Lower Eightmile Creek

Site Information

Site Location: Mt Hood NF, east of cascade crest, Forest Road 4440

Year Installed: 2000

Lat/Long: 121°26”32.90”W
45°24”47.89”N

Watershed Area (mi²): 4.78

Stream Slope (ft/ft)[1]: 0.037

Channel Type: Step-pool

Bankfull Width (ft): 16.5

Survey Date: April 26 2007

[1]*Water surface slope extending up to 20 channel widths up and downstream of crossing.*

Culvert Information

Culvert Type: Open-bottom arch

Culvert Material: Annular CMP

Culvert Width: 12 ft

Outlet Type: Mitered

Culvert Length: 55 ft

Inlet Type: Mitered

Pipe Slope (structure slope): 0.024

Culvert Bed Slope: 0.026

(First hydraulic control upstream of inlet to first hydraulic control downstream of outlet.)

Culvert width as a percentage of bankfull width: 0.73

Alignment Conditions: Appears OK. May have been slight adjustment from original stream channel.

Bed Conditions: Coarse angular material in pipe. Some material has aggraded in upstream half of pipe. Some riprap material from inlet sides possibly being recruited into pipe.

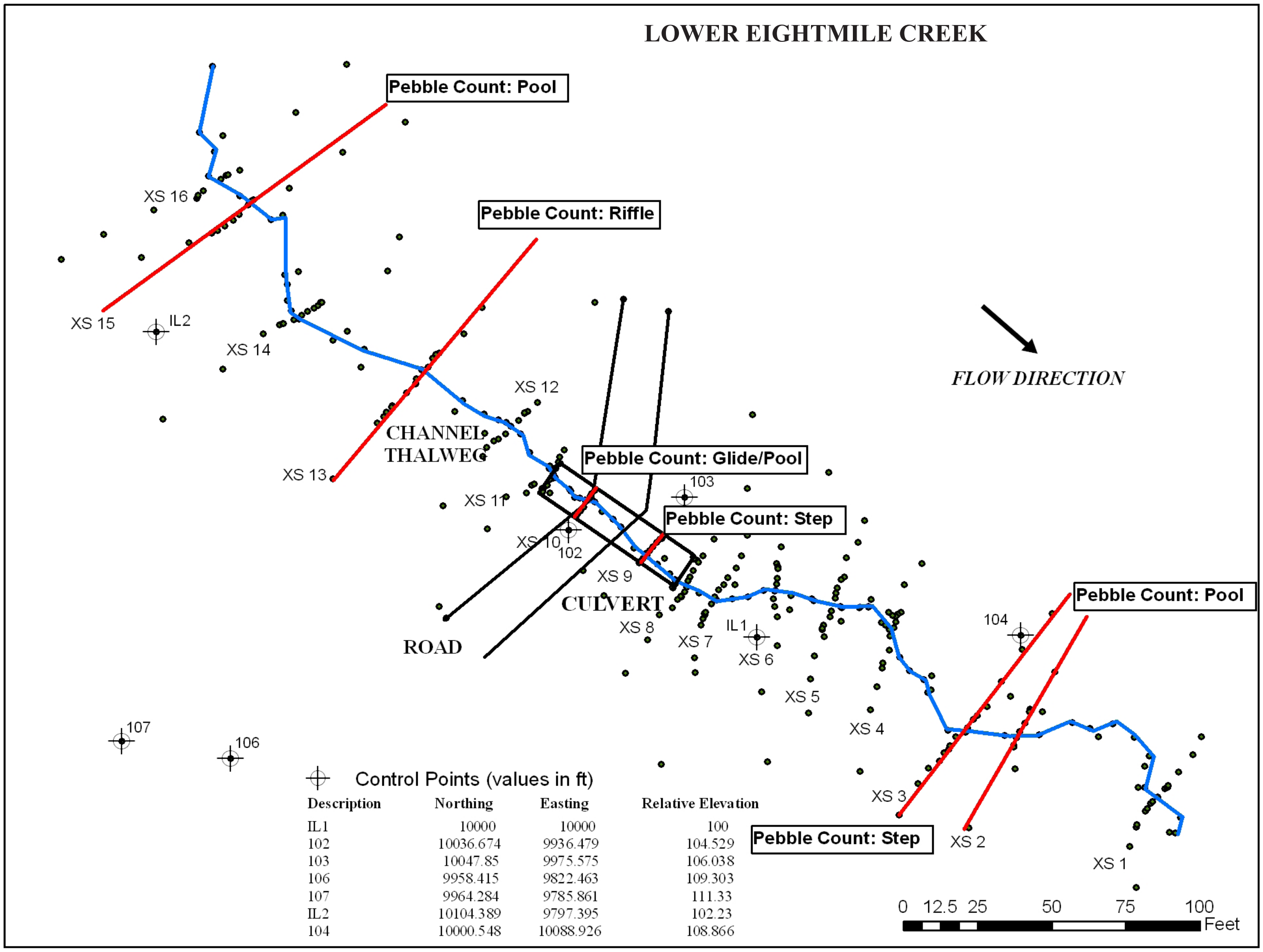
Pipe Condition: Good condition.

Hydrology

Discharge (cfs) for indicated recurrence interval

25% 2-yr	Q_{bf}[2]	2-year	5-year	10-year	50-year	100-year
43	50	171	236	287	418	478

[2]*Bankfull flow estimated by matching modeled water surface elevations to field-identified bankfull elevations.*



Description	Northing	Easting	Relative Elevation
IL1	10000	10000	100
102	10036.674	9936.479	104.529
103	10047.85	9975.575	106.038
106	9958.415	9822.463	109.303
107	9964.284	9785.861	111.33
IL2	10104.389	9797.395	102.23
104	10000.548	10088.926	108.866

Points represent survey points

Figure 1—Plan view map.

HISTORY

There is no information available for site history.

SITE DESCRIPTION

The Lower Eightmile culvert is a bottomless arch mitered to conform to the slope of the road fill. It is a relatively new installation (2000). The upstream portion of the culvert is characterized by a wide and deep pool that drops into a series of steps/steep riffles through the culvert to the outlet. Large angular bed material makes up the bed through the downstream portion of the culvert.

An upstream and downstream representative reach were identified at this site. The upstream representative reach consists of a series of three wood jams that account for most of the drop in grade through the reach. Backwater pools, riffles, and short steps are interspersed between the three jams. Fines have accumulated in the backwater pools created by the jams. A low active flood plain with large conifers and small underbrush line both banks.

The downstream representative reach begins as a relatively steep and evenly graded riffle. At the downstream end, the channel opens up into a wide backwater pool. A low flood-plain surface on the right bank, similar to the upstream reference reach, contributes wood to the channel. Whereas no log jams were present in the representative reach, large wood was present both in and around the channel. The lack of wood jams may be a result of the maintenance of the channel due to its proximity to a campground area on the left bank.

SURVEY SUMMARY

Sixteen cross sections and a longitudinal profile were surveyed along Lower Eightmile Creek in April 2007 to characterize the culvert and an upstream and downstream representative reach. Representative sections in the culvert were taken through a pool and steep riffle. Two additional cross sections were surveyed upstream to characterize the inlet as well as the contraction of flow. Another two cross sections were surveyed downstream of the culvert to characterize the outlet and the expansion of flow.

In the upstream representative reach, representative cross sections were taken through a pool and a riffle. An additional two sections were taken to characterize the upstream and downstream boundaries of the reach. In the downstream representative reach, representative cross sections were taken through a step and a pool. An additional two sections were taken to characterize the upstream and downstream boundaries of the reach.

PROFILE ANALYSIS SEGMENT SUMMARY

The profile analysis resulted in a total of 14 profile segments. Two segments with similar gradient in the upstream channel were not combined in order to separate out the inlet transition segment (segment I) from the upstream representative segment K. The culvert consisted of two profile segments. The downstream segment in the culvert was comparable to two representative profile segments, one in the upstream channel and one in the downstream channel. The upstream segment in the culvert was comparable to one representative profile segment in the downstream channel. The upstream transition segment was comparable to three representative profile segments, two in the upstream channel and one in the downstream channel. One downstream transition segment was comparable to an upstream and a downstream representative segment and one was comparable just to a downstream representative segment. See figure 2 and table 1.

SCOUR CONDITIONS

Observed conditions

Footing scour – Footings are exposed throughout much of the culvert but they are not scoured to the base of the footings and they generally appear in good condition. The riprap placed around the culvert and along the road fill has remained in place.

Culvert-bed adjustment – There are no obvious signs of bed adjustment except for some recently aggraded sediment in the upstream half of the culvert. There is angular rock forming a step in the downstream portion of the culvert; it is unknown whether this was placed during construction or if it washed in from the riprap banks at the inlet.

Profile characteristics – The profile has a convex shape through the crossing with a rise in bed elevation within the culvert (figure 2).

Residual depths – Culvert residual depths are lower than residual depths in corresponding channel segments (C, J, and A) (figure 21). The upstream transition segment (I) has residual depths that are both greater and less than the range of residual depths in corresponding profile segments (D, J, and L). The single residual depth in downstream transition segment F is lower than the single depth in corresponding profile segment L.

Substrate – The bed material in the pool in the upstream portion of the culvert has more coarse material and fewer fines than pools in the upstream and downstream channels. This pool is more glide-like (higher velocity and less residual depth) than the pools in the natural channel. The step in the culvert also has more coarse material than the riffles/steps in the natural channel. The D_{84} and D_{95}s are both larger in the culvert than in the riffle and step units in the natural channel. There are also fewer fines in the culvert.

Predicted conditions

Cross-section characteristics – Modeling suggests that the culvert has a large effect on flow geometry. The culvert exhibits signs of inlet control conditions. Backwatered conditions create subcritical flow upstream of the inlet that transitions to supercritical or near supercritical within the pipe. The flow geometry therefore changes dramatically within the culvert (figures 5 through 7 and 12 through 19). Flow area, wetted perimeter, and top width are reduced whereas hydraulic radius and depth are increased, particularly near the upstream end of the culvert. Transition areas are also affected, particularly the upstream transition (I) where widths and depths are elevated above what is found in corresponding profile segments in the natural channel (D, J, and L).

Shear stress – Shear stress is low at the inlet because of backwater effects but increases towards the downstream end of the culvert and is very high at the outlet area (figure 10). The downstream transition area (F) exhibits the greatest shear stress (figures 10 and 19). The upstream transition (I) has low shear stress because of the effect of culvert backwater on the energy grade slope.

Excess shear – Model results show that the culvert excess shear stress is within the range of channel conditions (figure 20) except at high flows (Q_{50} and above) where culvert bed mobility may exceed that of the natural channel.

Velocity – Velocity is low at the inlet because of backwater effects but increases towards the downstream end of the culvert and is very high at the outlet area (figure 11). The downstream transition area (F) exhibits the greatest velocity (figures 11 and 18). The upstream transition (I) has low velocity because of the effect of culvert backwater on the energy grade slope.

Scour summary

Currently there are no significant signs of scour in the pipe. The rise in bed elevation in the culvert appears to be related to the step that makes up the downstream half of the pipe. This step is composed of angular large cobbles and small boulders and may be riprap material washed into the culvert from the banks at the inlet. There is streambed material (rounded alluvium) that has aggraded upstream of this step. The grade control provided by the step, and the associated aggradation in the upstream half of the pipe, may be limiting culvert capacity and creating scour risk during high flows.

Hydraulic modeling at this site indicates inlet control conditions at high flows. High shear stress and velocity at the downstream end of the pipe may create scour risk. This site is a relatively recent installation (year 2000) has not yet experienced large flood flows. This site is likely to experience considerable adjustment during future floods, which may scour material from the pipe, as well as flatten and coarsen the bed.

AOP CONDITIONS

Cross-section complexity – The sum of squared height differences in the culvert cross sections are both greater than those in the channel cross sections (table 3).

Profile complexity – Vertical sinuosity in the culvert segments were equal to or lower than corresponding profile segments in the natural channel (table 4). Vertical sinuosity in the upstream transition (I) was within the range of corresponding profile segments (D, J, and L). Vertical sinuosity in the downstream transition segments (E and F) were equal to or lower than corresponding profile segments in the natural channel (D, L, and C).

Depth distribution – The upstream cross section in the culvert had less shallow channel margin habitat than the natural channel but the downstream cross-section value was within the range of the natural channel (table 5).

Habitat units – The culvert has more glide habitat and less pool habitat than the channel outside the crossing (table 6).

Residual depths – Culvert residual depths are lower than residual depths in corresponding channel segments (C, J, and A) (figure 21). The upstream transition segment (I) has residual depths that are both greater and less than the range of residual depths in corresponding profile segments (D, J, and L). The single residual depth in downstream transition segment F is lower than the single depth in corresponding profile segment L.

Substrate – The bed material in the pool in the upstream portion of the culvert has more coarse material and fewer fines than pools in the upstream and downstream channels. This pool is more glide-like (higher velocity and less residual depth) than the pools in the natural channel. The step in the culvert also has more coarse material than the riffles/steps in the natural channel. The D_{84} and D_{95} are both larger in the culvert than in the riffle and step units in the natural channel. There are also fewer fines in the culvert.

Large woody debris – There was a very small amount of LWD present in the culvert (table 8). The natural channel had moderate to very high LWD abundance. LWD formed steps and scour pools in the channel outside the crossing and played a primary role in habitat unit creation and complexity. Features in the culvert did not mimic the role of wood in the natural channel.

AOP summary

Visual observations of the culvert bed indicate significantly less complexity than the natural channel bed. Large wood plays an important role in creating steps and complexity in the natural channel and this dynamic is not present in the culvert. The rock step in the culvert is unlike anything found in the natural channel. The natural channel either has free-formed riffles of gravels or cobbles or wood-forced steps. The complexity metrics used in the analysis do not adequately reflect these observations.

Flow in the culvert was wall-to-wall throughout much of its length at the time of the survey. At low summer flows, wide shallow flow may create fish passage issues. At higher flows, the high velocity in the downstream portion of the pipe may also impede passage, especially considering the lack of bank roughness that can provide velocity refuge.

There were patches of exposed banks observed during the survey but they were discontinuous and would not create suitable conditions for passage of terrestrial organisms at the observed flow.

DESIGN CONSIDERATIONS

Hydraulic analysis and observations at other sample sites suggest that this site may experience bed adjustment during future high flows. The culvert appears to have insufficient capacity to adequately convey high flows. Contributing factors may include an inadequate culvert size and the presence of aggraded material within the pipe. Design improvements would include a larger culvert (current culvert is less than 75 percent of the bankfull width) and a properly constructed bed that creates a more uniform profile through the crossing. Constructed bed elements could include banks that provide flow concentration and roughness (velocity refuge) for fish passage and that also would provide exposed banks to facilitate passage of terrestrial organisms.

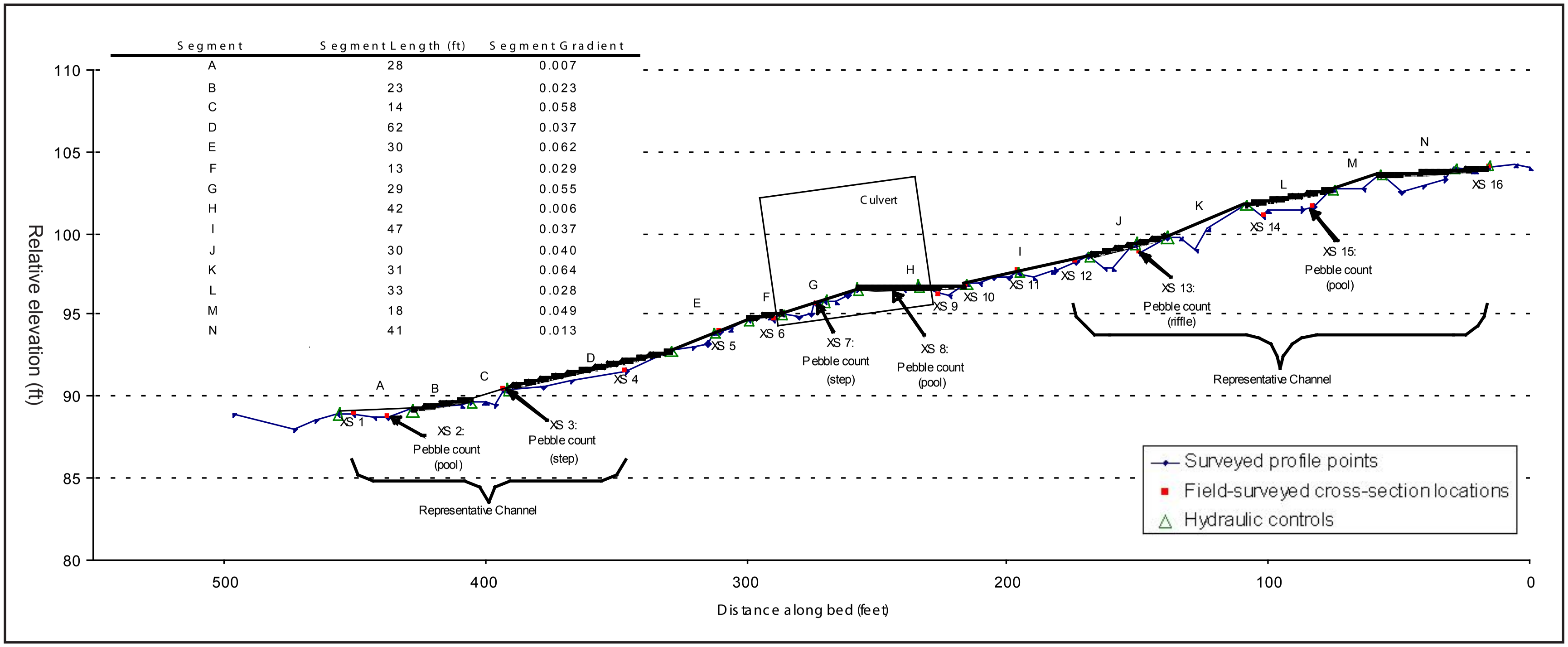


Figure 2—Lower Eightmile Creek longitudinal profile.

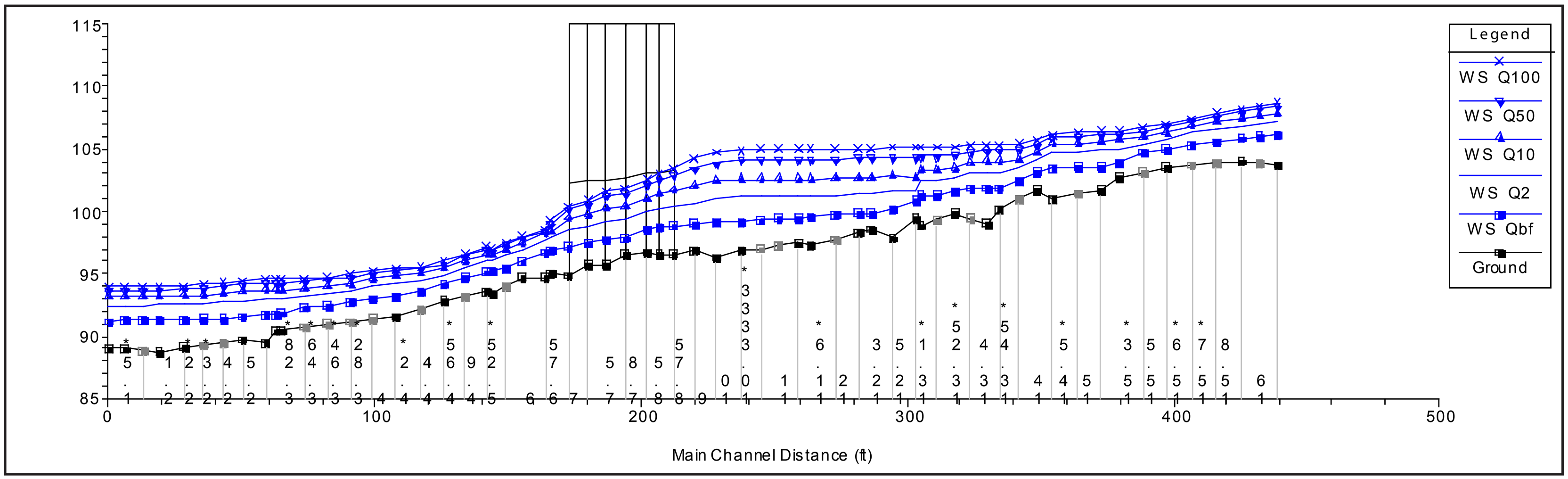
Table 1—Segment comparisons

Culvert Segment	Representative Channel Segment	% Difference in Gradient
G	C	4.5%
G	J	28.1%
H	A	25.9%
Upstream Transition		
I	D	0.1%
I	J	5.3%
I	L	25.9%
Downstream Transition		
F	D	21.6%
F	L	5.6%
E	C	7.4%

Table 2—Summary of segments used for comparisons

Segment	Range of Manning's n values[1]	# of measured XSs	# of interpolated XSs
A	0.08 – 0.0832	2	3
C	0.0876 – 0.0945	1	3
D	0.0861 – 0.1052	1	7
E	0.1052 – 0.1244	1	5
F	0.1093 – 0.1209	1	2
G	0.1058 – 0.1115	1	4
H	0.0997 – 0.1105	2	5
I	0.1079 – 0.1191	3	5
J	0.1049 – 0.1256	1	5
L	0.1009 – 0.1138	2	3

[1]Obtained using equation from Jarrett (1984): n = 0.39S0.38R-0.16, where S=stream slope; R=hydraulic radius. Jarrett's equation only applied within the following ranges: S = 0.002 to 0.08, R = 0.5 ft to 7 ft. For cross sections outside these ranges, n was computed either from adjacent sections that fell within the ranges, using the guidance of Arcement and Schneider (1987), or from the HEC-RAS recommendations for culvert modeling.



Stations with decimal values are interpolated cross sections placed along the surveyed profile.

Figure 3—HEC-RAS profile.

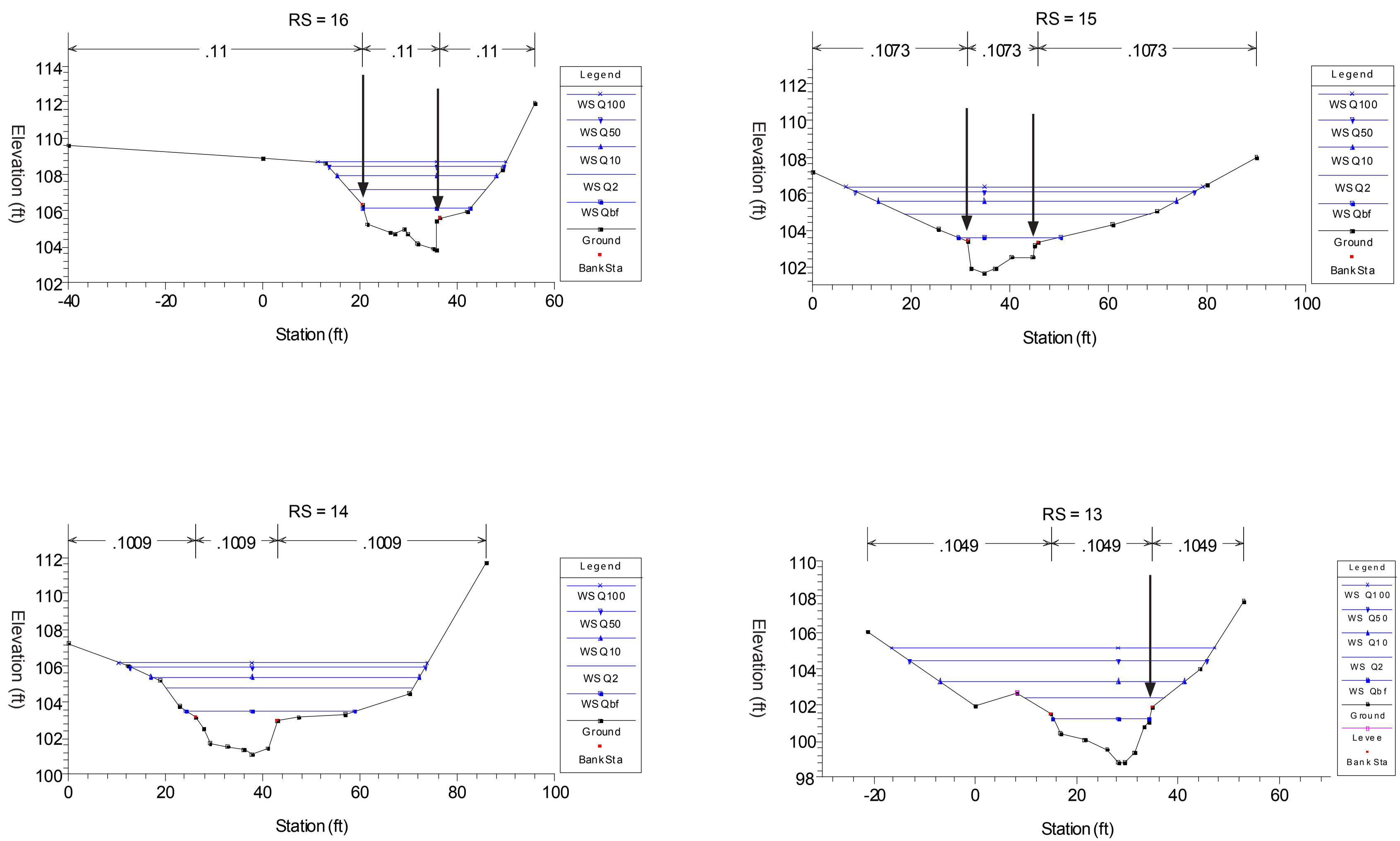
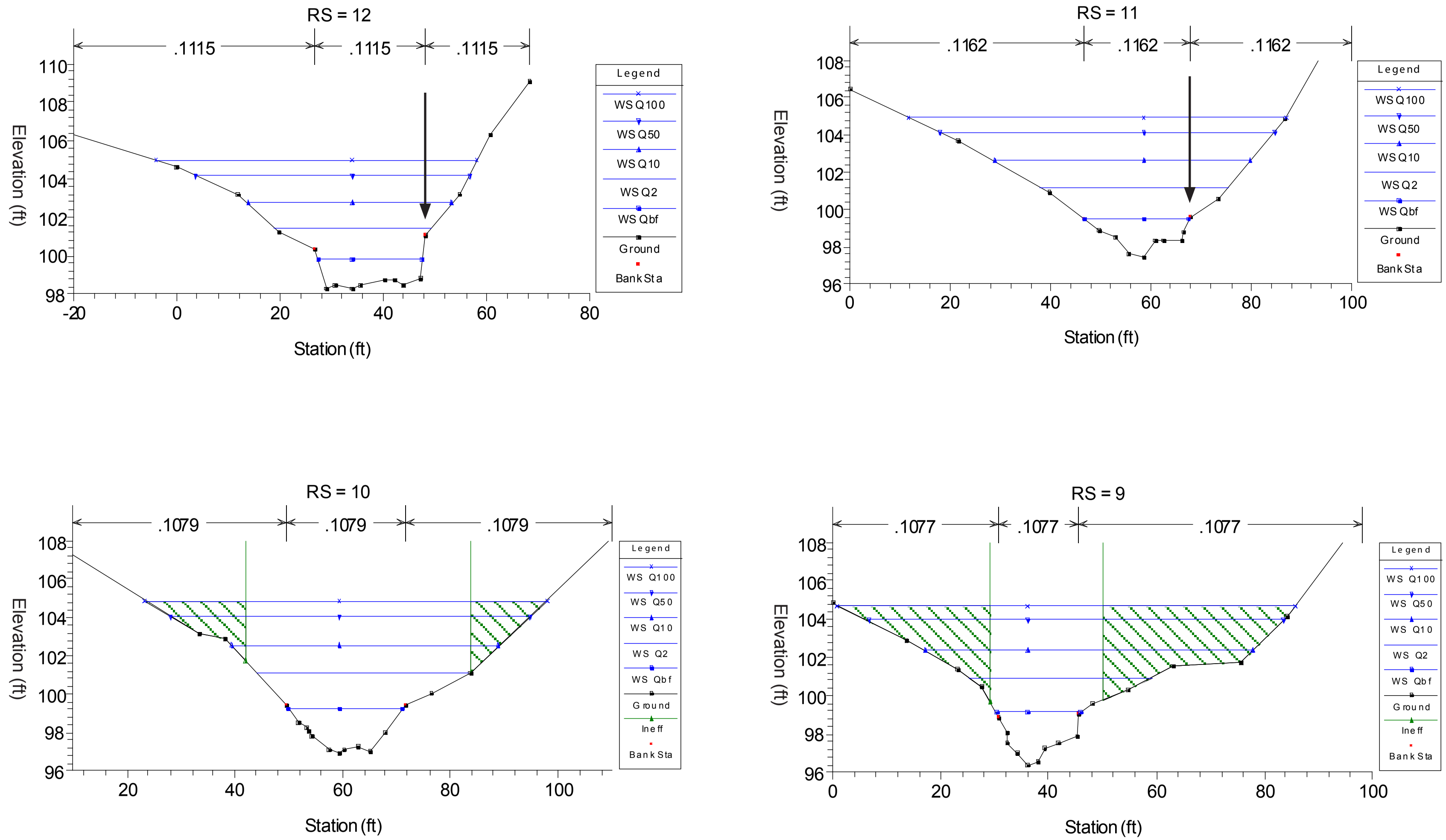


Figure 4—Cross-section plots. Only measured cross sections are included. Manning's n values are included at the top of the cross section. The stationing (RS) corresponds to the stationing on the HEC-RAS profile. Green arrows define the ineffective flow areas. Black arrows represent points surveyed in as the bankfull channel boundary. Only those points identified in the field and supported by hydraulic and topographic analyses are marked below.



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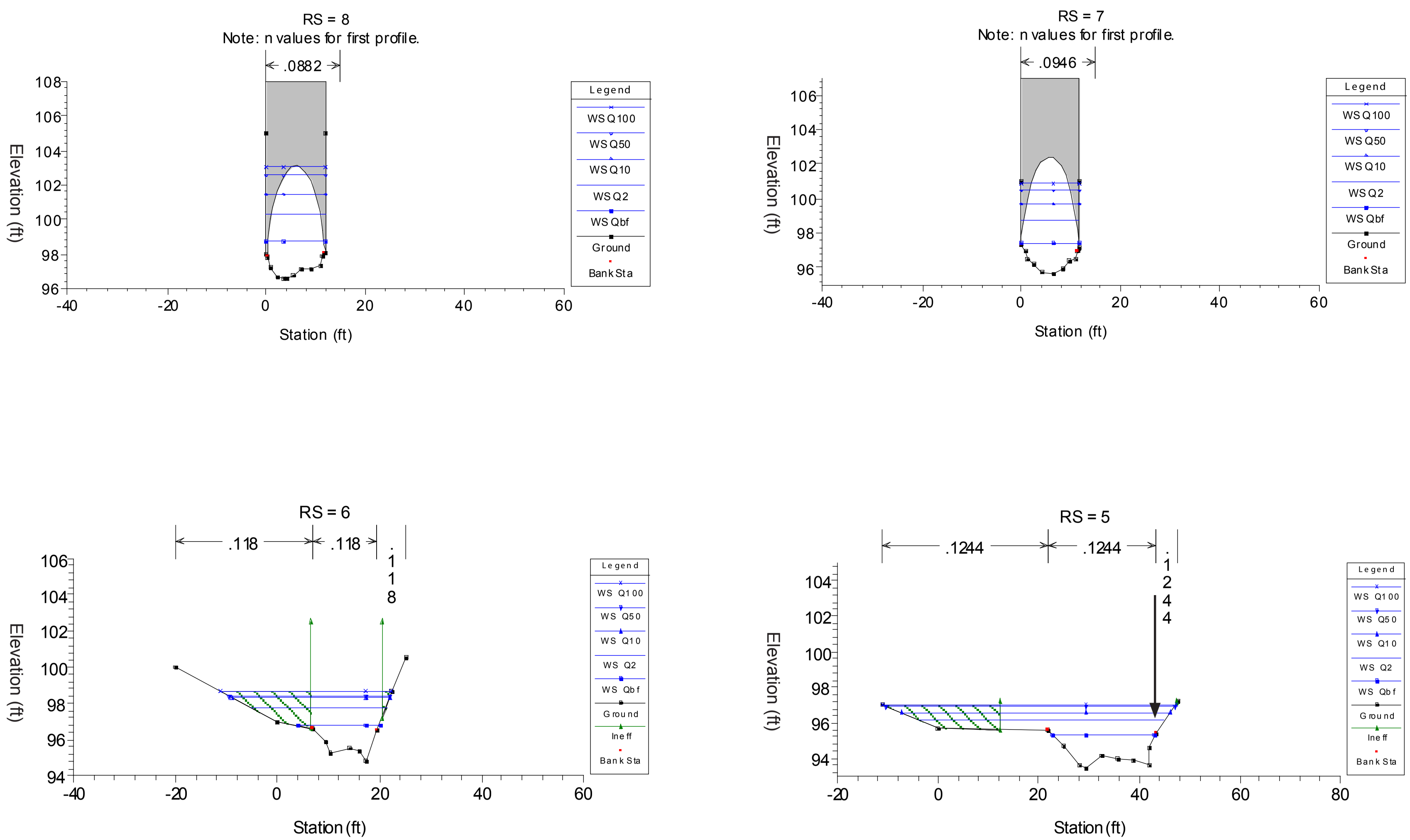

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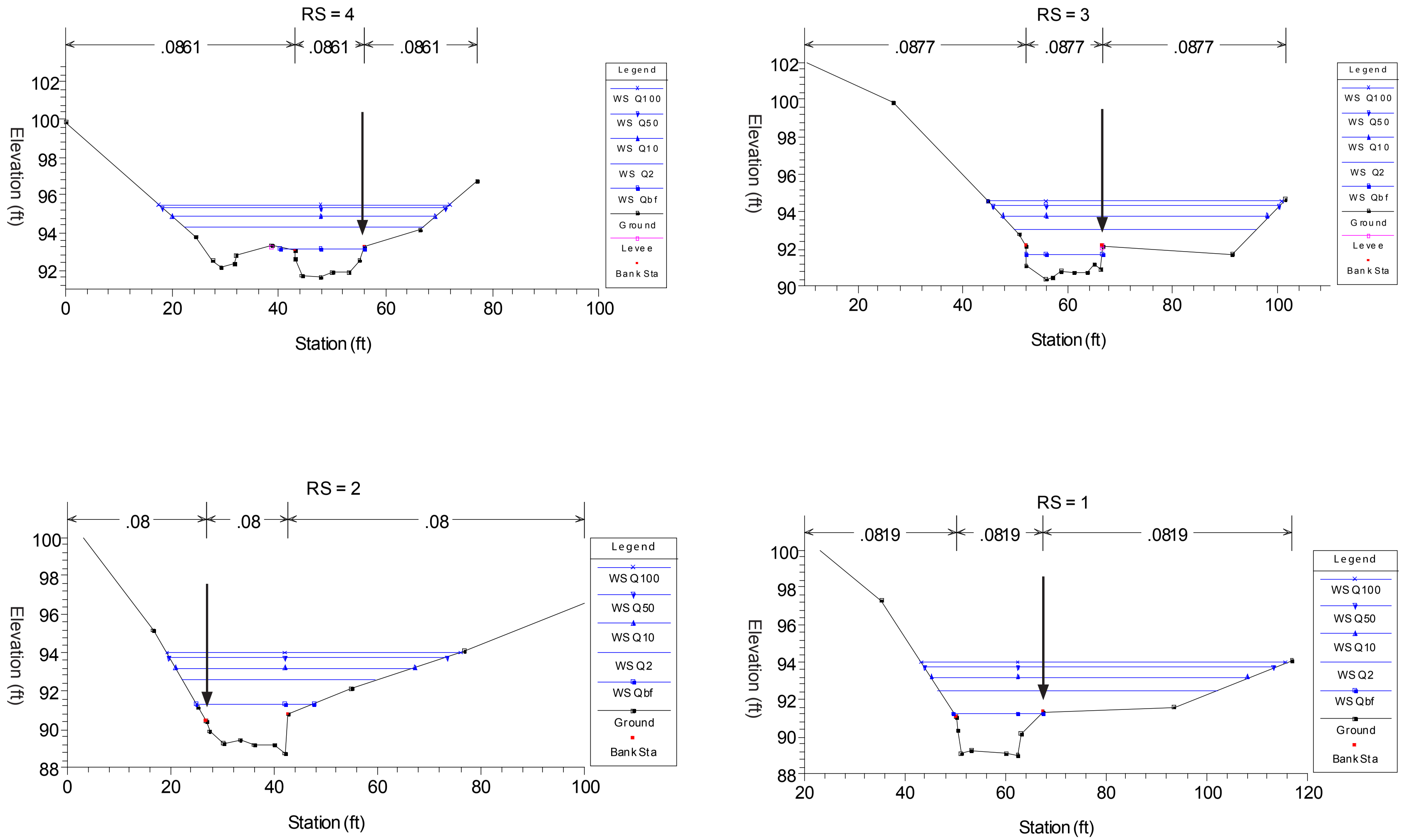

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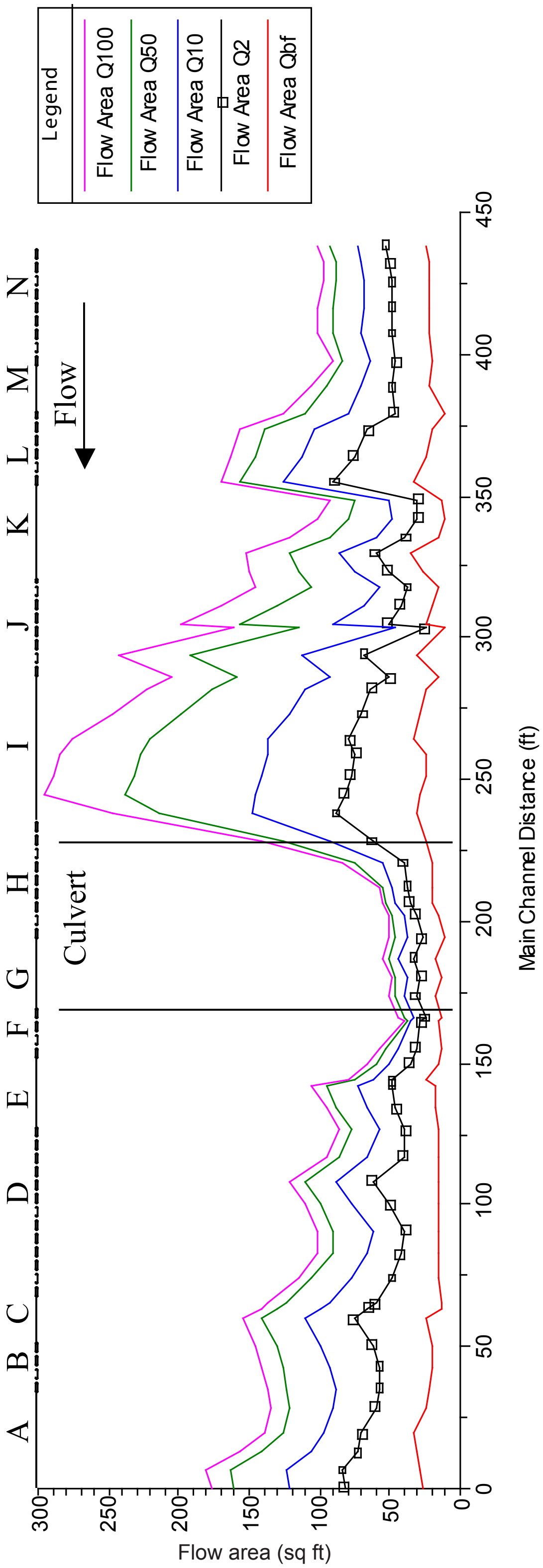


Figure 5—Flow area (total) profile plot.

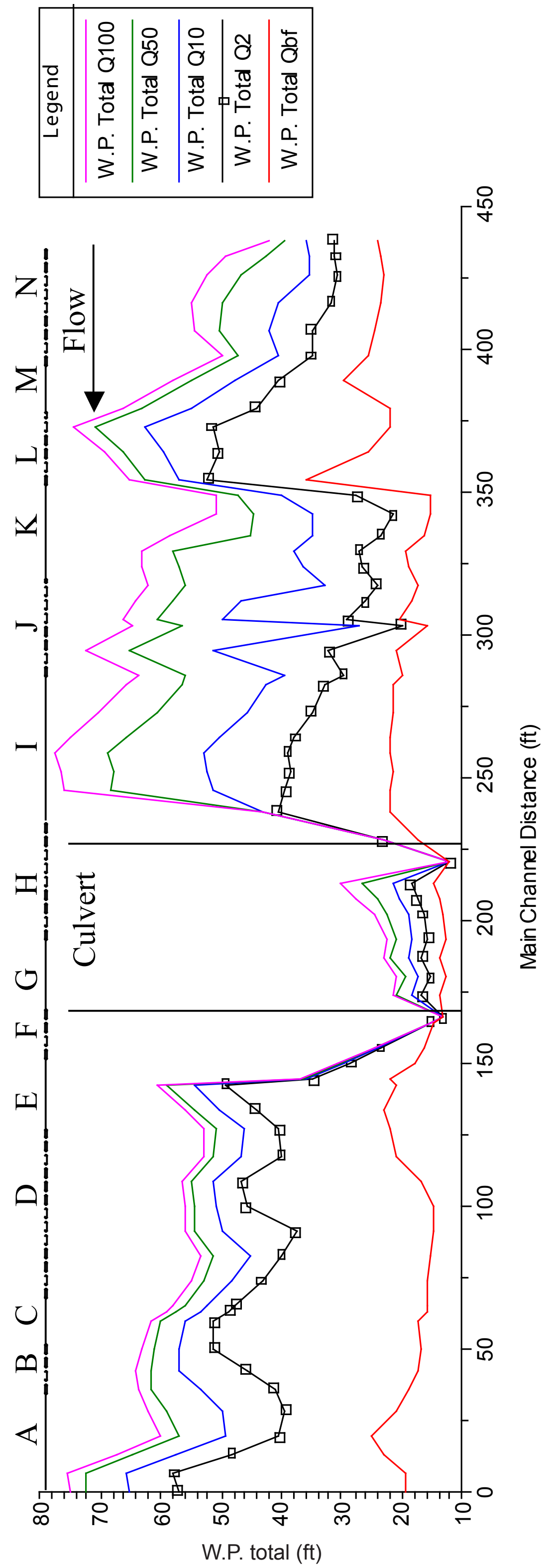


Figure 6—Wetted perimeter.

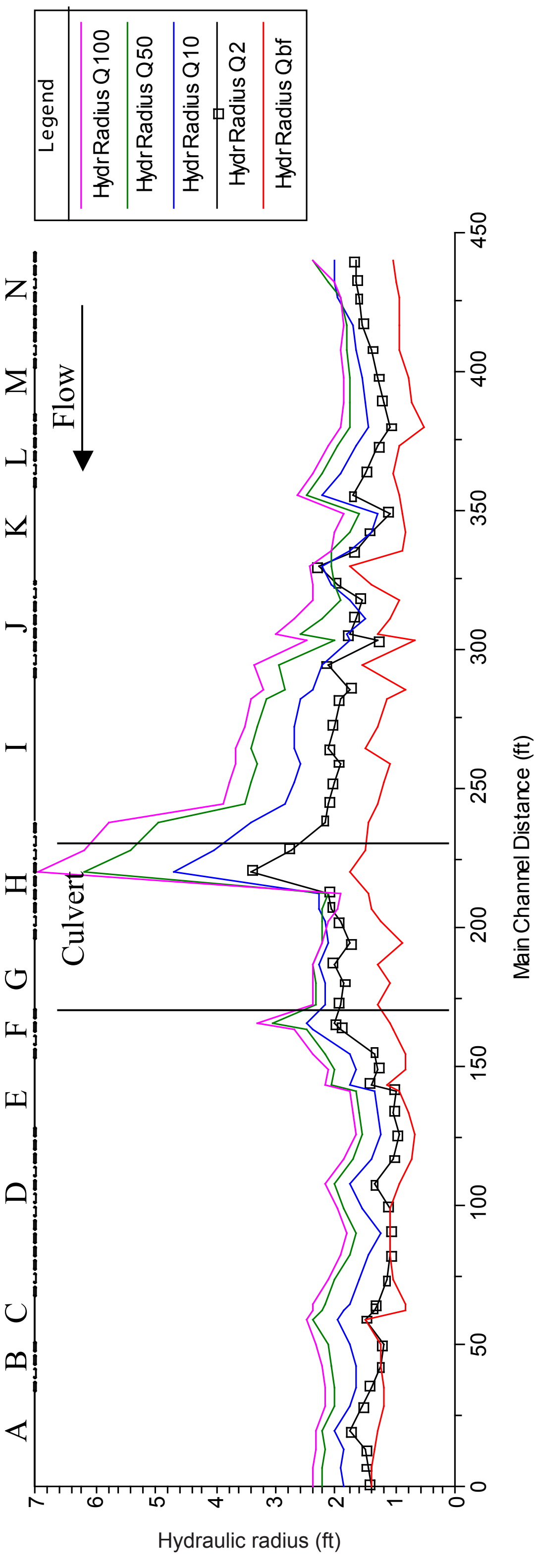


Figure 7—Hydraulic radius.

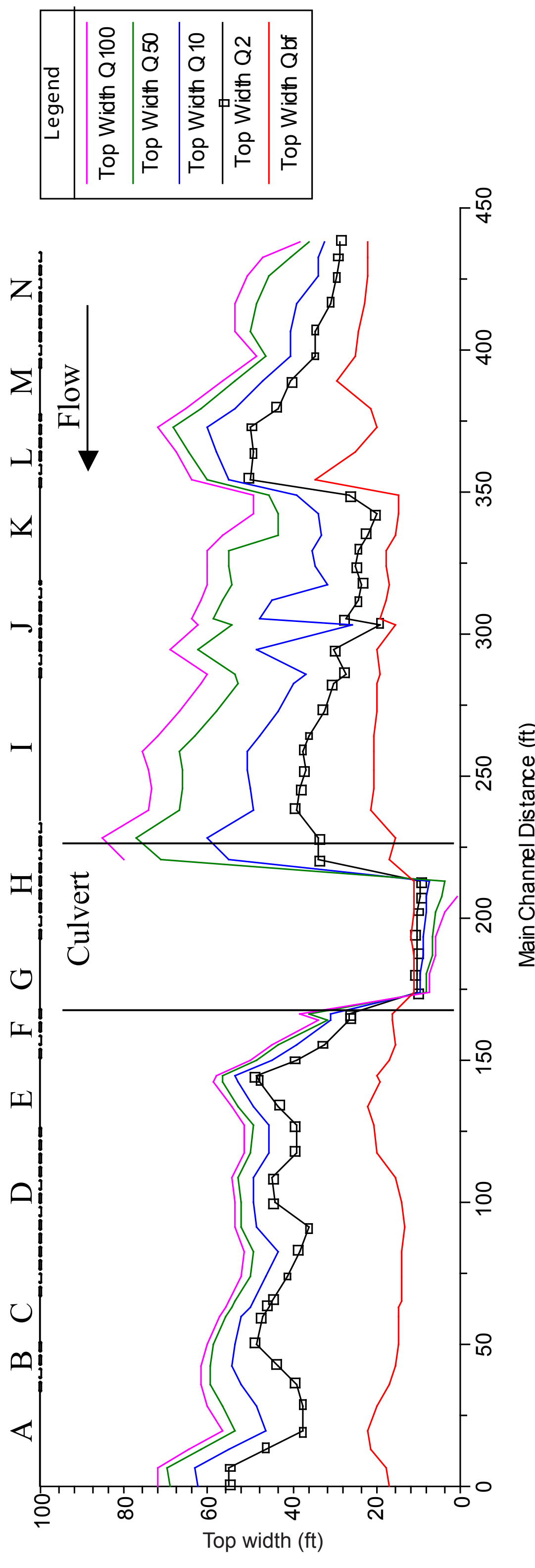


Figure 8—Top width.

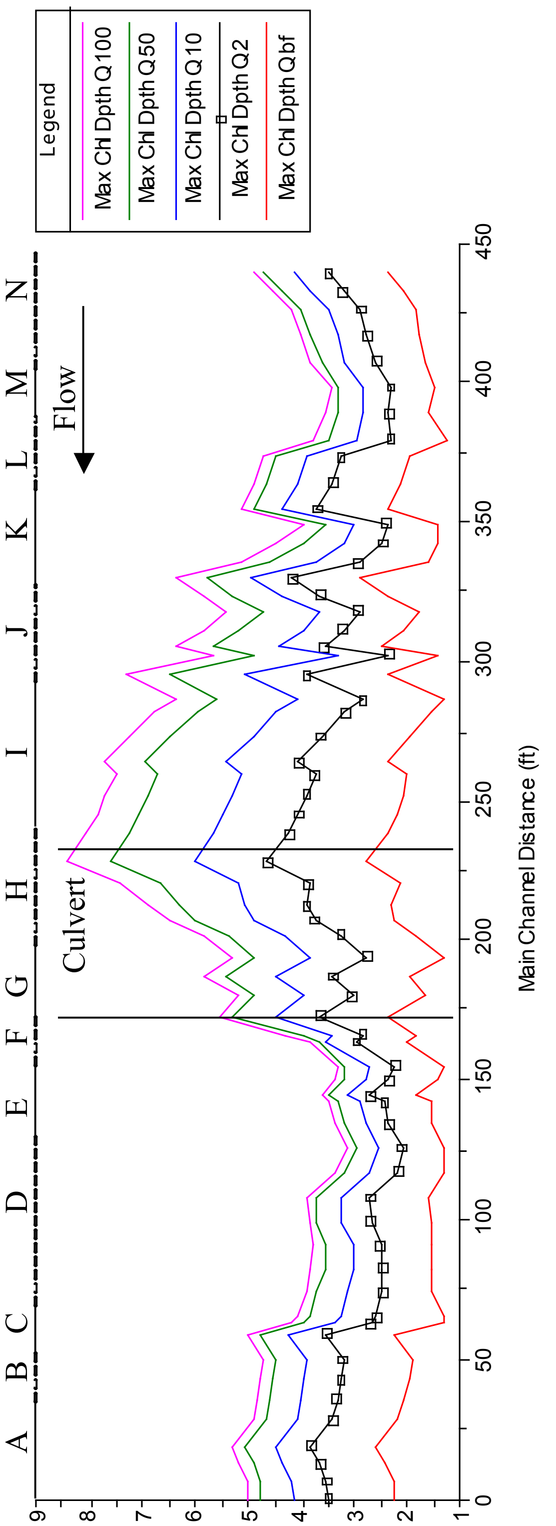


Figure 9—Maximum depth.

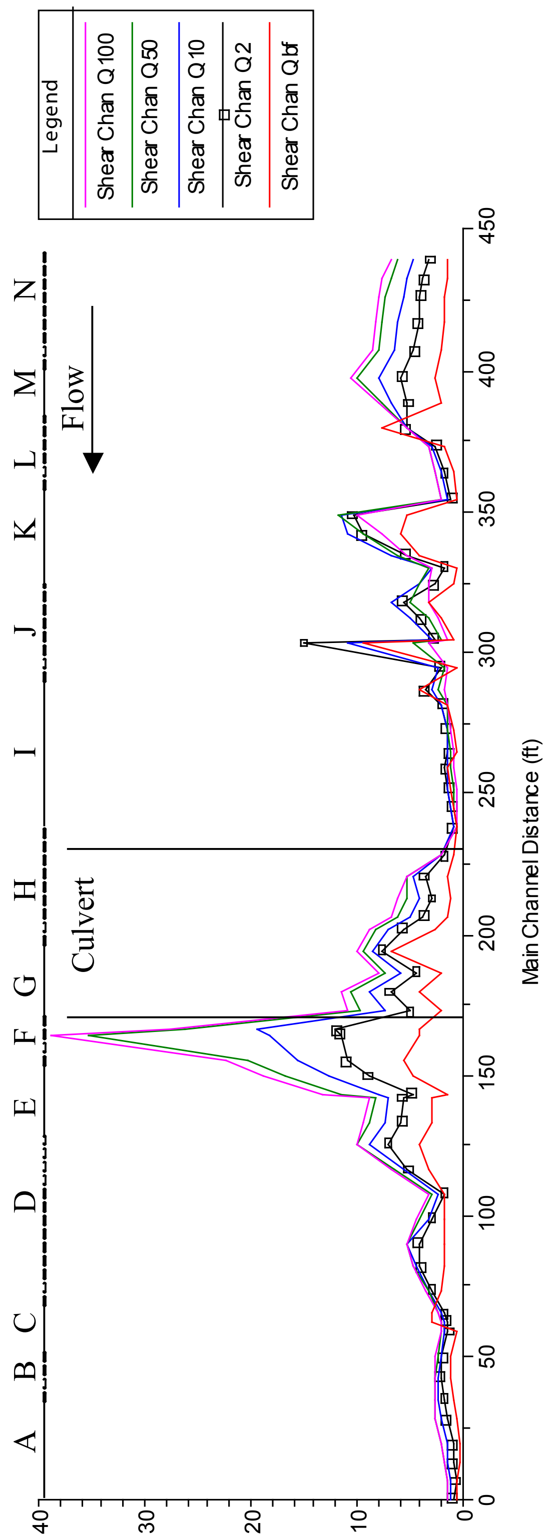


Figure 10—Shear stress (channel) profile.

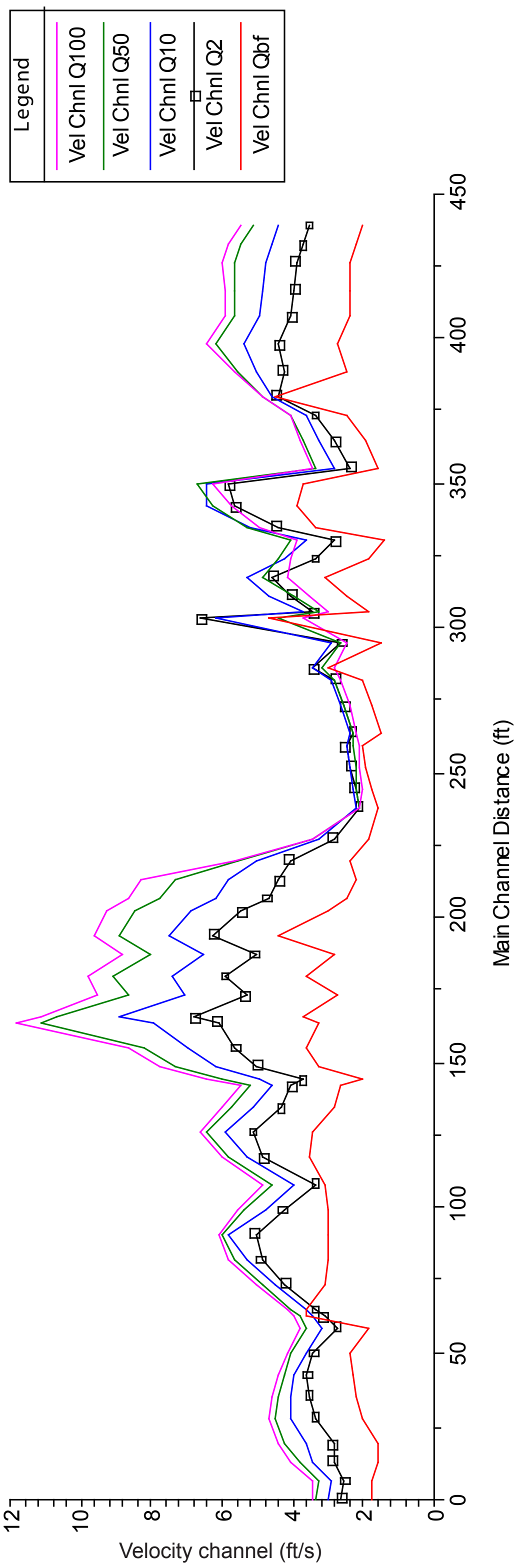
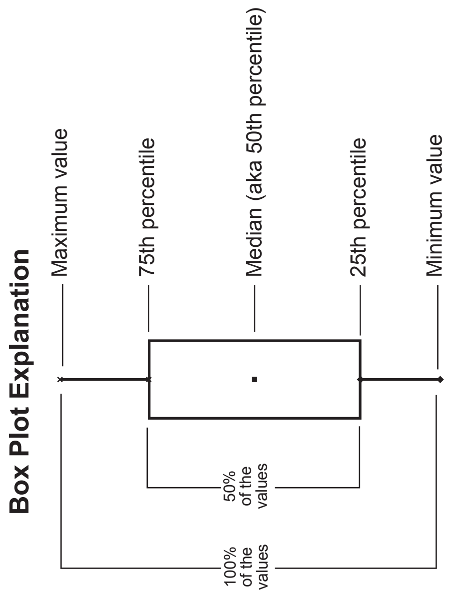


Figure 11—Velocity (channel) profile plot.



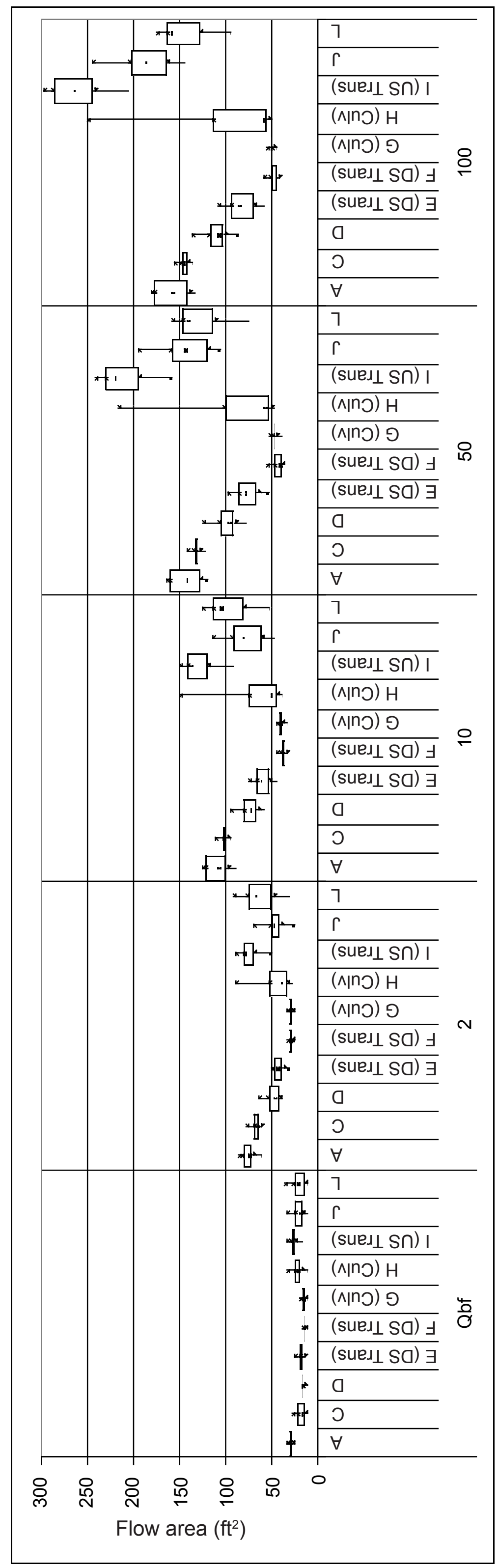


Figure 12—Flow area (total).

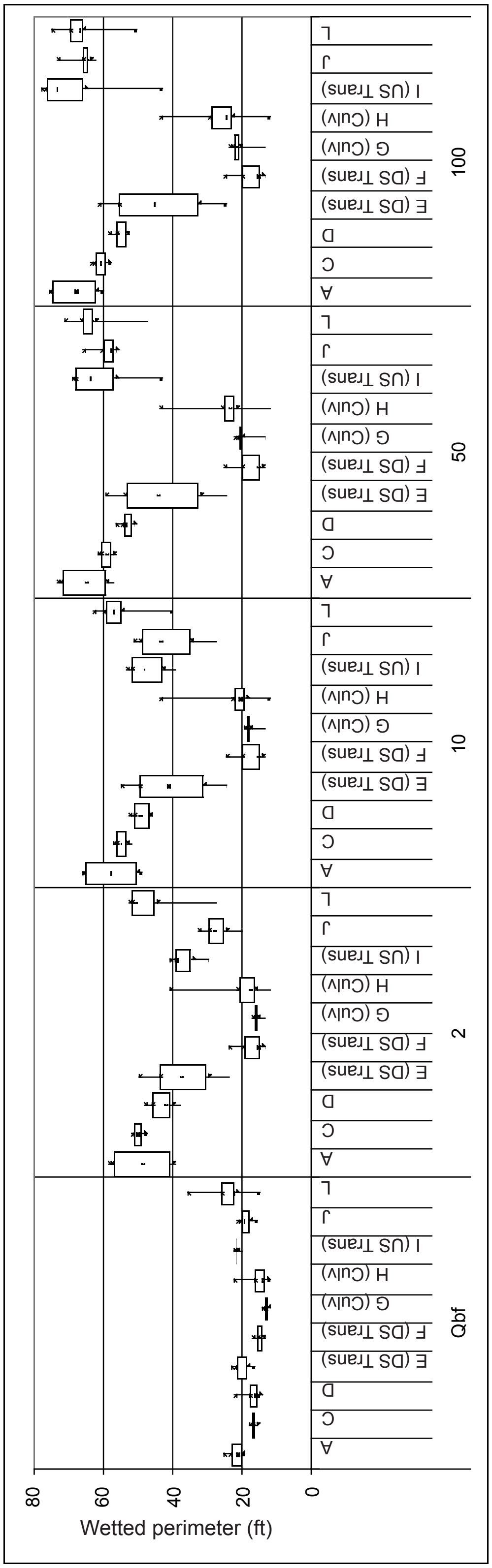


Figure 13—Wetted perimeter.

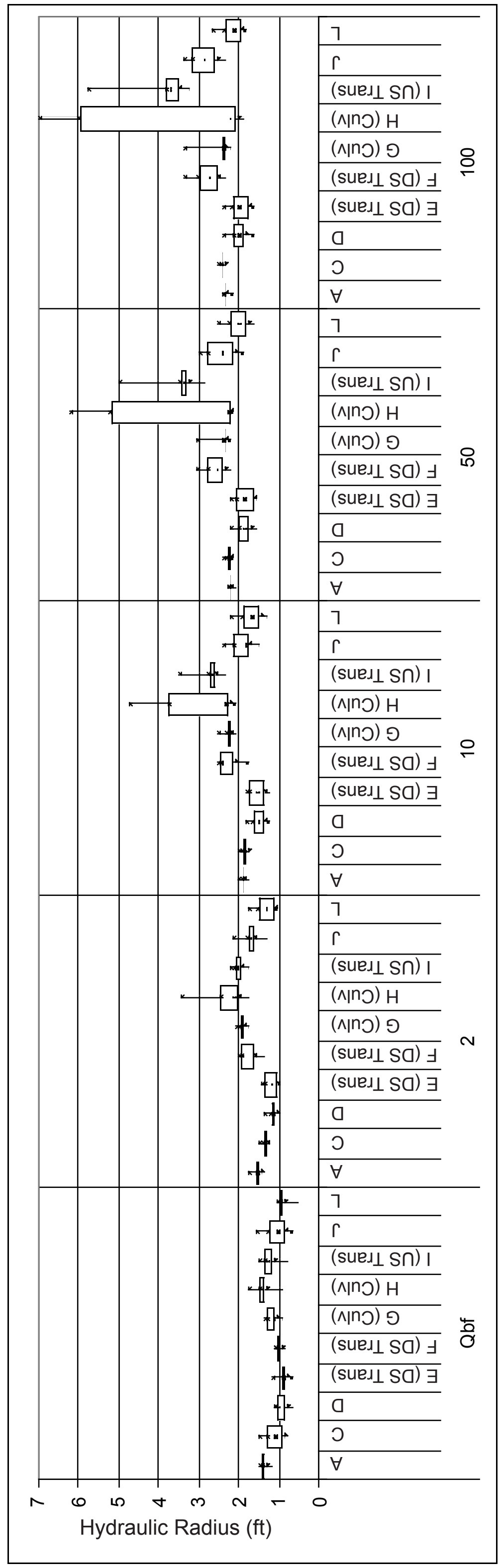


Figure 14—Hydraulic radius.

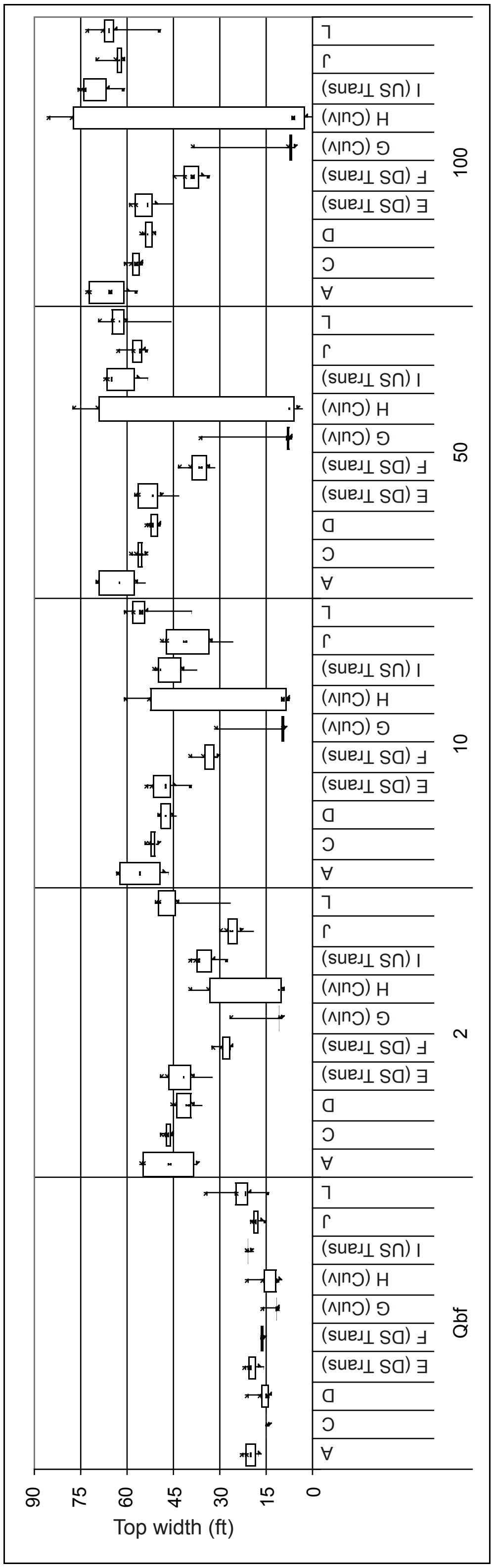


Figure 15—Top width.

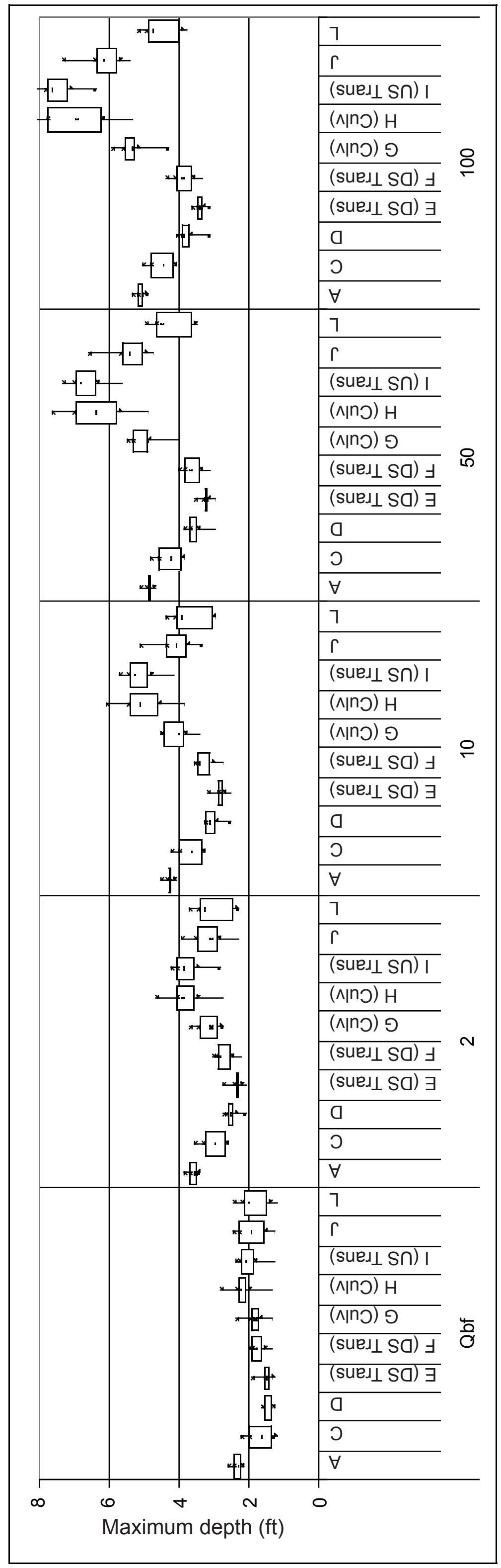


Figure 16—Maximum depth.

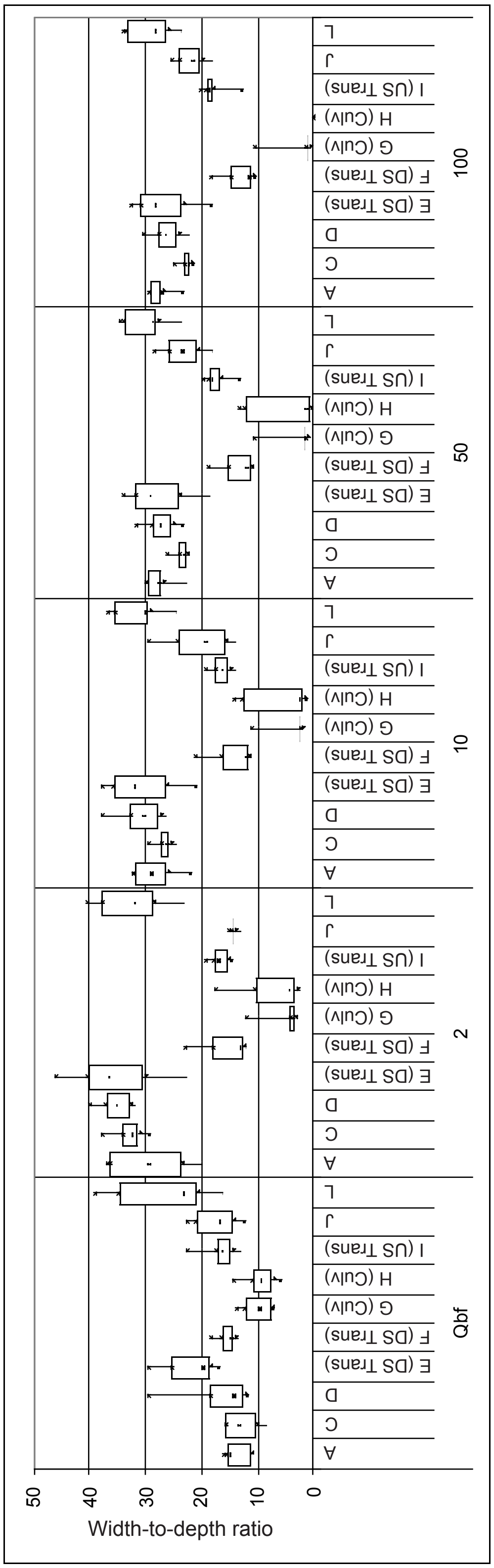


Figure 17—Width-to-depth ratio.

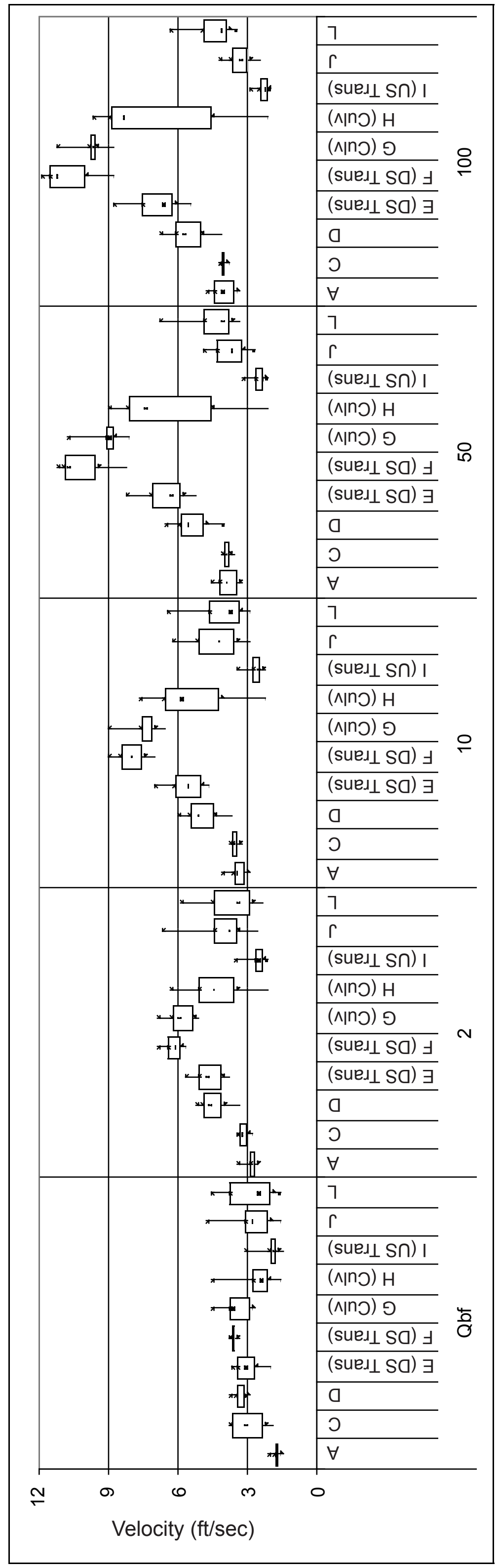


Figure 18—Velocity (channel).

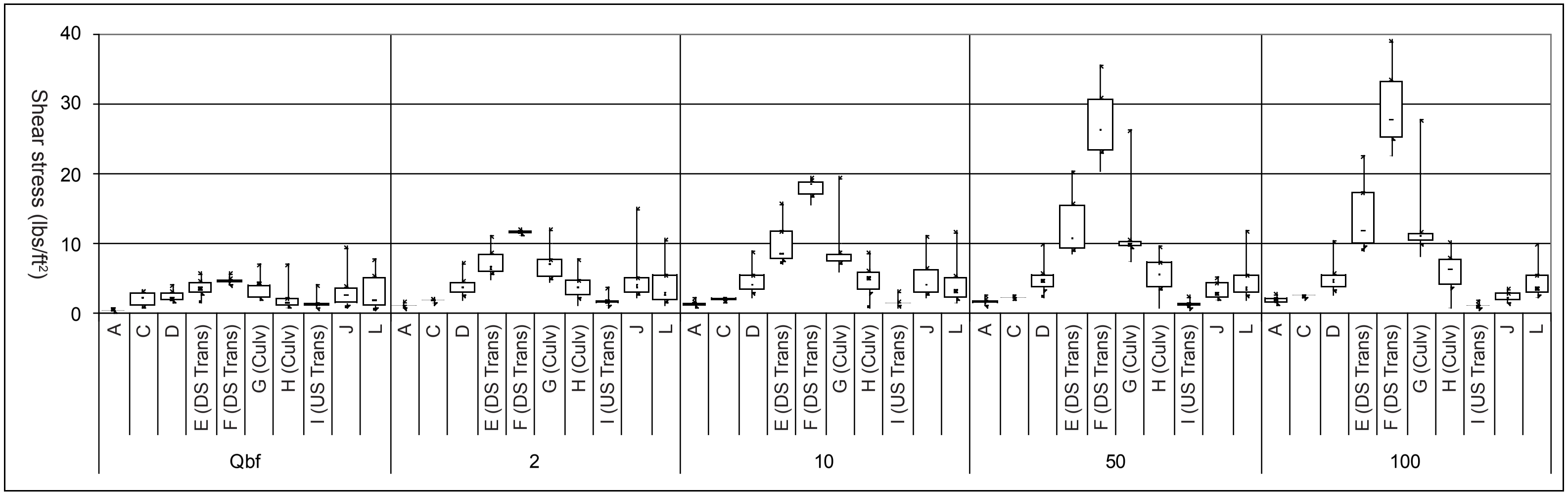
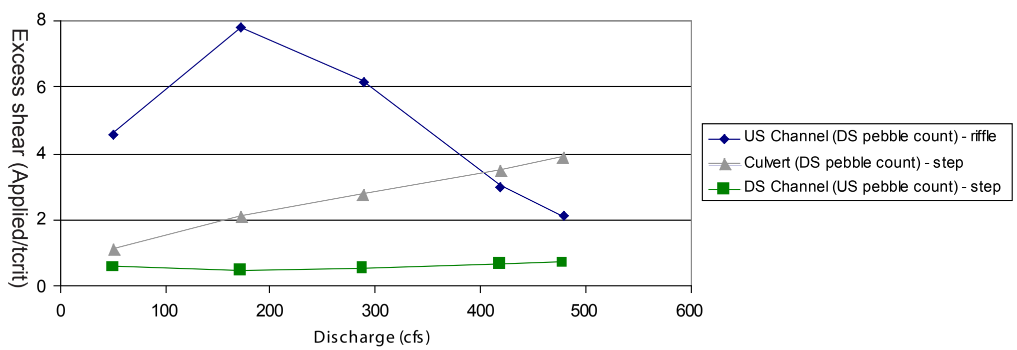


Figure 19—Shear stress (channel).



Excess shear stress is the channel shear divided by the critical shear for bed entrainment of the D_{84} particle size. Values of excess shear greater than 1 indicate bed movement for the D_{84} particle size.

Figure 20—Excess shear stress.

Culvert Scour Assessment

Table 3—Sum of squared height difference

Reach	XS Location	Unit type	Sum of squared height difference	Within range of channel conditions?
Culvert	US	Pool	0.09	No
	DS	Step	0.10	No
Upstream	US	Pool	0.04	
	DS	Riffle	0.08	
Downstream	US	Step	0.06	
	DS	Pool	0.05	

Table 4—Vertical sinuosity

Segment	Location	Vertical Sinuosity (ft/ft)
A	DS channel	1.001
B	DS channel	1.000
C	DS channel	1.009
D	DS channel	1.001
E	DS transition	1.004
F	DS transition	1.001
G	Culvert	1.007
H	Culvert	1.001
I	US transition	1.003
J	US channel	1.012
K	US channel	1.009
L	US channel	1.004v
M	US channel	1.005
N	US channel	1.003

Table 5—Depth distribution

Reach	XS Location	25% Q_2	Within range of channel conditions?
Culvert	US	0	No
	DS	3	Yes
Upstream	US	8	
	DS	3	
Downstream	US	1	
	DS	8	

Table 6—Habitat unit composition

	Percent of surface area			
Reach	Pool	Glide	Riffle	Step
Culvert	12%	47%	33%	0%
Upstream Channel	70%	4%	12%	14%
Downstream Channel	32%	0%	53%	15%

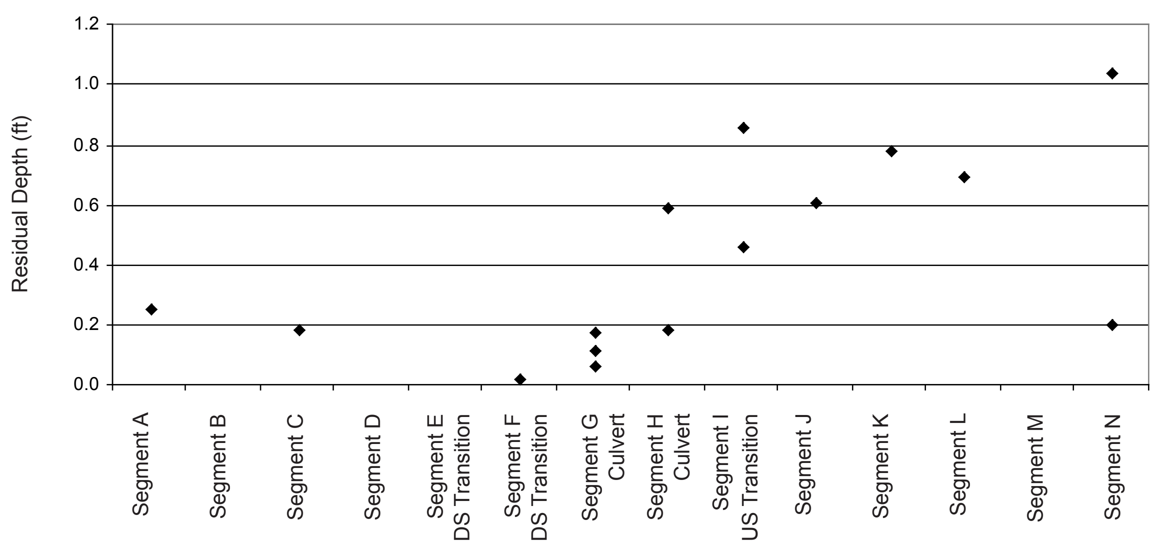


Figure 21—Residual depths.

Culvert Scour Assessment

Table 7—Bed material sorting and skewness

Reach	XS Location	Unit Type	Sorting	Within range of channel conditions?	Skewness	Within range of channel conditions?
Culvert	US	Pool	2.27	Yes	0.26	Yes
	DS	Step	1.22	No	-0.15	No
Upstream	US	Pool	2.06		0.35	
	DS	Riffle	3.17		0.36	
Downstream	US	Step	1.59		0.35	
	DS	Pool	2.64		0.00	

Table 8—Large woody debris

Reach	Pieces/Channel Width
Culvert	0.3
Upstream	5.49
Downstream	1.73

Terminology:

US = Upstream

DS = Downstream

RR = Reference reach

XS = Cross section

View upstream through culvert.

View downstream through culvert.


Downstream reference reach - upstream pebble count, riffle.


Downstream reference reach – downstream pebble count, pool.


Upstream reference reach – upstream pebble count, pool.


Upstream reference reach – downstream pebble count, riffle.

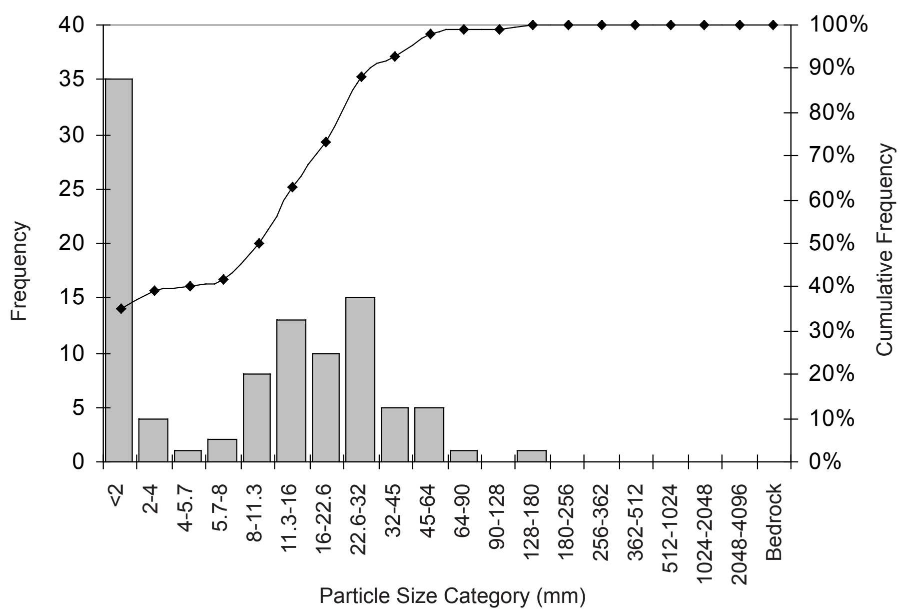

Culvert – downstream pebble count, riffle.


Culvert – upstream pebble count, pool.

Culvert Scour Assessment

Cross section: Upstream Reference Reach – Upstream Pebble Count

Material	Size Class (mm)	Count	Item %	Cumulative %
sand	<2	35	35%	35%
very fine gravel	2 - 4	4	4%	39%
fine gravel	4 - 5.7	1	1%	40%
fine gravel	5.7 - 8	2	2%	42%
medium gravel	8 - 11.3	8	8%	50%
medium gravel	11.3 - 16	13	13%	63%
coarse gravel	16 - 22.6	10	10%	73%
coarse gravel	22.6 - 32	15	15%	88%
very coarse gravel	32 - 45	5	5%	93%
very coarse gravel	45 - 64	5	5%	98%
small cobble	64 - 90	1	1%	99%
medium cobble	90 - 128	0	0%	99%
large cobble	128 - 180	1	1%	100%
very large cobble	180 - 256	0	0%	100%
small boulder	256 - 362	0	0%	100%
small boulder	362 - 512	0	0%	100%
medium boulder	512 - 1024	0	0%	100%
large boulder	1024 - 2048	0	0%	100%
very large boulder	2048 - 4096	0	0%	100%
bedrock	Bedrock	0	0%	100%



Size Class	Size percent finer than (mm)
D5	1
D16	1
D50	12
D84	28
D95	50
D100	140

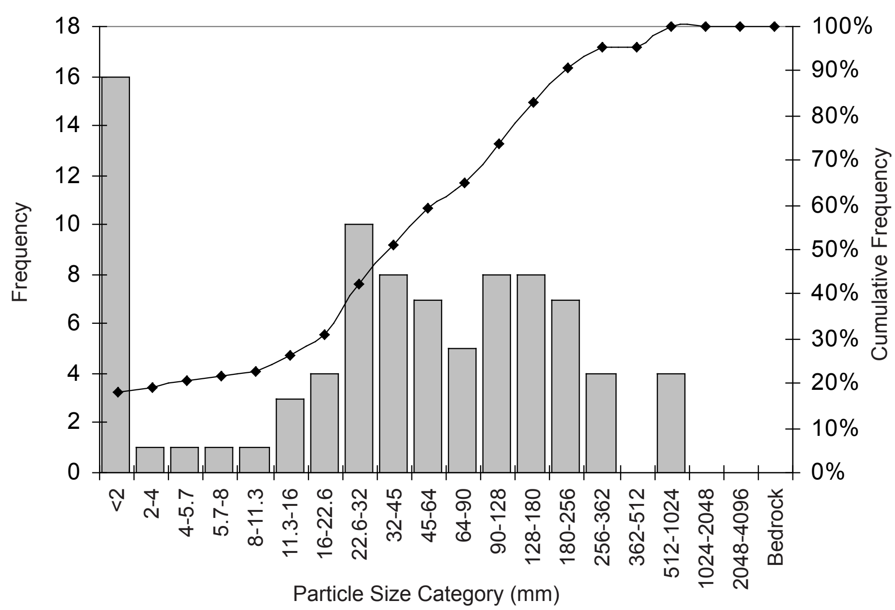
Material	Percent Composition
Sand	35%
Gravel	63%
Cobble	2%
Boulder	0%
Bedrock	0%

Sorting Coefficient: 2.06

Skewness Coefficient: 0.35

Cross section: Upstream Reference Reach – Downstream Pebble Count

Material	Size Class (mm)	Count	Item %	Cumulative %
sand	<2	16	18%	18%
very fine gravel	2 - 4	1	1%	19%
fine gravel	4 - 5.7	1	1%	20%
fine gravel	5.7 - 8	1	1%	22%
medium gravel	8 - 11.3	1	1%	23%
medium gravel	11.3 - 16	3	3%	26%
coarse gravel	16 - 22.6	4	5%	31%
coarse gravel	22.6 - 32	10	11%	42%
very coarse gravel	32 - 45	8	9%	51%
very coarse gravel	45 - 64	7	8%	59%
small cobble	64 - 90	5	6%	65%
medium cobble	90 - 128	8	9%	74%
large cobble	128 - 180	8	9%	83%
very large cobble	180 - 256	7	8%	91%
small boulder	256 - 362	4	5%	95%
small boulder	362 - 512	0	0%	95%
medium boulder	512 - 1024	4	5%	100%
large boulder	1024 - 2048	0	0%	100%
very large boulder	2048 - 4096	0	0%	100%
bedrock	Bedrock	0	0%	100%



Size Class	Size percent finer than (mm)
D5	1
D16	1
D50	43
D84	200
D95	313
D100	530

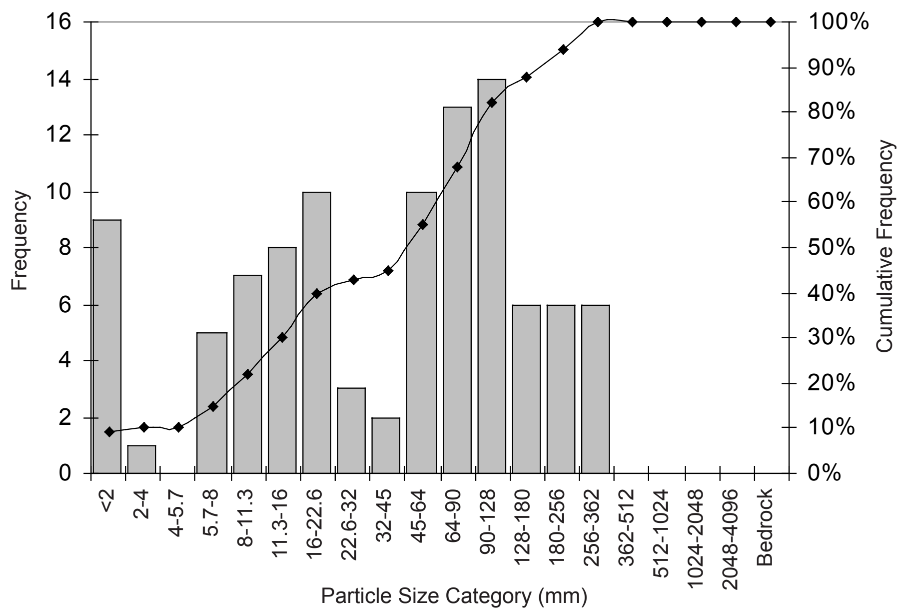
Material	Percent Composition
Sand	18%
Gravel	41%
Cobble	32%
Boulder	9%
Bedrock	0%

Sorting Coefficient: 3.17

Skewness Coefficient: 0.36

Cross section: Culvert – Upstream Pebble Count

Material	Size Class (mm)	Count	Item %	Cumulative %
sand	<2	9	9%	9%
very fine gravel	2 - 4	1	1%	10%
fine gravel	4 - 5.7	0	0%	10%
fine gravel	5.7 - 8	5	5%	15%
medium gravel	8 - 11.3	7	7%	22%
medium gravel	11.3 - 16	8	8%	30%
coarse gravel	16 - 22.6	10	10%	40%
coarse gravel	22.6 - 32	3	3%	43%
very coarse gravel	32 - 45	2	2%	45%
very coarse gravel	45 - 64	10	10%	55%
small cobble	64 - 90	13	13%	68%
medium cobble	90 - 128	14	14%	82%
large cobble	128 - 180	6	6%	88%
very large cobble	180 - 256	6	6%	94%
small boulder	256 - 362	6	6%	100%
small boulder	362 - 512	0	0%	100%
medium boulder	512 - 1024	0	0%	100%
large boulder	1024 - 2048	0	0%	100%
very large boulder	2048 - 4096	0	0%	100%
bedrock	Bedrock	0	0%	100%



Size Class	Size percent finer than (mm)
D5	1
D16	10
D50	50
D84	180
D95	262
D100	330

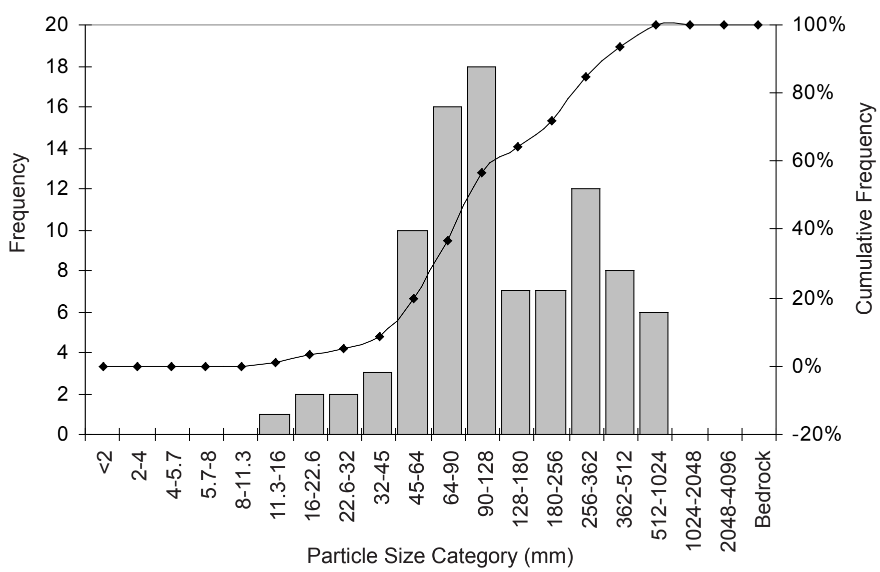
Material	Percent Composition
Sand	9%
Gravel	46%
Cobble	39%
Boulder	6%
Bedrock	0%

Sorting Coefficient: 2.27

Skewness Coefficient: 0.26

Cross section: Culvert – Downstream Pebble Count

Material	Size Range (mm)	Count	Item %	Cumulative %
sand	<2	0	0%	0%
very fine gravel	2 - 4	0	0%	0%
fine gravel	4 - 5.7	0	0%	0%
fine gravel	5.7 - 8	0	0%	0%
medium gravel	8 - 11.3	0	0%	0%
medium gravel	11.3 - 16	1	1%	1%
coarse gravel	16 - 22.6	2	2%	3%
coarse gravel	22.6 - 32	2	2%	5%
very coarse gravel	32 - 45	3	3%	9%
very coarse gravel	45 - 64	10	11%	20%
small cobble	64 - 90	16	17%	37%
medium cobble	90 - 128	18	20%	57%
large cobble	128 - 180	7	8%	64%
very large cobble	180 - 256	7	8%	72%
small boulder	256 - 362	12	13%	85%
small boulder	362 - 512	8	9%	93%
medium boulder	512 - 1024	6	7%	100%
large boulder	1024 - 2048	0	0%	100%
very large boulder	2048 - 4096	0	0%	100%
bedrock	> 4096	0	0%	100%



Size Class	Size percent finer than (mm)
D5	36
D16	60
D50	120
D84	350
D95	525
D100	550

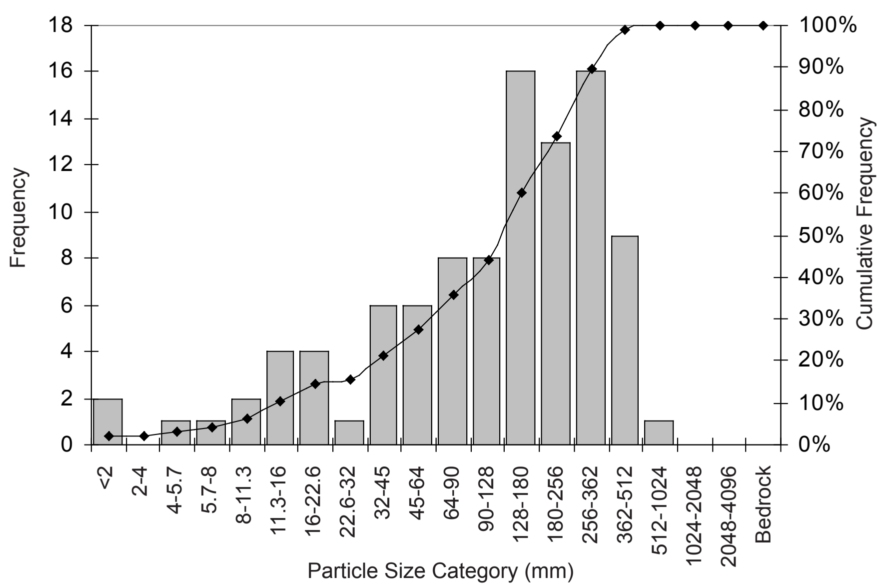
Material	Percent Composition
Sand	0%
Gravel	20%
Cobble	52%
Boulder	28%
Bedrock	0%

Sorting Coefficient: 1.22

Skewness Coefficient: -0.15

Cross section: Downstream Reference Reach – Upstream Pebble Count

Material	Size Class (mm)	Count	Item %	Cumulative %
sand	<2	2	2%	2%
very fine gravel	2 - 4	0	0%	2%
fine gravel	4 - 5.7	1	1%	3%
fine gravel	5.7 - 8	1	1%	4%
medium gravel	8 - 11.3	2	2%	6%
medium gravel	11.3 - 16	4	4%	10%
coarse gravel	16 - 22.6	4	4%	14%
coarse gravel	22.6 - 32	1	1%	15%
very coarse gravel	32 - 45	6	6%	21%
very coarse gravel	45 - 64	6	6%	28%
small cobble	64 - 90	8	8%	36%
medium cobble	90 - 128	8	8%	44%
large cobble	128 - 180	16	16%	60%
very large cobble	180 - 256	13	13%	73%
small boulder	256 - 362	16	16%	90%
small boulder	362 - 512	9	9%	99%
medium boulder	512 - 1024	1	1%	100%
large boulder	1024 - 2048	0	0%	100%
very large boulder	2048 - 4096	0	0%	100%
bedrock	Bedrock	0	0%	100%



Size Class	Size percent finer than (mm)
D5	10
D16	35
D50	140
D84	300
D95	420
D100	550

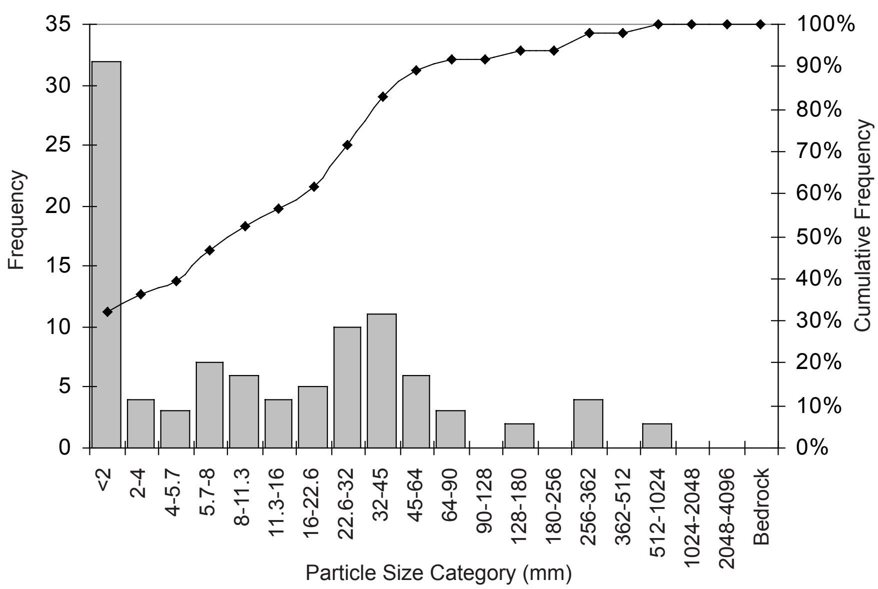
Material	Percent Composition
Sand	2%
Gravel	26%
Cobble	46%
Boulder	27%
Bedrock	0%

Sorting Coefficient: 1.59

Skewness Coefficient: 0.35

Cross section: Downstream Reference Reach – Downstream Pebble Count

Material	Size Class (mm)	Count	Item %	Cumulative %
sand	<2	32	32%	32%
very fine gravel	2 - 4	4	4%	36%
fine gravel	4 - 5.7	3	3%	39%
fine gravel	5.7 - 8	7	7%	46%
medium gravel	8 - 11.3	6	6%	53%
medium gravel	11.3 - 16	4	4%	57%
coarse gravel	16 - 22.6	5	5%	62%
coarse gravel	22.6 - 32	10	10%	72%
very coarse gravel	32 - 45	11	11%	83%
very coarse gravel	45 - 64	6	6%	89%
small cobble	64 - 90	3	3%	92%
medium cobble	90 - 128	0	0%	92%
large cobble	128 - 180	2	2%	94%
very large cobble	180 - 256	0	0%	94%
small boulder	256 - 362	4	4%	98%
small boulder	362 - 512	0	0%	98%
medium boulder	512 - 1024	2	2%	100%
large boulder	1024 - 2048	0	0%	100%
very large boulder	2048 - 4096	0	0%	100%
bedrock	Bedrock	0	0%	100%



Size Class	Size percent finer than (mm)
D5	1
D16	1
D50	10
D84	50
D95	271
D100	700

Material	Percent Composition
Sand	32%
Gravel	57%
Cobble	5%
Boulder	6%
Bedrock	0%

Sorting Coefficient: 2.64

Skewness Coefficient: 0.00