Cross-Section Instructions

1. Set up the level at a location where the entire cross-section is visible (watch for obstacles such as trees). The instrument location should be above the highest point in the cross-section (Figure 1).
2. Measure the distance across the channel with a tape. Keep the tape stretched perpendicular to the flow during the entire exercise.
3. Determine the Bankfull maximum depth by measuring the distance between the deepest point and the Bankfull Stage (D_{MAX}).
4. Take a Backsight (BS) to a permanent feature so that you can use it later for cross checking your data. (You can use an assumed known elevation for the Benchmark e.g. 100 ft). Determine the height of instrument HI (Table 1).
5. Take rod readings to the major features of the stream channel (top of left bank, left bankfull, left edge of water, thalweg, right edge of water, right bankfull, and top of right bank) along the tape. Record both distance and rod reading. Left and right are always determined looking downstream. (Table 1).
6. Measure the width at an elevation 2 times the Maximum Bankfull Depth. This is known as the Flood Prone Width (W_{fpa})
7. Calculate bankfull cross sectional area and plot cross section(Table 2, Figure 2)
8. Calculate mean depth (D_{BKF}), Width/Depth ratio (W/D) and entrenchment ratio (ER) Use worksheet (last page in this handout)
9. Check Regional curves (available at http://www.wildlandhydrology.com/assets/Rosgen_Geomorphic_Channel_Design.pdf) to make sure cross sectional area,b ankfull width and depth are reasonable)

Figure 1. Cross section survey.

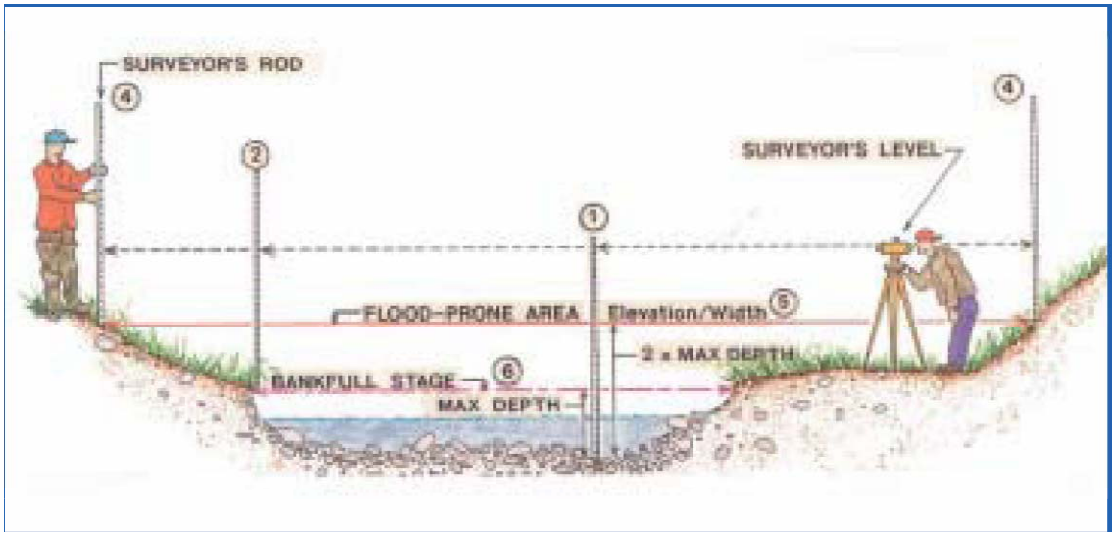


Table 1: Cross-Section Form (example)

*Instructions: Enter data only in gray cells

Site:

Station	Distance, Point, or BS	Back-Sight HI	Height of Instrument FS	Fore-Sight Elevation	Notes, Comments, Remarks
ft	ft	ft	ft	ft	
BM	5	105	----	100	Benchmark
0			8	97	LBF
2			8.25	96.75	
3			8.8	96.2	
6			9	96	
8			9.5	95.5	LEW
12			10	95	THL
16			9.95	95.05	REW
19			9.5	95.5	
21			9	96	
22			8.45	96.55	
25			8	97	RBF

BM=Benchmark
LBF=Left Bankfull
LEW=Left Edge Water
THL=Thalweg
REW=Right Edge Water
RBF=Right Bankfull

Unit helper

Field Measurement			Table form
ft	in	in (fraction)	ft
1	0	0	1.000
ft	in	in (fraction)	ft
0	1	0	0.083
ft	in	in (fraction)	ft
0	0	1/8	0.010

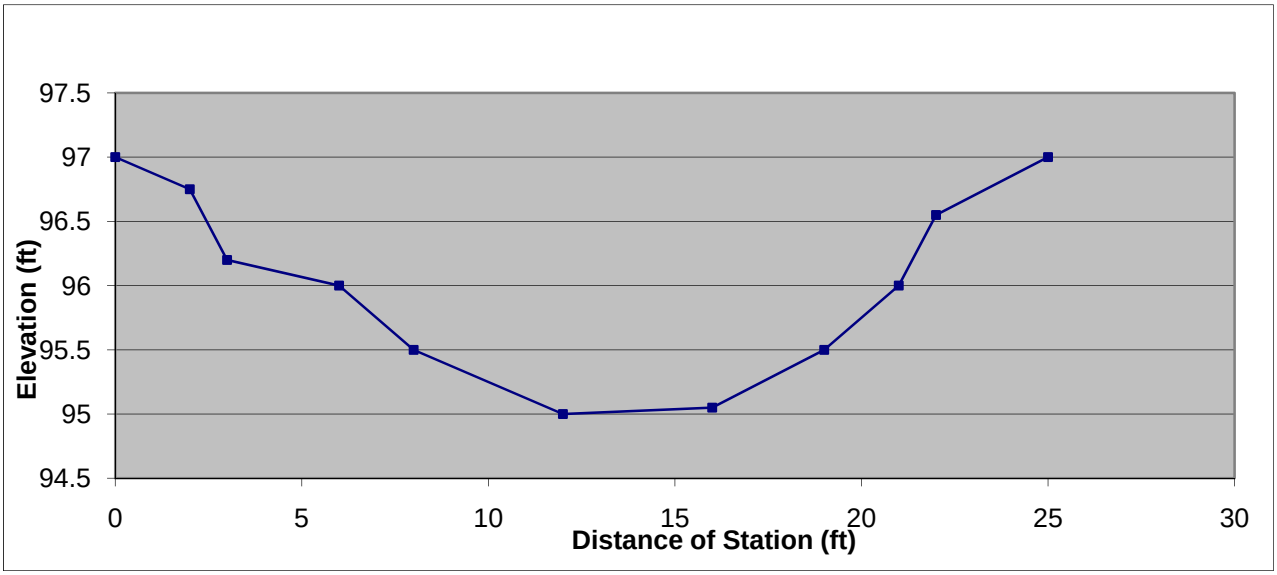
Table 2: Cross-Sectional Area Calculation (example)

Station	Elevation	Depth	Cell Width	Average Cell Depth	Incremental Area
0	97	0	-----	-----	-----
2	96.75	0.25	2-0=2	(0+.25)/2=0.125	2x0.125=0.25
3	96.2	0.8	1	0.525	0.525
6	96	1	3	0.9	2.7
8	95.5	1.5	2	1.25	2.5
12	95	2	4	1.75	7
16	95.05	1.95	4	1.975	7.9
19	95.5	1.5	3	1.725	5.175
21	96	1	2	1.25	2.5
22	96.55	0.45	1	0.725	0.725
25	97	0	3	0.225	0.675
				Total Area (ft^2)	30.0

Key Morphological Parameters

Bankfull Area (ft^2)	Bankfull Width (ft)	Mean bankfull Depth (ft)	Width/Depth Ratio
30.0	25.0	1.2	20.9

Width of Flood Prone Area (ft)	Entrenchment Ratio
35.0 (measured value)	1.4



Item	Distance, Point, or **Station** ft	Back-Sight **BS** ft	Height of Instrument **HI** ft	Fore-Sight **FS** ft	**Elevation** ft	**Notes, Comments, Remarks**
1	BM		100	----	100	Benchmark
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

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1	0	0		1.000
ft	in	in (fraction)		ft
0	1	0		0.083
ft	in	in (fraction)		ft
0	0	1/8		0.010

Stream Survey Data Sheet

Site:

Riffle Cross-Section:

Area at Bankfull, A_{bkf}	0.0	ft^2	Mean Depth at Bankfull, $D_{bkf}=A_{bkf}/W_{bkf}$	0.0	ft
Width at bankfull, W_{bkf}	0.0	ft	Entrenchment Ratio, ER= $Wfpa/W_{bkf}$	0.0	ft/ft
Width Flood Prone Area, W_{fpa}	0.0	ft	Width to Depth Ratio, $W/D=W_{bkf}/D_{bkf}$	0.0	ft/ft
Maximum Depth Bankfull, D_{max}	0.0	ft	Bank Height Ratio, $BHR=D_{TOB}/D_{max}$	0.0	ft/ft
Max Depth Top Low Bank, D_{TOB}	0.0	ft	Max Depth Ratio=D_{max}/D_{bkf}	0.0	ft/ft

Longitudinal Profile:

Length of Channel Thalweg		ft	Slope of Channel	0	ft/ft
Length of valley		ft	Sinuosity	0	ft/ft
Elevation Change		ft			

Pool Cross-Section:

Pool Area at Bankfull	ft^2	Pool Area Ratio	ft^2/ft^2
Pool Width at Bankfull	ft	Pool Width Ratio	ft/ft
Pool Max Depth Bankfull	ft	Pool Max Depth Ratio	ft/ft

Pattern survey

Meander Wavelength	ft	Meander Wavelength Ratio	ft/ft
Meander Belt Width	ft	Meander Width Ratio	ft/ft
Radius of Curvature	ft	Radius of Curvature Ratio	ft/ft

Pebble Count Results (reachwide):

Median Particle Size, d50 _ mm