir (cfs)		Max Chl Dpth (ft)	7.12	6.91
Weir Sta Lft (ft)		Vel Total (ft/s)	5.41	5.17
Weir Sta Rgt (ft)		Flow Area (sq ft)	247.73	258.94
Weir Submerg		Froude # Chl	0.42	0.41
Weir Max Depth (ft)		Specif Force (cu ft)	986.80	982.78
Min El Weir Flow (ft)	955.01	Hydr Depth (ft)	5.05	4.84
Min El Prs (ft)	950.00	W.P. Total (ft)	52.41	56.35
Delta EG (ft)	0.28	Conv. Total (cfs)	25921.2	26588.2
Delta WS (ft)	0.25	Top Width (ft)	49.05	60.11
BR Open Area (sq ft)	661.16	Frctn Loss (ft)		
BR Open Vel (ft/s)	5.41	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.79	0.73
Br Sel Method	Momentum	Power Total (lb/ft s)	4.27	3.77

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

BRIDGE OUTPUT Profile #10yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	944.97	E.G. Elev (ft)	944.96	944.48
W.S. US. (ft)	944.50	W.S. Elev (ft)	944.49	944.03
Q Total (cfs)	1650.00	Crit W.S. (ft)	941.30	941.09
Q Bridge (cfs)	1650.00	Max Chl Dpth (ft)	8.15	7.69
Q Weir (cfs)		Vel Total (ft/s)	5.35	4.93
Weir Sta Lft (ft)		Flow Area (sq ft)	308.33	334.84
Weir Sta Rgt (ft)		Froude # Chl	0.40	0.41
Weir Submerg		Specif Force (cu ft)	1326.38	1321.89
Weir Max Depth (ft)		Hydr Depth (ft)	4.12	4.37
Min El Weir Flow (ft)	955.01	W.P. Total (ft)	78.54	88.63
Min El Prs (ft)	950.00	Conv. Total (cfs)	34480.1	34146.9
Delta EG (ft)	0.51	Top Width (ft)	74.89	76.65
Delta WS (ft)	0.46	Frctn Loss (ft)		
BR Open Area (sq ft)	1009.46	C & E Loss (ft)		
BR Open Vel (ft/s)	5.35	Shear Total (lb/sq ft)	0.56	0.55
Coef of Q		Power Total (lb/ft s)	3.00	2.71
Br Sel Method	Momentum			

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

BRIDGE OUTPUT Profile #25yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	946.15	E.G. Elev (ft)	946.14	945.60
W.S. US. (ft)	945.65	W.S. Elev (ft)	945.63	945.10
Q Total (cfs)	2110.00	Crit W.S. (ft)	942.04	941.79
Q Bridge (cfs)	2110.00	Max Chl Dpth (ft)	9.29	8.76
Q Weir (cfs)		Vel Total (ft/s)	4.93	4.81
Weir Sta Lft (ft)		Flow Area (sq ft)	427.83	438.40
Weir Sta Rgt (ft)		Froude # Chl	0.39	0.39
Weir Submerg		Specif Force (cu ft)	1830.45	1823.94
Weir Max Depth (ft)		Hydr Depth (ft)	3.49	3.33
Min El Weir Flow (ft)	955.01	W.P. Total (ft)	127.43	145.95
Min El Prs (ft)	950.00	Conv. Total (cfs)	46115.0	46418.1
Delta EG (ft)	0.57	Top Width (ft)	122.52	131.55
Delta WS (ft)	0.52	Frctn Loss (ft)		
BR Open Area (sq ft)	1009.46	C & E Loss (ft)		
BR Open Vel (ft/s)	4.93	Shear Total (lb/sq ft)	0.44	0.39
Coef of Q		Power Total (lb/ft s)	2.16	1.86
Br Sel Method	Momentum			

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

BRIDGE OUTPUT Profile #50yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	946.50	E.G. Elev (ft)	946.49	945.94
W.S. US. (ft)	945.88	W.S. Elev (ft)	945.86	945.33
Q Total (cfs)	2450.00	Crit W.S. (ft)	942.53	942.27
Q Bridge (cfs)	2450.00	Max Chl Dpth (ft)	9.52	8.99
Q Weir (cfs)		Vel Total (ft/s)	5.37	5.23
Weir Sta Lft (ft)		Flow Area (sq ft)	456.06	468.20
Weir Sta Rgt (ft)		Froude # Chl	0.43	0.43
Weir Submerg		Specif Force (cu ft)	2038.93	2033.02
Weir Max Depth (ft)		Hydr Depth (ft)	3.68	3.53
Min El Weir Flow (ft)	955.01	W.P. Total (ft)	129.17	147.48
Min El Prs (ft)	950.00	Conv. Total (cfs)	48951.5	49345.3
Delta EG (ft)	0.58	Top Width (ft)	123.95	132.53
Delta WS (ft)	0.52	Frctn Loss (ft)		
BR Open Area (sq ft)	1009.46			

BR Open Vel (ft/s)	5.37	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.55	0.49
Br Sel Method	Momentum	Power Total (lb/ft s)	2.97	2.56

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

BRIDGE OUTPUT Profile #100yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	947.05	E.G. Elev (ft)	947.03	946.47
W.S. US. (ft)	946.37	W.S. Elev (ft)	946.35	945.80
Q Total (cfs)	2800.00	Crit W.S. (ft)	943.02	942.73
Q Bridge (cfs)	2800.00	Max Chl Dpth (ft)	10.01	9.46
Q Weir (cfs)		Vel Total (ft/s)	5.42	5.28
Weir Sta Lft (ft)		Flow Area (sq ft)	516.75	530.35
Weir Sta Rgt (ft)		Froude # Chl	0.44	0.44
Weir Submerg		Specif Force (cu ft)	2367.46	2358.75
Weir Max Depth (ft)		Hydr Depth (ft)	4.13	3.94
Min El Weir Flow (ft)	955.01	W.P. Total (ft)	130.82	150.64
Min El Prs (ft)	950.00	Conv. Total (cfs)	55571.9	55725.2
Delta EG (ft)	0.60	Top Width (ft)	125.01	134.56
Delta WS (ft)	0.54	Frctn Loss (ft)		
BR Open Area (sq ft)	1009.46	C & E Loss (ft)		
BR Open Vel (ft/s)	5.42	Shear Total (lb/sq ft)	0.63	0.55
Coef of Q		Power Total (lb/ft s)	3.39	2.93
Br Sel Method	Momentum			

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

BRIDGE OUTPUT Profile #500yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	948.23	E.G. Elev (ft)	948.21	947.62
W.S. US. (ft)	947.42	W.S. Elev (ft)	947.38	946.79
Q Total (cfs)	3650.00	Crit W.S. (ft)	944.06	943.69
Q Bridge (cfs)	3650.00	Max Chl Dpth (ft)	11.04	10.45
Q Weir (cfs)		Vel Total (ft/s)	5.64	5.48
Weir Sta Lft (ft)		Flow Area (sq ft)	647.38	666.09
Weir Sta Rgt (ft)		Froude # Chl	0.46	0.46
Weir Submerg		Specif Force (cu ft)	3205.62	3194.65
Weir Max Depth (ft)		Hydr Depth (ft)	4.99	4.80
Min El Weir Flow (ft)	955.01	W.P. Total (ft)	137.56	157.38
Min El Prs (ft)	950.00	Conv. Total (cfs)	70979.5	70772.8
Delta EG (ft)	0.65	Top Width (ft)	129.79	138.87
Delta WS (ft)	0.59	Frctn Loss (ft)		
BR Open Area (sq ft)	1009.46	C & E Loss (ft)		
BR Open Vel (ft/s)	5.64	Shear Total (lb/sq ft)	0.78	0.70
Coef of Q		Power Total (lb/ft s)	4.38	3.85
Br Sel Method	Momentum			

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2650.675

INPUT
Description: 34
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	952.52	2.7	952.44	4	952.4	4.18	952.4	12.2	951.84
12.79	951.81	12.96	951.79	13.17	951.76	14.16	951.65	14.26	951.67
15.65	951.95	17.07	951.72	19.96	951.27	20.16	951.24	20.17	951.24
30.77	946.5	36.42	943.97	45.3	939.99	45.91	939.21	50.22	939.1
51.24	939.07	51.58	939.47	52.67	941.17	54.17	943.51	57.49	943.66
76.42	936.34	97.92	936.34	112.58	943.53	122.7	944.14	130.74	944.61
132.49	944.65	135.41	944.7	173.13	944.96	191.38	953.59		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	57.49	.04	112.58	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
57.49	112.58	124.24	112.8	97.76	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	57.49	943.66	F

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	942.80	Wt. n-Val.		0.040	
Vel Head (ft)	0.41	Reach Len. (ft)	124.24	112.80	97.76
W.S. Elev (ft)	942.39	Flow Area (sq ft)		214.65	
Crit W.S. (ft)	940.11	Area (sq ft)	29.22	214.65	
E.G. Slope (ft/ft)	0.002875	Flow (cfs)		1100.00	
Q Total (cfs)	1100.00	Top Width (ft)	13.50	49.47	
Top Width (ft)	62.98	Avg. Vel. (ft/s)		5.12	
Vel Total (ft/s)	5.12	Hydr. Depth (ft)		4.34	
Max Chl Dpth (ft)	6.05	Conv. (cfs)		20516.3	
Conv. Total (cfs)	20516.3	Wetted Per. (ft)		52.01	
Length Wtd. (ft)	113.18	Shear (lb/sq ft)		0.74	
Min Ch El (ft)	936.34	Stream Power (lb/ft s)		3.80	
Alpha	1.00	Cum Volume (acre-ft)	2.49	10.76	1.44
Frctn Loss (ft)	0.47	Cum SA (acres)	2.50	2.13	1.29
C & E Loss (ft)	0.04				

Warning: Divided flow computed for this cross-section.
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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	943.65	Wt. n-Val.		0.040	
Vel Head (ft)	0.42	Reach Len. (ft)	124.24	112.80	97.76
W.S. Elev (ft)	943.23	Flow Area (sq ft)		257.66	
Crit W.S. (ft)	940.56	Area (sq ft)	37.28	257.66	
E.G. Slope (ft/ft)	0.002575	Flow (cfs)		1340.00	
Q Total (cfs)	1340.00	Top Width (ft)	11.56	53.34	
Top Width (ft)	64.90	Avg. Vel. (ft/s)		5.20	
Vel Total (ft/s)	5.20	Hydr. Depth (ft)		4.83	
Max Chl Dpth (ft)	6.89	Conv. (cfs)		26407.2	
Conv. Total (cfs)	26407.2	Wetted Per. (ft)		56.23	
Length Wtd. (ft)	112.80	Shear (lb/sq ft)		0.74	
Min Ch El (ft)	936.34	Stream Power (lb/ft s)		3.83	
Alpha	1.00	Cum Volume (acre-ft)	2.04	12.55	0.33
Frctn Loss (ft)	0.51	Cum SA (acres)	1.78	2.23	0.24
C & E Loss (ft)	0.09				

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

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	944.46	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.42	Reach Len. (ft)	124.24	112.80	97.76
W.S. Elev (ft)	944.04	Flow Area (sq ft)	56.95	302.45	2.20
Crit W.S. (ft)	941.09	Area (sq ft)	56.95	302.45	2.20
E.G. Slope (ft/ft)	0.002226	Flow (cfs)	57.78	1591.71	0.52
Q Total (cfs)	1650.00	Top Width (ft)	21.24	55.09	8.54
Top Width (ft)	84.86	Avg. Vel. (ft/s)	1.01	5.26	0.24
Vel Total (ft/s)	4.56	Hydr. Depth (ft)	2.68	5.49	0.26
Max Chl Dpth (ft)	7.70	Conv. (cfs)	1224.7	33738.6	11.0
Conv. Total (cfs)	34974.2	Wetted Per. (ft)	24.88	58.12	8.55
Length Wtd. (ft)	113.43	Shear (lb/sq ft)	0.32	0.72	0.04
Min Ch El (ft)	936.34	Stream Power (lb/ft s)	0.32	3.81	0.01
Alpha	1.28	Cum Volume (acre-ft)	7.43	13.49	3.51
Frctn Loss (ft)	0.40	Cum SA (acres)	3.95	2.27	2.35
C & E Loss (ft)	0.06				

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

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	945.58	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.45	Reach Len. (ft)	124.24	112.80	97.76
W.S. Elev (ft)	945.13				

Crit W.S. (ft)	941.79	Flow Area (sq ft)	81.22	362.02	32.46
E.G. Slope (ft/ft)	0.001944	Area (sq ft)	81.22	362.02	32.46
Q Total (cfs)	2110.00	Flow (cfs)	91.21	2007.15	11.64
Top Width (ft)	139.64	Top Width (ft)	23.65	55.09	60.90
Vel Total (ft/s)	4.44	Avg. Vel. (ft/s)	1.12	5.54	0.36
Max Chl Dpth (ft)	8.79	Hydr. Depth (ft)	3.43	6.57	0.53
Conv. Total (cfs)	47857.6	Conv. (cfs)	2068.7	45524.8	264.1
Length Wtd. (ft)	113.86	Wetted Per. (ft)	27.53	58.12	60.97
Min Ch El (ft)	936.34	Shear (lb/sq ft)	0.36	0.76	0.06
Alpha	1.49	Stream Power (lb/ft s)	0.40	4.19	0.02
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)	11.60	15.36	5.41
C & E Loss (ft)	0.03	Cum SA (acres)	4.65	2.33	3.12

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

CROSS SECTION OUTPUT Profile #50yr

E.G. Elev (ft)	945.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.56	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	945.36	Reach Len. (ft)	124.24	112.80	97.76
Crit W.S. (ft)	942.27	Flow Area (sq ft)	86.77	374.82	46.67
E.G. Slope (ft/ft)	0.002308	Area (sq ft)	86.77	374.82	46.67
Q Total (cfs)	2450.00	Flow (cfs)	109.46	2317.44	23.09
Top Width (ft)	140.65	Top Width (ft)	24.17	55.09	61.39
Vel Total (ft/s)	4.82	Avg. Vel. (ft/s)	1.26	6.18	0.49
Max Chl Dpth (ft)	9.02	Hydr. Depth (ft)	3.59	6.80	0.76
Conv. Total (cfs)	50997.7	Conv. (cfs)	2278.5	48238.5	480.7
Length Wtd. (ft)	113.82	Wetted Per. (ft)	28.10	58.12	61.51
Min Ch El (ft)	936.34	Shear (lb/sq ft)	0.44	0.93	0.11
Alpha	1.56	Stream Power (lb/ft s)	0.56	5.74	0.05
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	14.34	16.55	7.05
C & E Loss (ft)	0.05	Cum SA (acres)	4.92	2.37	3.79

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

CROSS SECTION OUTPUT Profile #100yr

E.G. Elev (ft)	946.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.62	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	945.83	Reach Len. (ft)	124.24	112.80	97.76
Crit W.S. (ft)	942.73	Flow Area (sq ft)	98.46	400.90	75.97
E.G. Slope (ft/ft)	0.002349	Area (sq ft)	98.46	400.90	75.97
Q Total (cfs)	2800.00	Flow (cfs)	132.71	2615.42	51.86
Top Width (ft)	142.71	Top Width (ft)	25.23	55.09	62.39
Vel Total (ft/s)	4.87	Avg. Vel. (ft/s)	1.35	6.52	0.68
Max Chl Dpth (ft)	9.49	Hydr. Depth (ft)	3.90	7.28	1.22
Conv. Total (cfs)	57770.2	Conv. (cfs)	2738.2	53961.9	1070.1
Length Wtd. (ft)	113.85	Wetted Per. (ft)	29.26	58.12	62.62
Min Ch El (ft)	936.34	Shear (lb/sq ft)	0.49	1.01	0.18
Alpha	1.68	Stream Power (lb/ft s)	0.67	6.60	0.12
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	16.54	17.70	9.44
C & E Loss (ft)	0.05	Cum SA (acres)	5.04	2.40	4.68

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

CROSS SECTION OUTPUT Profile #500yr

E.G. Elev (ft)	947.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.75	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	946.83	Reach Len. (ft)	124.24	112.80	97.76
Crit W.S. (ft)	943.67	Flow Area (sq ft)	124.81	455.98	139.42
E.G. Slope (ft/ft)	0.002459	Area (sq ft)	124.81	455.98	139.42
Q Total (cfs)	3650.00	Flow (cfs)	191.07	3316.49	142.44
Top Width (ft)	147.06	Top Width (ft)	27.46	55.09	64.51
Vel Total (ft/s)	5.07	Avg. Vel. (ft/s)	1.53	7.27	1.02
Max Chl Dpth (ft)	10.49	Hydr. Depth (ft)	4.54	8.28	2.16

Conv. Total (cfs)	73603.1	Conv. (cfs)	3853.0	66877.7	2872.4
Length Wtd. (ft)	113.80	Wetted Per. (ft)	31.70	58.12	64.96
Min Ch El (ft)	936.34	Shear (lb/sq ft)	0.60	1.20	0.33
Alpha	1.88	Stream Power (lb/ft s)	0.93	8.76	0.34
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	21.88	20.09	14.85
C & E Loss (ft)	0.05	Cum SA (acres)	5.23	2.43	6.20

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: Hope Creek
REACH: 1 RS: 2537.862

INPUT
Description: 35
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.57	1.68	951.52	5.06	951.33	7.62	951.19	10.6	951.03
11.7	950.9	11.87	950.88	12	950.91	12.29	950.97	12.64	951.03
13.02	951.11	13.52	951.21	14.36	951.15	17.81	950.89	18.02	950.79
24.82	947.51	36.7	941.84	42.07	939.73	44.05	938.98	47.25	938.91
55.82	938.83	58.75	939.7	59.89	940.18	64.72	942.21	74.58	942.62
86.01	942.94	86.62	942.94	105.3	943.01	110.95	943.14	112.96	941.41
119.14	935.6	126.05	935.54	137.81	935.66	139.43	939.26	143.82	943.94
147.5	944.04	163.97	943.74	166.25	943.69	175.41	944.27	205.66	948.76
230.07	953.39								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	110.95	.04	143.82	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
110.95	143.82	18.67	17.03	20.7	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
147.5	230.07	944.04	F

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	942.29	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	0.82	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	941.47	Flow Area (sq ft)	48.54	136.86	
Crit W.S. (ft)	940.18	Area (sq ft)	48.54	136.86	
E.G. Slope (ft/ft)	0.006432	Flow (cfs)	72.60	1027.40	
Q Total (cfs)	1100.00	Top Width (ft)	25.31	28.61	
Top Width (ft)	53.92	Avg. Vel. (ft/s)	1.50	7.51	
Vel Total (ft/s)	5.93	Hydr. Depth (ft)	1.92	4.78	
Max Chl Dpth (ft)	5.93	Conv. (cfs)	905.3	12810.2	
Conv. Total (cfs)	13715.5	Wetted Per. (ft)	26.26	34.22	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.74	1.61	
Min Ch El (ft)	935.54	Stream Power (lb/ft s)	1.11	12.06	
Alpha	1.50	Cum Volume (acre-ft)	2.38	10.30	1.44
Frctn Loss (ft)	0.03	Cum SA (acres)	2.45	2.02	1.29
C & E Loss (ft)	0.01				

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	943.05	Wt. n-Val.		0.040	
Vel Head (ft)	1.36	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	941.68	Flow Area (sq ft)		143.06	
Crit W.S. (ft)	940.67	Area (sq ft)		143.06	
E.G. Slope (ft/ft)	0.009670	Flow (cfs)		1340.00	
Q Total (cfs)	1340.00	Top Width (ft)		29.06	
Top Width (ft)	29.06	Avg. Vel. (ft/s)		9.37	
Vel Total (ft/s)	9.37	Hydr. Depth (ft)		4.92	
Max Chl Dpth (ft)	6.14	Conv. (cfs)		13627.0	
Conv. Total (cfs)	13627.0	Wetted Per. (ft)		34.84	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		2.48	
Min Ch El (ft)	935.54	Stream Power (lb/ft s)		23.22	
Alpha	1.00	Cum Volume (acre-ft)	1.99	12.03	0.33
Frctn Loss (ft)	0.04	Cum SA (acres)	1.76	2.12	0.24
C & E Loss (ft)	0.01				

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

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	944.01	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	0.99	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	943.01	Flow Area (sq ft)	101.78	183.57	
Crit W.S. (ft)	941.36	Area (sq ft)	101.78	183.57	
E.G. Slope (ft/ft)	0.006276	Flow (cfs)	124.99	1525.01	
Q Total (cfs)	1650.00	Top Width (ft)	71.20	31.85	
Top Width (ft)	103.06	Avg. Vel. (ft/s)	1.23	8.31	
Vel Total (ft/s)	5.78	Hydr. Depth (ft)	1.43	5.76	
Max Chl Dpth (ft)	7.47	Conv. (cfs)	1577.8	19250.6	
Conv. Total (cfs)	20828.5	Wetted Per. (ft)	72.65	38.70	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.55	1.86	
Min Ch El (ft)	935.54	Stream Power (lb/ft s)	0.67	15.44	
Alpha	1.91	Cum Volume (acre-ft)	7.20	12.86	3.50
Frctn Loss (ft)	0.03	Cum SA (acres)	3.81	2.16	2.34
C & E Loss (ft)	0.01				

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	945.24	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.78	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	944.46	Flow Area (sq ft)	214.34	230.61	17.23
Crit W.S. (ft)	942.16	Area (sq ft)	214.34	230.61	17.23
E.G. Slope (ft/ft)	0.004173	Flow (cfs)	326.65	1774.39	8.96
Q Total (cfs)	2110.00	Top Width (ft)	79.73	32.87	32.85
Top Width (ft)	145.45	Avg. Vel. (ft/s)	1.52	7.69	0.52
Vel Total (ft/s)	4.57	Hydr. Depth (ft)	2.69	7.02	0.52
Max Chl Dpth (ft)	8.92	Conv. (cfs)	5056.4	27466.3	138.7
Conv. Total (cfs)	32661.3	Wetted Per. (ft)	81.51	40.17	32.89
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.69	1.50	0.14
Min Ch El (ft)	935.54	Stream Power (lb/ft s)	1.04	11.51	0.07
Alpha	2.41	Cum Volume (acre-ft)	11.18	14.59	5.36
Frctn Loss (ft)	0.02	Cum SA (acres)	4.50	2.22	3.01
C & E Loss (ft)	0.02				

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

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	945.47	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	1.09	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	944.38	Flow Area (sq ft)	208.18	228.07	14.71
Crit W.S. (ft)	942.22	Area (sq ft)	208.18	228.07	14.71
E.G. Slope (ft/ft)	0.005900	Flow (cfs)	370.53	2071.19	8.27
Q Total (cfs)	2450.00	Top Width (ft)	79.57	32.87	32.33
Top Width (ft)	144.77	Avg. Vel. (ft/s)	1.78	9.08	0.56
Vel Total (ft/s)	5.43	Hydr. Depth (ft)	2.62	6.94	0.46
Max Chl Dpth (ft)	8.84	Conv. (cfs)	4823.8	26963.9	107.7
Conv. Total (cfs)	31895.5	Wetted Per. (ft)	81.33	40.17	32.36
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.94	2.09	0.17
Min Ch El (ft)	935.54	Stream Power (lb/ft s)	1.68	18.99	0.09
Alpha	2.38	Cum Volume (acre-ft)	13.92	15.77	6.99
Frctn Loss (ft)	0.04	Cum SA (acres)	4.78	2.25	3.68
C & E Loss (ft)	0.12				

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

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	946.00	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	1.12	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	944.88	Flow Area (sq ft)	248.53	244.63	31.85
Crit W.S. (ft)	943.74	Area (sq ft)	248.53	244.63	31.85
E.G. Slope (ft/ft)	0.005700				

Q Total (cfs)	2800.00	Flow (cfs)	484.60	2287.85	27.55
Top Width (ft)	149.22	Top Width (ft)	80.63	32.87	35.72
Vel Total (ft/s)	5.33	Avg. Vel. (ft/s)	1.95	9.35	0.86
Max Chl Dpth (ft)	9.34	Hydr. Depth (ft)	3.08	7.44	0.89
Conv. Total (cfs)	37088.3	Conv. (cfs)	6419.0	30304.4	364.9
Length Wtd. (ft)	4.00	Wetted Per. (ft)	82.50	40.17	35.79
Min Ch El (ft)	935.54	Shear (lb/sq ft)	1.07	2.17	0.32
Alpha	2.54	Stream Power (lb/ft s)	2.09	20.27	0.27
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	16.04	16.87	9.31
C & E Loss (ft)	0.09	Cum SA (acres)	4.89	2.29	4.57

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

CROSS SECTION OUTPUT Profile #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	947.13	Element			
Vel Head (ft)	1.21	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	945.92	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	944.67	Flow Area (sq ft)	333.23	278.70	72.50
E.G. Slope (ft/ft)	0.005503	Area (sq ft)	333.23	278.70	72.50
Q Total (cfs)	3650.00	Flow (cfs)	761.61	2793.83	94.56
Top Width (ft)	158.37	Top Width (ft)	82.80	32.87	42.71
Vel Total (ft/s)	5.33	Avg. Vel. (ft/s)	2.29	10.02	1.30
Max Chl Dpth (ft)	10.38	Hydr. Depth (ft)	4.02	8.48	1.70
Conv. Total (cfs)	49202.7	Conv. (cfs)	10266.6	37661.3	1274.7
Length Wtd. (ft)	4.00	Wetted Per. (ft)	84.91	40.17	42.85
Min Ch El (ft)	935.54	Shear (lb/sq ft)	1.35	2.38	0.58
Alpha	2.74	Stream Power (lb/ft s)	3.08	23.89	0.76
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	21.22	19.14	14.62
C & E Loss (ft)	0.10	Cum SA (acres)	5.07	2.32	6.08

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: Hope Creek
REACH: 1 RS: 2532

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
0	955	950	500	955	950

Upstream Bridge Cross Section Data
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.58	1.68	951.53	5.06	951.34	7.62	951.2	10.6	951.04
11.7	950.91	11.87	950.89	12	950.92	12.29	950.98	12.64	951.04
13.02	951.12	13.52	951.22	14.36	951.16	17.81	950.9	18.02	950.8
24.82	947.52	36.7	941.85	42.07	939.74	44.05	938.99	47.25	938.92
55.82	938.84	58.75	939.71	59.89	940.19	64.72	942.22	74.58	942.63
86.01	942.95	86.62	942.95	105.3	943.02	110.95	943.15	112.96	941.42
119.14	935.61	126.05	935.55	137.81	935.67	139.43	939.27	143.82	943.95
147.5	944.05	163.97	943.75	166.25	943.7	175.41	944.28	205.66	948.77
230.07	953.4								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	110.95	.04	143.82	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
110.95	143.82	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
147.5	230.07	944.04	F

```
Downstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0     955     950      500     955     950

Downstream Bridge Cross Section Data
Station Elevation Data    num=      42
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  951.51    3.81  951.37    8.01  951.12    9.39  951.04   11.26  950.94
   12.64  950.87   13.62  950.76   13.96  950.73   14.51  950.83   15.61  951.05
   15.95  951.02   16.64  950.97   17.53  950.89   19.82  950.72   26.26  947.68
   27.23  947.22   39.19  941.51   41.84  940.47   46.14  938.84   53.11  938.68
   57.31  938.64   61.73  939.95   63.61   940.5   66.59  941.75   87.09  942.62
   91.05  942.73    92.4  942.77  101.58   942.8  119.91  943.24   126.7  937.37
  128.49  935.69  135.82  935.63  146.19  935.56  149.97  939.72  153.79  943.79
  159.23  943.93  163.68  944.05  166.92  943.99  177.85  945.02  184.02  945.43
  215.35  946.47  230.24  949.27

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .12  119.91     .04  153.79     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
        119.91  153.79          .1         .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev  Permanent
       0  119.91     943       F

Upstream Embankment side slope              =      0 horiz. to 1.0 vertical
Downstream Embankment side slope            =      0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=   40.29    Downstream=    42.2
Upstream     num=       2
    Width   Elev    Width   Elev
        8    935        8    950
Downstream     num=       2
    Width   Elev    Width   Elev
        8    935        8    950

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
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 #2yr

 E.G. US. (ft)                 942.29   Element                  Inside BR US  Inside BR DS
 W.S. US. (ft)                 941.47   E.G. Elev (ft)               942.25        942.16
 Q Total (cfs)                1100.00   W.S. Elev (ft)               941.35        940.87
 Q Bridge (cfs)               1100.00   Crit W.S. (ft)               940.17        940.14
 Q Weir (cfs)                           Max Chl Dpth (ft)              5.80          5.31
 Weir Sta Lft (ft)                      Vel Total (ft/s)               6.45          9.12
 Weir Sta Rgt (ft)                      Flow Area (sq ft)            170.64        120.57
 Weir Submerg                           Froude # Chl                   0.64          0.78
 Weir Max Depth (ft)                    Specif Force (cu ft)         655.41        603.43
 Min El Weir Flow (ft)         955.01   Hydr Depth (ft)                3.65          4.25
 Min El Prs (ft)               950.00   W.P. Total (ft)               55.02         32.70
 Delta EG (ft)                   0.25   Conv. Total (cfs)          13005.6       10688.9
 Delta WS (ft)                   1.11   Top Width (ft)                46.70         46.69
 BR Open Area (sq ft)         1324.58   Frctn Loss (ft)                0.05          0.09
 BR Open Vel (ft/s)              9.12   C & E Loss (ft)                0.04          0.04
 Coef of Q                              Shear Total (lb/sq ft)         1.39          2.44
```

Br Sel Method	Energy only	Power Total (lb/ft s)	8.93	22.24

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

BRIDGE OUTPUT Profile #5yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	943.05	E.G. Elev (ft)	943.00	942.94
W.S. US. (ft)	941.68	W.S. Elev (ft)	941.57	941.49
Q Total (cfs)	1340.00	Crit W.S. (ft)	940.68	940.72
Q Bridge (cfs)	1340.00	Max Chl Dpth (ft)	6.02	5.93
Q Weir (cfs)		Vel Total (ft/s)	9.60	9.67
Weir Sta Lft (ft)		Flow Area (sq ft)	139.58	138.59
Weir Sta Rgt (ft)		Froude # Chl	0.77	0.79
Weir Submerg		Specif Force (cu ft)	786.68	774.47
Weir Max Depth (ft)		Hydr Depth (ft)	4.85	4.67
Min El Weir Flow (ft)	955.01	W.P. Total (ft)	34.49	34.50
Min El Prs (ft)	950.00	Conv. Total (cfs)	13166.6	13009.1
Delta EG (ft)	0.24	Top Width (ft)	28.81	30.62
Delta WS (ft)	0.85	Frctn Loss (ft)	0.06	0.09
BR Open Area (sq ft)	787.01	C & E Loss (ft)	0.00	0.05
BR Open Vel (ft/s)	9.67	Shear Total (lb/sq ft)	2.62	2.66
Coef of Q		Power Total (lb/ft s)	25.12	25.72
Br Sel Method	Energy only			

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

BRIDGE OUTPUT Profile #10yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	944.01	E.G. Elev (ft)	943.97	943.87
W.S. US. (ft)	943.01	W.S. Elev (ft)	942.90	942.26
Q Total (cfs)	1650.00	Crit W.S. (ft)	941.34	941.38
Q Bridge (cfs)	1650.00	Max Chl Dpth (ft)	7.35	6.70
Q Weir (cfs)		Vel Total (ft/s)	6.48	10.18
Weir Sta Lft (ft)		Flow Area (sq ft)	254.70	162.04
Weir Sta Rgt (ft)		Froude # Chl	0.63	0.79
Weir Submerg		Specif Force (cu ft)	1140.66	1009.36
Weir Max Depth (ft)		Hydr Depth (ft)	3.47	5.18
Min El Weir Flow (ft)	955.01	W.P. Total (ft)	85.67	36.73
Min El Prs (ft)	950.00	Conv. Total (cfs)	19984.5	16190.2
Delta EG (ft)	0.30	Top Width (ft)	73.31	64.27
Delta WS (ft)	1.60	Frctn Loss (ft)	0.05	0.09
BR Open Area (sq ft)	1324.58	C & E Loss (ft)	0.05	0.07
BR Open Vel (ft/s)	10.18	Shear Total (lb/sq ft)	1.27	2.86
Coef of Q		Power Total (lb/ft s)	8.20	29.13
Br Sel Method	Energy only			

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
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, energy was used.
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, energy was used.

BRIDGE OUTPUT Profile #25yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	945.24	E.G. Elev (ft)	945.20	945.14
W.S. US. (ft)	944.46	W.S. Elev (ft)	944.25	944.29
Q Total (cfs)	2110.00	Crit W.S. (ft)	942.17	942.30
Q Bridge (cfs)	2110.00	Max Chl Dpth (ft)	8.70	8.73
Q Weir (cfs)		Vel Total (ft/s)	5.28	4.92
Weir Sta Lft (ft)		Flow Area (sq ft)	399.96	429.01
Weir Sta Rgt (ft)		Froude # Chl	0.56	0.54
Weir Submerg				

Weir Max Depth (ft)		Specif Force (cu ft)	1650.12	1687.54
Min El Weir Flow (ft)	955.01	Hydr Depth (ft)	2.96	3.33
Min El Prs (ft)	950.00	W.P. Total (ft)	151.14	143.98
Delta EG (ft)	0.32	Conv. Total (cfs)	29557.0	31346.2
Delta WS (ft)	2.13	Top Width (ft)	135.20	128.68
BR Open Area (sq ft)	1324.58	Frctn Loss (ft)	0.03	0.05
BR Open Vel (ft/s)	5.28	C & E Loss (ft)	0.03	0.17
Coef of Q		Shear Total (lb/sq ft)	0.84	0.84
Br Sel Method	Energy only	Power Total (lb/ft s)	4.44	4.15

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

BRIDGE OUTPUT Profile #50yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	945.47	E.G. Elev (ft)	945.31	945.17
W.S. US. (ft)	944.38	W.S. Elev (ft)	942.98	943.04
Q Total (cfs)	2450.00	Crit W.S. (ft)	942.22	943.01
Q Bridge (cfs)	2450.00	Max Chl Dpth (ft)	7.43	7.48
Q Weir (cfs)		Vel Total (ft/s)	9.40	8.55
Weir Sta Lft (ft)		Flow Area (sq ft)	260.78	286.68
Weir Sta Rgt (ft)		Froude # Chl	0.93	0.90
Weir Submerg		Specif Force (cu ft)	1657.39	1648.67
Weir Max Depth (ft)		Hydr Depth (ft)	3.11	2.85
Min El Weir Flow (ft)	955.01	W.P. Total (ft)	96.47	112.61
Min El Prs (ft)	950.00	Conv. Total (cfs)	20267.5	21308.1
Delta EG (ft)	0.42	Top Width (ft)	83.86	100.51
Delta WS (ft)	1.37	Frctn Loss (ft)	0.08	0.09
BR Open Area (sq ft)	1324.58	C & E Loss (ft)	0.06	0.03
BR Open Vel (ft/s)	9.40	Shear Total (lb/sq ft)	2.47	2.10
Coef of Q		Power Total (lb/ft s)	23.17	17.96
Br Sel Method	Energy only			

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

BRIDGE OUTPUT Profile #100yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	946.00	E.G. Elev (ft)	945.88	945.70
W.S. US. (ft)	944.88	W.S. Elev (ft)	943.81	943.72
Q Total (cfs)	2800.00	Crit W.S. (ft)	943.81	943.72
Q Bridge (cfs)	2800.00	Max Chl Dpth (ft)	8.26	8.16
Q Weir (cfs)		Vel Total (ft/s)	8.14	7.76
Weir Sta Lft (ft)		Flow Area (sq ft)	344.15	360.81
Weir Sta Rgt (ft)		Froude # Chl	0.85	0.84
Weir Submerg		Specif Force (cu ft)	1964.25	1945.23
Weir Max Depth (ft)		Hydr Depth (ft)	3.34	3.25
Min El Weir Flow (ft)	955.01	W.P. Total (ft)	117.95	125.15
Min El Prs (ft)	950.00	Conv. Total (cfs)	25843.6	26252.9
Delta EG (ft)	0.45	Top Width (ft)	110.13	111.16
Delta WS (ft)	1.20	Frctn Loss (ft)	0.07	
BR Open Area (sq ft)	1324.58	C & E Loss (ft)	0.03	
BR Open Vel (ft/s)	8.14	Shear Total (lb/sq ft)	2.14	2.05
Coef of Q		Power Total (lb/ft s)	17.40	15.89
Br Sel Method	Energy only			

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
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: 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, energy was used.

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.

BRIDGE OUTPUT Profile #500yr

E.G. US. (ft)	947.13	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	945.92	E.G. Elev (ft)	947.00	946.81
Q Total (cfs)	3650.00	W.S. Elev (ft)	944.80	944.56
Q Bridge (cfs)	3650.00	Crit W.S. (ft)	944.80	944.56
Q Weir (cfs)		Max Chl Dpth (ft)	9.25	9.00
Weir Sta Lft (ft)		Vel Total (ft/s)	7.66	7.85
Weir Sta Rgt (ft)		Flow Area (sq ft)	476.52	464.70
Weir Submerg		Froude # Chl	0.84	0.87
Weir Max Depth (ft)		Specif Force (cu ft)	2683.14	2643.55
Min El Weir Flow (ft)	955.01	Hydr Depth (ft)	3.39	3.52
Min El Prs (ft)	950.00	W.P. Total (ft)	157.61	148.08
Delta EG (ft)	0.51	Conv. Total (cfs)	34860.5	34022.9
Delta WS (ft)	1.41	Top Width (ft)	140.41	132.16
BR Open Area (sq ft)	1324.58	Frctn Loss (ft)	0.07	0.08
BR Open Vel (ft/s)	7.85	C & E Loss (ft)	0.01	0.04
Coef of Q		Shear Total (lb/sq ft)	2.07	2.25
Br Sel Method	Energy only	Power Total (lb/ft s)	15.85	17.71

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
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: 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: Hope Creek
REACH: 1 RS: 2520.830

INPUT
Description: 36
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.53	3.81	951.39	8.01	951.14	9.39	951.06	11.26	950.96
12.64	950.89	13.62	950.78	13.96	950.75	14.51	950.85	15.61	951.07
15.95	951.04	16.64	950.99	17.53	950.91	19.82	950.74	26.26	947.7
27.23	947.24	39.19	941.53	41.84	940.49	46.14	938.86	53.11	938.7
57.31	938.66	61.73	939.97	63.61	940.52	66.59	941.77	87.09	942.64
91.05	942.75	92.4	942.79	101.58	942.82	119.91	943.26	126.7	937.39
128.49	935.71	135.82	935.65	146.19	935.58	149.97	939.74	153.79	943.81
159.23	943.95	163.68	944.07	166.92	944.01	177.85	945.04	184.02	945.45
215.35	946.49	230.24	949.29						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	119.91	.04	153.79	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
119.91 153.79 97.79 129.85 152.46 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	119.91	943	F

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	942.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.68	Wt. n-Val.		0.040	
W.S. Elev (ft)	940.35	Reach Len. (ft)	97.79	129.85	152.46
Crit W.S. (ft)	940.14	Flow Area (sq ft)		105.67	
E.G. Slope (ft/ft)	0.015406	Area (sq ft)	25.81	105.67	
Q Total (cfs)	1100.00	Flow (cfs)		1100.00	
Top Width (ft)	48.12	Top Width (ft)	20.85	27.28	
Vel Total (ft/s)	10.41	Avg. Vel. (ft/s)		10.41	
Max Chl Dpth (ft)	4.77	Hydr. Depth (ft)		3.87	
Conv. Total (cfs)	8862.4	Conv. (cfs)		8862.4	
Length Wtd. (ft)	129.42	Wetted Per. (ft)		31.15	

Min Ch El (ft)	935.58	Shear (lb/sq ft)		3.26	
Alpha	1.00	Stream Power (lb/ft s)		33.96	
Frctn Loss (ft)	0.73	Cum Volume (acre-ft)	2.37	10.25	1.44
C & E Loss (ft)	0.38	Cum SA (acres)	2.44	2.01	1.29

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 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, energy was used.

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	942.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.97	Wt. n-Val.		0.040	
W.S. Elev (ft)	940.83	Reach Len. (ft)	97.79	129.85	152.46
Crit W.S. (ft)	940.73	Flow Area (sq ft)		119.01	
E.G. Slope (ft/ft)	0.016308	Area (sq ft)		119.01	
Q Total (cfs)	1340.00	Flow (cfs)		1340.00	
Top Width (ft)	28.28	Top Width (ft)		28.28	
Vel Total (ft/s)	11.26	Avg. Vel. (ft/s)		11.26	
Max Chl Dpth (ft)	5.25	Hydr. Depth (ft)		4.21	
Conv. Total (cfs)	10493.1	Conv. (cfs)		10493.1	
Length Wtd. (ft)	129.85	Wetted Per. (ft)		32.54	
Min Ch El (ft)	935.58	Shear (lb/sq ft)		3.72	
Alpha	1.00	Stream Power (lb/ft s)		41.92	
Frctn Loss (ft)	0.84	Cum Volume (acre-ft)	1.99	11.97	0.33
C & E Loss (ft)	0.42	Cum SA (acres)	1.76	2.11	0.24

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, energy was used.

CROSS SECTION OUTPUT Profile #10yr

E.G. Elev (ft)	943.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.29	Wt. n-Val.		0.040	
W.S. Elev (ft)	941.42	Reach Len. (ft)	97.79	129.85	152.46
Crit W.S. (ft)	941.42	Flow Area (sq ft)		135.85	
E.G. Slope (ft/ft)	0.017017	Area (sq ft)	50.93	135.85	
Q Total (cfs)	1650.00	Flow (cfs)		1650.00	
Top Width (ft)	55.78	Top Width (ft)	26.27	29.50	
Vel Total (ft/s)	12.15	Avg. Vel. (ft/s)		12.15	
Max Chl Dpth (ft)	5.84	Hydr. Depth (ft)		4.60	
Conv. Total (cfs)	12648.6	Conv. (cfs)		12648.6	
Length Wtd. (ft)	129.28	Wetted Per. (ft)		34.24	
Min Ch El (ft)	935.58	Shear (lb/sq ft)		4.22	
Alpha	1.00	Stream Power (lb/ft s)		51.20	
Frctn Loss (ft)	0.83	Cum Volume (acre-ft)	7.17	12.80	3.50
C & E Loss (ft)	0.51	Cum SA (acres)	3.80	2.15	2.34

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

CROSS SECTION OUTPUT Profile #25yr

E.G. Elev (ft)	944.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.59	Wt. n-Val.		0.040	

W.S. Elev (ft)	942.32	Reach Len. (ft)	97.79	129.85	152.46
Crit W.S. (ft)	942.32	Flow Area (sq ft)		163.48	
E.G. Slope (ft/ft)	0.016571	Area (sq ft)	79.91	163.48	
Q Total (cfs)	2110.00	Flow (cfs)		2110.00	
Top Width (ft)	73.54	Top Width (ft)	42.14	31.40	
Vel Total (ft/s)	12.91	Avg. Vel. (ft/s)		12.91	
Max Chl Dpth (ft)	6.74	Hydr. Depth (ft)		5.21	
Conv. Total (cfs)	16391.3	Conv. (cfs)		16391.3	
Length Wtd. (ft)	128.73	Wetted Per. (ft)		36.87	
Min Ch El (ft)	935.58	Shear (lb/sq ft)		4.59	
Alpha	1.00	Stream Power (lb/ft s)		59.21	
Frctn Loss (ft)	0.80	Cum Volume (acre-ft)	11.11	14.51	5.36
C & E Loss (ft)	0.58	Cum SA (acres)	4.48	2.20	3.01

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

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	945.05	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	2.04	Reach Len. (ft)	97.79	129.85	152.46
W.S. Elev (ft)	943.01	Flow Area (sq ft)	117.22	185.40	
Crit W.S. (ft)	943.01	Area (sq ft)	117.22	185.40	
E.G. Slope (ft/ft)	0.013004	Flow (cfs)	223.56	2226.44	
Q Total (cfs)	2450.00	Top Width (ft)	73.30	32.83	
Top Width (ft)	106.13	Avg. Vel. (ft/s)	1.91	12.01	
Vel Total (ft/s)	8.10	Hydr. Depth (ft)	1.60	5.65	
Max Chl Dpth (ft)	7.43	Conv. (cfs)	1960.5	19523.8	
Conv. Total (cfs)	21484.2	Wetted Per. (ft)	74.67	38.85	
Length Wtd. (ft)	126.66	Shear (lb/sq ft)	1.27	3.87	
Min Ch El (ft)	935.58	Stream Power (lb/ft s)	2.43	46.53	
Alpha	2.00	Cum Volume (acre-ft)	13.87	15.69	6.99
Frctn Loss (ft)	0.67	Cum SA (acres)	4.75	2.24	3.68
C & E Loss (ft)	0.42				

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: 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 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 #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	945.56	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	1.87	Reach Len. (ft)	97.79	129.85	152.46
W.S. Elev (ft)	943.69	Flow Area (sq ft)	173.26	208.07	
Crit W.S. (ft)	943.69	Area (sq ft)	173.26	208.07	
E.G. Slope (ft/ft)	0.011128	Flow (cfs)	358.86	2441.14	
Q Total (cfs)	2800.00	Top Width (ft)	85.24	33.76	
Top Width (ft)	119.00	Avg. Vel. (ft/s)	2.07	11.73	
Vel Total (ft/s)	7.34	Hydr. Depth (ft)	2.03	6.16	
Max Chl Dpth (ft)	8.11	Conv. (cfs)	3401.9	23141.1	
Conv. Total (cfs)	26543.0	Wetted Per. (ft)	86.77	40.16	
Length Wtd. (ft)	125.75	Shear (lb/sq ft)	1.39	3.60	
Min Ch El (ft)	935.58	Stream Power (lb/ft s)	2.87	42.22	
Alpha	2.24	Cum Volume (acre-ft)	15.98	16.78	9.31
Frctn Loss (ft)	0.65	Cum SA (acres)	4.86	2.27	4.57
C & E Loss (ft)	0.36				

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 #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	946.62	Element			
Vel Head (ft)	2.11	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	944.51	Reach Len. (ft)	97.79	129.85	152.46
Crit W.S. (ft)	944.51	Flow Area (sq ft)	244.05	235.92	8.47
E.G. Slope (ft/ft)	0.011227	Area (sq ft)	244.05	235.92	8.47
Q Total (cfs)	3650.00	Flow (cfs)	628.83	3014.56	6.62
Top Width (ft)	139.26	Top Width (ft)	86.96	33.88	18.42
Vel Total (ft/s)	7.47	Avg. Vel. (ft/s)	2.58	12.78	0.78
Max Chl Dpth (ft)	8.93	Hydr. Depth (ft)	2.81	6.96	0.46
Conv. Total (cfs)	34447.4	Conv. (cfs)	5934.6	28450.3	62.5
Length Wtd. (ft)	124.40	Wetted Per. (ft)	88.68	40.33	18.45
Min Ch El (ft)	935.58	Shear (lb/sq ft)	1.93	4.10	0.32
Alpha	2.44	Stream Power (lb/ft s)	4.97	52.39	0.25
Frctn Loss (ft)	0.65	Cum Volume (acre-ft)	21.13	19.05	14.61
C & E Loss (ft)	0.40	Cum SA (acres)	5.04	2.31	6.07

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: Hope Creek
REACH: 1 RS: 2390.934

INPUT
Description: 37
Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.03	6.19	950.82	8.9	950.67	9.47	950.64	10.2	950.59
15.04	950.28	15.53	950.21	16	950.16	16.32	950.13	16.8	950.22
17.31	950.32	17.78	950.41	17.95	950.44	19.02	950.39	22.07	950.18
23.61	949.5	24.28	949.21	24.32	949.19	25.56	948.64	41.75	941.49
41.76	941.49	45.2	939.7	48.14	938.69	57.34	938.37	59.1	938.3
63.82	939.79	67.84	941.12	68.49	941.11	71.3	941.07	76.16	941.11
88.03	941.19	105.22	941.61	111.35	941.55	131.08	942.16	138.07	942.13
162.22	942.18	164.56	940.61	170.59	936.56	173.04	934.91	186.49	934.98
198.47	934.58	199.13	934.75	201.34	935.31	206.68	938.83	207.78	941.39
208.81	942.567	215.34	942.65	217	942.87	222.67	945.05	242.61	951.43

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	162.22	.04	208.81	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
162.22 208.81 38.36 36.6 36.24 .1 .3
Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	26.75		F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	940.92	Element			
Vel Head (ft)	0.43	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	940.49	Reach Len. (ft)	38.36	36.60	36.24
Crit W.S. (ft)		Flow Area (sq ft)	33.89	201.08	
E.G. Slope (ft/ft)	0.002925	Area (sq ft)	33.89	201.08	
Q Total (cfs)	1100.00	Flow (cfs)	29.40	1070.60	

Top Width (ft)	64.94	Top Width (ft)	22.28	42.66	
Vel Total (ft/s)	4.68	Avg. Vel. (ft/s)	0.87	5.32	
Max Chl Dpth (ft)	5.91	Hydr. Depth (ft)	1.52	4.71	
Conv. Total (cfs)	20338.1	Conv. (cfs)	543.6	19794.5	
Length Wtd. (ft)	36.62	Wetted Per. (ft)	22.99	46.62	
Min Ch El (ft)	934.58	Shear (lb/sq ft)	0.27	0.79	
Alpha	1.26	Stream Power (lb/ft s)	0.23	4.19	
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	2.30	9.80	1.44
C & E Loss (ft)	0.12	Cum SA (acres)	2.39	1.91	1.29

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 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 #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	941.54	Wt. n-Val.		0.040	
Vel Head (ft)	0.57	Reach Len. (ft)	38.36	36.60	36.24
W.S. Elev (ft)	940.97	Flow Area (sq ft)		221.70	
Crit W.S. (ft)		Area (sq ft)		221.70	
E.G. Slope (ft/ft)	0.003441	Flow (cfs)		1340.00	
Q Total (cfs)	1340.00	Top Width (ft)		43.58	
Top Width (ft)	43.58	Avg. Vel. (ft/s)		6.04	
Vel Total (ft/s)	6.04	Hydr. Depth (ft)		5.09	
Max Chl Dpth (ft)	6.39	Conv. (cfs)		22842.3	
Conv. Total (cfs)	22842.3	Wetted Per. (ft)		47.99	
Length Wtd. (ft)	36.60	Shear (lb/sq ft)		0.99	
Min Ch El (ft)	934.58	Stream Power (lb/ft s)		6.00	
Alpha	1.00	Cum Volume (acre-ft)	1.99	11.47	0.33
Frctn Loss (ft)	0.24	Cum SA (acres)	1.76	2.00	0.24
C & E Loss (ft)	0.10				

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 #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	942.25	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	0.60	Reach Len. (ft)	38.36	36.60	36.24
W.S. Elev (ft)	941.66	Flow Area (sq ft)	78.46	251.98	
Crit W.S. (ft)		Area (sq ft)	78.46	251.98	
E.G. Slope (ft/ft)	0.003350	Flow (cfs)	58.19	1591.81	
Q Total (cfs)	1650.00	Top Width (ft)	73.42	45.01	
Top Width (ft)	118.44	Avg. Vel. (ft/s)	0.74	6.32	
Vel Total (ft/s)	4.99	Hydr. Depth (ft)	1.07	5.60	
Max Chl Dpth (ft)	7.08	Conv. (cfs)	1005.5	27503.7	
Conv. Total (cfs)	28509.2	Wetted Per. (ft)	74.52	50.03	
Length Wtd. (ft)	36.63	Shear (lb/sq ft)	0.22	1.05	
Min Ch El (ft)	934.58	Stream Power (lb/ft s)	0.16	6.65	
Alpha	1.54	Cum Volume (acre-ft)	7.03	12.22	3.50
Frctn Loss (ft)	0.23	Cum SA (acres)	3.69	2.04	2.34
C & E Loss (ft)	0.12				

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 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 #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	943.21	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	0.64	Reach Len. (ft)	38.36	36.60	36.24
W.S. Elev (ft)	942.57	Flow Area (sq ft)	170.25	293.97	
Crit W.S. (ft)		Area (sq ft)	170.25	293.97	0.00
E.G. Slope (ft/ft)	0.003221	Flow (cfs)	147.63	1962.37	
Q Total (cfs)	2110.00	Top Width (ft)	122.92	46.59	0.24
Top Width (ft)	169.75	Avg. Vel. (ft/s)	0.87	6.68	
Vel Total (ft/s)	4.55	Hydr. Depth (ft)	1.39	6.31	
Max Chl Dpth (ft)	7.99	Conv. (cfs)	2601.3	34576.6	
Conv. Total (cfs)	37177.9	Wetted Per. (ft)	124.22	52.18	
Length Wtd. (ft)	36.66	Shear (lb/sq ft)	0.28	1.13	
Min Ch El (ft)	934.58	Stream Power (lb/ft s)	0.24	7.56	
Alpha	2.01	Cum Volume (acre-ft)	10.83	13.82	5.36
Frctn Loss (ft)	0.23				

C & E Loss (ft)	0.14	Cum SA (acres)	4.29	2.09	3.00

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.

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	943.86	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.63	Reach Len. (ft)	38.36	36.60	36.24
W.S. Elev (ft)	943.23	Flow Area (sq ft)	251.84	324.71	5.01
Crit W.S. (ft)		Area (sq ft)	251.84	324.71	5.01
E.G. Slope (ft/ft)	0.002861	Flow (cfs)	264.89	2182.90	2.21
Q Total (cfs)	2450.00	Top Width (ft)	124.41	46.59	9.13
Top Width (ft)	180.13	Avg. Vel. (ft/s)	1.05	6.72	0.44
Vel Total (ft/s)	4.21	Hydr. Depth (ft)	2.02	6.97	0.55
Max Chl Dpth (ft)	8.65	Conv. (cfs)	4952.2	40810.2	41.3
Conv. Total (cfs)	45803.7	Wetted Per. (ft)	125.85	52.18	9.21
Length Wtd. (ft)	36.69	Shear (lb/sq ft)	0.36	1.11	0.10
Min Ch El (ft)	934.58	Stream Power (lb/ft s)	0.38	7.47	0.04
Alpha	2.28	Cum Volume (acre-ft)	13.46	14.93	6.98
Frctn Loss (ft)	0.21	Cum SA (acres)	4.53	2.12	3.66
C & E Loss (ft)	0.16				

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 #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	944.30	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.68	Reach Len. (ft)	38.36	36.60	36.24
W.S. Elev (ft)	943.62	Flow Area (sq ft)	300.68	342.94	8.77
Crit W.S. (ft)		Area (sq ft)	300.68	342.94	8.77
E.G. Slope (ft/ft)	0.002966	Flow (cfs)	360.52	2434.16	5.32
Q Total (cfs)	2800.00	Top Width (ft)	125.30	46.59	10.14
Top Width (ft)	182.03	Avg. Vel. (ft/s)	1.20	7.10	0.61
Vel Total (ft/s)	4.29	Hydr. Depth (ft)	2.40	7.36	0.87
Max Chl Dpth (ft)	9.04	Conv. (cfs)	6620.3	44698.7	97.7
Conv. Total (cfs)	51416.6	Wetted Per. (ft)	126.82	52.18	10.30
Length Wtd. (ft)	36.73	Shear (lb/sq ft)	0.44	1.22	0.16
Min Ch El (ft)	934.58	Stream Power (lb/ft s)	0.53	8.64	0.10
Alpha	2.39	Cum Volume (acre-ft)	15.45	15.96	9.30
Frctn Loss (ft)	0.20	Cum SA (acres)	4.62	2.16	4.55
C & E Loss (ft)	0.13				

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
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 #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	945.35	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.77	Reach Len. (ft)	38.36	36.60	36.24
W.S. Elev (ft)	944.58	Flow Area (sq ft)	422.27	387.76	19.74
Crit W.S. (ft)		Area (sq ft)	422.27	387.76	19.74
E.G. Slope (ft/ft)	0.002995	Flow (cfs)	630.24	3002.07	17.69
Q Total (cfs)	3650.00	Top Width (ft)	127.47	46.59	12.65
Top Width (ft)	186.71	Avg. Vel. (ft/s)	1.49	7.74	0.90
Vel Total (ft/s)	4.40	Hydr. Depth (ft)	3.31	8.32	1.56
Max Chl Dpth (ft)	10.00	Conv. (cfs)	11515.7	54853.6	323.2
Conv. Total (cfs)	66692.5	Wetted Per. (ft)	129.20	52.18	12.98
Length Wtd. (ft)	36.81	Shear (lb/sq ft)	0.61	1.39	0.28
Min Ch El (ft)	934.58	Stream Power (lb/ft s)	0.91	10.76	0.25
Alpha	2.57	Cum Volume (acre-ft)	20.38	18.12	14.56
Frctn Loss (ft)	0.19	Cum SA (acres)	4.80	2.19	6.02
C & E Loss (ft)	0.12				

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: Hope Creek
REACH: 1 RS: 2354.325

INPUT
Description: 38
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	950.98	8.41	950.7	10.08	950.64	14.97	950.4	19.05	950.2
19.65	950.08	20.19	949.97	20.48	950.04	21.7	950.31	22.09	950.29
23.1	950.24	26.03	950.14	29.08	948.8	35.51	945.97	44.01	941.89
45.94	941.26	50.97	938.64	60.58	938.33	63.26	938.14	65.6	938.8
66.38	939.08	69.25	940.09	71.32	940.83	74.66	940.97	83.9	941.07
98.21	941.17	111.56	941.14	122.01	941.41	137.61	942.17	165.54	942.63
166.02	942.63	166.41	942.45	170.87	939.22	176.77	939.11	179.78	938.78
180.22	938.74	184.11	936.62	185.71	934.95	189.75	935.02	192.94	934.72
193.39	934.67	193.87	934.63	204.88	934.22	213.31	940.87	215.12	942.7
221	948.64	229.13	950.8						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	166.02	.04	215.12	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
166.02 215.12 95.4 91.3 65.8 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	166.02	941.7	F

Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	66.31	952

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	940.58	Wt. n-Val.		0.040	
Vel Head (ft)	1.65	Reach Len. (ft)	95.40	91.30	65.80
W.S. Elev (ft)	938.93	Flow Area (sq ft)		106.58	
Crit W.S. (ft)	938.93	Area (sq ft)		106.58	
E.G. Slope (ft/ft)	0.017731	Flow (cfs)		1100.00	
Q Total (cfs)	1100.00	Top Width (ft)		32.44	
Top Width (ft)	32.44	Avg. Vel. (ft/s)		10.32	
Vel Total (ft/s)	10.32	Hydr. Depth (ft)		3.29	
Max Chl Dpth (ft)	4.71	Conv. (cfs)		8260.8	
Conv. Total (cfs)	8260.8	Wetted Per. (ft)		35.36	
Length Wtd. (ft)	91.30	Shear (lb/sq ft)		3.34	
Min Ch El (ft)	934.22	Stream Power (lb/ft s)		34.44	
Alpha	1.00	Cum Volume (acre-ft)	2.29	9.67	1.44
Frctn Loss (ft)	0.44	Cum SA (acres)	2.38	1.88	1.29
C & E Loss (ft)	0.41				

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

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	941.19	Wt. n-Val.		0.040	
Vel Head (ft)	1.60	Reach Len. (ft)	95.40	91.30	65.80
W.S. Elev (ft)	939.60	Flow Area (sq ft)		132.15	
Crit W.S. (ft)	939.60	Area (sq ft)		132.15	
E.G. Slope (ft/ft)	0.017527	Flow (cfs)		1340.00	
Q Total (cfs)	1340.00	Top Width (ft)		41.35	
Top Width (ft)	41.35	Avg. Vel. (ft/s)		10.14	
Vel Total (ft/s)	10.14	Hydr. Depth (ft)		3.20	
Max Chl Dpth (ft)	5.38	Conv. (cfs)		10121.6	
Conv. Total (cfs)	10121.6	Wetted Per. (ft)		44.64	
Length Wtd. (ft)	91.30	Shear (lb/sq ft)		3.24	
Min Ch El (ft)	934.22	Stream Power (lb/ft s)		32.85	
Alpha	1.00	Cum Volume (acre-ft)	1.99	11.32	0.33
Frctn Loss (ft)	0.37	Cum SA (acres)	1.76	1.97	0.24
C & E Loss (ft)	0.39				

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

CROSS SECTION OUTPUT Profile #10yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	941.90	Element			
Vel Head (ft)	1.79	Wt. n-Val.		0.040	
W.S. Elev (ft)	940.11	Reach Len. (ft)	95.40	91.30	65.80
Crit W.S. (ft)	940.11	Flow Area (sq ft)		153.83	
E.G. Slope (ft/ft)	0.016841	Area (sq ft)	1.59	153.83	
Q Total (cfs)	1650.00	Flow (cfs)		1650.00	
Top Width (ft)	45.72	Top Width (ft)	3.01	42.72	
Vel Total (ft/s)	10.73	Avg. Vel. (ft/s)		10.73	
Max Chl Dpth (ft)	5.89	Hydr. Depth (ft)		3.60	
Conv. Total (cfs)	12714.6	Conv. (cfs)		12714.6	
Length Wtd. (ft)	91.30	Wetted Per. (ft)		46.35	
Min Ch El (ft)	934.22	Shear (lb/sq ft)		3.49	
Alpha	1.00	Stream Power (lb/ft s)		37.43	
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	6.99	12.05	3.50
C & E Loss (ft)	0.43	Cum SA (acres)	3.65	2.00	2.34

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

CROSS SECTION OUTPUT Profile #25yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	942.85	Element			
Vel Head (ft)	2.06	Wt. n-Val.		0.040	
W.S. Elev (ft)	940.79	Reach Len. (ft)	95.40	91.30	65.80
Crit W.S. (ft)	940.79	Flow Area (sq ft)		183.35	
E.G. Slope (ft/ft)	0.016341	Area (sq ft)	4.27	183.35	
Q Total (cfs)	2110.00	Flow (cfs)		2110.00	
Top Width (ft)	49.41	Top Width (ft)	4.90	44.51	
Vel Total (ft/s)	11.51	Avg. Vel. (ft/s)		11.51	
Max Chl Dpth (ft)	6.57	Hydr. Depth (ft)		4.12	
Conv. Total (cfs)	16506.1	Conv. (cfs)		16506.1	
Length Wtd. (ft)	91.32	Wetted Per. (ft)		48.60	
Min Ch El (ft)	934.22	Shear (lb/sq ft)		3.85	
Alpha	1.00	Stream Power (lb/ft s)		44.29	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	10.76	13.62	5.36
C & E Loss (ft)	0.49	Cum SA (acres)	4.24	2.05	3.00

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

CROSS SECTION OUTPUT Profile #50yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	943.49	Element			

Vel Head (ft)	2.24	Wt. n-Val.		0.040	
W.S. Elev (ft)	941.25	Reach Len. (ft)	95.40	91.30	65.80
Crit W.S. (ft)	941.25	Flow Area (sq ft)		204.21	
E.G. Slope (ft/ft)	0.016000	Area (sq ft)	13.41	204.21	
Q Total (cfs)	2450.00	Flow (cfs)		2450.00	
Top Width (ft)	95.28	Top Width (ft)	49.65	45.63	
Vel Total (ft/s)	12.00	Avg. Vel. (ft/s)		12.00	
Max Chl Dpth (ft)	7.03	Hydr. Depth (ft)		4.48	
Conv. Total (cfs)	19369.1	Conv. (cfs)		19369.1	
Length Wtd. (ft)	91.33	Wetted Per. (ft)		50.05	
Min Ch El (ft)	934.22	Shear (lb/sq ft)		4.08	
Alpha	1.00	Stream Power (lb/ft s)		48.89	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	13.34	14.71	6.97
C & E Loss (ft)	0.53	Cum SA (acres)	4.45	2.08	3.66

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

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	943.98	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	1.98	Reach Len. (ft)	95.40	91.30	65.80
W.S. Elev (ft)	941.99	Flow Area (sq ft)	57.58	238.57	
Crit W.S. (ft)	941.99	Area (sq ft)	57.58	238.57	
E.G. Slope (ft/ft)	0.012564	Flow (cfs)	69.54	2730.46	
Q Total (cfs)	2800.00	Top Width (ft)	67.66	47.38	
Top Width (ft)	115.04	Avg. Vel. (ft/s)	1.21	11.45	
Vel Total (ft/s)	9.45	Hydr. Depth (ft)	0.85	5.04	
Max Chl Dpth (ft)	7.77	Conv. (cfs)	620.4	24359.4	
Conv. Total (cfs)	24979.8	Wetted Per. (ft)	70.92	52.35	
Length Wtd. (ft)	91.39	Shear (lb/sq ft)	0.64	3.57	
Min Ch El (ft)	934.22	Stream Power (lb/ft s)	0.77	40.91	
Alpha	1.43	Cum Volume (acre-ft)	15.29	15.72	9.29
Frctn Loss (ft)	0.38	Cum SA (acres)	4.54	2.12	4.55
C & E Loss (ft)	0.43				

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: 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 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 #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	945.05	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	1.98	Reach Len. (ft)	95.40	91.30	65.80
W.S. Elev (ft)	943.06	Flow Area (sq ft)	152.19	290.47	0.06
Crit W.S. (ft)	943.06	Area (sq ft)	152.19	290.47	0.06
E.G. Slope (ft/ft)	0.010674	Flow (cfs)	250.88	3399.10	0.02
Q Total (cfs)	3650.00	Top Width (ft)	99.71	49.10	0.36
Top Width (ft)	149.17	Avg. Vel. (ft/s)	1.65	11.70	0.32
Vel Total (ft/s)	8.24	Hydr. Depth (ft)	1.53	5.92	0.18
Max Chl Dpth (ft)	8.84	Conv. (cfs)	2428.3	32900.2	0.2
Conv. Total (cfs)	35328.7	Wetted Per. (ft)	104.05	54.56	0.51
Length Wtd. (ft)	91.53	Shear (lb/sq ft)	0.97	3.55	0.08
Min Ch El (ft)	934.22	Stream Power (lb/ft s)	1.61	41.52	0.03
Alpha	1.88	Cum Volume (acre-ft)	20.13	17.83	14.55
Frctn Loss (ft)	0.38	Cum SA (acres)	4.70	2.15	6.01
C & E Loss (ft)	0.40				

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: Hope Creek
REACH: 1 RS: 2262

INPUT
Description:
Station Elevation Data num= 56

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.62	5.15	951.49	8.22	951.42	12.97	951.25	21.09	950.97
22.98	950.92	27.51	950.8	33.65	950.65	42.91	950.41	45.1	950.35
46.46	950.32	54.63	949.91	55.29	949.88	55.59	949.87	55.63	949.86
55.67	949.86	55.76	949.85	57.19	949.76	57.25	949.78	57.29	949.79
58.53	950.08	58.59	950.08	58.87	950.06	62.48	949.79	67.87	947.07
83.07	939.46	87.32	938.02	88.88	937.59	96.84	937.77	99.16	937.77
102.35	938.43	111.84	940.02	118.56	940.41	130.35	941.09	134.76	941.25
141.69	941.42	164.65	941.97	168.26	941.86	184.57	941.35	186.95	939.71
187.38	939.51	192.66	937.02	193.03	937.02	193.94	937.01	197.79	936.98
203	935.44	205.45	933.97	214.56	934.01	214.74	934.01	214.8	934.01
224.23	933.98	225.89	934	226.62	934	242.37	933.99	250.9	940.29
260.27	950.25								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	184.57	.04	250.9	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
184.57 250.9 220.4 181.12 126.56 .1 .3
Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	164.65	941	F

Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	103.86	953

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	939.49	Wt. n-Val.		0.040	
Vel Head (ft)	0.29	Reach Len. (ft)	220.40	181.12	126.56
W.S. Elev (ft)	939.20	Flow Area (sq ft)		253.41	
Crit W.S. (ft)	936.91	Area (sq ft)	0.79	253.41	
E.G. Slope (ft/ft)	0.002190	Flow (cfs)		1100.00	
Q Total (cfs)	1100.00	Top Width (ft)	3.08	61.38	
Top Width (ft)	64.46	Avg. Vel. (ft/s)		4.34	
Vel Total (ft/s)	4.34	Hydr. Depth (ft)		4.13	
Max Chl Dpth (ft)	5.23	Conv. (cfs)		23508.0	
Conv. Total (cfs)	23508.0	Wetted Per. (ft)		64.21	
Length Wtd. (ft)	181.23	Shear (lb/sq ft)		0.54	
Min Ch El (ft)	933.97	Stream Power (lb/ft s)		2.34	
Alpha	1.00	Cum Volume (acre-ft)	2.29	9.29	1.44
Frctn Loss (ft)	0.35	Cum SA (acres)	2.38	1.78	1.29
C & E Loss (ft)	0.00				

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	940.38	Wt. n-Val.		0.040	
Vel Head (ft)	0.29	Reach Len. (ft)	220.40	181.12	126.56
W.S. Elev (ft)	940.09	Flow Area (sq ft)		309.53	
Crit W.S. (ft)	937.33	Area (sq ft)		309.53	
E.G. Slope (ft/ft)	0.001786	Flow (cfs)		1340.00	
Q Total (cfs)	1340.00	Top Width (ft)		64.23	
Top Width (ft)	64.23	Avg. Vel. (ft/s)		4.33	
Vel Total (ft/s)	4.33	Hydr. Depth (ft)		4.82	
Max Chl Dpth (ft)	6.12				

Conv. Total (cfs)	31707.7	Conv. (cfs)		31707.7	
Length Wtd. (ft)	181.09	Wetted Per. (ft)		67.59	
Min Ch El (ft)	933.97	Shear (lb/sq ft)		0.51	
Alpha	1.00	Stream Power (lb/ft s)		2.21	
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)	1.99	10.86	0.33
C & E Loss (ft)	0.01	Cum SA (acres)	1.76	1.86	0.24

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

CROSS SECTION OUTPUT Profile #10yr

E.G. Elev (ft)	940.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.37	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	940.55	Reach Len. (ft)	220.40	181.12	126.56
Crit W.S. (ft)	937.74	Flow Area (sq ft)		339.08	0.03
E.G. Slope (ft/ft)	0.002043	Area (sq ft)	11.94	339.08	0.03
Q Total (cfs)	1650.00	Flow (cfs)		1650.00	0.00
Top Width (ft)	82.48	Top Width (ft)	17.08	65.16	0.24
Vel Total (ft/s)	4.87	Avg. Vel. (ft/s)		4.87	0.11
Max Chl Dpth (ft)	6.58	Hydr. Depth (ft)		5.20	0.13
Conv. Total (cfs)	36503.3	Conv. (cfs)		36503.3	0.1
Length Wtd. (ft)	181.37	Wetted Per. (ft)		68.73	0.35
Min Ch El (ft)	933.97	Shear (lb/sq ft)		0.63	0.01
Alpha	1.00	Stream Power (lb/ft s)		3.06	0.00
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)	6.98	11.53	3.50
C & E Loss (ft)	0.01	Cum SA (acres)	3.63	1.89	2.34

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #25yr

E.G. Elev (ft)	941.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.43	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	941.42	Reach Len. (ft)	220.40	181.12	126.56
Crit W.S. (ft)	938.31	Flow Area (sq ft)	34.20	396.38	0.60
E.G. Slope (ft/ft)	0.002007	Area (sq ft)	34.20	396.38	0.60
Q Total (cfs)	2110.00	Flow (cfs)	16.85	2092.97	0.18
Top Width (ft)	107.32	Top Width (ft)	39.93	66.33	1.06
Vel Total (ft/s)	4.89	Avg. Vel. (ft/s)	0.49	5.28	0.29
Max Chl Dpth (ft)	7.45	Hydr. Depth (ft)	0.86	5.98	0.56
Conv. Total (cfs)	47095.0	Conv. (cfs)	376.2	46714.8	3.9
Length Wtd. (ft)	181.95	Wetted Per. (ft)	42.81	70.15	1.55
Min Ch El (ft)	933.97	Shear (lb/sq ft)	0.10	0.71	0.05
Alpha	1.15	Stream Power (lb/ft s)	0.05	3.74	0.01
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)	10.71	13.02	5.35
C & E Loss (ft)	0.01	Cum SA (acres)	4.19	1.93	3.00

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #50yr

E.G. Elev (ft)	942.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.48	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	941.95	Reach Len. (ft)	220.40	181.12	126.56
Crit W.S. (ft)	938.71	Flow Area (sq ft)	66.01	431.78	1.30
E.G. Slope (ft/ft)	0.002011	Area (sq ft)	66.01	431.78	1.30
Q Total (cfs)	2450.00	Flow (cfs)	33.73	2415.78	0.50
Top Width (ft)	147.25	Top Width (ft)	79.35	66.33	1.56
Vel Total (ft/s)	4.91	Avg. Vel. (ft/s)	0.51	5.59	0.38
Max Chl Dpth (ft)	7.98	Hydr. Depth (ft)	0.83	6.51	0.83
Conv. Total (cfs)	54636.3	Conv. (cfs)	752.2	53873.1	11.0
Length Wtd. (ft)	182.63	Wetted Per. (ft)	82.79	70.15	2.28
Min Ch El (ft)	933.97	Shear (lb/sq ft)	0.10	0.77	0.07
Alpha	1.28	Stream Power (lb/ft s)	0.05	4.32	0.03
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)	13.25	14.04	6.97
C & E Loss (ft)	0.01	Cum SA (acres)	4.31	1.97	3.66

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #100yr

E.G. Elev (ft)	942.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.54	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	942.38	Reach Len. (ft)	220.40	181.12	126.56
Crit W.S. (ft)	939.08	Flow Area (sq ft)	100.46	460.10	2.05
E.G. Slope (ft/ft)	0.002086	Area (sq ft)	100.46	460.10	2.05
Q Total (cfs)	2800.00	Flow (cfs)	63.72	2735.35	0.93
Top Width (ft)	149.01	Top Width (ft)	80.71	66.33	1.97
Vel Total (ft/s)	4.98	Avg. Vel. (ft/s)	0.63	5.95	0.45
Max Chl Dpth (ft)	8.41	Hydr. Depth (ft)	1.24	6.94	1.04
Conv. Total (cfs)	61305.3	Conv. (cfs)	1395.2	59889.8	20.3
Length Wtd. (ft)	183.22	Wetted Per. (ft)	84.57	70.15	2.87
Min Ch El (ft)	933.97	Shear (lb/sq ft)	0.15	0.85	0.09
Alpha	1.39	Stream Power (lb/ft s)	0.10	5.08	0.04
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	15.12	14.99	9.29
C & E Loss (ft)	0.01	Cum SA (acres)	4.37	2.00	4.55

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

CROSS SECTION OUTPUT Profile #500yr

E.G. Elev (ft)	944.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	943.37	Reach Len. (ft)	220.40	181.12	126.56
Crit W.S. (ft)	939.91	Flow Area (sq ft)	180.43	525.82	4.46
E.G. Slope (ft/ft)	0.002159	Area (sq ft)	180.43	525.82	4.46
Q Total (cfs)	3650.00	Flow (cfs)	170.72	3476.62	2.66
Top Width (ft)	149.94	Top Width (ft)	80.71	66.33	2.90
Vel Total (ft/s)	5.14	Avg. Vel. (ft/s)	0.95	6.61	0.60
Max Chl Dpth (ft)	9.40	Hydr. Depth (ft)	2.24	7.93	1.54
Conv. Total (cfs)	78547.8	Conv. (cfs)	3674.0	74816.6	57.2
Length Wtd. (ft)	184.59	Wetted Per. (ft)	85.56	70.15	4.23
Min Ch El (ft)	933.97	Shear (lb/sq ft)	0.28	1.01	0.14
Alpha	1.58	Stream Power (lb/ft s)	0.27	6.68	0.08
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	19.77	16.98	14.55
C & E Loss (ft)	0.01	Cum SA (acres)	4.50	2.02	6.01

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

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2081.919

INPUT
Description: 39
Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	949.11	3.35	949.01	5.94	948.94	11.21	948.75	13.41	948.67
14.5	948.62	14.69	948.6	14.84	948.58	15.59	948.48	16.45	948.37
17.13	948.52	17.94	948.69	19.47	948.59	21.05	948.47	23.76	947.08
25.28	946.3	25.94	945.98	26.99	945.45	27.45	945.24	41.78	938.51
47.88	937.01	50.77	936.27	53.29	936.24	60.49	936.53	69.08	938.33
71.66	939.02	79.02	939.14	104.61	940.22	108.7	940.18	138.33	939.89
148.21	940.05	172.8	940.36	186.33	940.42	201.84	940.59	211.04	940.74
212.05	937.32	218.4	932.36	233.4	932.34	233.68	932.33	234.72	932.31
246.63	932.17	249.36	932.16	250.14	932.98	253.36	938.37	293.68	947.23
294.9	947.64								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	211.04	.04	253.36	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
211.04 253.36 293.59 431.27 483.25 .1 .3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	60.3	950

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	939.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	938.83	Reach Len. (ft)	293.59	431.27	483.25
Crit W.S. (ft)		Flow Area (sq ft)	12.94	243.21	0.48
E.G. Slope (ft/ft)	0.001683	Area (sq ft)	12.94	243.21	0.48
Q Total (cfs)	1100.00	Flow (cfs)	6.48	1093.43	0.09
Top Width (ft)	54.50	Top Width (ft)	10.65	41.76	2.10

Vel Total (ft/s)	4.29	Avg. Vel. (ft/s)	0.50	4.50	0.19
Max Chl Dpth (ft)	6.67	Hydr. Depth (ft)	1.21	5.82	0.23
Conv. Total (cfs)	26812.0	Conv. (cfs)	158.0	26651.8	2.2
Length Wtd. (ft)	426.99	Wetted Per. (ft)	13.21	48.00	2.15
Min Ch El (ft)	932.16	Shear (lb/sq ft)	0.10	0.53	0.02
Alpha	1.09	Stream Power (lb/ft s)	0.05	2.39	0.00
Frctn Loss (ft)	0.91	Cum Volume (acre-ft)	2.25	8.26	1.44
C & E Loss (ft)	0.01	Cum SA (acres)	2.34	1.56	1.29

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	940.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.35	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	939.71	Reach Len. (ft)	293.59	431.27	483.25
Crit W.S. (ft)		Flow Area (sq ft)		280.23	4.11
E.G. Slope (ft/ft)	0.001613	Area (sq ft)		280.23	4.11
Q Total (cfs)	1340.00	Flow (cfs)		1338.46	1.54
Top Width (ft)	48.13	Top Width (ft)		42.02	6.12
Vel Total (ft/s)	4.71	Avg. Vel. (ft/s)		4.78	0.38
Max Chl Dpth (ft)	7.55	Hydr. Depth (ft)		6.67	0.67
Conv. Total (cfs)	33362.7	Conv. (cfs)		33324.2	38.5
Length Wtd. (ft)	424.16	Wetted Per. (ft)		48.93	6.26
Min Ch El (ft)	932.16	Shear (lb/sq ft)		0.58	0.07
Alpha	1.03	Stream Power (lb/ft s)		2.76	0.02
Frctn Loss (ft)	0.80	Cum Volume (acre-ft)	1.99	9.63	0.33
C & E Loss (ft)	0.00	Cum SA (acres)	1.76	1.64	0.23

CROSS SECTION OUTPUT Profile #10yr

E.G. Elev (ft)	940.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.46	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	940.08	Reach Len. (ft)	293.59	431.27	483.25
Crit W.S. (ft)		Flow Area (sq ft)	47.78	295.57	6.65
E.G. Slope (ft/ft)	0.002003	Area (sq ft)	47.78	295.57	6.65
Q Total (cfs)	1650.00	Flow (cfs)	25.20	1621.54	3.26
Top Width (ft)	122.36	Top Width (ft)	72.46	42.12	7.78
Vel Total (ft/s)	4.71	Avg. Vel. (ft/s)	0.53	5.49	0.49
Max Chl Dpth (ft)	7.92	Hydr. Depth (ft)	0.66	7.02	0.85
Conv. Total (cfs)	36868.8	Conv. (cfs)	563.0	36232.8	72.9
Length Wtd. (ft)	413.51	Wetted Per. (ft)	76.31	49.31	7.96
Min Ch El (ft)	932.16	Shear (lb/sq ft)	0.08	0.75	0.10
Alpha	1.33	Stream Power (lb/ft s)	0.04	4.11	0.05
Frctn Loss (ft)	0.82	Cum Volume (acre-ft)	6.83	10.21	3.49
C & E Loss (ft)	0.04	Cum SA (acres)	3.40	1.66	2.33

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #25yr

E.G. Elev (ft)	941.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.55	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	940.90	Reach Len. (ft)	293.59	431.27	483.25
Crit W.S. (ft)		Flow Area (sq ft)	151.61	330.43	14.61
E.G. Slope (ft/ft)	0.002171	Area (sq ft)	151.61	330.43	14.61
Q Total (cfs)	2110.00	Flow (cfs)	86.03	2014.25	9.72
Top Width (ft)	204.59	Top Width (ft)	150.74	42.32	11.53
Vel Total (ft/s)	4.25	Avg. Vel. (ft/s)	0.57	6.10	0.67
Max Chl Dpth (ft)	8.74	Hydr. Depth (ft)	1.01	7.81	1.27
Conv. Total (cfs)	45285.9	Conv. (cfs)	1846.5	43230.8	208.6
Length Wtd. (ft)	405.38	Wetted Per. (ft)	155.43	50.00	11.81
Min Ch El (ft)	932.16	Shear (lb/sq ft)	0.13	0.90	0.17
Alpha	1.97	Stream Power (lb/ft s)	0.08	5.46	0.11
Frctn Loss (ft)	0.75	Cum Volume (acre-ft)	10.24	11.50	5.33
C & E Loss (ft)	0.09	Cum SA (acres)	3.70	1.71	2.99

CROSS SECTION OUTPUT Profile #50yr

E.G. Elev (ft)	942.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.58	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	941.46	Reach Len. (ft)	293.59	431.27	483.25
Crit W.S. (ft)		Flow Area (sq ft)	235.17	353.89	21.71
E.G. Slope (ft/ft)	0.002166	Area (sq ft)	235.17	353.89	21.71
Q Total (cfs)	2450.00	Flow (cfs)	178.17	2255.38	16.45
Top Width (ft)	207.12	Top Width (ft)	150.74	42.32	14.06
Vel Total (ft/s)	4.01	Avg. Vel. (ft/s)	0.76	6.37	0.76
Max Chl Dpth (ft)	9.30	Hydr. Depth (ft)	1.56	8.36	1.54

Conv. Total (cfs)	52648.4	Conv. (cfs)	3828.8	48466.1	353.5
Length Wtd. (ft)	400.17	Wetted Per. (ft)	155.98	50.00	14.39
Min Ch El (ft)	932.16	Shear (lb/sq ft)	0.20	0.96	0.20
Alpha	2.33	Stream Power (lb/ft s)	0.15	6.10	0.15
Frctn Loss (ft)	0.70	Cum Volume (acre-ft)	12.49	12.41	6.94
C & E Loss (ft)	0.10	Cum SA (acres)	3.73	1.74	3.64

CROSS SECTION OUTPUT Profile #100yr

E.G. Elev (ft)	942.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.63	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	941.87	Reach Len. (ft)	293.59	431.27	483.25
Crit W.S. (ft)		Flow Area (sq ft)	297.35	371.35	27.89
E.G. Slope (ft/ft)	0.002278	Area (sq ft)	297.35	371.35	27.89
Q Total (cfs)	2800.00	Flow (cfs)	269.72	2506.71	23.57
Top Width (ft)	208.99	Top Width (ft)	150.74	42.32	15.93
Vel Total (ft/s)	4.02	Avg. Vel. (ft/s)	0.91	6.75	0.85
Max Chl Dpth (ft)	9.71	Hydr. Depth (ft)	1.97	8.77	1.75
Conv. Total (cfs)	58660.1	Conv. (cfs)	5650.6	52515.6	493.8
Length Wtd. (ft)	396.90	Wetted Per. (ft)	156.40	50.00	16.31
Min Ch El (ft)	932.16	Shear (lb/sq ft)	0.27	1.06	0.24
Alpha	2.53	Stream Power (lb/ft s)	0.25	7.13	0.21
Frctn Loss (ft)	0.72	Cum Volume (acre-ft)	14.11	13.26	9.25
C & E Loss (ft)	0.11	Cum SA (acres)	3.79	1.77	4.52

CROSS SECTION OUTPUT Profile #500yr

E.G. Elev (ft)	943.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.71	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	942.88	Reach Len. (ft)	293.59	431.27	483.25
Crit W.S. (ft)		Flow Area (sq ft)	449.37	414.03	46.28
E.G. Slope (ft/ft)	0.002361	Area (sq ft)	449.37	414.03	46.28
Q Total (cfs)	3650.00	Flow (cfs)	544.08	3058.80	47.13
Top Width (ft)	213.58	Top Width (ft)	150.74	42.32	20.52
Vel Total (ft/s)	4.01	Avg. Vel. (ft/s)	1.21	7.39	1.02
Max Chl Dpth (ft)	10.72	Hydr. Depth (ft)	2.98	9.78	2.25
Conv. Total (cfs)	75124.3	Conv. (cfs)	11198.2	62956.2	970.0
Length Wtd. (ft)	390.04	Wetted Per. (ft)	157.41	50.00	21.01
Min Ch El (ft)	932.16	Shear (lb/sq ft)	0.42	1.22	0.32
Alpha	2.86	Stream Power (lb/ft s)	0.51	9.02	0.33
Frctn Loss (ft)	0.71	Cum Volume (acre-ft)	18.17	15.02	14.47
C & E Loss (ft)	0.13	Cum SA (acres)	3.91	1.80	5.98

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 1650

INPUT
Description:
Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	947.97	8.57	947.7	15.97	947.48	20.94	947.33	30.35	947.1
33.5	947.02	37.49	946.8	42.51	946.54	43.35	946.45	43.97	946.41
44.24	946.46	44.85	946.58	45.45	946.71	46.61	946.57	48.4	946.37
48.92	946.1	57.93	941.44	69.76	935.78	74.41	934.97	78.9	934.04
83.2	934.02	86.21	933.96	91.89	935.14	93.2	935.42	99.64	936.77
118.18	936.99	130.57	937.27	146.24	937.35	160.01	937.29	180.62	937.1
195.16	937.27	208.74	937.19	233.59	937.16	249.38	937.33	274.35	937.85
290.71	938.08	318.17	938.79	327.4	938.97	328.11	936.62	329.84	931.52
350.77	931.34	356.16	931.18	357.3	932.64	361.56	939.27	400.23	949.052

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	327.4	.04	361.56	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
327.4 361.56 172.21 158.59 117.87 .1 .3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	87	950

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	938.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.44	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	937.78	Reach Len. (ft)	172.21	158.59	117.87
Crit W.S. (ft)		Flow Area (sq ft)	124.53	189.86	

E.G. Slope (ft/ft)	0.002796	Area (sq ft)	124.53	189.86	
Q Total (cfs)	1100.00	Flow (cfs)	61.97	1038.03	
Top Width (ft)	216.85	Top Width (ft)	184.00	32.84	
Vel Total (ft/s)	3.50	Avg. Vel. (ft/s)	0.50	5.47	
Max Chl Dpth (ft)	6.60	Hydr. Depth (ft)	0.68	5.78	
Conv. Total (cfs)	20803.5	Conv. (cfs)	1172.0	19631.6	
Length Wtd. (ft)	159.31	Wetted Per. (ft)	187.95	40.88	
Min Ch El (ft)	931.18	Shear (lb/sq ft)	0.12	0.81	
Alpha	2.31	Stream Power (lb/ft s)	0.06	4.43	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	1.79	6.11	1.44
C & E Loss (ft)	0.00	Cum SA (acres)	1.69	1.20	1.27

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	939.26	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	0.39	Reach Len. (ft)	172.21	158.59	117.87
W.S. Elev (ft)	938.87	Flow Area (sq ft)	202.49	226.11	
Crit W.S. (ft)		Area (sq ft)	202.49	226.11	
E.G. Slope (ft/ft)	0.002257	Flow (cfs)	139.02	1200.98	
Q Total (cfs)	1340.00	Top Width (ft)	158.98	33.87	
Top Width (ft)	192.85	Avg. Vel. (ft/s)	0.69	5.31	
Vel Total (ft/s)	3.13	Hydr. Depth (ft)	1.27	6.68	
Max Chl Dpth (ft)	7.69	Conv. (cfs)	2926.2	25278.3	
Conv. Total (cfs)	28204.5	Wetted Per. (ft)	160.60	43.31	
Length Wtd. (ft)	159.66	Shear (lb/sq ft)	0.18	0.74	
Min Ch El (ft)	931.18	Stream Power (lb/ft s)	0.12	3.91	
Alpha	2.59	Cum Volume (acre-ft)	1.31	7.12	0.30
Frctn Loss (ft)	0.38	Cum SA (acres)	1.23	1.26	0.20
C & E Loss (ft)	0.01				

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	939.68	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.31	Reach Len. (ft)	172.21	158.59	117.87
W.S. Elev (ft)	939.36	Flow Area (sq ft)	474.01	243.03	0.02
Crit W.S. (ft)		Area (sq ft)	474.01	243.03	0.02
E.G. Slope (ft/ft)	0.001952	Flow (cfs)	401.63	1248.37	0.00
Q Total (cfs)	1650.00	Top Width (ft)	240.40	34.16	0.37
Top Width (ft)	274.93	Avg. Vel. (ft/s)	0.85	5.14	0.07
Vel Total (ft/s)	2.30	Hydr. Depth (ft)	1.97	7.11	0.05
Max Chl Dpth (ft)	8.18	Conv. (cfs)	9090.2	28254.8	0.0
Conv. Total (cfs)	37345.0	Wetted Per. (ft)	245.94	43.90	0.38
Length Wtd. (ft)	161.72	Shear (lb/sq ft)	0.23	0.67	0.01
Min Ch El (ft)	931.18	Stream Power (lb/ft s)	0.20	3.47	0.00
Alpha	3.80	Cum Volume (acre-ft)	5.07	7.55	3.46
Frctn Loss (ft)	0.32	Cum SA (acres)	2.35	1.29	2.28
C & E Loss (ft)	0.00				

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	940.62	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.27	Reach Len. (ft)	172.21	158.59	117.87
W.S. Elev (ft)	940.36	Flow Area (sq ft)	712.49	276.92	2.33
Crit W.S. (ft)		Area (sq ft)	712.49	276.92	2.33
E.G. Slope (ft/ft)	0.001584	Flow (cfs)	711.58	1397.67	0.75
Q Total (cfs)	2110.00	Top Width (ft)	240.40	34.16	4.29
Top Width (ft)	278.85	Avg. Vel. (ft/s)	1.00	5.05	0.32
Vel Total (ft/s)	2.13	Hydr. Depth (ft)	2.96	8.11	0.54
Max Chl Dpth (ft)	9.18	Conv. (cfs)	17880.9	35121.6	18.8
Conv. Total (cfs)	53021.4	Wetted Per. (ft)	246.93	43.90	4.43
Length Wtd. (ft)	162.99	Shear (lb/sq ft)	0.29	0.62	0.05
Min Ch El (ft)	931.18	Stream Power (lb/ft s)	0.28	3.15	0.02
Alpha	3.80	Cum Volume (acre-ft)	7.33	8.50	5.24
Frctn Loss (ft)	0.27	Cum SA (acres)	2.39	1.33	2.90
C & E Loss (ft)	0.00				

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	941.24	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.25	Reach Len. (ft)	172.21	158.59	117.87
W.S. Elev (ft)	940.99	Flow Area (sq ft)	864.60	298.54	5.84
Crit W.S. (ft)		Area (sq ft)	864.60	298.54	5.84
E.G. Slope (ft/ft)	0.001442	Flow (cfs)	935.85	1511.71	2.43
Q Total (cfs)	2450.00				

Top Width (ft)	281.35	Top Width (ft)	240.40	34.16	6.79
Vel Total (ft/s)	2.10	Avg. Vel. (ft/s)	1.08	5.06	0.42
Max Chl Dpth (ft)	9.81	Hydr. Depth (ft)	3.60	8.74	0.86
Conv. Total (cfs)	64516.6	Conv. (cfs)	24644.2	39808.4	64.0
Length Wtd. (ft)	163.58	Wetted Per. (ft)	247.56	43.90	7.01
Min Ch El (ft)	931.18	Shear (lb/sq ft)	0.31	0.61	0.08
Alpha	3.70	Stream Power (lb/ft s)	0.34	3.10	0.03
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	8.79	9.18	6.79
C & E Loss (ft)	0.00	Cum SA (acres)	2.41	1.36	3.52

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	941.67	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.27	Reach Len. (ft)	172.21	158.59	117.87
W.S. Elev (ft)	941.41	Flow Area (sq ft)	965.36	312.85	9.03
Crit W.S. (ft)		Area (sq ft)	965.36	312.85	9.03
E.G. Slope (ft/ft)	0.001482	Flow (cfs)	1138.72	1656.87	4.41
Q Total (cfs)	2800.00	Top Width (ft)	240.40	34.16	8.45
Top Width (ft)	283.01	Avg. Vel. (ft/s)	1.18	5.30	0.49
Vel Total (ft/s)	2.18	Hydr. Depth (ft)	4.02	9.16	1.07
Max Chl Dpth (ft)	10.23	Conv. (cfs)	29581.0	43041.0	114.6
Conv. Total (cfs)	72736.5	Wetted Per. (ft)	247.98	43.90	8.72
Length Wtd. (ft)	163.89	Shear (lb/sq ft)	0.36	0.66	0.10
Min Ch El (ft)	931.18	Stream Power (lb/ft s)	0.42	3.49	0.05
Alpha	3.63	Cum Volume (acre-ft)	9.86	9.87	9.04
Frctn Loss (ft)	0.26	Cum SA (acres)	2.47	1.39	4.39
C & E Loss (ft)	0.01				

CROSS SECTION OUTPUT Profile #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	942.75	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.28	Reach Len. (ft)	172.21	158.59	117.87
W.S. Elev (ft)	942.47	Flow Area (sq ft)	1220.56	349.12	20.23
Crit W.S. (ft)		Area (sq ft)	1220.56	349.12	20.23
E.G. Slope (ft/ft)	0.001457	Flow (cfs)	1664.65	1972.54	12.82
Q Total (cfs)	3650.00	Top Width (ft)	240.40	34.16	12.65
Top Width (ft)	287.21	Avg. Vel. (ft/s)	1.36	5.65	0.63
Vel Total (ft/s)	2.30	Hydr. Depth (ft)	5.08	10.22	1.60
Max Chl Dpth (ft)	11.29	Conv. (cfs)	43607.6	51673.3	335.7
Conv. Total (cfs)	95616.6	Wetted Per. (ft)	249.05	43.90	13.05
Length Wtd. (ft)	164.49	Shear (lb/sq ft)	0.45	0.72	0.14
Min Ch El (ft)	931.18	Stream Power (lb/ft s)	0.61	4.09	0.09
Alpha	3.43	Cum Volume (acre-ft)	12.55	11.25	14.10
Frctn Loss (ft)	0.26	Cum SA (acres)	2.60	1.42	5.79
C & E Loss (ft)	0.01				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 1492.060

INPUT
Description: 40
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	947.11	1.01	947.08	7.6	946.91	15.69	946.73	18.31	946.67
20.06	946.63	25.46	946.36	27.56	946.25	28.5	946.2	28.63	946.19
28.78	946.17	29.03	946.14	29.9	946.06	30.11	946.1	30.8	946.24
31.37	946.35	31.59	946.4	32.55	946.32	32.87	946.29	34.6	946.14
37.57	944.74	47.66	939.52	56.35	935.28	61.94	934.08	65.24	933.18
69.15	933.28	71.78	933.31	78.43	934.33	86.31	936.11	104.05	936.36
116.38	936.71	139.22	936.79	148.69	936.76	176.16	937.14	182.14	937.1
190.67	937.2	215.26	937.54	217.72	937.58	219.11	937.6	229.9	937.67
257.57	937.8	258.24	937.82	263.89	938.01	275.91	938.2	278.03	932.99
280.19	929.74	298.34	930.09	302.2	930.11	305.63	938.13	306.11	939.26
306.15	939.36	306.5	939.45	327.57	944.61	334.09	947.58		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	275.91	.04	306.11	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
275.91 306.11 383.24 408.33 377.92 .1 .3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	72	950

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	937.79	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	0.44	Reach Len. (ft)	383.24	408.33	377.92
W.S. Elev (ft)	937.35	Flow Area (sq ft)	102.91	190.86	
Crit W.S. (ft)		Area (sq ft)	102.91	190.86	
E.G. Slope (ft/ft)	0.002573	Flow (cfs)	54.30	1045.70	
Q Total (cfs)	1100.00	Top Width (ft)	129.34	29.04	
Top Width (ft)	158.37	Avg. Vel. (ft/s)	0.53	5.48	
Vel Total (ft/s)	3.74	Hydr. Depth (ft)	0.80	6.57	
Max Chl Dpth (ft)	7.61	Conv. (cfs)	1070.6	20616.7	
Conv. Total (cfs)	21687.3	Wetted Per. (ft)	133.62	38.49	
Length Wtd. (ft)	407.56	Shear (lb/sq ft)	0.12	0.80	
Min Ch El (ft)	929.74	Stream Power (lb/ft s)	0.07	4.36	
Alpha	2.04	Cum Volume (acre-ft)	1.34	5.42	1.44
Frctn Loss (ft)	1.65	Cum SA (acres)	1.07	1.08	1.27
C & E Loss (ft)	0.06				

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 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 #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	938.88	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	0.48	Reach Len. (ft)	383.24	408.33	377.92
W.S. Elev (ft)	938.40	Flow Area (sq ft)	122.92	221.74	
Crit W.S. (ft)		Area (sq ft)	122.92	221.74	
E.G. Slope (ft/ft)	0.002458	Flow (cfs)	72.33	1267.67	
Q Total (cfs)	1340.00	Top Width (ft)	129.36	29.83	
Top Width (ft)	159.19	Avg. Vel. (ft/s)	0.59	5.72	
Vel Total (ft/s)	3.89	Hydr. Depth (ft)	0.95	7.43	
Max Chl Dpth (ft)	8.66	Conv. (cfs)	1458.8	25566.9	
Conv. Total (cfs)	27025.7	Wetted Per. (ft)	131.00	40.55	
Length Wtd. (ft)	407.65	Shear (lb/sq ft)	0.14	0.84	
Min Ch El (ft)	929.74	Stream Power (lb/ft s)	0.08	4.80	
Alpha	2.05	Cum Volume (acre-ft)	0.66	6.31	0.30
Frctn Loss (ft)	1.55	Cum SA (acres)	0.66	1.14	0.20
C & E Loss (ft)	0.06				

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.
Warning: The energy loss was 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 #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	939.35	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	0.36	Reach Len. (ft)	383.24	408.33	377.92
W.S. Elev (ft)	938.99	Flow Area (sq ft)	410.05	239.68	
Crit W.S. (ft)		Area (sq ft)	410.05	239.68	
E.G. Slope (ft/ft)	0.002017	Flow (cfs)	356.45	1293.55	
Q Total (cfs)	1650.00	Top Width (ft)	203.91	30.09	
Top Width (ft)	234.00	Avg. Vel. (ft/s)	0.87	5.40	
Vel Total (ft/s)	2.54	Hydr. Depth (ft)	2.01	7.97	
Max Chl Dpth (ft)	9.25	Conv. (cfs)	7935.8	28799.1	
Conv. Total (cfs)	36734.9	Wetted Per. (ft)	209.85	41.20	
Length Wtd. (ft)	405.25	Shear (lb/sq ft)	0.25	0.73	
Min Ch El (ft)	929.74	Stream Power (lb/ft s)	0.21	3.95	
Alpha	3.57	Cum Volume (acre-ft)	3.32	6.67	3.46
Frctn Loss (ft)	1.54	Cum SA (acres)	1.47	1.17	2.28
C & E Loss (ft)	0.12				

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 #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	940.35	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.31				

W.S. Elev (ft)	940.04	Reach Len. (ft)	383.24	408.33	377.92
Crit W.S. (ft)		Flow Area (sq ft)	622.87	271.19	0.96
E.G. Slope (ft/ft)	0.001705	Area (sq ft)	622.87	271.19	0.96
Q Total (cfs)	2110.00	Flow (cfs)	655.59	1454.18	0.23
Top Width (ft)	236.90	Top Width (ft)	203.91	30.20	2.79
Vel Total (ft/s)	2.36	Avg. Vel. (ft/s)	1.05	5.36	0.24
Max Chl Dpth (ft)	10.30	Hydr. Depth (ft)	3.05	8.98	0.34
Conv. Total (cfs)	51098.7	Conv. (cfs)	15876.7	35216.4	5.6
Length Wtd. (ft)	403.79	Wetted Per. (ft)	210.90	41.49	2.94
Min Ch El (ft)	929.74	Shear (lb/sq ft)	0.31	0.70	0.03
Alpha	3.63	Stream Power (lb/ft s)	0.33	3.73	0.01
Frctn Loss (ft)	1.46	Cum Volume (acre-ft)	4.69	7.50	5.23
C & E Loss (ft)	0.18	Cum SA (acres)	1.51	1.21	2.89

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.
Warning: The energy loss was 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 #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	940.99	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.30	Reach Len. (ft)	383.24	408.33	377.92
W.S. Elev (ft)	940.69	Flow Area (sq ft)	755.31	290.80	3.63
Crit W.S. (ft)		Area (sq ft)	755.31	290.80	3.63
E.G. Slope (ft/ft)	0.001590	Flow (cfs)	871.16	1577.51	1.33
Q Total (cfs)	2450.00	Top Width (ft)	203.91	30.20	5.44
Top Width (ft)	239.55	Avg. Vel. (ft/s)	1.15	5.42	0.37
Vel Total (ft/s)	2.33	Hydr. Depth (ft)	3.70	9.63	0.67
Max Chl Dpth (ft)	10.95	Conv. (cfs)	21848.6	39563.6	33.4
Conv. Total (cfs)	61445.5	Wetted Per. (ft)	211.55	41.49	5.67
Length Wtd. (ft)	402.90	Shear (lb/sq ft)	0.35	0.70	0.06
Min Ch El (ft)	929.74	Stream Power (lb/ft s)	0.41	3.77	0.02
Alpha	3.57	Cum Volume (acre-ft)	5.58	8.11	6.77
Frctn Loss (ft)	1.40	Cum SA (acres)	1.53	1.24	3.50
C & E Loss (ft)	0.20				

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 #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	941.41	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.33	Reach Len. (ft)	383.24	408.33	377.92
W.S. Elev (ft)	941.08	Flow Area (sq ft)	835.92	302.74	6.10
Crit W.S. (ft)		Area (sq ft)	835.92	302.74	6.10
E.G. Slope (ft/ft)	0.001685	Flow (cfs)	1060.64	1736.62	2.74
Q Total (cfs)	2800.00	Top Width (ft)	203.91	30.20	7.06
Top Width (ft)	241.17	Avg. Vel. (ft/s)	1.27	5.74	0.45
Vel Total (ft/s)	2.45	Hydr. Depth (ft)	4.10	10.02	0.86
Max Chl Dpth (ft)	11.34	Conv. (cfs)	25839.4	42307.6	66.8
Conv. Total (cfs)	68213.8	Wetted Per. (ft)	211.94	41.49	7.33
Length Wtd. (ft)	401.42	Shear (lb/sq ft)	0.41	0.77	0.09
Min Ch El (ft)	929.74	Stream Power (lb/ft s)	0.53	4.40	0.04
Alpha	3.51	Cum Volume (acre-ft)	6.30	8.75	9.02
Frctn Loss (ft)	1.31	Cum SA (acres)	1.59	1.27	4.36
C & E Loss (ft)	0.14				

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 #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	942.48	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.36	Reach Len. (ft)	383.24	408.33	377.92
W.S. Elev (ft)	942.13	Flow Area (sq ft)	1048.71	334.26	15.69
Crit W.S. (ft)		Area (sq ft)	1048.71	334.26	15.69
E.G. Slope (ft/ft)	0.001731	Flow (cfs)	1563.87	2076.31	9.82
Q Total (cfs)	3650.00				

Top Width (ft)	245.43	Top Width (ft)	203.91	30.20	11.32
Vel Total (ft/s)	2.61	Avg. Vel. (ft/s)	1.49	6.21	0.63
Max Chl Dpth (ft)	12.39	Hydr. Depth (ft)	5.14	11.07	1.39
Conv. Total (cfs)	87719.7	Conv. (cfs)	37584.2	49899.5	236.0
Length Wtd. (ft)	399.95	Wetted Per. (ft)	212.98	41.49	11.72
Min Ch El (ft)	929.74	Shear (lb/sq ft)	0.53	0.87	0.14
Alpha	3.36	Stream Power (lb/ft s)	0.79	5.41	0.09
Frctn Loss (ft)	1.41	Cum Volume (acre-ft)	8.06	10.00	14.06
C & E Loss (ft)	0.17	Cum SA (acres)	1.72	1.30	5.76

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: Hope Creek
REACH: 1 RS: 1084

INPUT
Description:
Station Elevation Data num= 78

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	945.77	6.53	945.57	8.72	945.51	16.09	945.25	21.62	945.07
23.39	945.02	26.38	944.93	34.11	944.72	37.58	944.63	46.83	944.39
53.05	943.99	54.98	943.87	55.18	943.86	55.43	943.84	56.41	943.76
57.64	944.01	58.03	944.09	58.45	944.06	60.29	943.95	60.98	943.9
61.87	943.86	63.74	942.23	70.08	937.9	77.53	935.1	80.47	934.2
83.94	932.99	87.76	931.67	88.37	931.65	97.89	931.8	98.61	932.06
105.54	934.29	105.82	934.48	107.48	935.19	108.69	935.84	122.78	944.89
123.54	944.91	140.5	943.47	143.22	943.24	151.87	942.5	152.11	942.48
153.69	941.64	158.76	938.95	163.27	931.15	165.26	927.83	171.38	927.95
179.7	928.36	180.1	928.97	184.02	934.85	185.26	936.47	190.08	936.81
200.52	937.5	205.47	937.81	234.77	937.49	239.69	937.23	252.04	935.07
255.74	934.97	266.1	935.92	281.92	936.14	285.32	937.32	298.44	936.84
314.41	936.61	318.92	936.96	319.24	937.17	331.15	937.25	343.81	938.19
348.75	938.37	354.27	938.82	368.05	939.02	372.86	939.09	376.25	939.13
389.22	939.15	401.38	940.22	439.05	942.05	442.12	942.33	451.19	944
454.27	944.78	460.3	945.41	467.41	946.72				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	158.76	.04	185.26	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
158.76 185.26 53.7 55.9 61.7 .1 .3
Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	99	947

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	936.08	Element			
Vel Head (ft)	1.05	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	935.03	Reach Len. (ft)	53.70	55.90	61.70
Crit W.S. (ft)		Flow Area (sq ft)	12.25	131.05	0.08
E.G. Slope (ft/ft)	0.007233	Area (sq ft)	12.25	131.05	0.08
Q Total (cfs)	1100.00	Flow (cfs)	13.50	1086.50	0.01
Top Width (ft)	34.08	Top Width (ft)	8.10	23.13	2.84
Vel Total (ft/s)	7.67	Avg. Vel. (ft/s)	1.10	8.29	0.10
Max Chl Dpth (ft)	7.20	Hydr. Depth (ft)	1.51	5.67	0.03
Conv. Total (cfs)	12934.3	Conv. (cfs)	158.7	12775.5	0.1
Length Wtd. (ft)	55.87	Wetted Per. (ft)	11.45	30.83	2.85
Min Ch El (ft)	927.83	Shear (lb/sq ft)	0.48	1.92	0.01
Alpha	1.15	Stream Power (lb/ft s)	0.53	15.92	0.00
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	0.83	3.91	1.44
C & E Loss (ft)	0.01	Cum SA (acres)	0.46	0.84	1.26

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	937.26	Element			
Vel Head (ft)	1.13	Wt. n-Val.		0.040	
W.S. Elev (ft)	936.13	Reach Len. (ft)	53.70	55.90	61.70
Crit W.S. (ft)		Flow Area (sq ft)		157.42	

E.G. Slope (ft/ft)	0.006669	Area (sq ft)		157.42	
Q Total (cfs)	1340.00	Flow (cfs)		1340.00	
Top Width (ft)	24.61	Top Width (ft)		24.61	
Vel Total (ft/s)	8.51	Avg. Vel. (ft/s)		8.51	
Max Chl Dpth (ft)	8.30	Hydr. Depth (ft)		6.40	
Conv. Total (cfs)	16408.8	Conv. (cfs)		16408.8	
Length Wtd. (ft)	55.90	Wetted Per. (ft)		33.49	
Min Ch El (ft)	927.83	Shear (lb/sq ft)		1.96	
Alpha	1.00	Stream Power (lb/ft s)		16.66	
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)	0.12	4.53	0.30
C & E Loss (ft)	0.02	Cum SA (acres)	0.09	0.89	0.20

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	937.68	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	1.59	Reach Len. (ft)	53.70	55.90	61.70
W.S. Elev (ft)	936.10	Flow Area (sq ft)	22.05	156.56	14.95
Crit W.S. (ft)	934.78	Area (sq ft)	22.05	156.56	14.95
E.G. Slope (ft/ft)	0.009701	Flow (cfs)	35.11	1604.12	10.77
Q Total (cfs)	1650.00	Top Width (ft)	10.09	24.57	32.82
Top Width (ft)	67.49	Avg. Vel. (ft/s)	1.59	10.25	0.72
Vel Total (ft/s)	8.52	Hydr. Depth (ft)	2.18	6.37	0.46
Max Chl Dpth (ft)	8.27	Conv. (cfs)	356.5	16286.8	109.3
Conv. Total (cfs)	16752.6	Wetted Per. (ft)	14.78	33.41	32.96
Length Wtd. (ft)	55.93	Shear (lb/sq ft)	0.90	2.84	0.27
Min Ch El (ft)	927.83	Stream Power (lb/ft s)	1.44	29.08	0.20
Alpha	1.41	Cum Volume (acre-ft)	1.42	4.81	3.39
Frctn Loss (ft)	0.55	Cum SA (acres)	0.53	0.91	2.14
C & E Loss (ft)	0.04				

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	938.71	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	2.08	Reach Len. (ft)	53.70	55.90	61.70
W.S. Elev (ft)	936.64	Flow Area (sq ft)	27.70	169.94	35.51
Crit W.S. (ft)	936.23	Area (sq ft)	27.70	169.94	35.51
E.G. Slope (ft/ft)	0.012122	Flow (cfs)	53.74	2012.35	43.91
Q Total (cfs)	2110.00	Top Width (ft)	10.93	25.16	44.79
Top Width (ft)	80.88	Avg. Vel. (ft/s)	1.94	11.84	1.24
Vel Total (ft/s)	9.05	Hydr. Depth (ft)	2.53	6.75	0.79
Max Chl Dpth (ft)	8.81	Conv. (cfs)	488.1	18277.7	398.8
Conv. Total (cfs)	19164.6	Wetted Per. (ft)	16.31	34.50	45.06
Length Wtd. (ft)	56.07	Shear (lb/sq ft)	1.28	3.73	0.60
Min Ch El (ft)	927.83	Stream Power (lb/ft s)	2.49	44.15	0.74
Alpha	1.63	Cum Volume (acre-ft)	1.83	5.43	5.08
Frctn Loss (ft)	0.63	Cum SA (acres)	0.56	0.95	2.68
C & E Loss (ft)	0.13				

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	939.39	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	2.27	Reach Len. (ft)	53.70	55.90	61.70
W.S. Elev (ft)	937.12	Flow Area (sq ft)	33.17	182.18	67.72
Crit W.S. (ft)	937.12	Area (sq ft)	33.17	182.18	67.72
E.G. Slope (ft/ft)	0.012633	Flow (cfs)	70.19	2282.31	97.50
Q Total (cfs)	2450.00	Top Width (ft)	11.68	25.44	82.32
Top Width (ft)	119.44	Avg. Vel. (ft/s)	2.12	12.53	1.44
Vel Total (ft/s)	8.65	Hydr. Depth (ft)	2.84	7.16	0.82
Max Chl Dpth (ft)	9.29	Conv. (cfs)	624.5	20305.6	867.5
Conv. Total (cfs)	21797.5	Wetted Per. (ft)	17.69	35.05	82.80
Length Wtd. (ft)	56.22	Shear (lb/sq ft)	1.48	4.10	0.65
Min Ch El (ft)	927.83	Stream Power (lb/ft s)	3.13	51.35	0.93
Alpha	1.95	Cum Volume (acre-ft)	2.12	5.89	6.46
Frctn Loss (ft)	0.63	Cum SA (acres)	0.58	0.98	3.12
C & E Loss (ft)	0.18				

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: 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: 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 #100yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	939.96	Element			
Vel Head (ft)	1.69	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	938.27	Reach Len. (ft)	53.70	55.90	61.70
Crit W.S. (ft)	938.27	Flow Area (sq ft)	47.63	211.82	220.38
E.G. Slope (ft/ft)	0.008803	Area (sq ft)	47.63	211.82	220.38
Q Total (cfs)	2800.00	Flow (cfs)	95.62	2389.21	315.17
Top Width (ft)	200.33	Top Width (ft)	13.47	26.11	160.75
Vel Total (ft/s)	5.84	Avg. Vel. (ft/s)	2.01	11.28	1.43
Max Chl Dpth (ft)	10.44	Hydr. Depth (ft)	3.54	8.11	1.37
Conv. Total (cfs)	29843.9	Conv. (cfs)	1019.2	25465.4	3359.3
Length Wtd. (ft)	56.49	Wetted Per. (ft)	20.97	36.38	161.36
Min Ch El (ft)	927.83	Shear (lb/sq ft)	1.25	3.20	0.75
Alpha	3.20	Stream Power (lb/ft s)	2.51	36.09	1.07
Frctn Loss (ft)	0.54	Cum Volume (acre-ft)	2.41	6.34	8.04
C & E Loss (ft)	0.01	Cum SA (acres)	0.63	1.01	3.64

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: 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 #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	940.90	Element			
Vel Head (ft)	2.07	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	938.83	Reach Len. (ft)	53.70	55.90	61.70
Crit W.S. (ft)	938.83	Flow Area (sq ft)	55.49	226.66	313.90
E.G. Slope (ft/ft)	0.010717	Area (sq ft)	55.49	226.66	313.90
Q Total (cfs)	3650.00	Flow (cfs)	129.54	2916.39	604.08
Top Width (ft)	210.81	Top Width (ft)	14.35	26.43	170.02
Vel Total (ft/s)	6.12	Avg. Vel. (ft/s)	2.33	12.87	1.92
Max Chl Dpth (ft)	11.00	Hydr. Depth (ft)	3.87	8.57	1.85
Conv. Total (cfs)	35257.3	Conv. (cfs)	1251.3	28170.9	5835.1
Length Wtd. (ft)	56.93	Wetted Per. (ft)	22.58	37.04	170.65
Min Ch El (ft)	927.83	Shear (lb/sq ft)	1.64	4.09	1.23
Alpha	3.55	Stream Power (lb/ft s)	3.84	52.69	2.37
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)	3.20	7.37	12.63
C & E Loss (ft)	0.19	Cum SA (acres)	0.76	1.04	4.97

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: 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: 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: Hope Creek
REACH: 1 RS: 1027.831

INPUT
Description: 41
Station Elevation Data num= 78

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.64	.11	943.66	.26	943.69	.47	943.74	3.16	943.35
8.41	942.72	8.57	942.7	8.6	942.7	8.63	942.7	8.69	942.7
8.77	942.7	8.8	942.67	10.14	942.06	19.03	938.04	20.45	937.31
21.15	936.76	23.71	934.69	24.42	934.07	27.5	933.27	33.75	931.64
33.91	931.6	34.39	931.49	34.79	931.48	35.58	931.5	41.42	931.61
42.18	931.82	42.3	931.86	49.56	934.07	49.69	934.1	52.11	934.7
52.83	935.25	53.16	935.5	53.38	935.67	57.6	938.89	63.46	943.36
64.81	943.38	66.6	943.71	75.4	942.96	103.47	938.63	107.04	937.23
107.29	936.79	110.84	930.57	110.91	930.72	112.29	927.42	123.63	928.15
126.77	928.46	129.58	930.95	131.58	932.89	133.77	935	136.12	935.57
141.91	935.67	144.88	935.93	168.07	934.94	173.97	934.87	177.44	934.94
180.68	935.1	183.38	935.12	206.79	934.58	214.04	935.27	225.7	937.14
234.19	936.22	243.54	936.41	250.97	936.46	257.91	936.81	259.34	936.65
261.48	937.11	268.27	936.97	287.64	938.55	291.44	938.6	317.37	938.95
335.12	939.19	339.22	939.19	356.99	940.76	382.79	943.01	385.89	943.23

387.25 943.38 388.26 943.43 390.52 943.72

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	107.04	.04	136.12	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
107.04	136.12	76.72	78.07	78.34	.1	.3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	40.88	945

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	935.67	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	1.04	Reach Len. (ft)	76.72	78.07	78.34
W.S. Elev (ft)	934.63	Flow Area (sq ft)	16.88	130.91	0.06
Crit W.S. (ft)		Area (sq ft)	16.88	130.91	0.06
E.G. Slope (ft/ft)	0.007529	Flow (cfs)	20.17	1079.82	0.01
Q Total (cfs)	1100.00	Top Width (ft)	10.94	24.86	2.56
Top Width (ft)	38.35	Avg. Vel. (ft/s)	1.19	8.25	0.09
Vel Total (ft/s)	7.44	Hydr. Depth (ft)	1.54	5.27	0.02
Max Chl Dpth (ft)	7.21	Conv. (cfs)	232.4	12444.3	0.1
Conv. Total (cfs)	12676.8	Wetted Per. (ft)	14.40	31.98	2.56
Length Wtd. (ft)	78.01	Shear (lb/sq ft)	0.55	1.92	0.01
Min Ch El (ft)	927.42	Stream Power (lb/ft s)	0.66	15.87	0.00
Alpha	1.21	Cum Volume (acre-ft)	0.81	3.74	1.44
Frctn Loss (ft)	0.37	Cum SA (acres)	0.45	0.81	1.26
C & E Loss (ft)	0.15				

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 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 #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	936.87	Wt. n-Val.		0.040	0.120
Vel Head (ft)	1.06	Reach Len. (ft)	76.72	78.07	78.34
W.S. Elev (ft)	935.81	Flow Area (sq ft)		162.25	2.05
Crit W.S. (ft)		Area (sq ft)		162.25	2.05
E.G. Slope (ft/ft)	0.006706	Flow (cfs)		1339.42	0.58
Q Total (cfs)	1340.00	Top Width (ft)		28.27	13.68
Top Width (ft)	41.95	Avg. Vel. (ft/s)		8.26	0.28
Vel Total (ft/s)	8.16	Hydr. Depth (ft)		5.74	0.15
Max Chl Dpth (ft)	8.39	Conv. (cfs)		16356.7	7.1
Conv. Total (cfs)	16363.8	Wetted Per. (ft)		36.29	13.96
Length Wtd. (ft)	78.06	Shear (lb/sq ft)		1.87	0.06
Min Ch El (ft)	927.42	Stream Power (lb/ft s)		15.45	0.02
Alpha	1.02	Cum Volume (acre-ft)	0.12	4.33	0.30
Frctn Loss (ft)	0.33	Cum SA (acres)	0.09	0.85	0.19
C & E Loss (ft)	0.12				

Warning: Divided flow computed for this cross-section.
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 #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	937.09	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	1.45	Reach Len. (ft)	76.72	78.07	78.34
W.S. Elev (ft)	935.65	Flow Area (sq ft)	28.91	157.73	40.81
Crit W.S. (ft)	934.52	Area (sq ft)	28.91	157.73	40.81
E.G. Slope (ft/ft)	0.009964	Flow (cfs)	50.36	1562.88	36.76
Q Total (cfs)	1650.00	Top Width (ft)	12.47	28.18	69.36
Top Width (ft)	110.01	Avg. Vel. (ft/s)	1.74	9.91	0.90
Vel Total (ft/s)	7.25	Hydr. Depth (ft)	2.32	5.60	0.59
Max Chl Dpth (ft)	8.23	Conv. (cfs)	504.5	15657.1	368.2
Conv. Total (cfs)	16529.9	Wetted Per. (ft)	17.28	36.11	69.45
Length Wtd. (ft)	77.97	Shear (lb/sq ft)	1.04	2.72	0.37
Min Ch El (ft)	927.42	Stream Power (lb/ft s)	1.81	26.92	0.33
Alpha	1.77	Cum Volume (acre-ft)	1.39	4.61	3.35
Frctn Loss (ft)	0.41	Cum SA (acres)	0.52	0.88	2.07
C & E Loss (ft)	0.24				

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 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 #25yr

E.G. Elev (ft)	937.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.65	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	936.31	Reach Len. (ft)	76.72	78.07	78.34
Crit W.S. (ft)		Flow Area (sq ft)	37.43	176.46	94.00
E.G. Slope (ft/ft)	0.010502	Area (sq ft)	37.43	176.46	94.00
Q Total (cfs)	2110.00	Flow (cfs)	74.57	1907.88	127.54
Top Width (ft)	131.40	Top Width (ft)	13.34	28.55	89.51
Vel Total (ft/s)	6.85	Avg. Vel. (ft/s)	1.99	10.81	1.36
Max Chl Dpth (ft)	8.89	Hydr. Depth (ft)	2.81	6.18	1.05
Conv. Total (cfs)	20589.4	Conv. (cfs)	727.7	18617.1	1244.6
Length Wtd. (ft)	77.96	Wetted Per. (ft)	19.03	36.87	89.68
Min Ch El (ft)	927.42	Shear (lb/sq ft)	1.29	3.14	0.69
Alpha	2.26	Stream Power (lb/ft s)	2.57	33.93	0.93
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	1.79	5.21	4.98
C & E Loss (ft)	0.28	Cum SA (acres)	0.55	0.92	2.59

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 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 #50yr

E.G. Elev (ft)	938.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.66	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	936.82	Reach Len. (ft)	76.72	78.07	78.34
Crit W.S. (ft)		Flow Area (sq ft)	44.40	191.09	148.25
E.G. Slope (ft/ft)	0.010144	Area (sq ft)	44.40	191.09	148.25
Q Total (cfs)	2450.00	Flow (cfs)	93.07	2118.88	238.06
Top Width (ft)	161.86	Top Width (ft)	14.00	28.85	119.01
Vel Total (ft/s)	6.38	Avg. Vel. (ft/s)	2.10	11.09	1.61
Max Chl Dpth (ft)	9.40	Hydr. Depth (ft)	3.17	6.62	1.25
Conv. Total (cfs)	24325.5	Conv. (cfs)	924.0	21037.8	2363.6
Length Wtd. (ft)	77.95	Wetted Per. (ft)	20.38	37.45	119.28
Min Ch El (ft)	927.42	Shear (lb/sq ft)	1.38	3.23	0.79
Alpha	2.62	Stream Power (lb/ft s)	2.89	35.83	1.26
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	2.07	5.65	6.31
C & E Loss (ft)	0.28	Cum SA (acres)	0.57	0.95	2.98

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 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 #100yr

E.G. Elev (ft)	939.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.76	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	937.24	Reach Len. (ft)	76.72	78.07	78.34
Crit W.S. (ft)		Flow Area (sq ft)	50.43	203.31	201.94
E.G. Slope (ft/ft)	0.010372	Area (sq ft)	50.43	203.31	201.94
Q Total (cfs)	2800.00	Flow (cfs)	112.27	2355.95	331.78
Top Width (ft)	179.11	Top Width (ft)	14.58	29.08	135.45
Vel Total (ft/s)	6.14	Avg. Vel. (ft/s)	2.23	11.59	1.64
Max Chl Dpth (ft)	9.82	Hydr. Depth (ft)	3.46	6.99	1.49
Conv. Total (cfs)	27492.9	Conv. (cfs)	1102.4	23132.9	3257.7
Length Wtd. (ft)	77.95	Wetted Per. (ft)	21.52	37.93	135.81
Min Ch El (ft)	927.42	Shear (lb/sq ft)	1.52	3.47	0.96
Alpha	3.01	Stream Power (lb/ft s)	3.38	40.22	1.58
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	2.35	6.07	7.74
C & E Loss (ft)	0.32	Cum SA (acres)	0.62	0.98	3.43

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 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 #500yr

E.G. Elev (ft)	940.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.42	Wt. n-Val.	0.120	0.040	0.120

W.S. Elev (ft)	938.61	Reach Len. (ft)	76.72	78.07	78.34
Crit W.S. (ft)		Flow Area (sq ft)	74.11	243.28	399.80
E.G. Slope (ft/ft)	0.007465	Area (sq ft)	74.11	243.28	399.80
Q Total (cfs)	3650.00	Flow (cfs)	156.12	2695.41	798.47
Top Width (ft)	205.30	Top Width (ft)	19.89	29.08	156.33
Vel Total (ft/s)	5.09	Avg. Vel. (ft/s)	2.11	11.08	2.00
Max Chl Dpth (ft)	11.19	Hydr. Depth (ft)	3.73	8.37	2.56
Conv. Total (cfs)	42246.3	Conv. (cfs)	1807.0	31197.6	9241.7
Length Wtd. (ft)	77.95	Wetted Per. (ft)	28.93	37.93	156.74
Min Ch El (ft)	927.42	Shear (lb/sq ft)	1.19	2.99	1.19
Alpha	3.54	Stream Power (lb/ft s)	2.52	33.12	2.37
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	3.12	7.07	12.12
C & E Loss (ft)	0.22	Cum SA (acres)	0.74	1.00	4.74

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 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: Hope Creek
REACH: 1 RS: 949.7572

INPUT
Description: 42
Station Elevation Data num= 101

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.79	1	943.76	5.16	943.66	8.7	943.48	12.91	943.23
13.26	943.23	13.55	943.2	13.92	943.17	14.75	943.09	15.36	943.21
16.27	943.41	18.16	943.24	20.55	943.08	26.6	940.19	28.03	939.5
29.65	938.73	34.6	936.52	35.78	935.8	38.74	933.98	39.11	933.76
41.67	933.23	49.84	931.54	51.38	931.5	58.31	931.32	66.73	933.85
67.61	934.12	69.32	934.16	71.76	934.21	86.6	933.94	86.82	933.94
86.85	933.94	104.1	933.96	104.52	933.45	105.52	932.83	110.64	929.65
115.12	926.86	121.54	926.93	127.95	926.93	131.57	931.93	132.62	933.46
133.76	933.42	135.15	933.49	150.91	934.25	174.08	935.44	175.6	935.45
177.91	935.79	197.28	935.53	215.59	935.97	216.91	936.01	218.12	936.06
228.46	936.33	231.16	936.23	233.14	936.15	240.03	935.92	247.58	936.52
254.49	936.95	261.34	937.02	267.28	937.63	267.72	937.68	268.03	937.68
268.29	937.69	268.42	937.69	268.63	937.69	272.47	937.76	273.62	937.79
317.79	938.07	322.25	938.15	344.92	938.59	356.38	938.81	360.75	938.9
366.67	939.01	371.41	939.32	371.47	939.45	371.6	939.7	371.71	939.91
371.84	939.91	372.29	939.94	375.27	940.02	386.37	940.98	386.77	940.98
386.87	940.97	387.07	940.53	387.12	940.41	394.7	940.52	394.76	940.52
394.79	940.52	394.93	940.52	395.94	940.56	396.62	940.6	400.62	940.81
405.48	941.1	405.49	941.13	405.72	941.51	405.75	941.51	406.22	941.51
406.51	941.51	411.8	942.01	412.47	942.37	415.9	942.45	418.57	942.52
424.64	943.1								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	104.1	.04	132.62	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
104.1	132.62	69.19	71.66	70.51	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	21.33		F

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	935.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.53	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	934.61	Reach Len. (ft)	69.19	71.66	70.51
Crit W.S. (ft)		Flow Area (sq ft)	87.65	167.16	15.92
E.G. Slope (ft/ft)	0.003217	Area (sq ft)	87.65	167.16	15.92
Q Total (cfs)	1100.00	Flow (cfs)	73.44	1018.37	8.20
Top Width (ft)	120.25	Top Width (ft)	66.39	28.52	25.34
Vel Total (ft/s)	4.06	Avg. Vel. (ft/s)	0.84	6.09	0.51
Max Chl Dpth (ft)	7.75	Hydr. Depth (ft)	1.32	5.86	0.63
Conv. Total (cfs)	19393.5	Conv. (cfs)	1294.7	17954.3	144.5
Length Wtd. (ft)	71.48	Wetted Per. (ft)	67.27	34.00	25.37
Min Ch El (ft)	926.86	Shear (lb/sq ft)	0.26	0.99	0.13
Alpha	2.08	Stream Power (lb/ft s)	0.22	6.02	0.06
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.72	3.48	1.42
C & E Loss (ft)	0.11	Cum SA (acres)	0.38	0.76	1.23

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 #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	936.41	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.64	Reach Len. (ft)	69.19	71.66	70.51
W.S. Elev (ft)	935.77	Flow Area (sq ft)	16.76	200.07	20.09
Crit W.S. (ft)		Area (sq ft)	16.76	200.07	20.09
E.G. Slope (ft/ft)	0.002905	Flow (cfs)	14.74	1305.49	19.77
Q Total (cfs)	1340.00	Top Width (ft)	9.25	28.52	9.26
Top Width (ft)	47.03	Avg. Vel. (ft/s)	0.88	6.53	0.98
Vel Total (ft/s)	5.66	Hydr. Depth (ft)	1.81	7.01	2.17
Max Chl Dpth (ft)	8.91	Conv. (cfs)	273.6	24223.2	366.8
Conv. Total (cfs)	24863.6	Wetted Per. (ft)	11.07	34.00	11.22
Length Wtd. (ft)	71.64	Shear (lb/sq ft)	0.27	1.07	0.32
Min Ch El (ft)	926.86	Stream Power (lb/ft s)	0.24	6.96	0.32
Alpha	1.30	Cum Volume (acre-ft)	0.11	4.00	0.28
Frctn Loss (ft)	0.10	Cum SA (acres)	0.08	0.80	0.17
C & E Loss (ft)	0.12				

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 #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	936.44	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.64	Reach Len. (ft)	69.19	71.66	70.51
W.S. Elev (ft)	935.80	Flow Area (sq ft)	167.66	201.04	63.70
Crit W.S. (ft)		Area (sq ft)	167.66	201.04	63.70
E.G. Slope (ft/ft)	0.003270	Flow (cfs)	213.46	1396.44	40.10
Q Total (cfs)	1650.00	Top Width (ft)	68.32	28.52	75.91
Top Width (ft)	172.75	Avg. Vel. (ft/s)	1.27	6.95	0.63
Vel Total (ft/s)	3.82	Hydr. Depth (ft)	2.45	7.05	0.84
Max Chl Dpth (ft)	8.94	Conv. (cfs)	3732.9	24420.3	701.2
Conv. Total (cfs)	28854.3	Wetted Per. (ft)	69.54	34.00	75.99
Length Wtd. (ft)	71.35	Shear (lb/sq ft)	0.49	1.21	0.17
Min Ch El (ft)	926.86	Stream Power (lb/ft s)	0.63	8.38	0.11
Alpha	2.82	Cum Volume (acre-ft)	1.22	4.29	3.26
Frctn Loss (ft)	0.10	Cum SA (acres)	0.45	0.83	1.94
C & E Loss (ft)	0.13				

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 #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	937.24	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.70	Reach Len. (ft)	69.19	71.66	70.51
W.S. Elev (ft)	936.54	Flow Area (sq ft)	218.72	222.17	136.79
Crit W.S. (ft)		Area (sq ft)	218.72	222.17	136.79
E.G. Slope (ft/ft)	0.003346	Flow (cfs)	331.76	1668.52	109.73
Q Total (cfs)	2110.00	Top Width (ft)	69.55	28.52	115.30
Top Width (ft)	213.36	Avg. Vel. (ft/s)	1.52	7.51	0.80
Vel Total (ft/s)	3.65	Hydr. Depth (ft)	3.14	7.79	1.19
Max Chl Dpth (ft)	9.68	Conv. (cfs)	5735.4	28845.5	1896.9
Conv. Total (cfs)	36477.9	Wetted Per. (ft)	70.97	34.00	115.42
Length Wtd. (ft)	71.28	Shear (lb/sq ft)	0.64	1.36	0.25
Min Ch El (ft)	926.86	Stream Power (lb/ft s)	0.98	10.25	0.20
Alpha	3.37	Cum Volume (acre-ft)	1.56	4.85	4.78
Frctn Loss (ft)	0.11	Cum SA (acres)	0.48	0.87	2.40
C & E Loss (ft)	0.14				

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 OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	937.77	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.71	Reach Len. (ft)	69.19	71.66	70.51
W.S. Elev (ft)	937.06	Flow Area (sq ft)	255.18	236.99	199.33
Crit W.S. (ft)		Area (sq ft)	255.18	236.99	199.33
E.G. Slope (ft/ft)	0.003285	Flow (cfs)	420.00	1841.18	188.82
Q Total (cfs)	2450.00	Top Width (ft)	70.71	28.52	129.12
Top Width (ft)	228.35	Avg. Vel. (ft/s)	1.65	7.77	0.95
Vel Total (ft/s)	3.54	Hydr. Depth (ft)	3.61	8.31	1.54
Max Chl Dpth (ft)	10.20	Conv. (cfs)	7328.1	32124.6	3294.5
Conv. Total (cfs)	42747.2	Wetted Per. (ft)	72.25	34.00	129.25
Length Wtd. (ft)	71.23				

Min Ch El (ft)	926.86	Shear (lb/sq ft)	0.72	1.43	0.32
Alpha	3.66	Stream Power (lb/ft s)	1.19	11.10	0.30
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	1.80	5.27	6.00
C & E Loss (ft)	0.13	Cum SA (acres)	0.49	0.90	2.76

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 #100yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	938.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.71	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	937.56	Reach Len. (ft)	69.19	71.66	70.51
Crit W.S. (ft)		Flow Area (sq ft)	290.98	251.32	265.42
E.G. Slope (ft/ft)	0.003184	Area (sq ft)	290.98	251.32	265.42
Q Total (cfs)	2800.00	Flow (cfs)	508.87	1998.90	292.23
Top Width (ft)	234.37	Top Width (ft)	71.84	28.52	134.01
Vel Total (ft/s)	3.47	Avg. Vel. (ft/s)	1.75	7.95	1.10
Max Chl Dpth (ft)	10.70	Hydr. Depth (ft)	4.05	8.81	1.98
Conv. Total (cfs)	49624.2	Conv. (cfs)	9018.7	35426.3	5179.2
Length Wtd. (ft)	71.18	Wetted Per. (ft)	73.48	34.00	134.17
Min Ch El (ft)	926.86	Shear (lb/sq ft)	0.79	1.47	0.39
Alpha	3.81	Stream Power (lb/ft s)	1.38	11.68	0.43
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	2.05	5.67	7.32
C & E Loss (ft)	0.13	Cum SA (acres)	0.54	0.92	3.18

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 #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	939.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.71	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	938.77	Reach Len. (ft)	69.19	71.66	70.51
Crit W.S. (ft)		Flow Area (sq ft)	379.56	285.84	485.24
E.G. Slope (ft/ft)	0.002907	Area (sq ft)	379.56	285.84	485.24
Q Total (cfs)	3650.00	Flow (cfs)	737.49	2366.93	545.58
Top Width (ft)	324.91	Top Width (ft)	74.54	28.52	221.85
Vel Total (ft/s)	3.17	Avg. Vel. (ft/s)	1.94	8.28	1.12
Max Chl Dpth (ft)	11.91	Hydr. Depth (ft)	5.09	10.02	2.19
Conv. Total (cfs)	67698.0	Conv. (cfs)	13678.6	43900.3	10119.1
Length Wtd. (ft)	71.10	Wetted Per. (ft)	76.45	34.00	222.03
Min Ch El (ft)	926.86	Shear (lb/sq ft)	0.90	1.53	0.40
Alpha	4.51	Stream Power (lb/ft s)	1.75	12.63	0.45
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	2.72	6.60	11.32
C & E Loss (ft)	0.12	Cum SA (acres)	0.65	0.95	4.40

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: Hope Creek
REACH: 1 RS: 878.1000

INPUT
Description: 43
Station Elevation Data num= 79

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.4	4.62	943.27	12.24	942.85	13.31	942.79	14.12	942.73
14.71	942.68	15.15	942.76	16.29	942.99	18.76	942.58	19.41	942.47
19.52	942.46	19.72	942.51	19.97	942.47	22.77	941.14	26.12	939.56
30.92	937.28	33.11	936.24	35.42	935.49	37.97	934.62	41.46	933.43
44.51	932.73	51.56	931.08	56.54	930.66	57.07	930.61	59.4	931.43
63.04	933.05	64.33	933.1	65.33	933.15	67.44	930.19	69.77	926.96
78.74	927	89.85	926.71	97.65	926.93	98.25	927.28	106.61	932.18
108.09	933.66	119.52	933.66	124.63	933.55	125.69	932.83	131.34	930.43
144.19	930.77	157.15	930.94	160.97	932.4	165.06	933.66	165.68	933.94
165.79	933.97	174.11	934.07	174.39	934.08	181.48	934.3	181.53	934.3
181.95	934.31	196.47	934.26	196.85	934.27	200.03	934.36	213.22	934.59
219.4	934.83	226.87	934.97	231.24	935.18	246.06	935.99	247.45	936.14
248.28	936.23	248.84	936.24	259.76	936.54	281.28	936.87	295.4	937.26
295.55	937.26	295.62	937.26	306.15	937.47	307.19	937.49	307.21	937.49
307.24	937.49	327.79	938.51	333.23	938.62	333.32	938.62	333.5	938.62
339.82	938.76	347.5	939.48	382.45	942.32	384.11	942.43		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
      0     .12   65.33     .04  108.09     .12

Bank Sta: Left   Right     Lengths: Left Channel   Right     Coeff Contr.   Expan.
         65.33  108.09              18.27   18.76   20.13          .1          .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev  Permanent
     300  384.11            F
```

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	934.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	934.78	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	930.36	Flow Area (sq ft)	71.78	290.88	187.36
E.G. Slope (ft/ft)	0.000726	Area (sq ft)	71.78	290.88	187.36
Q Total (cfs)	1100.00	Flow (cfs)	43.96	967.66	88.38
Top Width (ft)	180.73	Top Width (ft)	27.84	42.76	110.13
Vel Total (ft/s)	2.00	Avg. Vel. (ft/s)	0.61	3.33	0.47
Max Chl Dpth (ft)	8.07	Hydr. Depth (ft)	2.58	6.80	1.70
Conv. Total (cfs)	40838.8	Conv. (cfs)	1632.1	35925.4	3281.3
Length Wtd. (ft)	4.00	Wetted Per. (ft)	28.84	47.98	111.38
Min Ch El (ft)	926.71	Shear (lb/sq ft)	0.11	0.27	0.08
Alpha	2.44	Stream Power (lb/ft s)	0.07	0.91	0.04
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.60	3.10	1.26
C & E Loss (ft)	0.00	Cum SA (acres)	0.31	0.70	1.12

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	936.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	935.95	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	930.81	Flow Area (sq ft)		340.53	9.76
E.G. Slope (ft/ft)	0.000881	Area (sq ft)		340.53	9.76
Q Total (cfs)	1340.00	Flow (cfs)		1335.32	4.68
Top Width (ft)	47.03	Top Width (ft)		42.76	4.27
Vel Total (ft/s)	3.83	Avg. Vel. (ft/s)		3.92	0.48
Max Chl Dpth (ft)	9.24	Hydr. Depth (ft)		7.96	2.29
Conv. Total (cfs)	45144.0	Conv. (cfs)		44986.5	157.6
Length Wtd. (ft)	4.00	Wetted Per. (ft)		50.78	6.56
Min Ch El (ft)	926.71	Shear (lb/sq ft)		0.37	0.08
Alpha	1.05	Stream Power (lb/ft s)		1.45	0.04
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.10	3.56	0.26
C & E Loss (ft)	0.00	Cum SA (acres)	0.07	0.74	0.16

CROSS SECTION OUTPUT Profile #10yr

E.G. Elev (ft)	936.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	936.01	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	931.54	Flow Area (sq ft)	107.97	343.08	341.77
E.G. Slope (ft/ft)	0.000810	Area (sq ft)	107.97	343.08	341.77
Q Total (cfs)	1650.00	Flow (cfs)	84.40	1346.55	219.05
Top Width (ft)	212.37	Top Width (ft)	31.50	42.76	138.11
Vel Total (ft/s)	2.08	Avg. Vel. (ft/s)	0.78	3.92	0.64
Max Chl Dpth (ft)	9.30	Hydr. Depth (ft)	3.43	8.02	2.47
Conv. Total (cfs)	57961.3	Conv. (cfs)	2964.7	47301.7	7694.9
Length Wtd. (ft)	4.00	Wetted Per. (ft)	32.70	47.98	139.39
Min Ch El (ft)	926.71	Shear (lb/sq ft)	0.17	0.36	0.12
Alpha	2.92	Stream Power (lb/ft s)	0.13	1.42	0.08
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.00	3.84	2.93
C & E Loss (ft)	0.00	Cum SA (acres)	0.37	0.77	1.76

CROSS SECTION OUTPUT Profile #25yr

E.G. Elev (ft)	936.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	936.75	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	932.25	Flow Area (sq ft)	132.06	374.81	451.14
E.G. Slope (ft/ft)	0.000917	Area (sq ft)	132.06	374.81	451.14
Q Total (cfs)	2110.00	Flow (cfs)	120.88	1660.24	328.88
Top Width (ft)	241.23	Top Width (ft)	33.29	42.76	165.18
Vel Total (ft/s)	2.20	Avg. Vel. (ft/s)	0.92	4.43	0.73
Max Chl Dpth (ft)	10.04	Hydr. Depth (ft)	3.97	8.77	2.73
Conv. Total (cfs)	69664.1	Conv. (cfs)	3990.9	54814.9	10858.3
Length Wtd. (ft)	4.00	Wetted Per. (ft)	34.64	47.98	166.48
Min Ch El (ft)	926.71	Shear (lb/sq ft)	0.22	0.45	0.16
Alpha	3.21	Stream Power (lb/ft s)	0.20	1.98	0.11
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.29	4.36	4.30
C & E Loss (ft)	0.00	Cum SA (acres)	0.39	0.81	2.18

CROSS SECTION OUTPUT Profile #50yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	937.52	Element			
Vel Head (ft)	0.27	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	937.25	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	932.69	Flow Area (sq ft)	149.19	396.46	541.01
E.G. Slope (ft/ft)	0.000974	Area (sq ft)	149.19	396.46	541.01
Q Total (cfs)	2450.00	Flow (cfs)	149.23	1878.39	422.38
Top Width (ft)	264.19	Top Width (ft)	34.35	42.76	187.07
Vel Total (ft/s)	2.25	Avg. Vel. (ft/s)	1.00	4.74	0.78
Max Chl Dpth (ft)	10.54	Hydr. Depth (ft)	4.34	9.27	2.89
Conv. Total (cfs)	78510.5	Conv. (cfs)	4782.2	60193.3	13535.1
Length Wtd. (ft)	4.00	Wetted Per. (ft)	35.82	47.98	188.38
Min Ch El (ft)	926.71	Shear (lb/sq ft)	0.25	0.50	0.17
Alpha	3.42	Stream Power (lb/ft s)	0.25	2.38	0.14
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.48	4.75	5.40
C & E Loss (ft)	0.00	Cum SA (acres)	0.41	0.84	2.50

CROSS SECTION OUTPUT Profile #100yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	938.03	Element			
Vel Head (ft)	0.29	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	937.74	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	933.05	Flow Area (sq ft)	166.20	417.32	634.40
E.G. Slope (ft/ft)	0.001000	Area (sq ft)	166.20	417.32	637.36
Q Total (cfs)	2800.00	Flow (cfs)	177.35	2073.77	548.89
Top Width (ft)	282.35	Top Width (ft)	35.38	42.76	204.21
Vel Total (ft/s)	2.30	Avg. Vel. (ft/s)	1.07	4.97	0.87
Max Chl Dpth (ft)	11.03	Hydr. Depth (ft)	4.70	9.76	3.31
Conv. Total (cfs)	88523.6	Conv. (cfs)	5606.9	65563.3	17353.4
Length Wtd. (ft)	4.00	Wetted Per. (ft)	36.96	47.98	193.22
Min Ch El (ft)	926.71	Shear (lb/sq ft)	0.28	0.54	0.21
Alpha	3.50	Stream Power (lb/ft s)	0.30	2.70	0.18
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.69	5.12	6.59
C & E Loss (ft)	0.00	Cum SA (acres)	0.46	0.87	2.91

CROSS SECTION OUTPUT Profile #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	939.25	Element			
Vel Head (ft)	0.31	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	938.94	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	933.55	Flow Area (sq ft)	210.17	468.63	864.69
E.G. Slope (ft/ft)	0.000981	Area (sq ft)	210.17	468.63	898.95
Q Total (cfs)	3650.00	Flow (cfs)	247.41	2491.73	910.86
Top Width (ft)	314.33	Top Width (ft)	37.91	42.76	233.66
Vel Total (ft/s)	2.36	Avg. Vel. (ft/s)	1.18	5.32	1.05
Max Chl Dpth (ft)	12.23	Hydr. Depth (ft)	5.54	10.96	4.51
Conv. Total (cfs)	116517.7	Conv. (cfs)	7898.0	79542.6	29077.1
Length Wtd. (ft)	4.00	Wetted Per. (ft)	39.75	47.98	193.22
Min Ch El (ft)	926.71	Shear (lb/sq ft)	0.32	0.60	0.27
Alpha	3.52	Stream Power (lb/ft s)	0.38	3.18	0.29
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	2.26	5.98	10.20
C & E Loss (ft)	0.00	Cum SA (acres)	0.56	0.89	4.03

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 871

INPUT
Description: BR 16 Bnt 8
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	950	945	500	950	945

Upstream Bridge Cross Section Data
Station Elevation Data num= 79

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.44	4.62	943.31	12.24	942.89	13.31	942.83	14.12	942.77
14.71	942.72	15.15	942.8	16.29	943.03	18.76	942.62	19.41	942.51
19.52	942.5	19.72	942.55	19.97	942.51	22.77	941.18	26.12	939.6
30.92	937.32	33.11	936.28	35.42	935.53	37.97	934.66	41.46	933.47

```
   44.51  932.77   51.56  931.12   56.54   930.7   57.07  930.65    59.4  931.47
   63.04  933.09   64.33  933.14   65.33  933.19   67.44  930.23   69.77     927
   78.74  927.04   89.85  926.75   97.65  926.97   98.25  927.32  106.61  932.22
  108.09   933.7  119.52   933.7  124.63  933.59  125.69  932.87  131.34  930.47
  144.19  930.81  157.15  930.98  160.97  932.44  165.06   933.7  165.68  933.98
  165.79  934.01  174.11  934.11  174.39  934.12  181.48  934.34  181.53  934.34
  181.95  934.35  196.47   934.3  196.85  934.31  200.03   934.4  213.22  934.63
   219.4  934.87  226.87  935.01  231.24  935.22  246.06  936.03  247.45  936.18
  248.28  936.27  248.84  936.28  259.76  936.58  281.28  936.91   295.4   937.3
  295.55   937.3  295.62   937.3  306.15  937.51  307.19  937.53  307.21  937.53
  307.24  937.53  327.79  938.55  333.23  938.66  333.32  938.66   333.5  938.66
  339.82   938.8   347.5  939.52  382.45  942.36  384.11  942.47

 Manning's n Values          num=        3
      Sta   n Val      Sta   n Val      Sta   n Val
        0     .12    65.33     .04   108.09     .12

 Bank Sta: Left   Right    Coeff Contr.   Expan.
           65.33  108.09            .1       .3
 Ineffective Flow      num=        1
    Sta L   Sta R    Elev  Permanent
      300  384.11                  F

 Downstream  Deck/Roadway Coordinates
     num=        2
      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
        0     950     945      500     950     945

 Downstream Bridge Cross Section Data
 Station Elevation Data     num=       87
      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
        0  943.33      .75  943.31     8.78  943.08    16.47  942.65    17.59  942.58
    17.89  942.56    18.96  942.46    19.36  942.53    19.82  942.62    20.56  942.76
    21.51  942.62    22.04  942.55    22.72  942.45    24.27  942.26    28.56  940.22
    37.18  936.16    42.05  934.57    45.51  933.48    47.73  932.96    50.65  932.26
    55.86  930.92    59.41  930.71    61.27  930.54    65.35  932.07    67.41  932.93
    67.55  932.99    67.67  933.04    68.71  932.86    70.18  932.69    70.85  930.96
    76.45   926.8    90.47  926.89    97.43  926.98   100.48  928.94   108.35  933.17
   115.62  933.29   118.97  933.29   121.95  931.21   123.63  930.22   127.08  930.41
   136.35  930.19   138.36  930.14    144.5   930.2   146.07  930.79   147.83  931.29
   154.58  933.42   156.91  932.69   157.16  932.61   166.32  933.59   166.43  933.59
   172.14  933.67   177.28  933.48   186.03   933.7   189.81  933.58   191.49  933.52
   194.87  933.34   201.39  933.81   205.36  933.97   211.79   934.3   213.69  934.39
   220.86  934.75   223.53  935.03   232.87  935.43   236.51  935.65   245.35  935.86
   247.96  935.93      258  936.22   258.09  936.22   258.14  936.22    260.1  936.25
   268.67  936.48   270.38  936.49   285.85  936.74   305.53  937.04   306.54  937.07
   306.56  937.07   307.32  937.08    307.4  937.08   333.26  938.37   333.47  938.38
   333.48  938.38   333.73  938.38   334.71  938.47   349.59  939.35   372.72  940.84
   382.06  941.29   387.77  942.12

 Manning's n Values          num=        3
      Sta   n Val      Sta   n Val      Sta   n Val
        0     .12    67.67     .04   108.35     .12

 Bank Sta: Left   Right    Coeff Contr.   Expan.
           67.67  108.35            .1       .3

 Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
 Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow =      .98
 Elevation at which weir flow begins           =
 Energy head used in spillway design           =
 Spillway height used in design                =
 Weir crest shape                              = Broad Crested

 Number of Piers =  1

 Pier Data
 Pier Station     Upstream=   36.52    Downstream=   40.86
 Upstream     num=        2
     Width   Elev    Width   Elev
         8    925        8    945
 Downstream     num=        2
     Width   Elev    Width   Elev
         8    925        8    945

 Number of Bridge Coefficient Sets =  1

 Low Flow Methods and Data
        Energy
        Momentum                  Cd   =        2
 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 #2yr

E.G. US. (ft)	934.94
W.S. US. (ft)	934.78
Q Total (cfs)	1100.00
Q Bridge (cfs)	1100.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	950.01
Min El Prs (ft)	945.00
Delta EG (ft)	0.02
Delta WS (ft)	0.04
BR Open Area (sq ft)	3176.06
BR Open Vel (ft/s)	2.04
Coef of Q	
Br Sel Method	Energy only

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	934.93	934.93
W.S. Elev (ft)	934.78	934.76
Crit W.S. (ft)	930.40	931.02
Max Chl Dpth (ft)	8.03	7.96
Vel Total (ft/s)	2.04	2.01
Flow Area (sq ft)	540.28	547.25
Froude # Chl	0.23	0.25
Specif Force (cu ft)	1537.16	1447.28
Hydr Depth (ft)	3.06	3.11
W.P. Total (ft)	184.81	183.88
Conv. Total (cfs)	40292.9	36147.9
Top Width (ft)	176.52	176.08
Frctn Loss (ft)	0.00	0.01
C & E Loss (ft)	0.00	0.00
Shear Total (lb/sq ft)	0.14	0.17
Power Total (lb/ft s)	0.28	0.35

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #5yr

E.G. US. (ft)	936.18
W.S. US. (ft)	935.95
Q Total (cfs)	1340.00
Q Bridge (cfs)	1340.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	950.01
Min El Prs (ft)	945.00
Delta EG (ft)	0.03
Delta WS (ft)	0.10
BR Open Area (sq ft)	746.37
BR Open Vel (ft/s)	4.23
Coef of Q	
Br Sel Method	Energy only

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	936.18	936.17
W.S. Elev (ft)	935.94	935.87
Crit W.S. (ft)	930.85	931.37
Max Chl Dpth (ft)	9.19	9.07
Vel Total (ft/s)	3.85	4.23
Flow Area (sq ft)	348.14	316.87
Froude # Chl	0.25	0.29
Specif Force (cu ft)	1587.52	1403.63
Hydr Depth (ft)	7.40	6.74
W.P. Total (ft)	52.25	51.26
Conv. Total (cfs)	46474.4	39944.3
Top Width (ft)	47.03	47.03
Frctn Loss (ft)	0.01	0.01
C & E Loss (ft)	0.01	0.00
Shear Total (lb/sq ft)	0.35	0.43
Power Total (lb/ft s)	1.33	1.84

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #10yr

E.G. US. (ft)	936.20
W.S. US. (ft)	936.01
Q Total (cfs)	1650.00
Q Bridge (cfs)	1650.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	950.01
Min El Prs (ft)	945.00
Delta EG (ft)	0.02
Delta WS (ft)	0.05
BR Open Area (sq ft)	3176.06
BR Open Vel (ft/s)	2.13
Coef of Q	
Br Sel Method	Energy only

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	936.20	936.19
W.S. Elev (ft)	936.00	935.98
Crit W.S. (ft)	931.58	932.03
Max Chl Dpth (ft)	9.25	9.18
Vel Total (ft/s)	2.13	2.13
Flow Area (sq ft)	775.45	775.20
Froude # Chl	0.25	0.27
Specif Force (cu ft)	2405.23	2319.32
Hydr Depth (ft)	3.78	3.79
W.P. Total (ft)	214.47	213.74
Conv. Total (cfs)	57173.7	52184.2
Top Width (ft)	204.93	204.69
Frctn Loss (ft)	0.01	0.01
C & E Loss (ft)	0.00	0.00
Shear Total (lb/sq ft)	0.19	0.23
Power Total (lb/ft s)	0.40	0.48

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #25yr

E.G. US. (ft)	936.99
W.S. US. (ft)	936.75
Q Total (cfs)	2110.00
Q Bridge (cfs)	2110.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	950.01
Min El Prs (ft)	945.00
Delta EG (ft)	0.02
Delta WS (ft)	0.05
BR Open Area (sq ft)	3176.06
BR Open Vel (ft/s)	2.26
Coef of Q	
Br Sel Method	Energy only

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	936.98	936.98
W.S. Elev (ft)	936.74	936.71
Crit W.S. (ft)	932.29	932.80
Max Chl Dpth (ft)	9.99	9.91
Vel Total (ft/s)	2.26	2.25
Flow Area (sq ft)	933.30	936.80
Froude # Chl	0.27	0.29
Specif Force (cu ft)	3106.33	3018.67
Hydr Depth (ft)	4.06	3.90
W.P. Total (ft)	240.37	250.31
Conv. Total (cfs)	68707.3	62934.8
Top Width (ft)	229.85	240.03
Frctn Loss (ft)	0.01	0.01
C & E Loss (ft)	0.00	0.00
Shear Total (lb/sq ft)	0.23	0.26
Power Total (lb/ft s)	0.52	0.59

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #50yr

E.G. US. (ft)	937.52
W.S. US. (ft)	937.25
Q Total (cfs)	2450.00
Q Bridge (cfs)	2450.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	950.01
Min El Prs (ft)	945.00
Delta EG (ft)	0.02
Delta WS (ft)	0.06
BR Open Area (sq ft)	3176.06
BR Open Vel (ft/s)	2.32
Coef of Q	
Br Sel Method	Energy only

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	937.52	937.51
W.S. Elev (ft)	937.24	937.21
Crit W.S. (ft)	932.73	933.17
Max Chl Dpth (ft)	10.49	10.41
Vel Total (ft/s)	2.32	2.30
Flow Area (sq ft)	1055.85	1065.71
Froude # Chl	0.28	0.30
Specif Force (cu ft)	3660.25	3576.06
Hydr Depth (ft)	4.15	3.99
W.P. Total (ft)	265.78	278.56
Conv. Total (cfs)	77206.7	71215.1
Top Width (ft)	254.14	267.15
Frctn Loss (ft)	0.01	0.01
C & E Loss (ft)	0.00	0.00
Shear Total (lb/sq ft)	0.25	0.28
Power Total (lb/ft s)	0.58	0.65

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #100yr

E.G. US. (ft)	938.03
W.S. US. (ft)	937.74
Q Total (cfs)	2800.00
Q Bridge (cfs)	2800.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	950.01
Min El Prs (ft)	945.00
Delta EG (ft)	0.02
Delta WS (ft)	0.06
BR Open Area (sq ft)	3176.06
BR Open Vel (ft/s)	2.37
Coef of Q	
Br Sel Method	Energy only

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	938.02	938.02
W.S. Elev (ft)	937.72	937.70
Crit W.S. (ft)	933.09	933.25
Max Chl Dpth (ft)	10.97	10.90
Vel Total (ft/s)	2.37	2.34
Flow Area (sq ft)	1182.03	1198.42
Froude # Chl	0.29	0.31
Specif Force (cu ft)	4254.29	4177.84
Hydr Depth (ft)	4.51	4.31
W.P. Total (ft)	274.65	290.45
Conv. Total (cfs)	86815.3	80623.1
Top Width (ft)	273.09	277.95
Frctn Loss (ft)	0.01	0.01
C & E Loss (ft)	0.00	0.00
Shear Total (lb/sq ft)	0.28	0.31
Power Total (lb/ft s)	0.66	0.73

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

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

BRIDGE OUTPUT Profile #500yr

E.G. US. (ft)	939.25	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	938.94	E.G. Elev (ft)	939.24	939.23
Q Total (cfs)	3650.00	W.S. Elev (ft)	938.92	938.90
Q Bridge (cfs)	3650.00	Crit W.S. (ft)	933.59	934.69
Q Weir (cfs)		Max Chl Dpth (ft)	12.17	12.10
Weir Sta Lft (ft)		Vel Total (ft/s)	2.44	2.36
Weir Sta Rgt (ft)		Flow Area (sq ft)	1496.90	1546.46
Weir Submerg		Froude # Chl	0.29	0.31
Weir Max Depth (ft)		Specif Force (cu ft)	5970.42	5931.44
Min El Weir Flow (ft)	950.01	Hydr Depth (ft)	5.66	5.11
Min El Prs (ft)	945.00	W.P. Total (ft)	279.83	317.79
Delta EG (ft)	0.02	Conv. Total (cfs)	114005.1	106633.9
Delta WS (ft)	0.06	Top Width (ft)	305.56	302.59
BR Open Area (sq ft)	3176.06	Frctn Loss (ft)	0.01	0.01
BR Open Vel (ft/s)	2.44	C & E Loss (ft)	0.00	0.00
Coef of Q		Shear Total (lb/sq ft)	0.34	0.36
Br Sel Method	Energy only	Power Total (lb/ft s)	0.83	0.84

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 859.3424

INPUT
Description: 44
Station Elevation Data num= 87

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.41	.75	943.39	8.78	943.16	16.47	942.73	17.59	942.66
17.89	942.64	18.96	942.54	19.36	942.61	19.82	942.7	20.56	942.84
21.51	942.7	22.04	942.63	22.72	942.53	24.27	942.34	28.56	940.3
37.18	936.24	42.05	934.65	45.51	933.56	47.73	933.04	50.65	932.34
55.86	931	59.41	930.79	61.27	930.62	65.35	932.15	67.41	933.01
67.55	933.07	67.67	933.12	68.71	932.94	70.18	932.77	70.85	931.04
76.45	926.88	90.47	926.97	97.43	927.06	100.48	929.02	108.35	933.25
115.62	933.37	118.97	933.37	121.95	931.29	123.63	930.3	127.08	930.49
136.35	930.27	138.36	930.22	144.5	930.28	146.07	930.87	147.83	931.37
154.58	933.5	156.91	932.77	157.16	932.69	166.32	933.67	166.43	933.67
172.14	933.75	177.28	933.56	186.03	933.78	189.81	933.66	191.49	933.6
194.87	933.42	201.39	933.89	205.36	934.05	211.79	934.38	213.69	934.47
220.86	934.83	223.53	935.11	232.87	935.51	236.51	935.73	245.35	935.94
247.96	936.01	258	936.3	258.09	936.3	258.14	936.3	260.1	936.33
268.67	936.56	270.38	936.57	285.85	936.82	305.53	937.12	306.54	937.15
306.56	937.15	307.32	937.16	307.4	937.16	333.26	938.45	333.47	938.46
333.48	938.46	333.73	938.46	334.71	938.55	349.59	939.43	372.72	940.92
382.06	941.37	387.77	942.2						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	67.67	.04	108.35	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
67.67	108.35	123.89	123.81	123.48	.1	.3

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	934.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	934.74	Reach Len. (ft)	123.89	123.81	123.48
Crit W.S. (ft)		Flow Area (sq ft)	67.12	250.97	213.49
E.G. Slope (ft/ft)	0.000991	Area (sq ft)	67.12	250.97	213.49
Q Total (cfs)	1100.00	Flow (cfs)	48.16	924.20	127.64
Top Width (ft)	177.30	Top Width (ft)	25.90	40.68	110.72
Vel Total (ft/s)	2.07	Avg. Vel. (ft/s)	0.72	3.68	0.60
Max Chl Dpth (ft)	7.86	Hydr. Depth (ft)	2.59	6.17	1.93
Conv. Total (cfs)	34944.9	Conv. (cfs)	1530.0	29360.2	4054.8
Length Wtd. (ft)	123.78	Wetted Per. (ft)	26.88	44.91	112.39
Min Ch El (ft)	926.88	Shear (lb/sq ft)	0.15	0.35	0.12
Alpha	2.68	Stream Power (lb/ft s)	0.11	1.27	0.07
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	0.57	2.98	1.17
C & E Loss (ft)	0.01	Cum SA (acres)	0.30	0.68	1.07

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	936.16	Element	Left OB	Channel	Right OB

Vel Head (ft)	0.31	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	935.85	Reach Len. (ft)	123.89	123.81	123.48
Crit W.S. (ft)		Flow Area (sq ft)		295.96	16.15
E.G. Slope (ft/ft)	0.001280	Area (sq ft)		295.96	16.15
Q Total (cfs)	1340.00	Flow (cfs)		1329.31	10.69
Top Width (ft)	47.03	Top Width (ft)		40.68	6.35
Vel Total (ft/s)	4.29	Avg. Vel. (ft/s)		4.49	0.66
Max Chl Dpth (ft)	8.97	Hydr. Depth (ft)		7.28	2.54
Conv. Total (cfs)	37456.5	Conv. (cfs)		37157.5	298.9
Length Wtd. (ft)	123.80	Wetted Per. (ft)		47.63	8.84
Min Ch El (ft)	926.88	Shear (lb/sq ft)		0.50	0.15
Alpha	1.09	Stream Power (lb/ft s)		2.23	0.10
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	0.10	3.42	0.25
C & E Loss (ft)	0.03	Cum SA (acres)	0.07	0.73	0.16

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	936.18	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.22	Reach Len. (ft)	123.89	123.81	123.48
W.S. Elev (ft)	935.96	Flow Area (sq ft)	100.94	300.52	361.48
Crit W.S. (ft)		Area (sq ft)	100.94	300.52	361.48
E.G. Slope (ft/ft)	0.001053	Flow (cfs)	89.48	1286.37	274.15
Q Total (cfs)	1650.00	Top Width (ft)	29.63	40.68	137.68
Top Width (ft)	207.99	Avg. Vel. (ft/s)	0.89	4.28	0.76
Vel Total (ft/s)	2.16	Hydr. Depth (ft)	3.41	7.39	2.63
Max Chl Dpth (ft)	9.08	Conv. (cfs)	2757.6	39643.8	8448.9
Conv. Total (cfs)	50850.3	Wetted Per. (ft)	30.80	44.91	139.39
Length Wtd. (ft)	123.76	Shear (lb/sq ft)	0.22	0.44	0.17
Min Ch El (ft)	926.88	Stream Power (lb/ft s)	0.19	1.88	0.13
Alpha	3.08	Cum Volume (acre-ft)	0.96	3.70	2.78
Frctn Loss (ft)	0.17	Cum SA (acres)	0.36	0.75	1.70
C & E Loss (ft)	0.02				

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	936.97	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.27	Reach Len. (ft)	123.89	123.81	123.48
W.S. Elev (ft)	936.69	Flow Area (sq ft)	123.45	330.43	473.09
Crit W.S. (ft)		Area (sq ft)	123.45	330.43	473.09
E.G. Slope (ft/ft)	0.001171	Flow (cfs)	126.63	1588.92	394.45
Q Total (cfs)	2110.00	Top Width (ft)	31.45	40.68	169.67
Top Width (ft)	241.81	Avg. Vel. (ft/s)	1.03	4.81	0.83
Vel Total (ft/s)	2.28	Hydr. Depth (ft)	3.92	8.12	2.79
Max Chl Dpth (ft)	9.81	Conv. (cfs)	3700.8	46434.9	11527.5
Conv. Total (cfs)	61663.2	Wetted Per. (ft)	32.77	44.91	171.39
Length Wtd. (ft)	123.75	Shear (lb/sq ft)	0.28	0.54	0.20
Min Ch El (ft)	926.88	Stream Power (lb/ft s)	0.28	2.59	0.17
Alpha	3.40	Cum Volume (acre-ft)	1.23	4.21	4.10
Frctn Loss (ft)	0.19	Cum SA (acres)	0.38	0.79	2.10
C & E Loss (ft)	0.01				

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	937.50	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.31	Reach Len. (ft)	123.89	123.81	123.48
W.S. Elev (ft)	937.19	Flow Area (sq ft)	139.49	350.82	566.12
Crit W.S. (ft)		Area (sq ft)	139.49	350.82	566.12
E.G. Slope (ft/ft)	0.001236	Flow (cfs)	155.75	1803.58	490.68
Q Total (cfs)	2450.00	Top Width (ft)	32.52	40.68	199.75
Top Width (ft)	272.95	Avg. Vel. (ft/s)	1.12	5.14	0.87
Vel Total (ft/s)	2.32	Hydr. Depth (ft)	4.29	8.62	2.83
Max Chl Dpth (ft)	10.31	Conv. (cfs)	4430.7	51309.3	13959.0
Conv. Total (cfs)	69699.1	Wetted Per. (ft)	33.95	44.91	201.47
Length Wtd. (ft)	123.74	Shear (lb/sq ft)	0.32	0.60	0.22
Min Ch El (ft)	926.88	Stream Power (lb/ft s)	0.35	3.10	0.19
Alpha	3.66	Cum Volume (acre-ft)	1.43	4.59	5.16
Frctn Loss (ft)	0.19	Cum SA (acres)	0.40	0.82	2.42
C & E Loss (ft)	0.01				

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	938.01	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.32	Reach Len. (ft)	123.89	123.81	123.48
W.S. Elev (ft)	937.68	Flow Area (sq ft)	155.63	370.70	666.13
Crit W.S. (ft)		Area (sq ft)	155.63	370.70	666.13
E.G. Slope (ft/ft)	0.001250	Flow (cfs)	183.93	1988.92	627.15
Q Total (cfs)	2800.00	Top Width (ft)	33.55	40.68	209.55
Top Width (ft)	283.78				

Vel Total (ft/s)	2.35	Avg. Vel. (ft/s)	1.18	5.37	0.94
Max Chl Dpth (ft)	10.80	Hydr. Depth (ft)	4.64	9.11	3.18
Conv. Total (cfs)	79183.5	Conv. (cfs)	5201.5	56246.4	17735.6
Length Wtd. (ft)	123.74	Wetted Per. (ft)	35.10	44.91	211.27
Min Ch El (ft)	926.88	Shear (lb/sq ft)	0.35	0.64	0.25
Alpha	3.76	Stream Power (lb/ft s)	0.41	3.46	0.23
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	1.62	4.95	6.31
C & E Loss (ft)	0.01	Cum SA (acres)	0.44	0.85	2.82

CROSS SECTION OUTPUT Profile #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	939.22	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.34	Reach Len. (ft)	123.89	123.81	123.48
W.S. Elev (ft)	938.89	Flow Area (sq ft)	197.52	419.62	932.23
Crit W.S. (ft)		Area (sq ft)	197.52	419.62	932.23
E.G. Slope (ft/ft)	0.001196	Flow (cfs)	254.20	2391.87	1003.93
Q Total (cfs)	3650.00	Top Width (ft)	36.11	40.68	232.04
Top Width (ft)	308.83	Avg. Vel. (ft/s)	1.29	5.70	1.08
Vel Total (ft/s)	2.36	Hydr. Depth (ft)	5.47	10.32	4.02
Max Chl Dpth (ft)	12.01	Conv. (cfs)	7349.4	69153.5	29025.7
Conv. Total (cfs)	105528.5	Wetted Per. (ft)	37.92	44.91	233.81
Length Wtd. (ft)	123.72	Shear (lb/sq ft)	0.39	0.70	0.30
Min Ch El (ft)	926.88	Stream Power (lb/ft s)	0.50	3.98	0.32
Alpha	3.91	Cum Volume (acre-ft)	2.18	5.79	9.81
Frctn Loss (ft)	0.18	Cum SA (acres)	0.55	0.87	3.93
C & E Loss (ft)	0.01				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 735.5340

INPUT
Description: 45
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.13	3.78	943.02	6.78	942.93	10.3	942.83	14.96	942.68
19.33	942.54	20.22	942.5	25.75	942.23	28.02	942.11	29.17	942.05
32.12	941.84	32.54	941.81	35.07	941.66	42.67	936.74	43.14	936.42
43.68	936.08	44.17	935.95	44.64	935.84	54.3	933.46	62.22	931.26
64.32	930.68	65.85	930.65	72.51	930.55	75.8	931.43	77.21	931.81
79.99	932.56	82.41	933.21	85.18	933.45	90.62	933.36	92.4	929.94
95.39	926.37	100.59	926.47	104.21	926.54	111.26	926.59	114.02	928.4
118.04	932.88	131.84	932.51	139.52	932.02	154.34	932	156.27	932
157.55	932.01	170.29	932.22	171.44	932.26	174.81	932.59	188.36	933.24
193.73	934.12	194.83	934.17	199.73	934.24	201.97	934.27	207.25	934.44
209.03	934.5	212.65	934.97	220.18	934.66	228.85	934.72	235.85	935.06
245.79	934.97	255.94	935.08	268.99	935.77	274.38	935.81	287.92	935.59
291.34	935.62	306	935.64	314.36	935.69	320.46	935.84	325.38	936.59
326.25	936.27	329.92	936.78	334.99	937.33	337.92	937.79	349.59	939.43
372.72	940.92	382.06	941.37	387.77	942.2				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	90.62	.04	118.04	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
90.62	118.04	19.18	19.15	18.15	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
266	387.77		F

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	934.74	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.31	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	934.43	Flow Area (sq ft)	90.69	183.85	149.68
Crit W.S. (ft)	931.29	Area (sq ft)	90.69	183.85	149.68
E.G. Slope (ft/ft)	0.001834	Flow (cfs)	81.48	906.28	112.24
Q Total (cfs)	1100.00	Top Width (ft)	40.25	27.42	88.87
Top Width (ft)	156.55	Avg. Vel. (ft/s)	0.90	4.93	0.75
Vel Total (ft/s)	2.59	Hydr. Depth (ft)	2.25	6.71	1.68
Max Chl Dpth (ft)	8.06	Conv. (cfs)	1902.8	21164.0	2621.1
Conv. Total (cfs)	25687.9	Wetted Per. (ft)	41.11	33.70	89.00
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.25	0.62	0.19
Min Ch El (ft)	926.37	Stream Power (lb/ft s)	0.23	3.08	0.14
Alpha	2.99	Cum Volume (acre-ft)	0.34	2.37	0.65
Frctn Loss (ft)	0.01	Cum SA (acres)	0.21	0.59	0.79
C & E Loss (ft)	0.00				

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	935.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.57	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	935.34	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	931.79	Flow Area (sq ft)	10.54	208.91	37.60
E.G. Slope (ft/ft)	0.002437	Area (sq ft)	10.54	208.91	37.60
Q Total (cfs)	1340.00	Flow (cfs)	8.21	1292.83	38.96
Top Width (ft)	47.03	Top Width (ft)	5.44	27.42	14.17
Vel Total (ft/s)	5.21	Avg. Vel. (ft/s)	0.78	6.19	1.04
Max Chl Dpth (ft)	8.97	Hydr. Depth (ft)	1.94	7.62	2.65
Conv. Total (cfs)	27143.1	Conv. (cfs)	166.3	26187.6	789.3
Length Wtd. (ft)	4.00	Wetted Per. (ft)	7.33	33.70	17.03
Min Ch El (ft)	926.37	Shear (lb/sq ft)	0.22	0.94	0.34
Alpha	1.36	Stream Power (lb/ft s)	0.17	5.84	0.35
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.08	2.70	0.18
C & E Loss (ft)	0.00	Cum SA (acres)	0.06	0.63	0.13

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION OUTPUT Profile #10yr

E.G. Elev (ft)	935.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.38	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	935.61	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	932.99	Flow Area (sq ft)	141.24	216.35	294.35
E.G. Slope (ft/ft)	0.001966	Area (sq ft)	141.24	216.35	294.40
Q Total (cfs)	1650.00	Flow (cfs)	163.67	1230.90	255.43
Top Width (ft)	224.73	Top Width (ft)	45.06	27.42	152.25
Vel Total (ft/s)	2.53	Avg. Vel. (ft/s)	1.16	5.69	0.87
Max Chl Dpth (ft)	9.24	Hydr. Depth (ft)	3.13	7.89	1.99
Conv. Total (cfs)	37210.2	Conv. (cfs)	3691.0	27758.7	5760.5
Length Wtd. (ft)	4.00	Wetted Per. (ft)	46.07	33.70	148.15
Min Ch El (ft)	926.37	Shear (lb/sq ft)	0.38	0.79	0.24
Alpha	3.81	Stream Power (lb/ft s)	0.44	4.48	0.21
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.61	2.97	1.85
C & E Loss (ft)	0.00	Cum SA (acres)	0.25	0.66	1.29

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #25yr

E.G. Elev (ft)	936.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.40	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	936.37	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	933.84	Flow Area (sq ft)	176.39	237.09	406.30
E.G. Slope (ft/ft)	0.001985	Area (sq ft)	176.39	237.09	444.59
Q Total (cfs)	2110.00	Flow (cfs)	230.01	1440.78	439.21
Top Width (ft)	281.72	Top Width (ft)	47.40	27.42	206.90
Vel Total (ft/s)	2.57	Avg. Vel. (ft/s)	1.30	6.08	1.08
Max Chl Dpth (ft)	10.00	Hydr. Depth (ft)	3.72	8.65	2.75
Conv. Total (cfs)	47354.7	Conv. (cfs)	5162.1	32335.4	9857.1
Length Wtd. (ft)	4.00	Wetted Per. (ft)	48.55	33.70	148.15
Min Ch El (ft)	926.37	Shear (lb/sq ft)	0.45	0.87	0.34
Alpha	3.87	Stream Power (lb/ft s)	0.59	5.30	0.37
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.81	3.41	2.80
C & E Loss (ft)	0.00	Cum SA (acres)	0.27	0.69	1.57

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #50yr

E.G. Elev (ft)	937.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	936.89	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	934.16	Flow Area (sq ft)	201.36	251.42	483.62
E.G. Slope (ft/ft)	0.001971	Area (sq ft)	201.36	251.42	554.55
Q Total (cfs)	2450.00	Flow (cfs)	282.11	1582.90	584.99
Top Width (ft)	288.53	Top Width (ft)	48.19	27.42	212.92
Vel Total (ft/s)	2.62	Avg. Vel. (ft/s)	1.40	6.30	1.21
Max Chl Dpth (ft)	10.52	Hydr. Depth (ft)	4.18	9.17	3.27
Conv. Total (cfs)	55190.6	Conv. (cfs)	6354.9	35657.7	13178.0
Length Wtd. (ft)	4.00	Wetted Per. (ft)	49.49	33.70	148.15
Min Ch El (ft)	926.37	Shear (lb/sq ft)	0.50	0.92	0.40
Alpha	3.83	Stream Power (lb/ft s)	0.70	5.78	0.49
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.94	3.73	3.57
C & E Loss (ft)	0.00	Cum SA (acres)	0.28	0.72	1.83

CROSS SECTION OUTPUT Profile #100yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	937.80	Element			
Vel Head (ft)	0.42	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	937.39	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	934.71	Flow Area (sq ft)	225.36	264.97	556.72
E.G. Slope (ft/ft)	0.001966	Area (sq ft)	225.36	264.97	660.86
Q Total (cfs)	2800.00	Flow (cfs)	335.81	1725.45	738.75
Top Width (ft)	293.69	Top Width (ft)	48.95	27.42	217.32
Vel Total (ft/s)	2.67	Avg. Vel. (ft/s)	1.49	6.51	1.33
Max Chl Dpth (ft)	11.02	Hydr. Depth (ft)	4.60	9.66	3.76
Conv. Total (cfs)	63152.9	Conv. (cfs)	7574.0	38916.8	16662.1
Length Wtd. (ft)	4.00	Wetted Per. (ft)	50.40	33.70	148.15
Min Ch El (ft)	926.37	Shear (lb/sq ft)	0.55	0.96	0.46
Alpha	3.76	Stream Power (lb/ft s)	0.82	6.28	0.61
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	1.08	4.04	4.43
C & E Loss (ft)	0.00	Cum SA (acres)	0.33	0.75	2.22

CROSS SECTION OUTPUT Profile #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	939.03	Element			
Vel Head (ft)	0.42	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	938.61	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	935.79	Flow Area (sq ft)	286.56	298.60	738.21
E.G. Slope (ft/ft)	0.001838	Area (sq ft)	286.56	298.60	932.47
Q Total (cfs)	3650.00	Flow (cfs)	470.67	2036.10	1143.23
Top Width (ft)	304.01	Top Width (ft)	50.84	27.42	225.74
Vel Total (ft/s)	2.76	Avg. Vel. (ft/s)	1.64	6.82	1.55
Max Chl Dpth (ft)	12.24	Hydr. Depth (ft)	5.64	10.89	4.99
Conv. Total (cfs)	85139.3	Conv. (cfs)	10978.7	47493.7	26666.8
Length Wtd. (ft)	4.00	Wetted Per. (ft)	52.66	33.70	148.15
Min Ch El (ft)	926.37	Shear (lb/sq ft)	0.62	1.02	0.57
Alpha	3.55	Stream Power (lb/ft s)	1.03	6.93	0.89
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	1.49	4.77	7.16
C & E Loss (ft)	0.00	Cum SA (acres)	0.43	0.78	3.28

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 728

INPUT
Description: BR 16 Bnt 7
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	950	945	500	950	945

Upstream Bridge Cross Section Data
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.09	3.78	942.98	6.78	942.89	10.3	942.79	14.96	942.64
19.33	942.5	20.22	942.46	25.75	942.19	28.02	942.07	29.17	942.01
32.12	941.8	32.54	941.77	35.07	941.62	42.67	936.7	43.14	936.38
43.68	936.04	44.17	935.91	44.64	935.8	54.3	933.42	62.22	931.22
64.32	930.64	65.85	930.61	72.51	930.51	75.8	931.39	77.21	931.77
79.99	932.52	82.41	933.17	85.18	933.41	90.62	933.32	92.4	929.9
95.39	926.33	100.59	926.43	104.21	926.5	111.26	926.55	114.02	928.36
118.04	932.84	131.84	932.47	139.52	931.98	154.34	931.96	156.27	931.96
157.55	931.97	170.29	932.18	171.44	932.22	174.81	932.55	188.36	933.2
193.73	934.08	194.83	934.13	199.73	934.2	201.97	934.23	207.25	934.4
209.03	934.46	212.65	934.93	220.18	934.62	228.85	934.68	235.85	935.02
245.79	934.93	255.94	935.04	268.99	935.73	274.38	935.77	287.92	935.55
291.34	935.58	306	935.6	314.36	935.65	320.46	935.8	325.38	936.55
326.25	936.23	329.92	936.74	334.99	937.29	337.92	937.75	349.59	939.39
372.72	940.88	382.06	941.33	387.77	942.16				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	90.62	.04	118.04	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
90.62	118.04	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
266	387.77		F

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	950	945	500	950	945

Downstream Bridge Cross Section Data
Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.31	.67	943.29	3.63	943.2	12.92	942.93	23.8	942.61
25.43	942.55	31.56	942.28	32.74	942.22	35.68	942.1	37.39	941.97
40.89	941.7	41.23	941.68	41.33	941.67	41.39	941.66	41.49	941.6
50.2	936.01	60.57	933.29	60.72	933.25	69.81	930.73	69.89	930.68
78.25	930.5	78.54	930.49	78.75	930.64	88.68	933.31	98.57	933.14
99.37	933.2	102.75	927.16	103.13	926.47	103.28	926.27	116.97	926.55
118.4	926.56	118.91	926.97	124.26	932.94	124.52	932.95	138.12	932.03
138.33	931.97	139.89	931.96	143.44	931.99	157.74	932.24	162.63	932.09
171.95	932.13	179.1	932.28	180.24	932.29	180.65	932.32	181.58	932.42
191.38	933.42	194.71	934.05	198.87	934.62	200.85	935.48	204.37	936.37
211.1	936.56	217.68	936.56	227.54	936.64	245.88	936.79	251.73	936.89
257.2	937.02	290.84	937.41	295.8	937.53	303.59	937.32	328.94	937.58
340.6	937.69	349.59	939.52	372.72	941.01	382.06	941.46	387.77	942.29

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	99.37	.04	124.26	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
99.37	124.26	.1	.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data
Pier Station Upstream= 51.93 Downstream= 58.2
Upstream num= 2

Width	Elev	Width	Elev
8	925	8	950

Downstream num= 2

Width	Elev	Width	Elev
8	925	8	950

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Momentum Cd = 2
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 #2yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	934.74	E.G. Elev (ft)	934.73	934.72
W.S. US. (ft)	934.43	W.S. Elev (ft)	934.43	934.36
Q Total (cfs)	1100.00	Crit W.S. (ft)	931.27	931.57
Q Bridge (cfs)	1100.00	Max Chl Dpth (ft)	8.10	8.09
Q Weir (cfs)		Vel Total (ft/s)	2.58	2.79
Weir Sta Lft (ft)		Flow Area (sq ft)	425.99	394.17
Weir Sta Rgt (ft)		Froude # Chl	0.33	0.36
Weir Submerg		Specif Force (cu ft)	1105.78	1026.27
Weir Max Depth (ft)		Hydr Depth (ft)	2.80	2.92
Min El Weir Flow (ft)	950.01	W.P. Total (ft)	160.65	144.05
Min El Prs (ft)	945.00	Conv. Total (cfs)	26007.9	23069.1
Delta EG (ft)	0.05			

Delta WS (ft)	0.08	Top Width (ft)	152.10	134.77
BR Open Area (sq ft)	2800.44	Frctn Loss (ft)	0.01	0.02
BR Open Vel (ft/s)	2.79	C & E Loss (ft)	0.00	0.01
Coef of Q		Shear Total (lb/sq ft)	0.30	0.39
Br Sel Method	Energy only	Power Total (lb/ft s)	0.76	1.08

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #5yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	935.92	E.G. Elev (ft)	935.90	935.87
W.S. US. (ft)	935.34	W.S. Elev (ft)	935.34	935.17
Q Total (cfs)	1340.00	Crit W.S. (ft)	931.75	932.08
Q Bridge (cfs)	1340.00	Max Chl Dpth (ft)	9.01	8.90
Q Weir (cfs)		Vel Total (ft/s)	5.17	5.67
Weir Sta Lft (ft)		Flow Area (sq ft)	259.00	236.34
Weir Sta Rgt (ft)		Froude # Chl	0.39	0.44
Weir Submerg		Specif Force (cu ft)	1162.09	1077.89
Weir Max Depth (ft)		Hydr Depth (ft)	5.51	5.03
Min El Weir Flow (ft)	950.01	W.P. Total (ft)	53.32	53.92
Min El Prs (ft)	945.00	Conv. Total (cfs)	27551.1	23511.8
Delta EG (ft)	0.08	Top Width (ft)	47.03	47.03
Delta WS (ft)	0.20	Frctn Loss (ft)	0.02	0.03
BR Open Area (sq ft)	698.59	C & E Loss (ft)	0.01	0.00
BR Open Vel (ft/s)	5.67	Shear Total (lb/sq ft)	0.72	0.89
Coef of Q		Power Total (lb/ft s)	3.71	5.04
Br Sel Method	Energy only			

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #10yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	935.99	E.G. Elev (ft)	935.98	935.97
W.S. US. (ft)	935.61	W.S. Elev (ft)	935.61	935.55
Q Total (cfs)	1650.00	Crit W.S. (ft)	932.95	933.29
Q Bridge (cfs)	1650.00	Max Chl Dpth (ft)	9.28	9.28
Q Weir (cfs)		Vel Total (ft/s)	2.55	2.96
Weir Sta Lft (ft)		Flow Area (sq ft)	646.81	557.77
Weir Sta Rgt (ft)		Froude # Chl	0.35	0.38
Weir Submerg		Specif Force (cu ft)	1819.05	1680.60
Weir Max Depth (ft)		Hydr Depth (ft)	3.04	3.95
Min El Weir Flow (ft)	950.01	W.P. Total (ft)	223.08	152.48
Min El Prs (ft)	945.00	Conv. Total (cfs)	37515.1	33815.8
Delta EG (ft)	0.05	Top Width (ft)	236.60	141.15
Delta WS (ft)	0.07	Frctn Loss (ft)	0.01	0.02
BR Open Area (sq ft)	2800.44	C & E Loss (ft)	0.00	0.01
BR Open Vel (ft/s)	2.96	Shear Total (lb/sq ft)	0.35	0.54
Coef of Q		Power Total (lb/ft s)	0.89	1.61
Br Sel Method	Energy only			

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #25yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	936.77	E.G. Elev (ft)	936.76	936.74
W.S. US. (ft)	936.37	W.S. Elev (ft)	936.36	936.24
Q Total (cfs)	2110.00	Crit W.S. (ft)	933.79	934.04
Q Bridge (cfs)	2110.00	Max Chl Dpth (ft)	10.03	9.97
Q Weir (cfs)		Vel Total (ft/s)	2.61	3.21
Weir Sta Lft (ft)		Flow Area (sq ft)	807.47	656.89
Weir Sta Rgt (ft)		Froude # Chl	0.36	0.41
Weir Submerg		Specif Force (cu ft)	2433.15	2191.90
Weir Max Depth (ft)		Hydr Depth (ft)	3.76	4.50
Min El Weir Flow (ft)	950.01	W.P. Total (ft)	226.97	158.92
Min El Prs (ft)	945.00	Conv. Total (cfs)	47432.6	40969.2
Delta EG (ft)	0.07	Top Width (ft)	274.26	146.00
Delta WS (ft)	0.14	Frctn Loss (ft)	0.01	0.02
BR Open Area (sq ft)	2800.44	C & E Loss (ft)	0.01	0.01
BR Open Vel (ft/s)	3.21	Shear Total (lb/sq ft)	0.44	0.68
Coef of Q		Power Total (lb/ft s)	1.15	2.20
Br Sel Method	Energy only			

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #50yr

E.G. US. (ft)	937.30
W.S. US. (ft)	936.89
Q Total (cfs)	2450.00
Q Bridge (cfs)	2450.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	950.01
Min El Prs (ft)	945.00
Delta EG (ft)	0.08
Delta WS (ft)	0.27
BR Open Area (sq ft)	2800.44
BR Open Vel (ft/s)	3.42
Coef of Q	
Br Sel Method	Energy only

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	937.29	937.25
W.S. Elev (ft)	936.87	936.64
Crit W.S. (ft)	934.08	934.42
Max Chl Dpth (ft)	10.54	10.37
Vel Total (ft/s)	2.67	3.42
Flow Area (sq ft)	918.10	717.40
Froude # Chl	0.37	0.45
Specif Force (cu ft)	2927.38	2561.53
Hydr Depth (ft)	4.26	4.23
W.P. Total (ft)	228.92	183.60
Conv. Total (cfs)	54940.4	44106.5
Top Width (ft)	280.76	169.74
Frctn Loss (ft)	0.01	0.03
C & E Loss (ft)	0.02	0.01
Shear Total (lb/sq ft)	0.50	0.75
Power Total (lb/ft s)	1.33	2.57

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #100yr

E.G. US. (ft)	937.80
W.S. US. (ft)	937.39
Q Total (cfs)	2800.00
Q Bridge (cfs)	2800.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	950.01
Min El Prs (ft)	945.00
Delta EG (ft)	0.10
Delta WS (ft)	0.36
BR Open Area (sq ft)	2800.44
BR Open Vel (ft/s)	3.55
Coef of Q	
Br Sel Method	Energy only

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	937.79	937.75
W.S. Elev (ft)	937.36	937.02
Crit W.S. (ft)	934.66	934.80
Max Chl Dpth (ft)	11.03	10.75
Vel Total (ft/s)	2.73	3.55
Flow Area (sq ft)	1023.80	789.49
Froude # Chl	0.37	0.48
Specif Force (cu ft)	3456.55	2950.80
Hydr Depth (ft)	4.73	3.94
W.P. Total (ft)	230.80	215.19
Conv. Total (cfs)	62599.7	47547.9
Top Width (ft)	285.82	200.46
Frctn Loss (ft)	0.02	0.03
C & E Loss (ft)	0.03	0.02
Shear Total (lb/sq ft)	0.55	0.79
Power Total (lb/ft s)	1.52	2.82

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #500yr

E.G. US. (ft)	939.03
W.S. US. (ft)	938.61
Q Total (cfs)	3650.00
Q Bridge (cfs)	3650.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	950.01
Min El Prs (ft)	945.00
Delta EG (ft)	0.12
Delta WS (ft)	0.39
BR Open Area (sq ft)	2800.44
BR Open Vel (ft/s)	3.34
Coef of Q	
Br Sel Method	Energy only

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	939.02	938.97
W.S. Elev (ft)	938.58	938.19
Crit W.S. (ft)	935.75	935.55
Max Chl Dpth (ft)	12.25	11.92
Vel Total (ft/s)	2.83	3.34
Flow Area (sq ft)	1288.32	1093.79
Froude # Chl	0.37	0.48
Specif Force (cu ft)	4986.27	4213.50
Hydr Depth (ft)	5.90	3.79
W.P. Total (ft)	235.48	305.73
Conv. Total (cfs)	83699.1	62466.2
Top Width (ft)	296.07	288.25
Frctn Loss (ft)	0.01	0.03
C & E Loss (ft)	0.03	0.03
Shear Total (lb/sq ft)	0.65	0.76
Power Total (lb/ft s)	1.84	2.54

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 716.3877

INPUT
Description: 46
Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.22	.67	943.2	3.63	943.11	12.92	942.84	23.8	942.52
25.43	942.46	31.56	942.19	32.74	942.13	35.68	942.01	37.39	941.88
40.89	941.61	41.23	941.59	41.33	941.58	41.39	941.57	41.49	941.51
50.2	935.92	60.57	933.2	60.72	933.16	69.81	930.64	69.89	930.59
78.25	930.41	78.54	930.4	78.75	930.55	88.68	933.22	98.57	933.05
99.37	933.11	102.75	927.07	103.13	926.38	103.28	926.18	116.97	926.46
118.4	926.47	118.91	926.88	124.26	932.85	124.52	932.86	138.12	931.94
138.33	931.88	139.89	931.87	143.44	931.9	157.74	932.15	162.63	932
171.95	932.04	179.1	932.19	180.24	932.2	180.65	932.23	181.58	932.33
191.38	933.33	194.71	933.96	198.87	934.53	200.85	935.39	204.37	936.28
211.1	936.47	217.68	936.47	227.54	936.55	245.88	936.7	251.73	936.8
257.2	936.93	290.84	937.32	295.8	937.44	303.59	937.23	328.94	937.49
340.6	937.6	349.59	939.43	372.72	940.92	382.06	941.37	387.77	942.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	99.37	.04	124.26	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
99.37	124.26	125.31	121.03	115.29	.1	.3

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	934.69
Vel Head (ft)	0.34
W.S. Elev (ft)	934.35
Crit W.S. (ft)	
E.G. Slope (ft/ft)	0.002144
Q Total (cfs)	1100.00
Top Width (ft)	141.40
Vel Total (ft/s)	2.68
Max Chl Dpth (ft)	8.17
Conv. Total (cfs)	23757.2
Length Wtd. (ft)	120.95
Min Ch El (ft)	926.18
Alpha	3.03
Frctn Loss (ft)	0.38
C & E Loss (ft)	0.04

Element	Left OB	Channel	Right OB
Wt. n-Val.	0.120	0.040	0.120
Reach Len. (ft)	125.31	121.03	115.29
Flow Area (sq ft)	97.03	167.68	145.34
Area (sq ft)	97.03	167.68	145.34
Flow (cfs)	94.09	874.64	131.27
Top Width (ft)	43.19	24.89	73.31
Avg. Vel. (ft/s)	0.97	5.22	0.90
Hydr. Depth (ft)	2.25	6.74	1.98
Conv. (cfs)	2032.0	18890.0	2835.1
Wetted Per. (ft)	44.11	31.75	73.50
Shear (lb/sq ft)	0.29	0.71	0.26
Stream Power (lb/ft s)	0.29	3.69	0.24
Cum Volume (acre-ft)	0.30	2.29	0.59
Cum SA (acres)	0.19	0.57	0.76

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 #5yr

E.G. Elev (ft)	935.84
Vel Head (ft)	0.70
W.S. Elev (ft)	935.14
Crit W.S. (ft)	
E.G. Slope (ft/ft)	0.003191
Q Total (cfs)	1340.00
Top Width (ft)	47.03
Vel Total (ft/s)	5.60
Max Chl Dpth (ft)	8.96
Conv. Total (cfs)	23723.2
Length Wtd. (ft)	120.99
Min Ch El (ft)	926.18
Alpha	1.44
Frctn Loss (ft)	0.51
C & E Loss (ft)	0.03

Element	Left OB	Channel	Right OB
Wt. n-Val.	0.120	0.040	0.120
Reach Len. (ft)	125.31	121.03	115.29
Flow Area (sq ft)	21.51	187.36	30.38
Area (sq ft)	21.51	187.36	30.38
Flow (cfs)	21.47	1283.76	34.76
Top Width (ft)	10.69	24.89	11.45
Avg. Vel. (ft/s)	1.00	6.85	1.14
Hydr. Depth (ft)	2.01	7.53	2.65
Conv. (cfs)	380.1	22727.6	615.5
Wetted Per. (ft)	12.62	31.75	14.52
Shear (lb/sq ft)	0.34	1.18	0.42
Stream Power (lb/ft s)	0.34	8.05	0.48
Cum Volume (acre-ft)	0.07	2.62	0.16
Cum SA (acres)	0.06	0.62	0.12

CROSS SECTION OUTPUT Profile #10yr

E.G. Elev (ft)	935.94
Vel Head (ft)	0.40
W.S. Elev (ft)	935.54
Crit W.S. (ft)	
E.G. Slope (ft/ft)	0.002242
Q Total (cfs)	1650.00
Top Width (ft)	149.81
Vel Total (ft/s)	2.83
Max Chl Dpth (ft)	9.36
Conv. Total (cfs)	34846.8
Length Wtd. (ft)	120.66

Element	Left OB	Channel	Right OB
Wt. n-Val.	0.120	0.040	0.120
Reach Len. (ft)	125.31	121.03	115.29
Flow Area (sq ft)	151.12	197.30	235.19
Area (sq ft)	151.12	197.30	235.19
Flow (cfs)	188.24	1172.93	288.83
Top Width (ft)	47.73	24.89	77.19
Avg. Vel. (ft/s)	1.25	5.94	1.23
Hydr. Depth (ft)	3.17	7.93	3.05
Conv. (cfs)	3975.5	24771.5	6099.8
Wetted Per. (ft)	48.80	31.75	77.59

Min Ch El (ft)	926.18	Shear (lb/sq ft)	0.43	0.87	0.42
Alpha	3.20	Stream Power (lb/ft s)	0.54	5.17	0.52
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)	0.55	2.88	1.73
C & E Loss (ft)	0.03	Cum SA (acres)	0.23	0.64	1.24

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	936.70	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.47	Reach Len. (ft)	125.31	121.03	115.29
W.S. Elev (ft)	936.24	Flow Area (sq ft)	185.01	214.55	289.66
Crit W.S. (ft)		Area (sq ft)	185.01	214.55	289.66
E.G. Slope (ft/ft)	0.002484	Flow (cfs)	270.04	1419.88	420.08
Q Total (cfs)	2110.00	Top Width (ft)	49.66	24.89	79.93
Top Width (ft)	154.49	Avg. Vel. (ft/s)	1.46	6.62	1.45
Vel Total (ft/s)	3.06	Hydr. Depth (ft)	3.73	8.62	3.62
Max Chl Dpth (ft)	10.06	Conv. (cfs)	5417.8	28486.8	8428.0
Conv. Total (cfs)	42332.6	Wetted Per. (ft)	50.87	31.75	80.42
Length Wtd. (ft)	120.49	Shear (lb/sq ft)	0.56	1.05	0.56
Min Ch El (ft)	926.18	Stream Power (lb/ft s)	0.82	6.94	0.81
Alpha	3.22	Cum Volume (acre-ft)	0.73	3.31	2.65
Frctn Loss (ft)	0.38	Cum SA (acres)	0.25	0.68	1.51
C & E Loss (ft)	0.02				

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	937.22	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.59	Reach Len. (ft)	125.31	121.03	115.29
W.S. Elev (ft)	936.63	Flow Area (sq ft)	204.54	224.28	325.20
Crit W.S. (ft)		Area (sq ft)	204.54	224.28	325.20
E.G. Slope (ft/ft)	0.002944	Flow (cfs)	344.20	1664.10	441.70
Q Total (cfs)	2450.00	Top Width (ft)	50.27	24.89	112.63
Top Width (ft)	187.79	Avg. Vel. (ft/s)	1.68	7.42	1.36
Vel Total (ft/s)	3.25	Hydr. Depth (ft)	4.07	9.01	2.89
Max Chl Dpth (ft)	10.45	Conv. (cfs)	6344.1	30672.0	8141.3
Conv. Total (cfs)	45157.4	Wetted Per. (ft)	51.60	31.75	113.12
Length Wtd. (ft)	120.51	Shear (lb/sq ft)	0.73	1.30	0.53
Min Ch El (ft)	926.18	Stream Power (lb/ft s)	1.23	9.63	0.72
Alpha	3.61	Cum Volume (acre-ft)	0.86	3.63	3.39
Frctn Loss (ft)	0.41	Cum SA (acres)	0.26	0.71	1.77
C & E Loss (ft)	0.01				

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	937.70	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.68	Reach Len. (ft)	125.31	121.03	115.29
W.S. Elev (ft)	937.02	Flow Area (sq ft)	224.58	234.14	375.86
Crit W.S. (ft)		Area (sq ft)	224.58	234.14	375.86
E.G. Slope (ft/ft)	0.003235	Flow (cfs)	417.72	1874.33	507.96
Q Total (cfs)	2800.00	Top Width (ft)	50.89	24.89	140.92
Top Width (ft)	216.70	Avg. Vel. (ft/s)	1.86	8.01	1.35
Vel Total (ft/s)	3.35	Hydr. Depth (ft)	4.41	9.41	2.67
Max Chl Dpth (ft)	10.84	Conv. (cfs)	7343.7	32951.6	8930.1
Conv. Total (cfs)	49225.4	Wetted Per. (ft)	52.33	31.75	141.42
Length Wtd. (ft)	120.46	Shear (lb/sq ft)	0.87	1.49	0.54
Min Ch El (ft)	926.18	Stream Power (lb/ft s)	1.61	11.92	0.73
Alpha	3.89	Cum Volume (acre-ft)	0.99	3.94	4.22
Frctn Loss (ft)	0.43	Cum SA (acres)	0.31	0.74	2.14
C & E Loss (ft)	0.00				

CROSS SECTION OUTPUT Profile #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	938.91	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.69	Reach Len. (ft)	125.31	121.03	115.29
W.S. Elev (ft)	938.23	Flow Area (sq ft)	287.02	264.13	614.81
Crit W.S. (ft)		Area (sq ft)	287.02	264.13	614.81
E.G. Slope (ft/ft)	0.003046	Flow (cfs)	593.28	2223.11	833.62
Q Total (cfs)	3650.00	Top Width (ft)	52.77	24.89	219.42
Top Width (ft)	297.08	Avg. Vel. (ft/s)	2.07	8.42	1.36
Vel Total (ft/s)	3.13	Hydr. Depth (ft)	5.44	10.61	2.80
Max Chl Dpth (ft)	12.05	Conv. (cfs)	10749.9	40281.7	15104.8
Conv. Total (cfs)	66136.5	Wetted Per. (ft)	54.56	31.75	219.99
Length Wtd. (ft)	120.31	Shear (lb/sq ft)	1.00	1.58	0.53
Min Ch El (ft)	926.18	Stream Power (lb/ft s)	2.07	13.31	0.72
Alpha	4.52	Cum Volume (acre-ft)	1.37	4.65	6.85
Frctn Loss (ft)	0.41	Cum SA (acres)	0.41	0.77	3.19
C & E Loss (ft)	0.00				

RIVER: Hope Creek
REACH: 1 RS: 595.3610

INPUT
Description: 47
Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.8	.77	942.77	1.12	942.76	2.3	942.73	7.21	942.58
13.68	942.39	22.93	942.08	24.77	942.02	25.54	941.99	26.29	941.97
27.24	941.93	28.08	941.89	36.97	941.57	37.46	941.51	40.91	941.11
42.36	940.94	43.18	940.41	44.85	939.44	48.64	937.23	52.91	934.96
56.22	934.19	59.46	933.38	66.6	931.6	72.13	931.26	79.64	930.78
79.72	930.78	84.85	932.25	89.41	933.47	96.06	933.11	101.51	932.85
104.53	929.7	106.62	925.62	112.06	925.86	119.56	925.94	119.63	925.11
122.86	929.24	124.63	933.39	148.93	933.11	154.12	932.86	162.6	932.6
162.78	932.55	162.94	932.58	166.87	932.84	172.93	933.19	178.29	933.5
180.2	933.57	180.27	933.57	184.4	933.69	184.58	933.69	184.9	933.69
185.08	933.33	185.18	933.13	187.42	933.22	187.57	933.22	193.36	933.3
193.62	933.31	214.05	933.63	224.63	933.75	235.64	933.87	243.84	933.93
244.01	934.3	244.09	934.49	244.42	934.49	244.6	934.49	248.9	935.97
248.98	936	249.15	936.06	251.69	936.78	268.31	936.84	329.37	936.99
331.51	937.15	336.63	937.53	337.53	937.69	340.82	938.05	344	938.11
377.28	938.97	402.25	939.31	432.98	940	460.5	940.46	486.66	940.8
518.87	941.14	523.17	941.21	530.38	941.44	559.58	942.39		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	101.51	.04	124.63	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
101.51	124.63	18.02	17.77	17.42	.1	.3

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	934.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.75	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	933.52	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	931.25	Flow Area (sq ft)	55.75	143.48	27.43
E.G. Slope (ft/ft)	0.005136	Area (sq ft)	55.75	143.48	27.43
Q Total (cfs)	1100.00	Flow (cfs)	58.59	1028.34	13.07
Top Width (ft)	142.06	Top Width (ft)	42.61	23.12	76.32
Vel Total (ft/s)	4.85	Avg. Vel. (ft/s)	1.05	7.17	0.48
Max Chl Dpth (ft)	8.41	Hydr. Depth (ft)	1.31	6.21	0.36
Conv. Total (cfs)	15348.5	Conv. (cfs)	817.5	14348.7	182.3
Length Wtd. (ft)	4.00	Wetted Per. (ft)	43.26	32.48	76.62
Min Ch El (ft)	925.11	Shear (lb/sq ft)	0.41	1.42	0.11
Alpha	2.04	Stream Power (lb/ft s)	0.43	10.15	0.05
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.08	1.86	0.36
C & E Loss (ft)	0.01	Cum SA (acres)	0.06	0.51	0.56

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	935.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.02	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	934.29	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	931.85	Flow Area (sq ft)	13.73	161.15	11.38
E.G. Slope (ft/ft)	0.005718	Area (sq ft)	13.73	161.15	11.38
Q Total (cfs)	1340.00	Flow (cfs)	13.38	1316.79	9.83
Top Width (ft)	47.03	Top Width (ft)	12.10	23.12	11.81
Vel Total (ft/s)	7.19	Avg. Vel. (ft/s)	0.97	8.17	0.86
Max Chl Dpth (ft)	9.18	Hydr. Depth (ft)	1.13	6.97	0.96
Conv. Total (cfs)	17720.6	Conv. (cfs)	177.0	17413.7	129.9
Length Wtd. (ft)	4.00	Wetted Per. (ft)	12.93	32.48	12.84
Min Ch El (ft)	925.11	Shear (lb/sq ft)	0.38	1.77	0.32
Alpha	1.27	Stream Power (lb/ft s)	0.37	14.47	0.27
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.02	2.13	0.11
C & E Loss (ft)	0.01	Cum SA (acres)	0.03	0.55	0.09

CROSS SECTION OUTPUT Profile #10yr

E.G. Elev (ft)	935.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.67	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	934.88	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	932.99	Flow Area (sq ft)	117.57	174.97	181.35
E.G. Slope (ft/ft)	0.004185	Area (sq ft)	117.57	174.97	181.35

Q Total (cfs)	1650.00	Flow (cfs)	168.63	1292.10	189.28
Top Width (ft)	192.50	Top Width (ft)	48.27	23.12	121.11
Vel Total (ft/s)	3.48	Avg. Vel. (ft/s)	1.43	7.38	1.04
Max Chl Dpth (ft)	9.77	Hydr. Depth (ft)	2.44	7.57	1.50
Conv. Total (cfs)	25504.8	Conv. (cfs)	2606.5	19972.5	2925.7
Length Wtd. (ft)	4.00	Wetted Per. (ft)	49.07	32.48	121.95
Min Ch El (ft)	925.11	Shear (lb/sq ft)	0.63	1.41	0.39
Alpha	3.55	Stream Power (lb/ft s)	0.90	10.39	0.41
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.16	2.36	1.18
C & E Loss (ft)	0.02	Cum SA (acres)	0.09	0.58	0.98

CROSS SECTION OUTPUT Profile #25yr

E.G. Elev (ft)	936.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.66	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	935.65	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	934.48	Flow Area (sq ft)	155.06	192.60	274.55
E.G. Slope (ft/ft)	0.004029	Area (sq ft)	155.06	192.60	274.55
Q Total (cfs)	2110.00	Flow (cfs)	256.20	1487.77	366.02
Top Width (ft)	196.34	Top Width (ft)	49.89	23.12	123.33
Vel Total (ft/s)	3.39	Avg. Vel. (ft/s)	1.65	7.72	1.33
Max Chl Dpth (ft)	10.54	Hydr. Depth (ft)	3.11	8.33	2.23
Conv. Total (cfs)	33240.7	Conv. (cfs)	4036.2	23438.2	5766.3
Length Wtd. (ft)	4.00	Wetted Per. (ft)	50.88	32.48	124.29
Min Ch El (ft)	925.11	Shear (lb/sq ft)	0.77	1.49	0.56
Alpha	3.71	Stream Power (lb/ft s)	1.27	11.52	0.74
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.24	2.74	1.90
C & E Loss (ft)	0.02	Cum SA (acres)	0.11	0.62	1.24

CROSS SECTION OUTPUT Profile #50yr

E.G. Elev (ft)	936.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.67	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	936.13	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	934.87	Flow Area (sq ft)	179.41	203.78	334.55
E.G. Slope (ft/ft)	0.003991	Area (sq ft)	179.41	203.78	334.55
Q Total (cfs)	2450.00	Flow (cfs)	320.86	1626.80	502.35
Top Width (ft)	198.68	Top Width (ft)	50.80	23.12	124.76
Vel Total (ft/s)	3.41	Avg. Vel. (ft/s)	1.79	7.98	1.50
Max Chl Dpth (ft)	11.02	Hydr. Depth (ft)	3.53	8.81	2.68
Conv. Total (cfs)	38780.8	Conv. (cfs)	5078.8	25750.4	7951.6
Length Wtd. (ft)	4.00	Wetted Per. (ft)	51.91	32.48	125.80
Min Ch El (ft)	925.11	Shear (lb/sq ft)	0.86	1.56	0.66
Alpha	3.71	Stream Power (lb/ft s)	1.54	12.48	0.99
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.31	3.03	2.52
C & E Loss (ft)	0.02	Cum SA (acres)	0.12	0.65	1.46

CROSS SECTION OUTPUT Profile #100yr

E.G. Elev (ft)	937.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.68	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	936.59	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	935.23	Flow Area (sq ft)	203.03	214.44	392.44
E.G. Slope (ft/ft)	0.003963	Area (sq ft)	203.03	214.44	392.44
Q Total (cfs)	2800.00	Flow (cfs)	388.00	1764.71	647.29
Top Width (ft)	201.18	Top Width (ft)	51.67	23.12	126.39
Vel Total (ft/s)	3.46	Avg. Vel. (ft/s)	1.91	8.23	1.65
Max Chl Dpth (ft)	11.48	Hydr. Depth (ft)	3.93	9.28	3.11
Conv. Total (cfs)	44480.6	Conv. (cfs)	6163.8	28034.0	10282.8
Length Wtd. (ft)	4.00	Wetted Per. (ft)	52.89	32.48	127.50
Min Ch El (ft)	925.11	Shear (lb/sq ft)	0.95	1.63	0.76
Alpha	3.67	Stream Power (lb/ft s)	1.81	13.44	1.26
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.37	3.31	3.20
C & E Loss (ft)	0.02	Cum SA (acres)	0.16	0.67	1.79

CROSS SECTION OUTPUT Profile #500yr

E.G. Elev (ft)	938.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.70	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	937.80	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	935.96	Flow Area (sq ft)	267.06	242.48	621.41
E.G. Slope (ft/ft)	0.003769	Area (sq ft)	267.06	242.48	621.41
Q Total (cfs)	3650.00	Flow (cfs)	579.43	2112.36	958.22
Top Width (ft)	290.91	Top Width (ft)	53.85	23.12	213.93
Vel Total (ft/s)	3.23	Avg. Vel. (ft/s)	2.17	8.71	1.54
Max Chl Dpth (ft)	12.69	Hydr. Depth (ft)	4.96	10.49	2.90
Conv. Total (cfs)	59453.3	Conv. (cfs)	9438.0	34407.3	15608.0
Length Wtd. (ft)	4.00	Wetted Per. (ft)	55.39	32.48	215.11

Min Ch El (ft)	925.11	Shear (lb/sq ft)	1.13	1.76	0.68
Alpha	4.35	Stream Power (lb/ft s)	2.46	15.30	1.05
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.58	3.94	5.21
C & E Loss (ft)	0.02	Cum SA (acres)	0.25	0.70	2.61

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 589

INPUT
Description: BR 16 Bnt 6
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	945	942	600	945	942

Upstream Bridge Cross Section Data
Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.92	.77	942.89	1.12	942.88	2.3	942.85	7.21	942.7
13.68	942.51	22.93	942.2	24.77	942.14	25.54	942.11	26.29	942.09
27.24	942.05	28.08	942.01	36.97	941.69	37.46	941.63	40.91	941.23
42.36	941.06	43.18	940.53	44.85	939.56	48.64	937.35	52.91	935.08
56.22	934.31	59.46	933.5	66.6	931.72	72.13	931.38	79.64	930.9
79.72	930.9	84.85	932.37	89.41	933.59	96.06	933.23	101.51	932.97
104.53	929.82	106.62	925.74	112.06	925.98	119.56	926.06	119.63	925.23
122.86	929.36	124.63	933.51	148.93	933.23	154.12	932.98	162.6	932.72
162.78	932.67	162.94	932.7	166.87	932.96	172.93	933.31	178.29	933.62
180.2	933.69	180.27	933.69	184.4	933.81	184.58	933.81	184.9	933.81
185.08	933.45	185.18	933.25	187.42	933.34	187.57	933.34	193.36	933.42
193.62	933.43	214.05	933.75	224.63	933.87	235.64	933.99	243.84	934.05
244.01	934.42	244.09	934.61	244.42	934.61	244.6	934.61	248.9	936.09
248.98	936.12	249.15	936.18	251.69	936.9	268.31	936.96	329.37	937.11
331.51	937.27	336.63	937.65	337.53	937.81	340.82	938.17	344	938.23
377.28	939.09	402.25	939.43	432.98	940.12	460.5	940.58	486.66	940.92
518.87	941.26	523.17	941.33	530.38	941.56	559.58	942.51		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	101.51	.04	124.63	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
101.51	124.63	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	945	942	600	945	942

Downstream Bridge Cross Section Data
Station Elevation Data num= 81

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.44	2.79	942.36	11.49	942.11	12.62	942.07	18.49	941.87
24.12	941.69	31.12	941.38	35.04	941.23	37.07	941.02	39.14	940.8
40.25	940.67	42.82	939.27	43.99	938.63	47.93	936.37	52.12	934.73
59.22	932.72	64.68	931.36	66.32	931.26	77.61	930.55	77.69	930.57
79.18	930.99	87.24	933.17	89.57	933.04	99.42	932.56	104.88	926.89
105.63	925.4	115.48	925.84	118.16	925.87	119.43	925.84	122.56	933.16
144.26	932.92	148.05	932.87	159.02	932.74	160.14	932.76	162.73	932.83
169.9	933.02	173.85	933.09	174.28	933.15	175.37	933.18	177.77	933.35
178.47	933.4	180.69	933.52	180.93	933.52	181.04	933.52	181.2	933.52
181.26	933.34	181.4	932.99	190.75	933.06	190.95	933.06	191.43	933.06
191.64	933.06	195.55	933.13	210.54	933.38	214.3	933.43	238.14	933.69
238.86	933.69	240.41	933.7	240.44	933.77	240.66	934.27	241.14	934.27
241.17	934.27	241.42	934.31	241.61	934.34	242	934.41	242.36	934.55
249.42	936.55	306.93	936.76	330.2	936.82	333.01	937.02	334.16	937.23
340.82	937.82	344	937.88	377.28	938.74	402.25	939.08	432.98	939.77
460.5	940.23	486.66	940.57	518.87	940.91	523.17	940.98	530.38	941.21
559.58	942.16								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	99.42	.04	122.56	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
99.42	122.56	.1	.3

```
Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=   59.12    Downstream=   57.23
Upstream     num=        2
    Width   Elev    Width   Elev
        8    925        8    945
Downstream     num=        2
    Width   Elev    Width   Elev
        8    925        8    945

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
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 #2yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	934.27	E.G. Elev (ft)	934.24	934.16
W.S. US. (ft)	933.52	W.S. Elev (ft)	933.40	933.47
Q Total (cfs)	1100.00	Crit W.S. (ft)	931.37	931.17
Q Bridge (cfs)	1100.00	Max Chl Dpth (ft)	8.17	8.07
Q Weir (cfs)		Vel Total (ft/s)	5.64	4.51
Weir Sta Lft (ft)		Flow Area (sq ft)	194.91	244.07
Weir Sta Rgt (ft)		Froude # Chl	0.54	0.49
Weir Submerg		Specif Force (cu ft)	759.44	809.94
Weir Max Depth (ft)		Hydr Depth (ft)	1.86	1.58
Min El Weir Flow (ft)	945.01	W.P. Total (ft)	115.73	165.22
Min El Prs (ft)	942.00	Conv. Total (cfs)	14274.5	16350.2
Delta EG (ft)	0.17	Top Width (ft)	105.00	154.95
Delta WS (ft)	0.31	Frctn Loss (ft)	0.03	0.04
BR Open Area (sq ft)	2654.10	C & E Loss (ft)	0.04	0.02
BR Open Vel (ft/s)	5.64	Shear Total (lb/sq ft)	0.62	0.42
Coef of Q		Power Total (lb/ft s)	3.52	1.88
Br Sel Method	Energy only			

BRIDGE OUTPUT Profile #5yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	935.30	E.G. Elev (ft)	935.27	935.20
W.S. US. (ft)	934.29	W.S. Elev (ft)	934.16	934.22
Q Total (cfs)	1340.00	Crit W.S. (ft)	931.99	931.76
Q Bridge (cfs)	1340.00	Max Chl Dpth (ft)	8.93	8.82
Q Weir (cfs)		Vel Total (ft/s)	7.67	6.95
Weir Sta Lft (ft)		Flow Area (sq ft)	174.69	192.76
Weir Sta Rgt (ft)		Froude # Chl	0.58	0.53
Weir Submerg		Specif Force (cu ft)	939.62	977.23
Weir Max Depth (ft)		Hydr Depth (ft)	3.71	4.10
Min El Weir Flow (ft)	945.01	W.P. Total (ft)	56.41	55.22
Min El Prs (ft)	942.00	Conv. Total (cfs)	16609.3	18626.8
Delta EG (ft)	0.17	Top Width (ft)	47.03	47.03
Delta WS (ft)	0.33	Frctn Loss (ft)	0.03	0.05
BR Open Area (sq ft)	543.44	C & E Loss (ft)	0.04	0.02
BR Open Vel (ft/s)	7.67	Shear Total (lb/sq ft)	1.26	1.13
Coef of Q		Power Total (lb/ft s)	9.65	7.84
Br Sel Method	Energy only			

BRIDGE OUTPUT Profile #10yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	935.55			

W.S. US. (ft)	934.88	E.G. Elev (ft)	935.51	935.41
Q Total (cfs)	1650.00	W.S. Elev (ft)	934.63	934.75
Q Bridge (cfs)	1650.00	Crit W.S. (ft)	933.14	932.78
Q Weir (cfs)		Max Chl Dpth (ft)	9.40	9.35
Weir Sta Lft (ft)		Vel Total (ft/s)	4.19	3.50
Weir Sta Rgt (ft)		Flow Area (sq ft)	393.80	471.92
Weir Submerg		Froude # Chl	0.54	0.47
Weir Max Depth (ft)		Specif Force (cu ft)	1227.43	1353.86
Min El Weir Flow (ft)	945.01	Hydr Depth (ft)	2.17	2.58
Min El Prs (ft)	942.00	W.P. Total (ft)	194.55	195.39
Delta EG (ft)	0.21	Conv. Total (cfs)	22107.2	26235.3
Delta WS (ft)	0.59	Top Width (ft)	181.80	182.99
BR Open Area (sq ft)	2654.10	Frctn Loss (ft)	0.03	0.04
BR Open Vel (ft/s)	4.19	C & E Loss (ft)	0.06	0.04
Coef of Q		Shear Total (lb/sq ft)	0.70	0.60
Br Sel Method	Energy only	Power Total (lb/ft s)	2.95	2.09

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #25yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	936.31	E.G. Elev (ft)	936.27	936.19
W.S. US. (ft)	935.65	W.S. Elev (ft)	935.42	935.51
Q Total (cfs)	2110.00	Crit W.S. (ft)	934.61	934.27
Q Bridge (cfs)	2110.00	Max Chl Dpth (ft)	10.19	10.11
Q Weir (cfs)		Vel Total (ft/s)	3.90	3.44
Weir Sta Lft (ft)		Flow Area (sq ft)	540.41	614.01
Weir Sta Rgt (ft)		Froude # Chl	0.53	0.47
Weir Submerg		Specif Force (cu ft)	1677.98	1850.26
Weir Max Depth (ft)		Hydr Depth (ft)	2.89	3.27
Min El Weir Flow (ft)	945.01	W.P. Total (ft)	201.31	201.84
Min El Prs (ft)	942.00	Conv. Total (cfs)	29337.8	33926.1
Delta EG (ft)	0.18	Top Width (ft)	186.69	187.65
Delta WS (ft)	0.42	Frctn Loss (ft)	0.03	0.04
BR Open Area (sq ft)	2654.10	C & E Loss (ft)	0.05	0.02
BR Open Vel (ft/s)	3.90	Shear Total (lb/sq ft)	0.87	0.73
Coef of Q		Power Total (lb/ft s)	3.38	2.52
Br Sel Method	Energy only			

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #50yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	936.80	E.G. Elev (ft)	936.76	936.69
W.S. US. (ft)	936.13	W.S. Elev (ft)	935.92	936.00
Q Total (cfs)	2450.00	Crit W.S. (ft)	934.99	934.69
Q Bridge (cfs)	2450.00	Max Chl Dpth (ft)	10.69	10.60
Q Weir (cfs)		Vel Total (ft/s)	3.87	3.48
Weir Sta Lft (ft)		Flow Area (sq ft)	633.42	704.94
Weir Sta Rgt (ft)		Froude # Chl	0.53	0.48
Weir Submerg		Specif Force (cu ft)	2032.05	2231.33
Weir Max Depth (ft)		Hydr Depth (ft)	3.35	3.70
Min El Weir Flow (ft)	945.01	W.P. Total (ft)	204.88	205.89
Min El Prs (ft)	942.00	Conv. Total (cfs)	34499.4	39335.8
Delta EG (ft)	0.16	Top Width (ft)	189.06	190.58
Delta WS (ft)	0.36	Frctn Loss (ft)	0.03	0.03
BR Open Area (sq ft)	2654.10	C & E Loss (ft)	0.05	0.02
BR Open Vel (ft/s)	3.87	Shear Total (lb/sq ft)	0.97	0.83
Coef of Q		Power Total (lb/ft s)	3.77	2.88
Br Sel Method	Energy only			

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #100yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	937.27	E.G. Elev (ft)	937.23	937.17
W.S. US. (ft)	936.59	W.S. Elev (ft)	936.39	936.45
Q Total (cfs)	2800.00	Crit W.S. (ft)	935.34	935.05
Q Bridge (cfs)	2800.00	Max Chl Dpth (ft)	11.16	11.05
Q Weir (cfs)		Vel Total (ft/s)	3.87	3.53
Weir Sta Lft (ft)		Flow Area (sq ft)	722.75	792.89
Weir Sta Rgt (ft)		Froude # Chl	0.53	0.48
Weir Submerg				

Weir Max Depth (ft)		Specif Force (cu ft)	2417.44	2641.85
Min El Weir Flow (ft)	945.01	Hydr Depth (ft)	3.78	4.10
Min El Prs (ft)	942.00	W.P. Total (ft)	208.37	209.68
Delta EG (ft)	0.15	Conv. Total (cfs)	39825.0	44890.6
Delta WS (ft)	0.32	Top Width (ft)	191.43	193.30
BR Open Area (sq ft)	2654.10	Frctn Loss (ft)	0.03	0.03
BR Open Vel (ft/s)	3.87	C & E Loss (ft)	0.04	0.01
Coef of Q		Shear Total (lb/sq ft)	1.07	0.92
Br Sel Method	Energy only	Power Total (lb/ft s)	4.15	3.24

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #500yr

E.G. US. (ft)	938.51	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	937.80	E.G. Elev (ft)	938.46	938.38
Q Total (cfs)	3650.00	W.S. Elev (ft)	937.51	937.60
Q Bridge (cfs)	3650.00	Crit W.S. (ft)	936.05	935.74
Q Weir (cfs)		Max Chl Dpth (ft)	12.28	12.20
Weir Sta Lft (ft)		Vel Total (ft/s)	3.72	3.34
Weir Sta Rgt (ft)		Flow Area (sq ft)	979.97	1093.04
Weir Submerg		Froude # Chl	0.54	0.49
Weir Max Depth (ft)		Specif Force (cu ft)	3561.95	3887.37
Min El Weir Flow (ft)	945.01	Hydr Depth (ft)	3.52	3.84
Min El Prs (ft)	942.00	W.P. Total (ft)	297.92	303.63
Delta EG (ft)	0.17	Conv. Total (cfs)	51507.8	58510.6
Delta WS (ft)	0.40	Top Width (ft)	278.37	284.58
BR Open Area (sq ft)	2654.10	Frctn Loss (ft)	0.03	0.03
BR Open Vel (ft/s)	3.72	C & E Loss (ft)	0.05	0.02
Coef of Q		Shear Total (lb/sq ft)	1.03	0.87
Br Sel Method	Energy only	Power Total (lb/ft s)	3.84	2.92

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 577.5895

INPUT
Description: 48
Station Elevation Data num= 81

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.67	2.79	942.59	11.49	942.34	12.62	942.3	18.49	942.1
24.12	941.92	31.12	941.61	35.04	941.46	37.07	941.25	39.14	941.03
40.25	940.9	42.82	939.5	43.99	938.86	47.93	936.6	52.12	934.96
59.22	932.95	64.68	931.59	66.32	931.49	77.61	930.78	77.69	930.8
79.18	931.22	87.24	933.4	89.57	933.27	99.42	932.79	104.88	927.12
105.63	925.63	115.48	926.07	118.16	926.1	119.43	926.07	122.56	933.39
144.26	933.15	148.05	933.1	159.02	932.97	160.14	932.99	162.73	933.06
169.9	933.25	173.85	933.32	174.28	933.38	175.37	933.41	177.77	933.58
178.47	933.63	180.69	933.75	180.93	933.75	181.04	933.75	181.2	933.75
181.26	933.57	181.4	933.22	190.75	933.29	190.95	933.29	191.43	933.29
191.64	933.29	195.55	933.36	210.54	933.61	214.3	933.66	238.14	933.92
238.86	933.92	240.41	933.93	240.44	934	240.66	934.5	241.14	934.5
241.17	934.5	241.42	934.54	241.61	934.57	242	934.64	242.36	934.78
249.42	936.78	306.93	936.99	330.2	937.05	333.01	937.25	334.16	937.46
340.82	938.05	344	938.11	377.28	938.97	402.25	939.31	432.98	940
460.5	940.46	486.66	940.8	518.87	941.14	523.17	941.21	530.38	941.44
559.58	942.39								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	99.42	.04	122.56	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
99.42	122.56	27	24	22	.1	.3

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	934.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.89	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	933.21	Reach Len. (ft)	27.00	24.00	22.00
Crit W.S. (ft)		Flow Area (sq ft)	43.90	134.36	3.47
E.G. Slope (ft/ft)	0.006238	Area (sq ft)	43.90	134.36	3.47

Q Total (cfs)	1100.00	Flow (cfs)	53.72	1045.45	0.82
Top Width (ft)	88.96	Top Width (ft)	36.76	23.06	29.13
Vel Total (ft/s)	6.05	Avg. Vel. (ft/s)	1.22	7.78	0.24
Max Chl Dpth (ft)	7.58	Hydr. Depth (ft)	1.19	5.83	0.12
Conv. Total (cfs)	13927.4	Conv. (cfs)	680.2	13236.7	10.4
Length Wtd. (ft)	24.07	Wetted Per. (ft)	37.33	31.11	29.14
Min Ch El (ft)	925.63	Shear (lb/sq ft)	0.46	1.68	0.05
Alpha	1.57	Stream Power (lb/ft s)	0.56	13.09	0.01
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.06	1.80	0.35
C & E Loss (ft)	0.00	Cum SA (acres)	0.05	0.50	0.53

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #5yr

E.G. Elev (ft)	935.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.17	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	933.96	Reach Len. (ft)	27.00	24.00	22.00
Crit W.S. (ft)		Flow Area (sq ft)	10.61	151.78	7.43
E.G. Slope (ft/ft)	0.006733	Area (sq ft)	10.61	151.78	7.43
Q Total (cfs)	1340.00	Flow (cfs)	9.54	1325.10	5.36
Top Width (ft)	47.03	Top Width (ft)	12.18	23.14	11.71
Vel Total (ft/s)	7.89	Avg. Vel. (ft/s)	0.90	8.73	0.72
Max Chl Dpth (ft)	8.33	Hydr. Depth (ft)	0.87	6.56	0.63
Conv. Total (cfs)	16330.8	Conv. (cfs)	116.2	16149.2	65.3
Length Wtd. (ft)	24.01	Wetted Per. (ft)	12.75	31.31	12.41
Min Ch El (ft)	925.63	Shear (lb/sq ft)	0.35	2.04	0.25
Alpha	1.21	Stream Power (lb/ft s)	0.31	17.79	0.18
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.02	2.07	0.10
C & E Loss (ft)	0.06	Cum SA (acres)	0.02	0.54	0.09

CROSS SECTION OUTPUT Profile #10yr

E.G. Elev (ft)	935.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.05	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	934.29	Reach Len. (ft)	27.00	24.00	22.00
Crit W.S. (ft)		Flow Area (sq ft)	90.00	159.38	104.12
E.G. Slope (ft/ft)	0.006508	Area (sq ft)	90.00	159.38	104.12
Q Total (cfs)	1650.00	Flow (cfs)	141.33	1413.32	95.35
Top Width (ft)	186.07	Top Width (ft)	44.93	23.14	118.01
Vel Total (ft/s)	4.67	Avg. Vel. (ft/s)	1.57	8.87	0.92
Max Chl Dpth (ft)	8.66	Hydr. Depth (ft)	2.00	6.89	0.88
Conv. Total (cfs)	20452.8	Conv. (cfs)	1751.8	17519.0	1181.9
Length Wtd. (ft)	24.14	Wetted Per. (ft)	45.67	31.31	118.63
Min Ch El (ft)	925.63	Shear (lb/sq ft)	0.80	2.07	0.36
Alpha	3.10	Stream Power (lb/ft s)	1.26	18.34	0.33
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	0.12	2.29	1.12
C & E Loss (ft)	0.02	Cum SA (acres)	0.08	0.57	0.93

CROSS SECTION OUTPUT Profile #25yr

E.G. Elev (ft)	936.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.91	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	935.22	Reach Len. (ft)	27.00	24.00	22.00
Crit W.S. (ft)		Flow Area (sq ft)	133.55	181.03	216.06
E.G. Slope (ft/ft)	0.005365	Area (sq ft)	133.55	181.03	216.06
Q Total (cfs)	2110.00	Flow (cfs)	236.80	1586.72	286.48
Top Width (ft)	192.48	Top Width (ft)	47.97	23.14	121.37
Vel Total (ft/s)	3.98	Avg. Vel. (ft/s)	1.77	8.77	1.33
Max Chl Dpth (ft)	9.59	Hydr. Depth (ft)	2.78	7.82	1.78
Conv. Total (cfs)	28806.3	Conv. (cfs)	3232.8	21662.4	3911.1
Length Wtd. (ft)	24.08	Wetted Per. (ft)	48.86	31.31	122.23
Min Ch El (ft)	925.63	Shear (lb/sq ft)	0.92	1.94	0.59
Alpha	3.69	Stream Power (lb/ft s)	1.62	16.97	0.79
Frctn Loss (ft)	0.14	Cum Volume (acre-ft)	0.19	2.67	1.80
C & E Loss (ft)	0.03	Cum SA (acres)	0.09	0.61	1.19

CROSS SECTION OUTPUT Profile #50yr

E.G. Elev (ft)	936.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.87	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	935.77	Reach Len. (ft)	27.00	24.00	22.00
Crit W.S. (ft)		Flow Area (sq ft)	160.12	193.66	282.83
E.G. Slope (ft/ft)	0.005018	Area (sq ft)	160.12	193.66	282.83
Q Total (cfs)	2450.00	Flow (cfs)	303.67	1717.02	429.31
Top Width (ft)	195.80	Top Width (ft)	49.37	23.14	123.29
Vel Total (ft/s)	3.85	Avg. Vel. (ft/s)	1.90	8.87	1.52
Max Chl Dpth (ft)	10.14	Hydr. Depth (ft)	3.24	8.37	2.29

Conv. Total (cfs)	34587.3	Conv. (cfs)	4287.1	24239.6	6060.7
Length Wtd. (ft)	24.04	Wetted Per. (ft)	50.36	31.31	124.23
Min Ch El (ft)	925.63	Shear (lb/sq ft)	1.00	1.94	0.71
Alpha	3.78	Stream Power (lb/ft s)	1.89	17.18	1.08
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.24	2.95	2.39
C & E Loss (ft)	0.02	Cum SA (acres)	0.10	0.64	1.40

CROSS SECTION OUTPUT Profile #100yr

E.G. Elev (ft)	937.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.85	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	936.27	Reach Len. (ft)	27.00	24.00	22.00
Crit W.S. (ft)		Flow Area (sq ft)	185.19	205.26	345.10
E.G. Slope (ft/ft)	0.004795	Area (sq ft)	185.19	205.26	345.10
Q Total (cfs)	2800.00	Flow (cfs)	371.59	1849.40	579.01
Top Width (ft)	198.85	Top Width (ft)	50.65	23.14	125.06
Vel Total (ft/s)	3.81	Avg. Vel. (ft/s)	2.01	9.01	1.68
Max Chl Dpth (ft)	10.64	Hydr. Depth (ft)	3.66	8.87	2.76
Conv. Total (cfs)	40436.4	Conv. (cfs)	5366.3	26708.3	8361.8
Length Wtd. (ft)	24.00	Wetted Per. (ft)	51.73	31.31	126.07
Min Ch El (ft)	925.63	Shear (lb/sq ft)	1.07	1.96	0.82
Alpha	3.78	Stream Power (lb/ft s)	2.15	17.68	1.37
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	0.30	3.23	3.05
C & E Loss (ft)	0.02	Cum SA (acres)	0.14	0.66	1.74

CROSS SECTION OUTPUT Profile #500yr

E.G. Elev (ft)	938.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.93	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	937.40	Reach Len. (ft)	27.00	24.00	22.00
Crit W.S. (ft)		Flow Area (sq ft)	243.67	231.35	526.78
E.G. Slope (ft/ft)	0.004784	Area (sq ft)	243.67	231.35	526.78
Q Total (cfs)	3650.00	Flow (cfs)	568.19	2255.07	826.75
Top Width (ft)	287.29	Top Width (ft)	52.88	23.14	211.26
Vel Total (ft/s)	3.64	Avg. Vel. (ft/s)	2.33	9.75	1.57
Max Chl Dpth (ft)	11.77	Hydr. Depth (ft)	4.61	10.00	2.49
Conv. Total (cfs)	52770.9	Conv. (cfs)	8214.8	32603.2	11952.9
Length Wtd. (ft)	24.04	Wetted Per. (ft)	54.24	31.31	212.37
Min Ch El (ft)	925.63	Shear (lb/sq ft)	1.34	2.21	0.74
Alpha	4.53	Stream Power (lb/ft s)	3.13	21.51	1.16
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.48	3.84	4.98
C & E Loss (ft)	0.03	Cum SA (acres)	0.23	0.69	2.53

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 553

INPUT
Description:
Station Elevation Data num= 85

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.21	2.4	943.12	6.36	942.98	13.48	942.79	19.11	942.64
22.44	942.54	31.48	942.28	33.25	942.21	44.05	941.88	48.99	941.65
55.18	941.34	56.78	941.17	58.79	940.99	60.66	940.82	62.2	939.91
72.86	935.45	74.1	934.97	75.9	934.46	77.96	933.86	86.02	931.51
93.37	931.04	97.35	930.89	100.07	931.83	106.56	933.56	110.67	933.3
119.1	932.89	123.55	927.81	124.88	925.33	131.29	925.53	139.83	926.12
142.45	931.2	142.73	931.18	143.98	933.31	163.33	933.44	178.73	933.42
197.98	933.36	203.22	933.34	225.79	933.68	226.8	933.69	226.94	933.69
227.11	933.69	244.72	933.87	254.26	933.92	256.72	933.94	256.77	934.05
256.97	934.5	257.07	934.5	257.47	934.5	259.03	934.87	259.23	934.92
259.64	935.01	263.5	935.73	267.34	936.78	269.11	936.78	276.34	936.48
303.15	936.45	348.71	936.47	352.44	936.66	376.44	936.68	377.37	936.68
377.43	936.68	383.04	936.67	386.76	936.55	387.41	936.52	388.31	936.5
389.32	936.48	390.19	936.48	390.86	936.48	397.94	936.4	410.57	936.44
410.71	936.43	411	936.41	411.9	936.35	411.98	936.53	412.16	936.97
412.44	936.97	412.51	936.97	412.66	936.97	421.59	937.53	425.35	937.77
425.46	937.78	425.67	937.79	455.16	938.95	474.04	939.27	488.61	939.39

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	119.1	.04	143.98	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
119.1 143.98 95.41 94 90.84 .1 .3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent

0	106.56	933.56	F
267.34	488.61	936.78	F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	933.96	Element			
Vel Head (ft)	0.90	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	933.05	Reach Len. (ft)	95.41	94.00	90.84
Crit W.S. (ft)	930.85	Flow Area (sq ft)	0.28	144.32	
E.G. Slope (ft/ft)	0.005817	Area (sq ft)	33.17	144.32	
Q Total (cfs)	1100.00	Flow (cfs)	0.05	1099.95	
Top Width (ft)	52.04	Top Width (ft)	27.31	24.73	
Vel Total (ft/s)	7.61	Avg. Vel. (ft/s)	0.18	7.62	
Max Chl Dpth (ft)	7.72	Hydr. Depth (ft)	0.08	5.84	
Conv. Total (cfs)	14423.2	Conv. (cfs)	0.6	14422.5	
Length Wtd. (ft)	93.94	Wetted Per. (ft)	3.37	32.71	
Min Ch El (ft)	925.33	Shear (lb/sq ft)	0.03	1.60	
Alpha	1.00	Stream Power (lb/ft s)	0.01	12.21	
Frctn Loss (ft)	0.48	Cum Volume (acre-ft)	0.04	1.72	0.35
C & E Loss (ft)	0.06	Cum SA (acres)	0.03	0.49	0.53

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	934.93	Element			
Vel Head (ft)	0.98	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	933.95	Reach Len. (ft)	95.41	94.00	90.84
Crit W.S. (ft)	931.53	Flow Area (sq ft)	9.31	166.54	5.82
E.G. Slope (ft/ft)	0.005338	Area (sq ft)	9.31	166.54	5.82
Q Total (cfs)	1340.00	Flow (cfs)	6.76	1329.61	3.62
Top Width (ft)	47.03	Top Width (ft)	12.54	24.88	9.61
Vel Total (ft/s)	7.38	Avg. Vel. (ft/s)	0.73	7.98	0.62
Max Chl Dpth (ft)	8.62	Hydr. Depth (ft)	0.74	6.69	0.61
Conv. Total (cfs)	18341.0	Conv. (cfs)	92.6	18198.8	49.6
Length Wtd. (ft)	93.97	Wetted Per. (ft)	12.95	33.01	10.18
Min Ch El (ft)	925.33	Shear (lb/sq ft)	0.24	1.68	0.19
Alpha	1.16	Stream Power (lb/ft s)	0.17	13.42	0.12
Frctn Loss (ft)	0.46	Cum Volume (acre-ft)	0.01	1.98	0.10
C & E Loss (ft)	0.04	Cum SA (acres)	0.02	0.53	0.08

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

CROSS SECTION OUTPUT Profile #10yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	935.16	Element			
Vel Head (ft)	1.22	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	933.94	Reach Len. (ft)	95.41	94.00	90.84
Crit W.S. (ft)	932.32	Flow Area (sq ft)	65.94	166.39	45.96
E.G. Slope (ft/ft)	0.007098	Area (sq ft)	65.94	166.39	45.96
Q Total (cfs)	1650.00	Flow (cfs)	92.65	1530.99	26.36
Top Width (ft)	179.04	Top Width (ft)	41.42	24.88	112.74
Vel Total (ft/s)	5.93	Avg. Vel. (ft/s)	1.41	9.20	0.57
Max Chl Dpth (ft)	8.61	Hydr. Depth (ft)	1.59	6.69	0.41
Conv. Total (cfs)	19585.1	Conv. (cfs)	1099.7	18172.5	312.9
Length Wtd. (ft)	93.89	Wetted Per. (ft)	42.19	33.01	112.75
Min Ch El (ft)	925.33	Shear (lb/sq ft)	0.69	2.23	0.18
Alpha	2.24	Stream Power (lb/ft s)	0.97	20.55	0.10
Frctn Loss (ft)	0.65	Cum Volume (acre-ft)	0.07	2.20	1.08
C & E Loss (ft)	0.03	Cum SA (acres)	0.05	0.55	0.87

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

CROSS SECTION OUTPUT Profile #25yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	935.96	Element			
Vel Head (ft)	1.20	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	934.76	Reach Len. (ft)	95.41	94.00	90.84
Crit W.S. (ft)	934.32	Flow Area (sq ft)	101.00	186.76	138.65
E.G. Slope (ft/ft)	0.006529	Area (sq ft)	101.00	186.76	138.65
Q Total (cfs)	2110.00	Flow (cfs)	172.86	1779.97	157.17
Top Width (ft)	183.73	Top Width (ft)	44.26	24.88	114.59
Vel Total (ft/s)	4.95	Avg. Vel. (ft/s)	1.71	9.53	1.13
Max Chl Dpth (ft)	9.43	Hydr. Depth (ft)	2.28	7.51	1.21
Conv. Total (cfs)	26113.3	Conv. (cfs)	2139.3	22028.8	1945.1

Length Wtd. (ft)	93.75	Wetted Per. (ft)	45.14	33.01	114.99
Min Ch El (ft)	925.33	Shear (lb/sq ft)	0.91	2.31	0.49
Alpha	3.14	Stream Power (lb/ft s)	1.56	21.98	0.56
Frctn Loss (ft)	0.67	Cum Volume (acre-ft)	0.12	2.56	1.71
C & E Loss (ft)	0.02	Cum SA (acres)	0.06	0.59	1.13

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

CROSS SECTION OUTPUT Profile #50yr

E.G. Elev (ft)	936.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.10	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	935.38	Reach Len. (ft)	95.41	94.00	90.84
Crit W.S. (ft)	934.77	Flow Area (sq ft)	129.11	202.22	210.78
E.G. Slope (ft/ft)	0.005816	Area (sq ft)	129.11	202.22	210.78
Q Total (cfs)	2450.00	Flow (cfs)	238.97	1918.18	292.85
Top Width (ft)	188.60	Top Width (ft)	46.06	24.88	117.65
Vel Total (ft/s)	4.52	Avg. Vel. (ft/s)	1.85	9.49	1.39
Max Chl Dpth (ft)	10.05	Hydr. Depth (ft)	2.80	8.13	1.79
Conv. Total (cfs)	32125.7	Conv. (cfs)	3133.5	25152.2	3840.0
Length Wtd. (ft)	93.63	Wetted Per. (ft)	47.05	33.01	118.11
Min Ch El (ft)	925.33	Shear (lb/sq ft)	1.00	2.22	0.65
Alpha	3.48	Stream Power (lb/ft s)	1.84	21.10	0.90
Frctn Loss (ft)	0.63	Cum Volume (acre-ft)	0.15	2.84	2.27
C & E Loss (ft)	0.03	Cum SA (acres)	0.07	0.62	1.34

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

CROSS SECTION OUTPUT Profile #100yr

E.G. Elev (ft)	936.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.05	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	935.93	Reach Len. (ft)	95.41	94.00	90.84
Crit W.S. (ft)	935.16	Flow Area (sq ft)	154.92	215.96	276.53
E.G. Slope (ft/ft)	0.005380	Area (sq ft)	154.92	215.96	276.53
Q Total (cfs)	2800.00	Flow (cfs)	305.20	2058.52	436.29
Top Width (ft)	192.54	Top Width (ft)	47.40	24.88	120.27
Vel Total (ft/s)	4.32	Avg. Vel. (ft/s)	1.97	9.53	1.58
Max Chl Dpth (ft)	10.60	Hydr. Depth (ft)	3.27	8.68	2.30
Conv. Total (cfs)	38173.0	Conv. (cfs)	4160.8	28064.2	5948.0
Length Wtd. (ft)	93.56	Wetted Per. (ft)	48.50	33.01	120.79
Min Ch El (ft)	925.33	Shear (lb/sq ft)	1.07	2.20	0.77
Alpha	3.61	Stream Power (lb/ft s)	2.11	20.95	1.21
Frctn Loss (ft)	0.65	Cum Volume (acre-ft)	0.20	3.11	2.89
C & E Loss (ft)	0.06	Cum SA (acres)	0.11	0.65	1.68

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 OUTPUT Profile #500yr

E.G. Elev (ft)	938.17	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.27	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	936.90	Reach Len. (ft)	95.41	94.00	90.84
Crit W.S. (ft)	935.92	Flow Area (sq ft)	201.74	239.96	448.86
E.G. Slope (ft/ft)	0.005901	Area (sq ft)	201.74	239.96	448.86
Q Total (cfs)	3650.00	Flow (cfs)	480.00	2569.60	600.40
Top Width (ft)	342.73	Top Width (ft)	49.70	24.88	268.15
Vel Total (ft/s)	4.10	Avg. Vel. (ft/s)	2.38	10.71	1.34
Max Chl Dpth (ft)	11.57	Hydr. Depth (ft)	4.06	9.64	1.67
Conv. Total (cfs)	47515.9	Conv. (cfs)	6248.6	33451.2	7816.1
Length Wtd. (ft)	93.50	Wetted Per. (ft)	50.99	33.01	269.17
Min Ch El (ft)	925.33	Shear (lb/sq ft)	1.46	2.68	0.61
Alpha	4.87	Stream Power (lb/ft s)	3.47	28.68	0.82
Frctn Loss (ft)	0.72	Cum Volume (acre-ft)	0.34	3.71	4.73
C & E Loss (ft)	0.08	Cum SA (acres)	0.20	0.68	2.41

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 459.5899

INPUT
Description: 49
Station Elevation Data num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.04	6	941.89	8.93	941.82	15.34	941.67	21.48	941.52
26.59	941.3	32.67	941.04	33.89	940.94	39.92	940.63	78.79	937.03
89.54	935.58	92.61	935.24	96.73	934.77	99.98	932.13	101.87	927.67
102.96	925.06	110.59	925.16	113.71	925.32	113.97	925.32	118.8	925.57
122.68	929.97	125.04	931.97	162.19	932.73	163.5	932.72	168.1	931.01
171.56	930.73	175.66	930.99	177.87	932.06	180.07	932.04	192.5	931.76
198.2	931.75	203.57	932.23	210.31	932.81	214.9	933.24	217.65	933.51
223.36	934.07	224.57	934.15	228.71	934.44	229.09	934.46	229.28	934.48
231.3	934.63	231.71	934.63	232.08	934.63	247.46	934.45	250.39	934.42
260.6	934.46	260.79	934.73	261	935.03	261.16	935.04	261.37	935.04
261.82	935.05	270.31	935.39	282.06	935.49	283.48	935.51	290.77	935.6
299.06	935.69	312.31	935.83	321.87	936.05	323.66	936.09	324.11	936.1
324.14	936.1	324.15	936.1	324.39	936.14	324.4	936.14	324.71	936.19
324.74	936.19	326.12	936.43	340	938				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	96.73	.04	125.04	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
96.73	125.04	18.06	18.05	18.28	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
232.08	340	934.66	F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	933.42	Element			
Vel Head (ft)	0.71	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	932.71	Reach Len. (ft)	18.06	18.05	18.28
Crit W.S. (ft)	930.23	Flow Area (sq ft)		154.02	56.04
E.G. Slope (ft/ft)	0.004479	Area (sq ft)		154.02	56.04
Q Total (cfs)	1100.00	Flow (cfs)		1060.80	39.21
Top Width (ft)	107.59	Top Width (ft)		25.77	81.82
Vel Total (ft/s)	5.24	Avg. Vel. (ft/s)		6.89	0.70
Max Chl Dpth (ft)	7.65	Hydr. Depth (ft)		5.98	0.68
Conv. Total (cfs)	16436.5	Conv. (cfs)		15850.7	585.8
Length Wtd. (ft)	18.06	Wetted Per. (ft)		33.40	82.44
Min Ch El (ft)	925.06	Shear (lb/sq ft)		1.29	0.19
Alpha	1.67	Stream Power (lb/ft s)		8.88	0.13
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)		1.40	0.29
C & E Loss (ft)	0.04	Cum SA (acres)		0.43	0.44

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	934.42	Element			
Vel Head (ft)	0.84	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	933.59	Reach Len. (ft)	18.06	18.05	18.28
Crit W.S. (ft)	930.88	Flow Area (sq ft)		177.09	26.69
E.G. Slope (ft/ft)	0.004550	Area (sq ft)		177.09	26.69
Q Total (cfs)	1340.00	Flow (cfs)		1312.95	27.05
Top Width (ft)	45.57	Top Width (ft)		26.85	18.72
Vel Total (ft/s)	6.58	Avg. Vel. (ft/s)		7.41	1.01
Max Chl Dpth (ft)	8.53	Hydr. Depth (ft)		6.59	1.43
Conv. Total (cfs)	19866.3	Conv. (cfs)		19465.3	401.1
Length Wtd. (ft)	18.06	Wetted Per. (ft)		34.79	19.96
Min Ch El (ft)	925.06	Shear (lb/sq ft)		1.45	0.38
Alpha	1.25	Stream Power (lb/ft s)		10.72	0.39
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.00	1.61	0.06
C & E Loss (ft)	0.00	Cum SA (acres)	0.00	0.47	0.05

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

CROSS SECTION OUTPUT Profile #10yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	934.49	Element			
Vel Head (ft)	1.13	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	933.36	Reach Len. (ft)	18.06	18.05	18.28
Crit W.S. (ft)	931.82	Flow Area (sq ft)		171.11	113.24

E.G. Slope (ft/ft)	0.006725	Area (sq ft)		171.11	113.24
Q Total (cfs)	1650.00	Flow (cfs)		1517.71	132.29
Top Width (ft)	117.69	Top Width (ft)		26.58	91.11
Vel Total (ft/s)	5.80	Avg. Vel. (ft/s)		8.87	1.17
Max Chl Dpth (ft)	8.30	Hydr. Depth (ft)		6.44	1.24
Conv. Total (cfs)	20121.0	Conv. (cfs)		18507.8	1613.2
Length Wtd. (ft)	18.08	Wetted Per. (ft)		34.44	91.77
Min Ch El (ft)	925.06	Shear (lb/sq ft)		2.09	0.52
Alpha	2.15	Stream Power (lb/ft s)		18.50	0.61
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	0.00	1.84	0.92
C & E Loss (ft)	0.09	Cum SA (acres)	0.00	0.50	0.66

CROSS SECTION OUTPUT Profile #25yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	935.27	Element			
Vel Head (ft)	1.37	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	933.90	Reach Len. (ft)	18.06	18.05	18.28
Crit W.S. (ft)	933.42	Flow Area (sq ft)		185.48	163.35
E.G. Slope (ft/ft)	0.007934	Area (sq ft)		185.48	163.35
Q Total (cfs)	2110.00	Flow (cfs)		1855.39	254.61
Top Width (ft)	123.79	Top Width (ft)		27.24	96.56
Vel Total (ft/s)	6.05	Avg. Vel. (ft/s)		10.00	1.56
Max Chl Dpth (ft)	8.84	Hydr. Depth (ft)		6.81	1.69
Conv. Total (cfs)	23688.1	Conv. (cfs)		20829.7	2858.4
Length Wtd. (ft)	18.09	Wetted Per. (ft)		35.29	97.24
Min Ch El (ft)	925.06	Shear (lb/sq ft)		2.60	0.83
Alpha	2.41	Stream Power (lb/ft s)		26.05	1.30
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	0.01	2.16	1.39
C & E Loss (ft)	0.14	Cum SA (acres)	0.01	0.54	0.91

CROSS SECTION OUTPUT Profile #50yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	935.83	Element			
Vel Head (ft)	1.39	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	934.44	Reach Len. (ft)	18.06	18.05	18.28
Crit W.S. (ft)	933.90	Flow Area (sq ft)		200.45	217.58
E.G. Slope (ft/ft)	0.007809	Area (sq ft)		200.45	217.65
Q Total (cfs)	2450.00	Flow (cfs)		2061.48	388.52
Top Width (ft)	138.65	Top Width (ft)		27.90	110.75
Vel Total (ft/s)	5.86	Avg. Vel. (ft/s)		10.28	1.79
Max Chl Dpth (ft)	9.38	Hydr. Depth (ft)		7.18	2.10
Conv. Total (cfs)	27724.9	Conv. (cfs)		23328.3	4396.7
Length Wtd. (ft)	18.10	Wetted Per. (ft)		36.15	104.37
Min Ch El (ft)	925.06	Shear (lb/sq ft)		2.70	1.02
Alpha	2.61	Stream Power (lb/ft s)		27.80	1.81
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	0.01	2.41	1.82
C & E Loss (ft)	0.15	Cum SA (acres)	0.02	0.57	1.11

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	936.28	Element			
Vel Head (ft)	1.66	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	934.62	Reach Len. (ft)	18.06	18.05	18.28
Crit W.S. (ft)	934.31	Flow Area (sq ft)		205.41	236.16
E.G. Slope (ft/ft)	0.009235	Area (sq ft)		205.41	239.70
Q Total (cfs)	2800.00	Flow (cfs)		2323.03	476.97
Top Width (ft)	161.74	Top Width (ft)		28.12	133.62
Vel Total (ft/s)	6.34	Avg. Vel. (ft/s)		11.31	2.02
Max Chl Dpth (ft)	9.56	Hydr. Depth (ft)		7.30	2.23
Conv. Total (cfs)	29136.6	Conv. (cfs)		24173.2	4963.3
Length Wtd. (ft)	18.10	Wetted Per. (ft)		36.43	106.80
Min Ch El (ft)	925.06	Shear (lb/sq ft)		3.25	1.27
Alpha	2.66	Stream Power (lb/ft s)		36.77	2.57
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.03	2.66	2.35
C & E Loss (ft)	0.19	Cum SA (acres)	0.06	0.59	1.41

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.

CROSS SECTION OUTPUT Profile #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	937.37	Element			
Vel Head (ft)	2.03	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	935.34	Reach Len. (ft)	18.06	18.05	18.28
Crit W.S. (ft)	935.33	Flow Area (sq ft)	1.45	225.97	339.78

E.G. Slope (ft/ft)	0.010488	Area (sq ft)	1.45	225.97	339.78
Q Total (cfs)	3650.00	Flow (cfs)	0.79	2889.51	759.70
Top Width (ft)	177.49	Top Width (ft)	5.06	28.31	144.12
Vel Total (ft/s)	6.44	Avg. Vel. (ft/s)	0.55	12.79	2.24
Max Chl Dpth (ft)	10.28	Hydr. Depth (ft)	0.29	7.98	2.36
Conv. Total (cfs)	35640.9	Conv. (cfs)	7.7	28215.0	7418.2
Length Wtd. (ft)	18.11	Wetted Per. (ft)	5.09	36.67	145.14
Min Ch El (ft)	925.06	Shear (lb/sq ft)	0.19	4.03	1.53
Alpha	3.15	Stream Power (lb/ft s)	0.10	51.59	3.43
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	0.12	3.21	3.91
C & E Loss (ft)	0.27	Cum SA (acres)	0.14	0.62	1.98

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

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 441.5446

INPUT
Description: 50
Station Elevation Data num= 96

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.02	2.57	941.95	10.59	941.74	11.79	941.71	18.84	941.55
24.3	941.42	29.99	941.19	34.56	940.99	35.53	940.95	39.81	940.76
43.46	940.55	79.09	938.34	86.59	937.32	91.15	936.71	92.6	936.52
98.5	935.72	99.23	935.64	104.05	931.72	105.43	930.61	105.78	929.78
107.4	925.9	107.84	924.84	108.02	924.84	123.15	925.61	124.93	927.63
129.52	931.52	146.93	931.87	161.86	931.81	165.26	932.06	170.98	932.19
172.77	932.6	173.12	932.43	173.71	932.1	175.63	931.07	176.84	930.43
177.92	929.73	178.07	929.72	180.27	929.51	182.71	929.66	183.27	929.93
187.29	931.85	194.07	931.77	195.69	931.76	196.88	931.74	201.24	931.57
210.59	931.44	227.05	931.69	228.34	931.74	229.31	931.73	231.72	932.1
240.48	933.36	251.36	934.25	252.06	934.3	256.1	934.6	257.74	934.72
258.09	934.75	258.25	934.77	259.27	934.85	259.8	934.85	260.05	934.86
273.79	934.8	273.91	934.81	276.44	934.92	284.32	935.02	284.49	935.02
284.84	935.02	289.35	935	289.6	935.35	289.74	935.57	290.02	935.57
290.53	935.57	296.36	935.65	301.96	935.71	302.48	935.71	307.44	935.77
311.85	935.82	326.28	936.01	330.22	936.11	340.59	936.11	348.75	936.32
348.82	936.32	361.55	936.4	361.58	936.4	361.74	936.41	361.81	936.41
361.98	936.41	373.41	936.64	373.79	936.65	374.29	936.65	375.15	936.66
378.05	936.68	380.6	936.7	382.93	936.72	385.16	936.73	387.38	936.74
387.97	936.74								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	99.23	.04	129.52	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
99.23	129.52	122.28	116.67	109.21	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
237	387.97		F

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	933.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.59	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	932.72	Reach Len. (ft)	122.28	116.67	109.21
Crit W.S. (ft)		Flow Area (sq ft)		154.83	118.48
E.G. Slope (ft/ft)	0.003962	Area (sq ft)		154.83	118.48
Q Total (cfs)	1100.00	Flow (cfs)		1001.71	98.29
Top Width (ft)	133.19	Top Width (ft)		26.70	106.49
Vel Total (ft/s)	4.02	Avg. Vel. (ft/s)		6.47	0.83
Max Chl Dpth (ft)	7.88	Hydr. Depth (ft)		5.80	1.11
Conv. Total (cfs)	17475.1	Conv. (cfs)		15913.6	1561.5
Length Wtd. (ft)	116.17	Wetted Per. (ft)		33.64	107.90
Min Ch El (ft)	924.84	Shear (lb/sq ft)		1.14	0.27
Alpha	2.36	Stream Power (lb/ft s)		7.36	0.23
Frctn Loss (ft)	0.79	Cum Volume (acre-ft)		1.34	0.26
C & E Loss (ft)	0.08	Cum SA (acres)		0.42	0.40

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 #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	934.34	Wt. n-Val.		0.040	0.120
Vel Head (ft)	0.83	Reach Len. (ft)	122.28	116.67	109.21
W.S. Elev (ft)	933.51	Flow Area (sq ft)		176.45	30.54
Crit W.S. (ft)		Area (sq ft)		176.45	30.54
E.G. Slope (ft/ft)	0.004563	Flow (cfs)		1304.19	35.81
Q Total (cfs)	1340.00	Top Width (ft)		27.67	16.74
Top Width (ft)	44.41	Avg. Vel. (ft/s)		7.39	1.17
Vel Total (ft/s)	6.47	Hydr. Depth (ft)		6.38	1.82
Max Chl Dpth (ft)	8.67	Conv. (cfs)		19306.9	530.2
Conv. Total (cfs)	19837.1	Wetted Per. (ft)		34.90	18.40
Length Wtd. (ft)	116.54	Shear (lb/sq ft)		1.44	0.47
Min Ch El (ft)	924.84	Stream Power (lb/ft s)		10.64	0.55
Alpha	1.27	Cum Volume (acre-ft)	0.00	1.54	0.05
Frctn Loss (ft)	0.90	Cum SA (acres)	0.00	0.46	0.04
C & E Loss (ft)	0.10				

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 #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	934.29	Wt. n-Val.		0.040	0.120
Vel Head (ft)	0.81	Reach Len. (ft)	122.28	116.67	109.21
W.S. Elev (ft)	933.47	Flow Area (sq ft)		175.31	199.45
Crit W.S. (ft)		Area (sq ft)		175.31	200.79
E.G. Slope (ft/ft)	0.005227	Flow (cfs)		1382.68	267.32
Q Total (cfs)	1650.00	Top Width (ft)		27.62	112.33
Top Width (ft)	139.95	Avg. Vel. (ft/s)		7.89	1.34
Vel Total (ft/s)	4.40	Hydr. Depth (ft)		6.35	1.86
Max Chl Dpth (ft)	8.63	Conv. (cfs)		19124.0	3697.3
Conv. Total (cfs)	22821.3	Wetted Per. (ft)		34.84	108.89
Length Wtd. (ft)	115.47	Shear (lb/sq ft)		1.64	0.60
Min Ch El (ft)	924.84	Stream Power (lb/ft s)		12.95	0.80
Alpha	2.70	Cum Volume (acre-ft)	0.00	1.77	0.85
Frctn Loss (ft)	0.83	Cum SA (acres)	0.00	0.49	0.62
C & E Loss (ft)	0.05				

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 #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	935.01	Wt. n-Val.		0.040	0.120
Vel Head (ft)	0.91	Reach Len. (ft)	122.28	116.67	109.21
W.S. Elev (ft)	934.10	Flow Area (sq ft)		192.86	266.78
Crit W.S. (ft)		Area (sq ft)		192.86	273.55
E.G. Slope (ft/ft)	0.005676	Flow (cfs)		1657.70	452.30
Q Total (cfs)	2110.00	Top Width (ft)		28.39	119.98
Top Width (ft)	148.38	Avg. Vel. (ft/s)		8.60	1.70
Vel Total (ft/s)	4.59	Hydr. Depth (ft)		6.79	2.48
Max Chl Dpth (ft)	9.26	Conv. (cfs)		22003.0	6003.5
Conv. Total (cfs)	28006.5	Wetted Per. (ft)		35.83	108.89
Length Wtd. (ft)	115.10	Shear (lb/sq ft)		1.91	0.87
Min Ch El (ft)	924.84	Stream Power (lb/ft s)		16.39	1.47
Alpha	2.78	Cum Volume (acre-ft)	0.01	2.08	1.30
Frctn Loss (ft)	0.88	Cum SA (acres)	0.01	0.53	0.87
C & E Loss (ft)	0.05				

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

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	935.56	Wt. n-Val.		0.040	0.120
Vel Head (ft)	0.90	Reach Len. (ft)	122.28	116.67	109.21
W.S. Elev (ft)	934.66	Flow Area (sq ft)		209.10	327.52
Crit W.S. (ft)		Area (sq ft)		209.10	343.42
E.G. Slope (ft/ft)	0.005440	Flow (cfs)		1826.72	623.28
Q Total (cfs)	2450.00	Top Width (ft)		29.09	127.44
Top Width (ft)	156.53	Avg. Vel. (ft/s)		8.74	1.90
Vel Total (ft/s)	4.57	Hydr. Depth (ft)		7.19	3.05
Max Chl Dpth (ft)	9.82	Conv. (cfs)		24766.5	8450.4
Conv. Total (cfs)	33216.9	Wetted Per. (ft)		36.73	108.89
Length Wtd. (ft)	114.91				

Min Ch El (ft)	924.84	Shear (lb/sq ft)		1.93	1.02
Alpha	2.77	Stream Power (lb/ft s)		16.89	1.94
Frctn Loss (ft)	0.93	Cum Volume (acre-ft)	0.01	2.32	1.70
C & E Loss (ft)	0.09	Cum SA (acres)	0.02	0.55	1.06

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.
Warning: The energy loss was 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 #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	935.95	Wt. n-Val.		0.040	0.120
Vel Head (ft)	1.02	Reach Len. (ft)	122.28	116.67	109.21
W.S. Elev (ft)	934.93	Flow Area (sq ft)		216.84	355.94
Crit W.S. (ft)		Area (sq ft)		216.84	379.10
E.G. Slope (ft/ft)	0.006110	Flow (cfs)		2041.20	758.80
Q Total (cfs)	2800.00	Top Width (ft)		29.41	147.53
Top Width (ft)	176.94	Avg. Vel. (ft/s)		9.41	2.13
Vel Total (ft/s)	4.89	Hydr. Depth (ft)		7.37	3.31
Max Chl Dpth (ft)	10.09	Conv. (cfs)		26114.0	9707.7
Conv. Total (cfs)	35821.8	Wetted Per. (ft)		37.15	108.89
Length Wtd. (ft)	114.71	Shear (lb/sq ft)		2.23	1.25
Min Ch El (ft)	924.84	Stream Power (lb/ft s)		20.96	2.66
Alpha	2.75	Cum Volume (acre-ft)	0.03	2.57	2.22
Frctn Loss (ft)	0.93	Cum SA (acres)	0.06	0.58	1.35
C & E Loss (ft)	0.06				

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

CROSS SECTION OUTPUT Profile #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	936.96	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	1.14	Reach Len. (ft)	122.28	116.67	109.21
W.S. Elev (ft)	935.83	Flow Area (sq ft)	0.15	243.72	452.43
Crit W.S. (ft)		Area (sq ft)	0.15	243.72	524.93
E.G. Slope (ft/ft)	0.006412	Flow (cfs)	0.03	2490.56	1159.41
Q Total (cfs)	3650.00	Top Width (ft)	1.51	30.29	182.74
Top Width (ft)	214.54	Avg. Vel. (ft/s)	0.21	10.22	2.56
Vel Total (ft/s)	5.24	Hydr. Depth (ft)	0.10	8.05	4.21
Max Chl Dpth (ft)	10.99	Conv. (cfs)	0.4	31102.3	14478.8
Conv. Total (cfs)	45581.5	Wetted Per. (ft)	1.52	38.28	108.89
Length Wtd. (ft)	114.39	Shear (lb/sq ft)	0.04	2.55	1.66
Min Ch El (ft)	924.84	Stream Power (lb/ft s)	0.01	26.05	4.26
Alpha	2.67	Cum Volume (acre-ft)	0.12	3.11	3.73
Frctn Loss (ft)	0.98	Cum SA (acres)	0.14	0.61	1.91
C & E Loss (ft)	0.08				

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: Hope Creek
REACH: 1 RS: 324.8710

INPUT
Description: 51
Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	941.99	3.04	941.9	10.67	941.67	19.8	941.44	23.34	941.34
25.09	941.3	35.5	940.99	43.83	940.76	47.91	940.66	57.91	940.24
59.16	940.19	60.58	940.18	66.71	940.17	74.73	939.87	94.55	939.79
102.5	937.82	103.29	937.61	117.83	934.16	121.6	933.79	125.43	932.15
127.9	931.09	134.64	928.98	138.5	924.9	147.78	924.63	154.52	929.76
155.65	930.58	156.97	930.74	165.65	930.74	186.81	931	194.51	930.91
197.26	930.82	218.13	930.34	221.67	930.73	224.45	931.33	227.69	929.63
228.26	928.77	231.6	928.83	232.18	928.84	234.6	928.96	235.55	929.77
237.23	930.43	239.4	931.19	264.08	930.55	264.8	930.53	266.87	930.51
275.43	930.72	284.3	930.93	285.4	930.99	305.92	931.62	306.95	931.63
307.82	931.8	315.89	932.88	316.36	932.92	317.36	932.96	325.11	933.38
329.89	933.5	339.85	933.8	341.24	933.83	347.01	934.23	356.66	934.88
357.61	934.96	358.56	935.05	358.67	935.06	358.73	935.06	363.29	935.52

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .12   127.9     .04  156.97     .12

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         127.9  156.97             17.95   17.59   16.66          .1        .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
     265  363.29              F
```

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	932.43	Element			
Vel Head (ft)	1.43	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	931.00	Reach Len. (ft)	17.95	17.59	16.66
Crit W.S. (ft)	931.00	Flow Area (sq ft)		107.02	40.46
E.G. Slope (ft/ft)	0.014489	Area (sq ft)		107.02	46.21
Q Total (cfs)	1100.00	Flow (cfs)		1051.66	48.34
Top Width (ft)	146.99	Top Width (ft)		28.78	118.22
Vel Total (ft/s)	7.46	Avg. Vel. (ft/s)		9.83	1.19
Max Chl Dpth (ft)	6.37	Hydr. Depth (ft)		3.72	0.41
Conv. Total (cfs)	9138.5	Conv. (cfs)		8736.9	401.6
Length Wtd. (ft)	17.56	Wetted Per. (ft)		32.85	98.94
Min Ch El (ft)	924.63	Shear (lb/sq ft)		2.95	0.37
Alpha	1.66	Stream Power (lb/ft s)		28.96	0.44
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)		0.99	0.05
C & E Loss (ft)	0.03	Cum SA (acres)		0.35	0.12

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: Divided flow computed for this cross-section.
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 #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	933.33	Element			
Vel Head (ft)	1.87	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	931.46	Reach Len. (ft)	17.95	17.59	16.66
Crit W.S. (ft)	931.46	Flow Area (sq ft)	0.16	120.44	9.32
E.G. Slope (ft/ft)	0.015797	Area (sq ft)	0.16	120.44	9.32
Q Total (cfs)	1340.00	Flow (cfs)	0.08	1328.74	11.18
Top Width (ft)	43.05	Top Width (ft)	0.86	29.07	13.12
Vel Total (ft/s)	10.31	Avg. Vel. (ft/s)	0.48	11.03	1.20
Max Chl Dpth (ft)	6.83	Hydr. Depth (ft)	0.18	4.14	0.71
Conv. Total (cfs)	10661.4	Conv. (cfs)	0.6	10571.8	89.0
Length Wtd. (ft)	17.59	Wetted Per. (ft)	0.94	33.16	13.79
Min Ch El (ft)	924.63	Shear (lb/sq ft)	0.17	3.58	0.67
Alpha	1.13	Stream Power (lb/ft s)	0.08	39.52	0.80
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)	0.00	1.14	0.00
C & E Loss (ft)	0.09	Cum SA (acres)	0.00	0.39	0.01

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #10yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	933.41	Element			
Vel Head (ft)	1.28	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	932.13	Reach Len. (ft)	17.95	17.59	16.66
Crit W.S. (ft)	932.13	Flow Area (sq ft)	1.27	140.00	161.93
E.G. Slope (ft/ft)	0.010379	Area (sq ft)	1.27	140.00	209.11
Q Total (cfs)	1650.00	Flow (cfs)	0.98	1384.00	265.03
Top Width (ft)	184.84	Top Width (ft)	2.43	29.07	153.34
Vel Total (ft/s)	5.44	Avg. Vel. (ft/s)	0.77	9.89	1.64
Max Chl Dpth (ft)	7.50	Hydr. Depth (ft)	0.52	4.82	1.50
Conv. Total (cfs)	16196.0	Conv. (cfs)	9.6	13585.0	2601.4
Length Wtd. (ft)	17.45	Wetted Per. (ft)	2.64	33.16	109.57
Min Ch El (ft)	924.63	Shear (lb/sq ft)	0.31	2.74	0.96
Alpha	2.78	Stream Power (lb/ft s)	0.24	27.04	1.57
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	0.00	1.34	0.34
C & E Loss (ft)	0.08	Cum SA (acres)	0.00	0.41	0.29

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #25yr

E.G. Elev (ft)	934.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.44	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	932.64	Reach Len. (ft)	17.95	17.59	16.66
Crit W.S. (ft)	932.64	Flow Area (sq ft)	2.80	154.78	216.88
E.G. Slope (ft/ft)	0.010781	Area (sq ft)	2.80	154.78	288.07
Q Total (cfs)	2110.00	Flow (cfs)	2.88	1667.54	439.59
Top Width (ft)	189.82	Top Width (ft)	3.62	29.07	157.14
Vel Total (ft/s)	5.63	Avg. Vel. (ft/s)	1.03	10.77	2.03
Max Chl Dpth (ft)	8.01	Hydr. Depth (ft)	0.78	5.32	2.01
Conv. Total (cfs)	20321.0	Conv. (cfs)	27.7	16059.7	4233.6
Length Wtd. (ft)	17.40	Wetted Per. (ft)	3.94	33.16	109.57
Min Ch El (ft)	924.63	Shear (lb/sq ft)	0.48	3.14	1.33
Alpha	2.92	Stream Power (lb/ft s)	0.49	33.85	2.70
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	0.00	1.62	0.60
C & E Loss (ft)	0.15	Cum SA (acres)	0.01	0.45	0.52

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: 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 #50yr

E.G. Elev (ft)	934.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.79	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	932.76	Reach Len. (ft)	17.95	17.59	16.66
Crit W.S. (ft)		Flow Area (sq ft)	3.25	158.21	229.63
E.G. Slope (ft/ft)	0.013171	Area (sq ft)	3.25	158.21	306.67
Q Total (cfs)	2450.00	Flow (cfs)	3.87	1911.72	534.41
Top Width (ft)	190.98	Top Width (ft)	3.89	29.07	158.02
Vel Total (ft/s)	6.26	Avg. Vel. (ft/s)	1.19	12.08	2.33
Max Chl Dpth (ft)	8.13	Hydr. Depth (ft)	0.83	5.44	2.13
Conv. Total (cfs)	21347.8	Conv. (cfs)	33.7	16657.5	4656.5
Length Wtd. (ft)	17.38	Wetted Per. (ft)	4.24	33.16	109.57
Min Ch El (ft)	924.63	Shear (lb/sq ft)	0.63	3.92	1.72
Alpha	2.93	Stream Power (lb/ft s)	0.75	47.41	4.01
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	0.01	1.83	0.89
C & E Loss (ft)	0.25	Cum SA (acres)	0.02	0.48	0.70

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 #100yr

E.G. Elev (ft)	934.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.66	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	933.29	Reach Len. (ft)	17.95	17.59	16.66
Crit W.S. (ft)	933.29	Flow Area (sq ft)	5.65	173.67	287.06
E.G. Slope (ft/ft)	0.011350	Area (sq ft)	5.65	173.67	392.65
Q Total (cfs)	2800.00	Flow (cfs)	7.50	2072.83	719.67
Top Width (ft)	200.70	Top Width (ft)	5.13	29.07	166.50
Vel Total (ft/s)	6.00	Avg. Vel. (ft/s)	1.33	11.94	2.51
Max Chl Dpth (ft)	8.66	Hydr. Depth (ft)	1.10	5.97	2.66
Conv. Total (cfs)	26282.3	Conv. (cfs)	70.4	19456.7	6755.2
Length Wtd. (ft)		Wetted Per. (ft)	5.59	33.16	109.57
Min Ch El (ft)	924.63	Shear (lb/sq ft)	0.72	3.71	1.86
Alpha	2.97	Stream Power (lb/ft s)	0.95	44.29	4.65
Frctn Loss (ft)		Cum Volume (acre-ft)	0.02	2.05	1.26
C & E Loss (ft)		Cum SA (acres)	0.05	0.50	0.96

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.

CROSS SECTION OUTPUT Profile #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	935.90	Element			
Vel Head (ft)	1.94	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	933.96	Reach Len. (ft)	17.95	17.59	16.66
Crit W.S. (ft)	933.96	Flow Area (sq ft)	9.75	193.25	359.81
E.G. Slope (ft/ft)	0.012070	Area (sq ft)	9.75	193.25	511.79
Q Total (cfs)	3650.00	Flow (cfs)	14.39	2554.15	1081.46
Top Width (ft)	223.36	Top Width (ft)	8.08	29.07	186.21
Vel Total (ft/s)	6.49	Avg. Vel. (ft/s)	1.47	13.22	3.01
Max Chl Dpth (ft)	9.33	Hydr. Depth (ft)	1.21	6.65	3.33
Conv. Total (cfs)	33222.4	Conv. (cfs)	131.0	23247.9	9843.5
Length Wtd. (ft)		Wetted Per. (ft)	8.64	33.16	109.57
Min Ch El (ft)	924.63	Shear (lb/sq ft)	0.85	4.39	2.47
Alpha	2.97	Stream Power (lb/ft s)	1.25	58.04	7.44
Frctn Loss (ft)		Cum Volume (acre-ft)	0.11	2.53	2.43
C & E Loss (ft)		Cum SA (acres)	0.13	0.53	1.45

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.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 307.2792

INPUT
Description: 52
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.07	1.47	942.03	5.01	941.93	11.36	941.75	17.13	941.58
22.31	941.44	29.82	941.23	30.96	941.2	39.58	940.95	41.95	940.88
52.06	940.6	53.36	940.57	54.33	940.54	55.1	940.51	55.32	940.5
59.1	940.34	65.43	940.06	67.87	939.93	80.28	939.47	97.61	938.56
109.76	935.55	113.7	934.72	120.36	933.16	123.71	932.84	128.91	932.33
131.93	931.04	141.99	925.13	152.79	924.63	153.13	924.88	153.55	925.18
159.79	929.7	160.17	929.97	169.36	931.07	176.83	931.07	201.66	930.81
227.48	930.36	228.31	930.34	228.37	930.34	232.22	931.17	236.69	928.84
236.78	928.7	242.07	928.79	242.18	928.79	242.66	928.81	242.85	928.97
246.07	930.24	247.92	930.97	250.37	930.88	252.55	930.83	281.31	930.51
287.78	930.67	303.38	930.89	306.21	930.93	307.84	930.99	317.55	931.4
327.01	931.74	334.72	932.58	337.13	932.65	347.07	932.93	350.64	933.16
353.8	933.32	359.37	933.59	363.76	933.83	365.53	933.95	369.18	934.26
376.76	934.84	379.4	935.04	383.7	935.41	386.23	935.63	386.51	935.64

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	128.91	.04	169.36	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
128.91 169.36 125.45 106.5 91.3 .1 .3
Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
281	386.51		F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	931.95	Element			
Vel Head (ft)	1.33	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	930.62	Reach Len. (ft)	125.45	106.50	91.30
Crit W.S. (ft)	930.37	Flow Area (sq ft)		113.76	20.69
E.G. Slope (ft/ft)	0.013896	Area (sq ft)		113.76	20.95
Q Total (cfs)	1100.00	Flow (cfs)		1069.05	30.95
Top Width (ft)	77.33	Top Width (ft)		32.92	44.42
Vel Total (ft/s)	8.18	Avg. Vel. (ft/s)		9.40	1.50
Max Chl Dpth (ft)	5.99	Hydr. Depth (ft)		3.46	0.52
Conv. Total (cfs)	9331.5	Conv. (cfs)		9069.0	262.5
Length Wtd. (ft)	106.28	Wetted Per. (ft)		36.19	40.74
Min Ch El (ft)	924.63	Shear (lb/sq ft)		2.73	0.44
Alpha	1.28	Stream Power (lb/ft s)		25.63	0.66
Frctn Loss (ft)	1.54	Cum Volume (acre-ft)		0.94	0.04
C & E Loss (ft)	0.00	Cum SA (acres)		0.33	0.09

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was 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 #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	932.73	Wt. n-Val.		0.040	0.120
Vel Head (ft)	1.57	Reach Len. (ft)	125.45	106.50	91.30
W.S. Elev (ft)	931.16	Flow Area (sq ft)		133.22	0.30
Crit W.S. (ft)	931.01	Area (sq ft)		133.22	0.30
E.G. Slope (ft/ft)	0.015308	Flow (cfs)		1339.91	0.09
Q Total (cfs)	1340.00	Top Width (ft)		37.72	3.29
Top Width (ft)	41.01	Avg. Vel. (ft/s)		10.06	0.31
Vel Total (ft/s)	10.04	Hydr. Depth (ft)		3.53	0.09
Max Chl Dpth (ft)	6.53	Conv. (cfs)		10829.6	0.8
Conv. Total (cfs)	10830.4	Wetted Per. (ft)		41.16	3.38
Length Wtd. (ft)	106.50	Shear (lb/sq ft)		3.09	0.09
Min Ch El (ft)	924.63	Stream Power (lb/ft s)		31.11	0.03
Alpha	1.00	Cum Volume (acre-ft)		1.09	0.00
Frctn Loss (ft)	1.70	Cum SA (acres)		0.37	0.00
C & E Loss (ft)	0.01				

Warning: The cross section had to be extended vertically during the critical depth 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.

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	932.98	Wt. n-Val.		0.040	0.120
Vel Head (ft)	1.02	Reach Len. (ft)	125.45	106.50	91.30
W.S. Elev (ft)	931.95	Flow Area (sq ft)		163.79	153.01
Crit W.S. (ft)	931.79	Area (sq ft)		163.79	196.37
E.G. Slope (ft/ft)	0.009286	Flow (cfs)		1426.31	223.69
Q Total (cfs)	1650.00	Top Width (ft)		39.57	159.61
Top Width (ft)	199.18	Avg. Vel. (ft/s)		8.71	1.46
Vel Total (ft/s)	5.21	Hydr. Depth (ft)		4.14	1.37
Max Chl Dpth (ft)	7.32	Conv. (cfs)		14801.6	2321.4
Conv. Total (cfs)	17123.0	Wetted Per. (ft)		43.17	112.83
Length Wtd. (ft)	105.36	Shear (lb/sq ft)		2.20	0.79
Min Ch El (ft)	924.63	Stream Power (lb/ft s)		19.15	1.15
Alpha	2.43	Cum Volume (acre-ft)		1.28	0.26
Frctn Loss (ft)	1.23	Cum SA (acres)		0.40	0.23
C & E Loss (ft)	0.07				

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was 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 #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	933.67	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.92	Reach Len. (ft)	125.45	106.50	91.30
W.S. Elev (ft)	932.75	Flow Area (sq ft)	0.90	195.84	241.91
Crit W.S. (ft)		Area (sq ft)	0.90	195.84	326.74
E.G. Slope (ft/ft)	0.007338	Flow (cfs)	0.34	1683.00	426.67
Q Total (cfs)	2110.00	Top Width (ft)	4.28	40.45	171.32
Top Width (ft)	216.05	Avg. Vel. (ft/s)	0.37	8.59	1.76
Vel Total (ft/s)	4.81	Hydr. Depth (ft)	0.21	4.84	2.17
Max Chl Dpth (ft)	8.12	Conv. (cfs)	3.9	19646.3	4980.7
Conv. Total (cfs)	24630.9	Wetted Per. (ft)	4.30	44.13	112.83
Length Wtd. (ft)	104.74	Shear (lb/sq ft)	0.10	2.03	0.98
Min Ch El (ft)	924.63	Stream Power (lb/ft s)	0.04	17.47	1.73
Alpha	2.57	Cum Volume (acre-ft)	0.00	1.55	0.48
Frctn Loss (ft)	1.03	Cum SA (acres)	0.01	0.43	0.46
C & E Loss (ft)	0.09				

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 #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	934.13	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.95	Reach Len. (ft)	125.45	106.50	91.30
W.S. Elev (ft)	933.18	Flow Area (sq ft)	3.74	213.43	290.47
Crit W.S. (ft)		Area (sq ft)	3.74	213.43	403.98
E.G. Slope (ft/ft)	0.006917	Flow (cfs)	2.19	1885.89	561.91
Q Total (cfs)	2450.00	Top Width (ft)	8.66	40.45	181.77
Top Width (ft)	230.88	Avg. Vel. (ft/s)	0.59	8.84	1.93
Vel Total (ft/s)	4.83	Hydr. Depth (ft)	0.43	5.28	2.60
Max Chl Dpth (ft)	8.55	Conv. (cfs)	26.4	22675.6	6756.3
Conv. Total (cfs)	29458.3	Wetted Per. (ft)	8.70	44.13	112.83
Length Wtd. (ft)	104.39				

Min Ch El (ft)	924.63	Shear (lb/sq ft)	0.19	2.09	1.11
Alpha	2.62	Stream Power (lb/ft s)	0.11	18.45	2.15
Frctn Loss (ft)	0.96	Cum Volume (acre-ft)	0.01	1.76	0.75
C & E Loss (ft)	0.08	Cum SA (acres)	0.01	0.46	0.63

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 #100yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	934.54	Element			
Vel Head (ft)	1.02	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	933.52	Reach Len. (ft)	125.45	106.50	91.30
Crit W.S. (ft)		Flow Area (sq ft)	6.87	226.94	327.75
E.G. Slope (ft/ft)	0.007009	Area (sq ft)	6.87	226.94	465.79
Q Total (cfs)	2800.00	Flow (cfs)	5.48	2102.79	691.73
Top Width (ft)	239.07	Top Width (ft)	10.08	40.45	188.54
Vel Total (ft/s)	4.99	Avg. Vel. (ft/s)	0.80	9.27	2.11
Max Chl Dpth (ft)	8.89	Hydr. Depth (ft)	0.68	5.61	2.94
Conv. Total (cfs)	33445.4	Conv. (cfs)	65.5	25117.4	8262.5
Length Wtd. (ft)	104.09	Wetted Per. (ft)	10.16	44.13	112.83
Min Ch El (ft)	924.63	Shear (lb/sq ft)	0.30	2.25	1.27
Alpha	2.64	Stream Power (lb/ft s)	0.24	20.85	2.68
Frctn Loss (ft)	0.91	Cum Volume (acre-ft)	0.02	1.97	1.09
C & E Loss (ft)	0.07	Cum SA (acres)	0.05	0.49	0.89

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

CROSS SECTION OUTPUT Profile #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	935.45	Element			
Vel Head (ft)	1.17	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	934.28	Reach Len. (ft)	125.45	106.50	91.30
Crit W.S. (ft)		Flow Area (sq ft)	15.80	257.78	412.86
E.G. Slope (ft/ft)	0.007067	Area (sq ft)	15.80	257.78	614.45
Q Total (cfs)	3650.00	Flow (cfs)	18.25	2611.16	1020.59
Top Width (ft)	253.88	Top Width (ft)	13.34	40.45	200.10
Vel Total (ft/s)	5.32	Avg. Vel. (ft/s)	1.16	10.13	2.47
Max Chl Dpth (ft)	9.65	Hydr. Depth (ft)	1.18	6.37	3.70
Conv. Total (cfs)	43417.1	Conv. (cfs)	217.1	31060.0	12140.0
Length Wtd. (ft)	103.64	Wetted Per. (ft)	13.51	44.13	112.83
Min Ch El (ft)	924.63	Shear (lb/sq ft)	0.52	2.58	1.61
Alpha	2.66	Stream Power (lb/ft s)	0.60	26.11	3.99
Frctn Loss (ft)	0.87	Cum Volume (acre-ft)	0.10	2.44	2.21
C & E Loss (ft)	0.07	Cum SA (acres)	0.12	0.51	1.37

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

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 200.7906

INPUT
Description: 53
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	940.82	3.68	940.71	6.23	940.64	8.91	940.57	13.51	940.45
18.78	940.31	27.5	940.06	30.84	939.98	34.35	939.87	37.16	939.79
43.56	939.6	48.35	939.4	54.12	939.15	63.12	938.33	68.38	937.88
93.35	933.59	99.54	932.77	104.36	932.32	109.58	931.82	113.35	931.73
121.96	931.63	130.5	931.44	135.54	929.12	146.37	925.36	149.82	924.99
165.46	924.92	166.69	924.6	176.09	930.77	176.22	930.86	176.87	931.26
178.33	931.31	184.24	931.37	191.89	931.3	207.99	930.36	234.49	930.85
236.49	931.18	242.42	932.01	251.94	929.4	254.2	928.96	262.71	928.67
264.66	928.73	268.78	930.12	272.34	931.16	284.42	930.75	285.45	930.73
307.43	930.12	311.92	929.96	315.13	930.06	337.63	930.5	346.55	930.65
347.42	930.67	347.67	930.66	348.24	930.66	360.75	930.78	370.77	930.96
375.96	931.23	378.68	931.13	379.9	931.13	386.05	931.23	387.76	931.29
390.4	931.32	397.39	931.61	407.88	931.77	409.47	931.86	418.29	932.46
424.54	932.95	427.39	933.09	440.16	934.12	441.03	934.29	448.03	934.92
451.94	935.08	452.63	935.1	456.19	935.65				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	130.5	.04	178.33	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
130.5	178.33	16.52	15.76	15.52	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
272.34	456.19		F

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	930.41	Wt. n-Val.		0.040	0.120
Vel Head (ft)	1.37	Reach Len. (ft)	16.52	15.76	15.52
W.S. Elev (ft)	929.04	Flow Area (sq ft)		116.84	2.69
Crit W.S. (ft)	928.93	Area (sq ft)		116.84	2.69
E.G. Slope (ft/ft)	0.015170	Flow (cfs)		1098.48	1.53
Q Total (cfs)	1100.00	Top Width (ft)		37.66	11.75
Top Width (ft)	49.42	Avg. Vel. (ft/s)		9.40	0.57
Vel Total (ft/s)	9.20	Hydr. Depth (ft)		3.10	0.23
Max Chl Dpth (ft)	4.44	Conv. (cfs)		8918.6	12.4
Conv. Total (cfs)	8931.0	Wetted Per. (ft)		39.67	11.82
Length Wtd. (ft)	15.76	Shear (lb/sq ft)		2.79	0.22
Min Ch El (ft)	924.60	Stream Power (lb/ft s)		26.22	0.12
Alpha	1.04	Cum Volume (acre-ft)		0.66	0.01
Frctn Loss (ft)	0.19	Cum SA (acres)		0.25	0.03
C & E Loss (ft)	0.13				

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	931.03	Wt. n-Val.		0.040	
Vel Head (ft)	1.65	Reach Len. (ft)	16.52	15.76	15.52
W.S. Elev (ft)	929.38	Flow Area (sq ft)		130.08	
Crit W.S. (ft)	929.37	Area (sq ft)		130.08	
E.G. Slope (ft/ft)	0.016594	Flow (cfs)		1340.00	
Q Total (cfs)	1340.00	Top Width (ft)		39.00	
Top Width (ft)	39.00	Avg. Vel. (ft/s)		10.30	
Vel Total (ft/s)	10.30	Hydr. Depth (ft)		3.34	
Max Chl Dpth (ft)	4.78	Conv. (cfs)		10402.4	
Conv. Total (cfs)	10402.4	Wetted Per. (ft)		41.18	
Length Wtd. (ft)	15.76	Shear (lb/sq ft)		3.27	
Min Ch El (ft)	924.60	Stream Power (lb/ft s)		33.71	
Alpha	1.00	Cum Volume (acre-ft)		0.77	
Frctn Loss (ft)	0.20	Cum SA (acres)		0.28	
C & E Loss (ft)	0.16				

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 #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	931.68	Wt. n-Val.		0.040	0.120
Vel Head (ft)	1.70	Reach Len. (ft)	16.52	15.76	15.52
W.S. Elev (ft)	929.98	Flow Area (sq ft)		154.09	17.14
Crit W.S. (ft)	929.98	Area (sq ft)		154.09	17.15
E.G. Slope (ft/ft)	0.015028	Flow (cfs)		1625.60	24.40
Q Total (cfs)	1650.00	Top Width (ft)		41.21	19.71
Top Width (ft)	60.92	Avg. Vel. (ft/s)		10.55	1.42
Vel Total (ft/s)	9.64	Hydr. Depth (ft)		3.74	0.92
Max Chl Dpth (ft)	5.38	Conv. (cfs)		13260.7	199.0
Conv. Total (cfs)	13459.7	Wetted Per. (ft)		43.70	18.87
Length Wtd. (ft)	15.76	Shear (lb/sq ft)		3.31	0.85
Min Ch El (ft)	924.60	Stream Power (lb/ft s)		34.90	1.21
Alpha	1.18	Cum Volume (acre-ft)		0.89	0.04
Frctn Loss (ft)	0.21	Cum SA (acres)		0.30	0.04
C & E Loss (ft)	0.10				

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: 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 #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	932.56	Wt. n-Val.		0.040	0.120
Vel Head (ft)	1.81				

W.S. Elev (ft)	930.75	Reach Len. (ft)	16.52	15.76	15.52
Crit W.S. (ft)	930.75	Flow Area (sq ft)		186.88	38.81
E.G. Slope (ft/ft)	0.013788	Area (sq ft)		186.88	64.12
Q Total (cfs)	2110.00	Flow (cfs)		2047.50	62.51
Top Width (ft)	168.58	Top Width (ft)		44.05	124.52
Vel Total (ft/s)	9.35	Avg. Vel. (ft/s)		10.96	1.61
Max Chl Dpth (ft)	6.15	Hydr. Depth (ft)		4.24	0.75
Conv. Total (cfs)	17969.3	Conv. (cfs)		17437.0	532.3
Length Wtd. (ft)	15.75	Wetted Per. (ft)		46.94	52.13
Min Ch El (ft)	924.60	Shear (lb/sq ft)		3.43	0.64
Alpha	1.33	Stream Power (lb/ft s)		37.54	1.03
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)		1.08	0.07
C & E Loss (ft)	0.00	Cum SA (acres)		0.33	0.15

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: 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 #50yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	933.09	Element			
Vel Head (ft)	1.78	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	931.31	Reach Len. (ft)	16.52	15.76	15.52
Crit W.S. (ft)	931.31	Flow Area (sq ft)		212.05	74.71
E.G. Slope (ft/ft)	0.012916	Area (sq ft)		212.05	153.64
Q Total (cfs)	2450.00	Flow (cfs)		2327.55	122.45
Top Width (ft)	237.74	Top Width (ft)		47.42	190.32
Vel Total (ft/s)	8.54	Avg. Vel. (ft/s)		10.98	1.64
Max Chl Dpth (ft)	6.71	Hydr. Depth (ft)		4.47	1.02
Conv. Total (cfs)	21557.9	Conv. (cfs)		20480.4	1077.5
Length Wtd. (ft)	15.75	Wetted Per. (ft)		50.58	74.25
Min Ch El (ft)	924.60	Shear (lb/sq ft)		3.38	0.81
Alpha	1.57	Stream Power (lb/ft s)		37.11	1.33
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)		1.24	0.17
C & E Loss (ft)	0.02	Cum SA (acres)		0.36	0.24

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: 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 #100yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	933.55	Element			
Vel Head (ft)	1.74	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	931.81	Reach Len. (ft)	16.52	15.76	15.52
Crit W.S. (ft)	931.81	Flow Area (sq ft)	3.61	236.15	119.24
E.G. Slope (ft/ft)	0.011340	Area (sq ft)	3.61	236.15	261.40
Q Total (cfs)	2800.00	Flow (cfs)	1.49	2594.58	203.93
Top Width (ft)	296.45	Top Width (ft)	20.51	47.83	228.11
Vel Total (ft/s)	7.80	Avg. Vel. (ft/s)	0.41	10.99	1.71
Max Chl Dpth (ft)	7.21	Hydr. Depth (ft)	0.18	4.94	1.30
Conv. Total (cfs)	26293.8	Conv. (cfs)	14.0	24364.8	1915.0
Length Wtd. (ft)	15.75	Wetted Per. (ft)	20.52	51.02	92.71
Min Ch El (ft)	924.60	Shear (lb/sq ft)	0.12	3.28	0.91
Alpha	1.84	Stream Power (lb/ft s)	0.05	36.00	1.56
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.00	1.40	0.33
C & E Loss (ft)	0.02	Cum SA (acres)	0.00	0.38	0.45

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: 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 #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	934.51	Element			
Vel Head (ft)	1.84	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	932.67	Reach Len. (ft)	16.52	15.76	15.52
Crit W.S. (ft)	932.67	Flow Area (sq ft)	25.47	277.41	200.12
E.G. Slope (ft/ft)	0.010154	Area (sq ft)	25.47	277.41	465.36
Q Total (cfs)	3650.00	Flow (cfs)	28.51	3210.90	410.59

Top Width (ft)	320.43	Top Width (ft)	29.92	47.83	242.68
Vel Total (ft/s)	7.26	Avg. Vel. (ft/s)	1.12	11.57	2.05
Max Chl Dpth (ft)	8.07	Hydr. Depth (ft)	0.85	5.80	2.13
Conv. Total (cfs)	36222.8	Conv. (cfs)	282.9	31865.1	4074.7
Length Wtd. (ft)	15.74	Wetted Per. (ft)	29.96	51.02	94.90
Min Ch El (ft)	924.60	Shear (lb/sq ft)	0.54	3.45	1.34
Alpha	2.25	Stream Power (lb/ft s)	0.60	39.89	2.74
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	0.04	1.78	1.08
C & E Loss (ft)	0.02	Cum SA (acres)	0.06	0.41	0.91

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: 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: Hope Creek
REACH: 1 RS: 185.0263

INPUT
Description: 54
Station Elevation Data num= 90

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	940.9	.23	940.89	4.79	940.75	12.43	940.54	19.61	940.33
24.97	940.18	28.01	940.1	37.1	939.87	46.81	939.57	49.79	939.48
54.76	939.27	60.03	939.05	62.74	938.8	74.73	937.76	101.6	932.71
106.32	932.08	107.47	931.97	124.1	931.54	134.46	931.42	139.14	930.34
142.76	928.76	145.19	928.18	148.08	927.48	164.97	924.66	165.64	924.46
168.13	924.43	181	924.31	181.54	925.82	184.27	929	186.31	931.36
191.21	931.72	193.53	931.75	220.16	931.48	228.64	930.98	242.69	931.24
246.95	931.93	249.99	930.58	251.61	930.2	257.54	928.82	259.05	928.74
266.32	928.71	270.08	928.64	270.46	928.84	271.16	929.07	273.91	930.17
277.06	931.05	278.85	930.84	284.22	930.81	296.25	930.4	302.44	930.26
315.31	929.9	328.78	929.94	339.43	930.15	351.48	930.13	361.37	930.36
372.01	930.6	377.94	930.67	381.65	930.81	386.53	930.84	391.74	930.93
396.69	930.93	399.56	930.9	404.99	930.97	407.46	931.14	409.66	931.22
410.64	931.23	411.34	931.28	418.16	931.31	427.92	931.6	434.01	931.74
437.77	931.92	449.6	932.25	453.05	932.43	459.98	932.57	463.01	932.75
463.56	932.78	464.29	932.92	469.22	934.56	469.42	934.62	469.43	934.62
469.46	934.63	469.8	934.65	476.37	935.06	476.91	935.11	477.32	935.16
480.63	935.18	481.34	935.33	481.48	935.36	481.55	935.37	484.57	935.92

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	134.46	.04	193.53	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
134.46	193.53	137.52	156.8	137.84	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
277.06	484.57		F

CROSS SECTION OUTPUT Profile #2yr

E.G. Elev (ft)	930.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.94	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	929.15	Reach Len. (ft)	137.52	156.80	137.84
Crit W.S. (ft)	928.52	Flow Area (sq ft)		140.90	5.95
E.G. Slope (ft/ft)	0.009752	Area (sq ft)		140.90	5.95
Q Total (cfs)	1100.00	Flow (cfs)		1096.13	3.87
Top Width (ft)	57.76	Top Width (ft)		42.53	15.23
Vel Total (ft/s)	7.49	Avg. Vel. (ft/s)		7.78	0.65
Max Chl Dpth (ft)	4.84	Hydr. Depth (ft)		3.31	0.39
Conv. Total (cfs)	11139.3	Conv. (cfs)		11100.1	39.2
Length Wtd. (ft)	156.77	Wetted Per. (ft)		45.62	15.37
Min Ch El (ft)	924.31	Shear (lb/sq ft)		1.88	0.24
Alpha	1.07	Stream Power (lb/ft s)		14.63	0.15
Frctn Loss (ft)	1.72	Cum Volume (acre-ft)		0.61	0.01
C & E Loss (ft)	0.05	Cum SA (acres)		0.23	0.02

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was 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 #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	930.66	Element			
Vel Head (ft)	1.12	Wt. n-Val.		0.040	
W.S. Elev (ft)	929.54	Reach Len. (ft)	137.52	156.80	137.84
Crit W.S. (ft)	928.93	Flow Area (sq ft)		157.61	
E.G. Slope (ft/ft)	0.010465	Area (sq ft)		157.61	
Q Total (cfs)	1340.00	Flow (cfs)		1340.00	
Top Width (ft)	43.75	Top Width (ft)		43.75	
Vel Total (ft/s)	8.50	Avg. Vel. (ft/s)		8.50	
Max Chl Dpth (ft)	5.23	Hydr. Depth (ft)		3.60	
Conv. Total (cfs)	13098.7	Conv. (cfs)		13098.7	
Length Wtd. (ft)	156.80	Wetted Per. (ft)		47.10	
Min Ch El (ft)	924.31	Shear (lb/sq ft)		2.19	
Alpha	1.00	Stream Power (lb/ft s)		18.59	
Frctn Loss (ft)	1.80	Cum Volume (acre-ft)		0.71	
C & E Loss (ft)	0.10	Cum SA (acres)		0.26	

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 OUTPUT Profile #10yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	931.23	Element			
Vel Head (ft)	1.38	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	929.84	Reach Len. (ft)	137.52	156.80	137.84
Crit W.S. (ft)	929.54	Flow Area (sq ft)		171.18	18.17
E.G. Slope (ft/ft)	0.012106	Area (sq ft)		171.18	18.17
Q Total (cfs)	1650.00	Flow (cfs)		1627.02	22.98
Top Width (ft)	64.67	Top Width (ft)		44.72	19.95
Vel Total (ft/s)	8.71	Avg. Vel. (ft/s)		9.50	1.26
Max Chl Dpth (ft)	5.53	Hydr. Depth (ft)		3.83	0.91
Conv. Total (cfs)	14996.6	Conv. (cfs)		14787.7	208.8
Length Wtd. (ft)	156.67	Wetted Per. (ft)		48.27	20.31
Min Ch El (ft)	924.31	Shear (lb/sq ft)		2.68	0.68
Alpha	1.17	Stream Power (lb/ft s)		25.47	0.86
Frctn Loss (ft)	1.79	Cum Volume (acre-ft)		0.84	0.03
C & E Loss (ft)	0.18	Cum SA (acres)		0.28	0.03

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.

CROSS SECTION OUTPUT Profile #25yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	932.05	Element			
Vel Head (ft)	1.86	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	930.19	Reach Len. (ft)	137.52	156.80	137.84
Crit W.S. (ft)	930.19	Flow Area (sq ft)		187.11	25.60
E.G. Slope (ft/ft)	0.015081	Area (sq ft)		187.11	33.21
Q Total (cfs)	2110.00	Flow (cfs)		2067.98	42.03
Top Width (ft)	117.70	Top Width (ft)		45.83	71.87
Vel Total (ft/s)	9.92	Avg. Vel. (ft/s)		11.05	1.64
Max Chl Dpth (ft)	5.88	Hydr. Depth (ft)		4.08	1.14
Conv. Total (cfs)	17181.7	Conv. (cfs)		16839.4	342.2
Length Wtd. (ft)	156.61	Wetted Per. (ft)		49.62	22.83
Min Ch El (ft)	924.31	Shear (lb/sq ft)		3.55	1.06
Alpha	1.22	Stream Power (lb/ft s)		39.24	1.73
Frctn Loss (ft)	1.80	Cum Volume (acre-ft)		1.01	0.05
C & E Loss (ft)	0.33	Cum SA (acres)		0.31	0.11

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 #50yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	932.62	Element			
Vel Head (ft)	1.94	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	930.68	Reach Len. (ft)	137.52	156.80	137.84
Crit W.S. (ft)	930.68	Flow Area (sq ft)		209.79	37.34
E.G. Slope (ft/ft)	0.014569	Area (sq ft)		209.79	78.52
Q Total (cfs)	2450.00	Flow (cfs)		2379.95	70.05
Top Width (ft)	164.14	Top Width (ft)		48.05	116.09

Vel Total (ft/s)	9.91	Avg. Vel. (ft/s)	11.34	1.88
Max Chl Dpth (ft)	6.37	Hydr. Depth (ft)	4.37	1.44
Conv. Total (cfs)	20297.8	Conv. (cfs)	19717.5	580.4
Length Wtd. (ft)	156.53	Wetted Per. (ft)	52.13	26.56
Min Ch El (ft)	924.31	Shear (lb/sq ft)	3.66	1.28
Alpha	1.27	Stream Power (lb/ft s)	41.53	2.40
Frctn Loss (ft)	1.68	Cum Volume (acre-ft)	1.16	0.12
C & E Loss (ft)	0.35	Cum SA (acres)	0.34	0.19

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 #100yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	933.15	Element			
Vel Head (ft)	1.97	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	931.18	Reach Len. (ft)	137.52	156.80	137.84
Crit W.S. (ft)	931.18	Flow Area (sq ft)		234.31	52.31
E.G. Slope (ft/ft)	0.013848	Area (sq ft)		234.31	150.54
Q Total (cfs)	2800.00	Flow (cfs)		2691.92	108.08
Top Width (ft)	224.37	Top Width (ft)		50.63	173.73
Vel Total (ft/s)	9.77	Avg. Vel. (ft/s)		11.49	2.07
Max Chl Dpth (ft)	6.87	Hydr. Depth (ft)		4.63	1.24
Conv. Total (cfs)	23793.6	Conv. (cfs)		22875.1	918.4
Length Wtd. (ft)	156.43	Wetted Per. (ft)		55.00	43.10
Min Ch El (ft)	924.31	Shear (lb/sq ft)		3.68	1.05
Alpha	1.33	Stream Power (lb/ft s)		42.32	2.17
Frctn Loss (ft)	1.57	Cum Volume (acre-ft)		1.31	0.26
C & E Loss (ft)	0.36	Cum SA (acres)		0.36	0.38

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 #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	934.18	Element			
Vel Head (ft)	1.78	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	932.40	Reach Len. (ft)	137.52	156.80	137.84
Crit W.S. (ft)	932.40	Flow Area (sq ft)	21.07	303.37	139.56
E.G. Slope (ft/ft)	0.011150	Area (sq ft)	21.07	303.37	429.28
Q Total (cfs)	3650.00	Flow (cfs)	21.50	3373.56	254.95
Top Width (ft)	348.55	Top Width (ft)	30.54	59.07	258.94
Vel Total (ft/s)	7.87	Avg. Vel. (ft/s)	1.02	11.12	1.83
Max Chl Dpth (ft)	8.09	Hydr. Depth (ft)	0.69	5.14	1.67
Conv. Total (cfs)	34567.0	Conv. (cfs)	203.6	31949.0	2414.5
Length Wtd. (ft)	156.00	Wetted Per. (ft)	30.57	63.56	84.51
Min Ch El (ft)	924.31	Shear (lb/sq ft)	0.48	3.32	1.15
Alpha	1.85	Stream Power (lb/ft s)	0.49	36.95	2.10
Frctn Loss (ft)	1.23	Cum Volume (acre-ft)	0.03	1.68	0.92
C & E Loss (ft)	0.30	Cum SA (acres)	0.05	0.39	0.82

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: Hope Creek
REACH: 1 RS: 28.22144

INPUT
Description:
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	940.04	2.31	939.98	11.56	939.71	15.15	939.61	17.29	939.56
22.02	939.44	26.99	939.32	32.27	939.17	37.02	939.05	39.52	938.98
41.93	938.9	47.05	938.69	49.77	938.58	50.79	938.54	61.84	937.24
63.7	937.01	67.92	935.96	79.12	934.46	86.27	931.47	92.56	931.52
93.61	931.06	93.94	930.93	95.48	930.37	95.66	930.28	97.51	929.41
101.36	927.97	107.28	927.29	108.01	927.21	109.73	926.77	119.71	924.46
123.65	924.38	124.51	923.96	130.97	923.36	131.94	923.36	132.69	923.36
175.81	927.66	185.76	927.98	187.62	928.18	190.78	928.37	211.65	929.57
221.55	930.05	228.5	929.55	279.2	930.78	279.38	930.78	279.43	930.78
279.45	930.78	281.18	930.79	326.81	931.05	328.75	931.05	359.76	929.92
365.16	929.79	371.86	929.83	398.04	930.17	413.2	929.96	420.31	930.27
432.57	930.33	436.58	930.47	437.46	930.43	458.64	930.92	459.48	930.94
461.65	930.98	482.99	931.36	497.99	931.82	509.84	932.09	531.87	932.92
538.1	933.22	545.87	933.58	554.58	934.01	557.76	934.15	567.92	934.67
576.52	935.64	581.59	936.23	581.71	936.25				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	92.56	.04	221.55	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
92.56 221.55 18.33 16.08 17.35 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
328.75	581.71	931.05	F

CROSS SECTION OUTPUT Profile #2yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	928.32	Element			
Vel Head (ft)	0.77	Wt. n-Val.		0.040	
W.S. Elev (ft)	927.55	Reach Len. (ft)	18.33	16.08	17.35
Crit W.S. (ft)	927.20	Flow Area (sq ft)		156.07	
E.G. Slope (ft/ft)	0.012425	Area (sq ft)		156.07	
Q Total (cfs)	1100.00	Flow (cfs)		1100.00	
Top Width (ft)	69.60	Top Width (ft)		69.60	
Vel Total (ft/s)	7.05	Avg. Vel. (ft/s)		7.05	
Max Chl Dpth (ft)	4.19	Hydr. Depth (ft)		2.24	
Conv. Total (cfs)	9868.3	Conv. (cfs)		9868.3	
Length Wtd. (ft)	16.08	Wetted Per. (ft)		70.28	
Min Ch El (ft)	923.36	Shear (lb/sq ft)		1.72	
Alpha	1.00	Stream Power (lb/ft s)		12.14	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		0.08	
C & E Loss (ft)	0.16	Cum SA (acres)		0.03	

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

CROSS SECTION OUTPUT Profile #5yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	928.75	Element			
Vel Head (ft)	0.79	Wt. n-Val.		0.040	
W.S. Elev (ft)	927.97	Reach Len. (ft)	18.33	16.08	17.35
Crit W.S. (ft)	927.57	Flow Area (sq ft)		187.94	
E.G. Slope (ft/ft)	0.012712	Area (sq ft)		187.94	
Q Total (cfs)	1340.00	Flow (cfs)		1340.00	
Top Width (ft)	83.91	Top Width (ft)		83.91	
Vel Total (ft/s)	7.13	Avg. Vel. (ft/s)		7.13	
Max Chl Dpth (ft)	4.61	Hydr. Depth (ft)		2.24	
Conv. Total (cfs)	11884.9	Conv. (cfs)		11884.9	
Length Wtd. (ft)	16.08	Wetted Per. (ft)		84.61	
Min Ch El (ft)	923.36	Shear (lb/sq ft)		1.76	
Alpha	1.00	Stream Power (lb/ft s)		12.57	
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		0.09	
C & E Loss (ft)	0.15	Cum SA (acres)		0.03	

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

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	929.25	Wt. n-Val.		0.040	
Vel Head (ft)	0.78	Reach Len. (ft)	18.33	16.08	17.35
W.S. Elev (ft)	928.47	Flow Area (sq ft)		232.11	
Crit W.S. (ft)	928.02	Area (sq ft)		232.11	
E.G. Slope (ft/ft)	0.010860	Flow (cfs)		1650.00	
Q Total (cfs)	1650.00	Top Width (ft)		92.46	
Top Width (ft)	92.46	Avg. Vel. (ft/s)		7.11	
Vel Total (ft/s)	7.11	Hydr. Depth (ft)		2.51	
Max Chl Dpth (ft)	5.11	Conv. (cfs)		15833.5	
Conv. Total (cfs)	15833.5	Wetted Per. (ft)		93.27	
Length Wtd. (ft)	16.08	Shear (lb/sq ft)		1.69	
Min Ch El (ft)	923.36	Stream Power (lb/ft s)		11.99	
Alpha	1.00	Cum Volume (acre-ft)		0.11	
Frctn Loss (ft)	0.08	Cum SA (acres)		0.04	
C & E Loss (ft)	0.14				

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

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	929.92	Wt. n-Val.		0.040	
Vel Head (ft)	0.77	Reach Len. (ft)	18.33	16.08	17.35
W.S. Elev (ft)	929.15	Flow Area (sq ft)		299.96	
Crit W.S. (ft)	928.48	Area (sq ft)		299.96	
E.G. Slope (ft/ft)	0.009085	Flow (cfs)		2110.00	
Q Total (cfs)	2110.00	Top Width (ft)		106.17	
Top Width (ft)	106.17	Avg. Vel. (ft/s)		7.03	
Vel Total (ft/s)	7.03	Hydr. Depth (ft)		2.83	
Max Chl Dpth (ft)	5.79	Conv. (cfs)		22136.6	
Conv. Total (cfs)	22136.6	Wetted Per. (ft)		107.13	
Length Wtd. (ft)	16.08	Shear (lb/sq ft)		1.59	
Min Ch El (ft)	923.36	Stream Power (lb/ft s)		11.17	
Alpha	1.00	Cum Volume (acre-ft)		0.14	
Frctn Loss (ft)	0.08	Cum SA (acres)		0.04	
C & E Loss (ft)	0.12				

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

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	930.36	Wt. n-Val.		0.040	0.120
Vel Head (ft)	0.76	Reach Len. (ft)	18.33	16.08	17.35
W.S. Elev (ft)	929.60	Flow Area (sq ft)		349.23	0.06
Crit W.S. (ft)	928.81	Area (sq ft)		349.23	0.06
E.G. Slope (ft/ft)	0.008218	Flow (cfs)		2450.00	0.01
Q Total (cfs)	2450.00	Top Width (ft)		115.09	2.57
Top Width (ft)	117.66	Avg. Vel. (ft/s)		7.02	0.09
Vel Total (ft/s)	7.01	Hydr. Depth (ft)		3.03	0.02
Max Chl Dpth (ft)	6.24	Conv. (cfs)		27025.3	0.1
Conv. Total (cfs)	27025.4	Wetted Per. (ft)		116.15	2.58
Length Wtd. (ft)	16.08	Shear (lb/sq ft)		1.54	0.01
Min Ch El (ft)	923.36	Stream Power (lb/ft s)		10.82	0.00
Alpha	1.00	Cum Volume (acre-ft)		0.15	0.00
Frctn Loss (ft)	0.08	Cum SA (acres)		0.04	0.00
C & E Loss (ft)	0.11				

Warning: Divided flow computed for this cross-section.
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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	930.78	Wt. n-Val.		0.040	0.120
Vel Head (ft)	0.76	Reach Len. (ft)	18.33	16.08	17.35
W.S. Elev (ft)	930.02				

Crit W.S. (ft)	929.11	Flow Area (sq ft)	399.69	6.03
E.G. Slope (ft/ft)	0.007603	Area (sq ft)	399.69	9.94
Q Total (cfs)	2800.00	Flow (cfs)	2797.53	2.47
Top Width (ft)	185.15	Top Width (ft)	124.66	60.49
Vel Total (ft/s)	6.90	Avg. Vel. (ft/s)	7.00	0.41
Max Chl Dpth (ft)	6.66	Hydr. Depth (ft)	3.21	0.23
Conv. Total (cfs)	32111.8	Conv. (cfs)	32083.5	28.3
Length Wtd. (ft)	16.08	Wetted Per. (ft)	125.83	25.80
Min Ch El (ft)	923.36	Shear (lb/sq ft)	1.51	0.11
Alpha	1.03	Stream Power (lb/ft s)	10.55	0.05
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.17	0.00
C & E Loss (ft)	0.10	Cum SA (acres)	0.05	0.01

Warning: Divided flow computed for this cross-section.
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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #500yr

			Left OB	Channel	Right OB
E.G. Elev (ft)	931.67	Element			
Vel Head (ft)	0.78	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	930.89	Reach Len. (ft)	18.33	16.08	17.35
Crit W.S. (ft)	929.72	Flow Area (sq ft)		509.97	45.46
E.G. Slope (ft/ft)	0.005831	Area (sq ft)		509.97	126.75
Q Total (cfs)	3650.00	Flow (cfs)		3619.83	30.17
Top Width (ft)	329.03	Top Width (ft)		127.50	201.53
Vel Total (ft/s)	6.57	Avg. Vel. (ft/s)		7.10	0.66
Max Chl Dpth (ft)	7.53	Hydr. Depth (ft)		4.00	0.59
Conv. Total (cfs)	47798.9	Conv. (cfs)		47403.8	395.1
Length Wtd. (ft)	16.09	Wetted Per. (ft)		128.84	77.32
Min Ch El (ft)	923.36	Shear (lb/sq ft)		1.44	0.21
Alpha	1.16	Stream Power (lb/ft s)		10.23	0.14
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)		0.22	0.04
C & E Loss (ft)	0.09	Cum SA (acres)		0.05	0.09

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 12.13838

INPUT
Description:
Station Elevation Data num= 76

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	940.07	.7	940.05	3.92	939.97	8.07	939.85	16.26	939.61
16.81	939.6	26.89	939.34	28.65	939.29	31.7	939.2	34.52	939.12
41.16	938.95	43.72	938.85	52.59	938.45	57.86	937.84	62.59	937.25
73.35	934.55	82.97	933.27	96.32	928.57	97.68	927.86	97.75	927.92
98.47	928.44	99.74	927.5	101.9	926.54	102	926.5	102.19	926.42
103.84	925.81	105.01	925.31	106.91	924.06	113.87	923.71	119.39	923.92
131.76	923.96	134.3	923.96	140.71	923.38	147.13	923.37	152.06	923.37
160.82	925.05	165.03	925.95	177.65	926.47	194.04	927.54	196.5	927.85
199.73	928.26	200.75	928.26	201.59	928.5	204.02	928.71	230.3	930.78
231.49	930.87	235.12	931.17	239.41	930.92	248.08	930.3	277.97	931.04
309.17	930.8	328.23	930.9	357.99	930.94	361.73	930.8	381.06	930.33
405.56	930.49	407.44	930.51	409.33	930.49	425.15	930.72	447.82	930.92
459.33	930.45	460.49	930.43	467.39	930.61	481.16	930.95	486.76	931.05
505.55	931.53	518.14	931.78	532.55	932.18	549.78	933.01	558.53	933.41
565.38	933.55	575.24	933.98	581.01	934.29	588.91	934.72	597.13	935.9
598.62	936.07								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	82.97	.04	235.12	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
82.97 235.12 16.79 12.14 12.8 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
277.97	598.62	931.04	F

CROSS SECTION OUTPUT Profile #2yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	928.07	Wt. n-Val.		0.040	
Vel Head (ft)	0.25	Reach Len. (ft)			
W.S. Elev (ft)	927.82	Flow Area (sq ft)		273.33	
Crit W.S. (ft)	926.22	Area (sq ft)		273.33	
E.G. Slope (ft/ft)	0.002999	Flow (cfs)		1100.00	
Q Total (cfs)	1100.00	Top Width (ft)		96.95	
Top Width (ft)	96.95	Avg. Vel. (ft/s)		4.02	
Vel Total (ft/s)	4.02	Hydr. Depth (ft)		2.82	
Max Chl Dpth (ft)	4.45	Conv. (cfs)		20087.0	
Conv. Total (cfs)	20087.0	Wetted Per. (ft)		98.23	
Length Wtd. (ft)		Shear (lb/sq ft)		0.52	
Min Ch El (ft)	923.37	Stream Power (lb/ft s)		2.10	
Alpha	1.00	Cum Volume (acre-ft)			
Frctn Loss (ft)		Cum SA (acres)			
C & E Loss (ft)					

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

CROSS SECTION OUTPUT Profile #5yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	928.51	Wt. n-Val.		0.040	
Vel Head (ft)	0.28	Reach Len. (ft)			
W.S. Elev (ft)	928.23	Flow Area (sq ft)		314.30	
Crit W.S. (ft)	926.56	Area (sq ft)		314.30	
E.G. Slope (ft/ft)	0.003000	Flow (cfs)		1340.00	
Q Total (cfs)	1340.00	Top Width (ft)		101.97	
Top Width (ft)	101.97	Avg. Vel. (ft/s)		4.26	
Vel Total (ft/s)	4.26	Hydr. Depth (ft)		3.08	
Max Chl Dpth (ft)	4.86	Conv. (cfs)		24464.6	
Conv. Total (cfs)	24464.6	Wetted Per. (ft)		103.63	
Length Wtd. (ft)		Shear (lb/sq ft)		0.57	
Min Ch El (ft)	923.37	Stream Power (lb/ft s)		2.42	
Alpha	1.00	Cum Volume (acre-ft)			
Frctn Loss (ft)		Cum SA (acres)			
C & E Loss (ft)					

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #10yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	929.03	Wt. n-Val.		0.040	
Vel Head (ft)	0.32	Reach Len. (ft)			
W.S. Elev (ft)	928.71	Flow Area (sq ft)		364.75	
Crit W.S. (ft)	926.93	Area (sq ft)		364.75	
E.G. Slope (ft/ft)	0.003001	Flow (cfs)		1650.00	
Q Total (cfs)	1650.00	Top Width (ft)		108.12	
Top Width (ft)	108.12	Avg. Vel. (ft/s)		4.52	
Vel Total (ft/s)	4.52	Hydr. Depth (ft)		3.37	
Max Chl Dpth (ft)	5.34	Conv. (cfs)		30118.5	
Conv. Total (cfs)	30118.5	Wetted Per. (ft)		110.06	
Length Wtd. (ft)		Shear (lb/sq ft)		0.62	
Min Ch El (ft)	923.37	Stream Power (lb/ft s)		2.81	
Alpha	1.00	Cum Volume (acre-ft)			
Frctn Loss (ft)		Cum SA (acres)			
C & E Loss (ft)					

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

CROSS SECTION OUTPUT Profile #25yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	929.72	Wt. n-Val.		0.040	
Vel Head (ft)	0.36	Reach Len. (ft)			
W.S. Elev (ft)	929.36	Flow Area (sq ft)		437.99	
Crit W.S. (ft)	927.40	Area (sq ft)		437.99	
E.G. Slope (ft/ft)	0.003001	Flow (cfs)		2110.00	
Q Total (cfs)	2110.00	Top Width (ft)		118.18	
Top Width (ft)	118.18	Avg. Vel. (ft/s)		4.82	
Vel Total (ft/s)	4.82	Hydr. Depth (ft)		3.71	
Max Chl Dpth (ft)	5.99	Conv. (cfs)		38516.7	
Conv. Total (cfs)	38516.7	Wetted Per. (ft)		120.25	
Length Wtd. (ft)		Shear (lb/sq ft)		0.68	
Min Ch El (ft)	923.37	Stream Power (lb/ft s)		3.29	
Alpha	1.00	Cum Volume (acre-ft)			
Frctn Loss (ft)		Cum SA (acres)			
C & E Loss (ft)					

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

CROSS SECTION OUTPUT Profile #50yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	930.17	Wt. n-Val.		0.040	
Vel Head (ft)	0.39	Reach Len. (ft)			
W.S. Elev (ft)	929.78	Flow Area (sq ft)		489.33	
Crit W.S. (ft)	927.69	Area (sq ft)		489.33	
E.G. Slope (ft/ft)	0.003005	Flow (cfs)		2450.00	
Q Total (cfs)	2450.00	Top Width (ft)		124.75	
Top Width (ft)	124.75	Avg. Vel. (ft/s)		5.01	
Vel Total (ft/s)	5.01	Hydr. Depth (ft)		3.92	
Max Chl Dpth (ft)	6.41	Conv. (cfs)		44697.0	
Conv. Total (cfs)	44697.0	Wetted Per. (ft)		126.91	
Length Wtd. (ft)		Shear (lb/sq ft)		0.72	
Min Ch El (ft)	923.37	Stream Power (lb/ft s)		3.62	
Alpha	1.00	Cum Volume (acre-ft)			
Frctn Loss (ft)		Cum SA (acres)			
C & E Loss (ft)					

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

CROSS SECTION OUTPUT Profile #100yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	930.60	Wt. n-Val.		0.040	
Vel Head (ft)	0.42	Reach Len. (ft)			
W.S. Elev (ft)	930.18	Flow Area (sq ft)		540.66	
Crit W.S. (ft)	927.98	Area (sq ft)		540.66	
E.G. Slope (ft/ft)	0.003003	Flow (cfs)		2800.00	
Q Total (cfs)	2800.00	Top Width (ft)		130.98	
Top Width (ft)	130.98	Avg. Vel. (ft/s)		5.18	
Vel Total (ft/s)	5.18	Hydr. Depth (ft)		4.13	
Max Chl Dpth (ft)	6.81	Conv. (cfs)		51098.3	
Conv. Total (cfs)	51098.3	Wetted Per. (ft)		133.23	
Length Wtd. (ft)		Shear (lb/sq ft)		0.76	
Min Ch El (ft)	923.37	Stream Power (lb/ft s)		3.94	
Alpha	1.00	Cum Volume (acre-ft)			
Frctn Loss (ft)		Cum SA (acres)			
C & E Loss (ft)					

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

CROSS SECTION OUTPUT Profile #500yr

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	931.51	Wt. n-Val.		0.040	0.120
Vel Head (ft)	0.48	Reach Len. (ft)			
W.S. Elev (ft)	931.03	Flow Area (sq ft)		657.83	14.69
Crit W.S. (ft)	928.60	Area (sq ft)		657.83	75.83
E.G. Slope (ft/ft)	0.003006	Flow (cfs)		3644.91	5.09
Q Total (cfs)	3650.00	Top Width (ft)		144.16	247.53
Top Width (ft)	391.69	Avg. Vel. (ft/s)		5.54	0.35
Vel Total (ft/s)	5.43	Hydr. Depth (ft)		4.56	0.36
Max Chl Dpth (ft)	7.66	Conv. (cfs)		66485.5	92.8
Conv. Total (cfs)	66578.3	Wetted Per. (ft)		146.59	40.34
Length Wtd. (ft)		Shear (lb/sq ft)		0.84	0.07
Min Ch El (ft)	923.37	Stream Power (lb/ft s)		4.67	0.02
Alpha	1.04	Cum Volume (acre-ft)			
Frctn Loss (ft)		Cum SA (acres)			
C & E Loss (ft)					

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

SUMMARY OF MANNING'S N VALUES

River:Hope Creek

Reach	River Sta.	n1	n2	n3	n4
1	8000	.12	.045	.1	
1	7548	.12	.045	.1	

1	7061	.12	.045	.1	
1	6930	.12	.045	.1	
1	6719	Culvert			
1	6496	.12	.035	.08	
1	6278	.12	.025	.08	
1	5629	.12	.025	.08	
1	5428	.12	.025	.08	
1	5146	Culvert			
1	4969	.09	.04	.12	
1	4925.680	.09	.04	.1	.12
1	4918	Bridge			
1	4907.867	.09	.04	.1	.12
1	4783.015	.09	.04	.12	
1	4775	Bridge			
1	4764.388	.09	.04	.12	
1	4718	.09	.04	.12	
1	4643.051	.09	.04	.12	
1	4636	Bridge			
1	4625.316	.09	.04	.12	
1	4503.708	.09	.04	.1	
1	4496	Bridge			
1	4485.049	.09	.04	.1	
1	4361.840	.09	.04	.1	.12
1	4354	Bridge			
1	4343.304	.09	.04	.1	.12
1	4222.473	.09	.04	.1	.12
1	4215	Bridge			
1	4204.470	.09	.04	.1	.12
1	4080.463	.09	.04	.12	
1	4074	Bridge			
1	4062.727	.09	.04	.12	
1	3940.903	.09	.04	.12	
1	3934	Bridge			
1	3922.633	.09	.04	.12	
1	3799.870	.09	.04	.12	
1	3792	Bridge			
1	3781.101	.09	.04	.12	
1	3659.612	.09	.04	.12	
1	3652	Bridge			
1	3641.433	.09	.04	.12	
1	3518.856	.09	.04	.12	
1	3512	Bridge			
1	3500.626	.09	.04	.12	
1	3378.489	.09	.04	.12	
1	3371	Bridge			
1	3360.436	.09	.04	.12	
1	3238.304	.09	.04	.12	
1	3231	Bridge			
1	3220.243	.09	.04	.12	
1	3147	.09	.04	.12	
1	3097.384	.09	.04	.12	
1	3090	Bridge			
1	3079.078	.09	.04	.12	
1	2955.929	.09	.04	.12	
1	2949	Bridge			
1	2937.884	.09	.04	.12	
1	2870	.09	.04	.12	
1	2813.979	.09	.04	.12	
1	2807	Bridge			
1	2795.938	.09	.04	.12	
1	2668.395	.12	.04	.12	
1	2662	Bridge			
1	2650.675	.12	.04	.12	
1	2537.862	.12	.04	.12	
1	2532	Bridge			
1	2520.830	.12	.04	.12	
1	2390.934	.12	.04	.12	
1	2354.325	.12	.04	.12	
1	2262	.12	.04	.12	
1	2081.919	.12	.04	.12	
1	1650	.12	.04	.12	
1	1492.060	.12	.04	.12	
1	1084	.12	.04	.12	
1	1027.831	.12	.04	.12	
1	949.7572	.12	.04	.12	
1	878.1000	.12	.04	.12	
1	871	Bridge			
1	859.3424	.12	.04	.12	
1	735.5340	.12	.04	.12	
1	728	Bridge			
1	716.3877	.12	.04	.12	
1	595.3610	.12	.04	.12	

1	589	Bridge			
1	577.5895		.12	.04	.12
1	553		.12	.04	.12
1	459.5899		.12	.04	.12
1	441.5446		.12	.04	.12
1	324.8710		.12	.04	.12
1	307.2792		.12	.04	.12
1	200.7906		.12	.04	.12
1	185.0263		.12	.04	.12
1	28.22144		.12	.04	.12
1	12.13838		.12	.04	.12

SUMMARY OF REACH LENGTHS

River: Hope Creek

Reach	River Sta.		Left	Channel	Right
1	8000		393.3	452.1	505.73
1	7548		498.18	486.75	465.44
1	7061		137.61	131.25	117.04
1	6930		458.64	434.11	418.59
1	6719	Culvert			
1	6496		261.27	218.1	177.15
1	6278		596.84	648.74	713.24
1	5629		205.65	201.08	200.99
1	5428		519.24	458.42	414.44
1	5146	Culvert			
1	4969		170.27	251.19	305.99
1	4925.680		18.25	17.81	18.01
1	4918	Bridge			
1	4907.867		122.42	124.85	123.52
1	4783.015		18.84	18.63	18.24
1	4775	Bridge			
1	4764.388		48.37	45.95	44.99
1	4718		71.98	75.39	77.8
1	4643.051		17.45	17.74	17.85
1	4636	Bridge			
1	4625.316		120.71	121.61	122.64
1	4503.708		19.61	18.66	18.24
1	4496	Bridge			
1	4485.049		123.05	123.21	122.55
1	4361.840		19	18.54	18
1	4354	Bridge			
1	4343.304		119.24	120.83	121.61
1	4222.473		17.55	18	17.71
1	4215	Bridge			
1	4204.470		124.62	124.01	123.48
1	4080.463		17.85	17.74	17.82
1	4074	Bridge			
1	4062.727		120.53	121.82	121.07
1	3940.903		18.03	18.27	18.28
1	3934	Bridge			
1	3922.633		121.49	122.76	124.97
1	3799.870		19.61	18.77	18.18
1	3792	Bridge			
1	3781.101		119.49	121.49	122.1
1	3659.612		18.36	18.18	17.87
1	3652	Bridge			
1	3641.433		122.87	122.58	125.68
1	3518.856		18.65	18.23	18.01
1	3512	Bridge			
1	3500.626		121.15	122.14	120.16
1	3378.489		17.27	18.05	17.97
1	3371	Bridge			
1	3360.436		122.81	122.13	120.82
1	3238.304		18.33	18.06	18.17
1	3231	Bridge			
1	3220.243		73.32	73.11	72.78
1	3147		46.78	49.75	49.66
1	3097.384		19.08	18.31	18.45
1	3090	Bridge			
1	3079.078		124.18	123.15	120.49
1	2955.929		18	18.05	18.27
1	2949	Bridge			
1	2937.884		68.38	65.3	63.65
1	2870		51.13	58.6	53.12
1	2813.979		18.36	18.04	17.52
1	2807	Bridge			

1	2795.938	124.19	127.54	116.57
1	2668.395	18.55	17.72	17.36
1	2662	Bridge		
1	2650.675	124.24	112.8	97.76
1	2537.862	18.67	17.03	20.7
1	2532	Bridge		
1	2520.830	97.79	129.85	152.46
1	2390.934	38.36	36.6	36.24
1	2354.325	95.4	91.3	65.8
1	2262	220.4	181.12	126.56
1	2081.919	293.59	431.27	483.25
1	1650	172.21	158.59	117.87
1	1492.060	383.24	408.33	377.92
1	1084	53.7	55.9	61.7
1	1027.831	76.72	78.07	78.34
1	949.7572	69.19	71.66	70.51
1	878.1000	18.27	18.76	20.13
1	871	Bridge		
1	859.3424	123.89	123.81	123.48
1	735.5340	19.18	19.15	18.15
1	728	Bridge		
1	716.3877	125.31	121.03	115.29
1	595.3610	18.02	17.77	17.42
1	589	Bridge		
1	577.5895	27	24	22
1	553	95.41	94	90.84
1	459.5899	18.06	18.05	18.28
1	441.5446	122.28	116.67	109.21
1	324.8710	17.95	17.59	16.66
1	307.2792	125.45	106.5	91.3
1	200.7906	16.52	15.76	15.52
1	185.0263	137.52	156.8	137.84
1	28.22144	18.33	16.08	17.35
1	12.13838	16.79	12.14	12.8

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Hope Creek

Reach	River Sta.	Contr.	Expan.
1	8000	.1	.3
1	7548	.1	.3
1	7061	.3	.5
1	6930	.3	.5
1	6719	Culvert	
1	6496	.3	.5
1	6278	.1	.3
1	5629	.3	.5
1	5428	.3	.5
1	5146	Culvert	
1	4969	.3	.5
1	4925.680	.1	.3
1	4918	Bridge	
1	4907.867	.1	.3
1	4783.015	.1	.3
1	4775	Bridge	
1	4764.388	.1	.3
1	4718	.1	.3
1	4643.051	.1	.3
1	4636	Bridge	
1	4625.316	.1	.3
1	4503.708	.1	.3
1	4496	Bridge	
1	4485.049	.1	.3
1	4361.840	.1	.3
1	4354	Bridge	
1	4343.304	.1	.3
1	4222.473	.1	.3
1	4215	Bridge	
1	4204.470	.1	.3
1	4080.463	.1	.3
1	4074	Bridge	
1	4062.727	.1	.3
1	3940.903	.1	.3
1	3934	Bridge	
1	3922.633	.1	.3
1	3799.870	.1	.3
1	3792	Bridge	

1	3781.101		.1	.3
1	3659.612		.1	.3
1	3652	Bridge		
1	3641.433		.1	.3
1	3518.856		.1	.3
1	3512	Bridge		
1	3500.626		.1	.3
1	3378.489		.1	.3
1	3371	Bridge		
1	3360.436		.1	.3
1	3238.304		.1	.3
1	3231	Bridge		
1	3220.243		.1	.3
1	3147		.1	.3
1	3097.384		.1	.3
1	3090	Bridge		
1	3079.078		.1	.3
1	2955.929		.1	.3
1	2949	Bridge		
1	2937.884		.1	.3
1	2870		.1	.3
1	2813.979		.1	.3
1	2807	Bridge		
1	2795.938		.1	.3
1	2668.395		.1	.3
1	2662	Bridge		
1	2650.675		.1	.3
1	2537.862		.1	.3
1	2532	Bridge		
1	2520.830		.1	.3
1	2390.934		.1	.3
1	2354.325		.1	.3
1	2262		.1	.3
1	2081.919		.1	.3
1	1650		.1	.3
1	1492.060		.1	.3
1	1084		.1	.3
1	1027.831		.1	.3
1	949.7572		.1	.3
1	878.1000		.1	.3
1	871	Bridge		
1	859.3424		.1	.3
1	735.5340		.1	.3
1	728	Bridge		
1	716.3877		.1	.3
1	595.3610		.1	.3
1	589	Bridge		
1	577.5895		.1	.3
1	553		.1	.3
1	459.5899		.1	.3
1	441.5446		.1	.3
1	324.8710		.1	.3
1	307.2792		.1	.3
1	200.7906		.1	.3
1	185.0263		.1	.3
1	28.22144		.1	.3
1	12.13838		.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
1	8000	2yr	540.00	999.59	1002.57	1002.22	1003.06	0.010873	5.83	129.33	109.97	0.68
1	8000	5yr	690.00	999.59	1003.11	1002.48	1003.77	0.010986	6.50	106.12	38.80	0.69
1	8000	10yr	860.00	999.59	1003.23	1002.89	1003.80	0.010206	6.59	224.61	177.72	0.69
1	8000	25yr	1070.00	999.59	1003.54	1003.23	1004.17	0.010162	7.04	285.59	203.72	0.70
1	8000	50yr	1240.00	999.59	1003.77	1003.54	1004.42	0.009891	7.29	334.64	216.17	0.70
1	8000	100yr	1400.00	999.59	1003.99	1003.67	1004.66	0.009634	7.50	383.92	236.49	0.69
1	8000	500yr	1790.00	999.59	1004.45		1005.12	0.008992	7.84	495.89	253.34	0.68
1	7548	2yr	540.00	993.51	996.29	996.09	997.02	0.016922	6.87	84.46	59.35	0.84
1	7548	5yr	690.00	993.51	996.64	996.40	997.53	0.017668	7.58	90.99	38.16	0.87
1	7548	10yr	860.00	993.51	996.90	996.85	997.90	0.017514	8.17	127.17	75.84	0.89
1	7548	25yr	1070.00	993.51	997.27	997.21	998.38	0.016931	8.72	155.51	80.09	0.89
1	7548	50yr	1240.00	993.51	997.52	997.46	998.73	0.016865	9.18	175.96	83.36	0.90
1	7548	100yr	1400.00	993.51	997.73	997.69	999.05	0.016973	9.61	193.94	86.14	0.91
1	7548	500yr	1790.00	993.51	998.23	998.23	999.75	0.016776	10.46	238.37	92.64	0.93
1	7061	2yr	680.00	983.03	985.90	985.90	986.98	0.024332	8.35	81.47	38.27	1.01
1	7061	5yr	890.00	983.03	986.35	986.35	987.61	0.022782	8.98	99.07	39.36	1.00

1	7061		10yr	1100.00	983.03	986.75	986.75	988.17	0.022072	9.57	114.94	40.29	1.00
1	7061		25yr	1380.00	983.03	987.22	987.22	988.87	0.021738	10.29	134.08	41.35	1.01
1	7061		50yr	1590.00	983.03	987.56	987.56	989.35	0.021267	10.72	148.33	42.12	1.01
1	7061		100yr	1790.00	983.03	987.89	987.89	989.78	0.020645	11.04	162.11	42.86	1.00
1	7061		500yr	2300.00	983.03	990.86		991.75	0.005866	7.59	302.83	53.32	0.56
1	6930		2yr	680.00	976.44	982.97	979.31	983.09	0.000946	2.82	241.13	48.57	0.22
1	6930		5yr	890.00	976.44	984.09	979.76	984.23	0.000887	2.99	297.16	51.60	0.22
1	6930		10yr	1100.00	976.44	985.12	980.16	985.27	0.000794	3.13	351.28	55.45	0.21
1	6930		25yr	1380.00	976.44	986.40	980.64	986.57	0.000697	3.30	418.47	60.72	0.21
1	6930		50yr	1590.00	976.44	987.31	980.97	987.49	0.000647	3.41	465.88	64.44	0.20
1	6930		100yr	1790.00	976.44	988.15	981.29	988.34	0.000606	3.51	510.24	67.92	0.20
1	6930		500yr	2300.00	976.44	991.07	982.02	991.26	0.000417	3.47	663.24	79.92	0.17
1	6719	S. Marietta Pkwy		Culvert									
1	6496		2yr	680.00	966.25	972.08	970.43	972.62	0.002900	5.92	117.53	38.10	0.49
1	6496		5yr	890.00	966.25	972.74	970.98	973.44	0.003133	6.74	135.73	43.03	0.53
1	6496		10yr	1100.00	966.25	972.95	971.50	973.93	0.004177	8.00	141.61	44.62	0.61
1	6496		25yr	1380.00	966.25	973.34	972.12	974.69	0.005157	9.32	152.69	47.62	0.69
1	6496		50yr	1590.00	966.25	973.49	972.55	975.18	0.006301	10.48	156.66	48.69	0.76
1	6496		100yr	1790.00	966.25	973.73	972.96	975.70	0.006980	11.33	163.33	50.50	0.81
1	6496		500yr	2300.00	966.25	974.26	973.90	977.01	0.008678	13.36	178.28	54.46	0.91
1	6278		2yr	680.00	965.79	970.22	970.22	971.51	0.006108	9.15	83.20	74.61	0.93
1	6278		5yr	890.00	965.79	970.77	970.77	972.27	0.006004	9.93	108.68	51.99	0.94
1	6278		10yr	1100.00	965.79	971.33	971.33	972.79	0.004996	10.03	181.48	97.86	0.88
1	6278		25yr	1380.00	965.79	971.85	971.85	973.49	0.004919	10.79	234.64	108.87	0.89
1	6278		50yr	1590.00	965.79	972.22	972.22	973.96	0.004796	11.24	278.16	123.79	0.90
1	6278		100yr	1790.00	965.79	972.60	972.60	974.37	0.004553	11.49	326.82	138.43	0.88
1	6278		500yr	2300.00	965.79	973.40	973.40	975.28	0.004209	12.15	449.80	164.67	0.87
1	5629		2yr	680.00	958.42	962.58	962.58	963.99	0.007214	9.53	71.37	26.24	1.01
1	5629		5yr	890.00	958.42	963.15	963.15	964.81	0.007095	10.36	85.91	25.76	1.00
1	5629		10yr	1100.00	958.42	963.66	963.66	965.56	0.006274	11.08	101.16	28.88	0.99
1	5629		25yr	1380.00	958.42	964.29	964.29	966.49	0.005937	11.92	119.86	30.41	0.99
1	5629		50yr	1590.00	958.42	964.73	964.73	967.14	0.005767	12.50	133.35	31.48	0.99
1	5629		100yr	1790.00	958.42	967.71		968.86	0.001465	8.65	238.22	38.76	0.54
1	5629		500yr	2300.00	958.42	969.41		970.64	0.001235	9.04	351.36	116.98	0.51
1	5428		2yr	680.00	955.36	960.93	959.53	961.54	0.001820	6.30	110.79	334.51	0.54
1	5428		5yr	890.00	955.36	962.12	960.09	962.76	0.001733	6.44	138.22	25.76	0.49
1	5428		10yr	1100.00	955.36	963.47	960.60	964.08	0.000967	6.30	183.64	375.98	0.43
1	5428		25yr	1380.00	955.36	964.57	961.22	965.28	0.000913	6.78	215.42	411.45	0.43
1	5428		50yr	1590.00	955.36	964.93	961.66	965.78	0.001043	7.46	225.71	429.26	0.46
1	5428		100yr	1790.00	955.36	967.84	962.07	968.42	0.000476	6.18	309.34	446.55	0.33
1	5428		500yr	2300.00	955.36	969.97	963.02	970.01	0.000061	2.50	3981.41	463.29	0.12
1	5146	I-75		Culvert									
1	4969		2yr	680.00	950.60	954.86	954.03	955.81	0.009944	7.82	86.90	22.59	0.70
1	4969		5yr	890.00	950.60	955.71	954.65	956.80	0.009462	8.38	106.23	23.15	0.69
1	4969		10yr	1100.00	950.60	956.47	955.23	957.69	0.009207	8.87	124.00	23.87	0.68
1	4969		25yr	1380.00	950.60	957.38	955.92	958.77	0.008795	9.47	146.07	26.37	0.68
1	4969		50yr	1590.00	950.60	957.99	956.40	959.52	0.008526	9.91	161.17	29.27	0.67
1	4969		100yr	1790.00	950.60	958.55	956.86	960.19	0.008284	10.30	174.98	32.19	0.67
1	4969		500yr	2300.00	950.60	959.79	957.90	961.76	0.008045	11.28	206.03	38.76	0.68
1	4925.680		2yr	680.00	948.84	954.31	951.94	954.54	0.001865	3.90	174.53	40.46	0.33
1	4925.680		5yr	890.00	948.84	955.27	952.39	955.53	0.001729	4.16	213.69	41.31	0.32
1	4925.680		10yr	1100.00	948.84	956.12	952.76	956.42	0.001624	4.42	249.69	43.14	0.32
1	4925.680		25yr	1380.00	948.84	957.13	953.26	957.48	0.001559	4.74	294.38	45.36	0.32
1	4925.680		50yr	1590.00	948.84	957.80	953.60	958.18	0.001547	4.97	325.34	46.96	0.32
1	4925.680		100yr	1790.00	948.84	958.41	953.91	958.82	0.001538	5.17	354.33	48.42	0.32
1	4925.680		500yr	2300.00	948.84	959.79	954.63	960.28	0.001516	5.66	425.99	57.44	0.32
1	4918	BR 17 - Bent19		Bridge									
1	4907.867		2yr	680.00	948.29	953.86		954.10	0.001736	3.90	174.21	37.60	0.32
1	4907.867		5yr	890.00	948.29	954.85		955.12	0.001667	4.20	211.73	38.78	0.32
1	4907.867		10yr	1100.00	948.29	955.73		956.04	0.001599	4.46	246.69	40.30	0.31
1	4907.867		25yr	1380.00	948.29	956.77		957.13	0.001550	4.80	289.72	42.65	0.31
1	4907.867		50yr	1590.00	948.29	957.46		957.85	0.001545	5.04	319.75	44.32	0.32
1	4907.867		100yr	1790.00	948.29	958.09		958.51	0.001536	5.25	348.05	47.13	0.32
1	4907.867		500yr	2300.00	948.29	959.50		960.01	0.001500	5.75	426.29	63.06	0.32
1	4783.015		2yr	680.00	947.57	953.69	950.50	953.90	0.001372	3.71	183.39	36.52	0.29
1	4783.015		5yr	890.00	947.57	954.67	951.02	954.92	0.001387	4.05	219.93	37.82	0.30
1	4783.015		10yr	1100.00	947.57	955.56	951.49	955.85	0.001401	4.33	254.03	38.99	0.30
1	4783.015		25yr	1380.00	947.57	956.60	952.07	956.94	0.001439	4.67	295.23	40.37	0.30
1	4783.015		50yr	1590.00	947.57	957.28	952.45	957.66	0.001478	4.92	323.35	41.28	0.31
1	4783.015		100yr	1790.00	947.57	957.91	952.80	958.32	0.001507	5.12	349.42	42.10	0.31

1	4783.015	500yr	2300.00	947.57	959.32	953.62	959.81	0.001595	5.61	410.07	43.96	0.32
1	4775 BR 17 - Bent18		Bridge									
1	4764.388	2yr	680.00	947.39	953.61		953.86	0.001709	4.05	167.87	33.76	0.32
1	4764.388	5yr	890.00	947.39	954.58		954.89	0.001737	4.41	201.72	35.68	0.33
1	4764.388	10yr	1100.00	947.39	955.47		955.81	0.001750	4.70	234.00	37.50	0.33
1	4764.388	25yr	1380.00	947.39	956.50		956.90	0.001784	5.03	274.19	39.96	0.34
1	4764.388	50yr	1590.00	947.39	957.19		957.62	0.001802	5.26	301.99	40.93	0.34
1	4764.388	100yr	1790.00	947.39	957.81		958.28	0.001812	5.46	327.83	41.82	0.34
1	4764.388	500yr	2300.00	947.39	959.22		959.77	0.001868	5.93	388.05	43.83	0.35
1	4718	2yr	920.00	946.98	953.11		953.71	0.004027	6.18	148.98	29.05	0.48
1	4718	5yr	1180.00	946.98	954.02		954.72	0.004133	6.71	175.98	30.41	0.49
1	4718	10yr	1450.00	946.98	954.83		955.63	0.004392	7.21	201.23	32.55	0.51
1	4718	25yr	1800.00	946.98	955.78		956.71	0.004338	7.73	233.81	35.55	0.52
1	4718	50yr	2060.00	946.98	956.41		957.43	0.004360	8.10	256.73	37.52	0.52
1	4718	100yr	2310.00	946.98	956.98		958.08	0.004378	8.43	278.57	39.29	0.53
1	4718	500yr	2930.00	946.98	958.27		959.56	0.004420	9.14	331.74	43.10	0.54
1	4643.051	2yr	920.00	946.11	952.57	950.61	953.35	0.005089	7.11	134.02	29.10	0.54
1	4643.051	5yr	1180.00	946.11	953.39	951.33	954.34	0.005404	7.88	156.11	27.96	0.56
1	4643.051	10yr	1450.00	946.11	954.12	952.04	955.23	0.005676	8.55	182.95	34.01	0.58
1	4643.051	25yr	1800.00	946.11	955.00	952.86	956.30	0.005904	9.26	214.26	36.78	0.60
1	4643.051	50yr	2060.00	946.11	955.57	953.41	957.00	0.006119	9.77	235.71	38.56	0.61
1	4643.051	100yr	2310.00	946.11	956.10	953.94	957.65	0.006259	10.20	256.31	40.05	0.62
1	4643.051	500yr	2930.00	946.11	957.26	955.11	959.10	0.006612	11.18	305.16	44.01	0.65
1	4636 BR 17 - Bent17		Bridge									
1	4625.316	2yr	920.00	946.16	952.35		953.21	0.005871	7.48	127.62	27.62	0.56
1	4625.316	5yr	1180.00	946.16	953.15		954.20	0.006273	8.30	150.58	29.98	0.59
1	4625.316	10yr	1450.00	946.16	953.85		955.10	0.006738	9.09	172.27	32.04	0.62
1	4625.316	25yr	1800.00	946.16	954.67		956.16	0.007219	9.97	199.51	34.47	0.64
1	4625.316	50yr	2060.00	946.16	955.17		956.86	0.007686	10.62	217.22	35.95	0.66
1	4625.316	100yr	2310.00	946.16	955.62		957.49	0.008088	11.19	233.89	37.34	0.68
1	4625.316	500yr	2930.00	946.16	956.62		958.91	0.009045	12.49	272.66	40.55	0.73
1	4503.708	2yr	920.00	945.71	951.90	949.75	952.54	0.004281	6.43	144.17	29.79	0.50
1	4503.708	5yr	1180.00	945.71	952.69	950.43	953.48	0.004519	7.13	168.80	32.23	0.52
1	4503.708	10yr	1450.00	945.71	953.38	951.06	954.32	0.004842	7.82	191.57	34.36	0.54
1	4503.708	25yr	1800.00	945.71	954.20	951.81	955.32	0.005036	8.56	221.67	40.61	0.56
1	4503.708	50yr	2060.00	945.71	954.69	952.31	955.97	0.005243	9.13	243.19	46.32	0.58
1	4503.708	100yr	2310.00	945.71	955.15	952.81	956.56	0.005384	9.61	265.51	50.46	0.59
1	4503.708	500yr	2930.00	945.71	956.16	953.89	957.88	0.005716	10.70	319.07	56.37	0.62
1	4496 BR 17 - Bent16		Bridge									
1	4485.049	2yr	920.00	945.71	951.59		952.22	0.004331	6.37	144.93	29.70	0.50
1	4485.049	5yr	1180.00	945.71	952.37		953.15	0.004567	7.07	168.99	31.95	0.52
1	4485.049	10yr	1450.00	945.71	953.03		953.97	0.004924	7.78	190.75	33.86	0.54
1	4485.049	25yr	1800.00	945.71	953.83		954.96	0.005229	8.56	218.76	38.25	0.56
1	4485.049	50yr	2060.00	945.71	954.28		955.58	0.005544	9.18	237.91	46.37	0.59
1	4485.049	100yr	2310.00	945.71	954.68		956.13	0.005835	9.74	257.46	51.03	0.61
1	4485.049	500yr	2930.00	945.71	955.55		957.38	0.006474	11.00	303.93	55.70	0.65
1	4361.840	2yr	920.00	945.60	951.04	949.27	951.66	0.004701	6.33	145.38	32.38	0.53
1	4361.840	5yr	1180.00	945.60	951.82	949.88	952.56	0.004859	6.89	171.15	33.96	0.54
1	4361.840	10yr	1450.00	945.60	952.45	950.46	953.33	0.005219	7.51	193.14	38.77	0.57
1	4361.840	25yr	1800.00	945.60	953.30	951.14	954.28	0.005079	7.96	247.16	70.89	0.57
1	4361.840	50yr	2060.00	945.60	953.80	951.61	954.86	0.005001	8.32	283.32	73.17	0.57
1	4361.840	100yr	2310.00	945.60	954.25	952.03	955.37	0.004939	8.63	316.51	75.28	0.57
1	4361.840	500yr	2930.00	945.60	955.26	953.33	956.53	0.004813	9.31	393.79	77.51	0.58
1	4354 BR 17 - Bent15		Bridge									
1	4343.304	2yr	920.00	945.35	950.93		951.55	0.004676	6.31	145.79	32.50	0.53
1	4343.304	5yr	1180.00	945.35	951.71		952.44	0.004833	6.87	171.66	34.11	0.54
1	4343.304	10yr	1450.00	945.35	952.34		953.21	0.005184	7.48	193.74	35.41	0.56
1	4343.304	25yr	1800.00	945.35	953.12		954.13	0.005374	8.09	231.51	69.44	0.58
1	4343.304	50yr	2060.00	945.35	953.60		954.71	0.005399	8.49	265.58	70.98	0.59
1	4343.304	100yr	2310.00	945.35	954.04		955.23	0.005359	8.84	296.93	73.07	0.59
1	4343.304	500yr	2930.00	945.35	954.99		956.36	0.005334	9.61	368.36	75.97	0.60
1	4222.473	2yr	920.00	944.89	950.56	948.33	951.03	0.003333	5.53	166.33	35.45	0.45
1	4222.473	5yr	1180.00	944.89	951.32	948.91	951.90	0.003529	6.08	194.14	37.16	0.47
1	4222.473	10yr	1450.00	944.89	951.92	949.46	952.61	0.003952	6.69	216.94	43.66	0.50
1	4222.473	25yr	1800.00	944.89	952.73	950.11	953.51	0.003958	7.13	283.42	97.09	0.51
1	4222.473	50yr	2060.00	944.89	953.26	950.56	954.08	0.003790	7.38	335.87	99.30	0.50
1	4222.473	100yr	2310.00	944.89	953.74	950.98	954.60	0.003649	7.59	383.98	100.54	0.50
1	4222.473	500yr	2930.00	944.89	954.78	952.04	955.72	0.003465	8.09	489.54	102.64	0.50

1	4215	BR 17 - Bent14		Bridge									
1	4204.470		2yr	920.00	944.78	950.31		950.77	0.003198	5.42	169.68	36.50	0.44
1	4204.470		5yr	1180.00	944.78	951.06		951.62	0.003395	5.97	197.56	38.07	0.46
1	4204.470		10yr	1450.00	944.78	951.65		952.32	0.003749	6.57	227.63	72.01	0.49
1	4204.470		25yr	1800.00	944.78	952.38		953.15	0.003782	7.09	293.95	96.27	0.50
1	4204.470		50yr	2060.00	944.78	952.87		953.69	0.003725	7.40	341.57	98.30	0.50
1	4204.470		100yr	2310.00	944.78	953.31		954.18	0.003664	7.65	385.45	99.13	0.50
1	4204.470		500yr	2930.00	944.78	954.32		955.29	0.003535	8.21	486.51	101.02	0.51
1	4080.463		2yr	920.00	944.50	949.85	948.06	950.33	0.003879	5.58	170.50	49.15	0.49
1	4080.463		5yr	1180.00	944.50	950.61	948.62	951.16	0.003903	6.00	196.65	44.42	0.50
1	4080.463		10yr	1450.00	944.50	951.20	949.16	951.82	0.004017	6.40	244.44	60.90	0.52
1	4080.463		25yr	1800.00	944.50	951.94	949.78	952.64	0.004046	6.82	296.37	79.63	0.52
1	4080.463		50yr	2060.00	944.50	952.45	950.20	953.20	0.003900	7.03	340.94	91.27	0.52
1	4080.463		100yr	2310.00	944.50	952.92	950.57	953.69	0.003772	7.20	384.49	95.19	0.52
1	4080.463		500yr	2930.00	944.50	953.98	951.36	954.82	0.003441	7.56	492.36	107.17	0.51
1	4074	BR 17 - Bent13		Bridge									
1	4062.727		2yr	920.00	944.35	949.71		950.19	0.003881	5.58	168.69	47.78	0.49
1	4062.727		5yr	1180.00	944.35	950.46		951.02	0.003897	6.00	196.76	44.43	0.50
1	4062.727		10yr	1450.00	944.35	951.06		951.69	0.004010	6.40	241.62	61.06	0.52
1	4062.727		25yr	1800.00	944.35	951.81		952.52	0.004011	6.80	295.98	82.98	0.52
1	4062.727		50yr	2060.00	944.35	952.33		953.07	0.003843	7.00	343.41	94.80	0.52
1	4062.727		100yr	2310.00	944.35	952.79		953.56	0.003730	7.17	387.83	98.65	0.51
1	4062.727		500yr	2930.00	944.35	953.83		954.67	0.003455	7.57	500.13	117.30	0.51
1	3940.903		2yr	920.00	943.93	949.20	947.48	949.70	0.004116	5.69	167.11	49.15	0.51
1	3940.903		5yr	1180.00	943.93	949.94	948.04	950.52	0.004144	6.13	192.46	44.04	0.52
1	3940.903		10yr	1450.00	943.93	950.55	948.58	951.19	0.004190	6.49	247.94	72.84	0.53
1	3940.903		25yr	1800.00	943.93	951.33	949.20	952.02	0.004048	6.80	310.55	87.65	0.52
1	3940.903		50yr	2060.00	943.93	951.87	949.63	952.60	0.003877	7.00	370.58	134.41	0.52
1	3940.903		100yr	2310.00	943.93	952.38	950.03	953.10	0.003574	7.03	440.76	139.16	0.50
1	3940.903		500yr	2930.00	943.93	953.54	950.95	954.24	0.002953	7.09	610.11	151.76	0.47
1	3934	BR 17 - Bent12		Bridge									
1	3922.633		2yr	920.00	943.43	948.89		949.34	0.003591	5.42	176.62	51.10	0.48
1	3922.633		5yr	1180.00	943.43	949.64		950.17	0.003667	5.87	201.12	44.82	0.49
1	3922.633		10yr	1450.00	943.43	950.24		950.84	0.003744	6.23	255.29	67.89	0.50
1	3922.633		25yr	1800.00	943.43	951.04		951.69	0.003609	6.55	322.60	104.42	0.50
1	3922.633		50yr	2060.00	943.43	951.60		952.27	0.003418	6.71	385.12	127.04	0.49
1	3922.633		100yr	2310.00	943.43	952.11		952.79	0.003195	6.78	455.95	140.60	0.48
1	3922.633		500yr	2930.00	943.43	953.28		953.95	0.002670	6.90	630.76	174.72	0.45
1	3799.870		2yr	920.00	942.55	948.60	946.11	948.95	0.002438	4.73	196.73	65.48	0.40
1	3799.870		5yr	1180.00	942.55	949.35	946.67	949.76	0.002539	5.18	227.62	45.55	0.41
1	3799.870		10yr	1450.00	942.55	949.96	947.19	950.42	0.002519	5.54	319.45	133.76	0.42
1	3799.870		25yr	1800.00	942.55	950.81	947.81	951.29	0.002301	5.70	452.83	174.31	0.41
1	3799.870		50yr	2060.00	942.55	951.42	948.23	951.88	0.002118	5.73	565.94	199.78	0.39
1	3799.870		100yr	2310.00	942.55	951.98	948.67	952.42	0.001884	5.69	681.59	235.23	0.38
1	3799.870		500yr	2930.00	942.55	953.23	949.46	953.63	0.001493	5.64	957.04	269.34	0.34
1	3792	BR 17 - Bent11		Bridge									
1	3781.101		2yr	920.00	942.35	948.46		948.80	0.002348	4.67	196.98	46.67	0.39
1	3781.101		5yr	1180.00	942.35	949.20		949.61	0.002463	5.13	230.01	45.66	0.40
1	3781.101		10yr	1450.00	942.35	949.87		950.32	0.002392	5.46	316.42	130.23	0.41
1	3781.101		25yr	1800.00	942.35	950.75		951.21	0.002175	5.60	452.96	172.69	0.40
1	3781.101		50yr	2060.00	942.35	951.37		951.82	0.002012	5.65	566.29	204.72	0.38
1	3781.101		100yr	2310.00	942.35	951.93		952.37	0.001798	5.64	689.31	234.30	0.37
1	3781.101		500yr	2930.00	942.35	953.18		953.57	0.001421	5.57	987.67	255.56	0.34
1	3659.612		2yr	920.00	942.15	948.14	945.70	948.50	0.002546	4.80	191.67	45.29	0.41
1	3659.612		5yr	1180.00	942.15	948.86	946.26	949.29	0.002666	5.27	223.81	45.38	0.42
1	3659.612		10yr	1450.00	942.15	949.56	946.78	950.03	0.002510	5.53	309.22	98.95	0.42
1	3659.612		25yr	1800.00	942.15	950.45	947.39	950.94	0.002314	5.73	412.38	130.30	0.41
1	3659.612		50yr	2060.00	942.15	951.06	947.82	951.56	0.002213	5.87	499.08	164.73	0.40
1	3659.612		100yr	2310.00	942.15	951.64	948.19	952.13	0.001993	5.88	609.27	196.16	0.39
1	3659.612		500yr	2930.00	942.15	952.93	949.24	953.38	0.001582	5.86	887.16	225.80	0.36
1	3652	BR 17 - Bent10		Bridge									
1	3641.433		2yr	920.00	942.15	948.08		948.45	0.002647	4.87	189.06	43.73	0.41
1	3641.433		5yr	1180.00	942.15	948.80		949.24	0.002766	5.34	220.99	45.26	0.43
1	3641.433		10yr	1450.00	942.15	949.50		949.98	0.002629	5.63	295.74	92.95	0.43
1	3641.433		25yr	1800.00	942.15	950.39		950.90	0.002435	5.85	396.42	132.45	0.42
1	3641.433		50yr	2060.00	942.15	951.00		951.51	0.002283	5.94	484.56	154.67	0.41
1	3641.433		100yr	2310.00	942.15	951.58		952.09	0.002074	5.97	584.65	193.26	0.39
1	3641.433		500yr	2930.00	942.15	952.88		953.34	0.001633	5.92	870.04	243.57	0.36

1	3518.856		2yr	920.00	941.93	947.71	945.48	948.11	0.002918	5.04	182.54	43.13	0.43
1	3518.856		5yr	1180.00	941.93	948.40	946.04	948.88	0.003115	5.53	213.32	45.90	0.45
1	3518.856		10yr	1450.00	941.93	949.08	946.56	949.62	0.003208	5.92	245.04	48.58	0.46
1	3518.856		25yr	1800.00	941.93	949.95	947.19	950.56	0.003026	6.23	293.33	62.62	0.46
1	3518.856		50yr	2060.00	941.93	950.55	947.61	951.19	0.002912	6.42	332.11	68.05	0.46
1	3518.856		100yr	2310.00	941.93	951.12	947.96	951.78	0.002747	6.56	373.56	77.54	0.45
1	3518.856		500yr	2930.00	941.93	952.35	948.83	953.07	0.002434	6.91	485.75	102.60	0.43
1	3512	BR 17 - Bent09		Bridge									
1	3500.626		2yr	920.00	941.73	947.56		947.94	0.002832	4.99	184.53	43.32	0.43
1	3500.626		5yr	1180.00	941.73	948.24		948.71	0.003044	5.49	215.12	46.05	0.45
1	3500.626		10yr	1450.00	941.73	948.92		949.45	0.003133	5.87	247.17	48.76	0.46
1	3500.626		25yr	1800.00	941.73	949.79		950.38	0.002964	6.18	297.64	66.64	0.46
1	3500.626		50yr	2060.00	941.73	950.38		951.01	0.002862	6.38	338.24	72.03	0.45
1	3500.626		100yr	2310.00	941.73	950.94		951.59	0.002715	6.53	380.86	81.35	0.45
1	3500.626		500yr	2930.00	941.73	952.13		952.85	0.002440	6.91	490.51	100.67	0.43
1	3378.489		2yr	920.00	941.38	947.21	944.93	947.60	0.002822	4.98	184.75	43.34	0.43
1	3378.489		5yr	1180.00	941.38	947.86	945.49	948.33	0.003104	5.52	213.59	45.90	0.45
1	3378.489		10yr	1450.00	941.38	948.55	946.01	949.08	0.003017	5.86	265.97	75.18	0.45
1	3378.489		25yr	1800.00	941.38	949.47	946.62	950.03	0.002728	6.06	341.26	88.77	0.44
1	3378.489		50yr	2060.00	941.38	950.09	947.04	950.66	0.002576	6.19	397.46	93.66	0.43
1	3378.489		100yr	2310.00	941.38	950.68	947.42	951.26	0.002378	6.26	455.80	102.09	0.42
1	3378.489		500yr	2930.00	941.38	951.93	948.40	952.54	0.002066	6.53	599.01	120.88	0.40
1	3371	BR 17 - Bent08		Bridge									
1	3360.436		2yr	920.00	941.32	947.13		947.52	0.002860	5.00	183.87	43.25	0.43
1	3360.436		5yr	1180.00	941.32	947.76		948.25	0.003173	5.57	211.91	45.77	0.46
1	3360.436		10yr	1450.00	941.32	948.46		949.00	0.003073	5.90	259.87	71.97	0.46
1	3360.436		25yr	1800.00	941.32	949.40		949.97	0.002761	6.09	333.35	85.53	0.44
1	3360.436		50yr	2060.00	941.32	950.02		950.61	0.002607	6.22	387.98	90.42	0.43
1	3360.436		100yr	2310.00	941.32	950.61		951.21	0.002413	6.31	444.23	98.81	0.42
1	3360.436		500yr	2930.00	941.32	951.86		952.49	0.002114	6.59	581.65	117.23	0.41
1	3238.304		2yr	920.00	941.06	946.74	944.61	947.15	0.003148	5.18	177.44	42.53	0.45
1	3238.304		5yr	1180.00	941.06	947.30	945.18	947.83	0.003617	5.84	201.89	44.75	0.48
1	3238.304		10yr	1450.00	941.06	947.99	945.71	948.59	0.003628	6.19	234.08	47.52	0.49
1	3238.304		25yr	1800.00	941.06	948.96	946.32	949.59	0.003353	6.38	284.33	60.54	0.48
1	3238.304		50yr	2060.00	941.06	949.59	946.72	950.25	0.003218	6.52	324.17	65.58	0.47
1	3238.304		100yr	2310.00	941.06	950.20	947.10	950.87	0.003008	6.58	366.29	78.18	0.46
1	3238.304		500yr	2930.00	941.06	951.50	947.95	952.20	0.002501	6.80	488.50	105.21	0.44
1	3231	BR 17 - Bent07		Bridge									
1	3220.243		2yr	920.00	940.86	946.57		946.98	0.003076	5.14	178.92	42.67	0.44
1	3220.243		5yr	1180.00	940.86	947.13		947.65	0.003546	5.80	203.35	44.88	0.48
1	3220.243		10yr	1450.00	940.86	947.83		948.42	0.003554	6.15	235.85	47.67	0.49
1	3220.243		25yr	1800.00	940.86	948.80		949.42	0.003288	6.34	286.70	60.85	0.48
1	3220.243		50yr	2060.00	940.86	949.42		950.07	0.003173	6.48	326.08	65.81	0.47
1	3220.243		100yr	2310.00	940.86	950.03		950.69	0.002962	6.55	368.21	76.44	0.46
1	3220.243		500yr	2930.00	940.86	951.31		952.01	0.002494	6.80	481.01	96.44	0.44
1	3147		2yr	1100.00	940.68	945.86		946.62	0.006365	7.02	156.74	40.55	0.63
1	3147		5yr	1340.00	940.68	946.40		947.27	0.006478	7.47	179.39	42.71	0.64
1	3147		10yr	1650.00	940.68	947.05		948.03	0.006519	7.94	207.92	45.28	0.65
1	3147		25yr	2110.00	940.68	947.91		949.03	0.006513	8.49	248.53	48.71	0.66
1	3147		50yr	2450.00	940.68	948.44		949.68	0.006659	8.91	276.15	59.46	0.68
1	3147		100yr	2800.00	940.68	948.99		950.31	0.006610	9.21	309.97	63.83	0.68
1	3147		500yr	3650.00	940.68	950.15		951.64	0.006304	9.86	390.42	75.86	0.68
1	3097.384		2yr	1100.00	940.56	945.18	944.50	946.21	0.009733	8.16	134.88	38.45	0.77
1	3097.384		5yr	1340.00	940.56	945.69	944.98	946.85	0.009739	8.63	155.18	40.51	0.78
1	3097.384		10yr	1650.00	940.56	946.34	945.55	947.61	0.009392	9.04	182.49	43.12	0.77
1	3097.384		25yr	2110.00	940.56	947.23	946.29	948.63	0.008888	9.49	222.28	46.66	0.77
1	3097.384		50yr	2450.00	940.56	947.69	946.79	949.25	0.009221	10.02	244.43	48.52	0.79
1	3097.384		100yr	2800.00	940.56	948.23	947.27	949.89	0.009090	10.34	271.27	58.90	0.79
1	3097.384		500yr	3650.00	940.56	949.43	948.36	951.25	0.008539	10.84	348.26	68.56	0.78
1	3090	BR 17 - Bent06		Bridge									
1	3079.078		2yr	1100.00	940.36	944.47	944.30	945.87	0.014964	9.49	115.85	36.42	0.94
1	3079.078		5yr	1340.00	940.36	945.06	944.78	946.52	0.013515	9.70	138.10	38.78	0.91
1	3079.078		10yr	1650.00	940.36	945.81	945.35	947.30	0.011720	9.79	168.55	41.81	0.86
1	3079.078		25yr	2110.00	940.36	946.78		948.34	0.010267	10.00	210.98	45.68	0.82
1	3079.078		50yr	2450.00	940.36	947.20	946.59	948.96	0.010887	10.65	230.13	47.33	0.85
1	3079.078		100yr	2800.00	940.36	947.70	947.07	949.58	0.010751	10.99	254.71	49.36	0.85
1	3079.078		500yr	3650.00	940.36	948.80	948.16	950.92	0.010466	11.69	319.58	65.13	0.86
1	2955.929		2yr	1100.00	938.59	943.77	942.54	944.53	0.006318	6.99	157.32	40.73	0.63
1	2955.929		5yr	1340.00	938.59	944.49	943.02	945.28	0.005729	7.14	187.70	43.61	0.61

1	2955.929		10yr	1650.00	938.59	945.37	943.58	946.19	0.005085	7.25	227.72	47.14	0.58
1	2955.929		25yr	2110.00	938.59	946.43	944.32	947.31	0.004729	7.55	281.46	60.28	0.57
1	2955.929		50yr	2450.00	938.59	946.79	944.82	947.83	0.005300	8.19	304.22	63.23	0.61
1	2955.929		100yr	2800.00	938.59	947.33	945.30	948.45	0.005355	8.51	339.03	67.49	0.61
1	2955.929		500yr	3650.00	938.59	948.51	946.39	949.79	0.005148	9.12	430.81	85.37	0.62
1	2949	BR 17 - Bent05		Bridge									
1	2937.884		2yr	1100.00	938.39	943.52		944.30	0.006573	7.09	155.11	40.51	0.64
1	2937.884		5yr	1340.00	938.39	944.26		945.06	0.005844	7.19	186.36	43.48	0.61
1	2937.884		10yr	1650.00	938.39	945.17		945.99	0.005095	7.25	227.55	47.12	0.58
1	2937.884		25yr	2110.00	938.39	946.22		947.11	0.004742	7.55	281.15	60.24	0.57
1	2937.884		50yr	2450.00	938.39	946.56		947.61	0.005384	8.24	302.23	62.98	0.61
1	2937.884		100yr	2800.00	938.39	947.08		948.22	0.005477	8.58	335.81	67.11	0.62
1	2937.884		500yr	3650.00	938.39	948.19		949.52	0.005465	9.31	420.02	84.43	0.63
1	2870		2yr	1100.00	937.72	943.27		943.88	0.004796	6.31	174.42	42.90	0.55
1	2870		5yr	1340.00	937.72	944.05		944.69	0.004283	6.40	209.43	46.14	0.53
1	2870		10yr	1650.00	937.72	945.01		945.65	0.003708	6.43	266.32	69.83	0.50
1	2870		25yr	2110.00	937.72	946.12		946.79	0.003118	6.63	346.16	74.03	0.47
1	2870		50yr	2450.00	937.72	946.46		947.26	0.003483	7.26	371.22	75.27	0.50
1	2870		100yr	2800.00	937.72	946.98		947.86	0.003451	7.62	411.24	77.22	0.51
1	2870		500yr	3650.00	937.72	948.10		949.15	0.003469	8.43	499.50	81.35	0.52
1	2813.979		2yr	1100.00	937.22	943.07	941.15	943.61	0.003909	5.86	187.73	44.16	0.50
1	2813.979		5yr	1340.00	937.22	943.89	941.63	944.44	0.003513	5.96	225.00	47.52	0.48
1	2813.979		10yr	1650.00	937.22	944.87	942.18	945.43	0.003021	6.01	280.04	60.86	0.46
1	2813.979		25yr	2110.00	937.22	946.00	942.93	946.61	0.002607	6.31	351.27	65.94	0.44
1	2813.979		50yr	2450.00	937.22	946.31	943.42	947.05	0.002991	6.97	372.05	67.40	0.47
1	2813.979		100yr	2800.00	937.22	946.82	943.92	947.65	0.003037	7.38	407.34	69.81	0.48
1	2813.979		500yr	3650.00	937.22	947.91	944.98	948.95	0.003190	8.29	486.57	75.98	0.50
1	2807	BR 17 - Bent04		Bridge									
1	2795.938		2yr	1100.00	937.22	942.97		943.53	0.004171	6.00	183.40	43.75	0.52
1	2795.938		5yr	1340.00	937.22	943.79		944.36	0.003713	6.08	220.53	47.13	0.49
1	2795.938		10yr	1650.00	937.22	944.76		945.35	0.003213	6.14	274.33	60.98	0.47
1	2795.938		25yr	2110.00	937.22	945.86		946.49	0.002796	6.44	349.86	81.27	0.45
1	2795.938		50yr	2450.00	937.22	946.13		946.91	0.003259	7.15	371.42	82.94	0.49
1	2795.938		100yr	2800.00	937.22	946.60		947.48	0.003332	7.57	409.80	85.89	0.50
1	2795.938		500yr	3650.00	937.22	947.61		948.70	0.003548	8.53	491.51	93.75	0.53
1	2668.395		2yr	1100.00	936.34	942.62	940.23	943.05	0.002937	5.30	207.59	45.65	0.44
1	2668.395		5yr	1340.00	936.34	943.48	940.73	943.93	0.002652	5.39	248.42	49.10	0.42
1	2668.395		10yr	1650.00	936.34	944.50	941.27	944.97	0.002275	5.49	309.24	75.59	0.40
1	2668.395		25yr	2110.00	936.34	945.65	942.03	946.15	0.002077	5.75	431.22	126.24	0.39
1	2668.395		50yr	2450.00	936.34	945.88	942.53	946.50	0.002475	6.41	461.08	128.48	0.43
1	2668.395		100yr	2800.00	936.34	946.37	942.98	947.05	0.002497	6.74	525.46	131.56	0.44
1	2668.395		500yr	3650.00	936.34	947.42	944.03	948.23	0.002572	7.47	666.74	138.08	0.45
1	2662	BR 17 - Bent03		Bridge									
1	2650.675		2yr	1100.00	936.34	942.39	940.11	942.80	0.002875	5.12	214.65	62.98	0.43
1	2650.675		5yr	1340.00	936.34	943.23	940.56	943.65	0.002575	5.20	257.66	64.90	0.42
1	2650.675		10yr	1650.00	936.34	944.04	941.09	944.46	0.002226	5.26	361.60	84.86	0.40
1	2650.675		25yr	2110.00	936.34	945.13	941.79	945.58	0.001944	5.54	475.70	139.64	0.38
1	2650.675		50yr	2450.00	936.34	945.36	942.27	945.92	0.002308	6.18	508.25	140.65	0.42
1	2650.675		100yr	2800.00	936.34	945.83	942.73	946.45	0.002349	6.52	575.33	142.71	0.43
1	2650.675		500yr	3650.00	936.34	946.83	943.67	947.58	0.002459	7.27	720.21	147.06	0.45
1	2537.862		2yr	1100.00	935.54	941.47	940.18	942.29	0.006432	7.51	185.40	53.92	0.60
1	2537.862		5yr	1340.00	935.54	941.68	940.67	943.05	0.009670	9.37	143.06	29.06	0.74
1	2537.862		10yr	1650.00	935.54	943.01	941.36	944.01	0.006276	8.31	285.35	103.06	0.61
1	2537.862		25yr	2110.00	935.54	944.46	942.16	945.24	0.004173	7.69	462.18	145.45	0.51
1	2537.862		50yr	2450.00	935.54	944.38	942.22	945.47	0.005900	9.08	450.97	144.77	0.61
1	2537.862		100yr	2800.00	935.54	944.88	943.74	946.00	0.005700	9.35	525.00	149.22	0.60
1	2537.862		500yr	3650.00	935.54	945.92	944.67	947.13	0.005503	10.02	684.43	158.37	0.61
1	2532	BR 17 - Bent02		Bridge									
1	2520.830		2yr	1100.00	935.58	940.35	940.14	942.04	0.015406	10.41	105.67	48.12	0.93
1	2520.830		5yr	1340.00	935.58	940.83	940.73	942.80	0.016308	11.26	119.01	28.28	0.97
1	2520.830		10yr	1650.00	935.58	941.42	941.42	943.71	0.017017	12.15	135.85	55.78	1.00
1	2520.830		25yr	2110.00	935.58	942.32	942.32	944.91	0.016571	12.91	163.48	73.54	1.00
1	2520.830		50yr	2450.00	935.58	943.01	943.01	945.05	0.013004	12.01	302.62	106.13	0.89
1	2520.830		100yr	2800.00	935.58	943.69	943.69	945.56	0.011128	11.73	381.32	119.00	0.83
1	2520.830		500yr	3650.00	935.58	944.51	944.51	946.62	0.011227	12.78	488.43	139.26	0.85
1	2390.934		2yr	1100.00	934.58	940.49		940.92	0.002925	5.32	234.97	64.94	0.43
1	2390.934		5yr	1340.00	934.58	940.97		941.54	0.003441	6.04	221.70	43.58	0.47
1	2390.934		10yr	1650.00	934.58	941.66		942.25	0.003350	6.32	330.44	118.44	0.47
1	2390.934		25yr	2110.00	934.58	942.57		943.21	0.003221	6.68	464.23	169.75	0.47

1	2390.934	50yr	2450.00	934.58	943.23		943.86	0.002861	6.72	581.56	180.13	0.45
1	2390.934	100yr	2800.00	934.58	943.62		944.30	0.002966	7.10	652.40	182.03	0.46
1	2390.934	500yr	3650.00	934.58	944.58		945.35	0.002995	7.74	829.77	186.71	0.47
1	2354.325 BR 17 - Bent01	2yr	1100.00	934.22	938.93	938.93	940.58	0.017731	10.32	106.58	32.44	1.00
1	2354.325 BR 17 - Bent01	5yr	1340.00	934.22	939.60	939.60	941.19	0.017527	10.14	132.15	41.35	1.00
1	2354.325 BR 17 - Bent01	10yr	1650.00	934.22	940.11	940.11	941.90	0.016841	10.73	153.83	45.72	1.00
1	2354.325 BR 17 - Bent01	25yr	2110.00	934.22	940.79	940.79	942.85	0.016341	11.51	183.35	49.41	1.00
1	2354.325 BR 17 - Bent01	50yr	2450.00	934.22	941.25	941.25	943.49	0.016000	12.00	204.21	95.28	1.00
1	2354.325 BR 17 - Bent01	100yr	2800.00	934.22	941.99	941.99	943.98	0.012564	11.45	296.15	115.04	0.90
1	2354.325 BR 17 - Bent01	500yr	3650.00	934.22	943.06	943.06	945.05	0.010674	11.70	442.73	149.17	0.85
1	2262	2yr	1100.00	933.97	939.20	936.91	939.49	0.002190	4.34	253.41	64.46	0.38
1	2262	5yr	1340.00	933.97	940.09	937.33	940.38	0.001786	4.33	309.53	64.23	0.35
1	2262	10yr	1650.00	933.97	940.55	937.74	940.91	0.002043	4.87	339.11	82.48	0.38
1	2262	25yr	2110.00	933.97	941.42	938.31	941.85	0.002007	5.28	431.18	107.32	0.38
1	2262	50yr	2450.00	933.97	941.95	938.71	942.43	0.002011	5.59	499.09	147.25	0.39
1	2262	100yr	2800.00	933.97	942.38	939.08	942.92	0.002086	5.95	562.61	149.01	0.40
1	2262	500yr	3650.00	933.97	943.37	939.91	944.02	0.002159	6.61	710.71	149.94	0.41
1	2081.919	2yr	1100.00	932.16	938.83		939.14	0.001683	4.50	256.63	54.50	0.33
1	2081.919	5yr	1340.00	932.16	939.71		940.07	0.001613	4.78	284.34	48.13	0.33
1	2081.919	10yr	1650.00	932.16	940.08		940.54	0.002003	5.49	350.00	122.36	0.36
1	2081.919	25yr	2110.00	932.16	940.90		941.46	0.002171	6.10	496.66	204.59	0.38
1	2081.919	50yr	2450.00	932.16	941.46		942.04	0.002166	6.37	610.77	207.12	0.39
1	2081.919	100yr	2800.00	932.16	941.87		942.51	0.002278	6.75	696.59	208.99	0.40
1	2081.919	500yr	3650.00	932.16	942.88		943.59	0.002361	7.39	909.68	213.58	0.42
1	1650	2yr	1100.00	931.18	937.78		938.22	0.002796	5.47	314.39	216.85	0.40
1	1650	5yr	1340.00	931.18	938.87		939.26	0.002257	5.31	428.60	192.85	0.36
1	1650	10yr	1650.00	931.18	939.36		939.68	0.001952	5.14	717.06	274.93	0.34
1	1650	25yr	2110.00	931.18	940.36		940.62	0.001584	5.05	991.74	278.85	0.31
1	1650	50yr	2450.00	931.18	940.99		941.24	0.001442	5.06	1168.98	281.35	0.30
1	1650	100yr	2800.00	931.18	941.41		941.67	0.001482	5.30	1287.25	283.01	0.31
1	1650	500yr	3650.00	931.18	942.47		942.75	0.001457	5.65	1589.91	287.21	0.31
1	1492.060	2yr	1100.00	929.74	937.35		937.79	0.002573	5.48	293.77	158.37	0.38
1	1492.060	5yr	1340.00	929.74	938.40		938.88	0.002458	5.72	344.66	159.19	0.37
1	1492.060	10yr	1650.00	929.74	938.99		939.35	0.002017	5.40	649.73	234.00	0.34
1	1492.060	25yr	2110.00	929.74	940.04		940.35	0.001705	5.36	895.01	236.90	0.32
1	1492.060	50yr	2450.00	929.74	940.69		940.99	0.001590	5.42	1049.75	239.55	0.31
1	1492.060	100yr	2800.00	929.74	941.08		941.41	0.001685	5.74	1144.77	241.17	0.32
1	1492.060	500yr	3650.00	929.74	942.13		942.48	0.001731	6.21	1398.65	245.43	0.33
1	1084	2yr	1100.00	927.83	935.03		936.08	0.007233	8.29	143.38	34.08	0.61
1	1084	5yr	1340.00	927.83	936.13		937.26	0.006669	8.51	157.42	24.61	0.59
1	1084	10yr	1650.00	927.83	936.10	934.78	937.68	0.009701	10.25	193.56	67.49	0.72
1	1084	25yr	2110.00	927.83	936.64	936.23	938.71	0.012122	11.84	233.14	80.88	0.80
1	1084	50yr	2450.00	927.83	937.12	937.12	939.39	0.012633	12.53	283.08	119.44	0.83
1	1084	100yr	2800.00	927.83	938.27	938.27	939.96	0.008803	11.28	479.83	200.33	0.70
1	1084	500yr	3650.00	927.83	938.83	938.83	940.90	0.010717	12.87	596.04	210.81	0.77
1	1027.831	2yr	1100.00	927.42	934.63		935.67	0.007529	8.25	147.85	38.35	0.63
1	1027.831	5yr	1340.00	927.42	935.81		936.87	0.006706	8.26	164.29	41.95	0.61
1	1027.831	10yr	1650.00	927.42	935.65	934.52	937.09	0.009964	9.91	227.45	110.01	0.74
1	1027.831	25yr	2110.00	927.42	936.31		937.95	0.010502	10.81	307.89	131.40	0.77
1	1027.831	50yr	2450.00	927.42	936.82		938.48	0.010144	11.09	383.75	161.86	0.76
1	1027.831	100yr	2800.00	927.42	937.24		939.00	0.010372	11.59	455.68	179.11	0.77
1	1027.831	500yr	3650.00	927.42	938.61		940.04	0.007465	11.08	717.18	205.30	0.68
1	949.7572	2yr	1100.00	926.86	934.61		935.15	0.003217	6.09	270.73	120.25	0.44
1	949.7572	5yr	1340.00	926.86	935.77		936.41	0.002905	6.53	236.91	47.03	0.43
1	949.7572	10yr	1650.00	926.86	935.80		936.44	0.003270	6.95	432.40	172.75	0.46
1	949.7572	25yr	2110.00	926.86	936.54		937.24	0.003346	7.51	577.68	213.36	0.47
1	949.7572	50yr	2450.00	926.86	937.06		937.77	0.003285	7.77	691.50	228.35	0.47
1	949.7572	100yr	2800.00	926.86	937.56		938.28	0.003184	7.95	807.73	234.37	0.47
1	949.7572	500yr	3650.00	926.86	938.77		939.48	0.002907	8.28	1150.64	324.91	0.46
1	878.1000	2yr	1100.00	926.71	934.78	930.36	934.94	0.000726	3.33	550.01	180.73	0.22
1	878.1000	5yr	1340.00	926.71	935.95	930.81	936.18	0.000881	3.92	350.29	47.03	0.24
1	878.1000	10yr	1650.00	926.71	936.01	931.54	936.20	0.000810	3.92	792.82	212.37	0.24
1	878.1000	25yr	2110.00	926.71	936.75	932.25	936.99	0.000917	4.43	958.01	241.23	0.26
1	878.1000	50yr	2450.00	926.71	937.25	932.69	937.52	0.000974	4.74	1086.66	264.19	0.27
1	878.1000	100yr	2800.00	926.71	937.74	933.05	938.03	0.001000	4.97	1217.91	282.35	0.28
1	878.1000	500yr	3650.00	926.71	938.94	933.55	939.25	0.000981	5.32	1543.49	314.33	0.28
1	871		Bridge									
1	859.3424	2yr	1100.00	926.88	934.74		934.92	0.000991	3.68	531.59	177.30	0.26
1	859.3424	5yr	1340.00	926.88	935.85		936.16	0.001280	4.49	312.11	47.03	0.29
1	859.3424	10yr	1650.00	926.88	935.96		936.18	0.001053	4.28	762.93	207.99	0.28
1	859.3424	25yr	2110.00	926.88	936.69		936.97	0.001171	4.81	926.97	241.81	0.30

1	859.3424	50yr	2450.00	926.88	937.19		937.50	0.001236	5.14	1056.42	272.95	0.31
1	859.3424	100yr	2800.00	926.88	937.68		938.01	0.001250	5.37	1192.46	283.78	0.31
1	859.3424	500yr	3650.00	926.88	938.89		939.22	0.001196	5.70	1549.37	308.83	0.31
1	735.5340	2yr	1100.00	926.37	934.43	931.29	934.74	0.001834	4.93	424.22	156.55	0.34
1	735.5340	5yr	1340.00	926.37	935.34	931.79	935.92	0.002437	6.19	257.05	47.03	0.40
1	735.5340	10yr	1650.00	926.37	935.61	932.99	935.99	0.001966	5.69	651.94	224.73	0.36
1	735.5340	25yr	2110.00	926.37	936.37	933.84	936.77	0.001985	6.08	819.78	281.72	0.36
1	735.5340	50yr	2450.00	926.37	936.89	934.16	937.30	0.001971	6.30	936.41	288.53	0.37
1	735.5340	100yr	2800.00	926.37	937.39	934.71	937.80	0.001966	6.51	1047.04	293.69	0.37
1	735.5340	500yr	3650.00	926.37	938.61	935.79	939.03	0.001838	6.82	1323.37	304.01	0.36
1	728		Bridge									
1	716.3877	2yr	1100.00	926.18	934.35		934.69	0.002144	5.22	410.05	141.40	0.35
1	716.3877	5yr	1340.00	926.18	935.14		935.84	0.003191	6.85	239.25	47.03	0.44
1	716.3877	10yr	1650.00	926.18	935.54		935.94	0.002242	5.94	583.61	149.81	0.37
1	716.3877	25yr	2110.00	926.18	936.24		936.70	0.002484	6.62	689.23	154.49	0.40
1	716.3877	50yr	2450.00	926.18	936.63		937.22	0.002944	7.42	754.03	187.79	0.44
1	716.3877	100yr	2800.00	926.18	937.02		937.70	0.003235	8.01	834.58	216.70	0.46
1	716.3877	500yr	3650.00	926.18	938.23		938.91	0.003046	8.42	1165.96	297.08	0.46
1	595.3610	2yr	1100.00	925.11	933.52	931.25	934.27	0.005136	7.17	226.66	142.06	0.51
1	595.3610	5yr	1340.00	925.11	934.29	931.85	935.30	0.005718	8.17	186.26	47.03	0.55
1	595.3610	10yr	1650.00	925.11	934.88	932.99	935.55	0.004185	7.38	473.88	192.50	0.47
1	595.3610	25yr	2110.00	925.11	935.65	934.48	936.31	0.004029	7.72	622.21	196.34	0.47
1	595.3610	50yr	2450.00	925.11	936.13	934.87	936.80	0.003991	7.98	717.75	198.68	0.47
1	595.3610	100yr	2800.00	925.11	936.59	935.23	937.27	0.003963	8.23	809.91	201.18	0.48
1	595.3610	500yr	3650.00	925.11	937.80	935.96	938.51	0.003769	8.71	1130.96	290.91	0.47
1	589		Bridge									
1	577.5895	2yr	1100.00	925.63	933.21		934.10	0.006238	7.78	181.73	88.96	0.57
1	577.5895	5yr	1340.00	925.63	933.96		935.13	0.006733	8.73	169.82	47.03	0.60
1	577.5895	10yr	1650.00	925.63	934.29		935.34	0.006508	8.87	353.50	186.07	0.60
1	577.5895	25yr	2110.00	925.63	935.22		936.13	0.005365	8.77	530.63	192.48	0.55
1	577.5895	50yr	2450.00	925.63	935.77		936.64	0.005018	8.87	636.60	195.80	0.54
1	577.5895	100yr	2800.00	925.63	936.27		937.12	0.004795	9.01	735.55	198.85	0.53
1	577.5895	500yr	3650.00	925.63	937.40		938.33	0.004784	9.75	1001.80	287.29	0.54
1	553	2yr	1100.00	925.33	933.05	930.85	933.96	0.005817	7.62	144.60	52.04	0.56
1	553	5yr	1340.00	925.33	933.95	931.53	934.93	0.005338	7.98	181.66	47.03	0.54
1	553	10yr	1650.00	925.33	933.94	932.32	935.16	0.007098	9.20	278.30	179.04	0.63
1	553	25yr	2110.00	925.33	934.76	934.32	935.96	0.006529	9.53	426.41	183.73	0.61
1	553	50yr	2450.00	925.33	935.38	934.77	936.48	0.005816	9.49	542.11	188.60	0.59
1	553	100yr	2800.00	925.33	935.93	935.16	936.98	0.005380	9.53	647.41	192.54	0.57
1	553	500yr	3650.00	925.33	936.90	935.92	938.17	0.005901	10.71	890.56	342.73	0.61
1	459.5899	2yr	1100.00	925.06	932.71	930.23	933.42	0.004479	6.89	210.07	107.59	0.50
1	459.5899	5yr	1340.00	925.06	933.59	930.88	934.42	0.004550	7.41	203.78	45.57	0.51
1	459.5899	10yr	1650.00	925.06	933.36	931.82	934.49	0.006725	8.87	284.35	117.69	0.62
1	459.5899	25yr	2110.00	925.06	933.90	933.42	935.27	0.007934	10.00	348.83	123.79	0.68
1	459.5899	50yr	2450.00	925.06	934.44	933.90	935.83	0.007809	10.28	418.03	138.65	0.68
1	459.5899	100yr	2800.00	925.06	934.62	934.31	936.28	0.009235	11.31	441.56	161.74	0.74
1	459.5899	500yr	3650.00	925.06	935.34	935.33	937.37	0.010488	12.79	567.20	177.49	0.80
1	441.5446	2yr	1100.00	924.84	932.72		933.31	0.003962	6.47	273.31	133.19	0.47
1	441.5446	5yr	1340.00	924.84	933.51		934.34	0.004563	7.39	206.99	44.41	0.52
1	441.5446	10yr	1650.00	924.84	933.47		934.29	0.005227	7.89	374.77	139.95	0.55
1	441.5446	25yr	2110.00	924.84	934.10		935.01	0.005676	8.60	459.64	148.38	0.58
1	441.5446	50yr	2450.00	924.84	934.66		935.56	0.005440	8.74	536.62	156.53	0.57
1	441.5446	100yr	2800.00	924.84	934.93		935.95	0.006110	9.41	572.78	176.94	0.61
1	441.5446	500yr	3650.00	924.84	935.83		936.96	0.006412	10.22	696.29	214.54	0.63
1	324.8710	2yr	1100.00	924.63	931.00	931.00	932.43	0.014489	9.83	147.48	146.99	0.90
1	324.8710	5yr	1340.00	924.63	931.46	931.46	933.33	0.015797	11.03	129.92	43.05	0.96
1	324.8710	10yr	1650.00	924.63	932.13	932.13	933.41	0.010379	9.89	303.19	184.84	0.79
1	324.8710	25yr	2110.00	924.63	932.64	932.64	934.08	0.010781	10.77	374.46	189.82	0.82
1	324.8710	50yr	2450.00	924.63	932.76		934.55	0.013171	12.08	391.09	190.98	0.91
1	324.8710	100yr	2800.00	924.63	933.29	933.29	934.95	0.011350	11.94	466.38	200.70	0.86
1	324.8710	500yr	3650.00	924.63	933.96	933.96	935.90	0.012070	13.22	562.81	223.36	0.90
1	307.2792	2yr	1100.00	924.63	930.62	930.37	931.95	0.013896	9.40	134.45	77.33	0.89
1	307.2792	5yr	1340.00	924.63	931.16	931.01	932.73	0.015308	10.06	133.53	41.01	0.94
1	307.2792	10yr	1650.00	924.63	931.95	931.79	932.98	0.009286	8.71	316.80	199.18	0.75
1	307.2792	25yr	2110.00	924.63	932.75		933.67	0.007338	8.59	438.64	216.05	0.69
1	307.2792	50yr	2450.00	924.63	933.18		934.13	0.006917	8.84	507.64	230.88	0.68
1	307.2792	100yr	2800.00	924.63	933.52		934.54	0.007009	9.27	561.56	239.07	0.69
1	307.2792	500yr	3650.00	924.63	934.28		935.45	0.007067	10.13	686.44	253.88	0.71
1	200.7906	2yr	1100.00	924.60	929.04	928.93	930.41	0.015170	9.40	119.53	49.42	0.94
1	200.7906	5yr	1340.00	924.60	929.38	929.37	931.03	0.016594	10.30	130.08	39.00	0.99

1	200.7906	10yr	1650.00	924.60	929.98	929.98	931.68	0.015028	10.55	171.23	60.92	0.96
1	200.7906	25yr	2110.00	924.60	930.75	930.75	932.56	0.013788	10.96	225.68	168.58	0.94
1	200.7906	50yr	2450.00	924.60	931.31	931.31	933.09	0.012916	10.98	286.75	237.74	0.91
1	200.7906	100yr	2800.00	924.60	931.81	931.81	933.55	0.011340	10.99	359.00	296.45	0.87
1	200.7906	500yr	3650.00	924.60	932.67	932.67	934.51	0.010154	11.57	502.99	320.43	0.85
1	185.0263	2yr	1100.00	924.31	929.15	928.52	930.09	0.009752	7.78	146.85	57.76	0.75
1	185.0263	5yr	1340.00	924.31	929.54	928.93	930.66	0.010465	8.50	157.61	43.75	0.79
1	185.0263	10yr	1650.00	924.31	929.84	929.54	931.23	0.012106	9.50	189.35	64.67	0.86
1	185.0263	25yr	2110.00	924.31	930.19	930.19	932.05	0.015081	11.05	212.71	117.70	0.96
1	185.0263	50yr	2450.00	924.31	930.68	930.68	932.62	0.014569	11.34	247.13	164.14	0.96
1	185.0263	100yr	2800.00	924.31	931.18	931.18	933.15	0.013848	11.49	286.61	224.37	0.94
1	185.0263	500yr	3650.00	924.31	932.40	932.40	934.18	0.011150	11.12	464.01	348.55	0.86
1	28.22144	2yr	1100.00	923.36	927.55	927.20	928.32	0.012425	7.05	156.07	69.60	0.83
1	28.22144	5yr	1340.00	923.36	927.97	927.57	928.75	0.012712	7.13	187.94	83.91	0.84
1	28.22144	10yr	1650.00	923.36	928.47	928.02	929.25	0.010860	7.11	232.11	92.46	0.79
1	28.22144	25yr	2110.00	923.36	929.15	928.48	929.92	0.009085	7.03	299.96	106.17	0.74
1	28.22144	50yr	2450.00	923.36	929.60	928.81	930.36	0.008218	7.02	349.29	117.66	0.71
1	28.22144	100yr	2800.00	923.36	930.02	929.11	930.78	0.007603	7.00	405.72	185.15	0.69
1	28.22144	500yr	3650.00	923.36	930.89	929.72	931.67	0.005831	7.10	555.43	329.03	0.63
1	12.13838	2yr	1100.00	923.37	927.82	926.22	928.07	0.002999	4.02	273.33	96.95	0.42
1	12.13838	5yr	1340.00	923.37	928.23	926.56	928.51	0.003000	4.26	314.30	101.97	0.43
1	12.13838	10yr	1650.00	923.37	928.71	926.93	929.03	0.003001	4.52	364.75	108.12	0.43
1	12.13838	25yr	2110.00	923.37	929.36	927.40	929.72	0.003001	4.82	437.99	118.18	0.44
1	12.13838	50yr	2450.00	923.37	929.78	927.69	930.17	0.003005	5.01	489.33	124.75	0.45
1	12.13838	100yr	2800.00	923.37	930.18	927.98	930.60	0.003003	5.18	540.66	130.98	0.45
1	12.13838	500yr	3650.00	923.37	931.03	928.60	931.51	0.003006	5.54	672.53	391.69	0.46

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)
1	8000		2yr	1003.06	1002.57	0.49	6.03	0.02	40.61	499.39		109.97
1	8000		5yr	1003.77	1003.11	0.66	6.21	0.02		690.00		38.80
1	8000		10yr	1003.80	1003.23	0.57	5.86	0.04	130.44	729.35	0.21	177.72
1	8000		25yr	1004.17	1003.54	0.63	5.74	0.05	202.90	864.80	2.30	203.72
1	8000		50yr	1004.42	1003.77	0.65	5.63	0.06	273.66	961.25	5.09	216.17
1	8000		100yr	1004.66	1003.99	0.66	5.55	0.07	338.16	1052.76	9.09	236.49
1	8000		500yr	1005.12	1004.45	0.67	5.28	0.08	527.38	1240.20	22.42	253.34
1	7548		2yr	997.02	996.29	0.73	10.00	0.04	4.82	535.18		59.35
1	7548		5yr	997.53	996.64	0.89	9.88	0.04		690.00		38.16
1	7548		10yr	997.90	996.90	1.00	9.68	0.04	33.41	826.59		75.84
1	7548		25yr	998.38	997.27	1.11	9.46	0.05	64.36	1005.59	0.05	80.09
1	7548		50yr	998.73	997.52	1.22	9.33	0.06	91.06	1148.54	0.41	83.36
1	7548		100yr	999.05	997.73	1.32	9.21	0.06	117.42	1281.48	1.11	86.14
1	7548		500yr	999.75	998.23	1.52	4.24	0.19	189.08	1596.15	4.77	92.64
1	7061		2yr	986.98	985.90	1.08	0.35	0.48		680.00		38.27
1	7061		5yr	987.61	986.35	1.25	0.32	0.56		890.00		39.36
1	7061		10yr	988.17	986.75	1.42	0.29	0.63		1100.00		40.29
1	7061		25yr	988.87	987.22	1.64	0.26	0.74		1380.00		41.35
1	7061		50yr	989.35	987.56	1.78	0.25	0.80		1590.00		42.12
1	7061		100yr	989.78	987.89	1.89	0.23	0.85		1790.00		42.86
1	7061		500yr	991.75	990.86	0.90	0.14	0.35		2300.00		53.32
1	6930		2yr	983.09	982.97	0.12				680.00		48.57
1	6930		5yr	984.23	984.09	0.14				890.00		51.60
1	6930		10yr	985.27	985.12	0.15				1100.00		55.45
1	6930		25yr	986.57	986.40	0.17				1380.00		60.72
1	6930		50yr	987.49	987.31	0.18				1590.00		64.44
1	6930		100yr	988.34	988.15	0.19				1790.00		67.92
1	6930		500yr	991.26	991.07	0.19				2300.00		79.92
1	6719	S. Marietta Pkwy		Culvert								
1	6496		2yr	972.62	972.08	0.54	0.89	0.23	2.36	677.39	0.24	38.10
1	6496		5yr	973.44	972.74	0.70	0.92	0.24	4.56	885.01	0.43	43.03
1	6496		10yr	973.93	972.95	0.99	1.00	0.14	6.17	1093.25	0.58	44.62
1	6496		25yr	974.69	973.34	1.34	1.11	0.09	8.92	1370.26	0.82	47.62
1	6496		50yr	975.18	973.49	1.69	1.21	0.01	10.74	1578.28	0.97	48.69
1	6496		100yr	975.70	973.73	1.98	1.23	0.10	12.92	1775.92	1.16	50.50
1	6496		500yr	977.01	974.26	2.75	1.30	0.43	18.80	2279.54	1.66	54.46
1	6278		2yr	971.51	970.22	1.30	4.30	0.01	2.89	677.11		74.61
1	6278		5yr	972.27	970.77	1.50	4.22	0.02	16.57	873.43		51.99
1	6278		10yr	972.79	971.33	1.46	3.61	0.04	73.85	1026.09	0.06	97.86
1	6278		25yr	973.49	971.85	1.64	3.48	0.06	132.78	1246.76	0.45	108.87

1	6278		50yr	973.96	972.22	1.74	3.39	0.07	182.47	1405.60	1.92	123.79
1	6278		100yr	974.37	972.60	1.78	1.54	0.19	236.94	1546.87	6.19	138.43
1	6278		500yr	975.28	973.40	1.88	1.34	0.20	383.55	1884.64	31.81	164.67
1	5629		2yr	963.99	962.58	1.41	0.65	0.40	0.01	679.99		26.24
1	5629		5yr	964.81	963.15	1.67	0.62	0.51		890.00		25.76
1	5629		10yr	965.56	963.66	1.90	0.40	0.65	1.36	1098.64	0.00	28.88
1	5629		25yr	966.49	964.29	2.20	0.38	0.75	3.84	1376.15	0.01	30.41
1	5629		50yr	967.14	964.73	2.42	0.41	0.78	6.55	1583.44	0.02	31.48
1	5629		100yr	968.86	967.71	1.14	0.16	0.28	29.46	1760.45	0.09	38.76
1	5629		500yr	970.64	969.41	1.23	0.03	0.60	65.40	2234.42	0.18	116.98
1	5428		2yr	961.54	960.93	0.61			1.78	677.93	0.29	334.51
1	5428		5yr	962.76	962.12	0.64				890.00		25.76
1	5428		10yr	964.08	963.47	0.61			6.52	1090.38	3.09	375.98
1	5428		25yr	965.28	964.57	0.71			9.44	1365.42	5.14	411.45
1	5428		50yr	965.78	964.93	0.86			11.27	1572.39	6.34	429.26
1	5428		100yr	968.42	967.84	0.58			15.37	1764.60	10.03	446.55
1	5428		500yr	970.01	969.97	0.04			1440.37	850.11	9.53	463.29
1	5146	I-75		Culvert								
1	4969		2yr	955.81	954.86	0.95	0.91	0.36		680.00		22.59
1	4969		5yr	956.80	955.71	1.09	0.85	0.41		890.00		23.15
1	4969		10yr	957.69	956.47	1.22	0.81	0.46	0.00	1100.00		23.87
1	4969		25yr	958.77	957.38	1.39	0.78	0.52	0.47	1379.53		26.37
1	4969		50yr	959.52	957.99	1.52	0.76	0.57	1.06	1588.80	0.14	29.27
1	4969		100yr	960.19	958.55	1.64	0.75	0.61	1.74	1787.64	0.63	32.19
1	4969		500yr	961.76	959.79	1.97	0.74	0.74	3.70	2293.74	2.56	38.76
1	4925.680		2yr	954.54	954.31	0.24				680.00		40.46
1	4925.680		5yr	955.53	955.27	0.27				890.00		41.31
1	4925.680		10yr	956.42	956.12	0.30			0.26	1099.74		43.14
1	4925.680		25yr	957.48	957.13	0.35			1.95	1378.05		45.36
1	4925.680		50yr	958.18	957.80	0.38			4.43	1585.57		46.96
1	4925.680		100yr	958.82	958.41	0.41			7.93	1782.07		48.42
1	4925.680		500yr	960.28	959.79	0.49			21.85	2277.11	1.04	57.44
1	4918	BR 17 - Bent19		Bridge								
1	4907.867		2yr	954.10	953.86	0.24	0.19	0.01		680.00		37.60
1	4907.867		5yr	955.12	954.85	0.27	0.19	0.01		890.00		38.78
1	4907.867		10yr	956.04	955.73	0.31	0.19	0.01	0.06	1099.94		40.30
1	4907.867		25yr	957.13	956.77	0.36	0.19	0.01	1.16	1378.84		42.65
1	4907.867		50yr	957.85	957.46	0.39	0.19	0.01	3.18	1586.83		44.32
1	4907.867		100yr	958.51	958.09	0.43	0.19	0.01	6.24	1783.76	0.01	47.13
1	4907.867		500yr	960.01	959.50	0.51	0.19	0.01	18.98	2275.37	5.65	63.06
1	4783.015		2yr	953.90	953.69	0.21	0.01	0.00		680.00		36.52
1	4783.015		5yr	954.92	954.67	0.25	0.01	0.00		890.00		37.82
1	4783.015		10yr	955.85	955.56	0.29	0.01	0.00		1100.00		38.99
1	4783.015		25yr	956.94	956.60	0.34	0.01	0.00		1380.00		40.37
1	4783.015		50yr	957.66	957.28	0.38	0.01	0.00		1590.00		41.28
1	4783.015		100yr	958.32	957.91	0.41	0.01	0.00		1790.00		42.10
1	4783.015		500yr	959.81	959.32	0.49	0.01	0.00		2300.00		43.96
1	4775	BR 17 - Bent18		Bridge								
1	4764.388		2yr	953.86	953.61	0.25	0.12	0.03		680.00		33.76
1	4764.388		5yr	954.89	954.58	0.30	0.12	0.04		890.00		35.68
1	4764.388		10yr	955.81	955.47	0.34	0.13	0.05		1100.00		37.50
1	4764.388		25yr	956.90	956.50	0.39	0.13	0.05		1380.00		39.96
1	4764.388		50yr	957.62	957.19	0.43	0.13	0.06		1590.00		40.93
1	4764.388		100yr	958.28	957.81	0.46	0.13	0.06		1790.00		41.82
1	4764.388		500yr	959.77	959.22	0.55	0.13	0.07		2300.00		43.83
1	4718		2yr	953.71	953.11	0.59	0.34	0.02		920.00		29.05
1	4718		5yr	954.72	954.02	0.70	0.35	0.03		1180.00		30.41
1	4718		10yr	955.63	954.83	0.81	0.37	0.03		1450.00		32.55
1	4718		25yr	956.71	955.78	0.93	0.38	0.04	0.65	1799.35		35.55
1	4718		50yr	957.43	956.41	1.02	0.39	0.04	2.51	2057.49		37.52
1	4718		100yr	958.08	956.98	1.10	0.39	0.05	5.70	2304.30		39.29
1	4718		500yr	959.56	958.27	1.29	0.40	0.05	20.21	2909.79		43.10
1	4643.051		2yr	953.35	952.57	0.78			6.29	913.71		29.10
1	4643.051		5yr	954.34	953.39	0.95			12.38	1167.62		27.96
1	4643.051		10yr	955.23	954.12	1.11			29.69	1420.31		34.01
1	4643.051		25yr	956.30	955.00	1.29	0.02	0.00	54.02	1745.98		36.78
1	4643.051		50yr	957.00	955.57	1.43	0.02	0.00	75.28	1984.72		38.56
1	4643.051		100yr	957.65	956.10	1.55	0.03	0.00	98.67	2211.33		40.05
1	4643.051		500yr	959.10	957.26	1.84	0.03	0.00	164.32	2765.68		44.01

1	4636	BR 17 - Bent17		Bridge								
1	4625.316		2yr	953.21	952.35	0.86	0.61	0.07	6.83	913.17		27.62
1	4625.316		5yr	954.20	953.15	1.06	0.64	0.08	16.68	1163.32		29.98
1	4625.316		10yr	955.10	953.85	1.26	0.69	0.09	30.82	1419.18		32.04
1	4625.316		25yr	956.16	954.67	1.50	0.73	0.11	55.26	1744.74		34.47
1	4625.316		50yr	956.86	955.17	1.69	0.76	0.12	76.11	1983.89		35.95
1	4625.316		100yr	957.49	955.62	1.87	0.79	0.14	98.77	2211.23		37.34
1	4625.316		500yr	958.91	956.62	2.30	0.86	0.17	164.00	2766.00		40.55
1	4503.708		2yr	952.54	951.90	0.64			0.74	919.26		29.79
1	4503.708		5yr	953.48	952.69	0.79			3.68	1176.32		32.23
1	4503.708		10yr	954.32	953.38	0.94			9.06	1440.95		34.36
1	4503.708		25yr	955.32	954.20	1.13			19.93	1779.74	0.33	40.61
1	4503.708		50yr	955.97	954.69	1.28			29.64	2027.82	2.54	46.32
1	4503.708		100yr	956.56	955.15	1.41			40.82	2261.39	7.79	50.46
1	4503.708		500yr	957.88	956.16	1.72			70.93	2827.28	31.79	56.37
1	4496	BR 17 - Bent16		Bridge								
1	4485.049		2yr	952.22	951.59	0.63	0.56	0.00	0.24	919.76		29.70
1	4485.049		5yr	953.15	952.37	0.78	0.58	0.01	2.04	1177.96		31.95
1	4485.049		10yr	953.97	953.03	0.94	0.62	0.02	5.86	1444.14		33.86
1	4485.049		25yr	954.96	953.83	1.13	0.63	0.05	14.30	1785.67	0.03	38.25
1	4485.049		50yr	955.58	954.28	1.29	0.65	0.07	21.60	2037.08	1.32	46.37
1	4485.049		100yr	956.13	954.68	1.45	0.66	0.10	29.73	2274.60	5.66	51.03
1	4485.049		500yr	957.38	955.55	1.83	0.68	0.17	53.89	2849.07	27.05	55.70
1	4361.840		2yr	951.66	951.04	0.62				920.00		32.38
1	4361.840		5yr	952.56	951.82	0.74				1180.00		33.96
1	4361.840		10yr	953.33	952.45	0.88				1449.99	0.01	38.77
1	4361.840		25yr	954.28	953.30	0.97				1780.73	19.27	70.89
1	4361.840		50yr	954.86	953.80	1.05			0.13	2012.12	47.75	73.17
1	4361.840		100yr	955.37	954.25	1.12			0.79	2228.15	81.06	75.28
1	4361.840		500yr	956.53	955.26	1.27	0.02	0.01	4.91	2744.81	180.28	77.51
1	4354	BR 17 - Bent15		Bridge								
1	4343.304		2yr	951.55	950.93	0.62	0.47	0.04		920.00		32.50
1	4343.304		5yr	952.44	951.71	0.73	0.50	0.05		1180.00		34.11
1	4343.304		10yr	953.21	952.34	0.87	0.54	0.05		1450.00		35.41
1	4343.304		25yr	954.13	953.12	1.01	0.55	0.07		1795.33	4.67	69.44
1	4343.304		50yr	954.71	953.60	1.11	0.54	0.09	0.01	2036.35	23.64	70.98
1	4343.304		100yr	955.23	954.04	1.19	0.53	0.10	0.27	2260.27	49.46	73.07
1	4343.304		500yr	956.36	954.99	1.37	0.51	0.13	3.32	2795.69	130.99	75.97
1	4222.473		2yr	951.03	950.56	0.48				920.00		35.45
1	4222.473		5yr	951.90	951.32	0.57				1180.00		37.16
1	4222.473		10yr	952.61	951.92	0.69				1450.00	0.01	43.66
1	4222.473		25yr	953.51	952.73	0.78			0.02	1778.86	21.12	97.09
1	4222.473		50yr	954.08	953.26	0.82			0.35	2000.95	58.70	99.30
1	4222.473		100yr	954.60	953.74	0.85			1.25	2205.25	103.50	100.54
1	4222.473		500yr	955.72	954.78	0.94			4.21	2694.85	230.94	102.64
1	4215	BR 17 - Bent14		Bridge								
1	4204.470		2yr	950.77	950.31	0.46	0.44	0.00		920.00		36.50
1	4204.470		5yr	951.62	951.06	0.55	0.45	0.00		1180.00		38.07
1	4204.470		10yr	952.32	951.65	0.67	0.48	0.01		1447.58	2.42	72.01
1	4204.470		25yr	953.15	952.38	0.77	0.48	0.02	0.10	1767.56	32.35	96.27
1	4204.470		50yr	953.69	952.87	0.82	0.47	0.02	0.67	1989.03	70.30	98.30
1	4204.470		100yr	954.18	953.31	0.87	0.46	0.03	1.79	2194.18	114.03	99.13
1	4204.470		500yr	955.29	954.32	0.96	0.43	0.04	5.24	2683.63	241.13	101.02
1	4080.463		2yr	950.33	949.85	0.48				916.10	3.90	49.15
1	4080.463		5yr	951.16	950.61	0.56				1180.00		44.42
1	4080.463		10yr	951.82	951.20	0.63				1429.85	20.15	60.90
1	4080.463		25yr	952.64	951.94	0.71				1767.43	32.57	79.63
1	4080.463		50yr	953.20	952.45	0.75			1.46	2002.26	56.27	91.27
1	4080.463		100yr	953.69	952.92	0.77			6.14	2222.11	81.75	95.19
1	4080.463		500yr	954.82	953.98	0.84			26.47	2753.01	150.52	107.17
1	4074	BR 17 - Bent13		Bridge								
1	4062.727		2yr	950.19	949.71	0.48	0.49	0.00		917.67	2.33	47.78
1	4062.727		5yr	951.02	950.46	0.56	0.49	0.00		1180.00		44.43
1	4062.727		10yr	951.69	951.06	0.63	0.50	0.00		1435.29	14.71	61.06
1	4062.727		25yr	952.52	951.81	0.71	0.49	0.00		1771.67	28.34	82.98
1	4062.727		50yr	953.07	952.33	0.74	0.47	0.00	1.69	2005.01	53.30	94.80
1	4062.727		100yr	953.56	952.79	0.77	0.44	0.01	6.44	2223.64	79.92	98.65
1	4062.727		500yr	954.67	953.83	0.84	0.39	0.04	26.51	2758.27	145.22	117.30

1	3940.903		2yr	949.70	949.20	0.50				916.05	3.95	49.15
1	3940.903		5yr	950.52	949.94	0.58				1180.00		44.04
1	3940.903		10yr	951.19	950.55	0.64				1427.13	22.87	72.84
1	3940.903		25yr	952.02	951.33	0.70				1748.74	51.26	87.65
1	3940.903		50yr	952.60	951.87	0.74			1.36	1990.03	68.61	134.41
1	3940.903		100yr	953.10	952.38	0.73			6.39	2181.08	122.53	139.16
1	3940.903		500yr	954.24	953.54	0.70			28.60	2629.09	272.30	151.76
1	3934	BR 17 - Bent12		Bridge								
1	3922.633		2yr	949.34	948.89	0.45	0.36	0.03		915.05	4.95	51.10
1	3922.633		5yr	950.17	949.64	0.53	0.37	0.04		1180.00		44.82
1	3922.633		10yr	950.84	950.24	0.59	0.37	0.04		1427.46	22.54	67.89
1	3922.633		25yr	951.69	951.04	0.65	0.35	0.05	0.00	1755.50	44.49	104.42
1	3922.633		50yr	952.27	951.60	0.67	0.33	0.06	3.12	1986.22	70.66	127.04
1	3922.633		100yr	952.79	952.11	0.67	0.30	0.07	9.28	2184.39	116.33	140.60
1	3922.633		500yr	953.95	953.28	0.67	0.24	0.08	23.23	2646.65	260.12	174.72
1	3799.870		2yr	948.95	948.60	0.35				919.66	0.34	65.48
1	3799.870		5yr	949.76	949.35	0.42				1180.00		45.55
1	3799.870		10yr	950.42	949.96	0.47				1417.99	32.02	133.76
1	3799.870		25yr	951.29	950.81	0.47			3.34	1690.43	106.23	174.31
1	3799.870		50yr	951.88	951.42	0.46			10.02	1869.64	180.34	199.78
1	3799.870		100yr	952.42	951.98	0.44	0.01	0.00	18.31	2015.31	276.38	235.23
1	3799.870		500yr	953.63	953.23	0.40			60.67	2351.09	518.24	269.34
1	3792	BR 17 - Bent11		Bridge								
1	3781.101		2yr	948.80	948.46	0.34	0.30	0.00		919.98	0.02	46.67
1	3781.101		5yr	949.61	949.20	0.41	0.31	0.00		1180.00		45.66
1	3781.101		10yr	950.32	949.87	0.45	0.30	0.00		1424.49	25.51	130.23
1	3781.101		25yr	951.21	950.75	0.46	0.27	0.00	4.53	1700.04	95.43	172.69
1	3781.101		50yr	951.82	951.37	0.45	0.26	0.00	8.98	1883.95	167.07	204.72
1	3781.101		100yr	952.37	951.93	0.44	0.23	0.01	22.01	2039.47	248.52	234.30
1	3781.101		500yr	953.57	953.18	0.39	0.18	0.01	69.28	2362.98	497.74	255.56
1	3659.612		2yr	948.50	948.14	0.36				920.00	0.00	45.29
1	3659.612		5yr	949.29	948.86	0.43				1180.00		45.38
1	3659.612		10yr	950.03	949.56	0.46	0.01	0.00		1416.58	33.42	98.95
1	3659.612		25yr	950.94	950.45	0.49	0.01	0.00	3.72	1712.28	84.00	130.30
1	3659.612		50yr	951.56	951.06	0.50	0.01	0.00	10.78	1927.19	122.03	164.73
1	3659.612		100yr	952.13	951.64	0.49	0.01	0.00	20.57	2103.04	186.39	196.16
1	3659.612		500yr	953.38	952.93	0.45	0.01	0.00	68.43	2470.40	391.17	225.80
1	3652	BR 17 - Bent10		Bridge								
1	3641.433		2yr	948.45	948.08	0.37	0.34	0.00		920.00		43.73
1	3641.433		5yr	949.24	948.80	0.44	0.36	0.00		1180.00		45.26
1	3641.433		10yr	949.98	949.50	0.48	0.36	0.01		1424.30	25.70	92.95
1	3641.433		25yr	950.90	950.39	0.51	0.33	0.01	3.20	1727.69	69.11	132.45
1	3641.433		50yr	951.51	951.00	0.51	0.32	0.01	10.11	1932.34	117.55	154.67
1	3641.433		100yr	952.09	951.58	0.51	0.29	0.02	19.32	2116.44	174.24	193.26
1	3641.433		500yr	953.34	952.88	0.46	0.24	0.03	67.76	2483.19	379.05	243.57
1	3518.856		2yr	948.11	947.71	0.39				920.00		43.13
1	3518.856		5yr	948.88	948.40	0.48				1180.00		45.90
1	3518.856		10yr	949.62	949.08	0.54				1450.00		48.58
1	3518.856		25yr	950.56	949.95	0.60			1.79	1797.95	0.26	62.62
1	3518.856		50yr	951.19	950.55	0.64			7.94	2050.77	1.29	68.05
1	3518.856		100yr	951.78	951.12	0.66			15.68	2290.99	3.33	77.54
1	3518.856		500yr	953.07	952.35	0.72			56.77	2861.20	12.04	102.60
1	3512	BR 17 - Bent09		Bridge								
1	3500.626		2yr	947.94	947.56	0.39	0.35	0.00		920.00		43.32
1	3500.626		5yr	948.71	948.24	0.47	0.38	0.00		1180.00		46.05
1	3500.626		10yr	949.45	948.92	0.53	0.38	0.00		1450.00		48.76
1	3500.626		25yr	950.38	949.79	0.59	0.35	0.01	2.04	1796.80	1.16	66.64
1	3500.626		50yr	951.01	950.38	0.63	0.33	0.02	8.27	2047.58	4.16	72.03
1	3500.626		100yr	951.59	950.94	0.66	0.31	0.02	15.93	2285.47	8.60	81.35
1	3500.626		500yr	952.85	952.13	0.72	0.27	0.03	54.46	2851.92	23.62	100.67
1	3378.489		2yr	947.60	947.21	0.39				920.00		43.34
1	3378.489		5yr	948.33	947.86	0.47				1180.00		45.90
1	3378.489		10yr	949.08	948.55	0.53				1438.85	11.15	75.18
1	3378.489		25yr	950.03	949.47	0.56			2.16	1757.15	40.69	88.77
1	3378.489		50yr	950.66	950.09	0.57			8.63	1984.21	67.16	93.66
1	3378.489		100yr	951.26	950.68	0.58	0.01	0.00	17.32	2197.30	95.38	102.09
1	3378.489		500yr	952.54	951.93	0.61	0.01	0.00	59.87	2705.44	164.69	120.88
1	3371	BR 17 - Bent08		Bridge								

1	3360.436		2yr	947.52	947.13	0.39	0.37	0.00		920.00		43.25
1	3360.436		5yr	948.25	947.76	0.48	0.41	0.00		1180.00		45.77
1	3360.436		10yr	949.00	948.46	0.54	0.41	0.01		1442.38	7.62	71.97
1	3360.436		25yr	949.97	949.40	0.57	0.37	0.01	2.12	1764.87	33.01	85.53
1	3360.436		50yr	950.61	950.02	0.58	0.35	0.01	8.65	1995.14	56.21	90.42
1	3360.436		100yr	951.21	950.61	0.59	0.33	0.01	17.36	2211.60	81.04	98.81
1	3360.436		500yr	952.49	951.86	0.63	0.28	0.01	59.57	2728.09	142.34	117.23
1	3238.304		2yr	947.15	946.74	0.42				920.00		42.53
1	3238.304		5yr	947.83	947.30	0.53				1180.00		44.75
1	3238.304		10yr	948.59	947.99	0.60				1450.00		47.52
1	3238.304		25yr	949.59	948.96	0.63			1.04	1798.97		60.54
1	3238.304		50yr	950.25	949.59	0.66			7.11	2052.89		65.58
1	3238.304		100yr	950.87	950.20	0.67			14.04	2295.88	0.08	78.18
1	3238.304		500yr	952.20	951.50	0.70			58.33	2863.36	8.31	105.21
1	3231	BR 17 - Bent07		Bridge								
1	3220.243		2yr	946.98	946.57	0.41	0.32	0.04		920.00		42.67
1	3220.243		5yr	947.65	947.13	0.52	0.35	0.03		1180.00		44.88
1	3220.243		10yr	948.42	947.83	0.59	0.35	0.04		1450.00		47.67
1	3220.243		25yr	949.42	948.80	0.62	0.34	0.05	1.26	1798.74		60.85
1	3220.243		50yr	950.07	949.42	0.65	0.34	0.06	7.46	2052.54		65.81
1	3220.243		100yr	950.69	950.03	0.66	0.32	0.07	14.65	2295.31	0.04	76.44
1	3220.243		500yr	952.01	951.31	0.70	0.29	0.08	58.93	2867.88	3.20	96.44
1	3147		2yr	946.62	945.86	0.76	0.39	0.03		1100.00		40.55
1	3147		5yr	947.27	946.40	0.87	0.39	0.03		1340.00		42.71
1	3147		10yr	948.03	947.05	0.98	0.39	0.03		1650.00		45.28
1	3147		25yr	949.03	947.91	1.12	0.38	0.03		2110.00		48.71
1	3147		50yr	949.68	948.44	1.23	0.39	0.03	0.52	2449.48		59.46
1	3147		100yr	950.31	948.99	1.31	0.38	0.03	6.38	2793.62		63.83
1	3147		500yr	951.64	950.15	1.50	0.36	0.03	33.54	3616.44	0.02	75.86
1	3097.384		2yr	946.21	945.18	1.03				1100.00		38.45
1	3097.384		5yr	946.85	945.69	1.16				1340.00		40.51
1	3097.384		10yr	947.61	946.34	1.27				1650.00		43.12
1	3097.384		25yr	948.63	947.23	1.40				2110.00		46.66
1	3097.384		50yr	949.25	947.69	1.56				2450.00		48.52
1	3097.384		100yr	949.89	948.23	1.66			0.13	2799.87		58.90
1	3097.384		500yr	951.25	949.43	1.81			20.21	3629.79		68.56
1	3090	BR 17 - Bent06		Bridge								
1	3079.078		2yr	945.87	944.47	1.40	1.14	0.19		1100.00		36.42
1	3079.078		5yr	946.52	945.06	1.46	1.04	0.20		1340.00		38.78
1	3079.078		10yr	947.30	945.81	1.49	0.91	0.20		1650.00		41.81
1	3079.078		25yr	948.34	946.78	1.55	0.83	0.20		2110.00		45.68
1	3079.078		50yr	948.96	947.20	1.76	0.91	0.22		2450.00		47.33
1	3079.078		100yr	949.58	947.70	1.88	0.91	0.23		2800.00		49.36
1	3079.078		500yr	950.92	948.80	2.11	0.88	0.25	10.83	3639.17		65.13
1	2955.929		2yr	944.53	943.77	0.76				1100.00		40.73
1	2955.929		5yr	945.28	944.49	0.79				1340.00		43.61
1	2955.929		10yr	946.19	945.37	0.82				1650.00		47.14
1	2955.929		25yr	947.31	946.43	0.88			0.82	2109.18		60.28
1	2955.929		50yr	947.83	946.79	1.04			4.32	2445.69		63.23
1	2955.929		100yr	948.45	947.33	1.12			13.07	2786.93		67.49
1	2955.929		500yr	949.79	948.51	1.27			50.56	3599.44		85.37
1	2949	BR 17 - Bent05		Bridge								
1	2937.884		2yr	944.30	943.52	0.78	0.36	0.05		1100.00		40.51
1	2937.884		5yr	945.06	944.26	0.80	0.32	0.05		1340.00		43.48
1	2937.884		10yr	945.99	945.17	0.82	0.28	0.05		1650.00		47.12
1	2937.884		25yr	947.11	946.22	0.89	0.25	0.06	0.79	2109.21		60.24
1	2937.884		50yr	947.61	946.56	1.05	0.28	0.08	3.97	2446.03		62.98
1	2937.884		100yr	948.22	947.08	1.14	0.28	0.08	12.25	2787.75		67.11
1	2937.884		500yr	949.52	948.19	1.33	0.28	0.08	44.72	3605.28		84.43
1	2870		2yr	943.88	943.27	0.62	0.25	0.03		1100.00		42.90
1	2870		5yr	944.69	944.05	0.64	0.23	0.03		1340.00		46.14
1	2870		10yr	945.65	945.01	0.64	0.20	0.02	7.09	1642.91		69.83
1	2870		25yr	946.79	946.12	0.67	0.17	0.02	41.05	2068.88	0.08	74.03
1	2870		50yr	947.26	946.46	0.80	0.19	0.02	59.18	2390.53	0.29	75.27
1	2870		100yr	947.86	946.98	0.87	0.19	0.01	87.52	2711.49	0.98	77.22
1	2870		500yr	949.15	948.10	1.06	0.19	0.00	164.20	3481.16	4.64	81.35
1	2813.979		2yr	943.61	943.07	0.53				1100.00		44.16
1	2813.979		5yr	944.44	943.89	0.55				1340.00		47.52
1	2813.979		10yr	945.43	944.87	0.56			4.06	1645.94		60.86
1	2813.979		25yr	946.61	946.00	0.61			20.39	2089.15	0.46	65.94

1	2813.979	50yr	947.05	946.31	0.75			28.86	2420.07	1.07	67.40
1	2813.979	100yr	947.65	946.82	0.83			42.70	2754.58	2.72	69.81
1	2813.979	500yr	948.95	947.91	1.04			81.50	3558.47	10.03	75.98
1	2807 BR 17 - Bent04		Bridge								
1	2795.938	2yr	943.53	942.97	0.56	0.44	0.04		1100.00		43.75
1	2795.938	5yr	944.36	943.79	0.57	0.40	0.04		1340.00		47.13
1	2795.938	10yr	945.35	944.76	0.58	0.34	0.03	3.83	1646.17		60.98
1	2795.938	25yr	946.49	945.86	0.64	0.31	0.04	20.26	2086.89	2.85	81.27
1	2795.938	50yr	946.91	946.13	0.78	0.36	0.05	28.09	2415.16	6.75	82.94
1	2795.938	100yr	947.48	946.60	0.87	0.37	0.06	41.19	2742.88	15.93	85.89
1	2795.938	500yr	948.70	947.61	1.09	0.38	0.09	77.02	3527.68	45.30	93.75
1	2668.395	2yr	943.05	942.62	0.44				1100.00		45.65
1	2668.395	5yr	943.93	943.48	0.45				1340.00		49.10
1	2668.395	10yr	944.97	944.50	0.47				1647.12	2.88	75.59
1	2668.395	25yr	946.15	945.65	0.50			1.84	2069.14	39.02	126.24
1	2668.395	50yr	946.50	945.88	0.62			3.81	2387.41	58.79	128.48
1	2668.395	100yr	947.05	946.37	0.68			9.59	2690.31	100.10	131.56
1	2668.395	500yr	948.23	947.42	0.81			30.14	3402.77	217.09	138.08
1	2662 BR 17 - Bent03		Bridge								
1	2650.675	2yr	942.80	942.39	0.41	0.47	0.04		1100.00		62.98
1	2650.675	5yr	943.65	943.23	0.42	0.51	0.09		1340.00		64.90
1	2650.675	10yr	944.46	944.04	0.42	0.40	0.06	57.78	1591.71	0.52	84.86
1	2650.675	25yr	945.58	945.13	0.45	0.31	0.03	91.21	2007.15	11.64	139.64
1	2650.675	50yr	945.92	945.36	0.56	0.40	0.05	109.46	2317.44	23.09	140.65
1	2650.675	100yr	946.45	945.83	0.62	0.40	0.05	132.71	2615.42	51.86	142.71
1	2650.675	500yr	947.58	946.83	0.75	0.40	0.05	191.07	3316.49	142.44	147.06
1	2537.862	2yr	942.29	941.47	0.82	0.03	0.01	72.60	1027.40		53.92
1	2537.862	5yr	943.05	941.68	1.36	0.04	0.01		1340.00		29.06
1	2537.862	10yr	944.01	943.01	0.99	0.03	0.01	124.99	1525.01		103.06
1	2537.862	25yr	945.24	944.46	0.78	0.02	0.02	326.65	1774.39	8.96	145.45
1	2537.862	50yr	945.47	944.38	1.09	0.04	0.12	370.53	2071.19	8.27	144.77
1	2537.862	100yr	946.00	944.88	1.12	0.03	0.09	484.60	2287.85	27.55	149.22
1	2537.862	500yr	947.13	945.92	1.21	0.03	0.10	761.61	2793.83	94.56	158.37
1	2532 BR 17 - Bent02		Bridge								
1	2520.830	2yr	942.04	940.35	1.68	0.73	0.38		1100.00		48.12
1	2520.830	5yr	942.80	940.83	1.97	0.84	0.42		1340.00		28.28
1	2520.830	10yr	943.71	941.42	2.29	0.83	0.51		1650.00		55.78
1	2520.830	25yr	944.91	942.32	2.59	0.80	0.58		2110.00		73.54
1	2520.830	50yr	945.05	943.01	2.04	0.67	0.42	223.56	2226.44		106.13
1	2520.830	100yr	945.56	943.69	1.87	0.65	0.36	358.86	2441.14		119.00
1	2520.830	500yr	946.62	944.51	2.11	0.65	0.40	628.83	3014.56	6.62	139.26
1	2390.934	2yr	940.92	940.49	0.43	0.22	0.12	29.40	1070.60		64.94
1	2390.934	5yr	941.54	940.97	0.57	0.24	0.10		1340.00		43.58
1	2390.934	10yr	942.25	941.66	0.60	0.23	0.12	58.19	1591.81		118.44
1	2390.934	25yr	943.21	942.57	0.64	0.23	0.14	147.63	1962.37		169.75
1	2390.934	50yr	943.86	943.23	0.63	0.21	0.16	264.89	2182.90	2.21	180.13
1	2390.934	100yr	944.30	943.62	0.68	0.20	0.13	360.52	2434.16	5.32	182.03
1	2390.934	500yr	945.35	944.58	0.77	0.19	0.12	630.24	3002.07	17.69	186.71
1	2354.325 BR 17 - Bent01	2yr	940.58	938.93	1.65	0.44	0.41		1100.00		32.44
1	2354.325 BR 17 - Bent01	5yr	941.19	939.60	1.60	0.37	0.39		1340.00		41.35
1	2354.325 BR 17 - Bent01	10yr	941.90	940.11	1.79	0.41	0.43		1650.00		45.72
1	2354.325 BR 17 - Bent01	25yr	942.85	940.79	2.06	0.40	0.49		2110.00		49.41
1	2354.325 BR 17 - Bent01	50yr	943.49	941.25	2.24	0.40	0.53		2450.00		95.28
1	2354.325 BR 17 - Bent01	100yr	943.98	941.99	1.98	0.38	0.43	69.54	2730.46		115.04
1	2354.325 BR 17 - Bent01	500yr	945.05	943.06	1.98	0.38	0.40	250.88	3399.10	0.02	149.17
1	2262	2yr	939.49	939.20	0.29	0.35	0.00		1100.00		64.46
1	2262	5yr	940.38	940.09	0.29	0.31	0.01		1340.00		64.23
1	2262	10yr	940.91	940.55	0.37	0.37	0.01		1650.00	0.00	82.48
1	2262	25yr	941.85	941.42	0.43	0.38	0.01	16.85	2092.97	0.18	107.32
1	2262	50yr	942.43	941.95	0.48	0.38	0.01	33.73	2415.78	0.50	147.25
1	2262	100yr	942.92	942.38	0.54	0.40	0.01	63.72	2735.35	0.93	149.01
1	2262	500yr	944.02	943.37	0.65	0.42	0.01	170.72	3476.62	2.66	149.94
1	2081.919	2yr	939.14	938.83	0.31	0.91	0.01	6.48	1093.43	0.09	54.50
1	2081.919	5yr	940.07	939.71	0.35	0.80	0.00		1338.46	1.54	48.13
1	2081.919	10yr	940.54	940.08	0.46	0.82	0.04	25.20	1621.54	3.26	122.36
1	2081.919	25yr	941.46	940.90	0.55	0.75	0.09	86.03	2014.25	9.72	204.59
1	2081.919	50yr	942.04	941.46	0.58	0.70	0.10	178.17	2255.38	16.45	207.12
1	2081.919	100yr	942.51	941.87	0.63	0.72	0.11	269.72	2506.71	23.57	208.99
1	2081.919	500yr	943.59	942.88	0.71	0.71	0.13	544.08	3058.80	47.13	213.58

1	1650	2yr	938.22	937.78	0.44	0.43	0.00	61.97	1038.03		216.85
1	1650	5yr	939.26	938.87	0.39	0.38	0.01	139.02	1200.98		192.85
1	1650	10yr	939.68	939.36	0.31	0.32	0.00	401.63	1248.37	0.00	274.93
1	1650	25yr	940.62	940.36	0.27	0.27	0.00	711.58	1397.67	0.75	278.85
1	1650	50yr	941.24	940.99	0.25	0.25	0.00	935.85	1511.71	2.43	281.35
1	1650	100yr	941.67	941.41	0.27	0.26	0.01	1138.72	1656.87	4.41	283.01
1	1650	500yr	942.75	942.47	0.28	0.26	0.01	1664.65	1972.54	12.82	287.21
1	1492.060	2yr	937.79	937.35	0.44	1.65	0.06	54.30	1045.70		158.37
1	1492.060	5yr	938.88	938.40	0.48	1.55	0.06	72.33	1267.67		159.19
1	1492.060	10yr	939.35	938.99	0.36	1.54	0.12	356.45	1293.55		234.00
1	1492.060	25yr	940.35	940.04	0.31	1.46	0.18	655.59	1454.18	0.23	236.90
1	1492.060	50yr	940.99	940.69	0.30	1.40	0.20	871.16	1577.51	1.33	239.55
1	1492.060	100yr	941.41	941.08	0.33	1.31	0.14	1060.64	1736.62	2.74	241.17
1	1492.060	500yr	942.48	942.13	0.36	1.41	0.17	1563.87	2076.31	9.82	245.43
1	1084	2yr	936.08	935.03	1.05	0.41	0.01	13.50	1086.50	0.01	34.08
1	1084	5yr	937.26	936.13	1.13	0.37	0.02		1340.00		24.61
1	1084	10yr	937.68	936.10	1.59	0.55	0.04	35.11	1604.12	10.77	67.49
1	1084	25yr	938.71	936.64	2.08	0.63	0.13	53.74	2012.35	43.91	80.88
1	1084	50yr	939.39	937.12	2.27	0.63	0.18	70.19	2282.31	97.50	119.44
1	1084	100yr	939.96	938.27	1.69	0.54	0.01	95.62	2389.21	315.17	200.33
1	1084	500yr	940.90	938.83	2.07	0.51	0.19	129.54	2916.39	604.08	210.81
1	1027.831	2yr	935.67	934.63	1.04	0.37	0.15	20.17	1079.82	0.01	38.35
1	1027.831	5yr	936.87	935.81	1.06	0.33	0.12		1339.42	0.58	41.95
1	1027.831	10yr	937.09	935.65	1.45	0.41	0.24	50.36	1562.88	36.76	110.01
1	1027.831	25yr	937.95	936.31	1.65	0.43	0.28	74.57	1907.88	127.54	131.40
1	1027.831	50yr	938.48	936.82	1.66	0.42	0.28	93.07	2118.88	238.06	161.86
1	1027.831	100yr	939.00	937.24	1.76	0.41	0.32	112.27	2355.95	331.78	179.11
1	1027.831	500yr	940.04	938.61	1.42	0.34	0.22	156.12	2695.41	798.47	205.30
1	949.7572	2yr	935.15	934.61	0.53	0.10	0.11	73.44	1018.37	8.20	120.25
1	949.7572	5yr	936.41	935.77	0.64	0.10	0.12	14.74	1305.49	19.77	47.03
1	949.7572	10yr	936.44	935.80	0.64	0.10	0.13	213.46	1396.44	40.10	172.75
1	949.7572	25yr	937.24	936.54	0.70	0.11	0.14	331.76	1668.52	109.73	213.36
1	949.7572	50yr	937.77	937.06	0.71	0.12	0.13	420.00	1841.18	188.82	228.35
1	949.7572	100yr	938.28	937.56	0.71	0.12	0.13	508.87	1998.90	292.23	234.37
1	949.7572	500yr	939.48	938.77	0.71	0.11	0.12	737.49	2366.93	545.58	324.91
1	878.1000	2yr	934.94	934.78	0.15	0.00	0.00	43.96	967.66	88.38	180.73
1	878.1000	5yr	936.18	935.95	0.24	0.00	0.00		1335.32	4.68	47.03
1	878.1000	10yr	936.20	936.01	0.20	0.00	0.00	84.40	1346.55	219.05	212.37
1	878.1000	25yr	936.99	936.75	0.24	0.00	0.00	120.88	1660.24	328.88	241.23
1	878.1000	50yr	937.52	937.25	0.27	0.00	0.00	149.23	1878.39	422.38	264.19
1	878.1000	100yr	938.03	937.74	0.29	0.00	0.00	177.35	2073.77	548.89	282.35
1	878.1000	500yr	939.25	938.94	0.31	0.00	0.00	247.41	2491.73	910.86	314.33
1	871		Bridge								
1	859.3424	2yr	934.92	934.74	0.18	0.16	0.01	48.16	924.20	127.64	177.30
1	859.3424	5yr	936.16	935.85	0.31	0.21	0.03		1329.31	10.69	47.03
1	859.3424	10yr	936.18	935.96	0.22	0.17	0.02	89.48	1286.37	274.15	207.99
1	859.3424	25yr	936.97	936.69	0.27	0.19	0.01	126.63	1588.92	394.45	241.81
1	859.3424	50yr	937.50	937.19	0.31	0.19	0.01	155.75	1803.58	490.68	272.95
1	859.3424	100yr	938.01	937.68	0.32	0.19	0.01	183.93	1988.92	627.15	283.78
1	859.3424	500yr	939.22	938.89	0.34	0.18	0.01	254.20	2391.87	1003.93	308.83
1	735.5340	2yr	934.74	934.43	0.31	0.01	0.00	81.48	906.28	112.24	156.55
1	735.5340	5yr	935.92	935.34	0.57	0.01	0.00	8.21	1292.83	38.96	47.03
1	735.5340	10yr	935.99	935.61	0.38	0.01	0.00	163.67	1230.90	255.43	224.73
1	735.5340	25yr	936.77	936.37	0.40	0.01	0.00	230.01	1440.78	439.21	281.72
1	735.5340	50yr	937.30	936.89	0.41	0.01	0.00	282.11	1582.90	584.99	288.53
1	735.5340	100yr	937.80	937.39	0.42	0.01	0.00	335.81	1725.45	738.75	293.69
1	735.5340	500yr	939.03	938.61	0.42	0.01	0.00	470.67	2036.10	1143.23	304.01
1	728		Bridge								
1	716.3877	2yr	934.69	934.35	0.34	0.38	0.04	94.09	874.64	131.27	141.40
1	716.3877	5yr	935.84	935.14	0.70	0.51	0.03	21.47	1283.76	34.76	47.03
1	716.3877	10yr	935.94	935.54	0.40	0.36	0.03	188.24	1172.93	288.83	149.81
1	716.3877	25yr	936.70	936.24	0.47	0.38	0.02	270.04	1419.88	420.08	154.49
1	716.3877	50yr	937.22	936.63	0.59	0.41	0.01	344.20	1664.10	441.70	187.79
1	716.3877	100yr	937.70	937.02	0.68	0.43	0.00	417.72	1874.33	507.96	216.70
1	716.3877	500yr	938.91	938.23	0.69	0.41	0.00	593.28	2223.11	833.62	297.08
1	595.3610	2yr	934.27	933.52	0.75	0.02	0.01	58.59	1028.34	13.07	142.06
1	595.3610	5yr	935.30	934.29	1.02	0.02	0.01	13.38	1316.79	9.83	47.03
1	595.3610	10yr	935.55	934.88	0.67	0.02	0.02	168.63	1292.10	189.28	192.50
1	595.3610	25yr	936.31	935.65	0.66	0.02	0.02	256.20	1487.77	366.02	196.34
1	595.3610	50yr	936.80	936.13	0.67	0.02	0.02	320.86	1626.80	502.35	198.68
1	595.3610	100yr	937.27	936.59	0.68	0.02	0.02	388.00	1764.71	647.29	201.18

1	595.3610	500yr	938.51	937.80	0.70	0.02	0.02	579.43	2112.36	958.22	290.91
1	589		Bridge								
1	577.5895	2yr	934.10	933.21	0.89	0.14	0.00	53.72	1045.45	0.82	88.96
1	577.5895	5yr	935.13	933.96	1.17	0.14	0.06	9.54	1325.10	5.36	47.03
1	577.5895	10yr	935.34	934.29	1.05	0.16	0.02	141.33	1413.32	95.35	186.07
1	577.5895	25yr	936.13	935.22	0.91	0.14	0.03	236.80	1586.72	286.48	192.48
1	577.5895	50yr	936.64	935.77	0.87	0.13	0.02	303.67	1717.02	429.31	195.80
1	577.5895	100yr	937.12	936.27	0.85	0.12	0.02	371.59	1849.40	579.01	198.85
1	577.5895	500yr	938.33	937.40	0.93	0.13	0.03	568.19	2255.07	826.75	287.29
1	553	2yr	933.96	933.05	0.90	0.48	0.06	0.05	1099.95		52.04
1	553	5yr	934.93	933.95	0.98	0.46	0.04	6.76	1329.61	3.62	47.03
1	553	10yr	935.16	933.94	1.22	0.65	0.03	92.65	1530.99	26.36	179.04
1	553	25yr	935.96	934.76	1.20	0.67	0.02	172.86	1779.97	157.17	183.73
1	553	50yr	936.48	935.38	1.10	0.63	0.03	238.97	1918.18	292.85	188.60
1	553	100yr	936.98	935.93	1.05	0.65	0.06	305.20	2058.52	436.29	192.54
1	553	500yr	938.17	936.90	1.27	0.72	0.08	480.00	2569.60	600.40	342.73
1	459.5899	2yr	933.42	932.71	0.71	0.08	0.04		1060.80	39.21	107.59
1	459.5899	5yr	934.42	933.59	0.84	0.08	0.00		1312.95	27.05	45.57
1	459.5899	10yr	934.49	933.36	1.13	0.11	0.09		1517.71	132.29	117.69
1	459.5899	25yr	935.27	933.90	1.37	0.12	0.14		1855.39	254.61	123.79
1	459.5899	50yr	935.83	934.44	1.39	0.12	0.15		2061.48	388.52	138.65
1	459.5899	100yr	936.28	934.62	1.66	0.13	0.19		2323.03	476.97	161.74
1	459.5899	500yr	937.37	935.34	2.03	0.15	0.27	0.79	2889.51	759.70	177.49
1	441.5446	2yr	933.31	932.72	0.59	0.79	0.08		1001.71	98.29	133.19
1	441.5446	5yr	934.34	933.51	0.83	0.90	0.10		1304.19	35.81	44.41
1	441.5446	10yr	934.29	933.47	0.81	0.83	0.05		1382.68	267.32	139.95
1	441.5446	25yr	935.01	934.10	0.91	0.88	0.05		1657.70	452.30	148.38
1	441.5446	50yr	935.56	934.66	0.90	0.93	0.09		1826.72	623.28	156.53
1	441.5446	100yr	935.95	934.93	1.02	0.93	0.06		2041.20	758.80	176.94
1	441.5446	500yr	936.96	935.83	1.14	0.98	0.08	0.03	2490.56	1159.41	214.54
1	324.8710	2yr	932.43	931.00	1.43	0.25	0.03		1051.66	48.34	146.99
1	324.8710	5yr	933.33	931.46	1.87	0.27	0.09	0.08	1328.74	11.18	43.05
1	324.8710	10yr	933.41	932.13	1.28	0.17	0.08	0.98	1384.00	265.03	184.84
1	324.8710	25yr	934.08	932.64	1.44	0.15	0.15	2.88	1667.54	439.59	189.82
1	324.8710	50yr	934.55	932.76	1.79	0.16	0.25	3.87	1911.72	534.41	190.98
1	324.8710	100yr	934.95	933.29	1.66			7.50	2072.83	719.67	200.70
1	324.8710	500yr	935.90	933.96	1.94			14.39	2554.15	1081.46	223.36
1	307.2792	2yr	931.95	930.62	1.33	1.54	0.00		1069.05	30.95	77.33
1	307.2792	5yr	932.73	931.16	1.57	1.70	0.01		1339.91	0.09	41.01
1	307.2792	10yr	932.98	931.95	1.02	1.23	0.07		1426.31	223.69	199.18
1	307.2792	25yr	933.67	932.75	0.92	1.03	0.09	0.34	1683.00	426.67	216.05
1	307.2792	50yr	934.13	933.18	0.95	0.96	0.08	2.19	1885.89	561.91	230.88
1	307.2792	100yr	934.54	933.52	1.02	0.91	0.07	5.48	2102.79	691.73	239.07
1	307.2792	500yr	935.45	934.28	1.17	0.87	0.07	18.25	2611.16	1020.59	253.88
1	200.7906	2yr	930.41	929.04	1.37	0.19	0.13		1098.48	1.53	49.42
1	200.7906	5yr	931.03	929.38	1.65	0.20	0.16		1340.00		39.00
1	200.7906	10yr	931.68	929.98	1.70	0.21	0.10		1625.60	24.40	60.92
1	200.7906	25yr	932.56	930.75	1.81	0.23	0.00		2047.50	62.51	168.58
1	200.7906	50yr	933.09	931.31	1.78	0.22	0.02		2327.55	122.45	237.74
1	200.7906	100yr	933.55	931.81	1.74	0.20	0.02	1.49	2594.58	203.93	296.45
1	200.7906	500yr	934.51	932.67	1.84	0.17	0.02	28.51	3210.90	410.59	320.43
1	185.0263	2yr	930.09	929.15	0.94	1.72	0.05		1096.13	3.87	57.76
1	185.0263	5yr	930.66	929.54	1.12	1.80	0.10		1340.00		43.75
1	185.0263	10yr	931.23	929.84	1.38	1.79	0.18		1627.02	22.98	64.67
1	185.0263	25yr	932.05	930.19	1.86	1.80	0.33		2067.98	42.03	117.70
1	185.0263	50yr	932.62	930.68	1.94	1.68	0.35		2379.95	70.05	164.14
1	185.0263	100yr	933.15	931.18	1.97	1.57	0.36		2691.92	108.08	224.37
1	185.0263	500yr	934.18	932.40	1.78	1.23	0.30	21.50	3373.56	254.95	348.55
1	28.22144	2yr	928.32	927.55	0.77	0.09	0.16		1100.00		69.60
1	28.22144	5yr	928.75	927.97	0.79	0.09	0.15		1340.00		83.91
1	28.22144	10yr	929.25	928.47	0.78	0.08	0.14		1650.00		92.46
1	28.22144	25yr	929.92	929.15	0.77	0.08	0.12		2110.00		106.17
1	28.22144	50yr	930.36	929.60	0.76	0.08	0.11		2450.00	0.01	117.66
1	28.22144	100yr	930.78	930.02	0.76	0.07	0.10		2797.53	2.47	185.15
1	28.22144	500yr	931.67	930.89	0.78	0.07	0.09		3619.83	30.17	329.03
1	12.13838	2yr	928.07	927.82	0.25				1100.00		96.95
1	12.13838	5yr	928.51	928.23	0.28				1340.00		101.97
1	12.13838	10yr	929.03	928.71	0.32				1650.00		108.12
1	12.13838	25yr	929.72	929.36	0.36				2110.00		118.18
1	12.13838	50yr	930.17	929.78	0.39				2450.00		124.75
1	12.13838	100yr	930.60	930.18	0.42				2800.00		130.98

1	12.13838	500yr	931.51	931.03	0.48	3644.91	5.09	391.69

Profile Output Table - Six XS Bridge

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Crit W.S. (ft)	Frctn Loss (ft)	C & E Loss (ft)	Top Width (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Vel Chnl (ft/s)
1	4969	2yr	955.81	954.86	954.03	0.91	0.36	22.59		680.00		7.82
1	4969	5yr	956.80	955.71	954.65	0.85	0.41	23.15		890.00		8.38
1	4969	10yr	957.69	956.47	955.23	0.81	0.46	23.87	0.00	1100.00		8.87
1	4969	25yr	958.77	957.38	955.92	0.78	0.52	26.37	0.47	1379.53		9.47
1	4969	50yr	959.52	957.99	956.40	0.76	0.57	29.27	1.06	1588.80	0.14	9.91
1	4969	100yr	960.19	958.55	956.86	0.75	0.61	32.19	1.74	1787.64	0.63	10.30
1	4969	500yr	961.76	959.79	957.90	0.74	0.74	38.76	3.70	2293.74	2.56	11.28
1	4925.680	2yr	954.54	954.31	951.94			40.46		680.00		3.90
1	4925.680	5yr	955.53	955.27	952.39			41.31		890.00		4.16
1	4925.680	10yr	956.42	956.12	952.76			43.14	0.26	1099.74		4.42
1	4925.680	25yr	957.48	957.13	953.26			45.36	1.95	1378.05		4.74
1	4925.680	50yr	958.18	957.80	953.60			46.96	4.43	1585.57		4.97
1	4925.680	100yr	958.82	958.41	953.91			48.42	7.93	1782.07		5.17
1	4925.680	500yr	960.28	959.79	954.63			57.44	21.85	2277.11	1.04	5.66
1	4918 BR 17 - Bent19 BR U	2yr	954.41	954.16	951.83			38.81		680.00		4.01
1	4918 BR 17 - Bent19 BR U	5yr	955.39	955.10	952.26			39.50		890.00		4.30
1	4918 BR 17 - Bent19 BR U	10yr	956.28	955.95	952.66			41.09	0.24	1099.76		4.58
1	4918 BR 17 - Bent19 BR U	25yr	957.33	956.95	953.16			43.08	1.89	1378.11		4.92
1	4918 BR 17 - Bent19 BR U	50yr	958.03	957.62	953.50			44.54	4.37	1585.63		5.18
1	4918 BR 17 - Bent19 BR U	100yr	958.67	958.22	953.82			45.86	7.91	1782.10		5.40
1	4918 BR 17 - Bent19 BR U	500yr	960.12	959.57	954.56			48.62	22.30	2277.69	0.01	5.94
1	4918 BR 17 - Bent19 BR D	2yr	954.12	953.84	951.47			35.95		680.00		4.19
1	4918 BR 17 - Bent19 BR D	5yr	955.14	954.82	951.93			36.91		890.00		4.49
1	4918 BR 17 - Bent19 BR D	10yr	956.06	955.70	952.35			38.00	0.01	1099.99		4.76
1	4918 BR 17 - Bent19 BR D	25yr	957.14	956.74	952.87			40.03	0.76	1379.24		5.11
1	4918 BR 17 - Bent19 BR D	50yr	957.87	957.42	953.24			41.53	2.43	1587.57		5.37
1	4918 BR 17 - Bent19 BR D	100yr	958.53	958.04	953.58			42.90	5.18	1784.82		5.60
1	4918 BR 17 - Bent19 BR D	500yr	960.02	959.44	954.38			52.08	17.43	2281.94	0.63	6.15
1	4907.867	2yr	954.10	953.86		0.19	0.01	37.60		680.00		3.90
1	4907.867	5yr	955.12	954.85		0.19	0.01	38.78		890.00		4.20
1	4907.867	10yr	956.04	955.73		0.19	0.01	40.30	0.06	1099.94		4.46
1	4907.867	25yr	957.13	956.77		0.19	0.01	42.65	1.16	1378.84		4.80
1	4907.867	50yr	957.85	957.46		0.19	0.01	44.32	3.18	1586.83		5.04
1	4907.867	100yr	958.51	958.09		0.19	0.01	47.13	6.24	1783.76	0.01	5.25
1	4907.867	500yr	960.01	959.50		0.19	0.01	63.06	18.98	2275.37	5.65	5.75
1	4783.015	2yr	953.90	953.69	950.50	0.01	0.00	36.52		680.00		3.71
1	4783.015	5yr	954.92	954.67	951.02	0.01	0.00	37.82		890.00		4.05
1	4783.015	10yr	955.85	955.56	951.49	0.01	0.00	38.99		1100.00		4.33
1	4783.015	25yr	956.94	956.60	952.07	0.01	0.00	40.37		1380.00		4.67
1	4783.015	50yr	957.66	957.28	952.45	0.01	0.00	41.28		1590.00		4.92
1	4783.015	100yr	958.32	957.91	952.80	0.01	0.00	42.10		1790.00		5.12
1	4783.015	500yr	959.81	959.32	953.62	0.01	0.00	43.96		2300.00		5.61
1	4775 BR 17 - Bent18 BR U	2yr	953.89	953.68	950.47	0.01	0.01	36.57		680.00		3.68
1	4775 BR 17 - Bent18 BR U	5yr	954.92	954.67	951.00	0.01	0.01	37.87		890.00		4.02
1	4775 BR 17 - Bent18 BR U	10yr	955.84	955.55	951.45	0.01	0.01	39.04		1100.00		4.31
1	4775 BR 17 - Bent18 BR U	25yr	956.93	956.59	952.04	0.01	0.01	40.41		1380.00		4.65
1	4775 BR 17 - Bent18 BR U	50yr	957.65	957.28	952.43	0.01	0.01	41.33		1590.00		4.89
1	4775 BR 17 - Bent18 BR U	100yr	958.31	957.91	952.79	0.01	0.01	42.15		1790.00		5.10
1	4775 BR 17 - Bent18 BR U	500yr	959.80	959.32	953.60	0.01	0.01	44.01		2300.00		5.59
1	4775 BR 17 - Bent18 BR D	2yr	953.88	953.62	950.64	0.02	0.00	33.63		680.00		4.11
1	4775 BR 17 - Bent18 BR D	5yr	954.90	954.59	951.18	0.02	0.00	35.54		890.00		4.47
1	4775 BR 17 - Bent18 BR D	10yr	955.83	955.48	951.67	0.02	0.00	37.32		1100.00		4.75
1	4775 BR 17 - Bent18 BR D	25yr	956.91	956.51	952.28	0.02	0.00	39.86		1380.00		5.08
1	4775 BR 17 - Bent18 BR D	50yr	957.64	957.20	952.71	0.02	0.00	40.83		1590.00		5.32
1	4775 BR 17 - Bent18 BR D	100yr	958.29	957.82	953.10	0.02	0.00	41.72		1790.00		5.51
1	4775 BR 17 - Bent18 BR D	500yr	959.78	959.23	953.98	0.02	0.00	43.73		2300.00		5.97
1	4764.388	2yr	953.86	953.61		0.12	0.03	33.76		680.00		4.05
1	4764.388	5yr	954.89	954.58		0.12	0.04	35.68		890.00		4.41
1	4764.388	10yr	955.81	955.47		0.13	0.05	37.50		1100.00		4.70
1	4764.388	25yr	956.90	956.50		0.13	0.05	39.96		1380.00		5.03
1	4764.388	50yr	957.62	957.19		0.13	0.06	40.93		1590.00		5.26
1	4764.388	100yr	958.28	957.81		0.13	0.06	41.82		1790.00		5.46
1	4764.388	500yr	959.77	959.22		0.13	0.07	43.83		2300.00		5.93
1	4718	2yr	953.71	953.11		0.34	0.02	29.05		920.00		6.18
1	4718	5yr	954.72	954.02		0.35	0.03	30.41		1180.00		6.71

1	4718			10yr	955.63	954.83		0.37	0.03	32.55		1450.00		7.21
1	4718			25yr	956.71	955.78		0.38	0.04	35.55	0.65	1799.35		7.73
1	4718			50yr	957.43	956.41		0.39	0.04	37.52	2.51	2057.49		8.10
1	4718			100yr	958.08	956.98		0.39	0.05	39.29	5.70	2304.30		8.43
1	4718			500yr	959.56	958.27		0.40	0.05	43.10	20.21	2909.79		9.14
1	4643.051			2yr	953.35	952.57	950.61			29.10	6.29	913.71		7.11
1	4643.051			5yr	954.34	953.39	951.33			27.96	12.38	1167.62		7.88
1	4643.051			10yr	955.23	954.12	952.04			34.01	29.69	1420.31		8.55
1	4643.051			25yr	956.30	955.00	952.86	0.02	0.00	36.78	54.02	1745.98		9.26
1	4643.051			50yr	957.00	955.57	953.41	0.02	0.00	38.56	75.28	1984.72		9.77
1	4643.051			100yr	957.65	956.10	953.94	0.03	0.00	40.05	98.67	2211.33		10.20
1	4643.051			500yr	959.10	957.26	955.11	0.03	0.00	44.01	164.32	2765.68		11.18
1	4636	BR 17 - Bent17	BR U	2yr	953.33	952.54	950.63			28.96	6.02	913.98		7.17
1	4636	BR 17 - Bent17	BR U	5yr	954.32	953.36	951.36			27.94	15.02	1164.98		7.91
1	4636	BR 17 - Bent17	BR U	10yr	955.21	954.08	952.05			33.86	28.98	1421.02		8.61
1	4636	BR 17 - Bent17	BR U	25yr	956.27	954.96	952.87	0.04	0.01	36.61	52.93	1747.07		9.34
1	4636	BR 17 - Bent17	BR U	50yr	956.98	955.52	953.45	0.04	0.02	38.38	73.92	1986.08		9.85
1	4636	BR 17 - Bent17	BR U	100yr	957.62	956.04	953.97	0.04	0.02	39.88	96.96	2213.04		10.29
1	4636	BR 17 - Bent17	BR U	500yr	959.07	957.20	955.13	0.04	0.03	43.75	162.06	2767.95		11.27
1	4636	BR 17 - Bent17	BR D	2yr	953.23	952.39	950.54			27.80	7.25	912.75		7.39
1	4636	BR 17 - Bent17	BR D	5yr	954.23	953.20	951.27			30.15	17.52	1162.48		8.20
1	4636	BR 17 - Bent17	BR D	10yr	955.13	953.91	951.99			32.29	32.13	1417.87		8.98
1	4636	BR 17 - Bent17	BR D	25yr	956.22	954.79	952.84	0.05	0.01	34.89	58.43	1741.57		9.76
1	4636	BR 17 - Bent17	BR D	50yr	956.92	955.31	953.40	0.06	0.01	36.44	80.41	1979.59		10.38
1	4636	BR 17 - Bent17	BR D	100yr	957.56	955.79	953.94	0.06	0.01	37.93	104.16	2205.84		10.92
1	4636	BR 17 - Bent17	BR D	500yr	959.00	956.84	955.14	0.07	0.01	41.33	173.77	2756.23		12.13
1	4625.316			2yr	953.21	952.35		0.61	0.07	27.62	6.83	913.17		7.48
1	4625.316			5yr	954.20	953.15		0.64	0.08	29.98	16.68	1163.32		8.30
1	4625.316			10yr	955.10	953.85		0.69	0.09	32.04	30.82	1419.18		9.09
1	4625.316			25yr	956.16	954.67		0.73	0.11	34.47	55.26	1744.74		9.97
1	4625.316			50yr	956.86	955.17		0.76	0.12	35.95	76.11	1983.89		10.62
1	4625.316			100yr	957.49	955.62		0.79	0.14	37.34	98.77	2211.23		11.19
1	4625.316			500yr	958.91	956.62		0.86	0.17	40.55	164.00	2766.00		12.49
1	4503.708			2yr	952.54	951.90	949.75			29.79	0.74	919.26		6.43
1	4503.708			5yr	953.48	952.69	950.43			32.23	3.68	1176.32		7.13
1	4503.708			10yr	954.32	953.38	951.06			34.36	9.06	1440.95		7.82
1	4503.708			25yr	955.32	954.20	951.81			40.61	19.93	1779.74	0.33	8.56
1	4503.708			50yr	955.97	954.69	952.31			46.32	29.64	2027.82	2.54	9.13
1	4503.708			100yr	956.56	955.15	952.81			50.46	40.82	2261.39	7.79	9.61
1	4503.708			500yr	957.88	956.16	953.89			56.37	70.93	2827.28	31.79	10.70
1	4496	BR 17 - Bent16	BR U	2yr	952.52	951.88	949.78			29.72	0.70	919.30		6.46
1	4496	BR 17 - Bent16	BR U	5yr	953.46	952.67	950.45			32.15	3.57	1176.43		7.16
1	4496	BR 17 - Bent16	BR U	10yr	954.30	953.35	951.08			34.28	8.85	1441.15		7.85
1	4496	BR 17 - Bent16	BR U	25yr	955.30	954.16	951.82			38.98	19.55	1780.17	0.28	8.60
1	4496	BR 17 - Bent16	BR U	50yr	955.93	954.63	952.32			40.12	28.70	2029.96	1.35	9.22
1	4496	BR 17 - Bent16	BR U	100yr	956.49	955.02	952.81			41.94	38.72	2268.65	2.64	9.80
1	4496	BR 17 - Bent16	BR U	500yr	957.75	955.86	953.91			46.35	65.25	2857.83	6.92	11.19
1	4496	BR 17 - Bent16	BR D	2yr	952.26	951.64	949.54			29.84	0.28	919.72		6.31
1	4496	BR 17 - Bent16	BR D	5yr	953.19	952.42	950.17			32.10	2.21	1177.79		7.01
1	4496	BR 17 - Bent16	BR D	10yr	954.01	953.09	950.77			34.03	6.21	1443.79		7.71
1	4496	BR 17 - Bent16	BR D	25yr	955.00	953.90	951.50			38.34	14.96	1784.97	0.08	8.47
1	4496	BR 17 - Bent16	BR D	50yr	955.62	954.35	952.01			39.69	22.46	2036.72	0.82	9.09
1	4496	BR 17 - Bent16	BR D	100yr	956.18	954.75	952.47			43.34	30.81	2277.07	2.12	9.67
1	4496	BR 17 - Bent16	BR D	500yr	957.43	955.58	953.54			47.90	54.74	2867.72	7.54	11.04
1	4485.049			2yr	952.22	951.59		0.56	0.00	29.70	0.24	919.76		6.37
1	4485.049			5yr	953.15	952.37		0.58	0.01	31.95	2.04	1177.96		7.07
1	4485.049			10yr	953.97	953.03		0.62	0.02	33.86	5.86	1444.14		7.78
1	4485.049			25yr	954.96	953.83		0.63	0.05	38.25	14.30	1785.67	0.03	8.56
1	4485.049			50yr	955.58	954.28		0.65	0.07	46.37	21.60	2037.08	1.32	9.18
1	4485.049			100yr	956.13	954.68		0.66	0.10	51.03	29.73	2274.60	5.66	9.74
1	4485.049			500yr	957.38	955.55		0.68	0.17	55.70	53.89	2849.07	27.05	11.00
1	4361.840			2yr	951.66	951.04	949.27			32.38		920.00		6.33
1	4361.840			5yr	952.56	951.82	949.88			33.96		1180.00		6.89
1	4361.840			10yr	953.33	952.45	950.46			38.77		1449.99	0.01	7.51
1	4361.840			25yr	954.28	953.30	951.14			70.89		1780.73	19.27	7.96
1	4361.840			50yr	954.86	953.80	951.61			73.17	0.13	2012.12	47.75	8.32
1	4361.840			100yr	955.37	954.25	952.03			75.28	0.79	2228.15	81.06	8.63
1	4361.840			500yr	956.53	955.26	953.33	0.02	0.01	77.51	4.91	2744.81	180.28	9.31
1	4354	BR 17 - Bent15	BR U	2yr	951.59	950.97	949.21			32.33		920.00		6.36
1	4354	BR 17 - Bent15	BR U	5yr	952.49	951.74	949.82			33.90		1180.00		6.93
1	4354	BR 17 - Bent15	BR U	10yr	953.26	952.37	950.41			36.14		1450.00	0.00	7.55
1	4354	BR 17 - Bent15	BR U	25yr	954.17	953.15	951.10			62.65		1787.50	12.50	8.13

1	4354	BR 17 - Bent15	BR U	50yr	954.73	953.61	951.57			64.45	0.05	2029.21	30.74	8.58
1	4354	BR 17 - Bent15	BR U	100yr	955.24	954.01	952.00			66.41	0.45	2257.41	52.14	8.98
1	4354	BR 17 - Bent15	BR U	500yr	956.50	955.13	953.20	0.03	0.01	69.33	4.64	2800.60	124.76	9.61
1	4354	BR 17 - Bent15	BR D	2yr	951.59	950.94	949.25			32.26		920.00		6.46
1	4354	BR 17 - Bent15	BR D	5yr	952.48	951.71	949.86			33.88		1180.00		7.03
1	4354	BR 17 - Bent15	BR D	10yr	953.25	952.35	950.46			35.18		1450.00		7.64
1	4354	BR 17 - Bent15	BR D	25yr	954.18	953.13	951.14			61.17		1798.11	1.89	8.26
1	4354	BR 17 - Bent15	BR D	50yr	954.76	953.59	951.61			62.35	0.00	2046.30	13.70	8.71
1	4354	BR 17 - Bent15	BR D	100yr	955.28	954.00	952.03			64.33	0.13	2279.55	30.32	9.12
1	4354	BR 17 - Bent15	BR D	500yr	956.45	954.95	953.18	0.05	0.04	67.63	2.73	2842.43	84.84	9.97
1	4343.304			2yr	951.55	950.93		0.47	0.04	32.50		920.00		6.31
1	4343.304			5yr	952.44	951.71		0.50	0.05	34.11		1180.00		6.87
1	4343.304			10yr	953.21	952.34		0.54	0.05	35.41		1450.00		7.48
1	4343.304			25yr	954.13	953.12		0.55	0.07	69.44		1795.33	4.67	8.09
1	4343.304			50yr	954.71	953.60		0.54	0.09	70.98	0.01	2036.35	23.64	8.49
1	4343.304			100yr	955.23	954.04		0.53	0.10	73.07	0.27	2260.27	49.46	8.84
1	4343.304			500yr	956.36	954.99		0.51	0.13	75.97	3.32	2795.69	130.99	9.61
1	4222.473			2yr	951.03	950.56	948.33			35.45		920.00		5.53
1	4222.473			5yr	951.90	951.32	948.91			37.16		1180.00		6.08
1	4222.473			10yr	952.61	951.92	949.46			43.66		1450.00	0.01	6.69
1	4222.473			25yr	953.51	952.73	950.11			97.09	0.02	1778.86	21.12	7.13
1	4222.473			50yr	954.08	953.26	950.56			99.30	0.35	2000.95	58.70	7.38
1	4222.473			100yr	954.60	953.74	950.98			100.54	1.25	2205.25	103.50	7.59
1	4222.473			500yr	955.72	954.78	952.04			102.64	4.21	2694.85	230.94	8.09
1	4215	BR 17 - Bent14	BR U	2yr	951.00	950.52	948.33			35.41		920.00		5.55
1	4215	BR 17 - Bent14	BR U	5yr	951.86	951.28	948.92			37.12		1180.00		6.10
1	4215	BR 17 - Bent14	BR U	10yr	952.58	951.88	949.47			40.95		1450.00	0.00	6.71
1	4215	BR 17 - Bent14	BR U	25yr	953.46	952.66	950.12			88.88	0.01	1782.70	17.29	7.21
1	4215	BR 17 - Bent14	BR U	50yr	954.02	953.17	950.57			90.98	0.28	2011.75	47.98	7.52
1	4215	BR 17 - Bent14	BR U	100yr	954.53	953.63	950.98			92.36	1.10	2223.50	85.40	7.77
1	4215	BR 17 - Bent14	BR U	500yr	955.65	954.64	951.97			94.39	4.09	2732.22	193.68	8.36
1	4215	BR 17 - Bent14	BR D	2yr	950.79	950.33	948.15			36.43		920.00		5.46
1	4215	BR 17 - Bent14	BR D	5yr	951.64	951.08	948.73			38.01		1180.00		6.01
1	4215	BR 17 - Bent14	BR D	10yr	952.35	951.67	949.26			74.23		1447.00	3.00	6.60
1	4215	BR 17 - Bent14	BR D	25yr	953.18	952.41	949.91			88.16	0.09	1767.56	32.36	7.12
1	4215	BR 17 - Bent14	BR D	50yr	953.72	952.89	950.34			90.19	0.62	1993.27	66.11	7.45
1	4215	BR 17 - Bent14	BR D	100yr	954.22	953.33	950.74			91.06	1.74	2203.64	104.62	7.73
1	4215	BR 17 - Bent14	BR D	500yr	955.32	954.32	951.99			92.91	5.30	2710.01	214.69	8.36
1	4204.470			2yr	950.77	950.31		0.44	0.00	36.50		920.00		5.42
1	4204.470			5yr	951.62	951.06		0.45	0.00	38.07		1180.00		5.97
1	4204.470			10yr	952.32	951.65		0.48	0.01	72.01		1447.58	2.42	6.57
1	4204.470			25yr	953.15	952.38		0.48	0.02	96.27	0.10	1767.56	32.35	7.09
1	4204.470			50yr	953.69	952.87		0.47	0.02	98.30	0.67	1989.03	70.30	7.40
1	4204.470			100yr	954.18	953.31		0.46	0.03	99.13	1.79	2194.18	114.03	7.65
1	4204.470			500yr	955.29	954.32		0.43	0.04	101.02	5.24	2683.63	241.13	8.21
1	4080.463			2yr	950.33	949.85	948.06			49.15		916.10	3.90	5.58
1	4080.463			5yr	951.16	950.61	948.62			44.42		1180.00		6.00
1	4080.463			10yr	951.82	951.20	949.16			60.90		1429.85	20.15	6.40
1	4080.463			25yr	952.64	951.94	949.78			79.63		1767.43	32.57	6.82
1	4080.463			50yr	953.20	952.45	950.20			91.27	1.46	2002.26	56.27	7.03
1	4080.463			100yr	953.69	952.92	950.57			95.19	6.14	2222.11	81.75	7.20
1	4080.463			500yr	954.82	953.98	951.36			107.17	26.47	2753.01	150.52	7.56
1	4074	BR 17 - Bent13	BR U	2yr	950.29	949.80	948.02			48.96		916.21	3.79	5.61
1	4074	BR 17 - Bent13	BR U	5yr	951.12	950.56	948.59			44.34		1180.00		6.03
1	4074	BR 17 - Bent13	BR U	10yr	951.78	951.15	949.14			60.71		1430.10	19.90	6.42
1	4074	BR 17 - Bent13	BR U	25yr	952.60	951.88	949.76			78.69		1768.43	31.57	6.86
1	4074	BR 17 - Bent13	BR U	50yr	953.15	952.39	950.18			89.17	1.25	2004.11	54.64	7.09
1	4074	BR 17 - Bent13	BR U	100yr	953.64	952.85	950.57			92.10	5.63	2224.99	79.38	7.30
1	4074	BR 17 - Bent13	BR U	500yr	954.76	953.88	951.35			98.87	24.84	2757.08	148.09	7.77
1	4074	BR 17 - Bent13	BR D	2yr	950.22	949.73	947.99			47.35		917.86	2.14	5.65
1	4074	BR 17 - Bent13	BR D	5yr	951.05	950.47	948.54			44.21		1180.00		6.07
1	4074	BR 17 - Bent13	BR D	10yr	951.72	951.08	949.08			60.31		1435.76	14.24	6.47
1	4074	BR 17 - Bent13	BR D	25yr	952.55	951.83	949.71			81.93		1773.64	26.36	6.89
1	4074	BR 17 - Bent13	BR D	50yr	953.10	952.34	950.13			92.42	1.25	2008.47	50.28	7.11
1	4074	BR 17 - Bent13	BR D	100yr	953.60	952.80	950.49			95.34	5.63	2228.06	76.30	7.31
1	4074	BR 17 - Bent13	BR D	500yr	954.71	953.81	951.29			108.32	24.49	2763.70	141.81	7.81
1	4062.727			2yr	950.19	949.71		0.49	0.00	47.78		917.67	2.33	5.58
1	4062.727			5yr	951.02	950.46		0.49	0.00	44.43		1180.00		6.00
1	4062.727			10yr	951.69	951.06		0.50	0.00	61.06		1435.29	14.71	6.40
1	4062.727			25yr	952.52	951.81		0.49	0.00	82.98		1771.67	28.34	6.80
1	4062.727			50yr	953.07	952.33		0.47	0.00	94.80	1.69	2005.01	53.30	7.00
1	4062.727			100yr	953.56	952.79		0.44	0.01	98.65	6.44	2223.64	79.92	7.17

1	4062.727			500yr	954.67	953.83		0.39	0.04	117.30	26.51	2758.27	145.22	7.57
1	3940.903			2yr	949.70	949.20	947.48			49.15		916.05	3.95	5.69
1	3940.903			5yr	950.52	949.94	948.04			44.04		1180.00		6.13
1	3940.903			10yr	951.19	950.55	948.58			72.84		1427.13	22.87	6.49
1	3940.903			25yr	952.02	951.33	949.20			87.65		1748.74	51.26	6.80
1	3940.903			50yr	952.60	951.87	949.63			134.41	1.36	1990.03	68.61	7.00
1	3940.903			100yr	953.10	952.38	950.03			139.16	6.39	2181.08	122.53	7.03
1	3940.903			500yr	954.24	953.54	950.95			151.76	28.60	2629.09	272.30	7.09
1	3934	BR 17 - Bent12	BR U	2yr	949.57	949.07	947.38			48.93		916.16	3.84	5.73
1	3934	BR 17 - Bent12	BR U	5yr	950.40	949.81	947.94			43.95		1180.00		6.16
1	3934	BR 17 - Bent12	BR U	10yr	951.06	950.41	948.48			72.37		1427.61	22.39	6.53
1	3934	BR 17 - Bent12	BR U	25yr	951.90	951.19	949.11			86.44		1749.69	50.31	6.84
1	3934	BR 17 - Bent12	BR U	50yr	952.48	951.73	949.52			132.30	1.16	1993.21	65.63	7.07
1	3934	BR 17 - Bent12	BR U	100yr	952.98	952.23	949.93			136.01	5.89	2186.25	117.86	7.14
1	3934	BR 17 - Bent12	BR U	500yr	954.12	953.37	950.82			143.52	26.67	2634.33	269.00	7.28
1	3934	BR 17 - Bent12	BR D	2yr	949.38	948.86	947.21			48.74		916.45	3.55	5.78
1	3934	BR 17 - Bent12	BR D	5yr	950.20	949.60	947.78			43.81		1180.00		6.21
1	3934	BR 17 - Bent12	BR D	10yr	950.88	950.22	948.32			62.25		1429.08	20.92	6.57
1	3934	BR 17 - Bent12	BR D	25yr	951.73	951.00	948.95			90.38		1765.32	34.68	6.93
1	3934	BR 17 - Bent12	BR D	50yr	952.32	951.57	949.36			110.06	1.23	1994.45	64.32	7.06
1	3934	BR 17 - Bent12	BR D	100yr	952.84	952.06	949.74			135.10	6.02	2211.23	92.75	7.21
1	3934	BR 17 - Bent12	BR D	500yr	954.00	953.24	950.46			144.26	27.78	2664.33	237.90	7.33
1	3922.633			2yr	949.34	948.89		0.36	0.03	51.10		915.05	4.95	5.42
1	3922.633			5yr	950.17	949.64		0.37	0.04	44.82		1180.00		5.87
1	3922.633			10yr	950.84	950.24		0.37	0.04	67.89		1427.46	22.54	6.23
1	3922.633			25yr	951.69	951.04		0.35	0.05	104.42	0.00	1755.50	44.49	6.55
1	3922.633			50yr	952.27	951.60		0.33	0.06	127.04	3.12	1986.22	70.66	6.71
1	3922.633			100yr	952.79	952.11		0.30	0.07	140.60	9.28	2184.39	116.33	6.78
1	3922.633			500yr	953.95	953.28		0.24	0.08	174.72	23.23	2646.65	260.12	6.90
1	3799.870			2yr	948.95	948.60	946.11			65.48		919.66	0.34	4.73
1	3799.870			5yr	949.76	949.35	946.67			45.55		1180.00		5.18
1	3799.870			10yr	950.42	949.96	947.19			133.76		1417.99	32.02	5.54
1	3799.870			25yr	951.29	950.81	947.81			174.31	3.34	1690.43	106.23	5.70
1	3799.870			50yr	951.88	951.42	948.23			199.78	10.02	1869.64	180.34	5.73
1	3799.870			100yr	952.42	951.98	948.67	0.01	0.00	235.23	18.31	2015.31	276.38	5.69
1	3799.870			500yr	953.63	953.23	949.46			269.34	60.67	2351.09	518.24	5.64
1	3792	BR 17 - Bent11	BR U	2yr	948.90	948.55	946.06			65.15		919.71	0.29	4.74
1	3792	BR 17 - Bent11	BR U	5yr	949.71	949.29	946.64			45.53		1180.00		5.20
1	3792	BR 17 - Bent11	BR U	10yr	950.37	949.90	947.16			132.44		1418.97	31.03	5.56
1	3792	BR 17 - Bent11	BR U	25yr	951.24	950.76	947.77			171.16	3.18	1693.13	103.69	5.75
1	3792	BR 17 - Bent11	BR U	50yr	951.84	951.36	948.20			194.95	9.65	1874.51	175.84	5.82
1	3792	BR 17 - Bent11	BR U	100yr	952.41	951.96	948.63	0.01	0.00	228.63	18.49	2012.28	279.22	5.76
1	3792	BR 17 - Bent11	BR U	500yr	953.59	953.17	949.42			261.33	53.65	2345.71	530.64	5.79
1	3792	BR 17 - Bent11	BR D	2yr	948.82	948.47	946.00			44.89		920.00	0.00	4.76
1	3792	BR 17 - Bent11	BR D	5yr	949.63	949.21	946.57			45.49		1180.00		5.22
1	3792	BR 17 - Bent11	BR D	10yr	950.35	949.87	947.07			126.51		1428.81	21.19	5.56
1	3792	BR 17 - Bent11	BR D	25yr	951.24	950.75	947.70			166.36	3.71	1709.26	87.03	5.75
1	3792	BR 17 - Bent11	BR D	50yr	951.85	951.36	948.12			189.14	10.67	1892.80	156.53	5.82
1	3792	BR 17 - Bent11	BR D	100yr	952.40	951.92	948.49	0.02	0.01	225.86	19.49	2054.79	235.72	5.85
1	3792	BR 17 - Bent11	BR D	500yr	953.60	953.18	949.59			247.32	58.91	2369.90	501.20	5.80
1	3781.101			2yr	948.80	948.46		0.30	0.00	46.67		919.98	0.02	4.67
1	3781.101			5yr	949.61	949.20		0.31	0.00	45.66		1180.00		5.13
1	3781.101			10yr	950.32	949.87		0.30	0.00	130.23		1424.49	25.51	5.46
1	3781.101			25yr	951.21	950.75		0.27	0.00	172.69	4.53	1700.04	95.43	5.60
1	3781.101			50yr	951.82	951.37		0.26	0.00	204.72	8.98	1883.95	167.07	5.65
1	3781.101			100yr	952.37	951.93		0.23	0.01	234.30	22.01	2039.47	248.52	5.64
1	3781.101			500yr	953.57	953.18		0.18	0.01	255.56	69.28	2362.98	497.74	5.57
1	3659.612			2yr	948.50	948.14	945.70			45.29		920.00	0.00	4.80
1	3659.612			5yr	949.29	948.86	946.26			45.38		1180.00		5.27
1	3659.612			10yr	950.03	949.56	946.78	0.01	0.00	98.95		1416.58	33.42	5.53
1	3659.612			25yr	950.94	950.45	947.39	0.01	0.00	130.30	3.72	1712.28	84.00	5.73
1	3659.612			50yr	951.56	951.06	947.82	0.01	0.00	164.73	10.78	1927.19	122.03	5.87
1	3659.612			100yr	952.13	951.64	948.19	0.01	0.00	196.16	20.57	2103.04	186.39	5.88
1	3659.612			500yr	953.38	952.93	949.24	0.01	0.00	225.80	68.43	2470.40	391.17	5.86
1	3652	BR 17 - Bent10	BR U	2yr	948.49	948.13	945.70			44.07		920.00		4.81
1	3652	BR 17 - Bent10	BR U	5yr	949.28	948.85	946.27			45.36		1180.00		5.29
1	3652	BR 17 - Bent10	BR U	10yr	950.02	949.55	946.80	0.02	0.00	97.90		1417.25	32.75	5.55
1	3652	BR 17 - Bent10	BR U	25yr	950.93	950.44	947.40	0.01	0.00	127.04	3.53	1714.18	82.29	5.79
1	3652	BR 17 - Bent10	BR U	50yr	951.55	951.03	947.84	0.01	0.00	158.38	10.35	1929.64	120.01	5.97
1	3652	BR 17 - Bent10	BR U	100yr	952.12	951.61	948.21	0.01	0.00	187.74	19.58	2107.01	183.42	6.02
1	3652	BR 17 - Bent10	BR U	500yr	953.37	952.89	949.26	0.01	0.00	217.37	60.15	2469.94	399.92	6.04

1	3652	BR 17 - Bent10	BR D	2yr	948.47	948.11	945.71			43.84		920.00		4.84
1	3652	BR 17 - Bent10	BR D	5yr	949.27	948.83	946.27			45.32		1180.00		5.31
1	3652	BR 17 - Bent10	BR D	10yr	950.00	949.52	946.80	0.02	0.00	92.72		1423.60	26.40	5.60
1	3652	BR 17 - Bent10	BR D	25yr	950.92	950.41	947.40	0.02	0.00	130.64	3.31	1727.41	69.28	5.86
1	3652	BR 17 - Bent10	BR D	50yr	951.54	951.01	947.82	0.02	0.00	151.39	10.15	1932.70	117.15	5.99
1	3652	BR 17 - Bent10	BR D	100yr	952.11	951.59	948.24	0.02	0.00	200.56	19.26	2115.81	174.93	6.06
1	3652	BR 17 - Bent10	BR D	500yr	953.36	952.88	949.20	0.01	0.01	235.57	61.28	2477.33	391.39	6.07
1	3641.433			2yr	948.45	948.08		0.34	0.00	43.73		920.00		4.87
1	3641.433			5yr	949.24	948.80		0.36	0.00	45.26		1180.00		5.34
1	3641.433			10yr	949.98	949.50		0.36	0.01	92.95		1424.30	25.70	5.63
1	3641.433			25yr	950.90	950.39		0.33	0.01	132.45	3.20	1727.69	69.11	5.85
1	3641.433			50yr	951.51	951.00		0.32	0.01	154.67	10.11	1932.34	117.55	5.94
1	3641.433			100yr	952.09	951.58		0.29	0.02	193.26	19.32	2116.44	174.24	5.97
1	3641.433			500yr	953.34	952.88		0.24	0.03	243.57	67.76	2483.19	379.05	5.92
1	3518.856			2yr	948.11	947.71	945.48			43.13		920.00		5.04
1	3518.856			5yr	948.88	948.40	946.04			45.90		1180.00		5.53
1	3518.856			10yr	949.62	949.08	946.56			48.58		1450.00		5.92
1	3518.856			25yr	950.56	949.95	947.19			62.62	1.79	1797.95	0.26	6.23
1	3518.856			50yr	951.19	950.55	947.61			68.05	7.94	2050.77	1.29	6.42
1	3518.856			100yr	951.78	951.12	947.96			77.54	15.68	2290.99	3.33	6.56
1	3518.856			500yr	953.07	952.35	948.83			102.60	56.77	2861.20	12.04	6.91
1	3512	BR 17 - Bent09	BR U	2yr	948.05	947.66	945.45			43.07		920.00		5.06
1	3512	BR 17 - Bent09	BR U	5yr	948.83	948.35	946.01			45.83		1180.00		5.55
1	3512	BR 17 - Bent09	BR U	10yr	949.57	949.02	946.54			48.26		1450.00		5.94
1	3512	BR 17 - Bent09	BR U	25yr	950.50	949.89	947.15			60.37	1.59	1798.17	0.23	6.28
1	3512	BR 17 - Bent09	BR U	50yr	951.12	950.47	947.57			64.52	7.38	2051.44	1.19	6.52
1	3512	BR 17 - Bent09	BR U	100yr	951.72	951.02	947.95			69.24	15.77	2291.15	3.08	6.71
1	3512	BR 17 - Bent09	BR U	500yr	952.99	952.20	948.79			94.24	46.08	2872.38	11.54	7.20
1	3512	BR 17 - Bent09	BR D	2yr	947.97	947.57	945.39			42.98		920.00		5.08
1	3512	BR 17 - Bent09	BR D	5yr	948.74	948.25	945.94			45.73		1180.00		5.58
1	3512	BR 17 - Bent09	BR D	10yr	949.48	948.93	946.46			48.21		1450.00		5.96
1	3512	BR 17 - Bent09	BR D	25yr	950.41	949.79	947.08			63.88	1.44	1797.68	0.87	6.30
1	3512	BR 17 - Bent09	BR D	50yr	951.03	950.37	947.50			68.04	7.07	2049.36	3.58	6.54
1	3512	BR 17 - Bent09	BR D	100yr	951.62	950.92	947.86			72.81	15.20	2287.04	7.76	6.72
1	3512	BR 17 - Bent09	BR D	500yr	952.88	952.09	948.72			92.22	43.42	2863.87	22.71	7.22
1	3500.626			2yr	947.94	947.56		0.35	0.00	43.32		920.00		4.99
1	3500.626			5yr	948.71	948.24		0.38	0.00	46.05		1180.00		5.49
1	3500.626			10yr	949.45	948.92		0.38	0.00	48.76		1450.00		5.87
1	3500.626			25yr	950.38	949.79		0.35	0.01	66.64	2.04	1796.80	1.16	6.18
1	3500.626			50yr	951.01	950.38		0.33	0.02	72.03	8.27	2047.58	4.16	6.38
1	3500.626			100yr	951.59	950.94		0.31	0.02	81.35	15.93	2285.47	8.60	6.53
1	3500.626			500yr	952.85	952.13		0.27	0.03	100.67	54.46	2851.92	23.62	6.91
1	3378.489			2yr	947.60	947.21	944.93			43.34		920.00		4.98
1	3378.489			5yr	948.33	947.86	945.49			45.90		1180.00		5.52
1	3378.489			10yr	949.08	948.55	946.01			75.18		1438.85	11.15	5.86
1	3378.489			25yr	950.03	949.47	946.62			88.77	2.16	1757.15	40.69	6.06
1	3378.489			50yr	950.66	950.09	947.04			93.66	8.63	1984.21	67.16	6.19
1	3378.489			100yr	951.26	950.68	947.42	0.01	0.00	102.09	17.32	2197.30	95.38	6.26
1	3378.489			500yr	952.54	951.93	948.40	0.01	0.00	120.88	59.87	2705.44	164.69	6.53
1	3371	BR 17 - Bent08	BR U	2yr	947.58	947.19	944.93			43.28		920.00		5.00
1	3371	BR 17 - Bent08	BR U	5yr	948.31	947.83	945.49			45.85		1180.00		5.54
1	3371	BR 17 - Bent08	BR U	10yr	949.05	948.52	946.02			74.77		1439.25	10.75	5.88
1	3371	BR 17 - Bent08	BR U	25yr	950.00	949.43	946.63			86.40	1.97	1758.47	39.56	6.11
1	3371	BR 17 - Bent08	BR U	50yr	950.63	950.04	947.05			90.01	8.15	1986.51	65.34	6.28
1	3371	BR 17 - Bent08	BR U	100yr	951.25	950.65	947.42	0.01	0.00	94.01	17.48	2198.04	94.48	6.38
1	3371	BR 17 - Bent08	BR U	500yr	952.53	951.88	948.40	0.01	0.00	112.79	51.73	2709.93	168.35	6.74
1	3371	BR 17 - Bent08	BR D	2yr	947.54	947.15	944.91			43.21		920.00		5.02
1	3371	BR 17 - Bent08	BR D	5yr	948.27	947.79	945.47			45.76		1180.00		5.57
1	3371	BR 17 - Bent08	BR D	10yr	949.03	948.49	945.99			71.62		1442.57	7.43	5.91
1	3371	BR 17 - Bent08	BR D	25yr	949.99	949.41	946.61			83.22	1.98	1765.82	32.20	6.14
1	3371	BR 17 - Bent08	BR D	50yr	950.63	950.03	947.03			86.83	8.29	1996.79	54.92	6.31
1	3371	BR 17 - Bent08	BR D	100yr	951.23	950.62	947.40	0.02	0.01	90.71	17.48	2212.41	80.12	6.43
1	3371	BR 17 - Bent08	BR D	500yr	952.52	951.84	948.36	0.02	0.01	109.14	51.53	2732.99	145.48	6.81
1	3360.436			2yr	947.52	947.13		0.37	0.00	43.25		920.00		5.00
1	3360.436			5yr	948.25	947.76		0.41	0.00	45.77		1180.00		5.57
1	3360.436			10yr	949.00	948.46		0.41	0.01	71.97		1442.38	7.62	5.90
1	3360.436			25yr	949.97	949.40		0.37	0.01	85.53	2.12	1764.87	33.01	6.09
1	3360.436			50yr	950.61	950.02		0.35	0.01	90.42	8.65	1995.14	56.21	6.22
1	3360.436			100yr	951.21	950.61		0.33	0.01	98.81	17.36	2211.60	81.04	6.31
1	3360.436			500yr	952.49	951.86		0.28	0.01	117.23	59.57	2728.09	142.34	6.59
1	3238.304			2yr	947.15	946.74	944.61			42.53		920.00		5.18
1	3238.304			5yr	947.83	947.30	945.18			44.75		1180.00		5.84

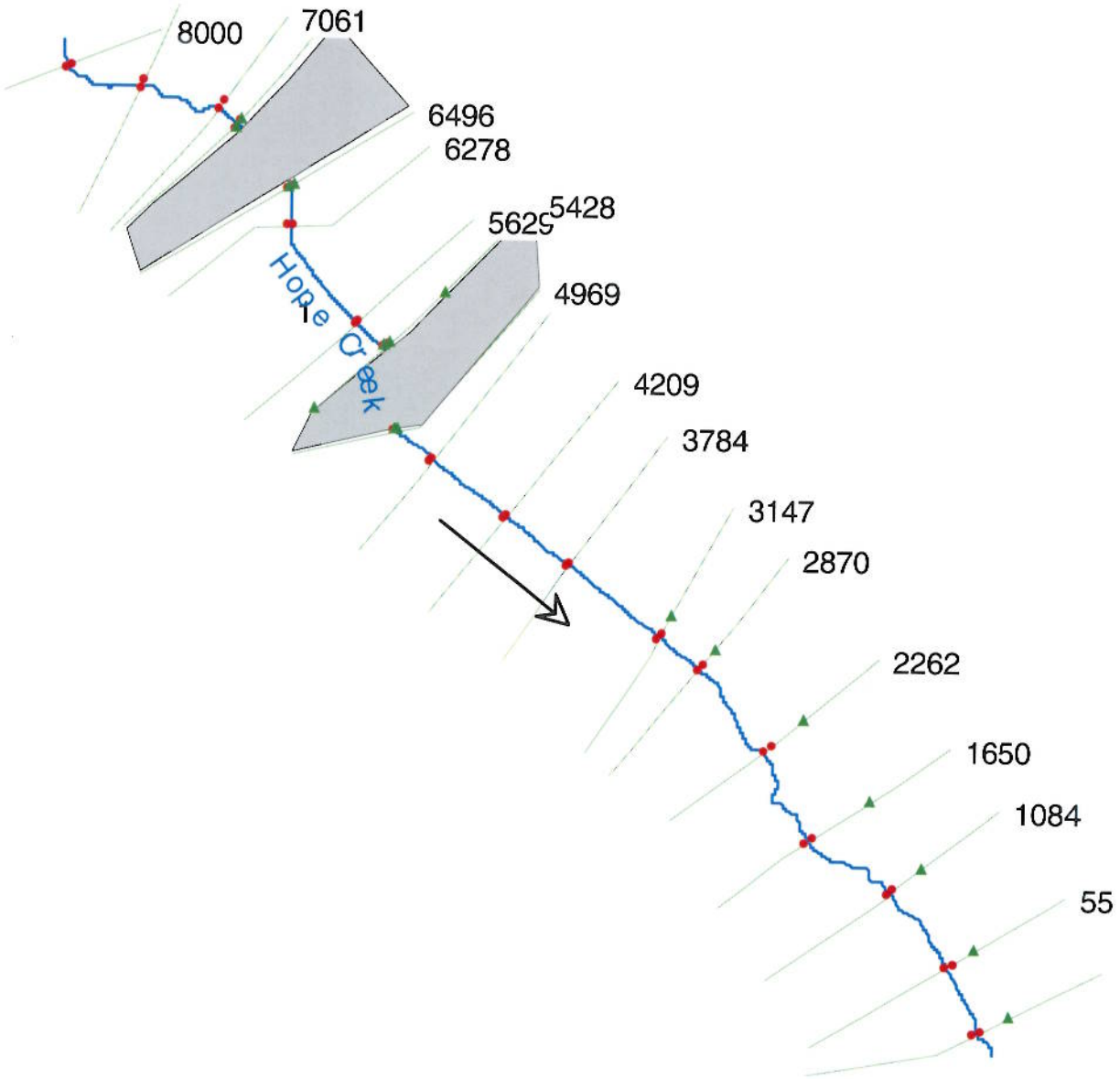
1	3238.304			10yr	948.59	947.99	945.71			47.52		1450.00		6.19
1	3238.304			25yr	949.59	948.96	946.32			60.54	1.04	1798.97		6.38
1	3238.304			50yr	950.25	949.59	946.72			65.58	7.11	2052.89		6.52
1	3238.304			100yr	950.87	950.20	947.10			78.18	14.04	2295.88	0.08	6.58
1	3238.304			500yr	952.20	951.50	947.95			105.21	58.33	2863.36	8.31	6.80
1	3231	BR 17 - Bent07	BR U	2yr	947.10	946.68	944.59			42.46		920.00		5.21
1	3231	BR 17 - Bent07	BR U	5yr	947.77	947.24	945.15			44.67		1180.00		5.87
1	3231	BR 17 - Bent07	BR U	10yr	948.53	947.93	945.68			47.45		1450.00		6.22
1	3231	BR 17 - Bent07	BR U	25yr	949.53	948.89	946.29			58.83	0.89	1799.11		6.43
1	3231	BR 17 - Bent07	BR U	50yr	950.19	949.51	946.71			62.55	6.60	2053.40		6.60
1	3231	BR 17 - Bent07	BR U	100yr	950.81	950.12	947.08			68.39	16.08	2293.88	0.04	6.70
1	3231	BR 17 - Bent07	BR U	500yr	952.12	951.36	947.93			97.00	49.28	2873.47	7.25	7.07
1	3231	BR 17 - Bent07	BR D	2yr	947.01	946.58	944.52			42.36		920.00		5.24
1	3231	BR 17 - Bent07	BR D	5yr	947.68	947.14	945.08			44.56		1180.00		5.91
1	3231	BR 17 - Bent07	BR D	10yr	948.44	947.84	945.60			47.34		1450.00		6.25
1	3231	BR 17 - Bent07	BR D	25yr	949.45	948.80	946.22			58.69	0.77	1799.23		6.46
1	3231	BR 17 - Bent07	BR D	50yr	950.10	949.42	946.63			62.39	6.31	2053.69		6.63
1	3231	BR 17 - Bent07	BR D	100yr	950.72	950.02	947.01			66.61	15.72	2294.27	0.01	6.73
1	3231	BR 17 - Bent07	BR D	500yr	952.04	951.27	947.86			87.76	48.64	2878.67	2.69	7.10
1	3220.243			2yr	946.98	946.57		0.32	0.04	42.67		920.00		5.14
1	3220.243			5yr	947.65	947.13		0.35	0.03	44.88		1180.00		5.80
1	3220.243			10yr	948.42	947.83		0.35	0.04	47.67		1450.00		6.15
1	3220.243			25yr	949.42	948.80		0.34	0.05	60.85	1.26	1798.74		6.34
1	3220.243			50yr	950.07	949.42		0.34	0.06	65.81	7.46	2052.54		6.48
1	3220.243			100yr	950.69	950.03		0.32	0.07	76.44	14.65	2295.31	0.04	6.55
1	3220.243			500yr	952.01	951.31		0.29	0.08	96.44	58.93	2867.88	3.20	6.80
1	3147			2yr	946.62	945.86		0.39	0.03	40.55		1100.00		7.02
1	3147			5yr	947.27	946.40		0.39	0.03	42.71		1340.00		7.47
1	3147			10yr	948.03	947.05		0.39	0.03	45.28		1650.00		7.94
1	3147			25yr	949.03	947.91		0.38	0.03	48.71		2110.00		8.49
1	3147			50yr	949.68	948.44		0.39	0.03	59.46	0.52	2449.48		8.91
1	3147			100yr	950.31	948.99		0.38	0.03	63.83	6.38	2793.62		9.21
1	3147			500yr	951.64	950.15		0.36	0.03	75.86	33.54	3616.44	0.02	9.86
1	3097.384			2yr	946.21	945.18	944.50			38.45		1100.00		8.16
1	3097.384			5yr	946.85	945.69	944.98			40.51		1340.00		8.63
1	3097.384			10yr	947.61	946.34	945.55			43.12		1650.00		9.04
1	3097.384			25yr	948.63	947.23	946.29			46.66		2110.00		9.49
1	3097.384			50yr	949.25	947.69	946.79			48.52		2450.00		10.02
1	3097.384			100yr	949.89	948.23	947.27			58.90	0.13	2799.87		10.34
1	3097.384			500yr	951.25	949.43	948.36			68.56	20.21	3629.79		10.84
1	3090	BR 17 - Bent06	BR U	2yr	946.13	945.03	944.48			38.02		1100.00		8.41
1	3090	BR 17 - Bent06	BR U	5yr	946.77	945.54	944.96			40.08		1340.00		8.88
1	3090	BR 17 - Bent06	BR U	10yr	947.53	946.20	945.52			42.71		1650.00		9.26
1	3090	BR 17 - Bent06	BR U	25yr	948.55	947.10	946.27			46.30		2110.00		9.68
1	3090	BR 17 - Bent06	BR U	50yr	949.18	947.55	946.77			48.06		2450.00		10.23
1	3090	BR 17 - Bent06	BR U	100yr	949.80	948.06	947.24			49.07		2800.00		10.61
1	3090	BR 17 - Bent06	BR U	500yr	951.14	949.08	948.27			62.99	13.16	3636.84		11.53
1	3090	BR 17 - Bent06	BR D	2yr	945.99	944.72	944.40			37.08		1100.00		9.02
1	3090	BR 17 - Bent06	BR D	5yr	946.63	945.24	944.90			39.16		1340.00		9.45
1	3090	BR 17 - Bent06	BR D	10yr	947.40	945.93	945.45			41.92		1650.00		9.72
1	3090	BR 17 - Bent06	BR D	25yr	948.42	946.86	946.21			45.63		2110.00		10.03
1	3090	BR 17 - Bent06	BR D	50yr	949.05	947.29	946.71			47.33		2450.00		10.64
1	3090	BR 17 - Bent06	BR D	100yr	949.67	947.79	947.18			48.68		2800.00		11.01
1	3090	BR 17 - Bent06	BR D	500yr	951.01	948.78	948.22			61.57	8.55	3641.45		12.00
1	3079.078			2yr	945.87	944.47	944.30	1.14	0.19	36.42		1100.00		9.49
1	3079.078			5yr	946.52	945.06	944.78	1.04	0.20	38.78		1340.00		9.70
1	3079.078			10yr	947.30	945.81	945.35	0.91	0.20	41.81		1650.00		9.79
1	3079.078			25yr	948.34	946.78		0.83	0.20	45.68		2110.00		10.00
1	3079.078			50yr	948.96	947.20	946.59	0.91	0.22	47.33		2450.00		10.65
1	3079.078			100yr	949.58	947.70	947.07	0.91	0.23	49.36		2800.00		10.99
1	3079.078			500yr	950.92	948.80	948.16	0.88	0.25	65.13	10.83	3639.17		11.69
1	2955.929			2yr	944.53	943.77	942.54			40.73		1100.00		6.99
1	2955.929			5yr	945.28	944.49	943.02			43.61		1340.00		7.14
1	2955.929			10yr	946.19	945.37	943.58			47.14		1650.00		7.25
1	2955.929			25yr	947.31	946.43	944.32			60.28	0.82	2109.18		7.55
1	2955.929			50yr	947.83	946.79	944.82			63.23	4.32	2445.69		8.19
1	2955.929			100yr	948.45	947.33	945.30			67.49	13.07	2786.93		8.51
1	2955.929			500yr	949.79	948.51	946.39			85.37	50.56	3599.44		9.12
1	2949	BR 17 - Bent05	BR U	2yr	944.46	943.69	942.51			40.55		1100.00		7.07
1	2949	BR 17 - Bent05	BR U	5yr	945.22	944.41	942.99			43.45		1340.00		7.20
1	2949	BR 17 - Bent05	BR U	10yr	946.13	945.30	943.56			47.02		1650.00		7.29
1	2949	BR 17 - Bent05	BR U	25yr	947.25	946.34	944.31			58.37	0.60	2109.40		7.62

1	2949	BR 17 - Bent05	BR U	50yr	947.76	946.69	944.81			60.43	3.58	2446.43		8.32
1	2949	BR 17 - Bent05	BR U	100yr	948.37	947.19	945.28			63.41	11.25	2788.75		8.74
1	2949	BR 17 - Bent05	BR U	500yr	949.67	948.24	946.31			76.18	37.07	3612.93		9.65
1	2949	BR 17 - Bent05	BR D	2yr	944.35	943.55	942.43			40.28		1100.00		7.20
1	2949	BR 17 - Bent05	BR D	5yr	945.11	944.29	942.92			43.23		1340.00		7.30
1	2949	BR 17 - Bent05	BR D	10yr	946.03	945.19	943.49			46.84		1650.00		7.36
1	2949	BR 17 - Bent05	BR D	25yr	947.15	946.23	944.24			58.09	0.39	2109.61		7.69
1	2949	BR 17 - Bent05	BR D	50yr	947.66	946.56	944.71			60.10	3.01	2446.99		8.40
1	2949	BR 17 - Bent05	BR D	100yr	948.27	947.06	945.21			63.10	10.40	2789.60		8.81
1	2949	BR 17 - Bent05	BR D	500yr	949.57	948.11	946.26			75.98	34.50	3615.50		9.74
1	2937.884			2yr	944.30	943.52		0.36	0.05	40.51		1100.00		7.09
1	2937.884			5yr	945.06	944.26		0.32	0.05	43.48		1340.00		7.19
1	2937.884			10yr	945.99	945.17		0.28	0.05	47.12		1650.00		7.25
1	2937.884			25yr	947.11	946.22		0.25	0.06	60.24	0.79	2109.21		7.55
1	2937.884			50yr	947.61	946.56		0.28	0.08	62.98	3.97	2446.03		8.24
1	2937.884			100yr	948.22	947.08		0.28	0.08	67.11	12.25	2787.75		8.58
1	2937.884			500yr	949.52	948.19		0.28	0.08	84.43	44.72	3605.28		9.31
1	2870			2yr	943.88	943.27		0.25	0.03	42.90		1100.00		6.31
1	2870			5yr	944.69	944.05		0.23	0.03	46.14		1340.00		6.40
1	2870			10yr	945.65	945.01		0.20	0.02	69.83	7.09	1642.91		6.43
1	2870			25yr	946.79	946.12		0.17	0.02	74.03	41.05	2068.88	0.08	6.63
1	2870			50yr	947.26	946.46		0.19	0.02	75.27	59.18	2390.53	0.29	7.26
1	2870			100yr	947.86	946.98		0.19	0.01	77.22	87.52	2711.49	0.98	7.62
1	2870			500yr	949.15	948.10		0.19	0.00	81.35	164.20	3481.16	4.64	8.43
1	2813.979			2yr	943.61	943.07	941.15			44.16		1100.00		5.86
1	2813.979			5yr	944.44	943.89	941.63			47.52		1340.00		5.96
1	2813.979			10yr	945.43	944.87	942.18			60.86	4.06	1645.94		6.01
1	2813.979			25yr	946.61	946.00	942.93			65.94	20.39	2089.15	0.46	6.31
1	2813.979			50yr	947.05	946.31	943.42			67.40	28.86	2420.07	1.07	6.97
1	2813.979			100yr	947.65	946.82	943.92			69.81	42.70	2754.58	2.72	7.38
1	2813.979			500yr	948.95	947.91	944.98			75.98	81.50	3558.47	10.03	8.29
1	2807	BR 17 - Bent04	BR U	2yr	943.59	943.05	941.17			43.09		1100.00		5.90
1	2807	BR 17 - Bent04	BR U	5yr	944.41	943.84	941.65			44.68		1340.00		6.05
1	2807	BR 17 - Bent04	BR U	10yr	945.39	944.79	942.17			52.56	2.88	1647.12		6.23
1	2807	BR 17 - Bent04	BR U	25yr	946.55	945.86	942.92			57.32	11.67	2098.00	0.33	6.66
1	2807	BR 17 - Bent04	BR U	50yr	946.98	946.13	943.39			58.55	16.01	2433.22	0.77	7.43
1	2807	BR 17 - Bent04	BR U	100yr	947.57	946.60	943.86			60.75	23.41	2774.49	2.11	7.94
1	2807	BR 17 - Bent04	BR U	500yr	948.84	947.58	944.93			66.03	44.83	3596.87	8.30	9.08
1	2807	BR 17 - Bent04	BR D	2yr	943.56	943.02	941.16			43.02		1100.00		5.94
1	2807	BR 17 - Bent04	BR D	5yr	944.39	943.82	941.64			44.62		1340.00		6.09
1	2807	BR 17 - Bent04	BR D	10yr	945.37	944.77	942.20			52.99	3.55	1646.45		6.25
1	2807	BR 17 - Bent04	BR D	25yr	946.52	945.83	942.91			73.12	13.22	2094.06	2.71	6.68
1	2807	BR 17 - Bent04	BR D	50yr	946.94	946.09	943.39			74.70	17.79	2425.71	6.49	7.45
1	2807	BR 17 - Bent04	BR D	100yr	947.51	946.55	943.86			77.54	25.34	2758.91	15.75	7.94
1	2807	BR 17 - Bent04	BR D	500yr	948.75	947.50	944.92			84.55	46.32	3557.38	46.30	9.07
1	2795.938			2yr	943.53	942.97		0.44	0.04	43.75		1100.00		6.00
1	2795.938			5yr	944.36	943.79		0.40	0.04	47.13		1340.00		6.08
1	2795.938			10yr	945.35	944.76		0.34	0.03	60.98	3.83	1646.17		6.14
1	2795.938			25yr	946.49	945.86		0.31	0.04	81.27	20.26	2086.89	2.85	6.44
1	2795.938			50yr	946.91	946.13		0.36	0.05	82.94	28.09	2415.16	6.75	7.15
1	2795.938			100yr	947.48	946.60		0.37	0.06	85.89	41.19	2742.88	15.93	7.57
1	2795.938			500yr	948.70	947.61		0.38	0.09	93.75	77.02	3527.68	45.30	8.53
1	2668.395			2yr	943.05	942.62	940.23			45.65		1100.00		5.30
1	2668.395			5yr	943.93	943.48	940.73			49.10		1340.00		5.39
1	2668.395			10yr	944.97	944.50	941.27			75.59		1647.12	2.88	5.49
1	2668.395			25yr	946.15	945.65	942.03			126.24	1.84	2069.14	39.02	5.75
1	2668.395			50yr	946.50	945.88	942.53			128.48	3.81	2387.41	58.79	6.41
1	2668.395			100yr	947.05	946.37	942.98			131.56	9.59	2690.31	100.10	6.74
1	2668.395			500yr	948.23	947.42	944.03			138.08	30.14	3402.77	217.09	7.47
1	2662	BR 17 - Bent03	BR U	2yr	943.04	942.60	940.26			45.59		1100.00		5.32
1	2662	BR 17 - Bent03	BR U	5yr	943.92	943.46	940.72			49.05		1340.00		5.41
1	2662	BR 17 - Bent03	BR U	10yr	944.96	944.49	941.30			74.89		1647.21	2.79	5.50
1	2662	BR 17 - Bent03	BR U	25yr	946.14	945.63	942.04			122.52	1.22	2070.49	38.29	5.76
1	2662	BR 17 - Bent03	BR U	50yr	946.49	945.86	942.53			123.95	2.50	2389.87	57.63	6.43
1	2662	BR 17 - Bent03	BR U	100yr	947.03	946.35	943.02			125.01	6.14	2695.52	98.34	6.78
1	2662	BR 17 - Bent03	BR U	500yr	948.21	947.38	944.06			129.79	17.34	3418.51	214.15	7.55
1	2662	BR 17 - Bent03	BR D	2yr	942.82	942.42	940.11			55.73		1100.00		5.09
1	2662	BR 17 - Bent03	BR D	5yr	943.67	943.25	940.56			60.11		1340.00		5.17
1	2662	BR 17 - Bent03	BR D	10yr	944.48	944.03	941.09			76.65	24.84	1624.66	0.50	5.38
1	2662	BR 17 - Bent03	BR D	25yr	945.60	945.10	941.79			131.55	40.38	2058.39	11.23	5.70
1	2662	BR 17 - Bent03	BR D	50yr	945.94	945.33	942.27			132.53	48.66	2378.89	22.46	6.37
1	2662	BR 17 - Bent03	BR D	100yr	946.47	945.80	942.73			134.56	59.48	2689.30	51.22	6.74

1	2662	BR 17 - Bent03	BR D	500yr	947.62	946.79	943.69			138.87	87.01	3419.54	143.45	7.54
1	2650.675			2yr	942.80	942.39	940.11	0.47	0.04	62.98		1100.00		5.12
1	2650.675			5yr	943.65	943.23	940.56	0.51	0.09	64.90		1340.00		5.20
1	2650.675			10yr	944.46	944.04	941.09	0.40	0.06	84.86	57.78	1591.71	0.52	5.26
1	2650.675			25yr	945.58	945.13	941.79	0.31	0.03	139.64	91.21	2007.15	11.64	5.54
1	2650.675			50yr	945.92	945.36	942.27	0.40	0.05	140.65	109.46	2317.44	23.09	6.18
1	2650.675			100yr	946.45	945.83	942.73	0.40	0.05	142.71	132.71	2615.42	51.86	6.52
1	2650.675			500yr	947.58	946.83	943.67	0.40	0.05	147.06	191.07	3316.49	142.44	7.27
1	2537.862			2yr	942.29	941.47	940.18	0.03	0.01	53.92	72.60	1027.40		7.51
1	2537.862			5yr	943.05	941.68	940.67	0.04	0.01	29.06		1340.00		9.37
1	2537.862			10yr	944.01	943.01	941.36	0.03	0.01	103.06	124.99	1525.01		8.31
1	2537.862			25yr	945.24	944.46	942.16	0.02	0.02	145.45	326.65	1774.39	8.96	7.69
1	2537.862			50yr	945.47	944.38	942.22	0.04	0.12	144.77	370.53	2071.19	8.27	9.08
1	2537.862			100yr	946.00	944.88	943.74	0.03	0.09	149.22	484.60	2287.85	27.55	9.35
1	2537.862			500yr	947.13	945.92	944.67	0.03	0.10	158.37	761.61	2793.83	94.56	10.02
1	2532	BR 17 - Bent02	BR U	2yr	942.25	941.35	940.17	0.05	0.04	46.70	57.48	1042.52		7.83
1	2532	BR 17 - Bent02	BR U	5yr	943.00	941.57	940.68	0.06	0.00	28.81		1340.00		9.60
1	2532	BR 17 - Bent02	BR U	10yr	943.97	942.90	941.34	0.05	0.05	73.31	107.22	1542.78		8.59
1	2532	BR 17 - Bent02	BR U	25yr	945.20	944.25	942.17	0.03	0.03	135.20	246.49	1859.25	4.27	8.32
1	2532	BR 17 - Bent02	BR U	50yr	945.31	942.98	942.22	0.08	0.06	83.86	147.38	2302.62		12.64
1	2532	BR 17 - Bent02	BR U	100yr	945.88	943.81	943.81	0.07	0.03	110.13	267.88	2532.12		12.12
1	2532	BR 17 - Bent02	BR U	500yr	947.00	944.80	944.80	0.07	0.01	140.41	509.55	3108.13	32.32	12.86
1	2532	BR 17 - Bent02	BR D	2yr	942.16	940.87	940.14	0.09	0.04	46.69		1100.00		9.12
1	2532	BR 17 - Bent02	BR D	5yr	942.94	941.49	940.72	0.09	0.05	30.62		1340.00		9.67
1	2532	BR 17 - Bent02	BR D	10yr	943.87	942.26	941.38	0.09	0.07	64.27		1650.00		10.18
1	2532	BR 17 - Bent02	BR D	25yr	945.14	944.29	942.30	0.05	0.17	128.68	284.95	1823.18	1.87	7.96
1	2532	BR 17 - Bent02	BR D	50yr	945.17	943.04	943.01	0.09	0.03	100.51	176.43	2273.57		12.15
1	2532	BR 17 - Bent02	BR D	100yr	945.70	943.72	943.72			111.16	298.66	2501.34		11.92
1	2532	BR 17 - Bent02	BR D	500yr	946.81	944.56	944.56	0.08	0.04	132.16	537.34	3104.34	8.33	13.03
1	2520.830			2yr	942.04	940.35	940.14	0.73	0.38	48.12		1100.00		10.41
1	2520.830			5yr	942.80	940.83	940.73	0.84	0.42	28.28		1340.00		11.26
1	2520.830			10yr	943.71	941.42	941.42	0.83	0.51	55.78		1650.00		12.15
1	2520.830			25yr	944.91	942.32	942.32	0.80	0.58	73.54		2110.00		12.91
1	2520.830			50yr	945.05	943.01	943.01	0.67	0.42	106.13	223.56	2226.44		12.01
1	2520.830			100yr	945.56	943.69	943.69	0.65	0.36	119.00	358.86	2441.14		11.73
1	2520.830			500yr	946.62	944.51	944.51	0.65	0.40	139.26	628.83	3014.56	6.62	12.78
1	2390.934			2yr	940.92	940.49		0.22	0.12	64.94	29.40	1070.60		5.32
1	2390.934			5yr	941.54	940.97		0.24	0.10	43.58		1340.00		6.04
1	2390.934			10yr	942.25	941.66		0.23	0.12	118.44	58.19	1591.81		6.32
1	2390.934			25yr	943.21	942.57		0.23	0.14	169.75	147.63	1962.37		6.68
1	2390.934			50yr	943.86	943.23		0.21	0.16	180.13	264.89	2182.90	2.21	6.72
1	2390.934			100yr	944.30	943.62		0.20	0.13	182.03	360.52	2434.16	5.32	7.10
1	2390.934			500yr	945.35	944.58		0.19	0.12	186.71	630.24	3002.07	17.69	7.74
1	949.7572			2yr	935.15	934.61		0.10	0.11	120.25	73.44	1018.37	8.20	6.09
1	949.7572			5yr	936.41	935.77		0.10	0.12	47.03	14.74	1305.49	19.77	6.53
1	949.7572			10yr	936.44	935.80		0.10	0.13	172.75	213.46	1396.44	40.10	6.95
1	949.7572			25yr	937.24	936.54		0.11	0.14	213.36	331.76	1668.52	109.73	7.51
1	949.7572			50yr	937.77	937.06		0.12	0.13	228.35	420.00	1841.18	188.82	7.77
1	949.7572			100yr	938.28	937.56		0.12	0.13	234.37	508.87	1998.90	292.23	7.95
1	949.7572			500yr	939.48	938.77		0.11	0.12	324.91	737.49	2366.93	545.58	8.28
1	878.1000			2yr	934.94	934.78	930.36	0.00	0.00	180.73	43.96	967.66	88.38	3.33
1	878.1000			5yr	936.18	935.95	930.81	0.00	0.00	47.03		1335.32	4.68	3.92
1	878.1000			10yr	936.20	936.01	931.54	0.00	0.00	212.37	84.40	1346.55	219.05	3.92
1	878.1000			25yr	936.99	936.75	932.25	0.00	0.00	241.23	120.88	1660.24	328.88	4.43
1	878.1000			50yr	937.52	937.25	932.69	0.00	0.00	264.19	149.23	1878.39	422.38	4.74
1	878.1000			100yr	938.03	937.74	933.05	0.00	0.00	282.35	177.35	2073.77	548.89	4.97
1	878.1000			500yr	939.25	938.94	933.55	0.00	0.00	314.33	247.41	2491.73	910.86	5.32
1	871	BR U		2yr	934.93	934.78	930.40	0.00	0.00	176.52	44.07	969.72	86.21	3.36
1	871	BR U		5yr	936.18	935.94	930.85	0.01	0.01	47.03		1334.16	5.85	3.94
1	871	BR U		10yr	936.20	936.00	931.58	0.01	0.00	204.93	82.83	1351.47	215.70	3.96
1	871	BR U		25yr	936.98	936.74	932.29	0.01	0.00	229.85	114.92	1667.36	327.72	4.47
1	871	BR U		50yr	937.52	937.24	932.73	0.01	0.00	254.14	138.91	1891.79	419.29	4.80
1	871	BR U		100yr	938.02	937.72	933.09	0.01	0.00	273.09	162.01	2094.18	543.81	5.05
1	871	BR U		500yr	939.24	938.92	933.59	0.01	0.00	305.56	216.37	2523.36	910.27	5.41
1	871	BR D		2yr	934.93	934.76	931.02	0.01	0.00	176.08	50.13	917.22	132.65	3.60
1	871	BR D		5yr	936.17	935.87	931.37	0.01	0.00	47.03		1326.66	13.34	4.42
1	871	BR D		10yr	936.19	935.98	932.03	0.01	0.00	204.69	89.36	1281.20	279.43	4.21
1	871	BR D		25yr	936.98	936.71	932.80	0.01	0.00	240.03	121.75	1587.97	400.28	4.75
1	871	BR D		50yr	937.51	937.21	933.17	0.01	0.00	267.15	145.25	1799.27	505.48	5.07
1	871	BR D		100yr	938.02	937.70	933.25	0.01	0.00	277.95	167.53	1988.46	644.01	5.31
1	871	BR D		500yr	939.23	938.90	934.69	0.01	0.00	302.59	220.18	2402.44	1027.38	5.67

1	859.3424		2yr	934.92	934.74		0.16	0.01	177.30	48.16	924.20	127.64	3.68
1	859.3424		5yr	936.16	935.85		0.21	0.03	47.03		1329.31	10.69	4.49
1	859.3424		10yr	936.18	935.96		0.17	0.02	207.99	89.48	1286.37	274.15	4.28
1	859.3424		25yr	936.97	936.69		0.19	0.01	241.81	126.63	1588.92	394.45	4.81
1	859.3424		50yr	937.50	937.19		0.19	0.01	272.95	155.75	1803.58	490.68	5.14
1	859.3424		100yr	938.01	937.68		0.19	0.01	283.78	183.93	1988.92	627.15	5.37
1	859.3424		500yr	939.22	938.89		0.18	0.01	308.83	254.20	2391.87	1003.93	5.70
1	735.5340		2yr	934.74	934.43	931.29	0.01	0.00	156.55	81.48	906.28	112.24	4.93
1	735.5340		5yr	935.92	935.34	931.79	0.01	0.00	47.03	8.21	1292.83	38.96	6.19
1	735.5340		10yr	935.99	935.61	932.99	0.01	0.00	224.73	163.67	1230.90	255.43	5.69
1	735.5340		25yr	936.77	936.37	933.84	0.01	0.00	281.72	230.01	1440.78	439.21	6.08
1	735.5340		50yr	937.30	936.89	934.16	0.01	0.00	288.53	282.11	1582.90	584.99	6.30
1	735.5340		100yr	937.80	937.39	934.71	0.01	0.00	293.69	335.81	1725.45	738.75	6.51
1	735.5340		500yr	939.03	938.61	935.79	0.01	0.00	304.01	470.67	2036.10	1143.23	6.82
1	728	BR U	2yr	934.73	934.43	931.27	0.01	0.00	152.10	82.56	903.40	114.04	4.89
1	728	BR U	5yr	935.90	935.34	931.75	0.02	0.01	47.03	10.22	1285.26	44.52	6.12
1	728	BR U	10yr	935.98	935.61	932.95	0.01	0.00	236.60	159.15	1229.98	260.87	5.66
1	728	BR U	25yr	936.76	936.36	933.79	0.01	0.01	274.26	217.00	1446.62	446.38	6.08
1	728	BR U	50yr	937.29	936.87	934.08	0.01	0.02	280.76	259.84	1596.19	593.97	6.33
1	728	BR U	100yr	937.79	937.36	934.66	0.02	0.03	285.82	303.70	1745.61	750.69	6.58
1	728	BR U	500yr	939.02	938.58	935.75	0.01	0.03	296.07	410.95	2073.38	1165.66	6.94
1	728	BR D	2yr	934.72	934.36	931.57	0.02	0.01	134.77	90.80	882.49	126.71	5.33
1	728	BR D	5yr	935.87	935.17	932.08	0.03	0.00	47.03	22.96	1277.60	39.44	6.88
1	728	BR D	10yr	935.97	935.55	933.29	0.02	0.01	141.15	178.12	1187.11	284.77	6.08
1	728	BR D	25yr	936.74	936.24	934.04	0.02	0.01	146.00	250.28	1441.98	417.74	6.79
1	728	BR D	50yr	937.25	936.64	934.42	0.03	0.01	169.74	312.28	1678.27	459.45	7.55
1	728	BR D	100yr	937.75	937.02	934.80	0.03	0.02	200.46	376.43	1907.84	515.73	8.23
1	728	BR D	500yr	938.97	938.19	935.55	0.03	0.03	288.25	525.15	2306.66	818.19	8.84
1	716.3877		2yr	934.69	934.35		0.38	0.04	141.40	94.09	874.64	131.27	5.22
1	716.3877		5yr	935.84	935.14		0.51	0.03	47.03	21.47	1283.76	34.76	6.85
1	716.3877		10yr	935.94	935.54		0.36	0.03	149.81	188.24	1172.93	288.83	5.94
1	716.3877		25yr	936.70	936.24		0.38	0.02	154.49	270.04	1419.88	420.08	6.62
1	716.3877		50yr	937.22	936.63		0.41	0.01	187.79	344.20	1664.10	441.70	7.42
1	716.3877		100yr	937.70	937.02		0.43	0.00	216.70	417.72	1874.33	507.96	8.01
1	716.3877		500yr	938.91	938.23		0.41	0.00	297.08	593.28	2223.11	833.62	8.42
1	595.3610		2yr	934.27	933.52	931.25	0.02	0.01	142.06	58.59	1028.34	13.07	7.17
1	595.3610		5yr	935.30	934.29	931.85	0.02	0.01	47.03	13.38	1316.79	9.83	8.17
1	595.3610		10yr	935.55	934.88	932.99	0.02	0.02	192.50	168.63	1292.10	189.28	7.38
1	595.3610		25yr	936.31	935.65	934.48	0.02	0.02	196.34	256.20	1487.77	366.02	7.72
1	595.3610		50yr	936.80	936.13	934.87	0.02	0.02	198.68	320.86	1626.80	502.35	7.98
1	595.3610		100yr	937.27	936.59	935.23	0.02	0.02	201.18	388.00	1764.71	647.29	8.23
1	595.3610		500yr	938.51	937.80	935.96	0.02	0.02	290.91	579.43	2112.36	958.22	8.71
1	589	BR U	2yr	934.24	933.40	931.37	0.03	0.04	105.00	56.49	1038.56	4.95	7.53
1	589	BR U	5yr	935.27	934.16	931.99	0.03	0.04	47.03	9.93	1323.29	6.78	8.51
1	589	BR U	10yr	935.51	934.63	933.14	0.03	0.06	181.80	144.29	1369.52	136.20	8.24
1	589	BR U	25yr	936.27	935.42	934.61	0.03	0.05	186.69	222.50	1571.57	315.93	8.51
1	589	BR U	50yr	936.76	935.92	934.99	0.03	0.05	189.06	278.55	1715.38	456.07	8.75
1	589	BR U	100yr	937.23	936.39	935.34	0.03	0.04	191.43	335.93	1857.86	606.21	8.98
1	589	BR U	500yr	938.46	937.51	936.05	0.03	0.05	278.37	501.81	2279.92	868.27	9.79
1	589	BR D	2yr	934.16	933.47	931.17	0.04	0.02	154.95	67.54	1014.93	17.53	6.97
1	589	BR D	5yr	935.20	934.22	931.76	0.05	0.02	47.03	18.08	1309.28	12.64	8.03
1	589	BR D	10yr	935.41	934.75	932.78	0.04	0.04	182.99	164.88	1291.90	193.22	7.37
1	589	BR D	25yr	936.19	935.51	934.27	0.04	0.02	187.65	239.41	1500.18	370.41	7.77
1	589	BR D	50yr	936.69	936.00	934.69	0.03	0.02	190.58	293.48	1649.40	507.12	8.08
1	589	BR D	100yr	937.17	936.45	935.05	0.03	0.01	193.30	349.19	1797.16	653.65	8.37
1	589	BR D	500yr	938.38	937.60	935.74	0.03	0.02	284.58	504.08	2183.06	962.86	9.04
1	577.5895		2yr	934.10	933.21		0.14	0.00	88.96	53.72	1045.45	0.82	7.78
1	577.5895		5yr	935.13	933.96		0.14	0.06	47.03	9.54	1325.10	5.36	8.73
1	577.5895		10yr	935.34	934.29		0.16	0.02	186.07	141.33	1413.32	95.35	8.87
1	577.5895		25yr	936.13	935.22		0.14	0.03	192.48	236.80	1586.72	286.48	8.77
1	577.5895		50yr	936.64	935.77		0.13	0.02	195.80	303.67	1717.02	429.31	8.87
1	577.5895		100yr	937.12	936.27		0.12	0.02	198.85	371.59	1849.40	579.01	9.01
1	577.5895		500yr	938.33	937.40		0.13	0.03	287.29	568.19	2255.07	826.75	9.75
1	553		2yr	933.96	933.05	930.85	0.48	0.06	52.04	0.05	1099.95		7.62
1	553		5yr	934.93	933.95	931.53	0.46	0.04	47.03	6.76	1329.61	3.62	7.98
1	553		10yr	935.16	933.94	932.32	0.65	0.03	179.04	92.65	1530.99	26.36	9.20
1	553		25yr	935.96	934.76	934.32	0.67	0.02	183.73	172.86	1779.97	157.17	9.53
1	553		50yr	936.48	935.38	934.77	0.63	0.03	188.60	238.97	1918.18	292.85	9.49
1	553		100yr	936.98	935.93	935.16	0.65	0.06	192.54	305.20	2058.52	436.29	9.53
1	553		500yr	938.17	936.90	935.92	0.72	0.08	342.73	480.00	2569.60	600.40	10.71

Duplicate Effective Model (HEC-RAS) FEMA Floodway Profiles



```
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: HopeCreek_Br16-17
Project File : HopeCreek_Br16-17.prj
Run Date and Time: 11/30/2009 10:24:36 AM

Project in English units

Project Description:
Cobb County Priority Area 3 Flood Study - Modified to provide Base Model for
Bridges 16 & 17 of I-75 Corridor HOV Project
Hope Creek
Rottenwood Creek
Watershed

Model extends from confluence with Rottenwood Creek to 1180 feet
upstream of South Marietta Parkway WB to I-75 NB ramp

PLAN DATA

Plan Title: ex fw
Plan File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.p02

Geometry Title: Existing
Geometry File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.g01

Flow Title : ex fw
Flow File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.f03

Plan Description:
Existing Conditions Floodway

Plan Summary Information:

Number of:	Cross Sections	= 19	Multiple Openings	=	0
	Culverts	= 2	Inline Structures	=	0
	Bridges	= 0	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

Encroachment Data
Equal Conveyance = True
Left Offset = 0

Right Offset = 0

River = Hope Creek Reach = 1

RS	Profile	Method	Value1	Value2
8000	100 enc	1	9975.44	10014.28
7548	100 enc	1	9975.44	10014.28
7061	100 enc	1	9971.13	10025.25
6930	100 enc	1	9968.55	10020.97
6719	100 enc	1	9970	10030
6496	100 enc	1	9970	10030
6278	100 enc	1	9960.02	10012.01
5629	100 enc	1	9986.25	10012.01
5428	100 enc	1	9986.25	10012.01
5146	100 enc	4	.1	
4969	100 enc	1	9988.91	10012.88
4718	100 enc	1	9988.91	10012.88
4209	100 enc	1	9988.91	10052.15
3784	100 enc	1	9985.09	10093.33
3147	100 enc	1	9975.96	10021.07
2870	100 enc	1	9983.04	10021.35
2262	100 enc	1	9894.94	10021.06
1650	100 enc	1	9818.08	10016.49
1084	100 enc	1	9969.46	10016.49
553	100 enc	1	9969.46	10016.49
151	100 enc	1	9969.45	10016.48

FLOW DATA

Flow Title: ex fw
Flow File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.f03

Flow Data (cfs)

River	Reach	RS	100 nat	100 enc
Hope Creek	1	8000	1400	1400
Hope Creek	1	7061	1790	1790
Hope Creek	1	4718	2310	2310
Hope Creek	1	3147	2800	2800

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Hope Creek	1	100 nat		Normal S = 0.0095

GEOMETRY DATA

Geometry Title: Existing
Geometry File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.g01

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 8000

INPUT
Description:
Station Elevation Data num= 75

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9463.98	1030.38	9477.66	1030.09	9483.68	1029.62	9503.89	1027.75	9530.87	1023.72
9549.21	1022.8	9584.69	1018.61	9595.4	1017.38	9638.5	1013.13	9667.04	1011.39
9692.31	1010.32	9730.61	1006.96	9741.69	1006.28	9746.1	1006.09	9752.37	1005.9
9795.04	1003.98	9803.95	1003.91	9815.76	1003.7	9830.29	1003.2	9842.43	1003.29
9847.65	1003.23	9856.36	1002.52	9864.45	1002.02	9872.65	1001.42	9875.36	1001.23
9884.35	1001.84	9891.79	1002.43	9896.36	1002.67	9905.33	1003.01	9914.36	1002.76
9926.07	1002.62	9931.4	1003.14	9943.29	1002.52	9951.53	1002.22	9953.9	1002.17
9957.29	1001.98	9971.84	1001.7	9975.44	1001.76	9988.3	1000.04	10000	999.59
10008.8	999.78	10014.28	1003.13	10019.72	1003.11	10021.42	1003.27	10024.73	1003.59

```
10026.72  1003.7 10029.7 1003.8910035.93 1004.2910038.89 1004.5210050.88 1004.82
 10054.9 1004.9210066.83 1005.6410070.49 1006.3910088.12 1013.6310117.17 1024.76
10122.05 1026.46 10124.1 1027.24 10162.5 1042.5310167.13 1044.3410168.05 1044.34
10169.42  1044.310213.71 1043.7210243.63 1043.1410252.63 1042.9410267.22 1042.59
 10275.8 1043.4310282.48 1044.1810295.71 1045.67 10302.3 1046.1110311.15 1046.67
10320.12 1047.0710327.08 1047.3110341.63 1047.5110357.77 1047.6710363.53 1047.72

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9463.98     .12 9975.44    .04510014.28      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9975.4410014.28             393.3   452.1  505.73             .1       .3

CROSS SECTION OUTPUT  Profile #100 nat

  E.G. Elev (ft)           1004.65    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.67    Wt. n-Val.                0.120      0.045     0.100
  W.S. Elev (ft)           1003.98    Reach Len. (ft)          393.30     452.10    505.73
  Crit W.S. (ft)           1003.67    Flow Area (sq ft)        232.79     140.11      9.18
  E.G. Slope (ft/ft)      0.009732    Area (sq ft)             232.79     140.11      9.18
  Q Total (cfs)            1400.00    Flow (cfs)               336.71    1054.33      8.96
  Top Width (ft)            236.20    Top Width (ft)           180.48      38.84     16.88
  Vel Total (ft/s)            3.66    Avg. Vel. (ft/s)           1.45       7.52      0.98
  Max Chl Dpth (ft)           4.39    Hydr. Depth (ft)           1.29       3.61      0.54
  Conv. Total (cfs)        14191.4    Conv. (cfs)              3413.2    10687.4      90.8
  Length Wtd. (ft)          442.74    Wetted Per. (ft)         180.68      39.91     16.91
  Min Ch El (ft)            999.59    Shear (lb/sq ft)           0.78       2.13      0.33
  Alpha                       3.21    Stream Power (lb/ft s)     1.13      16.05      0.32
  Frctn Loss (ft)             5.55    Cum Volume (acre-ft)      49.55      43.23     19.35
  C & E Loss (ft)             0.06    Cum SA (acres)            15.87       6.62     10.72

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 #100 enc

  E.G. Elev (ft)           1005.78    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               1.08    Wt. n-Val.                          0.045
  W.S. Elev (ft)           1004.70    Reach Len. (ft)          393.30     452.10    505.73
  Crit W.S. (ft)           1003.81    Flow Area (sq ft)                   168.05
  E.G. Slope (ft/ft)      0.010798    Area (sq ft)                        168.05
  Q Total (cfs)            1400.00    Flow (cfs)                         1400.00
  Top Width (ft)              38.84    Top Width (ft)                       38.84
  Vel Total (ft/s)            8.33    Avg. Vel. (ft/s)                      8.33
  Max Chl Dpth (ft)           5.11    Hydr. Depth (ft)                      4.33
  Conv. Total (cfs)        13472.5    Conv. (cfs)                        13472.5
  Length Wtd. (ft)          452.10    Wetted Per. (ft)                     44.42
  Min Ch El (ft)            999.59    Shear (lb/sq ft)                      2.55
  Alpha                       1.00    Stream Power (lb/ft s)               21.25
  Frctn Loss (ft)             6.28    Cum Volume (acre-ft)      10.49      46.07      6.61
  C & E Loss (ft)             0.05    Cum SA (acres)             3.51       6.62      1.48

Warning: The cross section had to be extended vertically during the critical depth 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: The parabolic search method failed to converge on critical depth.  The program will try the
         cross section slice/secant method to find critical depth.

CROSS SECTION


RIVER: Hope Creek
REACH: 1                    RS: 7548

INPUT
Description:
Station Elevation Data     num=      95
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9526.38 1019.36 9535.84 1020.99 9558.22 1023.46 9567.58 1024.26 9588.58 1026.67
 9613.72 1030.04 9620.11 1031.25  9624.5 1031.34 9665.28 1031.25 9674.09 1030.87
 9675.01  1030.8 9676.95 1030.74 9697.17 1030.46 9700.91 1030.37 9701.12 1030.35
```

9703.3	1030.19	9711.46	1029.38	9728.82	1028.34	9730.23	1028.23	9734.47	1027.41
9748.82	1024.57	9755.76	1022.99	9757.94	1022.53	9759.65	1022.23	9763.2	1022.13
9764.62	1022.09	9779.95	1021.68	9781.66	1021.28	9796.41	1018.78	9804.23	1017.43
9809.59	1016.6	9814.14	1016.28	9819.77	1015.61	9834.54	1013.19	9841.92	1012.25
9863.29	1009.3	9888.65	1003.16	9940.03	996.67	9975.44	995.68	9988.3	993.96
10000	993.51	10008.8	993.71	10014.28	997.05	10067.71	1007.38	10085.14	1008.78
10118.08	1016.92	10138.68	1018.74	10151.21	1024.73	10189.24	1028.02	10203.71	1031.8
10203.72	1031.8	10205.42	1032.54	10209.79	1032.82	10233.39	1034.19	10242.14	1032.96
10250.96	1031.61	10300.24	1026.71	10304.99	1026.24	10307.58	1026.11	10346.07	1025.26
10359.84	1025.09	10383.03	1025.81	10390.28	1026.04	10399.25	1026.35	10401.42	1026.58
10412.29	1027.99	10417.11	1028.14	10421.82	1028.31	10426.39	1028.46	10443.15	1029.02
10444.68	1030.12	10445.56	1030.78	10446.23	1030.91	10447.05	1031.11	10449.34	1031.13
10458.07	1031.32	10544.37	1032.53	10590.09	1033.15	10599.94	1033.28	10607	1033.36
10608.5	1033.29	10611.62	1033.16	10617.49	1032.89	10624.53	1032.13	10643.06	1030.23
10651.47	1031.77	10656.87	1032.71	10687.01	1037.24	10697.68	1038.79	10713.21	1041.42
10726.49	1044.12	10739.72	1047.29	10745.46	1047.21	10769.24	1046.73	10770.04	1046.49

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9526.38	.12	9975.44	.04	510014.28	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9975.44	10014.28	498.18	486.75	465.44	.1	.3

CROSS SECTION OUTPUT Profile #100 nat

			Left OB	Channel	Right OB
E.G. Elev (ft)	999.05	Element			
Vel Head (ft)	1.31	Wt. n-Val.	0.120	0.045	0.100
W.S. Elev (ft)	997.74	Reach Len. (ft)	498.18	486.75	465.44
Crit W.S. (ft)	997.69	Flow Area (sq ft)	60.05	133.84	1.24
E.G. Slope (ft/ft)	0.016722	Area (sq ft)	60.05	133.84	1.24
Q Total (cfs)	1400.00	Flow (cfs)	118.33	1280.51	1.16
Top Width (ft)	86.32	Top Width (ft)	43.90	38.84	3.58
Vel Total (ft/s)	7.17	Avg. Vel. (ft/s)	1.97	9.57	0.94
Max Chl Dpth (ft)	4.23	Hydr. Depth (ft)	1.37	3.45	0.35
Conv. Total (cfs)	10826.5	Conv. (cfs)	915.1	9902.5	9.0
Length Wtd. (ft)	487.17	Wetted Per. (ft)	43.98	39.91	3.65
Min Ch El (ft)	993.51	Shear (lb/sq ft)	1.43	3.50	0.35
Alpha	1.63	Stream Power (lb/ft s)	2.81	33.50	0.33
Frctn Loss (ft)	9.21	Cum Volume (acre-ft)	48.23	41.81	19.29
C & E Loss (ft)	0.06	Cum SA (acres)	14.86	6.21	10.60

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 energy loss was 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 #100 enc

			Left OB	Channel	Right OB
E.G. Elev (ft)	999.46	Element			
Vel Head (ft)	1.53	Wt. n-Val.		0.045	
W.S. Elev (ft)	997.93	Reach Len. (ft)	498.18	486.75	465.44
Crit W.S. (ft)	997.73	Flow Area (sq ft)		141.15	
E.G. Slope (ft/ft)	0.018519	Area (sq ft)		141.15	
Q Total (cfs)	1400.00	Flow (cfs)		1400.00	
Top Width (ft)	38.84	Top Width (ft)		38.84	
Vel Total (ft/s)	9.92	Avg. Vel. (ft/s)		9.92	
Max Chl Dpth (ft)	4.42	Hydr. Depth (ft)		3.63	
Conv. Total (cfs)	10287.9	Conv. (cfs)		10287.9	
Length Wtd. (ft)	486.75	Wetted Per. (ft)		43.04	
Min Ch El (ft)	993.51	Shear (lb/sq ft)		3.79	
Alpha	1.00	Stream Power (lb/ft s)		37.61	
Frctn Loss (ft)	9.64	Cum Volume (acre-ft)	10.49	44.47	6.61
C & E Loss (ft)	0.04	Cum SA (acres)	3.51	6.21	1.48

Warning: The cross section had to be extended vertically during the critical depth 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: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 7061

INPUT
Description:
Station Elevation Data num= 159

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9406	1029.59	9406.8	1029.58	9412.44	1029.48	9415	1029.37	9417.03	1029.31
9443.24	1029.43	9450.59	1029.25	9468.34	1027.91	9468.95	1027.89	9470.03	1027.82
9472.57	1027.76	9494.4	1027.17	9508.81	1026.74	9522.21	1026.14	9529.87	1025.78
9540.03	1025.26	9542.94	1025.1	9550.74	1023.78	9555.78	1022.7	9556.24	1022.73
9557.7	1022.87	9562.94	1023.44	9565.17	1023.61	9575.57	1023.5	9580.17	1023.42
9587.93	1023.32	9598.67	1023.07	9599.38	1023.06	9600.51	1023.04	9602.71	1022.64
9609.19	1021.54	9611.92	1021.7	9613.63	1021.89	9616.7	1022.15	9619.43	1021.93
9623.35	1021.65	9628.88	1021.43	9630.84	1021.08	9632.86	1021.02	9634.46	1021.01
9638.62	1020.9	9649.66	1020.23	9661.68	1020.21	9664.79	1020.14	9666.42	1019.98
9671.21	1019.76	9689.76	1019.47	9689.84	1019.47	9691.24	1019.36	9709.86	1017.89
9721.53	1016.9	9726.33	1016.72	9759.26	1014.81	9761.14	1014.75	9762.36	1014.68
9780.16	1013.98	9780.69	1013.92	9790.67	1013.21	9791.61	1013.08	9798.15	1013.16
9812.18	1012.5	9819.24	1012.06	9824.99	1011.66	9844.07	1010.18	9848.6	1009.99
9853.66	1009.49	9860.35	1008.71	9881.03	1005.77	9905.26	1001.98	9956.74	993.8
9957.4	993.7	9958.42	993.52	9971.13	990.89	9975.44	985.2	9988.3	983.48
10000	983.03	10008.8	983.22	10014.28	986.57	10018	989.04	10021.34	989.95
10025.25	991.08	10030.35	991.41	10047.87	992.47	10065.41	993.53	10087.95	996.31
10090.3	996.66	10098.54	997.89	10117.31	1004.01	10148.34	1010.17	10153.13	1011.17
10172.64	1021.28	10176.67	1023.16	10179.84	1023.15	10183.38	1023.12	10188.78	1023.36
10202.88	1023.99	10213.29	1024.42	10226.28	1022.18	10226.77	1022.09	10227.46	1022.28
10241.61	1026.02	10251.97	1025.35	10268.27	1024.31	10270.48	1023.91	10272.98	1023.47
10275.57	1023.05	10294.44	1022.51	10307.45	1022.13	10332.89	1020.66	10353.46	1019.53
10372.85	1018.67	10396.23	1018.12	10414.8	1017.86	10442.07	1017.3	10452.8	1017.31
10464.36	1017.22	10494.19	1017.02	10522.76	1017.21	10523.39	1017.21	10531.48	1017.85
10533.95	1018.04	10536.82	1018.12	10585.37	1019.39	10586.48	1020.42	10587.3	1021.24
10588.03	1021.41	10588.69	1021.51	10591.05	1021.36	10594.88	1021.25	10668.88	1021.37
10726.1	1021.52	10737.69	1021.07	10738.06	1021.06	10738.94	1020.95	10744.59	1019.98
10748.54	1018.93	10755.29	1017.78	10760.92	1020.36	10763.2	1021.24	10765.44	1022.19
10768.32	1022.95	10783.45	1026.44	10790.6	1027.96	10804.29	1029.79	10811.01	1031.68
10813.99	1032.27	10832.96	1037.39	10844.91	1040.77	10850.61	1040.95	10859.81	1041.33
10861.36	1041.64	10862.62	1042.42	10866.94	1044.75	10875.86	1050.61	10882.14	1050.7
10883.76	1050.71	10891.49	1050.78	10896.05	1050.88	10902.47	1050.95		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9406	.12	9971.13	.045	10025.25	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9971.13	10025.25	137.61	131.25	117.04	.3	.5

CROSS SECTION OUTPUT Profile #100 nat

E.G. Elev (ft)	989.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.91	Wt. n-Val.		0.045	
W.S. Elev (ft)	987.87	Reach Len. (ft)	137.61	131.25	117.04
Crit W.S. (ft)	987.87	Flow Area (sq ft)		161.42	
E.G. Slope (ft/ft)	0.020907	Area (sq ft)		161.42	
Q Total (cfs)	1790.00	Flow (cfs)		1790.00	
Top Width (ft)	42.82	Top Width (ft)		42.82	
Vel Total (ft/s)	11.09	Avg. Vel. (ft/s)		11.09	
Max Chl Dpth (ft)	4.84	Hydr. Depth (ft)		3.77	
Conv. Total (cfs)	12379.7	Conv. (cfs)		12379.7	
Length Wtd. (ft)	131.25	Wetted Per. (ft)		45.61	
Min Ch El (ft)	983.03	Shear (lb/sq ft)		4.62	
Alpha	1.00	Stream Power (lb/ft s)		51.23	
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	47.88	40.16	19.28
C & E Loss (ft)	0.86	Cum SA (acres)	14.61	5.76	10.58

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 #100 enc

E.G. Elev (ft)	989.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.91	Wt. n-Val.		0.045	
W.S. Elev (ft)	987.87	Reach Len. (ft)	137.61	131.25	117.04
Crit W.S. (ft)	987.87	Flow Area (sq ft)		161.42	
E.G. Slope (ft/ft)	0.020907	Area (sq ft)		161.42	
Q Total (cfs)	1790.00	Flow (cfs)		1790.00	
Top Width (ft)	42.82	Top Width (ft)		42.82	
Vel Total (ft/s)	11.09	Avg. Vel. (ft/s)		11.09	
Max Chl Dpth (ft)	4.84	Hydr. Depth (ft)		3.77	
Conv. Total (cfs)	12379.7	Conv. (cfs)		12379.7	
Length Wtd. (ft)	131.25	Wetted Per. (ft)		45.61	
Min Ch El (ft)	983.03	Shear (lb/sq ft)		4.62	
Alpha	1.00	Stream Power (lb/ft s)		51.23	
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)	10.49	42.77	6.61
C & E Loss (ft)	0.86	Cum SA (acres)	3.51	5.76	1.48

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: Hope Creek
REACH: 1 RS: 6930

INPUT
Description:
Station Elevation Data num= 160

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9220	1039.24	9220.1	1039.21	9222.3	1038.59	9223.89	1038.76	9226.19	1038.96
9239.4	1038.71	9244.14	1038.65	9247.01	1038.79	9248.23	1038.85	9258.34	1040.95
9259.41	1041.17	9259.97	1041.13	9260.21	1041.11	9284.32	1039.5	9289.32	1039.44
9295.51	1038.96	9299.93	1038.82	9324.87	1038	9327.78	1037.82	9334.25	1037.57
9341.53	1037.09	9360.57	1036.31	9389.67	1035.3	9394.12	1035.2	9404.89	1034.49
9413.09	1034.05	9418.75	1034.17	9419.3	1034.14	9419.39	1034.14	9421.23	1033.95
9422.44	1033.89	9422.97	1033.92	9442.04	1033.22	9451.3	1033.05	9457.37	1032.68
9465.07	1032.4	9467.85	1032.25	9470.3	1032.17	9479.1	1031.72	9481.1	1031.69
9482.89	1031.67	9484.29	1031.61	9493.48	1031.17	9504.14	1030.12	9510.79	1029.75
9527.7	1029.74	9531.72	1029.87	9536.61	1028.31	9543.39	1026.55	9544.62	1026.23
9551.01	1025.88	9555.77	1025.8	9558.6	1025.65	9559.65	1025.61	9561.42	1025.54
9562.87	1025.45	9576.95	1024.54	9583.58	1024.54	9603.83	1024.61	9605.06	1024.64
9614.13	1024.43	9629.3	1023.83	9635.17	1023.18	9677.72	1017.86	9690.68	1015.89
9705.62	1014.17	9743.92	1007.8	9761.59	1004.27	9781.95	1000.87	9799.86	997.76
9802.38	997.61	9935.39	995.4	9949.54	993.31	9968.55	984.36	9975.44	978.61
9988.3	976.89	10000	976.44	10008.8	976.63	10014.28	979.98	10020.97	984.41
10043.21	995.61	10048.18	997.11	10057.13	999.87	10068.66	1004.05	10077.53	1006.9
10095.99	1012.29	10096.38	1012.41	10100.94	1013.87	10118.32	1019.41	10120.85	1019.63
10125.47	1020.03	10129.66	1020.32	10130.85	1020.39	10137.04	1020.74	10149.87	1021.53
10162.24	1022.21	10172.48	1021.27	10188.19	1019.93	10191.33	1020.03	10216.37	1020.67
10223.77	102	110244.75	1021.98	10257.34	1024.52	10270.27	1027.04	10271.16	1027.21
10291.78	1026.15	10301.35	1025.67	10306.92	1025.51	10311.15	1025.45	10317.03	1025.33
10324.03	1025.31	10330.04	1024.72	10339.43	1024.21	10344.12	1023.87	10345.71	1023.78
10346.49	1020.59	10382.18	1018.84	10395.66	1018.78	10404.26	1018.34	10428.42	1016.1
10429.71	1016.26	10434.02	1016.71	10456.11	1017.31	10477.39	1017.88	10479.3	1019.58
10479.36	1019.63	10479.4	1019.63	10480.98	1019.74	10482.56	1019.69	10487.26	1019.48
10503.63	1027.77	10532.55	1030.39	10547.44	1033.97	10608.9	1028.59	10620.08	1020.12
10627.66	1020.05	10631.56	1019.98	10647.3	1018.68	10651.96	1018.49	10661.62	1032.78
10670.53	1040.1	10689.1	1043.11	10691.47	1043.84	10693.34	1044.45	10720.64	1048.67
10725.76	1048.85	10725.97	1048.86	10726.07	1048.86	10727.91	1048.92	10755.6	1050.01
10755.97	1050.02	10778.09	1050.66	10778.67	1050.66	10782.35	1050.73	10783.08	1050.74

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10786.63 1050.8110787.48 1050.82 10790.7 1050.8610793.36 1050.8910809.98 1051.08

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
    9220     .12 9968.55    .04510020.97      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9968.5510020.97            458.64  434.11  418.59            .3        .5
Ineffective Flow      num=        2
   Sta L   Sta R    Elev  Permanent
    9220 9968.55 1012.94       F
10020.9710809.98 1013.06       F

CROSS SECTION OUTPUT  Profile #100 nat

  E.G. Elev (ft)              988.34   Element                  Left OB    Channel   Right OB
  Vel Head (ft)                 0.19   Wt. n-Val.                           0.045
  W.S. Elev (ft)              988.15   Reach Len. (ft)          458.64     434.11     418.59
  Crit W.S. (ft)              981.30   Flow Area (sq ft)                   510.24
  E.G. Slope (ft/ft)        0.000606   Area (sq ft)              15.29     510.24      13.93
  Q Total (cfs)              1790.00   Flow (cfs)                         1790.00
  Top Width (ft)               67.92   Top Width (ft)             8.06      52.42       7.44
  Vel Total (ft/s)              3.51   Avg. Vel. (ft/s)                      3.51
  Max Chl Dpth (ft)            11.71   Hydr. Depth (ft)                      9.73
  Conv. Total (cfs)          72717.2   Conv. (cfs)                        72717.2
  Length Wtd. (ft)            434.11   Wetted Per. (ft)                     56.91
  Min Ch El (ft)              976.44   Shear (lb/sq ft)                      0.34
  Alpha                         1.00   Stream Power (lb/ft s)                1.19
  Frctn Loss (ft)                      Cum Volume (acre-ft)      47.86      39.15      19.26
  C & E Loss (ft)                      Cum SA (acres)            14.60       5.61      10.57

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

CROSS SECTION OUTPUT  Profile #100 enc

  E.G. Elev (ft)              988.34   Element                  Left OB    Channel   Right OB
  Vel Head (ft)                 0.19   Wt. n-Val.                           0.045
  W.S. Elev (ft)              988.15   Reach Len. (ft)          458.64     434.11     418.59
  Crit W.S. (ft)              981.30   Flow Area (sq ft)                   510.24
  E.G. Slope (ft/ft)        0.000715   Area (sq ft)                        510.24
  Q Total (cfs)              1790.00   Flow (cfs)                         1790.00
  Top Width (ft)               52.42   Top Width (ft)                       52.42
  Vel Total (ft/s)              3.51   Avg. Vel. (ft/s)                      3.51
  Max Chl Dpth (ft)            11.71   Hydr. Depth (ft)                      9.73
  Conv. Total (cfs)          66930.2   Conv. (cfs)                        66930.2
  Length Wtd. (ft)            434.11   Wetted Per. (ft)                     64.44
  Min Ch El (ft)              976.44   Shear (lb/sq ft)                      0.35
  Alpha                         1.00   Stream Power (lb/ft s)                1.24
  Frctn Loss (ft)                      Cum Volume (acre-ft)      10.49      41.76       6.61
  C & E Loss (ft)                      Cum SA (acres)             3.51       5.61       1.48

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

CULVERT


RIVER: Hope Creek
REACH: 1                    RS: 6719

INPUT
Description: S. Marietta Pkwy, HC-6 2-10x8' Box Culvert
Distance from Upstream XS =     29.5
Deck/Roadway Width        =      375
Weir Coefficient          =      2.6
Upstream  Deck/Roadway Coordinates
    num=      109
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
 9224.89 1024.53          9228.8 1024.52          9256.11 1024.26
 9264.29 1024.22         9286.73 1024.05          9298.95 1024.01
 9302.27    1024         9327.78 1023.82          9338.47 1023.78
 9347.74 1023.76         9351.96 1023.75          9362.14 1023.67
 9389.96  1023.6         9393.38 1023.58          9417.65 1023.33
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9430.93	1023.07	9435.62	1022.98	9462.23	1022.7
9478.58	1022.65	9492.7	1022.53	9508.71	1022.48
9535.25	1022.25	9551.34	1022.16	9563.3	1021.96
9590.79	1021.8	9598.41	1021.72	9605.98	1021.65
9626.95	1021.45	9631.92	1021.4	9636.71	1021.46
9640.54	1021.51	9648.68	1021.46	9673.39	1021.3
9690.21	1021.09	9699.9	1021.04	9711.48	1020.97
9742.37	1020.82	9746.12	1020.79	9754.37	1020.71
9764.06	1020.56	9788.93	1020.32	9798.43	1020.19
9806.68	1020.19	9831.72	1020.2	9838.32	1020.1
9854.25	1019.91	9864.96	1019.76	9890.5	1019.47
9899.11	1019.48	9949.6	1017.97	9976.17	1017.97
9979.69	1017.97	9980.07	1017.97	10003.19	1017.97
10075.41	1020.31	10090.03	1020.52	10109.94	1020.85
10130.24	1021.27	10140.15	1021.51	10161.25	1022
10174.98	1022.22	10182.64	1022.4	10205.31	1023.1
10227.98	1023.65	10237.1	1023.98	10257.17	1024.61
10278.59	1025.38	10286.05	1025.68	10300.3	1026.18
10311.54	1026.63	10322.75	1027.05	10334.05	1027.5
10346.61	1027.92	10358.01	1028.33	10370.6	1028.75
10381.28	1029.09	10389.18	1029.4	10394.55	1029.67
10406.41	1030.13	10408.67	1030.27	10411.49	1030.42
10423.81	1030.89	10441.47	1031.33	10468.74	1032.45
10472.78	1032.68	10477.2	1032.93	10481.87	1033.2
10503.95	1034.11	10843.01	1047.54	10866.03	1048.42
10873.74	1048.63	10877.47	1048.73	10926.33	1050.44
10934.63	1050.8	10936.31	1050.83	10943.63	1051.06
10945.29	1051.07	10946.54	1051.1	10948.45	1051.11
10949.63	1051.14	10951.6	1051.14	10952.66	1051.16
10953.56	1051.17	10973.73	1051.38	10990.8	1052.11
10992.49	1052.16	10994.6	1052.21	10997.14	1052.27
11008.41	1052.56				

Upstream Bridge Cross Section Data
Station Elevation Data num= 160

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9220	1039.24	9220.1	1039.21	9222.3	1038.59	9223.89	1038.76	9226.19	1038.96
9239.4	1038.71	9244.14	1038.65	9247.01	1038.79	9248.23	1038.85	9258.34	1040.95
9259.41	1041.17	9259.97	1041.13	9260.21	1041.11	9284.32	1039.5	9289.32	1039.44
9295.51	1038.96	9299.93	1038.82	9324.87	1038	9327.78	1037.82	9334.25	1037.57
9341.53	1037.09	9360.57	1036.31	9389.67	1035.3	9394.12	1035.2	9404.89	1034.49
9413.09	1034.05	9418.75	1034.17	9419.3	1034.14	9419.39	1034.14	9421.23	1033.95
9422.44	1033.89	9422.97	1033.92	9442.04	1033.22	9451.3	1033.05	9457.37	1032.68
9465.07	1032.4	9467.85	1032.25	9470.3	1032.17	9479.1	1031.72	9481.1	1031.69
9482.89	1031.67	9484.29	1031.61	9493.48	1031.17	9504.14	1030.12	9510.79	1029.75
9527.7	1029.74	9531.72	1029.87	9536.61	1028.31	9543.39	1026.55	9544.62	1026.23
9551.01	1025.88	9555.77	1025.8	9558.6	1025.65	9559.65	1025.61	9561.42	1025.54
9562.87	1025.45	9576.95	1024.54	9583.58	1024.54	9603.83	1024.61	9605.06	1024.64
9614.13	1024.43	9629.3	1023.83	9635.17	1023.18	9677.72	1017.86	9690.68	1015.89
9705.62	1014.17	9743.92	1007.8	9761.59	1004.27	9781.95	1000.87	9799.86	997.76
9802.38	997.61	9935.39	995.4	9949.54	993.31	9968.55	984.36	9975.44	978.61
9988.3	976.89	10000	976.44	10008.8	976.63	10014.28	979.98	10020.97	984.41
10043.21	995.61	10048.18	997.11	10057.13	999.87	10068.66	1004.05	10077.53	1006.9
10095.99	1012.29	10096.38	1012.41	10100.94	1013.87	10118.32	1019.41	10120.85	1019.63
10125.47	1020.03	10129.66	1020.32	10130.85	1020.39	10137.04	1020.74	10149.87	1021.53
10162.24	1022.21	10172.48	1021.27	10188.19	1019.93	10191.33	1020.03	10216.37	1020.67
10223.77	1021	10244.75	1021.98	10257.34	1024.52	10270.27	1027.04	10271.16	1027.21
10291.78	1026.15	10301.35	1025.67	10306.92	1025.51	10311.15	1025.45	10317.03	1025.33
10324.03	1025.31	10330.04	1024.72	10339.43	1024.21	10344.12	1023.87	10345.71	1023.78
10346.49	1020.59	10382.18	1018.84	10395.66	1018.78	10404.26	1018.34	10428.42	1016.1
10429.71	1016.26	10434.02	1016.71	10456.11	1017.31	10477.39	1017.88	10479.3	1019.58
10479.36	1019.63	10479.4	1019.63	10480.98	1019.74	10482.56	1019.69	10487.26	1019.48
10503.63	1027.77	10532.55	1030.39	10547.44	1033.97	10608.9	1028.59	10620.08	1020.12
10627.66	1020.05	10631.56	1019.98	10647.3	1018.68	10651.96	1018.49	10661.62	1032.78
10670.53	1040.1	10689.1	1043.11	10691.47	1043.84	10693.34	1044.45	10720.64	1048.67
10725.76	1048.85	10725.97	1048.86	10726.07	1048.86	10727.91	1048.92	10755.6	1050.01
10755.97	1050.02	10778.09	1050.66	10778.67	1050.66	10782.35	1050.73	10783.08	1050.74
10786.63	1050.81	10787.48	1050.82	10790.7	1050.86	10793.36	1050.89	10809.98	1051.08

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9220	.12	9968.55	.045	10020.97	.1

Bank Sta: Left	Right	Coeff Contr.	Expan.
9968.55	10020.97	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
9220	9968.55	1012.94	F
10020.97	10809.98	1013.06	F

Downstream Deck/Roadway Coordinates
num= 109

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
9224.89	1024.53		9228.8	1024.52		9256.11	1024.26	
9264.29	1024.22		9286.73	1024.05		9298.95	1024.01	
9302.27	1024		9327.78	1023.82		9338.47	1023.78	
9347.74	1023.76		9351.96	1023.75		9362.14	1023.67	
9389.96	1023.6		9393.38	1023.58		9417.65	1023.33	
9430.93	1023.07		9435.62	1022.98		9462.23	1022.7	
9478.58	1022.65		9492.7	1022.53		9508.71	1022.48	
9535.25	1022.25		9551.34	1022.16		9563.3	1021.96	
9590.79	1021.8		9598.41	1021.72		9605.98	1021.65	
9626.95	1021.45		9631.92	1021.4		9636.71	1021.46	
9640.54	1021.51		9648.68	1021.46		9673.39	1021.3	
9690.21	1021.09		9699.9	1021.04		9711.48	1020.97	
9742.37	1020.82		9746.12	1020.79		9754.37	1020.71	
9764.06	1020.56		9788.93	1020.32		9798.43	1020.19	
9806.68	1020.19		9831.72	1020.2		9838.32	1020.1	
9854.25	1019.91		9864.96	1019.76		9890.5	1019.47	
9899.11	1019.48		9949.6	1017.97		9976.17	1017.97	
9979.69	1017.97		9980.07	1017.97		10003.19	1017.97	
10075.41	1020.31		10090.03	1020.52		10109.94	1020.85	
10130.24	1021.27		10140.15	1021.51		10161.25	1022	
10174.98	1022.22		10182.64	1022.4		10205.31	1023.1	
10227.98	1023.65		10237.1	1023.98		10257.17	1024.61	
10278.59	1025.38		10286.05	1025.68		10300.3	1026.18	
10311.54	1026.63		10322.75	1027.05		10334.05	1027.5	
10346.61	1027.92		10358.01	1028.33		10370.6	1028.75	
10381.28	1029.09		10389.18	1029.4		10394.55	1029.67	
10406.41	1030.13		10408.67	1030.27		10411.49	1030.42	
10423.81	1030.89		10441.47	1031.33		10468.74	1032.45	
10472.78	1032.68		10477.2	1032.93		10481.87	1033.2	
10503.95	1034.11		10843.01	1047.54		10866.03	1048.42	
10873.74	1048.63		10877.47	1048.73		10926.33	1050.44	
10934.63	1050.8		10936.31	1050.83		10943.63	1051.06	
10945.29	1051.07		10946.54	1051.1		10948.45	1051.11	
10949.63	1051.14		10951.6	1051.14		10952.66	1051.16	
10953.56	1051.17		10973.73	1051.38		10990.8	1052.11	
10992.49	1052.16		10994.6	1052.21		10997.14	1052.27	
11008.41	1052.56							

Downstream Bridge Cross Section Data
Station Elevation Data num= 147

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9224	1008.24	9226.89	1008.36	9243.31	1013.37	9259.38	1018.43	9269.24	1022.55
9291.82	1026.54	9326	1029.62	9342.43	1029.72	9369.89	1027.86	9381.38	1027.38
9399.05	1026.89	9428.94	1026.38	9448.44	1025.93	9471.66	1025.89	9493.46	1024.97
9515.45	1024.01	9540.18	1022.27	9561.15	1020.37	9564.97	1019.88	9601.42	1018.3
9613.65	1017.66	9616.61	1017.6	9617.89	1017.55	9621.58	1017.36	9631.35	1016.92
9652.92	1015.71	9655.48	1015.68	9659.18	1015.83	9665.99	1015.83	9673.37	1015.14
9678.53	1014.49	9683.37	1013.87	9694.57	1012.4	9704.57	1011.18	9714.1	1010.28
9725.77	1009.05	9729.01	1008.76	9742.1	1007.7	9765.94	1005.12	9766.09	1005.1
9766.15	1005.1	9766.33	1005.08	9781.43	1001.6	9786.59	1000.58	9803.15	999.15
9822.62	997.34	9831.69	994.97	9835.33	994.23	9841.94	994.03	9853.73	993.5
9858.66	993.14	9876.56	991.06	9889.59	989.26	9904.06	987.96	9906.52	987.63
9911.03	987.08	9917.06	986.17	9942.39	982.91	9943.57	982.73	9949.25	981.79
9951.67	981.26	9953.81	980.93	9961.37	979.81	9963.73	979.2	9963.86	979.16
9963.96	979.13	9972.02	976.15	9986.26	970.21	9995.17	966.46	10000.01	966.25
10004.33	966.41	10012.02	970.35	10018.62	971.84	10018.77	971.87	10030.71	974.19
10038.9	976.25	10063.61	978.28	10071.74	979.31	10082.2	980.42	10082.83	980.67
10097.63	986.53	10112.06	991.58	10127.56	997.72	10144.44	1004.51	10151.56	1007.73
10163.21	1011.45	10169.32	1013.12	10188.77	1014.04	10211.26	1015.15	10214.29	1015.2
10224.2	1015.34	10237.58	1014.47	10250.81	1013.51	10264.06	1011.45	10285.12	1007.83
10299.84	1007.41	10310.22	1006.94	10321.5	1006.55	10336.04	1006.22	10366.82	1005.89
10400.17	1005.48	10412.19	1005.31	10420.54	1005.29	10426.73	1005.34	10445.35	1005.52
10468.51	1005.51	10473.15	1005.84	10490.06	1007.21	10495.91	1007.53	10499.5	1007.67
10514.26	1008.29	10535.05	1009.19	10539.13	1009.34	10539.53	1009.34	10540.45	1009.29
10540.68	1009.33	10542.23	1009.57	10548.52	1009.51	10549.84	1009.51	10550.24	1009.5
10550.96	1009.49	10632.64	1010.38	10692.76	1011.02	10693.53	101	110704.22	1010.65
10706.54	1010.57	10706.66	1010.57	10707.3	1010.47	10727.5	1007.58	10733.15	1008.4
10736.43	1008.87	10738.34	1009.14	10743.67	1009.49	10751.9	1010.54	10768.19	1012.44
10779.79	1014.37	10785.54	1015.09	10796.61	1016.48	10828.95	1020.84	10836.88	1021.95

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10841.48 1022.8910897.62 1034.6310900.87  1035.310901.07 1035.3410901.55 1035.54
10920.18 1043.2710937.78  1044.1

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
    9224     .12 9986.26    .03510012.02     .08

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9986.2610012.02             .3       .5
Ineffective Flow      num=        2
   Sta L   Sta R    Elev  Permanent
    9224 9984.26  977.17        F
10012.1210937.78  977.22        F

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

Number of Culverts =  1

Culvert Name      Shape       Rise     Span
Culvert #1            Box        8       10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
               29.5     375     .011     .011        0                   .5                1
Number of Barrels =  2
Upstream   Elevation =  977.32
Centerline Stations
    Sta.    Sta.
  9994.5 10005.5
Downstream Elevation =  967.01
Centerline Stations
    Sta.    Sta.
  9994.5 10005.5

CROSS SECTION


RIVER: Hope Creek
REACH: 1                    RS: 6496

INPUT
Description:
Station Elevation Data     num=      147
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9224 1008.24 9226.89 1008.36 9243.31 1013.37 9259.38 1018.43 9269.24 1022.55
 9291.82 1026.54    9326 1029.62 9342.43 1029.72 9369.89 1027.86 9381.38 1027.38
 9399.05 1026.89 9428.94 1026.38 9448.44 1025.93 9471.66 1025.89 9493.46 1024.97
 9515.45 1024.01 9540.18 1022.27 9561.15 1020.37 9564.97 1019.88 9601.42  1018.3
 9613.65 1017.66 9616.61  1017.6 9617.89 1017.55 9621.58 1017.36 9631.35 1016.92
 9652.92 1015.71 9655.48 1015.68 9659.18 1015.83 9665.99 1015.83 9673.37 1015.14
 9678.53 1014.49 9683.37 1013.87 9694.57  1012.4 9704.57 1011.18  9714.1 1010.28
 9725.77 1009.05 9729.01 1008.76  9742.1  1007.7 9765.94 1005.12 9766.09  1005.1
 9766.15  1005.1 9766.33 1005.08 9781.43  1001.6 9786.59 1000.58 9803.15  999.15
 9822.62  997.34 9831.69  994.97 9835.33  994.23 9841.94  994.03 9853.73   993.5
 9858.66  993.14 9876.56  991.06 9889.59  989.26 9904.06  987.96 9906.52  987.63
 9911.03  987.08 9917.06  986.17 9942.39  982.91 9943.57  982.73 9949.25  981.79
 9951.67  981.26 9953.81  980.93 9961.37  979.81 9963.73   979.2 9963.86  979.16
 9963.96  979.13 9972.02  976.15 9986.26  970.21 9995.17  966.4610000.01  966.25
10004.33  966.4110012.02  970.3510018.62  971.8410018.77  971.8710030.71  974.19
 10038.9  976.2510063.61  978.2810071.74  979.31 10082.2  980.4210082.83  980.67
10097.63  986.5310112.06  991.5810127.56  997.7210144.44  1004.510151.56 1007.73
10163.21 1011.4510169.32 1013.1210188.77 1014.0410211.26 1015.1510214.29  1015.2
 10224.2 1015.3410237.58 1014.4710250.81 1013.5110264.06 1011.4510285.12 1007.83
10299.84  1007.410310.22 1006.94 10321.5 1006.5510336.04 1006.2210366.82 1005.89
10400.17 1005.4810412.19  1005.310420.54 1005.2910426.73 1005.3410445.35 1005.52
10468.51 1005.5110473.15 1005.8410490.06 1007.2110495.91 1007.53 10499.5 1007.67
10514.26 1008.2910535.05 1009.1910539.13 1009.3410539.53 1009.3410540.45 1009.29
10540.68 1009.3310542.23 1009.5710548.52 1009.5110549.84  1009.510550.24  1009.5
10550.96 1009.4910632.64 1010.3810692.76 1011.0210693.53    101110704.22 1010.65
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10706.54 1010.5710706.66 1010.57 10707.3 1010.47 10727.5 1007.5810733.15  1008.4
10736.43 1008.8710738.34 1009.1410743.67 1009.49 10751.9 1010.5410768.19 1012.44
10779.79 1014.3710785.54 1015.0910796.61 1016.4810828.95 1020.8410836.88 1021.95
10841.48 1022.8910897.62 1034.6310900.87  1035.310901.07 1035.3410901.55 1035.54
10920.18 1043.2710937.78  1044.1

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
    9224     .12 9986.26    .03510012.02     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.2610012.02            261.27   218.1  177.15             .3       .5
Ineffective Flow      num=        2
   Sta L   Sta R    Elev  Permanent
    9224 9984.26  977.17        F
10012.1210937.78  977.22        F

CROSS SECTION OUTPUT  Profile #100 nat

  E.G. Elev (ft)            975.70    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               1.98    Wt. n-Val.                0.120      0.035     0.080
  W.S. Elev (ft)            973.73    Reach Len. (ft)          261.27     218.10    177.15
  Crit W.S. (ft)            972.96    Flow Area (sq ft)          6.20     156.79      0.34
  E.G. Slope (ft/ft)      0.006980    Area (sq ft)              14.82     156.79     26.52
  Q Total (cfs)           1790.00     Flow (cfs)                12.92    1775.92      1.16
  Top Width (ft)            50.50     Top Width (ft)             8.43      25.76     16.31
  Vel Total (ft/s)          10.96     Avg. Vel. (ft/s)           2.08      11.33      3.43
  Max Chl Dpth (ft)          7.48     Hydr. Depth (ft)           3.10       6.09      3.37
  Conv. Total (cfs)       21425.3     Conv. (cfs)              154.7    21256.7      13.9
  Length Wtd. (ft)          221.03    Wetted Per. (ft)           2.17      27.47      0.10
  Min Ch El (ft)            966.25    Shear (lb/sq ft)           1.25       2.49      1.43
  Alpha                       1.06    Stream Power (lb/ft s)     2.60      28.17      4.90
  Frctn Loss (ft)             1.23    Cum Volume (acre-ft)      47.70      35.82     19.07
  C & E Loss (ft)             0.10    Cum SA (acres)            14.51       5.22     10.45

Warning: The energy loss was 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,
         energy was used.

CROSS SECTION OUTPUT  Profile #100 enc

  E.G. Elev (ft)            976.17    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               1.46    Wt. n-Val.                0.120      0.035     0.080
  W.S. Elev (ft)            974.71    Reach Len. (ft)          261.27     218.10    177.15
  Crit W.S. (ft)            972.96    Flow Area (sq ft)          8.17     182.17      0.44
  E.G. Slope (ft/ft)      0.004218    Area (sq ft)              24.30     182.17     43.97
  Q Total (cfs)           1790.00     Flow (cfs)                15.91    1772.70      1.38
  Top Width (ft)            54.53     Top Width (ft)            10.79      25.76     17.98
  Vel Total (ft/s)           9.38     Avg. Vel. (ft/s)           1.95       9.73      3.16
  Max Chl Dpth (ft)          8.46     Hydr. Depth (ft)           4.08       7.07      4.35
  Conv. Total (cfs)       27562.3     Conv. (cfs)              245.1    27295.9      21.3
  Length Wtd. (ft)          219.67    Wetted Per. (ft)           2.17      27.47      0.10
  Min Ch El (ft)            966.25    Shear (lb/sq ft)           0.99       1.75      1.12
  Alpha                       1.07    Stream Power (lb/ft s)     1.93      16.99      3.53
  Frctn Loss (ft)             1.08    Cum Volume (acre-ft)      10.36      38.31      6.40
  C & E Loss (ft)             0.24    Cum SA (acres)             3.45       5.22      1.39

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,
         energy was used.

CROSS SECTION


RIVER: Hope Creek
REACH: 1                    RS: 6278

INPUT
Description:
Station Elevation Data    num=     152
```

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9081.15	996.06	9082.91	996.19	9096.24	998.98	9107.19	1000.88	9119.02	1003.07
9143.99	1007.08	9144.35	1007.14	9144.68	1007.2	9145.13	1007.29	9172.53	1010.79
9173.31	1010.9	9174.23	1010.96	9196.78	1011.79	9212.08	1011.9	9247.33	1012.66
9249.56	1012.63	9250.92	1012.63	9290.16	1012.37	9315.71	1013.53	9325.23	1013.48
9380.97	1011.7	9391.06	1010.99	9403.02	1010.86	9426.52	1009.83	9446.23	1009.82
9462.5	1008.74	9480.81	1008.85	9497.49	1007.9	9511.5	1007.76	9532.99	1005.61
9558.7	1005.74	9568.54	1005.34	9576.77	1005.16	9621.91	1002.46	9635.69	1001.59
9640.35	1001.15	9643.47	1000.74	9652.37	999.54	9671.6	997.1	9690.22	993.65
9696.46	992.75	9698.82	992.55	9712.91	991.1	9716.16	990.91	9717.9	990.73
9733.19	988.93	9767.04	986.29	9771.28	986.07	9775.09	985.6	9778.24	985.08
9803.29	982.33	9805.11	981.96	9806.14	981.81	9828.14	978.6	9841.13	976.27
9846.28	975.46	9849.85	974.52	9865.92	973.78	9894.36	972.39	9906.49	971.83
9923.4	970.83	9931	970.28	9963.22	969.91	9977.07	970.05	9978.95	970.05
9982.03	970.07	9986.44	969.88	9994.93	966.01	9999.92	965.79	10004.17	965.99
10012.01	970.73	10012.19	971.06	10013.67	971.78	10018.89	972.07	10035.15	972.95
10037.83	973.12	10061.54	984.92	10096.71	1003.17	10102.72	1005.57	10108.59	1007.99
10121.62	1008.58	10134.66	1009.23	10142.38	1009.62	10150.64	1009.92	10172.94	1009.57
10180.71	1009.25	10190.28	1008.51	10190.58	1008.47	10194.46	1008.18	10200.26	1007.74
10205.91	1007.27	10209.31	1007.02	10216.24	1006.4	10217.9	1006.28	10225.69	1005.61
10226.15	1005.58	10230.99	1005.18	10234.25	1004.87	10241.27	1004.25	10243.87	1004.09
10250.27	1003.61	10255.08	1003.45	10261.26	1003.05	10266.96	1002.77	10272.27	1002.66
10278.02	1002.54	10284.47	1002.43	10289.22	1002.29	10295.61	1002.23	10301.06	1002.21
10303.51	1002.21	10303.89	1002.22	10311.51	1002.31	10313.54	1002.35	10319.77	1002.71
10323.95	1002.84	10331.46	1003.13	10335.32	1003.33	10345.2	1003.71	10348.19	1003.56
10363.59	1003.04	10365.04	1003.27	10375.03	1004.78	10382.49	1004.98	10387.53	1005.11
10403.75	1005.53	10404	1005.63	10404.92	1005.96	10405.86	1005.81	10407.19	1005.59
10408.05	1005.47	10409.28	1005.45	10418.18	1005.54	10444.24	1005.72	10513.05	1006.13
10543.78	1006.32	10555.15	1006.38	10557.12	1006.34	10567.37	1006.05	10568.27	1005.92
10594.52	1002.02	10597.88	1002.48	10604.11	1003.45	10617.01	1004.43	10644.31	1006.96
10672.77	1010.15	10682.08	1011.42	10698.91	1014.09	10732.41	1019.24	10761.2	1026.39
10776.79	1030.53	10796.04	1031.62						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9081.15	.12	9986.44	.025	10012.01	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9986.44	10012.01	596.84	648.74	713.24	.1	.3

CROSS SECTION OUTPUT Profile #100 nat

			Left OB	Channel	Right OB
E.G. Elev (ft)	974.37	Element			
Vel Head (ft)	1.78	Wt. n-Val.	0.120	0.025	0.080
W.S. Elev (ft)	972.59	Reach Len. (ft)	596.84	648.74	713.24
Crit W.S. (ft)	972.59	Flow Area (sq ft)	183.93	134.53	8.06
E.G. Slope (ft/ft)	0.004561	Area (sq ft)	183.93	134.53	8.06
Q Total (cfs)	1790.00	Flow (cfs)	236.75	1547.09	6.16
Top Width (ft)	138.34	Top Width (ft)	96.23	25.57	16.54
Vel Total (ft/s)	5.48	Avg. Vel. (ft/s)	1.29	11.50	0.76
Max Chl Dpth (ft)	6.80	Hydr. Depth (ft)	1.91	5.26	0.49
Conv. Total (cfs)	26506.1	Conv. (cfs)	3505.7	22909.2	91.2
Length Wtd. (ft)	645.03	Wetted Per. (ft)	96.31	27.74	16.93
Min Ch El (ft)	965.79	Shear (lb/sq ft)	0.54	1.38	0.14
Alpha	3.81	Stream Power (lb/ft s)	0.70	15.88	0.10
Frctn Loss (ft)	1.68	Cum Volume (acre-ft)	47.10	35.09	19.00
C & E Loss (ft)	0.16	Cum SA (acres)	14.20	5.10	10.39

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 OUTPUT Profile #100 enc

			Left OB	Channel	Right OB
E.G. Elev (ft)	974.85	Element			
Vel Head (ft)	2.26	Wt. n-Val.	0.120	0.025	
W.S. Elev (ft)	972.59	Reach Len. (ft)	596.84	648.74	713.24

Crit W.S. (ft)	972.59	Flow Area (sq ft)	68.74	134.42	
E.G. Slope (ft/ft)	0.005841	Area (sq ft)	68.74	134.42	
Q Total (cfs)	1790.00	Flow (cfs)	115.45	1674.55	
Top Width (ft)	51.99	Top Width (ft)	26.42	25.57	
Vel Total (ft/s)	8.81	Avg. Vel. (ft/s)	1.68	12.46	
Max Chl Dpth (ft)	6.80	Hydr. Depth (ft)	2.60	5.26	
Conv. Total (cfs)	23421.2	Conv. (cfs)	1510.7	21910.5	
Length Wtd. (ft)	647.07	Wetted Per. (ft)	29.07	29.60	
Min Ch El (ft)	965.79	Shear (lb/sq ft)	0.86	1.66	
Alpha	1.87	Stream Power (lb/ft s)	1.45	20.63	
Frctn Loss (ft)	2.29	Cum Volume (acre-ft)	10.09	37.52	6.31
C & E Loss (ft)	0.31	Cum SA (acres)	3.34	5.10	1.36

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 cross section had to be extended vertically during the critical depth 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.
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 5629

INPUT
Description:
Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9149.56	1005.63	9155.17	1005.09	9168.89	1003.2	9169.74	1003.12	9185.59	1002.37
9191.98	1002.32	9204.71	1002.57	9209.01	1002.94	9212.67	1002.91	9219.98	1002.65
9235.5	1002.63	9245.76	1003.69	9255.14	1002.66	9262.2	1002.38	9268.92	1001.62
9279.44	1000.89	9282.54	1000.81	9305.55	998.95	9307.5	998.93	9307.96	998.92
9308.15	998.93	9332.23	998.67	9333.52	998.58	9335.33	998.41	9347.98	997.98
9352.54	997.64	9360.38	997.02	9372.9	996.6	9391.41	996.7	9397.64	996.58
9408.85	996.16	9433.28	995.16	9445.2	994.42	9449.82	994.15	9485.07	991.83
9496.77	990.66	9498.38	990.55	9505.4	989.9	9517.62	988.64	9520.28	987.92
9522.28	986.53	9524.68	986.34	9529.57	986.01	9536.62	985.63	9541.32	985.27
9546.48	984.06	9548.46	983.57	9553.78	983.84	9553.88	983.83	9569	983.32
9570.72	983.25	9573.16	983.19	9579.43	983.15	9588.39	982.74	9592.04	982.61
9600.41	982.33	9601.96	982.04	9603.01	981.93	9611.43	980.44	9615.95	980.47
9621.37	980.19	9628.21	981.24	9631.12	981.2	9660.65	980.94	9662.18	980.92
9663.41	980.83	9680.64	976.68	9688.56	975.37	9694.14	974.48	9699.85	973.74
9703.1	973.44	9708.01	973.59	9714.45	973.49	9718.86	973.55	9729.39	973.45
9734.64	973.58	9737.31	973.56	9748.19	973.75	9749.7	973.74	9750.86	973.64
9761.28	973.99	9764.91	974	9779.35	973.41	9794.19	972.77	9796.98	972.65
9802.81	971.45	9811.56	970.63	9816.07	969.91	9823.25	969.22	9836.58	968.9
9852.51	968.61	9862.6	968.52	9876.71	968.56	9885.29	969.14	9892.29	969.46
9906.05	970.29	9910.69	970.53	9912.47	972.42	9950.99	971.68	9972.01	968.32
9986.25	962.38	9995.16	958.63	10000	958.42	10004.32	958.58	10012.01	962.52
10012.87	983.28	10081.79	980.68	10087.66	980.21	10106.13	978.58	10106.56	978.62
10121.64	980.21	10132.22	981.31	10136.37	981.48	10145.34	981.83	10251.81	981.77
10319.47	981.51	10326.03	981.52	10327.04	981.51	10327.53	981.41	10333.28	980.7
10335.22	980.24	10346.64	977.91	10350.14	978.24	10366.73	980.67	10378.74	982.27
10384.24	982.67	10390.68	983.16	10403.43	986.28	10406.08	988.01	10420.4	996.89
10421.8	996.92	10446.91	997.38	10456.42	997.46	10509.85	997.33	10515.45	997.17
10520.38	997.21	0548.49	997.62	10561.01	998.09	10567.5	997.92	10577.44	997.73
10598.03	998.24	10606.83	998.43	10629.41	998.41	10642.02	997.78	10651.67	997.53
10655.91	997.49	10666.52	997.52	10695.02	997.98	10709.97	998.02	10720.29	998.12
10727.97	998.42	10736.69	998.75	10786.94	1000.05	10801.76	1000.51		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9149.56	.12	9986.25	.025	10012.01	.08

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

9986.2510012.01 205.65 201.08 200.99 .3 .5

CROSS SECTION OUTPUT Profile #100 nat

			Left OB	Channel	Right OB
E.G. Elev (ft)	968.64	Element			
Vel Head (ft)	1.25	Wt. n-Val.	0.120	0.025	0.080
W.S. Elev (ft)	967.39	Reach Len. (ft)	205.65	201.08	200.99
Crit W.S. (ft)		Flow Area (sq ft)	30.12	195.33	0.49
E.G. Slope (ft/ft)	0.001687	Area (sq ft)	30.12	195.33	0.49
Q Total (cfs)	1790.00	Flow (cfs)	26.80	1763.12	0.08
Top Width (ft)	37.98	Top Width (ft)	12.02	25.76	0.20
Vel Total (ft/s)	7.92	Avg. Vel. (ft/s)	0.89	9.03	0.17
Max Chl Dpth (ft)	8.97	Hydr. Depth (ft)	2.51	7.58	2.43
Conv. Total (cfs)	43578.7	Conv. (cfs)	652.4	42924.4	2.0
Length Wtd. (ft)	201.12	Wetted Per. (ft)	13.02	27.47	4.88
Min Ch El (ft)	958.42	Shear (lb/sq ft)	0.24	0.75	0.01
Alpha	1.28	Stream Power (lb/ft s)	0.22	6.76	0.00
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	45.64	32.64	18.93
C & E Loss (ft)	0.31	Cum SA (acres)	13.46	4.71	10.25

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 #100 enc

			Left OB	Channel	Right OB
E.G. Elev (ft)	968.88	Element			
Vel Head (ft)	1.22	Wt. n-Val.		0.025	
W.S. Elev (ft)	967.66	Reach Len. (ft)	205.65	201.08	200.99
Crit W.S. (ft)		Flow Area (sq ft)		202.17	
E.G. Slope (ft/ft)	0.002380	Area (sq ft)		202.17	
Q Total (cfs)	1790.00	Flow (cfs)		1790.00	
Top Width (ft)	25.76	Top Width (ft)		25.76	
Vel Total (ft/s)	8.85	Avg. Vel. (ft/s)		8.85	
Max Chl Dpth (ft)	9.24	Hydr. Depth (ft)		7.85	
Conv. Total (cfs)	36691.7	Conv. (cfs)		36691.7	
Length Wtd. (ft)	201.08	Wetted Per. (ft)		37.89	
Min Ch El (ft)	958.42	Shear (lb/sq ft)		0.79	
Alpha	1.00	Stream Power (lb/ft s)		7.02	
Frctn Loss (ft)	0.29	Cum Volume (acre-ft)	9.61	35.01	6.31
C & E Loss (ft)	0.29	Cum SA (acres)	3.16	4.71	1.36

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: Hope Creek
REACH: 1 RS: 5428

INPUT
Description:
Station Elevation Data num= 139

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8880	1017.68	8881.7	1017.62	8890.39	1017.27	8895.17	1017.13	8898.42	1016.88
8905.03	1016.67	8909.13	1016.75	8911.61	1016.71	8929.44	1016.27	8930.08	1016.26
8930.87	1016.22	8931.49	1016.2	8936.73	1016.03	8956.97	1015.02	8959.15	1015
8970.1	1015.14	8971.12	1015.12	8973.35	1015.09	8980.54	1015.08	8981.63	1015.03
8987.58	1014.87	8992.82	1014.7	8994.89	1014.63	8999.89	1014.6	9012.01	1014.2
9013.22	1014.16	9021.42	1013.62	9027.09	1013.57	9045.66	1012.91	9046.29	1012.88
9048.07	1012.81	9051.84	1012.62	9056.36	1012.36	9057.91	1012.26	9063.21	1011.8
9082.18	1009.56	9088.07	1008.78	9091.74	1008.25	9094.97	1007.92	9102.18	1007.27
9126.65	1006.06	9174.1	1001.47	9175.17	1001.36	9175.67	1001.31	9176.37	1001.26
9176.71	1001.21	9177.28	1001.16	9215.69	998.51	9224.02	997.57	9236.66	996.05
9236.79	996.05	9272.98	993.96	9295.37	992.45	9307.21	991.85	9325.97	990.47
9327.88	990.18	9328.69	990.11	9333.85	989.56	9352.23	987.68	9362.6	986.64
9383.62	985.48	9388.62	985.11	9391.91	984.83	9432.86	982.72	9444.36	981.97
9454.54	980.96	9469.63	979.5	9489.12	977.69	9492.06	977.07	9494.28	976.62
9507.56	973.91	9512.84	972.83	9514.96	972.42	9521.05	972.17	9524.88	972.02
9533.91	971.61	9541.48	971.31	9547.26	970.53	9547.7	970.49	9548.77	970.36

9550.44	970.24	9564.15	969.34	9564.53	969.32	9566.83	968.61	9581.36	965.46
9584.59	965.06	9587.25	964.84	9596.02	964.69	9606.43	964.53	9608.17	964.51
9613.93	964.43	9635.01	964.06	9645.73	962.26	9649.59	961.6	9659.69	961.41
9674.25	961.01	9682.31	960.85	9953.74	960.3	9966.04	960.04	9971.16	959.98
9974.67	959.83	9978.83	959.81	9986.25	959.32	9995.16	955.57	10000	955.36
10004.32	955.5	210012.01	959.46	10016.4	966.46	10019.39	973.97	10019.65	973.83
10020.43	973.45	10047.3	973.75	10054.63	973.87	10060.74	973.93	10065.85	973.68
10095.76	972.45	10108.5	973.81	10118.8	974.85	10124.9	975.16	10129.19	975.42
10132.75	975.61	10178.93	975.81	10208.91	975.93	10300.93	976.31	10307.69	976.33
10308.62	976.18	10312.59	975.44	10319.33	974.22	10323.96	975.27	10355.3	982.04
10359.11	983.97	10360.64	998.51	10398.32	998.15	10436.27	997.91	0461.02	998.2
10511.39	998.61	0520.87	998.62	10530.55	998.46	10531.68	998.43		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8880	.12	9986.25	.025	10012.01	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9986.25	10012.01	519.24	458.42	414.44	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
9575	9984.63	968.08	T
10013.39	10531.68	969.97	T

CROSS SECTION OUTPUT Profile #100 nat

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	968.15	Wt. n-Val.	0.120	0.025	0.080
Vel Head (ft)	0.63	Reach Len. (ft)	519.24	458.42	414.44
W.S. Elev (ft)	967.53	Flow Area (sq ft)	14.30	277.61	9.61
Crit W.S. (ft)	962.05	Area (sq ft)	2578.91	277.61	20.28
E.G. Slope (ft/ft)	0.000528	Flow (cfs)	8.34	1771.84	9.82
Q Total (cfs)	1790.00	Top Width (ft)	414.42	25.76	4.82
Top Width (ft)	445.00	Avg. Vel. (ft/s)	0.58	6.38	1.02
Vel Total (ft/s)	5.94	Hydr. Depth (ft)	2.98	10.78	6.97
Max Chl Dpth (ft)	12.17	Conv. (cfs)	363.1	77118.0	427.3
Conv. Total (cfs)	77908.4	Wetted Per. (ft)	4.87	27.47	2.60
Length Wtd. (ft)	458.42	Shear (lb/sq ft)	0.10	0.33	0.12
Min Ch El (ft)	955.36	Stream Power (lb/ft s)	0.06	2.13	0.12
Alpha	1.14	Cum Volume (acre-ft)	39.48	31.55	18.88
Frctn Loss (ft)		Cum SA (acres)	12.45	4.59	10.24
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #100 enc

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	968.29	Wt. n-Val.		0.025	
Vel Head (ft)	0.63	Reach Len. (ft)	519.24	458.42	414.44
W.S. Elev (ft)	967.66	Flow Area (sq ft)		281.08	
Crit W.S. (ft)	962.07	Area (sq ft)		281.08	
E.G. Slope (ft/ft)	0.000969	Flow (cfs)		1790.00	
Q Total (cfs)	1790.00	Top Width (ft)		25.76	
Top Width (ft)	25.76	Avg. Vel. (ft/s)		6.37	
Vel Total (ft/s)	6.37	Hydr. Depth (ft)		10.91	
Max Chl Dpth (ft)	12.30	Conv. (cfs)		57502.3	
Conv. Total (cfs)	57502.3	Wetted Per. (ft)		44.02	
Length Wtd. (ft)	458.42	Shear (lb/sq ft)		0.39	
Min Ch El (ft)	955.36	Stream Power (lb/ft s)		2.46	
Alpha	1.00	Cum Volume (acre-ft)	9.61	33.90	6.31
Frctn Loss (ft)		Cum SA (acres)	3.16	4.59	1.36
C & E Loss (ft)					

Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CULVERT

RIVER: Hope Creek
REACH: 1 RS: 5146

INPUT
Description: I-75, HC-4, 2-9x6 Box
Distance from Upstream XS = 17
Deck/Roadway Width = 425

Weir Coefficient = 2.8
Upstream Deck/Roadway Coordinates
num= 121

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
8877.88	1014.31		8885.17	1013.96		8907.41	1012.17	
8918.63	1011.43		8927.44	1011.13		8988.38	1009.03	
8991.01	1008.91		9024.72	1007.63		9048.71	1005.15	
9057.07	1004.18		9069.38	1003.06		9112.43	1000.94	
9115.2	1000.52		9117.04	1000.56		9119.51	1000.03	
9122.16	999.35		9146.05	998.39		9156.73	997.91	
9158.93	997.82		9159.77	997.79		9162.87	997.65	
9191.73	996.39		9198.48	996		9204.74	995.81	
9207.33	995.23		9217.31	992.96		9221.32	992.35	
9222.87	992.31		9247.33	991.25		9254.19	990.89	
9272.57	989.64		9274.57	989.5		9275.59	989.2	
9278.74	988.13		9281.27	987.27		9284.4	987.66	
9289.98	988.63		9296.13	988.18		9302.12	987.41	
9311.11	986.45		9320.01	985.63		9321.66	985.47	
9323.02	985.32		9331.13	984.28		9333.22	984.16	
9339.34	983.97		9343.65	983.55		9349.61	983.18	
9356.06	982.93		9359.01	982.82		9360.73	982.44	
9366.23	981.36		9375.12	980.54		9384.91	979.74	
9394.33	978.6		9410.5	976.7		9439.25	974.19	
9444.61	973.8		9474.25	970.91		9488.42	969.84	
9499.54	969.12		9516.33	968.51		9537.11	967.34	
9559.06	964.09		9562.99	963.52		9566.48	963.27	
9684.38	964.81		9685.32	965.09		9725.25	969.45	
9730.79	969.45		9737.49	969.45		9745.37	969.45	
9752.75	969.45		9765.99	969.45		9885.76	967.26	
9893.79	967.37		9944.35	968.44		9956.98	968.66	
9970.88	969.52		9982.88	969.52		10024.87	969.52	
10036.05	970.14		10041.11	970.23		10050.31	970.4	
10108.03	971.73		10118.43	972.04		10131.15	972.34	
10135.54	972.54		10189.34	974.07		10196.9	974.17	
10210.77	974.61		10297.86	974.86		10330.75	974.96	
10333.8	974.97		10337.4	974.35		10346.03	972.86	
10349.55	973.73		10381.62	981.42		10405.7	992.45	
10408.55	993.67		10409.29	993.72		10450.59	995.25	
10456.78	995.51		10462.41	995.54		10492.18	996.02	
10525.03	995.39		10527.38	995.31		10528.77	995.32	
10531.44	995.33		10565.96	995.33		10597.8	995.59	
10598.34	995.58		10598.94	995.61		10637.36	996.21	
10665.54	995.98		10673.12	995.92		10712.68	996.38	
10740.48	996.87		10764.42	997.25		10799.24	998.33	
10801.36	998.34							

Upstream Bridge Cross Section Data
Station Elevation Data num= 139

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8880	1017.68	8881.7	1017.62	8890.39	1017.27	8895.17	1017.13	8898.42	1016.88		
8905.03	1016.67	8909.13	1016.75	8911.61	1016.71	8929.44	1016.27	8930.08	1016.26		
8930.87	1016.22	8931.49	1016.2	8936.73	1016.03	8956.97	1015.02	8959.15	1015		
8970.1	1015.14	8971.12	1015.12	8973.35	1015.09	8980.54	1015.08	8981.63	1015.03		
8987.58	1014.87	8992.82	1014.7	8994.89	1014.63	8999.89	1014.6	9012.01	1014.2		
9013.22	1014.16	9021.42	1013.62	9027.09	1013.57	9045.66	1012.91	9046.29	1012.88		
9048.07	1012.81	9051.84	1012.62	9056.36	1012.36	9057.91	1012.26	9063.21	1011.8		
9082.18	1009.56	9088.07	1008.78	9091.74	1008.25	9094.97	1007.92	9102.18	1007.27		
9126.65	1006.06	9174.1	1001.47	9175.17	1001.36	9175.67	1001.31	9176.37	1001.26		
9176.71	1001.21	9177.28	1001.16	9215.69	998.51	9224.02	997.57	9236.66	996.05		
9236.79	996.05	9272.98	993.96	9295.37	992.45	9307.21	991.85	9325.97	990.47		
9327.88	990.18	9328.69	990.11	9333.85	989.56	9352.23	987.68	9362.6	986.64		
9383.62	985.48	9388.62	985.11	9391.91	984.83	9432.86	982.72	9444.36	981.97		
9454.54	980.96	9469.63	979.5	9489.12	977.69	9492.06	977.07	9494.28	976.62		
9507.56	973.91	9512.84	972.83	9514.96	972.42	9521.05	972.17	9524.88	972.02		
9533.91	971.61	9541.48	971.31	9547.26	970.53	9547.7	970.49	9548.77	970.36		
9550.44	970.24	9564.15	969.34	9564.53	969.32	9566.83	968.61	9581.36	965.46		
9584.59	965.06	9587.25	964.84	9596.02	964.69	9606.43	964.53	9608.17	964.51		
9613.93	964.43	9635.01	964.06	9645.73	962.26	9649.59	961.6	9659.69	961.41		
9674.25	961.01	9682.31	960.85	9953.74	960.3	9966.04	960.04	9971.16	959.98		
9974.67	959.83	9978.83	959.81	9986.25	959.32	9995.16	955.57	10000	955.36		
10004.32	955.52	10012.01	959.46	10016.4	966.46	10019.39	973.97	10019.65	973.83		
10020.43	973.45	10047.3	973.75	10054.63	973.87	10060.74	973.93	10065.85	973.68		
10095.76	972.45	10108.5	973.81	10118.8	974.85	10124.9	975.16	10129.19	975.42		
10132.75	975.61	10178.93	975.81	10208.91	975.93	10300.93	976.31	10307.69	976.33		
10308.62	976.18	10312.59	975.44	10319.33	974.22	10323.96	975.27	10355.3	982.04		
10359.11	983.97	10360.64	998.51	10398.32	998.15	10436.27	997.91	10461.02	998.2		

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10511.39   998.610520.87  998.6210530.55  998.4610531.68  998.43

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
    8880     .12 9986.25    .02510012.01     .08

Bank Sta: Left   Right    Coeff Contr.   Expan.
        9986.2510012.01          .3        .5
Ineffective Flow      num=        2
   Sta L   Sta R    Elev  Permanent
    9575 9984.63  968.08        T
10013.3910531.68  969.97        T

Downstream  Deck/Roadway Coordinates
    num=      121
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
 8877.88 1014.31          8885.17 1013.96          8907.41 1012.17
 8918.63 1011.43          8927.44 1011.13          8988.38 1009.03
 8991.01 1008.91          9024.72 1007.63          9048.71 1005.15
 9057.07 1004.18          9069.38 1003.06          9112.43 1000.94
  9115.2 1000.52          9117.04 1000.56          9119.51 1000.03
 9122.16  999.35          9146.05  998.39          9156.73  997.91
 9158.93  997.82          9159.77  997.79          9162.87  997.65
 9191.73  996.39          9198.48     996          9204.74  995.81
 9207.33  995.23          9217.31  992.96          9221.32  992.35
 9222.87  992.31          9247.33  991.25          9254.19  990.89
 9272.57  989.64          9274.57   989.5          9275.59   989.2
 9278.74  988.13          9281.27  987.27           9284.4  987.66
 9289.98  988.63          9296.13  988.18          9302.12  987.41
 9311.11  986.45          9320.01  985.63          9321.66  985.47
 9323.02  985.32          9331.13  984.28          9333.22  984.16
 9339.34  983.97          9343.65  983.55          9349.61  983.18
 9356.06  982.93          9359.01  982.82          9360.73  982.44
 9366.23  981.36          9375.12  980.54          9384.91  979.74
 9394.33   978.6           9410.5   976.7          9439.25  974.19
 9444.61   973.8          9474.25  970.91          9488.42  969.84
 9499.54  969.12          9516.33  968.51          9537.11  967.34
 9559.06  964.09          9562.99  963.52          9566.48  963.27
 9684.38  964.81          9685.32  965.09          9725.25  969.45
 9730.79  969.45          9737.49  969.45          9745.37  969.45
 9752.75  969.45          9765.99  969.45          9885.76  967.26
 9893.79  967.37          9944.35  968.44          9956.98  968.66
 9970.88  969.52          9982.88  969.52         10024.87  969.52
10036.05  970.14         10041.11  970.23         10050.31   970.4
10108.03  971.73         10118.43  972.04         10131.15  972.34
10135.54  972.54         10189.34  974.07          10196.9  974.17
10210.77  974.61         10297.86  974.86         10330.75  974.96
 10333.8  974.97          10337.4  974.35         10346.03  972.86
10349.55  973.73         10381.62  981.42          10405.7  992.45
10408.55  993.67         10409.29  993.72         10450.59  995.25
10456.78  995.51         10462.41  995.54         10492.18  996.02
10525.03  995.39         10527.38  995.31         10528.77  995.32
10531.44  995.33         10565.96  995.33          10597.8  995.59
10598.34  995.58         10598.94  995.61         10637.36  996.21
10665.54  995.98         10673.12  995.92         10712.68  996.38
10740.48  996.87         10764.42  997.25         10799.24  998.33
10801.36  998.34

Downstream Bridge Cross Section Data
Station Elevation Data    num=     157
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8866 1008.46 8866.04 1008.46 8873.96 1008.15 8877.18 1008.15 8881.58 1008.38
 8887.58 1008.13 8913.96 1007.31 8915.68 1007.26 8918.81 1007.23 8943.94 1006.18
 8945.71 1005.64 8954.99  1003.6 8964.49  1003.6 8995.86 1003.05 9001.03 1003.03
 9002.63 1003.02 9003.97 1002.98 9035.31 1001.44 9043.76 1001.21 9057.87 1000.36
 9058.85 1000.17  9059.8  1000.1 9074.56  999.25 9078.13  999.57 9091.88  999.16
  9102.7  998.95 9113.79  998.83 9129.67  998.73 9132.32  998.67 9140.97  998.73
 9149.13  998.47 9153.93  998.39 9155.08  998.03  9169.7  997.09 9175.48   996.5
 9185.46  995.69 9199.49  994.33 9205.58   993.7 9220.98  992.62 9226.09   991.8
 9233.83   991.5 9242.96  990.96 9258.56  989.48 9285.42  988.13 9292.34  987.76
 9311.69  987.02 9318.37  986.78 9320.74  986.53 9324.82  985.88 9328.08  985.18
 9341.88  982.47 9346.73  981.35 9351.23  980.08 9356.87  978.92 9360.72  979.07
 9363.48   979.3 9364.58  979.34 9372.37  978.75 9373.72  978.64 9385.58   977.7
 9387.52  977.54 9389.02   977.4 9391.34  977.03 9394.57  976.48 9396.36  976.36
 9397.25  976.29 9401.15  974.97 9403.55  974.96 9408.36  974.69 9412.31  974.63
 9436.96  972.17 9444.24  971.64 9453.17   971.3 9458.23  971.08 9462.77  970.88
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 9478.62  970.03  9494.5  968.91 9501.94  968.72 9531.25  966.52 9539.45  966.14
  9540.4   966.1 9542.71  965.95 9554.53  965.29 9558.73  963.77 9569.43  960.61
  9600.4  959.56 9624.17  958.39 9638.99  957.84 9652.47  957.06 9663.72  960.71
 9674.97  964.74 9689.32  964.84 9715.02  964.97 9725.37  963.65 9727.61  963.32
 9732.87  963.41 9741.13  963.62 9751.88  965.94 9753.03  966.18 9753.65  966.19
 9769.43  966.59 9865.27  966.24 9876.54  966.29 9899.28   966.5 9925.28  966.52
 9938.13  966.58  9962.9  966.55 9966.34  966.58 9967.87  966.59 9968.35  966.59
 9970.14  966.43 9970.75  966.38 9974.46  962.41 9988.91  956.36 9990.74  950.63
   10000   950.610010.74  951.2210012.88  957.5110026.81  962.3210030.78  962.53
10033.08  963.2710048.84  968.2410053.37  969.8710062.18  972.2210098.75  980.36
10100.19  980.6410120.19  981.1610152.39  980.8210196.07  980.4710196.53  980.48
10236.47  976.9710238.26  976.8410240.25  976.5810262.15  976.2610263.03  976.24
 10276.5  976.2210302.84  976.1310311.44  976.1510346.55  976.1310362.69  976.28
10394.65  976.2310401.57  976.2410413.15  976.3910447.25  976.6210452.06  976.66
10458.13  976.7110466.41  977.1310495.79  977.5610505.74  978.2210515.78  978.64
10530.16  978.9610532.53  979.4910545.54  980.51 10546.7   980.810566.33  984.59
10570.96  985.4110575.33  984.42

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    8866     .09 9988.91     .0410012.88     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9988.9110012.88              .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    8866 9988.56     963       F
10013.5410575.33  969.81       F

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

Number of Culverts =  1

Culvert Name      Shape      Rise    Span
Culvert #1            Box       6       9
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 17     425     .012     .012          0                   .5                 1
Number of Barrels =  2
Upstream   Elevation =  955.35
Centerline Stations
    Sta.    Sta.
    9995   10005
Downstream Elevation =  950.84
Centerline Stations
    Sta.    Sta.
    9995   10005

CROSS SECTION


RIVER: Hope Creek
REACH: 1                    RS: 4969

INPUT
Description:
Station Elevation Data     num=     157
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    8866 1008.46 8866.04 1008.46 8873.96 1008.15 8877.18 1008.15 8881.58 1008.38
 8887.58 1008.13 8913.96 1007.31 8915.68 1007.26 8918.81 1007.23 8943.94 1006.18
 8945.71 1005.64 8954.99  1003.6 8964.49  1003.6 8995.86 1003.05 9001.03 1003.03
 9002.63 1003.02 9003.97 1002.98 9035.31 1001.44 9043.76 1001.21 9057.87 1000.36
 9058.85 1000.17  9059.8  1000.1 9074.56  999.25 9078.13  999.57 9091.88  999.16
  9102.7  998.95 9113.79  998.83 9129.67  998.73 9132.32  998.67 9140.97  998.73
 9149.13  998.47 9153.93  998.39 9155.08  998.03  9169.7  997.09 9175.48   996.5
 9185.46  995.69 9199.49  994.33 9205.58   993.7 9220.98  992.62 9226.09   991.8
 9233.83   991.5 9242.96  990.96 9258.56  989.48 9285.42  988.13 9292.34  987.76
 9311.69  987.02 9318.37  986.78 9320.74  986.53 9324.82  985.88 9328.08  985.18
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 9341.88  982.47 9346.73  981.35 9351.23  980.08 9356.87  978.92 9360.72   979.07
 9363.48   979.3 9364.58  979.34 9372.37  978.75 9373.72  978.64 9385.58    977.7
 9387.52  977.54 9389.02   977.4 9391.34  977.03 9394.57  976.48 9396.36   976.36
 9397.25  976.29 9401.15  974.97 9403.55  974.96 9408.36  974.69 9412.31   974.63
 9436.96  972.17 9444.24  971.64 9453.17   971.3 9458.23  971.08 9462.77   970.88
 9478.62  970.03  9494.5  968.91 9501.94  968.72 9531.25  966.52 9539.45   966.14
  9540.4   966.1 9542.71  965.95 9554.53  965.29 9558.73  963.77 9569.43   960.61
  9600.4  959.56 9624.17  958.39 9638.99  957.84 9652.47  957.06 9663.72   960.71
 9674.97  964.74 9689.32  964.84 9715.02  964.97 9725.37  963.65 9727.61   963.32
 9732.87  963.41 9741.13  963.62 9751.88  965.94 9753.03  966.18 9753.65   966.19
 9769.43  966.59 9865.27  966.24 9876.54  966.29 9899.28   966.5 9925.28   966.52
 9938.13  966.58  9962.9  966.55 9966.34  966.58 9967.87  966.59 9968.35   966.59
 9970.14  966.43 9970.75  966.38 9974.46  962.41 9988.91  956.36 9990.74   950.63
   10000   950.610010.74  951.2210012.88  957.5110026.81  962.3210030.78   962.53
10033.08  963.2710048.84  968.2410053.37  969.8710062.18  972.2210098.75   980.36
10100.19  980.6410120.19  981.1610152.39  980.8210196.07  980.4710196.53   980.48
10236.47  976.9710238.26  976.8410240.25  976.5810262.15  976.2610263.03   976.24
 10276.5  976.2210302.84  976.1310311.44  976.1510346.55  976.1310362.69   976.28
10394.65  976.2310401.57  976.2410413.15  976.3910447.25  976.6210452.06   976.66
10458.13  976.7110466.41  977.1310495.79  977.5610505.74  978.2210515.78   978.64
10530.16  978.9610532.53  979.4910545.54  980.51 10546.7   980.810566.33   984.59
10570.96  985.4110575.33  984.42

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
    8866     .09 9988.91     .0410012.88     .12

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9988.9110012.88            170.27  251.19  305.99              .3        .5
Ineffective Flow     num=        2
   Sta L   Sta R    Elev  Permanent
    8866 9988.56     963        F
10013.5410575.33  969.81        F
```

CROSS SECTION OUTPUT Profile #100 nat

			Left OB	Channel	Right OB
E.G. Elev (ft)	960.14	Element			
Vel Head (ft)	1.69	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	958.45	Reach Len. (ft)	170.27	251.19	305.99
Crit W.S. (ft)	956.86	Flow Area (sq ft)	0.71	171.37	0.55
E.G. Slope (ft/ft)	0.008656	Area (sq ft)	26.72	171.37	1.28
Q Total (cfs)	1790.00	Flow (cfs)	1.64	1787.82	0.53
Top Width (ft)	65.52	Top Width (ft)	38.83	23.97	2.73
Vel Total (ft/s)	10.37	Avg. Vel. (ft/s)	2.32	10.43	0.98
Max Chl Dpth (ft)	7.85	Hydr. Depth (ft)	2.02	7.15	0.83
Conv. Total (cfs)	19239.8	Conv. (cfs)	17.7	19216.4	5.7
Length Wtd. (ft)	251.00	Wetted Per. (ft)	0.38	32.68	0.70
Min Ch El (ft)	950.60	Shear (lb/sq ft)	1.01	2.83	0.42
Alpha	1.01	Stream Power (lb/ft s)	2.34	29.57	0.41
Frctn Loss (ft)	2.90	Cum Volume (acre-ft)	23.95	29.18	18.78
C & E Loss (ft)	0.35	Cum SA (acres)	9.75	4.33	10.20

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

CROSS SECTION OUTPUT Profile #100 enc

			Left OB	Channel	Right OB
E.G. Elev (ft)	960.13	Element			
Vel Head (ft)	1.71	Wt. n-Val.		0.040	
W.S. Elev (ft)	958.42	Reach Len. (ft)	170.27	251.19	305.99
Crit W.S. (ft)	956.86	Flow Area (sq ft)		170.52	
E.G. Slope (ft/ft)	0.009904	Area (sq ft)		170.52	
Q Total (cfs)	1790.00	Flow (cfs)		1790.00	
Top Width (ft)	23.97	Top Width (ft)		23.97	
Vel Total (ft/s)	10.50	Avg. Vel. (ft/s)		10.50	
Max Chl Dpth (ft)	7.82	Hydr. Depth (ft)		7.11	
Conv. Total (cfs)	17986.7	Conv. (cfs)		17986.7	
Length Wtd. (ft)	251.19	Wetted Per. (ft)		35.64	
Min Ch El (ft)	950.60	Shear (lb/sq ft)		2.96	
Alpha	1.00	Stream Power (lb/ft s)		31.05	

Frctn Loss (ft)	2.72	Cum Volume (acre-ft)	9.61	31.52	6.31
C & E Loss (ft)	0.15	Cum SA (acres)	3.16	4.33	1.36

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 energy loss was 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, energy was used.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4718

INPUT
Description:
Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8972	997.24	8976.78	997.33	8976.86	997.33	8986.2	997.18	8987.8	997.11
8990.79	996.91	8997.19	996.41	9002.09	996.28	9009.99	995.85	9012.04	995.76
9012.95	995.68	9013.37	995.66	9018.71	995.23	9027.24	994.69	9034.39	994.23
9038.61	993.95	9042.92	993.43	9048.77	992.92	9056.1	992.82	9063.1	992.39
9073.16	991.77	9104.51	990.62	9112.07	990.26	9115.62	989.85	9124.02	988.92
9130.94	988.72	9179.4	987.29	9185.64	987.11	9188.46	987.15	9231.45	988.38
9234.51	988.38	9238.93	988.53	9252.21	990.88	9255.3	991.41	9260.5	991.38
9283.34	990.89	9296.54	990.72	9306.63	989.97	9330.21	989.09	9360.22	986.39
9367.81	985.9	9369.04	985.9	9371.82	985.75	9385.95	985.64	9387.1	985.63
9417.48	981.81	9432.14	979	9434.11	978.58	9441.59	977.97	9453.79	976.84
9463.26	975.98	9482.19	973.68	9493.72	972.7	9497.08	972.48	9505.18	971.89
9518.75	971.62	9521.2	971.73	9521.25	971.73	9522.35	971.72	9525.77	971.06
9530.31	970.24	9531.11	970.07	9531.37	970.01	9532.72	969.71	9536.16	968.92
9544.42	967.21	9551.68	965.78	9570.08	962.74	9571.16	962.74	9572.95	962.78
9578.49	962.97	9581.77	962.74	9589.06	962.16	9599.87	961.46	9605.56	961.14
9608.83	961.05	9609.08	961.04	9613	960.97	9615.68	960.91	9618.08	960.86
9620.15	960.77	9622.72	960.73	9626.04	960.68	9626.15	960.67	9626.28	960.67
9632.28	960.48	9633.03	960.44	9639.08	959.97	9649.35	959.76	9651.2	959.73
9653.63	959.69	9656.99	959.64	9662.14	959.54	9669.56	959.37	9672.68	959.41
9674.07	959.46	9674.36	959.46	9677.89	959.32	9683.22	958.95	9691.6	957.28
9693.18	956.96	9694.12	957.18	9720.63	963.68	9745.02	963.86	9760.81	964.02
9769.56	963.2	9776.45	962.16	9785.52	964.06	9789.08	964.78	9794.69	964.96
9808.84	965.41	9973.88	966.79	9973.89	966.79	9974.46	958.08	9988.91	952.03
9990.74	946.3	10000	946.27	10010.74	946.89	10012.88	953.18	10026.81	957.99
10051.57	960.94	10074.18	969.01	10087.82	968.42	10102.32	968.53	10132.3	969.12
10149.37	969.88	10184.84	971.52	10186.62	971.55	10198.38	974.21	10209.57	976.64
10211.27	977.03	10213.32	977.38	10216.78	977.59	10230.18	978.32	10233.23	978.41
10243.31	978.68	10245.46	978.68	10254.91	977.71	10270.38	976.35	10271.31	976.42
10280.18	976.66	10325.82	979.26	10328.61	979.37	10360.67	980.12	10371.09	981.47
10405.25	982.88	10407.05	982.96	10409.18	983.05	10426.1	991.58	10430.76	995.77
10442.03	997.15	10459.18	999.23	10472.57	1000.52	10483.22	1001.12	10519.32	1003.74
10540.29	1006.48	10566.04	1007.25	10575.84	1007.25	10583.81	1007.85	10611.38	1010.11
10616.22	1010.47								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8972	.09	9988.91	.04	10012.88	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9988.91	10012.88	511.63	509.41	507.2	.1	.3

CROSS SECTION OUTPUT Profile #100 nat

			Left OB	Channel	Right OB
E.G. Elev (ft)	956.89	Element			
Vel Head (ft)	2.86	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	954.03	Reach Len. (ft)	511.63	509.41	507.20
Crit W.S. (ft)	953.64	Flow Area (sq ft)	4.78	169.22	1.05
E.G. Slope (ft/ft)	0.014942	Area (sq ft)	4.78	169.22	1.05
Q Total (cfs)	2310.00	Flow (cfs)	9.15	2299.98	0.87
Top Width (ft)	31.22	Top Width (ft)	4.78	23.97	2.47
Vel Total (ft/s)	13.20	Avg. Vel. (ft/s)	1.91	13.59	0.83
Max Chl Dpth (ft)	7.76	Hydr. Depth (ft)	1.00	7.06	0.43
Conv. Total (cfs)	18897.3	Conv. (cfs)	74.9	18815.4	7.1
Length Wtd. (ft)	509.20	Wetted Per. (ft)	5.18	32.68	2.61
Min Ch El (ft)	946.27	Shear (lb/sq ft)	0.86	4.83	0.38

Alpha	1.06	Stream Power (lb/ft s)	1.65	65.66	0.31
Frctn Loss (ft)	2.73	Cum Volume (acre-ft)	23.89	28.20	18.77
C & E Loss (ft)	0.65	Cum SA (acres)	9.66	4.20	10.18

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 OUTPUT Profile #100 enc

			Left OB	Channel	Right OB
E.G. Elev (ft)	957.25	Element			
Vel Head (ft)	2.22	Wt. n-Val.		0.040	
W.S. Elev (ft)	955.03	Reach Len. (ft)	511.63	509.41	507.20
Crit W.S. (ft)		Flow Area (sq ft)		193.19	
E.G. Slope (ft/ft)	0.011656	Area (sq ft)		193.19	
Q Total (cfs)	2310.00	Flow (cfs)		2310.00	
Top Width (ft)	23.97	Top Width (ft)		23.97	
Vel Total (ft/s)	11.96	Avg. Vel. (ft/s)		11.96	
Max Chl Dpth (ft)	8.76	Hydr. Depth (ft)		8.06	
Conv. Total (cfs)	21396.1	Conv. (cfs)		21396.1	
Length Wtd. (ft)	509.19	Wetted Per. (ft)		37.53	
Min Ch El (ft)	946.27	Shear (lb/sq ft)		3.75	
Alpha	1.00	Stream Power (lb/ft s)		44.79	
Frctn Loss (ft)	2.73	Cum Volume (acre-ft)	9.61	30.47	6.31
C & E Loss (ft)	0.45	Cum SA (acres)	3.16	4.20	1.36

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.
Warning: The energy loss was 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: Hope Creek
REACH: 1 RS: 4209

INPUT
Description:
Station Elevation Data num= 150

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9040.93	979.93	9048.16	980.07	9050.36	979.95	9065.17	979.55	9104.34	979.53
9121.05	979.89	9122.09	979.92	9122.56	979.99	9123.53	980.11	9127.7	980.58
9137.89	979.96	9150.4	979.37	9156.34	978.88	9165.39	978.22	9169.92	977.9
9172.32	977.73	9176.09	979.07	9178.86	980.03	9180.37	980.02	9184.34	979.99
9201.13	979.81	9202.05	979.65	9206.3	979.76	9215.68	979.7	9220.34	979.27
9227.49	979.01	9230.19	978.97	9232.96	978.93	9239.48	978.95	9242.94	979
9250.26	978.64	9255.19	978.5	9256.93	978.63	9261.47	978.33	9271.63	978.4
9296.92	977.8	9300.98	977.99	9302.16	978.05	9303.16	978.11	9304.53	978.22
9330.3	979.32	9355.47	979.08	9360.57	978.96	9384.05	979.01	9410.74	980.33
9423.98	980.48	9465.44	979.64	9474.8	979.59	9485.8	979.64	9499.99	979.49
9513.36	978.95	9528.96	978.69	9553.4	977.77	9554.05	977.75	9564.73	976.8
9572.65	976.43	9603.18	974.02	9620.95	972.01	9627.41	971.82	9638.67	971.05
9649.54	969.99	9657.14	969.07	9671.31	968.19	9702.4	966.21	9709.01	965.76
9728.92	963.87	9730.1	963.79	9744.35	959.86	9745.25	959.61	9745.48	959.62
9752.16	959.95	9754.05	960.08	9971.1	961.89	9974.09	961.91	9974.13	961.91
9974.24	961.92	9975.76	961.99	9977.52	955.93	9978.9	951.88	9979.63	951.56
9988.91	948.14	9990.74	942.41	10000	942.38	10010.74	943	10012.88	947.23
10016.82	947.23	10019.5	947.29	10019.54	947.29	10063.39	948.42	10091.95	960.11
10105.25	964.91	10130.01	967.47	10130.79	967.54	10131.2	967.55	10163.66	968.26
10165.91	970.03	10175.58	976.21	10196.17	976.63	10220.22	976.91	10220.58	976.14
10222.54	971.83	10222.62	971.89	10225.59	973.42	10227.22	974.26	10228.82	972.01
10228.92	971.88	10229.52	971.39	10259.1	971.17	10259.7	971.17	10259.92	971.16
10261.08	971.19	10261.52	971.21	10297.44	972.35	10304.5	974.73	10309.84	977.11
10321.49	977.45	10327.35	977.41	10330.63	977.57	10364.56	979.44	10387.63	980.84
10389.51	980.96	10392.69	981.21	10396.43	981.48	10432.8	984.35	10439.03	984.97
10448.66	985.66	10466.2	987.08	10478.94	988.08	10487.56	988.95	10494.39	990.25
10498.74	990.54	10508.21	991.07	10521.53	991.31	10526.05	991.45	10538.67	991.82
10547.74	990.97	10552.09	990.75	10565.66	992.15	10569.26	994.94	10572.92	995.33

10579.81	995.1810592.92	995.1610596.72	995.0710602.46	994.92 10619.3	995.09	
10623.32	994.1510629.07	994.0610645.37	993.4810661.82	994.6410661.91	994.65	

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9040.93	.09	9988.91	.04	10012.88	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9988.91	10012.88	422.16	424.62	427.61	.1	.3

CROSS SECTION OUTPUT Profile #100 nat

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	953.51	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.69	Reach Len. (ft)	422.16	424.62	427.61
W.S. Elev (ft)	952.82	Flow Area (sq ft)	28.50	235.60	278.44
Crit W.S. (ft)		Area (sq ft)	28.50	235.60	278.44
E.G. Slope (ft/ft)	0.002729	Flow (cfs)	44.56	1775.90	489.53
Q Total (cfs)	2310.00	Top Width (ft)	10.33	23.97	61.26
Top Width (ft)	95.56	Avg. Vel. (ft/s)	1.56	7.54	1.76
Vel Total (ft/s)	4.26	Hydr. Depth (ft)	2.76	9.83	4.55
Max Chl Dpth (ft)	10.44	Conv. (cfs)	853.1	33996.7	9371.3
Conv. Total (cfs)	44221.1	Wetted Per. (ft)	11.68	30.77	62.14
Length Wtd. (ft)	425.28	Shear (lb/sq ft)	0.42	1.30	0.76
Min Ch El (ft)	942.38	Stream Power (lb/ft s)	0.65	9.83	1.34
Alpha	2.45	Cum Volume (acre-ft)	23.69	25.84	17.14
Frctn Loss (ft)	0.74	Cum SA (acres)	9.57	3.91	9.81
C & E Loss (ft)	0.11				

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 #100 enc

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	954.07	Wt. n-Val.		0.040	0.120
Vel Head (ft)	0.71	Reach Len. (ft)	422.16	424.62	427.61
W.S. Elev (ft)	953.36	Flow Area (sq ft)		248.55	224.96
Crit W.S. (ft)		Area (sq ft)		248.55	224.96
E.G. Slope (ft/ft)	0.003071	Flow (cfs)		1855.41	454.59
Q Total (cfs)	2310.00	Top Width (ft)		23.97	39.27
Top Width (ft)	63.24	Avg. Vel. (ft/s)		7.46	2.02
Vel Total (ft/s)	4.88	Hydr. Depth (ft)		10.37	5.73
Max Chl Dpth (ft)	10.98	Conv. (cfs)		33482.6	8203.6
Conv. Total (cfs)	41686.2	Wetted Per. (ft)		35.99	44.51
Length Wtd. (ft)	425.16	Shear (lb/sq ft)		1.32	0.97
Min Ch El (ft)	942.38	Stream Power (lb/ft s)		9.88	1.96
Alpha	1.91	Cum Volume (acre-ft)	9.61	27.89	5.00
Frctn Loss (ft)	0.89	Cum SA (acres)	3.16	3.91	1.13
C & E Loss (ft)	0.09				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3784

INPUT
Description:
Station Elevation Data num= 124

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9121.12	992.2	9126.51	991.8	9134.62	991.34	9138.79	991.08	9147.61	991.95		
9150.34	992.11	9151.71	992.36	9161.08	991.89	9163.42	991.85	9169.38	991.54		
9171.44	991.51	9173.32	991.5	9178.09	991.29	9201.77	990.63	9202.62	990.62		
9206.08	990.61	9207.88	990.29	9209.94	990	9215.72	990.34	9226.43	990.07		
9241.9	989.66	9249.28	989.53	9252.87	989.47	9269.27	990.28	9282.92	990.88		
9291.56	990.77	9315.1	990.59	9321.64	990.48	9335	990.56	9347.34	990.4		
9350.53	989.47	9359.78	987.22	9361.46	987.12	9367.15	986.68	9376.13	985.75		
9408.12	984.82	9425.42	983.58	9433.04	983.34	9438.8	982.96	9480.16	982.64		
9501.46	982.38	9508.34	982.16	9564.15	979.13	9575.82	978.14	9591.25	977.01		
9626.84	973.37	9647.21	970.94	9674.17	966.4	9683.46	964.76	9694.4	965.18		
9716.69	966.54	9738.31	960.81	9742.03	959.7	9745.57	959.19	9765.39	956.21		
9770.73	957.06	9780.75	958.83	9965.74	959.19	9980.06	959.21	9980.84	959.21		
9981	959.16	9981.96	958.74	9982.02	958.55	9985.09	948.69	9990.71	942.87		
9991.86	940.46	10000	940.39	10009.75	940.96	10015.84	944.11	10017.26	948.06		
10020.05	948.11	10022.23	948.15	10066.34	948.62	10070.43	948.74	10072.57	948.8		

10090.32	948.7410111.63	948.75	10126	948.7510179.81	950.0210184.63	950.22
10186.29	950.2310193.64	950.6210213.97		951.7210218.52	950.4710225.65	948.77
10225.78	948.8210227.01	949.3510232.44		951.710233.08	951.9310242.64	952.08
10249.17	952.0510257.62	956.93	10263.7	959.3310288.51	972.2410288.53	972.24
10288.55	972.2410329.14	972.3810336.73		972.3110360.76	974.4110362.61	974.46
10365.54	974.6910385.04	976.7410386.66		976.8210388.23	976.86	10395.8 977.54
10410.67	978.1210422.61	978.7710449.82		979.6310457.88	980.0910477.94	980.33
10522.77	981.510537.15	982.0110539.99		982.1510543.04	982.4410546.55	982.77
10573.17	984.5910576.93	984.9410593.23		986.3210593.96	986.410594.34	986.61
10602.24	989.78	10603.9	989.9210617.48	990.4110630.42	990.99	

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9121.12	.09	9985.09	.04	10017.26	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9985.09	10017.26	629.04	636.89	643.21	.1	.3

CROSS SECTION OUTPUT Profile #100 nat

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	952.66	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.33	Reach Len. (ft)	629.04	636.89	643.21
W.S. Elev (ft)	952.33	Flow Area (sq ft)	2.06	328.03	662.42
Crit W.S. (ft)		Area (sq ft)	2.06	328.03	662.42
E.G. Slope (ft/ft)	0.001216	Flow (cfs)	0.79	1736.07	573.14
Q Total (cfs)	2310.00	Top Width (ft)	1.13	32.17	232.39
Top Width (ft)	265.69	Avg. Vel. (ft/s)	0.38	5.29	0.87
Vel Total (ft/s)	2.33	Hydr. Depth (ft)	1.82	10.20	2.85
Max Chl Dpth (ft)	11.94	Conv. (cfs)	22.6	49784.9	16435.8
Conv. Total (cfs)	66243.2	Wetted Per. (ft)	3.81	39.72	233.54
Length Wtd. (ft)	637.63	Shear (lb/sq ft)	0.04	0.63	0.22
Min Ch El (ft)	940.39	Stream Power (lb/ft s)	0.02	3.32	0.19
Alpha	3.92	Cum Volume (acre-ft)	23.54	23.09	12.53
Frctn Loss (ft)	1.75	Cum SA (acres)	9.52	3.64	8.37
C & E Loss (ft)	0.13				

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

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	953.09	Wt. n-Val.		0.040	0.120
Vel Head (ft)	0.42	Reach Len. (ft)	629.04	636.89	643.21
W.S. Elev (ft)	952.67	Flow Area (sq ft)		338.99	317.23
Crit W.S. (ft)		Area (sq ft)		338.99	317.23
E.G. Slope (ft/ft)	0.001523	Flow (cfs)		1925.94	384.06
Q Total (cfs)	2310.00	Top Width (ft)		32.17	76.07
Top Width (ft)	108.24	Avg. Vel. (ft/s)		5.68	1.21
Vel Total (ft/s)	3.52	Hydr. Depth (ft)		10.54	4.17
Max Chl Dpth (ft)	12.28	Conv. (cfs)		49348.4	9840.8
Conv. Total (cfs)	59189.2	Wetted Per. (ft)		43.70	80.00
Length Wtd. (ft)	637.37	Shear (lb/sq ft)		0.74	0.38
Min Ch El (ft)	940.39	Stream Power (lb/ft s)		4.19	0.46
Alpha	2.19	Cum Volume (acre-ft)	9.61	25.03	2.34
Frctn Loss (ft)	2.04	Cum SA (acres)	3.16	3.64	0.56
C & E Loss (ft)	0.12				

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: Hope Creek
REACH: 1 RS: 3147

INPUT
Description:
Station Elevation Data num= 133

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9194.19	974.38	9198.06	974.29	9207.31	975.08	9211.28	975.88	9226.88	975.64		
9230.77	975.33	9231.88	975.28	9233.31	975.24	9248.2	975.02	9257.9	974.71		
9263.74	974.68	9266.86	974.57	9269.53	974.28	9274.53	972.61	9284.3	969.96		
9285.48	970.18	9286.43	970.09	9305.11	970.09	9320.22	968.51	9336.64	968.14		
9368.31	967.74	9371.48	967.57	9374.54	967.36	9384.64	967.22	9400.96	966.78		
9411.2	966.28	9435.19	964.72	9439.06	964.71	9444.12	964.57	9448.93	964.41		
9479.98	962.57	9491.13	962.12	9511.56	961.63	9517.76	961.28	9526.62	959.85		
9560.45	955.28	9563.32	954.9	9565.54	954.46	9576.06	952.63	9595.9	951.8		
9627.68	950.73	9643.51	948.28	9643.55	948.28	9649.41	948.15	9658.11	947.69		
9669.42	947.15	9678.31	947.01	9689.98	946.9	9705.78	946.34	9716.75	946.11		
9729	945.72	9741.8	944.64	9743.49	944.45	9774.8	955.04	9775.13	955.16		
9859.56	955.55	9882.57	955.6	9885.18	955.8	9911.21	955.73	9935.01	955.47		
9936.29	955.46	9963.11	955.95	9974.09	955.54	9975.96	947.63	9990.72	943.19		
9991.87	940.78	10000.01	940.71	10009.76	941.28	10015.85	944.43	10021.07	946.63		
10035.3	948.52	10074.92	952.46	10090.43	960.74	10101.74	966.47	10102.28	966.48		
10109.48	966.71	10118.96	966.95	10145.18	967.95	10158.05	968.48	10162.96	968.68		
10166.9	972.61	10167.19	972.92	10174.35	973.08	10236.6	973.92	10236.8	975.58		
10238.39	987.57	10256.96	986.91	10302.34	987.24	10311.99	987.43	10312.28	987.43		
10312.36	987.54	10314.45	990.99	10318.4	991.74	10342.41	996.54	10342.78	995.25		
10344.21	992.35	10368.69	992.22	10370.44	992.21	10378.18	992.33	10382.62	992.5		
10402.41	993.25	10403.62	994.76	10404.18	995.66	10437.28	995.71	10438.31	995.71		
10438.57	995.72	10438.65	995.72	10474.13	997.55	10477.45	998.61	10491.82	1003.16		
10500.34	1003.91	10504.83	1003.96	10520.39	1004.65	10533.09	1004.64	10534.71	1004.22		
10537.51	1004.68	10543.09	1004.84	10557.26	1005.28	10570.67	1005.61	10578.69	1005.2		
10587.99	1004.82	10592.42	1005.12	10595.58	1005.17	10612.29	1004.67	10621.96	1004.27		
10632.52	1003.82	10652.12	1004.58	10665.48	1005.25	10671.09	1005.41	10675.63	1005.47		
10706.31	1005.86	10735.24	1006.35	10752.14	1006.83						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9194.19	.09	9975.96	.04	10021.07	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9975.96 10021.07 288.86 277.25 266.63 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
9194.19	9880.92	965.7	F

CROSS SECTION OUTPUT Profile #100 nat

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	950.78	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	1.65	Reach Len. (ft)	288.86	277.25	266.63
W.S. Elev (ft)	949.13	Flow Area (sq ft)	0.27	267.63	23.97
Crit W.S. (ft)	948.18	Area (sq ft)	282.88	267.63	23.97
E.G. Slope (ft/ft)	0.007966	Flow (cfs)	0.12	2770.49	29.39
Q Total (cfs)	2800.00	Top Width (ft)	119.65	45.11	20.35
Top Width (ft)	185.11	Avg. Vel. (ft/s)	0.46	10.35	1.23
Vel Total (ft/s)	9.59	Hydr. Depth (ft)	0.75	5.93	1.18
Max Chl Dpth (ft)	8.42	Conv. (cfs)	1.4	31040.9	329.3
Conv. Total (cfs)	31371.6	Wetted Per. (ft)	1.54	48.51	20.50
Length Wtd. (ft)	277.18	Shear (lb/sq ft)	0.09	2.74	0.58
Min Ch El (ft)	940.71	Stream Power (lb/ft s)	0.04	28.40	0.71
Alpha	1.15	Cum Volume (acre-ft)	21.49	18.73	7.46
Frctn Loss (ft)	1.96	Cum SA (acres)	8.65	3.08	6.51
C & E Loss (ft)	0.03				

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was 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 OUTPUT Profile #100 enc

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	950.94	Wt. n-Val.		0.040	
Vel Head (ft)	1.57	Reach Len. (ft)	288.86	277.25	266.63
W.S. Elev (ft)	949.36	Flow Area (sq ft)		278.28	
Crit W.S. (ft)	948.13	Area (sq ft)		278.28	
E.G. Slope (ft/ft)	0.008035	Flow (cfs)		2800.00	
Q Total (cfs)	2800.00	Top Width (ft)		45.11	
Top Width (ft)	45.11				

Vel Total (ft/s)	10.06	Avg. Vel. (ft/s)		10.06
Max Chl Dpth (ft)	8.65	Hydr. Depth (ft)		6.17
Conv. Total (cfs)	31236.2	Conv. (cfs)		31236.2
Length Wtd. (ft)	277.25	Wetted Per. (ft)		52.98
Min Ch El (ft)	940.71	Shear (lb/sq ft)		2.63
Alpha	1.00	Stream Power (lb/ft s)		26.51
Frctn Loss (ft)	2.01	Cum Volume (acre-ft)	9.61	20.51
C & E Loss (ft)	0.02	Cum SA (acres)	3.16	3.08

Warning: The energy loss was 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: Hope Creek
REACH: 1 RS: 2870

INPUT
Description:
Station Elevation Data num= 122

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9236.27	964.39	9237.82	963.98	9241.65	962.98	9270.6	961.43	9272.03	961.37
9272.49	961.33	9288.89	960.88	9289.43	960.87	9297.17	960.67	9322.78	958.97
9345.19	958.66	9368.09	957.27	9405.56	956.22	9415.84	955.92	9422.13	954.95
9427.86	953.28	9450.99	952.95	9461.28	952.78	9468.95	952.53	9474.83	952.47
9479.48	952.33	9508.86	950.9	9541.66	949.56	9544.61	949.42	9548.61	949.24
9580.37	947.87	9603.85	947.65	9616.13	947.53	9632.73	946.82	9651.88	945.72
9666.03	945.36	9687.63	945.07	9716.8	944.07	9720.31	943.95	9738.28	943.55
9756.67	951.2	9761.8	953.45	9766.35	955.54	9789.23	955.09	9869.35	953.46
9874.29	955.27	9874.5	955.35	9877.08	955.3	9944.26	953.82	9964.09	953.42
9971.37	949.36	9983.04	945.38	9990.71	940.29	9991.86	937.88	10000	937.81
10009.75	938.38	10015.84	941.53	10021.06	943.73	10021.35	945.93	10036.8	946.73
10048.77	947.36	10058.59	948.11	10081.01	955.41	10088.54	958	10118.76	966.14
10122.79	967.16	10127.17	968.25	10130.76	968.54	10156.95	968.45	10158.92	968.51
10159.06	968.77	10162.28	975.79	10170.01	976.04	10188.52	976.67	10189.98	976.34
10193.76	975.57	10200.98	973.99	10208.08	974.09	10230.91	974.53	10236.32	974.93
10242.31	975.17	10247.09	975.39	10254.76	975.83	10262.08	976.29	10272.18	980.56
10275.04	981.78	10286.28	982.42	10306.47	984.09	10310.58	984.36	10314.39	984.68
10320.26	984.83	10355.62	986.27	10368.52	986.87	10387.88	987.89	10399.66	988.34
10421.82	988.87	10435.65	989.18	10442.52	989.45	10463.79	990.66	10485.88	991.86
10501.57	992.71	10509.4	993.14	10529.16	993.99	10550.8	994.94	10561.39	995.53
10567.13	995.86	10576.83	996.35	10590.7	997.11	10608.32	998.41	10629.7	1000.43
10630.53	1000.48	10634.45	1000.79	10650	1003.41	10664.49	1005.58	10672.25	1006.82
10677.95	1008.14	10695.66	1009.99	10708.76	1011.29	10711.21	1010.99	10716.43	1010.32
10723.48	1009.54	10728.38	1008.92	10730.36	1008.74	10738.81	1008.92	10757.18	1009.03
10769.24	1009.21	10774.24	1009.31						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9236.27	.09	9983.04	.04	10021.35	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9983.04	10021.35	626.39	607.72	588.56	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
9236.27	9885.33	969.99	F

CROSS SECTION OUTPUT Profile #100 nat

E.G. Elev (ft)	948.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.54	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	947.24	Reach Len. (ft)	626.39	607.72	588.56
Crit W.S. (ft)	945.48	Flow Area (sq ft)	5.09	278.02	16.59
E.G. Slope (ft/ft)	0.006308	Area (sq ft)	262.12	278.02	16.59
Q Total (cfs)	2800.00	Flow (cfs)	6.13	2781.53	12.34
Top Width (ft)	193.26	Top Width (ft)	129.76	38.31	25.19
Vel Total (ft/s)	9.34	Avg. Vel. (ft/s)	1.21	10.00	0.74
Max Chl Dpth (ft)	9.43	Hydr. Depth (ft)	0.93	7.26	0.66
Conv. Total (cfs)	35255.0	Conv. (cfs)	77.2	35022.4	155.4
Length Wtd. (ft)	609.07	Wetted Per. (ft)	5.77	44.52	25.22
Min Ch El (ft)	937.81	Shear (lb/sq ft)	0.35	2.46	0.26
Alpha	1.14	Stream Power (lb/ft s)	0.42	24.60	0.19

Frctn Loss (ft)	5.17	Cum Volume (acre-ft)	19.68	17.00	7.33
C & E Loss (ft)	0.03	Cum SA (acres)	7.82	2.81	6.37

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was 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 OUTPUT Profile #100 enc

			Left OB	Channel	Right OB
E.G. Elev (ft)	948.90	Element			
Vel Head (ft)	1.51	Wt. n-Val.		0.040	
W.S. Elev (ft)	947.39	Reach Len. (ft)	626.39	607.72	588.56
Crit W.S. (ft)	945.48	Flow Area (sq ft)		283.81	
E.G. Slope (ft/ft)	0.006597	Area (sq ft)		283.81	
Q Total (cfs)	2800.00	Flow (cfs)		2800.00	
Top Width (ft)	38.31	Top Width (ft)		38.31	
Vel Total (ft/s)	9.87	Avg. Vel. (ft/s)		9.87	
Max Chl Dpth (ft)	9.58	Hydr. Depth (ft)		7.41	
Conv. Total (cfs)	34473.7	Conv. (cfs)		34473.7	
Length Wtd. (ft)	609.24	Wetted Per. (ft)		48.00	
Min Ch El (ft)	937.81	Shear (lb/sq ft)		2.44	
Alpha	1.00	Stream Power (lb/ft s)		24.02	
Frctn Loss (ft)	4.60	Cum Volume (acre-ft)	9.61	18.72	
C & E Loss (ft)	0.06	Cum SA (acres)	3.16	2.81	

Warning: The energy loss was 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: Hope Creek
REACH: 1 RS: 2262

INPUT
Description:
Station Elevation Data num= 133

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9224	974.07	9227.31	974.01	9239.87	972.94	9249.96	971.88	9251.71	971.8
9264.77	970.91	9271.88	970.7	9282.18	970.31	9303.84	969.89	9308.29	969.16
9315.82	967.82	9325.01	966.15	9332.21	965.1	9346.52	963.95	9361.63	962.25
9368.69	960.91	9384.3	958.08	9394.37	956.16	9402.64	954.7	9409.67	954.3
9429.81	948.94	9433.84	948.9	9438.29	948.74	9461.46	948.26	9488.59	946.99
9494.4	946.81	9509.05	946.26	9518.02	944.82	9523.27	944.03	9531.14	942.78
9534.75	942.23	9547.2	944.33	9551.55	945.05	9559.73	946.23	9589.94	945.83
9603.48	945.69	9641.93	944.1	9642.2	944.09	9642.27	944.12	9656.03	952.55
9722.92	950.74	9759.74	949.85	9761.31	950.41	9763.17	951.88	9819.69	950.24
9854.03	949.41	9857.92	949.21	9868.23	945.53	9891.79	935.34	9906.36	939.83
9910.26	940.95	9915.27	940.87	9915.97	940.86	9947.68	940.58	9962.98	940.5
9978.64	940.7	9982.47	939.55	9990.71	937.82	9991.86	935.41	10000	935.34
10009.75	935.91	10015.84	939.06	10021.06	941.26	10026.41	940.91	10041.16	940.76
10047.88	940.69	10065.18	940.51	10073.25	952.26	10078.55	958.42	10084.66	960.88
10105.82	964.3	10114.5	965.82	10117.86	966.24	10123.67	972.67	10124.1	972.96
10131.52	972.51	10147.56	971.75	10154.63	970.17	10159.73	968.91	10161.7	968.93
10165.7	968.81	10182.5	968.42	10204.53	968.58	10213.84	968.8	10216.36	975.24
10217.27	977.11	10225.84	977.38	10230.74	977.69	10239.45	978.01	10246.44	978.26
10251.56	978.66	10257.72	978.92	10267.54	979.32	10277.97	979.47	10291.05	979.95
10298.32	980.02	10308.19	980.36	10316.67	980.39	10331.31	980.71	10334.94	980.9
10345.24	981.23	10351.93	979.09	10353.82	978.48	10356.77	978.6	10377.74	979.44
10399.46	980.57	10409.64	981.03	10420.41	981.5	10450.14	983.32	10456.81	983.95
10476.53	984.46	10478.99	984.54	10479.74	984.56	10491.1	984.69	10502.92	984.87
10503.76	984.88	10503.88	984.88	10529.97	985.22	10539.32	985.21	10566.58	985.27
10568.42	985.81	10576.74	988.11	10578.17	988.4	10583.08	989.44	10584.01	991.22
10587.43	997.6	10597.96	997.69	10623.19	998.04	10630.62	996.96	10631.81	996.79
10643.14	996.43	10655.81	996.04	10656.58	996.04				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9224	.12	9978.64	.04	10021.06	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9978.6410021.06 588.24 612.35 580.92 .1 .3
Ineffective Flow num= 1
Sta L Sta R Elev Permanent
9224 9756.4 970.05 F

CROSS SECTION OUTPUT Profile #100 nat

			Left OB	Channel	Right OB
E.G. Elev (ft)	943.60	Element			
Vel Head (ft)	1.46	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	942.14	Reach Len. (ft)	588.24	612.35	580.92
Crit W.S. (ft)	940.92	Flow Area (sq ft)	227.30	199.80	62.05
E.G. Slope (ft/ft)	0.012009	Area (sq ft)	227.30	199.80	62.05
Q Total (cfs)	2800.00	Flow (cfs)	516.76	2180.62	102.62
Top Width (ft)	190.23	Top Width (ft)	102.57	42.42	45.24
Vel Total (ft/s)	5.72	Avg. Vel. (ft/s)	2.27	10.91	1.65
Max Chl Dpth (ft)	6.80	Hydr. Depth (ft)	2.22	4.71	1.37
Conv. Total (cfs)	25550.7	Conv. (cfs)	4715.6	19898.7	936.4
Length Wtd. (ft)	604.92	Wetted Per. (ft)	104.82	45.52	46.11
Min Ch El (ft)	935.34	Shear (lb/sq ft)	1.63	3.29	1.01
Alpha	2.86	Stream Power (lb/ft s)	3.70	35.92	1.67
Frctn Loss (ft)	2.92	Cum Volume (acre-ft)	16.16	13.66	6.80
C & E Loss (ft)	0.33	Cum SA (acres)	6.15	2.25	5.89

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.
Warning: The energy loss was 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 OUTPUT Profile #100 enc

			Left OB	Channel	Right OB
E.G. Elev (ft)	944.25	Element			
Vel Head (ft)	1.33	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	942.92	Reach Len. (ft)	588.24	612.35	580.92
Crit W.S. (ft)	942.46	Flow Area (sq ft)	219.27	232.90	
E.G. Slope (ft/ft)	0.008731	Area (sq ft)	219.27	232.90	
Q Total (cfs)	2800.00	Flow (cfs)	456.00	2344.00	
Top Width (ft)	126.12	Top Width (ft)	83.70	42.42	
Vel Total (ft/s)	6.19	Avg. Vel. (ft/s)	2.08	10.06	
Max Chl Dpth (ft)	7.58	Hydr. Depth (ft)	2.62	5.49	
Conv. Total (cfs)	29965.0	Conv. (cfs)	4880.0	25085.0	
Length Wtd. (ft)	607.37	Wetted Per. (ft)	91.00	47.18	
Min Ch El (ft)	935.34	Shear (lb/sq ft)	1.31	2.69	
Alpha	2.23	Stream Power (lb/ft s)	2.73	27.08	
Frctn Loss (ft)	2.72	Cum Volume (acre-ft)	8.04	15.12	
C & E Loss (ft)	0.26	Cum SA (acres)	2.56	2.25	

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: Hope Creek
REACH: 1 RS: 1650

INPUT
Description:
Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9080	959.23	9082.15	959.18	9094.24	957.23	9102.24	956	9122.23	956.6
9125.94	956.75	9129.02	956.73	9140.09	956.36	9141.56	956.33	9153.36	956.43
9162.15	956.28	9167.82	956.2	9174.93	955.92	9183.93	955.6	9189.87	955.16
9202.23	953.12	9224.19	949.43	9237.69	948.49	9239.55	948.36	9240.95	948.39

9262.4	948.93	9276.39	949.14	9276.56	949.14	9276.69	949.12	9276.9	949.1
9295.56	947.1	9303.07	947.2	9318.83	947.49	9327.37	944.83	9341.25	941.09
9347.98	940.69	9370.16	939.61	9396.69	938.92	9413.3	938.18	9423.83	937.71
9444.96	937.06	9447.49	937.01	9449.75	936.83	9463.08	935.6	9467.65	937.35
9489.63	945.62	9501.33	950.14	9587.45	947.74	9604.78	947.25	9605.57	947.71
9608.47	949.25	9667.6	947.47	9699.12	946.55	9700.22	946.4	9705.08	945.95
9714.21	942.09	9739.56	931.66	9751.74	933.46	9768.25	936.09	9779.24	936.5
9796.96	937.67	9842.73	937.21	9846.91	937.2	9875.65	937.26	9903.87	937.38
9917.41	937.36	9935.8	937.43	9969.46	938.91	9986.51	933.5	10000	932.05
10015.43	931.5	10016.49	938.23	10019.49	938.23	10021.58	938.33	10037.72	939.44
10047.02	941.4	10076.37	947.08	10086.91	953.86	10094.12	959.68	10116.73	960.88
10155.95	963.05	10157.8	966.09	10160.53	970.72	10160.92	971.4	10163.75	971.29
10200.81	968.95	10224.9	968.83	10250.81	968.5	10254.69	969.05	10258.13	971.09
10276.5	973.41	10297.75	976.5	10302.26	976.59	10315.25	976.67	10334.67	976.79
10343.39	976.96	10352.55	976.8	10375.13	978.14	10383.59	978.89	10398.41	979.26
10411.97	979.83	10416.24	979.99	10420.2	980.15	10426.32	982.67	10428.76	984.15
10430.91	984.83	10432.33	985.66	10436.58	985.34	10441.61	985.17	10456.16	985.61
10457.66	985.27	10472.25	982.74	10487.54	983.04	10506.66	983.6	10508.37	985.36
10509.49	986.97	10534.97	989.72	10549.8	990.62	10555.3	988.85	10569.74	985.02
10585.25	984.56	10603.18	984.49						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9080	.12	9969.46	.04	10016.49	.12

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

9969.46 10016.49 559.26 566 568.78 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
9080	9607.63	960.22	F

CROSS SECTION OUTPUT Profile #100 nat

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	940.35	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.34	Reach Len. (ft)	559.26	566.00	568.78
W.S. Elev (ft)	940.00	Flow Area (sq ft)	784.22	294.59	27.76
Crit W.S. (ft)	937.62	Area (sq ft)	997.16	294.59	27.76
E.G. Slope (ft/ft)	0.002582	Flow (cfs)	1050.97	1729.79	19.24
Q Total (cfs)	2800.00	Top Width (ft)	362.84	47.03	23.91
Top Width (ft)	433.78	Avg. Vel. (ft/s)	1.34	5.87	0.69
Vel Total (ft/s)	2.53	Hydr. Depth (ft)	3.13	6.26	1.16
Max Chl Dpth (ft)	8.48	Conv. (cfs)	20684.6	34044.9	378.7
Conv. Total (cfs)	55108.2	Wetted Per. (ft)	252.25	53.69	24.01
Length Wtd. (ft)	564.57	Shear (lb/sq ft)	0.50	0.88	0.19
Min Ch El (ft)	931.52	Stream Power (lb/ft s)	0.67	5.19	0.13
Alpha	3.43	Cum Volume (acre-ft)	7.89	10.19	6.20
Frctn Loss (ft)	1.97	Cum SA (acres)	3.01	1.62	5.43
C & E Loss (ft)	0.06				

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

CROSS SECTION OUTPUT Profile #100 enc

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	941.27	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	0.47	Reach Len. (ft)	559.26	566.00	568.78
W.S. Elev (ft)	940.79	Flow Area (sq ft)	497.88	331.68	
Crit W.S. (ft)	938.84	Area (sq ft)	497.88	331.68	
E.G. Slope (ft/ft)	0.002724	Flow (cfs)	701.22	2098.78	
Q Total (cfs)	2800.00	Top Width (ft)	151.38	47.03	
Top Width (ft)	198.41	Avg. Vel. (ft/s)	1.41	6.33	
Vel Total (ft/s)	3.38	Hydr. Depth (ft)	3.29	7.05	
Max Chl Dpth (ft)	9.27	Conv. (cfs)	13435.9	40214.4	
Conv. Total (cfs)	53650.3	Wetted Per. (ft)	154.75	56.25	
Length Wtd. (ft)	565.16	Shear (lb/sq ft)	0.55	1.00	
Min Ch El (ft)	931.52	Stream Power (lb/ft s)	0.77	6.34	
Alpha	2.68	Cum Volume (acre-ft)	3.20	11.15	
Frctn Loss (ft)	2.01	Cum SA (acres)	0.97	1.62	
C & E Loss (ft)	0.06				

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 energy loss was 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: Hope Creek
REACH: 1 RS: 1084

INPUT
Description:
Station Elevation Data num= 128

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9250	958.25	9262.04	958.16	9268.42	958.09	9276.11	957.76	9284.26	957.48
9296.08	956.24	9303.51	955.98	9315.31	955.22	9327.67	954.79	9329.51	954.71
9338.67	954.76	9339.11	954.72	9340.08	954.64	9348.68	954.46	9380.83	953.69
9396.6	952.95	9413	952.33	9420.43	951.7	9422.65	951.55	9436.55	951.64
9445.91	951.69	9458.46	951.73	9466.13	951.59	9470.28	951.59	9476.93	951.73
9486.65	951.99	9489.58	952.02	9490.32	952.04	9499.52	952.01	9500.06	952
9500.25	951.97	9514.85	951.41	9517.67	950.23	9523.85	948.6	9528.15	946.38
9533.02	946.42	9566.59	945.22	9571.72	944.92	9573.36	944.83	9585.41	943.65
9609.38	941.59	9628.55	941.31	9651.77	941.03	9659.2	942.62	9683.37	947.73
9728.82	946.31	9786.63	944.59	9789.58	946.9	9789.78	947.03	9798.3	946.76
9880.78	944.03	9883.94	943.77	9886.72	943.49	9888.86	943.22	9901.54	937.82
9918.64	930.25	9929.19	936.21	9944.64	944.64	9965.03	943.57	9966.47	943.52
9969.46	936.13	9986.51	930.72	10000	929.27	10015.43	928.74	10016.49	936.04
10039.68	937.17	10046.11	937.32	10058.02	937.33	10068.3	937.22	10081.55	935.09
10085.35	934.47	10102.41	934.71	10103.48	934.72	10103.74	934.76	10116.39	936.39
10132.81	936.69	10144.88	937	10150.02	937.04	10159.45	937.14	10204.66	938.24
10221.75	938.72	10230.9	939.25	10246.76	939.69	10273.56	940.69	10284.49	940.78
10290.34	942.21	10302.96	948.72	10325.54	949.61	10328.16	949.85	10332.16	950.03
10361.32	951.21	10386.75	952.91	10394.92	953.37	10406.47	957.55	10415.69	960.87
10420.18	960.78	10429.87	960.68	10454.39	960.68	10461.74	960.84	10474.08	960.7
10507.83	960.49	10517.08	960.54	10543.02	960.84	10564.5	960.79	10579.26	960.62
10586.65	960.06	10614.92	960.09	10615.53	960.17	10617.38	960.39	10633.52	962.29
10639.35	963.03	10650.41	962.99	10656.51	960.87	10663.36	959.68	10675.43	960.1
10707.61	960.16	10717.97	960.23	10725	960.32	10729.35	960.31	10764.05	960.54
10772.25	960.37	10775.89	960.24	10783.58	960.81	10790.72	961.51	10794.57	961.68
10801.45	961.95	10812.61	961.29	10816.76	960.85				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9250	.12	9969.46	.04	10016.49	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9969.46	10016.49	542.18	530.8	523.69	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
9250	9790.84	953.96	F

CROSS SECTION OUTPUT Profile #100 nat

			Left OB	Channel	Right OB
E.G. Elev (ft)	938.32	Element			
Vel Head (ft)	0.93	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	937.39	Reach Len. (ft)	542.18	530.80	523.69
Crit W.S. (ft)	935.68	Flow Area (sq ft)	103.09	302.08	148.33
E.G. Slope (ft/ft)	0.004950	Area (sq ft)	103.09	302.08	148.33
Q Total (cfs)	2800.00	Flow (cfs)	194.09	2479.68	126.23
Top Width (ft)	229.65	Top Width (ft)	29.35	47.03	153.27
Vel Total (ft/s)	5.06	Avg. Vel. (ft/s)	1.88	8.21	0.85
Max Chl Dpth (ft)	8.65	Hydr. Depth (ft)	3.51	6.42	0.97
Conv. Total (cfs)	39797.9	Conv. (cfs)	2758.7	35245.0	1794.1
Length Wtd. (ft)	530.59	Wetted Per. (ft)	33.58	54.27	153.64
Min Ch El (ft)	928.74	Shear (lb/sq ft)	0.95	1.72	0.30
Alpha	2.34	Stream Power (lb/ft s)	1.79	14.12	0.25
Frctn Loss (ft)	2.50	Cum Volume (acre-ft)	0.83	6.31	5.05
C & E Loss (ft)	0.02	Cum SA (acres)	0.49	1.01	4.27

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was 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 OUTPUT Profile #100 enc

			Left OB	Channel	Right OB
E.G. Elev (ft)	939.19	Element			
Vel Head (ft)	1.08	Wt. n-Val.		0.040	
W.S. Elev (ft)	938.12	Reach Len. (ft)	542.18	530.80	523.69
Crit W.S. (ft)	935.72	Flow Area (sq ft)		336.18	
E.G. Slope (ft/ft)	0.004865	Area (sq ft)		336.18	
Q Total (cfs)	2800.00	Flow (cfs)		2800.00	
Top Width (ft)	47.03	Top Width (ft)		47.03	
Vel Total (ft/s)	8.33	Avg. Vel. (ft/s)		8.33	
Max Chl Dpth (ft)	9.38	Hydr. Depth (ft)		7.15	
Conv. Total (cfs)	40143.5	Conv. (cfs)		40143.5	
Length Wtd. (ft)	530.80	Wetted Per. (ft)		58.33	
Min Ch El (ft)	928.74	Shear (lb/sq ft)		1.75	
Alpha	1.00	Stream Power (lb/ft s)		14.58	
Frctn Loss (ft)	2.67	Cum Volume (acre-ft)		6.81	
C & E Loss (ft)	0.01	Cum SA (acres)		1.01	

Warning: The energy loss was 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: Hope Creek
REACH: 1 RS: 553

INPUT
Description:
Station Elevation Data num= 114

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9255	938.36	9260.19	938.23	9277.53	937.33	9292.28	937.24	9313.22	937.62
9338.68	937.68	9363.09	937.98	9391.99	938.45	9393.5	938.47	9393.78	938.47
9394.05	938.48	9394.89	938.49	9426.92	939.09	9439.13	939.23	9450.27	939.54
9466.89	939.99	9470.01	940.12	9472.69	940.16	9491.6	940.34	9493.69	940.38
9510.03	940.18	9517.27	940.22	9522.4	940.45	9547.85	941.5	9558.43	941.73
9567.22	941.99	9579.43	942.28	9580.49	942.28	9582.37	942.27	9586.32	942.36
9610.6	942.34	9619.18	942.45	9627	942.55	9664.09	942.92	9674.6	943.02
9680.22	943.2	9691.65	944.15	9694.43	944.38	9706.19	943.06	9708.32	942.82
9718.27	943.92	9730.49	945.14	9805.62	942.71	9832.31	941.91	9834.9	943.33
9836.59	944.19	9904.76	942.32	9928.41	941.69	9931.44	941.04	9934.78	940.47
9969.46	933.57	9986.51	928.16	10000	926.71	10015.43	926.18	10016.49	932.97
10023.06	932.97	10023.55	932.96	10044	932.91	10085.74	933.17	10093.48	933.19
10097.4	933.15	10099.8	933.19	10129.31	933.17	10144.97	933.01	10153.77	933.08
10179.02	934.09	10191.87	934.21	10199.97	934.97	10206.98	935.54	10238.7	935.43
10262.62	935.17	10266.97	936.32	10271.51	936.98	10293.65	937.36	10297.63	937.43
10300.55	937.54	10302.53	937.56	10334.03	938.09	10338.67	939.02	10379.66	938.09
10384.98	938.05	10388.16	938.11	10421.44	938.97	10446.41	939.31	10477.14	940
10504.66	940.46	10530.82	940.8	10563.03	941.14	10567.33	941.21	10574.54	941.44
10603.74	942.39	10623.45	942.51	10643.69	942.54	10644.19	942.6	10656.13	944.36
10658.49	944.3	10681.08	943.57	10716.04	943.08	10719.7	943.04	10724.47	943.07
10743.14	943.49	10759.03	943.9	10760.44	943.48	10769.84	941.45	10776.71	944.3
10785.93	948.54	10793.82	947.78	10799.79	947.24	10819.14	942.4	10822.81	941.03
10851.82	941.02	10856.11	940.93	10867.16	940.93	10869.17	940.89		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9255	.12	9969.46	.04	10016.49	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9969.46	10016.49	411.44	402.61	393.59	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
9255	9842.75	947.18	F

CROSS SECTION OUTPUT Profile #100 nat

			Left OB	Channel	Right OB
E.G. Elev (ft)	935.80	Element			
Vel Head (ft)	0.86	Wt. n-Val.	0.120	0.040	0.120

W.S. Elev (ft)	934.93	Reach Len. (ft)	411.44	402.61	393.59
Crit W.S. (ft)	933.81	Flow Area (sq ft)	4.68	307.24	303.27
E.G. Slope (ft/ft)	0.004491	Area (sq ft)	4.68	307.24	303.27
Q Total (cfs)	2800.00	Flow (cfs)	2.97	2444.81	352.22
Top Width (ft)	237.00	Top Width (ft)	6.86	47.03	183.11
Vel Total (ft/s)	4.55	Avg. Vel. (ft/s)	0.63	7.96	1.16
Max Chl Dpth (ft)	8.75	Hydr. Depth (ft)	0.68	6.53	1.66
Conv. Total (cfs)	41780.3	Conv. (cfs)	44.3	36480.3	5255.7
Length Wtd. (ft)	401.73	Wetted Per. (ft)	6.99	53.77	183.17
Min Ch El (ft)	926.18	Shear (lb/sq ft)	0.19	1.60	0.46
Alpha	2.68	Stream Power (lb/ft s)	0.12	12.75	0.54
Frctn Loss (ft)	2.53	Cum Volume (acre-ft)	0.16	2.60	2.34
C & E Loss (ft)	0.06	Cum SA (acres)	0.26	0.43	2.25

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 OUTPUT Profile #100 enc

			Left OB	Channel	Right OB
E.G. Elev (ft)	936.51	Element			
Vel Head (ft)	1.13	Wt. n-Val.		0.040	
W.S. Elev (ft)	935.39	Reach Len. (ft)	411.44	402.61	393.59
Crit W.S. (ft)	933.15	Flow Area (sq ft)		328.48	
E.G. Slope (ft/ft)	0.005216	Area (sq ft)		328.48	
Q Total (cfs)	2800.00	Flow (cfs)		2800.00	
Top Width (ft)	47.03	Top Width (ft)		47.03	
Vel Total (ft/s)	8.52	Avg. Vel. (ft/s)		8.52	
Max Chl Dpth (ft)	9.21	Hydr. Depth (ft)		6.98	
Conv. Total (cfs)	38770.9	Conv. (cfs)		38770.9	
Length Wtd. (ft)	402.61	Wetted Per. (ft)		58.00	
Min Ch El (ft)	926.18	Shear (lb/sq ft)		1.84	
Alpha	1.00	Stream Power (lb/ft s)		15.72	
Frctn Loss (ft)	2.77	Cum Volume (acre-ft)		2.76	
C & E Loss (ft)	0.05	Cum SA (acres)		0.43	

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: Hope Creek
REACH: 1 RS: 151

INPUT
Description:
Station Elevation Data num= 115

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9244.2	937.1	9247.8	937.15	9253.15	933.38	9254.18	932.73	9261.37	936.2
9262.65	936.69	9264.19	936.66	9291	935.79	9308.25	935.17	9312.9	935.08
9314.42	935.11	9328.02	935.45	9337.25	936.18	9344.7	936.8	9347.41	937.04
9351.82	937.39	9372.57	937.79	9381.35	938.01	9401.26	938.22	9402.33	938.26
9405.66	937.92	9414.42	937.02	9424.88	936.01	9437.14	935.35	9450.78	935.27
9457.8	935.26	9466.9	935.52	9477.33	935.69	9497.37	936.01	9526.12	936.3
9536.6	936.1	9545.03	935.78	9549.09	935.46	9590.44	933.05	9603.24	932.64
9603.71	932.63	9604.42	932.63	9620.2	932.51	9657.28	930.58	9664.96	930.21
9678.41	935.01	9698.16	942.13	9797	940.14	9800.28	940.08	9800.64	940.19
9804.24	941.22	9804.26	941.22	9875.82	939.9	9895.5	939.5	9899.44	939.02
9912.68	937.24	9915.54	937.57	9955.68	931.49	9969.45	931.44	9986.5	926.03
9999.99	924.58	10015.42	924.05	10016.48	931.35	10027.71	932.09	10037.99	926.62
10043.55	926.64	10051.68	930.5	10081.7	930.61	10083.22	930.59	10106.37	931.24
10133.58	931.46	10138.68	931.48	10159.29	931.22	10196.65	931.06	10209.72	931.15
10219.77	931.22	10260.14	931.69	10296.89	931.39	10309.28	931.23	10310.24	931.29
10310.9	931.28	10355.57	931.98	10360.96	931.95	10398.06	932.26	10416.03	932.18

10444.2	932.0910452.32	933.1610462.94	934.5910468.01	934.2510483.83	934.27
10507.11	93410516.99	933.910527.57	933.8610547.69	933.5910555.03	934.47
10565.13	935.610568.64	935.5210571.94	935.6310593.68	935.75 10613.1	935.51
10660.38	936.48 10663.5	936.5810684.25	936.5910714.61	936.8210717.98	937.01
10746.57	938.65 10750	938.1210756.23	937.5510757.17	937.4610772.82	938.92
10773.43	938.9710773.89	939.0210778.36	938.97 10815.7	938.8910824.65	938.93
10865.2	939.54 10888.8	939.41 10915.6	939.6210933.58	939.6810960.11	940.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9244.2	.12	9969.45	.04	10016.48	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9969.4510016.48 144.3 150.57 180.1 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
9244.2	9801.53	943.96	F

CROSS SECTION OUTPUT Profile #100 nat

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	933.20	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	1.49	Reach Len. (ft)			
W.S. Elev (ft)	931.71	Flow Area (sq ft)	3.51	255.42	214.60
Crit W.S. (ft)	930.39	Area (sq ft)	28.98	255.42	214.60
E.G. Slope (ft/ft)	0.009504	Flow (cfs)	1.59	2597.70	200.71
Q Total (cfs)	2800.00	Top Width (ft)	48.78	47.03	315.26
Top Width (ft)	411.07	Avg. Vel. (ft/s)	0.45	10.17	0.94
Vel Total (ft/s)	5.91	Hydr. Depth (ft)	0.23	5.43	0.68
Max Chl Dpth (ft)	7.66	Conv. (cfs)	16.4	26646.2	2058.8
Conv. Total (cfs)	28721.3	Wetted Per. (ft)	15.23	54.27	317.44
Length Wtd. (ft)		Shear (lb/sq ft)	0.14	2.79	0.40
Min Ch El (ft)	924.05	Stream Power (lb/ft s)	0.06	28.40	0.38
Alpha	2.75	Cum Volume (acre-ft)			
Frctn Loss (ft)		Cum SA (acres)			
C & E Loss (ft)					

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #100 enc

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	933.68	Wt. n-Val.		0.040	
Vel Head (ft)	1.68	Reach Len. (ft)			
W.S. Elev (ft)	932.01	Flow Area (sq ft)		269.54	
Crit W.S. (ft)	931.02	Area (sq ft)		269.54	
E.G. Slope (ft/ft)	0.009508	Flow (cfs)		2800.00	
Q Total (cfs)	2800.00	Top Width (ft)		47.03	
Top Width (ft)	47.03	Avg. Vel. (ft/s)		10.39	
Vel Total (ft/s)	10.39	Hydr. Depth (ft)		5.73	
Max Chl Dpth (ft)	7.96	Conv. (cfs)		28714.8	
Conv. Total (cfs)	28714.8	Wetted Per. (ft)		55.50	
Length Wtd. (ft)		Shear (lb/sq ft)		2.88	
Min Ch El (ft)	924.05	Stream Power (lb/ft s)		29.95	
Alpha	1.00	Cum Volume (acre-ft)			
Frctn Loss (ft)		Cum SA (acres)			
C & E Loss (ft)					

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

SUMMARY OF MANNING'S N VALUES

River:Hope Creek

Reach	River Sta.	n1	n2	n3
1	8000	.12	.045	.1
1	7548	.12	.045	.1
1	7061	.12	.045	.1
1	6930	.12	.045	.1
1	6719	Culvert		

1	6496	.12	.035	.08
1	6278	.12	.025	.08
1	5629	.12	.025	.08
1	5428	.12	.025	.08
1	5146	Culvert		
1	4969	.09	.04	.12
1	4718	.09	.04	.12
1	4209	.09	.04	.12
1	3784	.09	.04	.12
1	3147	.09	.04	.12
1	2870	.09	.04	.12
1	2262	.12	.04	.12
1	1650	.12	.04	.12
1	1084	.12	.04	.12
1	553	.12	.04	.12
1	151	.12	.04	.12

SUMMARY OF REACH LENGTHS

River: Hope Creek

Reach	River Sta.	Left	Channel	Right
1	8000	393.3	452.1	505.73
1	7548	498.18	486.75	465.44
1	7061	137.61	131.25	117.04
1	6930	458.64	434.11	418.59
1	6719	Culvert		
1	6496	261.27	218.1	177.15
1	6278	596.84	648.74	713.24
1	5629	205.65	201.08	200.99
1	5428	519.24	458.42	414.44
1	5146	Culvert		
1	4969	170.27	251.19	305.99
1	4718	511.63	509.41	507.2
1	4209	422.16	424.62	427.61
1	3784	629.04	636.89	643.21
1	3147	288.86	277.25	266.63
1	2870	626.39	607.72	588.56
1	2262	588.24	612.35	580.92
1	1650	559.26	566	568.78
1	1084	542.18	530.8	523.69
1	553	411.44	402.61	393.59
1	151	144.3	150.57	180.1

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Hope Creek

Reach	River Sta.	Contr.	Expan.
1	8000	.1	.3
1	7548	.1	.3
1	7061	.3	.5
1	6930	.3	.5
1	6719	Culvert	
1	6496	.3	.5
1	6278	.1	.3
1	5629	.3	.5
1	5428	.3	.5
1	5146	Culvert	
1	4969	.3	.5
1	4718	.1	.3
1	4209	.1	.3
1	3784	.1	.3
1	3147	.1	.3
1	2870	.1	.3
1	2262	.1	.3
1	1650	.1	.3
1	1084	.1	.3

1	553	.1	.3
1	151	.1	.3

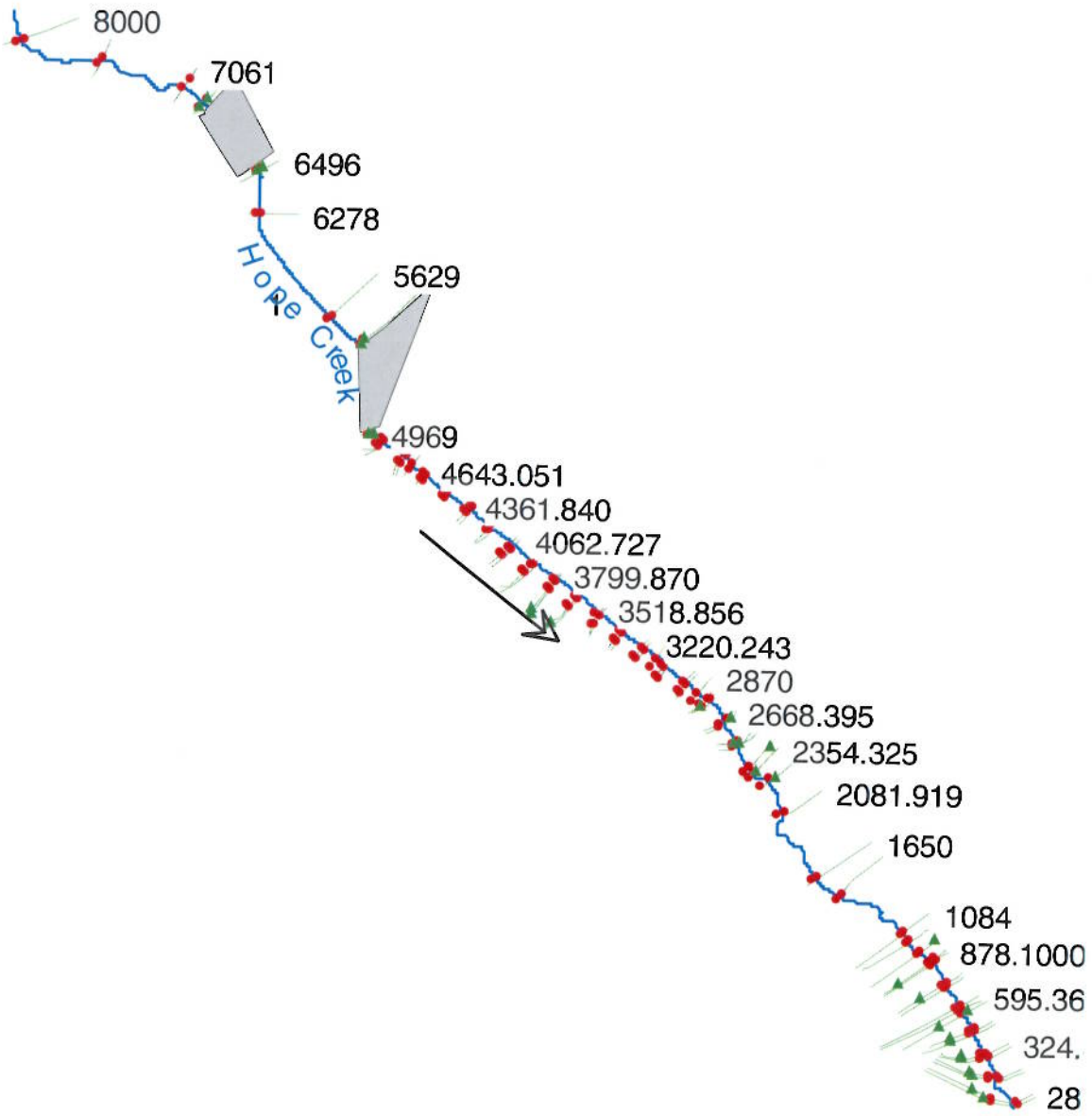
Profile Output Table - Encroachment 1

Reach	River Sta		Profile	W.S. Elev	Prof Delta WS	E.G. Elev	Top Wdth Act	Q Left	Q Channel	Q Right	Enc Sta L	Ch Sta L	Ch Sta R	Enc Sta R
				(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)
1	8000		100 nat	1003.98		1004.65	236.20	336.71	1054.33	8.96		9975.44	10014.28	
1	8000		100 enc	1004.70	0.72	1005.78	38.84		1400.00		9975.44	9975.44	10014.28	10014.28
1	7548		100 nat	997.74		999.05	86.32	118.33	1280.51	1.16		9975.44	10014.28	
1	7548		100 enc	997.93	0.19	999.46	38.84		1400.00		9975.44	9975.44	10014.28	10014.28
1	7061		100 nat	987.87		989.78	42.82		1790.00			9971.13	10025.25	
1	7061		100 enc	987.87	0.00	989.78	42.82		1790.00		9971.13	9971.13	10025.25	10025.25
1	6930		100 nat	988.15		988.34	52.42		1790.00			9968.55	10020.97	
1	6930		100 enc	988.15	0.00	988.34	52.42		1790.00		9968.55	9968.55	10020.97	10020.97
1	6719	S. Marietta Pkwy		Culvert										
1	6496		100 nat	973.73		975.70	27.86	12.92	1775.92	1.16		9986.26	10012.02	
1	6496		100 enc	974.71	0.99	976.17	27.86	15.91	1772.70	1.38	9970.00	9986.26	10012.02	10030.00
1	6278		100 nat	972.59		974.37	138.34	236.75	1547.09	6.16		9986.44	10012.01	
1	6278		100 enc	972.59	0.00	974.85	51.99	115.45	1674.55		9960.02	9986.44	10012.01	10012.01

1	5629		100 nat	967.39		968.64	37.98	26.80	1763.12	0.08		9986.25	10012.01	
1	5629		100 enc	967.66	0.27	968.88	25.76		1790.00		9986.25	9986.25	10012.01	
1	5428		100 nat	967.53		968.15	31.93	8.34	1771.84	9.82		9986.25	10012.01	
1	5428		100 enc	967.66	0.13	968.29	25.76		1790.00		9986.25	9986.25	10012.01	
1	5146	I-75		Culvert										
1	4969		100 nat	958.45		960.14	24.98	1.64	1787.82	0.53		9988.91	10012.88	
1	4969		100 enc	958.42	-0.04	960.13	23.97		1790.00		9988.91	9988.91	10012.88	
1	4718		100 nat	954.03		956.89	31.22	9.15	2299.98	0.87		9988.91	10012.88	
1	4718		100 enc	955.03	1.00	957.25	23.97		2310.00		9988.91	9988.91	10012.88	
1	4209		100 nat	952.82		953.51	95.56	44.56	1775.90	489.53		9988.91	10012.88	
1	4209		100 enc	953.36	0.54	954.07	63.24		1855.41	454.59	9988.91	9988.91	10012.88	
1	3784		100 nat	952.33		952.66	265.69	0.79	1736.07	573.14		9985.09	10017.26	
1	3784		100 enc	952.67	0.34	953.09	108.24		1925.94	384.06	9985.09	9985.09	10017.26	
1	3147		100 nat	949.13		950.78	65.81	0.12	2770.49	29.39		9975.96	10021.07	
1	3147		100 enc	949.36	0.24	950.94	45.11		2800.00		9975.96	9975.96	10021.07	
1	2870		100 nat	947.24		948.79	68.96	6.13	2781.53	12.34		9983.04	10021.35	
1	2870		100 enc	947.39	0.15	948.90	38.31		2800.00		9983.04	9983.04	10021.35	

1	2262	100 nat	942.14		943.60	190.23	516.76	2180.62	102.62		9978.64	10021.06
1	2262	100 enc	942.92	0.78	944.25	126.12	456.00	2344.00		9894.94	9978.64	10021.06
10021.06												
1	1650	100 nat	940.00		940.35	321.12	1050.97	1729.79	19.24		9969.46	10016.49
1	1650	100 enc	940.79	0.79	941.27	198.41	701.22	2098.78		9818.08	9969.46	10016.49
10016.49												
1	1084	100 nat	937.39		938.32	229.65	194.09	2479.68	126.23		9969.46	10016.49
1	1084	100 enc	938.12	0.73	939.19	47.03		2800.00		9969.46	9969.46	10016.49
10016.49												
1	553	100 nat	934.93		935.80	237.00	2.97	2444.81	352.22		9969.46	10016.49
1	553	100 enc	935.39	0.45	936.51	47.03		2800.00		9969.46	9969.46	10016.49
10016.49												
1	151	100 nat	931.71		933.20	377.51	1.59	2597.70	200.71		9969.45	10016.48
1	151	100 enc	932.01	0.30	933.68	47.03		2800.00		9969.45	9969.45	10016.48
10016.48												

Corrected Effective Model (HEC-RAS) FEMA Floodway Profiles



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                    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: HopeCreek_Br16-17
Project File : HopeCreek_Br16-17.prj
Run Date and Time: 11/30/2009 10:29:15 AM

Project in English units

Project Description:
Cobb County Priority Area 3 Flood Study - Modified to provide Base Model for
Bridges 16 & 17 of I-75 Corridor HOV Project
Hope Creek
Rottenwood Creek
Watershed

Model extends from confluence with Rottenwood Creek to 1180 feet
upstream of South Marietta Parkway WB to I-75 NB ramp



PLAN DATA

Plan Title: Corrected Effective - ChanRealign
Plan File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.p07

          Geometry Title: Corrected Effective Chan Realign
          Geometry File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.g02

          Flow Title    : Base-Comb Flow Data
          Flow File     : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.f06

Plan Summary Information:
Number of:  Cross Sections =   72    Multiple Openings  =    0
            Culverts       =    2    Inline Structures  =    0
            Bridges        =    0    Lateral Structures =    0

Computational Information
    Water surface calculation tolerance  =  0.01
    Critical depth calculation tolerance =  0.01
    Maximum number of iterations         =  40
    Maximum difference tolerance         =  0.1
    Flow tolerance factor                =  0.001

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

Encroachment Data
   Equal Conveyance = False
   Left Offset      =        0
   Right Offset     =        0

River = Hope Creek        Reach = 1
RS      Profile            Method  Value1  Value2
8000    100 YR FW               1 9975.4410014.28
7548    100 YR FW               1 9975.4410014.28
7061    100 YR FW               1 9971.1310025.25
6930    100 YR FW               1 9968.5510020.97
6496    100 YR FW               1    9970   10030
6278    100 YR FW               1 9960.0210012.01
```

5629	100	YR	FW	1	9986.2510012.01
5428	100	YR	FW	1	9986.2510012.01
4969	100	YR	FW	1	9988.9110012.88
4925.680100	YR	FW		1	24.79 66.83
4907.867100	YR	FW		1	26.77 66.58
4783.015100	YR	FW		1	5.33 53.7
4764.388100	YR	FW		1	9.98 57.59
4718	100	YR	FW	1	56.84 92.74
4643.051100	YR	FW		1	19.65 50.52
4625.316100	YR	FW		1	21.3 53.69
4503.708100	YR	FW		1	23.18 63.68
4485.049100	YR	FW		1	26.59 68.53
4361.840100	YR	FW		1	15.31 66.76
4343.304100	YR	FW		1	22.55 75.43
4222.473100	YR	FW		1	47.12 109.32
4204.470100	YR	FW		1	42.78 106.5
4080.463100	YR	FW		1	67.6 120.16
4062.727100	YR	FW		1	71.47 124.03
3940.903100	YR	FW		1	72.89 125.39
3922.633100	YR	FW		1	76.76 129.26
3799.870100	YR	FW		1	48.58 98.54
3781.101100	YR	FW		1	55.46 105.42
3659.612100	YR	FW		1	52.29 102.25
3641.433100	YR	FW		1	54.01 103.97
3518.856100	YR	FW		1	49.46 102.1
3500.626100	YR	FW		1	46.8 99.44
3378.489100	YR	FW		1	49.79 100.69
3360.436100	YR	FW		1	50.53 101.43
3238.304100	YR	FW		1	47.19 102.95
3220.243100	YR	FW		1	45.5 101.26
3147	100	YR	FW	1	89.92 145.68
3097.384100	YR	FW		1	60.82 126.32
3079.078100	YR	FW		1	68.21 133.71
2955.929100	YR	FW		1	70.8 133.39
2937.884100	YR	FW		1	72.94 133.78
2870	100	YR	FW	1	106.36 157.49
2813.979100	YR	FW		1	39.47 90.6
2795.938100	YR	FW		1	43.32 94.45
2668.395100	YR	FW		1	38.44 108.59
2650.675100	YR	FW		1	42.43 112.58
2537.862100	YR	FW		1	64.72 151
2520.830100	YR	FW		1	65.05 153.79
2390.934100	YR	FW		1	101.31 208.81
2354.325100	YR	FW		1	102.33 215.12
2262	100	YR	FW	1	124.78 250.9
2081.919100	YR	FW		1	119.54 266.93
1650	100	YR	FW	1	163.15 361.56
1492.060100	YR	FW		1	146.55 306.11
1084	100	YR	FW	1	158.76 205.79
1027.831100	YR	FW		1	107.04 154.07
949.7572100	YR	FW		1	94.85 141.88
878.1000100	YR	FW		1	65.33 112.36
859.3424100	YR	FW		1	67.67 114.7
735.5340100	YR	FW		1	85.18 132.21
716.3877100	YR	FW		1	88.68 135.71
595.3610100	YR	FW		1	89.41 136.44
577.5895100	YR	FW		1	87.24 134.27
553	100	YR	FW	1	106.56 153.59
459.5899100	YR	FW		1	96.73 143.76
441.5446100	YR	FW		1	99.23 146.26
324.8710100	YR	FW		1	123.06 170.09
307.2792100	YR	FW		1	125.62 172.65
200.7906100	YR	FW		1	130.5 178.33
185.0263100	YR	FW		1	134.46 193.53
28.22144100	YR	FW		1	92.56 221.55
12.13838100	YR	FW		1	82.97 235.12

FLOW DATA

Flow Title: Base-Comb Flow Data
Flow File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.f06

Flow Data (cfs)

River	Reach	RS	100 YR	100 YR FW
Hope Creek	1	8000	1400	1400
Hope Creek	1	7061	1790	1790
Hope Creek	1	4718	2310	2310
Hope Creek	1	3147	2800	2800

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Hope Creek	1	100 YR		Normal S = 0.003
Hope Creek	1	100 YR FW		Normal S = 0.003

GEOMETRY DATA

Geometry Title: Corrected Effective Chan Realign
Geometry File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.g02

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 8000

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9692.31	1010.32	9730.61	1006.96	9741.69	1006.28	9746.1	1006.09	9752.37	1005.9
9795.04	1003.98	9803.95	1003.91	9815.76	1003.7	9830.29	1003.2	9842.43	1003.29
9847.65	1003.23	9856.36	1002.52	9864.45	1002.02	9872.65	1001.42	9875.36	1001.23
9884.35	1001.84	9891.79	1002.43	9896.36	1002.67	9905.33	1003.01	9914.36	1002.76
9926.07	1002.62	9931.4	1003.14	9943.29	1002.52	9951.53	1002.22	9953.9	1002.17
9957.29	1001.98	9971.84	1001.7	9975.44	1001.76	9988.3	1000.04	10000	999.59
10008.8	999.78	10014.28	1003.13	10019.72	1003.11	10021.42	1003.27	10024.73	1003.59
10026.72	1003.7	10029.7	1003.89	10035.93	1004.29	10038.89	1004.52	10050.88	1004.82
10054.9	1004.92	10066.83	1005.64	10070.49	1006.39	10088.12	1013.63		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9692.31	.12	9975.44	.045	10014.28	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9975.44	10014.28	393.3	452.1	505.73	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	1004.65	Wt. n-Val.	0.120	0.045	0.100
Vel Head (ft)	0.67	Reach Len. (ft)	393.30	452.10	505.73
W.S. Elev (ft)	1003.98	Flow Area (sq ft)	232.83	140.12	9.19
Crit W.S. (ft)	1003.67	Area (sq ft)	232.83	140.12	9.19
E.G. Slope (ft/ft)	0.009730	Flow (cfs)	336.75	1054.29	8.96
Q Total (cfs)	1400.00	Top Width (ft)	180.49	38.84	16.88
Top Width (ft)	236.21	Avg. Vel. (ft/s)	1.45	7.52	0.98
Vel Total (ft/s)	3.66	Hydr. Depth (ft)	1.29	3.61	0.54
Max Chl Dpth (ft)	4.39	Conv. (cfs)	3413.9	10688.3	90.9
Conv. Total (cfs)	14193.1	Wetted Per. (ft)	180.69	39.91	16.92
Length Wtd. (ft)	442.74	Shear (lb/sq ft)	0.78	2.13	0.33
Min Ch El (ft)	999.59	Stream Power (lb/ft s)	1.13	16.05	0.32
Alpha	3.21	Cum Volume (acre-ft)	43.63	48.18	12.17
Frctn Loss (ft)	5.55	Cum SA (acres)	12.31	7.26	6.88
C & E Loss (ft)	0.06				

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 energy loss was 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 #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	1005.78	Wt. n-Val.		0.045	
Vel Head (ft)	1.08	Reach Len. (ft)	393.30	452.10	505.73
W.S. Elev (ft)	1004.70	Flow Area (sq ft)		168.08	
Crit W.S. (ft)	1003.81	Area (sq ft)		168.08	
E.G. Slope (ft/ft)	0.010794	Flow (cfs)		1400.00	
Q Total (cfs)	1400.00	Top Width (ft)		38.84	
Top Width (ft)	38.84	Avg. Vel. (ft/s)		8.33	
Vel Total (ft/s)	8.33	Hydr. Depth (ft)		4.33	
Max Chl Dpth (ft)	5.11	Conv. (cfs)		13475.4	
Conv. Total (cfs)	13475.4	Wetted Per. (ft)		44.43	
Length Wtd. (ft)	452.10	Shear (lb/sq ft)		2.55	
Min Ch El (ft)	999.59				

Alpha	1.00	Stream Power (lb/ft s)		21.24	
Frctn Loss (ft)	6.28	Cum Volume (acre-ft)	12.44	51.92	1.98
C & E Loss (ft)	0.05	Cum SA (acres)	3.33	7.28	0.69

Warning: The cross section had to be extended vertically during the critical depth 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: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 7548

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9863.29	1009.3	9888.65	1003.16	9940.03	996.67	9975.44	995.68	9988.3	993.96
10000	993.51	10008.8	993.71	10014.28	997.05	10067.71	1007.38	10085.14	1008.78

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9863.29	.12	9975.44	.045	10014.28	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9975.44	10014.28	498.18	486.75	465.44	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	999.05	Element			
Vel Head (ft)	1.31	Wt. n-Val.	0.120	0.045	0.100
W.S. Elev (ft)	997.74	Reach Len. (ft)	498.18	486.75	465.44
Crit W.S. (ft)	997.69	Flow Area (sq ft)	60.02	133.82	1.24
E.G. Slope (ft/ft)	0.016734	Area (sq ft)	60.02	133.82	1.24
Q Total (cfs)	1400.00	Flow (cfs)	118.29	1280.55	1.16
Top Width (ft)	86.31	Top Width (ft)	43.89	38.84	3.58
Vel Total (ft/s)	7.18	Avg. Vel. (ft/s)	1.97	9.57	0.94
Max Chl Dpth (ft)	4.23	Hydr. Depth (ft)	1.37	3.45	0.35
Conv. Total (cfs)	10822.6	Conv. (cfs)	914.4	9899.2	8.9
Length Wtd. (ft)	487.17	Wetted Per. (ft)	43.97	39.91	3.64
Min Ch El (ft)	993.51	Shear (lb/sq ft)	1.43	3.50	0.35
Alpha	1.63	Stream Power (lb/ft s)	2.81	33.52	0.33
Frctn Loss (ft)	9.20	Cum Volume (acre-ft)	42.30	46.76	12.11
C & E Loss (ft)	0.06	Cum SA (acres)	11.30	6.86	6.76

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 #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	999.46	Element			
Vel Head (ft)	1.53	Wt. n-Val.		0.045	
W.S. Elev (ft)	997.93	Reach Len. (ft)	498.18	486.75	465.44
Crit W.S. (ft)	997.73	Flow Area (sq ft)		141.12	
E.G. Slope (ft/ft)	0.018530	Area (sq ft)		141.12	
Q Total (cfs)	1400.00	Flow (cfs)		1400.00	
Top Width (ft)	38.84	Top Width (ft)		38.84	
Vel Total (ft/s)	9.92	Avg. Vel. (ft/s)		9.92	
Max Chl Dpth (ft)	4.42	Hydr. Depth (ft)		3.63	
Conv. Total (cfs)	10284.6	Conv. (cfs)		10284.6	
Length Wtd. (ft)	486.75	Wetted Per. (ft)		43.04	
Min Ch El (ft)	993.51	Shear (lb/sq ft)		3.79	
Alpha	1.00	Stream Power (lb/ft s)		37.63	
Frctn Loss (ft)	9.64	Cum Volume (acre-ft)	12.44	50.31	1.98
C & E Loss (ft)	0.04	Cum SA (acres)	3.33	6.88	0.69

Warning: The cross section had to be extended vertically during the critical depth 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: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 7061

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9905.26	1001.98	9956.74	993.8	9957.4	993.7	9958.42	993.52	9971.13	990.89
9975.44	985.2	9988.3	983.48	10000	983.03	10008.8	983.22	10014.28	986.57
10018	989.04	10021.34	989.95	10025.25	991.08	10030.35	991.41	10047.87	992.47
10065.41	993.53	10087.95	996.31	10090.3	996.66	10098.54	997.89	10117.31	1004.01

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9905.26	.12	9971.13	.04	10025.25	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9971.13	10025.25	137.61	131.25	117.04	.3	.5

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	989.78	Wt. n-Val.		0.045	
Vel Head (ft)	1.91	Reach Len. (ft)	137.61	131.25	117.04
W.S. Elev (ft)	987.87	Flow Area (sq ft)		161.47	
Crit W.S. (ft)	987.87	Area (sq ft)		161.47	
E.G. Slope (ft/ft)	0.020890	Flow (cfs)		1790.00	
Q Total (cfs)	1790.00	Top Width (ft)		42.82	
Top Width (ft)	42.82	Avg. Vel. (ft/s)		11.09	
Vel Total (ft/s)	11.09	Hydr. Depth (ft)		3.77	
Max Chl Dpth (ft)	4.84	Conv. (cfs)		12384.5	
Conv. Total (cfs)	12384.5	Wetted Per. (ft)		45.61	
Length Wtd. (ft)	131.25	Shear (lb/sq ft)		4.62	
Min Ch El (ft)	983.03	Stream Power (lb/ft s)		51.18	
Alpha	1.00	Cum Volume (acre-ft)	41.96	45.11	12.10
Frctn Loss (ft)	0.23	Cum SA (acres)	11.05	6.40	6.74
C & E Loss (ft)	0.86				

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 #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	989.78	Wt. n-Val.		0.045	
Vel Head (ft)	1.91	Reach Len. (ft)	137.61	131.25	117.04
W.S. Elev (ft)	987.87	Flow Area (sq ft)		161.45	
Crit W.S. (ft)	987.87	Area (sq ft)		161.45	
E.G. Slope (ft/ft)	0.020896	Flow (cfs)		1790.00	
Q Total (cfs)	1790.00	Top Width (ft)		42.82	
Top Width (ft)	42.82	Avg. Vel. (ft/s)		11.09	
Vel Total (ft/s)	11.09	Hydr. Depth (ft)		3.77	
Max Chl Dpth (ft)	4.84	Conv. (cfs)		12382.9	
Conv. Total (cfs)	12382.9	Wetted Per. (ft)		45.61	
Length Wtd. (ft)	131.25	Shear (lb/sq ft)		4.62	
Min Ch El (ft)	983.03	Stream Power (lb/ft s)		51.20	
Alpha	1.00	Cum Volume (acre-ft)	12.44	48.62	1.98
Frctn Loss (ft)	0.27	Cum SA (acres)	3.33	6.42	0.69
C & E Loss (ft)	0.86				

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: Hope Creek
REACH: 1 RS: 6930

INPUT
Description:
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9781.95	1000.87	9799.86	997.76	9802.38	997.61	9935.39	995.4	9949.54	993.31
9968.55	984.36	9975.44	978.61	9988.3	976.89	10000	976.44	10008.8	976.63
10014.28	979.98	10020.97	984.41	10043.21	995.61	10048.18	997.11	10057.13	999.87

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9781.95	.12	9968.55	.045	10020.97	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9968.55	10020.97	458.64	434.11	418.59	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
9781.95	9968.55	1017.97	T
10020.97	10057.13	1017.97	T

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	988.34	Wt. n-Val.		0.045	
Vel Head (ft)	0.19	Reach Len. (ft)	458.64	434.11	418.59
W.S. Elev (ft)	988.15	Flow Area (sq ft)		510.24	
Crit W.S. (ft)	981.28	Area (sq ft)	15.29	510.24	13.93
E.G. Slope (ft/ft)	0.000606	Flow (cfs)		1790.00	
Q Total (cfs)	1790.00	Top Width (ft)	8.06	52.42	7.44
Top Width (ft)	67.92	Avg. Vel. (ft/s)		3.51	
Vel Total (ft/s)	3.51	Hydr. Depth (ft)		9.73	
Max Chl Dpth (ft)	11.71	Conv. (cfs)		72717.2	
Conv. Total (cfs)	72717.2	Wetted Per. (ft)		56.91	
Length Wtd. (ft)	434.11	Shear (lb/sq ft)		0.34	
Min Ch El (ft)	976.44	Stream Power (lb/ft s)		1.19	
Alpha	1.00	Cum Volume (acre-ft)	41.94	44.10	12.08
Frctn Loss (ft)		Cum SA (acres)	11.03	6.26	6.73
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	988.34	Wt. n-Val.		0.045	
Vel Head (ft)	0.19	Reach Len. (ft)	458.64	434.11	418.59
W.S. Elev (ft)	988.15	Flow Area (sq ft)		510.24	
Crit W.S. (ft)	981.28	Area (sq ft)		510.24	
E.G. Slope (ft/ft)	0.000715	Flow (cfs)		1790.00	
Q Total (cfs)	1790.00	Top Width (ft)		52.42	
Top Width (ft)	52.42	Avg. Vel. (ft/s)		3.51	
Vel Total (ft/s)	3.51	Hydr. Depth (ft)		9.73	
Max Chl Dpth (ft)	11.71	Conv. (cfs)		66930.2	
Conv. Total (cfs)	66930.2	Wetted Per. (ft)		64.44	
Length Wtd. (ft)	434.11	Shear (lb/sq ft)		0.35	
Min Ch El (ft)	976.44	Stream Power (lb/ft s)		1.24	
Alpha	1.00	Cum Volume (acre-ft)	12.44	47.61	1.98
Frctn Loss (ft)		Cum SA (acres)	3.33	6.28	0.69
C & E Loss (ft)					

CULVERT

RIVER: Hope Creek
REACH: 1 RS: 6719

INPUT
Description: S. Marietta Pkwy, HC-6 2-10x8' Box Culvert
Distance from Upstream XS = 29.5
Deck/Roadway Width = 375
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 109

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
9224.89	1024.53		9228.8	1024.52		9256.11	1024.26	
9264.29	1024.22		9286.73	1024.05		9298.95	1024.01	
9302.27	1024		9327.78	1023.82		9338.47	1023.78	
9347.74	1023.76		9351.96	1023.75		9362.14	1023.67	
9389.96	1023.6		9393.38	1023.58		9417.65	1023.33	

9430.93	1023.07	9435.62	1022.98	9462.23	1022.7
9478.58	1022.65	9492.7	1022.53	9508.71	1022.48
9535.25	1022.25	9551.34	1022.16	9563.3	1021.96
9590.79	1021.8	9598.41	1021.72	9605.98	1021.65
9626.95	1021.45	9631.92	1021.4	9636.71	1021.46
9640.54	1021.51	9648.68	1021.46	9673.39	1021.3
9690.21	1021.09	9699.9	1021.04	9711.48	1020.97
9742.37	1020.82	9746.12	1020.79	9754.37	1020.71
9764.06	1020.56	9788.93	1020.32	9798.43	1020.19
9806.68	1020.19	9831.72	1020.2	9838.32	1020.1
9854.25	1019.91	9864.96	1019.76	9890.5	1019.47
9899.11	1019.48	9949.6	1017.97	9976.17	1017.97
9979.69	1017.97	9980.07	1017.97	10003.19	1017.97
10075.41	1020.31	10090.03	1020.52	10109.94	1020.85
10130.24	1021.27	10140.15	1021.51	10161.25	1022
10174.98	1022.22	10182.64	1022.4	10205.31	1023.1
10227.98	1023.65	10237.1	1023.98	10257.17	1024.61
10278.59	1025.38	10286.05	1025.68	10300.3	1026.18
10311.54	1026.63	10322.75	1027.05	10334.05	1027.5
10346.61	1027.92	10358.01	1028.33	10370.6	1028.75
10381.28	1029.09	10389.18	1029.4	10394.55	1029.67
10406.41	1030.13	10408.67	1030.27	10411.49	1030.42
10423.81	1030.89	10441.47	1031.33	10468.74	1032.45
10472.78	1032.68	10477.2	1032.93	10481.87	1033.2
10503.95	1034.11	10843.01	1047.54	10866.03	1048.42
10873.74	1048.63	10877.47	1048.73	10926.33	1050.44
10934.63	1050.8	10936.31	1050.83	10943.63	1051.06
10945.29	1051.07	10946.54	1051.1	10948.45	1051.11
10949.63	1051.14	10951.6	1051.14	10952.66	1051.16
10953.56	1051.17	10973.73	1051.38	10990.8	1052.11
10992.49	1052.16	10994.6	1052.21	10997.14	1052.27
11008.41	1052.56				

Upstream Bridge Cross Section Data
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9781.95	1000.87	9799.86	997.76	9802.38	997.61	9935.39	995.4	9949.54	993.31		
9968.55	984.36	9975.44	978.61	9988.3	976.89	10000	976.44	10012	976.63		
10014.28	979.98	10020.97	984.41	10043.21	995.61	10048.18	997.11	10057.13	999.87		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9781.95	.12	9968.55	.045	10020.97	.1

Bank Sta: Left Right Coeff Contr. Expan.
9968.55 10020.97 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
9781.95	9968.55	1017.97	T
10020.97	10057.13	1017.97	T

Downstream Deck/Roadway Coordinates
num= 109

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
9224.89	1024.53		9228.8	1024.52		9256.11	1024.26	
9264.29	1024.22		9286.73	1024.05		9298.95	1024.01	
9302.27	1024		9327.78	1023.82		9338.47	1023.78	
9347.74	1023.76		9351.96	1023.75		9362.14	1023.67	
9389.96	1023.6		9393.38	1023.58		9417.65	1023.33	
9430.93	1023.07		9435.62	1022.98		9462.23	1022.7	
9478.58	1022.65		9492.7	1022.53		9508.71	1022.48	
9535.25	1022.25		9551.34	1022.16		9563.3	1021.96	
9590.79	1021.8		9598.41	1021.72		9605.98	1021.65	
9626.95	1021.45		9631.92	1021.4		9636.71	1021.46	
9640.54	1021.51		9648.68	1021.46		9673.39	1021.3	
9690.21	1021.09		9699.9	1021.04		9711.48	1020.97	
9742.37	1020.82		9746.12	1020.79		9754.37	1020.71	
9764.06	1020.56		9788.93	1020.32		9798.43	1020.19	
9806.68	1020.19		9831.72	1020.2		9838.32	1020.1	
9854.25	1019.91		9864.96	1019.76		9890.5	1019.47	
9899.11	1019.48		9949.6	1017.97		9976.17	1017.97	
9979.69	1017.97		9980.07	1017.97		10003.19	1017.97	
10075.41	1020.31		10090.03	1020.52		10109.94	1020.85	
10130.24	1021.27		10140.15	1021.51		10161.25	1022	
10174.98	1022.22		10182.64	1022.4		10205.31	1023.1	
10227.98	1023.65		10237.1	1023.98		10257.17	1024.61	
10278.59	1025.38		10286.05	1025.68		10300.3	1026.18	
10311.54	1026.63		10322.75	1027.05		10334.05	1027.5	
10346.61	1027.92		10358.01	1028.33		10370.6	1028.75	
10381.28	1029.09		10389.18	1029.4		10394.55	1029.67	
10406.41	1030.13		10408.67	1030.27		10411.49	1030.42	
10423.81	1030.89		10441.47	1031.33		10468.74	1032.45	

```
10472.78 1032.68        10477.2 1032.93        10481.87  1033.2
10503.95 1034.11       10843.01 1047.54        10866.03 1048.42
10873.74 1048.63       10877.47 1048.73        10926.33 1050.44
10934.63  1050.8       10936.31 1050.83        10943.63 1051.06
10945.29 1051.07       10946.54  1051.1        10948.45 1051.11
10949.63 1051.14        10951.6 1051.14        10952.66 1051.16
10953.56 1051.17       10973.73 1051.38         10990.8 1052.11
10992.49 1052.16        10994.6 1052.21        10997.14 1052.27
11008.41 1052.56

Downstream Bridge Cross Section Data
Station Elevation Data    num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9889.59  989.26 9904.06  987.96 9906.52  987.63 9911.03  987.08 9917.06  986.17
 9942.39  982.91 9943.57  982.73 9949.25  981.79 9951.67  981.26 9953.81  980.93
 9961.37  979.81 9963.73   979.2 9963.86  979.16 9963.96  979.13 9972.02  976.15
 9986.26  970.21    9989  966.4610000.01  966.25   10011  966.4110012.02  970.35
10018.62  971.8410018.77  971.8710030.71  974.19 10038.9  976.2510063.61  978.28
10071.74  979.31 10082.2  980.4210082.83  980.6710097.63  986.5310112.06  991.58

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9889.59     .12 9986.26    .03510012.02     .08

Bank Sta: Left   Right    Coeff Contr.   Expan.
      9986.2610012.02             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 9889.59 9984.26 1017.97       F
10012.1210112.06 1017.97       F

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

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1          Box        8      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
              29.5     375     .012     .012        0                   .5                 1
Number of Barrels =  2
Upstream   Elevation =  977.32
Centerline Stations
    Sta.    Sta.
  9994.5 10005.5
Downstream Elevation =  967.01
Centerline Stations
    Sta.    Sta.
  9994.5 10005.5

CROSS SECTION


RIVER: Hope Creek
REACH: 1                  RS: 6496

INPUT
Description:
Station Elevation Data    num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9889.59  989.26 9904.06  987.96 9906.52  987.63 9911.03  987.08 9917.06  986.17
 9942.39  982.91 9943.57  982.73 9949.25  981.79 9951.67  981.26 9953.81  980.93
 9961.37  979.81 9963.73   979.2 9963.86  979.16 9963.96  979.13 9972.02  976.15
 9986.26  970.21 9995.17  966.4610000.01  966.2510004.33  966.4110012.02  970.35
10018.62  971.8410018.77  971.8710030.71  974.19 10038.9  976.2510063.61  978.28
10071.74  979.31 10082.2  980.4210082.83  980.6710097.63  986.5310112.06  991.58

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9889.59     .12 9986.26    .03510012.02     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      9986.2610012.02            261.27   218.1  177.15             .3       .5
Ineffective Flow     num=       2
```

Sta L	Sta R	Elev	Permanent
9889.59	9984.26	1017.97	F
10012.12	10112.06	1017.97	F

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	975.70	Wt. n-Val.	0.120	0.035	0.080
Vel Head (ft)	1.98	Reach Len. (ft)	261.27	218.10	177.15
W.S. Elev (ft)	973.73	Flow Area (sq ft)	6.20	156.79	0.34
Crit W.S. (ft)	972.96	Area (sq ft)	14.82	156.79	26.52
E.G. Slope (ft/ft)	0.006980	Flow (cfs)	12.92	1775.92	1.16
Q Total (cfs)	1790.00	Top Width (ft)	8.43	25.76	16.31
Top Width (ft)	50.50	Avg. Vel. (ft/s)	2.08	11.33	3.43
Vel Total (ft/s)	10.96	Hydr. Depth (ft)	3.10	6.09	3.37
Max Chl Dpth (ft)	7.48	Conv. (cfs)	154.7	21256.4	13.9
Conv. Total (cfs)	21425.0	Wetted Per. (ft)	2.17	27.47	0.10
Length Wtd. (ft)	221.03	Shear (lb/sq ft)	1.25	2.49	1.43
Min Ch El (ft)	966.25	Stream Power (lb/ft s)	2.60	28.17	4.90
Alpha	1.06	Cum Volume (acre-ft)	41.78	40.78	11.89
Frctn Loss (ft)	1.23	Cum SA (acres)	10.95	5.87	6.62
C & E Loss (ft)	0.10				

Warning: The energy loss was 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, energy was used.

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	976.17	Wt. n-Val.	0.120	0.035	0.080
Vel Head (ft)	1.46	Reach Len. (ft)	261.27	218.10	177.15
W.S. Elev (ft)	974.71	Flow Area (sq ft)	8.17	182.17	0.44
Crit W.S. (ft)	972.96	Area (sq ft)	24.30	182.17	43.97
E.G. Slope (ft/ft)	0.004218	Flow (cfs)	15.91	1772.70	1.38
Q Total (cfs)	1790.00	Top Width (ft)	10.79	25.76	17.98
Top Width (ft)	54.53	Avg. Vel. (ft/s)	1.95	9.73	3.16
Vel Total (ft/s)	9.38	Hydr. Depth (ft)	4.08	7.07	4.35
Max Chl Dpth (ft)	8.46	Conv. (cfs)	245.1	27295.9	21.3
Conv. Total (cfs)	27562.3	Wetted Per. (ft)	2.17	27.47	0.10
Length Wtd. (ft)	219.67	Shear (lb/sq ft)	0.99	1.75	1.12
Min Ch El (ft)	966.25	Stream Power (lb/ft s)	1.93	16.99	3.53
Alpha	1.07	Cum Volume (acre-ft)	12.31	44.16	1.77
Frctn Loss (ft)	1.08	Cum SA (acres)	3.27	5.89	0.60
C & E Loss (ft)	0.24				

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, energy was used.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 6278

INPUT
Description:
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9803.29	982.33	9805.11	981.96	9806.14	981.81	9828.14	978.6	9841.13	976.27
9846.28	975.46	9849.85	974.52	9865.92	973.78	9894.36	972.39	9906.49	971.83
9923.4	970.83	9931	970.28	9963.22	969.91	9977.07	970.05	9978.95	970.05
9982.03	970.07	9986.44	969.88	9994.93	966.01	9999.92	965.79	10004.17	965.99
10012.01	970.73	10012.19	971.06	10013.67	971.78	10018.89	972.07	10035.15	972.95
10037.83	973.12	10061.54	984.92						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9803.29	.12	9986.44	.02	10012.01	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9986.44	10012.01	596.84	648.74	713.24	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	974.37	Wt. n-Val.	0.120	0.025	0.080
Vel Head (ft)	1.78				

W.S. Elev (ft)	972.60	Reach Len. (ft)	596.84	648.74	713.24
Crit W.S. (ft)	972.60	Flow Area (sq ft)	184.14	134.59	8.09
E.G. Slope (ft/ft)	0.004553	Area (sq ft)	184.14	134.59	8.09
Q Total (cfs)	1790.00	Flow (cfs)	236.94	1546.87	6.19
Top Width (ft)	138.43	Top Width (ft)	96.28	25.57	16.58
Vel Total (ft/s)	5.48	Avg. Vel. (ft/s)	1.29	11.49	0.77
Max Chl Dpth (ft)	6.81	Hydr. Depth (ft)	1.91	5.26	0.49
Conv. Total (cfs)	26528.9	Conv. (cfs)	3511.5	22925.6	91.8
Length Wtd. (ft)	645.03	Wetted Per. (ft)	96.35	27.74	16.97
Min Ch El (ft)	965.79	Shear (lb/sq ft)	0.54	1.38	0.14
Alpha	3.81	Stream Power (lb/ft s)	0.70	15.85	0.10
Frctn Loss (ft)	1.70	Cum Volume (acre-ft)	41.18	40.05	11.82
C & E Loss (ft)	0.15	Cum SA (acres)	10.63	5.74	6.55

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 #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	974.85	Wt. n-Val.	0.120	0.025	
Vel Head (ft)	2.26	Reach Len. (ft)	596.84	648.74	713.24
W.S. Elev (ft)	972.59	Flow Area (sq ft)	68.74	134.42	
Crit W.S. (ft)	972.59	Area (sq ft)	68.74	134.42	
E.G. Slope (ft/ft)	0.005841	Flow (cfs)	115.45	1674.55	
Q Total (cfs)	1790.00	Top Width (ft)	26.42	25.57	
Top Width (ft)	51.99	Avg. Vel. (ft/s)	1.68	12.46	
Vel Total (ft/s)	8.81	Hydr. Depth (ft)	2.60	5.26	
Max Chl Dpth (ft)	6.80	Conv. (cfs)	1510.7	21910.5	
Conv. Total (cfs)	23421.2	Wetted Per. (ft)	29.07	29.60	
Length Wtd. (ft)	647.07	Shear (lb/sq ft)	0.86	1.66	
Min Ch El (ft)	965.79	Stream Power (lb/ft s)	1.45	20.63	
Alpha	1.87	Cum Volume (acre-ft)	12.03	43.37	1.68
Frctn Loss (ft)	2.30	Cum SA (acres)	3.16	5.76	0.56
C & E Loss (ft)	0.31				

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 cross section had to be extended vertically during the critical depth 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.
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 5629

INPUT
Description:
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9663.41	980.83	9680.64	976.68	9688.56	975.37	9694.14	974.48	9699.85	973.74
9703.1	973.44	9708.01	973.59	9714.45	973.49	9718.86	973.55	9729.39	973.45
9734.64	973.58	9737.31	973.56	9748.19	973.75	9749.7	973.74	9750.86	973.64
9761.28	973.99	9764.91	974	9779.35	973.41	9794.19	972.77	9796.98	972.65
9802.81	971.45	9811.56	970.63	9816.07	969.91	9823.25	969.22	9836.58	968.9
9852.51	968.61	9862.6	968.52	9876.71	968.56	9885.29	969.14	9892.29	969.46
9906.05	970.29	9910.69	970.53	9912.47	972.42	9950.99	971.68	9972.01	968.32
9986.25	962.38	9995.16	958.63	10000	958.42	10004.32	958.58	10012.01	962.52
10012.87	983.28								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9663.41	.12	9986.25	.02	510012.01	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9986.25	10012.01	205.65	201.08	200.99	.3	.5

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	968.61	Wt. n-Val.	0.120	0.025	0.080
Vel Head (ft)	1.26	Reach Len. (ft)	205.65	201.08	200.99
W.S. Elev (ft)	967.35	Flow Area (sq ft)	29.66	194.34	0.48
Crit W.S. (ft)		Area (sq ft)	29.66	194.34	0.48
E.G. Slope (ft/ft)	0.001716	Flow (cfs)	26.48	1763.44	0.08
Q Total (cfs)	1790.00	Top Width (ft)	11.93	25.76	0.20
Top Width (ft)	37.89	Avg. Vel. (ft/s)	0.89	9.07	0.17
Vel Total (ft/s)	7.97	Hydr. Depth (ft)	2.49	7.54	2.42
Max Chl Dpth (ft)	8.93	Conv. (cfs)	639.2	42564.5	1.9
Conv. Total (cfs)	43205.6	Wetted Per. (ft)	12.92	27.47	4.83
Length Wtd. (ft)	201.13	Shear (lb/sq ft)	0.25	0.76	0.01
Min Ch El (ft)	958.42	Stream Power (lb/ft s)	0.22	6.88	0.00
Alpha	1.28	Cum Volume (acre-ft)	39.72	37.60	11.75
Frctn Loss (ft)	0.18	Cum SA (acres)	9.89	5.36	6.42
C & E Loss (ft)	0.32				

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 #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	968.86	Wt. n-Val.		0.025	
Vel Head (ft)	1.22	Reach Len. (ft)	205.65	201.08	200.99
W.S. Elev (ft)	967.64	Flow Area (sq ft)		201.68	
Crit W.S. (ft)		Area (sq ft)		201.68	
E.G. Slope (ft/ft)	0.002396	Flow (cfs)		1790.00	
Q Total (cfs)	1790.00	Top Width (ft)		25.76	
Top Width (ft)	25.76	Avg. Vel. (ft/s)		8.88	
Vel Total (ft/s)	8.88	Hydr. Depth (ft)		7.83	
Max Chl Dpth (ft)	9.22	Conv. (cfs)		36566.3	
Conv. Total (cfs)	36566.3	Wetted Per. (ft)		37.85	
Length Wtd. (ft)	201.08	Shear (lb/sq ft)		0.80	
Min Ch El (ft)	958.42	Stream Power (lb/ft s)		7.07	
Alpha	1.00	Cum Volume (acre-ft)	11.56	40.87	1.68
Frctn Loss (ft)	0.29	Cum SA (acres)	2.98	5.38	0.56
C & E Loss (ft)	0.30				

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: Hope Creek
REACH: 1 RS: 5428

INPUT
Description:
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9494.28	976.62	9507.56	973.91	9512.84	972.83	9514.96	972.42	9521.05	972.17
9524.88	972.02	9533.91	971.61	9541.48	971.31	9547.26	970.53	9547.7	970.49
9548.77	970.36	9550.44	970.24	9564.15	969.34	9564.53	969.32	9566.83	968.61
9581.36	965.46	9584.59	965.06	9587.25	964.84	9596.02	964.69	9606.43	964.53
9608.17	964.51	9613.93	964.43	9635.01	964.06	9645.73	962.26	9649.59	961.6
9659.69	961.41	9674.25	961.01	9682.31	960.85	9953.74	960.3	9966.04	960.04
9971.16	959.98	9974.67	959.83	9978.83	959.81	9986.25	959.32	9995.16	955.57
10000	955.36	10004.32	955.52	10012.01	959.46	10016.4	966.46	10019.39	973.97

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9494.28	.12	9986.25	.02	510012.01	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9986.25	10012.01	519.24	458.42	414.44	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
9494.28	9984.63	969.52	F

CROSS SECTION OUTPUT Profile #100 YR

E.G. Elev (ft)	968.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.62	Wt. n-Val.	0.120	0.025	0.080
W.S. Elev (ft)	967.50	Reach Len. (ft)	519.24	458.42	414.44
Crit W.S. (ft)	962.07	Flow Area (sq ft)	13.16	276.84	9.57
E.G. Slope (ft/ft)	0.000529	Area (sq ft)	2566.49	276.84	20.13
Q Total (cfs)	1790.00	Flow (cfs)	15.12	1765.12	9.76
Top Width (ft)	444.85	Top Width (ft)	414.29	25.76	4.80
Vel Total (ft/s)	5.98	Avg. Vel. (ft/s)	1.15	6.38	1.02
Max Chl Dpth (ft)	12.14	Hydr. Depth (ft)	8.12	10.75	6.94
Conv. Total (cfs)	77842.8	Conv. (cfs)	657.6	76760.9	424.3
Length Wtd. (ft)	458.42	Wetted Per. (ft)	1.62	27.47	2.60
Min Ch El (ft)	955.36	Shear (lb/sq ft)	0.27	0.33	0.12
Alpha	1.12	Stream Power (lb/ft s)	0.31	2.12	0.12
Frctn Loss (ft)		Cum Volume (acre-ft)	33.59	36.51	11.70
C & E Loss (ft)		Cum SA (acres)	8.89	5.24	6.40

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

CROSS SECTION OUTPUT Profile #100 YR FW

E.G. Elev (ft)	968.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.63	Wt. n-Val.		0.025	
W.S. Elev (ft)	967.64	Reach Len. (ft)	519.24	458.42	414.44
Crit W.S. (ft)	962.06	Flow Area (sq ft)		280.59	
E.G. Slope (ft/ft)	0.000974	Area (sq ft)		280.59	
Q Total (cfs)	1790.00	Flow (cfs)		1790.00	
Top Width (ft)	25.76	Top Width (ft)		25.76	
Vel Total (ft/s)	6.38	Avg. Vel. (ft/s)		6.38	
Max Chl Dpth (ft)	12.28	Hydr. Depth (ft)		10.89	
Conv. Total (cfs)	57368.7	Conv. (cfs)		57368.7	
Length Wtd. (ft)	458.42	Wetted Per. (ft)		43.98	
Min Ch El (ft)	955.36	Shear (lb/sq ft)		0.39	
Alpha	1.00	Stream Power (lb/ft s)		2.47	
Frctn Loss (ft)		Cum Volume (acre-ft)	11.56	39.75	1.68
C & E Loss (ft)		Cum SA (acres)	2.98	5.26	0.56

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

CULVERT

RIVER: Hope Creek
REACH: 1 RS: 5146

INPUT
Description: I-75, HC-4, 2-9x6 Box
Distance from Upstream XS = 17
Deck/Roadway Width = 425
Weir Coefficient = 2.8
Upstream Deck/Roadway Coordinates
num= 50

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
9439.25	969.45		9725.25	969.45		9730.79	969.45	
9737.49	969.45		9745.37	969.45		9752.75	969.45	
9765.99	969.45		9970.88	969.52		9982.88	969.52	
10024.87	969.52		10036.05	970.14		10041.11	970.23	
10050.31	970.4		10108.03	971.73		10118.43	972.04	
10131.15	972.34		10135.54	972.54		10189.34	974.07	
10196.9	974.17		10210.77	974.61		10297.86	974.86	
10330.75	974.96		10333.8	974.97		10337.4	974.35	
10346.03	972.86		10349.55	973.73		10381.62	981.42	
10405.7	992.45		10408.55	993.67		10409.29	993.72	
10450.59	995.25		10456.78	995.51		10462.41	995.54	
10492.18	996.02		10525.03	995.39		10527.38	995.31	
10528.77	995.32		10531.44	995.33		10565.96	995.33	
10597.8	995.59		10598.34	995.58		10598.94	995.61	
10637.36	996.21		10665.54	995.98		10673.12	995.92	
10712.68	996.38		10740.48	996.87		10764.42	997.25	
10799.24	998.33		10801.36	998.34				

Upstream Bridge Cross Section Data
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9494.28	976.62	9507.56	973.91	9512.84	972.83	9514.96	972.42	9521.05	972.17

```
 9524.88  972.02 9533.91  971.61 9541.48  971.31 9547.26  970.53  9547.7  970.49
 9548.77  970.36 9550.44  970.24 9564.15  969.34 9564.53  969.32 9566.83  968.61
 9581.36  965.46 9584.59  965.06 9587.25  964.84 9596.02  964.69 9606.43  964.53
 9608.17  964.51 9613.93  964.43 9635.01  964.06 9645.73  962.26 9649.59   961.6
 9659.69  961.41 9674.25  961.01 9682.31  960.85 9953.74   960.3 9966.04  960.04
 9971.16  959.98 9974.67  959.83 9978.83  959.81 9986.25  959.32    9990   955.3
   10000   955.3   10010   955.310012.01  959.46 10016.4  966.4610019.39  973.97

Manning's n Values          num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
 9494.28      .12 9986.25     .02510012.01      .08

Bank Sta: Left   Right     Coeff Contr.    Expan.
       9986.2510012.01              .3        .5
Ineffective Flow      num=        2
   Sta L    Sta R     Elev  Permanent
 9494.28 9984.63   969.52        F
10013.3910019.39   969.52        F

Downstream  Deck/Roadway Coordinates
    num=       50
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
 9439.25  969.45          9725.25  969.45          9730.79  969.45
 9737.49  969.45          9745.37  969.45          9752.75  969.45
 9765.99  969.45          9970.88  969.52          9982.88  969.52
10024.87  969.52         10036.05  970.14         10041.11  970.23
10050.31   970.4         10108.03  971.73         10118.43  972.04
10131.15  972.34         10135.54  972.54         10189.34  974.07
 10196.9  974.17         10210.77  974.61         10297.86  974.86
10330.75  974.96          10333.8  974.97          10337.4  974.35
10346.03  972.86         10349.55  973.73         10381.62  981.42
 10405.7  992.45         10408.55  993.67         10409.29  993.72
10450.59  995.25         10456.78  995.51         10462.41  995.54
10492.18  996.02         10525.03  995.39         10527.38  995.31
10528.77  995.32         10531.44  995.33         10565.96  995.33
 10597.8  995.59         10598.34  995.58         10598.94  995.61
10637.36  996.21         10665.54  995.98         10673.12  995.92
10712.68  996.38         10740.48  996.87         10764.42  997.25
10799.24  998.33         10801.36  998.34

Downstream Bridge Cross Section Data
Station Elevation Data     num=       14
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9968.35  966.59 9970.14  966.43 9970.75  966.38 9974.46  962.41 9988.91  956.36
    9990  950.63   10000   950.610010.74   950.710012.88  957.5110026.81  962.32
10030.78  962.5310033.08  963.2710048.84  968.2410053.37  969.87

Manning's n Values          num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
 9968.35      .09 9988.91     .0410012.88      .12

Bank Sta: Left   Right     Coeff Contr.    Expan.
       9988.9110012.88              .3        .5
Ineffective Flow      num=        2
   Sta L    Sta R     Elev  Permanent
 9968.35 9988.56   969.52        F
10013.5410053.37   969.52        F

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

Number of Culverts =  1

Culvert Name      Shape       Rise     Span
Culvert #1            Box        6        9
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length     Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 17     425      .012      .012          0                  .5                  1
Number of Barrels =  2
Upstream   Elevation =  955.35
Centerline Stations
    Sta.     Sta.
    9995    10005
Downstream Elevation =  950.84
Centerline Stations
```

Sta.	Sta.
9995	10005

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4969

INPUT
Description:
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9968.35	966.59	9970.14	966.43	9970.75	966.38	9974.46	962.41	9988.91	956.36
9990.74	950.63	10000	950.61	10010.74	951.22	10012.88	957.51	10026.81	962.32
10030.78	962.53	10033.08	963.27	10048.84	968.24	10053.37	969.87		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9968.35	.12	9988.91	.04	10012.88	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9988.91	10012.88	170.27	251.19	305.99	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
9968.35	9988.56	969.52	F
10013.54	10053.37	969.52	F

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	960.04	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	1.79	Reach Len. (ft)	170.27	251.19	305.99
W.S. Elev (ft)	958.24	Flow Area (sq ft)	0.63	166.41	0.41
Crit W.S. (ft)	956.86	Area (sq ft)	4.24	166.41	0.78
E.G. Slope (ft/ft)	0.009555	Flow (cfs)	1.08	1788.57	0.35
Q Total (cfs)	1790.00	Top Width (ft)	4.50	23.97	2.13
Top Width (ft)	30.60	Avg. Vel. (ft/s)	1.70	10.75	0.85
Vel Total (ft/s)	10.69	Hydr. Depth (ft)	1.81	6.94	0.62
Max Chl Dpth (ft)	7.64	Conv. (cfs)	11.1	18297.4	3.6
Conv. Total (cfs)	18312.0	Wetted Per. (ft)	0.38	32.68	0.70
Length Wtd. (ft)	251.07	Shear (lb/sq ft)	1.00	3.04	0.35
Min Ch El (ft)	950.60	Stream Power (lb/ft s)	1.70	32.65	0.30
Alpha	1.01	Cum Volume (acre-ft)	18.27	34.18	11.60
Frctn Loss (ft)	0.87	Cum SA (acres)	6.39	4.98	6.37
C & E Loss (ft)	0.67				

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, energy was used.

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	960.12	Wt. n-Val.		0.040	
Vel Head (ft)	1.72	Reach Len. (ft)	170.27	251.19	305.99
W.S. Elev (ft)	958.40	Flow Area (sq ft)		170.12	
Crit W.S. (ft)	956.86	Area (sq ft)		170.12	
E.G. Slope (ft/ft)	0.009969	Flow (cfs)		1790.00	
Q Total (cfs)	1790.00	Top Width (ft)		23.97	
Top Width (ft)	23.97	Avg. Vel. (ft/s)		10.52	
Vel Total (ft/s)	10.52	Hydr. Depth (ft)		7.10	
Max Chl Dpth (ft)	7.80	Conv. (cfs)		17927.5	
Conv. Total (cfs)	17927.5	Wetted Per. (ft)		35.61	
Length Wtd. (ft)	251.19	Shear (lb/sq ft)		2.97	
Min Ch El (ft)	950.60	Stream Power (lb/ft s)		31.29	
Alpha	1.00	Cum Volume (acre-ft)	11.56	37.38	1.68
Frctn Loss (ft)	0.91	Cum SA (acres)	2.98	5.00	0.56
C & E Loss (ft)	0.63				

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,

energy was used.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4925.680

INPUT
Description: 1
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	966.05	.67	966.04	6.73	965.94	10.16	965.88	15.22	965.81
16.14	962	17.01	958.99	21.86	956.78	24.79	955.24	27.12	952.03
28.33	948.84	40.39	949.33	40.68	949.33	41.07	949.36	46.04	949.53
53.68	949.81	54.7	949.98	55.85	950.17	56.56	950.29	65.26	951.74
65.45	951.76	66.54	957.6	66.83	958.95	68.87	959.16	72.64	959.6
85.55	961.13	85.59	961.14	88	961.24	102.73	962.2	137.62	969.34

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.12	24.79	.04	66.83	.1	88	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
24.79	66.83	18.25	17.81	18.01	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	958.50	Element			
Vel Head (ft)	0.46	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	958.04	Reach Len. (ft)	18.25	17.81	18.01
Crit W.S. (ft)		Flow Area (sq ft)	7.69	329.07	
E.G. Slope (ft/ft)	0.001779	Area (sq ft)	7.69	329.07	
Q Total (cfs)	1790.00	Flow (cfs)	4.57	1785.44	
Top Width (ft)	47.54	Top Width (ft)	5.70	41.84	
Vel Total (ft/s)	5.32	Avg. Vel. (ft/s)	0.59	5.43	
Max Chl Dpth (ft)	9.20	Hydr. Depth (ft)	1.35	7.86	
Conv. Total (cfs)	42436.9	Conv. (cfs)	108.2	42328.7	
Length Wtd. (ft)	17.81	Wetted Per. (ft)	6.35	51.07	
Min Ch El (ft)	948.84	Shear (lb/sq ft)	0.13	0.72	
Alpha	1.04	Stream Power (lb/ft s)	0.08	3.88	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	18.24	32.75	11.60
C & E Loss (ft)	0.01	Cum SA (acres)	6.37	4.79	6.36

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	958.57	Element			
Vel Head (ft)	0.45	Wt. n-Val.		0.040	
W.S. Elev (ft)	958.12	Reach Len. (ft)	18.25	17.81	18.01
Crit W.S. (ft)		Flow Area (sq ft)		332.44	
E.G. Slope (ft/ft)	0.001864	Area (sq ft)		332.44	
Q Total (cfs)	1790.00	Flow (cfs)		1790.00	
Top Width (ft)	41.86	Top Width (ft)		41.86	
Vel Total (ft/s)	5.38	Avg. Vel. (ft/s)		5.38	
Max Chl Dpth (ft)	9.28	Hydr. Depth (ft)		7.94	
Conv. Total (cfs)	41464.7	Conv. (cfs)		41464.7	
Length Wtd. (ft)	17.81	Wetted Per. (ft)		54.03	
Min Ch El (ft)	948.84	Shear (lb/sq ft)		0.72	
Alpha	1.00	Stream Power (lb/ft s)		3.85	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	11.56	35.93	1.68
C & E Loss (ft)	0.01	Cum SA (acres)	2.98	4.81	0.56

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4907.867

INPUT
Description: 2
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	965.91	1.93	965.86	2.31	965.85	8.75	965.75	16.79	965.63
17.56	962.98	18.76	959.01	20.16	958.37	24.88	956.22	26.77	955.21
29.11	952.83	30.82	948.35	31.9	948.3	32.95	948.31	34.24	948.29
42.33	948.41	46.67	948.67	52.99	948.9	53.6	948.92	59.7	949.94
60.38	950.02	64.3	950.5	65.6	953.43	66.58	957.95	83.34	959.67
87.54	959.67	89.68	959.74	94.66	960.21	98.39	960.56	106.42	961.37
118.91	962.18	130.89	964.59	147.6	967.05				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.12	26.77	.04	66.58	.1	89.68	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
26.77	66.58	122.42	124.85	123.52	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	958.46	Element			
Vel Head (ft)	0.43	Wt. n-Val.	0.120	0.040	0.100
W.S. Elev (ft)	958.03	Reach Len. (ft)	122.42	124.85	123.52
Crit W.S. (ft)		Flow Area (sq ft)	7.95	337.27	0.03
E.G. Slope (ft/ft)	0.001576	Area (sq ft)	7.95	337.27	0.03
Q Total (cfs)	1790.00	Flow (cfs)	4.47	1785.53	0.00
Top Width (ft)	46.41	Top Width (ft)	5.86	39.81	0.74
Vel Total (ft/s)	5.18	Avg. Vel. (ft/s)	0.56	5.29	0.07
Max Chl Dpth (ft)	9.74	Hydr. Depth (ft)	1.36	8.47	0.04
Conv. Total (cfs)	45094.4	Conv. (cfs)	112.6	44981.8	0.0
Length Wtd. (ft)	124.85	Wetted Per. (ft)	6.50	49.58	0.75
Min Ch El (ft)	948.29	Shear (lb/sq ft)	0.12	0.67	0.00
Alpha	1.04	Stream Power (lb/ft s)	0.07	3.54	0.00
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	18.24	32.61	11.60
C & E Loss (ft)	0.01	Cum SA (acres)	6.37	4.77	6.36

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	958.53	Element			
Vel Head (ft)	0.43	Wt. n-Val.		0.040	
W.S. Elev (ft)	958.10	Reach Len. (ft)	122.42	124.85	123.52
Crit W.S. (ft)		Flow Area (sq ft)		340.38	
E.G. Slope (ft/ft)	0.001663	Area (sq ft)		340.38	
Q Total (cfs)	1790.00	Flow (cfs)		1790.00	
Top Width (ft)	39.81	Top Width (ft)		39.81	
Vel Total (ft/s)	5.26	Avg. Vel. (ft/s)		5.26	
Max Chl Dpth (ft)	9.81	Hydr. Depth (ft)		8.55	
Conv. Total (cfs)	43894.0	Conv. (cfs)		43894.0	
Length Wtd. (ft)	124.85	Wetted Per. (ft)		52.63	
Min Ch El (ft)	948.29	Shear (lb/sq ft)		0.67	
Alpha	1.00	Stream Power (lb/ft s)		3.53	
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	11.56	35.79	1.68
C & E Loss (ft)	0.01	Cum SA (acres)	2.98	4.79	0.56

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4783.015

INPUT
Description: 3
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	964.68	5.33	964.55	7.3	952.57	7.45	952.03	7.56	952.02
13.83	947.62	13.87	947.57	13.93	947.57	14.58	947.57	24.7	947.6
35.21	947.82	37.02	947.92	40.08	950.62	41.08	951.48	48.41	957.81
53.7	962.39	55.16	962.45	69.74	962.92	78.97	963.23	101.9	963.56
118.58	963.48	123.32	965.58	123.66	965.68	131.16	967.79		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	5.33	.04	53.7	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
5.33	53.7	18.84	18.63	18.24	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	958.26	Element			
Vel Head (ft)	0.41	Wt. n-Val.		0.040	
W.S. Elev (ft)	957.85	Reach Len. (ft)	18.84	18.63	18.24
Crit W.S. (ft)		Flow Area (sq ft)		346.73	
E.G. Slope (ft/ft)	0.001540	Area (sq ft)		346.73	
Q Total (cfs)	1790.00	Flow (cfs)		1790.00	
Top Width (ft)	42.02	Top Width (ft)		42.02	
Vel Total (ft/s)	5.16	Avg. Vel. (ft/s)		5.16	
Max Chl Dpth (ft)	10.28	Hydr. Depth (ft)		8.25	
Conv. Total (cfs)	45609.1	Conv. (cfs)		45609.1	
Length Wtd. (ft)	18.63	Wetted Per. (ft)		52.04	
Min Ch El (ft)	947.57	Shear (lb/sq ft)		0.64	

Alpha	1.00	Stream Power (lb/ft s)		3.31	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	18.23	31.63	11.60
C & E Loss (ft)	0.01	Cum SA (acres)	6.36	4.65	6.36

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	958.33	Wt. n-Val.		0.040	
Vel Head (ft)	0.41	Reach Len. (ft)	18.84	18.63	18.24
W.S. Elev (ft)	957.92	Flow Area (sq ft)		350.00	
Crit W.S. (ft)		Area (sq ft)		350.00	
E.G. Slope (ft/ft)	0.001500	Flow (cfs)		1790.00	
Q Total (cfs)	1790.00	Top Width (ft)		42.12	
Top Width (ft)	42.12	Avg. Vel. (ft/s)		5.11	
Vel Total (ft/s)	5.11	Hydr. Depth (ft)		8.31	
Max Chl Dpth (ft)	10.35	Conv. (cfs)		46210.7	
Conv. Total (cfs)	46210.7	Wetted Per. (ft)		52.23	
Length Wtd. (ft)	18.63	Shear (lb/sq ft)		0.63	
Min Ch El (ft)	947.57	Stream Power (lb/ft s)		3.21	
Alpha	1.00	Cum Volume (acre-ft)	11.56	34.81	1.68
Frctn Loss (ft)	0.03	Cum SA (acres)	2.98	4.67	0.56
C & E Loss (ft)	0.01				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4764.388

INPUT
Description: 4
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	964.72	.67	964.7	3.11	964.62	8.15	964.45	9.43	964.42
9.98	964.41	10.09	963.74	12.09	956.3	12.11	956.3	13.5	955.32
19.84	947.39	27.28	947.67	29.8	947.68	33.36	947.75	42.54	947.68
46.01	951.35	51.62	956.18	57.59	961.35	62.45	961.5	83.83	962.2
86.85	962.24	104.71	962.48	113.01	962.43	123.42	967.06	124.17	967.27
127.91	968.33								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	9.98	.04	57.59	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9.98	57.59	48.37	45.95	44.99	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	958.22	Wt. n-Val.		0.040	
Vel Head (ft)	0.47	Reach Len. (ft)	48.37	45.95	44.99
W.S. Elev (ft)	957.75	Flow Area (sq ft)		325.30	
Crit W.S. (ft)		Area (sq ft)		325.30	
E.G. Slope (ft/ft)	0.001852	Flow (cfs)		1790.00	
Q Total (cfs)	1790.00	Top Width (ft)		41.74	
Top Width (ft)	41.74	Avg. Vel. (ft/s)		5.50	
Vel Total (ft/s)	5.50	Hydr. Depth (ft)		7.79	
Max Chl Dpth (ft)	10.36	Conv. (cfs)		41594.4	
Conv. Total (cfs)	41594.4	Wetted Per. (ft)		50.94	
Length Wtd. (ft)	45.95	Shear (lb/sq ft)		0.74	
Min Ch El (ft)	947.39	Stream Power (lb/ft s)		4.06	
Alpha	1.00	Cum Volume (acre-ft)	18.23	31.49	11.60
Frctn Loss (ft)	0.13	Cum SA (acres)	6.36	4.64	6.36
C & E Loss (ft)	0.07				

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 OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	958.29	Wt. n-Val.		0.040	
Vel Head (ft)	0.46	Reach Len. (ft)	48.37	45.95	44.99
W.S. Elev (ft)	957.83	Flow Area (sq ft)		328.67	
Crit W.S. (ft)		Area (sq ft)		328.67	
E.G. Slope (ft/ft)	0.001799	Flow (cfs)		1790.00	
Q Total (cfs)	1790.00	Top Width (ft)		41.85	
Top Width (ft)	41.85	Avg. Vel. (ft/s)		5.45	
Vel Total (ft/s)	5.45	Hydr. Depth (ft)		7.85	
Max Chl Dpth (ft)	10.44	Conv. (cfs)		42200.5	
Conv. Total (cfs)	42200.5				

Length Wtd. (ft)	45.95	Wetted Per. (ft)		51.15	
Min Ch El (ft)	947.39	Shear (lb/sq ft)		0.72	
Alpha	1.00	Stream Power (lb/ft s)		3.93	
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	11.56	34.66	1.68
C & E Loss (ft)	0.06	Cum SA (acres)	2.98	4.66	0.56

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

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4718

INPUT
Description:
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	965.24	2.76	965.2	8.91	965.13	9.83	965.12	21.65	965.08
25.81	964.94	29	964.84	35.01	964.66	38.4	964.5	43.05	964.27
44.08	964.26	47.4	964.15	48.78	959.61	49.23	958.17	56.84	954.83
56.89	954.8	56.93	954.79	57.29	954.62	58.13	954.29	62.16	947.88
62.7	947.02	70.15	946.98	71.88	947	73.68	947	81.81	947.17
82.84	947.2	90.67	956.31	92.74	958.8	93.58	958.87	93.75	958.99
104.28	959.42	124.91	960.55	137.34	967.02	140.44	968.23		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	56.84	.04	92.74	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56.84	92.74	71.98	75.39	77.8	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	958.02	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	1.13	Reach Len. (ft)	71.98	75.39	77.80
W.S. Elev (ft)	956.90	Flow Area (sq ft)	4.86	270.36	
Crit W.S. (ft)		Area (sq ft)	4.86	270.36	
E.G. Slope (ft/ft)	0.004530	Flow (cfs)	3.90	2306.10	
Q Total (cfs)	2310.00	Top Width (ft)	4.71	34.32	
Top Width (ft)	39.02	Avg. Vel. (ft/s)	0.80	8.53	
Vel Total (ft/s)	8.39	Hydr. Depth (ft)	1.03	7.88	
Max Chl Dpth (ft)	9.92	Conv. (cfs)	58.0	34264.0	
Conv. Total (cfs)	34322.0	Wetted Per. (ft)	5.14	42.90	
Length Wtd. (ft)	75.34	Shear (lb/sq ft)	0.27	1.78	
Min Ch El (ft)	946.98	Stream Power (lb/ft s)	0.21	15.20	
Alpha	1.03	Cum Volume (acre-ft)	18.23	31.18	11.60
Frctn Loss (ft)	0.42	Cum SA (acres)	6.36	4.60	6.36
C & E Loss (ft)	0.06				

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

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	958.10	Wt. n-Val.		0.040	
Vel Head (ft)	1.11	Reach Len. (ft)	71.98	75.39	77.80
W.S. Elev (ft)	956.99	Flow Area (sq ft)		273.55	
Crit W.S. (ft)		Area (sq ft)		273.55	
E.G. Slope (ft/ft)	0.004683	Flow (cfs)		2310.00	
Q Total (cfs)	2310.00	Top Width (ft)		34.39	
Top Width (ft)	34.39	Avg. Vel. (ft/s)		8.44	
Vel Total (ft/s)	8.44	Hydr. Depth (ft)		7.95	
Max Chl Dpth (ft)	10.01	Conv. (cfs)		33755.4	
Conv. Total (cfs)	33755.4	Wetted Per. (ft)		45.18	
Length Wtd. (ft)	75.37	Shear (lb/sq ft)		1.77	
Min Ch El (ft)	946.98	Stream Power (lb/ft s)		14.95	
Alpha	1.00	Cum Volume (acre-ft)	11.56	34.34	1.68
Frctn Loss (ft)	0.45	Cum SA (acres)	2.98	4.62	0.56
C & E Loss (ft)	0.08				

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: Hope Creek
REACH: 1 RS: 4643.051

INPUT
Description: 5
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	963.92	1.83	963.85	2.78	960.82	3.65	958.04	5.06	957.49
8.02	956.63	17.07	952.9	17.88	952.59	23.27	950.51	24.64	947.3
24.8	946.95	26.35	946.82	36.34	946.11	42.31	946.56	42.77	946.6
42.83	946.6	45.12	949.85	49.15	955.57	50.52	958.85	54.97	959.06
70.87	959.95	70.9	959.95	75.43	961.27	80.72	962.42	88.01	966.04

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	23.27	.04	50.52	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
23.27	50.52	17.45	17.74	17.85	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	957.54	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	1.73	Reach Len. (ft)	17.45	17.74	17.85
W.S. Elev (ft)	955.81	Flow Area (sq ft)	35.73	209.31	
Crit W.S. (ft)		Area (sq ft)	35.73	209.31	
E.G. Slope (ft/ft)	0.007130	Flow (cfs)	68.85	2241.15	
Q Total (cfs)	2310.00	Top Width (ft)	13.26	25.98	
Top Width (ft)	39.24	Avg. Vel. (ft/s)	1.93	10.71	
Vel Total (ft/s)	9.43	Hydr. Depth (ft)	2.69	8.06	
Max Chl Dpth (ft)	9.70	Conv. (cfs)	815.3	26541.3	
Conv. Total (cfs)	27356.7	Wetted Per. (ft)	14.28	33.19	
Length Wtd. (ft)	17.73	Shear (lb/sq ft)	1.11	2.81	
Min Ch El (ft)	946.11	Stream Power (lb/ft s)	2.15	30.06	
Alpha	1.25	Cum Volume (acre-ft)	18.19	30.76	11.60
Frctn Loss (ft)	0.15	Cum SA (acres)	6.34	4.54	6.36
C & E Loss (ft)	0.05				

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	957.57	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	1.87	Reach Len. (ft)	17.45	17.74	17.85
W.S. Elev (ft)	955.70	Flow Area (sq ft)	16.26	206.41	
Crit W.S. (ft)		Area (sq ft)	16.26	206.41	
E.G. Slope (ft/ft)	0.007698	Flow (cfs)	29.14	2280.86	
Q Total (cfs)	2310.00	Top Width (ft)	3.62	25.93	
Top Width (ft)	29.55	Avg. Vel. (ft/s)	1.79	11.05	
Vel Total (ft/s)	10.37	Hydr. Depth (ft)	4.49	7.96	
Max Chl Dpth (ft)	9.59	Conv. (cfs)	332.1	25995.6	
Conv. Total (cfs)	26327.7	Wetted Per. (ft)	7.67	33.07	
Length Wtd. (ft)	17.73	Shear (lb/sq ft)	1.02	3.00	
Min Ch El (ft)	946.11	Stream Power (lb/ft s)	1.83	33.15	
Alpha	1.12	Cum Volume (acre-ft)	11.55	33.93	1.68
Frctn Loss (ft)	0.15	Cum SA (acres)	2.98	4.56	0.56
C & E Loss (ft)	0.03				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4625.316

INPUT
Description: 6
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	964.02	3.82	963.89	5.47	963.83	7.13	963.78	8.55	959.13
8.93	957.85	10.27	957.35	15.55	955.47	25.27	951.64	28.72	950.24
29.88	947.6	30.48	946.86	31.89	946.84	36.51	946.48	40.58	946.16
44.1	946.29	48.98	946.41	49.55	948.43	49.78	949.23	53.69	958.56
61.71	959.08	62.79	959.18	65.52	959.41	73.53	962.91	78.07	964.82
78.68	965.16	80.01	965.19	80.52	965.21				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	28.72	.04	53.69	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
28.72	53.69	120.71	121.61	122.64	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	957.35	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	2.19	Reach Len. (ft)	120.71	121.61	122.64
W.S. Elev (ft)	955.16	Flow Area (sq ft)	30.29	186.65	
Crit W.S. (ft)		Area (sq ft)	30.29	186.65	
E.G. Slope (ft/ft)	0.009876	Flow (cfs)	64.43	2245.57	
Q Total (cfs)	2310.00	Top Width (ft)	12.38	23.55	
Top Width (ft)	35.93	Avg. Vel. (ft/s)	2.13	12.03	
Vel Total (ft/s)	10.65	Hydr. Depth (ft)	2.45	7.93	
Max Chl Dpth (ft)	9.00	Conv. (cfs)	648.3	22596.0	
Conv. Total (cfs)	23244.3	Wetted Per. (ft)	13.33	31.73	
Length Wtd. (ft)	121.59	Shear (lb/sq ft)	1.40	3.63	
Min Ch El (ft)	946.16	Stream Power (lb/ft s)	2.98	43.64	
Alpha	1.24	Cum Volume (acre-ft)	18.18	30.68	11.60
Frctn Loss (ft)	1.04	Cum SA (acres)	6.34	4.53	6.36
C & E Loss (ft)	0.13				

Warning: The energy loss was 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 #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	957.38	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	2.17	Reach Len. (ft)	120.71	121.61	122.64
W.S. Elev (ft)	955.21	Flow Area (sq ft)	25.80	187.84	
Crit W.S. (ft)		Area (sq ft)	25.80	187.84	
E.G. Slope (ft/ft)	0.009736	Flow (cfs)	59.33	2250.67	
Q Total (cfs)	2310.00	Top Width (ft)	7.42	23.57	
Top Width (ft)	30.99	Avg. Vel. (ft/s)	2.30	11.98	
Vel Total (ft/s)	10.81	Hydr. Depth (ft)	3.48	7.97	
Max Chl Dpth (ft)	9.05	Conv. (cfs)	601.3	22809.4	
Conv. Total (cfs)	23410.6	Wetted Per. (ft)	10.00	31.78	
Length Wtd. (ft)	121.59	Shear (lb/sq ft)	1.57	3.59	
Min Ch El (ft)	946.16	Stream Power (lb/ft s)	3.61	43.04	
Alpha	1.20	Cum Volume (acre-ft)	11.54	33.85	1.68
Frctn Loss (ft)	1.01	Cum SA (acres)	2.98	4.55	0.56
C & E Loss (ft)	0.14				

Warning: The energy loss was 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: Hope Creek
REACH: 1 RS: 4503.708

INPUT
Description: 7
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	963.51	.39	963.5	1.99	963.45	2.95	963.42	3.49	963.41
8.74	963.25	11.25	963.18	12.78	963.14	14.37	957.94	14.89	956.13
15.91	955.95	18.36	955.51	24.58	952.99	26.92	952.01	29.54	950.91
30.93	949.48	33.76	946.03	36.69	945.97	43.72	945.82	53.37	945.71
55.01	949.03	57.39	952.5	58.25	953.76	69.47	955	81.3	962.68
83.07	963.72								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	29.54	.04	58.25	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
29.54	58.25	19.61	18.66	18.24	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	956.17	Wt. n-Val.	0.120	0.040	0.100
Vel Head (ft)	1.75	Reach Len. (ft)	19.61	18.66	18.24
W.S. Elev (ft)	954.42	Flow Area (sq ft)	14.80	214.33	1.99
Crit W.S. (ft)		Area (sq ft)	14.80	214.33	1.99
E.G. Slope (ft/ft)	0.007506	Flow (cfs)	21.81	2286.97	1.22
Q Total (cfs)	2310.00	Top Width (ft)	8.50	28.71	6.00
Top Width (ft)	43.21	Avg. Vel. (ft/s)	1.47	10.67	0.61
Vel Total (ft/s)	9.99	Hydr. Depth (ft)	1.74	7.47	0.33
Max Chl Dpth (ft)	8.71	Conv. (cfs)	251.7	26396.3	14.1
Conv. Total (cfs)	26662.1	Wetted Per. (ft)	9.20	35.51	6.04
Length Wtd. (ft)	18.67	Shear (lb/sq ft)	0.75	2.83	0.15
Min Ch El (ft)	945.71				

Alpha	1.13	Stream Power (lb/ft s)	1.11	30.19	0.09
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	18.12	30.12	11.60
C & E Loss (ft)	0.05	Cum SA (acres)	6.31	4.46	6.35

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	956.23	Wt. n-Val.	0.120	0.040	0.100
Vel Head (ft)	1.69	Reach Len. (ft)	19.61	18.66	18.24
W.S. Elev (ft)	954.54	Flow Area (sq ft)	14.64	217.77	2.63
Crit W.S. (ft)		Area (sq ft)	14.64	217.77	2.63
E.G. Slope (ft/ft)	0.007105	Flow (cfs)	23.10	2284.93	1.97
Q Total (cfs)	2310.00	Top Width (ft)	6.36	28.71	5.43
Top Width (ft)	40.50	Avg. Vel. (ft/s)	1.58	10.49	0.75
Vel Total (ft/s)	9.83	Hydr. Depth (ft)	2.30	7.59	0.48
Max Chl Dpth (ft)	8.83	Conv. (cfs)	274.0	27107.2	23.4
Conv. Total (cfs)	27404.6	Wetted Per. (ft)	7.88	35.51	5.65
Length Wtd. (ft)	18.67	Shear (lb/sq ft)	0.82	2.72	0.21
Min Ch El (ft)	945.71	Stream Power (lb/ft s)	1.30	28.55	0.16
Alpha	1.13	Cum Volume (acre-ft)	11.48	33.28	1.68
Frctn Loss (ft)	0.12	Cum SA (acres)	2.96	4.48	0.56
C & E Loss (ft)	0.05				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4485.049

INPUT
Description: 8
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	963.45	3.52	963.37	4.17	963.36	5.48	963.33	5.84	963.32
16.65	963.01	16.83	962.35	18.69	955.86	21.87	955.29	25.42	954.1
26.23	953.76	32.95	950.95	36.12	946.7	36.63	945.94	41.88	945.89
44.24	945.86	53.34	945.76	54.97	945.75	55.15	945.74	56.32	945.73
58.21	945.71	62.08	953.54	62.18	953.69	74.43	954.49	76.08	955.54
90.44	963.6								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	32.95	.04	62.18	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
32.95	62.18	123.05	123.21	122.55	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	955.99	Wt. n-Val.	0.120	0.040	0.100
Vel Head (ft)	1.58	Reach Len. (ft)	123.05	123.21	122.55
W.S. Elev (ft)	954.41	Flow Area (sq ft)	14.35	225.69	3.98
Crit W.S. (ft)		Area (sq ft)	14.35	225.69	3.98
E.G. Slope (ft/ft)	0.006613	Flow (cfs)	19.52	2288.05	2.43
Q Total (cfs)	2310.00	Top Width (ft)	8.46	29.23	11.04
Top Width (ft)	48.73	Avg. Vel. (ft/s)	1.36	10.14	0.61
Vel Total (ft/s)	9.47	Hydr. Depth (ft)	1.70	7.72	0.36
Max Chl Dpth (ft)	8.70	Conv. (cfs)	240.0	28135.6	29.9
Conv. Total (cfs)	28405.5	Wetted Per. (ft)	9.14	36.71	11.06
Length Wtd. (ft)	123.20	Shear (lb/sq ft)	0.65	2.54	0.15
Min Ch El (ft)	945.71	Stream Power (lb/ft s)	0.88	25.73	0.09
Alpha	1.14	Cum Volume (acre-ft)	18.11	30.03	11.59
Frctn Loss (ft)	0.80	Cum SA (acres)	6.30	4.45	6.35
C & E Loss (ft)	0.08				

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	956.06	Wt. n-Val.	0.120	0.040	0.100
Vel Head (ft)	1.53	Reach Len. (ft)	123.05	123.21	122.55
W.S. Elev (ft)	954.53	Flow Area (sq ft)	14.34	229.30	4.04
Crit W.S. (ft)		Area (sq ft)	14.34	229.30	4.04
E.G. Slope (ft/ft)	0.006260	Flow (cfs)	21.05	2285.59	3.36
Q Total (cfs)	2310.00	Top Width (ft)	6.36	29.23	6.35
Top Width (ft)	41.94	Avg. Vel. (ft/s)	1.47	9.97	0.83
Vel Total (ft/s)	9.33	Hydr. Depth (ft)	2.25	7.84	0.64
Max Chl Dpth (ft)	8.82	Conv. (cfs)	266.0	28888.7	42.5
Conv. Total (cfs)	29197.2	Wetted Per. (ft)	7.82	36.71	6.79
Length Wtd. (ft)	123.21	Shear (lb/sq ft)	0.72	2.44	0.23
Min Ch El (ft)	945.71	Stream Power (lb/ft s)	1.05	24.33	0.19
Alpha	1.13				

Frctn Loss (ft)	0.77	Cum Volume (acre-ft)	11.48	33.18	1.68
C & E Loss (ft)	0.06	Cum SA (acres)	2.95	4.47	0.55

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4361.840

INPUT
Description: 9
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	962.69	6.91	962.51	8.76	962.46	10.72	962.42	12.4	954.7
12.5	954.31	12.67	954.25	13.15	954.08	14.04	953.78	14.58	953.6
15.31	953.34	16.24	951.74	19.82	945.6	31.24	945.61	34.44	945.61
40.9	945.67	44.56	947.95	46.06	948.99	48.39	950.6	51.59	952.81
84.6	952.41	90.38	955.59	105.23	964.09	108.02	964.18	111.62	964.54

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.12	15.31	.04	51.59	.1	84.6	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
15.31	51.59	19	18.54	18	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	955.12	Wt. n-Val.	0.120	0.040	0.100
Vel Head (ft)	1.33	Reach Len. (ft)	19.00	18.54	18.00
W.S. Elev (ft)	953.79	Flow Area (sq ft)	0.29	241.30	40.69
Crit W.S. (ft)		Area (sq ft)	0.29	241.30	40.69
E.G. Slope (ft/ft)	0.006338	Flow (cfs)	0.10	2257.22	52.68
Q Total (cfs)	2310.00	Top Width (ft)	1.30	36.28	35.52
Top Width (ft)	73.10	Avg. Vel. (ft/s)	0.35	9.35	1.29
Vel Total (ft/s)	8.18	Hydr. Depth (ft)	0.22	6.65	1.15
Max Chl Dpth (ft)	8.19	Conv. (cfs)	1.3	28352.0	661.7
Conv. Total (cfs)	29015.0	Wetted Per. (ft)	1.38	42.90	35.88
Length Wtd. (ft)	18.53	Shear (lb/sq ft)	0.08	2.23	0.45
Min Ch El (ft)	945.60	Stream Power (lb/ft s)	0.03	20.82	0.58
Alpha	1.28	Cum Volume (acre-ft)	18.09	29.37	11.53
Frctn Loss (ft)	0.12	Cum SA (acres)	6.29	4.36	6.28
C & E Loss (ft)	0.01				

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	955.23	Wt. n-Val.		0.040	0.100
Vel Head (ft)	1.34	Reach Len. (ft)	19.00	18.54	18.00
W.S. Elev (ft)	953.89	Flow Area (sq ft)		244.89	17.76
Crit W.S. (ft)		Area (sq ft)		244.89	17.76
E.G. Slope (ft/ft)	0.006305	Flow (cfs)		2287.92	22.08
Q Total (cfs)	2310.00	Top Width (ft)		36.28	15.17
Top Width (ft)	51.45	Avg. Vel. (ft/s)		9.34	1.24
Vel Total (ft/s)	8.79	Hydr. Depth (ft)		6.75	1.17
Max Chl Dpth (ft)	8.29	Conv. (cfs)		28813.5	278.0
Conv. Total (cfs)	29091.5	Wetted Per. (ft)		43.45	16.43
Length Wtd. (ft)	18.54	Shear (lb/sq ft)		2.22	0.43
Min Ch El (ft)	945.60	Stream Power (lb/ft s)		20.73	0.53
Alpha	1.12	Cum Volume (acre-ft)	11.46	32.51	1.64
Frctn Loss (ft)	0.12	Cum SA (acres)	2.95	4.38	0.52
C & E Loss (ft)	0.00				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4343.304

INPUT
Description: 10
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	962.75	2.83	962.69	5.38	962.65	7.5	962.59	17.43	962.34
17.94	962.33	18.38	960.31	19.76	954.38	22.42	953.49	22.55	953.44
23.4	952.01	25.1	949.1	27.32	945.35	31.59	945.36	47.83	945.51
55.92	950.55	56.85	951.13	59.44	952.91	91.48	952.73	104.1	959.69
112.56	964.53	114.13	964.58	121.89	965.37				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.12	22.55	.04	59.44	.1	91.48	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
22.55	59.44	119.24	120.83	121.61	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	954.98	Wt. n-Val.	0.120	0.040	0.100
Vel Head (ft)	1.41	Reach Len. (ft)	119.24	120.83	121.61
W.S. Elev (ft)	953.58	Flow Area (sq ft)	0.03	238.69	24.85
Crit W.S. (ft)		Area (sq ft)	0.03	238.69	24.85
E.G. Slope (ft/ft)	0.006897	Flow (cfs)	0.00	2284.88	25.12
Q Total (cfs)	2310.00	Top Width (ft)	0.39	36.89	33.57
Top Width (ft)	70.85	Avg. Vel. (ft/s)	0.16	9.57	1.01
Vel Total (ft/s)	8.76	Hydr. Depth (ft)	0.07	6.47	0.74
Max Chl Dpth (ft)	8.23	Conv. (cfs)	0.0	27512.4	302.5
Conv. Total (cfs)	27815.0	Wetted Per. (ft)	0.41	43.67	33.79
Length Wtd. (ft)	120.84	Shear (lb/sq ft)	0.03	2.35	0.32
Min Ch El (ft)	945.35	Stream Power (lb/ft s)	0.00	22.53	0.32
Alpha	1.18	Cum Volume (acre-ft)	18.09	29.26	11.52
Frctn Loss (ft)	0.74	Cum SA (acres)	6.29	4.34	6.27
C & E Loss (ft)	0.08				

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	955.11	Wt. n-Val.		0.040	0.100
Vel Head (ft)	1.34	Reach Len. (ft)	119.24	120.83	121.61
W.S. Elev (ft)	953.77	Flow Area (sq ft)		245.89	14.48
Crit W.S. (ft)		Area (sq ft)		245.89	14.48
E.G. Slope (ft/ft)	0.006364	Flow (cfs)		2294.55	15.45
Q Total (cfs)	2310.00	Top Width (ft)		36.89	15.99
Top Width (ft)	52.88	Avg. Vel. (ft/s)		9.33	1.07
Vel Total (ft/s)	8.87	Hydr. Depth (ft)		6.67	0.91
Max Chl Dpth (ft)	8.42	Conv. (cfs)		28763.3	193.7
Conv. Total (cfs)	28957.1	Wetted Per. (ft)		44.00	16.94
Length Wtd. (ft)	120.84	Shear (lb/sq ft)		2.22	0.34
Min Ch El (ft)	945.35	Stream Power (lb/ft s)		20.72	0.36
Alpha	1.10	Cum Volume (acre-ft)	11.46	32.41	1.64
Frctn Loss (ft)	0.68	Cum SA (acres)	2.95	4.36	0.52
C & E Loss (ft)	0.07				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4222.473

INPUT
Description: 11
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	962.49	5.38	962.43	12.33	962.3	17.83	962.21	25.34	962.02
31.08	961.87	36.85	961.65	37.69	961.61	43.31	961.38	44.12	957.35
45.03	953.38	45.83	953.06	47.12	952.47	48.19	951.2	48.86	950.4
52.74	944.93	60.13	944.92	70.85	944.9	72.54	944.9	74.62	944.89
76.22	944.89	77.09	945.5	85.57	951.55	87.81	952.34	122	952.05
141.61	951.88	143.22	952.51	143.95	952.88	145.07	953.51	155.2	959.17
163.34	964.05	164.81	964.57	166.55	964.78	177.49	965.36	179.37	965.75

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.12	47.12	.04	87.81	.1	122	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
47.12	87.81	17.55	18	17.71	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	954.16	Wt. n-Val.	0.120	0.040	0.109
Vel Head (ft)	1.14	Reach Len. (ft)	17.55	18.00	17.71
W.S. Elev (ft)	953.02	Flow Area (sq ft)	0.33	261.31	50.54
Crit W.S. (ft)		Area (sq ft)	0.33	261.31	50.54
E.G. Slope (ft/ft)	0.005474	Flow (cfs)	0.12	2262.20	47.68
Q Total (cfs)	2310.00	Top Width (ft)	1.21	40.69	56.39
Top Width (ft)	98.29	Avg. Vel. (ft/s)	0.36	8.66	0.94
Vel Total (ft/s)	7.40	Hydr. Depth (ft)	0.28	6.42	0.90
Max Chl Dpth (ft)	8.13	Conv. (cfs)	1.6	30574.5	644.4
Conv. Total (cfs)	31220.6	Wetted Per. (ft)	1.33	46.75	56.64
Length Wtd. (ft)	17.99				

Min Ch El (ft)	944.89	Shear (lb/sq ft)	0.09	1.91	0.31
Alpha	1.34	Stream Power (lb/ft s)	0.03	16.54	0.29
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	18.09	28.57	11.41
C & E Loss (ft)	0.06	Cum SA (acres)	6.29	4.23	6.14

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	954.36	Wt. n-Val.		0.040	0.100
Vel Head (ft)	1.10	Reach Len. (ft)	17.55	18.00	17.71
W.S. Elev (ft)	953.26	Flow Area (sq ft)		271.00	21.74
Crit W.S. (ft)		Area (sq ft)		271.00	21.74
E.G. Slope (ft/ft)	0.005070	Flow (cfs)		2287.60	22.41
Q Total (cfs)	2310.00	Top Width (ft)		40.69	21.51
Top Width (ft)	62.20	Avg. Vel. (ft/s)		8.44	1.03
Vel Total (ft/s)	7.89	Hydr. Depth (ft)		6.66	1.01
Max Chl Dpth (ft)	8.37	Conv. (cfs)		32127.8	314.7
Conv. Total (cfs)	32442.5	Wetted Per. (ft)		47.53	22.61
Length Wtd. (ft)	18.00	Shear (lb/sq ft)		1.80	0.30
Min Ch El (ft)	944.89	Stream Power (lb/ft s)		15.23	0.31
Alpha	1.13	Cum Volume (acre-ft)	11.46	31.69	1.59
Frctn Loss (ft)	0.08	Cum SA (acres)	2.95	4.25	0.46
C & E Loss (ft)	0.04				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4204.470

INPUT
Description: 12
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	962.32	.81	962.31	12.72	962.09	13.15	962.08	13.23	962.08
13.34	962.08	15.34	962.03	25.81	961.75	26.55	961.73	38.57	961.27
38.73	961.26	40.2	953.99	40.42	952.86	42.13	952.18	42.78	951.91
46.47	947.57	47.12	946.81	47.93	945.86	48.93	944.81	52.39	944.78
53.79	944.78	73.57	944.78	73.66	944.84	74.92	945.73	82.68	951.95
117	951.46	135.9	951.19	143.86	955.94	167.53	964.49	178.33	965.76
180.52	966.11								

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.12	42.78	.04	82.68	.1	117	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
42.78	82.68	124.62	124.01	123.48	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	954.02	Wt. n-Val.	0.120	0.040	0.108
Vel Head (ft)	0.95	Reach Len. (ft)	124.62	124.01	123.48
W.S. Elev (ft)	953.06	Flow Area (sq ft)	1.60	276.67	82.48
Crit W.S. (ft)		Area (sq ft)	1.60	276.67	82.48
E.G. Slope (ft/ft)	0.004200	Flow (cfs)	0.89	2214.84	94.27
Q Total (cfs)	2310.00	Top Width (ft)	2.40	39.90	56.36
Top Width (ft)	98.66	Avg. Vel. (ft/s)	0.56	8.01	1.14
Vel Total (ft/s)	6.40	Hydr. Depth (ft)	0.67	6.93	1.46
Max Chl Dpth (ft)	8.28	Conv. (cfs)	13.8	34175.0	1454.6
Conv. Total (cfs)	35643.3	Wetted Per. (ft)	2.75	45.63	56.88
Length Wtd. (ft)	123.99	Shear (lb/sq ft)	0.15	1.59	0.38
Min Ch El (ft)	944.78	Stream Power (lb/ft s)	0.09	12.73	0.43
Alpha	1.50	Cum Volume (acre-ft)	18.09	28.46	11.39
Frctn Loss (ft)	0.54	Cum SA (acres)	6.29	4.22	6.12
C & E Loss (ft)	0.02				

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	954.23	Wt. n-Val.		0.040	0.100
Vel Head (ft)	0.97	Reach Len. (ft)	124.62	124.01	123.48
W.S. Elev (ft)	953.27	Flow Area (sq ft)		284.75	35.42
Crit W.S. (ft)		Area (sq ft)		284.75	35.42
E.G. Slope (ft/ft)	0.004160	Flow (cfs)		2267.72	42.29
Q Total (cfs)	2310.00	Top Width (ft)		39.90	23.82
Top Width (ft)	63.72	Avg. Vel. (ft/s)		7.96	1.19
Vel Total (ft/s)	7.21	Hydr. Depth (ft)		7.14	1.49
Max Chl Dpth (ft)	8.49	Conv. (cfs)		35160.4	655.6
Conv. Total (cfs)	35816.0	Wetted Per. (ft)		46.99	25.48
Length Wtd. (ft)	124.01				

Min Ch El (ft)	944.78	Shear (lb/sq ft)		1.57	0.36
Alpha	1.20	Stream Power (lb/ft s)		12.53	0.43
Frctn Loss (ft)	0.54	Cum Volume (acre-ft)	11.46	31.58	1.58
C & E Loss (ft)	0.02	Cum SA (acres)	2.95	4.24	0.46

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4080.463

INPUT
Description: 13
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	961.33	9.34	961.1	11.62	960.98	11.79	960.97	21.38	960.45
21.66	959.31	22	957.74	22.73	954.39	47.22	954.39	51.8	952.1
59.8	952.1	62.6	953.5	67.6	953.5	85.6	944.5	105.6	944.5
120.16	951.78	134	951.39	136.05	950.57	137.34	950.11	142.4	948.34
143.51	948.64	147.54	950.75	157.32	954.87	163.92	957.65	167.25	959.05
177.01	960.09	190.28	961.31	194.49	963.13				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	67.6	.04	120.16	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
67.6	120.16	17.85	17.74	17.82	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	953.46	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.90	Reach Len. (ft)	17.85	17.74	17.82
W.S. Elev (ft)	952.56	Flow Area (sq ft)	4.11	290.56	56.45
Crit W.S. (ft)		Area (sq ft)	4.11	290.56	56.45
E.G. Slope (ft/ft)	0.004604	Flow (cfs)	1.90	2240.46	67.63
Q Total (cfs)	2310.00	Top Width (ft)	9.84	50.68	31.68
Top Width (ft)	92.20	Avg. Vel. (ft/s)	0.46	7.71	1.20
Vel Total (ft/s)	6.58	Hydr. Depth (ft)	0.42	5.73	1.78
Max Chl Dpth (ft)	8.06	Conv. (cfs)	28.0	33019.9	996.8
Conv. Total (cfs)	34044.7	Wetted Per. (ft)	10.06	54.30	33.15
Length Wtd. (ft)	17.74	Shear (lb/sq ft)	0.12	1.54	0.49
Min Ch El (ft)	944.50	Stream Power (lb/ft s)	0.05	11.86	0.59
Alpha	1.33	Cum Volume (acre-ft)	18.08	27.65	11.19
Frctn Loss (ft)	0.08	Cum SA (acres)	6.27	4.09	6.00
C & E Loss (ft)	0.01				

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	953.68	Wt. n-Val.		0.040	
Vel Head (ft)	0.91	Reach Len. (ft)	17.85	17.74	17.82
W.S. Elev (ft)	952.77	Flow Area (sq ft)		301.10	
Crit W.S. (ft)		Area (sq ft)		301.10	
E.G. Slope (ft/ft)	0.004501	Flow (cfs)		2310.00	
Q Total (cfs)	2310.00	Top Width (ft)		51.10	
Top Width (ft)	51.10	Avg. Vel. (ft/s)		7.67	
Vel Total (ft/s)	7.67	Hydr. Depth (ft)		5.89	
Max Chl Dpth (ft)	8.27	Conv. (cfs)		34429.9	
Conv. Total (cfs)	34429.9	Wetted Per. (ft)		55.75	
Length Wtd. (ft)	17.74	Shear (lb/sq ft)		1.52	
Min Ch El (ft)	944.50	Stream Power (lb/ft s)		11.64	
Alpha	1.00	Cum Volume (acre-ft)	11.46	30.74	1.53
Frctn Loss (ft)	0.08	Cum SA (acres)	2.95	4.11	0.42
C & E Loss (ft)	0.01				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4062.727

INPUT
Description: 14
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	961.35	.05	961.35	8.73	961.14	13.47	961.02	20.16	960.66
21.8	960.57	22.24	960.55	24.06	960.45	24.86	960.41	25.56	960.37

26.99	954.56	27.06	954.24	51.09	954.24	55.67	951.95	63.67	951.95
66.47	953.35	71.47	953.35	89.47	944.35	109.47	944.35	124.03	951.63
140.23	951.23	143.98	950.75	149.95	948.75	150.86	948.45	152.32	949.01
155.42	950.92	159.93	952.82	190.27	956.12	191.91	956.42	192.39	956.67
206.62	963.85								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	71.47	.04	124.03	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
71.47	124.03	120.53	121.82	121.07	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	953.37	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.87	Reach Len. (ft)	120.53	121.82	121.07
W.S. Elev (ft)	952.50	Flow Area (sq ft)	5.01	295.14	59.32
Crit W.S. (ft)		Area (sq ft)	5.01	295.14	59.32
E.G. Slope (ft/ft)	0.004391	Flow (cfs)	2.52	2240.22	67.26
Q Total (cfs)	2310.00	Top Width (ft)	10.20	50.86	35.14
Top Width (ft)	96.21	Avg. Vel. (ft/s)	0.50	7.59	1.13
Vel Total (ft/s)	6.43	Hydr. Depth (ft)	0.49	5.80	1.69
Max Chl Dpth (ft)	8.15	Conv. (cfs)	38.0	33807.7	1015.1
Conv. Total (cfs)	34860.8	Wetted Per. (ft)	10.46	54.50	36.52
Length Wtd. (ft)	121.80	Shear (lb/sq ft)	0.13	1.48	0.45
Min Ch El (ft)	944.35	Stream Power (lb/ft s)	0.07	11.27	0.50
Alpha	1.35	Cum Volume (acre-ft)	18.08	27.53	11.17
Frctn Loss (ft)	0.56	Cum SA (acres)	6.27	4.07	5.98
C & E Loss (ft)	0.00				

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	953.60	Wt. n-Val.		0.040	
Vel Head (ft)	0.89	Reach Len. (ft)	120.53	121.82	121.07
W.S. Elev (ft)	952.71	Flow Area (sq ft)		305.77	
Crit W.S. (ft)		Area (sq ft)		305.77	
E.G. Slope (ft/ft)	0.004306	Flow (cfs)		2310.00	
Q Total (cfs)	2310.00	Top Width (ft)		51.28	
Top Width (ft)	51.28	Avg. Vel. (ft/s)		7.55	
Vel Total (ft/s)	7.55	Hydr. Depth (ft)		5.96	
Max Chl Dpth (ft)	8.36	Conv. (cfs)		35201.0	
Conv. Total (cfs)	35201.0	Wetted Per. (ft)		56.05	
Length Wtd. (ft)	121.82	Shear (lb/sq ft)		1.47	
Min Ch El (ft)	944.35	Stream Power (lb/ft s)		11.08	
Alpha	1.00	Cum Volume (acre-ft)	11.46	30.62	1.53
Frctn Loss (ft)	0.55	Cum SA (acres)	2.95	4.08	0.42
C & E Loss (ft)	0.01				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3940.903

INPUT
Description: 15
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960.68	1.45	960.65	3.61	960.62	7.93	960.51	8.56	960.49
9.12	960.48	13.03	960.38	15.98	960.31	16.3	960.3	16.85	960.29
17.34	960.26	28.75	959.73	29.55	956.84	30.51	953.75	52.65	953.75
57.09	951.53	65.09	951.53	67.89	952.93	72.89	952.93	90.89	943.93
110.89	943.93	125.39	951.18	146.62	949.48	148.42	948.9	150.72	947.56
151.28	947.79	161.7	951.21	166.68	951.49	199.63	951.75	201.05	952.11
222.06	960.02	226.18	960.22	259	961.9	278.73	962.16		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	72.89	.04	125.39	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
72.89	125.39	18.03	18.27	18.28	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	952.81	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.91				

W.S. Elev (ft)	951.89	Reach Len. (ft)	18.03	18.27	18.28
Crit W.S. (ft)		Flow Area (sq ft)	3.14	285.44	85.32
E.G. Slope (ft/ft)	0.004803	Area (sq ft)	3.14	285.44	85.32
Q Total (cfs)	2310.00	Flow (cfs)	1.28	2229.59	79.13
Top Width (ft)	134.66	Top Width (ft)	9.44	50.42	74.79
Vel Total (ft/s)	6.18	Avg. Vel. (ft/s)	0.41	7.81	0.93
Max Chl Dpth (ft)	7.96	Hydr. Depth (ft)	0.33	5.66	1.14
Conv. Total (cfs)	33331.9	Conv. (cfs)	18.5	32171.6	1141.8
Length Wtd. (ft)	18.27	Wetted Per. (ft)	9.61	54.01	75.93
Min Ch El (ft)	943.93	Shear (lb/sq ft)	0.10	1.58	0.34
Alpha	1.54	Stream Power (lb/ft s)	0.04	12.38	0.31
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	18.07	26.72	10.96
C & E Loss (ft)	0.06	Cum SA (acres)	6.24	3.93	5.83

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	953.04	Element			
Vel Head (ft)	0.95	Wt. n-Val.		0.040	
W.S. Elev (ft)	952.09	Reach Len. (ft)	18.03	18.27	18.28
Crit W.S. (ft)		Flow Area (sq ft)		295.55	
E.G. Slope (ft/ft)	0.004745	Area (sq ft)		295.55	
Q Total (cfs)	2310.00	Flow (cfs)		2310.00	
Top Width (ft)	50.82	Top Width (ft)		50.82	
Vel Total (ft/s)	7.82	Avg. Vel. (ft/s)		7.82	
Max Chl Dpth (ft)	8.16	Hydr. Depth (ft)		5.82	
Conv. Total (cfs)	33534.2	Conv. (cfs)		33534.2	
Length Wtd. (ft)	18.27	Wetted Per. (ft)		55.37	
Min Ch El (ft)	943.93	Shear (lb/sq ft)		1.58	
Alpha	1.00	Stream Power (lb/ft s)		12.36	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	11.46	29.78	1.53
C & E Loss (ft)	0.05	Cum SA (acres)	2.95	3.94	0.42

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3922.633

INPUT
Description: 16
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960.65	3.73	960.57	7.7	960.51	14.77	960.32	20.96	960.17
26.91	959.9	28.47	959.83	29.14	959.8	30.44	959.74	30.97	959.72
31.02	959.71	32.86	959.63	32.98	959.2	34.75	953.55	35.63	953.25
56.52	953.25	60.96	951.03	68.96	951.03	71.76	952.43	76.76	952.43
94.76	943.43	114.76	943.43	129.26	950.68	131.48	950.67	140.73	950.24
149.3	947.46	149.86	947.13	154.31	948.95	157.61	950.04	184.55	951.51
203.92	951.67	218.45	955.37	230.11	959.75	230.6	959.77	250.05	960.78
261.18	960.9	295.23	962.45						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	76.76	.04	129.26	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
76.76	129.26	121.49	122.76	124.97	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	952.68	Element			
Vel Head (ft)	0.73	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	951.94	Reach Len. (ft)	121.49	122.76	124.97
Crit W.S. (ft)		Flow Area (sq ft)	8.99	313.70	109.72
E.G. Slope (ft/ft)	0.003526	Area (sq ft)	8.99	313.70	109.72
Q Total (cfs)	2310.00	Flow (cfs)	5.43	2202.31	102.26
Top Width (ft)	138.93	Top Width (ft)	11.66	51.53	75.74
Vel Total (ft/s)	5.34	Avg. Vel. (ft/s)	0.60	7.02	0.93
Max Chl Dpth (ft)	8.51	Hydr. Depth (ft)	0.77	6.09	1.45
Conv. Total (cfs)	38901.0	Conv. (cfs)	91.4	37087.6	1722.1
Length Wtd. (ft)	122.92	Wetted Per. (ft)	12.09	55.25	76.89
Min Ch El (ft)	943.43	Shear (lb/sq ft)	0.16	1.25	0.31
Alpha	1.65	Stream Power (lb/ft s)	0.10	8.77	0.29
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)	18.07	26.59	10.92
C & E Loss (ft)	0.07	Cum SA (acres)	6.23	3.90	5.80

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	952.92	Wt. n-Val.		0.040	
Vel Head (ft)	0.80	Reach Len. (ft)	121.49	122.76	124.97
W.S. Elev (ft)	952.12	Flow Area (sq ft)		322.77	
Crit W.S. (ft)		Area (sq ft)		322.77	
E.G. Slope (ft/ft)	0.003684	Flow (cfs)		2310.00	
Q Total (cfs)	2310.00	Top Width (ft)		51.88	
Top Width (ft)	51.88	Avg. Vel. (ft/s)		7.16	
Vel Total (ft/s)	7.16	Hydr. Depth (ft)		6.22	
Max Chl Dpth (ft)	8.69	Conv. (cfs)		38056.1	
Conv. Total (cfs)	38056.1	Wetted Per. (ft)		57.08	
Length Wtd. (ft)	122.76	Shear (lb/sq ft)		1.30	
Min Ch El (ft)	943.43	Stream Power (lb/ft s)		9.31	
Alpha	1.00	Cum Volume (acre-ft)	11.46	29.65	1.53
Frctn Loss (ft)	0.40	Cum SA (acres)	2.95	3.92	0.42
C & E Loss (ft)	0.03				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3799.870

INPUT
Description: 17
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	959.27	5.2	959.02	7.96	958.9	9.49	958.84	10.79	952.31
25.46	952.31	29.78	950.15	37.78	950.15	40.58	951.55	48.58	951.55
66.58	942.55	86.58	942.55	98.54	948.53	107.55	949.01	109.65	948.99
113.54	948.44	132.09	948.53	136.05	949.46	154.64	949.63	179.04	949.75
184.92	949.94	197.4	950.31	226.61	951.21	256.43	951.91	278.92	952.23
279.83	952.61	281.1	959.19						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	48.58	.04	98.54	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
48.58	98.54	19.61	18.77	18.18	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
235	281.1		F

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	952.27	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.49	Reach Len. (ft)	19.61	18.77	18.18
W.S. Elev (ft)	951.78	Flow Area (sq ft)	20.15	344.40	275.44
Crit W.S. (ft)		Area (sq ft)	20.15	344.40	278.41
E.G. Slope (ft/ft)	0.002139	Flow (cfs)	10.64	2047.66	251.70
Q Total (cfs)	2310.00	Top Width (ft)	22.06	49.96	152.38
Top Width (ft)	224.40	Avg. Vel. (ft/s)	0.53	5.95	0.91
Vel Total (ft/s)	3.61	Hydr. Depth (ft)	0.91	6.89	2.02
Max Chl Dpth (ft)	9.23	Conv. (cfs)	230.0	44274.9	5442.4
Conv. Total (cfs)	49947.2	Wetted Per. (ft)	22.78	53.50	136.65
Length Wtd. (ft)	18.71	Shear (lb/sq ft)	0.12	0.86	0.27
Min Ch El (ft)	942.55	Stream Power (lb/ft s)	0.06	5.11	0.25
Alpha	2.41	Cum Volume (acre-ft)	18.02	25.67	10.37
Frctn Loss (ft)	0.04	Cum SA (acres)	6.19	3.76	5.47
C & E Loss (ft)	0.00				

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	952.48	Wt. n-Val.		0.040	
Vel Head (ft)	0.70	Reach Len. (ft)	19.61	18.77	18.18
W.S. Elev (ft)	951.79	Flow Area (sq ft)		344.62	
Crit W.S. (ft)		Area (sq ft)		344.62	
E.G. Slope (ft/ft)	0.002955	Flow (cfs)		2310.00	
Q Total (cfs)	2310.00	Top Width (ft)		49.96	
Top Width (ft)	49.96	Avg. Vel. (ft/s)		6.70	
Vel Total (ft/s)	6.70	Hydr. Depth (ft)		6.90	
Max Chl Dpth (ft)	9.24	Conv. (cfs)		42493.9	
Conv. Total (cfs)	42493.9	Wetted Per. (ft)		56.99	
Length Wtd. (ft)	18.77	Shear (lb/sq ft)		1.12	
Min Ch El (ft)	942.55	Stream Power (lb/ft s)		7.48	
Alpha	1.00	Cum Volume (acre-ft)	11.46	28.71	1.53
Frctn Loss (ft)	0.05				

C & E Loss (ft)	0.01	Cum SA (acres)	2.95	3.78	0.42

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3781.101

INPUT
Description: 18
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	959.29	1.65	959.25	3.76	959.16	4.12	959.14	13.32	958.75
13.54	957.59	14.46	952.92	14.62	952.11	32.34	952.11	36.66	949.95
44.66	949.95	47.46	951.35	55.46	951.35	73.46	942.35	93.46	942.35
105.42	948.33	115.26	948.84	135.98	949.23	139.96	949.2	149.09	949.27
173.47	949.38	190.53	949.93	226.75	951.01	237.46	951.34	248.38	951.6
266.11	951.56	284.21	959.15						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	55.46	.04	105.42	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
55.46	105.42	119.49	121.49	122.1	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
256	284.21		F

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	952.23	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.48	Reach Len. (ft)	119.49	121.49	122.10
W.S. Elev (ft)	951.75	Flow Area (sq ft)	23.83	352.66	271.49
Crit W.S. (ft)		Area (sq ft)	23.83	352.66	273.30
E.G. Slope (ft/ft)	0.002025	Flow (cfs)	13.54	2072.44	224.02
Q Total (cfs)	2310.00	Top Width (ft)	22.39	49.96	161.13
Top Width (ft)	233.49	Avg. Vel. (ft/s)	0.57	5.88	0.83
Vel Total (ft/s)	3.56	Hydr. Depth (ft)	1.06	7.06	1.80
Max Chl Dpth (ft)	9.40	Conv. (cfs)	300.9	46059.6	4978.9
Conv. Total (cfs)	51339.3	Wetted Per. (ft)	23.15	53.50	150.63
Length Wtd. (ft)	121.53	Shear (lb/sq ft)	0.13	0.83	0.23
Min Ch El (ft)	942.35	Stream Power (lb/ft s)	0.07	4.90	0.19
Alpha	2.44	Cum Volume (acre-ft)	18.02	25.52	10.25
Frctn Loss (ft)	0.26	Cum SA (acres)	6.18	3.74	5.41
C & E Loss (ft)	0.01				

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	952.42	Wt. n-Val.		0.040	
Vel Head (ft)	0.66	Reach Len. (ft)	119.49	121.49	122.10
W.S. Elev (ft)	951.75	Flow Area (sq ft)		353.10	
Crit W.S. (ft)		Area (sq ft)		353.10	
E.G. Slope (ft/ft)	0.002747	Flow (cfs)		2310.00	
Q Total (cfs)	2310.00	Top Width (ft)		49.96	
Top Width (ft)	49.96	Avg. Vel. (ft/s)		6.54	
Vel Total (ft/s)	6.54	Hydr. Depth (ft)		7.07	
Max Chl Dpth (ft)	9.40	Conv. (cfs)		44075.5	
Conv. Total (cfs)	44075.5	Wetted Per. (ft)		57.33	
Length Wtd. (ft)	121.49	Shear (lb/sq ft)		1.06	
Min Ch El (ft)	942.35	Stream Power (lb/ft s)		6.91	
Alpha	1.00	Cum Volume (acre-ft)	11.46	28.56	1.53
Frctn Loss (ft)	0.35	Cum SA (acres)	2.95	3.76	0.42
C & E Loss (ft)	0.00				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3659.612

INPUT
Description: 19
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	958.56	1.96	958.5	9.17	958.21	9.55	958.2	11.04	958.14
12.46	958.08	13.47	958.04	14.61	951.91	29.17	951.91	33.49	949.75
41.49	949.75	44.29	951.15	52.29	951.15	70.29	942.15	90.29	942.15
102.25	948.13	123.09	948.32	146.41	948.84	146.75	948.96	147.21	948.95

148.2	948.93	150.32	949.33	166.85	950.26	169.53	950.34	175.61	950.53
187.64	950.88	213.53	951.16	213.96	951.17	222.01	951.3	223.95	951.47
253.44	954.12	256.95	954.23	257.56	954.27	257.9	954.8	259.28	955.3
272.54	960.14								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	52.29	.04	102.25	.12

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

Left	Right	Left	Channel	Right		
52.29	102.25	18.36	18.18	17.87	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	951.96	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.55	Reach Len. (ft)	18.36	18.18	17.87
W.S. Elev (ft)	951.41	Flow Area (sq ft)	20.84	345.96	197.61
Crit W.S. (ft)		Area (sq ft)	20.84	345.96	197.61
E.G. Slope (ft/ft)	0.002293	Flow (cfs)	11.62	2136.02	162.36
Q Total (cfs)	2310.00	Top Width (ft)	22.12	49.96	121.04
Top Width (ft)	193.12	Avg. Vel. (ft/s)	0.56	6.17	0.82
Vel Total (ft/s)	4.09	Hydr. Depth (ft)	0.94	6.92	1.63
Max Chl Dpth (ft)	9.26	Conv. (cfs)	242.8	44609.3	3390.7
Conv. Total (cfs)	48242.8	Wetted Per. (ft)	22.85	53.50	121.14
Length Wtd. (ft)	18.16	Shear (lb/sq ft)	0.13	0.93	0.23
Min Ch El (ft)	942.15	Stream Power (lb/ft s)	0.07	5.72	0.19
Alpha	2.11	Cum Volume (acre-ft)	17.95	24.54	9.59
Frctn Loss (ft)	0.04	Cum SA (acres)	6.12	3.60	5.01
C & E Loss (ft)	0.00				

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	952.07	Wt. n-Val.		0.040	
Vel Head (ft)	0.70	Reach Len. (ft)	18.36	18.18	17.87
W.S. Elev (ft)	951.37	Flow Area (sq ft)		343.78	
Crit W.S. (ft)		Area (sq ft)		343.78	
E.G. Slope (ft/ft)	0.002977	Flow (cfs)		2310.00	
Q Total (cfs)	2310.00	Top Width (ft)		49.96	
Top Width (ft)	49.96	Avg. Vel. (ft/s)		6.72	
Vel Total (ft/s)	6.72	Hydr. Depth (ft)		6.88	
Max Chl Dpth (ft)	9.22	Conv. (cfs)		42337.3	
Conv. Total (cfs)	42337.3	Wetted Per. (ft)		56.95	
Length Wtd. (ft)	18.18	Shear (lb/sq ft)		1.12	
Min Ch El (ft)	942.15	Stream Power (lb/ft s)		7.54	
Alpha	1.00	Cum Volume (acre-ft)	11.46	27.59	1.53
Frctn Loss (ft)	0.05	Cum SA (acres)	2.95	3.62	0.42
C & E Loss (ft)	0.00				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3641.433

INPUT
Description: 20
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	958.43	.57	958.41	4.35	958.26	11.97	957.96	12.46	955.32
13.14	951.91	30.89	951.91	35.21	949.75	43.21	949.75	46.01	951.15
54.01	951.15	72.01	942.15	92.01	942.15	103.97	948.13	107.38	948.12
121.11	948.22	143.34	949.11	153.55	949.68	168.39	950.1	189.55	950.77
196.84	951.03	201.1	951.16	212.45	951.5	215.46	951.59	240.59	951.58
260.58	953.21	263.83	953.7	273.43	957.88	280.47	960.45		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	54.01	.04	103.97	.12

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

Left	Right	Left	Channel	Right		
54.01	103.97	122.87	122.58	125.68	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
238	280.47		F

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	951.92	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.56	Reach Len. (ft)	122.87	122.58	125.68
W.S. Elev (ft)	951.36				

Crit W.S. (ft)		Flow Area (sq ft)	19.63	343.20	180.99
E.G. Slope (ft/ft)	0.002366	Area (sq ft)	19.63	343.20	180.99
Q Total (cfs)	2310.00	Flow (cfs)	10.72	2141.29	157.98
Top Width (ft)	175.67	Top Width (ft)	22.01	49.96	103.69
Vel Total (ft/s)	4.25	Avg. Vel. (ft/s)	0.55	6.24	0.87
Max Chl Dpth (ft)	9.21	Hydr. Depth (ft)	0.89	6.87	1.75
Conv. Total (cfs)	47486.6	Conv. (cfs)	220.4	44018.5	3247.7
Length Wtd. (ft)	122.69	Wetted Per. (ft)	22.72	53.50	103.75
Min Ch El (ft)	942.15	Shear (lb/sq ft)	0.13	0.95	0.26
Alpha	2.00	Stream Power (lb/ft s)	0.07	5.91	0.22
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	17.95	24.40	9.51
C & E Loss (ft)	0.02	Cum SA (acres)	6.11	3.58	4.96

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	952.01	Wt. n-Val.		0.040	
Vel Head (ft)	0.72	Reach Len. (ft)	122.87	122.58	125.68
W.S. Elev (ft)	951.30	Flow Area (sq ft)		340.29	
Crit W.S. (ft)		Area (sq ft)		340.29	
E.G. Slope (ft/ft)	0.003070	Flow (cfs)		2310.00	
Q Total (cfs)	2310.00	Top Width (ft)		49.96	
Top Width (ft)	49.96	Avg. Vel. (ft/s)		6.79	
Vel Total (ft/s)	6.79	Hydr. Depth (ft)		6.81	
Max Chl Dpth (ft)	9.15	Conv. (cfs)		41691.9	
Conv. Total (cfs)	41691.9	Wetted Per. (ft)		56.81	
Length Wtd. (ft)	122.58	Shear (lb/sq ft)		1.15	
Min Ch El (ft)	942.15	Stream Power (lb/ft s)		7.79	
Alpha	1.00	Cum Volume (acre-ft)	11.46	27.44	1.53
Frctn Loss (ft)	0.39	Cum SA (acres)	2.95	3.60	0.42
C & E Loss (ft)	0.00				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3518.856

INPUT
Description: 21
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	957.68	6	957.44	7.5	957.38	8.18	957.36	9.45	951.67
29.38	951.67	33.66	949.53	41.66	949.53	44.46	950.93	49.46	950.93
67.46	941.93	87.46	941.93	102.1	949.25	122.59	955.73	123.17	955.98
125.06	956.77	128.58	957.77	135.97	958.03	151.56	958.19		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	49.46	.04	102.1	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
49.46	102.1	18.65	18.23	18.01	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	951.57	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.73	Reach Len. (ft)	18.65	18.23	18.01
W.S. Elev (ft)	950.84	Flow Area (sq ft)	13.85	334.20	3.97
Crit W.S. (ft)		Area (sq ft)	13.85	334.20	3.97
E.G. Slope (ft/ft)	0.003186	Flow (cfs)	9.69	2298.01	2.30
Q Total (cfs)	2310.00	Top Width (ft)	13.22	52.45	5.01
Top Width (ft)	70.68	Avg. Vel. (ft/s)	0.70	6.88	0.58
Vel Total (ft/s)	6.56	Hydr. Depth (ft)	1.05	6.37	0.79
Max Chl Dpth (ft)	8.91	Conv. (cfs)	171.6	40711.0	40.8
Conv. Total (cfs)	40923.5	Wetted Per. (ft)	13.84	56.28	5.26
Length Wtd. (ft)	18.23	Shear (lb/sq ft)	0.20	1.18	0.15
Min Ch El (ft)	941.93	Stream Power (lb/ft s)	0.14	8.12	0.09
Alpha	1.09	Cum Volume (acre-ft)	17.90	23.45	9.25
Frctn Loss (ft)	0.06	Cum SA (acres)	6.06	3.43	4.81
C & E Loss (ft)	0.01				

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	951.63	Wt. n-Val.		0.040	
Vel Head (ft)	0.73	Reach Len. (ft)	18.65	18.23	18.01
W.S. Elev (ft)	950.90	Flow Area (sq ft)		337.58	
Crit W.S. (ft)					

E.G. Slope (ft/ft)	0.003247	Area (sq ft)		337.58	
Q Total (cfs)	2310.00	Flow (cfs)		2310.00	
Top Width (ft)	52.58	Top Width (ft)		52.58	
Vel Total (ft/s)	6.84	Avg. Vel. (ft/s)		6.84	
Max Chl Dpth (ft)	8.97	Hydr. Depth (ft)		6.42	
Conv. Total (cfs)	40541.9	Conv. (cfs)		40541.9	
Length Wtd. (ft)	18.23	Wetted Per. (ft)		58.07	
Min Ch El (ft)	941.93	Shear (lb/sq ft)		1.18	
Alpha	1.00	Stream Power (lb/ft s)		8.06	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	11.46	26.49	1.53
C & E Loss (ft)	0.01	Cum SA (acres)	2.95	3.45	0.42

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3500.626

INPUT
Description: 22
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	957.7	6.62	957.44	11.15	957.26	12.12	952.84	12.47	951.47
26.72	951.47	31	949.33	39	949.33	41.8	950.73	46.8	950.73
64.8	941.73	84.8	941.73	99.44	949.05	104.37	949.45	123.93	955.54
128.87	956.06	141.46	957	162.91	957.82				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	46.8	.04	99.44	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
46.8	99.44	121.15	122.14	120.16	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	951.50	Element			
Vel Head (ft)	0.69	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	950.81	Reach Len. (ft)	121.15	122.14	120.16
Crit W.S. (ft)		Flow Area (sq ft)	16.62	343.40	10.66
E.G. Slope (ft/ft)	0.002911	Area (sq ft)	16.62	343.40	10.66
Q Total (cfs)	2310.00	Flow (cfs)	10.00	2292.32	7.68
Top Width (ft)	80.70	Top Width (ft)	18.76	52.64	9.30
Vel Total (ft/s)	6.23	Avg. Vel. (ft/s)	0.60	6.68	0.72
Max Chl Dpth (ft)	9.08	Hydr. Depth (ft)	0.89	6.52	1.15
Conv. Total (cfs)	42817.1	Conv. (cfs)	185.4	42489.3	142.4
Length Wtd. (ft)	122.09	Wetted Per. (ft)	19.44	56.49	9.52
Min Ch El (ft)	941.73	Shear (lb/sq ft)	0.16	1.10	0.20
Alpha	1.14	Stream Power (lb/ft s)	0.09	7.37	0.15
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)	17.89	23.30	9.24
C & E Loss (ft)	0.02	Cum SA (acres)	6.05	3.41	4.80

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	951.56	Element			
Vel Head (ft)	0.69	Wt. n-Val.		0.040	
W.S. Elev (ft)	950.87	Reach Len. (ft)	121.15	122.14	120.16
Crit W.S. (ft)		Flow Area (sq ft)		346.46	
E.G. Slope (ft/ft)	0.003003	Area (sq ft)		346.46	
Q Total (cfs)	2310.00	Flow (cfs)		2310.00	
Top Width (ft)	52.64	Top Width (ft)		52.64	
Vel Total (ft/s)	6.67	Avg. Vel. (ft/s)		6.67	
Max Chl Dpth (ft)	9.14	Hydr. Depth (ft)		6.58	
Conv. Total (cfs)	42154.7	Conv. (cfs)		42154.7	
Length Wtd. (ft)	122.14	Wetted Per. (ft)		58.45	
Min Ch El (ft)	941.73	Shear (lb/sq ft)		1.11	
Alpha	1.00	Stream Power (lb/ft s)		7.41	
Frctn Loss (ft)	0.37	Cum Volume (acre-ft)	11.46	26.35	1.53
C & E Loss (ft)	0.00	Cum SA (acres)	2.95	3.43	0.42

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3378.489

INPUT
Description: 23
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	957.04	.25	957.03	1.37	957	3.95	956.78	12.8	956.34
13.18	956.37	13.59	954.68	14.48	951.09	29.81	951.09	34.03	948.98
42.03	948.98	44.79	950.36	49.79	950.36	67.75	941.38	87.75	941.38
100.69	947.85	127.05	947.75	148.26	958.69				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	49.79	.04	100.69	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
49.79	100.69	17.27	18.05	17.97	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	951.14	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.62	Reach Len. (ft)	17.27	18.05	17.97
W.S. Elev (ft)	950.52	Flow Area (sq ft)	17.92	342.95	79.28
Crit W.S. (ft)		Area (sq ft)	17.92	342.95	79.28
E.G. Slope (ft/ft)	0.002590	Flow (cfs)	10.66	2208.65	90.69
Q Total (cfs)	2310.00	Top Width (ft)	18.85	50.90	31.74
Top Width (ft)	101.49	Avg. Vel. (ft/s)	0.59	6.44	1.14
Vel Total (ft/s)	5.25	Hydr. Depth (ft)	0.95	6.74	2.50
Max Chl Dpth (ft)	9.14	Conv. (cfs)	209.5	43397.4	1782.0
Conv. Total (cfs)	45388.9	Wetted Per. (ft)	19.54	54.55	32.41
Length Wtd. (ft)	18.04	Shear (lb/sq ft)	0.15	1.02	0.40
Min Ch El (ft)	941.38	Stream Power (lb/ft s)	0.09	6.55	0.45
Alpha	1.44	Cum Volume (acre-ft)	17.84	22.34	9.12
Frctn Loss (ft)	0.05	Cum SA (acres)	6.00	3.27	4.75
C & E Loss (ft)	0.00				

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	951.18	Wt. n-Val.		0.040	
Vel Head (ft)	0.72	Reach Len. (ft)	17.27	18.05	17.97
W.S. Elev (ft)	950.47	Flow Area (sq ft)		340.04	
Crit W.S. (ft)		Area (sq ft)		340.04	
E.G. Slope (ft/ft)	0.003110	Flow (cfs)		2310.00	
Q Total (cfs)	2310.00	Top Width (ft)		50.90	
Top Width (ft)	50.90	Avg. Vel. (ft/s)		6.79	
Vel Total (ft/s)	6.79	Hydr. Depth (ft)		6.68	
Max Chl Dpth (ft)	9.09	Conv. (cfs)		41419.1	
Conv. Total (cfs)	41419.1	Wetted Per. (ft)		57.27	
Length Wtd. (ft)	18.05	Shear (lb/sq ft)		1.15	
Min Ch El (ft)	941.38	Stream Power (lb/ft s)		7.83	
Alpha	1.00	Cum Volume (acre-ft)	11.46	25.39	1.53
Frctn Loss (ft)	0.06	Cum SA (acres)	2.95	3.28	0.42
C & E Loss (ft)	0.00				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3360.436

INPUT
Description: 24
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.98	.17	956.98	2.4	956.91	8.85	956.38	12.64	956.16
14.21	956.28	15.49	951.03	30.55	951.03	34.77	948.92	42.77	948.92
45.53	950.3	50.53	950.3	68.49	941.32	88.49	941.32	101.43	947.79
125.06	947.87	136.02	953.73	143.9	957.74				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	50.53	.04	101.43	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
50.53	101.43	122.81	122.13	120.82	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	951.09	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.63	Reach Len. (ft)	122.81	122.13	120.82
W.S. Elev (ft)	950.46	Flow Area (sq ft)	17.93	342.97	68.56
Crit W.S. (ft)		Area (sq ft)	17.93	342.97	68.56
E.G. Slope (ft/ft)	0.002622	Flow (cfs)	10.73	2222.37	76.90
Q Total (cfs)	2310.00	Top Width (ft)	18.85	50.90	28.48
Top Width (ft)	98.23				

Vel Total (ft/s)	5.38	Avg. Vel. (ft/s)	0.60	6.48	1.12
Max Chl Dpth (ft)	9.14	Hydr. Depth (ft)	0.95	6.74	2.41
Conv. Total (cfs)	45113.5	Conv. (cfs)	209.6	43402.0	1501.9
Length Wtd. (ft)	122.11	Wetted Per. (ft)	19.54	54.55	29.13
Min Ch El (ft)	941.32	Shear (lb/sq ft)	0.15	1.03	0.39
Alpha	1.40	Stream Power (lb/ft s)	0.09	6.67	0.43
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)	17.84	22.20	9.09
C & E Loss (ft)	0.01	Cum SA (acres)	5.99	3.25	4.74

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	951.13	Wt. n-Val.		0.040	
Vel Head (ft)	0.72	Reach Len. (ft)	122.81	122.13	120.82
W.S. Elev (ft)	950.41	Flow Area (sq ft)		340.25	
Crit W.S. (ft)		Area (sq ft)		340.25	
E.G. Slope (ft/ft)	0.003105	Flow (cfs)		2310.00	
Q Total (cfs)	2310.00	Top Width (ft)		50.90	
Top Width (ft)	50.90	Avg. Vel. (ft/s)		6.79	
Vel Total (ft/s)	6.79	Hydr. Depth (ft)		6.68	
Max Chl Dpth (ft)	9.09	Conv. (cfs)		41456.3	
Conv. Total (cfs)	41456.3	Wetted Per. (ft)		57.28	
Length Wtd. (ft)	122.13	Shear (lb/sq ft)		1.15	
Min Ch El (ft)	941.32	Stream Power (lb/ft s)		7.82	
Alpha	1.00	Cum Volume (acre-ft)	11.46	25.24	1.53
Frctn Loss (ft)	0.39	Cum SA (acres)	2.95	3.26	0.42
C & E Loss (ft)	0.00				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3238.304

INPUT
Description: 25
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.42	.7	956.41	2.5	956.32	11.18	955.84	12.83	955.83
12.9	955.52	13.37	953.77	14.16	950.71	27.01	950.71	31.11	948.66
39.11	948.66	42.19	950.2	47.19	950.2	65.19	941.06	85.19	941.06
102.95	949.94	118.62	951.21	132.5	958.49				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	47.19	.04	102.95	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
47.19	102.95	18.33	18.06	18.17	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	950.72	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.72	Reach Len. (ft)	18.33	18.06	18.17
W.S. Elev (ft)	950.01	Flow Area (sq ft)	14.43	337.92	0.03
Crit W.S. (ft)		Area (sq ft)	14.43	337.92	0.03
E.G. Slope (ft/ft)	0.003321	Flow (cfs)	10.49	2299.51	0.00
Q Total (cfs)	2310.00	Top Width (ft)	13.40	55.38	0.85
Top Width (ft)	69.63	Avg. Vel. (ft/s)	0.73	6.80	0.08
Vel Total (ft/s)	6.56	Hydr. Depth (ft)	1.08	6.10	0.03
Max Chl Dpth (ft)	8.95	Conv. (cfs)	182.1	39904.3	0.0
Conv. Total (cfs)	40086.4	Wetted Per. (ft)	14.03	59.62	0.85
Length Wtd. (ft)	18.06	Shear (lb/sq ft)	0.21	1.17	0.01
Min Ch El (ft)	941.06	Stream Power (lb/ft s)	0.16	8.00	0.00
Alpha	1.07	Cum Volume (acre-ft)	17.79	21.25	8.99
Frctn Loss (ft)	0.06	Cum SA (acres)	5.95	3.10	4.70
C & E Loss (ft)	0.01				

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	950.73	Wt. n-Val.		0.040	
Vel Head (ft)	0.73	Reach Len. (ft)	18.33	18.06	18.17
W.S. Elev (ft)	950.01	Flow Area (sq ft)		337.74	
Crit W.S. (ft)		Area (sq ft)		337.74	
E.G. Slope (ft/ft)	0.003362	Flow (cfs)		2310.00	
Q Total (cfs)	2310.00	Top Width (ft)		55.38	
Top Width (ft)	55.38	Avg. Vel. (ft/s)		6.84	
Vel Total (ft/s)	6.84				

Max Chl Dpth (ft)	8.95	Hydr. Depth (ft)		6.10	
Conv. Total (cfs)	39842.3	Conv. (cfs)		39842.3	
Length Wtd. (ft)	18.06	Wetted Per. (ft)		59.68	
Min Ch El (ft)	941.06	Shear (lb/sq ft)		1.19	
Alpha	1.00	Stream Power (lb/ft s)		8.12	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	11.46	24.29	1.53
C & E Loss (ft)	0.01	Cum SA (acres)	2.95	3.11	0.42

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3220.243

INPUT
Description: 26
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.31	8.34	955.93	10.15	955.85	11.38	955.8	12.89	950.51
25.32	950.51	29.42	948.46	37.42	948.46	40.5	950	45.5	950
63.5	940.86	83.5	940.86	101.26	949.74	114.79	952.45	118.77	952.9
124.5	957.46								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	45.5	.04	101.26	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
45.5	101.26	73.32	73.11	72.78	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

E.G. Elev (ft)	950.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.68	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	949.98	Reach Len. (ft)	73.32	73.11	72.78
Crit W.S. (ft)		Flow Area (sq ft)	16.78	347.40	0.14
E.G. Slope (ft/ft)	0.003048	Area (sq ft)	16.78	347.40	0.14
Q Total (cfs)	2310.00	Flow (cfs)	12.47	2297.51	0.02
Top Width (ft)	71.00	Top Width (ft)	14.08	55.72	1.20
Vel Total (ft/s)	6.34	Avg. Vel. (ft/s)	0.74	6.61	0.16
Max Chl Dpth (ft)	9.12	Hydr. Depth (ft)	1.19	6.23	0.12
Conv. Total (cfs)	41839.2	Conv. (cfs)	225.9	41612.9	0.4
Length Wtd. (ft)	73.11	Wetted Per. (ft)	14.80	60.00	1.22
Min Ch El (ft)	940.86	Shear (lb/sq ft)	0.22	1.10	0.02
Alpha	1.08	Stream Power (lb/ft s)	0.16	7.29	0.00
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	17.78	21.10	8.99
C & E Loss (ft)	0.07	Cum SA (acres)	5.94	3.07	4.69

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.

CROSS SECTION OUTPUT Profile #100 YR FW

E.G. Elev (ft)	950.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.69	Wt. n-Val.		0.040	
W.S. Elev (ft)	949.97	Reach Len. (ft)	73.32	73.11	72.78
Crit W.S. (ft)		Flow Area (sq ft)		347.11	
E.G. Slope (ft/ft)	0.003106	Area (sq ft)		347.11	
Q Total (cfs)	2310.00	Flow (cfs)		2310.00	
Top Width (ft)	55.71	Top Width (ft)		55.71	
Vel Total (ft/s)	6.66	Avg. Vel. (ft/s)		6.66	
Max Chl Dpth (ft)	9.11	Hydr. Depth (ft)		6.23	
Conv. Total (cfs)	41451.4	Conv. (cfs)		41451.4	
Length Wtd. (ft)	73.11	Wetted Per. (ft)		60.22	
Min Ch El (ft)	940.86	Shear (lb/sq ft)		1.12	
Alpha	1.00	Stream Power (lb/ft s)		7.44	
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	11.46	24.15	1.53
C & E Loss (ft)	0.07	Cum SA (acres)	2.95	3.09	0.42

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

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3147

INPUT
Description:
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.82	2.81	956.82	13.92	956.6	15.83	956.56	16.85	956.54
18.47	956.51	28.21	956.32	29.99	956.29	32.93	956.24	41.45	956.09
46.17	955.91	53.53	955.65	54.39	951.99	54.74	950.33	69.74	950.33
73.84	948.28	81.84	948.28	84.92	949.82	89.92	949.82	107.92	940.68
127.92	940.68	145.68	949.56	147.18	952.71	150.47	954.51	155.5	957.08

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	89.92	.04	145.68	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
89.92	145.68	46.78	49.75	49.66	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	950.25	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	1.37	Reach Len. (ft)	46.78	49.75	49.66
W.S. Elev (ft)	948.87	Flow Area (sq ft)	5.46	297.17	
Crit W.S. (ft)		Area (sq ft)	5.46	297.17	
E.G. Slope (ft/ft)	0.007003	Flow (cfs)	3.63	2796.37	
Q Total (cfs)	2800.00	Top Width (ft)	10.38	52.53	
Top Width (ft)	62.91	Avg. Vel. (ft/s)	0.66	9.41	
Vel Total (ft/s)	9.25	Hydr. Depth (ft)	0.53	5.66	
Max Chl Dpth (ft)	8.19	Conv. (cfs)	43.3	33416.5	
Conv. Total (cfs)	33459.8	Wetted Per. (ft)	10.66	56.42	
Length Wtd. (ft)	49.75	Shear (lb/sq ft)	0.22	2.30	
Min Ch El (ft)	940.68	Stream Power (lb/ft s)	0.15	21.67	
Alpha	1.03	Cum Volume (acre-ft)	17.77	20.56	8.99
Frctn Loss (ft)	0.44	Cum SA (acres)	5.92	2.98	4.69
C & E Loss (ft)	0.06				

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.

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	950.25	Wt. n-Val.		0.040	
Vel Head (ft)	1.38	Reach Len. (ft)	46.78	49.75	49.66
W.S. Elev (ft)	948.87	Flow Area (sq ft)		296.96	
Crit W.S. (ft)		Area (sq ft)		296.96	
E.G. Slope (ft/ft)	0.007034	Flow (cfs)		2800.00	
Q Total (cfs)	2800.00	Top Width (ft)		52.51	
Top Width (ft)	52.51	Avg. Vel. (ft/s)		9.43	
Vel Total (ft/s)	9.43	Hydr. Depth (ft)		5.66	
Max Chl Dpth (ft)	8.19	Conv. (cfs)		33384.4	
Conv. Total (cfs)	33384.4	Wetted Per. (ft)		56.41	
Length Wtd. (ft)	49.75	Shear (lb/sq ft)		2.31	
Min Ch El (ft)	940.68	Stream Power (lb/ft s)		21.80	
Alpha	1.00	Cum Volume (acre-ft)	11.46	23.61	1.53
Frctn Loss (ft)	0.44	Cum SA (acres)	2.95	3.00	0.42
C & E Loss (ft)	0.06				

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

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3097.384

INPUT
Description: 27
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.05	1.2	956.03	3.3	955.99	6.48	955.93	10.39	955.87
11.08	955.86	16.48	955.77	18.23	955.71	28.24	955.33	28.85	952.76
29.42	950.2	40.92	950.2	45	948.16	53	948.16	55.82	949.57
60.82	949.57	78.82	940.56	98.82	940.56	126.32	954.31	136.01	954.87

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	60.82	.04	126.32	.12

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

60.82	126.32	19.08	18.31	18.45	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.75	Element			
Vel Head (ft)	1.98	Wt. n-Val.		0.040	
W.S. Elev (ft)	947.76	Reach Len. (ft)	19.08	18.31	18.45
Crit W.S. (ft)	947.29	Flow Area (sq ft)		247.80	
E.G. Slope (ft/ft)	0.011598	Area (sq ft)		247.80	
Q Total (cfs)	2800.00	Flow (cfs)		2800.00	
Top Width (ft)	48.80	Top Width (ft)		48.80	
Vel Total (ft/s)	11.30	Avg. Vel. (ft/s)		11.30	
Max Chl Dpth (ft)	7.20	Hydr. Depth (ft)		5.08	
Conv. Total (cfs)	26000.0	Conv. (cfs)		26000.0	
Length Wtd. (ft)	18.31	Wetted Per. (ft)		52.20	
Min Ch El (ft)	940.56	Shear (lb/sq ft)		3.44	
Alpha	1.00	Stream Power (lb/ft s)		38.84	
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	17.76	20.25	8.99
C & E Loss (ft)	0.02	Cum SA (acres)	5.91	2.93	4.69

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.76	Element			
Vel Head (ft)	1.94	Wt. n-Val.		0.040	
W.S. Elev (ft)	947.82	Reach Len. (ft)	19.08	18.31	18.45
Crit W.S. (ft)		Flow Area (sq ft)		250.69	
E.G. Slope (ft/ft)	0.011233	Area (sq ft)		250.69	
Q Total (cfs)	2800.00	Flow (cfs)		2800.00	
Top Width (ft)	49.03	Top Width (ft)		49.03	
Vel Total (ft/s)	11.17	Avg. Vel. (ft/s)		11.17	
Max Chl Dpth (ft)	7.26	Hydr. Depth (ft)		5.11	
Conv. Total (cfs)	26418.3	Conv. (cfs)		26418.3	
Length Wtd. (ft)	18.31	Wetted Per. (ft)		52.47	
Min Ch El (ft)	940.56	Shear (lb/sq ft)		3.35	
Alpha	1.00	Stream Power (lb/ft s)		37.43	
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	11.46	23.30	1.53
C & E Loss (ft)	0.00	Cum SA (acres)	2.95	2.94	0.42

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3079.078

INPUT
Description: 28
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.01	8.09	955.84	20.97	955.62	21.18	955.62	21.33	955.61
21.42	955.61	21.46	955.61	26.75	955.41	32.9	955.17	32.97	954.89
33.26	953.62	34.09	950	48.31	950	52.39	947.96	60.39	947.96
63.21	949.37	68.21	949.37	86.21	940.36	106.21	940.36	133.71	954.11
141.67	960.92								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	68.21	.04	133.71	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
68.21	133.71	124.18	123.15	120.49	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.50	Element			
Vel Head (ft)	2.20	Wt. n-Val.		0.040	
W.S. Elev (ft)	947.30	Reach Len. (ft)	124.18	123.15	120.49
Crit W.S. (ft)	947.09	Flow Area (sq ft)		235.17	
E.G. Slope (ft/ft)	0.013395	Area (sq ft)		235.17	
Q Total (cfs)	2800.00	Flow (cfs)		2800.00	
Top Width (ft)	47.75	Top Width (ft)		47.75	
Vel Total (ft/s)	11.91	Avg. Vel. (ft/s)		11.91	
Max Chl Dpth (ft)	6.94	Hydr. Depth (ft)		4.92	
Conv. Total (cfs)	24192.7	Conv. (cfs)		24192.7	
Length Wtd. (ft)	123.15	Wetted Per. (ft)		51.03	
Min Ch El (ft)	940.36	Shear (lb/sq ft)		3.85	
Alpha	1.00	Stream Power (lb/ft s)		45.88	
Frctn Loss (ft)	1.22	Cum Volume (acre-ft)	17.76	20.15	8.99
C & E Loss (ft)	0.22	Cum SA (acres)	5.91	2.91	4.69

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 #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	949.56	Wt. n-Val.		0.040	
Vel Head (ft)	1.94	Reach Len. (ft)	124.18	123.15	120.49
W.S. Elev (ft)	947.62	Flow Area (sq ft)		250.37	
Crit W.S. (ft)	947.07	Area (sq ft)		250.37	
E.G. Slope (ft/ft)	0.011272	Flow (cfs)		2800.00	
Q Total (cfs)	2800.00	Top Width (ft)		49.01	
Top Width (ft)	49.01	Avg. Vel. (ft/s)		11.18	
Vel Total (ft/s)	11.18	Hydr. Depth (ft)		5.11	
Max Chl Dpth (ft)	7.26	Conv. (cfs)		26373.2	
Conv. Total (cfs)	26373.2	Wetted Per. (ft)		52.44	
Length Wtd. (ft)	123.15	Shear (lb/sq ft)		3.36	
Min Ch El (ft)	940.36	Stream Power (lb/ft s)		37.58	
Alpha	1.00	Cum Volume (acre-ft)	11.46	23.19	1.53
Frctn Loss (ft)	0.97	Cum SA (acres)	2.95	2.92	0.42
C & E Loss (ft)	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 energy loss was 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: Hope Creek
REACH: 1 RS: 2955.929

INPUT
Description: 29
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	955.26	.17	955.25	1.58	955.22	2.96	955.19	14.47	954.91
17.42	954.86	25.81	954.68	27.73	954.63	33.41	954.44	36.59	954.3
39.27	954.26	40.35	951.43	41.26	949.16	44.7	948.06	51.26	948.06
55	946.19	63	946.19	65.8	947.59	70.8	947.59	88.8	938.59
108.8	938.59	131.64	950.01	133.39	950.95	146.19	951.77	159.02	958.89

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	70.8	.04	133.39	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
70.8	133.39	18	18.05	18.27	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	948.06	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	1.46	Reach Len. (ft)	18.00	18.05	18.27
W.S. Elev (ft)	946.60	Flow Area (sq ft)	3.62	288.53	
Crit W.S. (ft)		Area (sq ft)	3.62	288.53	
E.G. Slope (ft/ft)	0.007625	Flow (cfs)	2.01	2797.99	
Q Total (cfs)	2800.00	Top Width (ft)	9.64	52.04	
Top Width (ft)	61.68	Avg. Vel. (ft/s)	0.56	9.70	
Vel Total (ft/s)	9.58	Hydr. Depth (ft)	0.38	5.54	
Max Chl Dpth (ft)	8.01	Conv. (cfs)	23.0	32041.6	
Conv. Total (cfs)	32064.6	Wetted Per. (ft)	9.83	55.82	
Length Wtd. (ft)	18.05	Shear (lb/sq ft)	0.18	2.46	
Min Ch El (ft)	938.59	Stream Power (lb/ft s)	0.10	23.86	
Alpha	1.02	Cum Volume (acre-ft)	17.76	19.41	8.99
Frctn Loss (ft)	0.13	Cum SA (acres)	5.90	2.76	4.69
C & E Loss (ft)	0.02				

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	948.36	Wt. n-Val.		0.040	
Vel Head (ft)	1.20	Reach Len. (ft)	18.00	18.05	18.27
W.S. Elev (ft)	947.16	Flow Area (sq ft)		318.41	
Crit W.S. (ft)		Area (sq ft)		318.41	
E.G. Slope (ft/ft)	0.005831	Flow (cfs)		2800.00	
Q Total (cfs)	2800.00	Top Width (ft)		54.29	
Top Width (ft)	54.29				

Vel Total (ft/s)	8.79	Avg. Vel. (ft/s)		8.79	
Max Chl Dpth (ft)	8.57	Hydr. Depth (ft)		5.87	
Conv. Total (cfs)	36668.5	Conv. (cfs)		36668.5	
Length Wtd. (ft)	18.05	Wetted Per. (ft)		58.34	
Min Ch El (ft)	938.59	Shear (lb/sq ft)		1.99	
Alpha	1.00	Stream Power (lb/ft s)		17.47	
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	11.46	22.39	1.53
C & E Loss (ft)	0.02	Cum SA (acres)	2.95	2.78	0.42

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2937.884

INPUT
Description: 30
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	955.18	3.55	955.08	9.78	954.93	16.46	954.77	24.53	954.58
29.74	954.46	36.56	954.25	37.07	954.22	37.98	954.08	39.74	954.05
41.29	954.15	41.45	954.12	41.5	954.11	41.51	954.11	43.3	952.45
46.32	947.86	53.4	947.86	57.14	945.99	65.14	945.99	67.94	947.39
72.94	947.39	90.94	938.39	110.94	938.39	133.78	949.81	135.71	949.92
149.06	950.76	158.64	952.74	171.31	955.98	171.63	956.08		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	72.94	.04	133.78	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
72.94	133.78	68.38	65.3	63.65	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	947.91	Element			
Vel Head (ft)	1.40	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	946.50	Reach Len. (ft)	68.38	65.30	63.65
Crit W.S. (ft)		Flow Area (sq ft)	4.64	293.97	
E.G. Slope (ft/ft)	0.007240	Area (sq ft)	4.64	293.97	
Q Total (cfs)	2800.00	Flow (cfs)	2.88	2797.12	
Top Width (ft)	62.51	Top Width (ft)	10.06	52.46	
Vel Total (ft/s)	9.38	Avg. Vel. (ft/s)	0.62	9.51	
Max Chl Dpth (ft)	8.11	Hydr. Depth (ft)	0.46	5.60	
Conv. Total (cfs)	32906.1	Conv. (cfs)	33.8	32872.3	
Length Wtd. (ft)	65.33	Wetted Per. (ft)	10.30	56.29	
Min Ch El (ft)	938.39	Shear (lb/sq ft)	0.20	2.36	
Alpha	1.03	Stream Power (lb/ft s)	0.13	22.46	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	17.76	19.29	8.99
C & E Loss (ft)	0.09	Cum SA (acres)	5.90	2.74	4.69

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	948.24	Element			
Vel Head (ft)	1.15	Wt. n-Val.		0.040	
W.S. Elev (ft)	947.10	Reach Len. (ft)	68.38	65.30	63.65
Crit W.S. (ft)		Flow Area (sq ft)		325.82	
E.G. Slope (ft/ft)	0.005476	Area (sq ft)		325.82	
Q Total (cfs)	2800.00	Flow (cfs)		2800.00	
Top Width (ft)	54.83	Top Width (ft)		54.83	
Vel Total (ft/s)	8.59	Avg. Vel. (ft/s)		8.59	
Max Chl Dpth (ft)	8.71	Hydr. Depth (ft)		5.94	
Conv. Total (cfs)	37838.4	Conv. (cfs)		37838.4	
Length Wtd. (ft)	65.30	Wetted Per. (ft)		58.94	
Min Ch El (ft)	938.39	Shear (lb/sq ft)		1.89	
Alpha	1.00	Stream Power (lb/ft s)		16.24	
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)	11.46	22.26	1.53
C & E Loss (ft)	0.05	Cum SA (acres)	2.95	2.75	0.42

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2870

INPUT
Description:

Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	955.26	4.58	955.19	8.22	955.11	16.64	954.94	21.8	954.78
27.44	954.62	29.41	954.56	37.45	954.37	42.1	954.26	47.85	954.08
55.33	953.86	60.57	953.49	61	953.46	61.09	953.46	61.19	953.45
62.63	953.36	63.31	953.3	64.12	953.24	64.61	953.34	65.63	953.54
67.72	953.59	70.48	953.68	70.74	953.54	88.2	944.12	96.76	944.12
101.36	944.97	106.36	944.97	121.79	937.72	141.79	937.72	157.49	945.57
177.07	956.1								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	106.36	.04	157.49	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
106.36	157.49	51.13	58.6	53.12	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	947.43	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	1.12	Reach Len. (ft)	51.13	58.60	53.12
W.S. Elev (ft)	946.32	Flow Area (sq ft)	38.12	321.91	0.52
Crit W.S. (ft)		Area (sq ft)	38.12	321.91	0.52
E.G. Slope (ft/ft)	0.004976	Flow (cfs)	46.83	2752.96	0.21
Q Total (cfs)	2800.00	Top Width (ft)	22.23	51.13	1.39
Top Width (ft)	74.74	Avg. Vel. (ft/s)	1.23	8.55	0.42
Vel Total (ft/s)	7.77	Hydr. Depth (ft)	1.72	6.30	0.37
Max Chl Dpth (ft)	8.60	Conv. (cfs)	663.9	39026.9	3.0
Conv. Total (cfs)	39693.8	Wetted Per. (ft)	22.86	54.60	1.57
Length Wtd. (ft)	58.51	Shear (lb/sq ft)	0.52	1.83	0.10
Min Ch El (ft)	937.72	Stream Power (lb/ft s)	0.64	15.66	0.04
Alpha	1.19	Cum Volume (acre-ft)	17.72	18.83	8.99
Frctn Loss (ft)	0.27	Cum SA (acres)	5.87	2.67	4.69
C & E Loss (ft)	0.02				

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	947.89	Wt. n-Val.		0.040	
Vel Head (ft)	0.98	Reach Len. (ft)	51.13	58.60	53.12
W.S. Elev (ft)	946.90	Flow Area (sq ft)		351.97	
Crit W.S. (ft)		Area (sq ft)		351.97	
E.G. Slope (ft/ft)	0.004131	Flow (cfs)		2800.00	
Q Total (cfs)	2800.00	Top Width (ft)		51.13	
Top Width (ft)	51.13	Avg. Vel. (ft/s)		7.96	
Vel Total (ft/s)	7.96	Hydr. Depth (ft)		6.88	
Max Chl Dpth (ft)	9.18	Conv. (cfs)		43566.6	
Conv. Total (cfs)	43566.6	Wetted Per. (ft)		57.87	
Length Wtd. (ft)	58.60	Shear (lb/sq ft)		1.57	
Min Ch El (ft)	937.72	Stream Power (lb/ft s)		12.48	
Alpha	1.00	Cum Volume (acre-ft)	11.46	21.75	1.53
Frctn Loss (ft)	0.22	Cum SA (acres)	2.95	2.67	0.42
C & E Loss (ft)	0.03				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2813.979

INPUT
Description: 31
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	953.48	.06	953.48	2.49	953.29	3.09	953.25	3.7	953.2
7.87	952.9	8.48	952.85	8.93	952.81	9.33	952.77	9.65	952.83
10.23	952.94	10.72	953.03	10.86	953.05	11.85	952.98	15.25	953
21.18	949.56	29.14	944.99	31.53	943.62	32.77	943.62	34.47	944.47
39.47	944.47	54.9	937.22	74.9	937.22	90.6	945.07	96.4	947.04
101.45	948.25	107.6	949.81	135.51	952.27	160.01	962.86	163.64	963.94

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	39.47	.04	90.6	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
39.47	90.6	18.36	18.04	17.52	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	947.14				

Vel Head (ft)	1.05	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	946.09	Reach Len. (ft)	18.36	18.04	17.52
Crit W.S. (ft)		Flow Area (sq ft)	19.90	335.72	1.52
E.G. Slope (ft/ft)	0.004404	Area (sq ft)	19.90	335.72	1.52
Q Total (cfs)	2800.00	Flow (cfs)	21.62	2777.62	0.76
Top Width (ft)	66.36	Top Width (ft)	12.24	51.13	2.99
Vel Total (ft/s)	7.84	Avg. Vel. (ft/s)	1.09	8.27	0.50
Max Chl Dpth (ft)	8.87	Hydr. Depth (ft)	1.63	6.57	0.51
Conv. Total (cfs)	42194.1	Conv. (cfs)	325.7	41856.9	11.5
Length Wtd. (ft)	18.04	Wetted Per. (ft)	13.10	54.60	3.16
Min Ch El (ft)	937.22	Shear (lb/sq ft)	0.42	1.69	0.13
Alpha	1.10	Stream Power (lb/ft s)	0.45	13.99	0.07
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	17.69	18.38	8.99
C & E Loss (ft)	0.00	Cum SA (acres)	5.85	2.60	4.69

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	947.63	Wt. n-Val.		0.040	
Vel Head (ft)	0.89	Reach Len. (ft)	18.36	18.04	17.52
W.S. Elev (ft)	946.74	Flow Area (sq ft)		369.23	
Crit W.S. (ft)		Area (sq ft)		369.23	
E.G. Slope (ft/ft)	0.003576	Flow (cfs)		2800.00	
Q Total (cfs)	2800.00	Top Width (ft)		51.13	
Top Width (ft)	51.13	Avg. Vel. (ft/s)		7.58	
Vel Total (ft/s)	7.58	Hydr. Depth (ft)		7.22	
Max Chl Dpth (ft)	9.52	Conv. (cfs)		46822.5	
Conv. Total (cfs)	46822.5	Wetted Per. (ft)		58.54	
Length Wtd. (ft)	18.04	Shear (lb/sq ft)		1.41	
Min Ch El (ft)	937.22	Stream Power (lb/ft s)		10.68	
Alpha	1.00	Cum Volume (acre-ft)	11.46	21.26	1.53
Frctn Loss (ft)	0.07	Cum SA (acres)	2.95	2.60	0.42
C & E Loss (ft)	0.00				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2795.938

INPUT
Description: 32
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	953.58	3.89	953.46	4.62	953.43	5.85	953.34	6.68	953.28
8.37	953.15	11.2	952.93	12.39	952.84	12.66	952.82	12.83	952.81
13.46	952.76	13.76	952.74	13.9	952.73	14.47	952.83	15.17	952.96
15.43	953.01	17.08	952.9	17.54	952.86	18.04	952.83	19.53	952.83
29.59	947	29.6	946.99	31.58	945.68	34.45	943.62	36.62	943.62
38.32	944.47	43.32	944.47	58.75	937.22	78.75	937.22	94.45	945.07
112.31	945.8	119.38	947.31	128.36	948.22	144.59	949.65	155.19	954.238

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	43.32	.04	94.45	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
43.32	94.45	124.19	127.54	116.57	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
111	155.19		F

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	947.05	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	1.09	Reach Len. (ft)	124.19	127.54	116.57
W.S. Elev (ft)	945.97	Flow Area (sq ft)	19.68	329.65	9.24
Crit W.S. (ft)		Area (sq ft)	19.68	329.65	9.55
E.G. Slope (ft/ft)	0.004664	Flow (cfs)	21.81	2772.90	5.29
Q Total (cfs)	2800.00	Top Width (ft)	12.17	51.13	18.64
Top Width (ft)	81.94	Avg. Vel. (ft/s)	1.11	8.41	0.57
Vel Total (ft/s)	7.81	Hydr. Depth (ft)	1.62	6.45	0.56
Max Chl Dpth (ft)	8.75	Conv. (cfs)	319.3	40601.9	77.5
Conv. Total (cfs)	40998.7	Wetted Per. (ft)	13.12	54.60	16.56
Length Wtd. (ft)	127.43	Shear (lb/sq ft)	0.44	1.76	0.16
Min Ch El (ft)	937.22	Stream Power (lb/ft s)	0.48	14.79	0.09
Alpha	1.15	Cum Volume (acre-ft)	17.68	18.25	8.99
Frctn Loss (ft)	0.54	Cum SA (acres)	5.84	2.58	4.69
C & E Loss (ft)	0.05				

CROSS SECTION OUTPUT Profile #100 YR FW

corrected FW.rep

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	947.57	Wt. n-Val.		0.040	
Vel Head (ft)	0.92	Reach Len. (ft)	124.19	127.54	116.57
W.S. Elev (ft)	946.65	Flow Area (sq ft)		364.58	
Crit W.S. (ft)		Area (sq ft)		364.58	
E.G. Slope (ft/ft)	0.003715	Flow (cfs)		2800.00	
Q Total (cfs)	2800.00	Top Width (ft)		51.13	
Top Width (ft)	51.13	Avg. Vel. (ft/s)		7.68	
Vel Total (ft/s)	7.68	Hydr. Depth (ft)		7.13	
Max Chl Dpth (ft)	9.43	Conv. (cfs)		45939.1	
Conv. Total (cfs)	45939.1	Wetted Per. (ft)		58.36	
Length Wtd. (ft)	127.52	Shear (lb/sq ft)		1.45	
Min Ch El (ft)	937.22	Stream Power (lb/ft s)		11.13	
Alpha	1.00	Cum Volume (acre-ft)	11.46	21.11	1.53
Frctn Loss (ft)	0.40	Cum SA (acres)	2.95	2.58	0.42
C & E Loss (ft)	0.05				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2668.395

INPUT
Description: 33
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	952.46	1.6	952.36	7.95	951.95	8.9	951.78	9.26	951.73
9.97	951.88	10.34	951.95	10.72	952.03	11.82	951.86	15.46	951.45
15.64	951.37	15.78	951.31	18.59	950.06	19.04	950.44	19.56	950.3
25	948.99	42.35	944.71	50.89	945.72	69.51	936.34	90.01	936.34
104.67	943.59	121.45	944.37	156.85	945	164.98	945.37	182.47	953.43
188.26	956.05								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	50.89	.04	104.67	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
50.89 104.67 18.55 17.72 17.36 .1 .3
Ineffective Flow num= 0
Sta L Sta R Elev Permanent

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	946.47	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.92	Reach Len. (ft)	18.55	17.72	17.36
W.S. Elev (ft)	945.55	Flow Area (sq ft)	4.37	354.63	59.69
Crit W.S. (ft)		Area (sq ft)	4.37	354.63	59.69
E.G. Slope (ft/ft)	0.003844	Flow (cfs)	1.85	2752.86	45.29
Q Total (cfs)	2800.00	Top Width (ft)	10.45	53.43	60.69
Top Width (ft)	124.57	Avg. Vel. (ft/s)	0.42	7.76	0.76
Vel Total (ft/s)	6.69	Hydr. Depth (ft)	0.42	6.64	0.98
Max Chl Dpth (ft)	9.21	Conv. (cfs)	29.9	44398.6	730.4
Conv. Total (cfs)	45158.9	Wetted Per. (ft)	10.60	57.32	60.76
Length Wtd. (ft)	17.73	Shear (lb/sq ft)	0.10	1.48	0.24
Min Ch El (ft)	936.34	Stream Power (lb/ft s)	0.04	11.53	0.18
Alpha	1.32	Cum Volume (acre-ft)	17.65	17.25	8.90
Frctn Loss (ft)	0.05	Cum SA (acres)	5.81	2.42	4.58
C & E Loss (ft)	0.08				

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	947.12	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.75	Reach Len. (ft)	18.55	17.72	17.36
W.S. Elev (ft)	946.37	Flow Area (sq ft)	14.41	398.71	10.52
Crit W.S. (ft)		Area (sq ft)	14.41	398.71	10.52
E.G. Slope (ft/ft)	0.002679	Flow (cfs)	9.74	2780.98	9.28
Q Total (cfs)	2800.00	Top Width (ft)	12.45	53.78	3.92
Top Width (ft)	70.15	Avg. Vel. (ft/s)	0.68	6.98	0.88
Vel Total (ft/s)	6.61	Hydr. Depth (ft)	1.16	7.41	2.68
Max Chl Dpth (ft)	10.03	Conv. (cfs)	188.1	53730.2	179.3
Conv. Total (cfs)	54097.7	Wetted Per. (ft)	13.32	57.70	6.52
Length Wtd. (ft)	17.74	Shear (lb/sq ft)	0.18	1.16	0.27
Min Ch El (ft)	936.34	Stream Power (lb/ft s)	0.12	8.06	0.24
Alpha	1.11	Cum Volume (acre-ft)	11.44	19.99	1.51
Frctn Loss (ft)	0.04				

C & E Loss (ft)	0.05	Cum SA (acres)	2.93	2.43	0.42

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2650.675

INPUT
Description: 34
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	952.52	2.7	952.44	4	952.4	4.18	952.4	12.2	951.84
12.79	951.81	12.96	951.79	13.17	951.76	14.16	951.65	14.26	951.67
15.65	951.95	17.07	951.72	19.96	951.27	20.16	951.24	20.17	951.24
30.77	946.5	36.42	943.97	45.3	939.99	45.91	939.21	50.22	939.1
51.24	939.07	51.58	939.47	52.67	941.17	54.17	943.51	57.49	943.66
76.42	936.34	97.92	936.34	112.58	943.53	122.7	944.14	130.74	944.61
132.49	944.65	135.41	944.7	173.13	944.96	191.38	953.59		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	57.49	.04	112.58	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
57.49	112.58	124.24	112.8	97.76	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	57.49	943.66	F

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	946.33	Element			
Vel Head (ft)	0.65	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	945.68	Reach Len. (ft)	124.24	112.80	97.76
Crit W.S. (ft)	942.73	Flow Area (sq ft)	94.58	392.36	66.32
E.G. Slope (ft/ft)	0.002545	Area (sq ft)	94.58	392.36	66.32
Q Total (cfs)	2800.00	Flow (cfs)	130.31	2626.47	43.22
Top Width (ft)	142.04	Top Width (ft)	24.88	55.09	62.07
Vel Total (ft/s)	5.06	Avg. Vel. (ft/s)	1.38	6.69	0.65
Max Chl Dpth (ft)	9.34	Hydr. Depth (ft)	3.80	7.12	1.07
Conv. Total (cfs)	55499.2	Conv. (cfs)	2582.9	52059.6	856.6
Length Wtd. (ft)	113.75	Wetted Per. (ft)	28.88	58.12	62.26
Min Ch El (ft)	936.34	Shear (lb/sq ft)	0.52	1.07	0.17
Alpha	1.64	Stream Power (lb/ft s)	0.72	7.18	0.11
Frctn Loss (ft)	0.49	Cum Volume (acre-ft)	17.62	17.09	8.87
C & E Loss (ft)	0.09	Cum SA (acres)	5.81	2.40	4.56

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

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	947.02	Element			
Vel Head (ft)	0.57	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	946.45	Reach Len. (ft)	124.24	112.80	97.76
Crit W.S. (ft)	942.73	Flow Area (sq ft)	84.63	434.99	
E.G. Slope (ft/ft)	0.002019	Area (sq ft)	84.63	434.99	
Q Total (cfs)	2800.00	Flow (cfs)	111.30	2688.70	
Top Width (ft)	70.15	Top Width (ft)	15.06	55.09	
Vel Total (ft/s)	5.39	Avg. Vel. (ft/s)	1.32	6.18	
Max Chl Dpth (ft)	10.11	Hydr. Depth (ft)	5.62	7.90	
Conv. Total (cfs)	62313.2	Conv. (cfs)	2477.0	59836.2	
Length Wtd. (ft)	113.25	Wetted Per. (ft)	23.29	61.04	
Min Ch El (ft)	936.34	Shear (lb/sq ft)	0.46	0.90	
Alpha	1.27	Stream Power (lb/ft s)	0.60	5.55	
Frctn Loss (ft)	0.44	Cum Volume (acre-ft)	11.42	19.82	1.51
C & E Loss (ft)	0.16	Cum SA (acres)	2.92	2.41	0.42

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 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 cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid,

water surface was used.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2537.862

INPUT
Description: 35
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.57	1.68	951.52	5.06	951.33	7.62	951.19	10.6	951.03
11.7	950.9	11.87	950.88	12	950.91	12.29	950.97	12.64	951.03
13.02	951.11	13.52	951.21	14.36	951.15	17.81	950.89	18.02	950.79
24.82	947.51	36.7	941.84	42.07	939.73	44.05	938.98	47.25	938.91
55.82	938.83	58.75	939.7	59.89	940.18	64.72	942.21	74.58	942.62
86.01	942.94	86.62	942.94	105.3	943.01	110.95	943.14	112.96	941.41
119.14	935.6	126.05	935.54	137.81	935.66	139.43	939.26	143.82	943.94
147.5	944.04	163.97	943.74	166.25	943.69	175.41	944.27	205.66	948.76
230.07	953.39								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	110.95	.04	143.82	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
110.95 143.82 18.67 17.03 20.7 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
147.5	230.07	944.04	F

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	945.75	Element			
Vel Head (ft)	1.57	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	944.18	Reach Len. (ft)	18.67	17.03	20.70
Crit W.S. (ft)	943.74	Flow Area (sq ft)	192.25	221.47	8.39
E.G. Slope (ft/ft)	0.008734	Area (sq ft)	192.25	221.47	8.39
Q Total (cfs)	2800.00	Flow (cfs)	396.29	2399.57	4.14
Top Width (ft)	142.17	Top Width (ft)	79.15	32.87	30.15
Vel Total (ft/s)	6.63	Avg. Vel. (ft/s)	2.06	10.83	0.49
Max Chl Dpth (ft)	8.64	Hydr. Depth (ft)	2.43	6.74	0.28
Conv. Total (cfs)	29960.7	Conv. (cfs)	4240.4	25675.9	44.3
Length Wtd. (ft)	17.25	Wetted Per. (ft)	80.87	40.17	30.17
Min Ch El (ft)	935.54	Shear (lb/sq ft)	1.30	3.01	0.15
Alpha	2.30	Stream Power (lb/ft s)	2.67	32.57	0.07
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	17.22	16.30	8.79
C & E Loss (ft)	0.03	Cum SA (acres)	5.66	2.29	4.45

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

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	946.43	Element			
Vel Head (ft)	2.12	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	944.31	Reach Len. (ft)	18.67	17.03	20.70
Crit W.S. (ft)	944.05	Flow Area (sq ft)	68.71	225.63	2.20
E.G. Slope (ft/ft)	0.010312	Area (sq ft)	68.71	225.63	2.20
Q Total (cfs)	2800.00	Flow (cfs)	109.22	2689.56	1.22
Top Width (ft)	86.28	Top Width (ft)	46.23	32.87	7.18
Vel Total (ft/s)	9.44	Avg. Vel. (ft/s)	1.59	11.92	0.55
Max Chl Dpth (ft)	8.77	Hydr. Depth (ft)	1.49	6.86	0.31
Conv. Total (cfs)	27572.5	Conv. (cfs)	1075.6	26484.9	12.0
Length Wtd. (ft)	17.10	Wetted Per. (ft)	48.34	40.17	7.51
Min Ch El (ft)	935.54	Shear (lb/sq ft)	0.92	3.62	0.19
Alpha	1.53	Stream Power (lb/ft s)	1.45	43.11	0.10
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	11.20	18.97	1.51
C & E Loss (ft)	0.02	Cum SA (acres)	2.83	2.29	0.41

Warning: The cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2520.830

INPUT

Description: 36

Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.53	3.81	951.39	8.01	951.14	9.39	951.06	11.26	950.96
12.64	950.89	13.62	950.78	13.96	950.75	14.51	950.85	15.61	951.07
15.95	951.04	16.64	950.99	17.53	950.91	19.82	950.74	26.26	947.7
27.23	947.24	39.19	941.53	41.84	940.49	46.14	938.86	53.11	938.7
57.31	938.66	61.73	939.97	63.61	940.52	66.59	941.77	87.09	942.64
91.05	942.75	92.4	942.79	101.58	942.82	119.91	943.26	126.7	937.39
128.49	935.71	135.82	935.65	146.19	935.58	149.97	939.74	153.79	943.81
159.23	943.95	163.68	944.07	166.92	944.01	177.85	945.04	184.02	945.45
215.35	946.49	230.24	949.29						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	119.91	.04	153.79	.12

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

119.91 153.79 97.79 129.85 152.46 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	119.91	943	F

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	945.56	Element			
Vel Head (ft)	1.87	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	943.69	Reach Len. (ft)	97.79	129.85	152.46
Crit W.S. (ft)	943.69	Flow Area (sq ft)	173.26	208.07	
E.G. Slope (ft/ft)	0.011128	Area (sq ft)	173.26	208.07	
Q Total (cfs)	2800.00	Flow (cfs)	358.86	2441.14	
Top Width (ft)	119.00	Top Width (ft)	85.24	33.76	
Vel Total (ft/s)	7.34	Avg. Vel. (ft/s)	2.07	11.73	
Max Chl Dpth (ft)	8.11	Hydr. Depth (ft)	2.03	6.16	
Conv. Total (cfs)	26543.0	Conv. (cfs)	3401.9	23141.1	
Length Wtd. (ft)	126.10	Wetted Per. (ft)	86.77	40.16	
Min Ch El (ft)	935.58	Shear (lb/sq ft)	1.39	3.60	
Alpha	2.24	Stream Power (lb/ft s)	2.87	42.22	
Frctn Loss (ft)	0.76	Cum Volume (acre-ft)	17.14	16.21	8.79
C & E Loss (ft)	0.31	Cum SA (acres)	5.62	2.27	4.44

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 #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	946.23	Element			
Vel Head (ft)	2.29	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	943.94	Reach Len. (ft)	97.79	129.85	152.46
Crit W.S. (ft)	943.94	Flow Area (sq ft)	72.94	216.72	
E.G. Slope (ft/ft)	0.011871	Area (sq ft)	72.94	216.72	
Q Total (cfs)	2800.00	Flow (cfs)	114.87	2685.13	
Top Width (ft)	88.74	Top Width (ft)	54.86	33.88	
Vel Total (ft/s)	9.67	Avg. Vel. (ft/s)	1.57	12.39	
Max Chl Dpth (ft)	8.36	Hydr. Depth (ft)	1.33	6.40	
Conv. Total (cfs)	25699.0	Conv. (cfs)	1054.3	24644.8	
Length Wtd. (ft)	128.57	Wetted Per. (ft)	57.83	40.47	
Min Ch El (ft)	935.58	Shear (lb/sq ft)	0.93	3.97	
Alpha	1.58	Stream Power (lb/ft s)	1.47	49.18	
Frctn Loss (ft)	0.77	Cum Volume (acre-ft)	11.17	18.88	1.51
C & E Loss (ft)	0.41	Cum SA (acres)	2.81	2.28	0.41

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 cross section had to be extended vertically during the critical depth 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: Hope Creek
REACH: 1 RS: 2390.934

INPUT
Description: 37
Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.03	6.19	950.82	8.9	950.67	9.47	950.64	10.2	950.59
15.04	950.28	15.53	950.21	16	950.16	16.32	950.13	16.8	950.22
17.31	950.32	17.78	950.41	17.95	950.44	19.02	950.39	22.07	950.18
23.61	949.5	24.28	949.21	24.32	949.19	25.56	948.64	41.75	941.49
41.76	941.49	45.2	939.7	48.14	938.69	57.34	938.37	59.1	938.3
63.82	939.79	67.84	941.12	68.49	941.11	71.3	941.07	76.16	941.11
88.03	941.19	105.22	941.61	111.35	941.55	131.08	942.16	138.07	942.13
162.22	942.18	164.56	940.61	170.59	936.56	173.04	934.91	186.49	934.98
198.47	934.58	199.13	934.75	201.34	935.31	206.68	938.83	207.78	941.39
208.81	942.567	215.34	942.65	217	942.87	222.67	945.05	242.61	951.43

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	162.22	.04	208.81	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
162.22	208.81	38.36	36.6	36.24	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	26.75		F

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	944.03	Element			
Vel Head (ft)	0.83	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	943.20	Reach Len. (ft)	38.36	36.60	36.24
Crit W.S. (ft)		Flow Area (sq ft)	248.47	323.45	4.76
E.G. Slope (ft/ft)	0.003799	Area (sq ft)	248.47	323.45	4.76
Q Total (cfs)	2800.00	Flow (cfs)	298.55	2499.10	2.35
Top Width (ft)	179.99	Top Width (ft)	124.35	46.59	9.06
Vel Total (ft/s)	4.86	Avg. Vel. (ft/s)	1.20	7.73	0.49
Max Chl Dpth (ft)	8.62	Hydr. Depth (ft)	2.00	6.94	0.53
Conv. Total (cfs)	45427.3	Conv. (cfs)	4843.7	40545.5	38.2
Length Wtd. (ft)	36.75	Wetted Per. (ft)	125.78	52.18	9.13
Min Ch El (ft)	934.58	Shear (lb/sq ft)	0.47	1.47	0.12
Alpha	2.27	Stream Power (lb/ft s)	0.56	11.36	0.06
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	16.66	15.42	8.78
C & E Loss (ft)	0.09	Cum SA (acres)	5.39	2.15	4.43

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 #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	944.58	Element			
Vel Head (ft)	0.91	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	943.68	Reach Len. (ft)	38.36	36.60	36.24
Crit W.S. (ft)		Flow Area (sq ft)	104.53	345.54	
E.G. Slope (ft/ft)	0.003634	Area (sq ft)	104.53	345.54	
Q Total (cfs)	2800.00	Flow (cfs)	109.26	2690.74	
Top Width (ft)	107.50	Top Width (ft)	60.91	46.59	
Vel Total (ft/s)	6.22	Avg. Vel. (ft/s)	1.05	7.79	
Max Chl Dpth (ft)	9.10	Hydr. Depth (ft)	1.72	7.42	
Conv. Total (cfs)	46447.1	Conv. (cfs)	1812.5	44634.6	
Length Wtd. (ft)	36.66	Wetted Per. (ft)	63.08	53.29	
Min Ch El (ft)	934.58	Shear (lb/sq ft)	0.38	1.47	
Alpha	1.51	Stream Power (lb/ft s)	0.39	11.46	
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	10.97	18.04	1.51
C & E Loss (ft)	0.04	Cum SA (acres)	2.68	2.16	0.41

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: Hope Creek
REACH: 1 RS: 2354.325

INPUT
Description: 38
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	950.98	8.41	950.7	10.08	950.64	14.97	950.4	19.05	950.2
19.65	950.08	20.19	949.97	20.48	950.04	21.7	950.31	22.09	950.29
23.1	950.24	26.03	950.14	29.08	948.8	35.51	945.97	44.01	941.89
45.94	941.26	50.97	938.64	60.58	938.33	63.26	938.14	65.6	938.8
66.38	939.08	69.25	940.09	71.32	940.83	74.66	940.97	83.9	941.07
98.21	941.17	111.56	941.14	122.01	941.41	137.61	942.17	165.54	942.63
166.02	942.63	166.41	942.45	170.87	939.22	176.77	939.11	179.78	938.78
180.22	938.74	184.11	936.62	185.71	934.95	189.75	935.02	192.94	934.72
193.39	934.67	193.87	934.63	204.88	934.22	213.31	940.87	215.12	942.7
221	948.64	229.13	950.8						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	166.02	.04	215.12	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
166.02 215.12 95.4 91.3 65.8 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	166.02	941.7	F

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	943.71	Element			
Vel Head (ft)	1.77	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	941.94	Reach Len. (ft)	95.40	91.30	65.80
Crit W.S. (ft)	941.94	Flow Area (sq ft)	118.08	236.04	
E.G. Slope (ft/ft)	0.011841	Area (sq ft)	118.08	236.04	
Q Total (cfs)	2800.00	Flow (cfs)	190.41	2609.60	
Top Width (ft)	136.22	Top Width (ft)	88.96	47.25	
Vel Total (ft/s)	7.91	Avg. Vel. (ft/s)	1.61	11.06	
Max Chl Dpth (ft)	7.72	Hydr. Depth (ft)	1.33	5.00	
Conv. Total (cfs)	25731.0	Conv. (cfs)	1749.8	23981.2	
Length Wtd. (ft)	91.53	Wetted Per. (ft)	90.19	52.19	
Min Ch El (ft)	934.22	Shear (lb/sq ft)	0.97	3.34	
Alpha	1.82	Stream Power (lb/ft s)	1.56	36.97	
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	16.50	15.19	8.78
C & E Loss (ft)	0.36	Cum SA (acres)	5.29	2.11	4.42

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: 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 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 #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	944.35	Element			
Vel Head (ft)	1.35	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	943.00	Reach Len. (ft)	95.40	91.30	65.80
Crit W.S. (ft)	941.83	Flow Area (sq ft)	71.04	287.53	
E.G. Slope (ft/ft)	0.007132	Area (sq ft)	71.04	287.53	
Q Total (cfs)	2800.00	Flow (cfs)	78.38	2721.62	
Top Width (ft)	112.79	Top Width (ft)	63.69	49.10	
Vel Total (ft/s)	7.81	Avg. Vel. (ft/s)	1.10	9.47	
Max Chl Dpth (ft)	8.78	Hydr. Depth (ft)	1.12	5.86	
Conv. Total (cfs)	33156.4	Conv. (cfs)	928.1	32228.2	
Length Wtd. (ft)	91.41	Wetted Per. (ft)	65.56	54.86	
Min Ch El (ft)	934.22	Shear (lb/sq ft)	0.48	2.33	
Alpha	1.43	Stream Power (lb/ft s)	0.53	22.09	
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	10.89	17.78	1.51
C & E Loss (ft)	0.29	Cum SA (acres)	2.63	2.12	0.41

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

additional cross sections.
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 cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2262

INPUT
Description:
Station Elevation Data num= 56

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.62	5.15	951.49	8.22	951.42	12.97	951.25	21.09	950.97
22.98	950.92	27.51	950.8	33.65	950.65	42.91	950.41	45.1	950.35
46.46	950.32	54.63	949.91	55.29	949.88	55.59	949.87	55.63	949.86
55.67	949.86	55.76	949.85	57.19	949.76	57.25	949.78	57.29	949.79
58.53	950.08	58.59	950.08	58.87	950.06	62.48	949.79	67.87	947.07
83.07	939.46	87.32	938.02	88.88	937.59	96.84	937.77	99.16	937.77
102.35	938.43	111.84	940.02	118.56	940.41	130.35	941.09	134.76	941.25
141.69	941.42	164.65	941.97	168.26	941.86	184.57	941.35	186.95	939.71
187.38	939.51	192.66	937.02	193.03	937.02	193.94	937.01	197.79	936.98
203	935.44	205.45	933.97	214.56	934.01	214.74	934.01	214.8	934.01
224.23	933.98	225.89	934	226.62	934	242.37	933.99	250.9	940.29
260.27	950.25								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	184.57	.04	250.9	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
184.57	250.9	220.4	181.12	126.56	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	164.65	941	F

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	942.57	Element			
Vel Head (ft)	0.56	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	942.01	Reach Len. (ft)	220.40	181.12	126.56
Crit W.S. (ft)	939.08	Flow Area (sq ft)	160.09	435.92	1.40
E.G. Slope (ft/ft)	0.002385	Area (sq ft)	160.09	435.92	1.40
Q Total (cfs)	2800.00	Flow (cfs)	126.06	2673.35	0.60
Top Width (ft)	174.55	Top Width (ft)	106.60	66.33	1.62
Vel Total (ft/s)	4.69	Avg. Vel. (ft/s)	0.79	6.13	0.43
Max Chl Dpth (ft)	8.04	Hydr. Depth (ft)	1.50	6.57	0.86
Conv. Total (cfs)	57330.3	Conv. (cfs)	2581.0	54737.1	12.2
Length Wtd. (ft)	183.98	Wetted Per. (ft)	107.75	70.15	2.37
Min Ch El (ft)	933.97	Shear (lb/sq ft)	0.22	0.93	0.09
Alpha	1.64	Stream Power (lb/ft s)	0.17	5.68	0.04
Frctn Loss (ft)	0.46	Cum Volume (acre-ft)	16.20	14.48	8.78
C & E Loss (ft)	0.01	Cum SA (acres)	5.08	1.99	4.42

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

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	943.83	Element			
Vel Head (ft)	0.40	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	943.43	Reach Len. (ft)	220.40	181.12	126.56
Crit W.S. (ft)	939.07	Flow Area (sq ft)	113.30	529.63	
E.G. Slope (ft/ft)	0.001371	Area (sq ft)	113.30	529.63	
Q Total (cfs)	2800.00	Flow (cfs)	77.24	2722.76	
Top Width (ft)	126.12	Top Width (ft)	59.79	66.33	
Vel Total (ft/s)	4.36	Avg. Vel. (ft/s)	0.68	5.14	
Max Chl Dpth (ft)	9.46	Hydr. Depth (ft)	1.89	7.98	
Conv. Total (cfs)	75631.0	Conv. (cfs)	2086.4	73544.6	
Length Wtd. (ft)	182.94	Wetted Per. (ft)	62.48	73.28	
Min Ch El (ft)	933.97	Shear (lb/sq ft)	0.16	0.62	
Alpha	1.36	Stream Power (lb/ft s)	0.11	3.18	
Frctn Loss (ft)	0.26	Cum Volume (acre-ft)	10.69	16.92	1.51
C & E Loss (ft)	0.01	Cum SA (acres)	2.49	2.00	0.41

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

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2081.919

INPUT
Description: 39
Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	949.11	3.35	949.01	5.94	948.94	11.21	948.75	13.41	948.67
14.5	948.62	14.69	948.6	14.84	948.58	15.59	948.48	16.45	948.37
17.13	948.52	17.94	948.69	19.47	948.59	21.05	948.47	23.76	947.08
25.28	946.3	25.94	945.98	26.99	945.45	27.45	945.24	41.78	938.51
47.88	937.01	50.77	936.27	53.29	936.24	60.49	936.53	69.08	938.33
71.66	939.02	79.02	939.14	104.61	940.22	108.7	940.18	138.33	939.89
148.21	940.05	172.8	940.36	186.33	940.42	201.84	940.59	211.04	940.74
212.05	937.32	218.4	932.36	233.4	932.34	233.68	932.33	234.72	932.31
246.63	932.17	249.36	932.16	250.14	932.98	253.36	938.37	293.68	947.23
294.9	947.64								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	211.04	.04	253.36	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
211.04	253.36	293.59	431.27	483.25	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	942.10	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.68	Reach Len. (ft)	293.59	431.27	483.25
W.S. Elev (ft)	941.42	Flow Area (sq ft)	322.43	352.16	21.14
Crit W.S. (ft)		Area (sq ft)	322.43	352.16	21.14
E.G. Slope (ft/ft)	0.002652	Flow (cfs)	307.02	2475.41	17.57
Q Total (cfs)	2800.00	Top Width (ft)	175.45	42.32	13.87
Top Width (ft)	231.64	Avg. Vel. (ft/s)	0.95	7.03	0.83
Vel Total (ft/s)	4.02	Hydr. Depth (ft)	1.84	8.32	1.52
Max Chl Dpth (ft)	9.26	Conv. (cfs)	5962.2	48071.1	341.2
Conv. Total (cfs)	54374.5	Wetted Per. (ft)	176.69	50.00	14.20
Length Wtd. (ft)	395.01	Shear (lb/sq ft)	0.30	1.17	0.25
Min Ch El (ft)	932.16	Stream Power (lb/ft s)	0.29	8.20	0.20
Alpha	2.70	Cum Volume (acre-ft)	14.98	12.84	8.74
Frctn Loss (ft)	0.84	Cum SA (acres)	4.36	1.77	4.40
C & E Loss (ft)	0.12				

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	943.55	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.50	Reach Len. (ft)	293.59	431.27	483.25
W.S. Elev (ft)	943.05	Flow Area (sq ft)	255.49	421.26	43.28
Crit W.S. (ft)		Area (sq ft)	255.49	421.26	43.28
E.G. Slope (ft/ft)	0.001512	Flow (cfs)	238.80	2520.03	41.17
Q Total (cfs)	2800.00	Top Width (ft)	91.50	42.32	13.57
Top Width (ft)	147.39	Avg. Vel. (ft/s)	0.93	5.98	0.95
Vel Total (ft/s)	3.89	Hydr. Depth (ft)	2.79	9.95	3.19
Max Chl Dpth (ft)	10.89	Conv. (cfs)	6140.5	64799.1	1058.6
Conv. Total (cfs)	71998.2	Wetted Per. (ft)	94.48	50.00	15.59
Length Wtd. (ft)	400.48	Shear (lb/sq ft)	0.26	0.80	0.26
Min Ch El (ft)	932.16	Stream Power (lb/ft s)	0.24	4.76	0.25
Alpha	2.14	Cum Volume (acre-ft)	9.75	14.94	1.44
Frctn Loss (ft)	0.54	Cum SA (acres)	2.11	1.77	0.39
C & E Loss (ft)	0.08				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 1650

INPUT
Description:
Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	947.97	8.57	947.7	15.97	947.48	20.94	947.33	30.35	947.1
33.5	947.02	37.49	946.8	42.51	946.54	43.35	946.45	43.97	946.41
44.24	946.46	44.85	946.58	45.45	946.71	46.61	946.57	48.4	946.37
48.92	946.1	57.93	941.44	69.76	935.78	74.41	934.97	78.9	934.04
83.2	934.02	86.21	933.96	91.89	935.14	93.2	935.42	99.64	936.77
118.18	936.99	130.57	937.27	146.24	937.35	160.01	937.29	180.62	937.1

195.16	937.27	208.74	937.19	233.59	937.16	249.38	937.33	274.35	937.85
290.71	938.08	318.17	938.79	327.4	938.97	328.11	936.62	329.84	931.52
350.77	931.34	356.16	931.18	357.3	932.64	361.56	939.27	400.23	949.052

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	327.4	.04	361.56	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
327.4	361.56	172.21	158.59	117.87	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	941.14	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.28	Reach Len. (ft)	172.21	158.59	117.87
W.S. Elev (ft)	940.85	Flow Area (sq ft)	968.25	293.90	4.95
Crit W.S. (ft)		Area (sq ft)	968.25	293.90	4.95
E.G. Slope (ft/ft)	0.001750	Flow (cfs)	1175.42	1622.43	2.15
Q Total (cfs)	2800.00	Top Width (ft)	268.24	34.16	6.26
Top Width (ft)	308.66	Avg. Vel. (ft/s)	1.21	5.52	0.43
Vel Total (ft/s)	2.21	Hydr. Depth (ft)	3.61	8.60	0.79
Max Chl Dpth (ft)	9.67	Conv. (cfs)	28098.4	38784.2	51.4
Conv. Total (cfs)	66934.0	Wetted Per. (ft)	269.88	43.90	6.46
Length Wtd. (ft)	164.11	Shear (lb/sq ft)	0.39	0.73	0.08
Min Ch El (ft)	931.18	Stream Power (lb/ft s)	0.48	4.04	0.04
Alpha	3.74	Cum Volume (acre-ft)	10.63	9.65	8.60
Frctn Loss (ft)	0.31	Cum SA (acres)	2.87	1.39	4.29
C & E Loss (ft)	0.01				

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	942.94	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	0.25	Reach Len. (ft)	172.21	158.59	117.87
W.S. Elev (ft)	942.69	Flow Area (sq ft)	829.40	356.50	
Crit W.S. (ft)		Area (sq ft)	829.40	356.50	
E.G. Slope (ft/ft)	0.001210	Flow (cfs)	1029.10	1770.91	
Q Total (cfs)	2800.00	Top Width (ft)	164.25	34.16	
Top Width (ft)	198.41	Avg. Vel. (ft/s)	1.24	4.97	
Vel Total (ft/s)	2.36	Hydr. Depth (ft)	5.05	10.44	
Max Chl Dpth (ft)	11.51	Conv. (cfs)	29578.4	50899.6	
Conv. Total (cfs)	80478.0	Wetted Per. (ft)	169.70	47.31	
Length Wtd. (ft)	163.20	Shear (lb/sq ft)	0.37	0.57	
Min Ch El (ft)	931.18	Stream Power (lb/ft s)	0.46	2.83	
Alpha	2.90	Cum Volume (acre-ft)	6.10	11.09	1.20
Frctn Loss (ft)	0.22	Cum SA (acres)	1.25	1.40	0.31
C & E Loss (ft)	0.01				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 1492.060

INPUT
Description: 40
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	947.11	1.01	947.08	7.6	946.91	15.69	946.73	18.31	946.67
20.06	946.63	25.46	946.36	27.56	946.25	28.5	946.2	28.63	946.19
28.78	946.17	29.03	946.14	29.9	946.06	30.11	946.1	30.8	946.24
31.37	946.35	31.59	946.4	32.55	946.32	32.87	946.29	34.6	946.14
37.57	944.74	47.66	939.52	56.35	935.28	61.94	934.08	65.24	933.18
69.15	933.28	71.78	933.31	78.43	934.33	86.31	936.11	104.05	936.36
116.38	936.71	139.22	936.79	148.69	936.76	176.16	937.14	182.14	937.1
190.67	937.2	215.26	937.54	217.72	937.58	219.11	937.6	229.9	937.67
257.57	937.8	258.24	937.82	263.89	938.01	275.91	938.2	278.03	932.99
280.19	929.74	298.34	930.09	302.2	930.11	305.63	938.13	306.11	939.26
306.15	939.36	306.5	939.45	327.57	944.61	334.09	947.58		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	275.91	.04	306.11	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
275.91	306.11	383.24	408.33	377.92	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	940.83	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.35				

W.S. Elev (ft)	940.48	Reach Len. (ft)	383.24	408.33	377.92
Crit W.S. (ft)		Flow Area (sq ft)	844.57	284.54	2.59
E.G. Slope (ft/ft)	0.001979	Area (sq ft)	844.57	284.54	2.59
Q Total (cfs)	2800.00	Flow (cfs)	1101.51	1697.55	0.95
Top Width (ft)	264.90	Top Width (ft)	230.11	30.20	4.60
Vel Total (ft/s)	2.47	Avg. Vel. (ft/s)	1.30	5.97	0.37
Max Chl Dpth (ft)	10.74	Hydr. Depth (ft)	3.67	9.42	0.56
Conv. Total (cfs)	62934.1	Conv. (cfs)	24758.0	38154.8	21.3
Length Wtd. (ft)	400.49	Wetted Per. (ft)	231.86	41.49	4.80
Min Ch El (ft)	929.74	Shear (lb/sq ft)	0.45	0.85	0.07
Alpha	3.63	Stream Power (lb/ft s)	0.59	5.06	0.02
Frctn Loss (ft)	1.47	Cum Volume (acre-ft)	7.04	8.59	8.59
C & E Loss (ft)	0.12	Cum SA (acres)	1.88	1.27	4.27

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 #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	942.70	Element			
Vel Head (ft)	0.35	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	942.35	Reach Len. (ft)	383.24	408.33	377.92
Crit W.S. (ft)		Flow Area (sq ft)	634.52	341.02	
E.G. Slope (ft/ft)	0.001545	Area (sq ft)	634.52	341.02	
Q Total (cfs)	2800.00	Flow (cfs)	866.78	1933.22	
Top Width (ft)	159.56	Top Width (ft)	129.36	30.20	
Vel Total (ft/s)	2.87	Avg. Vel. (ft/s)	1.37	5.67	
Max Chl Dpth (ft)	12.61	Hydr. Depth (ft)	4.91	11.29	
Conv. Total (cfs)	71233.0	Conv. (cfs)	22051.3	49181.7	
Length Wtd. (ft)	403.97	Wetted Per. (ft)	134.96	44.58	
Min Ch El (ft)	929.74	Shear (lb/sq ft)	0.45	0.74	
Alpha	2.76	Stream Power (lb/ft s)	0.62	4.18	
Frctn Loss (ft)	1.17	Cum Volume (acre-ft)	3.21	9.82	1.20
C & E Loss (ft)	0.15	Cum SA (acres)	0.67	1.28	0.31

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: Hope Creek
REACH: 1 RS: 1084

INPUT
Description:
Station Elevation Data num= 78

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	945.77	6.53	945.57	8.72	945.51	16.09	945.25	21.62	945.07
23.39	945.02	26.38	944.93	34.11	944.72	37.58	944.63	46.83	944.39
53.05	943.99	54.98	943.87	55.18	943.86	55.43	943.84	56.41	943.76
57.64	944.01	58.03	944.09	58.45	944.06	60.29	943.95	60.98	943.9
61.87	943.86	63.74	942.23	70.08	937.9	77.53	935.1	80.47	934.2
83.94	932.99	87.76	931.67	88.37	931.65	97.89	931.8	98.61	932.06
105.54	934.29	105.82	934.48	107.48	935.19	108.69	935.84	122.78	944.89
123.54	944.91	140.5	943.47	143.22	943.24	151.87	942.5	152.11	942.48
153.69	941.64	158.76	938.95	163.27	931.15	165.26	927.83	171.38	927.95
179.7	928.36	180.1	928.97	184.02	934.85	185.26	936.47	190.08	936.81
200.52	937.5	205.47	937.81	234.77	937.49	239.69	937.23	252.04	935.07
255.74	934.97	266.1	935.92	281.92	936.14	285.32	937.32	298.44	936.84
314.41	936.61	318.92	936.96	319.24	937.17	331.15	937.25	343.81	938.19
348.75	938.37	354.27	938.82	368.05	939.02	372.86	939.09	376.25	939.13
389.22	939.15	401.38	940.22	439.05	942.05	442.12	942.33	451.19	944
454.27	944.78	460.3	945.41	467.41	946.72				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	158.76	.04	185.26	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
158.76	185.26	53.7	55.9	61.7	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	939.24	Element			
Vel Head (ft)	1.50	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	937.74	Reach Len. (ft)	53.70	55.90	61.70
Crit W.S. (ft)		Flow Area (sq ft)	161.46	198.07	137.89
E.G. Slope (ft/ft)	0.009018	Area (sq ft)	161.46	198.07	137.89
Q Total (cfs)	2800.00	Flow (cfs)	455.12	2186.85	158.03
Top Width (ft)	211.91	Top Width (ft)	41.14	25.80	144.97
Vel Total (ft/s)	5.63	Avg. Vel. (ft/s)	2.82	11.04	1.15
Max Chl Dpth (ft)	9.91	Hydr. Depth (ft)	3.92	7.68	0.95
Conv. Total (cfs)	29485.2	Conv. (cfs)	4792.6	23028.5	1664.1
Length Wtd. (ft)	56.13	Wetted Per. (ft)	43.51	35.77	145.56
Min Ch El (ft)	927.83	Shear (lb/sq ft)	2.09	3.12	0.53
Alpha	3.05	Stream Power (lb/ft s)	5.89	34.42	0.61
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	2.62	6.33	7.98
C & E Loss (ft)	0.14	Cum SA (acres)	0.69	1.01	3.63

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	941.38	Element			
Vel Head (ft)	1.84	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	939.55	Reach Len. (ft)	53.70	55.90	61.70
Crit W.S. (ft)		Flow Area (sq ft)		245.50	48.89
E.G. Slope (ft/ft)	0.007293	Area (sq ft)		245.50	48.89
Q Total (cfs)	2800.00	Flow (cfs)		2712.80	87.20
Top Width (ft)	47.03	Top Width (ft)		26.50	20.53
Vel Total (ft/s)	9.51	Avg. Vel. (ft/s)		11.05	1.78
Max Chl Dpth (ft)	11.72	Hydr. Depth (ft)		9.26	2.38
Conv. Total (cfs)	32787.5	Conv. (cfs)		31766.4	1021.1
Length Wtd. (ft)	56.13	Wetted Per. (ft)		37.76	22.31
Min Ch El (ft)	927.83	Shear (lb/sq ft)		2.96	1.00
Alpha	1.31	Stream Power (lb/ft s)		32.71	1.78
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)	0.41	7.08	0.99
C & E Loss (ft)	0.11	Cum SA (acres)	0.10	1.01	0.22

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 1027.831

INPUT
Description: 41
Station Elevation Data num= 78

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.64	.11	943.66	.26	943.69	.47	943.74	3.16	943.35
8.41	942.72	8.57	942.7	8.6	942.7	8.63	942.7	8.69	942.7
8.77	942.7	8.8	942.67	10.14	942.06	19.03	938.04	20.45	937.31
21.15	936.76	23.71	934.69	24.42	934.07	27.5	933.27	33.75	931.64
33.91	931.6	34.39	931.49	34.79	931.48	35.58	931.5	41.42	931.61
42.18	931.82	42.3	931.86	49.56	934.07	49.69	934.1	52.11	934.7
52.83	935.25	53.16	935.5	53.38	935.67	57.6	938.89	63.46	943.36
64.81	943.38	66.6	943.71	75.4	942.96	103.47	938.63	107.04	937.23
107.29	936.79	110.84	930.57	110.91	930.72	112.29	927.42	123.63	928.15
126.77	928.46	129.58	930.95	131.58	932.89	133.77	935	136.12	935.57
141.91	935.67	144.88	935.93	168.07	934.94	173.97	934.87	177.44	934.94
180.68	935.1	183.38	935.12	206.79	934.58	214.04	935.27	225.7	937.14
234.19	936.22	243.54	936.41	250.97	936.46	257.91	936.81	259.34	936.65
261.48	937.11	268.27	936.97	287.64	938.55	291.44	938.6	317.37	938.95
335.12	939.19	339.22	939.19	356.99	940.76	382.79	943.01	385.89	943.23
387.25	943.38	388.26	943.43	390.52	943.72				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	107.04	.04	136.12	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
107.04	136.12	76.72	78.07	78.34	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	938.68	Element			
Vel Head (ft)	1.04	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	937.63	Reach Len. (ft)	76.72	78.07	78.34
Crit W.S. (ft)		Flow Area (sq ft)	152.12	214.71	255.99
E.G. Slope (ft/ft)	0.006508	Area (sq ft)	152.12	214.71	255.99
Q Total (cfs)	2800.00	Flow (cfs)	375.00	2043.79	381.21

Top Width (ft)	206.49	Top Width (ft)	37.15	29.08	140.26
Vel Total (ft/s)	4.50	Avg. Vel. (ft/s)	2.47	9.52	1.49
Max Chl Dpth (ft)	10.21	Hydr. Depth (ft)	4.09	7.38	1.83
Conv. Total (cfs)	34708.9	Conv. (cfs)	4648.5	25334.9	4725.5
Length Wtd. (ft)	77.89	Wetted Per. (ft)	40.22	37.93	140.63
Min Ch El (ft)	927.42	Shear (lb/sq ft)	1.54	2.30	0.74
Alpha	3.33	Stream Power (lb/ft s)	3.79	21.89	1.10
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	2.43	6.07	7.70
C & E Loss (ft)	0.09	Cum SA (acres)	0.64	0.98	3.42

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100 YR FW

E.G. Elev (ft)	940.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.48	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	939.44	Reach Len. (ft)	76.72	78.07	78.34
Crit W.S. (ft)		Flow Area (sq ft)		267.17	66.91
E.G. Slope (ft/ft)	0.005768	Area (sq ft)		267.17	66.91
Q Total (cfs)	2800.00	Flow (cfs)		2667.40	132.60
Top Width (ft)	47.03	Top Width (ft)		29.08	17.95
Vel Total (ft/s)	8.38	Avg. Vel. (ft/s)		9.98	1.98
Max Chl Dpth (ft)	12.02	Hydr. Depth (ft)		9.19	3.73
Conv. Total (cfs)	36868.1	Conv. (cfs)		35122.1	1746.0
Length Wtd. (ft)	78.06	Wetted Per. (ft)		40.13	21.87
Min Ch El (ft)	927.42	Shear (lb/sq ft)		2.40	1.10
Alpha	1.35	Stream Power (lb/ft s)		23.93	2.18
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)	0.41	6.75	0.91
C & E Loss (ft)	0.11	Cum SA (acres)	0.10	0.98	0.19

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 949.7572

INPUT
Description: 42
Station Elevation Data num= 101

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.79	1	943.76	5.16	943.66	8.7	943.48	12.91	943.23
13.26	943.23	13.55	943.2	13.92	943.17	14.75	943.09	15.36	943.21
16.27	943.41	18.16	943.24	20.55	943.08	26.6	940.19	28.03	939.5
29.65	938.73	34.6	936.52	35.78	935.8	38.74	933.98	39.11	933.76
41.67	933.23	49.84	931.54	51.38	931.5	58.31	931.32	66.73	933.85
67.61	934.12	69.32	934.16	71.76	934.21	86.6	933.94	86.82	933.94
86.85	933.94	104.1	933.96	104.52	933.45	105.52	932.83	110.64	929.65
115.12	926.86	121.54	926.93	127.95	926.93	131.57	931.93	132.62	933.46
133.76	933.42	135.15	933.49	150.91	934.25	174.08	935.44	175.6	935.45
177.91	935.79	197.28	935.53	215.59	935.97	216.91	936.01	218.12	936.06
228.46	936.33	231.16	936.23	233.14	936.15	240.03	935.92	247.58	936.52
254.49	936.95	261.34	937.02	267.28	937.63	267.72	937.68	268.03	937.68
268.29	937.69	268.42	937.69	268.63	937.69	272.47	937.76	273.62	937.79
317.79	938.07	322.25	938.15	344.92	938.59	356.38	938.81	360.75	938.9
366.67	939.01	371.41	939.32	371.47	939.45	371.6	939.7	371.71	939.91
371.84	939.91	372.29	939.94	375.27	940.02	386.37	940.98	386.77	940.98
386.87	940.97	387.07	940.53	387.12	940.41	394.7	940.52	394.76	940.52
394.79	940.52	394.93	940.52	395.94	940.56	396.62	940.6	400.62	940.81
405.48	941.1	405.49	941.13	405.72	941.51	405.75	941.51	406.22	941.51
406.51	941.51	411.8	942.01	412.47	942.37	415.9	942.45	418.57	942.52
424.64	943.1								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	104.1	.04	132.62	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
104.1	132.62	69.19	71.66	70.51	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	21.33		F

CROSS SECTION OUTPUT Profile #100 YR

E.G. Elev (ft)	938.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.74	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	937.49	Reach Len. (ft)	69.19	71.66	70.51
Crit W.S. (ft)		Flow Area (sq ft)	285.72	249.23	255.61
E.G. Slope (ft/ft)	0.003322	Area (sq ft)	285.72	249.23	255.61
Q Total (cfs)	2800.00	Flow (cfs)	505.05	2013.60	281.36

Top Width (ft)	233.49	Top Width (ft)	71.67	28.52	133.29
Vel Total (ft/s)	3.54	Avg. Vel. (ft/s)	1.77	8.08	1.10
Max Chl Dpth (ft)	10.63	Hydr. Depth (ft)	3.99	8.74	1.92
Conv. Total (cfs)	48579.6	Conv. (cfs)	8762.5	34935.7	4881.5
Length Wtd. (ft)	71.19	Wetted Per. (ft)	73.30	34.00	133.45
Min Ch El (ft)	926.86	Shear (lb/sq ft)	0.81	1.52	0.40
Alpha	3.80	Stream Power (lb/ft s)	1.43	12.28	0.44
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	2.04	5.65	7.24
C & E Loss (ft)	0.13	Cum SA (acres)	0.55	0.92	3.18

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 #100 YR FW

E.G. Elev (ft)	940.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.11	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	939.38	Reach Len. (ft)	69.19	71.66	70.51
Crit W.S. (ft)		Flow Area (sq ft)	50.15	303.03	53.52
E.G. Slope (ft/ft)	0.002972	Area (sq ft)	50.15	303.03	53.52
Q Total (cfs)	2800.00	Flow (cfs)	76.81	2638.19	85.00
Top Width (ft)	47.03	Top Width (ft)	9.25	28.52	9.26
Vel Total (ft/s)	6.88	Avg. Vel. (ft/s)	1.53	8.71	1.59
Max Chl Dpth (ft)	12.52	Hydr. Depth (ft)	5.42	10.63	5.78
Conv. Total (cfs)	51358.4	Conv. (cfs)	1408.8	48390.4	1559.2
Length Wtd. (ft)	71.60	Wetted Per. (ft)	14.68	34.00	14.83
Min Ch El (ft)	926.86	Shear (lb/sq ft)	0.63	1.65	0.67
Alpha	1.51	Stream Power (lb/ft s)	0.97	14.40	1.06
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.37	6.24	0.80
C & E Loss (ft)	0.19	Cum SA (acres)	0.09	0.92	0.17

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: Hope Creek
REACH: 1 RS: 878.1000

INPUT
Description: 43
Station Elevation Data num= 79

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.4	4.62	943.27	12.24	942.85	13.31	942.79	14.12	942.73
14.71	942.68	15.15	942.76	16.29	942.99	18.76	942.58	19.41	942.47
19.52	942.46	19.72	942.51	19.97	942.47	22.77	941.14	26.12	939.56
30.92	937.28	33.11	936.24	35.42	935.49	37.97	934.62	41.46	933.43
44.51	932.73	51.56	931.08	56.54	930.66	57.07	930.61	59.4	931.43
63.04	933.05	64.33	933.1	65.33	933.15	67.44	930.19	69.77	926.96
78.74	927	89.85	926.71	97.65	926.93	98.25	927.28	106.61	932.18
108.09	933.66	119.52	933.66	124.63	933.55	125.69	932.83	131.34	930.43
144.19	930.77	157.15	930.94	160.97	932.4	165.06	933.66	165.68	933.94
165.79	933.97	174.11	934.07	174.39	934.08	181.48	934.3	181.53	934.3
181.95	934.31	196.47	934.26	196.85	934.27	200.03	934.36	213.22	934.59
219.4	934.83	226.87	934.97	231.24	935.18	246.06	935.99	247.45	936.14
248.28	936.23	248.84	936.24	259.76	936.54	281.28	936.87	295.4	937.26
295.55	937.26	295.62	937.26	306.15	937.47	307.19	937.49	307.21	937.49
307.24	937.49	327.79	938.51	333.23	938.62	333.32	938.62	333.5	938.62
339.82	938.76	347.5	939.48	382.45	942.32	384.11	942.43		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	65.33	.04	108.09	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
65.33	108.09	18.27	18.76	20.13	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
300	384.11		F

CROSS SECTION OUTPUT Profile #100 YR

E.G. Elev (ft)	937.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	937.68	Reach Len. (ft)	18.27	18.76	20.13
Crit W.S. (ft)		Flow Area (sq ft)	163.95	414.60	622.19
E.G. Slope (ft/ft)	0.001032	Area (sq ft)	163.95	414.60	624.41

Q Total (cfs)	2800.00	Flow (cfs)	176.58	2083.64	539.78
Top Width (ft)	280.94	Top Width (ft)	35.25	42.76	202.93
Vel Total (ft/s)	2.33	Avg. Vel. (ft/s)	1.08	5.03	0.87
Max Chl Dpth (ft)	10.97	Hydr. Depth (ft)	4.65	9.70	3.24
Conv. Total (cfs)	87149.2	Conv. (cfs)	5495.9	64852.9	16800.5
Length Wtd. (ft)	19.01	Wetted Per. (ft)	36.81	47.98	193.22
Min Ch El (ft)	926.71	Shear (lb/sq ft)	0.29	0.56	0.21
Alpha	3.50	Stream Power (lb/ft s)	0.31	2.80	0.18
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	1.68	5.10	6.53
C & E Loss (ft)	0.00	Cum SA (acres)	0.46	0.87	2.91

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	940.17	Wt. n-Val.		0.040	0.120
Vel Head (ft)	0.47	Reach Len. (ft)	18.27	18.76	20.13
W.S. Elev (ft)	939.70	Flow Area (sq ft)		500.89	25.77
Crit W.S. (ft)		Area (sq ft)		500.89	25.77
E.G. Slope (ft/ft)	0.001160	Flow (cfs)		2779.97	20.03
Q Total (cfs)	2800.00	Top Width (ft)		42.76	4.27
Top Width (ft)	47.03	Avg. Vel. (ft/s)		5.55	0.78
Vel Total (ft/s)	5.32	Hydr. Depth (ft)		11.71	6.04
Max Chl Dpth (ft)	12.99	Conv. (cfs)		81611.6	588.0
Conv. Total (cfs)	82199.6	Wetted Per. (ft)		54.53	10.31
Length Wtd. (ft)	18.78	Shear (lb/sq ft)		0.67	0.18
Min Ch El (ft)	926.71	Stream Power (lb/ft s)		3.69	0.14
Alpha	1.08	Cum Volume (acre-ft)	0.33	5.57	0.74
Frctn Loss (ft)	0.03	Cum SA (acres)	0.08	0.87	0.16
C & E Loss (ft)	0.01				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 859.3424

INPUT
Description: 44
Station Elevation Data num= 87

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.41	.75	943.39	8.78	943.16	16.47	942.73	17.59	942.66
17.89	942.64	18.96	942.54	19.36	942.61	19.82	942.7	20.56	942.84
21.51	942.7	22.04	942.63	22.72	942.53	24.27	942.34	28.56	940.3
37.18	936.24	42.05	934.65	45.51	933.56	47.73	933.04	50.65	932.34
55.86	931	59.41	930.79	61.27	930.62	65.35	932.15	67.41	933.01
67.55	933.07	67.67	933.12	68.71	932.94	70.18	932.77	70.85	931.04
76.45	926.88	90.47	926.97	97.43	927.06	100.48	929.02	108.35	933.25
115.62	933.37	118.97	933.37	121.95	931.29	123.63	930.3	127.08	930.49
136.35	930.27	138.36	930.22	144.5	930.28	146.07	930.87	147.83	931.37
154.58	933.5	156.91	932.77	157.16	932.69	166.32	933.67	166.43	933.67
172.14	933.75	177.28	933.56	186.03	933.78	189.81	933.66	191.49	933.6
194.87	933.42	201.39	933.89	205.36	934.05	211.79	934.38	213.69	934.47
220.86	934.83	223.53	935.11	232.87	935.51	236.51	935.73	245.35	935.94
247.96	936.01	258	936.3	258.09	936.3	258.14	936.3	260.1	936.33
268.67	936.56	270.38	936.57	285.85	936.82	305.53	937.12	306.54	937.15
306.56	937.15	307.32	937.16	307.4	937.16	333.26	938.45	333.47	938.46
333.48	938.46	333.73	938.46	334.71	938.55	349.59	939.43	372.72	940.92
382.06	941.37	387.77	942.2						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	67.67	.04	108.35	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
67.67	108.35	123.89	123.81	123.48	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	937.95	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.33	Reach Len. (ft)	123.89	123.81	123.48
W.S. Elev (ft)	937.62	Flow Area (sq ft)	153.36	367.95	651.98
Crit W.S. (ft)		Area (sq ft)	153.36	367.95	651.98
E.G. Slope (ft/ft)	0.001294	Flow (cfs)	183.16	1998.54	618.29
Q Total (cfs)	2800.00	Top Width (ft)	33.41	40.68	208.19
Top Width (ft)	282.28	Avg. Vel. (ft/s)	1.19	5.43	0.95
Vel Total (ft/s)	2.39	Hydr. Depth (ft)	4.59	9.04	3.13
Max Chl Dpth (ft)	10.74	Conv. (cfs)	5091.2	55551.2	17186.0
Conv. Total (cfs)	77828.3	Wetted Per. (ft)	34.94	44.91	209.91
Length Wtd. (ft)	123.74	Shear (lb/sq ft)	0.35	0.66	0.25
Min Ch El (ft)	926.88	Stream Power (lb/ft s)	0.42	3.60	0.24
Alpha	3.75				

Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	1.62	4.94	6.23
C & E Loss (ft)	0.01	Cum SA (acres)	0.45	0.85	2.81

CROSS SECTION OUTPUT Profile #100 YR FW

E.G. Elev (ft)	940.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.58	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	939.55	Reach Len. (ft)	123.89	123.81	123.48
Crit W.S. (ft)		Flow Area (sq ft)		446.67	39.68
E.G. Slope (ft/ft)	0.001544	Area (sq ft)		446.67	39.68
Q Total (cfs)	2800.00	Flow (cfs)		2758.40	41.60
Top Width (ft)	47.03	Top Width (ft)		40.68	6.35
Vel Total (ft/s)	5.76	Avg. Vel. (ft/s)		6.18	1.05
Max Chl Dpth (ft)	12.67	Hydr. Depth (ft)		10.98	6.25
Conv. Total (cfs)	71249.4	Conv. (cfs)		70190.8	1058.6
Length Wtd. (ft)	123.80	Wetted Per. (ft)		51.34	12.55
Min Ch El (ft)	926.88	Shear (lb/sq ft)		0.84	0.30
Alpha	1.13	Stream Power (lb/ft s)		5.18	0.32
Frctn Loss (ft)	0.26	Cum Volume (acre-ft)	0.33	5.37	0.72
C & E Loss (ft)	0.05	Cum SA (acres)	0.08	0.85	0.16

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: Hope Creek
REACH: 1 RS: 735.5340

INPUT
Description: 45
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.13	3.78	943.02	6.78	942.93	10.3	942.83	14.96	942.68
19.33	942.54	20.22	942.5	25.75	942.23	28.02	942.11	29.17	942.05
32.12	941.84	32.54	941.81	35.07	941.66	42.67	936.74	43.14	936.42
43.68	936.08	44.17	935.95	44.64	935.84	54.3	933.46	62.22	931.26
64.32	930.68	65.85	930.65	72.51	930.55	75.8	931.43	77.21	931.81
79.99	932.56	82.41	933.21	85.18	933.45	90.62	933.36	92.4	929.94
95.39	926.37	100.59	926.47	104.21	926.54	111.26	926.59	114.02	928.4
118.04	932.88	131.84	932.51	139.52	932.02	154.34	932	156.27	932
157.55	932.01	170.29	932.22	171.44	932.26	174.81	932.59	188.36	933.24
193.73	934.12	194.83	934.17	199.73	934.24	201.97	934.27	207.25	934.44
209.03	934.5	212.65	934.97	220.18	934.66	228.85	934.72	235.85	935.06
245.79	934.97	255.94	935.08	268.99	935.77	274.38	935.81	287.92	935.59
291.34	935.62	306	935.64	314.36	935.69	320.46	935.84	325.38	936.59
326.25	936.27	329.92	936.78	334.99	937.33	337.92	937.79	349.59	939.43
372.72	940.92	382.06	941.37	387.77	942.2				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	90.62	.04	118.04	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
90.62	118.04	19.18	19.15	18.15	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
266	387.77		F

CROSS SECTION OUTPUT Profile #100 YR

E.G. Elev (ft)	937.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.43	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	937.30	Reach Len. (ft)	19.18	19.15	18.15
Crit W.S. (ft)		Flow Area (sq ft)	221.29	262.68	544.39
E.G. Slope (ft/ft)	0.002055	Area (sq ft)	221.29	262.68	642.78
Q Total (cfs)	2800.00	Flow (cfs)	333.71	1738.71	727.58
Top Width (ft)	292.95	Top Width (ft)	48.82	27.42	216.71
Vel Total (ft/s)	2.72	Avg. Vel. (ft/s)	1.51	6.62	1.34
Max Chl Dpth (ft)	10.93	Hydr. Depth (ft)	4.53	9.58	3.68
Conv. Total (cfs)	61773.1	Conv. (cfs)	7362.2	38359.2	16051.8
Length Wtd. (ft)	18.93	Wetted Per. (ft)	50.25	33.70	148.15
Min Ch El (ft)	926.37	Shear (lb/sq ft)	0.56	1.00	0.47
Alpha	3.77	Stream Power (lb/ft s)	0.85	6.62	0.63
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	1.08	4.04	4.40
C & E Loss (ft)	0.03	Cum SA (acres)	0.33	0.75	2.21

CROSS SECTION OUTPUT Profile #100 YR FW

E.G. Elev (ft)	939.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.09	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	938.74	Reach Len. (ft)	19.18	19.15	18.15
Crit W.S. (ft)		Flow Area (sq ft)	29.03	302.08	85.74
E.G. Slope (ft/ft)	0.002913	Area (sq ft)	29.03	302.08	85.74
Q Total (cfs)	2800.00	Flow (cfs)	37.66	2613.25	149.09
Top Width (ft)	47.03	Top Width (ft)	5.44	27.42	14.17
Vel Total (ft/s)	6.72	Avg. Vel. (ft/s)	1.30	8.65	1.74
Max Chl Dpth (ft)	12.37	Hydr. Depth (ft)	5.34	11.02	6.05
Conv. Total (cfs)	51878.4	Conv. (cfs)	697.7	48418.3	2762.4
Length Wtd. (ft)	19.10	Wetted Per. (ft)	10.73	33.70	20.43
Min Ch El (ft)	926.37	Shear (lb/sq ft)	0.49	1.63	0.76
Alpha	1.55	Stream Power (lb/ft s)	0.64	14.10	1.33
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.29	4.31	0.54
C & E Loss (ft)	0.02	Cum SA (acres)	0.08	0.75	0.13

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 716.3877

INPUT
Description: 46
Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.22	.67	943.2	3.63	943.11	12.92	942.84	23.8	942.52
25.43	942.46	31.56	942.19	32.74	942.13	35.68	942.01	37.39	941.88
40.89	941.61	41.23	941.59	41.33	941.58	41.39	941.57	41.49	941.51
50.2	935.92	60.57	933.2	60.72	933.16	69.81	930.64	69.89	930.59
78.25	930.41	78.54	930.4	78.75	930.55	88.68	933.22	98.57	933.05
99.37	933.11	102.75	927.07	103.13	926.38	103.28	926.18	116.97	926.46
118.4	926.47	118.91	926.88	124.26	932.85	124.52	932.86	138.12	931.94
138.33	931.88	139.89	931.87	143.44	931.9	157.74	932.15	162.63	932
171.95	932.04	179.1	932.19	180.24	932.2	180.65	932.23	181.58	932.33
191.38	933.33	194.71	933.96	198.87	934.53	200.85	935.39	204.37	936.28
211.1	936.47	217.68	936.47	227.54	936.55	245.88	936.7	251.73	936.8
257.2	936.93	290.84	937.32	295.8	937.44	303.59	937.23	328.94	937.49
340.6	937.6	349.59	939.43	372.72	940.92	382.06	941.37	387.77	942.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	99.37	.04	124.26	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
99.37	124.26	125.31	121.03	115.29	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

E.G. Elev (ft)	937.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.69	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	936.97	Reach Len. (ft)	125.31	121.03	115.29
Crit W.S. (ft)		Flow Area (sq ft)	222.12	232.94	369.14
E.G. Slope (ft/ft)	0.003302	Area (sq ft)	222.12	232.94	369.14
Q Total (cfs)	2800.00	Flow (cfs)	414.77	1877.24	507.99
Top Width (ft)	212.45	Top Width (ft)	50.81	24.89	136.75
Vel Total (ft/s)	3.40	Avg. Vel. (ft/s)	1.87	8.06	1.38
Max Chl Dpth (ft)	10.79	Hydr. Depth (ft)	4.37	9.36	2.70
Conv. Total (cfs)	48728.3	Conv. (cfs)	7218.3	32669.5	8840.5
Length Wtd. (ft)	120.47	Wetted Per. (ft)	52.24	31.75	137.24
Min Ch El (ft)	926.18	Shear (lb/sq ft)	0.88	1.51	0.55
Alpha	3.85	Stream Power (lb/ft s)	1.64	12.19	0.76
Frctn Loss (ft)	0.45	Cum Volume (acre-ft)	0.99	3.93	4.19
C & E Loss (ft)	0.00	Cum SA (acres)	0.31	0.74	2.13

CROSS SECTION OUTPUT Profile #100 YR FW

E.G. Elev (ft)	939.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.30	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	938.44	Reach Len. (ft)	125.31	121.03	115.29
Crit W.S. (ft)		Flow Area (sq ft)	56.76	269.43	68.13
E.G. Slope (ft/ft)	0.003814	Area (sq ft)	56.76	269.43	68.13
Q Total (cfs)	2800.00	Flow (cfs)	101.31	2571.27	127.41
Top Width (ft)	47.03	Top Width (ft)	10.69	24.89	11.45
Vel Total (ft/s)	7.10	Avg. Vel. (ft/s)	1.79	9.54	1.87
Max Chl Dpth (ft)	12.26	Hydr. Depth (ft)	5.31	10.82	5.95
Conv. Total (cfs)	45341.0	Conv. (cfs)	1640.6	41637.2	2063.3
Length Wtd. (ft)	120.96	Wetted Per. (ft)	15.91	31.75	17.81
Min Ch El (ft)	926.18	Shear (lb/sq ft)	0.85	2.02	0.91

Alpha	1.66	Stream Power (lb/ft s)	1.52	19.28	1.70
Frctn Loss (ft)	0.60	Cum Volume (acre-ft)	0.27	4.18	0.51
C & E Loss (ft)	0.05	Cum SA (acres)	0.07	0.74	0.12

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: Hope Creek
REACH: 1 RS: 595.3610

INPUT
Description: 47
Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.8	.77	942.77	1.12	942.76	2.3	942.73	7.21	942.58
13.68	942.39	22.93	942.08	24.77	942.02	25.54	941.99	26.29	941.97
27.24	941.93	28.08	941.89	36.97	941.57	37.46	941.51	40.91	941.11
42.36	940.94	43.18	940.41	44.85	939.44	48.64	937.23	52.91	934.96
56.22	934.19	59.46	933.38	66.6	931.6	72.13	931.26	79.64	930.78
79.72	930.78	84.85	932.25	89.41	933.47	96.06	933.11	101.51	932.85
104.53	929.7	106.62	925.62	112.06	925.86	119.56	925.94	119.63	925.11
122.86	929.24	124.63	933.39	148.93	933.11	154.12	932.86	162.6	932.6
162.78	932.55	162.94	932.58	166.87	932.84	172.93	933.19	178.29	933.5
180.2	933.57	180.27	933.57	184.4	933.69	184.58	933.69	184.9	933.69
185.08	933.33	185.18	933.13	187.42	933.22	187.57	933.22	193.36	933.3
193.62	933.31	214.05	933.63	224.63	933.75	235.64	933.87	243.84	933.93
244.01	934.3	244.09	934.49	244.42	934.49	244.6	934.49	248.9	935.97
248.98	936	249.15	936.06	251.69	936.78	268.31	936.84	329.37	936.99
331.51	937.15	336.63	937.53	337.53	937.69	340.82	938.05	344	938.11
377.28	938.97	402.25	939.31	432.98	940	460.5	940.46	486.66	940.8
518.87	941.14	523.17	941.21	530.38	941.44	559.58	942.39		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	101.51	.04	124.63	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
101.51	124.63	18.02	17.77	17.42	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	937.21	Element			
Vel Head (ft)	0.71	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	936.50	Reach Len. (ft)	18.02	17.77	17.42
Crit W.S. (ft)		Flow Area (sq ft)	198.43	212.38	381.19
E.G. Slope (ft/ft)	0.004173	Area (sq ft)	198.43	212.38	381.19
Q Total (cfs)	2800.00	Flow (cfs)	384.16	1781.97	633.87
Top Width (ft)	200.69	Top Width (ft)	51.50	23.12	126.08
Vel Total (ft/s)	3.54	Avg. Vel. (ft/s)	1.94	8.39	1.66
Max Chl Dpth (ft)	11.39	Hydr. Depth (ft)	3.85	9.19	3.02
Conv. Total (cfs)	43346.1	Conv. (cfs)	5947.1	27586.3	9812.7
Length Wtd. (ft)	17.73	Wetted Per. (ft)	52.70	32.48	127.17
Min Ch El (ft)	925.11	Shear (lb/sq ft)	0.98	1.70	0.78
Alpha	3.68	Stream Power (lb/ft s)	1.90	14.29	1.30
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	0.38	3.31	3.19
C & E Loss (ft)	0.01	Cum SA (acres)	0.16	0.67	1.79

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	939.08	Element			
Vel Head (ft)	1.85	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	937.24	Reach Len. (ft)	18.02	17.77	17.42
Crit W.S. (ft)		Flow Area (sq ft)	49.44	229.38	46.23
E.G. Slope (ft/ft)	0.006845	Area (sq ft)	49.44	229.38	46.23
Q Total (cfs)	2800.00	Flow (cfs)	108.00	2595.08	96.92
Top Width (ft)	47.03	Top Width (ft)	12.10	23.12	11.81
Vel Total (ft/s)	8.61	Avg. Vel. (ft/s)	2.18	11.31	2.10
Max Chl Dpth (ft)	12.13	Hydr. Depth (ft)	4.09	9.92	3.91
Conv. Total (cfs)	33842.3	Conv. (cfs)	1305.3	31365.5	1171.5
Length Wtd. (ft)	17.77	Wetted Per. (ft)	15.88	32.48	15.79
Min Ch El (ft)	925.11	Shear (lb/sq ft)	1.33	3.02	1.25
Alpha	1.60	Stream Power (lb/ft s)	2.91	34.14	2.62
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.12	3.49	0.36
C & E Loss (ft)	0.02	Cum SA (acres)	0.04	0.67	0.09

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 577.5895

INPUT
Description: 48
Station Elevation Data num= 81

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.67	2.79	942.59	11.49	942.34	12.62	942.3	18.49	942.1
24.12	941.92	31.12	941.61	35.04	941.46	37.07	941.25	39.14	941.03
40.25	940.9	42.82	939.5	43.99	938.86	47.93	936.6	52.12	934.96
59.22	932.95	64.68	931.59	66.32	931.49	77.61	930.78	77.69	930.8
79.18	931.22	87.24	933.4	89.57	933.27	99.42	932.79	104.88	927.12
105.63	925.63	115.48	926.07	118.16	926.1	119.43	926.07	122.56	933.39
144.26	933.15	148.05	933.1	159.02	932.97	160.14	932.99	162.73	933.06
169.9	933.25	173.85	933.32	174.28	933.38	175.37	933.41	177.77	933.58
178.47	933.63	180.69	933.75	180.93	933.75	181.04	933.75	181.2	933.75
181.26	933.57	181.4	933.22	190.75	933.29	190.95	933.29	191.43	933.29
191.64	933.29	195.55	933.36	210.54	933.61	214.3	933.66	238.14	933.92
238.86	933.92	240.41	933.93	240.44	934	240.66	934.5	241.14	934.5
241.17	934.5	241.42	934.54	241.61	934.57	242	934.64	242.36	934.78
249.42	936.78	306.93	936.99	330.2	937.05	333.01	937.25	334.16	937.46
340.82	938.05	344	938.11	377.28	938.97	402.25	939.31	432.98	940
460.5	940.46	486.66	940.8	518.87	941.14	523.17	941.21	530.38	941.44
559.58	942.39								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	99.42	.04	122.56	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
99.42	122.56	27	24	22	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	937.12	Element			
Vel Head (ft)	0.85	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	936.27	Reach Len. (ft)	27.00	24.00	22.00
Crit W.S. (ft)		Flow Area (sq ft)	185.19	205.26	345.10
E.G. Slope (ft/ft)	0.004795	Area (sq ft)	185.19	205.26	345.10
Q Total (cfs)	2800.00	Flow (cfs)	371.59	1849.40	579.01
Top Width (ft)	198.85	Top Width (ft)	50.65	23.14	125.06
Vel Total (ft/s)	3.81	Avg. Vel. (ft/s)	2.01	9.01	1.68
Max Chl Dpth (ft)	10.64	Hydr. Depth (ft)	3.66	8.87	2.76
Conv. Total (cfs)	40436.4	Conv. (cfs)	5366.3	26708.3	8361.8
Length Wtd. (ft)	24.00	Wetted Per. (ft)	51.73	31.31	126.07
Min Ch El (ft)	925.63	Shear (lb/sq ft)	1.07	1.96	0.82
Alpha	3.78	Stream Power (lb/ft s)	2.15	17.68	1.37
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	0.30	3.23	3.05
C & E Loss (ft)	0.02	Cum SA (acres)	0.14	0.66	1.74

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	938.93	Element			
Vel Head (ft)	2.05	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	936.88	Reach Len. (ft)	27.00	24.00	22.00
Crit W.S. (ft)		Flow Area (sq ft)	46.19	219.36	41.63
E.G. Slope (ft/ft)	0.007649	Area (sq ft)	46.19	219.36	41.63
Q Total (cfs)	2800.00	Flow (cfs)	102.80	2609.45	87.75
Top Width (ft)	47.03	Top Width (ft)	12.18	23.14	11.71
Vel Total (ft/s)	9.12	Avg. Vel. (ft/s)	2.23	11.90	2.11
Max Chl Dpth (ft)	11.25	Hydr. Depth (ft)	3.79	9.48	3.56
Conv. Total (cfs)	32014.6	Conv. (cfs)	1175.4	29835.8	1003.3
Length Wtd. (ft)	24.05	Wetted Per. (ft)	15.68	31.31	15.33
Min Ch El (ft)	925.63	Shear (lb/sq ft)	1.41	3.35	1.30
Alpha	1.59	Stream Power (lb/ft s)	3.13	39.80	2.73
Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	0.10	3.40	0.34
C & E Loss (ft)	0.08	Cum SA (acres)	0.03	0.66	0.09

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 553

INPUT
Description:
Station Elevation Data num= 85

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

0	943.21	2.4	943.12	6.36	942.98	13.48	942.79	19.11	942.64
22.44	942.54	31.48	942.28	33.25	942.21	44.05	941.88	48.99	941.65
55.18	941.34	56.78	941.17	58.79	940.99	60.66	940.82	62.2	939.91
72.86	935.45	74.1	934.97	75.9	934.46	77.96	933.86	86.02	931.51
93.37	931.04	97.35	930.89	100.07	931.83	106.56	933.56	110.67	933.3
119.1	932.89	123.55	927.81	124.88	925.33	131.29	925.53	139.83	926.12
142.45	931.2	142.73	931.18	143.98	933.31	163.33	933.44	178.73	933.42
197.98	933.36	203.22	933.34	225.79	933.68	226.8	933.69	226.94	933.69
227.11	933.69	244.72	933.87	254.26	933.92	256.72	933.94	256.77	934.05
256.97	934.5	257.07	934.5	257.47	934.5	259.03	934.87	259.23	934.92
259.64	935.01	263.5	935.73	267.34	936.78	269.11	936.78	276.34	936.48
303.15	936.45	348.71	936.47	352.44	936.66	376.44	936.68	377.37	936.68
377.43	936.68	383.04	936.67	386.76	936.55	387.41	936.52	388.31	936.5
389.32	936.48	390.19	936.48	390.86	936.48	397.94	936.4	410.57	936.44
410.71	936.43	411	936.41	411.9	936.35	411.98	936.53	412.16	936.97
412.44	936.97	412.51	936.97	412.66	936.97	421.59	937.53	425.35	937.77
425.46	937.78	425.67	937.79	455.16	938.95	474.04	939.27	488.61	939.39

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	119.1	.04	143.98	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
119.1	143.98	95.41	94	90.84	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	106.56	933.56	F
267.34	488.61	936.78	F

CROSS SECTION OUTPUT Profile #100 YR

E.G. Elev (ft)	936.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.05	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	935.93	Reach Len. (ft)	95.41	94.00	90.84
Crit W.S. (ft)	935.16	Flow Area (sq ft)	154.92	215.96	276.53
E.G. Slope (ft/ft)	0.005380	Area (sq ft)	154.92	215.96	276.53
Q Total (cfs)	2800.00	Flow (cfs)	305.20	2058.52	436.29
Top Width (ft)	192.54	Top Width (ft)	47.40	24.88	120.27
Vel Total (ft/s)	4.32	Avg. Vel. (ft/s)	1.97	9.53	1.58
Max Chl Dpth (ft)	10.60	Hydr. Depth (ft)	3.27	8.68	2.30
Conv. Total (cfs)	38173.0	Conv. (cfs)	4160.8	28064.2	5948.0
Length Wtd. (ft)	93.56	Wetted Per. (ft)	48.50	33.01	120.79
Min Ch El (ft)	925.33	Shear (lb/sq ft)	1.07	2.20	0.77
Alpha	3.61	Stream Power (lb/ft s)	2.11	20.95	1.21
Frctn Loss (ft)	0.65	Cum Volume (acre-ft)	0.20	3.11	2.89
C & E Loss (ft)	0.06	Cum SA (acres)	0.11	0.65	1.67

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 OUTPUT Profile #100 YR FW

E.G. Elev (ft)	938.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.78	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	936.90	Reach Len. (ft)	95.41	94.00	90.84
Crit W.S. (ft)	934.88	Flow Area (sq ft)	46.38	240.07	34.22
E.G. Slope (ft/ft)	0.006238	Area (sq ft)	46.38	240.07	34.22
Q Total (cfs)	2800.00	Flow (cfs)	92.58	2644.07	63.35
Top Width (ft)	47.03	Top Width (ft)	12.54	24.88	9.61
Vel Total (ft/s)	8.73	Avg. Vel. (ft/s)	2.00	11.01	1.85
Max Chl Dpth (ft)	11.57	Hydr. Depth (ft)	3.70	9.65	3.56
Conv. Total (cfs)	35452.8	Conv. (cfs)	1172.3	33478.4	802.1
Length Wtd. (ft)	93.89	Wetted Per. (ft)	15.90	33.01	13.14
Min Ch El (ft)	925.33	Shear (lb/sq ft)	1.14	2.83	1.01
Alpha	1.51	Stream Power (lb/ft s)	2.27	31.19	1.88
Frctn Loss (ft)	0.56	Cum Volume (acre-ft)	0.07	3.27	0.32
C & E Loss (ft)	0.09	Cum SA (acres)	0.03	0.65	0.08

Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 459.5899

INPUT
Description: 49
Station Elevation Data num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.04	6	941.89	8.93	941.82	15.34	941.67	21.48	941.52
26.59	941.3	32.67	941.04	33.89	940.94	39.92	940.63	78.79	937.03
89.54	935.58	92.61	935.24	96.73	934.77	99.98	932.13	101.87	927.67
102.96	925.06	110.59	925.16	113.71	925.32	113.97	925.32	118.8	925.57
122.68	929.97	125.04	931.97	162.19	932.73	163.5	932.72	168.1	931.01
171.56	930.73	175.66	930.99	177.87	932.06	180.07	932.04	192.5	931.76
198.2	931.75	203.57	932.23	210.31	932.81	214.9	933.24	217.65	933.51
223.36	934.07	224.57	934.15	228.71	934.44	229.09	934.46	229.28	934.48
231.3	934.63	231.71	934.63	232.08	934.63	247.46	934.45	250.39	934.42
260.6	934.46	260.79	934.73	261	935.03	261.16	935.04	261.37	935.04
261.82	935.05	270.31	935.39	282.06	935.49	283.48	935.51	290.77	935.6
299.06	935.69	312.31	935.83	321.87	936.05	323.66	936.09	324.11	936.1
324.14	936.1	324.15	936.1	324.39	936.14	324.4	936.14	324.71	936.19
324.74	936.19	326.12	936.43	340	938				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	96.73	.04	125.04	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
96.73	125.04	18.06	18.05	18.28	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
232.08	340	934.66	F

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	936.28	Element			
Vel Head (ft)	1.66	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	934.62	Reach Len. (ft)	18.06	18.05	18.28
Crit W.S. (ft)	934.31	Flow Area (sq ft)		205.41	236.16
E.G. Slope (ft/ft)	0.009235	Area (sq ft)		205.41	239.70
Q Total (cfs)	2800.00	Flow (cfs)		2323.03	476.97
Top Width (ft)	161.74	Top Width (ft)		28.12	133.62
Vel Total (ft/s)	6.34	Avg. Vel. (ft/s)		11.31	2.02
Max Chl Dpth (ft)	9.56	Hydr. Depth (ft)		7.30	2.23
Conv. Total (cfs)	29136.6	Conv. (cfs)		24173.2	4963.3
Length Wtd. (ft)	18.10	Wetted Per. (ft)		36.43	106.80
Min Ch El (ft)	925.06	Shear (lb/sq ft)		3.25	1.27
Alpha	2.66	Stream Power (lb/ft s)		36.77	2.57
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.03	2.66	2.35
C & E Loss (ft)	0.19	Cum SA (acres)	0.06	0.59	1.41

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.

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	938.03	Element			
Vel Head (ft)	1.48	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	936.56	Reach Len. (ft)	18.06	18.05	18.28
Crit W.S. (ft)	934.20	Flow Area (sq ft)		260.29	82.27
E.G. Slope (ft/ft)	0.005732	Area (sq ft)		260.29	82.27
Q Total (cfs)	2800.00	Flow (cfs)		2619.24	180.76
Top Width (ft)	47.03	Top Width (ft)		28.31	18.72
Vel Total (ft/s)	8.17	Avg. Vel. (ft/s)		10.06	2.20
Max Chl Dpth (ft)	11.50	Hydr. Depth (ft)		9.19	4.39
Conv. Total (cfs)	36984.6	Conv. (cfs)		34597.0	2387.6
Length Wtd. (ft)	18.06	Wetted Per. (ft)		38.46	22.93
Min Ch El (ft)	925.06	Shear (lb/sq ft)		2.42	1.28
Alpha	1.42	Stream Power (lb/ft s)		24.37	2.82
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.02	2.73	0.20
C & E Loss (ft)	0.01	Cum SA (acres)	0.01	0.59	0.05

Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 441.5446

INPUT

Description: 50

Station Elevation Data num= 96

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.02	2.57	941.95	10.59	941.74	11.79	941.71	18.84	941.55
24.3	941.42	29.99	941.19	34.56	940.99	35.53	940.95	39.81	940.76
43.46	940.55	79.09	938.34	86.59	937.32	91.15	936.71	92.6	936.52
98.5	935.72	99.23	935.64	104.05	931.72	105.43	930.61	105.78	929.78
107.4	925.9	107.84	924.84	108.02	924.84	123.15	925.61	124.93	927.63
129.52	931.52	146.93	931.87	161.86	931.81	165.26	932.06	170.98	932.19
172.77	932.6	173.12	932.43	173.71	932.1	175.63	931.07	176.84	930.43
177.92	929.73	178.07	929.72	180.27	929.51	182.71	929.66	183.27	929.93
187.29	931.85	194.07	931.77	195.69	931.76	196.88	931.74	201.24	931.57
210.59	931.44	227.05	931.69	228.34	931.74	229.31	931.73	231.72	932.1
240.48	933.36	251.36	934.25	252.06	934.3	256.1	934.6	257.74	934.72
258.09	934.75	258.25	934.77	259.27	934.85	259.8	934.85	260.05	934.86
273.79	934.8	273.91	934.81	276.44	934.92	284.32	935.02	284.49	935.02
284.84	935.02	289.35	935	289.6	935.35	289.74	935.57	290.02	935.57
290.53	935.57	296.36	935.65	301.96	935.71	302.48	935.71	307.44	935.77
311.85	935.82	326.28	936.01	330.22	936.11	340.59	936.11	348.75	936.32
348.82	936.32	361.55	936.4	361.58	936.4	361.74	936.41	361.81	936.41
361.98	936.41	373.41	936.64	373.79	936.65	374.29	936.65	375.15	936.66
378.05	936.68	380.6	936.7	382.93	936.72	385.16	936.73	387.38	936.74
387.97	936.74								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	99.23	.04	129.52	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
99.23	129.52	122.28	116.67	109.21	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
237	387.97		F

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	935.95	Wt. n-Val.		0.040	0.120
Vel Head (ft)	1.02	Reach Len. (ft)	122.28	116.67	109.21
W.S. Elev (ft)	934.93	Flow Area (sq ft)		216.84	355.94
Crit W.S. (ft)		Area (sq ft)		216.84	379.10
E.G. Slope (ft/ft)	0.006110	Flow (cfs)		2041.20	758.80
Q Total (cfs)	2800.00	Top Width (ft)		29.41	147.53
Top Width (ft)	176.94	Avg. Vel. (ft/s)		9.41	2.13
Vel Total (ft/s)	4.89	Hydr. Depth (ft)		7.37	3.31
Max Chl Dpth (ft)	10.09	Conv. (cfs)		26114.0	9707.7
Conv. Total (cfs)	35821.8	Wetted Per. (ft)		37.15	108.89
Length Wtd. (ft)	114.71	Shear (lb/sq ft)		2.23	1.25
Min Ch El (ft)	924.84	Stream Power (lb/ft s)		20.96	2.66
Alpha	2.75	Cum Volume (acre-ft)	0.03	2.57	2.22
Frctn Loss (ft)	0.93	Cum SA (acres)	0.06	0.58	1.35
C & E Loss (ft)	0.06				

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

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	937.92	Wt. n-Val.		0.040	0.120
Vel Head (ft)	1.44	Reach Len. (ft)	122.28	116.67	109.21
W.S. Elev (ft)	936.48	Flow Area (sq ft)		263.53	80.21
Crit W.S. (ft)		Area (sq ft)		263.53	80.21
E.G. Slope (ft/ft)	0.005629	Flow (cfs)		2620.02	179.98
Q Total (cfs)	2800.00	Top Width (ft)		30.29	16.74
Top Width (ft)	47.03	Avg. Vel. (ft/s)		9.94	2.24
Vel Total (ft/s)	8.15	Hydr. Depth (ft)		8.70	4.79
Max Chl Dpth (ft)	11.64	Conv. (cfs)		34920.9	2398.8
Conv. Total (cfs)	37319.7	Wetted Per. (ft)		39.11	21.37
Length Wtd. (ft)	116.30	Shear (lb/sq ft)		2.37	1.32
Min Ch El (ft)	924.84	Stream Power (lb/ft s)		23.54	2.96
Alpha	1.40	Cum Volume (acre-ft)	0.02	2.62	0.17
Frctn Loss (ft)	0.98	Cum SA (acres)	0.01	0.58	0.04
C & E Loss (ft)	0.15				

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: Hope Creek
REACH: 1 RS: 324.8710

INPUT
Description: 51
Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	941.99	3.04	941.9	10.67	941.67	19.8	941.44	23.34	941.34
25.09	941.3	35.5	940.99	43.83	940.76	47.91	940.66	57.91	940.24
59.16	940.19	60.58	940.18	66.71	940.17	74.73	939.87	94.55	939.79
102.5	937.82	103.29	937.61	117.83	934.16	121.6	933.79	125.43	932.15
127.9	931.09	134.64	928.98	138.5	924.9	147.78	924.63	154.52	929.76
155.65	930.58	156.97	930.74	165.65	930.74	186.81	931	194.51	930.91
197.26	930.82	218.13	930.34	221.67	930.73	224.45	931.33	227.69	929.63
228.26	928.77	231.6	928.83	232.18	928.84	234.6	928.96	235.55	929.77
237.23	930.43	239.4	931.19	264.08	930.55	264.8	930.53	266.87	930.51
275.43	930.72	284.3	930.93	285.4	930.99	305.92	931.62	306.95	931.63
307.82	931.8	315.89	932.88	316.36	932.92	317.36	932.96	325.11	933.38
329.89	933.5	339.85	933.8	341.24	933.83	347.01	934.23	356.66	934.88
357.61	934.96	358.56	935.05	358.67	935.06	358.73	935.06	363.29	935.52

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	127.9	.04	156.97	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
127.9 156.97 17.95 17.59 16.66 .1 .3
Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
265	363.29		F

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	934.95	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	1.66	Reach Len. (ft)	17.95	17.59	16.66
W.S. Elev (ft)	933.29	Flow Area (sq ft)	5.65	173.67	287.06
Crit W.S. (ft)	933.29	Area (sq ft)	5.65	173.67	392.65
E.G. Slope (ft/ft)	0.011350	Flow (cfs)	7.50	2072.83	719.67
Q Total (cfs)	2800.00	Top Width (ft)	5.13	29.07	166.50
Top Width (ft)	200.70	Avg. Vel. (ft/s)	1.33	11.94	2.51
Vel Total (ft/s)	6.00	Hydr. Depth (ft)	1.10	5.97	2.66
Max Chl Dpth (ft)	8.66	Conv. (cfs)	70.4	19456.7	6755.2
Conv. Total (cfs)	26282.3	Wetted Per. (ft)	5.59	33.16	109.57
Length Wtd. (ft)		Shear (lb/sq ft)	0.72	3.71	1.86
Min Ch El (ft)	924.63	Stream Power (lb/ft s)	0.95	44.29	4.65
Alpha	2.97	Cum Volume (acre-ft)	0.02	2.05	1.26
Frctn Loss (ft)		Cum SA (acres)	0.05	0.50	0.96
C & E Loss (ft)					

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.

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	936.80	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	2.92	Reach Len. (ft)	17.95	17.59	16.66
W.S. Elev (ft)	933.87	Flow Area (sq ft)	8.44	190.53	40.96
Crit W.S. (ft)	933.87	Area (sq ft)	8.44	190.53	40.96
E.G. Slope (ft/ft)	0.013865	Flow (cfs)	15.49	2673.66	110.85
Q Total (cfs)	2800.00	Top Width (ft)	4.84	29.07	13.12
Top Width (ft)	47.03	Avg. Vel. (ft/s)	1.84	14.03	2.71
Vel Total (ft/s)	11.67	Hydr. Depth (ft)	1.74	6.55	3.12
Max Chl Dpth (ft)	9.24	Conv. (cfs)	131.5	22706.5	941.4
Conv. Total (cfs)	23779.5	Wetted Per. (ft)	5.97	33.16	16.20
Length Wtd. (ft)	17.57	Shear (lb/sq ft)	1.22	4.97	2.19
Min Ch El (ft)	924.63	Stream Power (lb/ft s)	2.24	69.79	5.92
Alpha	1.38	Cum Volume (acre-ft)	0.01	2.01	0.02
Frctn Loss (ft)	0.25	Cum SA (acres)	0.01	0.50	0.01
C & E Loss (ft)	0.10				

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there

is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 307.2792

INPUT
Description: 52
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.07	1.47	942.03	5.01	941.93	11.36	941.75	17.13	941.58
22.31	941.44	29.82	941.23	30.96	941.2	39.58	940.95	41.95	940.88
52.06	940.6	53.36	940.57	54.33	940.54	55.1	940.51	55.32	940.5
59.1	940.34	65.43	940.06	67.87	939.93	80.28	939.47	97.61	938.56
109.76	935.55	113.7	934.72	120.36	933.16	123.71	932.84	128.91	932.33
131.93	931.04	141.99	925.13	152.79	924.63	153.13	924.88	153.55	925.18
159.79	929.7	160.17	929.97	169.36	931.07	176.83	931.07	201.66	930.81
227.48	930.36	228.31	930.34	228.37	930.34	232.22	931.17	236.69	928.84
236.78	928.7	242.07	928.79	242.18	928.79	242.66	928.81	242.85	928.97
246.07	930.24	247.92	930.97	250.37	930.88	252.55	930.83	281.31	930.51
287.78	930.67	303.38	930.89	306.21	930.93	307.84	930.99	317.55	931.4
327.01	931.74	334.72	932.58	337.13	932.65	347.07	932.93	350.64	933.16
353.8	933.32	359.37	933.59	363.76	933.83	365.53	933.95	369.18	934.26
376.76	934.84	379.4	935.04	383.7	935.41	386.23	935.63	386.51	935.64

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	128.91	.04	169.36	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
128.91 169.36 125.45 106.5 91.3 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
281	386.51		F

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	934.54	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	1.02	Reach Len. (ft)	125.45	106.50	91.30
W.S. Elev (ft)	933.52	Flow Area (sq ft)	6.87	226.94	327.75
Crit W.S. (ft)		Area (sq ft)	6.87	226.94	465.79
E.G. Slope (ft/ft)	0.007009	Flow (cfs)	5.48	2102.79	691.73
Q Total (cfs)	2800.00	Top Width (ft)	10.08	40.45	188.54
Top Width (ft)	239.07	Avg. Vel. (ft/s)	0.80	9.27	2.11
Vel Total (ft/s)	4.99	Hydr. Depth (ft)	0.68	5.61	2.94
Max Chl Dpth (ft)	8.89	Conv. (cfs)	65.5	25117.4	8262.5
Conv. Total (cfs)	33445.4	Wetted Per. (ft)	10.16	44.13	112.83
Length Wtd. (ft)	104.09	Shear (lb/sq ft)	0.30	2.25	1.27
Min Ch El (ft)	924.63	Stream Power (lb/ft s)	0.24	20.85	2.68
Alpha	2.64	Cum Volume (acre-ft)	0.02	1.97	1.09
Frctn Loss (ft)	0.91	Cum SA (acres)	0.05	0.49	0.89
C & E Loss (ft)	0.07				

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 OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	935.81	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	2.58	Reach Len. (ft)	125.45	106.50	91.30
W.S. Elev (ft)	933.23	Flow Area (sq ft)	2.44	215.44	7.12
Crit W.S. (ft)	933.23	Area (sq ft)	2.44	215.44	7.12
E.G. Slope (ft/ft)	0.014617	Flow (cfs)	2.69	2784.58	12.73
Q Total (cfs)	2800.00	Top Width (ft)	3.29	40.45	3.29
Top Width (ft)	47.03	Avg. Vel. (ft/s)	1.10	12.93	1.79
Vel Total (ft/s)	12.44	Hydr. Depth (ft)	0.74	5.33	2.16
Max Chl Dpth (ft)	8.60	Conv. (cfs)	22.2	23031.7	105.3
Conv. Total (cfs)	23159.2	Wetted Per. (ft)	3.89	44.13	5.45
Length Wtd. (ft)	106.47	Shear (lb/sq ft)	0.57	4.46	1.19
Min Ch El (ft)	924.63	Stream Power (lb/ft s)	0.63	57.58	2.13
Alpha	1.07	Cum Volume (acre-ft)	0.00	1.93	0.01
Frctn Loss (ft)	1.59	Cum SA (acres)	0.00	0.49	0.00
C & E Loss (ft)	0.07				

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The cross section had to be extended vertically during the critical depth 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: Hope Creek
REACH: 1 RS: 200.7906

INPUT
Description: 53
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	940.82	3.68	940.71	6.23	940.64	8.91	940.57	13.51	940.45
18.78	940.31	27.5	940.06	30.84	939.98	34.35	939.87	37.16	939.79
43.56	939.6	48.35	939.4	54.12	939.15	63.12	938.33	68.38	937.88
93.35	933.59	99.54	932.77	104.36	932.32	109.58	931.82	113.35	931.73
121.96	931.63	130.5	931.44	135.54	929.12	146.37	925.36	149.82	924.99
165.46	924.92	166.69	924.6	176.09	930.77	176.22	930.86	176.87	931.26
178.33	931.31	184.24	931.37	191.89	931.3	207.99	930.36	234.49	930.85
236.49	931.18	242.42	932.01	251.94	929.4	254.2	928.96	262.71	928.67
264.66	928.73	268.78	930.12	272.34	931.16	284.42	930.75	285.45	930.73
307.43	930.12	311.92	929.96	315.13	930.06	337.63	930.5	346.55	930.65
347.42	930.67	347.67	930.66	348.24	930.66	360.75	930.78	370.77	930.96
375.96	931.23	378.68	931.13	379.9	931.13	386.05	931.23	387.76	931.29
390.4	931.32	397.39	931.61	407.88	931.77	409.47	931.86	418.29	932.46
424.54	932.95	427.39	933.09	440.16	934.12	441.03	934.29	448.03	934.92
451.94	935.08	452.63	935.1	456.19	935.65				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	130.5	.04	178.33	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
130.5 178.33 16.52 15.76 15.52 .1 .3
Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
272.34	456.19		F

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	933.55	Element			
Vel Head (ft)	1.74	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	931.81	Reach Len. (ft)	16.52	15.76	15.52
Crit W.S. (ft)	931.81	Flow Area (sq ft)	3.61	236.15	119.24
E.G. Slope (ft/ft)	0.011340	Area (sq ft)	3.61	236.15	261.40
Q Total (cfs)	2800.00	Flow (cfs)	1.49	2594.58	203.93
Top Width (ft)	296.45	Top Width (ft)	20.51	47.83	228.11
Vel Total (ft/s)	7.80	Avg. Vel. (ft/s)	0.41	10.99	1.71
Max Chl Dpth (ft)	7.21	Hydr. Depth (ft)	0.18	4.94	1.30
Conv. Total (cfs)	26293.8	Conv. (cfs)	14.0	24364.8	1915.0
Length Wtd. (ft)	15.75	Wetted Per. (ft)	20.52	51.02	92.71
Min Ch El (ft)	924.60	Shear (lb/sq ft)	0.12	3.28	0.91
Alpha	1.84	Stream Power (lb/ft s)	0.05	36.00	1.56
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.00	1.40	0.33
C & E Loss (ft)	0.02	Cum SA (acres)	0.00	0.38	0.45

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: 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 #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	933.98	Element			
Vel Head (ft)	2.36	Wt. n-Val.		0.040	
W.S. Elev (ft)	931.62	Reach Len. (ft)	16.52	15.76	15.52
Crit W.S. (ft)	931.62	Flow Area (sq ft)		227.21	
E.G. Slope (ft/ft)	0.015216	Area (sq ft)		227.21	
Q Total (cfs)	2800.00	Flow (cfs)		2800.00	
Top Width (ft)	47.83	Top Width (ft)		47.83	
Vel Total (ft/s)	12.32	Avg. Vel. (ft/s)		12.32	
Max Chl Dpth (ft)	7.02	Hydr. Depth (ft)		4.75	
Conv. Total (cfs)	22699.1	Conv. (cfs)		22699.1	
Length Wtd. (ft)	15.76	Wetted Per. (ft)		51.52	
Min Ch El (ft)	924.60	Shear (lb/sq ft)		4.19	
Alpha	1.00	Stream Power (lb/ft s)		51.63	

Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	1.39
C & E Loss (ft)	0.02	Cum SA (acres)	0.38

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 185.0263

INPUT
Description: 54
Station Elevation Data num= 90

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	940.9	.23	940.89	4.79	940.75	12.43	940.54	19.61	940.33
24.97	940.18	28.01	940.1	37.1	939.87	46.81	939.57	49.79	939.48
54.76	939.27	60.03	939.05	62.74	938.8	74.73	937.76	101.6	932.71
106.32	932.08	107.47	931.97	124.1	931.54	134.46	931.42	139.14	930.34
142.76	928.76	145.19	928.18	148.08	927.48	164.97	924.66	165.64	924.46
168.13	924.43	181	924.31	181.54	925.82	184.27	929	186.31	931.36
191.21	931.72	193.53	931.75	220.16	931.48	228.64	930.98	242.69	931.24
246.95	931.93	249.99	930.58	251.61	930.2	257.54	928.82	259.05	928.74
266.32	928.71	270.08	928.64	270.46	928.84	271.16	929.07	273.91	930.17
277.06	931.05	278.85	930.84	284.22	930.81	296.25	930.4	302.44	930.26
315.31	929.9	328.78	929.94	339.43	930.15	351.48	930.13	361.37	930.36
372.01	930.6	377.94	930.67	381.65	930.81	386.53	930.84	391.74	930.93
396.69	930.93	399.56	930.9	404.99	930.97	407.46	931.14	409.66	931.22
410.64	931.23	411.34	931.28	418.16	931.31	427.92	931.6	434.01	931.74
437.77	931.92	449.6	932.25	453.05	932.43	459.98	932.57	463.01	932.75
463.56	932.78	464.29	932.92	469.22	934.56	469.42	934.62	469.43	934.62
469.46	934.63	469.8	934.65	476.37	935.06	476.91	935.11	477.32	935.16
480.63	935.18	481.34	935.33	481.48	935.36	481.55	935.37	484.57	935.92

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	134.46	.04	193.53	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
134.46	193.53	137.52	156.8	137.84	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
277.06	484.57		F

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	933.15	Element			
Vel Head (ft)	1.97	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	931.18	Reach Len. (ft)	137.52	156.80	137.84
Crit W.S. (ft)	931.18	Flow Area (sq ft)		234.31	52.31
E.G. Slope (ft/ft)	0.013848	Area (sq ft)		234.31	150.54
Q Total (cfs)	2800.00	Flow (cfs)		2691.92	108.08
Top Width (ft)	224.37	Top Width (ft)		50.63	173.73
Vel Total (ft/s)	9.77	Avg. Vel. (ft/s)		11.49	2.07
Max Chl Dpth (ft)	6.87	Hydr. Depth (ft)		4.63	1.24
Conv. Total (cfs)	23793.6	Conv. (cfs)		22875.1	918.4
Length Wtd. (ft)	156.43	Wetted Per. (ft)		55.00	43.10
Min Ch El (ft)	924.31	Shear (lb/sq ft)		3.68	1.05
Alpha	1.33	Stream Power (lb/ft s)		42.32	2.17
Frctn Loss (ft)	1.57	Cum Volume (acre-ft)		1.31	0.26
C & E Loss (ft)	0.36	Cum SA (acres)		0.36	0.38

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 #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	933.39	Element			
Vel Head (ft)	2.29	Wt. n-Val.		0.040	
W.S. Elev (ft)	931.10	Reach Len. (ft)	137.52	156.80	137.84
Crit W.S. (ft)	931.10	Flow Area (sq ft)		230.46	
E.G. Slope (ft/ft)	0.015664	Area (sq ft)		230.46	
Q Total (cfs)	2800.00	Flow (cfs)		2800.00	
Top Width (ft)	50.24	Top Width (ft)		50.24	
Vel Total (ft/s)	12.15	Avg. Vel. (ft/s)		12.15	
Max Chl Dpth (ft)	6.79	Hydr. Depth (ft)		4.59	
Conv. Total (cfs)	22372.0	Conv. (cfs)		22372.0	
Length Wtd. (ft)	156.80	Wetted Per. (ft)		54.56	
Min Ch El (ft)	924.31	Shear (lb/sq ft)		4.13	
Alpha	1.00	Stream Power (lb/ft s)		50.19	
Frctn Loss (ft)	1.66	Cum Volume (acre-ft)		1.31	
C & E Loss (ft)	0.46	Cum SA (acres)		0.36	

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 cross section had to be extended vertically during the critical depth 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: Hope Creek
REACH: 1 RS: 28.22144

INPUT
Description:
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	940.04	2.31	939.98	11.56	939.71	15.15	939.61	17.29	939.56
22.02	939.44	26.99	939.32	32.27	939.17	37.02	939.05	39.52	938.98
41.93	938.9	47.05	938.69	49.77	938.58	50.79	938.54	61.84	937.24
63.7	937.01	67.92	935.96	79.12	934.46	86.27	931.47	92.56	931.52
93.61	931.06	93.94	930.93	95.48	930.37	95.66	930.28	97.51	929.41
101.36	927.97	107.28	927.29	108.01	927.21	109.73	926.77	119.71	924.46
123.65	924.38	124.51	923.96	130.97	923.36	131.94	923.36	132.69	923.36
175.81	927.66	185.76	927.98	187.62	928.18	190.78	928.37	211.65	929.57
221.55	930.05	228.5	929.55	279.2	930.78	279.38	930.78	279.43	930.78
279.45	930.78	281.18	930.79	326.81	931.05	328.75	931.05	359.76	929.92
365.16	929.79	371.86	929.83	398.04	930.17	413.2	929.96	420.31	930.27
432.57	930.33	436.58	930.47	437.46	930.43	458.64	930.92	459.48	930.94
461.65	930.98	482.99	931.36	497.99	931.82	509.84	932.09	531.87	932.92
538.1	933.22	545.87	933.58	554.58	934.01	557.76	934.15	567.92	934.67
576.52	935.64	581.59	936.23	581.71	936.25				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	92.56	.04	221.55	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
92.56	221.55	18.33	16.08	17.35	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
328.75	581.71	931.05	F

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	930.78	Element			
Vel Head (ft)	0.76	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	930.02	Reach Len. (ft)	18.33	16.08	17.35
Crit W.S. (ft)	929.11	Flow Area (sq ft)		399.38	5.96
E.G. Slope (ft/ft)	0.007618	Area (sq ft)		399.38	9.79
Q Total (cfs)	2800.00	Flow (cfs)		2797.56	2.44
Top Width (ft)	184.46	Top Width (ft)		124.61	59.85
Vel Total (ft/s)	6.91	Avg. Vel. (ft/s)		7.00	0.41
Max Chl Dpth (ft)	6.66	Hydr. Depth (ft)		3.21	0.23
Conv. Total (cfs)	32079.5	Conv. (cfs)		32051.6	27.9
Length Wtd. (ft)	16.08	Wetted Per. (ft)		125.77	25.66
Min Ch El (ft)	923.36	Shear (lb/sq ft)		1.51	0.11
Alpha	1.03	Stream Power (lb/ft s)		10.58	0.05
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)		0.17	0.00

C & E Loss (ft)	0.10	Cum SA (acres)	0.05	0.01

Warning: Divided flow computed for this cross-section.
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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	930.78	Element			
Vel Head (ft)	0.76	Wt. n-Val.		0.040	
W.S. Elev (ft)	930.02	Reach Len. (ft)	18.33	16.08	17.35
Crit W.S. (ft)	929.09	Flow Area (sq ft)		399.61	
E.G. Slope (ft/ft)	0.007620	Area (sq ft)		399.61	
Q Total (cfs)	2800.00	Flow (cfs)		2800.00	
Top Width (ft)	124.65	Top Width (ft)		124.65	
Vel Total (ft/s)	7.01	Avg. Vel. (ft/s)		7.01	
Max Chl Dpth (ft)	6.66	Hydr. Depth (ft)		3.21	
Conv. Total (cfs)	32075.7	Conv. (cfs)		32075.7	
Length Wtd. (ft)	16.08	Wetted Per. (ft)		125.82	
Min Ch El (ft)	923.36	Shear (lb/sq ft)		1.51	
Alpha	1.00	Stream Power (lb/ft s)		10.59	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)		0.17	
C & E Loss (ft)	0.10	Cum SA (acres)		0.05	

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

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 12.13838

INPUT
Description:
Station Elevation Data num= 76

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	940.07	.7	940.05	3.92	939.97	8.07	939.85	16.26	939.61
16.81	939.6	26.89	939.34	28.65	939.29	31.7	939.2	34.52	939.12
41.16	938.95	43.72	938.85	52.59	938.45	57.86	937.84	62.59	937.25
73.35	934.55	82.97	933.27	96.32	928.57	97.68	927.86	97.75	927.92
98.47	928.44	99.74	927.5	101.9	926.54	102	926.5	102.19	926.42
103.84	925.81	105.01	925.31	106.91	924.06	113.87	923.71	119.39	923.92
131.76	923.96	134.3	923.96	140.71	923.38	147.13	923.37	152.06	923.37
160.82	925.05	165.03	925.95	177.65	926.47	194.04	927.54	196.5	927.85
199.73	928.26	200.75	928.26	201.59	928.5	204.02	928.71	230.3	930.78
231.49	930.87	235.12	931.17	239.41	930.92	248.08	930.3	277.97	931.04
309.17	930.8	328.23	930.9	357.99	930.94	361.73	930.8	381.06	930.33
405.56	930.49	407.44	930.51	409.33	930.49	425.15	930.72	447.82	930.92
459.33	930.45	460.49	930.43	467.39	930.61	481.16	930.95	486.76	931.05
505.55	931.53	518.14	931.78	532.55	932.18	549.78	933.01	558.53	933.41
565.38	933.55	575.24	933.98	581.01	934.29	588.91	934.72	597.13	935.9
598.62	936.07								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	82.97	.04	235.12	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
82.97	235.12	16.79	12.14	12.8	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
277.97	598.62	931.04	F

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	930.60	Element			
Vel Head (ft)	0.42	Wt. n-Val.		0.040	
W.S. Elev (ft)	930.18	Reach Len. (ft)			
Crit W.S. (ft)	927.98	Flow Area (sq ft)		540.66	
E.G. Slope (ft/ft)	0.003003	Area (sq ft)		540.66	
Q Total (cfs)	2800.00	Flow (cfs)		2800.00	
Top Width (ft)	130.98	Top Width (ft)		130.98	
Vel Total (ft/s)	5.18	Avg. Vel. (ft/s)		5.18	
Max Chl Dpth (ft)	6.81	Hydr. Depth (ft)		4.13	
Conv. Total (cfs)	51098.3	Conv. (cfs)		51098.3	

Length Wtd. (ft)		Wetted Per. (ft)	133.23
Min Ch El (ft)	923.37	Shear (lb/sq ft)	0.76
Alpha	1.00	Stream Power (lb/ft s)	3.94
Frctn Loss (ft)		Cum Volume (acre-ft)	
C & E Loss (ft)		Cum SA (acres)	

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

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	930.60	Element			
Vel Head (ft)	0.42	Wt. n-Val.		0.040	
W.S. Elev (ft)	930.18	Reach Len. (ft)			
Crit W.S. (ft)	927.98	Flow Area (sq ft)		540.81	
E.G. Slope (ft/ft)	0.003000	Area (sq ft)		540.81	
Q Total (cfs)	2800.00	Flow (cfs)		2800.00	
Top Width (ft)	131.00	Top Width (ft)		131.00	
Vel Total (ft/s)	5.18	Avg. Vel. (ft/s)		5.18	
Max Chl Dpth (ft)	6.81	Hydr. Depth (ft)		4.13	
Conv. Total (cfs)	51117.6	Conv. (cfs)		51117.6	
Length Wtd. (ft)		Wetted Per. (ft)		133.25	
Min Ch El (ft)	923.37	Shear (lb/sq ft)		0.76	
Alpha	1.00	Stream Power (lb/ft s)		3.94	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

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

SUMMARY OF MANNING'S N VALUES

River:Hope Creek

Reach	River Sta.	n1	n2	n3	n4
1	8000	.12	.045	.1	
1	7548	.12	.045	.1	
1	7061	.12	.045	.1	
1	6930	.12	.045	.1	
1	6719	Culvert			
1	6496	.12	.035	.08	
1	6278	.12	.025	.08	
1	5629	.12	.025	.08	
1	5428	.12	.025	.08	
1	5146	Culvert			
1	4969	.12	.04	.12	
1	4925.680	.12	.04	.1	.12
1	4907.867	.12	.04	.1	.12
1	4783.015	.12	.04	.12	
1	4764.388	.12	.04	.12	
1	4718	.12	.04	.12	
1	4643.051	.12	.04	.12	
1	4625.316	.12	.04	.12	
1	4503.708	.12	.04	.1	
1	4485.049	.12	.04	.1	
1	4361.840	.12	.04	.1	.12
1	4343.304	.12	.04	.1	.12
1	4222.473	.12	.04	.1	.12
1	4204.470	.12	.04	.1	.12
1	4080.463	.12	.04	.12	
1	4062.727	.12	.04	.12	
1	3940.903	.12	.04	.12	
1	3922.633	.12	.04	.12	
1	3799.870	.12	.04	.12	
1	3781.101	.12	.04	.12	
1	3659.612	.12	.04	.12	
1	3641.433	.12	.04	.12	
1	3518.856	.12	.04	.12	
1	3500.626	.12	.04	.12	
1	3378.489	.12	.04	.12	
1	3360.436	.12	.04	.12	
1	3238.304	.12	.04	.12	
1	3220.243	.12	.04	.12	
1	3147	.12	.04	.12	
1	3097.384	.12	.04	.12	
1	3079.078	.12	.04	.12	
1	2955.929	.12	.04	.12	

1	2937.884	.12	.04	.12
1	2870	.12	.04	.12
1	2813.979	.12	.04	.12
1	2795.938	.12	.04	.12
1	2668.395	.12	.04	.12
1	2650.675	.12	.04	.12
1	2537.862	.12	.04	.12
1	2520.830	.12	.04	.12
1	2390.934	.12	.04	.12
1	2354.325	.12	.04	.12
1	2262	.12	.04	.12
1	2081.919	.12	.04	.12
1	1650	.12	.04	.12
1	1492.060	.12	.04	.12
1	1084	.12	.04	.12
1	1027.831	.12	.04	.12
1	949.7572	.12	.04	.12
1	878.1000	.12	.04	.12
1	859.3424	.12	.04	.12
1	735.5340	.12	.04	.12
1	716.3877	.12	.04	.12
1	595.3610	.12	.04	.12
1	577.5895	.12	.04	.12
1	553	.12	.04	.12
1	459.5899	.12	.04	.12
1	441.5446	.12	.04	.12
1	324.8710	.12	.04	.12
1	307.2792	.12	.04	.12
1	200.7906	.12	.04	.12
1	185.0263	.12	.04	.12
1	28.22144	.12	.04	.12
1	12.13838	.12	.04	.12

SUMMARY OF REACH LENGTHS

River: Hope Creek

Reach	River Sta.	Left	Channel	Right
1	8000	393.3	452.1	505.73
1	7548	498.18	486.75	465.44
1	7061	137.61	131.25	117.04
1	6930	458.64	434.11	418.59
1	6719	Culvert		
1	6496	261.27	218.1	177.15
1	6278	596.84	648.74	713.24
1	5629	205.65	201.08	200.99
1	5428	519.24	458.42	414.44
1	5146	Culvert		
1	4969	170.27	251.19	305.99
1	4925.680	18.25	17.81	18.01
1	4907.867	122.42	124.85	123.52
1	4783.015	18.84	18.63	18.24
1	4764.388	48.37	45.95	44.99
1	4718	71.98	75.39	77.8
1	4643.051	17.45	17.74	17.85
1	4625.316	120.71	121.61	122.64
1	4503.708	19.61	18.66	18.24
1	4485.049	123.05	123.21	122.55
1	4361.840	19	18.54	18
1	4343.304	119.24	120.83	121.61
1	4222.473	17.55	18	17.71
1	4204.470	124.62	124.01	123.48
1	4080.463	17.85	17.74	17.82
1	4062.727	120.53	121.82	121.07
1	3940.903	18.03	18.27	18.28
1	3922.633	121.49	122.76	124.97
1	3799.870	19.61	18.77	18.18
1	3781.101	119.49	121.49	122.1
1	3659.612	18.36	18.18	17.87
1	3641.433	122.87	122.58	125.68
1	3518.856	18.65	18.23	18.01
1	3500.626	121.15	122.14	120.16
1	3378.489	17.27	18.05	17.97
1	3360.436	122.81	122.13	120.82
1	3238.304	18.33	18.06	18.17
1	3220.243	73.32	73.11	72.78
1	3147	46.78	49.75	49.66
1	3097.384	19.08	18.31	18.45

1	3079.078	124.18	123.15	120.49
1	2955.929	18	18.05	18.27
1	2937.884	68.38	65.3	63.65
1	2870	51.13	58.6	53.12
1	2813.979	18.36	18.04	17.52
1	2795.938	124.19	127.54	116.57
1	2668.395	18.55	17.72	17.36
1	2650.675	124.24	112.8	97.76
1	2537.862	18.67	17.03	20.7
1	2520.830	97.79	129.85	152.46
1	2390.934	38.36	36.6	36.24
1	2354.325	95.4	91.3	65.8
1	2262	220.4	181.12	126.56
1	2081.919	293.59	431.27	483.25
1	1650	172.21	158.59	117.87
1	1492.060	383.24	408.33	377.92
1	1084	53.7	55.9	61.7
1	1027.831	76.72	78.07	78.34
1	949.7572	69.19	71.66	70.51
1	878.1000	18.27	18.76	20.13
1	859.3424	123.89	123.81	123.48
1	735.5340	19.18	19.15	18.15
1	716.3877	125.31	121.03	115.29
1	595.3610	18.02	17.77	17.42
1	577.5895	27	24	22
1	553	95.41	94	90.84
1	459.5899	18.06	18.05	18.28
1	441.5446	122.28	116.67	109.21
1	324.8710	17.95	17.59	16.66
1	307.2792	125.45	106.5	91.3
1	200.7906	16.52	15.76	15.52
1	185.0263	137.52	156.8	137.84
1	28.22144	18.33	16.08	17.35
1	12.13838	16.79	12.14	12.8

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Hope Creek

Reach	River Sta.	Contr.	Expan.
1	8000	.1	.3
1	7548	.1	.3
1	7061	.3	.5
1	6930	.3	.5
1	6719	Culvert	
1	6496	.3	.5
1	6278	.1	.3
1	5629	.3	.5
1	5428	.3	.5
1	5146	Culvert	
1	4969	.3	.5
1	4925.680	.1	.3
1	4907.867	.1	.3
1	4783.015	.1	.3
1	4764.388	.1	.3
1	4718	.1	.3
1	4643.051	.1	.3
1	4625.316	.1	.3
1	4503.708	.1	.3
1	4485.049	.1	.3
1	4361.840	.1	.3
1	4343.304	.1	.3
1	4222.473	.1	.3
1	4204.470	.1	.3
1	4080.463	.1	.3
1	4062.727	.1	.3
1	3940.903	.1	.3
1	3922.633	.1	.3
1	3799.870	.1	.3
1	3781.101	.1	.3
1	3659.612	.1	.3
1	3641.433	.1	.3
1	3518.856	.1	.3
1	3500.626	.1	.3
1	3378.489	.1	.3
1	3360.436	.1	.3
1	3238.304	.1	.3
1	3220.243	.1	.3

1	3147	.1	.3
1	3097.384	.1	.3
1	3079.078	.1	.3
1	2955.929	.1	.3
1	2937.884	.1	.3
1	2870	.1	.3
1	2813.979	.1	.3
1	2795.938	.1	.3
1	2668.395	.1	.3
1	2650.675	.1	.3
1	2537.862	.1	.3
1	2520.830	.1	.3
1	2390.934	.1	.3
1	2354.325	.1	.3
1	2262	.1	.3
1	2081.919	.1	.3
1	1650	.1	.3
1	1492.060	.1	.3
1	1084	.1	.3
1	1027.831	.1	.3
1	949.7572	.1	.3
1	878.1000	.1	.3
1	859.3424	.1	.3
1	735.5340	.1	.3
1	716.3877	.1	.3
1	595.3610	.1	.3
1	577.5895	.1	.3
1	553	.1	.3
1	459.5899	.1	.3
1	441.5446	.1	.3
1	324.8710	.1	.3
1	307.2792	.1	.3
1	200.7906	.1	.3
1	185.0263	.1	.3
1	28.22144	.1	.3
1	12.13838	.1	.3

Profile Output Table - Encroachment 1

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Wdth Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
1	8000	100 YR	1003.98		1004.65	236.21	336.75	1054.29	8.96		9975.44	10014.28	
1	8000	100 YR FW	1004.70	0.72	1005.78	38.84		1400.00		9975.44	9975.44	10014.28	10014.28
1	7548	100 YR	997.74		999.05	86.31	118.29	1280.55	1.16		9975.44	10014.28	
1	7548	100 YR FW	997.93	0.19	999.46	38.84		1400.00		9975.44	9975.44	10014.28	10014.28
1	7061	100 YR	987.87		989.78	42.82		1790.00			9971.13	10025.25	
1	7061	100 YR FW	987.87	0.00	989.78	42.82		1790.00		9971.13	9971.13	10025.25	10025.25
1	6930	100 YR	988.15		988.34	52.42		1790.00			9968.55	10020.97	
1	6930	100 YR FW	988.15	0.00	988.34	52.42		1790.00		9968.55	9968.55	10020.97	

10020.97

1	6719	S. Marietta Pkwy		Culvert									
1	6496		100 YR	973.73		975.70	27.86	12.92	1775.92	1.16		9986.26	10012.02
1	6496		100 YR FW	974.71	0.99	976.17	27.86	15.91	1772.70	1.38	9970.00	9986.26	10012.02
10030.00													
1	6278		100 YR	972.60		974.37	138.43	236.94	1546.87	6.19		9986.44	10012.01
1	6278		100 YR FW	972.59	-0.01	974.85	51.99	115.45	1674.55		9960.02	9986.44	10012.01
10012.01													
1	5629		100 YR	967.35		968.61	37.89	26.48	1763.44	0.08		9986.25	10012.01
1	5629		100 YR FW	967.64	0.28	968.86	25.76		1790.00		9986.25	9986.25	10012.01
10012.01													
1	5428		100 YR	967.50		968.12	28.76	15.12	1765.12	9.76		9986.25	10012.01
1	5428		100 YR FW	967.64	0.15	968.27	25.76		1790.00		9986.25	9986.25	10012.01
10012.01													
1	5146	I-75		Culvert									
1	4969		100 YR	958.24		960.04	24.98	1.08	1788.57	0.35		9988.91	10012.88
1	4969		100 YR FW	958.40	0.15	960.12	23.97		1790.00		9988.91	9988.91	10012.88
10012.88													
1	4925.680		100 YR	958.04		958.50	47.54	4.57	1785.44			24.79	66.83
1	4925.680		100 YR FW	958.12	0.08	958.57	41.86		1790.00		24.79	24.79	66.83
66.83													
1	4907.867		100 YR	958.03		958.46	46.41	4.47	1785.53	0.00		26.77	66.58
1	4907.867		100 YR FW	958.10	0.08	958.53	39.81		1790.00		26.77	26.77	66.58
66.58													
1	4783.015		100 YR	957.85		958.26	42.02		1790.00			5.33	53.70

1	4783.015	100 YR FW	957.92	0.08	958.33	42.12		1790.00		5.33	5.33	53.70
53.70												
1	4764.388	100 YR	957.75		958.22	41.74		1790.00			9.98	57.59
1	4764.388	100 YR FW	957.83	0.08	958.29	41.85		1790.00		9.98	9.98	57.59
57.59												
1	4718	100 YR	956.90		958.02	39.02	3.90	2306.10			56.84	92.74
1	4718	100 YR FW	956.99	0.09	958.10	34.39		2310.00		56.84	56.84	92.74
92.74												
1	4643.051	100 YR	955.81		957.54	39.24	68.85	2241.15			23.27	50.52
1	4643.051	100 YR FW	955.70	-0.11	957.57	29.55	29.14	2280.86		19.65	23.27	50.52
50.52												
1	4625.316	100 YR	955.16		957.35	35.93	64.43	2245.57			28.72	53.69
1	4625.316	100 YR FW	955.21	0.05	957.38	30.99	59.33	2250.67		21.30	28.72	53.69
53.69												
1	4503.708	100 YR	954.42		956.17	43.21	21.81	2286.97	1.22		29.54	58.25
1	4503.708	100 YR FW	954.54	0.12	956.23	40.50	23.10	2284.93	1.97	23.18	29.54	58.25
63.68												
1	4485.049	100 YR	954.41		955.99	48.73	19.52	2288.05	2.43		32.95	62.18
1	4485.049	100 YR FW	954.53	0.12	956.06	41.94	21.05	2285.59	3.36	26.59	32.95	62.18
68.53												
1	4361.840	100 YR	953.79		955.12	73.10	0.10	2257.22	52.68		15.31	51.59
1	4361.840	100 YR FW	953.89	0.10	955.23	51.45		2287.92	22.08	15.31	15.31	51.59
66.76												
1	4343.304	100 YR	953.58		954.98	70.85	0.00	2284.88	25.12		22.55	59.44
1	4343.304	100 YR FW	953.77	0.20	955.11	52.88		2294.55	15.45	22.55	22.55	59.44
75.43												
1	4222.473	100 YR	953.02		954.16	98.29	0.12	2262.20	47.68		47.12	87.81

1	4222.473	100 YR FW	953.26	0.24	954.36	62.20		2287.60	22.41	47.12	47.12	87.81	
109.32													
1	4204.470	100 YR	953.06		954.02	98.66	0.89	2214.84	94.27		42.78	82.68	
1	4204.470	100 YR FW	953.27	0.20	954.23	63.72		2267.72	42.29	42.78	42.78	82.68	
106.50													
1	4080.463	100 YR	952.56		953.46	92.20	1.90	2240.46	67.63		67.60	120.16	
1	4080.463	100 YR FW	952.77	0.21	953.68	51.10		2310.00		67.60	67.60	120.16	
120.16													
1	4062.727	100 YR	952.50		953.37	96.21	2.52	2240.22	67.26		71.47	124.03	
1	4062.727	100 YR FW	952.71	0.21	953.60	51.28		2310.00		71.47	71.47	124.03	
124.03													
1	3940.903	100 YR	951.89		952.81	134.66	1.28	2229.59	79.13		72.89	125.39	
1	3940.903	100 YR FW	952.09	0.20	953.04	50.82		2310.00		72.89	72.89	125.39	
125.39													
1	3922.633	100 YR	951.94		952.68	138.93	5.43	2202.31	102.26		76.76	129.26	
1	3922.633	100 YR FW	952.12	0.18	952.92	51.88		2310.00		76.76	76.76	129.26	
129.26													
1	3799.870	100 YR	951.78		952.27	208.48	10.64	2047.66	251.70		48.58	98.54	
1	3799.870	100 YR FW	951.79	0.00	952.48	49.96		2310.00		48.58	48.58	98.54	
98.54													
1	3781.101	100 YR	951.75		952.23	222.93	13.54	2072.44	224.02		55.46	105.42	
1	3781.101	100 YR FW	951.75	0.01	952.42	49.96		2310.00		55.46	55.46	105.42	
105.42													
1	3659.612	100 YR	951.41		951.96	193.12	11.62	2136.02	162.36		52.29	102.25	
1	3659.612	100 YR FW	951.37	-0.04	952.07	49.96		2310.00		52.29	52.29	102.25	
102.25													
1	3641.433	100 YR	951.36		951.92	175.67	10.72	2141.29	157.98		54.01	103.97	
1	3641.433	100 YR FW	951.30	-0.06	952.01	49.96		2310.00		54.01	54.01	103.97	

103.97												
1	3518.856	100 YR	950.84		951.57	70.68	9.69	2298.01	2.30		49.46	102.10
1	3518.856	100 YR FW	950.90	0.06	951.63	52.58		2310.00		49.46	49.46	102.10
102.10												
1	3500.626	100 YR	950.81		951.50	80.70	10.00	2292.32	7.68		46.80	99.44
1	3500.626	100 YR FW	950.87	0.06	951.56	52.64		2310.00		46.80	46.80	99.44
99.44												
1	3378.489	100 YR	950.52		951.14	101.49	10.66	2208.65	90.69		49.79	100.69
1	3378.489	100 YR FW	950.47	-0.06	951.18	50.90		2310.00		49.79	49.79	100.69
100.69												
1	3360.436	100 YR	950.46		951.09	98.23	10.73	2222.37	76.90		50.53	101.43
1	3360.436	100 YR FW	950.41	-0.05	951.13	50.90		2310.00		50.53	50.53	101.43
101.43												
1	3238.304	100 YR	950.01		950.72	69.63	10.49	2299.51	0.00		47.19	102.95
1	3238.304	100 YR FW	950.01	0.00	950.73	55.38		2310.00		47.19	47.19	102.95
102.95												
1	3220.243	100 YR	949.98		950.66	71.00	12.47	2297.51	0.02		45.50	101.26
1	3220.243	100 YR FW	949.97	-0.01	950.66	55.71		2310.00		45.50	45.50	101.26
101.26												
1	3147	100 YR	948.87		950.25	62.91	3.63	2796.37			89.92	145.68
1	3147	100 YR FW	948.87	0.00	950.25	52.51		2800.00		89.92	89.92	145.68
145.68												
1	3097.384	100 YR	947.76		949.75	48.80		2800.00			60.82	126.32
1	3097.384	100 YR FW	947.82	0.06	949.76	49.03		2800.00		60.82	60.82	126.32
126.32												
1	3079.078	100 YR	947.30		949.50	47.75		2800.00			68.21	133.71
1	3079.078	100 YR FW	947.62	0.31	949.56	49.01		2800.00		68.21	68.21	133.71

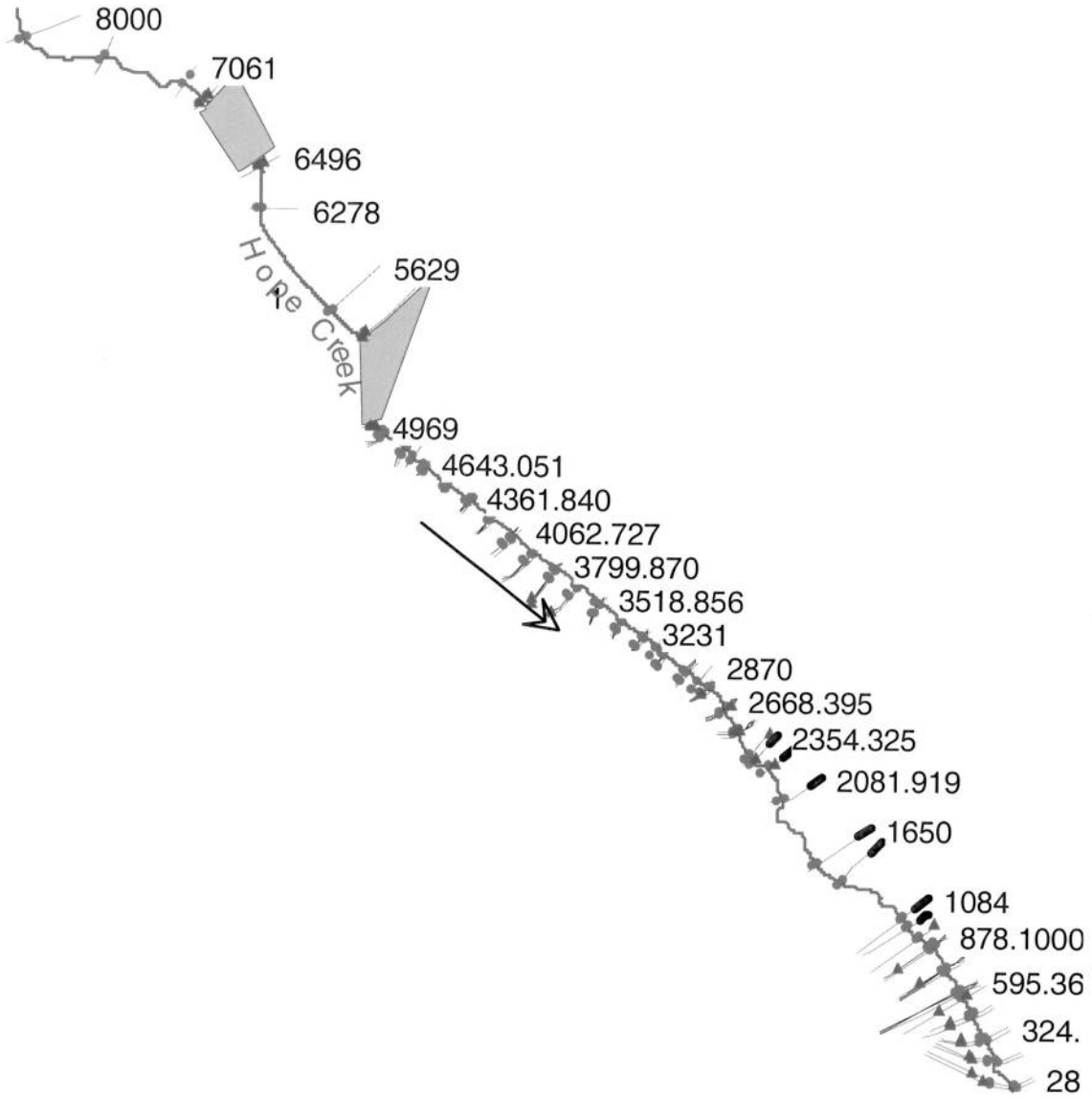
133.71												
1	2955.929	100 YR	946.60		948.06	61.68	2.01	2797.99			70.80	133.39
1	2955.929	100 YR FW	947.16	0.56	948.36	54.29		2800.00		70.80	70.80	133.39
133.39												
1	2937.884	100 YR	946.50		947.91	62.51	2.88	2797.12			72.94	133.78
1	2937.884	100 YR FW	947.10	0.59	948.24	54.83		2800.00		72.94	72.94	133.78
133.78												
1	2870	100 YR	946.32		947.43	74.74	46.83	2752.96	0.21		106.36	157.49
1	2870	100 YR FW	946.90	0.59	947.89	51.13		2800.00		106.36	106.36	157.49
157.49												
1	2813.979	100 YR	946.09		947.14	66.36	21.62	2777.62	0.76		39.47	90.60
1	2813.979	100 YR FW	946.74	0.66	947.63	51.13		2800.00		39.47	39.47	90.60
90.60												
1	2795.938	100 YR	945.97		947.05	79.85	21.81	2772.90	5.29		43.32	94.45
1	2795.938	100 YR FW	946.65	0.68	947.57	51.13		2800.00		43.32	43.32	94.45
94.45												
1	2668.395	100 YR	945.55		946.47	124.57	1.85	2752.86	45.29		50.89	104.67
1	2668.395	100 YR FW	946.37	0.82	947.12	70.15	9.74	2780.98	9.28	38.44	50.89	104.67
108.59												
1	2650.675	100 YR	945.68		946.33	142.04	130.31	2626.47	43.22		57.49	112.58
1	2650.675	100 YR FW	946.45	0.77	947.02	70.15	111.30	2688.70		42.43	57.49	112.58
112.58												
1	2537.862	100 YR	944.18		945.75	142.17	396.29	2399.57	4.14		110.95	143.82
1	2537.862	100 YR FW	944.31	0.13	946.43	86.28	109.22	2689.56	1.22	64.72	110.95	143.82
151.00												
1	2520.830	100 YR	943.69		945.56	119.00	358.86	2441.14			119.91	153.79
1	2520.830	100 YR FW	943.94	0.26	946.23	88.74	114.87	2685.13		65.05	119.91	153.79
153.79												

1	2390.934	100 YR	943.20		944.03	179.99	298.55	2499.10	2.35		162.22	208.81
1	2390.934	100 YR FW	943.68	0.47	944.58	107.50	109.26	2690.74		101.31	162.22	208.81
208.81												
1	2354.325 BR 17 - Bent01	100 YR	941.94		943.71	136.22	190.41	2609.60			166.02	215.12
1	2354.325 BR 17 - Bent01	100 YR FW	943.00	1.06	944.35	112.79	78.38	2721.62		102.33	166.02	215.12
215.12												
1	2262	100 YR	942.01		942.57	174.55	126.06	2673.35	0.60		184.57	250.90
1	2262	100 YR FW	943.43	1.41	943.83	126.12	77.24	2722.76		124.78	184.57	250.90
250.90												
1	2081.919	100 YR	941.42		942.10	231.64	307.02	2475.41	17.57		211.04	253.36
1	2081.919	100 YR FW	943.05	1.63	943.55	147.39	238.80	2520.03	41.17	119.54	211.04	253.36
266.93												
1	1650	100 YR	940.85		941.14	308.66	1175.42	1622.43	2.15		327.40	361.56
1	1650	100 YR FW	942.69	1.83	942.94	198.41	1029.10	1770.91		163.15	327.40	361.56
361.56												
1	1492.060	100 YR	940.48		940.83	264.90	1101.51	1697.55	0.95		275.91	306.11
1	1492.060	100 YR FW	942.35	1.87	942.70	159.56	866.78	1933.22		146.55	275.91	306.11
306.11												
1	1084	100 YR	937.74		939.24	211.91	455.12	2186.85	158.03		158.76	185.26
1	1084	100 YR FW	939.55	1.81	941.38	47.03		2712.80	87.20	158.76	158.76	185.26
205.79												
1	1027.831	100 YR	937.63		938.68	206.49	375.00	2043.79	381.21		107.04	136.12
1	1027.831	100 YR FW	939.44	1.80	940.91	47.03		2667.40	132.60	107.04	107.04	136.12
154.07												
1	949.7572	100 YR	937.49		938.23	233.49	505.05	2013.60	281.36		104.10	132.62
1	949.7572	100 YR FW	939.38	1.89	940.49	47.03	76.81	2638.19	85.00	94.85	104.10	132.62
141.88												

1	878.1000	100 YR	937.68		937.97	269.92	176.58	2083.64	539.78		65.33	108.09
1	878.1000	100 YR FW	939.70	2.02	940.17	47.03		2779.97	20.03	65.33	65.33	108.09
112.36												
1	859.3424	100 YR	937.62		937.95	282.28	183.16	1998.54	618.29		67.67	108.35
1	859.3424	100 YR FW	939.55	1.94	940.13	47.03		2758.40	41.60	67.67	67.67	108.35
114.70												
1	735.5340	100 YR	937.30		937.74	224.20	333.71	1738.71	727.58		90.62	118.04
1	735.5340	100 YR FW	938.74	1.44	939.83	47.03	37.66	2613.25	149.09	85.18	90.62	118.04
132.21												
1	716.3877	100 YR	936.97		937.66	212.45	414.77	1877.24	507.99		99.37	124.26
1	716.3877	100 YR FW	938.44	1.47	939.74	47.03	101.31	2571.27	127.41	88.68	99.37	124.26
135.71												
1	595.3610	100 YR	936.50		937.21	200.69	384.16	1781.97	633.87		101.51	124.63
1	595.3610	100 YR FW	937.24	0.74	939.08	47.03	108.00	2595.08	96.92	89.41	101.51	124.63
136.44												
1	577.5895	100 YR	936.27		937.12	198.85	371.59	1849.40	579.01		99.42	122.56
1	577.5895	100 YR FW	936.88	0.61	938.93	47.03	102.80	2609.45	87.75	87.24	99.42	122.56
134.27												
1	553	100 YR	935.93		936.98	192.54	305.20	2058.52	436.29		119.10	143.98
1	553	100 YR FW	936.90	0.97	938.69	47.03	92.58	2644.07	63.35	106.56	119.10	143.98
153.59												
1	459.5899	100 YR	934.62		936.28	134.21		2323.03	476.97		96.73	125.04
1	459.5899	100 YR FW	936.56	1.94	938.03	47.03		2619.24	180.76	96.73	96.73	125.04
143.76												
1	441.5446	100 YR	934.93		935.95	136.89		2041.20	758.80		99.23	129.52
1	441.5446	100 YR FW	936.48	1.55	937.92	47.03		2620.02	179.98	99.23	99.23	129.52
146.26												

1	324.8710	100 YR	933.29		934.95	142.23	7.50	2072.83	719.67		127.90	156.97
1	324.8710	100 YR FW	933.87	0.58	936.80	47.03	15.49	2673.66	110.85	123.06	127.90	156.97
170.09												
1	307.2792	100 YR	933.52		934.54	162.17	5.48	2102.79	691.73		128.91	169.36
1	307.2792	100 YR FW	933.23	-0.28	935.81	47.03	2.69	2784.58	12.73	125.62	128.91	169.36
172.65												
1	200.7906	100 YR	931.81		933.55	160.20	1.49	2594.58	203.93		130.50	178.33
1	200.7906	100 YR FW	931.62	-0.19	933.98	47.83		2800.00		130.50	130.50	178.33
178.33												
1	185.0263	100 YR	931.18		933.15	92.97		2691.92	108.08		134.46	193.53
1	185.0263	100 YR FW	931.10	-0.08	933.39	50.24		2800.00		134.46	134.46	193.53
193.53												
1	28.22144	100 YR	930.02		930.78	150.25		2797.56	2.44		92.56	221.55
1	28.22144	100 YR FW	930.02	0.00	930.78	124.65		2800.00		92.56	92.56	221.55
221.55												
1	12.13838	100 YR	930.18		930.60	130.98		2800.00			82.97	235.12
1	12.13838	100 YR FW	930.18	0.00	930.60	131.00		2800.00		82.97	82.97	235.12
235.12												

Proposed Condition Model (HEC-RAS) FEMA Floodway Profiles



```
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: HopeCreek_Br16-17
Project File : HopeCreek_Br16-17.prj
Run Date and Time: 11/30/2009 10:20:09 AM

Project in English units

Project Description:
Cobb County Priority Area 3 Flood Study - Modified to provide Base Model for
Bridges 16 & 17 of I-75 Corridor HOV Project
Hope Creek
Rottenwood Creek
Watershed

Model extends from confluence with Rottenwood Creek to 1180 feet
upstream of South Marietta Parkway WB to I-75 NB ramp

PLAN DATA

Plan Title: Proposed Struct - ChanRealign
Plan File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.p18

Geometry Title: Proposed Structure Chan Realign
Geometry File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.g17

Flow Title : Base-Comb Flow Data
Flow File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.f06

Plan Description:
8' sq piers
Using momentum and energy methods for structure analysis

Plan Summary Information:

Number of:	Cross Sections =	72	Multiple Openings =	0
	Culverts =	2	Inline Structures =	0
	Bridges =	21	Lateral Structures =	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 40
Maximum difference tolerance = 0.1
Flow tolerance factor = 0.001

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

Encroachment Data
Equal Conveyance = False

```
    Left Offset      =        0
    Right Offset     =        0

 River = Hope Creek        Reach = 1
 RS       Profile           Method  Value1  Value2
 8000     100 YR FW              1 9975.4410014.28
 7548     100 YR FW              1 9975.4410014.28
 7061     100 YR FW              1 9971.1310025.25
 6930     100 YR FW              1 9968.5510020.97
 6496     100 YR FW              1    9970   10030
 6278     100 YR FW              1 9960.0210012.01
 5629     100 YR FW              1 9986.2510012.01
 5428     100 YR FW              1 9986.2510012.01
 4969     100 YR FW              1 9988.9110012.88
 4925.680100 YR FW               1   24.79   66.83
 4907.867100 YR FW               1   26.77   66.58
 4783.015100 YR FW               1    5.33    53.7
 4764.388100 YR FW               1    9.98   57.59
 4718     100 YR FW               1   56.84   92.74
 4643.051100 YR FW               1   19.65   50.52
 4625.316100 YR FW               1    21.3   53.69
 4503.708100 YR FW               1   23.18   63.68
 4485.049100 YR FW               1   26.59   68.53
 4361.840100 YR FW               1   15.31   66.76
 4343.304100 YR FW               1   22.55   75.43
 4222.473100 YR FW               1   47.12  109.32
 4204.470100 YR FW               1   42.78   106.5
 4080.463100 YR FW               1    67.6  120.16
 4062.727100 YR FW               1   71.47  124.03
 3940.903100 YR FW               1   72.89  125.39
 3922.633100 YR FW               1   76.76  129.26
 3799.870100 YR FW               1   48.58   98.54
 3781.101100 YR FW               1   55.46  105.42
 3659.612100 YR FW               1   52.29  102.25
 3641.433100 YR FW               1   54.01  103.97
 3518.856100 YR FW               1   49.46   102.1
 3500.626100 YR FW               1    46.8   99.44
 3378.489100 YR FW               1   49.79  100.69
 3360.436100 YR FW               1   50.53  101.43
 3238.304100 YR FW               1   47.19  102.95
 3220.243100 YR FW               1    45.5  101.26
 3147     100 YR FW               1   89.92  145.68
 3097.384100 YR FW               1   60.82  126.32
 3079.078100 YR FW               1   68.21  133.71
 2955.929100 YR FW               1    70.8  133.39
 2937.884100 YR FW               1   72.94  133.78
 2870     100 YR FW               1  106.36  157.49
 2813.979100 YR FW               1   39.47    90.6
 2795.938100 YR FW               1   43.32   94.45
 2668.395100 YR FW               1   38.44  108.59
 2650.675100 YR FW               1   42.43  112.58
 2537.862100 YR FW               1   64.72     151
 2520.830100 YR FW               1   65.05  153.79
 2390.934100 YR FW               1  101.31  208.81
 2354.325100 YR FW               1  102.33  215.12
 2262     100 YR FW               1  124.78   250.9
 2081.919100 YR FW               1  119.54  266.93
 1650     100 YR FW               1  163.15  361.56
 1492.060100 YR FW               1  146.55  306.11
 1084     100 YR FW               1  158.76  205.79
 1027.831100 YR FW               1  107.04  154.07
 949.7572100 YR FW               1   94.85  141.88
 878.1000100 YR FW               1   65.33  112.36
 859.3424100 YR FW               1   67.67   114.7
 735.5340100 YR FW               1   85.18  132.21
 716.3877100 YR FW               1   88.68  135.71
 595.3610100 YR FW               1   89.41  136.44
 577.5895100 YR FW               1   87.24  134.27
 553      100 YR FW               1  106.56  153.59
 459.5899100 YR FW               1   96.73  143.76
 441.5446100 YR FW               1   99.23  146.26
 324.8710100 YR FW               1  123.06  170.09
 307.2792100 YR FW               1  125.62  172.65
 200.7906100 YR FW               1   130.5  178.33
 185.0263100 YR FW               1  134.46  193.53
 28.22144100 YR FW               1   92.56  221.55
```

12.13838100 YR FW 1 82.97 235.12

FLOW DATA

Flow Title: Base-Comb Flow Data
Flow File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.f06

Flow Data (cfs)

River	Reach	RS	100 YR	100 YR FW
Hope Creek	1	8000	1400	1400
Hope Creek	1	7061	1790	1790
Hope Creek	1	4718	2310	2310
Hope Creek	1	3147	2800	2800

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Hope Creek	1	100 YR		Normal S = 0.003
Hope Creek	1	100 YR FW		Normal S = 0.003

GEOMETRY DATA

Geometry Title: Proposed Structure Chan Realign
Geometry File : C:\Data\HEC-RAS Projects\Hope Creek\Hope Creek RAS 11_16\HopeCreek_Br16-17.g17

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 8000

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9692.31	1010.32	9730.61	1006.96	9741.69	1006.28	9746.1	1006.09	9752.37	1005.9
9795.04	1003.98	9803.95	1003.91	9815.76	1003.7	9830.29	1003.2	9842.43	1003.29
9847.65	1003.23	9856.36	1002.52	9864.45	1002.02	9872.65	1001.42	9875.36	1001.23
9884.35	1001.84	9891.79	1002.43	9896.36	1002.67	9905.33	1003.01	9914.36	1002.76
9926.07	1002.62	9931.4	1003.14	9943.29	1002.52	9951.53	1002.22	9953.9	1002.17
9957.29	1001.98	9971.84	1001.7	9975.44	1001.76	9988.3	1000.04	10000	999.59
10008.8	999.78	10014.28	1003.13	10019.72	1003.11	10021.42	1003.27	10024.73	1003.59
10026.72	1003.7	10029.7	1003.89	10035.93	1004.29	10038.89	1004.52	10050.88	1004.82
10054.9	1004.92	10066.83	1005.64	10070.49	1006.39	10088.12	1013.63		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9692.31	.12	9975.44	.045	10014.28	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9975.44	10014.28	393.3	452.1	505.73	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	1004.66	Element			
Vel Head (ft)	0.66	Wt. n-Val.	0.120	0.045	0.100
W.S. Elev (ft)	1003.99	Reach Len. (ft)	393.30	452.10	505.73
Crit W.S. (ft)	1003.67	Flow Area (sq ft)	234.19	140.41	9.32
E.G. Slope (ft/ft)	0.009634	Area (sq ft)	234.19	140.41	9.32
Q Total (cfs)	1400.00	Flow (cfs)	338.16	1052.76	9.09
Top Width (ft)	236.49	Top Width (ft)	180.65	38.84	17.00
Vel Total (ft/s)	3.65	Avg. Vel. (ft/s)	1.44	7.50	0.98
Max Chl Dpth (ft)	4.40	Hydr. Depth (ft)	1.30	3.62	0.55
Conv. Total (cfs)	14263.5	Conv. (cfs)	3445.2	10725.7	92.6
Length Wtd. (ft)	442.73	Wetted Per. (ft)	180.86	39.91	17.03
Min Ch El (ft)	999.59	Shear (lb/sq ft)	0.78	2.12	0.33
Alpha	3.22	Stream Power (lb/ft s)	1.12	15.87	0.32

Frctn Loss (ft)	5.55	Cum Volume (acre-ft)	43.96	49.85	13.32
C & E Loss (ft)	0.07	Cum SA (acres)	11.64	7.27	7.11

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 #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	1005.78	Element			
Vel Head (ft)	1.08	Wt. n-Val.		0.045	
W.S. Elev (ft)	1004.70	Reach Len. (ft)	393.30	452.10	505.73
Crit W.S. (ft)	1003.81	Flow Area (sq ft)		168.08	
E.G. Slope (ft/ft)	0.010794	Area (sq ft)		168.08	
Q Total (cfs)	1400.00	Flow (cfs)		1400.00	
Top Width (ft)	38.84	Top Width (ft)		38.84	
Vel Total (ft/s)	8.33	Avg. Vel. (ft/s)		8.33	
Max Chl Dpth (ft)	5.11	Hydr. Depth (ft)		4.33	
Conv. Total (cfs)	13475.4	Conv. (cfs)		13475.4	
Length Wtd. (ft)	452.10	Wetted Per. (ft)		44.43	
Min Ch El (ft)	999.59	Shear (lb/sq ft)		2.55	
Alpha	1.00	Stream Power (lb/ft s)		21.24	
Frctn Loss (ft)	6.28	Cum Volume (acre-ft)	12.56	53.42	2.10
C & E Loss (ft)	0.05	Cum SA (acres)	3.33	7.29	0.68

Warning: The cross section had to be extended vertically during the critical depth 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: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 7548

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9863.29	1009.3	9888.65	1003.16	9940.03	996.67	9975.44	995.68	9988.3	993.96
10000	993.51	10008.8	993.71	10014.28	997.05	10067.71	1007.38	10085.14	1008.78

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9863.29	.12	9975.44	.045	10014.28	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9975.44	10014.28	498.18	486.75	465.44	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	999.05	Element			
Vel Head (ft)	1.32	Wt. n-Val.	0.120	0.045	0.100
W.S. Elev (ft)	997.73	Reach Len. (ft)	498.18	486.75	465.44
Crit W.S. (ft)	997.69	Flow Area (sq ft)	59.44	133.31	1.19
E.G. Slope (ft/ft)	0.016973	Area (sq ft)	59.44	133.31	1.19
Q Total (cfs)	1400.00	Flow (cfs)	117.42	1281.48	1.11
Top Width (ft)	86.14	Top Width (ft)	43.79	38.84	3.51
Vel Total (ft/s)	7.22	Avg. Vel. (ft/s)	1.98	9.61	0.93
Max Chl Dpth (ft)	4.22	Hydr. Depth (ft)	1.36	3.43	0.34
Conv. Total (cfs)	10745.9	Conv. (cfs)	901.3	9836.2	8.5
Length Wtd. (ft)	487.16	Wetted Per. (ft)	43.87	39.91	3.57
Min Ch El (ft)	993.51	Shear (lb/sq ft)	1.44	3.54	0.35
Alpha	1.63	Stream Power (lb/ft s)	2.84	34.03	0.33
Frctn Loss (ft)	9.21	Cum Volume (acre-ft)	42.63	48.43	13.26
C & E Loss (ft)	0.06	Cum SA (acres)	10.62	6.87	6.99

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 #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	999.46	Element			
Vel Head (ft)	1.53	Wt. n-Val.		0.045	
W.S. Elev (ft)	997.93	Reach Len. (ft)	498.18	486.75	465.44
Crit W.S. (ft)	997.73	Flow Area (sq ft)		141.12	
E.G. Slope (ft/ft)	0.018530	Area (sq ft)		141.12	
Q Total (cfs)	1400.00	Flow (cfs)		1400.00	
Top Width (ft)	38.84	Top Width (ft)		38.84	
Vel Total (ft/s)	9.92	Avg. Vel. (ft/s)		9.92	
Max Chl Dpth (ft)	4.42	Hydr. Depth (ft)		3.63	
Conv. Total (cfs)	10284.6	Conv. (cfs)		10284.6	
Length Wtd. (ft)	486.75	Wetted Per. (ft)		43.04	
Min Ch El (ft)	993.51	Shear (lb/sq ft)		3.79	
Alpha	1.00	Stream Power (lb/ft s)		37.63	
Frctn Loss (ft)	9.64	Cum Volume (acre-ft)	12.56	51.81	2.10
C & E Loss (ft)	0.04	Cum SA (acres)	3.33	6.89	0.68

Warning: The cross section had to be extended vertically during the critical depth 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: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 7061

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9905.26	1001.98	9956.74	993.8	9957.4	993.7	9958.42	993.52	9971.13	990.89
9975.44	985.2	9988.3	983.48	10000	983.03	10008.8	983.22	10014.28	986.57
10018	989.04	10021.34	989.95	10025.25	991.08	10030.35	991.41	10047.87	992.47
10065.41	993.53	10087.95	996.31	10090.3	996.66	10098.54	997.89	10117.31	1004.01

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9905.26	.12	9971.13	.04	10025.25	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9971.13	10025.25	137.61	131.25	117.04	.3	.5

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	989.78	Element			
Vel Head (ft)	1.89	Wt. n-Val.		0.045	
W.S. Elev (ft)	987.89	Reach Len. (ft)	137.61	131.25	117.04
Crit W.S. (ft)	987.89	Flow Area (sq ft)		162.11	
E.G. Slope (ft/ft)	0.020645	Area (sq ft)		162.11	
Q Total (cfs)	1790.00	Flow (cfs)		1790.00	
Top Width (ft)	42.86	Top Width (ft)		42.86	
Vel Total (ft/s)	11.04	Avg. Vel. (ft/s)		11.04	
Max Chl Dpth (ft)	4.86	Hydr. Depth (ft)		3.78	
Conv. Total (cfs)	12457.9	Conv. (cfs)		12457.9	
Length Wtd. (ft)	131.25	Wetted Per. (ft)		45.66	
Min Ch El (ft)	983.03	Shear (lb/sq ft)		4.58	
Alpha	1.00	Stream Power (lb/ft s)		50.53	
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	42.29	46.77	13.25
C & E Loss (ft)	0.85	Cum SA (acres)	10.37	6.41	6.97

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 #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	989.78	Wt. n-Val.		0.045	
Vel Head (ft)	1.91	Reach Len. (ft)	137.61	131.25	117.04
W.S. Elev (ft)	987.87	Flow Area (sq ft)		161.45	
Crit W.S. (ft)	987.87	Area (sq ft)		161.45	
E.G. Slope (ft/ft)	0.020896	Flow (cfs)		1790.00	
Q Total (cfs)	1790.00	Top Width (ft)		42.82	
Top Width (ft)	42.82	Avg. Vel. (ft/s)		11.09	
Vel Total (ft/s)	11.09	Hydr. Depth (ft)		3.77	
Max Chl Dpth (ft)	4.84	Conv. (cfs)		12382.9	
Conv. Total (cfs)	12382.9	Wetted Per. (ft)		45.61	
Length Wtd. (ft)	131.25	Shear (lb/sq ft)		4.62	
Min Ch El (ft)	983.03	Stream Power (lb/ft s)		51.20	
Alpha	1.00	Cum Volume (acre-ft)	12.56	50.12	2.10
Frctn Loss (ft)	0.27	Cum SA (acres)	3.33	6.43	0.68
C & E Loss (ft)	0.86				

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: Hope Creek
REACH: 1 RS: 6930

INPUT
Description:
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9781.95	1000.87	9799.86	997.76	9802.38	997.61	9935.39	995.4	9949.54	993.31
9968.55	984.36	9975.44	978.61	9988.3	976.89	10000	976.44	10008.8	976.63
10014.28	979.98	10020.97	984.41	10043.21	995.61	10048.18	997.11	10057.13	999.87

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9781.95	.12	9968.55	.045	10020.97	.1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9968.55 10020.97 458.64 434.11 418.59 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
9781.95	9968.55	1017.97	T
10020.97	10057.13	1017.97	T

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	988.34	Wt. n-Val.		0.045	
Vel Head (ft)	0.19	Reach Len. (ft)	458.64	434.11	418.59
W.S. Elev (ft)	988.15	Flow Area (sq ft)		510.24	
Crit W.S. (ft)	981.29	Area (sq ft)	15.29	510.24	13.93
E.G. Slope (ft/ft)	0.000606	Flow (cfs)		1790.00	
Q Total (cfs)	1790.00	Top Width (ft)	8.06	52.42	7.44
Top Width (ft)	67.92	Avg. Vel. (ft/s)		3.51	
Vel Total (ft/s)	3.51	Hydr. Depth (ft)		9.73	
Max Chl Dpth (ft)	11.71	Conv. (cfs)		72717.2	
Conv. Total (cfs)	72717.2	Wetted Per. (ft)		56.91	
Length Wtd. (ft)	434.11	Shear (lb/sq ft)		0.34	
Min Ch El (ft)	976.44	Stream Power (lb/ft s)		1.19	
Alpha	1.00	Cum Volume (acre-ft)	42.27	45.76	13.23
Frctn Loss (ft)					

C & E Loss (ft)	Cum SA (acres)	10.36	6.27	6.96

CROSS SECTION OUTPUT Profile #100 YR FW

E.G. Elev (ft)	988.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.		0.045	
W.S. Elev (ft)	988.15	Reach Len. (ft)	458.64	434.11	418.59
Crit W.S. (ft)	981.28	Flow Area (sq ft)		510.24	
E.G. Slope (ft/ft)	0.000715	Area (sq ft)		510.24	
Q Total (cfs)	1790.00	Flow (cfs)		1790.00	
Top Width (ft)	52.42	Top Width (ft)		52.42	
Vel Total (ft/s)	3.51	Avg. Vel. (ft/s)		3.51	
Max Chl Dpth (ft)	11.71	Hydr. Depth (ft)		9.73	
Conv. Total (cfs)	66930.2	Conv. (cfs)		66930.2	
Length Wtd. (ft)	434.11	Wetted Per. (ft)		64.44	
Min Ch El (ft)	976.44	Shear (lb/sq ft)		0.35	
Alpha	1.00	Stream Power (lb/ft s)		1.24	
Frctn Loss (ft)		Cum Volume (acre-ft)	12.56	49.11	2.10
C & E Loss (ft)		Cum SA (acres)	3.33	6.29	0.68

CULVERT

RIVER: Hope Creek
REACH: 1 RS: 6719

INPUT
Description: S. Marietta Pkwy, HC-6 2-10x8' Box Culvert
Distance from Upstream XS = 29.5
Deck/Roadway Width = 375
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 109

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
9224.89	1024.53		9228.8	1024.52		9256.11	1024.26	
9264.29	1024.22		9286.73	1024.05		9298.95	1024.01	
9302.27	1024		9327.78	1023.82		9338.47	1023.78	
9347.74	1023.76		9351.96	1023.75		9362.14	1023.67	
9389.96	1023.6		9393.38	1023.58		9417.65	1023.33	
9430.93	1023.07		9435.62	1022.98		9462.23	1022.7	
9478.58	1022.65		9492.7	1022.53		9508.71	1022.48	
9535.25	1022.25		9551.34	1022.16		9563.3	1021.96	
9590.79	1021.8		9598.41	1021.72		9605.98	1021.65	
9626.95	1021.45		9631.92	1021.4		9636.71	1021.46	
9640.54	1021.51		9648.68	1021.46		9673.39	1021.3	
9690.21	1021.09		9699.9	1021.04		9711.48	1020.97	
9742.37	1020.82		9746.12	1020.79		9754.37	1020.71	
9764.06	1020.56		9788.93	1020.32		9798.43	1020.19	
9806.68	1020.19		9831.72	1020.2		9838.32	1020.1	
9854.25	1019.91		9864.96	1019.76		9890.5	1019.47	
9899.11	1019.48		9949.6	1017.97		9976.17	1017.97	
9979.69	1017.97		9980.07	1017.97		10003.19	1017.97	
10075.41	1020.31		10090.03	1020.52		10109.94	1020.85	
10130.24	1021.27		10140.15	1021.51		10161.25	1022	
10174.98	1022.22		10182.64	1022.4		10205.31	1023.1	
10227.98	1023.65		10237.1	1023.98		10257.17	1024.61	
10278.59	1025.38		10286.05	1025.68		10300.3	1026.18	
10311.54	1026.63		10322.75	1027.05		10334.05	1027.5	
10346.61	1027.92		10358.01	1028.33		10370.6	1028.75	
10381.28	1029.09		10389.18	1029.4		10394.55	1029.67	
10406.41	1030.13		10408.67	1030.27		10411.49	1030.42	
10423.81	1030.89		10441.47	1031.33		10468.74	1032.45	
10472.78	1032.68		10477.2	1032.93		10481.87	1033.2	
10503.95	1034.11		10843.01	1047.54		10866.03	1048.42	
10873.74	1048.63		10877.47	1048.73		10926.33	1050.44	
10934.63	1050.8		10936.31	1050.83		10943.63	1051.06	
10945.29	1051.07		10946.54	1051.1		10948.45	1051.11	
10949.63	1051.14		10951.6	1051.14		10952.66	1051.16	
10953.56	1051.17		10973.73	1051.38		10990.8	1052.11	
10992.49	1052.16		10994.6	1052.21		10997.14	1052.27	
11008.41	1052.56							

Upstream Bridge Cross Section Data
Station Elevation Data num= 15

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9781.95 1000.87 9799.86  997.76 9802.38  997.61 9935.39   995.4 9949.54  993.31
 9968.55  984.36 9975.44  978.61  9988.3  976.89   10000  976.44   10012  976.63
10014.28  979.9810020.97  984.4110043.21   995.610048.18   997.110057.13  999.87

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9781.95     .12 9968.55    .04510020.97      .1

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9968.5510020.97            .3        .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 9781.95 9968.55 1017.97        T
10020.9710057.13 1017.97        T

Downstream  Deck/Roadway Coordinates
    num=     109
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
 9224.89 1024.53          9228.8 1024.52          9256.11 1024.26
 9264.29 1024.22         9286.73 1024.05          9298.95 1024.01
 9302.27    1024         9327.78 1023.82          9338.47 1023.78
 9347.74 1023.76         9351.96 1023.75          9362.14 1023.67
 9389.96  1023.6         9393.38 1023.58          9417.65 1023.33
 9430.93 1023.07         9435.62 1022.98          9462.23  1022.7
 9478.58 1022.65          9492.7 1022.53          9508.71 1022.48
 9535.25 1022.25         9551.34 1022.16           9563.3 1021.96
 9590.79  1021.8         9598.41 1021.72          9605.98 1021.65
 9626.95 1021.45         9631.92  1021.4          9636.71 1021.46
 9640.54 1021.51         9648.68 1021.46          9673.39  1021.3
 9690.21 1021.09          9699.9 1021.04          9711.48 1020.97
 9742.37 1020.82         9746.12 1020.79          9754.37 1020.71
 9764.06 1020.56         9788.93 1020.32          9798.43 1020.19
 9806.68 1020.19         9831.72  1020.2          9838.32  1020.1
 9854.25 1019.91         9864.96 1019.76           9890.5 1019.47
 9899.11 1019.48          9949.6 1017.97          9976.17 1017.97
 9979.69 1017.97         9980.07 1017.97         10003.19 1017.97
10075.41 1020.31        10090.03 1020.52         10109.94 1020.85
10130.24 1021.27        10140.15 1021.51         10161.25     1022
10174.98 1022.22        10182.64  1022.4         10205.31  1023.1
10227.98 1023.65         10237.1 1023.98         10257.17 1024.61
10278.59 1025.38        10286.05 1025.68          10300.3 1026.18
10311.54 1026.63        10322.75 1027.05         10334.05  1027.5
10346.61 1027.92        10358.01 1028.33          10370.6 1028.75
10381.28 1029.09        10389.18  1029.4         10394.55 1029.67
10406.41 1030.13        10408.67 1030.27         10411.49 1030.42
10423.81 1030.89        10441.47 1031.33         10468.74 1032.45
10472.78 1032.68         10477.2 1032.93         10481.87  1033.2
10503.95 1034.11        10843.01 1047.54         10866.03 1048.42
10873.74 1048.63        10877.47 1048.73         10926.33 1050.44
10934.63  1050.8        10936.31 1050.83         10943.63 1051.06
10945.29 1051.07        10946.54  1051.1         10948.45 1051.11
10949.63 1051.14         10951.6 1051.14         10952.66 1051.16
10953.56 1051.17        10973.73 1051.38          10990.8 1052.11
10992.49 1052.16         10994.6 1052.21         10997.14 1052.27
11008.41 1052.56

Downstream Bridge Cross Section Data
Station Elevation Data     num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9889.59  989.26 9904.06  987.96 9906.52  987.63 9911.03  987.08 9917.06  986.17
 9942.39  982.91 9943.57  982.73 9949.25  981.79 9951.67  981.26 9953.81  980.93
 9961.37  979.81 9963.73   979.2 9963.86  979.16 9963.96  979.13 9972.02  976.15
 9986.26  970.21    9989 966.4610000.01  966.25   10011 966.4110012.02  970.35
10018.62 971.8410018.77  971.8710030.71  974.19 10038.9 976.2510063.61  978.28
10071.74  979.31 10082.2  980.4210082.83 980.6710097.63 986.5310112.06  991.58

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9889.59     .12 9986.26    .03510012.02      .08

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9986.2610012.02            .3        .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 9889.59 9984.26 1017.97        F
```

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

Number of Culverts =  1

Culvert Name      Shape      Rise    Span
Culvert #1           Box       8      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
               29.5     375     .012     .012        0                  .5                1
Number of Barrels =  2
Upstream   Elevation =  977.32
Centerline Stations
    Sta.    Sta.
  9994.5 10005.5
Downstream Elevation =  967.01
Centerline Stations
    Sta.    Sta.
  9994.5 10005.5

CROSS SECTION


RIVER: Hope Creek
REACH: 1                    RS: 6496

INPUT
Description:
Station Elevation Data     num=       30
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9889.59  989.26 9904.06  987.96 9906.52  987.63 9911.03  987.08 9917.06  986.17
 9942.39  982.91 9943.57  982.73 9949.25  981.79 9951.67  981.26 9953.81  980.93
 9961.37  979.81 9963.73   979.2 9963.86  979.16 9963.96  979.13 9972.02  976.15
 9986.26  970.21 9995.17  966.4610000.01  966.2510004.33  966.4110012.02  970.35
10018.62  971.8410018.77  971.8710030.71  974.19 10038.9  976.2510063.61  978.28
10071.74  979.31 10082.2  980.4210082.83  980.6710097.63  986.5310112.06  991.58

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
 9889.59      .12 9986.26     .03510012.02      .08

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9986.2610012.02              261.27   218.1  177.15              .3        .5
Ineffective Flow      num=        2
   Sta L    Sta R     Elev  Permanent
 9889.59 9984.26 1017.97        F
10012.1210112.06 1017.97        F

CROSS SECTION OUTPUT  Profile #100 YR

  E.G. Elev (ft)            975.70    Element                    Left OB    Channel   Right OB
  Vel Head (ft)               1.98    Wt. n-Val.                  0.120      0.035     0.080
  W.S. Elev (ft)            973.73    Reach Len. (ft)            261.27     218.10    177.15
  Crit W.S. (ft)            972.96    Flow Area (sq ft)            6.20     156.79      0.34
  E.G. Slope (ft/ft)      0.006980    Area (sq ft)                14.82     156.79     26.52
  Q Total (cfs)            1790.00    Flow (cfs)                  12.92    1775.92      1.16
  Top Width (ft)             50.50    Top Width (ft)               8.43      25.76     16.31
  Vel Total (ft/s)           10.96    Avg. Vel. (ft/s)             2.08      11.33      3.43
  Max Chl Dpth (ft)           7.48    Hydr. Depth (ft)             3.10       6.09      3.37
  Conv. Total (cfs)        21425.3    Conv. (cfs)                 154.7    21256.7      13.9
  Length Wtd. (ft)          221.03    Wetted Per. (ft)             2.17      27.47      0.10
  Min Ch El (ft)            966.25    Shear (lb/sq ft)             1.25       2.49      1.43
  Alpha                       1.06    Stream Power (lb/ft s)       2.60      28.17      4.90
  Frctn Loss (ft)             1.23    Cum Volume (acre-ft)        42.11      42.44     13.04
  C & E Loss (ft)             0.10    Cum SA (acres)              10.27       5.88      6.85
```

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

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	976.17	Element			
Vel Head (ft)	1.46	Wt. n-Val.	0.120	0.035	0.080
W.S. Elev (ft)	974.71	Reach Len. (ft)	261.27	218.10	177.15
Crit W.S. (ft)	972.96	Flow Area (sq ft)	8.17	182.17	0.44
E.G. Slope (ft/ft)	0.004217	Area (sq ft)	24.30	182.17	43.97
Q Total (cfs)	1790.00	Flow (cfs)	15.91	1772.70	1.38
Top Width (ft)	54.53	Top Width (ft)	10.79	25.76	17.98
Vel Total (ft/s)	9.38	Avg. Vel. (ft/s)	1.95	9.73	3.16
Max Chl Dpth (ft)	8.46	Hydr. Depth (ft)	4.09	7.07	4.35
Conv. Total (cfs)	27563.1	Conv. (cfs)	245.1	27296.7	21.3
Length Wtd. (ft)	219.67	Wetted Per. (ft)	2.17	27.47	0.10
Min Ch El (ft)	966.25	Shear (lb/sq ft)	0.99	1.75	1.12
Alpha	1.07	Stream Power (lb/ft s)	1.93	16.99	3.53
Frctn Loss (ft)	1.08	Cum Volume (acre-ft)	12.43	45.66	1.89
C & E Loss (ft)	0.24	Cum SA (acres)	3.27	5.90	0.59

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, energy was used.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 6278

INPUT
Description:
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9803.29	982.33	9805.11	981.96	9806.14	981.81	9828.14	978.6	9841.13	976.27
9846.28	975.46	9849.85	974.52	9865.92	973.78	9894.36	972.39	9906.49	971.83
9923.4	970.83	9931	970.28	9963.22	969.91	9977.07	970.05	9978.95	970.05
9982.03	970.07	9986.44	969.88	9994.93	966.01	9999.92	965.79	10004.17	965.99
10012.01	970.73	10012.19	971.06	10013.67	971.78	10018.89	972.07	10035.15	972.95
10037.83	973.12	10061.54	984.92						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9803.29	.12	9986.44	.025	10012.01	.08

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9986.44 10012.01 596.84 648.74 713.24 .1 .3

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	974.37	Element			
Vel Head (ft)	1.78	Wt. n-Val.	0.120	0.025	0.080
W.S. Elev (ft)	972.60	Reach Len. (ft)	596.84	648.74	713.24
Crit W.S. (ft)	972.60	Flow Area (sq ft)	184.14	134.59	8.09
E.G. Slope (ft/ft)	0.004553	Area (sq ft)	184.14	134.59	8.09
Q Total (cfs)	1790.00	Flow (cfs)	236.94	1546.87	6.19
Top Width (ft)	138.43	Top Width (ft)	96.28	25.57	16.58
Vel Total (ft/s)	5.48	Avg. Vel. (ft/s)	1.29	11.49	0.77
Max Chl Dpth (ft)	6.81	Hydr. Depth (ft)	1.91	5.26	0.49
Conv. Total (cfs)	26528.9	Conv. (cfs)	3511.5	22925.6	91.8
Length Wtd. (ft)	644.99	Wetted Per. (ft)	96.35	27.74	16.97
Min Ch El (ft)	965.79	Shear (lb/sq ft)	0.54	1.38	0.14
Alpha	3.81	Stream Power (lb/ft s)	0.70	15.85	0.10
Frctn Loss (ft)	1.54	Cum Volume (acre-ft)	41.51	41.71	12.97
C & E Loss (ft)	0.19	Cum SA (acres)	9.96	5.75	6.78

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 #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	974.85	Element			
Vel Head (ft)	2.26	Wt. n-Val.	0.120	0.025	
W.S. Elev (ft)	972.59	Reach Len. (ft)	596.84	648.74	713.24
Crit W.S. (ft)	972.59	Flow Area (sq ft)	68.74	134.42	
E.G. Slope (ft/ft)	0.005841	Area (sq ft)	68.74	134.42	
Q Total (cfs)	1790.00	Flow (cfs)	115.45	1674.55	
Top Width (ft)	51.99	Top Width (ft)	26.42	25.57	
Vel Total (ft/s)	8.81	Avg. Vel. (ft/s)	1.68	12.46	
Max Chl Dpth (ft)	6.80	Hydr. Depth (ft)	2.60	5.26	
Conv. Total (cfs)	23421.2	Conv. (cfs)	1510.7	21910.5	
Length Wtd. (ft)	647.07	Wetted Per. (ft)	29.07	29.60	
Min Ch El (ft)	965.79	Shear (lb/sq ft)	0.86	1.66	
Alpha	1.87	Stream Power (lb/ft s)	1.45	20.63	
Frctn Loss (ft)	2.09	Cum Volume (acre-ft)	12.16	44.87	1.80
C & E Loss (ft)	0.35	Cum SA (acres)	3.16	5.77	0.56

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 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 cross section had to be extended vertically during the critical depth 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.
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 5629

INPUT
Description:
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9663.41	980.83	9680.64	976.68	9688.56	975.37	9694.14	974.48	9699.85	973.74
9703.1	973.44	9708.01	973.59	9714.45	973.49	9718.86	973.55	9729.39	973.45
9734.64	973.58	9737.31	973.56	9748.19	973.75	9749.7	973.74	9750.86	973.64
9761.28	973.99	9764.91	974	9779.35	973.41	9794.19	972.77	9796.98	972.65
9802.81	971.45	9811.56	970.63	9816.07	969.91	9823.25	969.22	9836.58	968.9
9852.51	968.61	9862.6	968.52	9876.71	968.56	9885.29	969.14	9892.29	969.46
9906.05	970.29	9910.69	970.53	9912.47	972.42	9950.99	971.68	9972.01	968.32
9986.25	962.38	9995.16	958.63	10000	958.42	10004.32	958.58	10012.01	962.52
10012.87	983.28								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9663.41	.12	9986.25	.025	10012.01	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9986.25	10012.01	205.65	201.08	200.99	.3	.5

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	968.86	Element			
Vel Head (ft)	1.14	Wt. n-Val.	0.120	0.025	0.080
W.S. Elev (ft)	967.71	Reach Len. (ft)	205.65	201.08	200.99

Crit W.S. (ft)		Flow Area (sq ft)	34.09	203.57	0.56
E.G. Slope (ft/ft)	0.001465	Area (sq ft)	34.09	203.57	0.56
Q Total (cfs)	1790.00	Flow (cfs)	29.46	1760.45	0.09
Top Width (ft)	38.76	Top Width (ft)	12.79	25.76	0.21
Vel Total (ft/s)	7.51	Avg. Vel. (ft/s)	0.86	8.65	0.16
Max Chl Dpth (ft)	9.29	Hydr. Depth (ft)	2.67	7.90	2.60
Conv. Total (cfs)	46758.8	Conv. (cfs)	769.5	45987.0	2.3
Length Wtd. (ft)	201.14	Wetted Per. (ft)	13.85	27.47	5.19
Min Ch El (ft)	958.42	Shear (lb/sq ft)	0.23	0.68	0.01
Alpha	1.30	Stream Power (lb/ft s)	0.19	5.86	0.00
Frctn Loss (ft)	0.16	Cum Volume (acre-ft)	40.02	39.19	12.90
C & E Loss (ft)	0.28	Cum SA (acres)	9.21	5.37	6.64

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 #100 YR FW

E.G. Elev (ft)	969.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.09	Wt. n-Val.		0.025	
W.S. Elev (ft)	968.09	Reach Len. (ft)	205.65	201.08	200.99
Crit W.S. (ft)		Flow Area (sq ft)		213.36	
E.G. Slope (ft/ft)	0.002050	Area (sq ft)		213.36	
Q Total (cfs)	1790.00	Flow (cfs)		1790.00	
Top Width (ft)	25.76	Top Width (ft)		25.76	
Vel Total (ft/s)	8.39	Avg. Vel. (ft/s)		8.39	
Max Chl Dpth (ft)	9.67	Hydr. Depth (ft)		8.28	
Conv. Total (cfs)	39533.9	Conv. (cfs)		39533.9	
Length Wtd. (ft)	201.08	Wetted Per. (ft)		38.76	
Min Ch El (ft)	958.42	Shear (lb/sq ft)		0.70	
Alpha	1.00	Stream Power (lb/ft s)		5.91	
Frctn Loss (ft)	0.26	Cum Volume (acre-ft)	11.69	42.28	1.80
C & E Loss (ft)	0.25	Cum SA (acres)	2.98	5.39	0.56

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.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 5428

INPUT
Description:
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9494.28	976.62	9507.56	973.91	9512.84	972.83	9514.96	972.42	9521.05	972.17
9524.88	972.02	9533.91	971.61	9541.48	971.31	9547.26	970.53	9547.7	970.49
9548.77	970.36	9550.44	970.24	9564.15	969.34	9564.53	969.32	9566.83	968.61
9581.36	965.46	9584.59	965.06	9587.25	964.84	9596.02	964.69	9606.43	964.53
9608.17	964.51	9613.93	964.43	9635.01	964.06	9645.73	962.26	9649.59	961.6
9659.69	961.41	9674.25	961.01	9682.31	960.85	9953.74	960.3	9966.04	960.04
9971.16	959.98	9974.67	959.83	9978.83	959.81	9986.25	959.32	9995.16	955.57
10000	955.36	10004.32	955.52	10012.01	959.46	10016.4	966.46	10019.39	973.97

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9494.28	.12	9986.25	.025	10012.01	.08

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9986.25	10012.01	519.24	458.42	414.44	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
9494.28	9984.63	969.52	F
10013.39	10019.39	969.52	F

CROSS SECTION OUTPUT Profile #100 YR

E.G. Elev (ft)	968.42	Element	Left OB	Channel	Right OB

					proposed FW.rep
Vel Head (ft)	0.58	Wt. n-Val.	0.120	0.025	0.080
W.S. Elev (ft)	967.84	Reach Len. (ft)	519.24	458.42	414.44
Crit W.S. (ft)	962.07	Flow Area (sq ft)	13.71	285.59	10.04
E.G. Slope (ft/ft)	0.000476	Area (sq ft)	2707.45	285.59	21.79
Q Total (cfs)	1790.00	Flow (cfs)	15.37	1764.60	10.03
Top Width (ft)	446.55	Top Width (ft)	415.85	25.76	4.94
Vel Total (ft/s)	5.79	Avg. Vel. (ft/s)	1.12	6.18	1.00
Max Chl Dpth (ft)	12.48	Hydr. Depth (ft)	8.46	11.09	7.28
Conv. Total (cfs)	82009.6	Conv. (cfs)	704.1	80846.1	459.4
Length Wtd. (ft)	458.42	Wetted Per. (ft)	1.62	27.47	2.60
Min Ch El (ft)	955.36	Shear (lb/sq ft)	0.25	0.31	0.11
Alpha	1.12	Stream Power (lb/ft s)	0.28	1.91	0.11
Frctn Loss (ft)		Cum Volume (acre-ft)	33.54	38.06	12.85
C & E Loss (ft)		Cum SA (acres)	8.20	5.25	6.63

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

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	968.67	Wt. n-Val.		0.025	
Vel Head (ft)	0.58	Reach Len. (ft)	519.24	458.42	414.44
W.S. Elev (ft)	968.09	Flow Area (sq ft)		292.12	
Crit W.S. (ft)	962.06	Area (sq ft)		292.12	
E.G. Slope (ft/ft)	0.000874	Flow (cfs)		1790.00	
Q Total (cfs)	1790.00	Top Width (ft)		25.76	
Top Width (ft)	25.76	Avg. Vel. (ft/s)		6.13	
Vel Total (ft/s)	6.13	Hydr. Depth (ft)		11.34	
Max Chl Dpth (ft)	12.73	Conv. (cfs)		60530.6	
Conv. Total (cfs)	60530.6	Wetted Per. (ft)		44.88	
Length Wtd. (ft)	458.42	Shear (lb/sq ft)		0.36	
Min Ch El (ft)	955.36	Stream Power (lb/ft s)		2.18	
Alpha	1.00	Cum Volume (acre-ft)	11.69	41.11	1.80
Frctn Loss (ft)		Cum SA (acres)	2.98	5.27	0.56
C & E Loss (ft)					

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

CULVERT

RIVER: Hope Creek
REACH: 1 RS: 5146

INPUT
Description: I-75, HC-4, 2-9x6 Box
Distance from Upstream XS = 17
Deck/Roadway Width = 425
Weir Coefficient = 2.8
Upstream Deck/Roadway Coordinates
num= 50

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
9439.25	969.45		9725.25	969.45		9730.79	969.45	
9737.49	969.45		9745.37	969.45		9752.75	969.45	
9765.99	969.45		9970.88	969.52		9982.88	969.52	
10024.87	969.52		10036.05	970.14		10041.11	970.23	
10050.31	970.4		10108.03	971.73		10118.43	972.04	
10131.15	972.34		10135.54	972.54		10189.34	974.07	
10196.9	974.17		10210.77	974.61		10297.86	974.86	
10330.75	974.96		10333.8	974.97		10337.4	974.35	
10346.03	972.86		10349.55	973.73		10381.62	981.42	
10405.7	992.45		10408.55	993.67		10409.29	993.72	
10450.59	995.25		10456.78	995.51		10462.41	995.54	
10492.18	996.02		10525.03	995.39		10527.38	995.31	
10528.77	995.32		10531.44	995.33		10565.96	995.33	
10597.8	995.59		10598.34	995.58		10598.94	995.61	
10637.36	996.21		10665.54	995.98		10673.12	995.92	
10712.68	996.38		10740.48	996.87		10764.42	997.25	
10799.24	998.33		10801.36	998.34				

Upstream Bridge Cross Section Data
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
 9494.28  976.62 9507.56  973.91 9512.84  972.83 9514.96  972.42 9521.05  972.17
 9524.88  972.02 9533.91  971.61 9541.48  971.31 9547.26  970.53  9547.7  970.49
 9548.77  970.36 9550.44  970.24 9564.15  969.34 9564.53  969.32 9566.83  968.61
 9581.36  965.46 9584.59  965.06 9587.25  964.84 9596.02  964.69 9606.43  964.53
 9608.17  964.51 9613.93  964.43 9635.01  964.06 9645.73  962.26 9649.59   961.6
 9659.69  961.41 9674.25  961.01 9682.31  960.85 9953.74   960.3 9966.04  960.04
 9971.16  959.98 9974.67  959.83 9978.83  959.81 9986.25  959.32    9990   955.3
   10000   955.3   10010   955.310012.01  959.46 10016.4  966.4610019.39  973.97

Manning's n Values          num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
 9494.28      .12 9986.25     .02510012.01      .08

Bank Sta: Left   Right     Coeff Contr.    Expan.
       9986.2510012.01                .3        .5
Ineffective Flow      num=        2
   Sta L    Sta R     Elev  Permanent
 9494.28 9984.63   969.52        F
10013.3910019.39   969.52        F

Downstream  Deck/Roadway Coordinates
    num=       50
     Sta Hi Cord Lo Cord       Sta Hi Cord Lo Cord       Sta Hi Cord Lo Cord
 9439.25  969.45          9725.25  969.45          9730.79  969.45
 9737.49  969.45          9745.37  969.45          9752.75  969.45
 9765.99  969.45          9970.88  969.52          9982.88  969.52
10024.87  969.52         10036.05  970.14         10041.11  970.23
10050.31   970.4         10108.03  971.73         10118.43  972.04
10131.15  972.34         10135.54  972.54         10189.34  974.07
 10196.9  974.17         10210.77  974.61         10297.86  974.86
10330.75  974.96          10333.8  974.97          10337.4  974.35
10346.03  972.86         10349.55  973.73         10381.62  981.42
 10405.7  992.45         10408.55  993.67         10409.29  993.72
10450.59  995.25         10456.78  995.51         10462.41  995.54
10492.18  996.02         10525.03  995.39         10527.38  995.31
10528.77  995.32         10531.44  995.33         10565.96  995.33
 10597.8  995.59         10598.34  995.58         10598.94  995.61
10637.36  996.21         10665.54  995.98         10673.12  995.92
10712.68  996.38         10740.48  996.87         10764.42  997.25
10799.24  998.33         10801.36  998.34

Downstream Bridge Cross Section Data
Station Elevation Data     num=       14
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9968.35  966.59 9970.14  966.43 9970.75  966.38 9974.46  962.41 9988.91  956.36
    9990  950.63   10000   950.610010.74   950.710012.88  957.5110026.81  962.32
10030.78  962.5310033.08  963.2710048.84  968.2410053.37  969.87

Manning's n Values          num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
 9968.35      .09 9988.91     .0410012.88      .12

Bank Sta: Left   Right     Coeff Contr.    Expan.
       9988.9110012.88                .3        .5
Ineffective Flow      num=        2
   Sta L    Sta R     Elev  Permanent
 9968.35 9988.56   969.52        F
10013.5410053.37   969.52        F

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

Number of Culverts =  1

Culvert Name      Shape      Rise     Span
Culvert #1            Box         6        9
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 17     425     .012      .012          0                   .5                 1
```

```
Number of Barrels =  2
Upstream   Elevation =  955.35
Centerline Stations
    Sta.    Sta.
    9995   10005
Downstream Elevation =  950.84
Centerline Stations
    Sta.    Sta.
    9995   10005
```

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4969

INPUT
Description:

```
Station Elevation Data     num=      14
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9968.35   966.59 9970.14   966.43 9970.75   966.38 9974.46   962.41 9988.91   956.36
 9990.74   950.63   10000    950.610010.74   951.2210012.88   957.5110026.81   962.32
10030.78   962.5310033.08   963.2710048.84   968.2410053.37   969.87

Manning's n Values         num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
 9968.35      .09 9988.91     .0410012.88      .12

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9988.9110012.88              170.27  251.19  305.99              .3        .5
Ineffective Flow      num=        2
   Sta L    Sta R     Elev   Permanent
 9968.35 9988.56   969.52         F
10013.5410053.37   969.52         F
```

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	960.19	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	1.64	Reach Len. (ft)	170.27	251.19	305.99
W.S. Elev (ft)	958.55	Flow Area (sq ft)	0.74	173.63	0.61
Crit W.S. (ft)	956.86	Area (sq ft)	5.71	173.63	1.55
E.G. Slope (ft/ft)	0.008284	Flow (cfs)	1.74	1787.64	0.63
Q Total (cfs)	1790.00	Top Width (ft)	5.22	23.97	3.00
Top Width (ft)	32.19	Avg. Vel. (ft/s)	2.34	10.30	1.03
Vel Total (ft/s)	10.23	Hydr. Depth (ft)	2.11	7.24	0.92
Max Chl Dpth (ft)	7.95	Conv. (cfs)	19.1	19641.2	6.9
Conv. Total (cfs)	19667.1	Wetted Per. (ft)	0.38	32.68	0.70
Length Wtd. (ft)	250.98	Shear (lb/sq ft)	1.01	2.75	0.45
Min Ch El (ft)	950.60	Stream Power (lb/ft s)	2.36	28.29	0.46
Alpha	1.01	Cum Volume (acre-ft)	17.37	35.65	12.74
Frctn Loss (ft)	0.75	Cum SA (acres)	5.69	4.99	6.59
C & E Loss (ft)	0.61				

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

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	960.34	Wt. n-Val.		0.040	
Vel Head (ft)	1.54	Reach Len. (ft)	170.27	251.19	305.99
W.S. Elev (ft)	958.80	Flow Area (sq ft)		179.67	
Crit W.S. (ft)	956.86	Area (sq ft)		179.67	
E.G. Slope (ft/ft)	0.008559	Flow (cfs)		1790.00	
Q Total (cfs)	1790.00	Top Width (ft)		23.97	
Top Width (ft)	23.97	Avg. Vel. (ft/s)		9.96	
Vel Total (ft/s)	9.96	Hydr. Depth (ft)		7.50	
Max Chl Dpth (ft)	8.20	Conv. (cfs)		19348.3	
Conv. Total (cfs)	19348.3	Wetted Per. (ft)		36.40	
Length Wtd. (ft)	251.19				

Min Ch El (ft)	950.60	Shear (lb/sq ft)		2.64	
Alpha	1.00	Stream Power (lb/ft s)		26.27	
Frctn Loss (ft)	0.77	Cum Volume (acre-ft)	11.69	38.63	1.80
C & E Loss (ft)	0.57	Cum SA (acres)	2.98	5.01	0.56

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.
Warning: The energy loss was 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, energy was used.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4925.680

INPUT
Description: 1
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	966.05	.67	966.04	6.73	965.94	10.16	965.88	15.22	965.81
16.14	962	17.01	958.99	21.86	956.78	24.79	955.24	27.12	952.03
28.33	948.84	40.39	949.33	40.68	949.33	41.07	949.36	46.04	949.53
53.68	949.81	54.7	949.98	55.85	950.17	56.56	950.29	65.26	951.74
65.45	951.76	66.54	957.6	66.83	958.95	68.87	959.16	72.64	959.6
85.55	961.13	85.59	961.14	88	961.24	102.73	962.2	137.62	969.34

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.09	24.79	.04	66.83	.1	88	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
24.79	66.83	18.25	17.81	18.01	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	958.82	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	0.41	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	958.41	Flow Area (sq ft)	9.92	344.41	
Crit W.S. (ft)	953.91	Area (sq ft)	9.92	344.41	
E.G. Slope (ft/ft)	0.001538	Flow (cfs)	7.93	1782.07	
Q Total (cfs)	1790.00	Top Width (ft)	6.50	41.92	
Top Width (ft)	48.42	Avg. Vel. (ft/s)	0.80	5.17	
Vel Total (ft/s)	5.05	Hydr. Depth (ft)	1.53	8.22	
Max Chl Dpth (ft)	9.57	Conv. (cfs)	202.3	45445.9	
Conv. Total (cfs)	45648.3	Wetted Per. (ft)	7.23	51.44	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.13	0.64	
Min Ch El (ft)	948.84	Stream Power (lb/ft s)	0.11	3.33	
Alpha	1.04	Cum Volume (acre-ft)	17.34	34.15	12.73
Frctn Loss (ft)		Cum SA (acres)	5.67	4.80	6.58
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	958.99	Wt. n-Val.		0.040	
Vel Head (ft)	0.40	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	958.59	Flow Area (sq ft)		352.24	
Crit W.S. (ft)	953.91	Area (sq ft)		352.24	
E.G. Slope (ft/ft)	0.001573	Flow (cfs)		1790.00	
Q Total (cfs)	1790.00	Top Width (ft)		41.96	
Top Width (ft)	41.96	Avg. Vel. (ft/s)		5.08	
Vel Total (ft/s)	5.08	Hydr. Depth (ft)		8.39	
Max Chl Dpth (ft)	9.75	Conv. (cfs)		45131.4	
Conv. Total (cfs)	45131.4	Wetted Per. (ft)		54.99	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		0.63	
Min Ch El (ft)	948.84	Stream Power (lb/ft s)		3.20	
Alpha	1.00	Cum Volume (acre-ft)	11.69	37.09	1.80
Frctn Loss (ft)		Cum SA (acres)	2.98	4.82	0.56
C & E Loss (ft)					

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 4918

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	970	967	200	970	967

Upstream Bridge Cross Section Data
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	965.93	.67	965.92	6.73	965.82	10.16	965.76	15.22	965.69
16.14	961.88	17.01	958.87	21.86	956.66	24.79	955.12	27.12	951.91
28.33	948.72	40.39	949.21	40.68	949.21	41.07	949.24	46.04	949.41
53.68	949.69	54.7	949.86	55.85	950.05	56.56	950.17	65.26	951.62
65.45	951.64	66.54	957.48	66.83	958.83	68.87	959.04	72.64	959.48
85.55	961.01	85.59	961.02	88	961.12	102.73	962.08	137.62	969.22

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.09	24.79	.04	66.83	.1	88	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
24.79	66.83	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	970	967	200	970	967

Downstream Bridge Cross Section Data
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	966.15	1.93	966.1	2.31	966.09	8.75	965.99	16.79	965.87
17.56	963.22	18.76	959.25	20.16	958.61	24.88	956.46	26.77	955.45
29.11	953.07	30.82	948.59	31.9	948.54	32.95	948.55	34.24	948.53
42.33	948.65	46.67	948.91	52.99	949.14	53.6	949.16	59.7	950.18
60.38	950.26	64.3	950.74	65.6	953.67	66.58	958.19	83.34	959.91
87.54	959.91	89.68	959.98	94.66	960.45	98.39	960.8	106.42	961.61
118.91	962.42	130.89	964.83	147.6	967.29				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.09	26.77	.04	66.58	.1	89.68	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
26.77	66.58	.1	.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data
Pier Station Upstream= 68.3 Downstream= 68.3
Upstream num= 2

Width	Elev	Width	Elev
8	945	8	970

Downstream num= 2

Width	Elev	Width	Elev
8	945	8	970

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Momentum Cd = 2
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 YR

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	958.82	E.G. Elev (ft)	958.67	958.53
W.S. US. (ft)	958.41	W.S. Elev (ft)	958.22	958.04
Q Total (cfs)	1790.00	Crit W.S. (ft)	953.82	953.58
Q Bridge (cfs)	1790.00	Max Chl Dpth (ft)	9.50	9.51
Q Weir (cfs)		Vel Total (ft/s)	5.28	5.50
Weir Sta Lft (ft)		Flow Area (sq ft)	339.29	325.45
Weir Sta Rgt (ft)		Froude # Chl	0.33	0.34
Weir Submerg		Specif Force (cu ft)	1712.91	1709.03
Weir Max Depth (ft)		Hydr Depth (ft)	7.40	7.59
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	57.34	55.01
Min El Prs (ft)	967.00	Conv. Total (cfs)	43127.0	41353.5
Delta EG (ft)	0.31	Top Width (ft)	45.86	42.90
Delta WS (ft)	0.32	Frctn Loss (ft)		
BR Open Area (sq ft)	1024.02	C & E Loss (ft)		
BR Open Vel (ft/s)	5.50	Shear Total (lb/sq ft)	0.64	0.69
Coef of Q		Power Total (lb/ft s)	3.36	3.81
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #100 YR FW

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	958.99	E.G. Elev (ft)	958.84	958.70
W.S. US. (ft)	958.59	W.S. Elev (ft)	958.40	958.23
Q Total (cfs)	1790.00	Crit W.S. (ft)	953.82	953.58
Q Bridge (cfs)	1790.00	Max Chl Dpth (ft)	9.68	9.70
Q Weir (cfs)		Vel Total (ft/s)	5.31	5.50
Weir Sta Lft (ft)		Flow Area (sq ft)	337.10	325.58
Weir Sta Rgt (ft)		Froude # Chl	0.32	0.33
Weir Submerg		Specif Force (cu ft)	1760.74	1757.14
Weir Max Depth (ft)		Hydr Depth (ft)	8.53	8.68
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	50.46	49.23
Min El Prs (ft)	967.00	Conv. Total (cfs)	44420.7	42611.8
Delta EG (ft)	0.31	Top Width (ft)	39.51	37.53
Delta WS (ft)	0.33	Frctn Loss (ft)		
BR Open Area (sq ft)	654.87	C & E Loss (ft)		
BR Open Vel (ft/s)	5.50	Shear Total (lb/sq ft)	0.68	0.73
Coef of Q		Power Total (lb/ft s)	3.60	4.01
Br Sel Method	Momentum			

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4907.867

INPUT
Description: 2
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	965.91	1.93	965.86	2.31	965.85	8.75	965.75	16.79	965.63
17.56	962.98	18.76	959.01	20.16	958.37	24.88	956.22	26.77	955.21
29.11	952.83	30.82	948.35	31.9	948.3	32.95	948.31	34.24	948.29
42.33	948.41	46.67	948.67	52.99	948.9	53.6	948.92	59.7	949.94
60.38	950.02	64.3	950.5	65.6	953.43	66.58	957.95	83.34	959.67
87.54	959.67	89.68	959.74	94.66	960.21	98.39	960.56	106.42	961.37
118.91	962.18	130.89	964.59	147.6	967.05				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.09	26.77	.04	66.58	.1	89.68	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
26.77	66.58	122.42	124.85	123.52	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	958.51	Wt. n-Val.	0.090	0.040	0.100
Vel Head (ft)	0.43	Reach Len. (ft)	122.42	124.85	123.52
W.S. Elev (ft)	958.09	Flow Area (sq ft)	8.31	339.65	0.09
Crit W.S. (ft)		Area (sq ft)	8.31	339.65	0.09
E.G. Slope (ft/ft)	0.001536	Flow (cfs)	6.24	1783.76	0.01
Q Total (cfs)	1790.00	Top Width (ft)	5.99	39.81	1.33
Top Width (ft)	47.13	Avg. Vel. (ft/s)	0.75	5.25	0.10
Vel Total (ft/s)	5.14	Hydr. Depth (ft)	1.39	8.53	0.07
Max Chl Dpth (ft)	9.80	Conv. (cfs)	159.1	45514.0	0.2
Conv. Total (cfs)	45673.3	Wetted Per. (ft)	6.65	49.58	1.34
Length Wtd. (ft)	124.85	Shear (lb/sq ft)	0.12	0.66	0.01
Min Ch El (ft)	948.29	Stream Power (lb/ft s)	0.09	3.45	0.00
Alpha	1.04	Cum Volume (acre-ft)	17.34	34.02	12.73
Frctn Loss (ft)	0.19	Cum SA (acres)	5.67	4.78	6.58
C & E Loss (ft)	0.01				

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	958.68	Wt. n-Val.		0.040	
Vel Head (ft)	0.41	Reach Len. (ft)	122.42	124.85	123.52
W.S. Elev (ft)	958.27	Flow Area (sq ft)		346.82	
Crit W.S. (ft)		Area (sq ft)		346.82	
E.G. Slope (ft/ft)	0.001575	Flow (cfs)		1790.00	
Q Total (cfs)	1790.00	Top Width (ft)		39.81	
Top Width (ft)	39.81	Avg. Vel. (ft/s)		5.16	
Vel Total (ft/s)	5.16	Hydr. Depth (ft)		8.71	
Max Chl Dpth (ft)	9.98	Conv. (cfs)		45102.9	
Conv. Total (cfs)	45102.9	Wetted Per. (ft)		52.95	
Length Wtd. (ft)	124.85	Shear (lb/sq ft)		0.64	
Min Ch El (ft)	948.29	Stream Power (lb/ft s)		3.32	
Alpha	1.00	Cum Volume (acre-ft)	11.69	36.96	1.80
Frctn Loss (ft)	0.19	Cum SA (acres)	2.98	4.80	0.56
C & E Loss (ft)	0.01				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4783.015

INPUT
Description: 3
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	964.68	5.33	964.55	7.3	952.57	7.45	952.03	7.56	952.02
13.83	947.62	13.87	947.57	13.93	947.57	14.58	947.57	24.7	947.6
35.21	947.82	37.02	947.92	40.08	950.62	41.08	951.48	48.41	957.81
53.7	962.39	55.16	962.45	69.74	962.92	78.97	963.23	101.9	963.56
118.58	963.48	123.32	965.58	123.66	965.68	131.16	967.79		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	5.33	.04	53.7	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
5.33	53.7	18.84	18.63	18.24	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	958.32	Wt. n-Val.		0.040	
Vel Head (ft)	0.41	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	957.91	Flow Area (sq ft)		349.42	
Crit W.S. (ft)	952.80	Area (sq ft)		349.42	
E.G. Slope (ft/ft)	0.001507				

Q Total (cfs)	1790.00	Flow (cfs)		1790.00	
Top Width (ft)	42.10	Top Width (ft)		42.10	
Vel Total (ft/s)	5.12	Avg. Vel. (ft/s)		5.12	
Max Chl Dpth (ft)	10.34	Hydr. Depth (ft)		8.30	
Conv. Total (cfs)	46103.0	Conv. (cfs)		46103.0	
Length Wtd. (ft)	4.00	Wetted Per. (ft)		52.20	
Min Ch El (ft)	947.57	Shear (lb/sq ft)		0.63	
Alpha	1.00	Stream Power (lb/ft s)		3.23	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	17.33	33.03	12.73
C & E Loss (ft)	0.00	Cum SA (acres)	5.66	4.66	6.58

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	958.49	Wt. n-Val.		0.040	
Vel Head (ft)	0.39	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	958.10	Flow Area (sq ft)		357.31	
Crit W.S. (ft)	952.80	Area (sq ft)		357.31	
E.G. Slope (ft/ft)	0.001416	Flow (cfs)		1790.00	
Q Total (cfs)	1790.00	Top Width (ft)		42.35	
Top Width (ft)	42.35	Avg. Vel. (ft/s)		5.01	
Vel Total (ft/s)	5.01	Hydr. Depth (ft)		8.44	
Max Chl Dpth (ft)	10.53	Conv. (cfs)		47563.5	
Conv. Total (cfs)	47563.5	Wetted Per. (ft)		52.67	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		0.60	
Min Ch El (ft)	947.57	Stream Power (lb/ft s)		3.00	
Alpha	1.00	Cum Volume (acre-ft)	11.69	35.95	1.80
Frctn Loss (ft)	0.01	Cum SA (acres)	2.98	4.68	0.56
C & E Loss (ft)	0.00				

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 4775

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	970	967	200	970	967

Upstream Bridge Cross Section Data
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	964.64	5.33	964.51	7.3	952.53	7.45	951.99	7.56	951.98
13.83	947.58	13.87	947.53	13.93	947.53	14.58	947.53	24.7	947.56
35.21	947.78	37.02	947.88	40.08	950.58	41.08	951.44	48.41	957.77
53.7	962.35	55.16	962.41	69.74	962.88	78.97	963.19	101.9	963.52
118.58	963.44	123.32	965.54	123.66	965.64	131.16	967.75		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	5.33	.04	53.7	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
5.33	53.7	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	970	967	200	970	967

Downstream Bridge Cross Section Data
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	964.8	.67	964.78	3.11	964.7	8.15	964.53	9.43	964.5
9.98	964.49	10.09	963.82	12.09	956.38	12.11	956.38	13.5	955.4
19.84	947.47	27.28	947.75	29.8	947.76	33.36	947.83	42.54	947.76
46.01	951.43	51.62	956.26	57.59	961.43	62.45	961.58	83.83	962.28
86.85	962.32	104.71	962.56	113.01	962.51	123.42	967.14	124.17	967.35

127.91 968.41

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	9.98	.04	57.59	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
9.98	57.59	.1	.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data
Pier Station Upstream= 59.29 Downstream= 64.19

Upstream num= 2

Width	Elev	Width	Elev
8	945	8	970

Downstream num= 2

Width	Elev	Width	Elev
8	945	8	970

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Momentum Cd = 2
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 YR

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	958.32	E.G. Elev (ft)	958.31	958.29
W.S. US. (ft)	957.91	W.S. Elev (ft)	957.91	957.82
Q Total (cfs)	1790.00	Crit W.S. (ft)	952.79	953.10
Q Bridge (cfs)	1790.00	Max Chl Dpth (ft)	10.38	10.35
Q Weir (cfs)		Vel Total (ft/s)	5.10	5.51
Weir Sta Lft (ft)		Flow Area (sq ft)	350.95	324.90
Weir Sta Rgt (ft)		Froude # Chl	0.31	0.35
Weir Submerg		Specif Force (cu ft)	1922.52	1781.50
Weir Max Depth (ft)		Hydr Depth (ft)	8.33	7.79
Min El Weir Flow (ft)	970.01	W.P. Total (ft)	52.29	50.92
Min El Prs (ft)	967.00	Conv. Total (cfs)	46386.8	41523.1
Delta EG (ft)	0.04	Top Width (ft)	42.15	41.72
Delta WS (ft)	0.10	Frctn Loss (ft)	0.01	0.02
BR Open Area (sq ft)	1017.88	C & E Loss (ft)	0.01	0.00
BR Open Vel (ft/s)	5.51	Shear Total (lb/sq ft)	0.62	0.74
Coef of Q		Power Total (lb/ft s)	3.18	4.08
Br Sel Method	Energy only			

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #100 YR FW

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	958.49	E.G. Elev (ft)	958.48	958.47
W.S. US. (ft)	958.10	W.S. Elev (ft)	958.09	958.02
Q Total (cfs)	1790.00	Crit W.S. (ft)	952.79	953.10
Q Bridge (cfs)	1790.00			

Q Weir (cfs)		Max Chl Dpth (ft)	10.56	10.55
Weir Sta Lft (ft)		Vel Total (ft/s)	4.99	5.38
Weir Sta Rgt (ft)		Flow Area (sq ft)	358.86	332.98
Weir Submerg		Froude # Chl	0.30	0.34
Weir Max Depth (ft)		Specif Force (cu ft)	1982.67	1837.51
Min El Weir Flow (ft)	970.01	Hydr Depth (ft)	8.46	7.93
Min El Prs (ft)	967.00	W.P. Total (ft)	52.77	51.41
Delta EG (ft)	0.04	Conv. Total (cfs)	47852.5	42979.3
Delta WS (ft)	0.09	Top Width (ft)	42.40	42.00
BR Open Area (sq ft)	748.76	Frctn Loss (ft)	0.01	0.01
BR Open Vel (ft/s)	5.38	C & E Loss (ft)	0.01	0.00
Coef of Q		Shear Total (lb/sq ft)	0.59	0.70
Br Sel Method	Energy only	Power Total (lb/ft s)	2.96	3.77

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4764.388

INPUT
Description: 4
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	964.72	.67	964.7	3.11	964.62	8.15	964.45	9.43	964.42
9.98	964.41	10.09	963.74	12.09	956.3	12.11	956.3	13.5	955.32
19.84	947.39	27.28	947.67	29.8	947.68	33.36	947.75	42.54	947.68
46.01	951.35	51.62	956.18	57.59	961.35	62.45	961.5	83.83	962.2
86.85	962.24	104.71	962.48	113.01	962.43	123.42	967.06	124.17	967.27
127.91	968.33								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	9.98	.04	57.59	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9.98	57.59	48.37	45.95	44.99	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	958.28	Wt. n-Val.		0.040	
Vel Head (ft)	0.46	Reach Len. (ft)	48.37	45.95	44.99
W.S. Elev (ft)	957.81	Flow Area (sq ft)		327.83	
Crit W.S. (ft)		Area (sq ft)		327.83	
E.G. Slope (ft/ft)	0.001812	Flow (cfs)		1790.00	
Q Total (cfs)	1790.00	Top Width (ft)		41.82	
Top Width (ft)	41.82	Avg. Vel. (ft/s)		5.46	
Vel Total (ft/s)	5.46	Hydr. Depth (ft)		7.84	
Max Chl Dpth (ft)	10.42	Conv. (cfs)		42049.6	
Conv. Total (cfs)	42049.6	Wetted Per. (ft)		51.10	
Length Wtd. (ft)	45.95	Shear (lb/sq ft)		0.73	
Min Ch El (ft)	947.39	Stream Power (lb/ft s)		3.96	
Alpha	1.00	Cum Volume (acre-ft)	17.33	32.89	12.73
Frctn Loss (ft)	0.13	Cum SA (acres)	5.66	4.65	6.58
C & E Loss (ft)	0.06				

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

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	958.45	Wt. n-Val.		0.040	
Vel Head (ft)	0.44	Reach Len. (ft)	48.37	45.95	44.99
W.S. Elev (ft)	958.01	Flow Area (sq ft)		335.95	
Crit W.S. (ft)		Area (sq ft)		335.95	
E.G. Slope (ft/ft)	0.001692	Flow (cfs)		1790.00	
Q Total (cfs)	1790.00	Top Width (ft)		42.10	
Top Width (ft)	42.10	Avg. Vel. (ft/s)		5.33	
Vel Total (ft/s)	5.33	Hydr. Depth (ft)		7.98	
Max Chl Dpth (ft)	10.62				

Conv. Total (cfs)	43518.8	Conv. (cfs)		43518.8	
Length Wtd. (ft)	45.95	Wetted Per. (ft)		51.59	
Min Ch El (ft)	947.39	Shear (lb/sq ft)		0.69	
Alpha	1.00	Stream Power (lb/ft s)		3.66	
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	11.69	35.80	1.80
C & E Loss (ft)	0.06	Cum SA (acres)	2.98	4.67	0.56

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

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4718

INPUT
Description:
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	965.24	2.76	965.2	8.91	965.13	9.83	965.12	21.65	965.08
25.81	964.94	29	964.84	35.01	964.66	38.4	964.5	43.05	964.27
44.08	964.26	47.4	964.15	48.78	959.61	49.23	958.17	56.84	954.83
56.89	954.8	56.93	954.79	57.29	954.62	58.13	954.29	62.16	947.88
62.7	947.02	70.15	946.98	71.88	947	73.68	947	81.81	947.17
82.84	947.2	90.67	956.31	92.74	958.8	93.58	958.87	93.75	958.99
104.28	959.42	124.91	960.55	137.34	967.02	140.44	968.23		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	56.84	.04	92.74	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
56.84	92.74	71.98	75.39	77.8	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

E.G. Elev (ft)	958.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.10	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	956.98	Reach Len. (ft)	71.98	75.39	77.80
Crit W.S. (ft)		Flow Area (sq ft)	5.27	273.30	
E.G. Slope (ft/ft)	0.004378	Area (sq ft)	5.27	273.30	
Q Total (cfs)	2310.00	Flow (cfs)	5.70	2304.30	
Top Width (ft)	39.29	Top Width (ft)	4.90	34.39	
Vel Total (ft/s)	8.29	Avg. Vel. (ft/s)	1.08	8.43	
Max Chl Dpth (ft)	10.00	Hydr. Depth (ft)	1.08	7.95	
Conv. Total (cfs)	34913.5	Conv. (cfs)	86.1	34827.4	
Length Wtd. (ft)	75.31	Wetted Per. (ft)	5.35	43.01	
Min Ch El (ft)	946.98	Shear (lb/sq ft)	0.27	1.74	
Alpha	1.03	Stream Power (lb/ft s)	0.29	14.64	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	17.33	32.57	12.73
C & E Loss (ft)	0.05	Cum SA (acres)	5.65	4.61	6.58

CROSS SECTION OUTPUT Profile #100 YR FW

E.G. Elev (ft)	958.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.05	Wt. n-Val.		0.040	
W.S. Elev (ft)	957.22	Reach Len. (ft)	71.98	75.39	77.80
Crit W.S. (ft)		Flow Area (sq ft)		281.41	
E.G. Slope (ft/ft)	0.004327	Area (sq ft)		281.41	
Q Total (cfs)	2310.00	Flow (cfs)		2310.00	
Top Width (ft)	34.58	Top Width (ft)		34.58	
Vel Total (ft/s)	8.21	Avg. Vel. (ft/s)		8.21	
Max Chl Dpth (ft)	10.24	Hydr. Depth (ft)		8.14	
Conv. Total (cfs)	35116.3	Conv. (cfs)		35116.3	
Length Wtd. (ft)	75.36	Wetted Per. (ft)		45.71	
Min Ch El (ft)	946.98	Shear (lb/sq ft)		1.66	
Alpha	1.00	Stream Power (lb/ft s)		13.65	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	11.69	35.48	1.80
C & E Loss (ft)	0.06	Cum SA (acres)	2.98	4.63	0.56

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

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4643.051

INPUT
Description: 5
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	963.92	1.83	963.85	2.78	960.82	3.65	958.04	5.06	957.49
8.02	956.63	17.07	952.9	17.88	952.59	23.27	950.51	24.64	947.3
24.8	946.95	26.35	946.82	36.34	946.11	42.31	946.56	42.77	946.6
42.83	946.6	45.12	949.85	49.15	955.57	50.52	958.85	54.97	959.06
70.87	959.95	70.9	959.95	75.43	961.27	80.72	962.42	88.01	966.04

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	23.27	.04	50.52	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
23.27	50.52	17.45	17.74	17.85	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	957.65	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	1.55	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	956.10	Flow Area (sq ft)	39.60	216.71	
Crit W.S. (ft)	953.94	Area (sq ft)	39.60	216.71	
E.G. Slope (ft/ft)	0.006259	Flow (cfs)	98.67	2211.33	
Q Total (cfs)	2310.00	Top Width (ft)	13.95	26.10	
Top Width (ft)	40.05	Avg. Vel. (ft/s)	2.49	10.20	
Vel Total (ft/s)	9.01	Hydr. Depth (ft)	2.84	8.30	
Max Chl Dpth (ft)	9.99	Conv. (cfs)	1247.2	27951.6	
Conv. Total (cfs)	29198.8	Wetted Per. (ft)	15.03	33.50	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	1.03	2.53	
Min Ch El (ft)	946.11	Stream Power (lb/ft s)	2.57	25.80	
Alpha	1.23	Cum Volume (acre-ft)	17.29	32.14	12.73
Frctn Loss (ft)	0.03	Cum SA (acres)	5.64	4.55	6.58
C & E Loss (ft)	0.00				

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	957.81	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	1.65	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	956.16	Flow Area (sq ft)	17.91	218.32	
Crit W.S. (ft)	953.84	Area (sq ft)	17.91	218.32	
E.G. Slope (ft/ft)	0.006451	Flow (cfs)	40.22	2269.78	
Q Total (cfs)	2310.00	Top Width (ft)	3.62	26.13	
Top Width (ft)	29.75	Avg. Vel. (ft/s)	2.25	10.40	
Vel Total (ft/s)	9.78	Hydr. Depth (ft)	4.95	8.36	
Max Chl Dpth (ft)	10.05	Conv. (cfs)	500.8	28260.0	
Conv. Total (cfs)	28760.8	Wetted Per. (ft)	8.13	33.56	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.89	2.62	
Min Ch El (ft)	946.11	Stream Power (lb/ft s)	1.99	27.24	
Alpha	1.11	Cum Volume (acre-ft)	11.67	35.04	1.80
Frctn Loss (ft)		Cum SA (acres)	2.98	4.57	0.56
C & E Loss (ft)					

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 4636

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord

```
        0     970     967     200     970     967

 Upstream Bridge Cross Section Data
 Station Elevation Data    num=      25
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
        0  963.93    1.83  963.86    2.78  960.83    3.65  958.05    5.06   957.5
     8.02  956.64   17.07  952.91   17.88   952.6   23.27  950.52   24.64  947.31
     24.8  946.96   26.35  946.83   36.34  946.12   42.31  946.57   42.77  946.61
    42.83  946.61   45.12  949.86   49.15  955.58   50.52  958.86   54.97  959.07
    70.87  959.96    70.9  959.96   75.43  961.28   80.72  962.43   88.01  966.05

 Manning's n Values          num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
        0     .09   23.27     .04   50.52     .12

 Bank Sta: Left   Right    Coeff Contr.   Expan.
          23.27   50.52              .1       .3

 Downstream  Deck/Roadway Coordinates
     num=       2
      Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
        0     970     967     200     970     967

 Downstream Bridge Cross Section Data
 Station Elevation Data    num=      28
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
        0     964    3.82  963.87    5.47  963.81    7.13  963.76    8.55  959.11
     8.93  957.83   10.27  957.33   15.55  955.45   25.27  951.62   28.72  950.22
    29.88  947.58   30.48  946.84   31.89  946.82   36.51  946.46   40.58  946.14
     44.1  946.27   48.98  946.39   49.55  948.41   49.78  949.21   53.69  958.54
    61.71  959.06   62.79  959.16   65.52  959.39   73.53  962.89   78.07   964.8
    78.68  965.14   80.01  965.17   80.52  965.19

 Manning's n Values          num=       3
      Sta   n Val     Sta   n Val     Sta   n Val
        0     .09   28.72     .04   53.69     .12

 Bank Sta: Left   Right    Coeff Contr.   Expan.
          28.72   53.69              .1       .3

 Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
 Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow =     .98
 Elevation at which weir flow begins           =
 Energy head used in spillway design           =
 Spillway height used in design                =
 Weir crest shape                              = Broad Crested

 Number of Piers =  1

 Pier Data
 Pier Station     Upstream=   55.79    Downstream=   60.85
 Upstream     num=       2
     Width   Elev    Width   Elev
         8    945        8    970
 Downstream     num=       2
     Width   Elev    Width   Elev
         8    945        8    970

 Number of Bridge Coefficient Sets =  1

 Low Flow Methods and Data
        Energy
        Momentum                Cd   =       2
 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 YR

E.G. US. (ft)	957.65
W.S. US. (ft)	956.10
Q Total (cfs)	2310.00
Q Bridge (cfs)	2310.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	970.01
Min El Prs (ft)	967.00
Delta EG (ft)	0.16
Delta WS (ft)	0.47
BR Open Area (sq ft)	866.18
BR Open Vel (ft/s)	9.60
Coef of Q	
Br Sel Method	Energy only

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	957.62	957.56
W.S. Elev (ft)	956.04	955.79
Crit W.S. (ft)	953.97	953.94
Max Chl Dpth (ft)	9.92	9.65
Vel Total (ft/s)	9.10	9.60
Flow Area (sq ft)	253.83	240.73
Froude # Chl	0.63	0.66
Specif Force (cu ft)	1753.36	1736.74
Hydr Depth (ft)	6.37	6.35
W.P. Total (ft)	48.30	47.60
Conv. Total (cfs)	28852.2	26586.0
Top Width (ft)	39.88	37.93
Frctn Loss (ft)	0.04	0.06
C & E Loss (ft)	0.02	0.01
Shear Total (lb/sq ft)	2.10	2.38
Power Total (lb/ft s)	19.14	22.87

BRIDGE OUTPUT Profile #100 YR FW

E.G. US. (ft)	957.81
W.S. US. (ft)	956.16
Q Total (cfs)	2310.00
Q Bridge (cfs)	2310.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	970.01
Min El Prs (ft)	967.00
Delta EG (ft)	0.18
Delta WS (ft)	0.33
BR Open Area (sq ft)	569.13
BR Open Vel (ft/s)	9.75
Coef of Q	
Br Sel Method	Momentum

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	957.78	957.66
W.S. Elev (ft)	956.19	955.97
Crit W.S. (ft)	953.90	953.93
Max Chl Dpth (ft)	10.07	9.83
Vel Total (ft/s)	9.75	9.71
Flow Area (sq ft)	236.89	237.88
Froude # Chl	0.62	0.64
Specif Force (cu ft)	1765.58	1756.17
Hydr Depth (ft)	7.96	7.60
W.P. Total (ft)	37.47	40.62
Conv. Total (cfs)	29197.9	27508.5
Top Width (ft)	29.75	31.31
Frctn Loss (ft)		
C & E Loss (ft)		
Shear Total (lb/sq ft)	2.47	2.58
Power Total (lb/ft s)	24.09	25.04

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4625.316

INPUT
Description: 6
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	964.02	3.82	963.89	5.47	963.83	7.13	963.78	8.55	959.13
8.93	957.85	10.27	957.35	15.55	955.47	25.27	951.64	28.72	950.24
29.88	947.6	30.48	946.86	31.89	946.84	36.51	946.48	40.58	946.16
44.1	946.29	48.98	946.41	49.55	948.43	49.78	949.23	53.69	958.56
61.71	959.08	62.79	959.18	65.52	959.41	73.53	962.91	78.07	964.82
78.68	965.16	80.01	965.19	80.52	965.21				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	28.72	.04	53.69	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
28.72	53.69	120.71	121.61	122.64	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

E.G. Elev (ft)	957.49
Vel Head (ft)	1.87
W.S. Elev (ft)	955.62
Crit W.S. (ft)	
E.G. Slope (ft/ft)	0.008088
Q Total (cfs)	2310.00
Top Width (ft)	37.34
Vel Total (ft/s)	9.88

Element	Left OB	Channel	Right OB
Wt. n-Val.	0.090	0.040	
Reach Len. (ft)	120.71	121.61	122.64
Flow Area (sq ft)	36.29	197.60	
Area (sq ft)	36.29	197.60	
Flow (cfs)	98.77	2211.23	
Top Width (ft)	13.60	23.74	
Avg. Vel. (ft/s)	2.72	11.19	

Max Chl Dpth (ft)	9.46	Hydr. Depth (ft)	2.67	8.32	
Conv. Total (cfs)	25686.3	Conv. (cfs)	1098.2	24588.0	
Length Wtd. (ft)	121.58	Wetted Per. (ft)	14.63	32.23	
Min Ch El (ft)	946.16	Shear (lb/sq ft)	1.25	3.10	
Alpha	1.23	Stream Power (lb/ft s)	3.41	34.64	
Frctn Loss (ft)	0.79	Cum Volume (acre-ft)	17.27	32.06	12.73
C & E Loss (ft)	0.14	Cum SA (acres)	5.63	4.54	6.58

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	957.63	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	1.80	Reach Len. (ft)	120.71	121.61	122.64
W.S. Elev (ft)	955.83	Flow Area (sq ft)	30.39	202.48	
Crit W.S. (ft)		Area (sq ft)	30.39	202.48	
E.G. Slope (ft/ft)	0.007596	Flow (cfs)	88.17	2221.83	
Q Total (cfs)	2310.00	Top Width (ft)	7.42	23.83	
Top Width (ft)	31.25	Avg. Vel. (ft/s)	2.90	10.97	
Vel Total (ft/s)	9.92	Hydr. Depth (ft)	4.10	8.50	
Max Chl Dpth (ft)	9.67	Conv. (cfs)	1011.7	25492.3	
Conv. Total (cfs)	26504.0	Wetted Per. (ft)	10.61	32.45	
Length Wtd. (ft)	121.59	Shear (lb/sq ft)	1.36	2.96	
Min Ch El (ft)	946.16	Stream Power (lb/ft s)	3.94	32.47	
Alpha	1.18	Cum Volume (acre-ft)	11.66	34.96	1.80
Frctn Loss (ft)	0.72	Cum SA (acres)	2.97	4.56	0.56
C & E Loss (ft)	0.15				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4503.708

INPUT
Description: 7
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	963.51	.39	963.5	1.99	963.45	2.95	963.42	3.49	963.41
8.74	963.25	11.25	963.18	12.78	963.14	14.37	957.94	14.89	956.13
15.91	955.95	18.36	955.51	24.58	952.99	26.92	952.01	29.54	950.91
30.93	949.48	33.76	946.03	36.69	945.97	43.72	945.82	53.37	945.71
55.01	949.03	57.39	952.5	58.25	953.76	69.47	955	81.3	962.68
83.07	963.72								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	29.54	.04	58.25	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
29.54	58.25	19.61	18.66	18.24	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	956.56	Wt. n-Val.	0.090	0.040	0.100
Vel Head (ft)	1.41	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	955.15	Flow Area (sq ft)	21.64	235.21	8.67
Crit W.S. (ft)	952.81	Area (sq ft)	21.64	235.21	8.67
E.G. Slope (ft/ft)	0.005384	Flow (cfs)	40.82	2261.39	7.79
Q Total (cfs)	2310.00	Top Width (ft)	10.29	28.71	11.45
Top Width (ft)	50.46	Avg. Vel. (ft/s)	1.89	9.61	0.90
Vel Total (ft/s)	8.70	Hydr. Depth (ft)	2.10	8.19	0.76
Max Chl Dpth (ft)	9.44	Conv. (cfs)	556.3	30819.6	106.2
Conv. Total (cfs)	31482.1	Wetted Per. (ft)	11.13	35.51	11.57
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.65	2.23	0.25
Min Ch El (ft)	945.71	Stream Power (lb/ft s)	1.23	21.41	0.23
Alpha	1.20	Cum Volume (acre-ft)	17.19	31.46	12.72
Frctn Loss (ft)		Cum SA (acres)	5.60	4.47	6.56
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	956.76	Wt. n-Val.	0.090	0.040	0.100
Vel Head (ft)	1.31	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	955.45				

					proposed FW.rep
Crit W.S. (ft)	952.81	Flow Area (sq ft)	20.43	243.93	7.57
E.G. Slope (ft/ft)	0.004765	Area (sq ft)	20.43	243.93	7.57
Q Total (cfs)	2310.00	Flow (cfs)	40.88	2260.57	8.55
Top Width (ft)	40.50	Top Width (ft)	6.36	28.71	5.43
Vel Total (ft/s)	8.49	Avg. Vel. (ft/s)	2.00	9.27	1.13
Max Chl Dpth (ft)	9.74	Hydr. Depth (ft)	3.21	8.50	1.39
Conv. Total (cfs)	33464.1	Conv. (cfs)	592.2	32748.1	123.9
Length Wtd. (ft)	4.00	Wetted Per. (ft)	8.79	35.51	6.56
Min Ch El (ft)	945.71	Shear (lb/sq ft)	0.69	2.04	0.34
Alpha	1.17	Stream Power (lb/ft s)	1.38	18.94	0.39
Frctn Loss (ft)		Cum Volume (acre-ft)	11.59	34.33	1.79
C & E Loss (ft)		Cum SA (acres)	2.95	4.49	0.55

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 4496

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	970	967	200	970	967

Upstream Bridge Cross Section Data
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	963.51	.39	963.5	1.99	963.45	2.95	963.42	3.49	963.41
8.74	963.25	11.25	963.18	12.78	963.14	14.37	957.94	14.89	956.13
15.91	955.95	18.36	955.51	24.58	952.99	26.92	952.01	29.54	950.91
30.93	949.48	33.76	946.03	36.69	945.97	43.72	945.82	53.37	945.71
55.01	949.03	57.39	952.5	58.25	953.76	69.47	955	81.3	962.68
83.07	963.72								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	29.54	.04	58.25	.1

Bank Sta: Left	Right	Coeff Contr.	Expan.
29.54	58.25	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	970	967	200	970	967

Downstream Bridge Cross Section Data
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	963.45	3.52	963.37	4.17	963.36	5.48	963.33	5.84	963.32
16.65	963.01	16.83	962.35	18.69	955.86	21.87	955.29	25.42	954.1
26.23	953.76	32.95	950.95	36.12	946.7	36.63	945.94	41.88	945.89
44.24	945.86	53.34	945.76	54.97	945.75	55.15	945.74	56.32	945.73
58.21	945.71	62.08	953.54	62.18	953.69	74.43	954.49	76.08	955.54
90.44	963.6								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	32.95	.04	62.18	.1

Bank Sta: Left	Right	Coeff Contr.	Expan.
32.95	62.18	.1	.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data
Pier Station Upstream= 64.66 Downstream= 68.25
Upstream num= 2

Width	Elev	Width	Elev
8	945	8	970

Downstream num= 2

Width	Elev	Width	Elev
8	945	8	970

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Momentum Cd = 2
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 YR

E.G. US. (ft)	956.56
W.S. US. (ft)	955.15
Q Total (cfs)	2310.00
Q Bridge (cfs)	2310.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	970.01
Min El Prs (ft)	967.00
Delta EG (ft)	0.43
Delta WS (ft)	0.47
BR Open Area (sq ft)	975.20
BR Open Vel (ft/s)	9.07
Coef of Q	
Br Sel Method	Momentum

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	956.49	956.18
W.S. Elev (ft)	955.02	954.75
Crit W.S. (ft)	952.81	952.47
Max Chl Dpth (ft)	9.31	9.04
Vel Total (ft/s)	9.07	9.03
Flow Area (sq ft)	254.66	255.70
Froude # Chl	0.61	0.60
Specif Force (cu ft)	1713.35	1704.03
Hydr Depth (ft)	6.07	5.90
W.P. Total (ft)	50.69	52.97
Conv. Total (cfs)	30570.9	30644.3
Top Width (ft)	41.94	43.34
Frctn Loss (ft)		
C & E Loss (ft)		
Shear Total (lb/sq ft)	1.79	1.71
Power Total (lb/ft s)	16.24	15.47

BRIDGE OUTPUT Profile #100 YR FW

E.G. US. (ft)	956.76
W.S. US. (ft)	955.45
Q Total (cfs)	2310.00
Q Bridge (cfs)	2310.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	970.01
Min El Prs (ft)	967.00
Delta EG (ft)	0.40
Delta WS (ft)	0.40
BR Open Area (sq ft)	700.85
BR Open Vel (ft/s)	8.70
Coef of Q	
Br Sel Method	Momentum

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	956.71	956.41
W.S. Elev (ft)	955.39	955.11
Crit W.S. (ft)	952.81	952.47
Max Chl Dpth (ft)	9.68	9.40
Vel Total (ft/s)	8.70	8.65
Flow Area (sq ft)	265.52	266.91
Froude # Chl	0.57	0.56
Specif Force (cu ft)	1771.85	1763.96
Hydr Depth (ft)	7.08	7.09
W.P. Total (ft)	46.18	46.97
Conv. Total (cfs)	33025.4	33105.2
Top Width (ft)	37.48	37.66
Frctn Loss (ft)		
C & E Loss (ft)		
Shear Total (lb/sq ft)	1.76	1.73
Power Total (lb/ft s)	15.28	14.95

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4485.049

INPUT
Description: 8
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	963.45	3.52	963.37	4.17	963.36	5.48	963.33	5.84	963.32
16.65	963.01	16.83	962.35	18.69	955.86	21.87	955.29	25.42	954.1
26.23	953.76	32.95	950.95	36.12	946.7	36.63	945.94	41.88	945.89
44.24	945.86	53.34	945.76	54.97	945.75	55.15	945.74	56.32	945.73
58.21	945.71	62.08	953.54	62.18	953.69	74.43	954.49	76.08	955.54
90.44	963.6								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	32.95	.04	62.18	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
32.95	62.18	123.05	123.21	122.55	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	956.13	Element			
Vel Head (ft)	1.45	Wt. n-Val.	0.090	0.040	0.100
W.S. Elev (ft)	954.68	Reach Len. (ft)	123.05	123.21	122.55
Crit W.S. (ft)		Flow Area (sq ft)	16.72	233.51	7.23
E.G. Slope (ft/ft)	0.005835	Area (sq ft)	16.72	233.51	7.23
Q Total (cfs)	2310.00	Flow (cfs)	29.73	2274.60	5.66
Top Width (ft)	51.03	Top Width (ft)	9.26	29.23	12.55
Vel Total (ft/s)	8.97	Avg. Vel. (ft/s)	1.78	9.74	0.78
Max Chl Dpth (ft)	8.97	Hydr. Depth (ft)	1.81	7.99	0.58
Conv. Total (cfs)	30242.0	Conv. (cfs)	389.2	29778.5	74.2
Length Wtd. (ft)	123.20	Wetted Per. (ft)	9.98	36.71	12.63
Min Ch El (ft)	945.71	Shear (lb/sq ft)	0.61	2.32	0.21
Alpha	1.16	Stream Power (lb/ft s)	1.08	22.57	0.16
Frctn Loss (ft)	0.66	Cum Volume (acre-ft)	17.18	31.36	12.72
C & E Loss (ft)	0.10	Cum SA (acres)	5.60	4.46	6.56

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	956.37	Element			
Vel Head (ft)	1.31	Wt. n-Val.	0.090	0.040	0.100
W.S. Elev (ft)	955.05	Reach Len. (ft)	123.05	123.21	122.55
Crit W.S. (ft)		Flow Area (sq ft)	17.62	244.40	7.32
E.G. Slope (ft/ft)	0.004985	Area (sq ft)	17.62	244.40	7.32
Q Total (cfs)	2310.00	Flow (cfs)	33.84	2268.46	7.69
Top Width (ft)	41.94	Top Width (ft)	6.36	29.23	6.35
Vel Total (ft/s)	8.58	Avg. Vel. (ft/s)	1.92	9.28	1.05
Max Chl Dpth (ft)	9.34	Hydr. Depth (ft)	2.77	8.36	1.15
Conv. Total (cfs)	32716.4	Conv. (cfs)	479.3	32128.1	109.0
Length Wtd. (ft)	123.20	Wetted Per. (ft)	8.33	36.71	7.31
Min Ch El (ft)	945.71	Shear (lb/sq ft)	0.66	2.07	0.31
Alpha	1.15	Stream Power (lb/ft s)	1.26	19.23	0.33
Frctn Loss (ft)	0.58	Cum Volume (acre-ft)	11.58	34.23	1.78
C & E Loss (ft)	0.08	Cum SA (acres)	2.95	4.48	0.55

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4361.840

INPUT
Description: 9
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	962.69	6.91	962.51	8.76	962.46	10.72	962.42	12.4	954.7
12.5	954.31	12.67	954.25	13.15	954.08	14.04	953.78	14.58	953.6
15.31	953.34	16.24	951.74	19.82	945.6	31.24	945.61	34.44	945.61
40.9	945.67	44.56	947.95	46.06	948.99	48.39	950.6	51.59	952.81
84.6	952.41	90.38	955.59	105.23	964.09	108.02	964.18	111.62	964.54

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.09	15.31	.04	51.59	.1	84.6	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
15.31	51.59	19	18.54	18	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	955.37	Wt. n-Val.	0.090	0.040	0.101
Vel Head (ft)	1.12	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	954.25	Flow Area (sq ft)	1.20	258.04	57.27
Crit W.S. (ft)	952.03	Area (sq ft)	1.20	258.04	57.27
E.G. Slope (ft/ft)	0.004939	Flow (cfs)	0.79	2228.15	81.06
Q Total (cfs)	2310.00	Top Width (ft)	2.64	36.28	36.36
Top Width (ft)	75.28	Avg. Vel. (ft/s)	0.66	8.63	1.42
Vel Total (ft/s)	7.30	Hydr. Depth (ft)	0.45	7.11	1.58
Max Chl Dpth (ft)	8.65	Conv. (cfs)	11.3	31705.5	1153.5
Conv. Total (cfs)	32870.3	Wetted Per. (ft)	2.80	42.90	36.83
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.13	1.85	0.48
Min Ch El (ft)	945.60	Stream Power (lb/ft s)	0.09	16.02	0.68
Alpha	1.35	Cum Volume (acre-ft)	17.16	30.66	12.63
Frctn Loss (ft)		Cum SA (acres)	5.58	4.37	6.49
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	955.71	Wt. n-Val.		0.040	0.100
Vel Head (ft)	1.06	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	954.65	Flow Area (sq ft)		272.57	29.34
Crit W.S. (ft)	952.04	Area (sq ft)		272.57	29.34
E.G. Slope (ft/ft)	0.004440	Flow (cfs)		2268.53	41.47
Q Total (cfs)	2310.00	Top Width (ft)		36.28	15.17
Top Width (ft)	51.45	Avg. Vel. (ft/s)		8.32	1.41
Vel Total (ft/s)	7.65	Hydr. Depth (ft)		7.51	1.93
Max Chl Dpth (ft)	9.05	Conv. (cfs)		34045.5	622.4
Conv. Total (cfs)	34667.9	Wetted Per. (ft)		44.21	17.20
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		1.71	0.47
Min Ch El (ft)	945.60	Stream Power (lb/ft s)		14.22	0.67
Alpha	1.16	Cum Volume (acre-ft)	11.56	33.50	1.73
Frctn Loss (ft)		Cum SA (acres)	2.94	4.39	0.52
C & E Loss (ft)					

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 4354

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	970	967	200	970	967

Upstream Bridge Cross Section Data
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	962.64	6.91	962.46	8.76	962.41	10.72	962.37	12.4	954.65
12.5	954.26	12.67	954.2	13.15	954.03	14.04	953.73	14.58	953.55
15.31	953.29	16.24	951.69	19.82	945.55	31.24	945.56	34.44	945.56
40.9	945.62	44.56	947.9	46.06	948.94	48.39	950.55	51.59	952.76
84.6	952.36	90.38	955.54	105.23	964.04	108.02	964.13	111.62	964.49

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.09	15.31	.04	51.59	.1	84.6	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
15.31	51.59	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

```
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0     970     967      200     970     967

Downstream Bridge Cross Section Data
Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  962.87    2.83  962.81    5.38  962.77     7.5  962.71   17.43  962.46
   17.94  962.45   18.38  960.43   19.76   954.5   22.42  953.61   22.55  953.56
    23.4  952.13    25.1  949.22   27.32  945.47   31.59  945.48   47.83  945.63
   55.92  950.67   56.85  951.25   59.44  953.03   91.48  952.85   104.1  959.81
  112.56  964.65  114.13   964.7  121.89  965.49

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09   22.55     .04   59.44      .1   91.48     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
         22.55   59.44             .1       .3

Upstream Embankment side slope              =      0 horiz. to 1.0 vertical
Downstream Embankment side slope            =      0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=   60.58    Downstream=   67.63
Upstream     num=       2
    Width   Elev    Width   Elev
        8    945        8    970
Downstream     num=       2
    Width   Elev    Width   Elev
        8    945        8    970

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
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 YR

  E.G. US. (ft)                955.37    Element                  Inside BR US  Inside BR DS
  W.S. US. (ft)                954.25    E.G. Elev (ft)               955.24        955.28
  Q Total (cfs)               2310.00    W.S. Elev (ft)               954.01        954.00
  Q Bridge (cfs)              2310.00    Crit W.S. (ft)               952.00        952.03
  Q Weir (cfs)                           Max Chl Dpth (ft)              8.46          8.53
  Weir Sta Lft (ft)                      Vel Total (ft/s)               7.92          8.32
  Weir Sta Rgt (ft)                      Flow Area (sq ft)            291.58        277.51
  Weir Submerg                           Froude # Chl                   0.60          0.62
  Weir Max Depth (ft)                    Specif Force (cu ft)        1624.01       1613.41
  Min El Weir Flow (ft)        970.01    Hydr Depth (ft)                4.39          4.31
  Min El Prs (ft)              967.00    W.P. Total (ft)               76.30         73.52
  Delta EG (ft)                  0.14    Conv. Total (cfs)          31032.1       30131.5
  Delta WS (ft)                  0.21    Top Width (ft)                66.41         64.33
  BR Open Area (sq ft)        1385.47    Frctn Loss (ft)
  BR Open Vel (ft/s)             8.32    C & E Loss (ft)
  Coef of Q                              Shear Total (lb/sq ft)         1.32          1.38
  Br Sel Method             Momentum     Power Total (lb/ft s)         10.47         11.53
```

BRIDGE OUTPUT Profile #100 YR FW

E.G. US. (ft)	955.71
W.S. US. (ft)	954.65
Q Total (cfs)	2310.00
Q Bridge (cfs)	2310.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	970.01
Min El Prs (ft)	967.00
Delta EG (ft)	0.20
Delta WS (ft)	0.23
BR Open Area (sq ft)	824.99
BR Open Vel (ft/s)	8.40
Coef of Q	
Br Sel Method	Momentum

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	955.54	955.55
W.S. Elev (ft)	954.38	954.38
Crit W.S. (ft)	952.00	952.03
Max Chl Dpth (ft)	8.83	8.91
Vel Total (ft/s)	8.35	8.40
Flow Area (sq ft)	276.63	275.08
Froude # Chl	0.57	0.57
Specif Force (cu ft)	1686.80	1678.65
Hydr Depth (ft)	6.37	6.13
W.P. Total (ft)	53.52	54.45
Conv. Total (cfs)	33237.0	32701.1
Top Width (ft)	43.45	44.88
Frctn Loss (ft)		
C & E Loss (ft)		
Shear Total (lb/sq ft)	1.56	1.57
Power Total (lb/ft s)	13.01	13.22

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4343.304

INPUT
Description: 10
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	962.75	2.83	962.69	5.38	962.65	7.5	962.59	17.43	962.34
17.94	962.33	18.38	960.31	19.76	954.38	22.42	953.49	22.55	953.44
23.4	952.01	25.1	949.1	27.32	945.35	31.59	945.36	47.83	945.51
55.92	950.55	56.85	951.13	59.44	952.91	91.48	952.73	104.1	959.69
112.56	964.53	114.13	964.58	121.89	965.37				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.09	22.55	.04	59.44	.1	91.48	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
22.55	59.44	119.24	120.83	121.61	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

E.G. Elev (ft)	955.23
Vel Head (ft)	1.19
W.S. Elev (ft)	954.04
Crit W.S. (ft)	
E.G. Slope (ft/ft)	0.005359
Q Total (cfs)	2310.00
Top Width (ft)	73.07
Vel Total (ft/s)	7.78
Max Chl Dpth (ft)	8.69
Conv. Total (cfs)	31555.2
Length Wtd. (ft)	120.86
Min Ch El (ft)	945.35
Alpha	1.26
Frctn Loss (ft)	0.53
C & E Loss (ft)	0.10

Element	Left OB	Channel	Right OB
Wt. n-Val.	0.090	0.040	0.100
Reach Len. (ft)	119.24	120.83	121.61
Flow Area (sq ft)	0.53	255.80	40.61
Area (sq ft)	0.53	255.80	40.61
Flow (cfs)	0.27	2260.27	49.46
Top Width (ft)	1.77	36.89	34.41
Avg. Vel. (ft/s)	0.52	8.84	1.22
Hydr. Depth (ft)	0.30	6.93	1.18
Conv. (cfs)	3.7	30875.9	675.6
Wetted Per. (ft)	1.87	43.67	34.75
Shear (lb/sq ft)	0.09	1.96	0.39
Stream Power (lb/ft s)	0.05	17.32	0.48
Cum Volume (acre-ft)	17.16	30.55	12.61
Cum SA (acres)	5.58	4.35	6.48

CROSS SECTION OUTPUT Profile #100 YR FW

E.G. Elev (ft)	955.51
Vel Head (ft)	1.09
W.S. Elev (ft)	954.42
Crit W.S. (ft)	
E.G. Slope (ft/ft)	0.004690
Q Total (cfs)	2310.00
Top Width (ft)	52.88
Vel Total (ft/s)	7.84
Max Chl Dpth (ft)	9.07
Conv. Total (cfs)	33729.9
Length Wtd. (ft)	120.84

Element	Left OB	Channel	Right OB
Wt. n-Val.		0.040	0.100
Reach Len. (ft)	119.24	120.83	121.61
Flow Area (sq ft)		269.88	24.88
Area (sq ft)		269.88	24.88
Flow (cfs)		2278.11	31.89
Top Width (ft)		36.89	15.99
Avg. Vel. (ft/s)		8.44	1.28
Hydr. Depth (ft)		7.32	1.56
Conv. (cfs)		33264.2	465.7
Wetted Per. (ft)		44.65	17.59

Min Ch El (ft)	945.35	Shear (lb/sq ft)		1.77	0.41
Alpha	1.14	Stream Power (lb/ft s)		14.94	0.53
Frctn Loss (ft)	0.48	Cum Volume (acre-ft)	11.56	33.39	1.72
C & E Loss (ft)	0.08	Cum SA (acres)	2.94	4.37	0.51

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4222.473

INPUT
Description: 11
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	962.49	5.38	962.43	12.33	962.3	17.83	962.21	25.34	962.02
31.08	961.87	36.85	961.65	37.69	961.61	43.31	961.38	44.12	957.35
45.03	953.38	45.83	953.06	47.12	952.47	48.19	951.2	48.86	950.4
52.74	944.93	60.13	944.92	70.85	944.9	72.54	944.9	74.62	944.89
76.22	944.89	77.09	945.5	85.57	951.55	87.81	952.34	122	952.05
141.61	951.88	143.22	952.51	143.95	952.88	145.07	953.51	155.2	959.17
163.34	964.05	164.81	964.57	166.55	964.78	177.49	965.36	179.37	965.75

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.09	47.12	.04	87.81	.1	122	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
47.12	87.81	17.55	18	17.71	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	954.60	Wt. n-Val.	0.090	0.040	0.108
Vel Head (ft)	0.85	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	953.74	Flow Area (sq ft)	1.69	290.63	91.65
Crit W.S. (ft)	950.98	Area (sq ft)	1.69	290.63	91.65
E.G. Slope (ft/ft)	0.003649	Flow (cfs)	1.25	2205.25	103.50
Q Total (cfs)	2310.00	Top Width (ft)	2.17	40.69	57.68
Top Width (ft)	100.54	Avg. Vel. (ft/s)	0.74	7.59	1.13
Vel Total (ft/s)	6.02	Hydr. Depth (ft)	0.78	7.14	1.59
Max Chl Dpth (ft)	8.85	Conv. (cfs)	20.7	36505.2	1713.4
Conv. Total (cfs)	38239.3	Wetted Per. (ft)	2.65	46.75	58.11
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.15	1.42	0.36
Min Ch El (ft)	944.89	Stream Power (lb/ft s)	0.11	10.75	0.41
Alpha	1.52	Cum Volume (acre-ft)	17.16	29.80	12.43
Frctn Loss (ft)		Cum SA (acres)	5.57	4.24	6.35
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	954.96	Wt. n-Val.		0.040	0.100
Vel Head (ft)	0.83	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	954.13	Flow Area (sq ft)		306.38	40.44
Crit W.S. (ft)	950.98	Area (sq ft)		306.38	40.44
E.G. Slope (ft/ft)	0.003367	Flow (cfs)		2259.90	50.10
Q Total (cfs)	2310.00	Top Width (ft)		40.69	21.51
Top Width (ft)	62.20	Avg. Vel. (ft/s)		7.38	1.24
Vel Total (ft/s)	6.66	Hydr. Depth (ft)		7.53	1.88
Max Chl Dpth (ft)	9.24	Conv. (cfs)		38944.0	863.4
Conv. Total (cfs)	39807.4	Wetted Per. (ft)		48.40	23.48
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		1.33	0.36
Min Ch El (ft)	944.89	Stream Power (lb/ft s)		9.82	0.45
Alpha	1.20	Cum Volume (acre-ft)	11.56	32.59	1.63
Frctn Loss (ft)		Cum SA (acres)	2.94	4.26	0.46
C & E Loss (ft)					

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 4215

INPUT

```
Description:
Distance from Upstream XS =        4
Deck/Roadway Width        =        6
Weir Coefficient          =      2.6
Upstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0     970     967      200     970     967

Upstream Bridge Cross Section Data
Station Elevation Data    num=       35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  962.47    5.38  962.41   12.33  962.28   17.83  962.19   25.34     962
   31.08  961.85   36.85  961.63   37.69  961.59   43.31  961.36   44.12  957.33
   45.03  953.36   45.83  953.04   47.12  952.45   48.19  951.18   48.86  950.38
   52.74  944.91   60.13   944.9   70.85  944.88   72.54  944.88   74.62  944.87
   76.22  944.87   77.09  945.48   85.57  951.53   87.81  952.32     122  952.03
  141.61  951.86  143.22  952.49  143.95  952.86  145.07  953.49   155.2  959.15
  163.34  964.03  164.81  964.55  166.55  964.76  177.49  965.34  179.37  965.73

Manning's n Values        num=        4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09   47.12     .04   87.81      .1     122     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
          47.12  87.81            .1       .3

Downstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0     970     967      200     970     967

Downstream Bridge Cross Section Data
Station Elevation Data    num=       31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  962.37     .81  962.36   12.72  962.14   13.15  962.13   13.23  962.13
   13.34  962.13   15.34  962.08   25.81   961.8   26.55  961.78   38.57  961.32
   38.73  961.31    40.2  954.04   40.42  952.91   42.13  952.23   42.78  951.96
   46.47  947.62   47.12  946.86   47.93  945.91   48.93  944.86   52.39  944.83
   53.79  944.83   73.57  944.83   73.66  944.89   74.92  945.78   82.68     952
     117  951.41   135.9  951.24  143.86  955.99  167.53  964.54  178.33  965.81
  180.52  966.16

Manning's n Values        num=        4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09   42.78     .04   82.68      .1     117     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
          42.78  82.68            .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=   91.37    Downstream=   86.56
Upstream     num=        2
    Width   Elev    Width   Elev
        8    945        8    970
Downstream     num=        2
    Width   Elev    Width   Elev
        8    945        8    970

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                 Cd   =       2
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 YR

E.G. US. (ft)	954.60
W.S. US. (ft)	953.74
Q Total (cfs)	2310.00
Q Bridge (cfs)	2310.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	970.01
Min El Prs (ft)	967.00
Delta EG (ft)	0.42
Delta WS (ft)	0.43
BR Open Area (sq ft)	2010.71
BR Open Vel (ft/s)	6.34
Coef of Q	
Br Sel Method	Momentum

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	954.53	954.22
W.S. Elev (ft)	953.63	953.33
Crit W.S. (ft)	950.98	950.74
Max Chl Dpth (ft)	8.76	8.50
Vel Total (ft/s)	6.34	6.18
Flow Area (sq ft)	364.12	373.52
Froude # Chl	0.51	0.51
Specif Force (cu ft)	1733.63	1723.95
Hydr Depth (ft)	3.94	4.10
W.P. Total (ft)	102.04	100.76
Conv. Total (cfs)	36477.8	36976.6
Top Width (ft)	92.36	91.06
Frctn Loss (ft)		
C & E Loss (ft)		
Shear Total (lb/sq ft)	0.89	0.90
Power Total (lb/ft s)	5.67	5.59

BRIDGE OUTPUT Profile #100 YR FW

E.G. US. (ft)	954.96
W.S. US. (ft)	954.13
Q Total (cfs)	2310.00
Q Bridge (cfs)	2310.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	970.01
Min El Prs (ft)	967.00
Delta EG (ft)	0.39
Delta WS (ft)	0.40
BR Open Area (sq ft)	1030.93
BR Open Vel (ft/s)	7.10
Coef of Q	
Br Sel Method	Momentum

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	954.86	954.59
W.S. Elev (ft)	953.98	953.72
Crit W.S. (ft)	950.98	950.74
Max Chl Dpth (ft)	9.11	8.89
Vel Total (ft/s)	7.10	6.95
Flow Area (sq ft)	325.21	332.25
Froude # Chl	0.49	0.48
Specif Force (cu ft)	1796.90	1790.15
Hydr Depth (ft)	6.00	5.96
W.P. Total (ft)	63.77	65.09
Conv. Total (cfs)	38339.2	38995.0
Top Width (ft)	54.20	55.72
Frctn Loss (ft)		
C & E Loss (ft)		
Shear Total (lb/sq ft)	1.16	1.12
Power Total (lb/ft s)	8.21	7.78

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4204.470

INPUT
Description: 12
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	962.32	.81	962.31	12.72	962.09	13.15	962.08	13.23	962.08
13.34	962.08	15.34	962.03	25.81	961.75	26.55	961.73	38.57	961.27
38.73	961.26	40.2	953.99	40.42	952.86	42.13	952.18	42.78	951.91
46.47	947.57	47.12	946.81	47.93	945.86	48.93	944.81	52.39	944.78
53.79	944.78	73.57	944.78	73.66	944.84	74.92	945.73	82.68	951.95
117	951.46	135.9	951.19	143.86	955.94	167.53	964.49	178.33	965.76
180.52	966.11								

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.09	42.78	.04	82.68	.1	117	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
42.78	82.68	124.62	124.01	123.48	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	954.18	Element			
Vel Head (ft)	0.87	Wt. n-Val.	0.090	0.040	0.108
W.S. Elev (ft)	953.31	Reach Len. (ft)	124.62	124.01	123.48
Crit W.S. (ft)		Flow Area (sq ft)	2.20	286.64	96.61
E.G. Slope (ft/ft)	0.003664	Area (sq ft)	2.20	286.64	96.61
Q Total (cfs)	2310.00	Flow (cfs)	1.79	2194.18	114.03
Top Width (ft)	99.13	Top Width (ft)	2.45	39.90	56.78
Vel Total (ft/s)	5.99	Avg. Vel. (ft/s)	0.81	7.65	1.18
Max Chl Dpth (ft)	8.53	Hydr. Depth (ft)	0.90	7.18	1.70
Conv. Total (cfs)	38164.5	Conv. (cfs)	29.6	36251.0	1883.9
Length Wtd. (ft)	123.99	Wetted Per. (ft)	3.01	45.63	57.37
Min Ch El (ft)	944.78	Shear (lb/sq ft)	0.17	1.44	0.39
Alpha	1.55	Stream Power (lb/ft s)	0.14	11.00	0.45
Frctn Loss (ft)	0.46	Cum Volume (acre-ft)	17.15	29.68	12.39
C & E Loss (ft)	0.03	Cum SA (acres)	5.57	4.23	6.33

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	954.56	Element			
Vel Head (ft)	0.84	Wt. n-Val.		0.040	0.100
W.S. Elev (ft)	953.73	Reach Len. (ft)	124.62	124.01	123.48
Crit W.S. (ft)		Flow Area (sq ft)		303.08	46.36
E.G. Slope (ft/ft)	0.003373	Area (sq ft)		303.08	46.36
Q Total (cfs)	2310.00	Flow (cfs)		2251.07	58.93
Top Width (ft)	63.72	Top Width (ft)		39.90	23.82
Vel Total (ft/s)	6.61	Avg. Vel. (ft/s)		7.43	1.27
Max Chl Dpth (ft)	8.95	Hydr. Depth (ft)		7.60	1.95
Conv. Total (cfs)	39775.6	Conv. (cfs)		38760.9	1014.7
Length Wtd. (ft)	124.00	Wetted Per. (ft)		47.45	25.94
Min Ch El (ft)	944.78	Shear (lb/sq ft)		1.35	0.38
Alpha	1.23	Stream Power (lb/ft s)		9.99	0.48
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	11.56	32.46	1.62
C & E Loss (ft)	0.03	Cum SA (acres)	2.94	4.25	0.45

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4080.463

INPUT
Description: 13
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	961.33	9.34	961.1	11.62	960.98	11.79	960.97	21.38	960.45
21.66	959.31	22	957.74	22.73	954.39	47.22	954.39	51.8	952.1
59.8	952.1	62.6	953.5	67.6	953.5	85.6	944.5	105.6	944.5
120.16	951.78	134	951.39	136.05	950.57	137.34	950.11	142.4	948.34
143.51	948.64	147.54	950.75	157.32	954.87	163.92	957.65	167.25	959.05
177.01	960.09	190.28	961.31	194.49	963.13				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	67.6	.04	120.16	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
67.6	120.16	17.85	17.74	17.82	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	953.69	Element			
Vel Head (ft)	0.77	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	952.92	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	950.57	Flow Area (sq ft)	7.87	308.74	67.88
E.G. Slope (ft/ft)	0.003772	Area (sq ft)	7.87	308.74	67.88
Q Total (cfs)	2310.00	Flow (cfs)	6.14	2222.11	81.75
Top Width (ft)	95.19	Top Width (ft)	11.27	51.39	32.52
Vel Total (ft/s)	6.01	Avg. Vel. (ft/s)	0.78	7.20	1.20
Max Chl Dpth (ft)	8.42	Hydr. Depth (ft)	0.70	6.01	2.09
Conv. Total (cfs)	37612.7	Conv. (cfs)	100.0	36181.5	1331.1
Length Wtd. (ft)	4.00	Wetted Per. (ft)	11.65	55.10	34.06

Min Ch El (ft)	944.50	Shear (lb/sq ft)	0.16	1.32	0.47
Alpha	1.38	Stream Power (lb/ft s)	0.12	9.50	0.57
Frctn Loss (ft)		Cum Volume (acre-ft)	17.14	28.83	12.16
C & E Loss (ft)		Cum SA (acres)	5.55	4.10	6.20

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100 YR FW

E.G. Elev (ft)	954.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.75	Wt. n-Val.		0.040	
W.S. Elev (ft)	953.36	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	950.54	Flow Area (sq ft)		331.95	
E.G. Slope (ft/ft)	0.003403	Area (sq ft)		331.95	
Q Total (cfs)	2310.00	Flow (cfs)		2310.00	
Top Width (ft)	52.29	Top Width (ft)		52.29	
Vel Total (ft/s)	6.96	Avg. Vel. (ft/s)		6.96	
Max Chl Dpth (ft)	8.86	Hydr. Depth (ft)		6.35	
Conv. Total (cfs)	39598.1	Conv. (cfs)		39598.1	
Length Wtd. (ft)	4.00	Wetted Per. (ft)		57.69	
Min Ch El (ft)	944.50	Shear (lb/sq ft)		1.22	
Alpha	1.00	Stream Power (lb/ft s)		8.51	
Frctn Loss (ft)		Cum Volume (acre-ft)	11.56	31.56	1.55
C & E Loss (ft)		Cum SA (acres)	2.94	4.11	0.42

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 4074

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	965	962	500	965	962

Upstream Bridge Cross Section Data
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	961.3	9.34	961.07	11.62	960.95	11.79	960.94	21.38	960.42
21.66	959.28	22	957.71	22.73	954.36	47.22	954.36	51.8	952.07
59.8	952.07	62.6	953.47	67.6	953.47	85.6	944.47	105.6	944.47
120.16	951.75	134	951.36	136.05	950.54	137.34	950.08	142.4	948.31
143.51	948.61	147.54	950.72	157.32	954.84	163.92	957.62	167.25	959.02
177.01	960.06	190.28	961.28	194.49	963.1				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	67.6	.04	120.16	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
67.6	120.16	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	965	962	500	965	962

Downstream Bridge Cross Section Data
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	961.42	.05	961.42	8.73	961.21	13.47	961.09	20.16	960.73
21.8	960.64	22.24	960.62	24.06	960.52	24.86	960.48	25.56	960.44
26.99	954.63	27.06	954.31	51.09	954.31	55.67	952.02	63.67	952.02
66.47	953.42	71.47	953.42	89.47	944.42	109.47	944.42	124.03	951.7
140.23	951.3	143.98	950.82	149.95	948.82	150.86	948.52	152.32	949.08
155.42	950.99	159.93	952.89	190.27	956.19	191.91	956.49	192.39	956.74
206.62	963.92								

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09   71.47     .04  124.03     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
         71.47  124.03             .1       .3

Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=    67.6    Downstream=   71.47
Upstream      num=       2
    Width   Elev    Width   Elev
        8    940        8    965
Downstream      num=       2
    Width   Elev    Width   Elev
        8    940        8    965

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
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 YR

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	953.69	E.G. Elev (ft)	953.64	953.60
W.S. US. (ft)	952.92	W.S. Elev (ft)	952.85	952.80
Q Total (cfs)	2310.00	Crit W.S. (ft)	950.57	950.49
Q Bridge (cfs)	2310.00	Max Chl Dpth (ft)	8.38	8.38
Q Weir (cfs)		Vel Total (ft/s)	6.10	6.09
Weir Sta Lft (ft)		Flow Area (sq ft)	378.79	379.47
Weir Sta Rgt (ft)		Froude # Chl	0.51	0.51
Weir Submerg		Specif Force (cu ft)	1692.14	1684.43
Weir Max Depth (ft)		Hydr Depth (ft)	4.11	3.98
Min El Weir Flow (ft)	965.01	W.P. Total (ft)	98.74	101.88
Min El Prs (ft)	962.00	Conv. Total (cfs)	37585.2	37527.0
Delta EG (ft)	0.13	Top Width (ft)	92.10	95.34
Delta WS (ft)	0.13	Frctn Loss (ft)		
BR Open Area (sq ft)	1613.86	C & E Loss (ft)		
BR Open Vel (ft/s)	6.10	Shear Total (lb/sq ft)	0.90	0.88
Coef of Q		Power Total (lb/ft s)	5.52	5.36
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #100 YR FW

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	954.12	E.G. Elev (ft)	954.06	953.99
W.S. US. (ft)	953.36	W.S. Elev (ft)	953.27	953.20
Q Total (cfs)	2310.00	Crit W.S. (ft)	950.52	950.48
Q Bridge (cfs)	2310.00	Max Chl Dpth (ft)	8.80	8.78
Q Weir (cfs)		Vel Total (ft/s)	7.10	7.12
Weir Sta Lft (ft)		Flow Area (sq ft)	325.52	324.25
Weir Sta Rgt (ft)		Froude # Chl	0.48	0.49
Weir Submerg		Specif Force (cu ft)	1735.98	1729.46
Weir Max Depth (ft)		Hydr Depth (ft)	6.70	6.68
Min El Weir Flow (ft)	965.01			

Min El Prs (ft)	962.00	W.P. Total (ft)	53.74	53.71
Delta EG (ft)	0.16	Conv. Total (cfs)	40185.5	39936.6
Delta WS (ft)	0.16	Top Width (ft)	48.56	48.56
BR Open Area (sq ft)	749.26	Frctn Loss (ft)		
BR Open Vel (ft/s)	7.12	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	1.25	1.26
Br Sel Method	Momentum	Power Total (lb/ft s)	8.87	8.98

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 4062.727

INPUT
Description: 14
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	961.35	.05	961.35	8.73	961.14	13.47	961.02	20.16	960.66
21.8	960.57	22.24	960.55	24.06	960.45	24.86	960.41	25.56	960.37
26.99	954.56	27.06	954.24	51.09	954.24	55.67	951.95	63.67	951.95
66.47	953.35	71.47	953.35	89.47	944.35	109.47	944.35	124.03	951.63
140.23	951.23	143.98	950.75	149.95	948.75	150.86	948.45	152.32	949.01
155.42	950.92	159.93	952.82	190.27	956.12	191.91	956.42	192.39	956.67
206.62	963.85								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	71.47	.04	124.03	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
71.47	124.03	120.53	121.82	121.07	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	953.56	Element			
Vel Head (ft)	0.77	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	952.79	Reach Len. (ft)	120.53	121.82	121.07
Crit W.S. (ft)		Flow Area (sq ft)	8.15	310.03	69.65
E.G. Slope (ft/ft)	0.003730	Area (sq ft)	8.15	310.03	69.65
Q Total (cfs)	2310.00	Flow (cfs)	6.44	2223.64	79.92
Top Width (ft)	98.65	Top Width (ft)	11.37	51.44	35.83
Vel Total (ft/s)	5.96	Avg. Vel. (ft/s)	0.79	7.17	1.15
Max Chl Dpth (ft)	8.44	Hydr. Depth (ft)	0.72	6.03	1.94
Conv. Total (cfs)	37822.6	Conv. (cfs)	105.4	36408.6	1308.6
Length Wtd. (ft)	121.78	Wetted Per. (ft)	11.77	55.16	37.27
Min Ch El (ft)	944.35	Shear (lb/sq ft)	0.16	1.31	0.44
Alpha	1.40	Stream Power (lb/ft s)	0.13	9.39	0.50
Frctn Loss (ft)	0.44	Cum Volume (acre-ft)	17.14	28.71	12.13
C & E Loss (ft)	0.01	Cum SA (acres)	5.55	4.08	6.19

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	953.96	Element			
Vel Head (ft)	0.75	Wt. n-Val.		0.040	
W.S. Elev (ft)	953.20	Reach Len. (ft)	120.53	121.82	121.07
Crit W.S. (ft)		Flow Area (sq ft)		331.41	
E.G. Slope (ft/ft)	0.003419	Area (sq ft)		331.41	
Q Total (cfs)	2310.00	Flow (cfs)		2310.00	
Top Width (ft)	52.27	Top Width (ft)		52.27	
Vel Total (ft/s)	6.97	Avg. Vel. (ft/s)		6.97	
Max Chl Dpth (ft)	8.85	Hydr. Depth (ft)		6.34	
Conv. Total (cfs)	39507.3	Conv. (cfs)		39507.3	
Length Wtd. (ft)	121.82	Wetted Per. (ft)		57.65	
Min Ch El (ft)	944.35	Shear (lb/sq ft)		1.23	
Alpha	1.00	Stream Power (lb/ft s)		8.55	
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	11.56	31.42	1.55
C & E Loss (ft)	0.00	Cum SA (acres)	2.94	4.09	0.42

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3940.903

INPUT
Description: 15
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960.68	1.45	960.65	3.61	960.62	7.93	960.51	8.56	960.49
9.12	960.48	13.03	960.38	15.98	960.31	16.3	960.3	16.85	960.29
17.34	960.26	28.75	959.73	29.55	956.84	30.51	953.75	52.65	953.75
57.09	951.53	65.09	951.53	67.89	952.93	72.89	952.93	90.89	943.93
110.89	943.93	125.39	951.18	146.62	949.48	148.42	948.9	150.72	947.56
151.28	947.79	161.7	951.21	166.68	951.49	199.63	951.75	201.05	952.11
222.06	960.02	226.18	960.22	259	961.9	278.73	962.16		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	72.89	.04	125.39	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
72.89 125.39 18.03 18.27 18.28 .1 .3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	953.10	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.73	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	952.38	Flow Area (sq ft)	8.23	310.29	122.24
Crit W.S. (ft)	950.03	Area (sq ft)	8.23	310.29	122.24
E.G. Slope (ft/ft)	0.003574	Flow (cfs)	6.39	2181.08	122.53
Q Total (cfs)	2310.00	Top Width (ft)	11.39	51.40	76.37
Top Width (ft)	139.16	Avg. Vel. (ft/s)	0.78	7.03	1.00
Vel Total (ft/s)	5.24	Hydr. Depth (ft)	0.72	6.04	1.60
Max Chl Dpth (ft)	8.45	Conv. (cfs)	106.8	36483.1	2049.6
Conv. Total (cfs)	38639.5	Wetted Per. (ft)	11.79	55.10	77.59
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.16	1.26	0.35
Min Ch El (ft)	943.93	Stream Power (lb/ft s)	0.12	8.83	0.35
Alpha	1.70	Cum Volume (acre-ft)	17.11	27.84	11.86
Frctn Loss (ft)		Cum SA (acres)	5.52	3.93	6.03
C & E Loss (ft)					

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	953.54	Wt. n-Val.		0.040	
Vel Head (ft)	0.75	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	952.79	Flow Area (sq ft)		331.55	
Crit W.S. (ft)	949.98	Area (sq ft)		331.55	
E.G. Slope (ft/ft)	0.003412	Flow (cfs)		2310.00	
Q Total (cfs)	2310.00	Top Width (ft)		52.22	
Top Width (ft)	52.22	Avg. Vel. (ft/s)		6.97	
Vel Total (ft/s)	6.97	Hydr. Depth (ft)		6.35	
Max Chl Dpth (ft)	8.86	Conv. (cfs)		39543.9	
Conv. Total (cfs)	39543.9	Wetted Per. (ft)		57.63	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		1.23	
Min Ch El (ft)	943.93	Stream Power (lb/ft s)		8.54	
Alpha	1.00	Cum Volume (acre-ft)	11.56	30.50	1.55
Frctn Loss (ft)		Cum SA (acres)	2.94	3.95	0.42
C & E Loss (ft)					

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 3934

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

```
      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
        0      965      962      500      965      962

 Upstream Bridge Cross Section Data
 Station Elevation Data     num=       34
      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
        0   960.57     1.45   960.54     3.61   960.51     7.93    960.4     8.56   960.38
     9.12   960.37    13.03   960.27    15.98    960.2     16.3   960.19    16.85   960.18
    17.34   960.15    28.75   959.62    29.55   956.73    30.51   953.64    52.65   953.64
    57.09   951.42    65.09   951.42    67.89   952.82    72.89   952.82    90.89   943.82
   110.89   943.82   125.39   951.07   146.62   949.37   148.42   948.79   150.72   947.45
   151.28   947.68    161.7    951.1   166.68   951.38   199.63   951.64   201.05      952
   222.06   959.91   226.18   960.11      259   961.79   278.73   962.05

 Manning's n Values         num=        3
      Sta    n Val      Sta    n Val      Sta    n Val
        0      .09    72.89      .04   125.39      .12

 Bank Sta: Left    Right     Coeff Contr.    Expan.
           72.89   125.39          .1          .3

 Downstream  Deck/Roadway Coordinates
     num=        2
      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
        0      965      962      500      965      962

 Downstream Bridge Cross Section Data
 Station Elevation Data     num=       37
      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
        0   960.87     3.73   960.79      7.7   960.73    14.77   960.54    20.96   960.39
    26.91   960.12    28.47   960.05    29.14   960.02    30.44   959.96    30.97   959.94
    31.02   959.93    32.86   959.85    32.98   959.42    34.75   953.77    35.63   953.47
    56.52   953.47    60.96   951.25    68.96   951.25    71.76   952.65    76.76   952.65
    94.76   943.65   114.76   943.65   129.26    950.9   131.48   950.89   140.73   950.46
    149.3   947.68   149.86   947.35   154.31   949.17   157.61   950.26   184.55   951.73
   203.92   951.89   218.45   955.59   230.11   959.97    230.6   959.99   250.05      961
   261.18   961.12   295.23   962.67

 Manning's n Values         num=        3
      Sta    n Val      Sta    n Val      Sta    n Val
        0      .09    76.76      .04   129.26      .12

 Bank Sta: Left    Right     Coeff Contr.    Expan.
           76.76   129.26          .1          .3

 Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
 Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow =     .98
 Elevation at which weir flow begins           =
 Energy head used in spillway design           =
 Spillway height used in design                =
 Weir crest shape                              = Broad Crested

 Number of Piers =  1

 Pier Data
 Pier Station     Upstream=   72.89    Downstream=   76.76
 Upstream     num=        2
     Width    Elev     Width    Elev
         8     940         8     965
 Downstream     num=        2
     Width    Elev     Width    Elev
         8     940         8     965

 Number of Bridge Coefficient Sets =  1

 Low Flow Methods and Data
        Energy
        Momentum                 Cd    =        2
 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 YR

			Inside BR US	Inside BR DS
E.G. US. (ft)	953.10	Element		
W.S. US. (ft)	952.38	E.G. Elev (ft)	952.98	952.84
Q Total (cfs)	2310.00	W.S. Elev (ft)	952.23	952.06
Q Bridge (cfs)	2310.00	Crit W.S. (ft)	949.93	949.74
Q Weir (cfs)		Max Chl Dpth (ft)	8.41	8.41
Weir Sta Lft (ft)		Vel Total (ft/s)	5.33	5.55
Weir Sta Rgt (ft)		Flow Area (sq ft)	433.32	416.50
Weir Submerg		Froude # Chl	0.50	0.51
Weir Max Depth (ft)		Specif Force (cu ft)	1731.83	1722.90
Min El Weir Flow (ft)	965.01	Hydr Depth (ft)	3.19	3.08
Min El Prs (ft)	962.00	W.P. Total (ft)	142.37	141.40
Delta EG (ft)	0.32	Conv. Total (cfs)	38582.1	38194.8
Delta WS (ft)	0.27	Top Width (ft)	136.01	135.10
BR Open Area (sq ft)	2220.43	Frctn Loss (ft)		
BR Open Vel (ft/s)	5.55	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.68	0.67
Br Sel Method	Momentum	Power Total (lb/ft s)	3.63	3.73

BRIDGE OUTPUT Profile #100 YR FW

			Inside BR US	Inside BR DS
E.G. US. (ft)	953.54	Element		
W.S. US. (ft)	952.79	E.G. Elev (ft)	953.40	953.21
Q Total (cfs)	2310.00	W.S. Elev (ft)	952.62	952.42
Q Bridge (cfs)	2310.00	Crit W.S. (ft)	949.87	949.71
Q Weir (cfs)		Max Chl Dpth (ft)	8.80	8.77
Weir Sta Lft (ft)		Vel Total (ft/s)	7.11	7.14
Weir Sta Rgt (ft)		Flow Area (sq ft)	325.06	323.75
Weir Submerg		Froude # Chl	0.48	0.49
Weir Max Depth (ft)		Specif Force (cu ft)	1734.16	1727.44
Min El Weir Flow (ft)	965.01	Hydr Depth (ft)	6.70	6.68
Min El Prs (ft)	962.00	W.P. Total (ft)	53.66	53.63
Delta EG (ft)	0.36	Conv. Total (cfs)	40127.7	39871.0
Delta WS (ft)	0.32	Top Width (ft)	48.50	48.50
BR Open Area (sq ft)	780.17	Frctn Loss (ft)		
BR Open Vel (ft/s)	7.14	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	1.25	1.26
Br Sel Method	Momentum	Power Total (lb/ft s)	8.91	9.03

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3922.633

INPUT
Description: 16
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960.65	3.73	960.57	7.7	960.51	14.77	960.32	20.96	960.17
26.91	959.9	28.47	959.83	29.14	959.8	30.44	959.74	30.97	959.72
31.02	959.71	32.86	959.63	32.98	959.2	34.75	953.55	35.63	953.25
56.52	953.25	60.96	951.03	68.96	951.03	71.76	952.43	76.76	952.43
94.76	943.43	114.76	943.43	129.26	950.68	131.48	950.67	140.73	950.24
149.3	947.46	149.86	947.13	154.31	948.95	157.61	950.04	184.55	951.51
203.92	951.67	218.45	955.37	230.11	959.75	230.6	959.77	250.05	960.78
261.18	960.9	295.23	962.45						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	76.76	.04	129.26	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
76.76 129.26 121.49 122.76 124.97 .1 .3

CROSS SECTION OUTPUT Profile #100 YR

E.G. Elev (ft) 952.79 Element Left OB Channel Right OB

Vel Head (ft)	0.67	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	952.11	Reach Len. (ft)	121.49	122.76	124.97
Crit W.S. (ft)		Flow Area (sq ft)	11.01	322.41	122.53
E.G. Slope (ft/ft)	0.003195	Area (sq ft)	11.01	322.41	122.53
Q Total (cfs)	2310.00	Flow (cfs)	9.28	2184.39	116.33
Top Width (ft)	140.60	Top Width (ft)	12.33	51.87	76.40
Vel Total (ft/s)	5.07	Avg. Vel. (ft/s)	0.84	6.78	0.95
Max Chl Dpth (ft)	8.68	Hydr. Depth (ft)	0.89	6.22	1.60
Conv. Total (cfs)	40866.1	Conv. (cfs)	164.1	38644.0	2058.0
Length Wtd. (ft)	122.94	Wetted Per. (ft)	12.84	55.63	77.57
Min Ch El (ft)	943.43	Shear (lb/sq ft)	0.17	1.16	0.32
Alpha	1.69	Stream Power (lb/ft s)	0.14	7.83	0.30
Frctn Loss (ft)	0.30	Cum Volume (acre-ft)	17.11	27.71	11.81
C & E Loss (ft)	0.07	Cum SA (acres)	5.51	3.91	6.00

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	953.18	Element			
Vel Head (ft)	0.71	Wt. n-Val.		0.040	
W.S. Elev (ft)	952.47	Reach Len. (ft)	121.49	122.76	124.97
Crit W.S. (ft)		Flow Area (sq ft)		340.95	
E.G. Slope (ft/ft)	0.003147	Area (sq ft)		340.95	
Q Total (cfs)	2310.00	Flow (cfs)		2310.00	
Top Width (ft)	52.50	Top Width (ft)		52.50	
Vel Total (ft/s)	6.78	Avg. Vel. (ft/s)		6.78	
Max Chl Dpth (ft)	9.04	Hydr. Depth (ft)		6.49	
Conv. Total (cfs)	41176.5	Conv. (cfs)		41176.5	
Length Wtd. (ft)	122.76	Wetted Per. (ft)		58.16	
Min Ch El (ft)	943.43	Shear (lb/sq ft)		1.15	
Alpha	1.00	Stream Power (lb/ft s)		7.80	
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	11.56	30.36	1.55
C & E Loss (ft)	0.03	Cum SA (acres)	2.94	3.93	0.42

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3799.870

INPUT
Description: 17
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	959.27	5.2	959.02	7.96	958.9	9.49	958.84	10.79	952.31
25.46	952.31	29.78	950.15	37.78	950.15	40.58	951.55	48.58	951.55
66.58	942.55	86.58	942.55	98.54	948.53	107.55	949.01	109.65	948.99
113.54	948.44	132.09	948.53	136.05	949.46	154.64	949.63	179.04	949.75
184.92	949.94	197.4	950.31	226.61	951.21	256.43	951.91	278.92	952.23
279.83	952.61	281.1	959.19						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	48.58	.04	98.54	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
48.58	98.54	19.61	18.77	18.18	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
235	281.1		F

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	952.42	Element			
Vel Head (ft)	0.44	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	951.98	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	948.67	Flow Area (sq ft)	24.59	354.36	302.64
E.G. Slope (ft/ft)	0.001884	Area (sq ft)	24.59	354.36	309.70
Q Total (cfs)	2310.00	Flow (cfs)	18.31	2015.31	276.38
Top Width (ft)	235.23	Top Width (ft)	22.46	49.96	162.81
Vel Total (ft/s)	3.39	Avg. Vel. (ft/s)	0.74	5.69	0.91
Max Chl Dpth (ft)	9.43	Hydr. Depth (ft)	1.09	7.09	2.22
Conv. Total (cfs)	53218.3	Conv. (cfs)	421.8	46429.2	6367.4

Length Wtd. (ft)	4.00	Wetted Per. (ft)	23.22	53.50	136.65
Min Ch El (ft)	942.55	Shear (lb/sq ft)	0.12	0.78	0.26
Alpha	2.47	Stream Power (lb/ft s)	0.09	4.43	0.24
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	17.06	26.75	11.19
C & E Loss (ft)	0.00	Cum SA (acres)	5.46	3.77	5.66

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	952.81	Element			
Vel Head (ft)	0.62	Wt. n-Val.		0.040	
W.S. Elev (ft)	952.19	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	948.60	Flow Area (sq ft)		364.81	
E.G. Slope (ft/ft)	0.002491	Area (sq ft)		364.81	
Q Total (cfs)	2310.00	Flow (cfs)		2310.00	
Top Width (ft)	49.96	Top Width (ft)		49.96	
Vel Total (ft/s)	6.33	Avg. Vel. (ft/s)		6.33	
Max Chl Dpth (ft)	9.64	Hydr. Depth (ft)		7.30	
Conv. Total (cfs)	46286.4	Conv. (cfs)		46286.4	
Length Wtd. (ft)	4.00	Wetted Per. (ft)		57.79	
Min Ch El (ft)	942.55	Shear (lb/sq ft)		0.98	
Alpha	1.00	Stream Power (lb/ft s)		6.21	
Frctn Loss (ft)		Cum Volume (acre-ft)	11.56	29.37	1.55
C & E Loss (ft)		Cum SA (acres)	2.94	3.78	0.42

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 3792

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	965	962	500	965	962

Upstream Bridge Cross Section Data
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	959.23	5.2	958.98	7.96	958.86	9.49	958.8	10.79	952.27
25.46	952.27	29.78	950.11	37.78	950.11	40.58	951.51	48.58	951.51
66.58	942.51	86.58	942.51	98.54	948.49	107.55	948.97	109.65	948.95
113.54	948.4	132.09	948.49	136.05	949.42	154.64	949.59	179.04	949.71
184.92	949.9	197.4	950.27	226.61	951.17	256.43	951.87	278.92	952.19
279.83	952.57	281.1	959.15						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	48.58	.04	98.54	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
48.58	98.54	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
235	281.1		F

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	965	962	500	965	962

Downstream Bridge Cross Section Data
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	959.38	1.65	959.34	3.76	959.25	4.12	959.23	13.32	958.84
13.54	957.68	14.46	953.01	14.62	952.2	32.34	952.2	36.66	950.04
44.66	950.04	47.46	951.44	55.46	951.44	73.46	942.44	93.46	942.44
105.42	948.42	115.26	948.93	135.98	949.32	139.96	949.29	149.09	949.36
173.47	949.47	190.53	950.02	226.75	951.1	237.46	951.43	248.38	951.69
266.11	951.65	284.21	959.24						

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09   55.46     .04  105.42     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
         55.46  105.42          .1        .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev  Permanent
     256  284.21                F

Upstream Embankment side slope                =      0 horiz. to 1.0 vertical
Downstream Embankment side slope              =      0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=   48.58    Downstream=   55.46
Upstream     num=       2
    Width   Elev    Width   Elev
        8    940        8    965
Downstream     num=       2
    Width   Elev    Width   Elev
        8    940        8    965

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
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 YR

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	952.42	E.G. Elev (ft)	952.41	952.40
W.S. US. (ft)	951.98	W.S. Elev (ft)	951.96	951.92
Q Total (cfs)	2310.00	Crit W.S. (ft)	948.63	948.49
Q Bridge (cfs)	2310.00	Max Chl Dpth (ft)	9.45	9.48
Q Weir (cfs)		Vel Total (ft/s)	3.41	3.50
Weir Sta Lft (ft)		Flow Area (sq ft)	678.06	659.09
Weir Sta Rgt (ft)		Froude # Chl	0.37	0.37
Weir Submerg		Specif Force (cu ft)	2215.34	2180.05
Weir Max Depth (ft)		Hydr Depth (ft)	3.37	3.06
Min El Weir Flow (ft)	965.01	W.P. Total (ft)	207.83	221.95
Min El Prs (ft)	962.00	Conv. Total (cfs)	53450.5	52685.6
Delta EG (ft)	0.05	Top Width (ft)	228.63	225.86
Delta WS (ft)	0.05	Frctn Loss (ft)	0.01	0.02
BR Open Area (sq ft)	2881.10	C & E Loss (ft)	0.00	0.01
BR Open Vel (ft/s)	3.50	Shear Total (lb/sq ft)	0.38	0.36
Coef of Q		Power Total (lb/ft s)	1.30	1.25
Br Sel Method	Energy only			

BRIDGE OUTPUT Profile #100 YR FW

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	952.81	E.G. Elev (ft)	952.74	952.65
W.S. US. (ft)	952.19	W.S. Elev (ft)	952.08	951.99
Q Total (cfs)	2310.00	Crit W.S. (ft)	948.55	948.48
Q Bridge (cfs)	2310.00	Max Chl Dpth (ft)	9.57	9.55
Q Weir (cfs)		Vel Total (ft/s)	6.50	6.52
Weir Sta Lft (ft)				

Weir Sta Rgt (ft)		Flow Area (sq ft)	355.13	354.29
Weir Submerg		Froude # Chl	0.41	0.41
Weir Max Depth (ft)		Specif Force (cu ft)	1946.13	1940.76
Min El Weir Flow (ft)	965.01	Hydr Depth (ft)	7.73	7.71
Min El Prs (ft)	962.00	W.P. Total (ft)	51.60	51.58
Delta EG (ft)	0.18	Conv. Total (cfs)	47735.5	47559.0
Delta WS (ft)	0.18	Top Width (ft)	45.96	45.96
BR Open Area (sq ft)	811.00	Frctn Loss (ft)		
BR Open Vel (ft/s)	6.52	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	1.01	1.01
Br Sel Method	Momentum	Power Total (lb/ft s)	6.55	6.60

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3781.101

INPUT
Description: 18
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	959.29	1.65	959.25	3.76	959.16	4.12	959.14	13.32	958.75
13.54	957.59	14.46	952.92	14.62	952.11	32.34	952.11	36.66	949.95
44.66	949.95	47.46	951.35	55.46	951.35	73.46	942.35	93.46	942.35
105.42	948.33	115.26	948.84	135.98	949.23	139.96	949.2	149.09	949.27
173.47	949.38	190.53	949.93	226.75	951.01	237.46	951.34	248.38	951.6
266.11	951.56	284.21	959.15						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	55.46	.04	105.42	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
55.46 105.42 119.49 121.49 122.1 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
256	284.21		F

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	952.37	Element			
Vel Head (ft)	0.44	Wt. n-Val.	0.090	0.040	0.120
W.S. Elev (ft)	951.93	Reach Len. (ft)	119.49	121.49	122.10
Crit W.S. (ft)		Flow Area (sq ft)	28.01	361.92	299.38
E.G. Slope (ft/ft)	0.001798	Area (sq ft)	28.01	361.92	303.19
Q Total (cfs)	2310.00	Flow (cfs)	22.01	2039.47	248.52
Top Width (ft)	234.30	Top Width (ft)	22.76	49.96	161.58
Vel Total (ft/s)	3.35	Avg. Vel. (ft/s)	0.79	5.64	0.83
Max Chl Dpth (ft)	9.58	Hydr. Depth (ft)	1.23	7.24	1.99
Conv. Total (cfs)	54471.0	Conv. (cfs)	519.0	48091.6	5860.3
Length Wtd. (ft)	121.53	Wetted Per. (ft)	23.56	53.50	150.63
Min Ch El (ft)	942.35	Shear (lb/sq ft)	0.13	0.76	0.22
Alpha	2.50	Stream Power (lb/ft s)	0.10	4.28	0.19
Frctn Loss (ft)	0.23	Cum Volume (acre-ft)	17.05	26.60	11.06
C & E Loss (ft)	0.01	Cum SA (acres)	5.45	3.75	5.59

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	952.63	Element			
Vel Head (ft)	0.62	Wt. n-Val.		0.040	
W.S. Elev (ft)	952.01	Reach Len. (ft)	119.49	121.49	122.10
Crit W.S. (ft)		Flow Area (sq ft)		365.95	
E.G. Slope (ft/ft)	0.002467	Area (sq ft)		365.95	
Q Total (cfs)	2310.00	Flow (cfs)		2310.00	
Top Width (ft)	49.96	Top Width (ft)		49.96	
Vel Total (ft/s)	6.31	Avg. Vel. (ft/s)		6.31	
Max Chl Dpth (ft)	9.66	Hydr. Depth (ft)		7.32	
Conv. Total (cfs)	46503.9	Conv. (cfs)		46503.9	
Length Wtd. (ft)	121.49	Wetted Per. (ft)		57.84	
Min Ch El (ft)	942.35	Shear (lb/sq ft)		0.97	
Alpha	1.00	Stream Power (lb/ft s)		6.15	
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)	11.56	29.21	1.55
C & E Loss (ft)	0.00	Cum SA (acres)	2.94	3.76	0.42

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3659.612

INPUT
Description: 19
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	958.56	1.96	958.5	9.17	958.21	9.55	958.2	11.04	958.14
12.46	958.08	13.47	958.04	14.61	951.91	29.17	951.91	33.49	949.75
41.49	949.75	44.29	951.15	52.29	951.15	70.29	942.15	90.29	942.15
102.25	948.13	123.09	948.32	146.41	948.84	146.75	948.96	147.21	948.95
148.2	948.93	150.32	949.33	166.85	950.26	169.53	950.34	175.61	950.53
187.64	950.88	213.53	951.16	213.96	951.17	222.01	951.3	223.95	951.47
253.44	954.12	256.95	954.23	257.56	954.27	257.9	954.8	259.28	955.3
272.54	960.14								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	52.29	.04	102.25	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
52.29	102.25	18.36	18.18	17.87	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	952.13	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.49	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	951.64	Flow Area (sq ft)	26.00	357.47	225.80
Crit W.S. (ft)	948.19	Area (sq ft)	26.00	357.47	225.80
E.G. Slope (ft/ft)	0.001993	Flow (cfs)	20.57	2103.04	186.39
Q Total (cfs)	2310.00	Top Width (ft)	22.58	49.96	123.62
Top Width (ft)	196.16	Avg. Vel. (ft/s)	0.79	5.88	0.83
Vel Total (ft/s)	3.79	Hydr. Depth (ft)	1.15	7.16	1.83
Max Chl Dpth (ft)	9.49	Conv. (cfs)	460.9	47111.1	4175.5
Conv. Total (cfs)	51747.4	Wetted Per. (ft)	23.36	53.50	123.74
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.14	0.83	0.23
Min Ch El (ft)	942.15	Stream Power (lb/ft s)	0.11	4.89	0.19
Alpha	2.20	Cum Volume (acre-ft)	16.98	25.60	10.32
Frctn Loss (ft)	0.01	Cum SA (acres)	5.39	3.61	5.19
C & E Loss (ft)	0.00				

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	952.32	Wt. n-Val.		0.040	
Vel Head (ft)	0.64	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	951.68	Flow Area (sq ft)		359.35	
Crit W.S. (ft)	948.17	Area (sq ft)		359.35	
E.G. Slope (ft/ft)	0.002606	Flow (cfs)		2310.00	
Q Total (cfs)	2310.00	Top Width (ft)		49.96	
Top Width (ft)	49.96	Avg. Vel. (ft/s)		6.43	
Vel Total (ft/s)	6.43	Hydr. Depth (ft)		7.19	
Max Chl Dpth (ft)	9.53	Conv. (cfs)		45251.5	
Conv. Total (cfs)	45251.5	Wetted Per. (ft)		57.58	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		1.02	
Min Ch El (ft)	942.15	Stream Power (lb/ft s)		6.53	
Alpha	1.00	Cum Volume (acre-ft)	11.56	28.20	1.55
Frctn Loss (ft)		Cum SA (acres)	2.94	3.62	0.42
C & E Loss (ft)					

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 3652

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6

```
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0     960     957      500     960     957

Upstream Bridge Cross Section Data
Station Elevation Data     num=       36
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  958.56    1.96   958.5    9.17  958.21    9.55   958.2   11.04  958.14
   12.46  958.08   13.47  958.04   14.61  951.91   29.17  951.91   33.49  949.75
   41.49  949.75   44.29  951.15   52.29  951.15   70.29  942.15   90.29  942.15
  102.25  948.13  123.09  948.32  146.41  948.84  146.75  948.96  147.21  948.95
   148.2  948.93  150.32  949.33  166.85  950.26  169.53  950.34  175.61  950.53
  187.64  950.88  213.53  951.16  213.96  951.17  222.01   951.3  223.95  951.47
  253.44  954.12  256.95  954.23  257.56  954.27   257.9   954.8  259.28   955.3
  272.54  960.14

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09   52.29     .04  102.25     .12

Bank Sta: Left   Right     Coeff Contr.    Expan.
          52.29  102.25              .1       .3

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0     960     957      500     960     957

Downstream Bridge Cross Section Data
Station Elevation Data     num=       29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  958.43     .57  958.41    4.35  958.26   11.97  957.96   12.46  955.32
   13.14  951.91   30.89  951.91   35.21  949.75   43.21  949.75   46.01  951.15
   54.01  951.15   72.01  942.15   92.01  942.15  103.97  948.13  107.38  948.12
  121.11  948.22  143.34  949.11  153.55  949.68  168.39   950.1  189.55  950.77
  196.84  951.03   201.1  951.16  212.45   951.5  215.46  951.59  240.59  951.58
  260.58  953.21  263.83   953.7  273.43  957.88  280.47  960.45

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09   54.01     .04  103.97     .12

Bank Sta: Left   Right     Coeff Contr.    Expan.
          54.01  103.97              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
     238  280.47          F

Upstream Embankment side slope                =      0 horiz. to 1.0 vertical
Downstream Embankment side slope              =      0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=   52.29    Downstream=   54.01
Upstream     num=       2
    Width   Elev    Width   Elev
        8    940        8    960
Downstream     num=       2
    Width   Elev    Width   Elev
        8    940        8    960

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
      Energy
      Momentum                Cd   =       2
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 YR

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	952.13	E.G. Elev (ft)	952.12	952.11
W.S. US. (ft)	951.64	W.S. Elev (ft)	951.61	951.59
Q Total (cfs)	2310.00	Crit W.S. (ft)	948.21	948.24
Q Bridge (cfs)	2310.00	Max Chl Dpth (ft)	9.46	9.44
Q Weir (cfs)		Vel Total (ft/s)	3.88	3.99
Weir Sta Lft (ft)		Flow Area (sq ft)	595.32	578.32
Weir Sta Rgt (ft)		Froude # Chl	0.38	0.39
Weir Submerg		Specif Force (cu ft)	2142.33	2114.72
Weir Max Depth (ft)		Hydr Depth (ft)	3.17	2.92
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	194.61	204.62
Min El Prs (ft)	957.00	Conv. Total (cfs)	51161.9	50734.1
Delta EG (ft)	0.04	Top Width (ft)	187.74	200.56
Delta WS (ft)	0.06	Frctn Loss (ft)	0.01	0.02
BR Open Area (sq ft)	1748.35	C & E Loss (ft)	0.00	0.00
BR Open Vel (ft/s)	3.99	Shear Total (lb/sq ft)	0.39	0.37
Coef of Q		Power Total (lb/ft s)	1.51	1.46
Br Sel Method	Energy only			

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the energy inside of the bridge deck. This is not physically possible. Please review your bridge data and results for reasonableness.

BRIDGE OUTPUT Profile #100 YR FW

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	952.32	E.G. Elev (ft)	952.29	952.27
W.S. US. (ft)	951.68	W.S. Elev (ft)	951.61	951.59
Q Total (cfs)	2310.00	Crit W.S. (ft)	948.20	948.19
Q Bridge (cfs)	2310.00	Max Chl Dpth (ft)	9.46	9.44
Q Weir (cfs)		Vel Total (ft/s)	6.60	6.61
Weir Sta Lft (ft)		Flow Area (sq ft)	350.15	349.32
Weir Sta Rgt (ft)		Froude # Chl	0.42	0.42
Weir Submerg		Specif Force (cu ft)	1914.58	1909.39
Weir Max Depth (ft)		Hydr Depth (ft)	7.62	7.60
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	51.49	51.47
Min El Prs (ft)	957.00	Conv. Total (cfs)	46691.2	46517.7
Delta EG (ft)	0.07	Top Width (ft)	45.96	45.96
Delta WS (ft)	0.08	Frctn Loss (ft)		
BR Open Area (sq ft)	597.74	C & E Loss (ft)		
BR Open Vel (ft/s)	6.61	Shear Total (lb/sq ft)	1.04	1.04
Coef of Q		Power Total (lb/ft s)	6.86	6.91
Br Sel Method	Momentum			

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3641.433

INPUT
Description: 20
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	958.43	.57	958.41	4.35	958.26	11.97	957.96	12.46	955.32
13.14	951.91	30.89	951.91	35.21	949.75	43.21	949.75	46.01	951.15
54.01	951.15	72.01	942.15	92.01	942.15	103.97	948.13	107.38	948.12
121.11	948.22	143.34	949.11	153.55	949.68	168.39	950.1	189.55	950.77
196.84	951.03	201.1	951.16	212.45	951.5	215.46	951.59	240.59	951.58
260.58	953.21	263.83	953.7	273.43	957.88	280.47	960.45		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	54.01	.04	103.97	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
54.01	103.97	122.87	122.58	125.68	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
238	280.47		F

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	952.09	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.51	Reach Len. (ft)	122.87	122.58	125.68
W.S. Elev (ft)	951.58	Flow Area (sq ft)	24.68	354.55	205.42
Crit W.S. (ft)		Area (sq ft)	24.68	354.55	205.43
E.G. Slope (ft/ft)	0.002074	Flow (cfs)	19.32	2116.44	174.24
Q Total (cfs)	2310.00	Top Width (ft)	22.47	49.96	120.83
Top Width (ft)	193.26	Avg. Vel. (ft/s)	0.78	5.97	0.85
Vel Total (ft/s)	3.95	Hydr. Depth (ft)	1.10	7.10	1.74
Max Chl Dpth (ft)	9.43	Conv. (cfs)	424.2	46471.3	3825.9
Conv. Total (cfs)	50721.3	Wetted Per. (ft)	23.23	53.50	118.26
Length Wtd. (ft)	122.70	Shear (lb/sq ft)	0.14	0.86	0.22
Min Ch El (ft)	942.15	Stream Power (lb/ft s)	0.11	5.12	0.19
Alpha	2.10	Cum Volume (acre-ft)	16.97	25.45	10.23
Frctn Loss (ft)	0.29	Cum SA (acres)	5.38	3.59	5.13
C & E Loss (ft)	0.02				

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	952.25	Wt. n-Val.		0.040	
Vel Head (ft)	0.66	Reach Len. (ft)	122.87	122.58	125.68
W.S. Elev (ft)	951.60	Flow Area (sq ft)		355.17	
Crit W.S. (ft)		Area (sq ft)		355.17	
E.G. Slope (ft/ft)	0.002699	Flow (cfs)		2310.00	
Q Total (cfs)	2310.00	Top Width (ft)		49.96	
Top Width (ft)	49.96	Avg. Vel. (ft/s)		6.50	
Vel Total (ft/s)	6.50	Hydr. Depth (ft)		7.11	
Max Chl Dpth (ft)	9.45	Conv. (cfs)		44463.7	
Conv. Total (cfs)	44463.7	Wetted Per. (ft)		57.41	
Length Wtd. (ft)	122.58	Shear (lb/sq ft)		1.04	
Min Ch El (ft)	942.15	Stream Power (lb/ft s)		6.78	
Alpha	1.00	Cum Volume (acre-ft)	11.56	28.05	1.55
Frctn Loss (ft)	0.33	Cum SA (acres)	2.94	3.60	0.42
C & E Loss (ft)	0.00				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3518.856

INPUT
Description: 21
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	957.68	6	957.44	7.5	957.38	8.18	957.36	9.45	951.67
29.38	951.67	33.66	949.53	41.66	949.53	44.46	950.93	49.46	950.93
67.46	941.93	87.46	941.93	102.1	949.25	122.59	955.73	123.17	955.98
125.06	956.77	128.58	957.77	135.97	958.03	151.56	958.19		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	49.46	.04	102.1	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
49.46	102.1	18.65	18.23	18.01	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	951.78	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.66	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	951.12	Flow Area (sq ft)	18.73	349.29	5.54
Crit W.S. (ft)	947.96	Area (sq ft)	18.73	349.29	5.54
E.G. Slope (ft/ft)	0.002747				

					proposed FW.rep
Q Total (cfs)	2310.00	Flow (cfs)	15.68	2290.99	3.33
Top Width (ft)	77.54	Top Width (ft)	18.98	52.64	5.92
Vel Total (ft/s)	6.18	Avg. Vel. (ft/s)	0.84	6.56	0.60
Max Chl Dpth (ft)	9.19	Hydr. Depth (ft)	0.99	6.64	0.94
Conv. Total (cfs)	44073.4	Conv. (cfs)	299.1	43710.7	63.6
Length Wtd. (ft)	4.00	Wetted Per. (ft)	19.69	56.49	6.21
Min Ch El (ft)	941.93	Shear (lb/sq ft)	0.16	1.06	0.15
Alpha	1.12	Stream Power (lb/ft s)	0.14	6.95	0.09
Frctn Loss (ft)		Cum Volume (acre-ft)	16.91	24.46	9.93
C & E Loss (ft)		Cum SA (acres)	5.33	3.44	4.95

CROSS SECTION OUTPUT Profile #100 YR FW

E.G. Elev (ft)	951.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.		0.040	
W.S. Elev (ft)	951.27	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	947.96	Flow Area (sq ft)		356.90	
E.G. Slope (ft/ft)	0.002745	Area (sq ft)		356.90	
Q Total (cfs)	2310.00	Flow (cfs)		2310.00	
Top Width (ft)	52.64	Top Width (ft)		52.64	
Vel Total (ft/s)	6.47	Avg. Vel. (ft/s)		6.47	
Max Chl Dpth (ft)	9.34	Hydr. Depth (ft)		6.78	
Conv. Total (cfs)	44092.2	Conv. (cfs)		44092.2	
Length Wtd. (ft)	4.00	Wetted Per. (ft)		58.85	
Min Ch El (ft)	941.93	Shear (lb/sq ft)		1.04	
Alpha	1.00	Stream Power (lb/ft s)		6.73	
Frctn Loss (ft)		Cum Volume (acre-ft)	11.56	27.05	1.55
C & E Loss (ft)		Cum SA (acres)	2.94	3.46	0.42

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 3512

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	960	957	500	960	957

Upstream Bridge Cross Section Data
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	957.64	6	957.4	7.5	957.34	8.18	957.32	9.45	951.63
29.38	951.63	33.66	949.49	41.66	949.49	44.46	950.89	49.46	950.89
67.46	941.89	87.46	941.89	102.1	949.21	122.59	955.69	123.17	955.94
125.06	956.73	128.58	957.73	135.97	957.99	151.56	958.15		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	49.46	.04	102.1	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
49.46	102.1	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	960	957	500	960	957

Downstream Bridge Cross Section Data
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	957.79	6.62	957.53	11.15	957.35	12.12	952.93	12.47	951.56
26.72	951.56	31	949.42	39	949.42	41.8	950.82	46.8	950.82
64.8	941.82	84.8	941.82	99.44	949.14	104.37	949.54	123.93	955.63
128.87	956.15	141.46	957.09	162.91	957.91				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	46.8	.04	99.44	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
46.8	99.44	.1	.3

```
Upstream Embankment side slope                  =      0 horiz. to 1.0 vertical
Downstream Embankment side slope                =      0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins             =
Energy head used in spillway design             =
Spillway height used in design                  =
Weir crest shape                                = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=   49.46    Downstream=    46.8
Upstream     num=       2
    Width   Elev    Width   Elev
       8     940       8     960
Downstream     num=       2
    Width   Elev    Width   Elev
       8     940       8     960

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
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 YR

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	951.78	E.G. Elev (ft)	951.72	951.62
W.S. US. (ft)	951.12	W.S. Elev (ft)	951.02	950.92
Q Total (cfs)	2310.00	Crit W.S. (ft)	947.95	947.86
Q Bridge (cfs)	2310.00	Max Chl Dpth (ft)	9.13	9.10
Q Weir (cfs)		Vel Total (ft/s)	6.35	6.28
Weir Sta Lft (ft)		Flow Area (sq ft)	363.88	367.55
Weir Sta Rgt (ft)		Froude # Chl	0.45	0.45
Weir Submerg		Specif Force (cu ft)	1829.19	1822.97
Weir Max Depth (ft)		Hydr Depth (ft)	5.26	5.05
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	75.85	79.30
Min El Prs (ft)	957.00	Conv. Total (cfs)	43682.3	43453.0
Delta EG (ft)	0.19	Top Width (ft)	69.24	72.81
Delta WS (ft)	0.19	Frctn Loss (ft)		
BR Open Area (sq ft)	950.73	C & E Loss (ft)		
BR Open Vel (ft/s)	6.35	Shear Total (lb/sq ft)	0.84	0.82
Coef of Q		Power Total (lb/ft s)	5.32	5.14
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #100 YR FW

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	951.92	E.G. Elev (ft)	951.85	951.76
W.S. US. (ft)	951.27	W.S. Elev (ft)	951.16	951.07
Q Total (cfs)	2310.00	Crit W.S. (ft)	947.95	947.86
Q Bridge (cfs)	2310.00	Max Chl Dpth (ft)	9.27	9.25
Q Weir (cfs)		Vel Total (ft/s)	6.63	6.65
Weir Sta Lft (ft)		Flow Area (sq ft)	348.46	347.47
Weir Sta Rgt (ft)		Froude # Chl	0.44	0.44
Weir Submerg		Specif Force (cu ft)	1860.68	1854.93
Weir Max Depth (ft)		Hydr Depth (ft)	7.16	7.14
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	54.29	54.27
Min El Prs (ft)	957.00			

Delta EG (ft)	0.18	Conv. Total (cfs)	44705.7	44504.5
Delta WS (ft)	0.18	Top Width (ft)	48.64	48.64
BR Open Area (sq ft)	632.37	Frctn Loss (ft)		
BR Open Vel (ft/s)	6.65	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	1.07	1.08
Br Sel Method	Momentum	Power Total (lb/ft s)	7.09	7.16

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3500.626

INPUT
Description: 22
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	957.7	6.62	957.44	11.15	957.26	12.12	952.84	12.47	951.47
26.72	951.47	31	949.33	39	949.33	41.8	950.73	46.8	950.73
64.8	941.73	84.8	941.73	99.44	949.05	104.37	949.45	123.93	955.54
128.87	956.06	141.46	957	162.91	957.82				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	46.8	.04	99.44	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
46.8	99.44	121.15	122.14	120.16	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	951.59	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.66	Reach Len. (ft)	121.15	122.14	120.16
W.S. Elev (ft)	950.94	Flow Area (sq ft)	18.99	350.01	11.86
Crit W.S. (ft)		Area (sq ft)	18.99	350.01	11.86
E.G. Slope (ft/ft)	0.002715	Flow (cfs)	15.93	2285.47	8.60
Q Total (cfs)	2310.00	Top Width (ft)	19.01	52.64	9.70
Top Width (ft)	81.35	Avg. Vel. (ft/s)	0.84	6.53	0.73
Vel Total (ft/s)	6.07	Hydr. Depth (ft)	1.00	6.65	1.22
Max Chl Dpth (ft)	9.21	Conv. (cfs)	305.8	43861.6	165.1
Conv. Total (cfs)	44332.4	Wetted Per. (ft)	19.72	56.49	9.94
Length Wtd. (ft)	122.09	Shear (lb/sq ft)	0.16	1.05	0.20
Min Ch El (ft)	941.73	Stream Power (lb/ft s)	0.14	6.86	0.15
Alpha	1.15	Cum Volume (acre-ft)	16.90	24.32	9.93
Frctn Loss (ft)	0.31	Cum SA (acres)	5.32	3.42	4.95
C & E Loss (ft)	0.02				

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	951.74	Wt. n-Val.		0.040	
Vel Head (ft)	0.65	Reach Len. (ft)	121.15	122.14	120.16
W.S. Elev (ft)	951.09	Flow Area (sq ft)		358.13	
Crit W.S. (ft)		Area (sq ft)		358.13	
E.G. Slope (ft/ft)	0.002716	Flow (cfs)		2310.00	
Q Total (cfs)	2310.00	Top Width (ft)		52.64	
Top Width (ft)	52.64	Avg. Vel. (ft/s)		6.45	
Vel Total (ft/s)	6.45	Hydr. Depth (ft)		6.80	
Max Chl Dpth (ft)	9.36	Conv. (cfs)		44323.6	
Conv. Total (cfs)	44323.6	Wetted Per. (ft)		58.89	
Length Wtd. (ft)	122.14	Shear (lb/sq ft)		1.03	
Min Ch El (ft)	941.73	Stream Power (lb/ft s)		6.65	
Alpha	1.00	Cum Volume (acre-ft)	11.56	26.90	1.55
Frctn Loss (ft)	0.33	Cum SA (acres)	2.94	3.44	0.42
C & E Loss (ft)	0.00				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3378.489

INPUT
Description: 23

Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	957.04	.25	957.03	1.37	957	3.95	956.78	12.8	956.34
13.18	956.37	13.59	954.68	14.48	951.09	29.81	951.09	34.03	948.98
42.03	948.98	44.79	950.36	49.79	950.36	67.75	941.38	87.75	941.38
100.69	947.85	127.05	947.75	148.26	958.69				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	49.79	.04	100.69	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
49.79	100.69	17.27	18.05	17.97	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	951.26	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.58	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	950.68	Flow Area (sq ft)	20.84	350.78	84.18
Crit W.S. (ft)	947.42	Area (sq ft)	20.84	350.78	84.18
E.G. Slope (ft/ft)	0.002378	Flow (cfs)	17.32	2197.30	95.38
Q Total (cfs)	2310.00	Top Width (ft)	19.16	50.90	32.04
Top Width (ft)	102.09	Avg. Vel. (ft/s)	0.83	6.26	1.13
Vel Total (ft/s)	5.07	Hydr. Depth (ft)	1.09	6.89	2.63
Max Chl Dpth (ft)	9.30	Conv. (cfs)	355.1	45061.7	1956.1
Conv. Total (cfs)	47372.9	Wetted Per. (ft)	19.88	54.55	32.75
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.16	0.95	0.38
Min Ch El (ft)	941.38	Stream Power (lb/ft s)	0.13	5.98	0.43
Alpha	1.46	Cum Volume (acre-ft)	16.84	23.34	9.79
Frctn Loss (ft)	0.01	Cum SA (acres)	5.27	3.28	4.89
C & E Loss (ft)	0.00				

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	951.40	Wt. n-Val.		0.040	
Vel Head (ft)	0.66	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	950.74	Flow Area (sq ft)		353.86	
Crit W.S. (ft)	947.43	Area (sq ft)		353.86	
E.G. Slope (ft/ft)	0.002758	Flow (cfs)		2310.00	
Q Total (cfs)	2310.00	Top Width (ft)		50.90	
Top Width (ft)	50.90	Avg. Vel. (ft/s)		6.53	
Vel Total (ft/s)	6.53	Hydr. Depth (ft)		6.95	
Max Chl Dpth (ft)	9.36	Conv. (cfs)		43983.5	
Conv. Total (cfs)	43983.5	Wetted Per. (ft)		57.81	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		1.05	
Min Ch El (ft)	941.38	Stream Power (lb/ft s)		6.88	
Alpha	1.00	Cum Volume (acre-ft)	11.56	25.91	1.55
Frctn Loss (ft)		Cum SA (acres)	2.94	3.29	0.42
C & E Loss (ft)					

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 3371

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	960	957	500	960	957

Upstream Bridge Cross Section Data
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	957.03	.25	957.02	1.37	956.99	3.95	956.77	12.8	956.33
13.18	956.36	13.59	954.67	14.48	951.08	29.81	951.08	34.03	948.97
42.03	948.97	44.79	950.35	49.79	950.35	67.75	941.37	87.75	941.37
100.69	947.84	127.05	947.74	148.26	958.68				

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09   49.79     .04  100.69     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
          49.79  100.69          .1        .3

Downstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0     960     957     500     960     957

Downstream Bridge Cross Section Data
Station Elevation Data     num=       18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  957.01     .17  957.01     2.4  956.94    8.85  956.41   12.64  956.19
   14.21  956.31   15.49  951.06   30.55  951.06   34.77  948.95   42.77  948.95
   45.53  950.33   50.53  950.33   68.49  941.35   88.49  941.35  101.43  947.82
  125.06   947.9  136.02  953.76   143.9  957.77

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09   50.53     .04  101.43     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
          50.53  101.43          .1        .3

Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=   49.79    Downstream=   50.53
Upstream     num=       2
    Width   Elev    Width   Elev
        8    940        8    960
Downstream     num=       2
    Width   Elev    Width   Elev
        8    940        8    960

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd    =       2
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 YR

 E.G. US. (ft)                951.26    Element                  Inside BR US  Inside BR DS
 W.S. US. (ft)                950.68    E.G. Elev (ft)               951.25        951.23
 Q Total (cfs)               2310.00    W.S. Elev (ft)               950.65        950.62
 Q Bridge (cfs)              2310.00    Crit W.S. (ft)               947.42        947.40
 Q Weir (cfs)                           Max Chl Dpth (ft)              9.28          9.27
 Weir Sta Lft (ft)                      Vel Total (ft/s)               5.17          5.31
 Weir Sta Rgt (ft)                      Flow Area (sq ft)            447.21        435.41
 Weir Submerg                           Froude # Chl                   0.41          0.42
 Weir Max Depth (ft)                    Specif Force (cu ft)        1950.58       1934.34
 Min El Weir Flow (ft)        960.01    Hydr Depth (ft)                4.76          4.80
 Min El Prs (ft)              957.00    W.P. Total (ft)              101.20         97.87
```

Delta EG (ft)	0.05	Conv. Total (cfs)	47213.6	46835.8
Delta WS (ft)	0.06	Top Width (ft)	94.01	90.71
BR Open Area (sq ft)	1157.91	Frctn Loss (ft)	0.01	0.02
BR Open Vel (ft/s)	5.31	C & E Loss (ft)	0.00	0.01
Coef of Q		Shear Total (lb/sq ft)	0.66	0.68
Br Sel Method	Energy only	Power Total (lb/ft s)	3.41	3.58

BRIDGE OUTPUT Profile #100 YR FW

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	951.40	E.G. Elev (ft)	951.36	951.32
W.S. US. (ft)	950.74	W.S. Elev (ft)	950.66	950.62
Q Total (cfs)	2310.00	Crit W.S. (ft)	947.42	947.40
Q Bridge (cfs)	2310.00	Max Chl Dpth (ft)	9.29	9.27
Q Weir (cfs)		Vel Total (ft/s)	6.69	6.71
Weir Sta Lft (ft)		Flow Area (sq ft)	345.26	344.33
Weir Sta Rgt (ft)		Froude # Chl	0.43	0.44
Weir Submerg		Specif Force (cu ft)	1866.99	1861.41
Weir Max Depth (ft)		Hydr Depth (ft)	7.36	7.34
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	52.39	52.37
Min El Prs (ft)	957.00	Conv. Total (cfs)	45084.5	44892.3
Delta EG (ft)	0.10	Top Width (ft)	46.90	46.90
Delta WS (ft)	0.11	Frctn Loss (ft)		
BR Open Area (sq ft)	642.47	C & E Loss (ft)		
BR Open Vel (ft/s)	6.71	Shear Total (lb/sq ft)	1.08	1.09
Coef of Q		Power Total (lb/ft s)	7.23	7.29
Br Sel Method	Momentum			

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3360.436

INPUT
Description: 24
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.98	.17	956.98	2.4	956.91	8.85	956.38	12.64	956.16
14.21	956.28	15.49	951.03	30.55	951.03	34.77	948.92	42.77	948.92
45.53	950.3	50.53	950.3	68.49	941.32	88.49	941.32	101.43	947.79
125.06	947.87	136.02	953.73	143.9	957.74				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	50.53	.04	101.43	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
50.53	101.43	122.81	122.13	120.82	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	951.21	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.59	Reach Len. (ft)	122.81	122.13	120.82
W.S. Elev (ft)	950.61	Flow Area (sq ft)	20.78	350.60	72.85
Crit W.S. (ft)		Area (sq ft)	20.78	350.60	72.85
E.G. Slope (ft/ft)	0.002413	Flow (cfs)	17.36	2211.60	81.04
Q Total (cfs)	2310.00	Top Width (ft)	19.15	50.90	28.76
Top Width (ft)	98.81	Avg. Vel. (ft/s)	0.84	6.31	1.11
Vel Total (ft/s)	5.20	Hydr. Depth (ft)	1.09	6.89	2.53
Max Chl Dpth (ft)	9.29	Conv. (cfs)	353.3	45023.8	1649.9
Conv. Total (cfs)	47027.1	Wetted Per. (ft)	19.88	54.55	29.45
Length Wtd. (ft)	122.11	Shear (lb/sq ft)	0.16	0.97	0.37
Min Ch El (ft)	941.32	Stream Power (lb/ft s)	0.13	6.11	0.41
Alpha	1.41	Cum Volume (acre-ft)	16.83	23.19	9.76
Frctn Loss (ft)	0.33	Cum SA (acres)	5.26	3.26	4.88
C & E Loss (ft)	0.01				

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	951.30	Wt. n-Val.		0.040	
Vel Head (ft)	0.67	Reach Len. (ft)	122.81	122.13	120.82
W.S. Elev (ft)	950.63	Flow Area (sq ft)		351.29	
Crit W.S. (ft)					

E.G. Slope (ft/ft)	0.002819	Area (sq ft)		351.29	
Q Total (cfs)	2310.00	Flow (cfs)		2310.00	
Top Width (ft)	50.90	Top Width (ft)		50.90	
Vel Total (ft/s)	6.58	Avg. Vel. (ft/s)		6.58	
Max Chl Dpth (ft)	9.31	Hydr. Depth (ft)		6.90	
Conv. Total (cfs)	43503.8	Conv. (cfs)		43503.8	
Length Wtd. (ft)	122.13	Wetted Per. (ft)		57.71	
Min Ch El (ft)	941.32	Shear (lb/sq ft)		1.07	
Alpha	1.00	Stream Power (lb/ft s)		7.05	
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	11.56	25.76	1.55
C & E Loss (ft)	0.00	Cum SA (acres)	2.94	3.27	0.42

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3238.304

INPUT
Description: 25
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.42	.7	956.41	2.5	956.32	11.18	955.84	12.83	955.83
12.9	955.52	13.37	953.77	14.16	950.71	27.01	950.71	31.11	948.66
39.11	948.66	42.19	950.2	47.19	950.2	65.19	941.06	85.19	941.06
102.95	949.94	118.62	951.21	132.5	958.49				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	47.19	.04	102.95	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
47.19	102.95	18.33	18.06	18.17	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	950.87	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.67	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	950.20	Flow Area (sq ft)	17.13	348.73	0.43
Crit W.S. (ft)	947.10	Area (sq ft)	17.13	348.73	0.43
E.G. Slope (ft/ft)	0.003008	Flow (cfs)	14.04	2295.88	0.08
Q Total (cfs)	2310.00	Top Width (ft)	19.17	55.76	3.25
Top Width (ft)	78.18	Avg. Vel. (ft/s)	0.82	6.58	0.18
Vel Total (ft/s)	6.31	Hydr. Depth (ft)	0.89	6.25	0.13
Max Chl Dpth (ft)	9.14	Conv. (cfs)	256.0	41858.0	1.4
Conv. Total (cfs)	42115.4	Wetted Per. (ft)	19.90	60.04	3.26
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.16	1.09	0.02
Min Ch El (ft)	941.06	Stream Power (lb/ft s)	0.13	7.18	0.00
Alpha	1.08	Cum Volume (acre-ft)	16.78	22.21	9.66
Frctn Loss (ft)		Cum SA (acres)	5.20	3.11	4.83
C & E Loss (ft)					

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	950.95	Wt. n-Val.		0.040	
Vel Head (ft)	0.66	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	950.28	Flow Area (sq ft)		353.03	
Crit W.S. (ft)	947.10	Area (sq ft)		353.03	
E.G. Slope (ft/ft)	0.002951	Flow (cfs)		2310.00	
Q Total (cfs)	2310.00	Top Width (ft)		55.76	
Top Width (ft)	55.76	Avg. Vel. (ft/s)		6.54	
Vel Total (ft/s)	6.54	Hydr. Depth (ft)		6.33	
Max Chl Dpth (ft)	9.22	Conv. (cfs)		42522.1	
Conv. Total (cfs)	42522.1	Wetted Per. (ft)		60.47	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		1.08	
Min Ch El (ft)	941.06	Stream Power (lb/ft s)		7.04	
Alpha	1.00	Cum Volume (acre-ft)	11.56	24.77	1.55
Frctn Loss (ft)		Cum SA (acres)	2.94	3.12	0.42
C & E Loss (ft)					

BRIDGE

```
RIVER: Hope Creek
REACH: 1                    RS: 3231

INPUT
Description:
Distance from Upstream XS =       4
Deck/Roadway Width        =       6
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0     960     957     500     960     957

Upstream Bridge Cross Section Data
Station Elevation Data     num=       18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  956.38      .7  956.37     2.5  956.28   11.18   955.8   12.83  955.79
    12.9  955.48   13.37  953.73   14.16  950.67   27.01  950.67   31.11  948.62
   39.11  948.62   42.19  950.16   47.19  950.16   65.19  941.02   85.19  941.02
  102.95   949.9  118.62  951.17   132.5  958.45

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09   47.19     .04  102.95     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
          47.19  102.95          .1        .3

Downstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0     960     957     500     960     957

Downstream Bridge Cross Section Data
Station Elevation Data     num=       16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   956.4    8.34  956.02   10.15  955.94   11.38  955.89   12.89   950.6
   25.32   950.6   29.42  948.55   37.42  948.55    40.5  950.09    45.5  950.09
    63.5  940.95    83.5  940.95  101.26  949.83  114.79  952.54  118.77  952.99
   124.5  957.55

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09    45.5     .04  101.26     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
          45.5   101.26          .1        .3

Upstream Embankment side slope                =      0 horiz. to 1.0 vertical
Downstream Embankment side slope              =      0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=   47.19    Downstream=    45.5
Upstream     num=        2
    Width   Elev    Width   Elev
        8    940        8    960
Downstream     num=        2
    Width   Elev    Width   Elev
        8    940        8    960

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
      Energy
      Momentum                Cd   =       2
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 YR

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	950.87	E.G. Elev (ft)	950.81	950.72
W.S. US. (ft)	950.20	W.S. Elev (ft)	950.12	950.02
Q Total (cfs)	2310.00	Crit W.S. (ft)	947.08	947.01
Q Bridge (cfs)	2310.00	Max Chl Dpth (ft)	9.09	9.07
Q Weir (cfs)		Vel Total (ft/s)	6.44	6.47
Weir Sta Lft (ft)		Flow Area (sq ft)	358.86	357.14
Weir Sta Rgt (ft)		Froude # Chl	0.46	0.46
Weir Submerg		Specif Force (cu ft)	1811.62	1805.15
Weir Max Depth (ft)		Hydr Depth (ft)	5.25	5.36
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	74.89	73.08
Min El Prs (ft)	957.00	Conv. Total (cfs)	42006.5	41765.7
Delta EG (ft)	0.18	Top Width (ft)	68.39	66.61
Delta WS (ft)	0.17	Frctn Loss (ft)		
BR Open Area (sq ft)	1031.37	C & E Loss (ft)		
BR Open Vel (ft/s)	6.47	Shear Total (lb/sq ft)	0.90	0.93
Coef of Q		Power Total (lb/ft s)	5.82	6.04
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #100 YR FW

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	950.95	E.G. Elev (ft)	950.88	950.79
W.S. US. (ft)	950.28	W.S. Elev (ft)	950.18	950.09
Q Total (cfs)	2310.00	Crit W.S. (ft)	947.08	947.01
Q Bridge (cfs)	2310.00	Max Chl Dpth (ft)	9.16	9.14
Q Weir (cfs)		Vel Total (ft/s)	6.68	6.71
Weir Sta Lft (ft)		Flow Area (sq ft)	345.59	344.39
Weir Sta Rgt (ft)		Froude # Chl	0.46	0.46
Weir Submerg		Specif Force (cu ft)	1824.78	1818.46
Weir Max Depth (ft)		Hydr Depth (ft)	6.68	6.65
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	57.61	57.59
Min El Prs (ft)	957.00	Conv. Total (cfs)	42384.6	42151.3
Delta EG (ft)	0.18	Top Width (ft)	51.76	51.76
Delta WS (ft)	0.18	Frctn Loss (ft)		
BR Open Area (sq ft)	698.51	C & E Loss (ft)		
BR Open Vel (ft/s)	6.71	Shear Total (lb/sq ft)	1.11	1.12
Coef of Q		Power Total (lb/ft s)	7.44	7.52
Br Sel Method	Momentum			

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3220.243

INPUT
Description: 26
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.31	8.34	955.93	10.15	955.85	11.38	955.8	12.89	950.51
25.32	950.51	29.42	948.46	37.42	948.46	40.5	950	45.5	950
63.5	940.86	83.5	940.86	101.26	949.74	114.79	952.45	118.77	952.9
124.5	957.46								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	45.5	.04	101.26	.12

Bank Sta: Left Right
45.5 101.26

Lengths: Left Channel Right
73.32 73.11 72.78

Coeff Contr. Expan.
.1 .3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	950.69	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.66	Reach Len. (ft)	73.32	73.11	72.78
W.S. Elev (ft)	950.03	Flow Area (sq ft)	17.68	350.32	0.21
Crit W.S. (ft)		Area (sq ft)	17.68	350.32	0.21
E.G. Slope (ft/ft)	0.002962	Flow (cfs)	14.65	2295.31	0.04
Q Total (cfs)	2310.00	Top Width (ft)	19.22	55.76	1.46
Top Width (ft)	76.44	Avg. Vel. (ft/s)	0.83	6.55	0.18
Vel Total (ft/s)	6.27	Hydr. Depth (ft)	0.92	6.28	0.15
Max Chl Dpth (ft)	9.17	Conv. (cfs)	269.2	42176.4	0.7
Conv. Total (cfs)	42446.4	Wetted Per. (ft)	19.96	60.04	1.49
Length Wtd. (ft)	73.11	Shear (lb/sq ft)	0.16	1.08	0.03
Min Ch El (ft)	940.86	Stream Power (lb/ft s)	0.14	7.07	0.00
Alpha	1.08	Cum Volume (acre-ft)	16.77	22.07	9.66
Frctn Loss (ft)	0.32	Cum SA (acres)	5.20	3.09	4.83
C & E Loss (ft)	0.07				

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 OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	950.76	Wt. n-Val.		0.040	
Vel Head (ft)	0.66	Reach Len. (ft)	73.32	73.11	72.78
W.S. Elev (ft)	950.10	Flow Area (sq ft)		354.25	
Crit W.S. (ft)		Area (sq ft)		354.25	
E.G. Slope (ft/ft)	0.002920	Flow (cfs)		2310.00	
Q Total (cfs)	2310.00	Top Width (ft)		55.76	
Top Width (ft)	55.76	Avg. Vel. (ft/s)		6.52	
Vel Total (ft/s)	6.52	Hydr. Depth (ft)		6.35	
Max Chl Dpth (ft)	9.24	Conv. (cfs)		42747.0	
Conv. Total (cfs)	42747.0	Wetted Per. (ft)		60.51	
Length Wtd. (ft)	73.11	Shear (lb/sq ft)		1.07	
Min Ch El (ft)	940.86	Stream Power (lb/ft s)		6.96	
Alpha	1.00	Cum Volume (acre-ft)	11.56	24.63	1.55
Frctn Loss (ft)	0.31	Cum SA (acres)	2.94	3.10	0.42
C & E Loss (ft)	0.06				

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

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3147

INPUT
Description:
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.82	2.81	956.82	13.92	956.6	15.83	956.56	16.85	956.54
18.47	956.51	28.21	956.32	29.99	956.29	32.93	956.24	41.45	956.09
46.17	955.91	53.53	955.65	54.39	951.99	54.74	950.33	69.74	950.33
73.84	948.28	81.84	948.28	84.92	949.82	89.92	949.82	107.92	940.68
127.92	940.68	145.68	949.56	147.18	952.71	150.47	954.51	155.5	957.08

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	89.92	.04	145.68	.12

Bank Sta: Left Right
89.92 145.68

Lengths: Left	Channel	Right	Coeff Contr.	Expan.
46.78	49.75	49.66	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	950.31	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	1.31	Reach Len. (ft)	46.78	49.75	49.66
W.S. Elev (ft)	948.99	Flow Area (sq ft)	6.69	303.27	
Crit W.S. (ft)		Area (sq ft)	6.69	303.27	
E.G. Slope (ft/ft)	0.006610	Flow (cfs)	6.38	2793.62	
Q Total (cfs)	2800.00	Top Width (ft)	10.84	52.99	
Top Width (ft)	63.83	Avg. Vel. (ft/s)	0.95	9.21	
Vel Total (ft/s)	9.03	Hydr. Depth (ft)	0.62	5.72	
Max Chl Dpth (ft)	8.31				

Conv. Total (cfs)	34439.0	Conv. (cfs)	78.5	34360.5	
Length Wtd. (ft)	49.75	Wetted Per. (ft)	11.18	56.94	
Min Ch El (ft)	940.68	Shear (lb/sq ft)	0.25	2.20	
Alpha	1.04	Stream Power (lb/ft s)	0.24	20.25	
Frctn Loss (ft)	0.38	Cum Volume (acre-ft)	16.75	21.52	9.66
C & E Loss (ft)	0.03	Cum SA (acres)	5.17	2.99	4.83

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	950.39	Element			
Vel Head (ft)	1.26	Wt. n-Val.		0.040	
W.S. Elev (ft)	949.13	Reach Len. (ft)	46.78	49.75	49.66
Crit W.S. (ft)		Flow Area (sq ft)		310.63	
E.G. Slope (ft/ft)	0.006219	Area (sq ft)		310.63	
Q Total (cfs)	2800.00	Flow (cfs)		2800.00	
Top Width (ft)	53.54	Top Width (ft)		53.54	
Vel Total (ft/s)	9.01	Avg. Vel. (ft/s)		9.01	
Max Chl Dpth (ft)	8.45	Hydr. Depth (ft)		5.80	
Conv. Total (cfs)	35506.1	Conv. (cfs)		35506.1	
Length Wtd. (ft)	49.75	Wetted Per. (ft)		57.55	
Min Ch El (ft)	940.68	Shear (lb/sq ft)		2.10	
Alpha	1.00	Stream Power (lb/ft s)		18.89	
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	11.56	24.07	1.55
C & E Loss (ft)	0.02	Cum SA (acres)	2.94	3.01	0.42

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3097.384

INPUT
Description: 27
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.05	1.2	956.03	3.3	955.99	6.48	955.93	10.39	955.87
11.08	955.86	16.48	955.77	18.23	955.71	28.24	955.33	28.85	952.76
29.42	950.2	40.92	950.2	45	948.16	53	948.16	55.82	949.57
60.82	949.57	78.82	940.56	98.82	940.56	126.32	954.31	136.01	954.87

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	60.82	.04	126.32	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
60.82	126.32	19.08	18.31	18.45	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	949.89	Element			
Vel Head (ft)	1.66	Wt. n-Val.	0.090	0.040	
W.S. Elev (ft)	948.23	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	947.27	Flow Area (sq ft)	0.53	270.74	
E.G. Slope (ft/ft)	0.009090	Area (sq ft)	0.53	270.74	
Q Total (cfs)	2800.00	Flow (cfs)	0.13	2799.87	
Top Width (ft)	58.90	Top Width (ft)	8.26	50.64	
Vel Total (ft/s)	10.32	Avg. Vel. (ft/s)	0.25	10.34	
Max Chl Dpth (ft)	7.67	Hydr. Depth (ft)	0.06	5.35	
Conv. Total (cfs)	29367.9	Conv. (cfs)	1.4	29366.5	
Length Wtd. (ft)	4.00	Wetted Per. (ft)	8.29	54.26	
Min Ch El (ft)	940.56	Shear (lb/sq ft)	0.04	2.83	
Alpha	1.00	Stream Power (lb/ft s)	0.01	29.28	
Frctn Loss (ft)		Cum Volume (acre-ft)	16.75	21.19	9.66
C & E Loss (ft)		Cum SA (acres)	5.16	2.94	4.83

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	950.03	Element			
Vel Head (ft)	1.47	Wt. n-Val.		0.040	
W.S. Elev (ft)	948.55	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	947.27	Flow Area (sq ft)		287.57	

E.G. Slope (ft/ft)	0.007705	Area (sq ft)		287.57	
Q Total (cfs)	2800.00	Flow (cfs)		2800.00	
Top Width (ft)	51.95	Top Width (ft)		51.95	
Vel Total (ft/s)	9.74	Avg. Vel. (ft/s)		9.74	
Max Chl Dpth (ft)	7.99	Hydr. Depth (ft)		5.53	
Conv. Total (cfs)	31898.8	Conv. (cfs)		31898.8	
Length Wtd. (ft)	4.00	Wetted Per. (ft)		55.73	
Min Ch El (ft)	940.56	Shear (lb/sq ft)		2.48	
Alpha	1.00	Stream Power (lb/ft s)		24.17	
Frctn Loss (ft)		Cum Volume (acre-ft)	11.56	23.73	1.55
C & E Loss (ft)		Cum SA (acres)	2.94	2.95	0.42

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 3090

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	960	957	500	960	957

Upstream Bridge Cross Section Data
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.01	1.2	955.99	3.3	955.95	6.48	955.89	10.39	955.83
11.08	955.82	16.48	955.73	18.23	955.67	28.24	955.29	28.85	952.72
29.42	950.16	40.92	950.16	45	948.12	53	948.12	55.82	949.53
60.82	949.53	78.82	940.52	98.82	940.52	126.32	954.27		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	60.82	.04	126.32	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
60.82	126.32	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	960	957	500	960	957

Downstream Bridge Cross Section Data
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.1	8.09	955.93	20.97	955.71	21.18	955.71	21.33	955.7
21.42	955.7	21.46	955.7	26.75	955.5	32.9	955.26	32.97	954.98
33.26	953.71	34.09	950.09	48.31	950.09	52.39	948.05	60.39	948.05
63.21	949.46	68.21	949.46	86.21	940.45	106.21	940.45	133.71	954.2
141.67	961.01								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	68.21	.04	133.71	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
68.21	133.71	.1	.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data

Pier Station Upstream= 60.82 Downstream= 68.21

Upstream num= 2

Width	Elev	Width	Elev
8	940	8	960

Downstream num= 2

Width	Elev	Width	Elev
8	940	8	960

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Momentum Cd = 2
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 YR

E.G. US. (ft)	949.89
W.S. US. (ft)	948.23
Q Total (cfs)	2800.00
Q Bridge (cfs)	2800.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	960.01
Min El Prs (ft)	957.00
Delta EG (ft)	0.30
Delta WS (ft)	0.52
BR Open Area (sq ft)	1028.86
BR Open Vel (ft/s)	11.01
Coef of Q	
Br Sel Method	Momentum

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	949.80	949.67
W.S. Elev (ft)	948.06	947.79
Crit W.S. (ft)	947.24	947.18
Max Chl Dpth (ft)	7.54	7.34
Vel Total (ft/s)	10.61	11.01
Flow Area (sq ft)	263.94	254.28
Froude # Chl	0.81	0.85
Specif Force (cu ft)	1775.38	1759.22
Hydr Depth (ft)	5.38	5.22
W.P. Total (ft)	53.03	52.39
Conv. Total (cfs)	28580.5	27077.2
Top Width (ft)	49.07	48.68
Frctn Loss (ft)		
C & E Loss (ft)		
Shear Total (lb/sq ft)	2.98	3.24
Power Total (lb/ft s)	31.64	35.68

BRIDGE OUTPUT Profile #100 YR FW

E.G. US. (ft)	950.03
W.S. US. (ft)	948.55
Q Total (cfs)	2800.00
Q Bridge (cfs)	2800.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	960.01
Min El Prs (ft)	957.00
Delta EG (ft)	0.27
Delta WS (ft)	0.35
BR Open Area (sq ft)	775.40
BR Open Vel (ft/s)	10.16
Coef of Q	
Br Sel Method	Momentum

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	949.94	949.83
W.S. Elev (ft)	948.40	948.22
Crit W.S. (ft)	947.24	947.19
Max Chl Dpth (ft)	7.88	7.77
Vel Total (ft/s)	9.96	10.16
Flow Area (sq ft)	281.17	275.62
Froude # Chl	0.74	0.76
Specif Force (cu ft)	1813.88	1800.19
Hydr Depth (ft)	5.65	5.56
W.P. Total (ft)	54.16	53.80
Conv. Total (cfs)	31315.1	30426.8
Top Width (ft)	49.77	49.54
Frctn Loss (ft)		
C & E Loss (ft)		
Shear Total (lb/sq ft)	2.59	2.71
Power Total (lb/ft s)	25.80	27.52

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 3079.078

INPUT
Description: 28
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	956.01	8.09	955.84	20.97	955.62	21.18	955.62	21.33	955.61
21.42	955.61	21.46	955.61	26.75	955.41	32.9	955.17	32.97	954.89
33.26	953.62	34.09	950	48.31	950	52.39	947.96	60.39	947.96
63.21	949.37	68.21	949.37	86.21	940.36	106.21	940.36	133.71	954.11
141.67	960.92								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	68.21	.04	133.71	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
68.21	133.71	124.18	123.15	120.49	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	949.58	Wt. n-Val.		0.040	
Vel Head (ft)	1.88	Reach Len. (ft)	124.18	123.15	120.49
W.S. Elev (ft)	947.70	Flow Area (sq ft)		254.71	
Crit W.S. (ft)	947.07	Area (sq ft)		254.71	
E.G. Slope (ft/ft)	0.010751	Flow (cfs)		2800.00	
Q Total (cfs)	2800.00	Top Width (ft)		49.36	
Top Width (ft)	49.36	Avg. Vel. (ft/s)		10.99	
Vel Total (ft/s)	10.99	Hydr. Depth (ft)		5.16	
Max Chl Dpth (ft)	7.34	Conv. (cfs)		27003.9	
Conv. Total (cfs)	27003.9	Wetted Per. (ft)		52.83	
Length Wtd. (ft)	123.15	Shear (lb/sq ft)		3.24	
Min Ch El (ft)	940.36	Stream Power (lb/ft s)		35.57	
Alpha	1.00	Cum Volume (acre-ft)	16.75	21.08	9.66
Frctn Loss (ft)	0.91	Cum SA (acres)	5.16	2.91	4.83
C & E Loss (ft)	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 energy loss was 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 #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	949.76	Wt. n-Val.		0.040	
Vel Head (ft)	1.56	Reach Len. (ft)	124.18	123.15	120.49
W.S. Elev (ft)	948.20	Flow Area (sq ft)		279.58	
Crit W.S. (ft)		Area (sq ft)		279.58	
E.G. Slope (ft/ft)	0.008324	Flow (cfs)		2800.00	
Q Total (cfs)	2800.00	Top Width (ft)		51.34	
Top Width (ft)	51.34	Avg. Vel. (ft/s)		10.02	
Vel Total (ft/s)	10.02	Hydr. Depth (ft)		5.45	
Max Chl Dpth (ft)	7.84	Conv. (cfs)		30690.2	
Conv. Total (cfs)	30690.2	Wetted Per. (ft)		55.04	
Length Wtd. (ft)	123.15	Shear (lb/sq ft)		2.64	
Min Ch El (ft)	940.36	Stream Power (lb/ft s)		26.44	
Alpha	1.00	Cum Volume (acre-ft)	11.56	23.61	1.55
Frctn Loss (ft)	0.69	Cum SA (acres)	2.94	2.93	0.42
C & E Loss (ft)	0.19				

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.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2955.929

INPUT
Description: 29
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	955.26	.17	955.25	1.58	955.22	2.96	955.19	14.47	954.91
17.42	954.86	25.81	954.68	27.73	954.63	33.41	954.44	36.59	954.3
39.27	954.26	40.35	951.43	41.26	949.16	44.7	948.06	51.26	948.06
55	946.19	63	946.19	65.8	947.59	70.8	947.59	88.8	938.59

108.8	938.59	131.64	950.01	133.39	950.95	146.19	951.77	159.02	958.89

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	70.8	.04	133.39	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
70.8	133.39	18	18.05	18.27	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	948.45	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	1.12	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	947.33	Flow Area (sq ft)	11.67	327.36	
Crit W.S. (ft)	945.30	Area (sq ft)	11.67	327.36	
E.G. Slope (ft/ft)	0.005355	Flow (cfs)	13.07	2786.93	
Q Total (cfs)	2800.00	Top Width (ft)	12.54	54.94	
Top Width (ft)	67.49	Avg. Vel. (ft/s)	1.12	8.51	
Vel Total (ft/s)	8.26	Hydr. Depth (ft)	0.93	5.96	
Max Chl Dpth (ft)	8.74	Conv. (cfs)	178.6	38083.1	
Conv. Total (cfs)	38261.6	Wetted Per. (ft)	13.08	59.07	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.30	1.85	
Min Ch El (ft)	938.59	Stream Power (lb/ft s)	0.33	15.77	
Alpha	1.06	Cum Volume (acre-ft)	16.73	20.26	9.66
Frctn Loss (ft)		Cum SA (acres)	5.14	2.77	4.83
C & E Loss (ft)					

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	948.87	Wt. n-Val.		0.040	
Vel Head (ft)	0.93	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	947.94	Flow Area (sq ft)		361.85	
Crit W.S. (ft)	945.30	Area (sq ft)		361.85	
E.G. Slope (ft/ft)	0.004075	Flow (cfs)		2800.00	
Q Total (cfs)	2800.00	Top Width (ft)		56.70	
Top Width (ft)	56.70	Avg. Vel. (ft/s)		7.74	
Vel Total (ft/s)	7.74	Hydr. Depth (ft)		6.38	
Max Chl Dpth (ft)	9.35	Conv. (cfs)		43861.9	
Conv. Total (cfs)	43861.9	Wetted Per. (ft)		61.39	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		1.50	
Min Ch El (ft)	938.59	Stream Power (lb/ft s)		11.60	
Alpha	1.00	Cum Volume (acre-ft)	11.56	22.71	1.55
Frctn Loss (ft)		Cum SA (acres)	2.94	2.78	0.42
C & E Loss (ft)					

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 2949

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	960	955	500	960	955

Upstream Bridge Cross Section Data
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	955.22	.17	955.21	1.58	955.18	2.96	955.15	14.47	954.87
17.42	954.82	25.81	954.64	27.73	954.59	33.41	954.4	36.59	954.26
39.27	954.22	40.35	951.39	41.26	949.12	44.7	948.02	51.26	948.02
55	946.15	63	946.15	65.8	947.55	70.8	947.55	88.8	938.55
108.8	938.55	131.64	949.97	133.39	950.91	146.19	951.73	159.02	958.85

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
        0     .09    70.8     .04  133.39     .12

 Bank Sta: Left   Right     Coeff Contr.   Expan.
           70.8  133.39          .1          .3

 Downstream  Deck/Roadway Coordinates
     num=       2
      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
        0     960     955      500     960     955

 Downstream Bridge Cross Section Data
 Station Elevation Data     num=       29
      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
        0  955.27     3.55  955.17     9.78  955.02    16.46  954.86    24.53  954.67
    29.74  954.55    36.56  954.34    37.07  954.31    37.98  954.17    39.74  954.14
    41.29  954.24    41.45  954.21     41.5   954.2    41.51   954.2     43.3  952.54
    46.32  947.95     53.4  947.95    57.14  946.08    65.14  946.08    67.94  947.48
    72.94  947.48    90.94  938.48   110.94  938.48   133.78   949.9   135.71  950.01
   149.06  950.85   158.64  952.83   171.31  956.07   171.63  956.17

 Manning's n Values          num=        3
      Sta   n Val      Sta   n Val      Sta   n Val
        0     .09    72.94     .04   133.78     .12

 Bank Sta: Left   Right     Coeff Contr.   Expan.
           72.94  133.78          .1          .3

 Upstream Embankment side slope                  =       0 horiz. to 1.0 vertical
 Downstream Embankment side slope                =       0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow =     .98
 Elevation at which weir flow begins             =
 Energy head used in spillway design             =
 Spillway height used in design                  =
 Weir crest shape                                = Broad Crested

 Number of Piers =  1

 Pier Data
 Pier Station      Upstream=     70.8    Downstream=    72.94
 Upstream      num=        2
     Width   Elev     Width   Elev
         8    935         8    955
 Downstream      num=        2
     Width   Elev     Width   Elev
         8    935         8    955

 Number of Bridge Coefficient Sets =  1

 Low Flow Methods and Data
        Energy
        Momentum                  Cd   =        2
 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 YR

 E.G. US. (ft)                 948.45   Element                  Inside BR US  Inside BR DS
 W.S. US. (ft)                 947.33   E.G. Elev (ft)               948.37        948.27
 Q Total (cfs)                2800.00   W.S. Elev (ft)               947.19        947.06
 Q Bridge (cfs)               2800.00   Crit W.S. (ft)               945.28        945.21
 Q Weir (cfs)                           Max Chl Dpth (ft)              8.64          8.58
 Weir Sta Lft (ft)                      Vel Total (ft/s)               8.50          8.58
 Weir Sta Rgt (ft)                      Flow Area (sq ft)            329.60        326.33
 Weir Submerg                           Froude # Chl                   0.62          0.62
 Weir Max Depth (ft)                    Specif Force (cu ft)        1935.67       1925.47
 Min El Weir Flow (ft)         960.01   Hydr Depth (ft)                5.20          5.17
 Min El Prs (ft)               955.00   W.P. Total (ft)               69.23         68.83
```

Delta EG (ft)	0.23	Conv. Total (cfs)	37716.9	37258.4
Delta WS (ft)	0.25	Top Width (ft)	63.41	63.10
BR Open Area (sq ft)	1036.43	Frctn Loss (ft)		
BR Open Vel (ft/s)	8.58	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	1.64	1.67
Br Sel Method	Momentum	Power Total (lb/ft s)	13.92	14.34

BRIDGE OUTPUT Profile #100 YR FW

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	948.87	E.G. Elev (ft)	948.79	948.69
W.S. US. (ft)	947.94	W.S. Elev (ft)	947.80	947.69
Q Total (cfs)	2800.00	Crit W.S. (ft)	945.28	945.21
Q Bridge (cfs)	2800.00	Max Chl Dpth (ft)	9.25	9.21
Q Weir (cfs)		Vel Total (ft/s)	7.98	8.02
Weir Sta Lft (ft)		Flow Area (sq ft)	350.98	349.07
Weir Sta Rgt (ft)		Froude # Chl	0.54	0.55
Weir Submerg		Specif Force (cu ft)	2072.63	2063.68
Weir Max Depth (ft)		Hydr Depth (ft)	6.69	6.66
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	58.58	58.46
Min El Prs (ft)	955.00	Conv. Total (cfs)	43010.3	42677.8
Delta EG (ft)	0.22	Top Width (ft)	52.50	52.42
Delta WS (ft)	0.22	Frctn Loss (ft)		
BR Open Area (sq ft)	759.58	C & E Loss (ft)		
BR Open Vel (ft/s)	8.02	Shear Total (lb/sq ft)	1.59	1.60
Coef of Q		Power Total (lb/ft s)	12.65	12.87
Br Sel Method	Momentum			

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2937.884

INPUT
Description: 30
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	955.18	3.55	955.08	9.78	954.93	16.46	954.77	24.53	954.58
29.74	954.46	36.56	954.25	37.07	954.22	37.98	954.08	39.74	954.05
41.29	954.15	41.45	954.12	41.5	954.11	41.51	954.11	43.3	952.45
46.32	947.86	53.4	947.86	57.14	945.99	65.14	945.99	67.94	947.39
72.94	947.39	90.94	938.39	110.94	938.39	133.78	949.81	135.71	949.92
149.06	950.76	158.64	952.74	171.31	955.98	171.63	956.08		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	72.94	.04	133.78	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
72.94	133.78	68.38	65.3	63.65	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	948.22	Wt. n-Val.	0.090	0.040	
Vel Head (ft)	1.14	Reach Len. (ft)	68.38	65.30	63.65
W.S. Elev (ft)	947.08	Flow Area (sq ft)	11.08	324.74	
Crit W.S. (ft)		Area (sq ft)	11.08	324.74	
E.G. Slope (ft/ft)	0.005477	Flow (cfs)	12.25	2787.75	
Q Total (cfs)	2800.00	Top Width (ft)	12.35	54.75	
Top Width (ft)	67.11	Avg. Vel. (ft/s)	1.11	8.58	
Vel Total (ft/s)	8.34	Hydr. Depth (ft)	0.90	5.93	
Max Chl Dpth (ft)	8.69	Conv. (cfs)	165.5	37667.7	
Conv. Total (cfs)	37833.1	Wetted Per. (ft)	12.87	58.86	
Length Wtd. (ft)	65.35	Shear (lb/sq ft)	0.29	1.89	
Min Ch El (ft)	938.39	Stream Power (lb/ft s)	0.33	16.20	
Alpha	1.06	Cum Volume (acre-ft)	16.73	20.13	9.66
Frctn Loss (ft)	0.28	Cum SA (acres)	5.14	2.75	4.83
C & E Loss (ft)	0.08				

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	948.66	Wt. n-Val.		0.040	
Vel Head (ft)	0.94	Reach Len. (ft)	68.38	65.30	63.65
W.S. Elev (ft)	947.72	Flow Area (sq ft)		360.64	
Crit W.S. (ft)		Area (sq ft)		360.64	
E.G. Slope (ft/ft)	0.004115	Flow (cfs)		2800.00	
Q Total (cfs)	2800.00	Top Width (ft)		56.66	
Top Width (ft)	56.66	Avg. Vel. (ft/s)		7.76	
Vel Total (ft/s)	7.76	Hydr. Depth (ft)		6.36	
Max Chl Dpth (ft)	9.33	Conv. (cfs)		43649.7	
Conv. Total (cfs)	43649.7	Wetted Per. (ft)		61.32	
Length Wtd. (ft)	65.30	Shear (lb/sq ft)		1.51	
Min Ch El (ft)	938.39	Stream Power (lb/ft s)		11.73	
Alpha	1.00	Cum Volume (acre-ft)	11.56	22.56	1.55
Frctn Loss (ft)	0.23	Cum SA (acres)	2.94	2.75	0.42
C & E Loss (ft)	0.04				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2870

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	955.26	4.58	955.19	8.22	955.11	16.64	954.94	21.8	954.78
27.44	954.62	29.41	954.56	37.45	954.37	42.1	954.26	47.85	954.08
55.33	953.86	60.57	953.49	61	953.46	61.09	953.46	61.19	953.45
62.63	953.36	63.31	953.3	64.12	953.24	64.61	953.34	65.63	953.54
67.72	953.59	70.48	953.68	70.74	953.54	88.2	944.12	96.76	944.12
101.36	944.97	106.36	944.97	121.79	937.72	141.79	937.72	157.49	945.57
177.07	956.1								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	106.36	.04	157.49	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
106.36 157.49 51.13 58.6 53.12 .1 .3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	947.86	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.87	Reach Len. (ft)	51.13	58.60	53.12
W.S. Elev (ft)	946.98	Flow Area (sq ft)	53.36	356.02	1.85
Crit W.S. (ft)		Area (sq ft)	53.36	356.02	1.85
E.G. Slope (ft/ft)	0.003451	Flow (cfs)	87.52	2711.49	0.98
Q Total (cfs)	2800.00	Top Width (ft)	23.47	51.13	2.63
Top Width (ft)	77.22	Avg. Vel. (ft/s)	1.64	7.62	0.53
Vel Total (ft/s)	6.81	Hydr. Depth (ft)	2.27	6.96	0.71
Max Chl Dpth (ft)	9.26	Conv. (cfs)	1490.0	46159.0	16.7
Conv. Total (cfs)	47665.7	Wetted Per. (ft)	24.27	54.60	2.98
Length Wtd. (ft)	58.42	Shear (lb/sq ft)	0.47	1.40	0.13
Min Ch El (ft)	937.72	Stream Power (lb/ft s)	0.78	10.70	0.07
Alpha	1.21	Cum Volume (acre-ft)	16.68	19.62	9.66
Frctn Loss (ft)	0.19	Cum SA (acres)	5.11	2.67	4.83
C & E Loss (ft)	0.01				

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	948.39	Wt. n-Val.		0.040	
Vel Head (ft)	0.82	Reach Len. (ft)	51.13	58.60	53.12
W.S. Elev (ft)	947.57	Flow Area (sq ft)		386.16	
Crit W.S. (ft)		Area (sq ft)		386.16	
E.G. Slope (ft/ft)	0.003126	Flow (cfs)		2800.00	
Q Total (cfs)	2800.00	Top Width (ft)		51.13	
Top Width (ft)	51.13	Avg. Vel. (ft/s)		7.25	
Vel Total (ft/s)	7.25	Hydr. Depth (ft)		7.55	
Max Chl Dpth (ft)	9.85	Conv. (cfs)		50077.5	
Conv. Total (cfs)	50077.5	Wetted Per. (ft)		59.20	
Length Wtd. (ft)	58.60	Shear (lb/sq ft)		1.27	
Min Ch El (ft)	937.72	Stream Power (lb/ft s)		9.23	
Alpha	1.00				

Frctn Loss (ft)	0.17	Cum Volume (acre-ft)	11.56	22.00	proposed FW.rep
C & E Loss (ft)	0.02	Cum SA (acres)	2.94	2.67	1.55
					0.42

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2813.979

INPUT
Description: 31
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	953.48	.06	953.48	2.49	953.29	3.09	953.25	3.7	953.2
7.87	952.9	8.48	952.85	8.93	952.81	9.33	952.77	9.65	952.83
10.23	952.94	10.72	953.03	10.86	953.05	11.85	952.98	15.25	953
21.18	949.56	29.14	944.99	31.53	943.62	32.77	943.62	34.47	944.47
39.47	944.47	54.9	937.22	74.9	937.22	90.6	945.07	96.4	947.04
101.45	948.25	107.6	949.81	135.51	952.27	160.01	962.86	163.64	963.94

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	39.47	.04	90.6	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
39.47	90.6	18.36	18.04	17.52	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	947.65	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.83	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	946.82	Flow Area (sq ft)	29.40	373.42	4.52
Crit W.S. (ft)	943.92	Area (sq ft)	29.40	373.42	4.52
E.G. Slope (ft/ft)	0.003037	Flow (cfs)	42.70	2754.58	2.72
Q Total (cfs)	2800.00	Top Width (ft)	13.52	51.13	5.16
Top Width (ft)	69.81	Avg. Vel. (ft/s)	1.45	7.38	0.60
Vel Total (ft/s)	6.87	Hydr. Depth (ft)	2.17	7.30	0.88
Max Chl Dpth (ft)	9.60	Conv. (cfs)	774.8	49980.1	49.4
Conv. Total (cfs)	50804.3	Wetted Per. (ft)	14.58	54.60	5.45
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.38	1.30	0.16
Min Ch El (ft)	937.22	Stream Power (lb/ft s)	0.56	9.57	0.09
Alpha	1.13	Cum Volume (acre-ft)	16.63	19.13	9.66
Frctn Loss (ft)		Cum SA (acres)	5.09	2.60	4.83
C & E Loss (ft)					

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	948.19	Wt. n-Val.		0.040	
Vel Head (ft)	0.74	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	947.46	Flow Area (sq ft)		405.79	
Crit W.S. (ft)	943.91	Area (sq ft)		405.79	
E.G. Slope (ft/ft)	0.002696	Flow (cfs)		2800.00	
Q Total (cfs)	2800.00	Top Width (ft)		51.13	
Top Width (ft)	51.13	Avg. Vel. (ft/s)		6.90	
Vel Total (ft/s)	6.90	Hydr. Depth (ft)		7.94	
Max Chl Dpth (ft)	10.24	Conv. (cfs)		53926.3	
Conv. Total (cfs)	53926.3	Wetted Per. (ft)		59.97	
Length Wtd. (ft)	4.00	Shear (lb/sq ft)		1.14	
Min Ch El (ft)	937.22	Stream Power (lb/ft s)		7.86	
Alpha	1.00	Cum Volume (acre-ft)	11.56	21.47	1.55
Frctn Loss (ft)		Cum SA (acres)	2.94	2.60	0.42
C & E Loss (ft)					

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 2807

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6

```
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0     960     955      500     960     955

Upstream Bridge Cross Section Data
Station Elevation Data     num=       30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  953.48     .06  953.48    2.49  953.29    3.09  953.25     3.7   953.2
    7.87   952.9    8.48  952.85    8.93  952.81    9.33  952.77    9.65  952.83
   10.23  952.94   10.72  953.03   10.86  953.05   11.85  952.98   15.25     953
   21.18  949.56   29.14  944.99   31.53  943.62   32.77  943.62   34.47  944.47
   39.47  944.47    54.9  937.22    74.9  937.22    90.6  945.07    96.4  947.04
  101.45  948.25   107.6  949.81  135.51  952.27  160.01  962.86  163.64  963.94

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09   39.47     .04    90.6     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
         39.47    90.6              .1       .3

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
       0     960     955      500     960     955

Downstream Bridge Cross Section Data
Station Elevation Data     num=       35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  953.58    3.89  953.46    4.62  953.43    5.85  953.34    6.68  953.28
    8.37  953.15    11.2  952.93   12.39  952.84   12.66  952.82   12.83  952.81
   13.46  952.76   13.76  952.74    13.9  952.73   14.47  952.83   15.17  952.96
   15.43  953.01   17.08   952.9   17.54  952.86   18.04  952.83   19.53  952.83
   29.59     947    29.6  946.99   31.58  945.68   34.45  943.62   36.62  943.62
   38.32  944.47   43.32  944.47   58.75  937.22   78.75  937.22   94.45  945.07
  112.31   945.8  119.38  947.31  128.36  948.22  144.59  949.65  155.19 954.238

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .09   43.32     .04   94.45     .12

Bank Sta: Left   Right    Coeff Contr.   Expan.
         43.32   94.45              .1       .3
Ineffective Flow      num=       1
   Sta L   Sta R    Elev  Permanent
     111  155.19               F

Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Piers =  1

Pier Data
Pier Station      Upstream=   39.47    Downstream=   43.32
Upstream      num=       2
    Width   Elev    Width   Elev
        8    935        8    955
Downstream      num=       2
    Width   Elev    Width   Elev
        8    935        8    955

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
      Energy
      Momentum                Cd   =       2
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
```

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 YR

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	947.65	E.G. Elev (ft)	947.57	947.51
W.S. US. (ft)	946.82	W.S. Elev (ft)	946.60	946.55
Q Total (cfs)	2800.00	Crit W.S. (ft)	943.86	943.86
Q Bridge (cfs)	2800.00	Max Chl Dpth (ft)	9.38	9.33
Q Weir (cfs)		Vel Total (ft/s)	7.55	7.28
Weir Sta Lft (ft)		Flow Area (sq ft)	370.85	384.79
Weir Sta Rgt (ft)		Froude # Chl	0.51	0.52
Weir Submerg		Specif Force (cu ft)	2129.71	2120.96
Weir Max Depth (ft)		Hydr Depth (ft)	6.10	5.29
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	71.18	82.95
Min El Prs (ft)	955.00	Conv. Total (cfs)	45412.6	45195.6
Delta EG (ft)	0.18	Top Width (ft)	60.75	77.54
Delta WS (ft)	0.22	Frctn Loss (ft)		
BR Open Area (sq ft)	1092.98	C & E Loss (ft)		
BR Open Vel (ft/s)	7.55	Shear Total (lb/sq ft)	1.24	1.11
Coef of Q		Power Total (lb/ft s)	9.34	8.09
Br Sel Method	Momentum			

BRIDGE OUTPUT Profile #100 YR FW

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	948.19	E.G. Elev (ft)	948.13	948.11
W.S. US. (ft)	947.46	W.S. Elev (ft)	947.29	947.27
Q Total (cfs)	2800.00	Crit W.S. (ft)	943.84	943.86
Q Bridge (cfs)	2800.00	Max Chl Dpth (ft)	10.07	10.05
Q Weir (cfs)		Vel Total (ft/s)	7.32	7.34
Weir Sta Lft (ft)		Flow Area (sq ft)	382.47	381.44
Weir Sta Rgt (ft)		Froude # Chl	0.45	0.45
Weir Submerg		Specif Force (cu ft)	2314.30	2307.65
Weir Max Depth (ft)		Hydr Depth (ft)	8.12	8.09
Min El Weir Flow (ft)	960.01	W.P. Total (ft)	54.89	54.86
Min El Prs (ft)	955.00	Conv. Total (cfs)	51835.6	51616.3
Delta EG (ft)	0.11	Top Width (ft)	47.13	47.13
Delta WS (ft)	0.14	Frctn Loss (ft)		
BR Open Area (sq ft)	745.66	C & E Loss (ft)		
BR Open Vel (ft/s)	7.34	Shear Total (lb/sq ft)	1.27	1.28
Coef of Q		Power Total (lb/ft s)	9.29	9.38
Br Sel Method	Momentum			

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2795.938

INPUT
Description: 32
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	953.58	3.89	953.46	4.62	953.43	5.85	953.34	6.68	953.28
8.37	953.15	11.2	952.93	12.39	952.84	12.66	952.82	12.83	952.81
13.46	952.76	13.76	952.74	13.9	952.73	14.47	952.83	15.17	952.96
15.43	953.01	17.08	952.9	17.54	952.86	18.04	952.83	19.53	952.83
29.59	947	29.6	946.99	31.58	945.68	34.45	943.62	36.62	943.62
38.32	944.47	43.32	944.47	58.75	937.22	78.75	937.22	94.45	945.07
112.31	945.8	119.38	947.31	128.36	948.22	144.59	949.65	155.19	954.238

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.09	43.32	.04	94.45	.12

Bank Sta: Left 43.32 Right 94.45
Lengths: Left 124.19 Channel 127.54 Right 116.57
Coeff Contr. .1 Expan. .3
Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
111	155.19		F

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	947.48	Wt. n-Val.	0.090	0.040	0.120
Vel Head (ft)	0.87	Reach Len. (ft)	124.19	127.54	116.57
W.S. Elev (ft)	946.60	Flow Area (sq ft)	27.75	362.26	19.79
Crit W.S. (ft)		Area (sq ft)	27.75	362.26	22.40
E.G. Slope (ft/ft)	0.003332	Flow (cfs)	41.19	2742.88	15.93
Q Total (cfs)	2800.00	Top Width (ft)	13.14	51.13	21.63
Top Width (ft)	85.89	Avg. Vel. (ft/s)	1.48	7.57	0.80
Vel Total (ft/s)	6.83	Hydr. Depth (ft)	2.11	7.09	1.20
Max Chl Dpth (ft)	9.38	Conv. (cfs)	713.6	47514.9	276.0
Conv. Total (cfs)	48504.4	Wetted Per. (ft)	14.28	54.60	16.56
Length Wtd. (ft)	127.28	Shear (lb/sq ft)	0.40	1.38	0.25
Min Ch El (ft)	937.22	Stream Power (lb/ft s)	0.60	10.45	0.20
Alpha	1.20	Cum Volume (acre-ft)	16.62	18.98	9.65
Frctn Loss (ft)	0.37	Cum SA (acres)	5.09	2.58	4.82
C & E Loss (ft)	0.06				

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	948.09	Wt. n-Val.		0.040	
Vel Head (ft)	0.77	Reach Len. (ft)	124.19	127.54	116.57
W.S. Elev (ft)	947.32	Flow Area (sq ft)		398.84	
Crit W.S. (ft)		Area (sq ft)		398.84	
E.G. Slope (ft/ft)	0.002838	Flow (cfs)		2800.00	
Q Total (cfs)	2800.00	Top Width (ft)		51.13	
Top Width (ft)	51.13	Avg. Vel. (ft/s)		7.02	
Vel Total (ft/s)	7.02	Hydr. Depth (ft)		7.80	
Max Chl Dpth (ft)	10.10	Conv. (cfs)		52555.4	
Conv. Total (cfs)	52555.4	Wetted Per. (ft)		59.70	
Length Wtd. (ft)	127.51	Shear (lb/sq ft)		1.18	
Min Ch El (ft)	937.22	Stream Power (lb/ft s)		8.31	
Alpha	1.00	Cum Volume (acre-ft)	11.56	21.31	1.55
Frctn Loss (ft)	0.29	Cum SA (acres)	2.94	2.58	0.42
C & E Loss (ft)	0.05				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2668.395

INPUT
Description: 33
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	952.46	1.6	952.36	7.95	951.95	8.9	951.78	9.26	951.73
9.97	951.88	10.34	951.95	10.72	952.03	11.82	951.86	15.46	951.45
15.64	951.37	15.78	951.31	18.59	950.06	19.04	950.44	19.56	950.3
25	948.99	42.35	944.71	50.89	945.72	69.51	936.34	90.01	936.34
104.67	943.59	121.45	944.37	156.85	945	164.98	945.37	182.47	953.43
188.26	956.05								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	50.89	.04	104.67	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
50.89 104.67 18.55 17.72 17.36 .1 .3

Ineffective Flow num= 0

Sta L	Sta R	Elev	Permanent

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	947.05	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.68	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	946.37	Flow Area (sq ft)	15.52	399.19	110.76
Crit W.S. (ft)	942.98	Area (sq ft)	15.52	399.19	110.76
E.G. Slope (ft/ft)	0.002497	Flow (cfs)	9.59	2690.31	100.10
Q Total (cfs)	2800.00	Top Width (ft)	15.29	53.78	62.49
Top Width (ft)	131.56				

Vel Total (ft/s)	5.33	Avg. Vel. (ft/s)	0.62	6.74	0.90
Max Chl Dpth (ft)	10.03	Hydr. Depth (ft)	1.02	7.42	1.77
Conv. Total (cfs)	56033.8	Conv. (cfs)	191.9	53838.7	2003.2
Length Wtd. (ft)	4.00	Wetted Per. (ft)	15.55	57.70	62.74
Min Ch El (ft)	936.34	Shear (lb/sq ft)	0.16	1.08	0.28
Alpha	1.54	Stream Power (lb/ft s)	0.10	7.27	0.25
Frctn Loss (ft)		Cum Volume (acre-ft)	16.56	17.87	9.47
C & E Loss (ft)		Cum SA (acres)	5.04	2.42	4.71

Warning: Divided flow computed for this cross-section.

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	947.74	Element			
Vel Head (ft)	0.61	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	947.13	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	943.00	Flow Area (sq ft)	23.99	440.06	13.54
E.G. Slope (ft/ft)	0.001913	Area (sq ft)	23.99	440.06	13.54
Q Total (cfs)	2800.00	Flow (cfs)	18.53	2770.39	11.08
Top Width (ft)	70.15	Top Width (ft)	12.45	53.78	3.92
Vel Total (ft/s)	5.86	Avg. Vel. (ft/s)	0.77	6.30	0.82
Max Chl Dpth (ft)	10.79	Hydr. Depth (ft)	1.93	8.18	3.45
Conv. Total (cfs)	64013.4	Conv. (cfs)	423.6	63336.5	253.3
Length Wtd. (ft)	4.00	Wetted Per. (ft)	14.09	57.70	7.29
Min Ch El (ft)	936.34	Shear (lb/sq ft)	0.20	0.91	0.22
Alpha	1.14	Stream Power (lb/ft s)	0.16	5.73	0.18
Frctn Loss (ft)		Cum Volume (acre-ft)	11.52	20.08	1.54
C & E Loss (ft)		Cum SA (acres)	2.93	2.43	0.42

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 2662

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	955	950	500	955	950

Upstream Bridge Cross Section Data
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	952.46	1.6	952.36	7.95	951.95	8.9	951.78	9.26	951.73
9.97	951.88	10.34	951.95	10.72	952.03	11.82	951.86	15.46	951.45
15.64	951.37	15.78	951.31	18.59	950.06	19.04	950.44	19.56	950.3
25	948.99	42.35	944.71	50.89	945.72	69.51	936.34	90.01	936.34
104.67	943.59	121.45	944.37	156.85	945	164.98	945.37	182.47	953.43
188.26	956.05								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	50.89	.04	104.67	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
50.89	104.67	.1	.3

Ineffective Flow num= 0

Sta L	Sta R	Elev	Permanent

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	955	950	500	955	950

Downstream Bridge Cross Section Data
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	952.52	2.7	952.44	4	952.4	4.18	952.4	12.2	951.84
12.79	951.81	12.96	951.79	13.17	951.76	14.16	951.65	14.26	951.67

15.65	951.95	17.07	951.72	19.96	951.27	20.16	951.24	20.17	951.24
30.77	946.5	36.42	943.97	45.3	939.99	45.91	939.21	50.22	939.1
51.24	939.07	51.58	939.47	52.67	941.17	54.17	943.51	57.49	943.66
76.42	936.34	97.92	936.34	112.58	943.53	122.7	944.14	130.74	944.61
132.49	944.65	135.41	944.7	173.13	944.96	191.38	953.59		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	57.49	.04	112.58	.12

Bank Sta: Left Right Coeff Contr. Expan.
57.49 112.58 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	57.49	943.66	F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data
Pier Station Upstream= 38.09 Downstream= 43.35
Upstream num= 2

Width	Elev	Width	Elev
8	935	8	950

Downstream num= 2

Width	Elev	Width	Elev
8	935	8	950

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Momentum Cd = 2
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 YR

			Inside BR US	Inside BR DS
E.G. US. (ft)	947.05	Element		
W.S. US. (ft)	946.37	E.G. Elev (ft)	947.03	946.47
Q Total (cfs)	2800.00	W.S. Elev (ft)	946.35	945.80
Q Bridge (cfs)	2800.00	Crit W.S. (ft)	943.02	942.73
Q Weir (cfs)		Max Chl Dpth (ft)	10.01	9.46
Weir Sta Lft (ft)		Vel Total (ft/s)	5.42	5.28
Weir Sta Rgt (ft)		Flow Area (sq ft)	516.75	530.35
Weir Submerg		Froude # Chl	0.44	0.44
Weir Max Depth (ft)		Specif Force (cu ft)	2367.46	2358.75
Min El Weir Flow (ft)	955.01	Hydr Depth (ft)	4.13	3.94
Min El Prs (ft)	950.00	W.P. Total (ft)	130.82	150.64
Delta EG (ft)	0.60	Conv. Total (cfs)	55571.9	55725.2
Delta WS (ft)	0.54	Top Width (ft)	125.01	134.56
BR Open Area (sq ft)	1009.46	Frctn Loss (ft)		
BR Open Vel (ft/s)	5.42	C & E Loss (ft)		
Coef of Q		Shear Total (lb/sq ft)	0.63	0.55
Br Sel Method	Momentum	Power Total (lb/ft s)	3.39	2.93

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

BRIDGE OUTPUT Profile #100 YR FW

proposed FW.rep

E.G. US. (ft)	947.74
W.S. US. (ft)	947.13
Q Total (cfs)	2800.00
Q Bridge (cfs)	2800.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	955.01
Min El Prs (ft)	950.00
Delta EG (ft)	0.69
Delta WS (ft)	0.65
BR Open Area (sq ft)	661.16
BR Open Vel (ft/s)	5.97
Coef of Q	
Br Sel Method	Momentum

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	947.72	947.07
W.S. Elev (ft)	947.10	946.47
Crit W.S. (ft)	943.02	942.73
Max Chl Dpth (ft)	10.76	10.13
Vel Total (ft/s)	5.97	5.72
Flow Area (sq ft)	468.63	489.27
Froude # Chl	0.39	0.39
Specif Force (cu ft)	2589.62	2583.54
Hydr Depth (ft)	7.05	7.50
W.P. Total (ft)	72.83	77.95
Conv. Total (cfs)	63601.3	63302.1
Top Width (ft)	66.50	65.23
Frctn Loss (ft)		
C & E Loss (ft)		
Shear Total (lb/sq ft)	0.78	0.77
Power Total (lb/ft s)	4.65	4.39

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

CROSS SECTION

RIVER: Hope Creek
REACH: 1
RS: 2650.675

INPUT
Description: 34
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	952.52	2.7	952.44	4	952.4	4.18	952.4	12.2	951.84
12.79	951.81	12.96	951.79	13.17	951.76	14.16	951.65	14.26	951.67
15.65	951.95	17.07	951.72	19.96	951.27	20.16	951.24	20.17	951.24
30.77	946.5	36.42	943.97	45.3	939.99	45.91	939.21	50.22	939.1
51.24	939.07	51.58	939.47	52.67	941.17	54.17	943.51	57.49	943.66
76.42	936.34	97.92	936.34	112.58	943.53	122.7	944.14	130.74	944.61
132.49	944.65	135.41	944.7	173.13	944.96	191.38	953.59		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	57.49	.04	112.58	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
57.49	112.58	124.24	112.8	97.76	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	57.49	943.66	F

CROSS SECTION OUTPUT Profile #100 YR

E.G. Elev (ft)	946.45
Vel Head (ft)	0.62
W.S. Elev (ft)	945.83
Crit W.S. (ft)	942.73
E.G. Slope (ft/ft)	0.002349
Q Total (cfs)	2800.00
Top Width (ft)	142.71
Vel Total (ft/s)	4.87
Max Chl Dpth (ft)	9.49
Conv. Total (cfs)	57770.2
Length Wtd. (ft)	113.85
Min Ch El (ft)	936.34
Alpha	1.68
Frctn Loss (ft)	0.40
C & E Loss (ft)	0.05

Element	Left OB	Channel	Right OB
Wt. n-Val.	0.120	0.040	0.120
Reach Len. (ft)	124.24	112.80	97.76
Flow Area (sq ft)	98.46	400.90	75.97
Area (sq ft)	98.46	400.90	75.97
Flow (cfs)	132.71	2615.42	51.86
Top Width (ft)	25.23	55.09	62.39
Avg. Vel. (ft/s)	1.35	6.52	0.68
Hydr. Depth (ft)	3.90	7.28	1.22
Conv. (cfs)	2738.2	53961.9	1070.1
Wetted Per. (ft)	29.26	58.12	62.62
Shear (lb/sq ft)	0.49	1.01	0.18
Stream Power (lb/ft s)	0.67	6.60	0.12
Cum Volume (acre-ft)	16.54	17.70	9.44
Cum SA (acres)	5.04	2.40	4.68

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

energy was used.

CROSS SECTION OUTPUT Profile #100 YR FW

E.G. Elev (ft)	947.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.57	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	946.49	Reach Len. (ft)	124.24	112.80	97.76
Crit W.S. (ft)	942.73	Flow Area (sq ft)	85.19	437.04	
E.G. Slope (ft/ft)	0.001989	Area (sq ft)	85.19	437.04	
Q Total (cfs)	2800.00	Flow (cfs)	111.57	2688.43	
Top Width (ft)	70.15	Top Width (ft)	15.06	55.09	
Vel Total (ft/s)	5.36	Avg. Vel. (ft/s)	1.31	6.15	
Max Chl Dpth (ft)	10.15	Hydr. Depth (ft)	5.66	7.93	
Conv. Total (cfs)	62786.0	Conv. (cfs)	2501.9	60284.1	
Length Wtd. (ft)	113.31	Wetted Per. (ft)	23.33	61.08	
Min Ch El (ft)	936.34	Shear (lb/sq ft)	0.45	0.89	
Alpha	1.27	Stream Power (lb/ft s)	0.59	5.46	
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	11.50	19.90	1.53
C & E Loss (ft)	0.12	Cum SA (acres)	2.92	2.41	0.41

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
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 cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: Hope Creek
REACH: 1
RS: 2537.862

INPUT
Description: 35
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.57	1.68	951.52	5.06	951.33	7.62	951.19	10.6	951.03
11.7	950.9	11.87	950.88	12	950.91	12.29	950.97	12.64	951.03
13.02	951.11	13.52	951.21	14.36	951.15	17.81	950.89	18.02	950.79
24.82	947.51	36.7	941.84	42.07	939.73	44.05	938.98	47.25	938.91
55.82	938.83	58.75	939.7	59.89	940.18	64.72	942.21	74.58	942.62
86.01	942.94	86.62	942.94	105.3	943.01	110.95	943.14	112.96	941.41
119.14	935.6	126.05	935.54	137.81	935.66	139.43	939.26	143.82	943.94
147.5	944.04	163.97	943.74	166.25	943.69	175.41	944.27	205.66	948.76
230.07	953.39								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	110.95	.04	143.82	.12

Bank Sta: Left Right
110.95 143.82

Lengths: Left Channel Right
18.67 17.03 20.7

Coeff Contr. .1
Expan. .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
147.5	230.07	944.04	F

CROSS SECTION OUTPUT Profile #100 YR

E.G. Elev (ft)	946.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.12	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	944.88	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	943.74	Flow Area (sq ft)	248.53	244.63	31.85
E.G. Slope (ft/ft)	0.005700	Area (sq ft)	248.53	244.63	31.85
Q Total (cfs)	2800.00	Flow (cfs)	484.60	2287.85	27.55
Top Width (ft)	149.22	Top Width (ft)	80.63	32.87	35.72
Vel Total (ft/s)	5.33	Avg. Vel. (ft/s)	1.95	9.35	0.86
Max Chl Dpth (ft)	9.34	Hydr. Depth (ft)	3.08	7.44	0.89
Conv. Total (cfs)	37088.3	Conv. (cfs)	6419.0	30304.4	364.9
Length Wtd. (ft)	4.00	Wetted Per. (ft)	82.50	40.17	35.79
Min Ch El (ft)	935.54	Shear (lb/sq ft)	1.07	2.17	0.32
Alpha	2.54	Stream Power (lb/ft s)	2.09	20.27	0.27
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	16.04	16.87	9.31
C & E Loss (ft)	0.09	Cum SA (acres)	4.89	2.29	4.57

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

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	946.52	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	1.81	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	944.72	Flow Area (sq ft)	87.80	239.20	5.17
Crit W.S. (ft)	944.05	Area (sq ft)	87.80	239.20	5.17
E.G. Slope (ft/ft)	0.008237	Flow (cfs)	146.06	2649.58	4.36
Q Total (cfs)	2800.00	Top Width (ft)	46.23	32.87	7.18
Top Width (ft)	86.28	Avg. Vel. (ft/s)	1.66	11.08	0.84
Vel Total (ft/s)	8.43	Hydr. Depth (ft)	1.90	7.28	0.72
Max Chl Dpth (ft)	9.18	Conv. (cfs)	1609.2	29193.1	48.1
Conv. Total (cfs)	30850.4	Wetted Per. (ft)	48.75	40.17	7.92
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	0.93	3.06	0.34
Min Ch El (ft)	935.54	Stream Power (lb/ft s)	1.54	33.92	0.28
Alpha	1.64	Cum Volume (acre-ft)	11.26	19.02	1.53
Frctn Loss (ft)	0.03	Cum SA (acres)	2.83	2.29	0.41
C & E Loss (ft)	0.01				

Warning: The cross section had to be extended vertically during the critical depth calculations.

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 2532

INPUT
Description:
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	955	950	500	955	950

Upstream Bridge Cross Section Data
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.58	1.68	951.53	5.06	951.34	7.62	951.2	10.6	951.04
11.7	950.91	11.87	950.89	12	950.92	12.29	950.98	12.64	951.04
13.02	951.12	13.52	951.22	14.36	951.16	17.81	950.9	18.02	950.8
24.82	947.52	36.7	941.85	42.07	939.74	44.05	938.99	47.25	938.92
55.82	938.84	58.75	939.71	59.89	940.19	64.72	942.22	74.58	942.63
86.01	942.95	86.62	942.95	105.3	943.02	110.95	943.15	112.96	941.42
119.14	935.61	126.05	935.55	137.81	935.67	139.43	939.27	143.82	943.95
147.5	944.05	163.97	943.75	166.25	943.7	175.41	944.28	205.66	948.77
230.07	953.4								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	110.95	.04	143.82	.12

Bank Sta: Left Right Coeff Contr. Expan.
110.95 143.82 .1 .3
Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
147.5	230.07	944.04	F

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	955	950	500	955	950

Downstream Bridge Cross Section Data
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.51	3.81	951.37	8.01	951.12	9.39	951.04	11.26	950.94
12.64	950.87	13.62	950.76	13.96	950.73	14.51	950.83	15.61	951.05
15.95	951.02	16.64	950.97	17.53	950.89	19.82	950.72	26.26	947.68
27.23	947.22	39.19	941.51	41.84	940.47	46.14	938.84	53.11	938.68
57.31	938.64	61.73	939.95	63.61	940.5	66.59	941.75	87.09	942.62
91.05	942.73	92.4	942.77	101.58	942.8	119.91	943.24	126.7	937.37
128.49	935.69	135.82	935.63	146.19	935.56	149.97	939.72	153.79	943.79
159.23	943.93	163.68	944.05	166.92	943.99	177.85	945.02	184.02	945.43
215.35	946.47	230.24	949.27						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	119.91	.04	153.79	.12

Bank Sta: Left Right Coeff Contr. Expan.
119.91 153.79 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	119.91	943	F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data
Pier Station Upstream= 40.29 Downstream= 42.2
Upstream num= 2

Width	Elev	Width	Elev
8	935	8	950

Downstream num= 2

Width	Elev	Width	Elev
8	935	8	950

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Momentum Cd = 2
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 YR

E.G. US. (ft)	946.00
W.S. US. (ft)	944.88
Q Total (cfs)	2800.00
Q Bridge (cfs)	2800.00
Q Weir (cfs)	
Weir Sta Lft (ft)	
Weir Sta Rgt (ft)	
Weir Submerg	
Weir Max Depth (ft)	
Min El Weir Flow (ft)	955.01
Min El Prs (ft)	950.00
Delta EG (ft)	0.45
Delta WS (ft)	1.20
BR Open Area (sq ft)	1324.58
BR Open Vel (ft/s)	8.14
Coef of Q	
Br Sel Method	Energy only

Element	Inside BR US	Inside BR DS
E.G. Elev (ft)	945.88	945.70
W.S. Elev (ft)	943.81	943.72
Crit W.S. (ft)	943.81	943.72
Max Chl Dpth (ft)	8.26	8.16
Vel Total (ft/s)	8.14	7.76
Flow Area (sq ft)	344.15	360.81
Froude # Chl	0.85	0.84
Specif Force (cu ft)	1964.25	1945.23
Hydr Depth (ft)	3.34	3.25
W.P. Total (ft)	117.95	125.15
Conv. Total (cfs)	25843.6	26252.9
Top Width (ft)	110.13	111.16
Frctn Loss (ft)	0.07	
C & E Loss (ft)	0.03	
Shear Total (lb/sq ft)	2.14	2.05
Power Total (lb/ft s)	17.40	15.89

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
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: 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, energy was used.
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.

BRIDGE OUTPUT Profile #100 YR FW

			Inside BR US	Inside BR DS
E.G. US. (ft)	946.52	Element		
W.S. US. (ft)	944.72	E.G. Elev (ft)	946.49	946.36
Q Total (cfs)	2800.00	W.S. Elev (ft)	944.60	944.74
Q Bridge (cfs)	2800.00	Crit W.S. (ft)	944.05	943.92
Q Weir (cfs)		Max Chl Dpth (ft)	9.05	9.18
Weir Sta Lft (ft)		Vel Total (ft/s)	8.71	7.73
Weir Sta Rgt (ft)		Flow Area (sq ft)	321.46	362.21
Weir Submerg		Froude # Chl	0.74	0.70
Weir Max Depth (ft)		Specif Force (cu ft)	1967.12	1987.28
Min El Weir Flow (ft)	955.01	Hydr Depth (ft)	3.73	4.08
Min El Prs (ft)	950.00	W.P. Total (ft)	93.60	95.35
Delta EG (ft)	0.29	Conv. Total (cfs)	29895.0	32603.0
Delta WS (ft)	0.78	Top Width (ft)	86.28	88.74
BR Open Area (sq ft)	787.01	Frctn Loss (ft)	0.05	0.06
BR Open Vel (ft/s)	8.71	C & E Loss (ft)	0.08	0.07
Coef of Q		Shear Total (lb/sq ft)	1.88	1.75
Br Sel Method	Energy only	Power Total (lb/ft s)	16.38	13.52

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

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2520.830

INPUT
Description: 36
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.53	3.81	951.39	8.01	951.14	9.39	951.06	11.26	950.96
12.64	950.89	13.62	950.78	13.96	950.75	14.51	950.85	15.61	951.07
15.95	951.04	16.64	950.99	17.53	950.91	19.82	950.74	26.26	947.7
27.23	947.24	39.19	941.53	41.84	940.49	46.14	938.86	53.11	938.7
57.31	938.66	61.73	939.97	63.61	940.52	66.59	941.77	87.09	942.64
91.05	942.75	92.4	942.79	101.58	942.82	119.91	943.26	126.7	937.39
128.49	935.71	135.82	935.65	146.19	935.58	149.97	939.74	153.79	943.81
159.23	943.95	163.68	944.07	166.92	944.01	177.85	945.04	184.02	945.45
215.35	946.49	230.24	949.29						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	119.91	.04	153.79	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
119.91 153.79 97.79 129.85 152.46 .1 .3
Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	119.91	943	F

CROSS SECTION OUTPUT Profile #100 YR

E.G. Elev (ft)	945.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.87	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	943.69	Reach Len. (ft)	97.79	129.85	152.46
Crit W.S. (ft)	943.69	Flow Area (sq ft)	173.26	208.07	

E.G. Slope (ft/ft)	0.011128	Area (sq ft)	173.26	208.07	
Q Total (cfs)	2800.00	Flow (cfs)	358.86	2441.14	
Top Width (ft)	119.00	Top Width (ft)	85.24	33.76	
Vel Total (ft/s)	7.34	Avg. Vel. (ft/s)	2.07	11.73	
Max Chl Dpth (ft)	8.11	Hydr. Depth (ft)	2.03	6.16	
Conv. Total (cfs)	26543.0	Conv. (cfs)	3401.9	23141.1	
Length Wtd. (ft)	125.75	Wetted Per. (ft)	86.77	40.16	
Min Ch El (ft)	935.58	Shear (lb/sq ft)	1.39	3.60	
Alpha	2.24	Stream Power (lb/ft s)	2.87	42.22	
Frctn Loss (ft)	0.65	Cum Volume (acre-ft)	15.98	16.78	9.31
C & E Loss (ft)	0.36	Cum SA (acres)	4.86	2.27	4.57

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 #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	946.23	Element			
Vel Head (ft)	2.29	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	943.94	Reach Len. (ft)	97.79	129.85	152.46
Crit W.S. (ft)	943.94	Flow Area (sq ft)	72.94	216.72	
E.G. Slope (ft/ft)	0.011871	Area (sq ft)	72.94	216.72	
Q Total (cfs)	2800.00	Flow (cfs)	114.87	2685.13	
Top Width (ft)	88.74	Top Width (ft)	54.86	33.88	
Vel Total (ft/s)	9.67	Avg. Vel. (ft/s)	1.57	12.39	
Max Chl Dpth (ft)	8.36	Hydr. Depth (ft)	1.33	6.40	
Conv. Total (cfs)	25699.0	Conv. (cfs)	1054.3	24644.8	
Length Wtd. (ft)	128.56	Wetted Per. (ft)	57.83	40.47	
Min Ch El (ft)	935.58	Shear (lb/sq ft)	0.93	3.97	
Alpha	1.58	Stream Power (lb/ft s)	1.47	49.18	
Frctn Loss (ft)	0.77	Cum Volume (acre-ft)	11.22	18.93	1.53
C & E Loss (ft)	0.42	Cum SA (acres)	2.81	2.28	0.41

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 cross section had to be extended vertically during the critical depth 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: Hope Creek
REACH: 1 RS: 2390.934

INPUT
Description: 37
Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.03	6.19	950.82	8.9	950.67	9.47	950.64	10.2	950.59
15.04	950.28	15.53	950.21	16	950.16	16.32	950.13	16.8	950.22
17.31	950.32	17.78	950.41	17.95	950.44	19.02	950.39	22.07	950.18
23.61	949.5	24.28	949.21	24.32	949.19	25.56	948.64	41.75	941.49
41.76	941.49	45.2	939.7	48.14	938.69	57.34	938.37	59.1	938.3
63.82	939.79	67.84	941.12	68.49	941.11	71.3	941.07	76.16	941.11
88.03	941.19	105.22	941.61	111.35	941.55	131.08	942.16	138.07	942.13
162.22	942.18	164.56	940.61	170.59	936.56	173.04	934.91	186.49	934.98
198.47	934.58	199.13	934.75	201.34	935.31	206.68	938.83	207.78	941.39

208.81	942.567	215.34	942.65	217	942.87	222.67	945.05	242.61	951.43

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	162.22	.04	208.81	.12

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

Left	Right	Left	Channel	Right	Coeff Contr.	Expan.
162.22	208.81	38.36	36.6	36.24	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	26.75		F

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	944.30	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.68	Reach Len. (ft)	38.36	36.60	36.24
W.S. Elev (ft)	943.62	Flow Area (sq ft)	300.68	342.94	8.77
Crit W.S. (ft)		Area (sq ft)	300.68	342.94	8.77
E.G. Slope (ft/ft)	0.002966	Flow (cfs)	360.52	2434.16	5.32
Q Total (cfs)	2800.00	Top Width (ft)	125.30	46.59	10.14
Top Width (ft)	182.03	Avg. Vel. (ft/s)	1.20	7.10	0.61
Vel Total (ft/s)	4.29	Hydr. Depth (ft)	2.40	7.36	0.87
Max Chl Dpth (ft)	9.04	Conv. (cfs)	6620.3	44698.7	97.7
Conv. Total (cfs)	51416.6	Wetted Per. (ft)	126.82	52.18	10.30
Length Wtd. (ft)	36.73	Shear (lb/sq ft)	0.44	1.22	0.16
Min Ch El (ft)	934.58	Stream Power (lb/ft s)	0.53	8.64	0.10
Alpha	2.39	Cum Volume (acre-ft)	15.45	15.96	9.30
Frctn Loss (ft)	0.20	Cum SA (acres)	4.62	2.15	4.55
C & E Loss (ft)	0.13				

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

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 #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	944.59	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	0.90	Reach Len. (ft)	38.36	36.60	36.24
W.S. Elev (ft)	943.68	Flow Area (sq ft)	104.95	345.86	
Crit W.S. (ft)		Area (sq ft)	104.95	345.86	
E.G. Slope (ft/ft)	0.003622	Flow (cfs)	109.80	2690.20	
Q Total (cfs)	2800.00	Top Width (ft)	60.91	46.59	
Top Width (ft)	107.50	Avg. Vel. (ft/s)	1.05	7.78	
Vel Total (ft/s)	6.21	Hydr. Depth (ft)	1.72	7.42	
Max Chl Dpth (ft)	9.10	Conv. (cfs)	1824.4	44699.4	
Conv. Total (cfs)	46523.8	Wetted Per. (ft)	63.09	53.30	
Length Wtd. (ft)	36.66	Shear (lb/sq ft)	0.38	1.47	
Min Ch El (ft)	934.58	Stream Power (lb/ft s)	0.39	11.41	
Alpha	1.51	Cum Volume (acre-ft)	11.02	18.09	1.53
Frctn Loss (ft)	0.18	Cum SA (acres)	2.68	2.16	0.41
C & E Loss (ft)	0.04				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2354.325

INPUT
Description: 38
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	950.98	8.41	950.7	10.08	950.64	14.97	950.4	19.05	950.2
19.65	950.08	20.19	949.97	20.48	950.04	21.7	950.31	22.09	950.29
23.1	950.24	26.03	950.14	29.08	948.8	35.51	945.97	44.01	941.89
45.94	941.26	50.97	938.64	60.58	938.33	63.26	938.14	65.6	938.8
66.38	939.08	69.25	940.09	71.32	940.83	74.66	940.97	83.9	941.07
98.21	941.17	111.56	941.14	122.01	941.41	137.61	942.17	165.54	942.63
166.02	942.63	166.41	942.45	170.87	939.22	176.77	939.11	179.78	938.78
180.22	938.74	184.11	936.62	185.71	934.95	189.75	935.02	192.94	934.72
193.39	934.67	193.87	934.63	204.88	934.22	213.31	940.87	215.12	942.7
221	948.64	229.13	950.8						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	166.02	.04	215.12	.12

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

166.02 215.12 95.4 91.3 65.8 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	166.02	941.7	F

Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	66.31	952

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	943.98	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	1.98	Reach Len. (ft)	95.40	91.30	65.80
W.S. Elev (ft)	941.99	Flow Area (sq ft)	57.58	238.57	
Crit W.S. (ft)	941.99	Area (sq ft)	57.58	238.57	
E.G. Slope (ft/ft)	0.012564	Flow (cfs)	69.54	2730.46	
Q Total (cfs)	2800.00	Top Width (ft)	67.66	47.38	
Top Width (ft)	115.04	Avg. Vel. (ft/s)	1.21	11.45	
Vel Total (ft/s)	9.45	Hydr. Depth (ft)	0.85	5.04	
Max Chl Dpth (ft)	7.77	Conv. (cfs)	620.4	24359.4	
Conv. Total (cfs)	24979.8	Wetted Per. (ft)	70.92	52.35	
Length Wtd. (ft)	91.39	Shear (lb/sq ft)	0.64	3.57	
Min Ch El (ft)	934.22	Stream Power (lb/ft s)	0.77	40.91	
Alpha	1.43	Cum Volume (acre-ft)	15.29	15.72	9.29
Frctn Loss (ft)	0.38	Cum SA (acres)	4.54	2.12	4.55
C & E Loss (ft)	0.43				

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: 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 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 #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	944.36	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	1.34	Reach Len. (ft)	95.40	91.30	65.80
W.S. Elev (ft)	943.02	Flow Area (sq ft)	72.08	288.33	
Crit W.S. (ft)	941.83	Area (sq ft)	72.08	288.33	
E.G. Slope (ft/ft)	0.007061	Flow (cfs)	79.88	2720.12	
Q Total (cfs)	2800.00	Top Width (ft)	63.69	49.10	
Top Width (ft)	112.79	Avg. Vel. (ft/s)	1.11	9.43	
Vel Total (ft/s)	7.77	Hydr. Depth (ft)	1.13	5.87	
Max Chl Dpth (ft)	8.80	Conv. (cfs)	950.6	32370.9	
Conv. Total (cfs)	33321.5	Wetted Per. (ft)	65.57	54.88	
Length Wtd. (ft)	91.42	Shear (lb/sq ft)	0.48	2.32	
Min Ch El (ft)	934.22	Stream Power (lb/ft s)	0.54	21.85	
Alpha	1.43	Cum Volume (acre-ft)	10.94	17.83	1.53
Frctn Loss (ft)	0.24	Cum SA (acres)	2.63	2.12	0.41
C & E Loss (ft)	0.28				

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
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 cross section had to be extended vertically during the critical depth calculations.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2262

INPUT
Description:
Station Elevation Data num= 56

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.62	5.15	951.49	8.22	951.42	12.97	951.25	21.09	950.97
22.98	950.92	27.51	950.8	33.65	950.65	42.91	950.41	45.1	950.35
46.46	950.32	54.63	949.91	55.29	949.88	55.59	949.87	55.63	949.86
55.67	949.86	55.76	949.85	57.19	949.76	57.25	949.78	57.29	949.79
58.53	950.08	58.59	950.08	58.87	950.06	62.48	949.79	67.87	947.07
83.07	939.46	87.32	938.02	88.88	937.59	96.84	937.77	99.16	937.77
102.35	938.43	111.84	940.02	118.56	940.41	130.35	941.09	134.76	941.25
141.69	941.42	164.65	941.97	168.26	941.86	184.57	941.35	186.95	939.71
187.38	939.51	192.66	937.02	193.03	937.02	193.94	937.01	197.79	936.98
203	935.44	205.45	933.97	214.56	934.01	214.74	934.01	214.8	934.01
224.23	933.98	225.89	934	226.62	934	242.37	933.99	250.9	940.29
260.27	950.25								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	184.57	.04	250.9	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
184.57 250.9 220.4 181.12 126.56 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	164.65	941	F

Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	103.86	953

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	942.92	Element			
Vel Head (ft)	0.54	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	942.38	Reach Len. (ft)	220.40	181.12	126.56
Crit W.S. (ft)	939.08	Flow Area (sq ft)	100.46	460.10	2.05
E.G. Slope (ft/ft)	0.002086	Area (sq ft)	100.46	460.10	2.05
Q Total (cfs)	2800.00	Flow (cfs)	63.72	2735.35	0.93
Top Width (ft)	149.01	Top Width (ft)	80.71	66.33	1.97
Vel Total (ft/s)	4.98	Avg. Vel. (ft/s)	0.63	5.95	0.45
Max Chl Dpth (ft)	8.41	Hydr. Depth (ft)	1.24	6.94	1.04
Conv. Total (cfs)	61305.3	Conv. (cfs)	1395.2	59889.8	20.3
Length Wtd. (ft)	183.22	Wetted Per. (ft)	84.57	70.15	2.87
Min Ch El (ft)	933.97	Shear (lb/sq ft)	0.15	0.85	0.09
Alpha	1.39	Stream Power (lb/ft s)	0.10	5.08	0.04
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	15.12	14.99	9.29
C & E Loss (ft)	0.01	Cum SA (acres)	4.37	2.00	4.55

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

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	943.84	Element			
Vel Head (ft)	0.40	Wt. n-Val.	0.120	0.040	
W.S. Elev (ft)	943.44	Reach Len. (ft)	220.40	181.12	126.56
Crit W.S. (ft)	939.07	Flow Area (sq ft)	114.03	530.44	
E.G. Slope (ft/ft)	0.001363	Area (sq ft)	114.03	530.44	
Q Total (cfs)	2800.00	Flow (cfs)	77.85	2722.15	
Top Width (ft)	126.12	Top Width (ft)	59.79	66.33	
Vel Total (ft/s)	4.34	Avg. Vel. (ft/s)	0.68	5.13	
Max Chl Dpth (ft)	9.47	Hydr. Depth (ft)	1.91	8.00	
Conv. Total (cfs)	75831.4	Conv. (cfs)	2108.4	73723.0	
Length Wtd. (ft)	182.95	Wetted Per. (ft)	62.49	73.30	
Min Ch El (ft)	933.97	Shear (lb/sq ft)	0.16	0.62	
Alpha	1.36	Stream Power (lb/ft s)	0.11	3.16	
Frctn Loss (ft)	0.26	Cum Volume (acre-ft)	10.74	16.97	1.53
C & E Loss (ft)	0.01	Cum SA (acres)	2.49	2.00	0.41

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

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 2081.919

INPUT
Description: 39
Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	949.11	3.35	949.01	5.94	948.94	11.21	948.75	13.41	948.67
14.5	948.62	14.69	948.6	14.84	948.58	15.59	948.48	16.45	948.37
17.13	948.52	17.94	948.69	19.47	948.59	21.05	948.47	23.76	947.08
25.28	946.3	25.94	945.98	26.99	945.45	27.45	945.24	41.78	938.51
47.88	937.01	50.77	936.27	53.29	936.24	60.49	936.53	69.08	938.33
71.66	939.02	79.02	939.14	104.61	940.22	108.7	940.18	138.33	939.89
148.21	940.05	172.8	940.36	186.33	940.42	201.84	940.59	211.04	940.74
212.05	937.32	218.4	932.36	233.4	932.34	233.68	932.33	234.72	932.31
246.63	932.17	249.36	932.16	250.14	932.98	253.36	938.37	293.68	947.23
294.9	947.64								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	211.04	.04	253.36	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
211.04 253.36 293.59 431.27 483.25 .1 .3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	60.3	950

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	942.51	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.63	Reach Len. (ft)	293.59	431.27	483.25
W.S. Elev (ft)	941.87	Flow Area (sq ft)	297.35	371.35	27.89
Crit W.S. (ft)		Area (sq ft)	297.35	371.35	27.89
E.G. Slope (ft/ft)	0.002278	Flow (cfs)	269.72	2506.71	23.57
Q Total (cfs)	2800.00	Top Width (ft)	150.74	42.32	15.93
Top Width (ft)	208.99	Avg. Vel. (ft/s)	0.91	6.75	0.85
Vel Total (ft/s)	4.02	Hydr. Depth (ft)	1.97	8.77	1.75
Max Chl Dpth (ft)	9.71	Conv. (cfs)	5650.6	52515.6	493.8
Conv. Total (cfs)	58660.1	Wetted Per. (ft)	156.40	50.00	16.31
Length Wtd. (ft)	396.90	Shear (lb/sq ft)	0.27	1.06	0.24
Min Ch El (ft)	932.16	Stream Power (lb/ft s)	0.25	7.13	0.21
Alpha	2.53	Cum Volume (acre-ft)	14.11	13.26	9.25
Frctn Loss (ft)	0.72	Cum SA (acres)	3.79	1.77	4.52
C & E Loss (ft)	0.11				

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	943.56	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.50	Reach Len. (ft)	293.59	431.27	483.25
W.S. Elev (ft)	943.07	Flow Area (sq ft)	256.83	421.88	43.48
Crit W.S. (ft)		Area (sq ft)	256.83	421.88	43.48
E.G. Slope (ft/ft)	0.001503	Flow (cfs)	240.13	2518.54	41.33
Q Total (cfs)	2800.00	Top Width (ft)	91.50	42.32	13.57
Top Width (ft)	147.39	Avg. Vel. (ft/s)	0.94	5.97	0.95
Vel Total (ft/s)	3.88	Hydr. Depth (ft)	2.81	9.97	3.20
Max Chl Dpth (ft)	10.91	Conv. (cfs)	6193.4	64957.5	1066.0
Conv. Total (cfs)	72216.9	Wetted Per. (ft)	94.50	50.00	15.61
Length Wtd. (ft)	400.40	Shear (lb/sq ft)	0.26	0.79	0.26
Min Ch El (ft)	932.16	Stream Power (lb/ft s)	0.24	4.73	0.25
Alpha	2.14	Cum Volume (acre-ft)	9.80	14.99	1.46
Frctn Loss (ft)	0.54	Cum SA (acres)	2.11	1.77	0.39
C & E Loss (ft)	0.07				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 1650

INPUT
Description:
Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	947.97	8.57	947.7	15.97	947.48	20.94	947.33	30.35	947.1
33.5	947.02	37.49	946.8	42.51	946.54	43.35	946.45	43.97	946.41
44.24	946.46	44.85	946.58	45.45	946.71	46.61	946.57	48.4	946.37
48.92	946.1	57.93	941.44	69.76	935.78	74.41	934.97	78.9	934.04
83.2	934.02	86.21	933.96	91.89	935.14	93.2	935.42	99.64	936.77
118.18	936.99	130.57	937.27	146.24	937.35	160.01	937.29	180.62	937.1
195.16	937.27	208.74	937.19	233.59	937.16	249.38	937.33	274.35	937.85
290.71	938.08	318.17	938.79	327.4	938.97	328.11	936.62	329.84	931.52
350.77	931.34	356.16	931.18	357.3	932.64	361.56	939.27	400.23	949.052

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	327.4	.04	361.56	.12

Bank Sta: Left Right
327.4 361.56

Lengths: Left Channel Right
172.21 158.59 117.87

Coeff Contr. .1
Expan. .3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	87	950

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	941.67	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.27	Reach Len. (ft)	172.21	158.59	117.87
W.S. Elev (ft)	941.41	Flow Area (sq ft)	965.36	312.85	9.03
Crit W.S. (ft)		Area (sq ft)	965.36	312.85	9.03
E.G. Slope (ft/ft)	0.001482	Flow (cfs)	1138.72	1656.87	4.41
Q Total (cfs)	2800.00	Top Width (ft)	240.40	34.16	8.45
Top Width (ft)	283.01	Avg. Vel. (ft/s)	1.18	5.30	0.49
Vel Total (ft/s)	2.18	Hydr. Depth (ft)	4.02	9.16	1.07
Max Chl Dpth (ft)	10.23	Conv. (cfs)	29581.0	43041.0	114.6
Conv. Total (cfs)	72736.5	Wetted Per. (ft)	247.98	43.90	8.72
Length Wtd. (ft)	163.89	Shear (lb/sq ft)	0.36	0.66	0.10
Min Ch El (ft)	931.18	Stream Power (lb/ft s)	0.42	3.49	0.05
Alpha	3.63	Cum Volume (acre-ft)	9.86	9.87	9.04
Frctn Loss (ft)	0.26	Cum SA (acres)	2.47	1.39	4.38
C & E Loss (ft)	0.01				

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	942.95	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	0.25	Reach Len. (ft)	172.21	158.59	117.87
W.S. Elev (ft)	942.70	Flow Area (sq ft)	832.35	357.11	
Crit W.S. (ft)		Area (sq ft)	832.35	357.11	
E.G. Slope (ft/ft)	0.001201	Flow (cfs)	1031.20	1768.80	
Q Total (cfs)	2800.00	Top Width (ft)	164.25	34.16	
Top Width (ft)	198.41	Avg. Vel. (ft/s)	1.24	4.95	
Vel Total (ft/s)	2.35	Hydr. Depth (ft)	5.07	10.45	
Max Chl Dpth (ft)	11.52	Conv. (cfs)	29751.7	51032.6	
Conv. Total (cfs)	80784.3	Wetted Per. (ft)	169.71	47.33	
Length Wtd. (ft)	163.21	Shear (lb/sq ft)	0.37	0.57	
Min Ch El (ft)	931.18	Stream Power (lb/ft s)	0.46	2.80	
Alpha	2.90	Cum Volume (acre-ft)	6.13	11.13	1.22
Frctn Loss (ft)	0.22	Cum SA (acres)	1.25	1.39	0.31
C & E Loss (ft)	0.01				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 1492.060

INPUT
Description: 40
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	947.11	1.01	947.08	7.6	946.91	15.69	946.73	18.31	946.67
20.06	946.63	25.46	946.36	27.56	946.25	28.5	946.2	28.63	946.19
28.78	946.17	29.03	946.14	29.9	946.06	30.11	946.1	30.8	946.24
31.37	946.35	31.59	946.4	32.55	946.32	32.87	946.29	34.6	946.14
37.57	944.74	47.66	939.52	56.35	935.28	61.94	934.08	65.24	933.18
69.15	933.28	71.78	933.31	78.43	934.33	86.31	936.11	104.05	936.36
116.38	936.71	139.22	936.79	148.69	936.76	176.16	937.14	182.14	937.1

190.67	937.2	215.26	937.54	217.72	937.58	219.11	937.6	229.9	937.67
257.57	937.8	258.24	937.82	263.89	938.01	275.91	938.2	278.03	932.99
280.19	929.74	298.34	930.09	302.2	930.11	305.63	938.13	306.11	939.26
306.15	939.36	306.5	939.45	327.57	944.61	334.09	947.58		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	275.91	.04	306.11	.12

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

Left	Right	Left	Channel	Right	Coeff Contr.	Expan.
275.91	306.11	383.24	408.33	377.92	.1	.3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	72	950

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	941.41	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.33	Reach Len. (ft)	383.24	408.33	377.92
W.S. Elev (ft)	941.08	Flow Area (sq ft)	835.92	302.74	6.10
Crit W.S. (ft)		Area (sq ft)	835.92	302.74	6.10
E.G. Slope (ft/ft)	0.001685	Flow (cfs)	1060.64	1736.62	2.74
Q Total (cfs)	2800.00	Top Width (ft)	203.91	30.20	7.06
Top Width (ft)	241.17	Avg. Vel. (ft/s)	1.27	5.74	0.45
Vel Total (ft/s)	2.45	Hydr. Depth (ft)	4.10	10.02	0.86
Max Chl Dpth (ft)	11.34	Conv. (cfs)	25839.4	42307.6	66.8
Conv. Total (cfs)	68213.8	Wetted Per. (ft)	211.94	41.49	7.33
Length Wtd. (ft)	401.42	Shear (lb/sq ft)	0.41	0.77	0.09
Min Ch El (ft)	929.74	Stream Power (lb/ft s)	0.53	4.40	0.04
Alpha	3.51	Cum Volume (acre-ft)	6.30	8.75	9.02
Frctn Loss (ft)	1.31	Cum SA (acres)	1.59	1.27	4.36
C & E Loss (ft)	0.14				

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 #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	942.72	Wt. n-Val.	0.120	0.040	
Vel Head (ft)	0.35	Reach Len. (ft)	383.24	408.33	377.92
W.S. Elev (ft)	942.37	Flow Area (sq ft)	637.19	341.65	
Crit W.S. (ft)		Area (sq ft)	637.19	341.65	
E.G. Slope (ft/ft)	0.001533	Flow (cfs)	869.27	1930.73	
Q Total (cfs)	2800.00	Top Width (ft)	129.36	30.20	
Top Width (ft)	159.56	Avg. Vel. (ft/s)	1.36	5.65	
Vel Total (ft/s)	2.86	Hydr. Depth (ft)	4.93	11.31	
Max Chl Dpth (ft)	12.63	Conv. (cfs)	22203.8	49316.3	
Conv. Total (cfs)	71520.1	Wetted Per. (ft)	134.98	44.60	
Length Wtd. (ft)	403.95	Shear (lb/sq ft)	0.45	0.73	
Min Ch El (ft)	929.74	Stream Power (lb/ft s)	0.62	4.14	
Alpha	2.76	Cum Volume (acre-ft)	3.22	9.86	1.22
Frctn Loss (ft)	1.16	Cum SA (acres)	0.67	1.28	0.31
C & E Loss (ft)	0.15				

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: Hope Creek
REACH: 1 RS: 1084

INPUT
Description:
Station Elevation Data num= 78

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	945.77	6.53	945.57	8.72	945.51	16.09	945.25	21.62	945.07
23.39	945.02	26.38	944.93	34.11	944.72	37.58	944.63	46.83	944.39
53.05	943.99	54.98	943.87	55.18	943.86	55.43	943.84	56.41	943.76
57.64	944.01	58.03	944.09	58.45	944.06	60.29	943.95	60.98	943.9
61.87	943.86	63.74	942.23	70.08	937.9	77.53	935.1	80.47	934.2
83.94	932.99	87.76	931.67	88.37	931.65	97.89	931.8	98.61	932.06
105.54	934.29	105.82	934.48	107.48	935.19	108.69	935.84	122.78	944.89
123.54	944.91	140.5	943.47	143.22	943.24	151.87	942.5	152.11	942.48
153.69	941.64	158.76	938.95	163.27	931.15	165.26	927.83	171.38	927.95
179.7	928.36	180.1	928.97	184.02	934.85	185.26	936.47	190.08	936.81
200.52	937.5	205.47	937.81	234.77	937.49	239.69	937.23	252.04	935.07
255.74	934.97	266.1	935.92	281.92	936.14	285.32	937.32	298.44	936.84
314.41	936.61	318.92	936.96	319.24	937.17	331.15	937.25	343.81	938.19
348.75	938.37	354.27	938.82	368.05	939.02	372.86	939.09	376.25	939.13
389.22	939.15	401.38	940.22	439.05	942.05	442.12	942.33	451.19	944
454.27	944.78	460.3	945.41	467.41	946.72				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	158.76	.04	185.26	.12

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

158.76 185.26 53.7 55.9 61.7 .1 .3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	99	947

CROSS SECTION OUTPUT Profile #100 YR

E.G. Elev (ft)	939.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.69	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	938.27	Reach Len. (ft)	53.70	55.90	61.70
Crit W.S. (ft)	938.27	Flow Area (sq ft)	47.63	211.82	220.38
E.G. Slope (ft/ft)	0.008803	Area (sq ft)	47.63	211.82	220.38
Q Total (cfs)	2800.00	Flow (cfs)	95.62	2389.21	315.17
Top Width (ft)	200.33	Top Width (ft)	13.47	26.11	160.75
Vel Total (ft/s)	5.84	Avg. Vel. (ft/s)	2.01	11.28	1.43
Max Chl Dpth (ft)	10.44	Hydr. Depth (ft)	3.54	8.11	1.37
Conv. Total (cfs)	29843.9	Conv. (cfs)	1019.2	25465.4	3359.3
Length Wtd. (ft)	56.49	Wetted Per. (ft)	20.97	36.38	161.36
Min Ch El (ft)	927.83	Shear (lb/sq ft)	1.25	3.20	0.75
Alpha	3.20	Stream Power (lb/ft s)	2.51	36.09	1.07
Frctn Loss (ft)	0.54	Cum Volume (acre-ft)	2.41	6.34	8.04
C & E Loss (ft)	0.01	Cum SA (acres)	0.63	1.01	3.64

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: 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 #100 YR FW

E.G. Elev (ft)	941.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.81	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	939.62	Reach Len. (ft)	53.70	55.90	61.70
Crit W.S. (ft)		Flow Area (sq ft)		247.36	50.33
E.G. Slope (ft/ft)	0.007114	Area (sq ft)		247.36	50.33
Q Total (cfs)	2800.00	Flow (cfs)		2709.80	90.21
Top Width (ft)	47.03	Top Width (ft)		26.50	20.53
Vel Total (ft/s)	9.41	Avg. Vel. (ft/s)		10.95	1.79
Max Chl Dpth (ft)	11.79	Hydr. Depth (ft)		9.33	2.45
Conv. Total (cfs)	33198.3	Conv. (cfs)		32128.8	1069.5
Length Wtd. (ft)	56.13	Wetted Per. (ft)		37.83	22.38
Min Ch El (ft)	927.83	Shear (lb/sq ft)		2.90	1.00
Alpha	1.31	Stream Power (lb/ft s)		31.81	1.79
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	0.42	7.10	1.00
C & E Loss (ft)	0.11	Cum SA (acres)	0.10	1.01	0.22

CROSS SECTION

RIVER: Hope Creek
REACH: 1
RS: 1027.831

INPUT
Description: 41
Station Elevation Data num= 78

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.64	.11	943.66	.26	943.69	.47	943.74	3.16	943.35
8.41	942.72	8.57	942.7	8.6	942.7	8.63	942.7	8.69	942.7
8.77	942.7	8.8	942.67	10.14	942.06	19.03	938.04	20.45	937.31
21.15	936.76	23.71	934.69	24.42	934.07	27.5	933.27	33.75	931.64
33.91	931.6	34.39	931.49	34.79	931.48	35.58	931.5	41.42	931.61
42.18	931.82	42.3	931.86	49.56	934.07	49.69	934.1	52.11	934.7
52.83	935.25	53.16	935.5	53.38	935.67	57.6	938.89	63.46	943.36
64.81	943.38	66.6	943.71	75.4	942.96	103.47	938.63	107.04	937.23
107.29	936.79	110.84	930.57	110.91	930.72	112.29	927.42	123.63	928.15
126.77	928.46	129.58	930.95	131.58	932.89	133.77	935	136.12	935.57
141.91	935.67	144.88	935.93	168.07	934.94	173.97	934.87	177.44	934.94
180.68	935.1	183.38	935.12	206.79	934.58	214.04	935.27	225.7	937.14
234.19	936.22	243.54	936.41	250.97	936.46	257.91	936.81	259.34	936.65
261.48	937.11	268.27	936.97	287.64	938.55	291.44	938.6	317.37	938.95
335.12	939.19	339.22	939.19	356.99	940.76	382.79	943.01	385.89	943.23
387.25	943.38	388.26	943.43	390.52	943.72				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	107.04	.04	136.12	.12

Bank Sta: Left 107.04 Right 136.12
Lengths: Left 76.72 Channel 78.07 Right 78.34
Coeff Contr. .1
Expan. .3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	40.88	945

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	939.00	Element			
Vel Head (ft)	1.76	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	937.24	Reach Len. (ft)	76.72	78.07	78.34
Crit W.S. (ft)		Flow Area (sq ft)	50.43	203.31	201.94
E.G. Slope (ft/ft)	0.010372	Area (sq ft)	50.43	203.31	201.94
Q Total (cfs)	2800.00	Flow (cfs)	112.27	2355.95	331.78
Top Width (ft)	179.11	Top Width (ft)	14.58	29.08	135.45
Vel Total (ft/s)	6.14	Avg. Vel. (ft/s)	2.23	11.59	1.64
Max Chl Dpth (ft)	9.82	Hydr. Depth (ft)	3.46	6.99	1.49
Conv. Total (cfs)	27492.9	Conv. (cfs)	1102.4	23132.9	3257.7
Length Wtd. (ft)	77.95	Wetted Per. (ft)	21.52	37.93	135.81
Min Ch El (ft)	927.42	Shear (lb/sq ft)	1.52	3.47	0.96
Alpha	3.01	Stream Power (lb/ft s)	3.38	40.22	1.58
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	2.35	6.07	7.74
C & E Loss (ft)	0.32	Cum SA (acres)	0.62	0.98	3.43

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 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 #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	940.96	Element			
Vel Head (ft)	1.45	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	939.51	Reach Len. (ft)	76.72	78.07	78.34
Crit W.S. (ft)		Flow Area (sq ft)		269.37	68.26
E.G. Slope (ft/ft)	0.005617	Area (sq ft)		269.37	68.26
Q Total (cfs)	2800.00	Flow (cfs)		2665.01	134.99
Top Width (ft)	47.03	Top Width (ft)		29.08	17.95
Vel Total (ft/s)	8.29	Avg. Vel. (ft/s)		9.89	1.98
Max Chl Dpth (ft)	12.09	Hydr. Depth (ft)		9.26	3.80
Conv. Total (cfs)	37360.7	Conv. (cfs)		35559.5	1801.2
Length Wtd. (ft)	78.06	Wetted Per. (ft)		40.21	21.94
Min Ch El (ft)	927.42	Shear (lb/sq ft)		2.35	1.09
Alpha	1.36	Stream Power (lb/ft s)		23.24	2.16
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)	0.42	6.77	0.92
C & E Loss (ft)	0.11	Cum SA (acres)	0.10	0.98	0.19

CROSS SECTION

RIVER: Hope Creek
REACH: 1
RS: 949.7572

INPUT
Description: 42
Station Elevation Data num= 101

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.79	1	943.76	5.16	943.66	8.7	943.48	12.91	943.23
13.26	943.23	13.55	943.2	13.92	943.17	14.75	943.09	15.36	943.21
16.27	943.41	18.16	943.24	20.55	943.08	26.6	940.19	28.03	939.5
29.65	938.73	34.6	936.52	35.78	935.8	38.74	933.98	39.11	933.76
41.67	933.23	49.84	931.54	51.38	931.5	58.31	931.32	66.73	933.85
67.61	934.12	69.32	934.16	71.76	934.21	86.6	933.94	86.82	933.94
86.85	933.94	104.1	933.96	104.52	933.45	105.52	932.83	110.64	929.65
115.12	926.86	121.54	926.93	127.95	926.93	131.57	931.93	132.62	933.46
133.76	933.42	135.15	933.49	150.91	934.25	174.08	935.44	175.6	935.45
177.91	935.79	197.28	935.53	215.59	935.97	216.91	936.01	218.12	936.06
228.46	936.33	231.16	936.23	233.14	936.15	240.03	935.92	247.58	936.52
254.49	936.95	261.34	937.02	267.28	937.63	267.72	937.68	268.03	937.68
268.29	937.69	268.42	937.69	268.63	937.69	272.47	937.76	273.62	937.79
317.79	938.07	322.25	938.15	344.92	938.59	356.38	938.81	360.75	938.9
366.67	939.01	371.41	939.32	371.47	939.45	371.6	939.7	371.71	939.91
371.84	939.91	372.29	939.94	375.27	940.02	386.37	940.98	386.77	940.98
386.87	940.97	387.07	940.53	387.12	940.41	394.7	940.52	394.76	940.52
394.79	940.52	394.93	940.52	395.94	940.56	396.62	940.6	400.62	940.81
405.48	941.1	405.49	941.13	405.72	941.51	405.75	941.51	406.22	941.51
406.51	941.51	411.8	942.01	412.47	942.37	415.9	942.45	418.57	942.52
424.64	943.1								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	104.1	.04	132.62	.12

Bank Sta: Left Right
104.1 132.62

Lengths: Left Channel Right
69.19 71.66 70.51

Coeff Contr. .1
Expan. .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	21.33		F

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	938.28	Element			
Vel Head (ft)	0.71	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	937.56	Reach Len. (ft)	69.19	71.66	70.51
Crit W.S. (ft)		Flow Area (sq ft)	290.98	251.32	265.42
E.G. Slope (ft/ft)	0.003184	Area (sq ft)	290.98	251.32	265.42
Q Total (cfs)	2800.00	Flow (cfs)	508.87	1998.90	292.23
Top Width (ft)	234.37	Top Width (ft)	71.84	28.52	134.01
Vel Total (ft/s)	3.47	Avg. Vel. (ft/s)	1.75	7.95	1.10
Max Chl Dpth (ft)	10.70	Hydr. Depth (ft)	4.05	8.81	1.98
Conv. Total (cfs)	49624.2	Conv. (cfs)	9018.7	35426.3	5179.2
Length Wtd. (ft)	71.18	Wetted Per. (ft)	73.48	34.00	134.17
Min Ch El (ft)	926.86	Shear (lb/sq ft)	0.79	1.47	0.39
Alpha	3.81	Stream Power (lb/ft s)	1.38	11.68	0.43
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	2.05	5.66	7.32
C & E Loss (ft)	0.13	Cum SA (acres)	0.54	0.92	3.18

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 #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	940.55	Element			
Vel Head (ft)	1.09	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	939.45	Reach Len. (ft)	69.19	71.66	70.51
Crit W.S. (ft)		Flow Area (sq ft)	50.85	305.20	54.22
E.G. Slope (ft/ft)	0.002900	Area (sq ft)	50.85	305.20	54.22
Q Total (cfs)	2800.00	Flow (cfs)	77.38	2637.10	85.52
Top Width (ft)	47.03	Top Width (ft)	9.25	28.52	9.26
Vel Total (ft/s)	6.82	Avg. Vel. (ft/s)	1.52	8.64	1.58

Max Chl Dpth (ft)	12.59	Hydr. Depth (ft)	5.50	10.70	5.86
Conv. Total (cfs)	51992.5	Conv. (cfs)	1436.9	48967.6	1588.0
Length Wtd. (ft)	71.60	Wetted Per. (ft)	14.75	34.00	14.91
Min Ch El (ft)	926.86	Shear (lb/sq ft)	0.62	1.63	0.66
Alpha	1.51	Stream Power (lb/ft s)	0.95	14.04	1.04
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	0.38	6.25	0.81
C & E Loss (ft)	0.19	Cum SA (acres)	0.09	0.92	0.17

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: Hope Creek
REACH: 1 RS: 878.1000

INPUT
Description: 43
Station Elevation Data num= 79

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.4	4.62	943.27	12.24	942.85	13.31	942.79	14.12	942.73
14.71	942.68	15.15	942.76	16.29	942.99	18.76	942.58	19.41	942.47
19.52	942.46	19.72	942.51	19.97	942.47	22.77	941.14	26.12	939.56
30.92	937.28	33.11	936.24	35.42	935.49	37.97	934.62	41.46	933.43
44.51	932.73	51.56	931.08	56.54	930.66	57.07	930.61	59.4	931.43
63.04	933.05	64.33	933.1	65.33	933.15	67.44	930.19	69.77	926.96
78.74	927	89.85	926.71	97.65	926.93	98.25	927.28	106.61	932.18
108.09	933.66	119.52	933.66	124.63	933.55	125.69	932.83	131.34	930.43
144.19	930.77	157.15	930.94	160.97	932.4	165.06	933.66	165.68	933.94
165.79	933.97	174.11	934.07	174.39	934.08	181.48	934.3	181.53	934.3
181.95	934.31	196.47	934.26	196.85	934.27	200.03	934.36	213.22	934.59
219.4	934.83	226.87	934.97	231.24	935.18	246.06	935.99	247.45	936.14
248.28	936.23	248.84	936.24	259.76	936.54	281.28	936.87	295.4	937.26
295.55	937.26	295.62	937.26	306.15	937.47	307.19	937.49	307.21	937.49
307.24	937.49	327.79	938.51	333.23	938.62	333.32	938.62	333.5	938.62
339.82	938.76	347.5	939.48	382.45	942.32	384.11	942.43		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	65.33	.04	108.09	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
65.33 108.09 18.27 18.76 20.13 .1 .3

Ineffective Flow num= 1
Sta L Sta R Elev Permanent
300 384.11 F

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	938.03	Element			
Vel Head (ft)	0.29	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	937.74	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	933.05	Flow Area (sq ft)	166.20	417.32	634.40
E.G. Slope (ft/ft)	0.001000	Area (sq ft)	166.20	417.32	637.36
Q Total (cfs)	2800.00	Flow (cfs)	177.35	2073.77	548.89
Top Width (ft)	282.35	Top Width (ft)	35.38	42.76	204.21
Vel Total (ft/s)	2.30	Avg. Vel. (ft/s)	1.07	4.97	0.87
Max Chl Dpth (ft)	11.03	Hydr. Depth (ft)	4.70	9.76	3.31
Conv. Total (cfs)	88523.6	Conv. (cfs)	5606.9	65563.3	17353.4
Length Wtd. (ft)	4.00	Wetted Per. (ft)	36.96	47.98	193.22
Min Ch El (ft)	926.71	Shear (lb/sq ft)	0.28	0.54	0.21
Alpha	3.50	Stream Power (lb/ft s)	0.30	2.70	0.18
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	1.69	5.11	6.59
C & E Loss (ft)	0.00	Cum SA (acres)	0.46	0.87	2.91

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	940.24	Element			
Vel Head (ft)	0.47	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	939.77	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	933.06	Flow Area (sq ft)		503.90	26.07

E.G. Slope (ft/ft)	0.001139	Area (sq ft)		503.90	proposed FW.rep
Q Total (cfs)	2800.00	Flow (cfs)		2779.86	26.07
Top Width (ft)	47.03	Top Width (ft)		42.76	20.14
Vel Total (ft/s)	5.28	Avg. Vel. (ft/s)		5.52	4.27
Max Chl Dpth (ft)	13.06	Hydr. Depth (ft)		11.78	0.77
Conv. Total (cfs)	82958.2	Conv. (cfs)		82361.5	6.11
Length Wtd. (ft)	4.00	Wetted Per. (ft)		54.60	596.7
Min Ch El (ft)	926.71	Shear (lb/sq ft)		0.66	10.38
Alpha	1.08	Stream Power (lb/ft s)		3.62	0.18
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.34	5.59	0.14
C & E Loss (ft)	0.00	Cum SA (acres)	0.08	0.87	0.75
					0.16

Warning: The cross section had to be extended vertically during the critical depth calculations.

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 871

INPUT
Description: BR 16 Bnt 8
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	950	945	500	950	945

Upstream Bridge Cross Section Data
Station Elevation Data num= 79

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.44	4.62	943.31	12.24	942.89	13.31	942.83	14.12	942.77
14.71	942.72	15.15	942.8	16.29	943.03	18.76	942.62	19.41	942.51
19.52	942.5	19.72	942.55	19.97	942.51	22.77	941.18	26.12	939.6
30.92	937.32	33.11	936.28	35.42	935.53	37.97	934.66	41.46	933.47
44.51	932.77	51.56	931.12	56.54	930.7	57.07	930.65	59.4	931.47
63.04	933.09	64.33	933.14	65.33	933.19	67.44	930.23	69.77	927
78.74	927.04	89.85	926.75	97.65	926.97	98.25	927.32	106.61	932.22
108.09	933.7	119.52	933.7	124.63	933.59	125.69	932.87	131.34	930.47
144.19	930.81	157.15	930.98	160.97	932.44	165.06	933.7	165.68	933.98
165.79	934.01	174.11	934.11	174.39	934.12	181.48	934.34	181.53	934.34
181.95	934.35	196.47	934.3	196.85	934.31	200.03	934.4	213.22	934.63
219.4	934.87	226.87	935.01	231.24	935.22	246.06	936.03	247.45	936.18
248.28	936.27	248.84	936.28	259.76	936.58	281.28	936.91	295.4	937.3
295.55	937.3	295.62	937.3	306.15	937.51	307.19	937.53	307.21	937.53
307.24	937.53	327.79	938.55	333.23	938.66	333.32	938.66	333.5	938.66
339.82	938.8	347.5	939.52	382.45	942.36	384.11	942.47		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	65.33	.04	108.09	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
65.33	108.09	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
300	384.11		F

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	950	945	500	950	945

Downstream Bridge Cross Section Data
Station Elevation Data num= 87

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.33	.75	943.31	8.78	943.08	16.47	942.65	17.59	942.58
17.89	942.56	18.96	942.46	19.36	942.53	19.82	942.62	20.56	942.76
21.51	942.62	22.04	942.55	22.72	942.45	24.27	942.26	28.56	940.22
37.18	936.16	42.05	934.57	45.51	933.48	47.73	932.96	50.65	932.26
55.86	930.92	59.41	930.71	61.27	930.54	65.35	932.07	67.41	932.93
67.55	932.99	67.67	933.04	68.71	932.86	70.18	932.69	70.85	930.96
76.45	926.8	90.47	926.89	97.43	926.98	100.48	928.94	108.35	933.17

115.62	933.29	118.97	933.29	121.95	931.21	123.63	930.22	127.08	930.41
136.35	930.19	138.36	930.14	144.5	930.2	146.07	930.79	147.83	931.29
154.58	933.42	156.91	932.69	157.16	932.61	166.32	933.59	166.43	933.59
172.14	933.67	177.28	933.48	186.03	933.7	189.81	933.58	191.49	933.52
194.87	933.34	201.39	933.81	205.36	933.97	211.79	934.3	213.69	934.39
220.86	934.75	223.53	935.03	232.87	935.43	236.51	935.65	245.35	935.86
247.96	935.93	258	936.22	258.09	936.22	258.14	936.22	260.1	936.25
268.67	936.48	270.38	936.49	285.85	936.74	305.53	937.04	306.54	937.07
306.56	937.07	307.32	937.08	307.4	937.08	333.26	938.37	333.47	938.38
333.48	938.38	333.73	938.38	334.71	938.47	349.59	939.35	372.72	940.84
382.06	941.29	387.77	942.12						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	67.67	.04	108.35	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
67.67	108.35	.1	.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data
Pier Station Upstream= 36.52 Downstream= 40.86
Upstream num= 2

Width	Elev	Width	Elev
8	925	8	945

Downstream num= 2

Width	Elev	Width	Elev
8	925	8	945

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Momentum Cd = 2
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 YR

			Inside BR US	Inside BR DS
E.G. US. (ft)	938.03	Element		
W.S. US. (ft)	937.74	E.G. Elev (ft)	938.02	938.02
Q Total (cfs)	2800.00	W.S. Elev (ft)	937.72	937.70
Q Bridge (cfs)	2800.00	Crit W.S. (ft)	933.09	933.25
Q Weir (cfs)		Max Chl Dpth (ft)	10.97	10.90
Weir Sta Lft (ft)		Vel Total (ft/s)	2.37	2.34
Weir Sta Rgt (ft)		Flow Area (sq ft)	1182.03	1198.42
Weir Submerg		Froude # Chl	0.29	0.31
Weir Max Depth (ft)		Specif Force (cu ft)	4254.29	4177.84
Min El Weir Flow (ft)	950.01	Hydr Depth (ft)	4.51	4.31
Min El Prs (ft)	945.00	W.P. Total (ft)	274.65	290.45
Delta EG (ft)	0.02	Conv. Total (cfs)	86815.3	80623.1
Delta WS (ft)	0.06	Top Width (ft)	273.09	277.95
BR Open Area (sq ft)	3176.06	Frctn Loss (ft)	0.01	0.01
BR Open Vel (ft/s)	2.37	C & E Loss (ft)	0.00	0.00
Coef of Q		Shear Total (lb/sq ft)	0.28	0.31
Br Sel Method	Energy only	Power Total (lb/ft s)	0.66	0.73

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

BRIDGE OUTPUT Profile #100 YR FW

E.G. US. (ft)	940.24	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	939.77	E.G. Elev (ft)	940.23	940.22
Q Total (cfs)	2800.00	W.S. Elev (ft)	939.76	939.66
Q Bridge (cfs)	2800.00	Crit W.S. (ft)	933.10	933.82
Q Weir (cfs)		Max Chl Dpth (ft)	13.01	12.86
Weir Sta Lft (ft)		Vel Total (ft/s)	5.30	5.65
Weir Sta Rgt (ft)		Flow Area (sq ft)	527.99	495.35
Weir Submerg		Froude # Chl	0.28	0.32
Weir Max Depth (ft)		Specif Force (cu ft)	3574.18	3277.90
Min El Weir Flow (ft)	950.01	Hydr Depth (ft)	11.23	10.53
Min El Prs (ft)	945.00	W.P. Total (ft)	52.25	51.26
Delta EG (ft)	0.03	Conv. Total (cfs)	90298.8	80737.2
Delta WS (ft)	0.14	Top Width (ft)	47.03	47.03
BR Open Area (sq ft)	746.37	Frctn Loss (ft)	0.01	0.01
BR Open Vel (ft/s)	5.65	C & E Loss (ft)	0.01	0.00
Coef of Q		Shear Total (lb/sq ft)	0.61	0.73
Br Sel Method	Energy only	Power Total (lb/ft s)	3.22	4.10

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 859.3424

INPUT
Description: 44
Station Elevation Data num= 87

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.41	.75	943.39	8.78	943.16	16.47	942.73	17.59	942.66
17.89	942.64	18.96	942.54	19.36	942.61	19.82	942.7	20.56	942.84
21.51	942.7	22.04	942.63	22.72	942.53	24.27	942.34	28.56	940.3
37.18	936.24	42.05	934.65	45.51	933.56	47.73	933.04	50.65	932.34
55.86	931	59.41	930.79	61.27	930.62	65.35	932.15	67.41	933.01
67.55	933.07	67.67	933.12	68.71	932.94	70.18	932.77	70.85	931.04
76.45	926.88	90.47	926.97	97.43	927.06	100.48	929.02	108.35	933.25
115.62	933.37	118.97	933.37	121.95	931.29	123.63	930.3	127.08	930.49
136.35	930.27	138.36	930.22	144.5	930.28	146.07	930.87	147.83	931.37
154.58	933.5	156.91	932.77	157.16	932.69	166.32	933.67	166.43	933.67
172.14	933.75	177.28	933.56	186.03	933.78	189.81	933.66	191.49	933.6
194.87	933.42	201.39	933.89	205.36	934.05	211.79	934.38	213.69	934.47
220.86	934.83	223.53	935.11	232.87	935.51	236.51	935.73	245.35	935.94
247.96	936.01	258	936.3	258.09	936.3	258.14	936.3	260.1	936.33
268.67	936.56	270.38	936.57	285.85	936.82	305.53	937.12	306.54	937.15
306.56	937.15	307.32	937.16	307.4	937.16	333.26	938.45	333.47	938.46
333.48	938.46	333.73	938.46	334.71	938.55	349.59	939.43	372.72	940.92
382.06	941.37	387.77	942.2						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	67.67	.04	108.35	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
67.67	108.35	123.89	123.81	123.48	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

E.G. Elev (ft)	938.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	937.68	Reach Len. (ft)	123.89	123.81	123.48
Crit W.S. (ft)		Flow Area (sq ft)	155.63	370.70	666.13
E.G. Slope (ft/ft)	0.001250	Area (sq ft)	155.63	370.70	666.13
Q Total (cfs)	2800.00	Flow (cfs)	183.93	1988.92	627.15
Top Width (ft)	283.78	Top Width (ft)	33.55	40.68	209.55

Vel Total (ft/s)	2.35	Avg. Vel. (ft/s)	1.18	5.37	0.94
Max Chl Dpth (ft)	10.80	Hydr. Depth (ft)	4.64	9.11	3.18
Conv. Total (cfs)	79183.5	Conv. (cfs)	5201.5	56246.4	17735.6
Length Wtd. (ft)	123.74	Wetted Per. (ft)	35.10	44.91	211.27
Min Ch El (ft)	926.88	Shear (lb/sq ft)	0.35	0.64	0.25
Alpha	3.76	Stream Power (lb/ft s)	0.41	3.46	0.23
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)	1.62	4.95	6.31
C & E Loss (ft)	0.01	Cum SA (acres)	0.44	0.85	2.82

CROSS SECTION OUTPUT Profile #100 YR FW

			Left OB	Channel	Right OB
E.G. Elev (ft)	940.20	Element			
Vel Head (ft)	0.58	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	939.63	Reach Len. (ft)	123.89	123.81	123.48
Crit W.S. (ft)		Flow Area (sq ft)		449.72	40.16
E.G. Slope (ft/ft)	0.001512	Area (sq ft)		449.72	40.16
Q Total (cfs)	2800.00	Flow (cfs)		2758.17	41.83
Top Width (ft)	47.03	Top Width (ft)		40.68	6.35
Vel Total (ft/s)	5.72	Avg. Vel. (ft/s)		6.13	1.04
Max Chl Dpth (ft)	12.75	Hydr. Depth (ft)		11.06	6.32
Conv. Total (cfs)	71999.6	Conv. (cfs)		70924.0	1075.6
Length Wtd. (ft)	123.80	Wetted Per. (ft)		51.41	12.62
Min Ch El (ft)	926.88	Shear (lb/sq ft)		0.83	0.30
Alpha	1.13	Stream Power (lb/ft s)		5.07	0.31
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	0.34	5.39	0.73
C & E Loss (ft)	0.05	Cum SA (acres)	0.08	0.85	0.16

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 735.5340

INPUT
Description: 45
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.13	3.78	943.02	6.78	942.93	10.3	942.83	14.96	942.68
19.33	942.54	20.22	942.5	25.75	942.23	28.02	942.11	29.17	942.05
32.12	941.84	32.54	941.81	35.07	941.66	42.67	936.74	43.14	936.42
43.68	936.08	44.17	935.95	44.64	935.84	54.3	933.46	62.22	931.26
64.32	930.68	65.85	930.65	72.51	930.55	75.8	931.43	77.21	931.81
79.99	932.56	82.41	933.21	85.18	933.45	90.62	933.36	92.4	929.94
95.39	926.37	100.59	926.47	104.21	926.54	111.26	926.59	114.02	928.4
118.04	932.88	131.84	932.51	139.52	932.02	154.34	932	156.27	932
157.55	932.01	170.29	932.22	171.44	932.26	174.81	932.59	188.36	933.24
193.73	934.12	194.83	934.17	199.73	934.24	201.97	934.27	207.25	934.44
209.03	934.5	212.65	934.97	220.18	934.66	228.85	934.72	235.85	935.06
245.79	934.97	255.94	935.08	268.99	935.77	274.38	935.81	287.92	935.59
291.34	935.62	306	935.64	314.36	935.69	320.46	935.84	325.38	936.59
326.25	936.27	329.92	936.78	334.99	937.33	337.92	937.79	349.59	939.43
372.72	940.92	382.06	941.37	387.77	942.2				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	90.62	.04	118.04	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
90.62	118.04	19.18	19.15	18.15	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
266	387.77		F

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	937.80	Element			
Vel Head (ft)	0.42	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	937.39	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	934.71	Flow Area (sq ft)	225.36	264.97	556.72
E.G. Slope (ft/ft)	0.001966	Area (sq ft)	225.36	264.97	660.86
Q Total (cfs)	2800.00	Flow (cfs)	335.81	1725.45	738.75
Top Width (ft)	293.69	Top Width (ft)	48.95	27.42	217.32
Vel Total (ft/s)	2.67	Avg. Vel. (ft/s)	1.49	6.51	1.33
Max Chl Dpth (ft)	11.02	Hydr. Depth (ft)	4.60	9.66	3.76

Conv. Total (cfs)	63152.9	Conv. (cfs)	7574.0	38916.8	16662.1
Length Wtd. (ft)	4.00	Wetted Per. (ft)	50.40	33.70	148.15
Min Ch El (ft)	926.37	Shear (lb/sq ft)	0.55	0.96	0.46
Alpha	3.76	Stream Power (lb/ft s)	0.82	6.28	0.61
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	1.08	4.04	4.43
C & E Loss (ft)	0.00	Cum SA (acres)	0.33	0.75	2.21

CROSS SECTION OUTPUT Profile #100 YR FW

E.G. Elev (ft)	939.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.07	Wt. n-Val.	0.120	0.040	0.120
W.S. Elev (ft)	938.84	Reach Len. (ft)	4.00	4.00	4.00
Crit W.S. (ft)	934.77	Flow Area (sq ft)	29.54	304.68	87.09
E.G. Slope (ft/ft)	0.002828	Area (sq ft)	29.54	304.68	87.09
Q Total (cfs)	2800.00	Flow (cfs)	37.99	2611.73	150.28
Top Width (ft)	47.03	Top Width (ft)	5.44	27.42	14.17
Vel Total (ft/s)	6.65	Avg. Vel. (ft/s)	1.29	8.57	1.73
Max Chl Dpth (ft)	12.47	Hydr. Depth (ft)	5.43	11.11	6.15
Conv. Total (cfs)	52656.0	Conv. (cfs)	714.3	49115.5	2826.2
Length Wtd. (ft)	4.00	Wetted Per. (ft)	10.83	33.70	20.52
Min Ch El (ft)	926.37	Shear (lb/sq ft)	0.48	1.60	0.75
Alpha	1.56	Stream Power (lb/ft s)	0.62	13.68	1.29
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.29	4.31	0.55
C & E Loss (ft)	0.03	Cum SA (acres)	0.08	0.75	0.13

Warning: The cross section had to be extended vertically during the critical depth calculations.

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 728

INPUT
Description: BR 16 Bnt 7
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	950	945	500	950	945

Upstream Bridge Cross Section Data
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.09	3.78	942.98	6.78	942.89	10.3	942.79	14.96	942.64
19.33	942.5	20.22	942.46	25.75	942.19	28.02	942.07	29.17	942.01
32.12	941.8	32.54	941.77	35.07	941.62	42.67	936.7	43.14	936.38
43.68	936.04	44.17	935.91	44.64	935.8	54.3	933.42	62.22	931.22
64.32	930.64	65.85	930.61	72.51	930.51	75.8	931.39	77.21	931.77
79.99	932.52	82.41	933.17	85.18	933.41	90.62	933.32	92.4	929.9
95.39	926.33	100.59	926.43	104.21	926.5	111.26	926.55	114.02	928.36
118.04	932.84	131.84	932.47	139.52	931.98	154.34	931.96	156.27	931.96
157.55	931.97	170.29	932.18	171.44	932.22	174.81	932.55	188.36	933.2
193.73	934.08	194.83	934.13	199.73	934.2	201.97	934.23	207.25	934.4
209.03	934.46	212.65	934.93	220.18	934.62	228.85	934.68	235.85	935.02
245.79	934.93	255.94	935.04	268.99	935.73	274.38	935.77	287.92	935.55
291.34	935.58	306	935.6	314.36	935.65	320.46	935.8	325.38	936.55
326.25	936.23	329.92	936.74	334.99	937.29	337.92	937.75	349.59	939.39
372.72	940.88	382.06	941.33	387.77	942.16				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	90.62	.04	118.04	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
90.62	118.04	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
266	387.77		F

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	950	945	500	950	945

Downstream Bridge Cross Section Data
Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.31	.67	943.29	3.63	943.2	12.92	942.93	23.8	942.61
25.43	942.55	31.56	942.28	32.74	942.22	35.68	942.1	37.39	941.97
40.89	941.7	41.23	941.68	41.33	941.67	41.39	941.66	41.49	941.6
50.2	936.01	60.57	933.29	60.72	933.25	69.81	930.73	69.89	930.68
78.25	930.5	78.54	930.49	78.75	930.64	88.68	933.31	98.57	933.14
99.37	933.2	102.75	927.16	103.13	926.47	103.28	926.27	116.97	926.55
118.4	926.56	118.91	926.97	124.26	932.94	124.52	932.95	138.12	932.03
138.33	931.97	139.89	931.96	143.44	931.99	157.74	932.24	162.63	932.09
171.95	932.13	179.1	932.28	180.24	932.29	180.65	932.32	181.58	932.42
191.38	933.42	194.71	934.05	198.87	934.62	200.85	935.48	204.37	936.37
211.1	936.56	217.68	936.56	227.54	936.64	245.88	936.79	251.73	936.89
257.2	937.02	290.84	937.41	295.8	937.53	303.59	937.32	328.94	937.58
340.6	937.69	349.59	939.52	372.72	941.01	382.06	941.46	387.77	942.29

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	99.37	.04	124.26	.12

Bank Sta: Left	Right	Coeff Contr.	Expan.
99.37	124.26	.1	.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data
Pier Station Upstream= 51.93 Downstream= 58.2
Upstream num= 2

Width	Elev	Width	Elev
8	925	8	950

Downstream num= 2

Width	Elev	Width	Elev
8	925	8	950

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Momentum Cd = 2
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 YR

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	937.80	E.G. Elev (ft)	937.79	937.75
W.S. US. (ft)	937.39	W.S. Elev (ft)	937.36	937.02
Q Total (cfs)	2800.00	Crit W.S. (ft)	934.66	934.80
Q Bridge (cfs)	2800.00	Max Chl Dpth (ft)	11.03	10.75
Q Weir (cfs)		Vel Total (ft/s)	2.73	3.55
Weir Sta Lft (ft)		Flow Area (sq ft)	1023.80	789.49
Weir Sta Rgt (ft)		Froude # Chl	0.37	0.48
Weir Submerg		Specif Force (cu ft)	3456.55	2950.80
Weir Max Depth (ft)		Hydr Depth (ft)	4.73	3.94
Min El Weir Flow (ft)	950.01	W.P. Total (ft)	230.80	215.19
Min El Prs (ft)	945.00			

Delta EG (ft)	0.10	Conv. Total (cfs)	62599.7	47547.9
Delta WS (ft)	0.36	Top Width (ft)	285.82	200.46
BR Open Area (sq ft)	2800.44	Frctn Loss (ft)	0.02	0.03
BR Open Vel (ft/s)	3.55	C & E Loss (ft)	0.03	0.02
Coef of Q		Shear Total (lb/sq ft)	0.55	0.79
Br Sel Method	Energy only	Power Total (lb/ft s)	1.52	2.82

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #100 YR FW

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	939.90	E.G. Elev (ft)	939.87	939.83
W.S. US. (ft)	938.84	W.S. Elev (ft)	938.88	938.65
Q Total (cfs)	2800.00	Crit W.S. (ft)	934.76	935.23
Q Bridge (cfs)	2800.00	Max Chl Dpth (ft)	12.55	12.38
Q Weir (cfs)		Vel Total (ft/s)	6.58	7.00
Weir Sta Lft (ft)		Flow Area (sq ft)	425.48	400.01
Weir Sta Rgt (ft)		Froude # Chl	0.44	0.49
Weir Submerg		Specif Force (cu ft)	2801.63	2644.53
Weir Max Depth (ft)		Hydr Depth (ft)	9.05	8.51
Min El Weir Flow (ft)	950.01	W.P. Total (ft)	53.32	53.92
Min El Prs (ft)	945.00	Conv. Total (cfs)	54636.8	47496.9
Delta EG (ft)	0.12	Top Width (ft)	47.03	47.03
Delta WS (ft)	0.34	Frctn Loss (ft)	0.02	0.03
BR Open Area (sq ft)	698.59	C & E Loss (ft)	0.02	0.01
BR Open Vel (ft/s)	7.00	Shear Total (lb/sq ft)	1.31	1.61
Coef of Q		Power Total (lb/ft s)	8.61	11.27
Br Sel Method	Energy only			

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 716.3877

INPUT
Description: 46
Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.22	.67	943.2	3.63	943.11	12.92	942.84	23.8	942.52
25.43	942.46	31.56	942.19	32.74	942.13	35.68	942.01	37.39	941.88
40.89	941.61	41.23	941.59	41.33	941.58	41.39	941.57	41.49	941.51
50.2	935.92	60.57	933.2	60.72	933.16	69.81	930.64	69.89	930.59
78.25	930.41	78.54	930.4	78.75	930.55	88.68	933.22	98.57	933.05
99.37	933.11	102.75	927.07	103.13	926.38	103.28	926.18	116.97	926.46
118.4	926.47	118.91	926.88	124.26	932.85	124.52	932.86	138.12	931.94
138.33	931.88	139.89	931.87	143.44	931.9	157.74	932.15	162.63	932
171.95	932.04	179.1	932.19	180.24	932.2	180.65	932.23	181.58	932.33
191.38	933.33	194.71	933.96	198.87	934.53	200.85	935.39	204.37	936.28
211.1	936.47	217.68	936.47	227.54	936.55	245.88	936.7	251.73	936.8
257.2	936.93	290.84	937.32	295.8	937.44	303.59	937.23	328.94	937.49
340.6	937.6	349.59	939.43	372.72	940.92	382.06	941.37	387.77	942.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	99.37	.04	124.26	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
99.37	124.26	125.31	121.03	115.29	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	937.70	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.68	Reach Len. (ft)	125.31	121.03	115.29
W.S. Elev (ft)	937.02	Flow Area (sq ft)	224.58	234.14	375.86
Crit W.S. (ft)		Area (sq ft)	224.58	234.14	375.86
E.G. Slope (ft/ft)	0.003235	Flow (cfs)	417.72	1874.33	507.96
Q Total (cfs)	2800.00				

Top Width (ft)	216.70	Top Width (ft)	50.89	24.89	140.92
Vel Total (ft/s)	3.35	Avg. Vel. (ft/s)	1.86	8.01	1.35
Max Chl Dpth (ft)	10.84	Hydr. Depth (ft)	4.41	9.41	2.67
Conv. Total (cfs)	49225.4	Conv. (cfs)	7343.7	32951.6	8930.1
Length Wtd. (ft)	120.46	Wetted Per. (ft)	52.33	31.75	141.42
Min Ch El (ft)	926.18	Shear (lb/sq ft)	0.87	1.49	0.54
Alpha	3.89	Stream Power (lb/ft s)	1.61	11.92	0.73
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	0.99	3.94	4.22
C & E Loss (ft)	0.00	Cum SA (acres)	0.31	0.74	2.14

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	939.78	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	1.29	Reach Len. (ft)	125.31	121.03	115.29
W.S. Elev (ft)	938.50	Flow Area (sq ft)	57.36	270.84	68.78
Crit W.S. (ft)		Area (sq ft)	57.36	270.84	68.78
E.G. Slope (ft/ft)	0.003744	Flow (cfs)	101.94	2570.07	127.99
Q Total (cfs)	2800.00	Top Width (ft)	10.69	24.89	11.45
Top Width (ft)	47.03	Avg. Vel. (ft/s)	1.78	9.49	1.86
Vel Total (ft/s)	7.05	Hydr. Depth (ft)	5.37	10.88	6.01
Max Chl Dpth (ft)	12.32	Conv. (cfs)	1665.9	42000.9	2091.7
Conv. Total (cfs)	45758.5	Wetted Per. (ft)	15.97	31.75	17.87
Length Wtd. (ft)	120.96	Shear (lb/sq ft)	0.84	1.99	0.90
Min Ch El (ft)	926.18	Stream Power (lb/ft s)	1.49	18.92	1.67
Alpha	1.67	Cum Volume (acre-ft)	0.27	4.19	0.52
Frctn Loss (ft)	0.59	Cum SA (acres)	0.07	0.74	0.12
C & E Loss (ft)	0.05				

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

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 595.3610

INPUT
Description: 47
Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.8	.77	942.77	1.12	942.76	2.3	942.73	7.21	942.58
13.68	942.39	22.93	942.08	24.77	942.02	25.54	941.99	26.29	941.97
27.24	941.93	28.08	941.89	36.97	941.57	37.46	941.51	40.91	941.11
42.36	940.94	43.18	940.41	44.85	939.44	48.64	937.23	52.91	934.96
56.22	934.19	59.46	933.38	66.6	931.6	72.13	931.26	79.64	930.78
79.72	930.78	84.85	932.25	89.41	933.47	96.06	933.11	101.51	932.85
104.53	929.7	106.62	925.62	112.06	925.86	119.56	925.94	119.63	925.11
122.86	929.24	124.63	933.39	148.93	933.11	154.12	932.86	162.6	932.6
162.78	932.55	162.94	932.58	166.87	932.84	172.93	933.19	178.29	933.5
180.2	933.57	180.27	933.57	184.4	933.69	184.58	933.69	184.9	933.69
185.08	933.33	185.18	933.13	187.42	933.22	187.57	933.22	193.36	933.3
193.62	933.31	214.05	933.63	224.63	933.75	235.64	933.87	243.84	933.93
244.01	934.3	244.09	934.49	244.42	934.49	244.6	934.49	248.9	935.97
248.98	936	249.15	936.06	251.69	936.78	268.31	936.84	329.37	936.99
331.51	937.15	336.63	937.53	337.53	937.69	340.82	938.05	344	938.11
377.28	938.97	402.25	939.31	432.98	940	460.5	940.46	486.66	940.8
518.87	941.14	523.17	941.21	530.38	941.44	559.58	942.39		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	101.51	.04	124.63	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
101.51	124.63	18.02	17.77	17.42	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	937.27	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.68	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	936.59	Flow Area (sq ft)	203.03	214.44	392.44
Crit W.S. (ft)	935.20	Area (sq ft)	203.03	214.44	392.44
E.G. Slope (ft/ft)	0.003963	Flow (cfs)	388.00	1764.71	647.29
Q Total (cfs)	2800.00				

Top Width (ft)	201.18	Top Width (ft)	51.67	23.12	126.39
Vel Total (ft/s)	3.46	Avg. Vel. (ft/s)	1.91	8.23	1.65
Max Chl Dpth (ft)	11.48	Hydr. Depth (ft)	3.93	9.28	3.11
Conv. Total (cfs)	44480.6	Conv. (cfs)	6163.8	28034.0	10282.8
Length Wtd. (ft)	4.00	Wetted Per. (ft)	52.89	32.48	127.50
Min Ch El (ft)	925.11	Shear (lb/sq ft)	0.95	1.63	0.76
Alpha	3.67	Stream Power (lb/ft s)	1.81	13.44	1.26
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	0.37	3.31	3.20
C & E Loss (ft)	0.02	Cum SA (acres)	0.16	0.67	1.79

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	939.15	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	1.80	Reach Len. (ft)	4.00	4.00	4.00
W.S. Elev (ft)	937.35	Flow Area (sq ft)	50.78	231.94	47.54
Crit W.S. (ft)	935.30	Area (sq ft)	50.78	231.94	47.54
E.G. Slope (ft/ft)	0.006576	Flow (cfs)	110.15	2590.81	99.04
Q Total (cfs)	2800.00	Top Width (ft)	12.10	23.12	11.81
Top Width (ft)	47.03	Avg. Vel. (ft/s)	2.17	11.17	2.08
Vel Total (ft/s)	8.48	Hydr. Depth (ft)	4.20	10.03	4.03
Max Chl Dpth (ft)	12.24	Conv. (cfs)	1358.4	31949.7	1221.4
Conv. Total (cfs)	34529.5	Wetted Per. (ft)	15.99	32.48	15.90
Length Wtd. (ft)	4.00	Shear (lb/sq ft)	1.30	2.93	1.23
Min Ch El (ft)	925.11	Stream Power (lb/ft s)	2.83	32.74	2.56
Alpha	1.61	Cum Volume (acre-ft)	0.12	3.49	0.36
Frctn Loss (ft)	0.03	Cum SA (acres)	0.04	0.67	0.09
C & E Loss (ft)	0.00				

Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

BRIDGE

RIVER: Hope Creek
REACH: 1 RS: 589

INPUT
Description: BR 16 Bnt 6
Distance from Upstream XS = 4
Deck/Roadway Width = 6
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	945	942	600	945	942

Upstream Bridge Cross Section Data
Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.92	.77	942.89	1.12	942.88	2.3	942.85	7.21	942.7
13.68	942.51	22.93	942.2	24.77	942.14	25.54	942.11	26.29	942.09
27.24	942.05	28.08	942.01	36.97	941.69	37.46	941.63	40.91	941.23
42.36	941.06	43.18	940.53	44.85	939.56	48.64	937.35	52.91	935.08
56.22	934.31	59.46	933.5	66.6	931.72	72.13	931.38	79.64	930.9
79.72	930.9	84.85	932.37	89.41	933.59	96.06	933.23	101.51	932.97
104.53	929.82	106.62	925.74	112.06	925.98	119.56	926.06	119.63	925.23
122.86	929.36	124.63	933.51	148.93	933.23	154.12	932.98	162.6	932.72
162.78	932.67	162.94	932.7	166.87	932.96	172.93	933.31	178.29	933.62
180.2	933.69	180.27	933.69	184.4	933.81	184.58	933.81	184.9	933.81
185.08	933.45	185.18	933.25	187.42	933.34	187.57	933.34	193.36	933.42
193.62	933.43	214.05	933.75	224.63	933.87	235.64	933.99	243.84	934.05
244.01	934.42	244.09	934.61	244.42	934.61	244.6	934.61	248.9	936.09
248.98	936.12	249.15	936.18	251.69	936.9	268.31	936.96	329.37	937.11
331.51	937.27	336.63	937.65	337.53	937.81	340.82	938.17	344	938.23
377.28	939.09	402.25	939.43	432.98	940.12	460.5	940.58	486.66	940.92
518.87	941.26	523.17	941.33	530.38	941.56	559.58	942.51		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	101.51	.04	124.63	.12

Bank Sta: Left Right Coeff Contr. Expan.

```
        101.51  124.63              .1       .3

 Downstream  Deck/Roadway Coordinates
     num=        2
      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
        0      945     942      600      945     942

 Downstream Bridge Cross Section Data
 Station Elevation Data     num=       81
      Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
        0  942.44    2.79  942.36   11.49  942.11   12.62  942.07   18.49  941.87
    24.12  941.69   31.12  941.38   35.04  941.23   37.07  941.02   39.14   940.8
    40.25  940.67   42.82  939.27   43.99  938.63   47.93  936.37   52.12  934.73
    59.22  932.72   64.68  931.36   66.32  931.26   77.61  930.55   77.69  930.57
    79.18  930.99   87.24  933.17   89.57  933.04   99.42  932.56  104.88  926.89
   105.63   925.4  115.48  925.84  118.16  925.87  119.43  925.84  122.56  933.16
   144.26  932.92  148.05  932.87  159.02  932.74  160.14  932.76  162.73  932.83
    169.9  933.02  173.85  933.09  174.28  933.15  175.37  933.18  177.77  933.35
   178.47   933.4  180.69  933.52  180.93  933.52  181.04  933.52   181.2  933.52
   181.26  933.34   181.4  932.99  190.75  933.06  190.95  933.06  191.43  933.06
   191.64  933.06  195.55  933.13  210.54  933.38   214.3  933.43  238.14  933.69
   238.86  933.69  240.41   933.7  240.44  933.77  240.66  934.27  241.14  934.27
   241.17  934.27  241.42  934.31  241.61  934.34     242  934.41  242.36  934.55
   249.42  936.55  306.93  936.76   330.2  936.82  333.01  937.02  334.16  937.23
   340.82  937.82     344  937.88  377.28  938.74  402.25  939.08  432.98  939.77
    460.5  940.23  486.66  940.57  518.87  940.91  523.17  940.98  530.38  941.21
   559.58  942.16

 Manning's n Values         num=        3
      Sta   n Val     Sta   n Val     Sta   n Val
        0     .12   99.42     .04  122.56     .12

 Bank Sta: Left   Right    Coeff Contr.   Expan.
           99.42  122.56              .1       .3

 Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
 Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow =     .98
 Elevation at which weir flow begins           =
 Energy head used in spillway design           =
 Spillway height used in design                =
 Weir crest shape                              = Broad Crested

 Number of Piers =  1

 Pier Data
 Pier Station     Upstream=   59.12    Downstream=   57.23
 Upstream     num=        2
     Width   Elev    Width   Elev
         8    925        8    945
 Downstream     num=        2
     Width   Elev    Width   Elev
         8    925        8    945

 Number of Bridge Coefficient Sets =  1

 Low Flow Methods and Data
        Energy
        Momentum                  Cd   =        2
 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 YR

   E.G. US. (ft)                 937.27    Element                  Inside BR US  Inside BR DS
   W.S. US. (ft)                 936.59    E.G. Elev (ft)               937.23        937.17
   Q Total (cfs)                2800.00    W.S. Elev (ft)               936.39        936.45
```

Q Bridge (cfs)	2800.00	Crit W.S. (ft)	935.34	935.05
Q Weir (cfs)		Max Chl Dpth (ft)	11.16	11.05
Weir Sta Lft (ft)		Vel Total (ft/s)	3.87	3.53
Weir Sta Rgt (ft)		Flow Area (sq ft)	722.75	792.89
Weir Submerg		Froude # Chl	0.53	0.48
Weir Max Depth (ft)		Specif Force (cu ft)	2417.44	2641.85
Min El Weir Flow (ft)	945.01	Hydr Depth (ft)	3.78	4.10
Min El Prs (ft)	942.00	W.P. Total (ft)	208.37	209.68
Delta EG (ft)	0.15	Conv. Total (cfs)	39825.0	44890.6
Delta WS (ft)	0.32	Top Width (ft)	191.43	193.30
BR Open Area (sq ft)	2654.10	Frctn Loss (ft)	0.03	0.03
BR Open Vel (ft/s)	3.87	C & E Loss (ft)	0.04	0.01
Coef of Q		Shear Total (lb/sq ft)	1.07	0.92
Br Sel Method	Energy only	Power Total (lb/ft s)	4.15	3.24

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #100 YR FW

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	939.15	E.G. Elev (ft)	939.11	939.03
W.S. US. (ft)	937.35	W.S. Elev (ft)	937.33	937.41
Q Total (cfs)	2800.00	Crit W.S. (ft)	935.47	935.19
Q Bridge (cfs)	2800.00	Max Chl Dpth (ft)	12.10	12.01
Q Weir (cfs)		Vel Total (ft/s)	8.65	8.17
Weir Sta Lft (ft)		Flow Area (sq ft)	323.76	342.71
Weir Sta Rgt (ft)		Froude # Chl	0.63	0.59
Weir Submerg		Specif Force (cu ft)	2286.93	2366.92
Weir Max Depth (ft)		Hydr Depth (ft)	6.88	7.29
Min El Weir Flow (ft)	945.01	W.P. Total (ft)	56.41	55.22
Min El Prs (ft)	942.00	Conv. Total (cfs)	34171.4	37439.7
Delta EG (ft)	0.21	Top Width (ft)	47.03	47.03
Delta WS (ft)	0.47	Frctn Loss (ft)	0.04	0.05
BR Open Area (sq ft)	543.44	C & E Loss (ft)	0.05	0.04
BR Open Vel (ft/s)	8.65	Shear Total (lb/sq ft)	2.41	2.17
Coef of Q		Power Total (lb/ft s)	20.81	17.71
Br Sel Method	Energy only			

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 577.5895

INPUT
Description: 48
Station Elevation Data num= 81

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.67	2.79	942.59	11.49	942.34	12.62	942.3	18.49	942.1
24.12	941.92	31.12	941.61	35.04	941.46	37.07	941.25	39.14	941.03
40.25	940.9	42.82	939.5	43.99	938.86	47.93	936.6	52.12	934.96
59.22	932.95	64.68	931.59	66.32	931.49	77.61	930.78	77.69	930.8
79.18	931.22	87.24	933.4	89.57	933.27	99.42	932.79	104.88	927.12
105.63	925.63	115.48	926.07	118.16	926.1	119.43	926.07	122.56	933.39
144.26	933.15	148.05	933.1	159.02	932.97	160.14	932.99	162.73	933.06
169.9	933.25	173.85	933.32	174.28	933.38	175.37	933.41	177.77	933.58
178.47	933.63	180.69	933.75	180.93	933.75	181.04	933.75	181.2	933.75
181.26	933.57	181.4	933.22	190.75	933.29	190.95	933.29	191.43	933.29
191.64	933.29	195.55	933.36	210.54	933.61	214.3	933.66	238.14	933.92
238.86	933.92	240.41	933.93	240.44	934	240.66	934.5	241.14	934.5
241.17	934.5	241.42	934.54	241.61	934.57	242	934.64	242.36	934.78
249.42	936.78	306.93	936.99	330.2	937.05	333.01	937.25	334.16	937.46
340.82	938.05	344	938.11	377.28	938.97	402.25	939.31	432.98	940
460.5	940.46	486.66	940.8	518.87	941.14	523.17	941.21	530.38	941.44
559.58	942.39								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	99.42	.04	122.56	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
99.42	122.56	27	24	22	.1	.3

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	937.12	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	0.85	Reach Len. (ft)	27.00	24.00	22.00
W.S. Elev (ft)	936.27	Flow Area (sq ft)	185.19	205.26	345.10
Crit W.S. (ft)		Area (sq ft)	185.19	205.26	345.10
E.G. Slope (ft/ft)	0.004795	Flow (cfs)	371.59	1849.40	579.01
Q Total (cfs)	2800.00	Top Width (ft)	50.65	23.14	125.06
Top Width (ft)	198.85	Avg. Vel. (ft/s)	2.01	9.01	1.68
Vel Total (ft/s)	3.81	Hydr. Depth (ft)	3.66	8.87	2.76
Max Chl Dpth (ft)	10.64	Conv. (cfs)	5366.3	26708.3	8361.8
Conv. Total (cfs)	40436.4	Wetted Per. (ft)	51.73	31.31	126.07
Length Wtd. (ft)	24.00	Shear (lb/sq ft)	1.07	1.96	0.82
Min Ch El (ft)	925.63	Stream Power (lb/ft s)	2.15	17.68	1.37
Alpha	3.78	Cum Volume (acre-ft)	0.30	3.23	3.05
Frctn Loss (ft)	0.12	Cum SA (acres)	0.14	0.66	1.74
C & E Loss (ft)	0.02				

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	938.93	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	2.05	Reach Len. (ft)	27.00	24.00	22.00
W.S. Elev (ft)	936.88	Flow Area (sq ft)	46.19	219.36	41.63
Crit W.S. (ft)		Area (sq ft)	46.19	219.36	41.63
E.G. Slope (ft/ft)	0.007649	Flow (cfs)	102.80	2609.45	87.75
Q Total (cfs)	2800.00	Top Width (ft)	12.18	23.14	11.71
Top Width (ft)	47.03	Avg. Vel. (ft/s)	2.23	11.90	2.11
Vel Total (ft/s)	9.12	Hydr. Depth (ft)	3.79	9.48	3.56
Max Chl Dpth (ft)	11.25	Conv. (cfs)	1175.4	29835.8	1003.3
Conv. Total (cfs)	32014.6	Wetted Per. (ft)	15.68	31.31	15.33
Length Wtd. (ft)	24.05	Shear (lb/sq ft)	1.41	3.35	1.30
Min Ch El (ft)	925.63	Stream Power (lb/ft s)	3.13	39.80	2.73
Alpha	1.59	Cum Volume (acre-ft)	0.10	3.40	0.34
Frctn Loss (ft)	0.17	Cum SA (acres)	0.03	0.66	0.09
C & E Loss (ft)	0.08				

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 553

INPUT
Description:
Station Elevation Data num= 85

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.21	2.4	943.12	6.36	942.98	13.48	942.79	19.11	942.64
22.44	942.54	31.48	942.28	33.25	942.21	44.05	941.88	48.99	941.65
55.18	941.34	56.78	941.17	58.79	940.99	60.66	940.82	62.2	939.91
72.86	935.45	74.1	934.97	75.9	934.46	77.96	933.86	86.02	931.51
93.37	931.04	97.35	930.89	100.07	931.83	106.56	933.56	110.67	933.3
119.1	932.89	123.55	927.81	124.88	925.33	131.29	925.53	139.83	926.12
142.45	931.2	142.73	931.18	143.98	933.31	163.33	933.44	178.73	933.42
197.98	933.36	203.22	933.34	225.79	933.68	226.8	933.69	226.94	933.69
227.11	933.69	244.72	933.87	254.26	933.92	256.72	933.94	256.77	934.05
256.97	934.5	257.07	934.5	257.47	934.5	259.03	934.87	259.23	934.92
259.64	935.01	263.5	935.73	267.34	936.78	269.11	936.78	276.34	936.48
303.15	936.45	348.71	936.47	352.44	936.66	376.44	936.68	377.37	936.68
377.43	936.68	383.04	936.67	386.76	936.55	387.41	936.52	388.31	936.5
389.32	936.48	390.19	936.48	390.86	936.48	397.94	936.4	410.57	936.44
410.71	936.43	411	936.41	411.9	936.35	411.98	936.53	412.16	936.97
412.44	936.97	412.51	936.97	412.66	936.97	421.59	937.53	425.35	937.77
425.46	937.78	425.67	937.79	455.16	938.95	474.04	939.27	488.61	939.39

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	119.1	.04	143.98	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
119.1	143.98	95.41	94	90.84	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	106.56	933.56	F
267.34	488.61	936.78	F

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	936.98	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	1.05	Reach Len. (ft)	95.41	94.00	90.84
W.S. Elev (ft)	935.93	Flow Area (sq ft)	154.92	215.96	276.53
Crit W.S. (ft)	935.16	Area (sq ft)	154.92	215.96	276.53
E.G. Slope (ft/ft)	0.005380	Flow (cfs)	305.20	2058.52	436.29
Q Total (cfs)	2800.00	Top Width (ft)	47.40	24.88	120.27
Top Width (ft)	192.54	Avg. Vel. (ft/s)	1.97	9.53	1.58
Vel Total (ft/s)	4.32	Hydr. Depth (ft)	3.27	8.68	2.30
Max Chl Dpth (ft)	10.60	Conv. (cfs)	4160.8	28064.2	5948.0
Conv. Total (cfs)	38173.0	Wetted Per. (ft)	48.50	33.01	120.79
Length Wtd. (ft)	93.56	Shear (lb/sq ft)	1.07	2.20	0.77
Min Ch El (ft)	925.33	Stream Power (lb/ft s)	2.11	20.95	1.21
Alpha	3.61	Cum Volume (acre-ft)	0.20	3.11	2.89
Frctn Loss (ft)	0.65	Cum SA (acres)	0.11	0.65	1.67
C & E Loss (ft)	0.06				

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	938.69	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	1.78	Reach Len. (ft)	95.41	94.00	90.84
W.S. Elev (ft)	936.90	Flow Area (sq ft)	46.38	240.07	34.22
Crit W.S. (ft)	934.88	Area (sq ft)	46.38	240.07	34.22
E.G. Slope (ft/ft)	0.006238	Flow (cfs)	92.58	2644.07	63.35
Q Total (cfs)	2800.00	Top Width (ft)	12.54	24.88	9.61
Top Width (ft)	47.03	Avg. Vel. (ft/s)	2.00	11.01	1.85
Vel Total (ft/s)	8.73	Hydr. Depth (ft)	3.70	9.65	3.56
Max Chl Dpth (ft)	11.57	Conv. (cfs)	1172.3	33478.4	802.1
Conv. Total (cfs)	35452.8	Wetted Per. (ft)	15.90	33.01	13.14
Length Wtd. (ft)	93.89	Shear (lb/sq ft)	1.14	2.83	1.01
Min Ch El (ft)	925.33	Stream Power (lb/ft s)	2.27	31.19	1.88
Alpha	1.51	Cum Volume (acre-ft)	0.07	3.27	0.32
Frctn Loss (ft)	0.56	Cum SA (acres)	0.03	0.65	0.08
C & E Loss (ft)	0.09				

Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 459.5899

INPUT
Description: 49
Station Elevation Data num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.04	6	941.89	8.93	941.82	15.34	941.67	21.48	941.52
26.59	941.3	32.67	941.04	33.89	940.94	39.92	940.63	78.79	937.03
89.54	935.58	92.61	935.24	96.73	934.77	99.98	932.13	101.87	927.67
102.96	925.06	110.59	925.16	113.71	925.32	113.97	925.32	118.8	925.57
122.68	929.97	125.04	931.97	162.19	932.73	163.5	932.72	168.1	931.01
171.56	930.73	175.66	930.99	177.87	932.06	180.07	932.04	192.5	931.76
198.2	931.75	203.57	932.23	210.31	932.81	214.9	933.24	217.65	933.51
223.36	934.07	224.57	934.15	228.71	934.44	229.09	934.46	229.28	934.48
231.3	934.63	231.71	934.63	232.08	934.63	247.46	934.45	250.39	934.42
260.6	934.46	260.79	934.73	261	935.03	261.16	935.04	261.37	935.04
261.82	935.05	270.31	935.39	282.06	935.49	283.48	935.51	290.77	935.6
299.06	935.69	312.31	935.83	321.87	936.05	323.66	936.09	324.11	936.1
324.14	936.1	324.15	936.1	324.39	936.14	324.4	936.14	324.71	936.19
324.74	936.19	326.12	936.43	340	938				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	96.73	.04	125.04	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
96.73	125.04	18.06	18.05	18.28	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
232.08	340	934.66	F

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	936.28	Wt. n-Val.		0.040	0.120
Vel Head (ft)	1.66	Reach Len. (ft)	18.06	18.05	18.28
W.S. Elev (ft)	934.62	Flow Area (sq ft)		205.41	236.16
Crit W.S. (ft)	934.31	Area (sq ft)		205.41	239.70
E.G. Slope (ft/ft)	0.009235	Flow (cfs)		2323.03	476.97
Q Total (cfs)	2800.00	Top Width (ft)		28.12	133.62
Top Width (ft)	161.74	Avg. Vel. (ft/s)		11.31	2.02
Vel Total (ft/s)	6.34	Hydr. Depth (ft)		7.30	2.23
Max Chl Dpth (ft)	9.56	Conv. (cfs)		24173.2	4963.3
Conv. Total (cfs)	29136.6	Wetted Per. (ft)		36.43	106.80
Length Wtd. (ft)	18.10	Shear (lb/sq ft)		3.25	1.27
Min Ch El (ft)	925.06	Stream Power (lb/ft s)		36.77	2.57
Alpha	2.66	Cum Volume (acre-ft)	0.03	2.66	2.35
Frctn Loss (ft)	0.13	Cum SA (acres)	0.06	0.59	1.41
C & E Loss (ft)	0.19				

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.

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	938.03	Wt. n-Val.		0.040	0.120
Vel Head (ft)	1.48	Reach Len. (ft)	18.06	18.05	18.28
W.S. Elev (ft)	936.56	Flow Area (sq ft)		260.29	82.27
Crit W.S. (ft)	934.20	Area (sq ft)		260.29	82.27
E.G. Slope (ft/ft)	0.005732	Flow (cfs)		2619.24	180.76
Q Total (cfs)	2800.00	Top Width (ft)		28.31	18.72
Top Width (ft)	47.03	Avg. Vel. (ft/s)		10.06	2.20
Vel Total (ft/s)	8.17	Hydr. Depth (ft)		9.19	4.39
Max Chl Dpth (ft)	11.50	Conv. (cfs)		34597.0	2387.6
Conv. Total (cfs)	36984.6	Wetted Per. (ft)		38.46	22.93
Length Wtd. (ft)	18.06	Shear (lb/sq ft)		2.42	1.28
Min Ch El (ft)	925.06	Stream Power (lb/ft s)		24.37	2.82
Alpha	1.42	Cum Volume (acre-ft)	0.02	2.73	0.20
Frctn Loss (ft)	0.10	Cum SA (acres)	0.01	0.59	0.05
C & E Loss (ft)	0.01				

Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 441.5446

INPUT
Description: 50
Station Elevation Data num= 96

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.02	2.57	941.95	10.59	941.74	11.79	941.71	18.84	941.55
24.3	941.42	29.99	941.19	34.56	940.99	35.53	940.95	39.81	940.76
43.46	940.55	79.09	938.34	86.59	937.32	91.15	936.71	92.6	936.52
98.5	935.72	99.23	935.64	104.05	931.72	105.43	930.61	105.78	929.78
107.4	925.9	107.84	924.84	108.02	924.84	123.15	925.61	124.93	927.63
129.52	931.52	146.93	931.87	161.86	931.81	165.26	932.06	170.98	932.19
172.77	932.6	173.12	932.43	173.71	932.1	175.63	931.07	176.84	930.43
177.92	929.73	178.07	929.72	180.27	929.51	182.71	929.66	183.27	929.93
187.29	931.85	194.07	931.77	195.69	931.76	196.88	931.74	201.24	931.57
210.59	931.44	227.05	931.69	228.34	931.74	229.31	931.73	231.72	932.1
240.48	933.36	251.36	934.25	252.06	934.3	256.1	934.6	257.74	934.72
258.09	934.75	258.25	934.77	259.27	934.85	259.8	934.85	260.05	934.86
273.79	934.8	273.91	934.81	276.44	934.92	284.32	935.02	284.49	935.02

284.84	935.02	289.35	935	289.6	935.35	289.74	935.57	290.02	935.57
290.53	935.57	296.36	935.65	301.96	935.71	302.48	935.71	307.44	935.77
311.85	935.82	326.28	936.01	330.22	936.11	340.59	936.11	348.75	936.32
348.82	936.32	361.55	936.4	361.58	936.4	361.74	936.41	361.81	936.41
361.98	936.41	373.41	936.64	373.79	936.65	374.29	936.65	375.15	936.66
378.05	936.68	380.6	936.7	382.93	936.72	385.16	936.73	387.38	936.74
387.97	936.74								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	99.23	.04	129.52	.12

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

Left	Right	Left	Channel	Right	Coeff Contr.	Expan.
99.23	129.52	122.28	116.67	109.21	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
237	387.97		F

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	935.95	Wt. n-Val.		0.040	0.120
Vel Head (ft)	1.02	Reach Len. (ft)	122.28	116.67	109.21
W.S. Elev (ft)	934.93	Flow Area (sq ft)		216.84	355.94
Crit W.S. (ft)		Area (sq ft)		216.84	379.10
E.G. Slope (ft/ft)	0.006110	Flow (cfs)		2041.20	758.80
Q Total (cfs)	2800.00	Top Width (ft)		29.41	147.53
Top Width (ft)	176.94	Avg. Vel. (ft/s)		9.41	2.13
Vel Total (ft/s)	4.89	Hydr. Depth (ft)		7.37	3.31
Max Chl Dpth (ft)	10.09	Conv. (cfs)		26114.0	9707.7
Conv. Total (cfs)	35821.8	Wetted Per. (ft)		37.15	108.89
Length Wtd. (ft)	114.71	Shear (lb/sq ft)		2.23	1.25
Min Ch El (ft)	924.84	Stream Power (lb/ft s)		20.96	2.66
Alpha	2.75	Cum Volume (acre-ft)	0.03	2.57	2.22
Frctn Loss (ft)	0.93	Cum SA (acres)	0.06	0.58	1.35
C & E Loss (ft)	0.06				

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

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	937.92	Wt. n-Val.		0.040	0.120
Vel Head (ft)	1.44	Reach Len. (ft)	122.28	116.67	109.21
W.S. Elev (ft)	936.48	Flow Area (sq ft)		263.53	80.21
Crit W.S. (ft)		Area (sq ft)		263.53	80.21
E.G. Slope (ft/ft)	0.005629	Flow (cfs)		2620.02	179.98
Q Total (cfs)	2800.00	Top Width (ft)		30.29	16.74
Top Width (ft)	47.03	Avg. Vel. (ft/s)		9.94	2.24
Vel Total (ft/s)	8.15	Hydr. Depth (ft)		8.70	4.79
Max Chl Dpth (ft)	11.64	Conv. (cfs)		34920.9	2398.8
Conv. Total (cfs)	37319.7	Wetted Per. (ft)		39.11	21.37
Length Wtd. (ft)	116.30	Shear (lb/sq ft)		2.37	1.32
Min Ch El (ft)	924.84	Stream Power (lb/ft s)		23.54	2.96
Alpha	1.40	Cum Volume (acre-ft)	0.02	2.62	0.17
Frctn Loss (ft)	0.98	Cum SA (acres)	0.01	0.58	0.04
C & E Loss (ft)	0.15				

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: Hope Creek
REACH: 1 RS: 324.8710

INPUT
Description: 51
Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

0	941.99	3.04	941.9	10.67	941.67	19.8	941.44	23.34	941.34
25.09	941.3	35.5	940.99	43.83	940.76	47.91	940.66	57.91	940.24
59.16	940.19	60.58	940.18	66.71	940.17	74.73	939.87	94.55	939.79
102.5	937.82	103.29	937.61	117.83	934.16	121.6	933.79	125.43	932.15
127.9	931.09	134.64	928.98	138.5	924.9	147.78	924.63	154.52	929.76
155.65	930.58	156.97	930.74	165.65	930.74	186.81	931	194.51	930.91
197.26	930.82	218.13	930.34	221.67	930.73	224.45	931.33	227.69	929.63
228.26	928.77	231.6	928.83	232.18	928.84	234.6	928.96	235.55	929.77
237.23	930.43	239.4	931.19	264.08	930.55	264.8	930.53	266.87	930.51
275.43	930.72	284.3	930.93	285.4	930.99	305.92	931.62	306.95	931.63
307.82	931.8	315.89	932.88	316.36	932.92	317.36	932.96	325.11	933.38
329.89	933.5	339.85	933.8	341.24	933.83	347.01	934.23	356.66	934.88
357.61	934.96	358.56	935.05	358.67	935.06	358.73	935.06	363.29	935.52

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	127.9	.04	156.97	.12

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

127.9 156.97 17.95 17.59 16.66 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
265	363.29		F

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	934.95	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	1.66	Reach Len. (ft)	17.95	17.59	16.66
W.S. Elev (ft)	933.29	Flow Area (sq ft)	5.65	173.67	287.06
Crit W.S. (ft)	933.29	Area (sq ft)	5.65	173.67	392.65
E.G. Slope (ft/ft)	0.011350	Flow (cfs)	7.50	2072.83	719.67
Q Total (cfs)	2800.00	Top Width (ft)	5.13	29.07	166.50
Top Width (ft)	200.70	Avg. Vel. (ft/s)	1.33	11.94	2.51
Vel Total (ft/s)	6.00	Hydr. Depth (ft)	1.10	5.97	2.66
Max Chl Dpth (ft)	8.66	Conv. (cfs)	70.4	19456.7	6755.2
Conv. Total (cfs)	26282.3	Wetted Per. (ft)	5.59	33.16	109.57
Length Wtd. (ft)		Shear (lb/sq ft)	0.72	3.71	1.86
Min Ch El (ft)	924.63	Stream Power (lb/ft s)	0.95	44.29	4.65
Alpha	2.97	Cum Volume (acre-ft)	0.02	2.05	1.26
Frctn Loss (ft)		Cum SA (acres)	0.05	0.50	0.96
C & E Loss (ft)					

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.

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	936.80	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	2.92	Reach Len. (ft)	17.95	17.59	16.66
W.S. Elev (ft)	933.87	Flow Area (sq ft)	8.44	190.53	40.96
Crit W.S. (ft)	933.87	Area (sq ft)	8.44	190.53	40.96
E.G. Slope (ft/ft)	0.013865	Flow (cfs)	15.49	2673.66	110.85
Q Total (cfs)	2800.00	Top Width (ft)	4.84	29.07	13.12
Top Width (ft)	47.03	Avg. Vel. (ft/s)	1.84	14.03	2.71
Vel Total (ft/s)	11.67	Hydr. Depth (ft)	1.74	6.55	3.12
Max Chl Dpth (ft)	9.24	Conv. (cfs)	131.5	22706.5	941.4
Conv. Total (cfs)	23779.5	Wetted Per. (ft)	5.97	33.16	16.20
Length Wtd. (ft)	17.57	Shear (lb/sq ft)	1.22	4.97	2.19
Min Ch El (ft)	924.63	Stream Power (lb/ft s)	2.24	69.79	5.92
Alpha	1.38	Cum Volume (acre-ft)	0.01	2.01	0.02
Frctn Loss (ft)	0.25	Cum SA (acres)	0.01	0.50	0.01
C & E Loss (ft)	0.10				

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Hope Creek
REACH: 1
RS: 307.2792

INPUT
Description: 52
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.07	1.47	942.03	5.01	941.93	11.36	941.75	17.13	941.58
22.31	941.44	29.82	941.23	30.96	941.2	39.58	940.95	41.95	940.88
52.06	940.6	53.36	940.57	54.33	940.54	55.1	940.51	55.32	940.5
59.1	940.34	65.43	940.06	67.87	939.93	80.28	939.47	97.61	938.56
109.76	935.55	113.7	934.72	120.36	933.16	123.71	932.84	128.91	932.33
131.93	931.04	141.99	925.13	152.79	924.63	153.13	924.88	153.55	925.18
159.79	929.7	160.17	929.97	169.36	931.07	176.83	931.07	201.66	930.81
227.48	930.36	228.31	930.34	228.37	930.34	232.22	931.17	236.69	928.84
236.78	928.7	242.07	928.79	242.18	928.79	242.66	928.81	242.85	928.97
246.07	930.24	247.92	930.97	250.37	930.88	252.55	930.83	281.31	930.51
287.78	930.67	303.38	930.89	306.21	930.93	307.84	930.99	317.55	931.4
327.01	931.74	334.72	932.58	337.13	932.65	347.07	932.93	350.64	933.16
353.8	933.32	359.37	933.59	363.76	933.83	365.53	933.95	369.18	934.26
376.76	934.84	379.4	935.04	383.7	935.41	386.23	935.63	386.51	935.64

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	128.91	.04	169.36	.12

Bank Sta: Left Right
128.91 169.36

Lengths: Left Channel Right
125.45 106.5 91.3

Coeff Contr. .1
Expan. .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
281	386.51		F

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	934.54	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	1.02	Reach Len. (ft)	125.45	106.50	91.30
W.S. Elev (ft)	933.52	Flow Area (sq ft)	6.87	226.94	327.75
Crit W.S. (ft)		Area (sq ft)	6.87	226.94	465.79
E.G. Slope (ft/ft)	0.007009	Flow (cfs)	5.48	2102.79	691.73
Q Total (cfs)	2800.00	Top Width (ft)	10.08	40.45	188.54
Top Width (ft)	239.07	Avg. Vel. (ft/s)	0.80	9.27	2.11
Vel Total (ft/s)	4.99	Hydr. Depth (ft)	0.68	5.61	2.94
Max Chl Dpth (ft)	8.89	Conv. (cfs)	65.5	25117.4	8262.5
Conv. Total (cfs)	33445.4	Wetted Per. (ft)	10.16	44.13	112.83
Length Wtd. (ft)	104.09	Shear (lb/sq ft)	0.30	2.25	1.27
Min Ch El (ft)	924.63	Stream Power (lb/ft s)	0.24	20.85	2.68
Alpha	2.64	Cum Volume (acre-ft)	0.02	1.97	1.09
Frctn Loss (ft)	0.91	Cum SA (acres)	0.05	0.49	0.89
C & E Loss (ft)	0.07				

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 OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	935.81	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	2.58	Reach Len. (ft)	125.45	106.50	91.30
W.S. Elev (ft)	933.23	Flow Area (sq ft)	2.44	215.44	7.12
Crit W.S. (ft)	933.23	Area (sq ft)	2.44	215.44	7.12
E.G. Slope (ft/ft)	0.014617	Flow (cfs)	2.69	2784.58	12.73
Q Total (cfs)	2800.00	Top Width (ft)	3.29	40.45	3.29
Top Width (ft)	47.03	Avg. Vel. (ft/s)	1.10	12.93	1.79
Vel Total (ft/s)	12.44	Hydr. Depth (ft)	0.74	5.33	2.16
Max Chl Dpth (ft)	8.60	Conv. (cfs)	22.2	23031.7	105.3
Conv. Total (cfs)	23159.2	Wetted Per. (ft)	3.89	44.13	5.45
Length Wtd. (ft)	106.47	Shear (lb/sq ft)	0.57	4.46	1.19
Min Ch El (ft)	924.63	Stream Power (lb/ft s)	0.63	57.58	2.13
Alpha	1.07	Cum Volume (acre-ft)	0.00	1.93	0.01
Frctn Loss (ft)	1.59	Cum SA (acres)	0.00	0.49	0.00
C & E Loss (ft)	0.07				

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The cross section had to be extended vertically during the critical depth 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: Hope Creek
REACH: 1 RS: 200.7906

INPUT
Description: 53
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	940.82	3.68	940.71	6.23	940.64	8.91	940.57	13.51	940.45
18.78	940.31	27.5	940.06	30.84	939.98	34.35	939.87	37.16	939.79
43.56	939.6	48.35	939.4	54.12	939.15	63.12	938.33	68.38	937.88
93.35	933.59	99.54	932.77	104.36	932.32	109.58	931.82	113.35	931.73
121.96	931.63	130.5	931.44	135.54	929.12	146.37	925.36	149.82	924.99
165.46	924.92	166.69	924.6	176.09	930.77	176.22	930.86	176.87	931.26
178.33	931.31	184.24	931.37	191.89	931.3	207.99	930.36	234.49	930.85
236.49	931.18	242.42	932.01	251.94	929.4	254.2	928.96	262.71	928.67
264.66	928.73	268.78	930.12	272.34	931.16	284.42	930.75	285.45	930.73
307.43	930.12	311.92	929.96	315.13	930.06	337.63	930.5	346.55	930.65
347.42	930.67	347.67	930.66	348.24	930.66	360.75	930.78	370.77	930.96
375.96	931.23	378.68	931.13	379.9	931.13	386.05	931.23	387.76	931.29
390.4	931.32	397.39	931.61	407.88	931.77	409.47	931.86	418.29	932.46
424.54	932.95	427.39	933.09	440.16	934.12	441.03	934.29	448.03	934.92
451.94	935.08	452.63	935.1	456.19	935.65				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	130.5	.04	178.33	.12

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
130.5 178.33 16.52 15.76 15.52 .1 .3
Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
272.34	456.19		F

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	933.55	Wt. n-Val.	0.120	0.040	0.120
Vel Head (ft)	1.74	Reach Len. (ft)	16.52	15.76	15.52
W.S. Elev (ft)	931.81	Flow Area (sq ft)	3.61	236.15	119.24
Crit W.S. (ft)	931.81	Area (sq ft)	3.61	236.15	261.40
E.G. Slope (ft/ft)	0.011340	Flow (cfs)	1.49	2594.58	203.93
Q Total (cfs)	2800.00	Top Width (ft)	20.51	47.83	228.11
Top Width (ft)	296.45	Avg. Vel. (ft/s)	0.41	10.99	1.71
Vel Total (ft/s)	7.80	Hydr. Depth (ft)	0.18	4.94	1.30
Max Chl Dpth (ft)	7.21	Conv. (cfs)	14.0	24364.8	1915.0
Conv. Total (cfs)	26293.8	Wetted Per. (ft)	20.52	51.02	92.71
Length Wtd. (ft)	15.75	Shear (lb/sq ft)	0.12	3.28	0.91
Min Ch El (ft)	924.60	Stream Power (lb/ft s)	0.05	36.00	1.56
Alpha	1.84	Cum Volume (acre-ft)	0.00	1.40	0.33
Frctn Loss (ft)	0.20	Cum SA (acres)	0.00	0.38	0.45
C & E Loss (ft)	0.02				

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: 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 #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	933.98	Wt. n-Val.		0.040	
Vel Head (ft)	2.36	Reach Len. (ft)	16.52	15.76	15.52
W.S. Elev (ft)	931.62	Flow Area (sq ft)		227.21	
Crit W.S. (ft)	931.62	Area (sq ft)		227.21	
E.G. Slope (ft/ft)	0.015216				

Q Total (cfs)	2800.00	Flow (cfs)	2800.00
Top Width (ft)	47.83	Top Width (ft)	47.83
Vel Total (ft/s)	12.32	Avg. Vel. (ft/s)	12.32
Max Chl Dpth (ft)	7.02	Hydr. Depth (ft)	4.75
Conv. Total (cfs)	22699.1	Conv. (cfs)	22699.1
Length Wtd. (ft)	15.76	Wetted Per. (ft)	51.52
Min Ch El (ft)	924.60	Shear (lb/sq ft)	4.19
Alpha	1.00	Stream Power (lb/ft s)	51.63
Frctn Loss (ft)	0.24	Cum Volume (acre-ft)	1.39
C & E Loss (ft)	0.02	Cum SA (acres)	0.38

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 185.0263

INPUT
Description: 54
Station Elevation Data num= 90

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	940.9	.23	940.89	4.79	940.75	12.43	940.54	19.61	940.33
24.97	940.18	28.01	940.1	37.1	939.87	46.81	939.57	49.79	939.48
54.76	939.27	60.03	939.05	62.74	938.8	74.73	937.76	101.6	932.71
106.32	932.08	107.47	931.97	124.1	931.54	134.46	931.42	139.14	930.34
142.76	928.76	145.19	928.18	148.08	927.48	164.97	924.66	165.64	924.46
168.13	924.43	181	924.31	181.54	925.82	184.27	929	186.31	931.36
191.21	931.72	193.53	931.75	220.16	931.48	228.64	930.98	242.69	931.24
246.95	931.93	249.99	930.58	251.61	930.2	257.54	928.82	259.05	928.74
266.32	928.71	270.08	928.64	270.46	928.84	271.16	929.07	273.91	930.17
277.06	931.05	278.85	930.84	284.22	930.81	296.25	930.4	302.44	930.26
315.31	929.9	328.78	929.94	339.43	930.15	351.48	930.13	361.37	930.36
372.01	930.6	377.94	930.67	381.65	930.81	386.53	930.84	391.74	930.93
396.69	930.93	399.56	930.9	404.99	930.97	407.46	931.14	409.66	931.22
410.64	931.23	411.34	931.28	418.16	931.31	427.92	931.6	434.01	931.74
437.77	931.92	449.6	932.25	453.05	932.43	459.98	932.57	463.01	932.75
463.56	932.78	464.29	932.92	469.22	934.56	469.42	934.62	469.43	934.62
469.46	934.63	469.8	934.65	476.37	935.06	476.91	935.11	477.32	935.16
480.63	935.18	481.34	935.33	481.48	935.36	481.55	935.37	484.57	935.92

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	134.46	.04	193.53	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
134.46	193.53	137.52	156.8	137.84	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
277.06	484.57		F

CROSS SECTION OUTPUT Profile #100 YR

			Left OB	Channel	Right OB
E.G. Elev (ft)	933.15	Element			
Vel Head (ft)	1.97	Wt. n-Val.		0.040	0.120
W.S. Elev (ft)	931.18	Reach Len. (ft)	137.52	156.80	137.84
Crit W.S. (ft)	931.18	Flow Area (sq ft)		234.31	52.31
E.G. Slope (ft/ft)	0.013848	Area (sq ft)		234.31	150.54
Q Total (cfs)	2800.00	Flow (cfs)		2691.92	108.08
Top Width (ft)	224.37	Top Width (ft)		50.63	173.73
Vel Total (ft/s)	9.77	Avg. Vel. (ft/s)		11.49	2.07
Max Chl Dpth (ft)	6.87	Hydr. Depth (ft)		4.63	1.24
Conv. Total (cfs)	23793.6	Conv. (cfs)		22875.1	918.4
Length Wtd. (ft)	156.43	Wetted Per. (ft)		55.00	43.10
Min Ch El (ft)	924.31	Shear (lb/sq ft)		3.68	1.05
Alpha	1.33	Stream Power (lb/ft s)		42.32	2.17
Frctn Loss (ft)	1.57	Cum Volume (acre-ft)		1.31	0.26
C & E Loss (ft)	0.36	Cum SA (acres)		0.36	0.38

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 #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	933.39	Wt. n-Val.		0.040	
Vel Head (ft)	2.29	Reach Len. (ft)	137.52	156.80	137.84
W.S. Elev (ft)	931.10	Flow Area (sq ft)		230.46	
Crit W.S. (ft)	931.10	Area (sq ft)		230.46	
E.G. Slope (ft/ft)	0.015664	Flow (cfs)		2800.00	
Q Total (cfs)	2800.00	Top Width (ft)		50.24	
Top Width (ft)	50.24	Avg. Vel. (ft/s)		12.15	
Vel Total (ft/s)	12.15	Hydr. Depth (ft)		4.59	
Max Chl Dpth (ft)	6.79	Conv. (cfs)		22372.0	
Conv. Total (cfs)	22372.0	Wetted Per. (ft)		54.56	
Length Wtd. (ft)	156.80	Shear (lb/sq ft)		4.13	
Min Ch El (ft)	924.31	Stream Power (lb/ft s)		50.19	
Alpha	1.00	Cum Volume (acre-ft)		1.31	
Frctn Loss (ft)	1.66	Cum SA (acres)		0.36	
C & E Loss (ft)	0.46				

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 cross section had to be extended vertically during the critical depth 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: Hope Creek
REACH: 1 RS: 28.22144

INPUT
Description:
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	940.04	2.31	939.98	11.56	939.71	15.15	939.61	17.29	939.56
22.02	939.44	26.99	939.32	32.27	939.17	37.02	939.05	39.52	938.98
41.93	938.9	47.05	938.69	49.77	938.58	50.79	938.54	61.84	937.24
63.7	937.01	67.92	935.96	79.12	934.46	86.27	931.47	92.56	931.52
93.61	931.06	93.94	930.93	95.48	930.37	95.66	930.28	97.51	929.41
101.36	927.97	107.28	927.29	108.01	927.21	109.73	926.77	119.71	924.46
123.65	924.38	124.51	923.96	130.97	923.36	131.94	923.36	132.69	923.36
175.81	927.66	185.76	927.98	187.62	928.18	190.78	928.37	211.65	929.57
221.55	930.05	228.5	929.55	279.2	930.78	279.38	930.78	279.43	930.78
279.45	930.78	281.18	930.79	326.81	931.05	328.75	931.05	359.76	929.92
365.16	929.79	371.86	929.83	398.04	930.17	413.2	929.96	420.31	930.27
432.57	930.33	436.58	930.47	437.46	930.43	458.64	930.92	459.48	930.94
461.65	930.98	482.99	931.36	497.99	931.82	509.84	932.09	531.87	932.92
538.1	933.22	545.87	933.58	554.58	934.01	557.76	934.15	567.92	934.67
576.52	935.64	581.59	936.23	581.71	936.25				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	92.56	.04	221.55	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
92.56	221.55	18.33	16.08	17.35	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
328.75	581.71	931.05	F

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	930.78	Wt. n-Val.		0.040	0.120
Vel Head (ft)	0.76	Reach Len. (ft)	18.33	16.08	17.35
W.S. Elev (ft)	930.02	Flow Area (sq ft)		399.38	5.96
Crit W.S. (ft)	929.11	Area (sq ft)		399.38	9.79
E.G. Slope (ft/ft)	0.007618	Flow (cfs)		2797.56	2.44
Q Total (cfs)	2800.00	Top Width (ft)		124.61	59.85
Top Width (ft)	184.46	Avg. Vel. (ft/s)		7.00	0.41
Vel Total (ft/s)	6.91	Hydr. Depth (ft)		3.21	0.23
Max Chl Dpth (ft)	6.66	Conv. (cfs)		32051.6	27.9
Conv. Total (cfs)	32079.5	Wetted Per. (ft)		125.77	25.66
Length Wtd. (ft)	16.08	Shear (lb/sq ft)		1.51	0.11
Min Ch El (ft)	923.36	Stream Power (lb/ft s)		10.58	0.05
Alpha	1.03	Cum Volume (acre-ft)		0.17	0.00
Frctn Loss (ft)	0.07	Cum SA (acres)		0.05	0.01
C & E Loss (ft)	0.10				

Warning: Divided flow computed for this cross-section.
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.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	930.78	Wt. n-Val.		0.040	
Vel Head (ft)	0.76	Reach Len. (ft)	18.33	16.08	17.35
W.S. Elev (ft)	930.02	Flow Area (sq ft)		399.61	
Crit W.S. (ft)	929.09	Area (sq ft)		399.61	
E.G. Slope (ft/ft)	0.007620	Flow (cfs)		2800.00	
Q Total (cfs)	2800.00	Top Width (ft)		124.65	
Top Width (ft)	124.65	Avg. Vel. (ft/s)		7.01	
Vel Total (ft/s)	7.01	Hydr. Depth (ft)		3.21	
Max Chl Dpth (ft)	6.66	Conv. (cfs)		32075.7	
Conv. Total (cfs)	32075.7	Wetted Per. (ft)		125.82	
Length Wtd. (ft)	16.08	Shear (lb/sq ft)		1.51	
Min Ch El (ft)	923.36	Stream Power (lb/ft s)		10.59	
Alpha	1.00	Cum Volume (acre-ft)		0.17	
Frctn Loss (ft)	0.07	Cum SA (acres)		0.05	
C & E Loss (ft)	0.10				

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

CROSS SECTION

RIVER: Hope Creek
REACH: 1 RS: 12.13838

INPUT
Description:
Station Elevation Data num= 76

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	940.07	.7	940.05	3.92	939.97	8.07	939.85	16.26	939.61
16.81	939.6	26.89	939.34	28.65	939.29	31.7	939.2	34.52	939.12
41.16	938.95	43.72	938.85	52.59	938.45	57.86	937.84	62.59	937.25
73.35	934.55	82.97	933.27	96.32	928.57	97.68	927.86	97.75	927.92
98.47	928.44	99.74	927.5	101.9	926.54	102	926.5	102.19	926.42
103.84	925.81	105.01	925.31	106.91	924.06	113.87	923.71	119.39	923.92
131.76	923.96	134.3	923.96	140.71	923.38	147.13	923.37	152.06	923.37
160.82	925.05	165.03	925.95	177.65	926.47	194.04	927.54	196.5	927.85
199.73	928.26	200.75	928.26	201.59	928.5	204.02	928.71	230.3	930.78
231.49	930.87	235.12	931.17	239.41	930.92	248.08	930.3	277.97	931.04
309.17	930.8	328.23	930.9	357.99	930.94	361.73	930.8	381.06	930.33
405.56	930.49	407.44	930.51	409.33	930.49	425.15	930.72	447.82	930.92
459.33	930.45	460.49	930.43	467.39	930.61	481.16	930.95	486.76	931.05

505.55	931.53	518.14	931.78	532.55	932.18	549.78	933.01	558.53	933.41
565.38	933.55	575.24	933.98	581.01	934.29	588.91	934.72	597.13	935.9
598.62	936.07								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.12	82.97	.04	235.12	.12

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
82.97	235.12	16.79	12.14	12.8	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
277.97	598.62	931.04	F

CROSS SECTION OUTPUT Profile #100 YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	930.60	Wt. n-Val.		0.040	
Vel Head (ft)	0.42	Reach Len. (ft)			
W.S. Elev (ft)	930.18	Flow Area (sq ft)		540.66	
Crit W.S. (ft)	927.98	Area (sq ft)		540.66	
E.G. Slope (ft/ft)	0.003003	Flow (cfs)		2800.00	
Q Total (cfs)	2800.00	Top Width (ft)		130.98	
Top Width (ft)	130.98	Avg. Vel. (ft/s)		5.18	
Vel Total (ft/s)	5.18	Hydr. Depth (ft)		4.13	
Max Chl Dpth (ft)	6.81	Conv. (cfs)		51098.3	
Conv. Total (cfs)	51098.3	Wetted Per. (ft)		133.23	
Length Wtd. (ft)		Shear (lb/sq ft)		0.76	
Min Ch El (ft)	923.37	Stream Power (lb/ft s)		3.94	
Alpha	1.00	Cum Volume (acre-ft)			
Frctn Loss (ft)		Cum SA (acres)			
C & E Loss (ft)					

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

CROSS SECTION OUTPUT Profile #100 YR FW

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	930.60	Wt. n-Val.		0.040	
Vel Head (ft)	0.42	Reach Len. (ft)			
W.S. Elev (ft)	930.18	Flow Area (sq ft)		540.81	
Crit W.S. (ft)	927.98	Area (sq ft)		540.81	
E.G. Slope (ft/ft)	0.003000	Flow (cfs)		2800.00	
Q Total (cfs)	2800.00	Top Width (ft)		131.00	
Top Width (ft)	131.00	Avg. Vel. (ft/s)		5.18	
Vel Total (ft/s)	5.18	Hydr. Depth (ft)		4.13	
Max Chl Dpth (ft)	6.81	Conv. (cfs)		51117.6	
Conv. Total (cfs)	51117.6	Wetted Per. (ft)		133.25	
Length Wtd. (ft)		Shear (lb/sq ft)		0.76	
Min Ch El (ft)	923.37	Stream Power (lb/ft s)		3.94	
Alpha	1.00	Cum Volume (acre-ft)			
Frctn Loss (ft)		Cum SA (acres)			
C & E Loss (ft)					

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

SUMMARY OF MANNING'S N VALUES

River:Hope Creek

Reach	River Sta.	n1	n2	n3	n4
1	8000	.12	.045	.1	
1	7548	.12	.045	.1	
1	7061	.12	.045	.1	
1	6930	.12	.045	.1	
1	6719	Culvert			
1	6496	.12	.035	.08	
1	6278	.12	.025	.08	
1	5629	.12	.025	.08	
1	5428	.12	.025	.08	
1	5146	Culvert			

1	4969	.09	.04	.12	
1	4925.680	.09	.04	.1	.12
1	4918	Bridge			
1	4907.867	.09	.04	.1	.12
1	4783.015	.09	.04	.12	
1	4775	Bridge			
1	4764.388	.09	.04	.12	
1	4718	.09	.04	.12	
1	4643.051	.09	.04	.12	
1	4636	Bridge			
1	4625.316	.09	.04	.12	
1	4503.708	.09	.04	.1	
1	4496	Bridge			
1	4485.049	.09	.04	.1	
1	4361.840	.09	.04	.1	.12
1	4354	Bridge			
1	4343.304	.09	.04	.1	.12
1	4222.473	.09	.04	.1	.12
1	4215	Bridge			
1	4204.470	.09	.04	.1	.12
1	4080.463	.09	.04	.12	
1	4074	Bridge			
1	4062.727	.09	.04	.12	
1	3940.903	.09	.04	.12	
1	3934	Bridge			
1	3922.633	.09	.04	.12	
1	3799.870	.09	.04	.12	
1	3792	Bridge			
1	3781.101	.09	.04	.12	
1	3659.612	.09	.04	.12	
1	3652	Bridge			
1	3641.433	.09	.04	.12	
1	3518.856	.09	.04	.12	
1	3512	Bridge			
1	3500.626	.09	.04	.12	
1	3378.489	.09	.04	.12	
1	3371	Bridge			
1	3360.436	.09	.04	.12	
1	3238.304	.09	.04	.12	
1	3231	Bridge			
1	3220.243	.09	.04	.12	
1	3147	.09	.04	.12	
1	3097.384	.09	.04	.12	
1	3090	Bridge			
1	3079.078	.09	.04	.12	
1	2955.929	.09	.04	.12	
1	2949	Bridge			
1	2937.884	.09	.04	.12	
1	2870	.09	.04	.12	
1	2813.979	.09	.04	.12	
1	2807	Bridge			
1	2795.938	.09	.04	.12	
1	2668.395	.12	.04	.12	
1	2662	Bridge			
1	2650.675	.12	.04	.12	
1	2537.862	.12	.04	.12	
1	2532	Bridge			
1	2520.830	.12	.04	.12	
1	2390.934	.12	.04	.12	
1	2354.325	.12	.04	.12	
1	2262	.12	.04	.12	
1	2081.919	.12	.04	.12	
1	1650	.12	.04	.12	
1	1492.060	.12	.04	.12	
1	1084	.12	.04	.12	
1	1027.831	.12	.04	.12	
1	949.7572	.12	.04	.12	
1	878.1000	.12	.04	.12	
1	871	Bridge			
1	859.3424	.12	.04	.12	
1	735.5340	.12	.04	.12	
1	728	Bridge			
1	716.3877	.12	.04	.12	
1	595.3610	.12	.04	.12	
1	589	Bridge			
1	577.5895	.12	.04	.12	

1	553	.12	.04	.12
1	459.5899	.12	.04	.12
1	441.5446	.12	.04	.12
1	324.8710	.12	.04	.12
1	307.2792	.12	.04	.12
1	200.7906	.12	.04	.12
1	185.0263	.12	.04	.12
1	28.22144	.12	.04	.12
1	12.13838	.12	.04	.12

SUMMARY OF REACH LENGTHS

River: Hope Creek

Reach	River Sta.	Left	Channel	Right
1	8000	393.3	452.1	505.73
1	7548	498.18	486.75	465.44
1	7061	137.61	131.25	117.04
1	6930	458.64	434.11	418.59
1	6719	Culvert		
1	6496	261.27	218.1	177.15
1	6278	596.84	648.74	713.24
1	5629	205.65	201.08	200.99
1	5428	519.24	458.42	414.44
1	5146	Culvert		
1	4969	170.27	251.19	305.99
1	4925.680	18.25	17.81	18.01
1	4918	Bridge		
1	4907.867	122.42	124.85	123.52
1	4783.015	18.84	18.63	18.24
1	4775	Bridge		
1	4764.388	48.37	45.95	44.99
1	4718	71.98	75.39	77.8
1	4643.051	17.45	17.74	17.85
1	4636	Bridge		
1	4625.316	120.71	121.61	122.64
1	4503.708	19.61	18.66	18.24
1	4496	Bridge		
1	4485.049	123.05	123.21	122.55
1	4361.840	19	18.54	18
1	4354	Bridge		
1	4343.304	119.24	120.83	121.61
1	4222.473	17.55	18	17.71
1	4215	Bridge		
1	4204.470	124.62	124.01	123.48
1	4080.463	17.85	17.74	17.82
1	4074	Bridge		
1	4062.727	120.53	121.82	121.07
1	3940.903	18.03	18.27	18.28
1	3934	Bridge		
1	3922.633	121.49	122.76	124.97
1	3799.870	19.61	18.77	18.18
1	3792	Bridge		
1	3781.101	119.49	121.49	122.1
1	3659.612	18.36	18.18	17.87
1	3652	Bridge		
1	3641.433	122.87	122.58	125.68
1	3518.856	18.65	18.23	18.01
1	3512	Bridge		
1	3500.626	121.15	122.14	120.16
1	3378.489	17.27	18.05	17.97
1	3371	Bridge		
1	3360.436	122.81	122.13	120.82
1	3238.304	18.33	18.06	18.17
1	3231	Bridge		
1	3220.243	73.32	73.11	72.78
1	3147	46.78	49.75	49.66
1	3097.384	19.08	18.31	18.45
1	3090	Bridge		
1	3079.078	124.18	123.15	120.49
1	2955.929	18	18.05	18.27
1	2949	Bridge		

1	2937.884		68.38	65.3	63.65
1	2870		51.13	58.6	53.12
1	2813.979		18.36	18.04	17.52
1	2807	Bridge			
1	2795.938		124.19	127.54	116.57
1	2668.395		18.55	17.72	17.36
1	2662	Bridge			
1	2650.675		124.24	112.8	97.76
1	2537.862		18.67	17.03	20.7
1	2532	Bridge			
1	2520.830		97.79	129.85	152.46
1	2390.934		38.36	36.6	36.24
1	2354.325		95.4	91.3	65.8
1	2262		220.4	181.12	126.56
1	2081.919		293.59	431.27	483.25
1	1650		172.21	158.59	117.87
1	1492.060		383.24	408.33	377.92
1	1084		53.7	55.9	61.7
1	1027.831		76.72	78.07	78.34
1	949.7572		69.19	71.66	70.51
1	878.1000		18.27	18.76	20.13
1	871	Bridge			
1	859.3424		123.89	123.81	123.48
1	735.5340		19.18	19.15	18.15
1	728	Bridge			
1	716.3877		125.31	121.03	115.29
1	595.3610		18.02	17.77	17.42
1	589	Bridge			
1	577.5895		27	24	22
1	553		95.41	94	90.84
1	459.5899		18.06	18.05	18.28
1	441.5446		122.28	116.67	109.21
1	324.8710		17.95	17.59	16.66
1	307.2792		125.45	106.5	91.3
1	200.7906		16.52	15.76	15.52
1	185.0263		137.52	156.8	137.84
1	28.22144		18.33	16.08	17.35
1	12.13838		16.79	12.14	12.8

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Hope Creek

Reach	River Sta.		Contr.	Expan.
1	8000		.1	.3
1	7548		.1	.3
1	7061		.3	.5
1	6930		.3	.5
1	6719	Culvert		
1	6496		.3	.5
1	6278		.1	.3
1	5629		.3	.5
1	5428		.3	.5
1	5146	Culvert		
1	4969		.3	.5
1	4925.680		.1	.3
1	4918	Bridge		
1	4907.867		.1	.3
1	4783.015		.1	.3
1	4775	Bridge		
1	4764.388		.1	.3
1	4718		.1	.3
1	4643.051		.1	.3
1	4636	Bridge		
1	4625.316		.1	.3
1	4503.708		.1	.3
1	4496	Bridge		
1	4485.049		.1	.3
1	4361.840		.1	.3
1	4354	Bridge		
1	4343.304		.1	.3
1	4222.473		.1	.3

1	4215	Bridge		
1	4204.470		.1	.3
1	4080.463		.1	.3
1	4074	Bridge		
1	4062.727		.1	.3
1	3940.903		.1	.3
1	3934	Bridge		
1	3922.633		.1	.3
1	3799.870		.1	.3
1	3792	Bridge		
1	3781.101		.1	.3
1	3659.612		.1	.3
1	3652	Bridge		
1	3641.433		.1	.3
1	3518.856		.1	.3
1	3512	Bridge		
1	3500.626		.1	.3
1	3378.489		.1	.3
1	3371	Bridge		
1	3360.436		.1	.3
1	3238.304		.1	.3
1	3231	Bridge		
1	3220.243		.1	.3
1	3147		.1	.3
1	3097.384		.1	.3
1	3090	Bridge		
1	3079.078		.1	.3
1	2955.929		.1	.3
1	2949	Bridge		
1	2937.884		.1	.3
1	2870		.1	.3
1	2813.979		.1	.3
1	2807	Bridge		
1	2795.938		.1	.3
1	2668.395		.1	.3
1	2662	Bridge		
1	2650.675		.1	.3
1	2537.862		.1	.3
1	2532	Bridge		
1	2520.830		.1	.3
1	2390.934		.1	.3
1	2354.325		.1	.3
1	2262		.1	.3
1	2081.919		.1	.3
1	1650		.1	.3
1	1492.060		.1	.3
1	1084		.1	.3
1	1027.831		.1	.3
1	949.7572		.1	.3
1	878.1000		.1	.3
1	871	Bridge		
1	859.3424		.1	.3
1	735.5340		.1	.3
1	728	Bridge		
1	716.3877		.1	.3
1	595.3610		.1	.3
1	589	Bridge		
1	577.5895		.1	.3
1	553		.1	.3
1	459.5899		.1	.3
1	441.5446		.1	.3
1	324.8710		.1	.3
1	307.2792		.1	.3
1	200.7906		.1	.3
1	185.0263		.1	.3
1	28.22144		.1	.3
1	12.13838		.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
1	8000	100 YR	1400.00	999.59	1003.99	1003.67	1004.66	0.009634	7.50	383.92	236.49	0.69
1	8000	100 YR FW	1400.00	999.59	1004.70	1003.81	1005.78	0.010794	8.33	168.08	38.84	0.71

1	7548		100 YR	1400.00	993.51	997.73	997.69	999.05	0.016973	9.61	193.94	86.14	0.91
1	7548		100 YR FW	1400.00	993.51	997.93	997.73	999.46	0.018530	9.92	141.12	38.84	0.92
1	7061		100 YR	1790.00	983.03	987.89	987.89	989.78	0.020645	11.04	162.11	42.86	1.00
1	7061		100 YR FW	1790.00	983.03	987.87	987.87	989.78	0.020896	11.09	161.45	42.82	1.01
1	6930		100 YR	1790.00	976.44	988.15	981.29	988.34	0.000606	3.51	510.24	67.92	0.20
1	6930		100 YR FW	1790.00	976.44	988.15	981.28	988.34	0.000715	3.51	510.24	52.42	0.20
1	6719	S. Marietta Pkwy		Culvert									
1	6496		100 YR	1790.00	966.25	973.73	972.96	975.70	0.006980	11.33	163.33	50.50	0.81
1	6496		100 YR FW	1790.00	966.25	974.71	972.96	976.17	0.004217	9.73	190.78	54.53	0.64
1	6278		100 YR	1790.00	965.79	972.60	972.60	974.37	0.004553	11.49	326.82	138.43	0.88
1	6278		100 YR FW	1790.00	965.79	972.59	972.59	974.85	0.005841	12.46	203.16	51.99	0.96
1	5629		100 YR	1790.00	958.42	967.71		968.86	0.001465	8.65	238.22	38.76	0.54
1	5629		100 YR FW	1790.00	958.42	968.09		969.19	0.002050	8.39	213.36	25.76	0.51
1	5428		100 YR	1790.00	955.36	967.84	962.07	968.42	0.000476	6.18	309.34	446.55	0.33
1	5428		100 YR FW	1790.00	955.36	968.09	962.06	968.67	0.000874	6.13	292.12	25.76	0.32
1	5146	I-75		Culvert									
1	4969		100 YR	1790.00	950.60	958.55	956.86	960.19	0.008284	10.30	174.98	32.19	0.67
1	4969		100 YR FW	1790.00	950.60	958.80	956.86	960.34	0.008559	9.96	179.67	23.97	0.64
1	4925.680		100 YR	1790.00	948.84	958.41	953.91	958.82	0.001538	5.17	354.33	48.42	0.32
1	4925.680		100 YR FW	1790.00	948.84	958.59	953.91	958.99	0.001573	5.08	352.24	41.96	0.31
1	4918	BR 17 - Bent19		Bridge									
1	4907.867		100 YR	1790.00	948.29	958.09		958.51	0.001536	5.25	348.05	47.13	0.32
1	4907.867		100 YR FW	1790.00	948.29	958.27		958.68	0.001575	5.16	346.82	39.81	0.31
1	4783.015		100 YR	1790.00	947.57	957.91	952.80	958.32	0.001507	5.12	349.42	42.10	0.31
1	4783.015		100 YR FW	1790.00	947.57	958.10	952.80	958.49	0.001416	5.01	357.31	42.35	0.30
1	4775	BR 17 - Bent18		Bridge									
1	4764.388		100 YR	1790.00	947.39	957.81		958.28	0.001812	5.46	327.83	41.82	0.34
1	4764.388		100 YR FW	1790.00	947.39	958.01		958.45	0.001692	5.33	335.95	42.10	0.33
1	4718		100 YR	2310.00	946.98	956.98		958.08	0.004378	8.43	278.57	39.29	0.53
1	4718		100 YR FW	2310.00	946.98	957.22		958.26	0.004327	8.21	281.41	34.58	0.51
1	4643.051		100 YR	2310.00	946.11	956.10	953.94	957.65	0.006259	10.20	256.31	40.05	0.62
1	4643.051		100 YR FW	2310.00	946.11	956.16	953.84	957.81	0.006451	10.40	236.23	29.75	0.63
1	4636	BR 17 - Bent17		Bridge									
1	4625.316		100 YR	2310.00	946.16	955.62		957.49	0.008088	11.19	233.89	37.34	0.68
1	4625.316		100 YR FW	2310.00	946.16	955.83		957.63	0.007596	10.97	232.87	31.25	0.66
1	4503.708		100 YR	2310.00	945.71	955.15	952.81	956.56	0.005384	9.61	265.51	50.46	0.59
1	4503.708		100 YR FW	2310.00	945.71	955.45	952.81	956.76	0.004765	9.27	271.94	40.50	0.56
1	4496	BR 17 - Bent16		Bridge									
1	4485.049		100 YR	2310.00	945.71	954.68		956.13	0.005835	9.74	257.46	51.03	0.61
1	4485.049		100 YR FW	2310.00	945.71	955.05		956.37	0.004985	9.28	269.35	41.94	0.57
1	4361.840		100 YR	2310.00	945.60	954.25	952.03	955.37	0.004939	8.63	316.51	75.28	0.57
1	4361.840		100 YR FW	2310.00	945.60	954.65	952.04	955.71	0.004440	8.32	301.91	51.45	0.54
1	4354	BR 17 - Bent15		Bridge									
1	4343.304		100 YR	2310.00	945.35	954.04		955.23	0.005359	8.84	296.93	73.07	0.59
1	4343.304		100 YR FW	2310.00	945.35	954.42		955.51	0.004690	8.44	294.75	52.88	0.55
1	4222.473		100 YR	2310.00	944.89	953.74	950.98	954.60	0.003649	7.59	383.98	100.54	0.50
1	4222.473		100 YR FW	2310.00	944.89	954.13	950.98	954.96	0.003367	7.38	346.82	62.20	0.47
1	4215	BR 17 - Bent14		Bridge									

1	4204.470		100 YR	2310.00	944.78	953.31		954.18	0.003664	7.65	385.45	99.13	0.50
1	4204.470		100 YR FW	2310.00	944.78	953.73		954.56	0.003373	7.43	349.45	63.72	0.47
1	4080.463		100 YR	2310.00	944.50	952.92	950.57	953.69	0.003772	7.20	384.49	95.19	0.52
1	4080.463		100 YR FW	2310.00	944.50	953.36	950.54	954.12	0.003403	6.96	331.95	52.29	0.49
1	4074	BR 17 - Bent13		Bridge									
1	4062.727		100 YR	2310.00	944.35	952.79		953.56	0.003730	7.17	387.83	98.65	0.51
1	4062.727		100 YR FW	2310.00	944.35	953.20		953.96	0.003419	6.97	331.41	52.27	0.49
1	3940.903		100 YR	2310.00	943.93	952.38	950.03	953.10	0.003574	7.03	440.76	139.16	0.50
1	3940.903		100 YR FW	2310.00	943.93	952.79	949.98	953.54	0.003412	6.97	331.55	52.22	0.49
1	3934	BR 17 - Bent12		Bridge									
1	3922.633		100 YR	2310.00	943.43	952.11		952.79	0.003195	6.78	455.95	140.60	0.48
1	3922.633		100 YR FW	2310.00	943.43	952.47		953.18	0.003147	6.78	340.95	52.50	0.47
1	3799.870		100 YR	2310.00	942.55	951.98	948.67	952.42	0.001884	5.69	681.59	235.23	0.38
1	3799.870		100 YR FW	2310.00	942.55	952.19	948.60	952.81	0.002491	6.33	364.81	49.96	0.41
1	3792	BR 17 - Bent11		Bridge									
1	3781.101		100 YR	2310.00	942.35	951.93		952.37	0.001798	5.64	689.31	234.30	0.37
1	3781.101		100 YR FW	2310.00	942.35	952.01		952.63	0.002467	6.31	365.95	49.96	0.41
1	3659.612		100 YR	2310.00	942.15	951.64	948.19	952.13	0.001993	5.88	609.27	196.16	0.39
1	3659.612		100 YR FW	2310.00	942.15	951.68	948.17	952.32	0.002606	6.43	359.35	49.96	0.42
1	3652	BR 17 - Bent10		Bridge									
1	3641.433		100 YR	2310.00	942.15	951.58		952.09	0.002074	5.97	584.65	193.26	0.39
1	3641.433		100 YR FW	2310.00	942.15	951.60		952.25	0.002699	6.50	355.17	49.96	0.43
1	3518.856		100 YR	2310.00	941.93	951.12	947.96	951.78	0.002747	6.56	373.56	77.54	0.45
1	3518.856		100 YR FW	2310.00	941.93	951.27	947.96	951.92	0.002745	6.47	356.90	52.64	0.44
1	3512	BR 17 - Bent09		Bridge									
1	3500.626		100 YR	2310.00	941.73	950.94		951.59	0.002715	6.53	380.86	81.35	0.45
1	3500.626		100 YR FW	2310.00	941.73	951.09		951.74	0.002716	6.45	358.13	52.64	0.44
1	3378.489		100 YR	2310.00	941.38	950.68	947.42	951.26	0.002378	6.26	455.80	102.09	0.42
1	3378.489		100 YR FW	2310.00	941.38	950.74	947.43	951.40	0.002758	6.53	353.86	50.90	0.44
1	3371	BR 17 - Bent08		Bridge									
1	3360.436		100 YR	2310.00	941.32	950.61		951.21	0.002413	6.31	444.23	98.81	0.42
1	3360.436		100 YR FW	2310.00	941.32	950.63		951.30	0.002819	6.58	351.29	50.90	0.44
1	3238.304		100 YR	2310.00	941.06	950.20	947.10	950.87	0.003008	6.58	366.29	78.18	0.46
1	3238.304		100 YR FW	2310.00	941.06	950.28	947.10	950.95	0.002951	6.54	353.03	55.76	0.46
1	3231	BR 17 - Bent07		Bridge									
1	3220.243		100 YR	2310.00	940.86	950.03		950.69	0.002962	6.55	368.21	76.44	0.46
1	3220.243		100 YR FW	2310.00	940.86	950.10		950.76	0.002920	6.52	354.25	55.76	0.46
1	3147		100 YR	2800.00	940.68	948.99		950.31	0.006610	9.21	309.97	63.83	0.68
1	3147		100 YR FW	2800.00	940.68	949.13		950.39	0.006219	9.01	310.63	53.54	0.66
1	3097.384		100 YR	2800.00	940.56	948.23	947.27	949.89	0.009090	10.34	271.27	58.90	0.79
1	3097.384		100 YR FW	2800.00	940.56	948.55	947.27	950.03	0.007705	9.74	287.57	51.95	0.73
1	3090	BR 17 - Bent06		Bridge									
1	3079.078		100 YR	2800.00	940.36	947.70	947.07	949.58	0.010751	10.99	254.71	49.36	0.85
1	3079.078		100 YR FW	2800.00	940.36	948.20		949.76	0.008324	10.02	279.58	51.34	0.76
1	2955.929		100 YR	2800.00	938.59	947.33	945.30	948.45	0.005355	8.51	339.03	67.49	0.61
1	2955.929		100 YR FW	2800.00	938.59	947.94	945.30	948.87	0.004075	7.74	361.85	56.70	0.54
1	2949	BR 17 - Bent05		Bridge									

1	2937.884		100 YR	2800.00	938.39	947.08		948.22	0.005477	8.58	335.81	67.11	0.62
1	2937.884		100 YR FW	2800.00	938.39	947.72		948.66	0.004115	7.76	360.64	56.66	0.54
1	2870		100 YR	2800.00	937.72	946.98		947.86	0.003451	7.62	411.24	77.22	0.51
1	2870		100 YR FW	2800.00	937.72	947.57		948.39	0.003126	7.25	386.16	51.13	0.46
1	2813.979		100 YR	2800.00	937.22	946.82	943.92	947.65	0.003037	7.38	407.34	69.81	0.48
1	2813.979		100 YR FW	2800.00	937.22	947.46	943.91	948.19	0.002696	6.90	405.79	51.13	0.43
1	2807	BR 17 - Bent04		Bridge									
1	2795.938		100 YR	2800.00	937.22	946.60		947.48	0.003332	7.57	409.80	85.89	0.50
1	2795.938		100 YR FW	2800.00	937.22	947.32		948.09	0.002838	7.02	398.84	51.13	0.44
1	2668.395		100 YR	2800.00	936.34	946.37	942.98	947.05	0.002497	6.74	525.46	131.56	0.44
1	2668.395		100 YR FW	2800.00	936.34	947.13	943.00	947.74	0.001913	6.30	477.59	70.15	0.39
1	2662	BR 17 - Bent03		Bridge									
1	2650.675		100 YR	2800.00	936.34	945.83	942.73	946.45	0.002349	6.52	575.33	142.71	0.43
1	2650.675		100 YR FW	2800.00	936.34	946.49	942.73	947.05	0.001989	6.15	522.24	70.15	0.38
1	2537.862		100 YR	2800.00	935.54	944.88	943.74	946.00	0.005700	9.35	525.00	149.22	0.60
1	2537.862		100 YR FW	2800.00	935.54	944.72	944.05	946.52	0.008237	11.08	332.17	86.28	0.72
1	2532	BR 17 - Bent02		Bridge									
1	2520.830		100 YR	2800.00	935.58	943.69	943.69	945.56	0.011128	11.73	381.32	119.00	0.83
1	2520.830		100 YR FW	2800.00	935.58	943.94	943.94	946.23	0.011871	12.39	289.66	88.74	0.86
1	2390.934		100 YR	2800.00	934.58	943.62		944.30	0.002966	7.10	652.40	182.03	0.46
1	2390.934		100 YR FW	2800.00	934.58	943.68		944.59	0.003622	7.78	450.81	107.50	0.50
1	2354.325	BR 17 - Bent01	100 YR	2800.00	934.22	941.99	941.99	943.98	0.012564	11.45	296.15	115.04	0.90
1	2354.325	BR 17 - Bent01	100 YR FW	2800.00	934.22	943.02	941.83	944.36	0.007061	9.43	360.40	112.79	0.69
1	2262		100 YR	2800.00	933.97	942.38	939.08	942.92	0.002086	5.95	562.61	149.01	0.40
1	2262		100 YR FW	2800.00	933.97	943.44	939.07	943.84	0.001363	5.13	644.46	126.12	0.32
1	2081.919		100 YR	2800.00	932.16	941.87		942.51	0.002278	6.75	696.59	208.99	0.40
1	2081.919		100 YR FW	2800.00	932.16	943.07		943.56	0.001503	5.97	722.19	147.39	0.33
1	1650		100 YR	2800.00	931.18	941.41		941.67	0.001482	5.30	1287.25	283.01	0.31
1	1650		100 YR FW	2800.00	931.18	942.70		942.95	0.001201	4.95	1189.46	198.41	0.27
1	1492.060		100 YR	2800.00	929.74	941.08		941.41	0.001685	5.74	1144.77	241.17	0.32
1	1492.060		100 YR FW	2800.00	929.74	942.37		942.72	0.001533	5.65	978.84	159.56	0.30
1	1084		100 YR	2800.00	927.83	938.27	938.27	939.96	0.008803	11.28	479.83	200.33	0.70
1	1084		100 YR FW	2800.00	927.83	939.62		941.42	0.007114	10.95	297.69	47.03	0.63
1	1027.831		100 YR	2800.00	927.42	937.24		939.00	0.010372	11.59	455.68	179.11	0.77
1	1027.831		100 YR FW	2800.00	927.42	939.51		940.96	0.005617	9.89	337.63	47.03	0.57
1	949.7572		100 YR	2800.00	926.86	937.56		938.28	0.003184	7.95	807.73	234.37	0.47
1	949.7572		100 YR FW	2800.00	926.86	939.45		940.55	0.002900	8.64	410.28	47.03	0.47
1	878.1000		100 YR	2800.00	926.71	937.74	933.05	938.03	0.001000	4.97	1217.91	282.35	0.28
1	878.1000		100 YR FW	2800.00	926.71	939.77	933.06	940.24	0.001139	5.52	529.98	47.03	0.28
1	871			Bridge									
1	859.3424		100 YR	2800.00	926.88	937.68		938.01	0.001250	5.37	1192.46	283.78	0.31
1	859.3424		100 YR FW	2800.00	926.88	939.63		940.20	0.001512	6.13	489.88	47.03	0.33
1	735.5340		100 YR	2800.00	926.37	937.39	934.71	937.80	0.001966	6.51	1047.04	293.69	0.37
1	735.5340		100 YR FW	2800.00	926.37	938.84	934.77	939.90	0.002828	8.57	421.31	47.03	0.45
1	728			Bridge									
1	716.3877		100 YR	2800.00	926.18	937.02		937.70	0.003235	8.01	834.58	216.70	0.46
1	716.3877		100 YR FW	2800.00	926.18	938.50		939.78	0.003744	9.49	396.98	47.03	0.51
1	595.3610		100 YR	2800.00	925.11	936.59	935.20	937.27	0.003963	8.23	809.91	201.18	0.48
1	595.3610		100 YR FW	2800.00	925.11	937.35	935.30	939.15	0.006576	11.17	330.25	47.03	0.62

1	589		Bridge											
1	577.5895	100 YR	2800.00	925.63	936.27		937.12	0.004795	9.01	735.55	198.85	0.53
1	577.5895	100 YR FW	2800.00	925.63	936.88		938.93	0.007649	11.90	307.18	47.03	0.68
1	553	100 YR	2800.00	925.33	935.93	935.16	936.98	0.005380	9.53	647.41	192.54	0.57
1	553	100 YR FW	2800.00	925.33	936.90	934.88	938.69	0.006238	11.01	320.67	47.03	0.62
1	459.5899	100 YR	2800.00	925.06	934.62	934.31	936.28	0.009235	11.31	441.56	161.74	0.74
1	459.5899	100 YR FW	2800.00	925.06	936.56	934.20	938.03	0.005732	10.06	342.55	47.03	0.58
1	441.5446	100 YR	2800.00	924.84	934.93		935.95	0.006110	9.41	572.78	176.94	0.61
1	441.5446	100 YR FW	2800.00	924.84	936.48		937.92	0.005629	9.94	343.73	47.03	0.59
1	324.8710	100 YR	2800.00	924.63	933.29	933.29	934.95	0.011350	11.94	466.38	200.70	0.86
1	324.8710	100 YR FW	2800.00	924.63	933.87	933.87	936.80	0.013865	14.03	239.93	47.03	0.97
1	307.2792	100 YR	2800.00	924.63	933.52		934.54	0.007009	9.27	561.56	239.07	0.69
1	307.2792	100 YR FW	2800.00	924.63	933.23	933.23	935.81	0.014617	12.93	225.00	47.03	0.99
1	200.7906	100 YR	2800.00	924.60	931.81	931.81	933.55	0.011340	10.99	359.00	296.45	0.87
1	200.7906	100 YR FW	2800.00	924.60	931.62	931.62	933.98	0.015216	12.32	227.21	47.83	1.00
1	185.0263	100 YR	2800.00	924.31	931.18	931.18	933.15	0.013848	11.49	286.61	224.37	0.94
1	185.0263	100 YR FW	2800.00	924.31	931.10	931.10	933.39	0.015664	12.15	230.46	50.24	1.00
1	28.22144	100 YR	2800.00	923.36	930.02	929.11	930.78	0.007618	7.00	405.34	184.46	0.69
1	28.22144	100 YR FW	2800.00	923.36	930.02	929.09	930.78	0.007620	7.01	399.61	124.65	0.69
1	12.13838	100 YR	2800.00	923.37	930.18	927.98	930.60	0.003003	5.18	540.66	130.98	0.45
1	12.13838	100 YR FW	2800.00	923.37	930.18	927.98	930.60	0.003000	5.18	540.81	131.00	0.45

Profile Output Table - Encroachment 1

Reach	River Sta		Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Wdth Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
1	8000		100 YR	1003.99		1004.66	236.49	338.16	1052.76	9.09		9975.44	10014.28	
1	8000		100 YR FW	1004.70	0.71	1005.78	38.84		1400.00		9975.44	9975.44	10014.28	10014.28
1	7548		100 YR	997.73		999.05	86.14	117.42	1281.48	1.11		9975.44	10014.28	
1	7548		100 YR FW	997.93	0.20	999.46	38.84		1400.00		9975.44	9975.44	10014.28	10014.28
1	7061		100 YR	987.89		989.78	42.86		1790.00			9971.13	10025.25	
1	7061		100 YR FW	987.87	-0.02	989.78	42.82		1790.00		9971.13	9971.13	10025.25	10025.25
1	6930		100 YR	988.15		988.34	52.42		1790.00			9968.55	10020.97	
1	6930		100 YR FW	988.15	0.00	988.34	52.42		1790.00		9968.55	9968.55	10020.97	10020.97
1	6719	S. Marietta Pkwy		Culvert										
1	6496		100 YR	973.73		975.70	27.86	12.92	1775.92	1.16		9986.26	10012.02	
1	6496		100 YR FW	974.71	0.99	976.17	27.86	15.91	1772.70	1.38	9970.00	9986.26	10012.02	10030.00

1	6278			100 YR	972.60		974.37	138.43	236.94	1546.87	6.19		9986.44	10012.01	
1	6278			100 YR FW	972.59	-0.01	974.85	51.99	115.45	1674.55		9960.02	9986.44	10012.01	10012.01
1	5629			100 YR	967.71		968.86	38.76	29.46	1760.45	0.09		9986.25	10012.01	
1	5629			100 YR FW	968.09	0.38	969.19	25.76		1790.00		9986.25	9986.25	10012.01	10012.01
1	5428			100 YR	967.84		968.42	28.76	15.37	1764.60	10.03		9986.25	10012.01	
1	5428			100 YR FW	968.09	0.25	968.67	25.76		1790.00		9986.25	9986.25	10012.01	10012.01
1	5146	I-75			Culvert										
1	4969			100 YR	958.55		960.19	24.98	1.74	1787.64	0.63		9988.91	10012.88	
1	4969			100 YR FW	958.80	0.25	960.34	23.97		1790.00		9988.91	9988.91	10012.88	10012.88
1	4925.680			100 YR	958.41		958.82	48.42	7.93	1782.07			24.79	66.83	
1	4925.680			100 YR FW	958.59	0.19	958.99	41.96		1790.00		24.79	24.79	66.83	66.83
1	4918	BR 17 - Bent19	BR U	100 YR	958.22		958.67	45.86	7.91	1782.10			24.79	66.83	
1	4918	BR 17 - Bent19	BR U	100 YR FW	958.40	0.18	958.84	39.51		1790.00		24.79	24.79	66.83	66.83
1	4918	BR 17 - Bent19	BR D	100 YR	958.04		958.53	42.90	5.18	1784.82			26.77	66.58	
1	4918	BR 17 - Bent19	BR D	100 YR FW	958.23	0.18	958.70	37.53		1790.00		26.77	26.77	66.58	66.58
1	4907.867			100 YR	958.09		958.51	47.13	6.24	1783.76	0.01		26.77	66.58	
1	4907.867			100 YR FW	958.27	0.18	958.68	39.81		1790.00		26.77	26.77	66.58	66.58
1	4783.015			100 YR	957.91		958.32	42.10		1790.00			5.33	53.70	
1	4783.015			100 YR FW	958.10	0.19	958.49	42.35		1790.00		5.33	5.33	53.70	53.70
1	4775	BR 17 - Bent18	BR U	100 YR	957.91		958.31	42.15		1790.00			5.33	53.70	
1	4775	BR 17 - Bent18	BR U	100 YR FW	958.09	0.19	958.48	42.40		1790.00		5.33	5.33	53.70	53.70
1	4775	BR 17 - Bent18	BR D	100 YR	957.82		958.29	41.72		1790.00			9.98	57.59	
1	4775	BR 17 - Bent18	BR D	100 YR FW	958.02	0.19	958.47	42.00		1790.00		9.98	9.98	57.59	57.59
1	4764.388			100 YR	957.81		958.28	41.82		1790.00			9.98	57.59	
1	4764.388			100 YR FW	958.01	0.19	958.45	42.10		1790.00		9.98	9.98	57.59	57.59

1	4718			100 YR	956.98		958.08	39.29	5.70	2304.30			56.84	92.74	
1	4718			100 YR FW	957.22	0.24	958.26	34.58		2310.00		56.84	56.84	92.74	92.74
1	4643.051			100 YR	956.10		957.65	40.05	98.67	2211.33			23.27	50.52	
1	4643.051			100 YR FW	956.16	0.06	957.81	29.75	40.22	2269.78		19.65	23.27	50.52	50.52
1	4636	BR 17 - Bent17	BR U	100 YR	956.04		957.62	39.88	96.96	2213.04			23.27	50.52	
1	4636	BR 17 - Bent17	BR U	100 YR FW	956.19	0.15	957.78	29.75	65.36	2244.64		19.65	23.27	50.52	50.52
1	4636	BR 17 - Bent17	BR D	100 YR	955.79		957.56	37.93	104.16	2205.84			28.72	53.69	
1	4636	BR 17 - Bent17	BR D	100 YR FW	955.97	0.18	957.66	31.31	109.44	2200.56		21.30	28.72	53.69	53.69
1	4625.316			100 YR	955.62		957.49	37.34	98.77	2211.23			28.72	53.69	
1	4625.316			100 YR FW	955.83	0.21	957.63	31.25	88.17	2221.83		21.30	28.72	53.69	53.69
1	4503.708			100 YR	955.15		956.56	50.46	40.82	2261.39	7.79		29.54	58.25	
1	4503.708			100 YR FW	955.45	0.30	956.76	40.50	40.88	2260.57	8.55	23.18	29.54	58.25	63.68
1	4496	BR 17 - Bent16	BR U	100 YR	955.02		956.49	41.94	38.72	2268.65	2.64		29.54	58.25	
1	4496	BR 17 - Bent16	BR U	100 YR FW	955.39	0.36	956.71	37.48	46.97	2259.42	3.61	23.18	29.54	58.25	63.68
1	4496	BR 17 - Bent16	BR D	100 YR	954.75		956.18	43.34	30.81	2277.07	2.12		32.95	62.18	
1	4496	BR 17 - Bent16	BR D	100 YR FW	955.11	0.36	956.41	37.66	39.31	2268.12	2.57	26.59	32.95	62.18	68.53
1	4485.049			100 YR	954.68		956.13	51.03	29.73	2274.60	5.66		32.95	62.18	
1	4485.049			100 YR FW	955.05	0.37	956.37	41.94	33.84	2268.46	7.69	26.59	32.95	62.18	68.53
1	4361.840			100 YR	954.25		955.37	75.28	0.79	2228.15	81.06		15.31	51.59	
1	4361.840			100 YR FW	954.65	0.40	955.71	51.45		2268.53	41.47	15.31	15.31	51.59	66.76
1	4354	BR 17 - Bent15	BR U	100 YR	954.01		955.24	66.41	0.45	2257.41	52.14		15.31	51.59	
1	4354	BR 17 - Bent15	BR U	100 YR FW	954.38	0.37	955.54	43.45		2296.23	13.77	15.31	15.31	51.59	66.76
1	4354	BR 17 - Bent15	BR D	100 YR	954.00		955.28	64.33	0.13	2279.55	30.32		22.55	59.44	
1	4354	BR 17 - Bent15	BR D	100 YR FW	954.38	0.38	955.55	44.88		2298.06	11.94	22.55	22.55	59.44	75.43
1	4343.304			100 YR	954.04		955.23	73.07	0.27	2260.27	49.46		22.55	59.44	
1	4343.304			100 YR FW	954.42	0.38	955.51	52.88		2278.11	31.89	22.55	22.55	59.44	75.43

1	4222.473			100 YR	953.74		954.60	100.54	1.25	2205.25	103.50		47.12	87.81	
1	4222.473			100 YR FW	954.13	0.39	954.96	62.20		2259.90	50.10	47.12	47.12	87.81	109.32
1	4215	BR 17 - Bent14	BR U	100 YR	953.63		954.53	92.36	1.10	2223.50	85.40		47.12	87.81	
1	4215	BR 17 - Bent14	BR U	100 YR FW	953.98	0.35	954.86	54.20		2279.72	30.29	47.12	47.12	87.81	109.32
1	4215	BR 17 - Bent14	BR D	100 YR	953.33		954.22	91.06	1.74	2203.64	104.62		42.78	82.68	
1	4215	BR 17 - Bent14	BR D	100 YR FW	953.72	0.39	954.59	55.72		2268.94	41.06	42.78	42.78	82.68	106.50
1	4204.470			100 YR	953.31		954.18	99.13	1.79	2194.18	114.03		42.78	82.68	
1	4204.470			100 YR FW	953.73	0.41	954.56	63.72		2251.07	58.93	42.78	42.78	82.68	106.50
1	4080.463			100 YR	952.92		953.69	95.19	6.14	2222.11	81.75		67.60	120.16	
1	4080.463			100 YR FW	953.36	0.45	954.12	52.29		2310.00		67.60	67.60	120.16	120.16
1	4074	BR 17 - Bent13	BR U	100 YR	952.85		953.64	92.10	5.63	2224.99	79.38		67.60	120.16	
1	4074	BR 17 - Bent13	BR U	100 YR FW	953.27	0.43	954.06	48.56		2310.00		67.60	67.60	120.16	120.16
1	4074	BR 17 - Bent13	BR D	100 YR	952.80		953.60	95.34	5.63	2228.06	76.30		71.47	124.03	
1	4074	BR 17 - Bent13	BR D	100 YR FW	953.20	0.40	953.99	48.56		2310.00		71.47	71.47	124.03	124.03
1	4062.727			100 YR	952.79		953.56	98.65	6.44	2223.64	79.92		71.47	124.03	
1	4062.727			100 YR FW	953.20	0.41	953.96	52.27		2310.00		71.47	71.47	124.03	124.03
1	3940.903			100 YR	952.38		953.10	139.16	6.39	2181.08	122.53		72.89	125.39	
1	3940.903			100 YR FW	952.79	0.41	953.54	52.22		2310.00		72.89	72.89	125.39	125.39
1	3934	BR 17 - Bent12	BR U	100 YR	952.23		952.98	136.01	5.89	2186.25	117.86		72.89	125.39	
1	3934	BR 17 - Bent12	BR U	100 YR FW	952.62	0.39	953.40	48.50		2310.00		72.89	72.89	125.39	125.39
1	3934	BR 17 - Bent12	BR D	100 YR	952.06		952.84	135.10	6.02	2211.23	92.75		76.76	129.26	
1	3934	BR 17 - Bent12	BR D	100 YR FW	952.42	0.35	953.21	48.50		2310.00		76.76	76.76	129.26	129.26
1	3922.633			100 YR	952.11		952.79	140.60	9.28	2184.39	116.33		76.76	129.26	
1	3922.633			100 YR FW	952.47	0.36	953.18	52.50		2310.00		76.76	76.76	129.26	129.26
1	3799.870			100 YR	951.98		952.42	208.88	18.31	2015.31	276.38		48.58	98.54	

1	3799.870			100 YR FW	952.19	0.21	952.81	49.96		2310.00		48.58	48.58	98.54	98.54
1	3792	BR 17 - Bent11	BR U	100 YR	951.96		952.41	200.92	18.49	2012.28	279.22		48.58	98.54	
1	3792	BR 17 - Bent11	BR U	100 YR FW	952.08	0.12	952.74	45.96		2310.00		48.58	48.58	98.54	98.54
1	3792	BR 17 - Bent11	BR D	100 YR	951.92		952.40	215.10	19.49	2054.79	235.72		55.46	105.42	
1	3792	BR 17 - Bent11	BR D	100 YR FW	951.99	0.07	952.65	45.96		2310.00		55.46	55.46	105.42	105.42
1	3781.101			100 YR	951.93		952.37	223.30	22.01	2039.47	248.52		55.46	105.42	
1	3781.101			100 YR FW	952.01	0.08	952.63	49.96		2310.00		55.46	55.46	105.42	105.42
1	3659.612			100 YR	951.64		952.13	196.16	20.57	2103.04	186.39		52.29	102.25	
1	3659.612			100 YR FW	951.68	0.04	952.32	49.96		2310.00		52.29	52.29	102.25	102.25
1	3652	BR 17 - Bent10	BR U	100 YR	951.61		952.12	187.74	19.58	2107.01	183.42		52.29	102.25	
1	3652	BR 17 - Bent10	BR U	100 YR FW	951.61	0.00	952.29	45.96		2310.00		52.29	52.29	102.25	102.25
1	3652	BR 17 - Bent10	BR D	100 YR	951.59		952.11	197.85	19.26	2115.81	174.93		54.01	103.97	
1	3652	BR 17 - Bent10	BR D	100 YR FW	951.59	0.01	952.27	45.96		2310.00		54.01	54.01	103.97	103.97
1	3641.433			100 YR	951.58		952.09	190.62	19.32	2116.44	174.24		54.01	103.97	
1	3641.433			100 YR FW	951.60	0.01	952.25	49.96		2310.00		54.01	54.01	103.97	103.97
1	3518.856			100 YR	951.12		951.78	77.54	15.68	2290.99	3.33		49.46	102.10	
1	3518.856			100 YR FW	951.27	0.14	951.92	52.64		2310.00		49.46	49.46	102.10	102.10
1	3512	BR 17 - Bent09	BR U	100 YR	951.02		951.72	69.24	15.77	2291.15	3.08		49.46	102.10	
1	3512	BR 17 - Bent09	BR U	100 YR FW	951.16	0.14	951.85	48.64		2310.00		49.46	49.46	102.10	102.10
1	3512	BR 17 - Bent09	BR D	100 YR	950.92		951.62	72.81	15.20	2287.04	7.76		46.80	99.44	
1	3512	BR 17 - Bent09	BR D	100 YR FW	951.07	0.15	951.76	48.64		2310.00		46.80	46.80	99.44	99.44
1	3500.626			100 YR	950.94		951.59	81.35	15.93	2285.47	8.60		46.80	99.44	
1	3500.626			100 YR FW	951.09	0.15	951.74	52.64		2310.00		46.80	46.80	99.44	99.44
1	3378.489			100 YR	950.68		951.26	102.09	17.32	2197.30	95.38		49.79	100.69	
1	3378.489			100 YR FW	950.74	0.06	951.40	50.90		2310.00		49.79	49.79	100.69	100.69

1	3371	BR 17 - Bent08	BR U	100 YR	950.65		951.25	94.01	17.48	2198.04	94.48		49.79	100.69	
1	3371	BR 17 - Bent08	BR U	100 YR FW	950.66	0.02	951.36	46.90		2310.00		49.79	49.79	100.69	100.69
1	3371	BR 17 - Bent08	BR D	100 YR	950.62		951.23	90.71	17.48	2212.41	80.12		50.53	101.43	
1	3371	BR 17 - Bent08	BR D	100 YR FW	950.62	0.00	951.32	46.90		2310.00		50.53	50.53	101.43	101.43
1	3360.436			100 YR	950.61		951.21	98.81	17.36	2211.60	81.04		50.53	101.43	
1	3360.436			100 YR FW	950.63	0.01	951.30	50.90		2310.00		50.53	50.53	101.43	101.43
1	3238.304			100 YR	950.20		950.87	78.18	14.04	2295.88	0.08		47.19	102.95	
1	3238.304			100 YR FW	950.28	0.08	950.95	55.76		2310.00		47.19	47.19	102.95	102.95
1	3231	BR 17 - Bent07	BR U	100 YR	950.12		950.81	68.39	16.08	2293.88	0.04		47.19	102.95	
1	3231	BR 17 - Bent07	BR U	100 YR FW	950.18	0.07	950.88	51.76		2310.00		47.19	47.19	102.95	102.95
1	3231	BR 17 - Bent07	BR D	100 YR	950.02		950.72	66.61	15.72	2294.27	0.01		45.50	101.26	
1	3231	BR 17 - Bent07	BR D	100 YR FW	950.09	0.07	950.79	51.76		2310.00		45.50	45.50	101.26	101.26
1	3220.243			100 YR	950.03		950.69	76.44	14.65	2295.31	0.04		45.50	101.26	
1	3220.243			100 YR FW	950.10	0.07	950.76	55.76		2310.00		45.50	45.50	101.26	101.26
1	3147			100 YR	948.99		950.31	63.83	6.38	2793.62			89.92	145.68	
1	3147			100 YR FW	949.13	0.14	950.39	53.54		2800.00		89.92	89.92	145.68	145.68
1	3097.384			100 YR	948.23		949.89	58.90	0.13	2799.87			60.82	126.32	
1	3097.384			100 YR FW	948.55	0.33	950.03	51.95		2800.00		60.82	60.82	126.32	126.32
1	3090	BR 17 - Bent06	BR U	100 YR	948.06		949.80	49.07		2800.00			60.82	126.32	
1	3090	BR 17 - Bent06	BR U	100 YR FW	948.40	0.35	949.94	49.77		2800.00		60.82	60.82	126.32	126.32
1	3090	BR 17 - Bent06	BR D	100 YR	947.79		949.67	48.68		2800.00			68.21	133.71	
1	3090	BR 17 - Bent06	BR D	100 YR FW	948.22	0.43	949.83	49.54		2800.00		68.21	68.21	133.71	133.71
1	3079.078			100 YR	947.70		949.58	49.36		2800.00			68.21	133.71	
1	3079.078			100 YR FW	948.20	0.49	949.76	51.34		2800.00		68.21	68.21	133.71	133.71
1	2955.929			100 YR	947.33		948.45	67.49	13.07	2786.93			70.80	133.39	
1	2955.929			100 YR FW	947.94	0.62	948.87	56.70		2800.00		70.80	70.80	133.39	133.39

1	2949	BR 17 - Bent05	BR U	100 YR	947.19		948.37	63.41	11.25	2788.75			70.80	133.39			
1	2949	BR 17 - Bent05	BR U	100 YR FW	947.80	0.61	948.79	52.50		2800.00		70.80	70.80	133.39	133.39		
1	2949	BR 17 - Bent05	BR D	100 YR	947.06		948.27	63.10	10.40	2789.60			72.94	133.78			
1	2949	BR 17 - Bent05	BR D	100 YR FW	947.69	0.63	948.69	52.42		2800.00		72.94	72.94	133.78	133.78		
1	2937.884			100 YR	947.08		948.22	67.11	12.25	2787.75			72.94	133.78			
1	2937.884			100 YR FW	947.72	0.64	948.66	56.66		2800.00		72.94	72.94	133.78	133.78		
1	2870			100 YR	946.98		947.86	77.22	87.52	2711.49	0.98		106.36	157.49			
1	2870			100 YR FW	947.57	0.59	948.39	51.13		2800.00		106.36	106.36	157.49	157.49		
1	2813.979			100 YR	946.82		947.65	69.81	42.70	2754.58	2.72		39.47	90.60			
1	2813.979			100 YR FW	947.46	0.63	948.19	51.13		2800.00		39.47	39.47	90.60	90.60		
1	2807	BR 17 - Bent04	BR U	100 YR	946.60		947.57	60.75	23.41	2774.49	2.11		39.47	90.60			
1	2807	BR 17 - Bent04	BR U	100 YR FW	947.29	0.70	948.13	47.13		2800.00		39.47	39.47	90.60	90.60		
1	2807	BR 17 - Bent04	BR D	100 YR	946.55		947.51	72.73	25.34	2758.91	15.75		43.32	94.45			
1	2807	BR 17 - Bent04	BR D	100 YR FW	947.27	0.73	948.11	47.13		2800.00		43.32	43.32	94.45	94.45		
1	2795.938			100 YR	946.60		947.48	80.82	41.19	2742.88	15.93		43.32	94.45			
1	2795.938			100 YR FW	947.32	0.72	948.09	51.13		2800.00		43.32	43.32	94.45	94.45		
1	2668.395			100 YR	946.37		947.05	131.56	9.59	2690.31	100.10		50.89	104.67			
1	2668.395			100 YR FW	947.13	0.76	947.74	70.15	18.53	2770.39	11.08	38.44	50.89	104.67	108.59		
1	2662	BR 17 - Bent03	BR U	100 YR	946.35		947.03	125.01	6.14	2695.52	98.34		50.89	104.67			
1	2662	BR 17 - Bent03	BR U	100 YR FW	947.10	0.76	947.72	66.50	11.95	2771.45	16.61	38.44	50.89	104.67	108.59		
1	2662	BR 17 - Bent03	BR D	100 YR	945.80		946.47	134.56	59.48	2689.30	51.22		57.49	112.58			
1	2662	BR 17 - Bent03	BR D	100 YR FW	946.47	0.67	947.07	65.23	56.71	2743.29		42.43	57.49	112.58	112.58		
1	2650.675			100 YR	945.83		946.45	142.71	132.71	2615.42	51.86		57.49	112.58			
1	2650.675			100 YR FW	946.49	0.66	947.05	70.15	111.57	2688.43		42.43	57.49	112.58	112.58		
1	2537.862			100 YR	944.88		946.00	149.22	484.60	2287.85	27.55		110.95	143.82			

1	2537.862		100 YR FW	944.72	-0.16	946.52	86.28	146.06	2649.58	4.36	64.72	110.95	143.82	151.00
1	2532	BR 17 - Bent02 BR U	100 YR	943.81		945.88	103.08	267.88	2532.12			110.95	143.82	
1	2532	BR 17 - Bent02 BR U	100 YR FW	944.60	0.80	946.49	86.28	139.50	2657.00	3.51	64.72	110.95	143.82	151.00
1	2532	BR 17 - Bent02 BR D	100 YR	943.72		945.70	111.16	298.66	2501.34			119.91	153.79	
1	2532	BR 17 - Bent02 BR D	100 YR FW	944.74	1.02	946.36	88.74	208.08	2591.93		65.05	119.91	153.79	153.79
1	2520.830		100 YR	943.69		945.56	119.00	358.86	2441.14			119.91	153.79	
1	2520.830		100 YR FW	943.94	0.26	946.23	88.74	114.87	2685.13		65.05	119.91	153.79	153.79
1	2390.934		100 YR	943.62		944.30	182.03	360.52	2434.16	5.32		162.22	208.81	
1	2390.934		100 YR FW	943.68	0.06	944.59	107.50	109.80	2690.20		101.31	162.22	208.81	208.81
1	2354.325	BR 17 - Bent01	100 YR	941.99		943.98	115.04	69.54	2730.46			166.02	215.12	
1	2354.325	BR 17 - Bent01	100 YR FW	943.02	1.03	944.36	112.79	79.88	2720.12		102.33	166.02	215.12	215.12
1	2262		100 YR	942.38		942.92	149.01	63.72	2735.35	0.93		184.57	250.90	
1	2262		100 YR FW	943.44	1.06	943.84	126.12	77.85	2722.15		124.78	184.57	250.90	250.90
1	2081.919		100 YR	941.87		942.51	208.99	269.72	2506.71	23.57		211.04	253.36	
1	2081.919		100 YR FW	943.07	1.19	943.56	147.39	240.13	2518.54	41.33	119.54	211.04	253.36	266.93
1	1650		100 YR	941.41		941.67	283.01	1138.72	1656.87	4.41		327.40	361.56	
1	1650		100 YR FW	942.70	1.30	942.95	198.41	1031.20	1768.80		163.15	327.40	361.56	361.56
1	1492.060		100 YR	941.08		941.41	241.17	1060.64	1736.62	2.74		275.91	306.11	
1	1492.060		100 YR FW	942.37	1.29	942.72	159.56	869.27	1930.73		146.55	275.91	306.11	306.11
1	1084		100 YR	938.27		939.96	200.33	95.62	2389.21	315.17		158.76	185.26	
1	1084		100 YR FW	939.62	1.35	941.42	47.03		2709.80	90.21	158.76	158.76	185.26	205.79
1	1027.831		100 YR	937.24		939.00	179.11	112.27	2355.95	331.78		107.04	136.12	
1	1027.831		100 YR FW	939.51	2.27	940.96	47.03		2665.01	134.99	107.04	107.04	136.12	154.07
1	949.7572		100 YR	937.56		938.28	234.37	508.87	1998.90	292.23		104.10	132.62	
1	949.7572		100 YR FW	939.45	1.89	940.55	47.03	77.38	2637.10	85.52	94.85	104.10	132.62	141.88

1	878.1000		100 YR	937.74		938.03	270.05	177.35	2073.77	548.89		65.33	108.09	
1	878.1000		100 YR FW	939.77	2.02	940.24	47.03		2779.86	20.14	65.33	65.33	108.09	112.36
1	871	BR U	100 YR	937.72		938.02	261.93	162.01	2094.18	543.81		65.33	108.09	
1	871	BR U	100 YR FW	939.76	2.04	940.23	47.03		2766.94	33.06	65.33	65.33	108.09	112.36
1	871	BR D	100 YR	937.70		938.02	277.95	167.53	1988.46	644.01		67.67	108.35	
1	871	BR D	100 YR FW	939.66	1.96	940.22	47.03		2739.22	60.78	67.67	67.67	108.35	114.70
1	859.3424		100 YR	937.68		938.01	283.78	183.93	1988.92	627.15		67.67	108.35	
1	859.3424		100 YR FW	939.63	1.94	940.20	47.03		2758.17	41.83	67.67	67.67	108.35	114.70
1	735.5340		100 YR	937.39		937.80	224.33	335.81	1725.45	738.75		90.62	118.04	
1	735.5340		100 YR FW	938.84	1.45	939.90	47.03	37.99	2611.73	150.28	85.18	90.62	118.04	132.21
1	728	BR U	100 YR	937.36		937.79	216.36	303.70	1745.61	750.69		90.62	118.04	
1	728	BR U	100 YR FW	938.88	1.52	939.87	47.03	59.50	2550.65	189.85	85.18	90.62	118.04	132.21
1	728	BR D	100 YR	937.02		937.75	200.46	376.43	1907.84	515.73		99.37	124.26	
1	728	BR D	100 YR FW	938.65	1.63	939.83	47.03	130.89	2500.49	168.63	88.68	99.37	124.26	135.71
1	716.3877		100 YR	937.02		937.70	216.70	417.72	1874.33	507.96		99.37	124.26	
1	716.3877		100 YR FW	938.50	1.47	939.78	47.03	101.94	2570.07	127.99	88.68	99.37	124.26	135.71
1	595.3610		100 YR	936.59		937.27	201.18	388.00	1764.71	647.29		101.51	124.63	
1	595.3610		100 YR FW	937.35	0.76	939.15	47.03	110.15	2590.81	99.04	89.41	101.51	124.63	136.44
1	589	BR U	100 YR	936.39		937.23	191.43	335.93	1857.86	606.21		101.51	124.63	
1	589	BR U	100 YR FW	937.33	0.94	939.11	47.03	126.67	2558.19	115.14	89.41	101.51	124.63	136.44
1	589	BR D	100 YR	936.45		937.17	193.30	349.19	1797.16	653.65		99.42	122.56	
1	589	BR D	100 YR FW	937.41	0.95	939.03	47.03	140.67	2535.52	123.81	87.24	99.42	122.56	134.27
1	577.5895		100 YR	936.27		937.12	198.85	371.59	1849.40	579.01		99.42	122.56	
1	577.5895		100 YR FW	936.88	0.61	938.93	47.03	102.80	2609.45	87.75	87.24	99.42	122.56	134.27
1	553		100 YR	935.93		936.98	192.54	305.20	2058.52	436.29		119.10	143.98	
1	553		100 YR FW	936.90	0.97	938.69	47.03	92.58	2644.07	63.35	106.56	119.10	143.98	153.59

1	459.5899	100 YR	934.62		936.28	134.21		2323.03	476.97		96.73	125.04	
1	459.5899	100 YR FW	936.56	1.94	938.03	47.03		2619.24	180.76	96.73	96.73	125.04	143.76
1	441.5446	100 YR	934.93		935.95	136.89		2041.20	758.80		99.23	129.52	
1	441.5446	100 YR FW	936.48	1.55	937.92	47.03		2620.02	179.98	99.23	99.23	129.52	146.26
1	324.8710	100 YR	933.29		934.95	142.23	7.50	2072.83	719.67		127.90	156.97	
1	324.8710	100 YR FW	933.87	0.58	936.80	47.03	15.49	2673.66	110.85	123.06	127.90	156.97	170.09
1	307.2792	100 YR	933.52		934.54	162.17	5.48	2102.79	691.73		128.91	169.36	
1	307.2792	100 YR FW	933.23	-0.28	935.81	47.03	2.69	2784.58	12.73	125.62	128.91	169.36	172.65
1	200.7906	100 YR	931.81		933.55	160.20	1.49	2594.58	203.93		130.50	178.33	
1	200.7906	100 YR FW	931.62	-0.19	933.98	47.83		2800.00		130.50	130.50	178.33	178.33
1	185.0263	100 YR	931.18		933.15	92.97		2691.92	108.08		134.46	193.53	
1	185.0263	100 YR FW	931.10	-0.08	933.39	50.24		2800.00		134.46	134.46	193.53	193.53
1	28.22144	100 YR	930.02		930.78	150.25		2797.56	2.44		92.56	221.55	
1	28.22144	100 YR FW	930.02	0.00	930.78	124.65		2800.00		92.56	92.56	221.55	221.55
1	12.13838	100 YR	930.18		930.60	130.98		2800.00			82.97	235.12	
1	12.13838	100 YR FW	930.18	0.00	930.60	131.00		2800.00		82.97	82.97	235.12	235.12