```
                    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: creek
Project File : creek.prj
Run Date and Time: 10/5/2006 9:23:19 AM

Project in English units


PLAN DATA

Plan Title: Plan 10
Plan File : f:\HYDRO\Projects\Clifton Heights Commercial 2nd\HECRAS\creek.p10

          Geometry Title: existing
          Geometry File : f:\HYDRO\Projects\Clifton Heights Commercial 2nd\HECRAS\creek.g01

          Flow Title    : existing-pondpack
          Flow File     : f:\HYDRO\Projects\Clifton Heights Commercial 2nd\HECRAS\creek.f02

Plan Summary Information:
Number of:  Cross Sections =   10    Multiple Openings  =    0
            Culverts       =    0    Inline Structures  =    0
            Bridges        =    1    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: existing-pondpack
Flow File : f:\HYDRO\Projects\Clifton Heights Commercial 2nd\HECRAS\creek.f02

Flow Data (cfs)

  River           Reach           RS                  PF 1
  creek           55th            5801                3500


Boundary Conditions

  River           Reach           Profile                       Upstream                Downstream

  creek           55th            PF 1                                                    Critical



GEOMETRY DATA

Geometry Title: existing
Geometry File : f:\HYDRO\Projects\Clifton Heights Commercial 2nd\HECRAS\creek.g01

CROSS SECTION


RIVER: creek
REACH: 55th              RS: 5801

INPUT
Description:
Station Elevation Data    num=      18
```

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1287	5126	1286	5132	1284	5137	1282	5141	1280
5145	1278	5149	1276	5153	1274	5157	1272	5163	1272
5165	1274	5167	1276	5169	1278	5176	1280	5180	1282
5186	1284	5193	1286	5400	1288				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.05	5126	.03	5193	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5126	5193	100	222	300	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1286.61	Element			
Vel Head (ft)	1.13	Wt. n-Val.		0.030	
W.S. Elev (ft)	1285.48	Reach Len. (ft)	100.00	222.00	300.00
Crit W.S. (ft)		Flow Area (sq ft)		411.15	
E.G. Slope (ft/ft)	0.002808	Area (sq ft)		411.15	
Q Total (cfs)	3500.00	Flow (cfs)		3500.00	
Top Width (ft)	63.63	Top Width (ft)		63.63	
Vel Total (ft/s)	8.51	Avg. Vel. (ft/s)		8.51	
Max Chl Dpth (ft)	13.48	Hydr. Depth (ft)		6.46	
Conv. Total (cfs)	66051.6	Conv. (cfs)		66051.6	
Length Wtd. (ft)	221.74	Wetted Per. (ft)		70.39	
Min Ch El (ft)	1272.00	Shear (lb/sq ft)		1.02	
Alpha	1.00	Stream Power (lb/ft s)		8.72	
Frctn Loss (ft)	0.59	Cum Volume (acre-ft)	1.37	9.74	0.36
C & E Loss (ft)	0.00	Cum SA (acres)	0.86	1.48	0.93

CROSS SECTION

RIVER: creek
REACH: 55th RS: 5579

INPUT
Description:
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5006	1286	5128	1284	5139	1282	5146	1280	5149	1278
5152	1276	5157	1274	5159	1272	5169	1272	5171	1274
5181	1280	5183	1282	5185	1284	5202	1286	5265	1288
5292	1286	5333	1284						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5006	.05	5128	.03	5185	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5128	5185	50	130	180	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1286.02	Element			
Vel Head (ft)	1.13	Wt. n-Val.	0.050	0.030	0.050
W.S. Elev (ft)	1284.89	Reach Len. (ft)	50.00	130.00	180.00
Crit W.S. (ft)		Flow Area (sq ft)	24.09	405.66	11.45
E.G. Slope (ft/ft)	0.002543	Area (sq ft)	24.09	405.66	11.45
Q Total (cfs)	3500.00	Flow (cfs)	21.03	3469.22	9.76
Top Width (ft)	136.99	Top Width (ft)	54.22	57.00	25.77
Vel Total (ft/s)	7.93	Avg. Vel. (ft/s)	0.87	8.55	0.85
Max Chl Dpth (ft)	12.89	Hydr. Depth (ft)	0.44	7.12	0.44
Conv. Total (cfs)	69403.9	Conv. (cfs)	416.9	68793.4	193.5
Length Wtd. (ft)	121.75	Wetted Per. (ft)	54.22	64.03	26.74
Min Ch El (ft)	1272.00	Shear (lb/sq ft)	0.07	1.01	0.07
Alpha	1.15	Stream Power (lb/ft s)	0.06	8.60	0.06
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)	1.35	7.66	0.32
C & E Loss (ft)	0.01	Cum SA (acres)	0.79	1.18	0.85

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

CROSS SECTION

RIVER: creek
REACH: 55th RS: 5449

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1286	5058	1284	5091	1282	5133	1280	5137	1278
5141	1276	5145	1274	5147	1272	5154	1272	5155	1274
5158	1276	5161	1278	5165	1280	5168	1282	5172	1284
5269	1286	5350	1286	5388	1284				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.05	5133	.04	5172	.05

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          5133    5172              250     204     180             .1      .3

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           1285.59    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               1.09    Wt. n-Val.                0.050      0.040     0.050
  W.S. Elev (ft)           1284.49    Reach Len. (ft)          250.00     204.00    180.00
  Crit W.S. (ft)                      Flow Area (sq ft)        199.33     301.15      8.14
  E.G. Slope (ft/ft)      0.004941    Area (sq ft)             199.33     301.15      8.14
  Q Total (cfs)            3500.00    Flow (cfs)               710.85    2782.55      6.60
  Top Width (ft)            161.39    Top Width (ft)            89.24      39.00     33.15
  Vel Total (ft/s)             6.88    Avg. Vel. (ft/s)          3.57       9.24      0.81
  Max Chl Dpth (ft)           12.49    Hydr. Depth (ft)          2.23       7.72      0.25
  Conv. Total (cfs)        49794.0    Conv. (cfs)             10113.1    39587.0      93.9
  Length Wtd. (ft)          209.59    Wetted Per. (ft)          89.36      45.24     33.66
  Min Ch El (ft)           1272.00    Shear (lb/sq ft)          0.69       2.05      0.07
  Alpha                       1.49    Stream Power (lb/ft s)    2.45      18.97      0.06
  Frctn Loss (ft)             0.45    Cum Volume (acre-ft)      1.22       6.60      0.28
  C & E Loss (ft)             0.17    Cum SA (acres)            0.71       1.03      0.72


Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream 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: creek
REACH: 55th               RS: 5245

INPUT
Description:
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    5077    1284    5164    1282    5177    1280    5182    1278    5187    1276
    5192    1274    5195    1272    5206    1272    5209    1274    5216    1276
    5223    1278    5229    1280    5236    1282    5242    1284    5377    1284
    5440    1286

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    5077     .05    5164     .03    5242     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          5164    5242              205     205     205             .1      .3

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           1284.97    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.54    Wt. n-Val.                0.050      0.030     0.050
  W.S. Elev (ft)           1284.42    Reach Len. (ft)          205.00     205.00    205.00
  Crit W.S. (ft)                      Flow Area (sq ft)        123.87     544.06     60.05
  E.G. Slope (ft/ft)      0.001207    Area (sq ft)             123.87     544.06     60.05
  Q Total (cfs)            3500.00    Flow (cfs)               161.28    3304.80     33.92
  Top Width (ft)            313.35    Top Width (ft)            87.00      78.00    148.35
  Vel Total (ft/s)             4.81    Avg. Vel. (ft/s)          1.30       6.07      0.56
  Max Chl Dpth (ft)           12.42    Hydr. Depth (ft)          1.42       6.98      0.40
  Conv. Total (cfs)       100762.4    Conv. (cfs)              4643.3    95142.8     976.4
  Length Wtd. (ft)          205.00    Wetted Per. (ft)          87.45      82.01    148.36
  Min Ch El (ft)           1272.00    Shear (lb/sq ft)          0.11       0.50      0.03
  Alpha                       1.51    Stream Power (lb/ft s)    0.14       3.04      0.02
  Frctn Loss (ft)             0.31    Cum Volume (acre-ft)      0.29       4.62      0.14
  C & E Loss (ft)             0.02    Cum SA (acres)            0.20       0.76      0.35


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

CROSS SECTION


RIVER: creek
REACH: 55th               RS: 5040

INPUT
Description:
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    5000    1288    5093    1288    5117    1286    5124    1284    5136    1282
    5149    1280    5152    1278    5160    1272    5176    1272    5179    1274
    5185    1276    5191    1278    5197    1280    5203    1282    5209    1284
    5218    1286    5235    1286    5328    1286

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    5000     .05    5093     .03    5218     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          5093    5218               40      40      40             .1      .3
```

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1284.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.75	Wt. n-Val.		0.030	
W.S. Elev (ft)	1283.89	Reach Len. (ft)	10.00	10.00	10.00
Crit W.S. (ft)	1280.51	Flow Area (sq ft)		503.29	
E.G. Slope (ft/ft)	0.001959	Area (sq ft)		503.29	
Q Total (cfs)	3500.00	Flow (cfs)		3500.00	
Top Width (ft)	83.97	Top Width (ft)		83.97	
Vel Total (ft/s)	6.95	Avg. Vel. (ft/s)		6.95	
Max Chl Dpth (ft)	11.89	Hydr. Depth (ft)		5.99	
Conv. Total (cfs)	79070.2	Conv. (cfs)		79070.2	
Length Wtd. (ft)	10.00	Wetted Per. (ft)		89.09	
Min Ch El (ft)	1272.00	Shear (lb/sq ft)		0.69	
Alpha	1.00	Stream Power (lb/ft s)		4.81	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)		2.16	
C & E Loss (ft)	0.01	Cum SA (acres)		0.38	

BRIDGE

RIVER: creek
REACH: 55th RS: 5020

INPUT
Description:
Distance from Upstream XS = 10
Deck/Roadway Width = 20
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
5000	1286	5350	1286

Upstream Bridge Cross Section Data
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1288	5093	1288	5117	1286	5124	1284	5136	1282
5149	1280	5152	1278	5160	1272	5176	1272	5179	1274
5185	1276	5191	1278	5197	1280	5203	1282	5209	1284
5218	1286	5235	1286	5328	1286				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.05	5093	.03	5218	.05

Bank Sta: Left Right Coeff Contr. Expan.
5093 5218 .1 .3

Downstream Deck/Roadway Coordinates
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
5000	1286	5350	1286

Downstream Bridge Cross Section Data
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1289	5065	1288	5121	1286	5123	1284	5130	1282
5138	1280	5141	1278	5143	1276	5145	1274	5146	1272
5160	1272	5163	1274	5171	1276	5177	1278	5186	1280
5193	1282	5200	1284	5206	1286	5291	1286		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.05	5121	.03	5206	.05

Bank Sta: Left Right Coeff Contr. Expan.
5121 5206 .1 .3

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

Number of Piers = 2

Pier Data
Pier Station Upstream= 5153 Downstream= 5141
Upstream num= 2

Width	Elev	Width	Elev
2	1272	2	1292

Downstream num= 2

Width	Elev	Width	Elev
2	1272	2	1292

Pier Data
Pier Station Upstream= 5188 Downstream= 5176
Upstream num= 2

Width	Elev	Width	Elev

```
      2    1272       2    1290
Downstream     num=       2
    Width   Elev    Width   Elev
      2    1272       2    1290

Number of Bridge Coefficient Sets =  1

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

High Flow Method
      Energy Only

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

BRIDGE OUTPUT  Profile #PF 1

  E.G. US. (ft)               1284.64    Element                Inside BR US  Inside BR DS
  W.S. US. (ft)               1283.89    E.G. Elev (ft)             1284.60       1284.49
  Q Total (cfs)               3500.00    W.S. Elev (ft)             1283.71       1283.33
  Q Bridge (cfs)              3500.00    Crit W.S. (ft)             1280.72       1281.12
  Q Weir (cfs)                           Max Chl Dpth (ft)            11.71         11.33
  Weir Sta Lft (ft)                      Vel Total (ft/s)              7.58          8.65
  Weir Sta Rgt (ft)                      Flow Area (sq ft)           462.03        404.83
  Weir Submerg                           Froude # Chl                  0.55          0.63
  Weir Max Depth (ft)                    Specif Force (cu ft)        2865.74       2661.46
  Min El Weir Flow (ft)       1290.01    Hydr Depth (ft)               5.90          5.93
  Min El Prs (ft)             1286.00    W.P. Total (ft)             109.14         95.70
  Delta EG (ft)                  0.22    Conv. Total (cfs)          59886.6       52447.9
  Delta WS (ft)                  0.49    Top Width (ft)              78.35         68.31
  BR Open Area (sq ft)         606.17    Frctn Loss (ft)               0.08          0.03
  BR Open Vel (ft/s)             8.65    C & E Loss (ft)               0.03          0.04
  Coef of Q                              Shear Total (lb/sq ft)        0.90          1.18
  Br Sel Method          Energy only     Power Total (lb/ft s)         6.84         10.17


Warning: Pier drag coefficient of 2.0 assumed for Class B flow.
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: creek
REACH: 55th               RS: 5000

INPUT
Description:
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    5000    1289    5065    1288    5121    1286    5123    1284    5130    1282
    5138    1280    5141    1278    5143    1276    5145    1274    5146    1272
    5160    1272    5163    1274    5171    1276    5177    1278    5186    1280
    5193    1282    5200    1284    5206    1286    5291    1286

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    5000     .05    5121     .03    5206     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          5121    5206               50      50      50             .1      .3

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)             1284.41    Element                   Left OB    Channel   Right OB
  Vel Head (ft)                 1.02    Wt. n-Val.                            0.030
  W.S. Elev (ft)             1283.39    Reach Len. (ft)            50.00      50.00      50.00
  Crit W.S. (ft)                        Flow Area (sq ft)                    431.54
  E.G. Slope (ft/ft)        0.002767    Area (sq ft)                         431.54
  Q Total (cfs)              3500.00    Flow (cfs)                          3500.00
  Top Width (ft)               72.75    Top Width (ft)                        72.75
  Vel Total (ft/s)              8.11    Avg. Vel. (ft/s)                      8.11
  Max Chl Dpth (ft)            11.39    Hydr. Depth (ft)                      5.93
  Conv. Total (cfs)          66542.9    Conv. (cfs)                        66542.9
  Length Wtd. (ft)             50.00    Wetted Per. (ft)                      78.56
  Min Ch El (ft)             1272.00    Shear (lb/sq ft)                      0.95
  Alpha                         1.00    Stream Power (lb/ft s)                7.69
  Frctn Loss (ft)               0.15    Cum Volume (acre-ft)                  1.75
  C & E Loss (ft)               0.01    Cum SA (acres)                        0.31


CROSS SECTION


RIVER: creek
REACH: 55th               RS: 4950
```

```
INPUT
Description:
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    5000    1289    5065    1288    5121    1286    5123    1284    5130    1282
    5138    1280    5141    1278    5143    1276    5145    1274    5146    1272
    5160    1272    5163    1274    5171    1276    5177    1278    5186    1280
    5193    1282    5200    1284    5206    1286    5291    1286

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    5000     .05    5121     .03    5206     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          5121    5206               50      50      50             .1      .3

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           1284.26    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               1.11    Wt. n-Val.                          0.030
  W.S. Elev (ft)           1283.15    Reach Len. (ft)           50.00     50.00      50.00
  Crit W.S. (ft)                      Flow Area (sq ft)                  414.10
  E.G. Slope (ft/ft)      0.003080    Area (sq ft)                       414.10
  Q Total (cfs)            3500.00    Flow (cfs)                        3500.00
  Top Width (ft)             71.05    Top Width (ft)                      71.05
  Vel Total (ft/s)            8.45    Avg. Vel. (ft/s)                     8.45
  Max Chl Dpth (ft)          11.15    Hydr. Depth (ft)                     5.83
  Conv. Total (cfs)        63070.3    Conv. (cfs)                       63070.3
  Length Wtd. (ft)           50.00    Wetted Per. (ft)                    76.79
  Min Ch El (ft)           1272.00    Shear (lb/sq ft)                     1.04
  Alpha                       1.00    Stream Power (lb/ft s)               8.76
  Frctn Loss (ft)             0.16    Cum Volume (acre-ft)                 1.27
  C & E Loss (ft)             0.01    Cum SA (acres)                       0.23


CROSS SECTION


RIVER: creek
REACH: 55th               RS: 4900

INPUT
Description:
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    5000    1289    5065    1288    5121    1286    5123    1284    5130    1282
    5138    1280    5141    1278    5143    1276    5145    1274    5146    1272
    5160    1272    5163    1274    5171    1276    5177    1278    5186    1280
    5193    1282    5200    1284    5206    1286    5291    1286

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    5000     .05    5121     .03    5206     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          5121    5206               50      50      50             .1      .3

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           1284.08    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               1.23    Wt. n-Val.                          0.030
  W.S. Elev (ft)           1282.85    Reach Len. (ft)           50.00     50.00      50.00
  Crit W.S. (ft)                      Flow Area (sq ft)                  393.30
  E.G. Slope (ft/ft)      0.003520    Area (sq ft)                       393.30
  Q Total (cfs)            3500.00    Flow (cfs)                        3500.00
  Top Width (ft)             68.97    Top Width (ft)                      68.97
  Vel Total (ft/s)            8.90    Avg. Vel. (ft/s)                     8.90
  Max Chl Dpth (ft)          10.85    Hydr. Depth (ft)                     5.70
  Conv. Total (cfs)        58991.8    Conv. (cfs)                       58991.8
  Length Wtd. (ft)           50.00    Wetted Per. (ft)                    74.63
  Min Ch El (ft)           1272.00    Shear (lb/sq ft)                     1.16
  Alpha                       1.00    Stream Power (lb/ft s)              10.31
  Frctn Loss (ft)             0.19    Cum Volume (acre-ft)                 0.80
  C & E Loss (ft)             0.02    Cum SA (acres)                       0.15


CROSS SECTION


RIVER: creek
REACH: 55th               RS: 4850

INPUT
Description:
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    5000    1289    5065    1288    5121    1286    5123    1284    5130    1282
    5138    1280    5141    1278    5143    1276    5145    1274    5146    1272
    5160    1272    5163    1274    5171    1276    5177    1278    5186    1280
    5193    1282    5200    1284    5206    1286    5291    1286

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    5000     .05    5121     .03    5206     .05
```

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Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          5121    5206               50      50      50             .1      .3

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           1283.87    Element                   Left OB    Channel   Right OB
  Vel Head (ft)               1.42    Wt. n-Val.                           0.030
  W.S. Elev (ft)           1282.45    Reach Len. (ft)            50.00      50.00      50.00
  Crit W.S. (ft)           1280.94    Flow Area (sq ft)                    366.27
  E.G. Slope (ft/ft)      0.004232    Area (sq ft)                         366.27
  Q Total (cfs)            3500.00    Flow (cfs)                          3500.00
  Top Width (ft)             66.17    Top Width (ft)                        66.17
  Vel Total (ft/s)            9.56    Avg. Vel. (ft/s)                      9.56
  Max Chl Dpth (ft)          10.45    Hydr. Depth (ft)                      5.54
  Conv. Total (cfs)        53800.7    Conv. (cfs)                         53800.7
  Length Wtd. (ft)           50.00    Wetted Per. (ft)                      71.72
  Min Ch El (ft)           1272.00    Shear (lb/sq ft)                      1.35
  Alpha                       1.00    Stream Power (lb/ft s)               12.89
  Frctn Loss (ft)             0.29    Cum Volume (acre-ft)                  0.37
  C & E Loss (ft)             0.11    Cum SA (acres)                        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 conveyance ratio (upstream 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: creek
REACH: 55th               RS: 4800

INPUT
Description:
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    5000    1289    5065    1288    5121    1286    5123    1284    5130    1282
    5138    1280    5141    1278    5143    1276    5145    1274    5146    1272
    5160    1272    5163    1274    5171    1276    5177    1278    5186    1280
    5193    1282    5200    1284    5206    1286    5291    1286

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    5000     .05    5121     .03    5206     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          5121    5206                0       0       0             .1      .3

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           1283.47    Element                   Left OB    Channel   Right OB
  Vel Head (ft)               2.53    Wt. n-Val.                           0.030
  W.S. Elev (ft)           1280.94    Reach Len. (ft)
  Crit W.S. (ft)           1280.94    Flow Area (sq ft)                    274.34
  E.G. Slope (ft/ft)      0.008777    Area (sq ft)                         274.34
  Q Total (cfs)            3500.00    Flow (cfs)                          3500.00
  Top Width (ft)             55.04    Top Width (ft)                        55.04
  Vel Total (ft/s)           12.76    Avg. Vel. (ft/s)                      12.76
  Max Chl Dpth (ft)           8.94    Hydr. Depth (ft)                       4.98
  Conv. Total (cfs)        37358.4    Conv. (cfs)                         37358.4
  Length Wtd. (ft)                    Wetted Per. (ft)                      60.18
  Min Ch El (ft)           1272.00    Shear (lb/sq ft)                       2.50
  Alpha                       1.00    Stream Power (lb/ft s)                31.87
  Frctn Loss (ft)                     Cum Volume (acre-ft)
  C & E Loss (ft)                     Cum SA (acres)



SUMMARY OF MANNING'S N VALUES

River:creek

      Reach          River Sta.       n1        n2        n3

 55th                  5801              .05       .03       .05
 55th                  5579              .05       .03       .05
 55th                  5449              .05       .04       .05
 55th                  5245              .05       .03       .05
 55th                  5040              .05       .03       .05
 55th                  5020         Bridge
 55th                  5000              .05       .03       .05
 55th                  4950              .05       .03       .05
 55th                  4900              .05       .03       .05
 55th                  4850              .05       .03       .05
 55th                  4800              .05       .03       .05



SUMMARY OF REACH LENGTHS
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River: creek

Reach	River Sta.	Left	Channel	Right
55th	5801	100	222	300
55th	5579	50	130	180
55th	5449	250	204	180
55th	5245	205	205	205
55th	5040	40	40	40
55th	5020	Bridge		
55th	5000	50	50	50
55th	4950	50	50	50
55th	4900	50	50	50
55th	4850	50	50	50
55th	4800	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: creek

Reach	River Sta.	Contr.	Expan.
55th	5801	.1	.3
55th	5579	.1	.3
55th	5449	.1	.3
55th	5245	.1	.3
55th	5040	.1	.3
55th	5020	Bridge	
55th	5000	.1	.3
55th	4950	.1	.3
55th	4900	.1	.3
55th	4850	.1	.3
55th	4800	.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
55th	5801	PF 1	3500.00	1272.00	1285.48		1286.61	0.002808	8.51	411.15	63.63	0.59
55th	5579	PF 1	3500.00	1272.00	1284.89		1286.02	0.002543	8.55	441.21	136.99	0.56
55th	5449	PF 1	3500.00	1272.00	1284.49		1285.59	0.004941	9.24	508.62	161.39	0.59
55th	5245	PF 1	3500.00	1272.00	1284.42		1284.97	0.001207	6.07	727.98	313.35	0.41
55th	5040	PF 1	3500.00	1272.00	1283.89	1280.51	1284.64	0.001959	6.95	503.29	83.97	0.50
55th	5020		Bridge									
55th	5000	PF 1	3500.00	1272.00	1283.39		1284.41	0.002767	8.11	431.54	72.75	0.59
55th	4950	PF 1	3500.00	1272.00	1283.15		1284.26	0.003080	8.45	414.10	71.05	0.62
55th	4900	PF 1	3500.00	1272.00	1282.85		1284.08	0.003520	8.90	393.30	68.97	0.66
55th	4850	PF 1	3500.00	1272.00	1282.45	1280.94	1283.87	0.004232	9.56	366.27	66.17	0.72
55th	4800	PF 1	3500.00	1272.00	1280.94	1280.94	1283.47	0.008777	12.76	274.34	55.04	1.01

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)
55th	5801	PF 1	1286.61	1285.48	1.13	0.59	0.00		3500.00		63.63
55th	5579	PF 1	1286.02	1284.89	1.13	0.42	0.01	21.03	3469.22	9.76	136.99
55th	5449	PF 1	1285.59	1284.49	1.09	0.45	0.17	710.85	2782.55	6.60	161.39
55th	5245	PF 1	1284.97	1284.42	0.54	0.31	0.02	161.28	3304.80	33.92	313.35
55th	5040	PF 1	1284.64	1283.89	0.75	0.03	0.01		3500.00		83.97
55th	5020		Bridge								
55th	5000	PF 1	1284.41	1283.39	1.02	0.15	0.01		3500.00		72.75
55th	4950	PF 1	1284.26	1283.15	1.11	0.16	0.01		3500.00		71.05
55th	4900	PF 1	1284.08	1282.85	1.23	0.19	0.02		3500.00		68.97
55th	4850	PF 1	1283.87	1282.45	1.42	0.29	0.11		3500.00		66.17
55th	4800	PF 1	1283.47	1280.94	2.53				3500.00		55.04