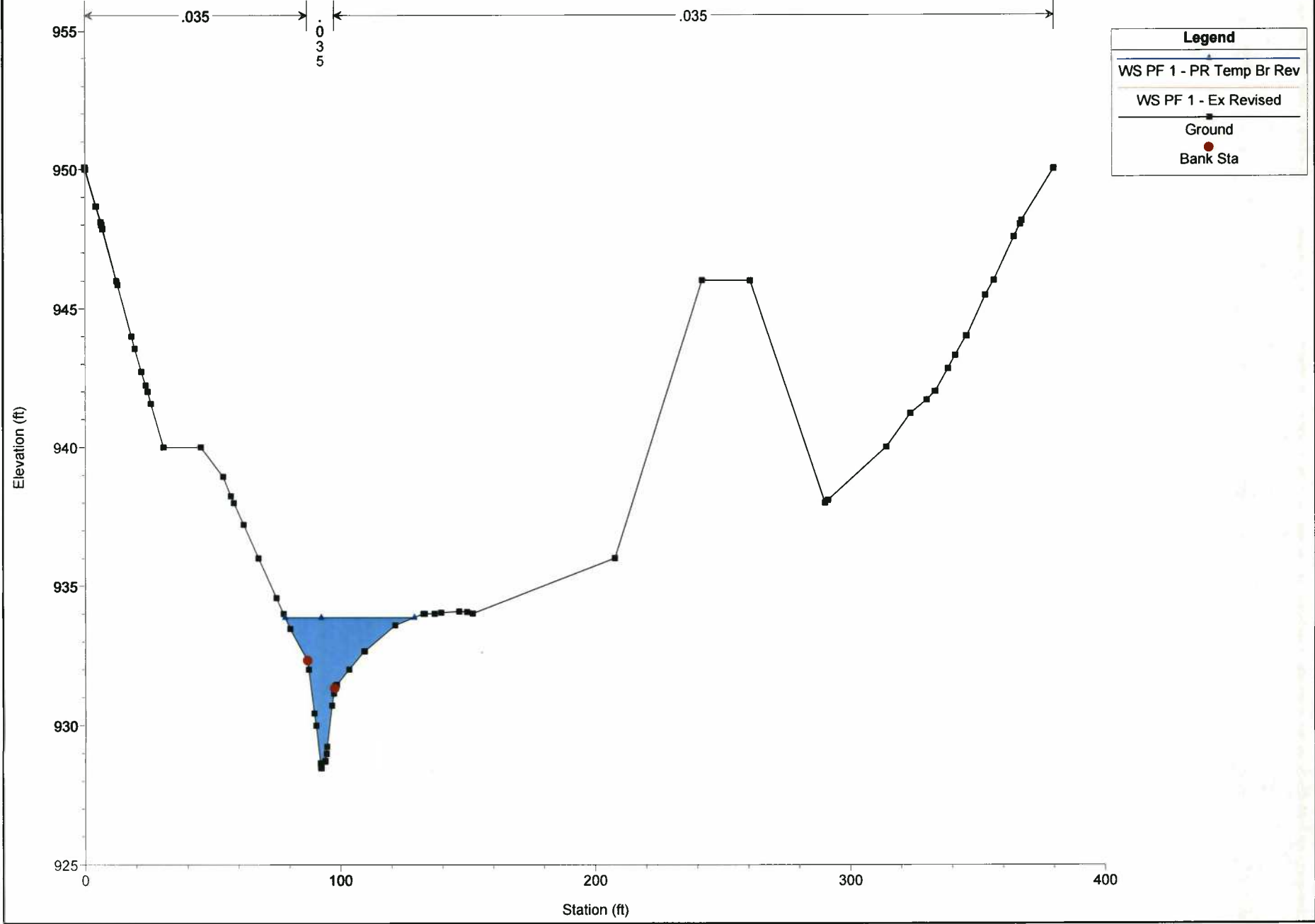
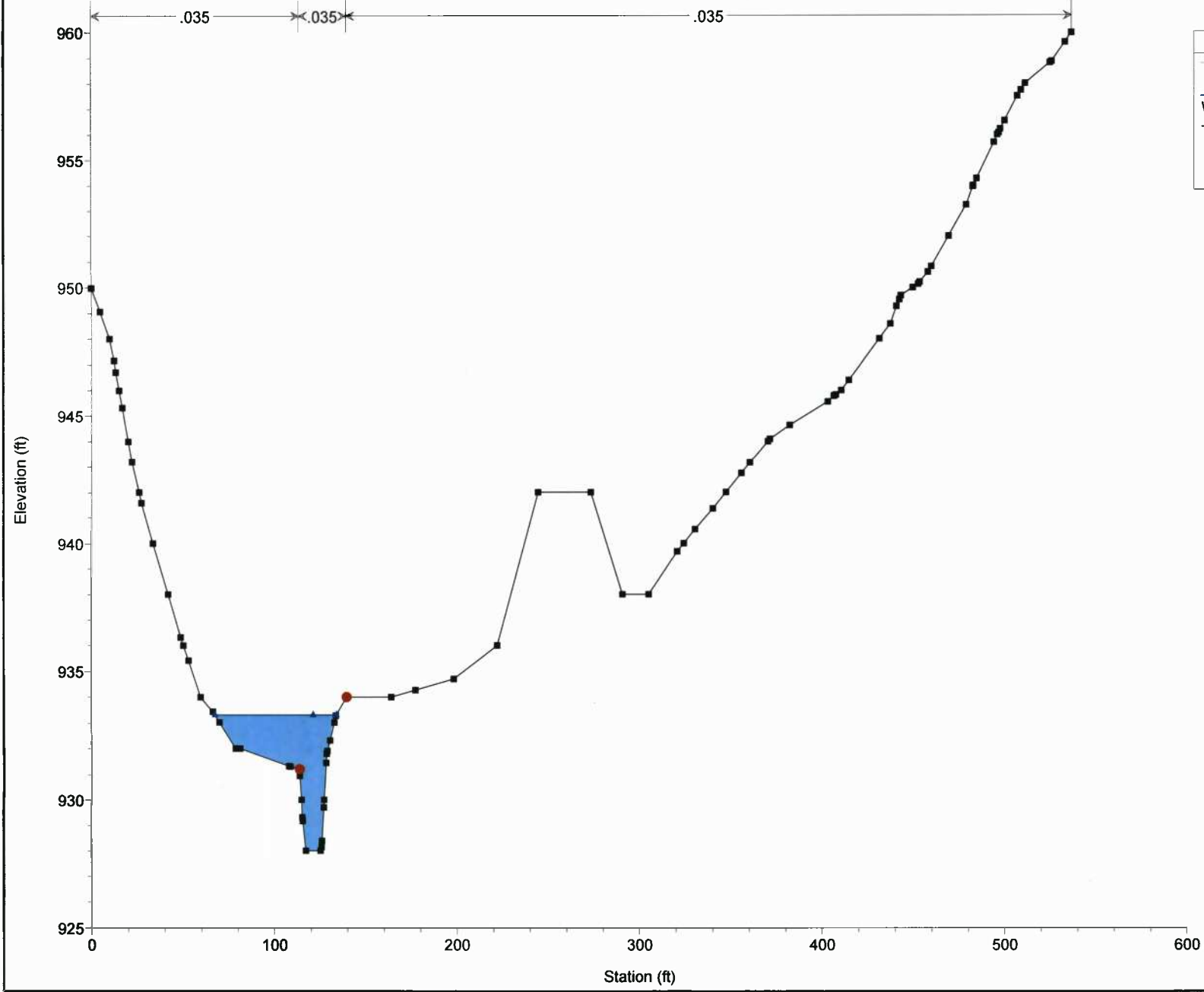


OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
 River = Bluestone Creek Reach = Upper RS = 10615.35



Legend	
▲	WS PF 1 - PR Temp Br Rev
▼	WS PF 1 - Ex Revised
■	Ground
●	Bank Sta

OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
River = Bluestone Creek Reach = Upper RS = 10402.90

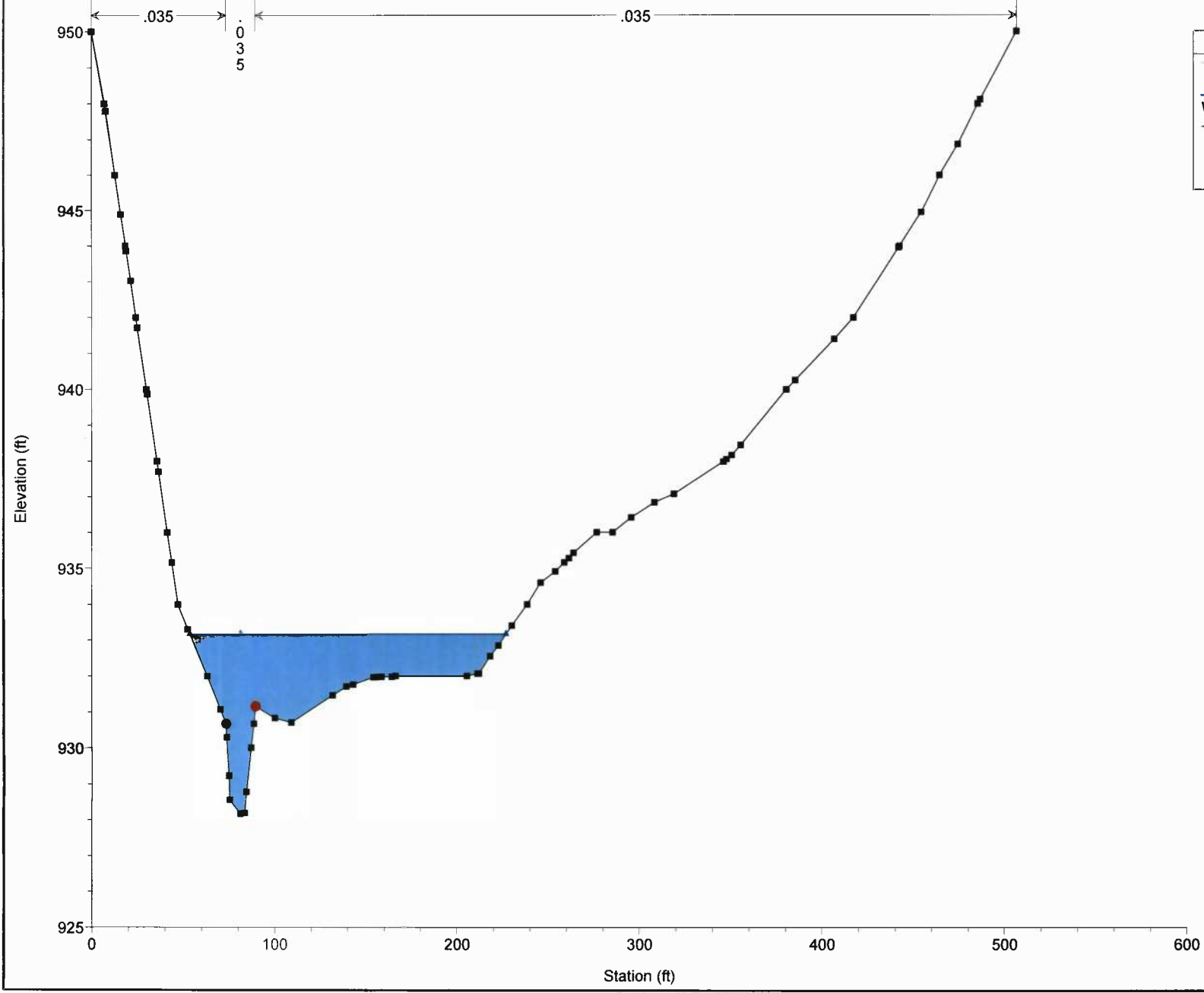


Legend	
WS PF 1 - Ex Revised	— (dashed line)
WS PF 1 - PR Temp Br Rev	— (solid line)
Ground	■ (square)
Bank Sta	● (red circle)

OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 10179.69

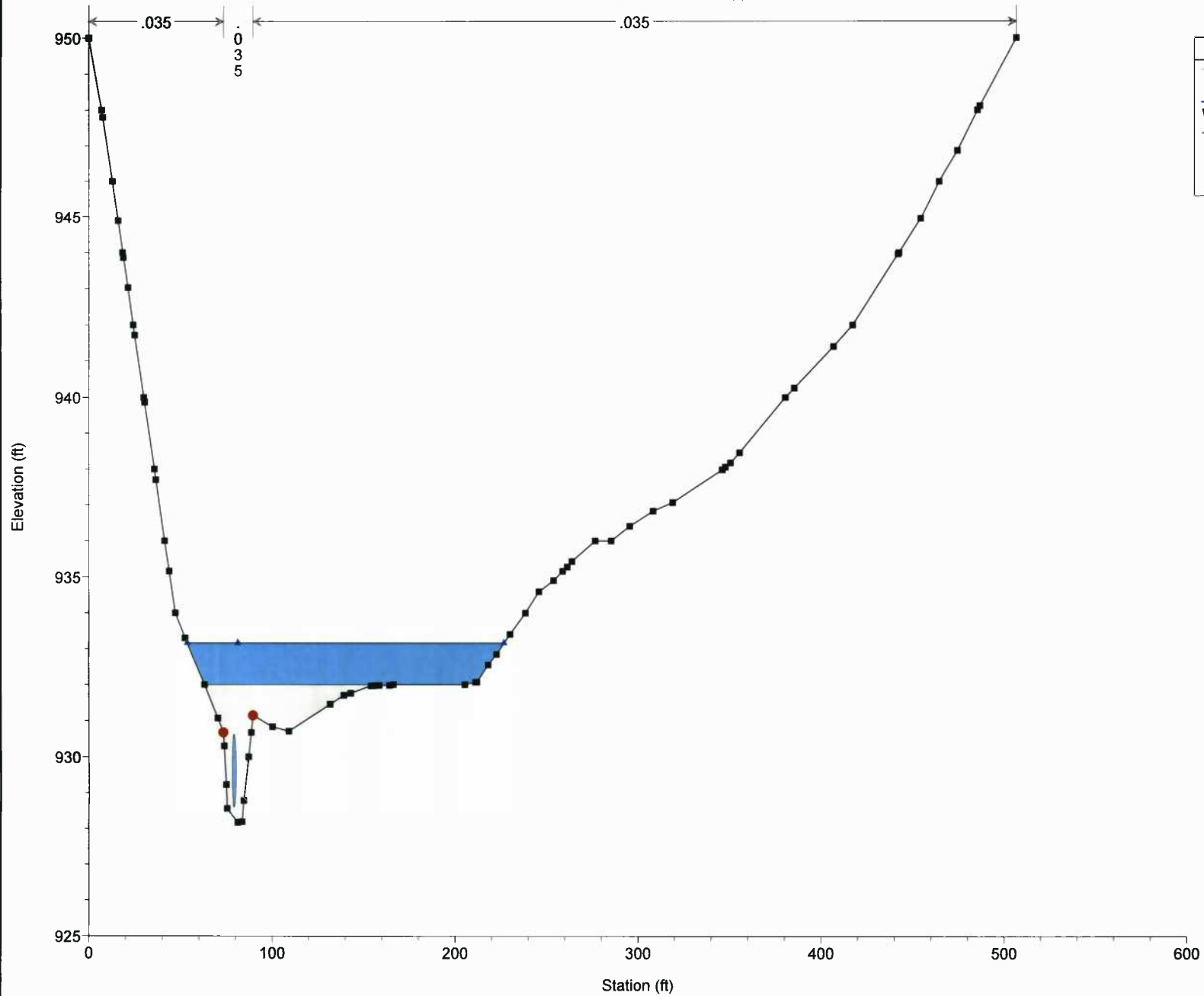


Legend	
WS PF 1 - Ex Revised	●
WS PF 1 - PR Temp Br Rev	▲
Ground	■
Bank Sta	●

OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 10155.71 Culv

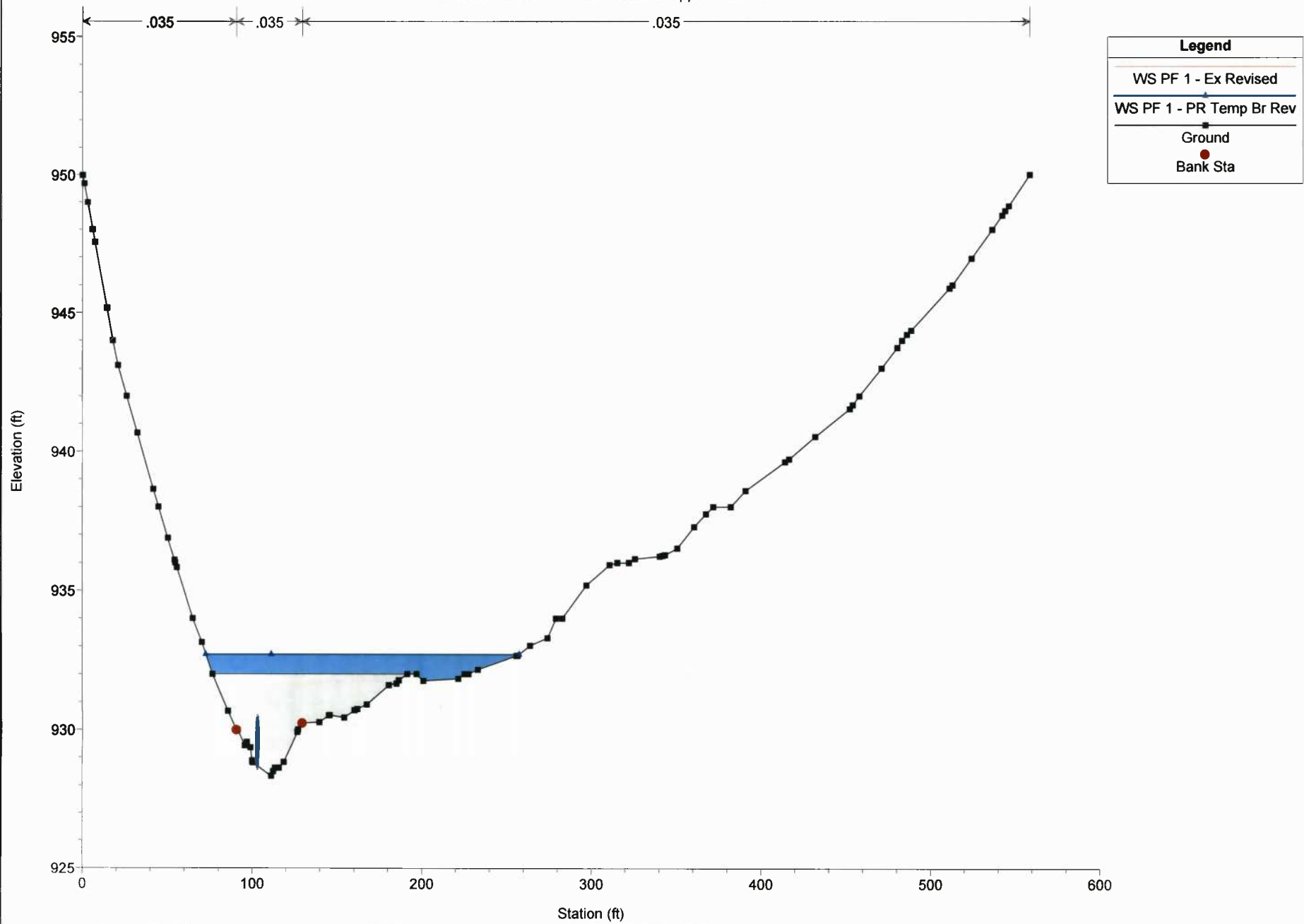




OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

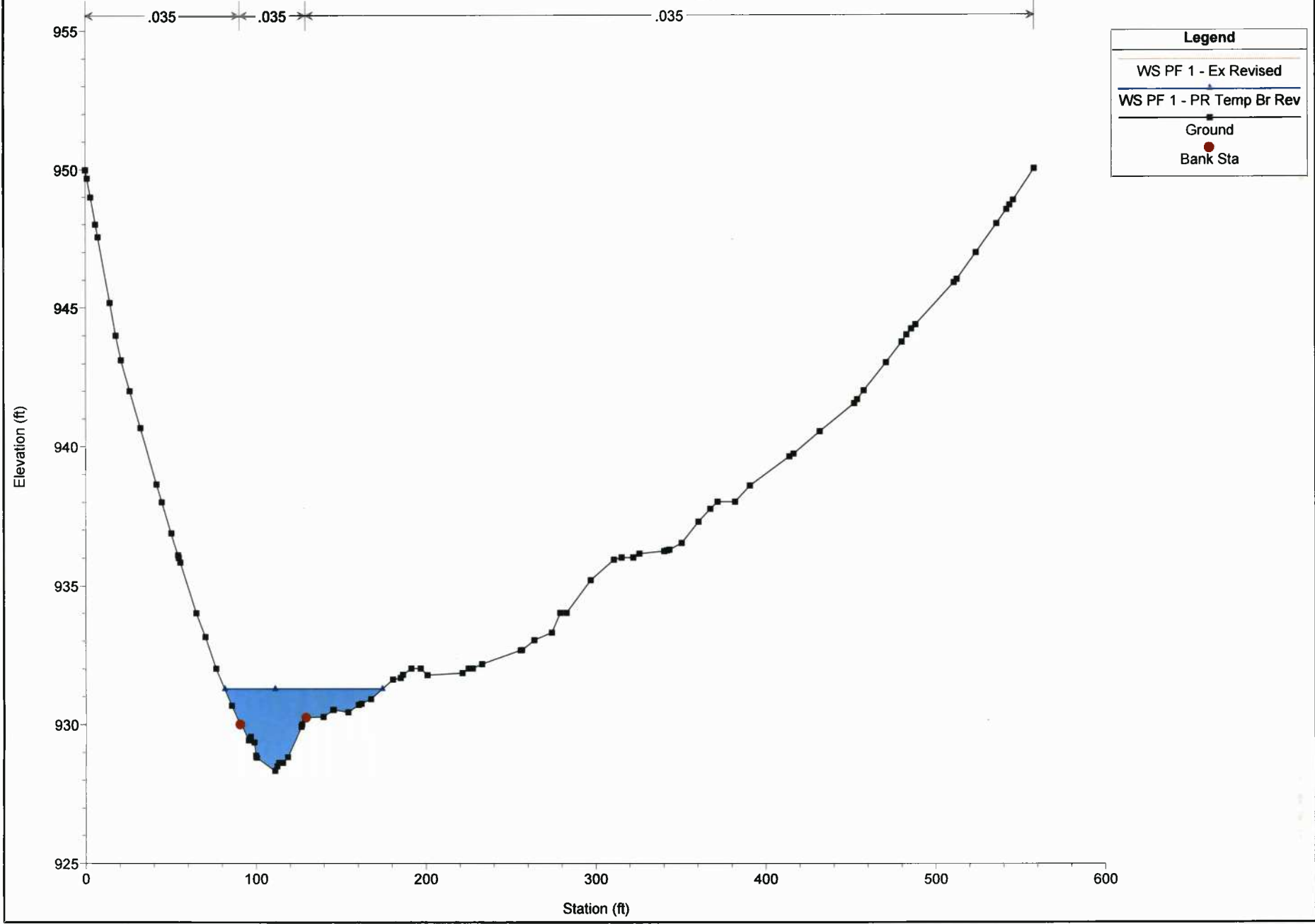
Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 10155.71 Culv



Legend	
WS PF 1 - Ex Revised	—
WS PF 1 - PR Temp Br Rev	- - -
Ground	■
Bank Sta	●

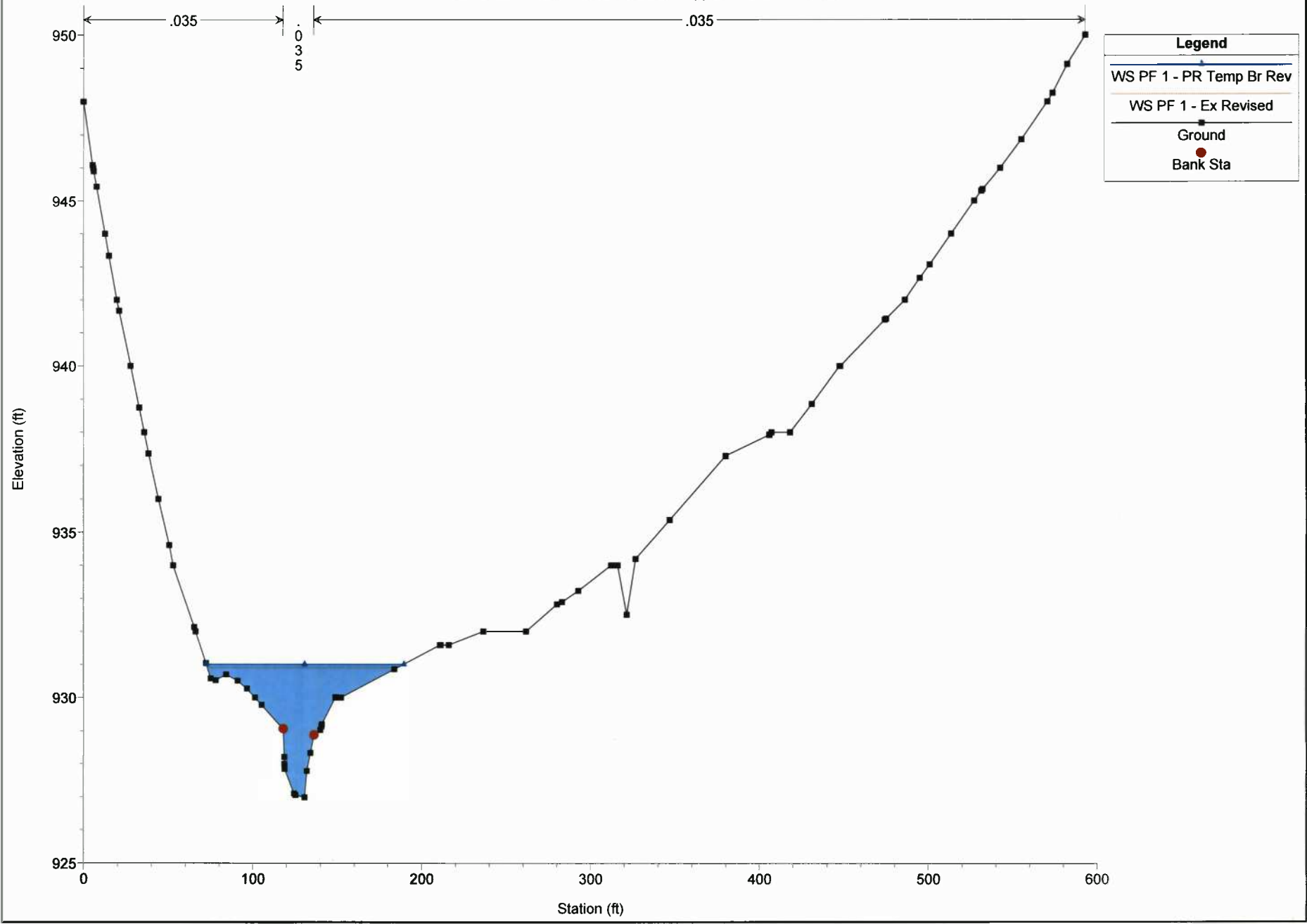
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
River = Bluestone Creek Reach = Upper RS = 10120.86



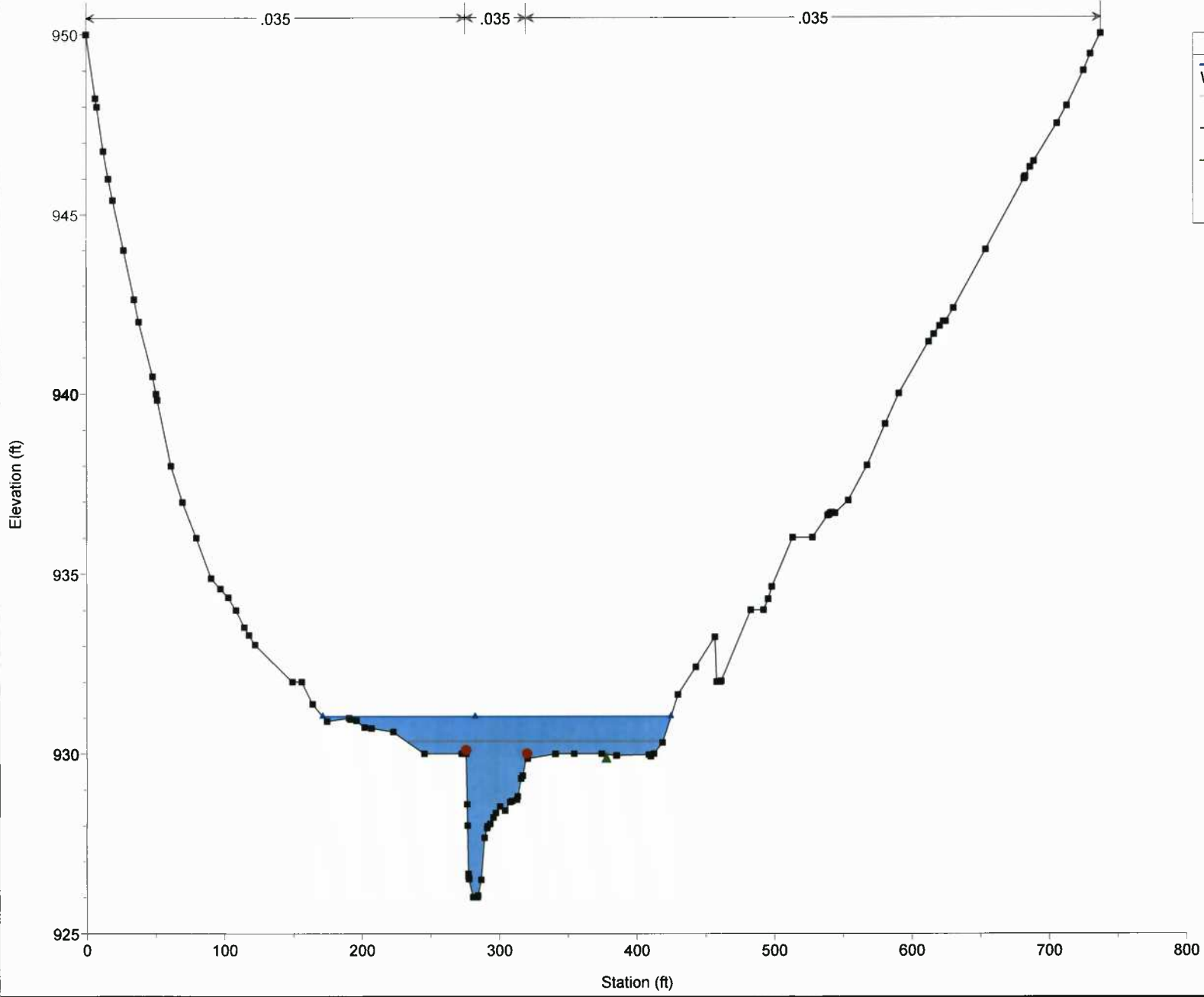
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 10055.03



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
 River = Bluestone Creek Reach = Middle RS = 9989.380

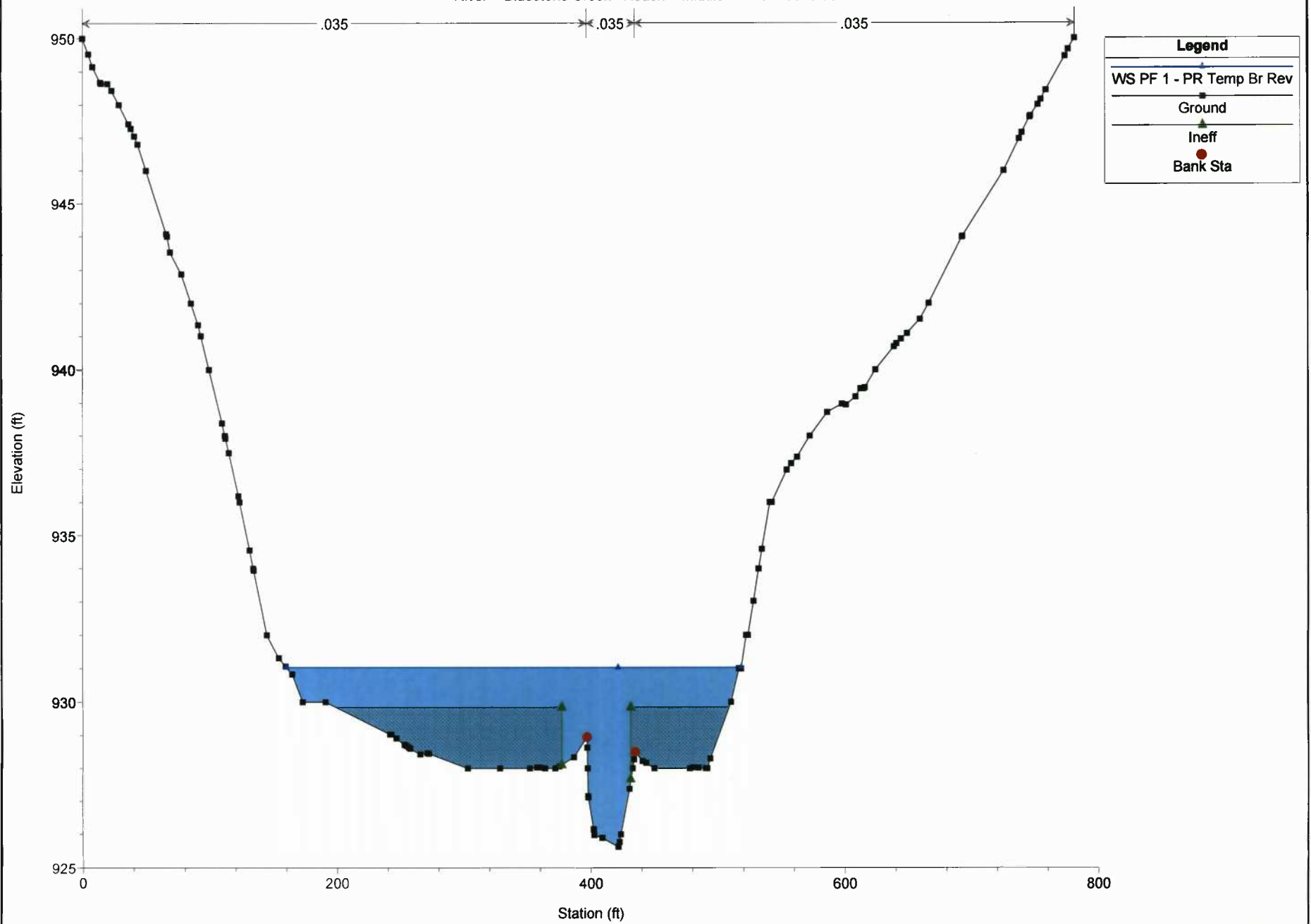


Legend	
WS PF 1 - PR Temp Br Rev	▲
WS PF 1 - Ex Revised	■
Ground	▲
Ineff	▲
Bank Sta	●

OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

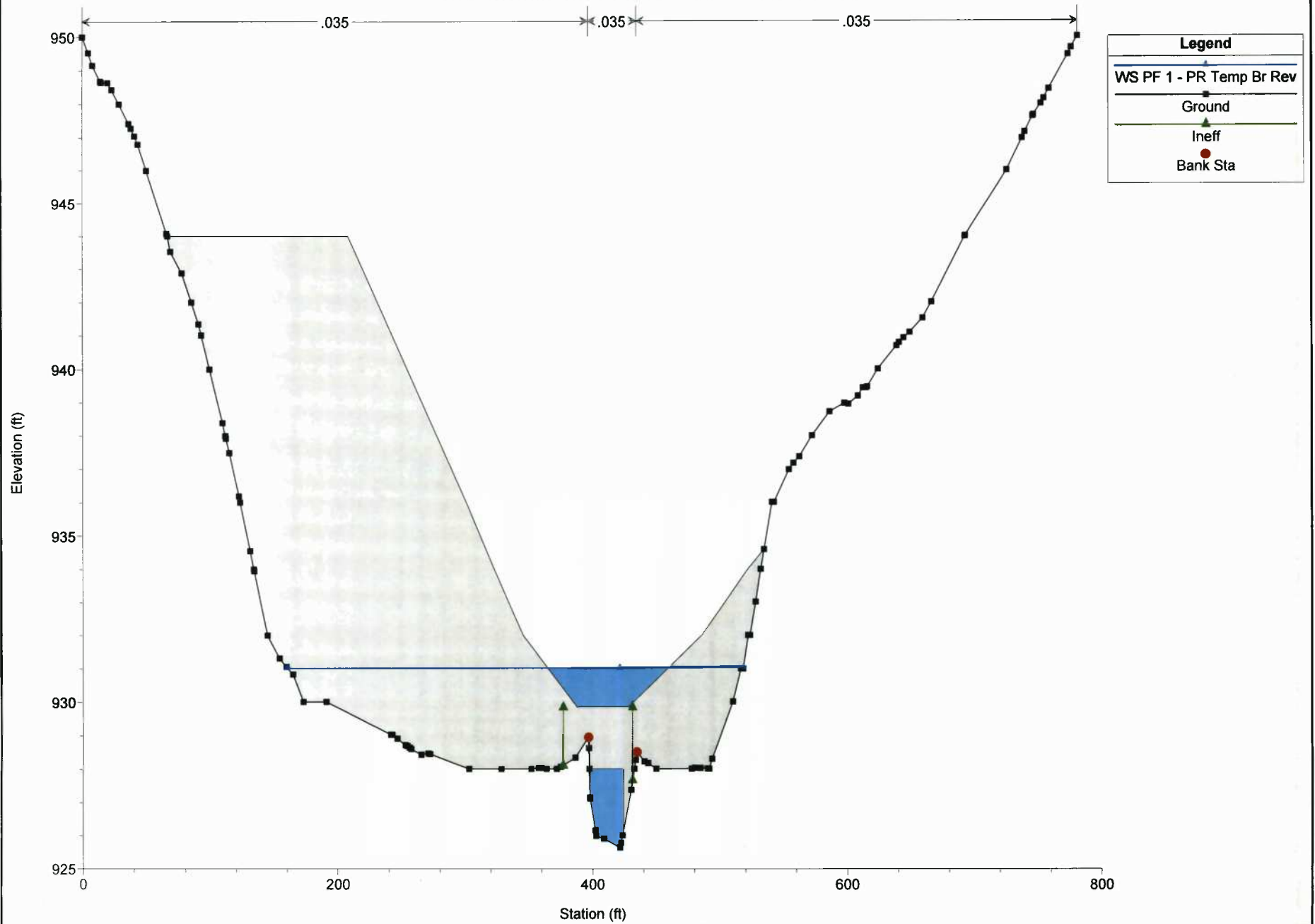
River = Bluestone Creek Reach = Middle RS = 9878.981



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

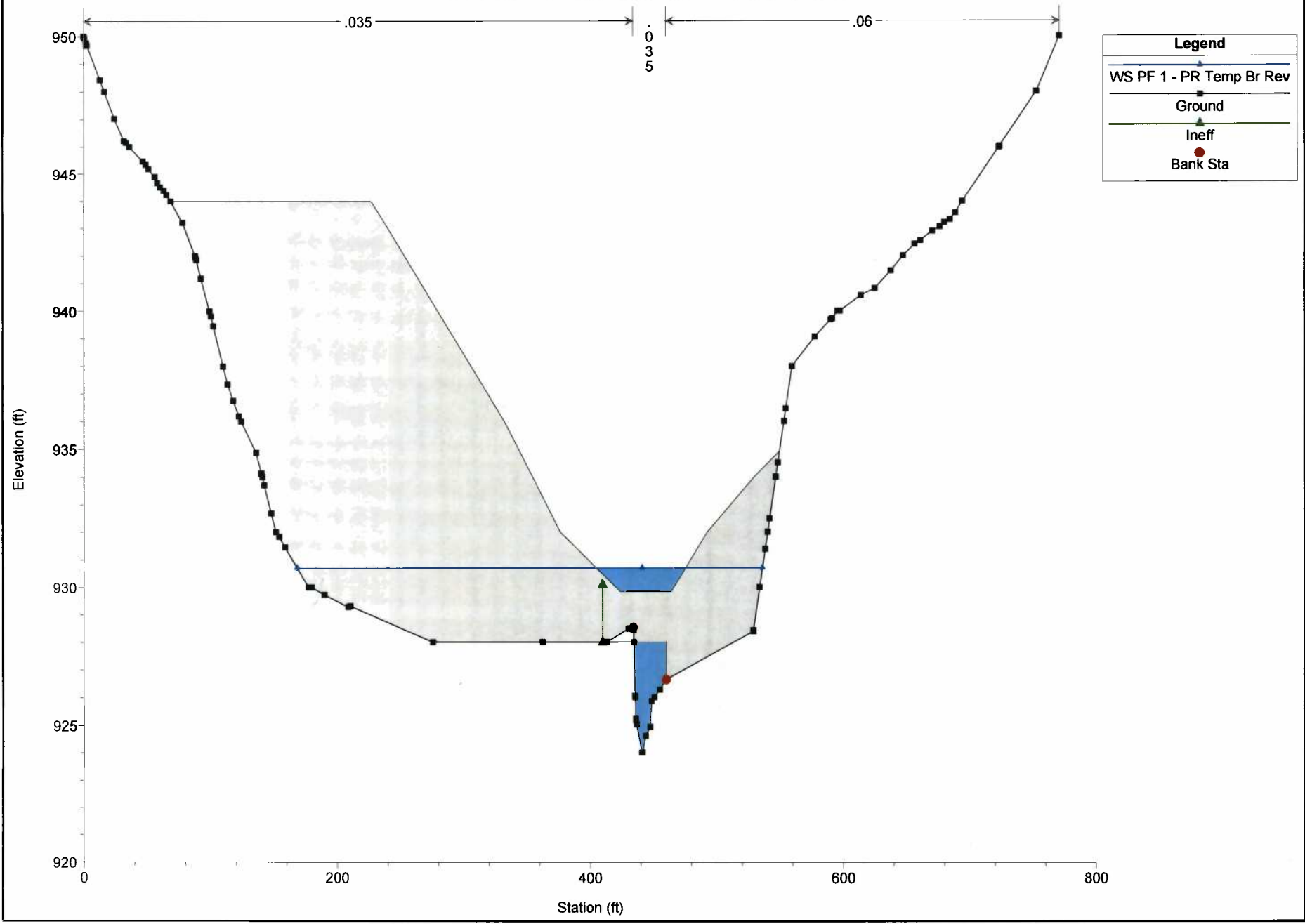
River = Bluestone Creek Reach = Middle RS = 9855.351 BR



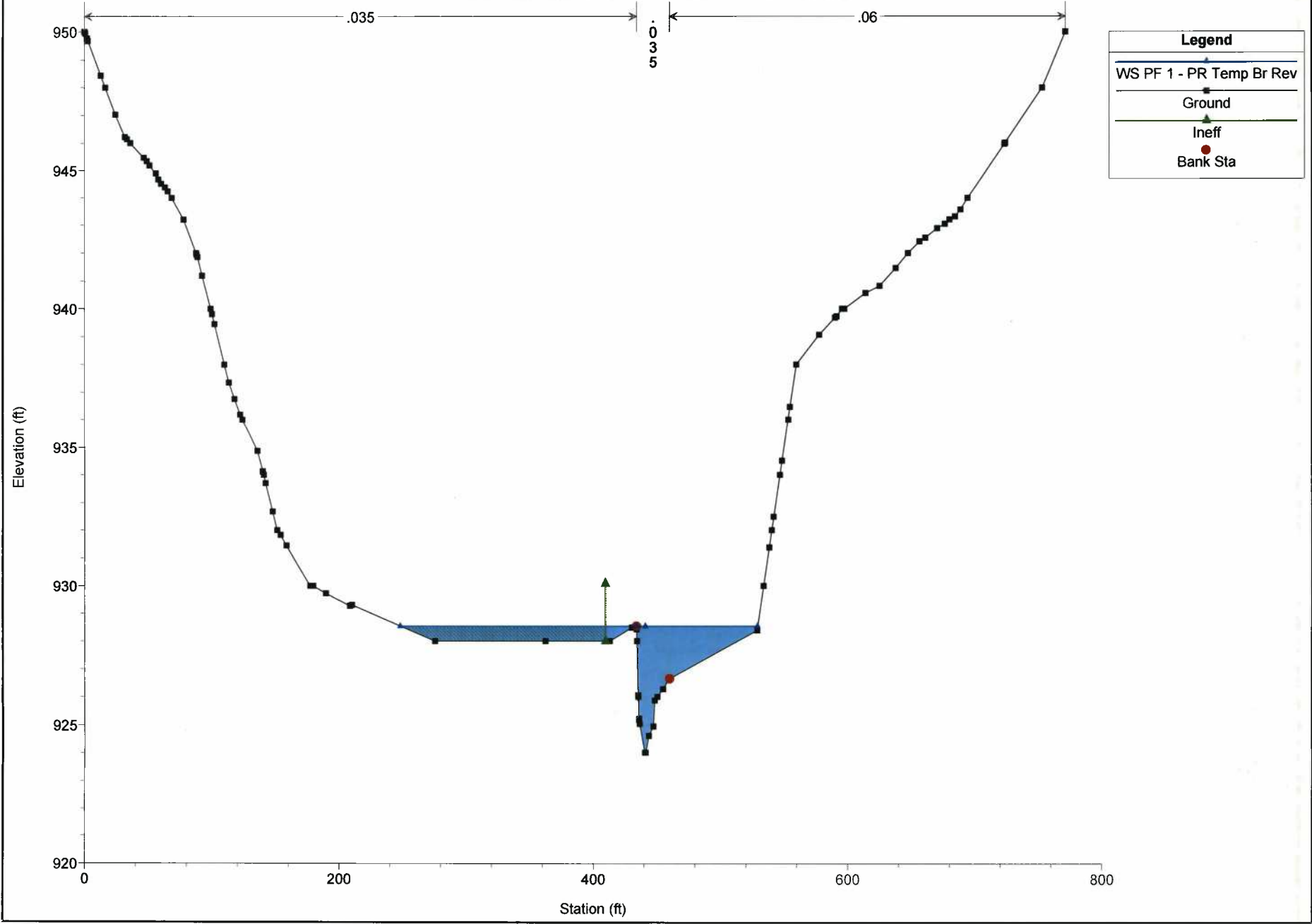
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 9855.351 BR

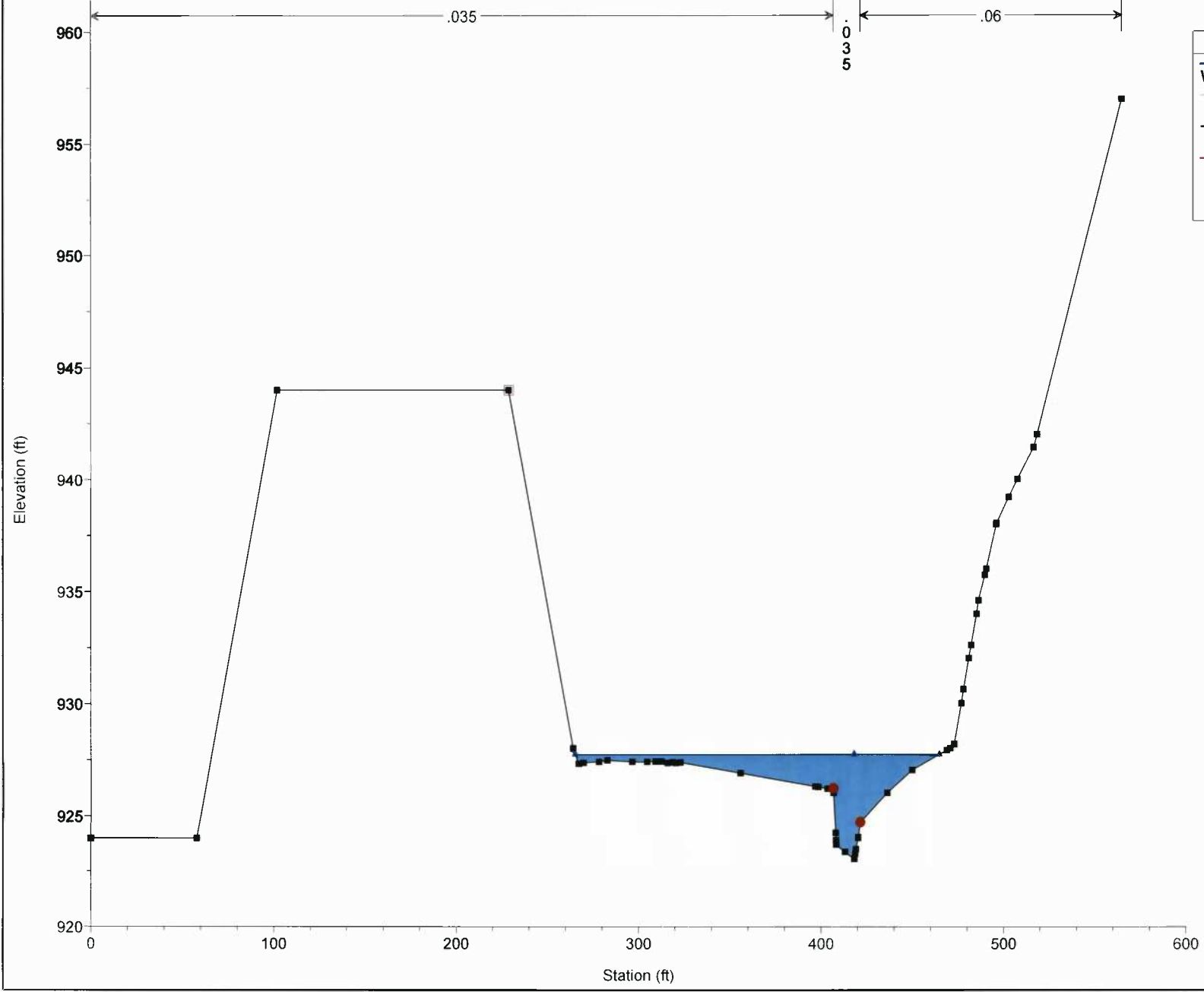


OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
 River = Bluestone Creek Reach = Middle RS = 9831.906



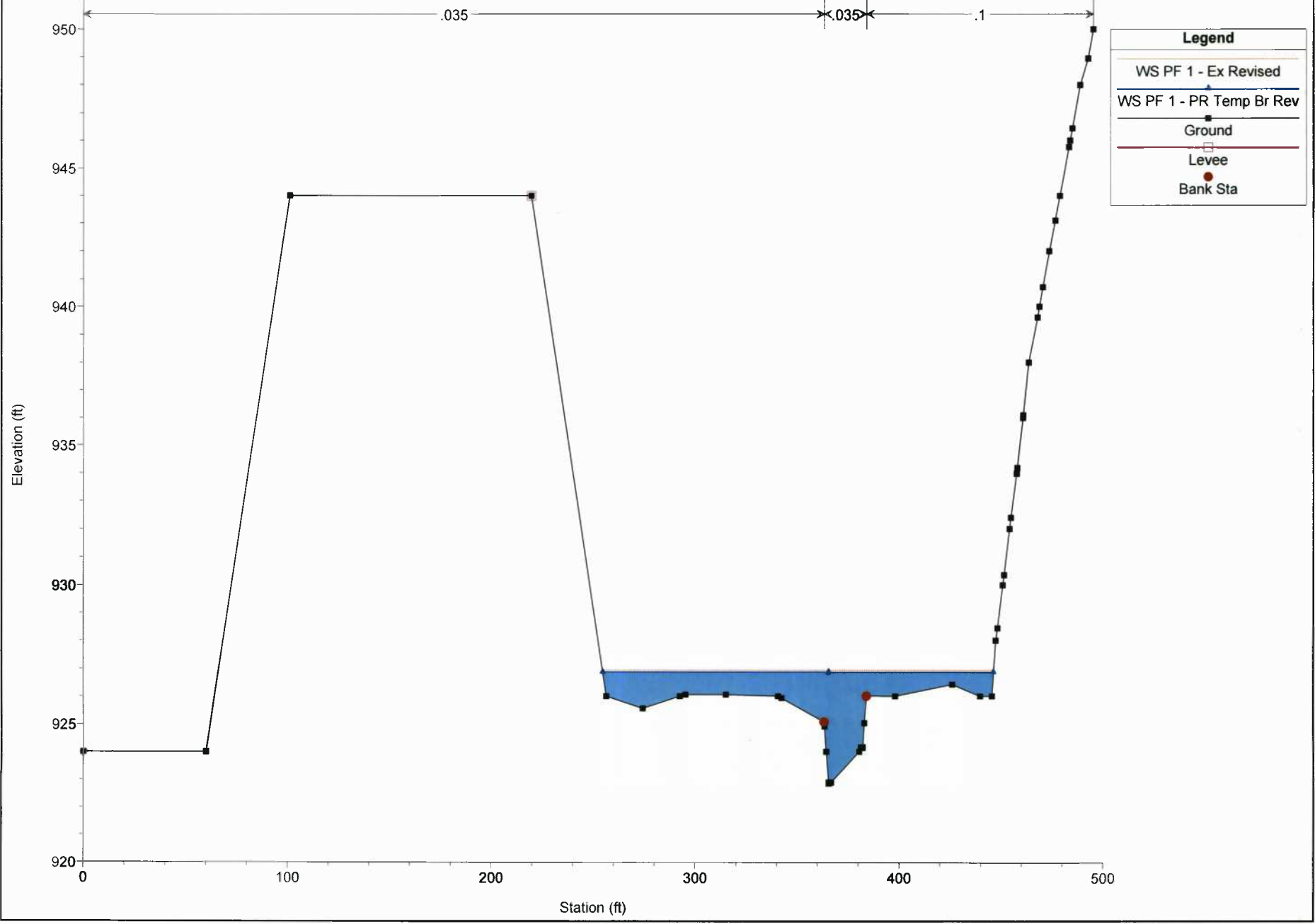


OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
 River = Bluestone Creek Reach = Middle RS = 9559.249

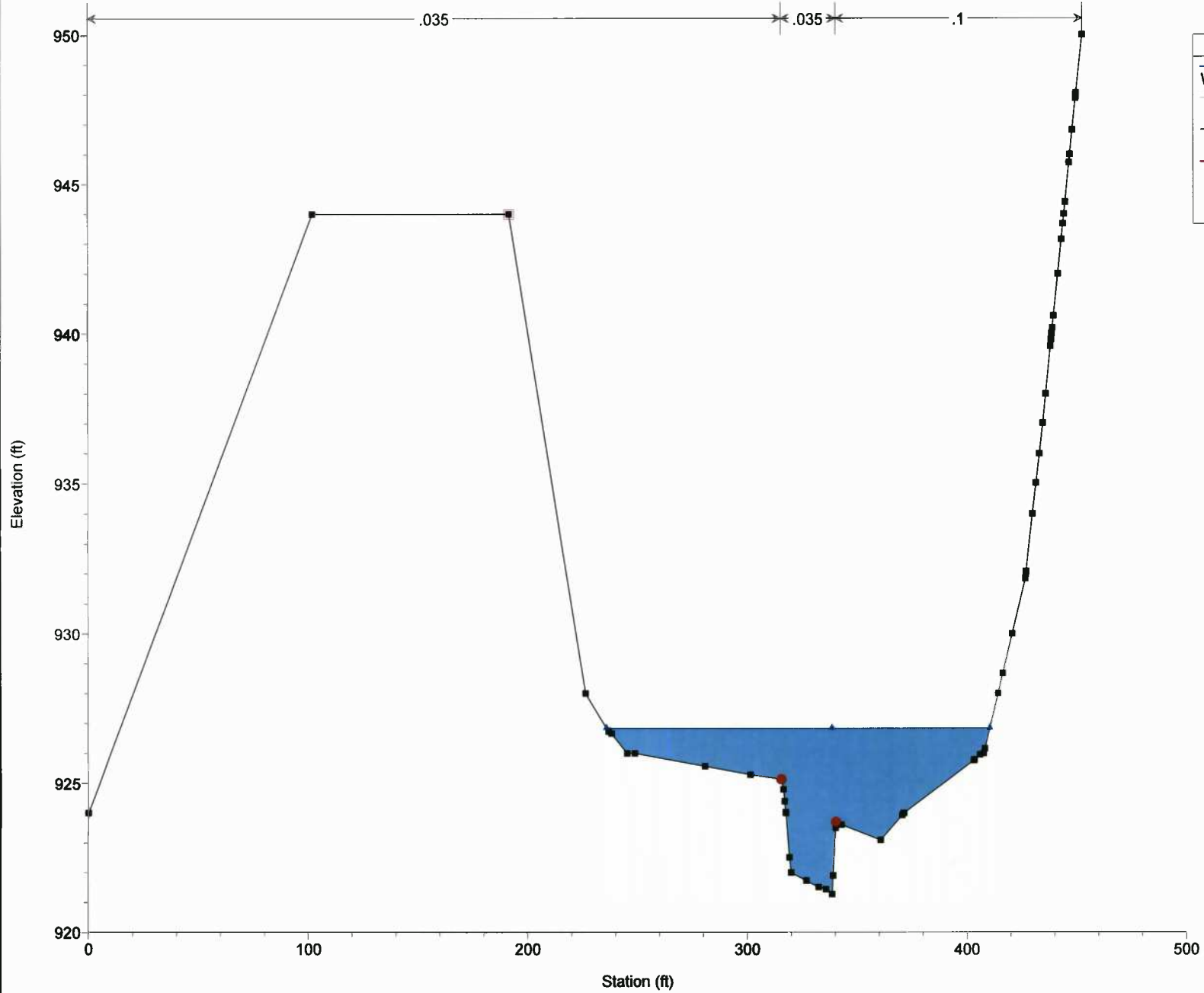


Legend	
WS PF 1 - PR Temp Br Rev	▲
WS PF 1 - Ex Revised	■
Ground	■
Levee	□
Bank Sta	●

OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
River = Bluestone Creek Reach = Middle RS = 9443.656



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
River = Bluestone Creek Reach = Middle RS = 9322.807

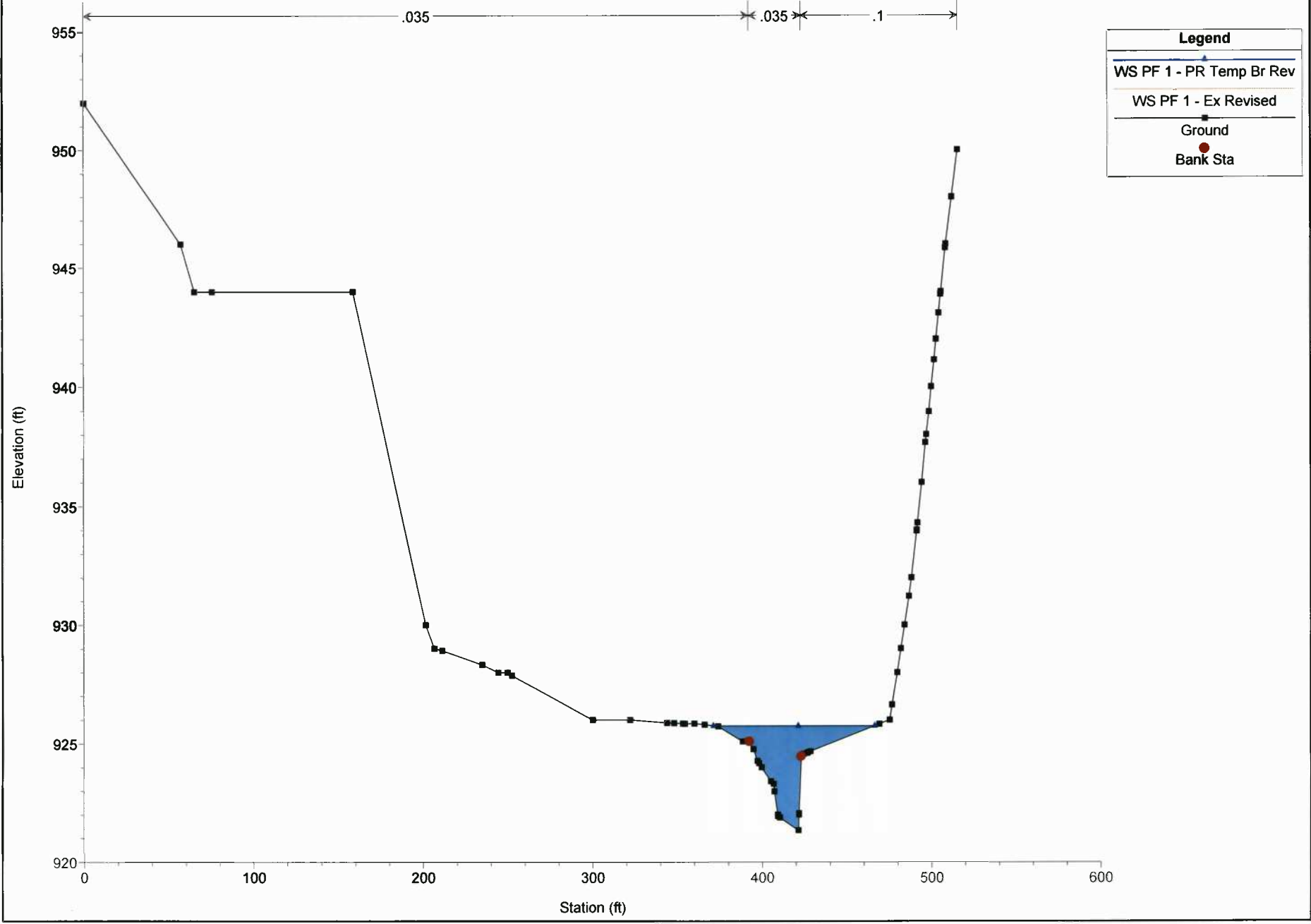


Legend	
WS PF 1 - PR Temp Br Rev	(Blue line with triangle)
WS PF 1 - Ex Revised	(Red line)
Ground	(Black squares)
Levee	(Red line)
Bank Sta	(Red circle)

OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 9266.019

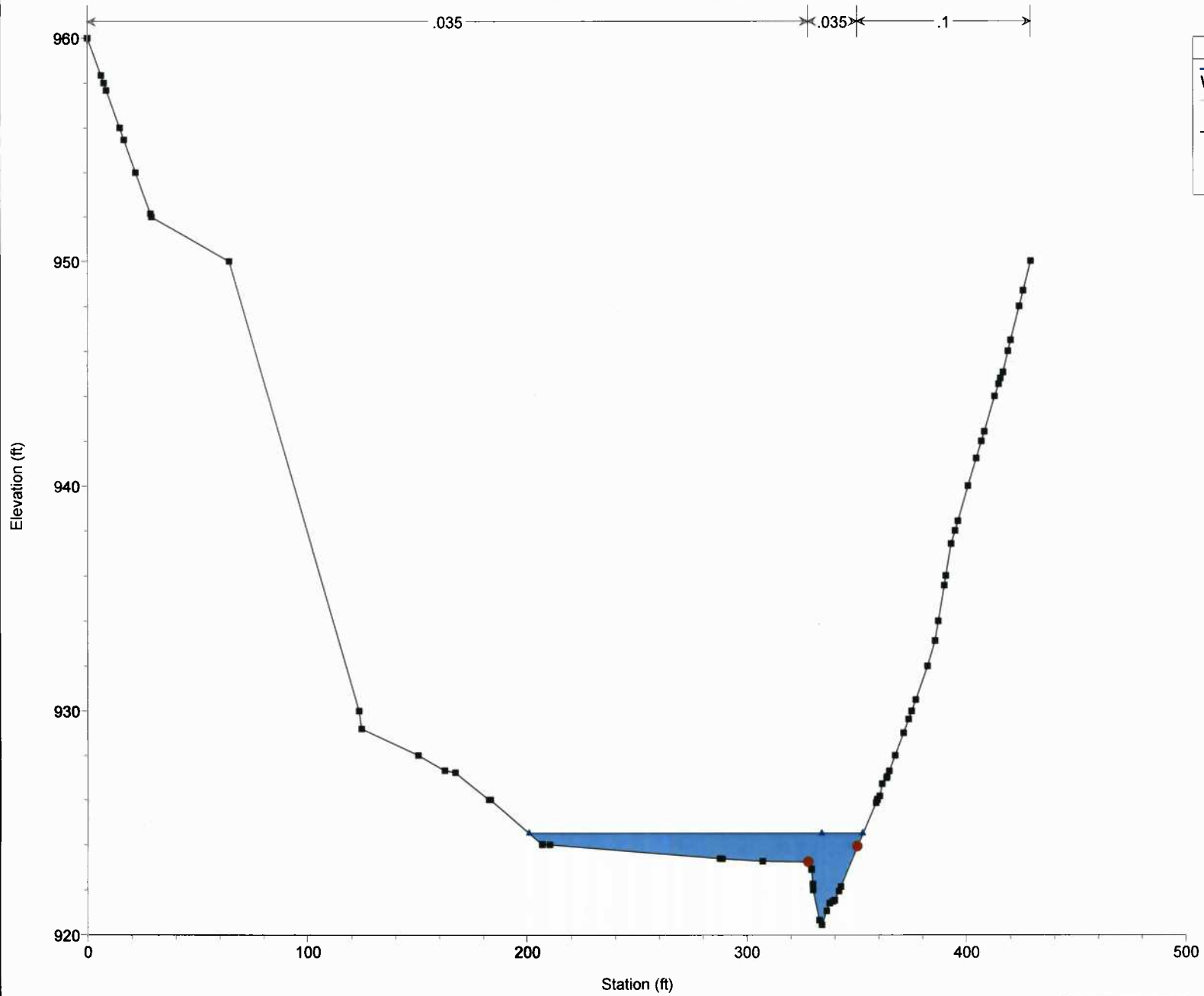


OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 9003.470

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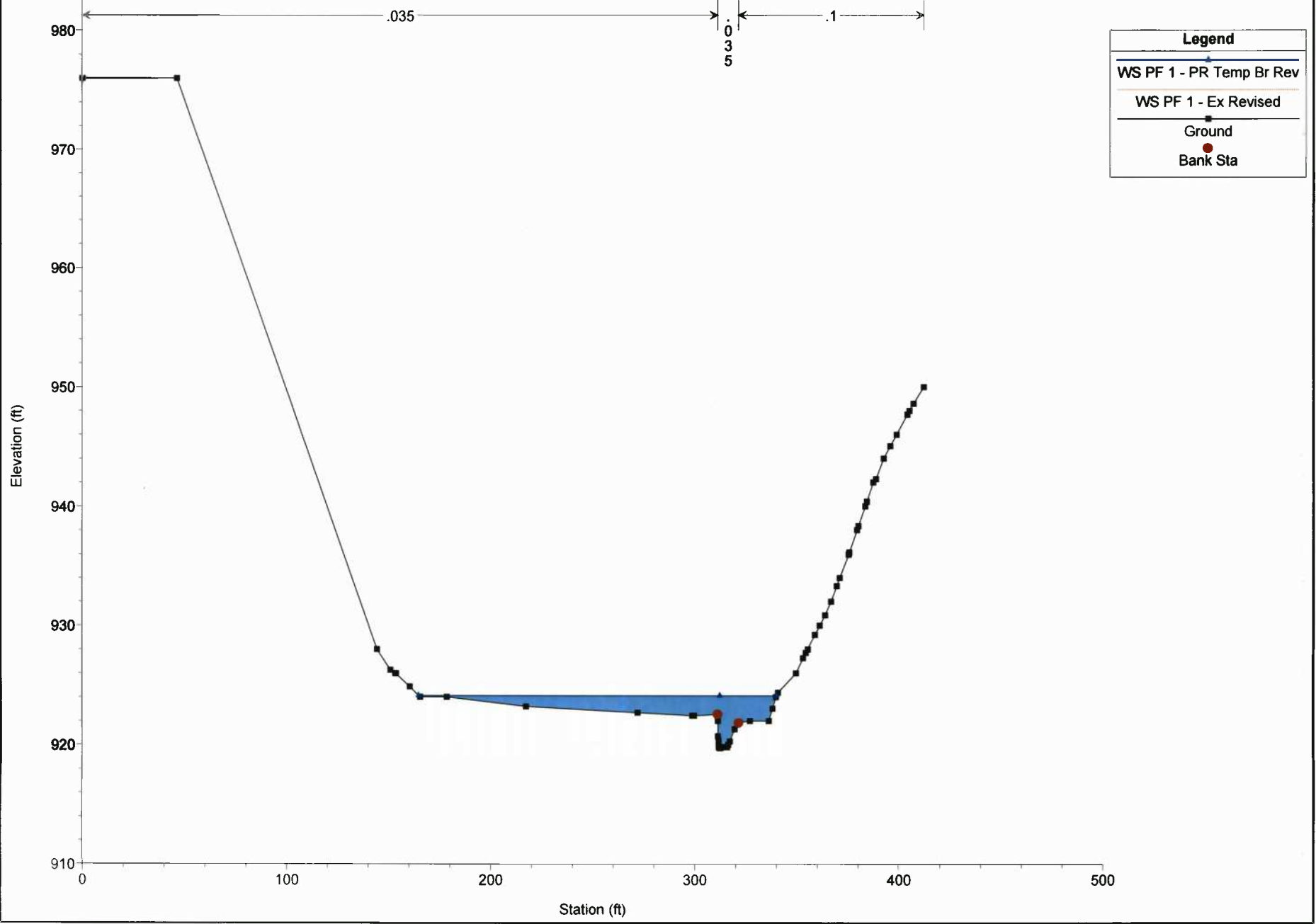


Legend	
	WS PF 1 - PR Temp Br Rev
	WS PF 1 - Ex Revised
	Ground
	Bank Sta

OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

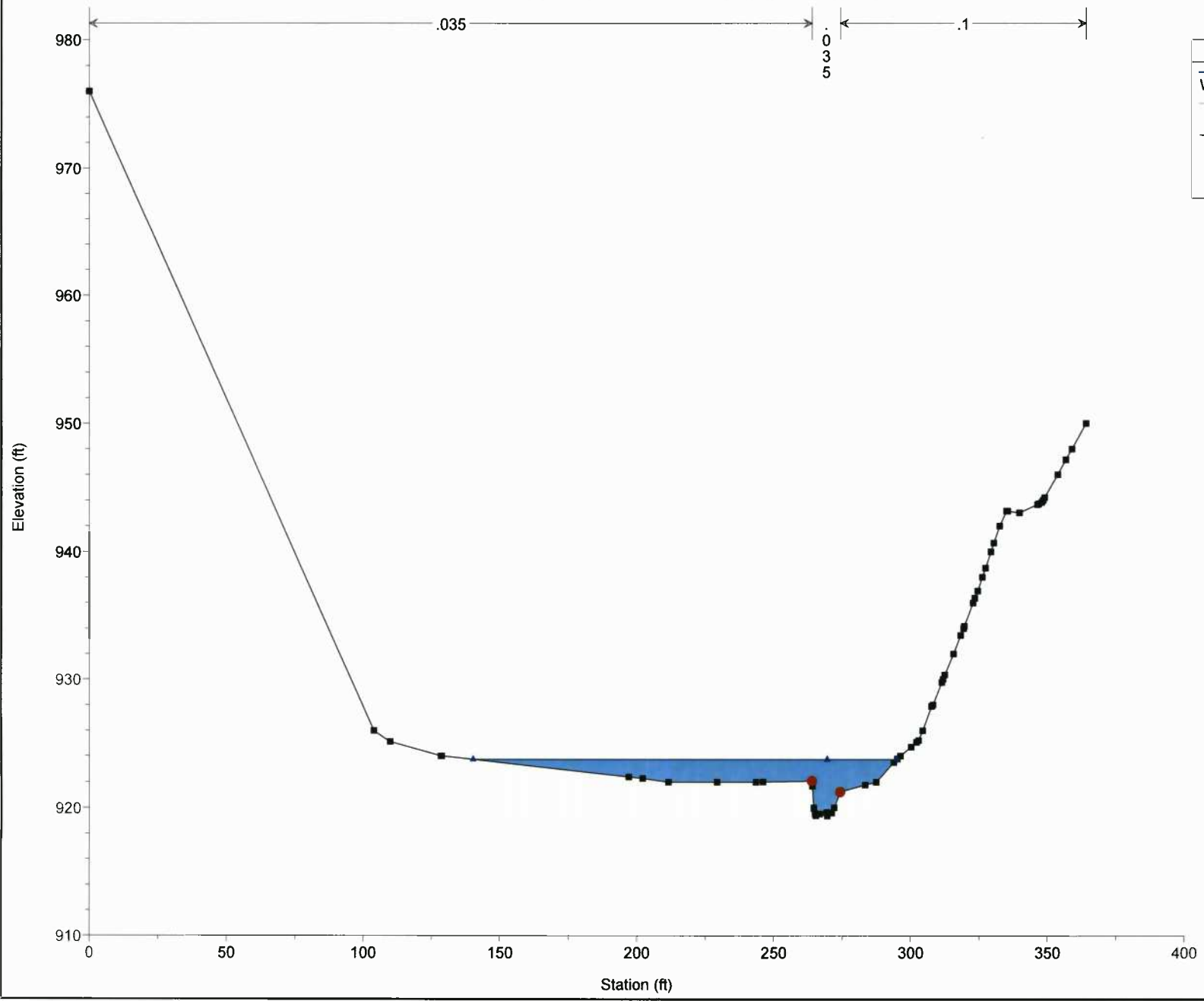
River = Bluestone Creek Reach = Middle RS = 8906.253



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 8843.186

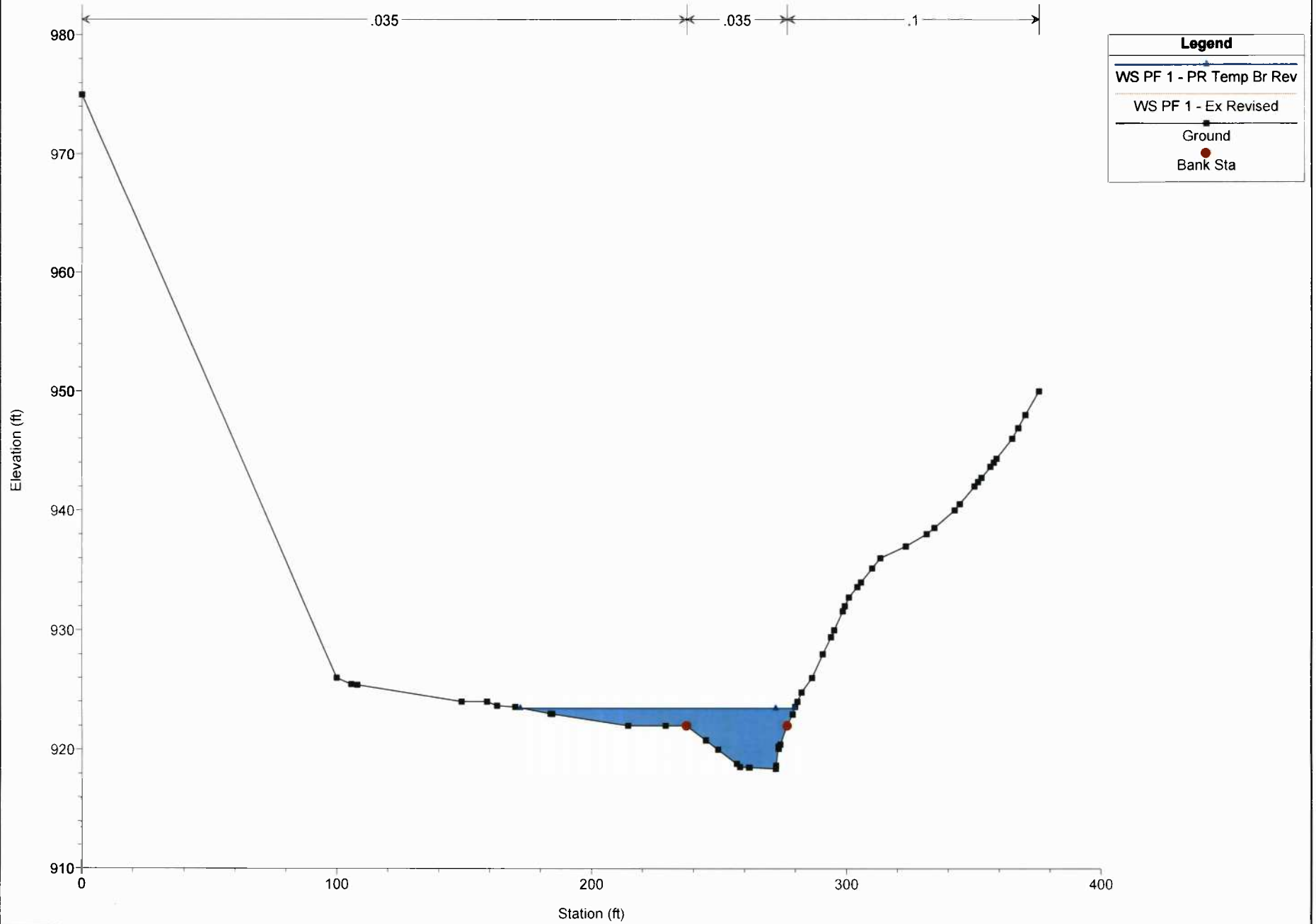


Legend	
WS PF 1 - PR Temp Br Rev	▲
WS PF 1 - Ex Revised	■
Ground	●
Bank Sta	●

OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 8712.623

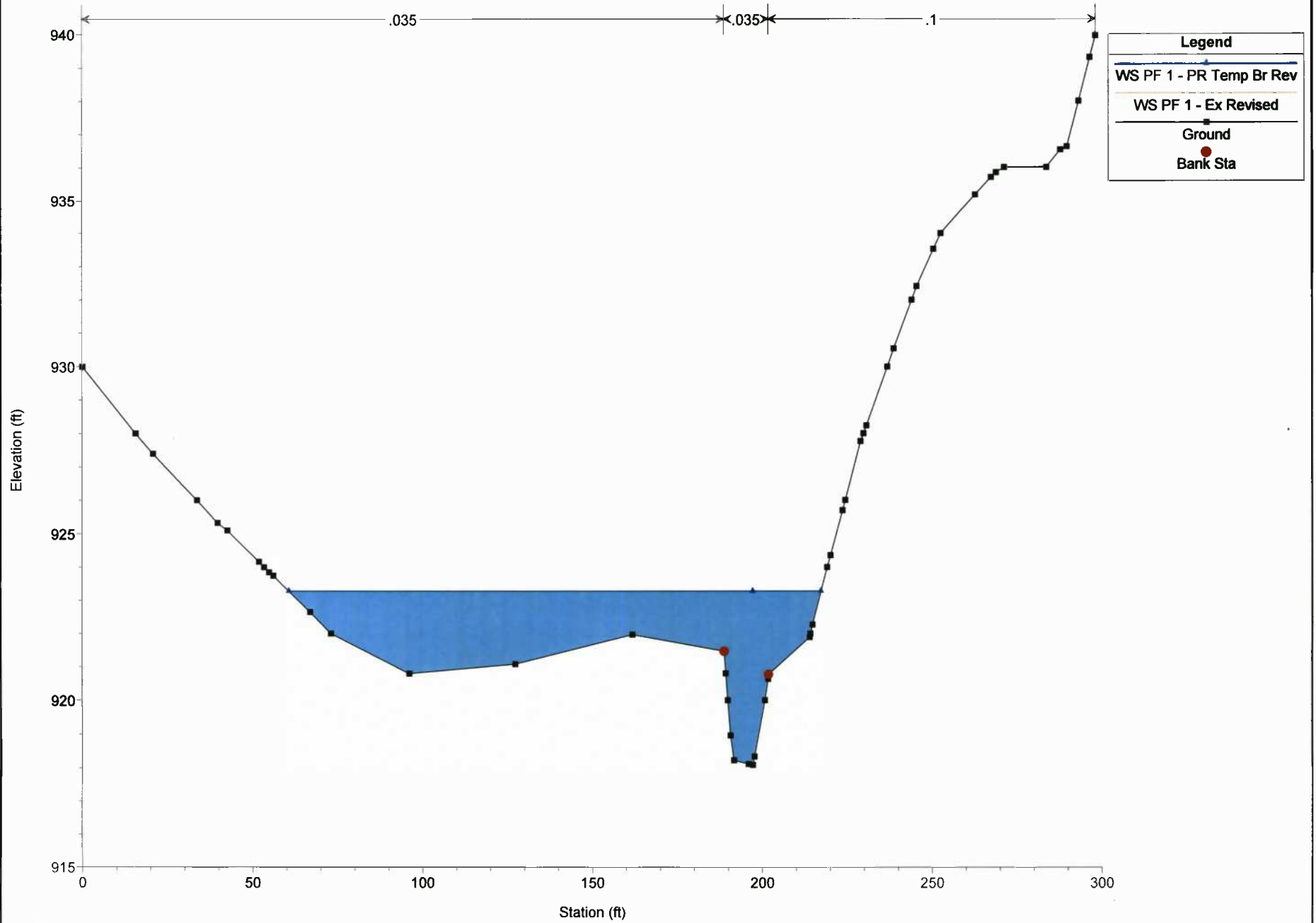




OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

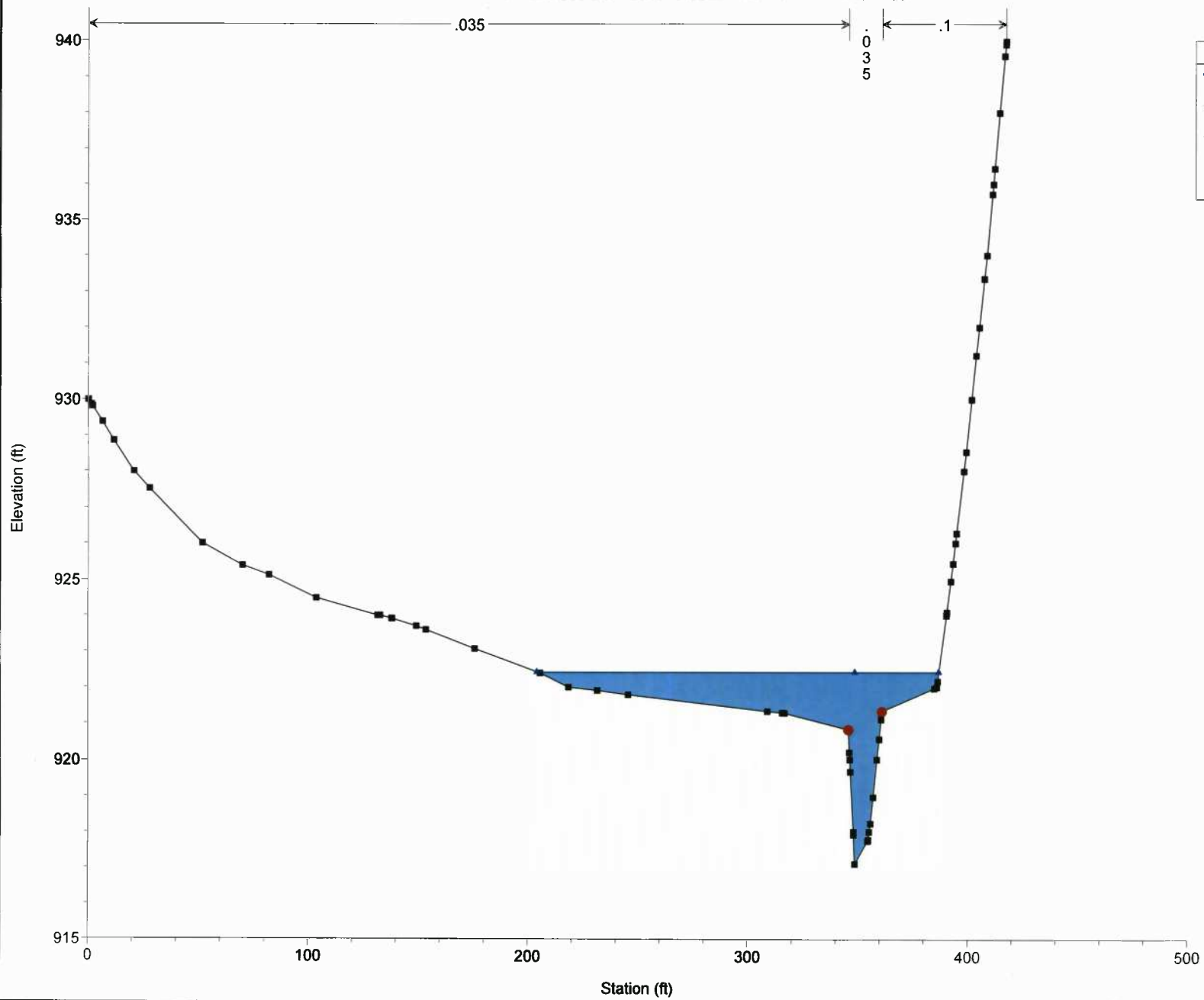
River = Bluestone Creek Reach = Middle RS = 8542.514



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 8379.502

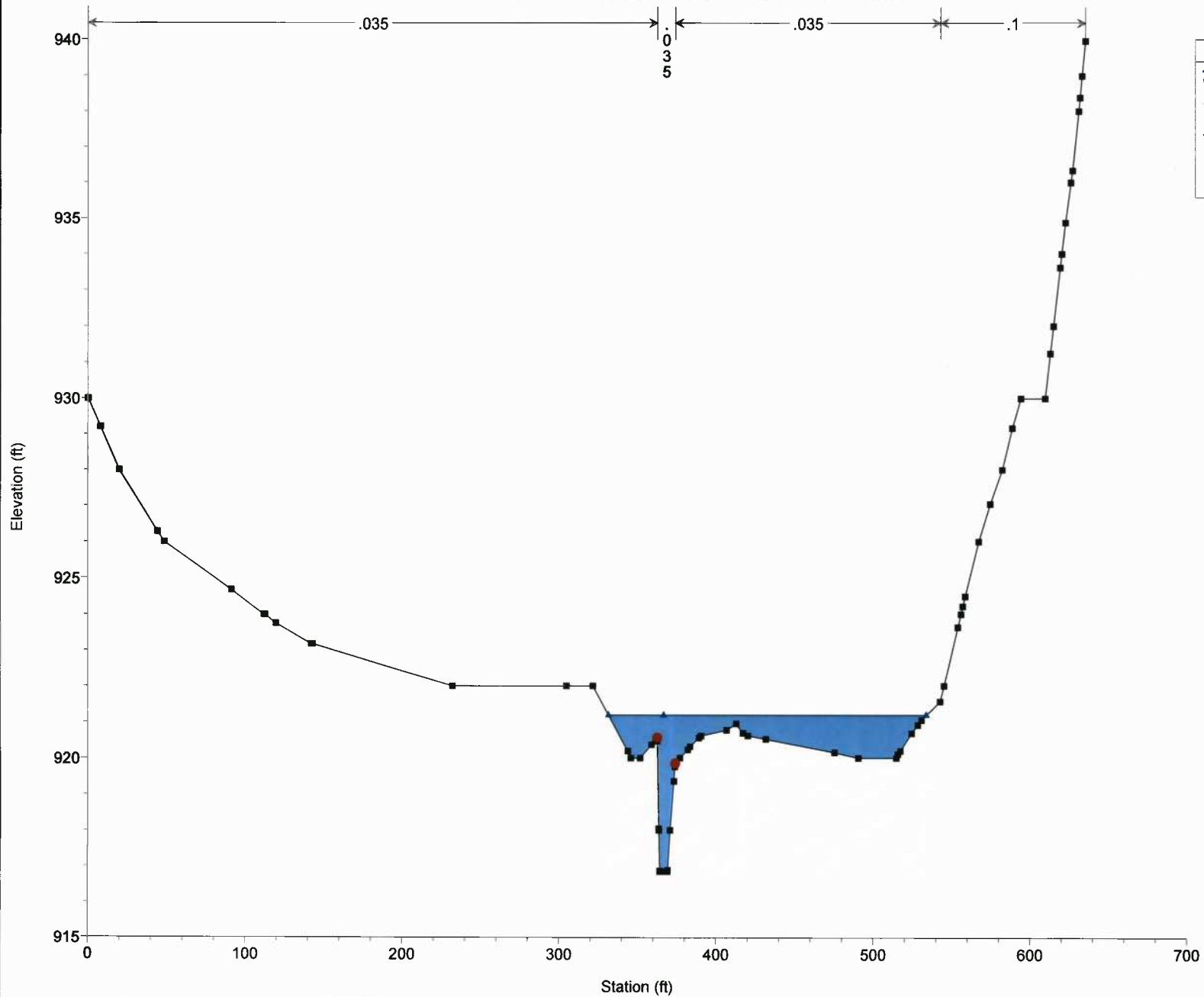


Legend	
WS PF 1 - PR Temp Br Rev	
WS PF 1 - Ex Revised	
Ground	
Bank Sta	

OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

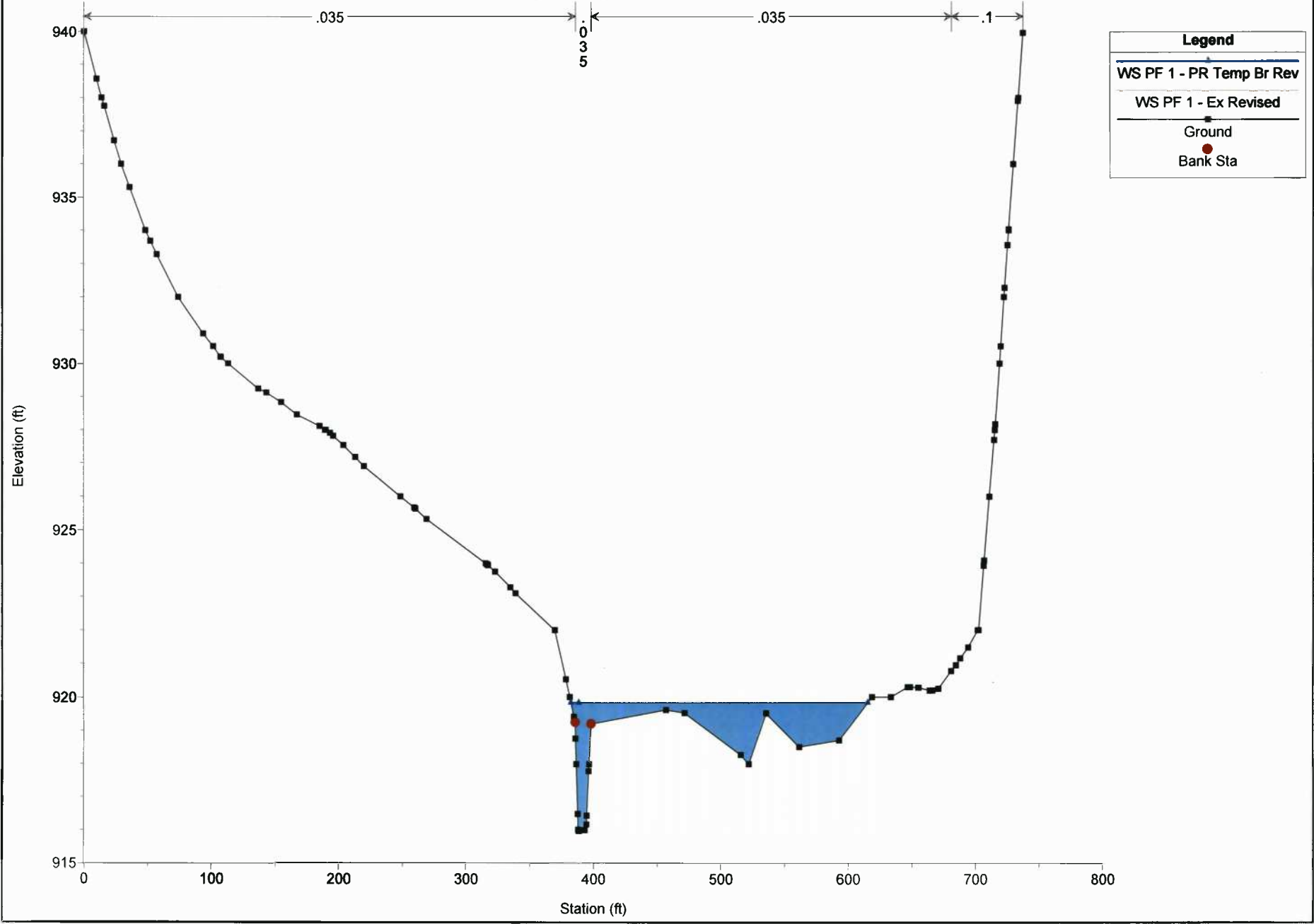
Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 8109.907



Legend	
WS PF 1 - PR Temp Br Rev	Blue line with diamond markers
WS PF 1 - Ex Revised	Black line with square markers
Ground	Black line with square markers
Bank Sta	Red dot

OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
 River = Bluestone Creek Reach = Middle RS = 7770.441



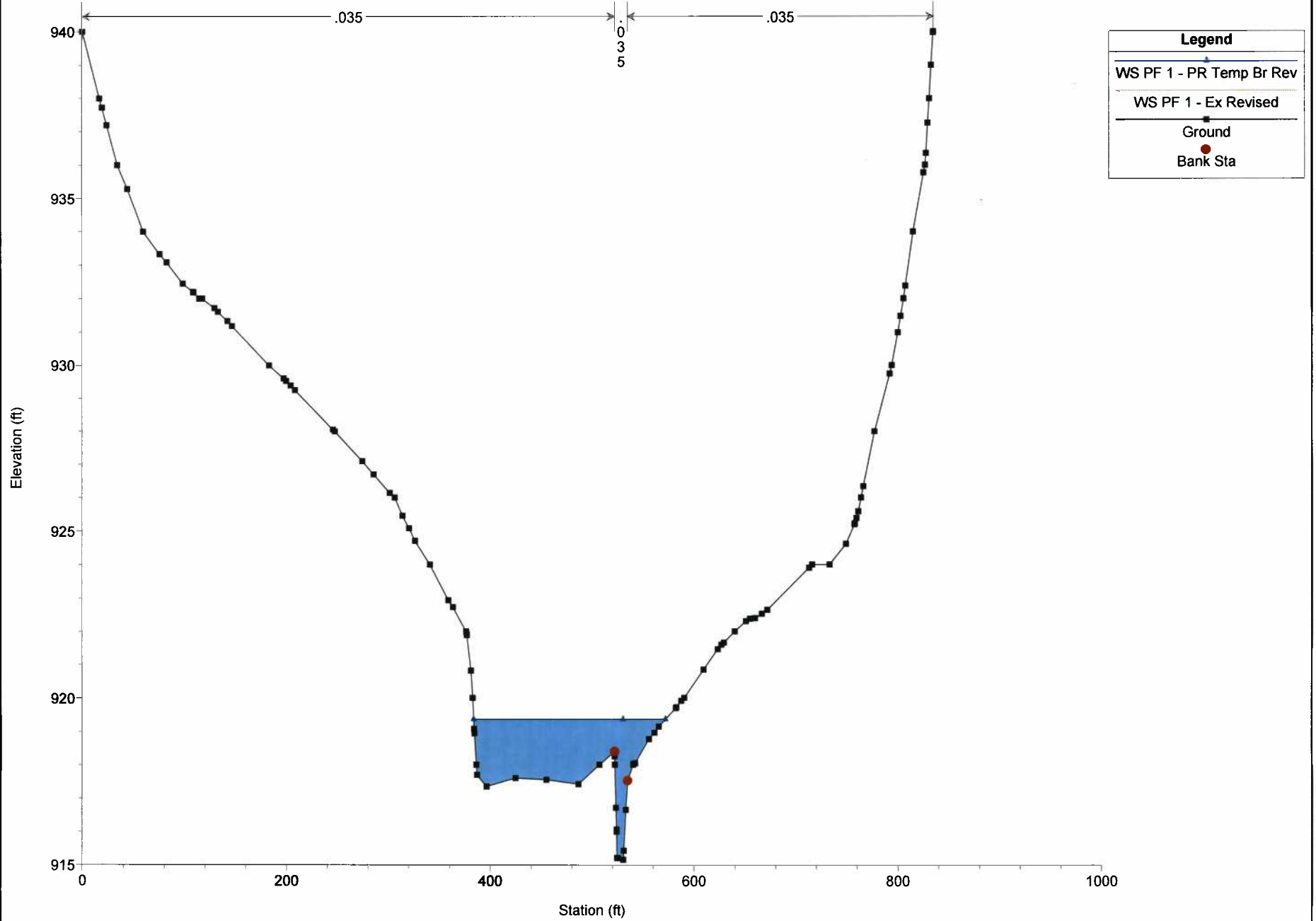
**Legend**

- WS PF 1 - PR Temp Br Rev
- WS PF 1 - Ex Revised
- Ground
- Bank Sta

OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

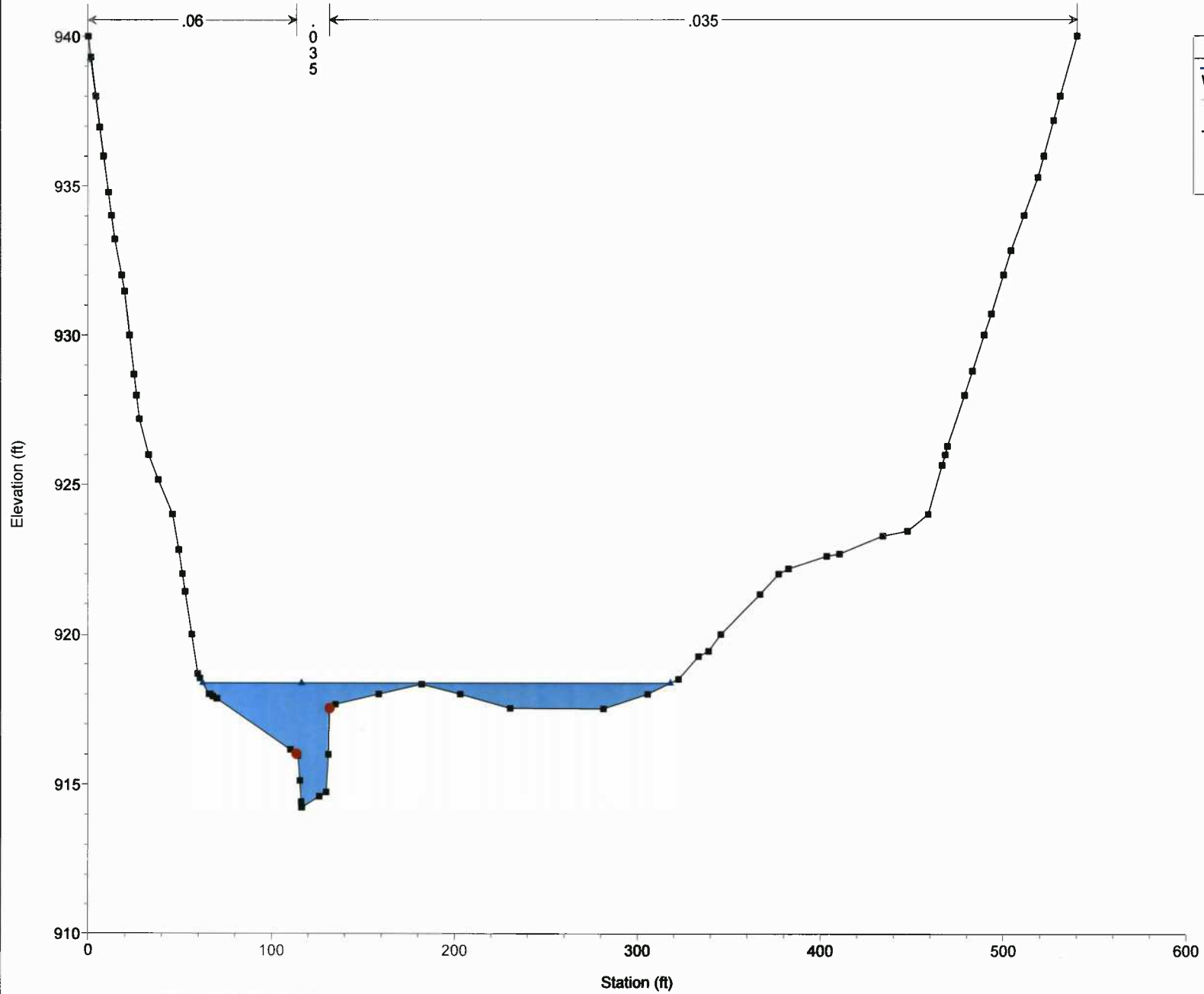
River = Bluestone Creek Reach = Middle RS = 7438.793



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 7150.429

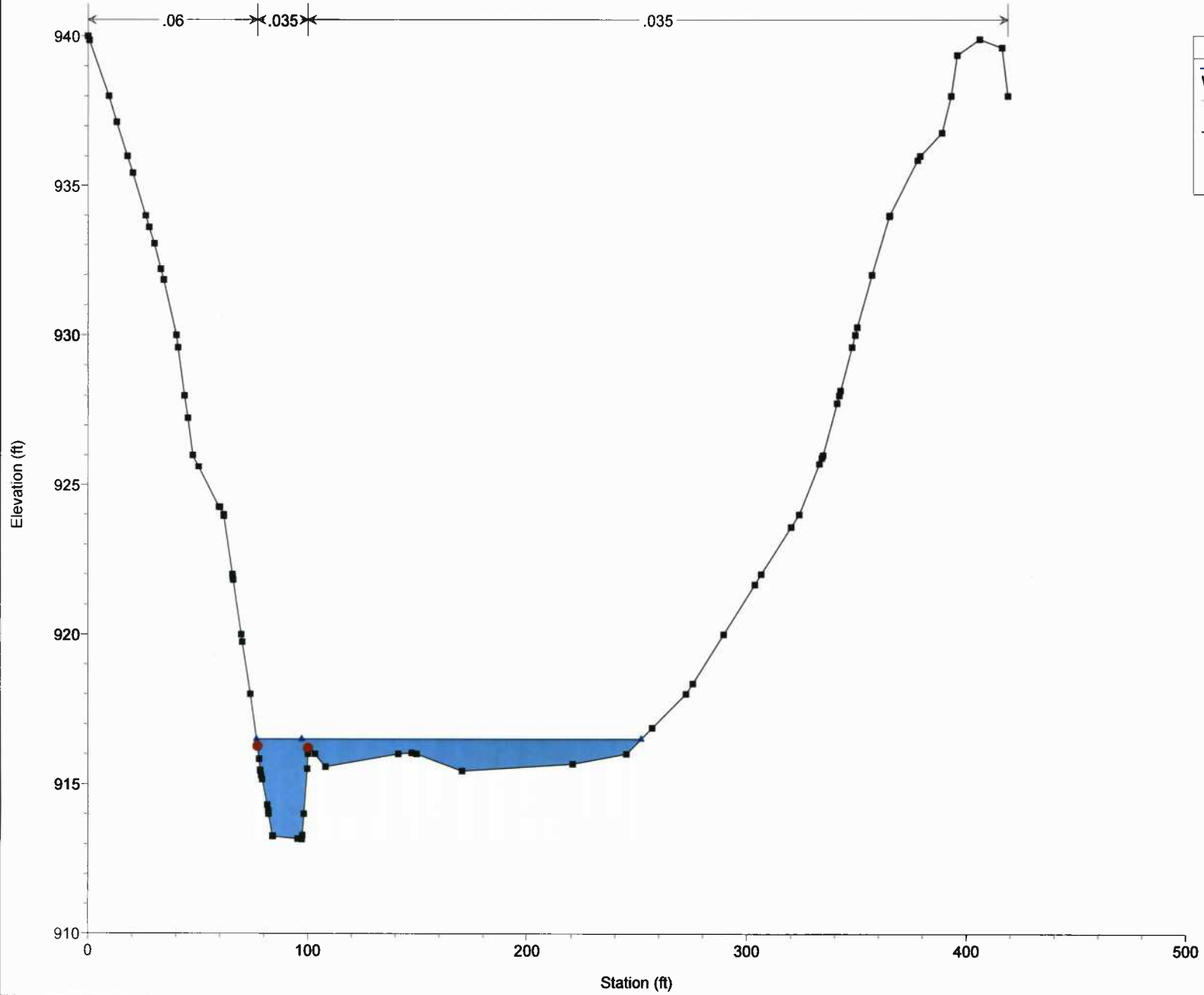


Legend	
WS PF 1 - PR Temp Br Rev	(Solid line with square markers)
WS PF 1 - Ex Revised	(Dashed line with square markers)
Ground	(Square marker)
Bank Sta	(Red dot)

OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

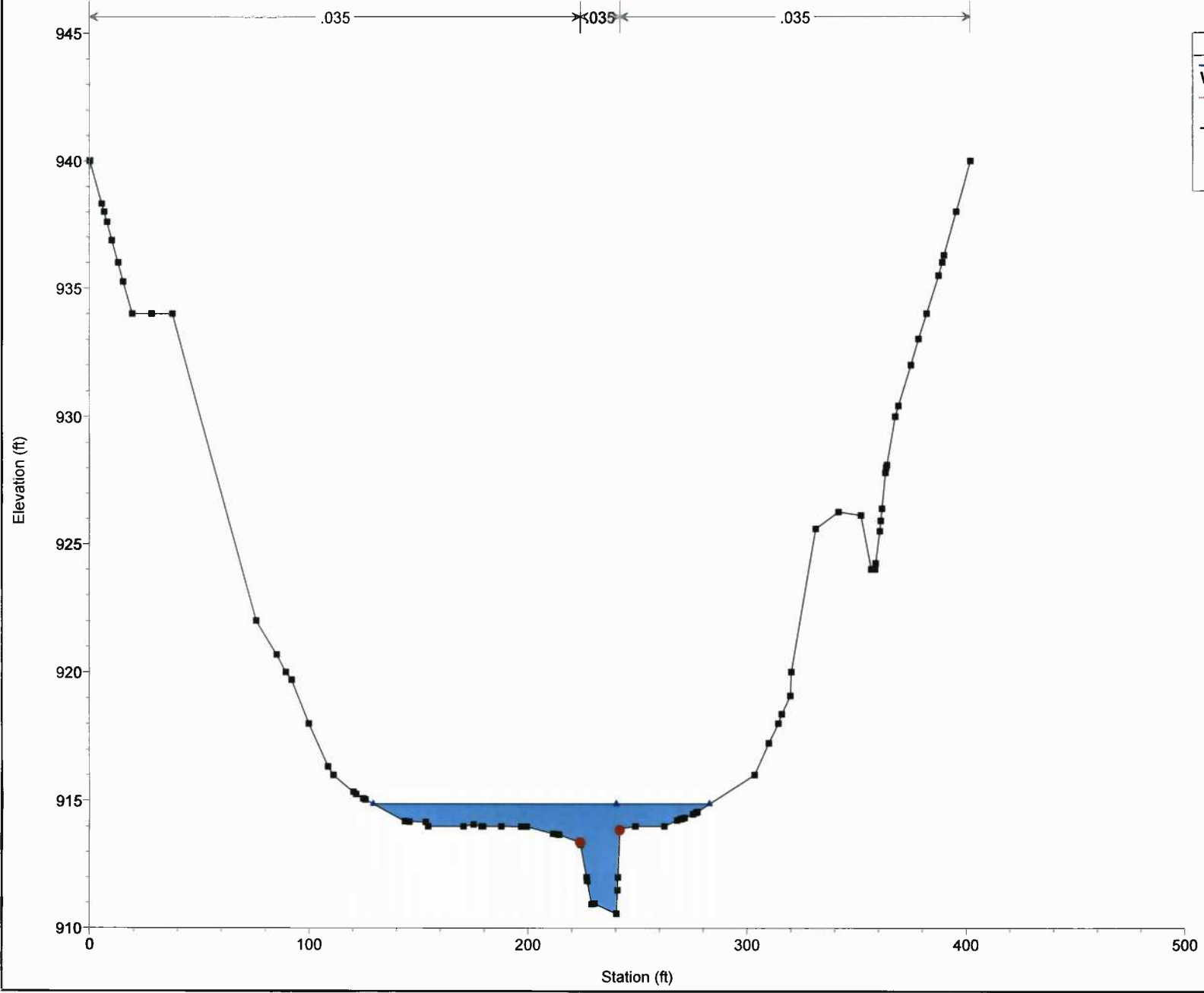
Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 6893.619



Legend	
WS PF 1 - PR Temp Br Rev	—■—
WS PF 1 - Ex Revised	- - -■- - -
Ground	■
Bank Sta	●

OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
River = Bluestone Creek Reach = Middle RS = 6579.154



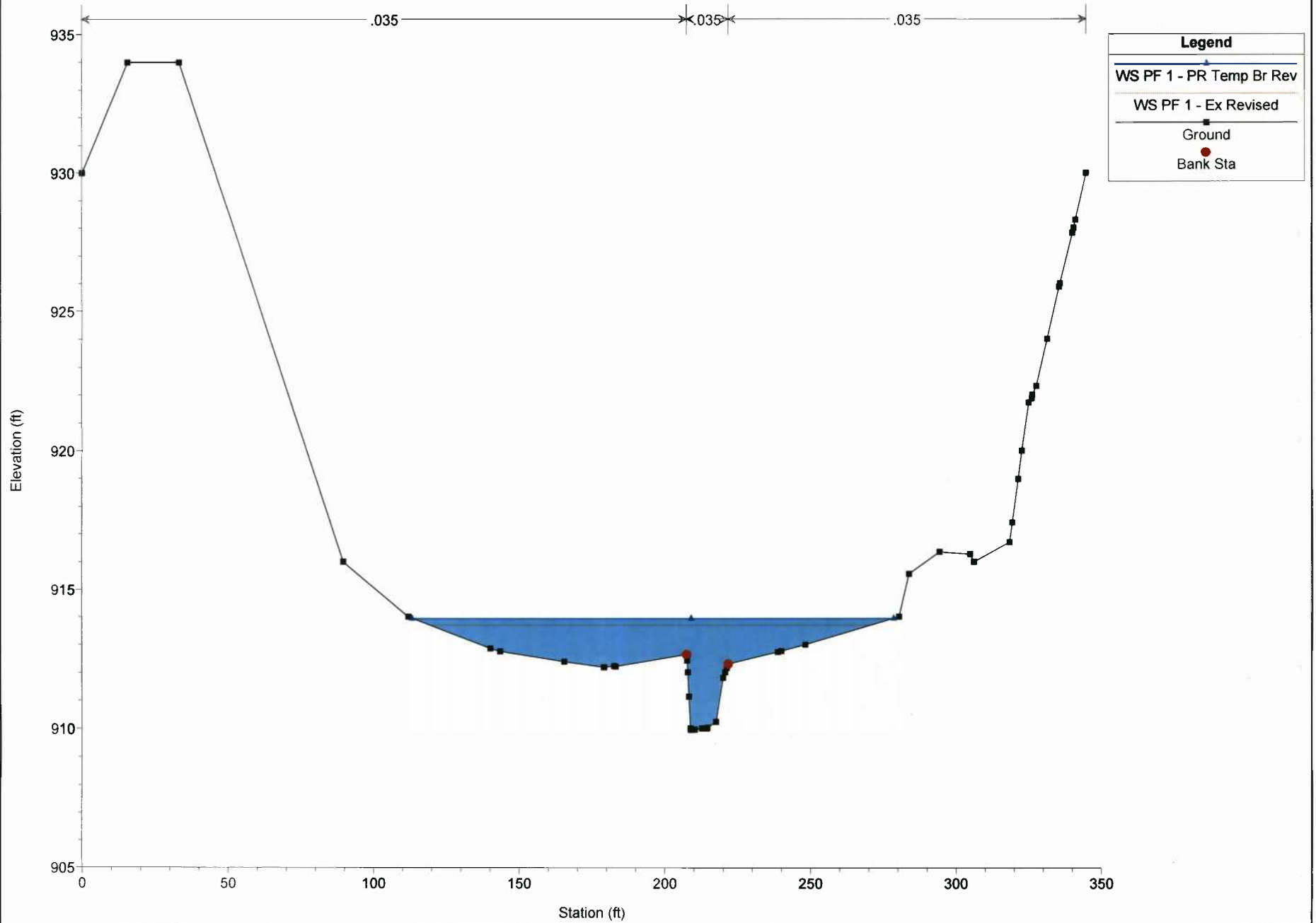
Legend	
WS PF 1 - PR Temp Br Rev	▲
WS PF 1 - Ex Revised	■
Ground	■
Bank Sta	●



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 6481.438



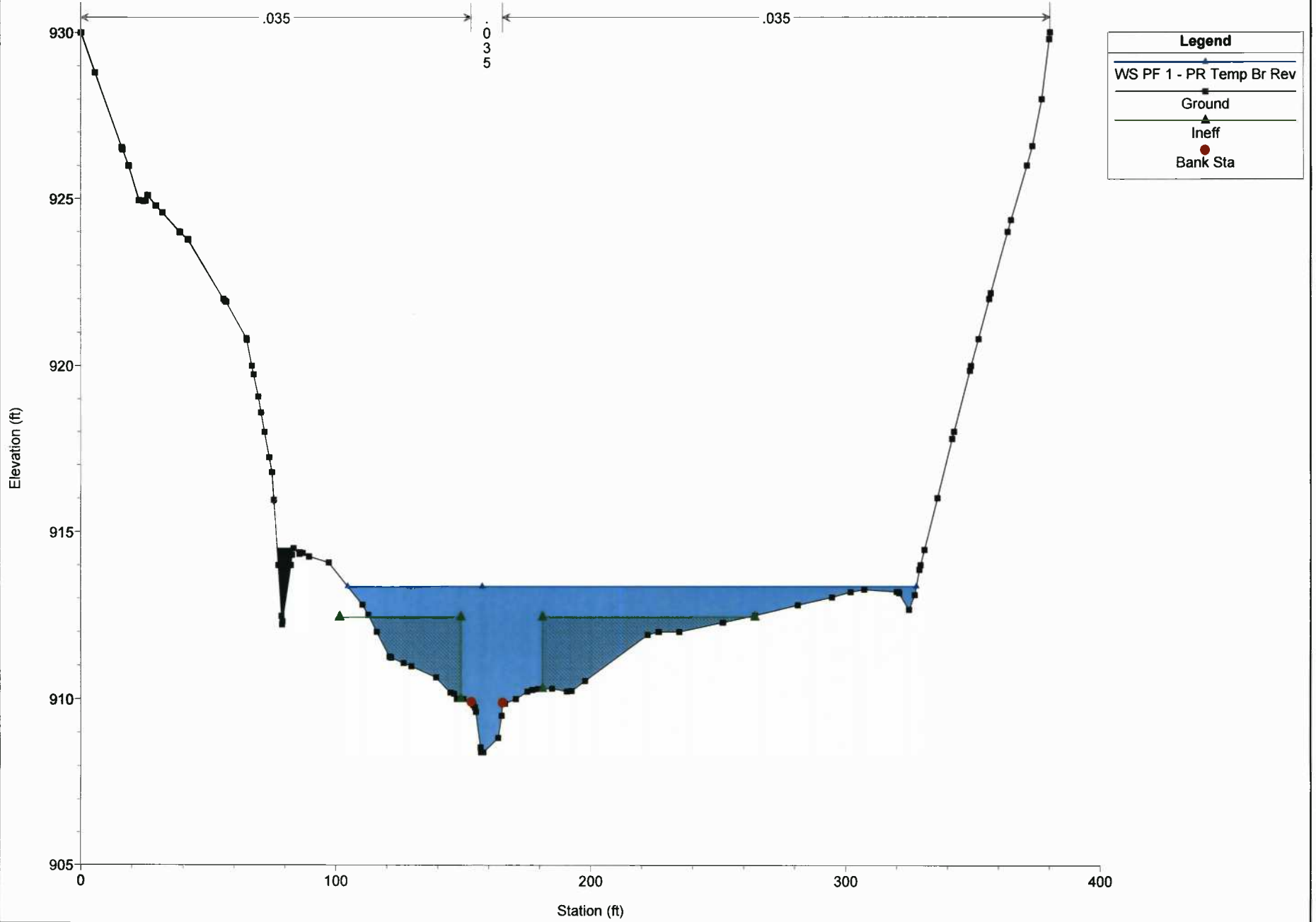
**Legend**

- WS PF 1 - PR Temp Br Rev
- WS PF 1 - Ex Revised
- Ground
- Bank Sta

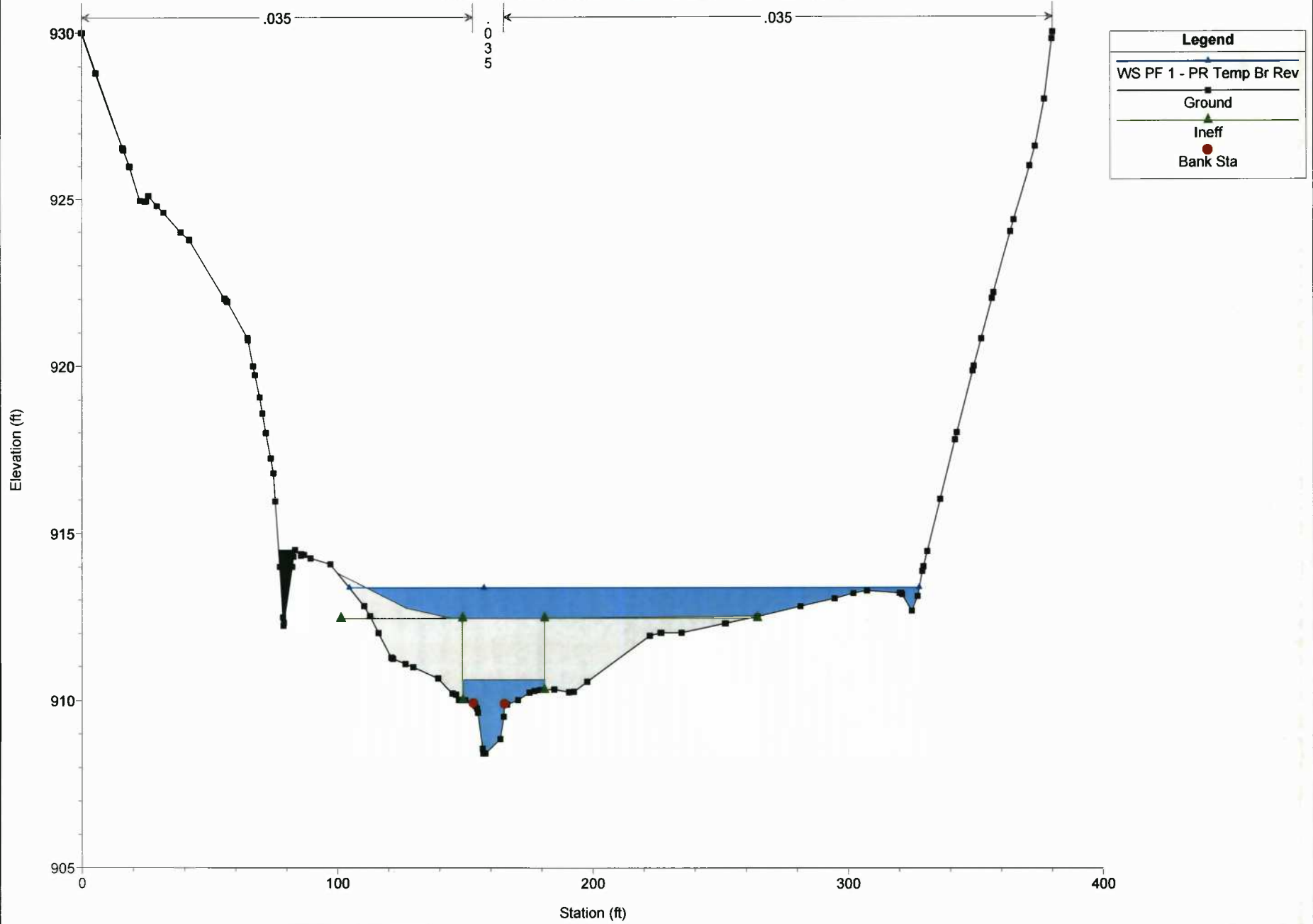
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 6323.723



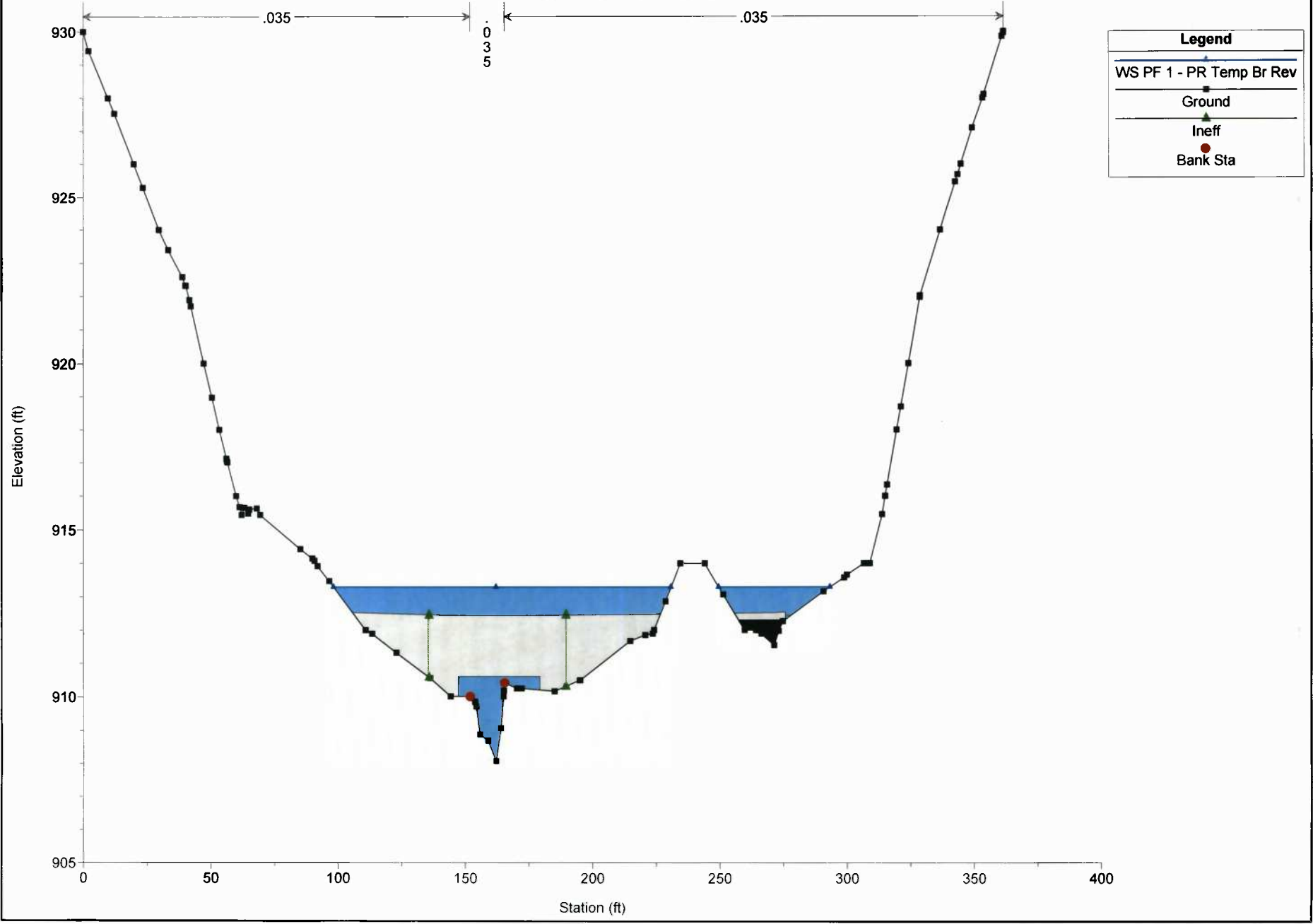
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
 River = Bluestone Creek Reach = Middle RS = 6303.783 BR



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 6303.783 BR

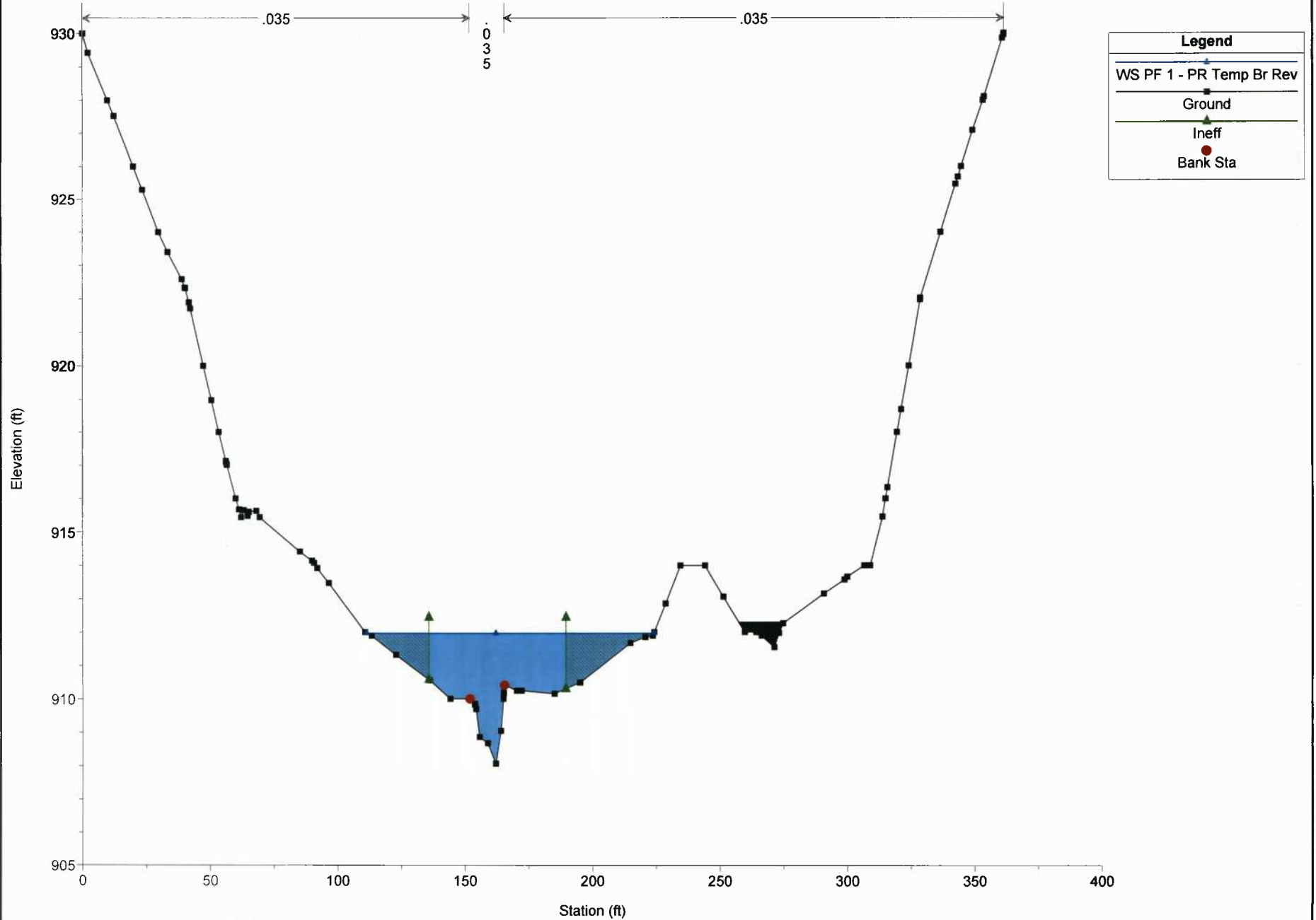


Legend	
WS PF 1 - PR Temp Br Rev	
Ground	
Ineff	
Bank Sta	

OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

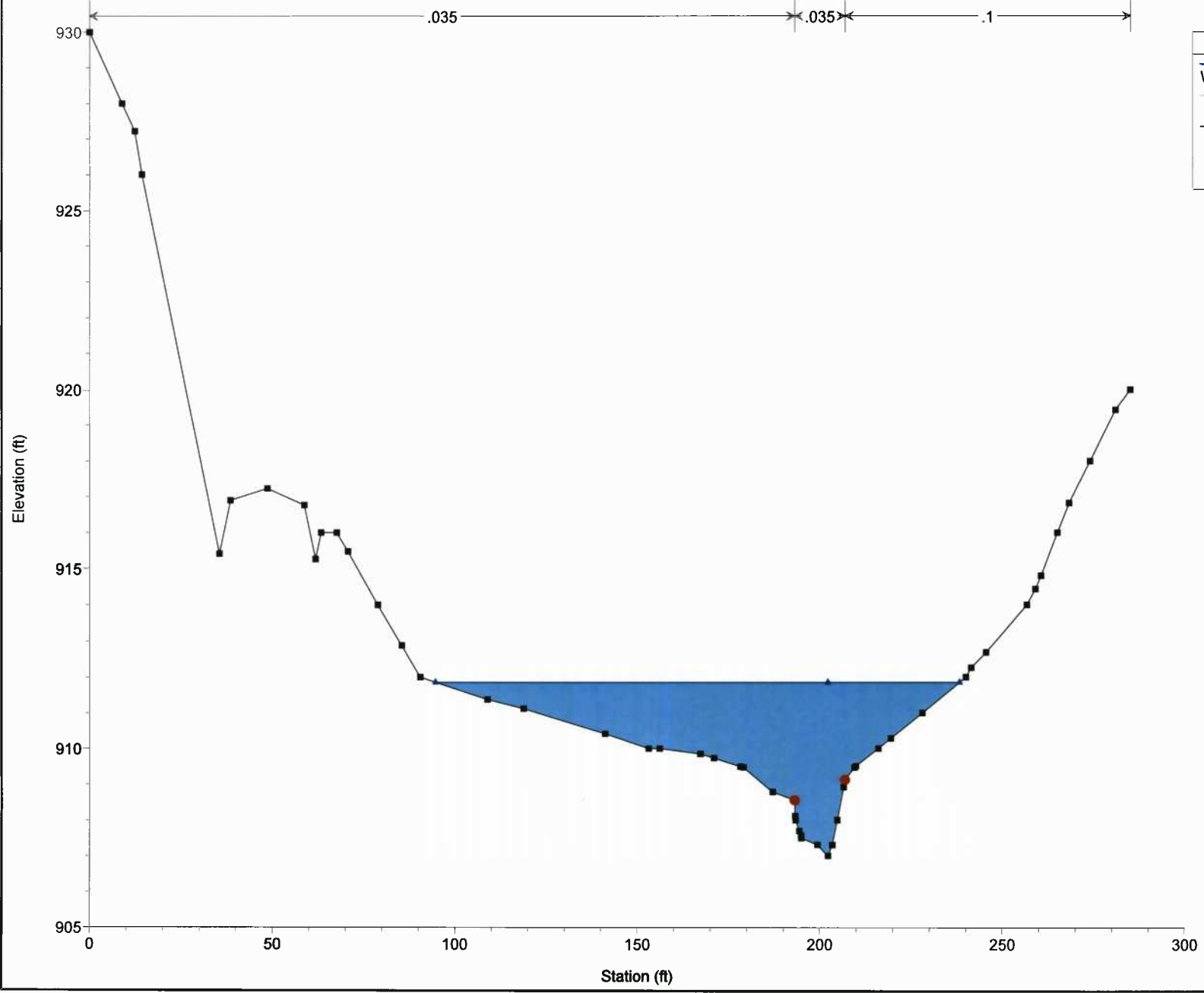
Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 6289.579



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
 River = Bluestone Creek Reach = Middle RS = 6179.412

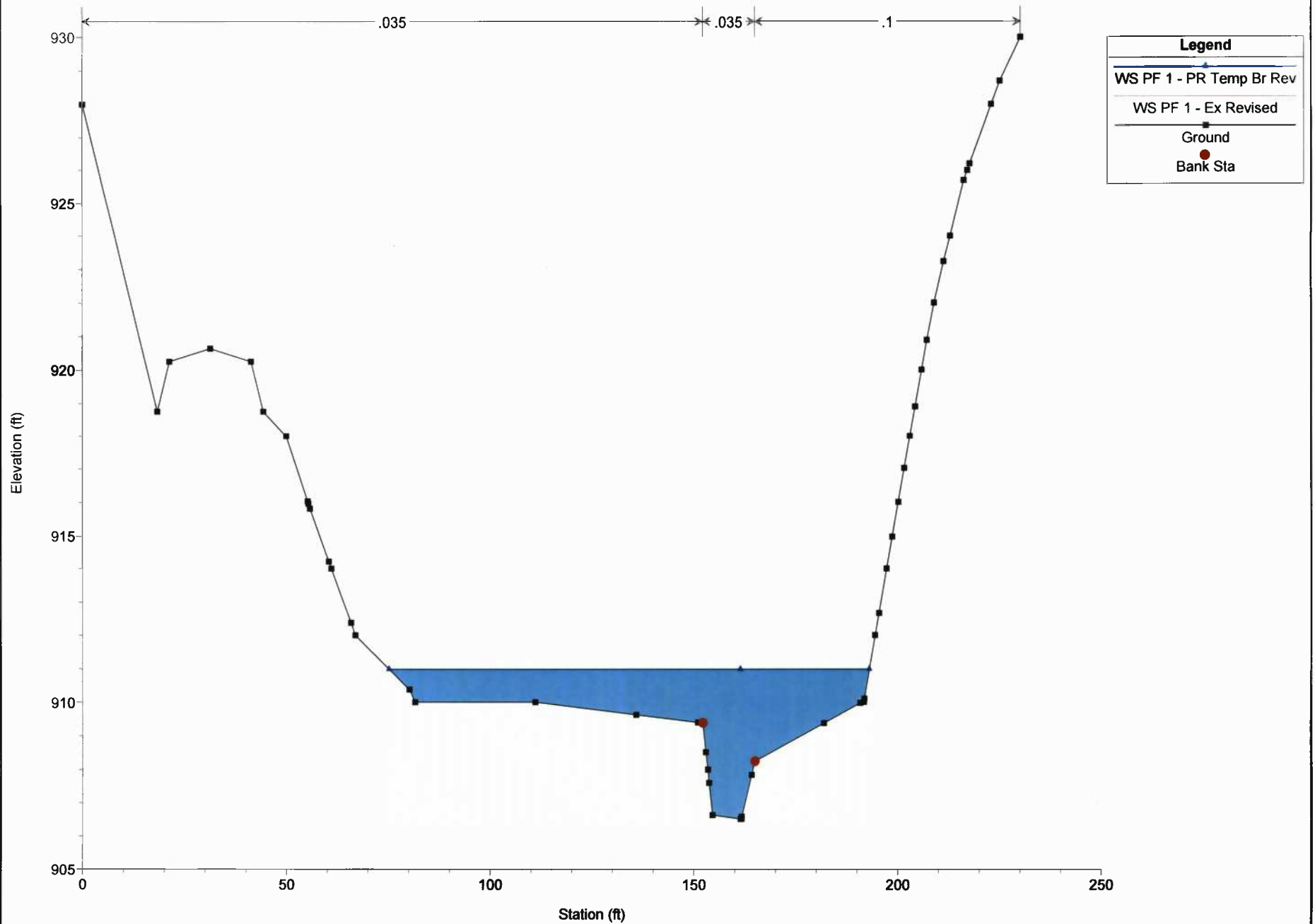
Legend	
WS PF 1 - PR Temp Br Rev	—▲—
WS PF 1 - Ex Revised	—■—
Ground	■
Bank Sta	●



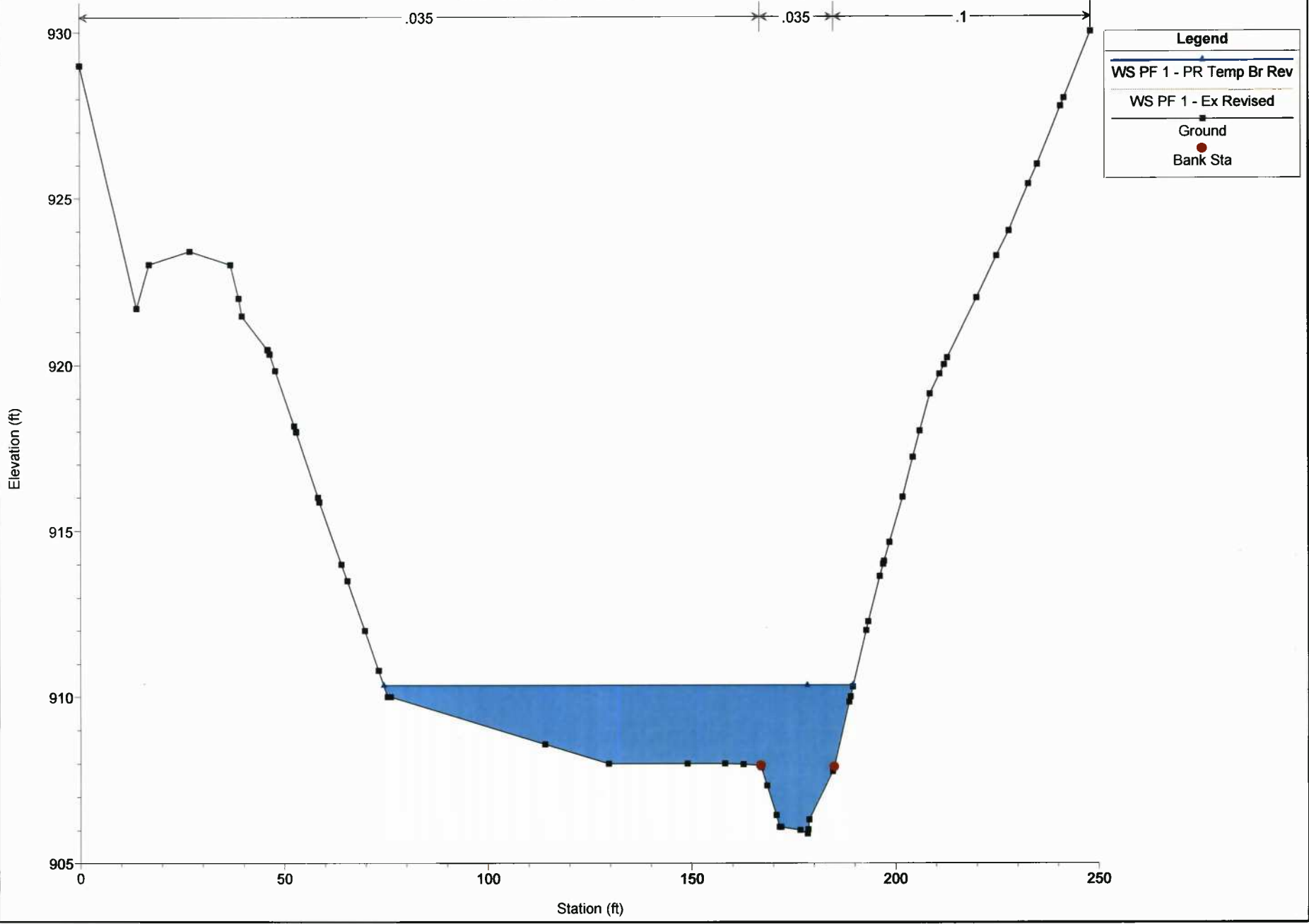
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 6057.761



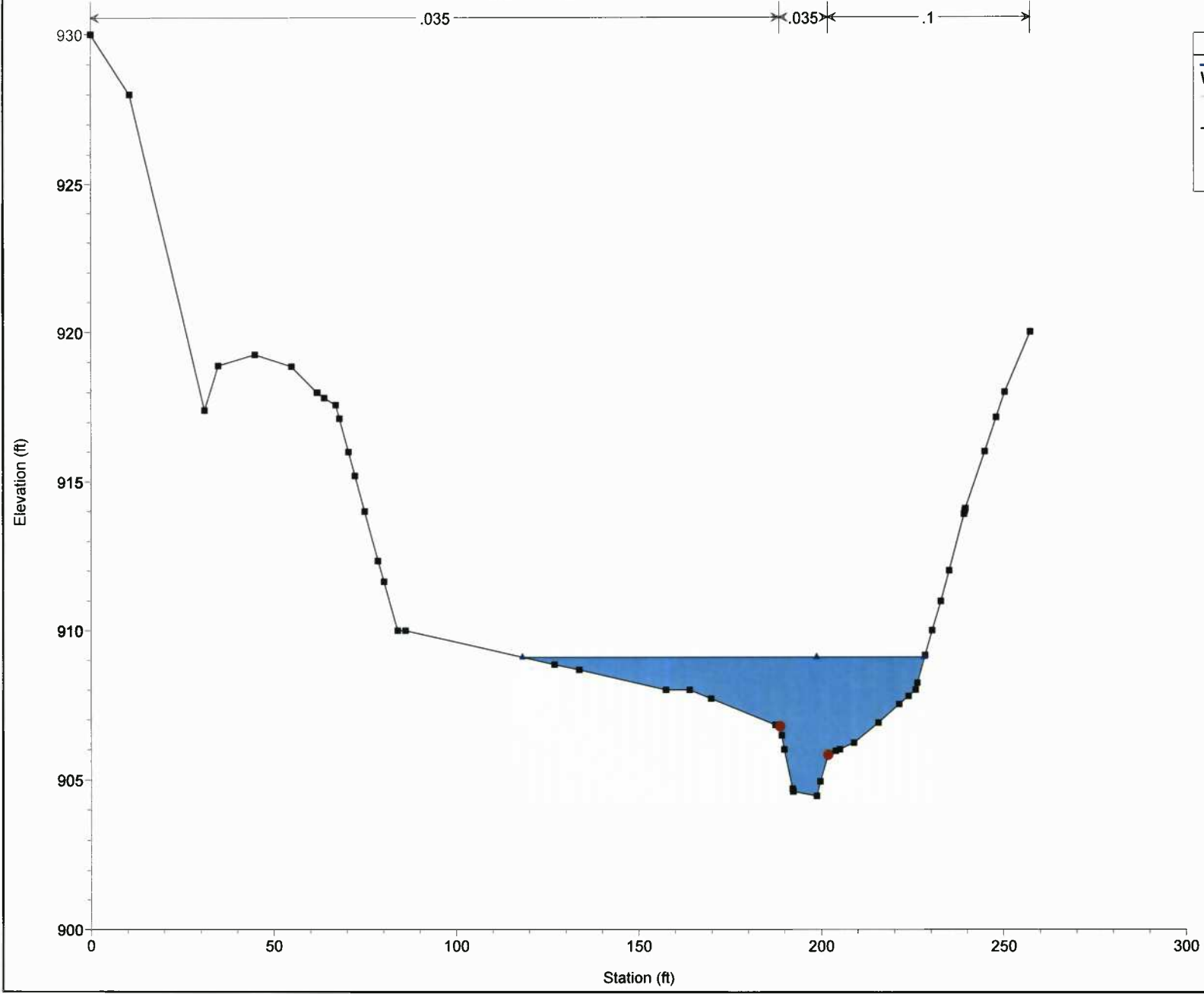
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
River = Bluestone Creek Reach = Middle RS = 5898.334



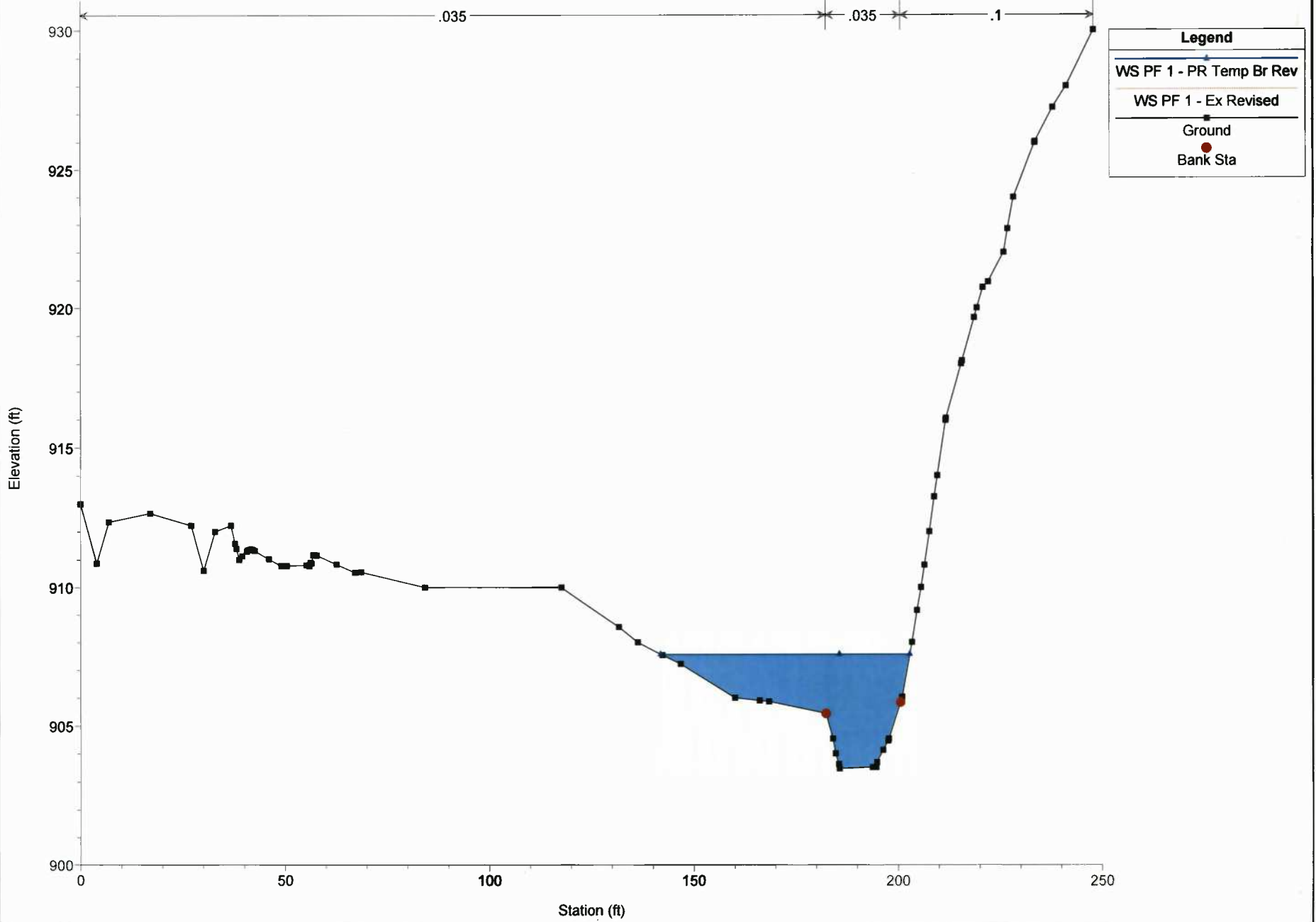


OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
 River = Bluestone Creek Reach = Middle RS = 5722.175

Legend	
WS PF 1 - PR Temp Br Rev	▲
WS PF 1 - Ex Revised	■
Ground	■
Bank Sta	●



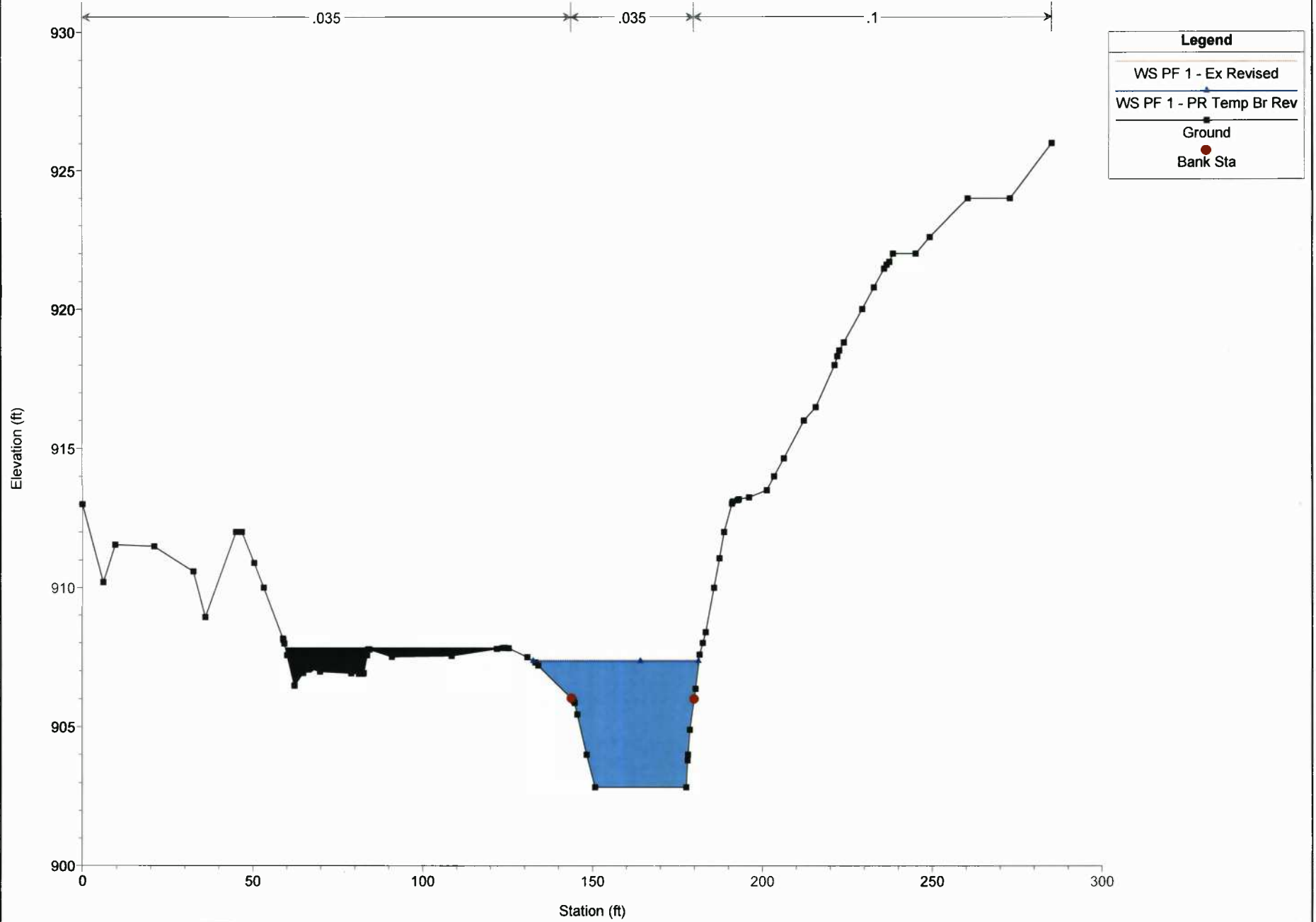
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
River = Bluestone Creek Reach = Middle RS = 5588.448



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

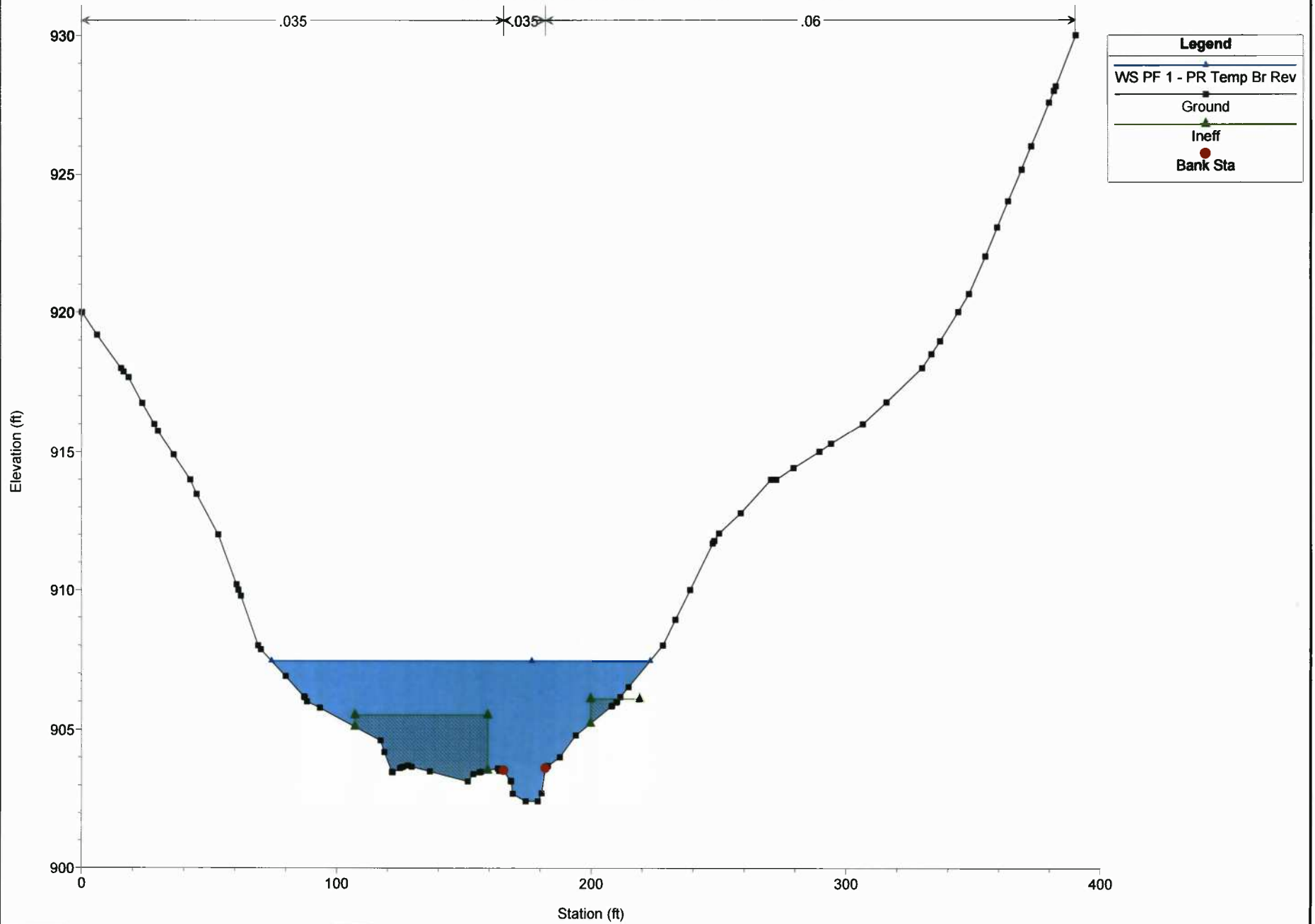
River = Bluestone Creek Reach = Middle RS = 5493.950



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

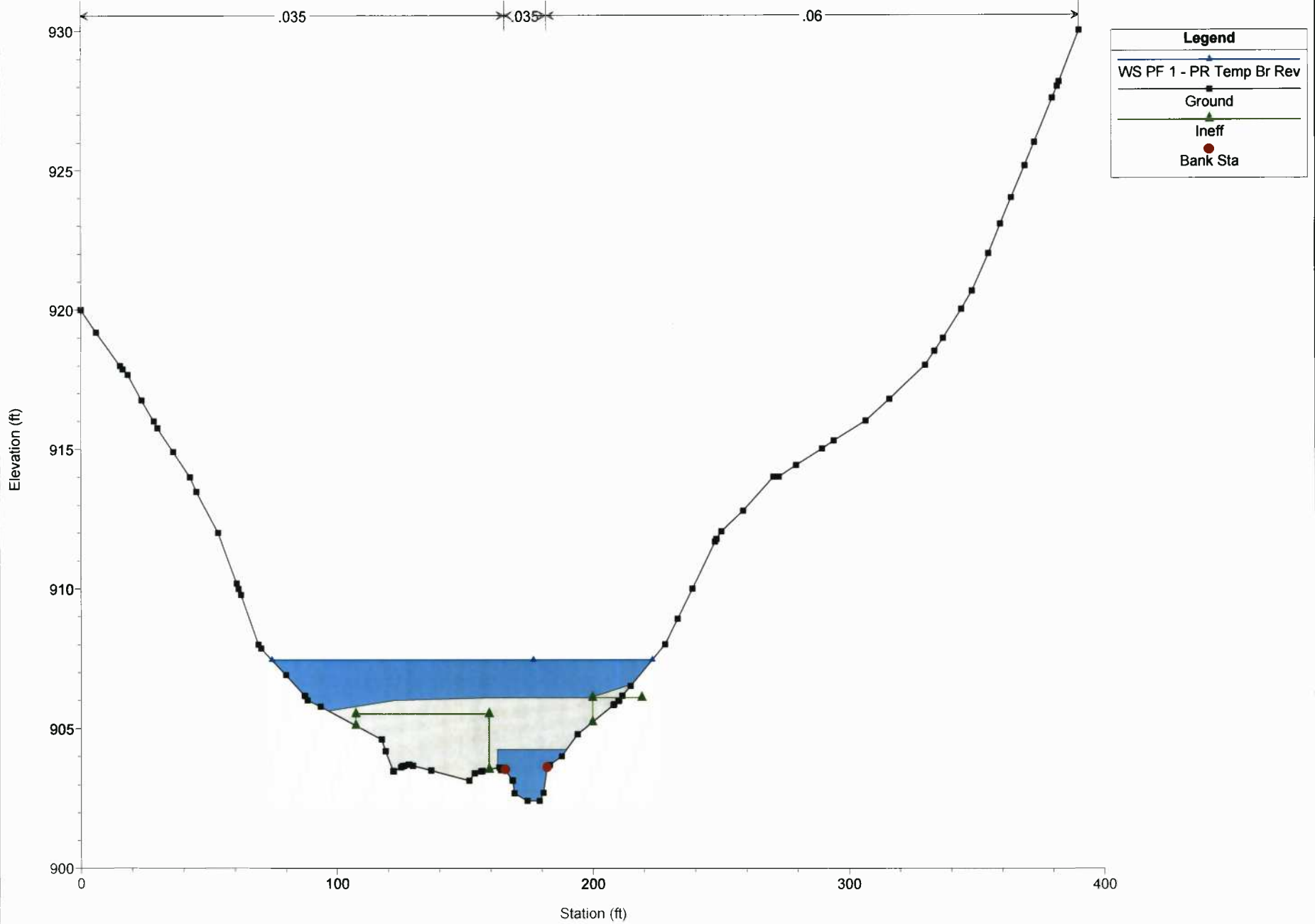
River = Bluestone Creek Reach = Middle RS = 5409.687



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

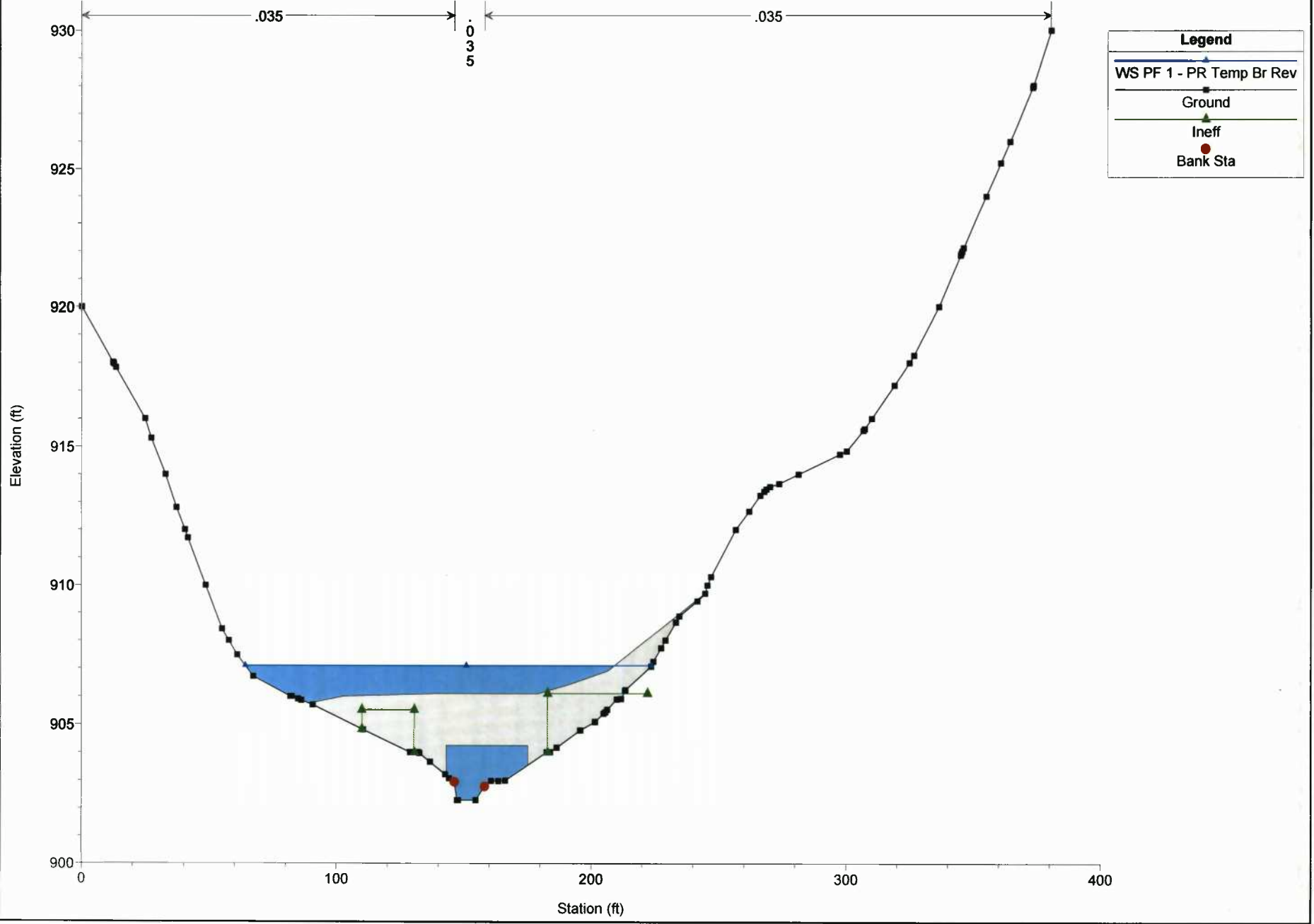
River = Bluestone Creek Reach = Middle RS = 5395.595 BR



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

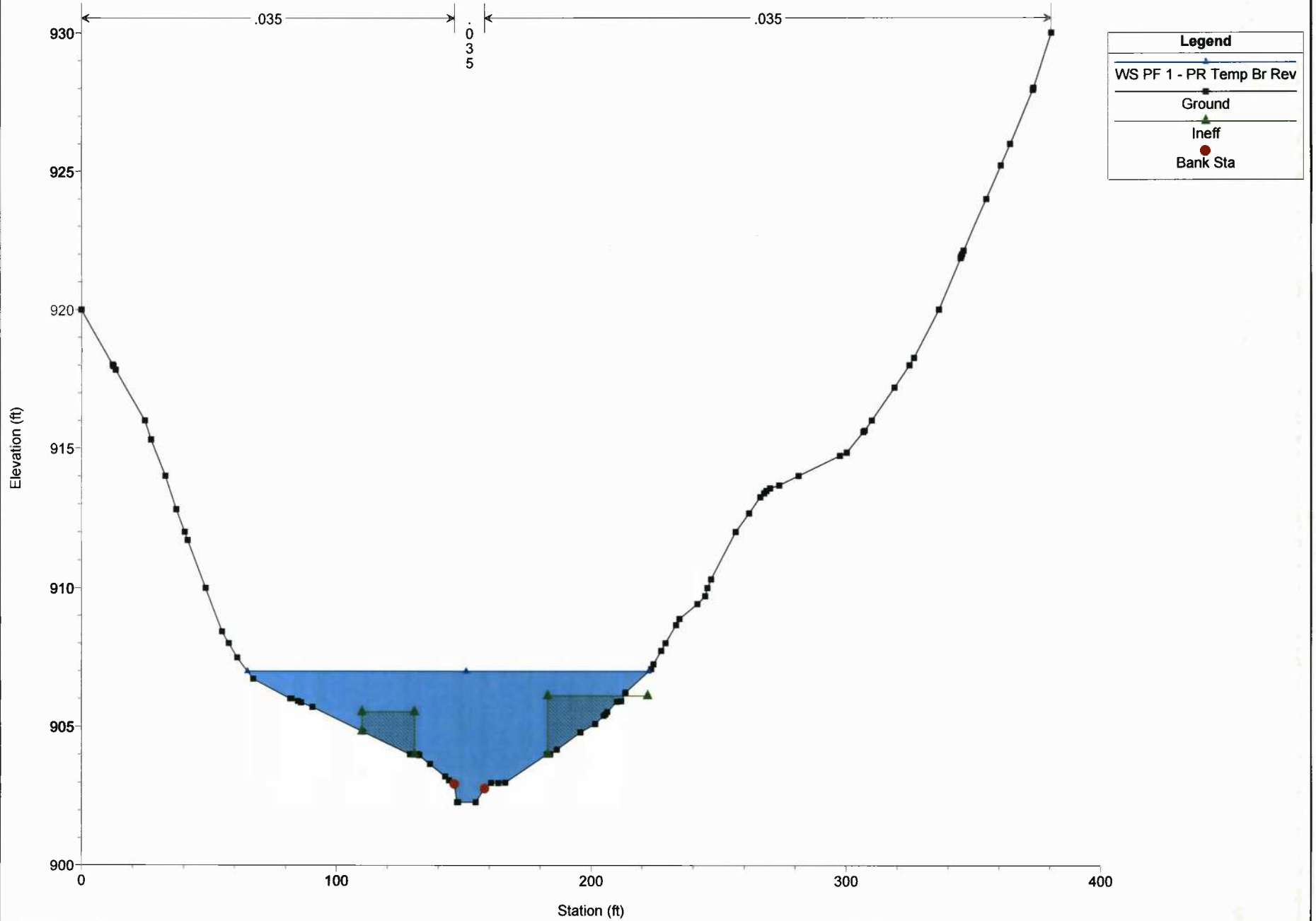
River = Bluestone Creek Reach = Middle RS = 5395.595 BR



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

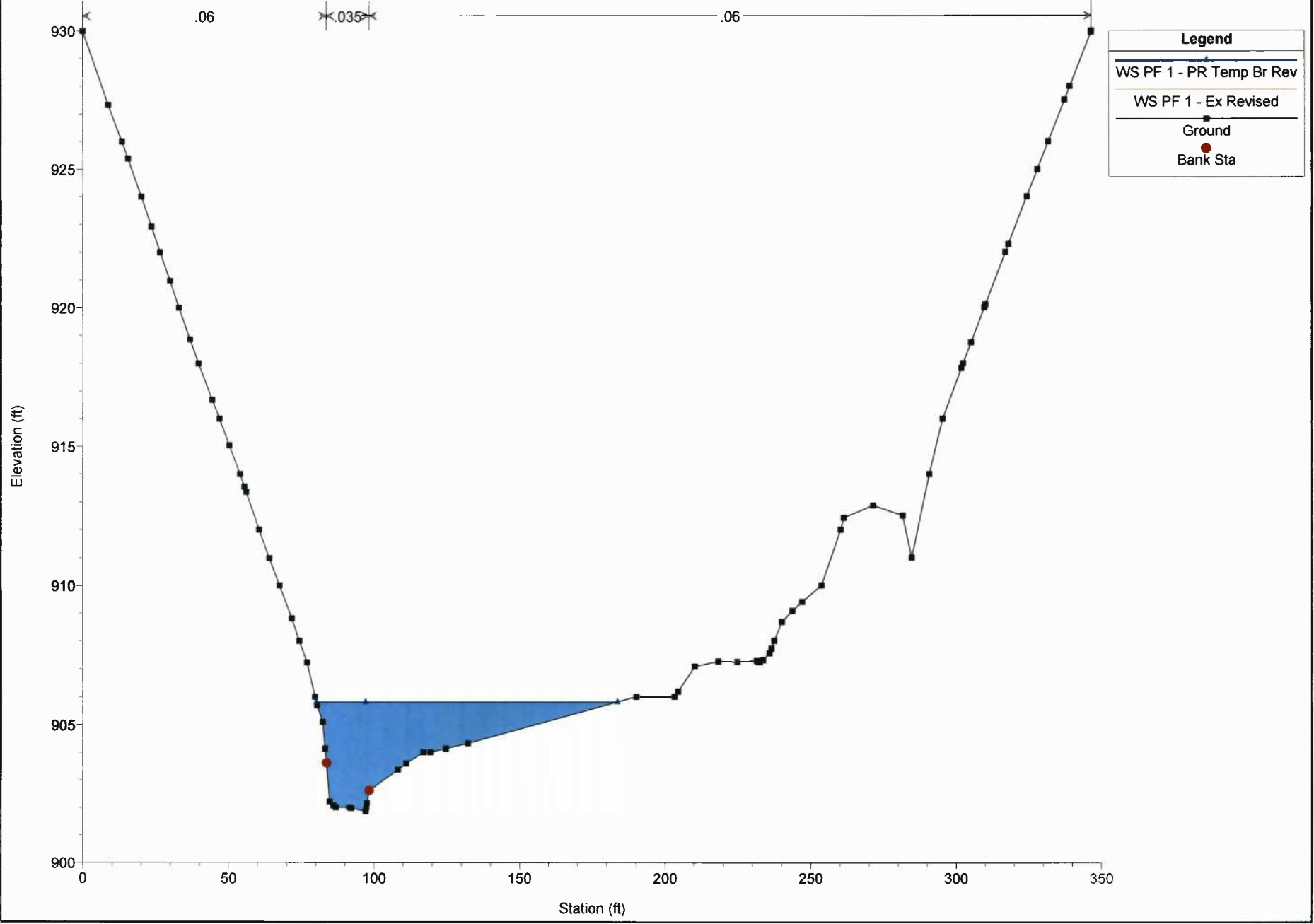
River = Bluestone Creek Reach = Middle RS = 5379.960



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 5291.039

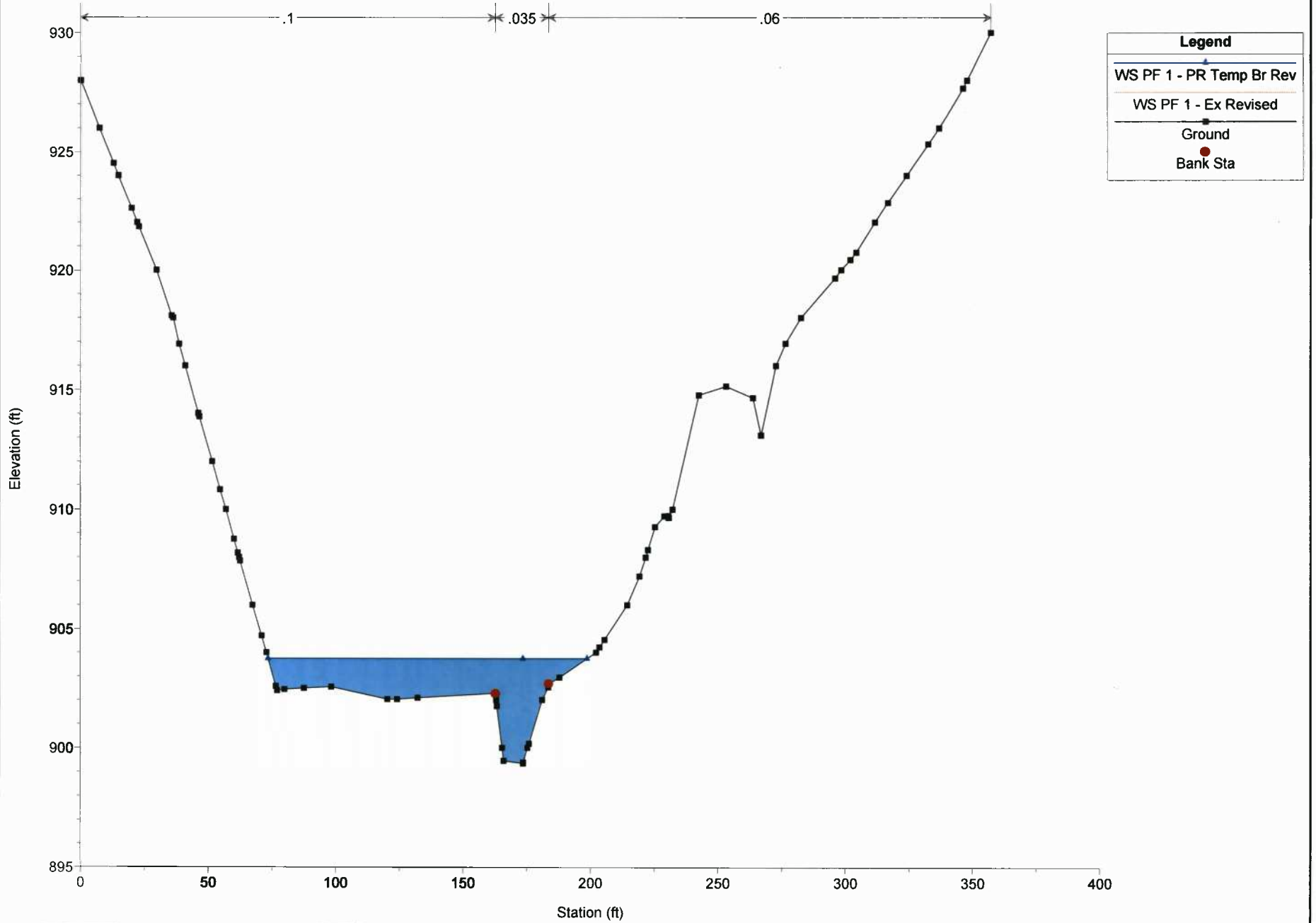




OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 5071.499

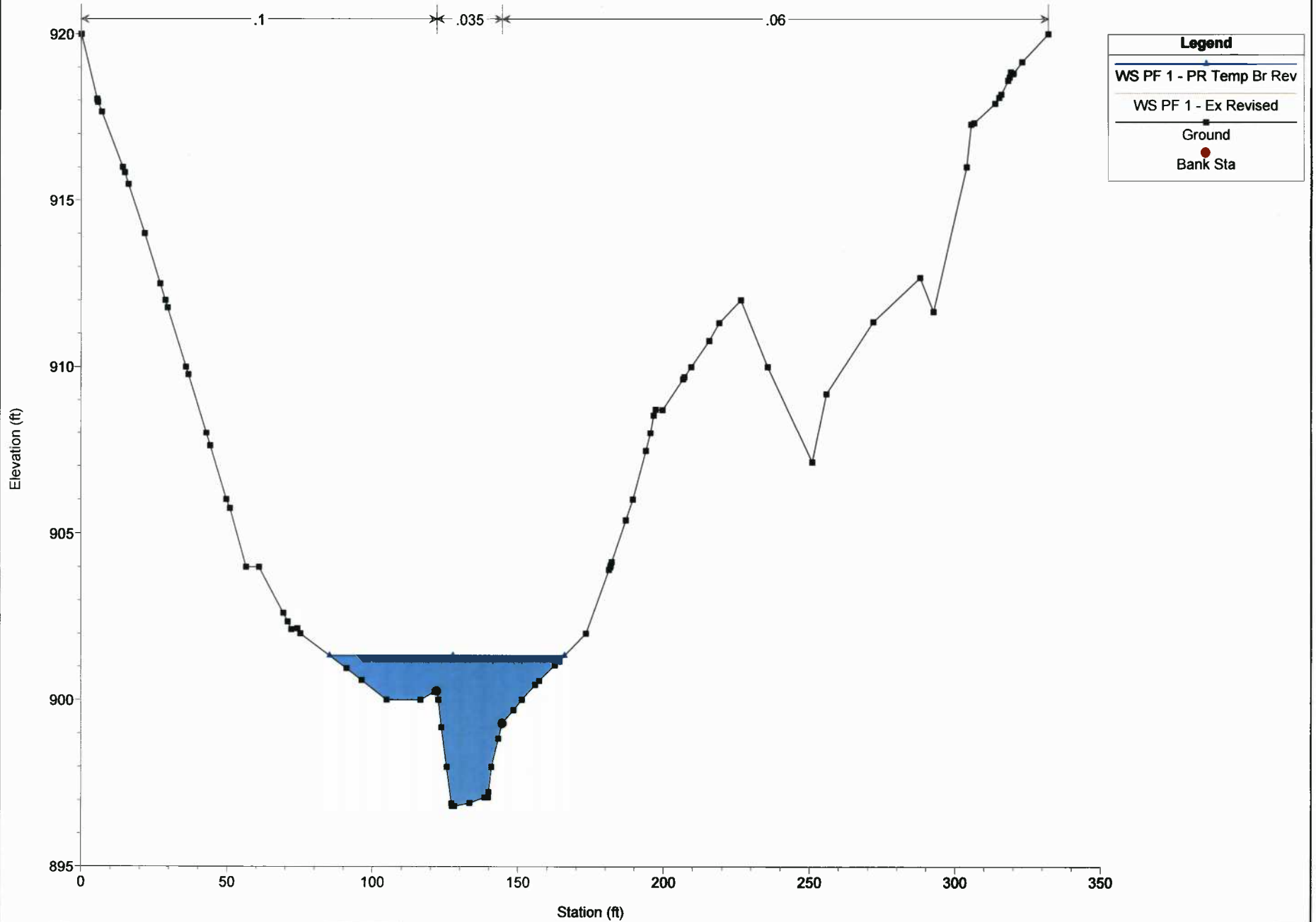


Legend	
WS PF 1 - PR Temp Br Rev	—■—
WS PF 1 - Ex Revised	—■—
Ground	—■—
Bank Sta	●

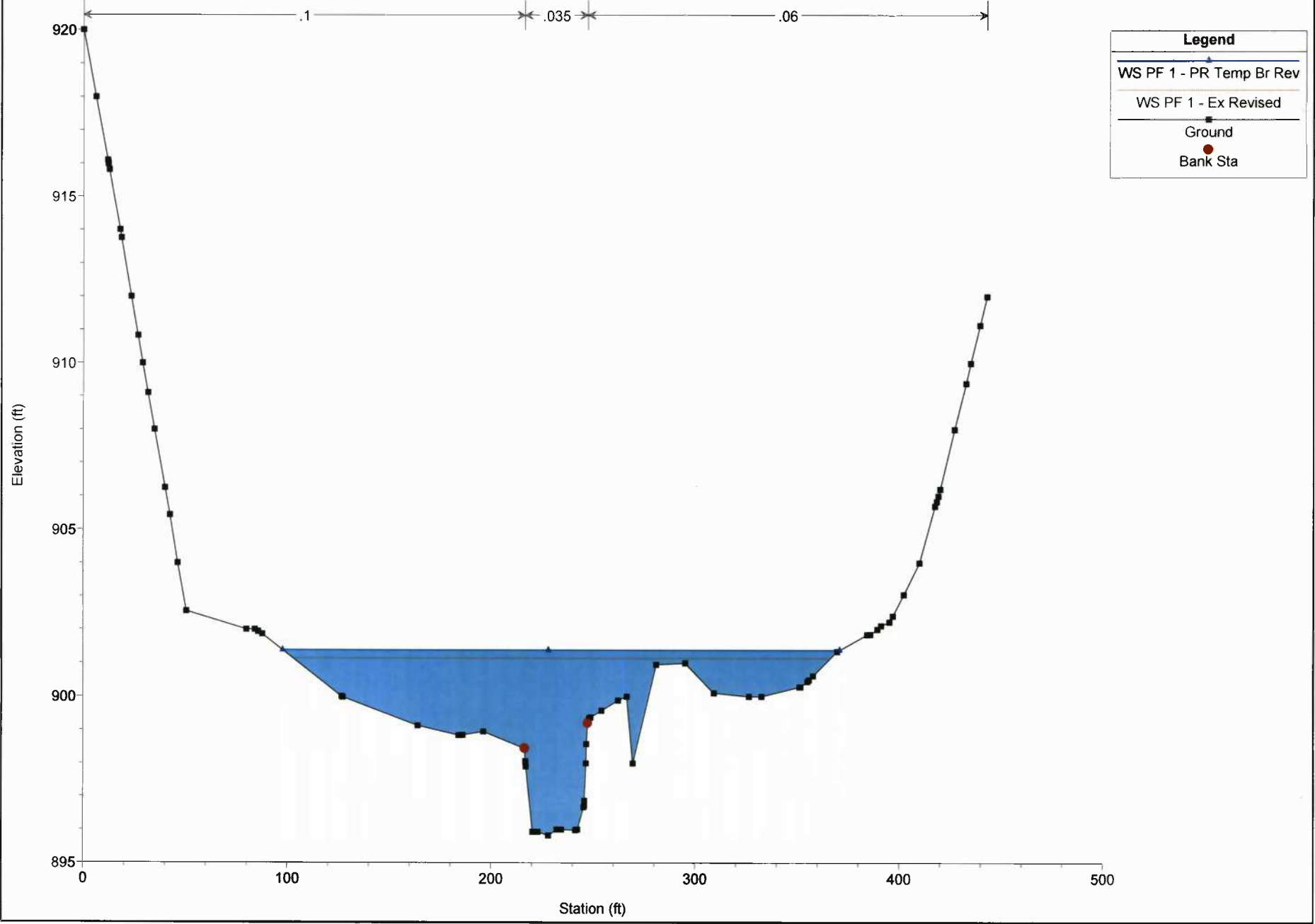
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 4871.481



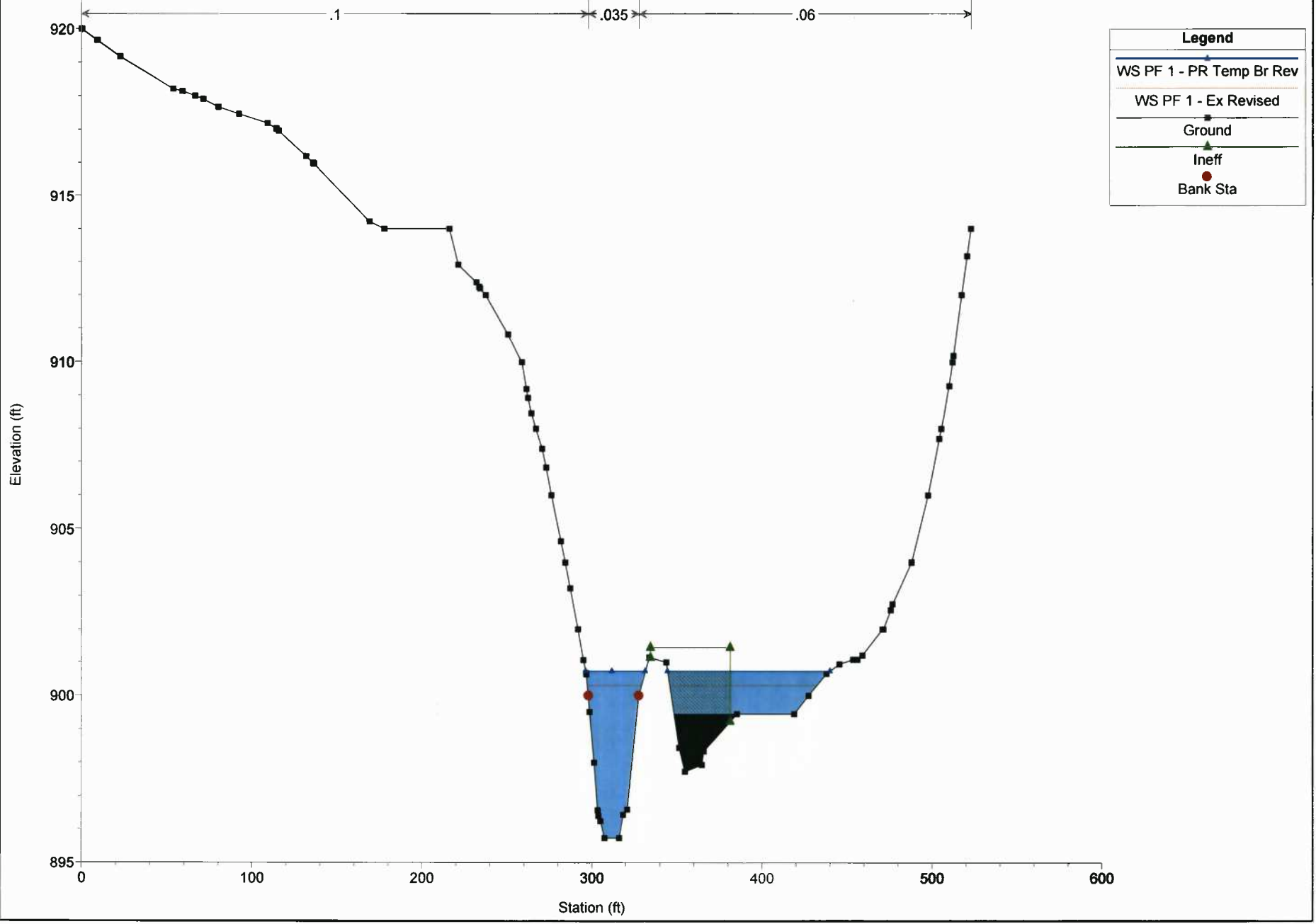
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
River = Bluestone Creek Reach = Middle RS = 4704.612



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 4682.971



Legend

WS PF 1 - PR Temp Br Rev

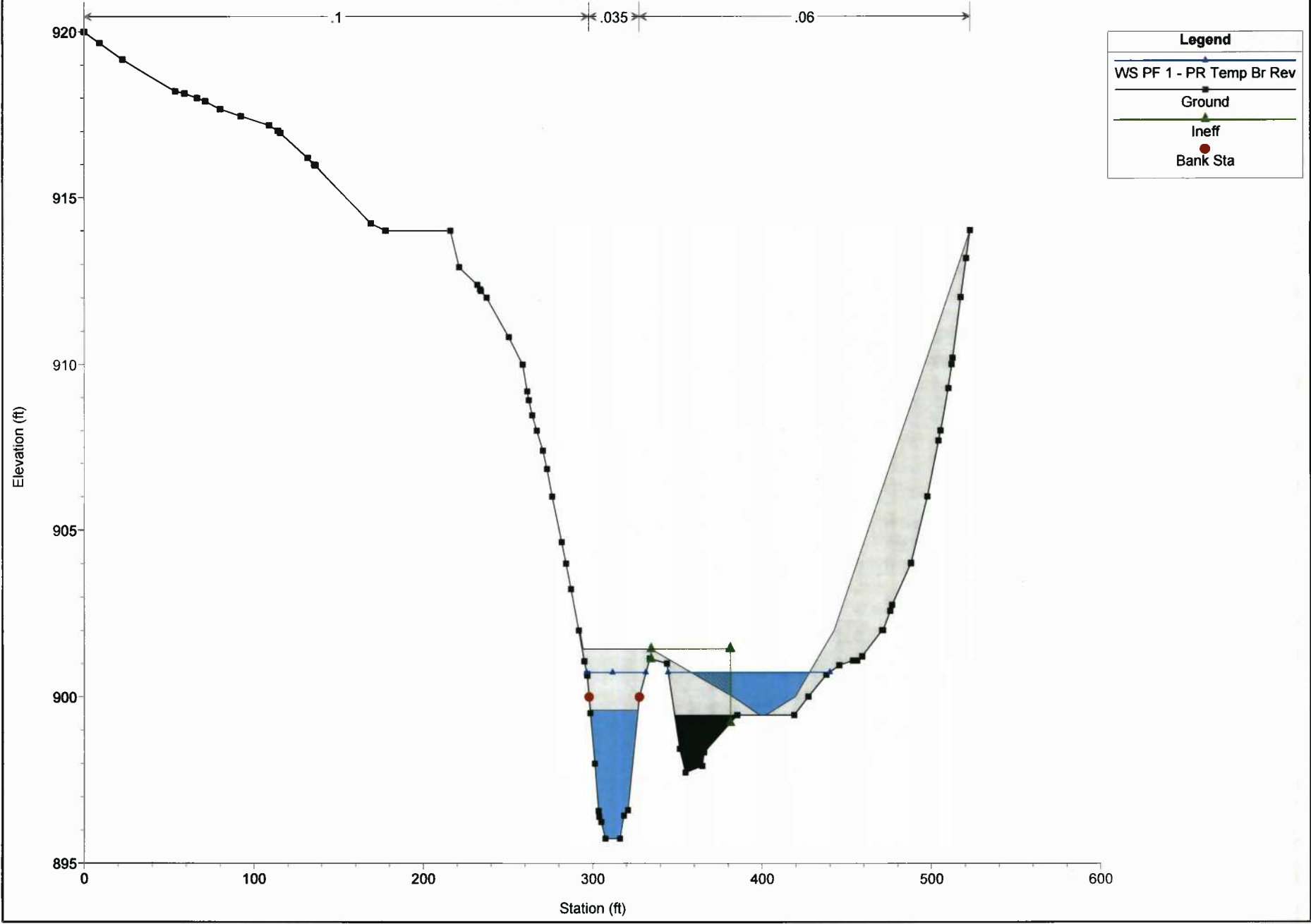
WS PF 1 - Ex Revised

Ground

Ineff

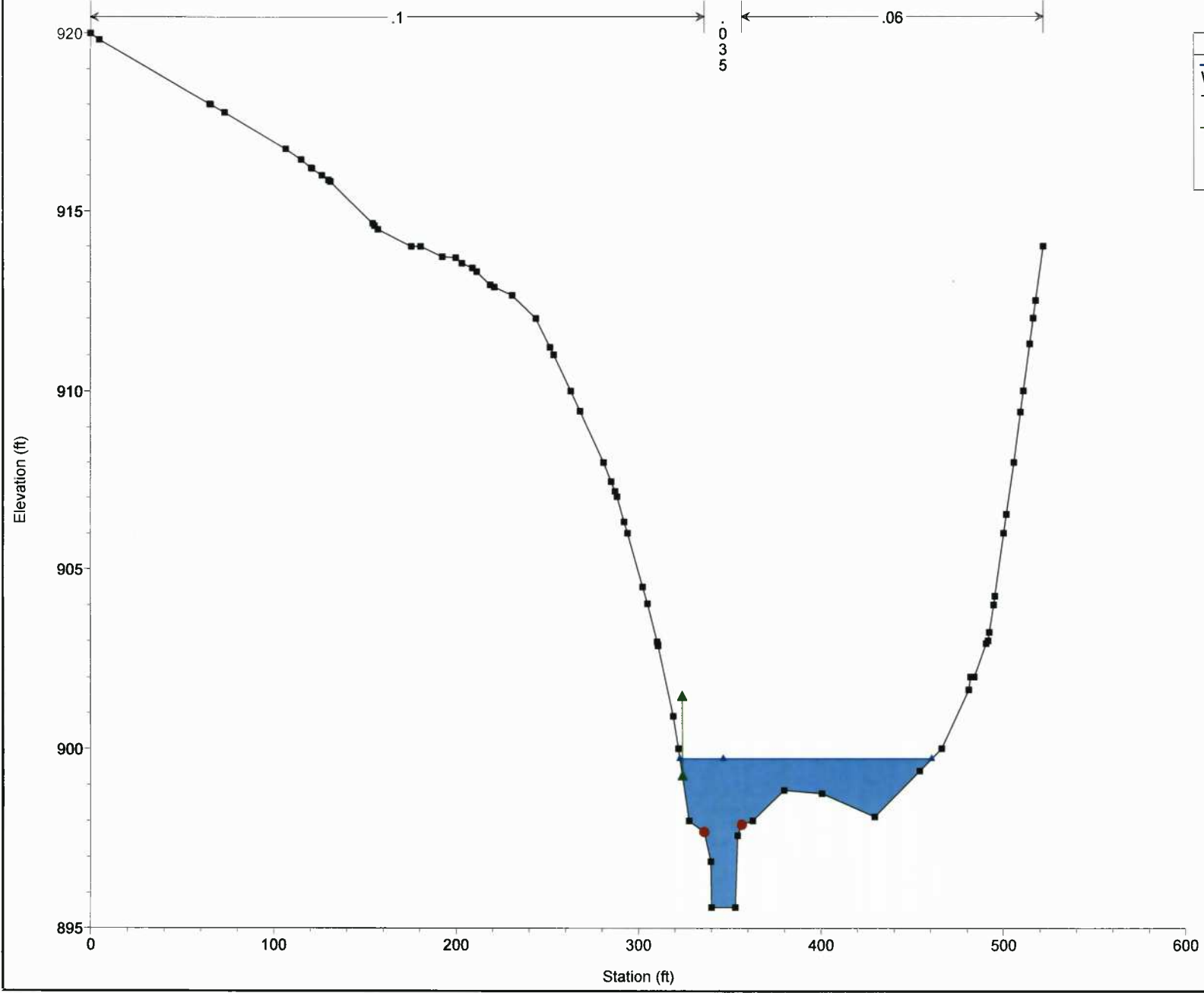
Bank Sta





OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
 River = Bluestone Creek Reach = Lower RS = 4657.419 BR





OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
 River = Bluestone Creek Reach = Lower RS = 4626.456



Legend	
	WS PF 1 - PR Temp Br Rev
	Ground
	Ineff
	Bank Sta

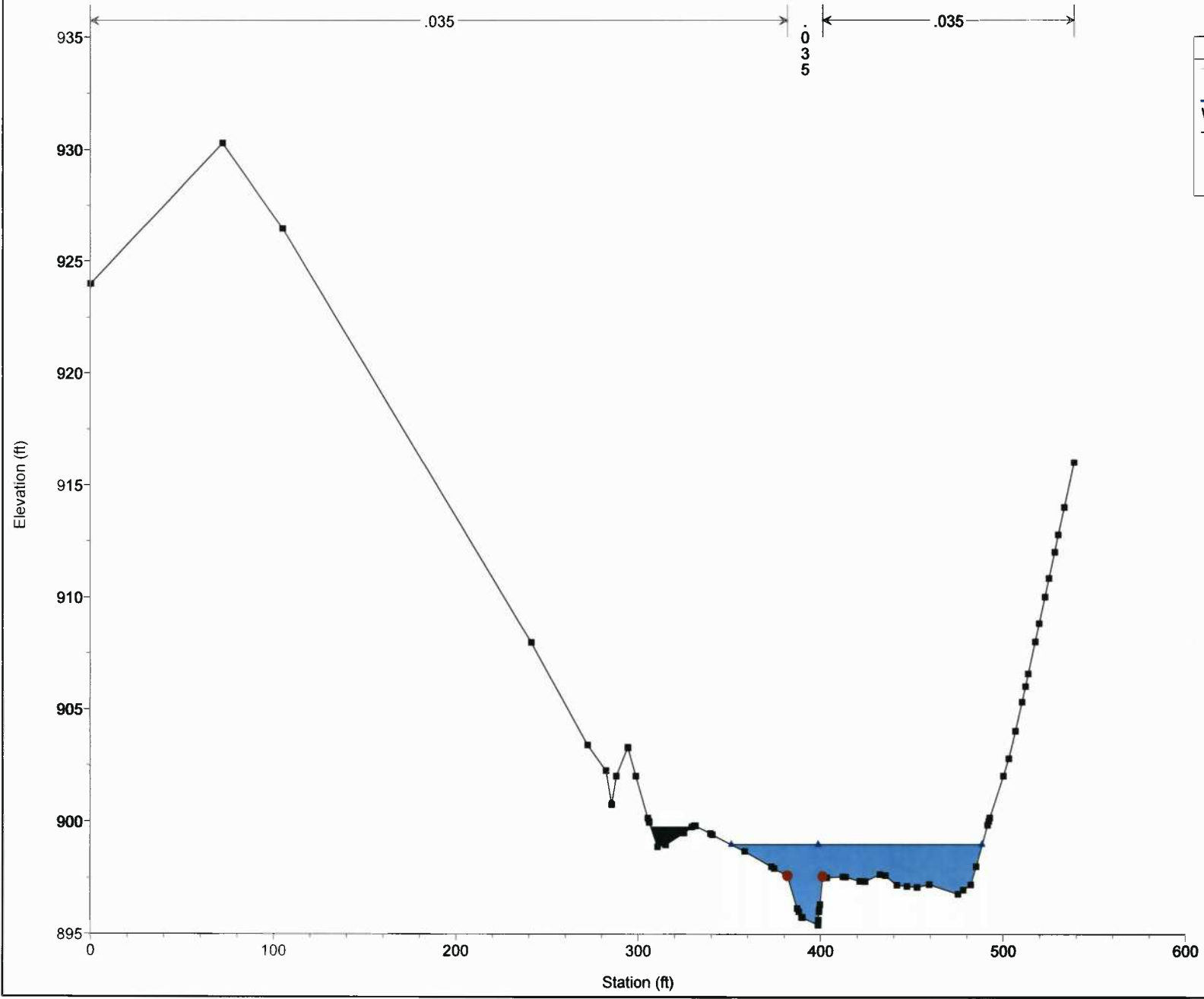
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 4559.288

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0  
3  
5

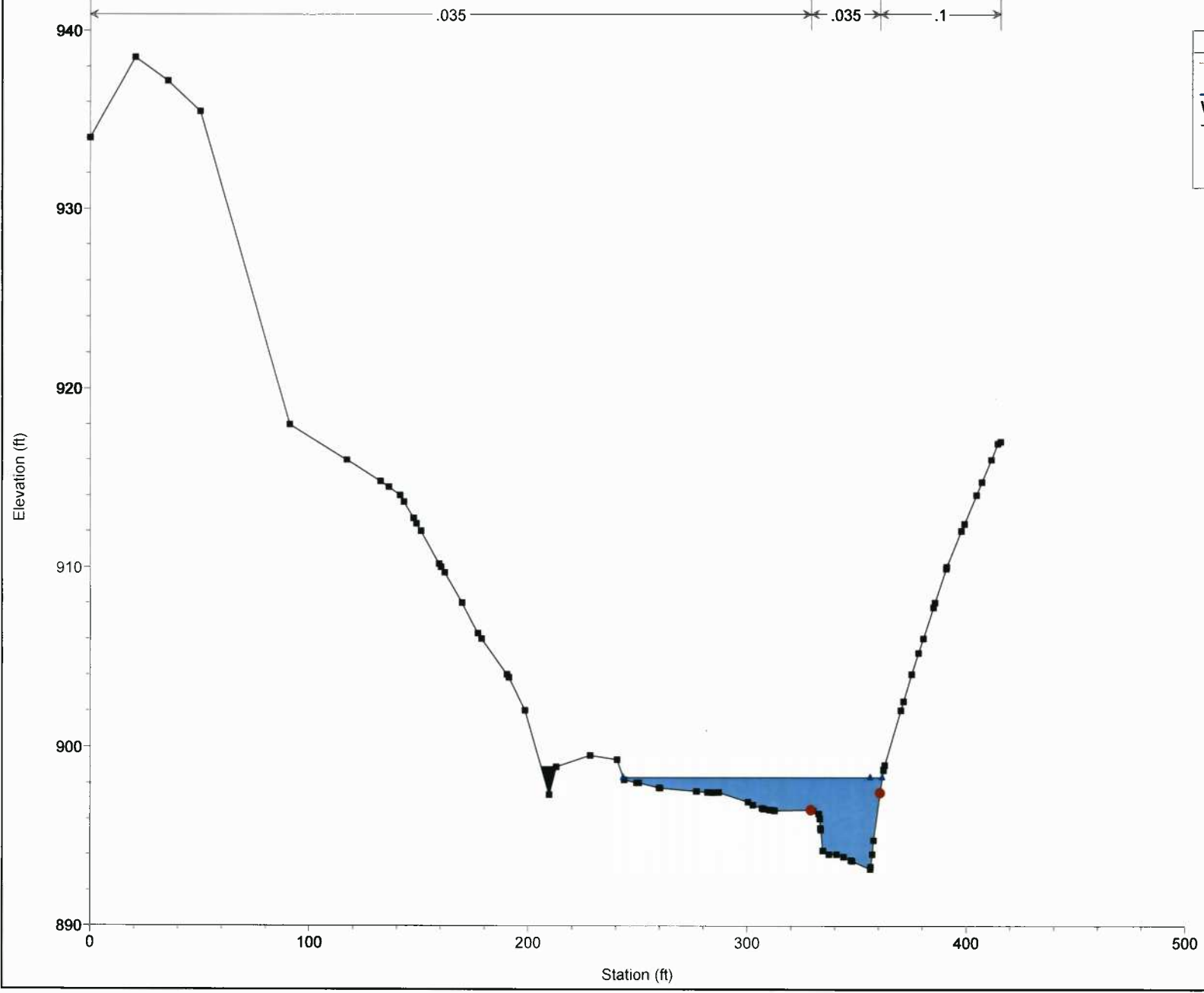
Legend	
WS PF 1 - Ex Revised	—▲—
WS PF 1 - PR Temp Br Rev	—■—
Ground	■
Bank Sta	●



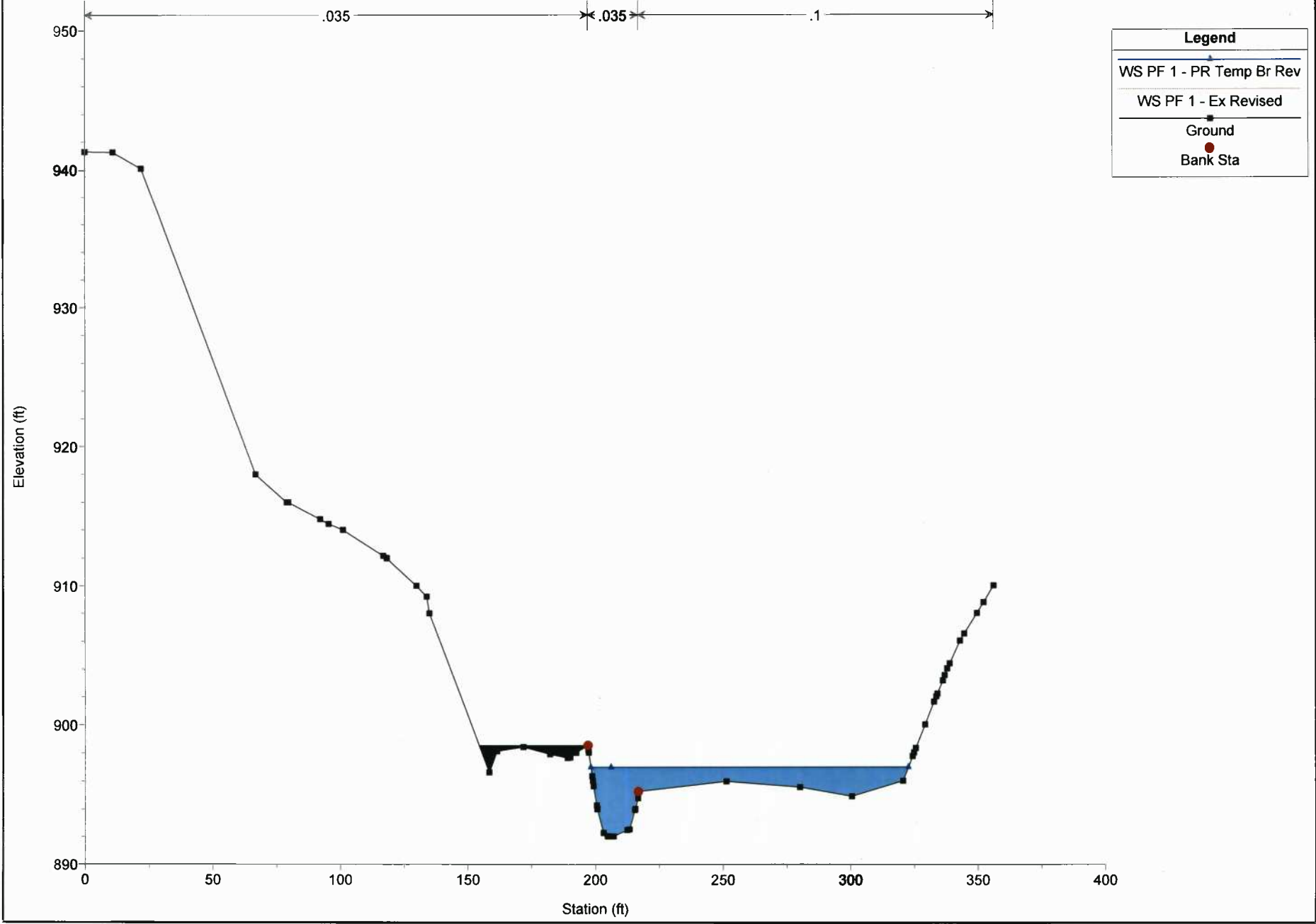


OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
 River = Bluestone Creek Reach = Lower RS = 4258.834

Legend	
—▲—	WS PF 1 - Ex Revised
—■—	WS PF 1 - PR Temp Br Rev
■	Ground
●	Bank Sta



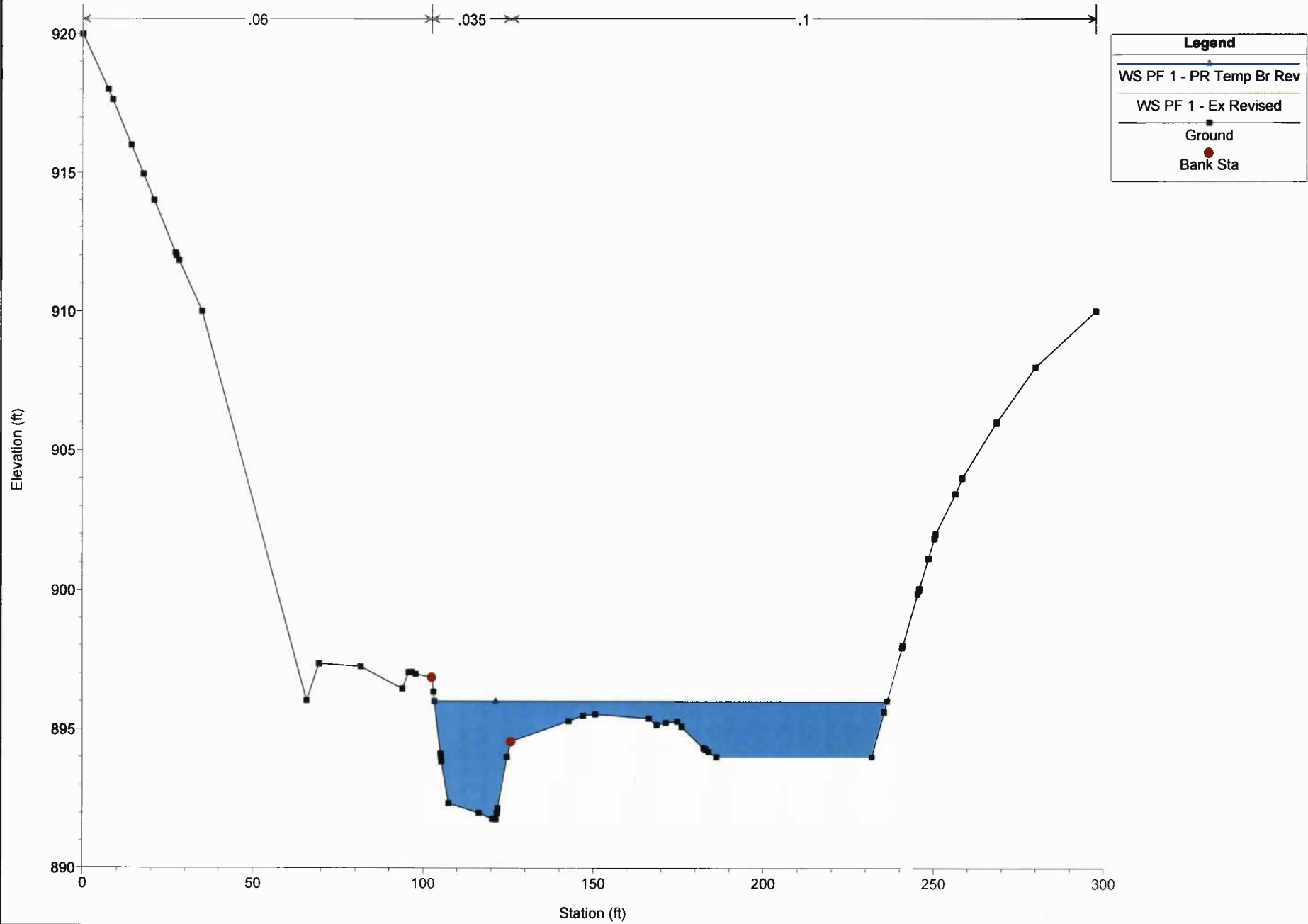
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
 River = Bluestone Creek Reach = Lower RS = 4054.239



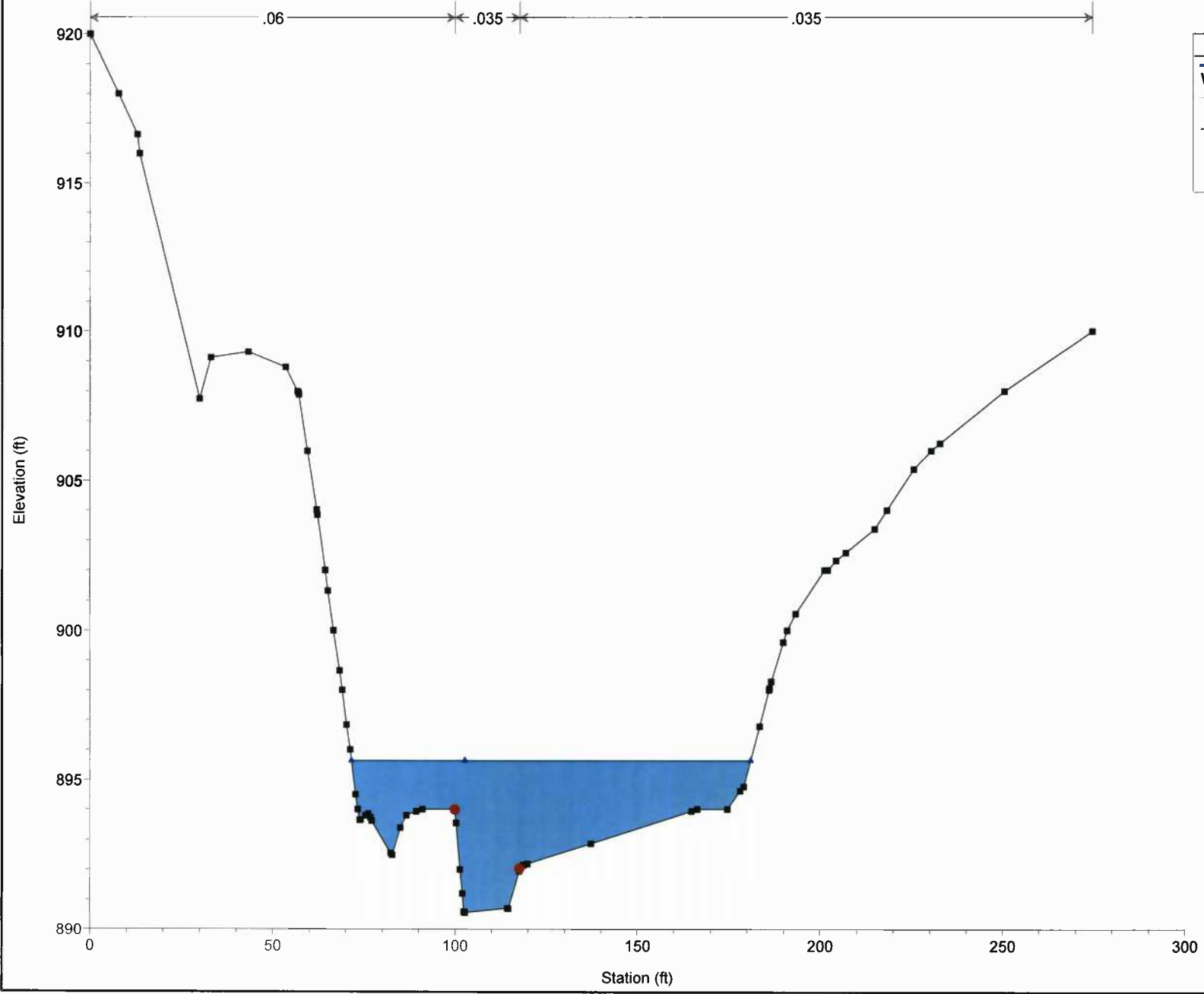
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 3934.570

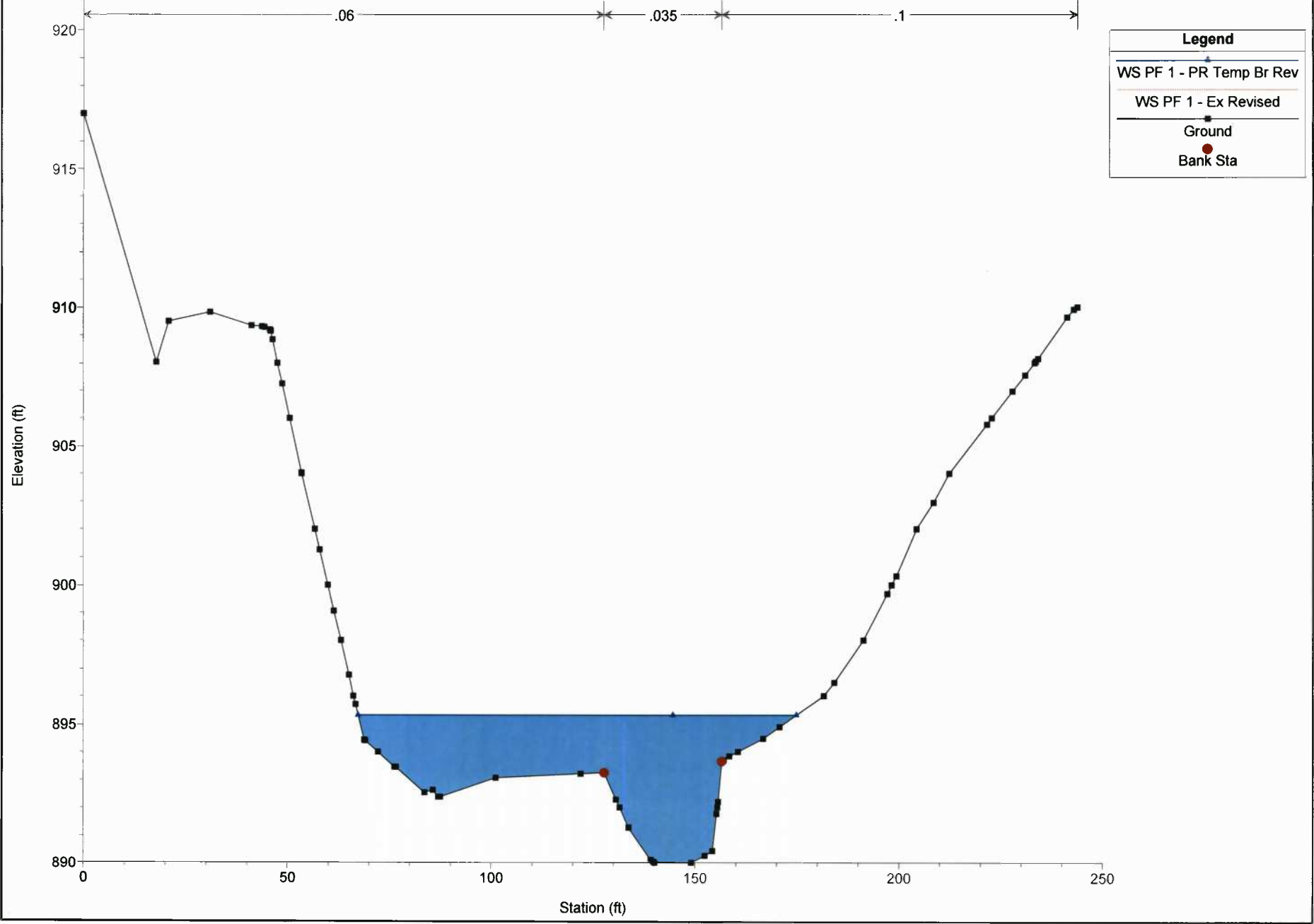


OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
 River = Bluestone Creek Reach = Lower RS = 3797.323

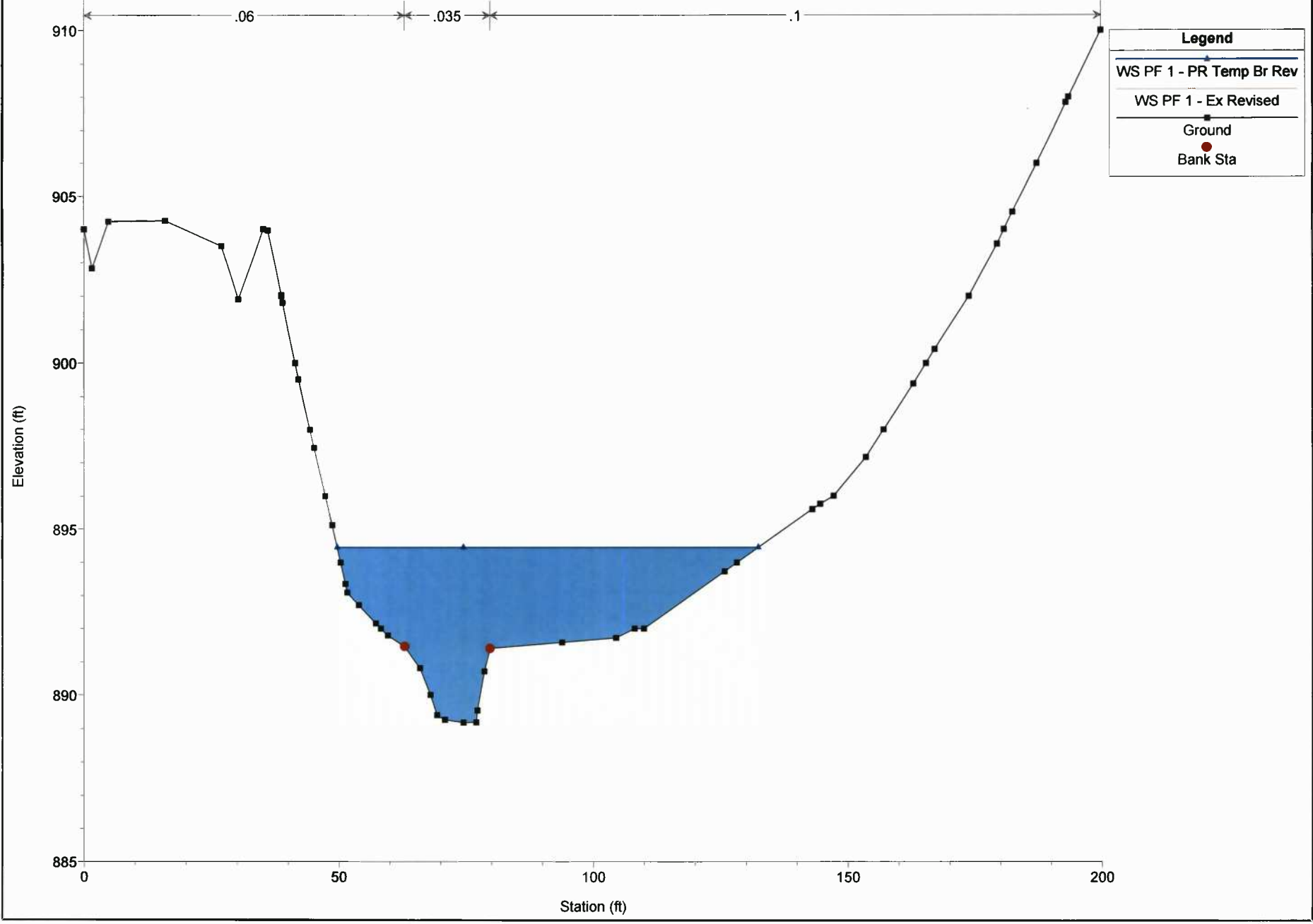


Legend	
WS PF 1 - PR Temp Br Rev	(Blue line with square markers)
WS PF 1 - Ex Revised	(Black line with square markers)
Ground	(Black square)
Bank Sta	(Red circle)

OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
 River = Bluestone Creek Reach = Lower RS = 3679.344



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
River = Bluestone Creek Reach = Lower RS = 3568.220



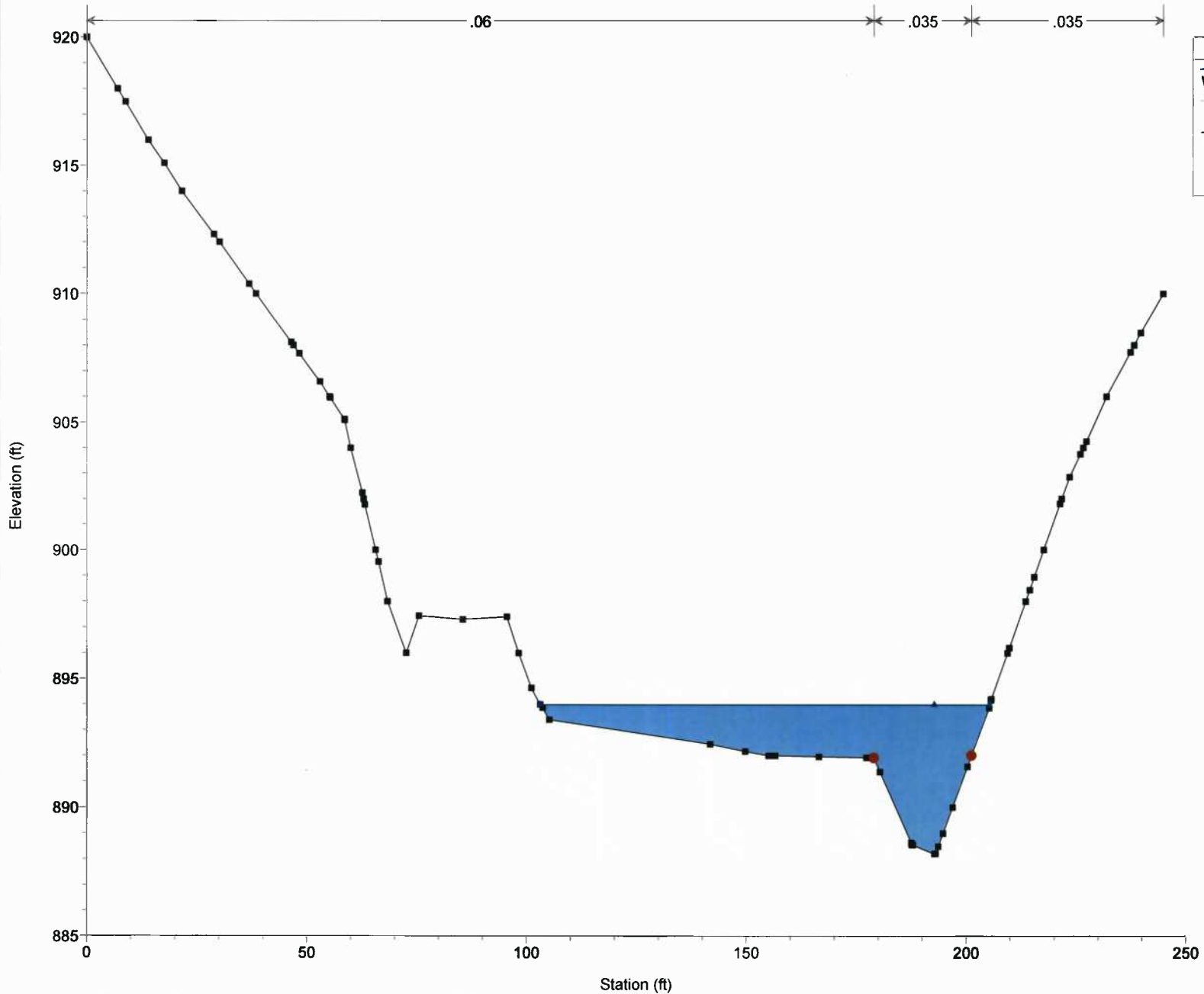
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 3438.299

← .06 → \* .035 \* → .035 →

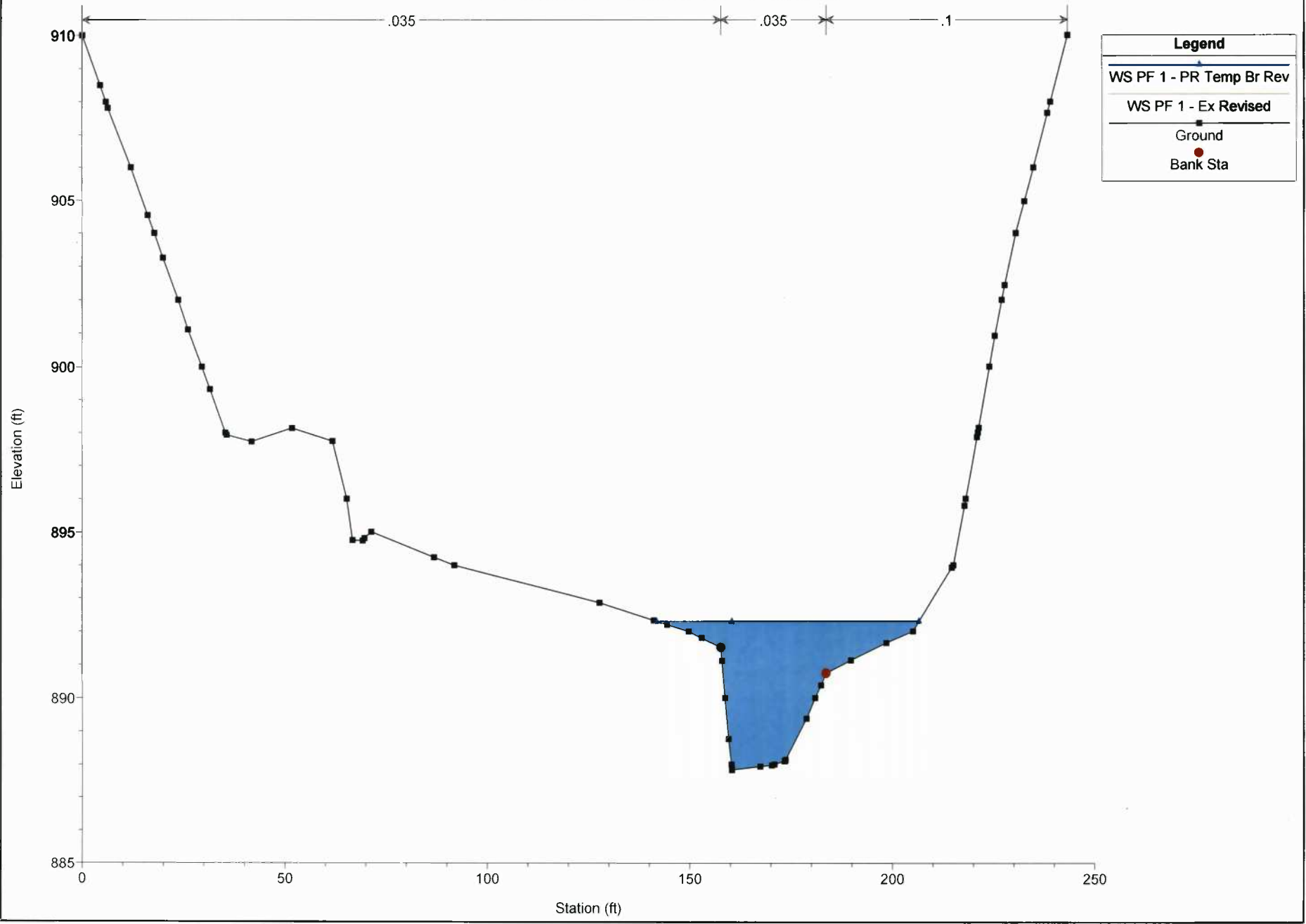
Legend	
—▲—	WS PF 1 - PR Temp Br Rev
—■—	WS PF 1 - Ex Revised
■	Ground
●	Bank Sta



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

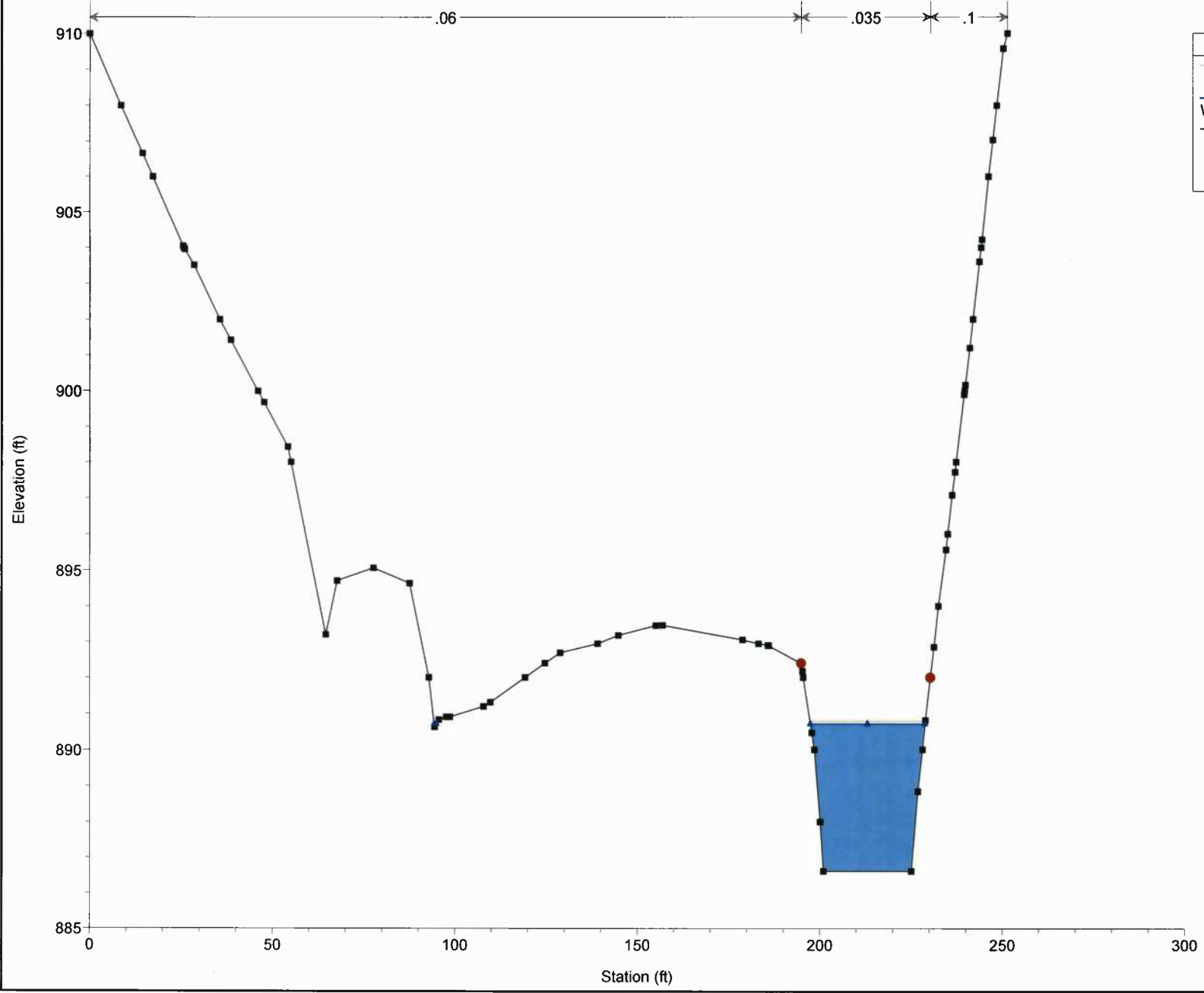
Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 3282.877





OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
 River = Bluestone Creek Reach = Lower RS = 3129.654

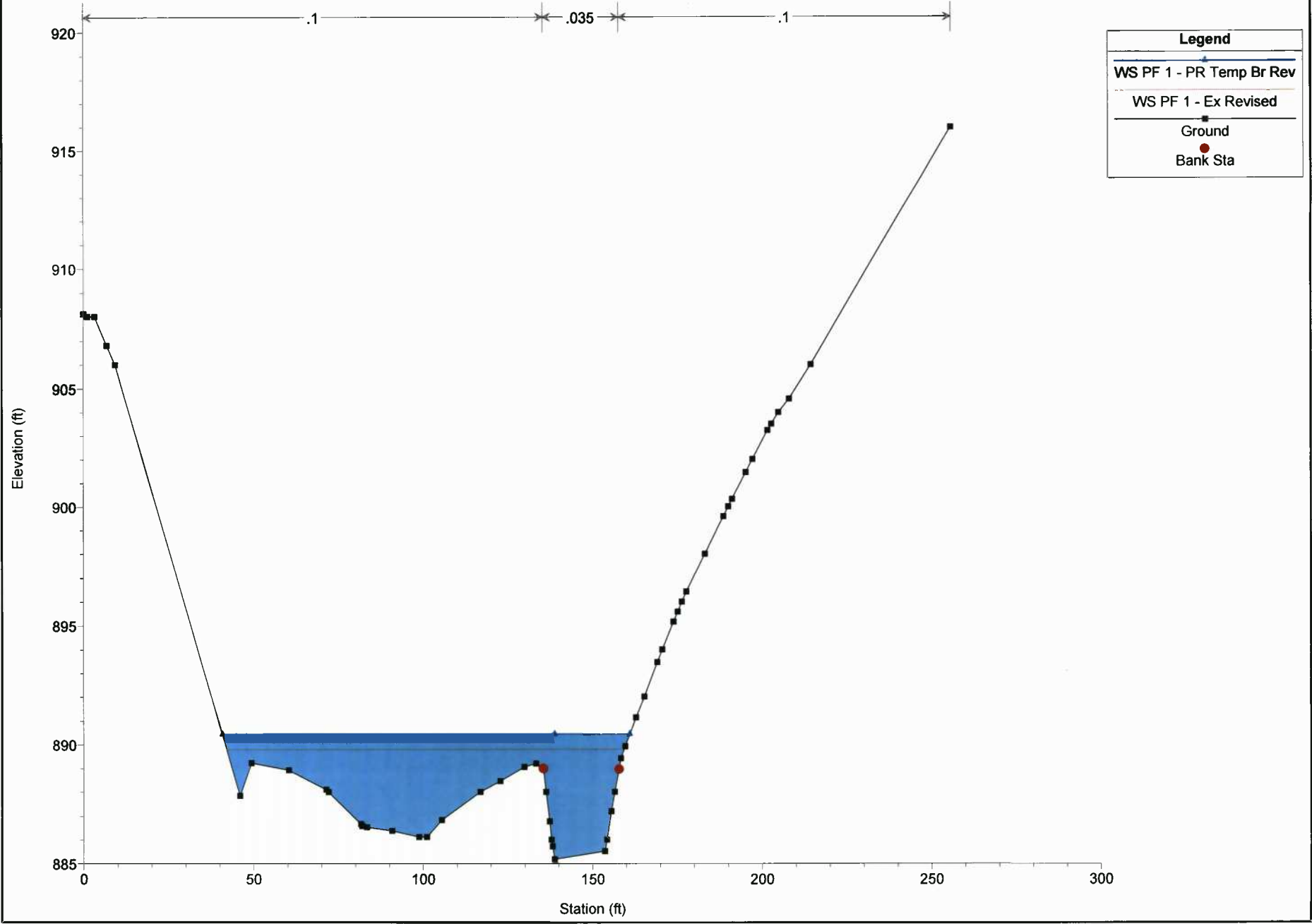


Legend	
WS PF 1 - Ex Revised	○
WS PF 1 - PR Temp Br Rev	△
Ground	■
Bank Sta	●

OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

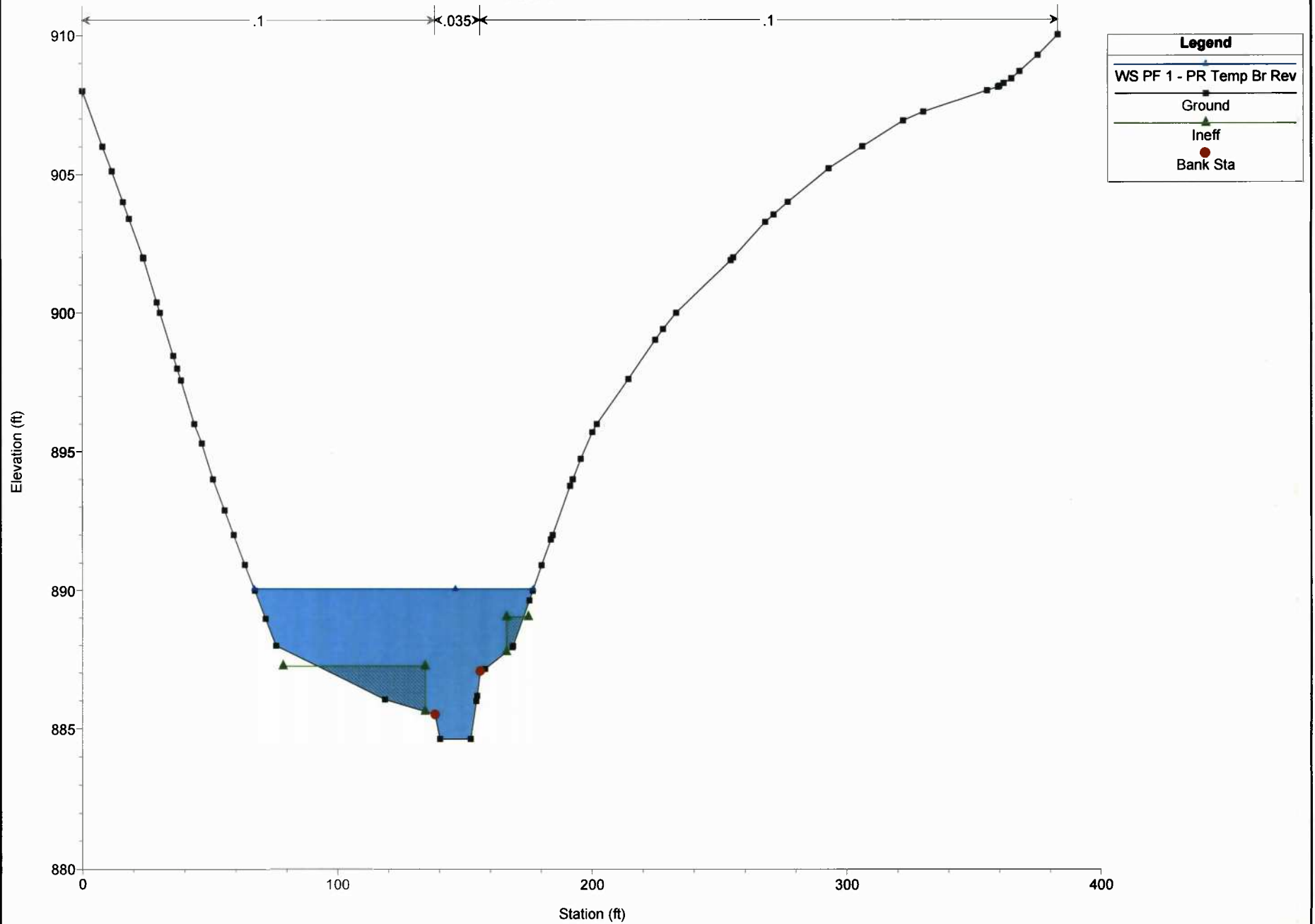
River = Bluestone Creek Reach = Lower RS = 2951.927



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

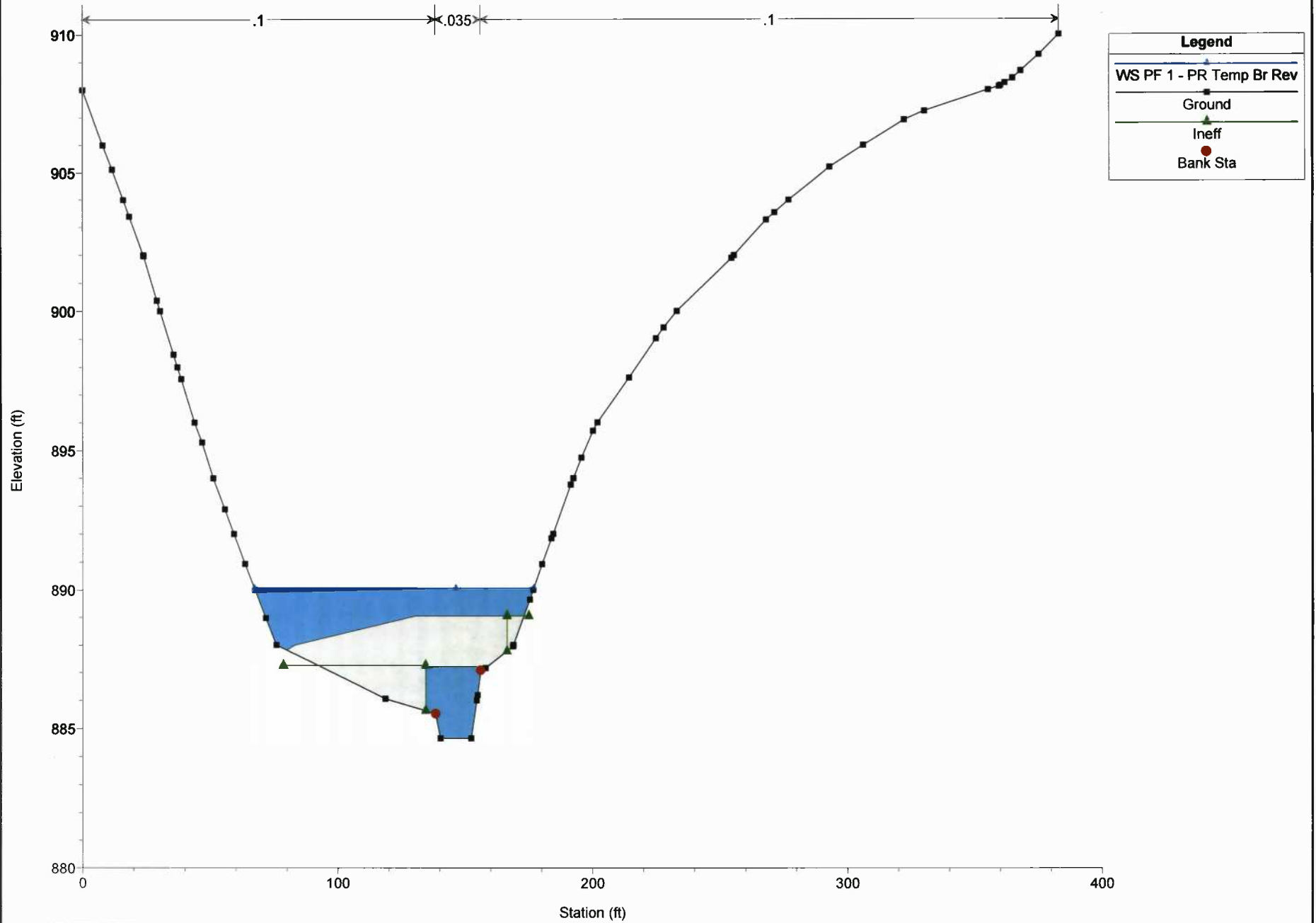
River = Bluestone Creek Reach = Lower RS = 2875.345



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

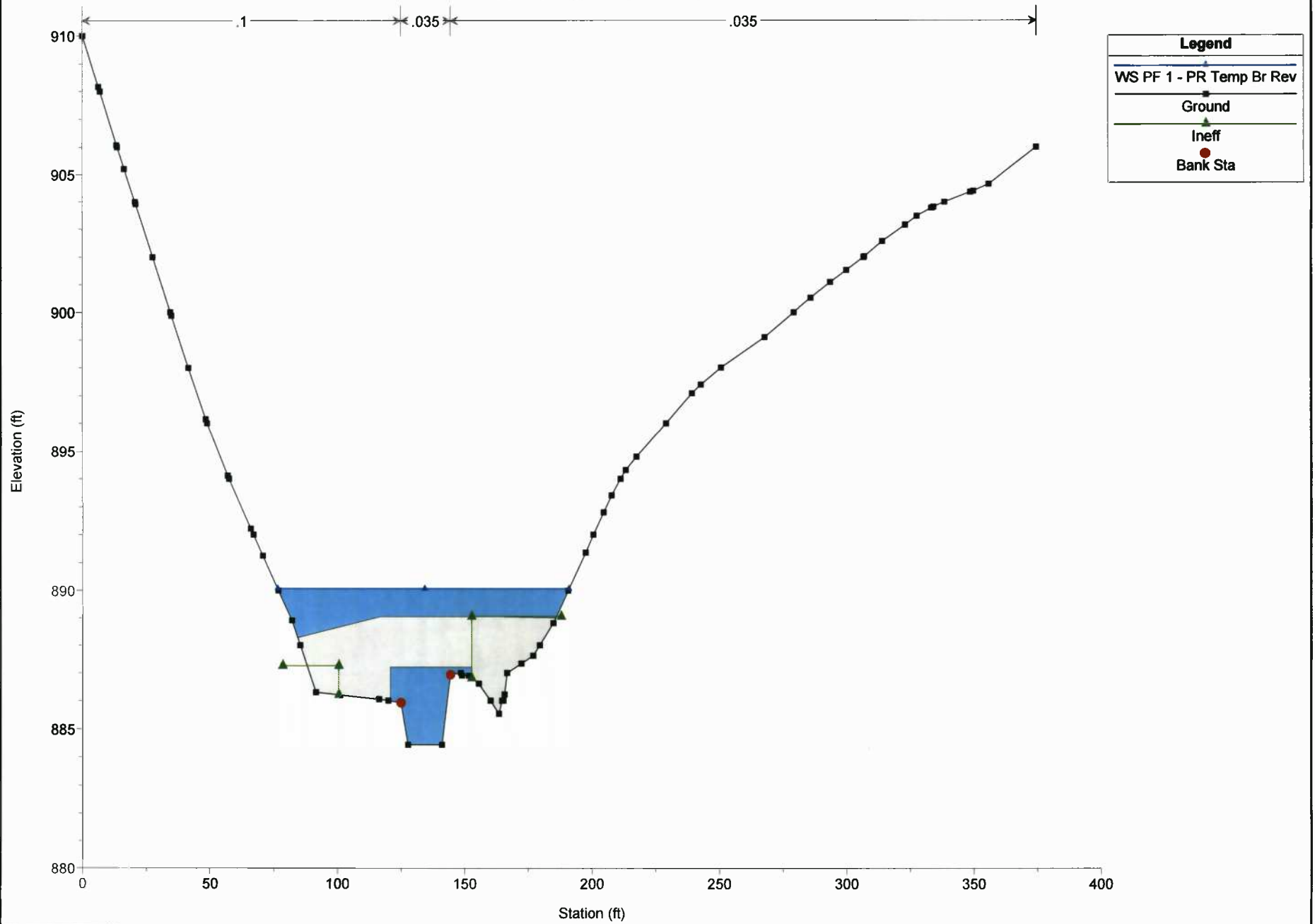
River = Bluestone Creek Reach = Lower RS = 2862.727 BR



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

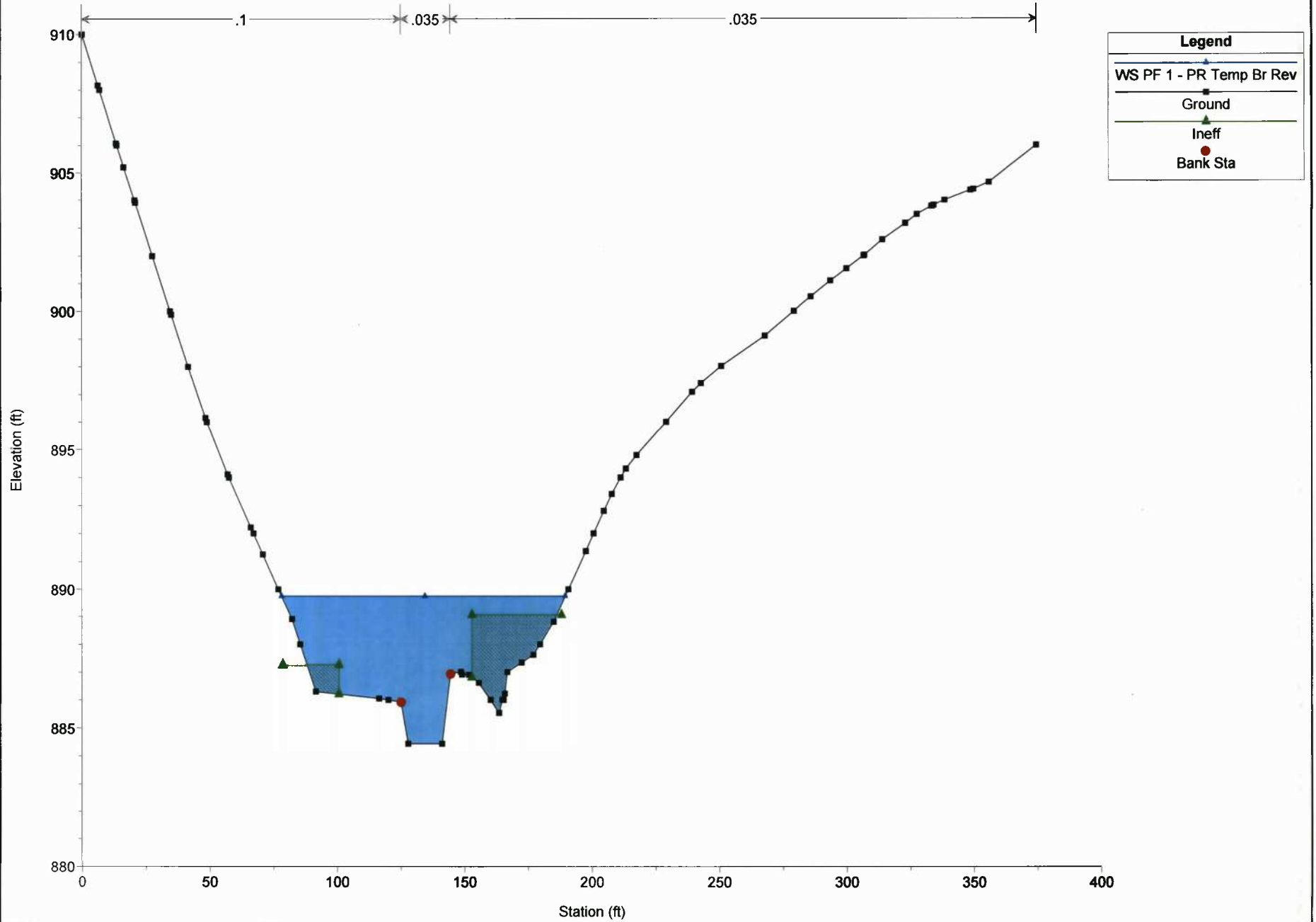
River = Bluestone Creek Reach = Lower RS = 2862.727 BR



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

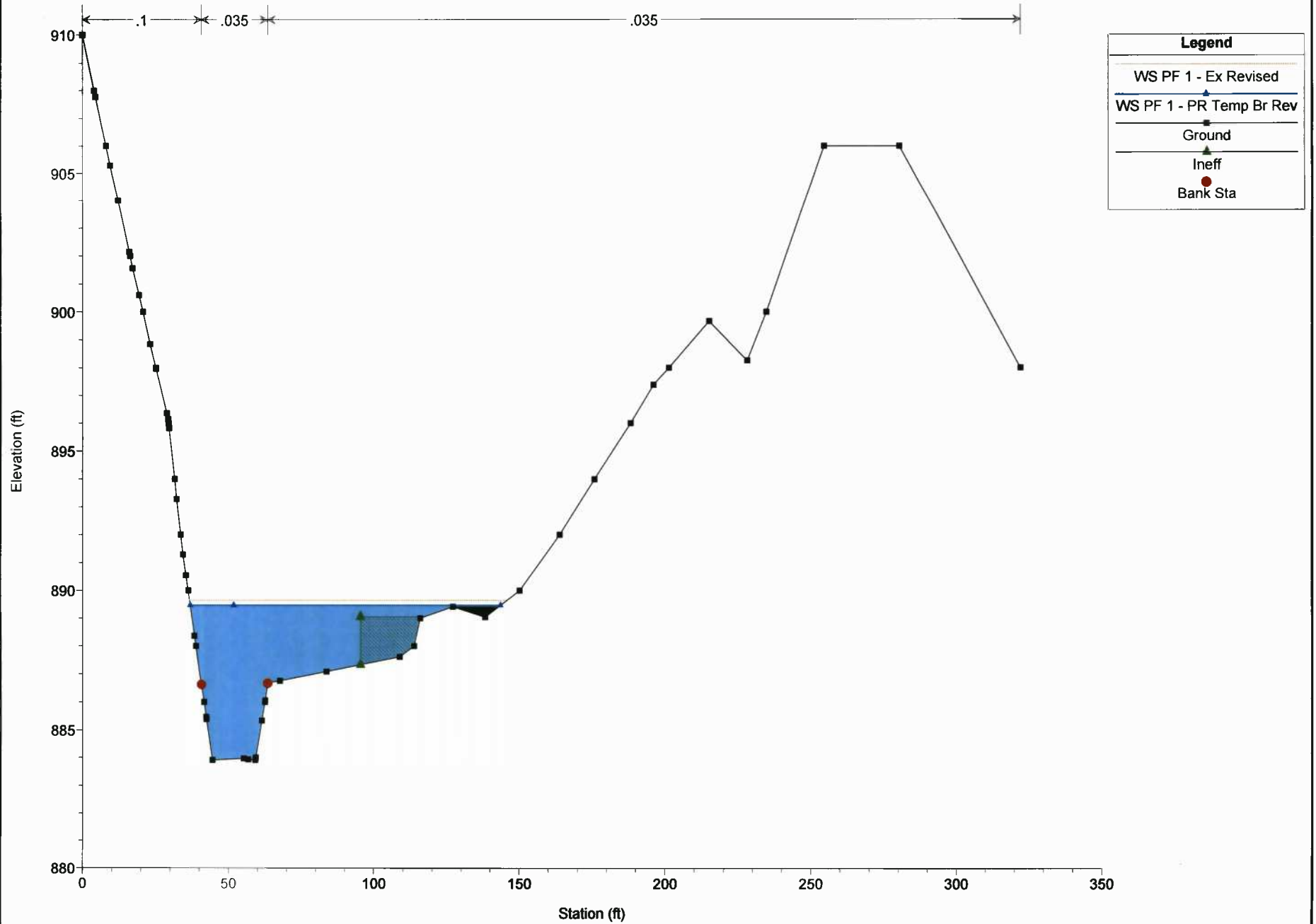
River = Bluestone Creek Reach = Lower RS = 2846.103



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

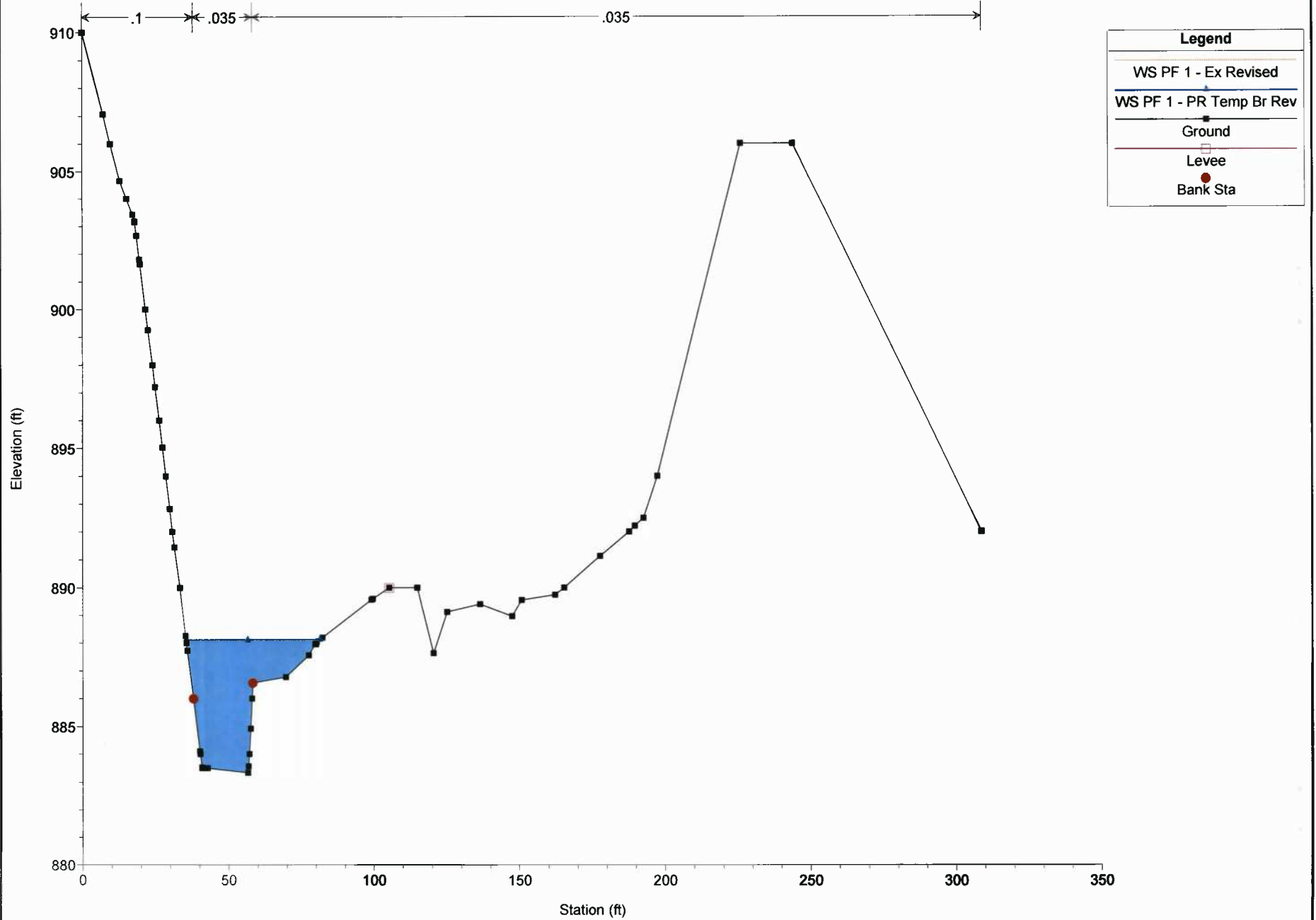
River = Bluestone Creek Reach = Lower RS = 2773.556



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 2690.443

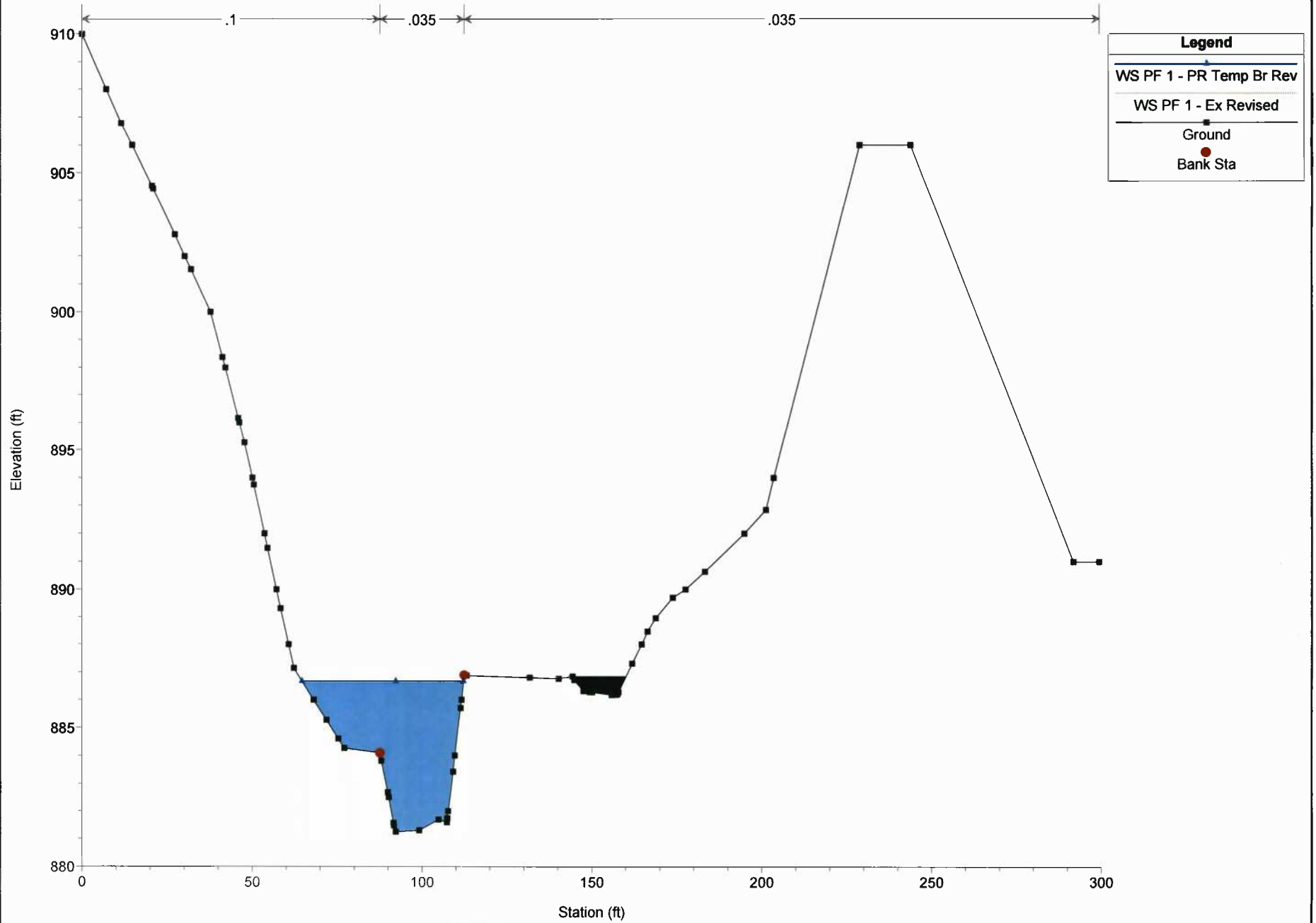




OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

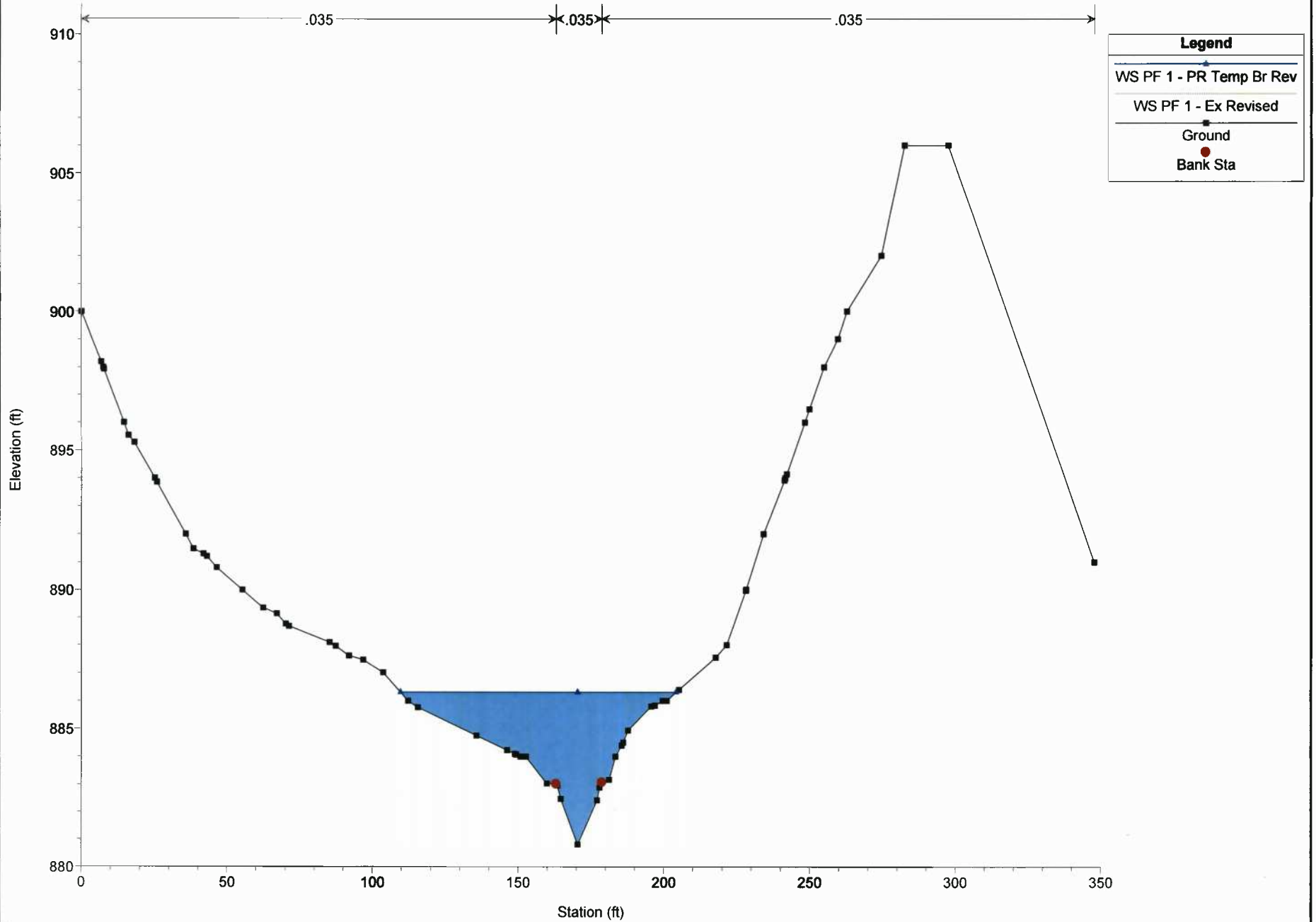
River = Bluestone Creek Reach = Lower RS = 2515.269



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

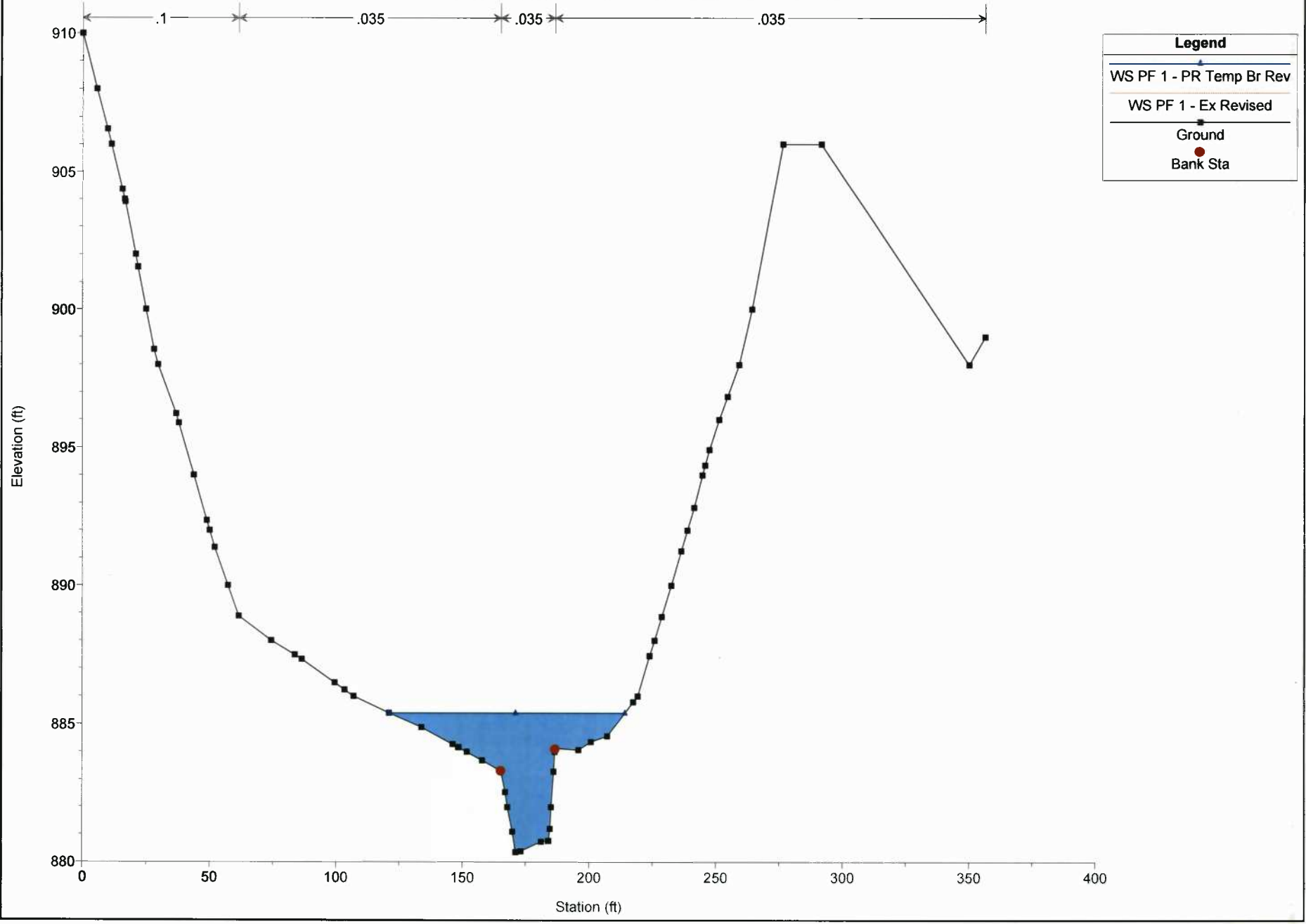
River = Bluestone Creek Reach = Lower RS = 2420.230



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

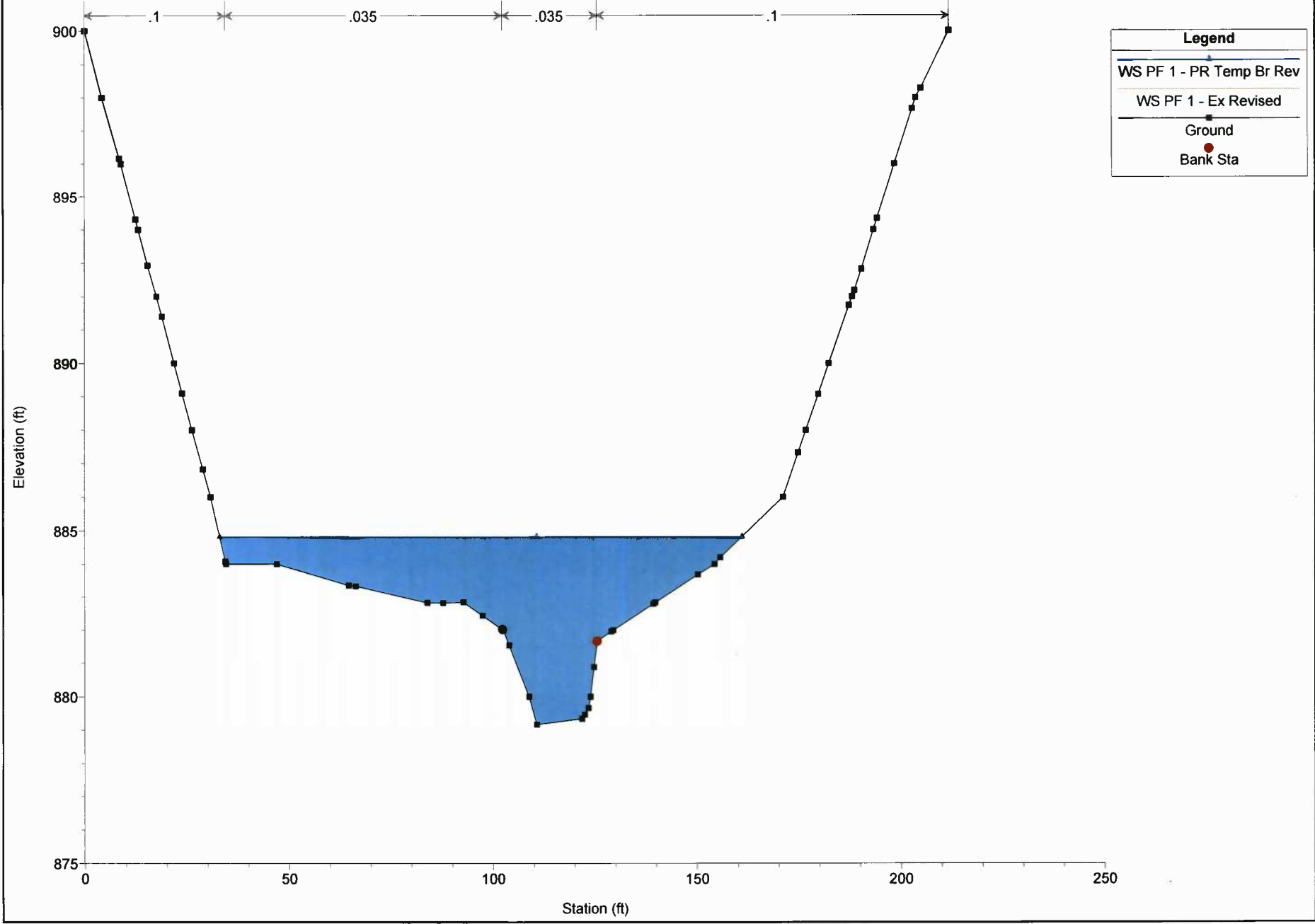
Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 2319.762



Legend	
WS PF 1 - PR Temp Br Rev	(Line with square markers)
WS PF 1 - Ex Revised	(Line with square markers)
Ground	(Line with square markers)
Bank Sta	(Red dot)

OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
 River = Bluestone Creek Reach = Lower RS = 2130.340

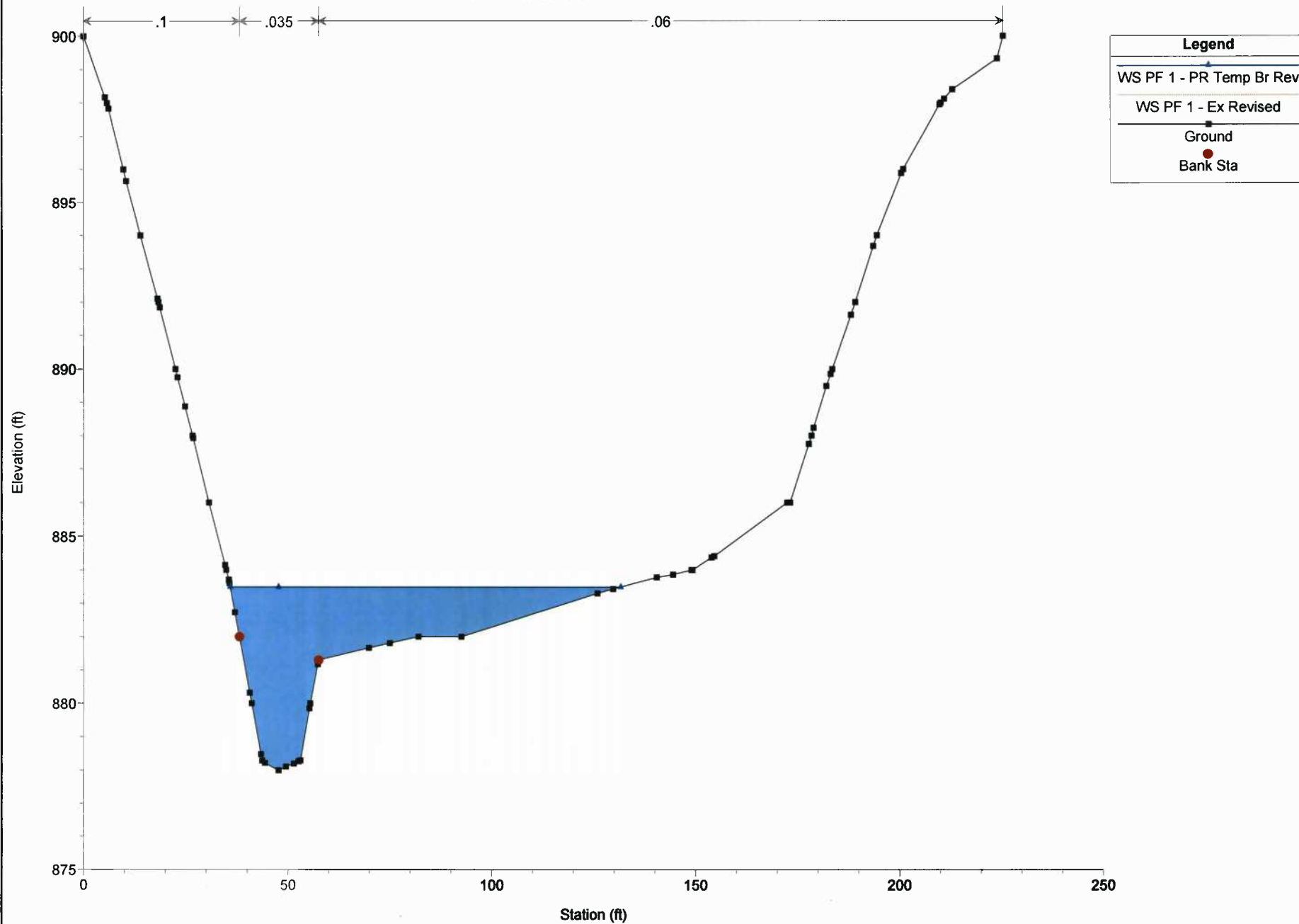


Legend	
WS PF 1 - PR Temp Br Rev	(Solid line)
WS PF 1 - Ex Revised	(Dashed line)
Ground	(Black square)
Bank Sta	(Red dot)

OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

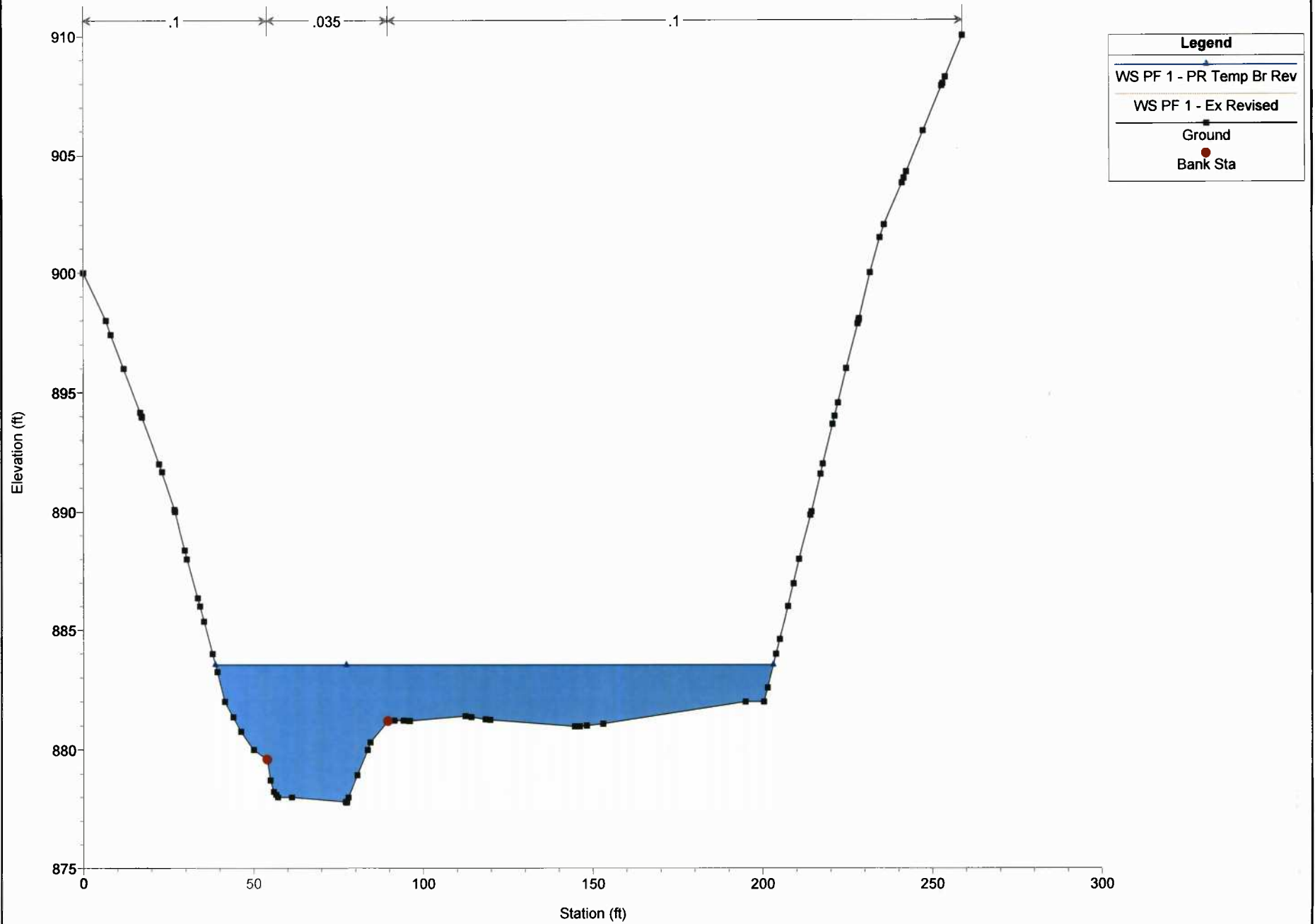
River = Bluestone Creek Reach = Lower RS = 1966.255



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

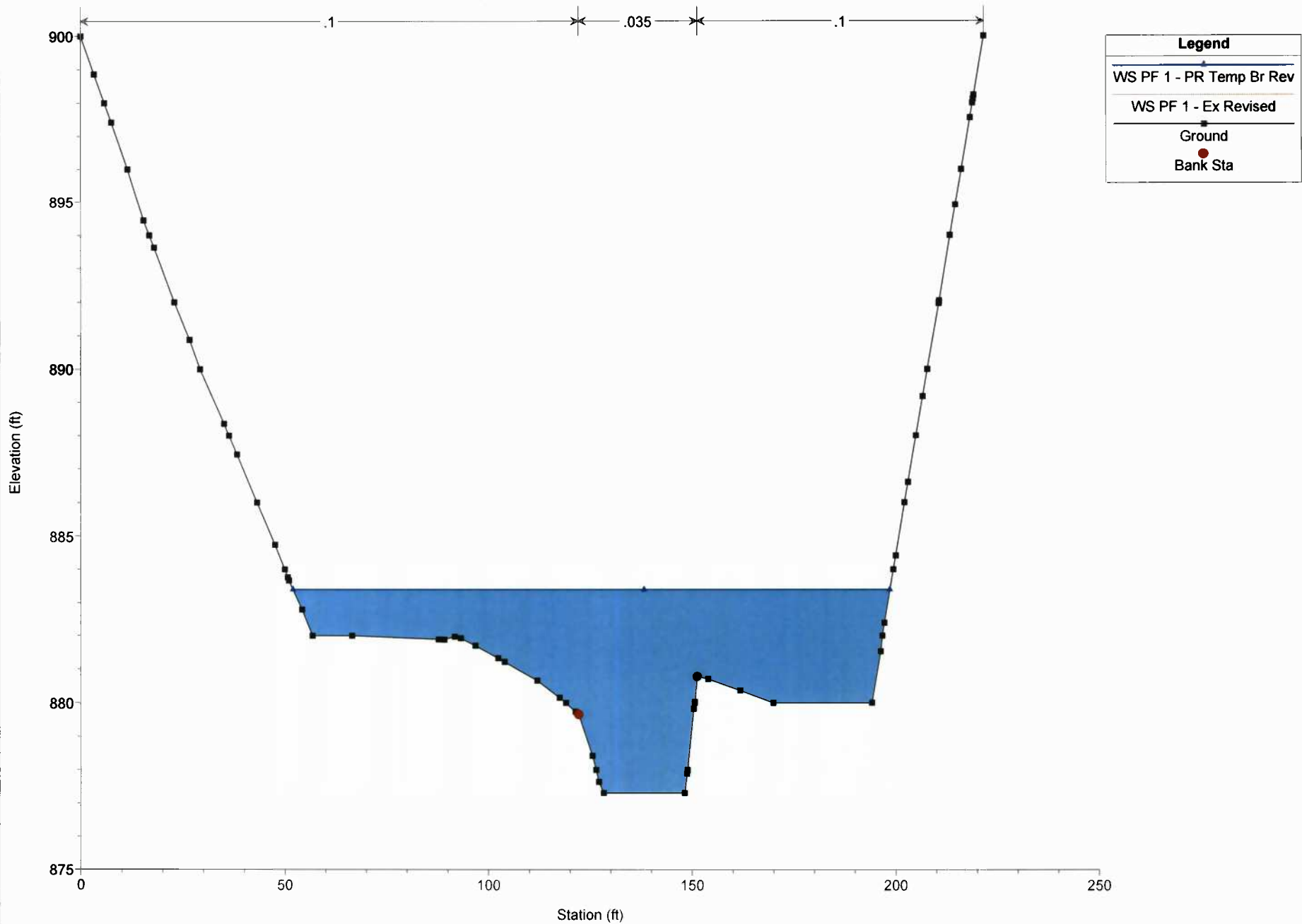
River = Bluestone Creek Reach = Lower RS = 1908.167



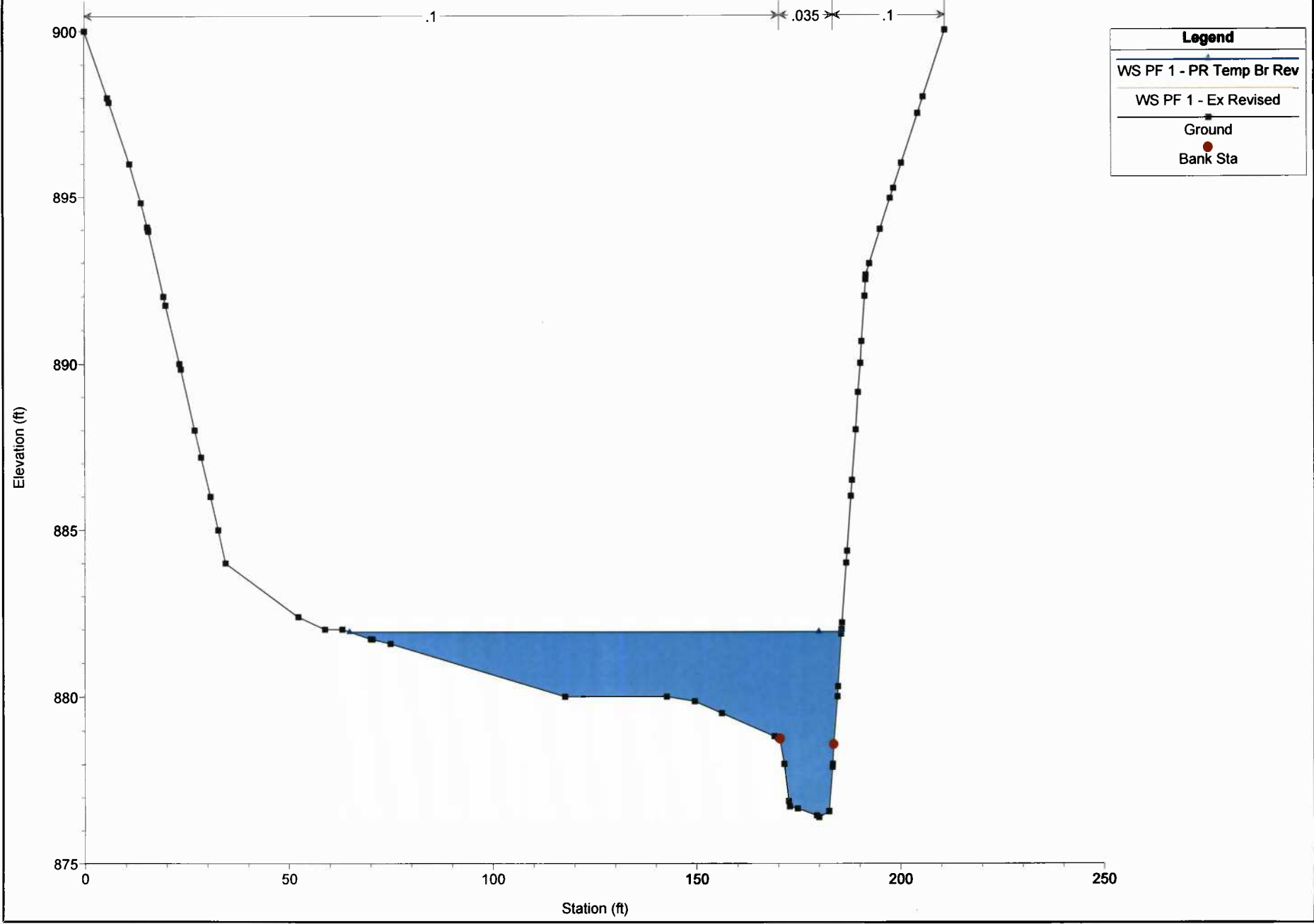
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 1819.717



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
River = Bluestone Creek Reach = Lower RS = 1647.228



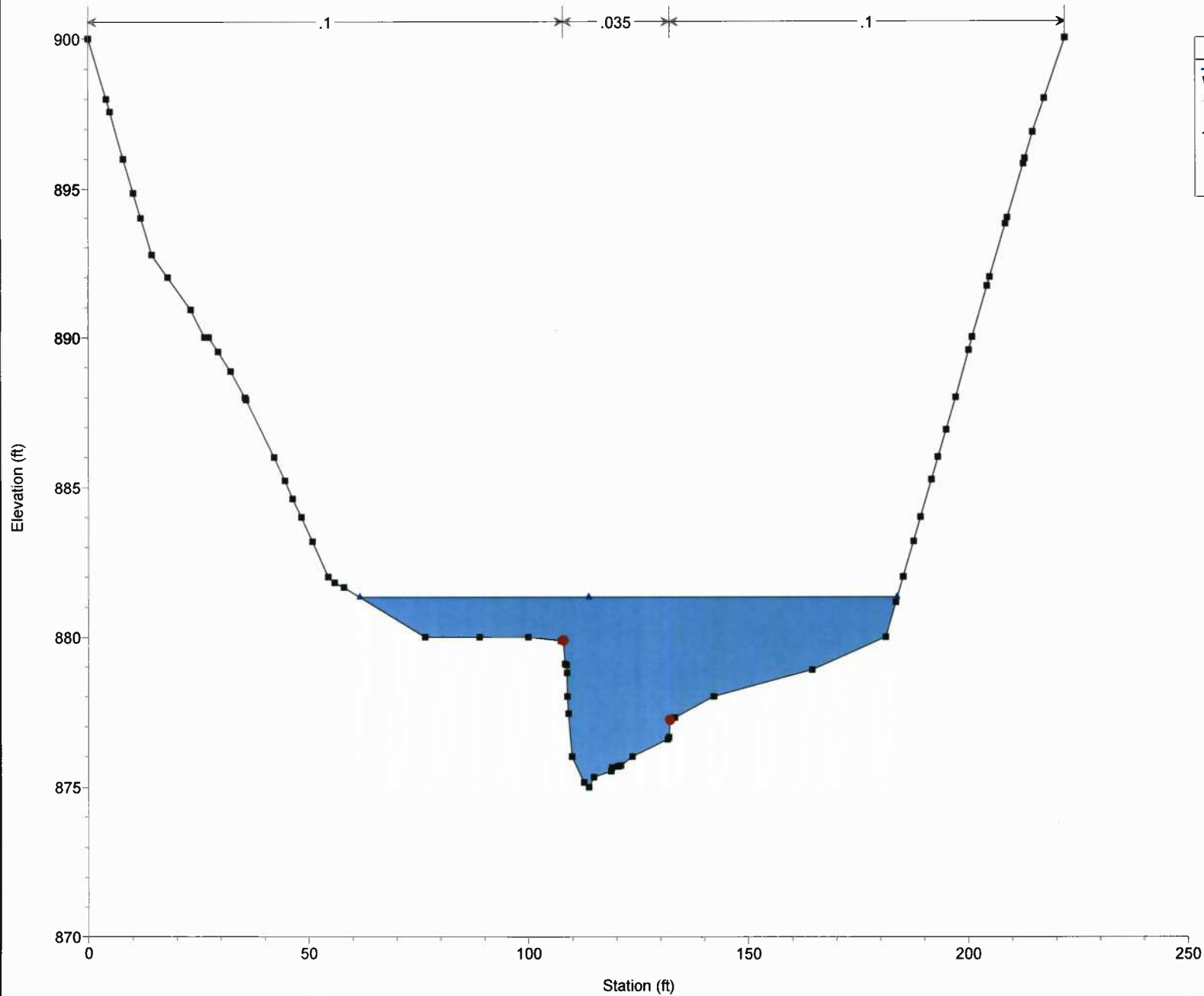
Legend	
—	WS PF 1 - PR Temp Br Rev
- - -	WS PF 1 - Ex Revised
■	Ground
●	Bank Sta



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

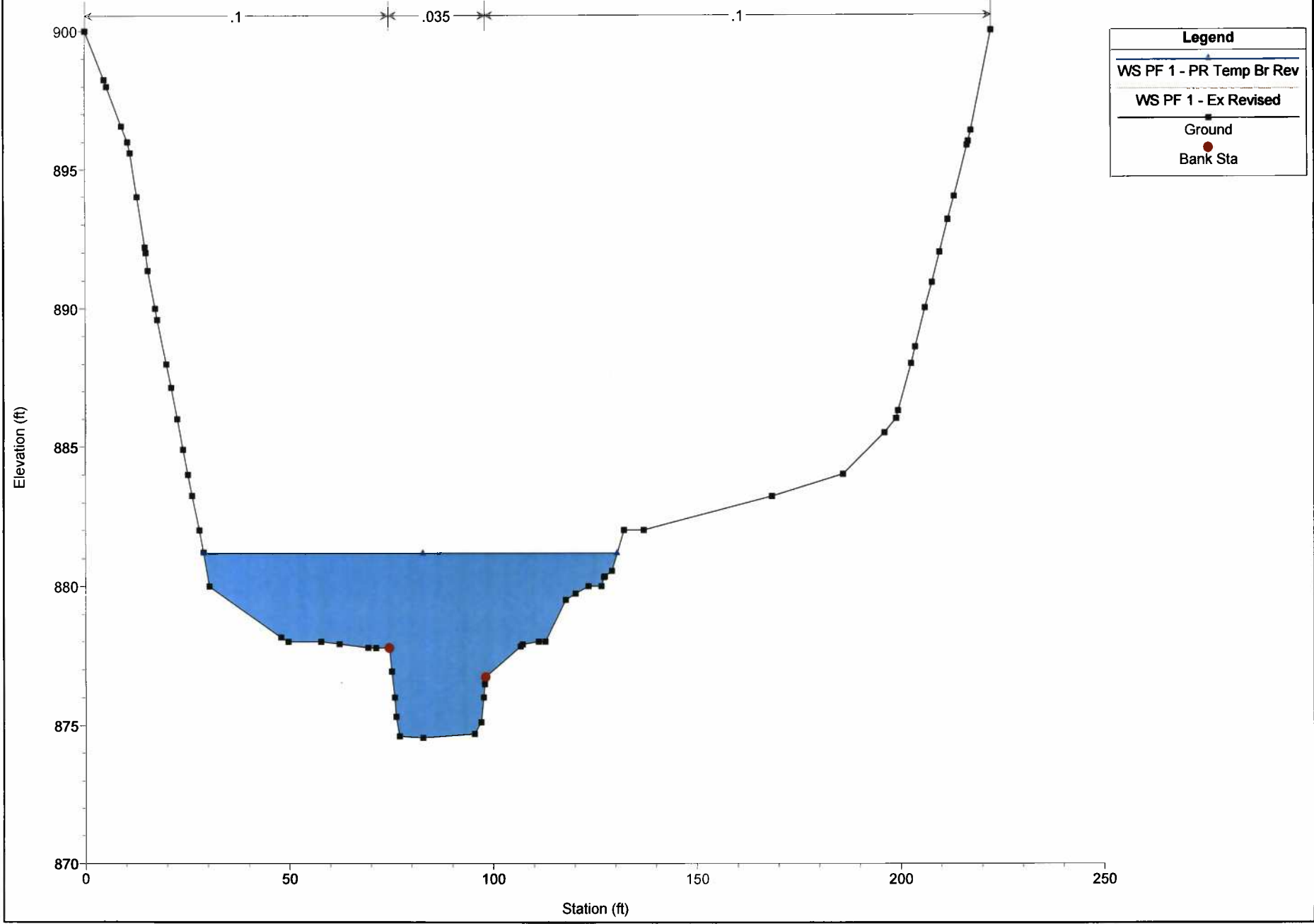
Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 1512.215

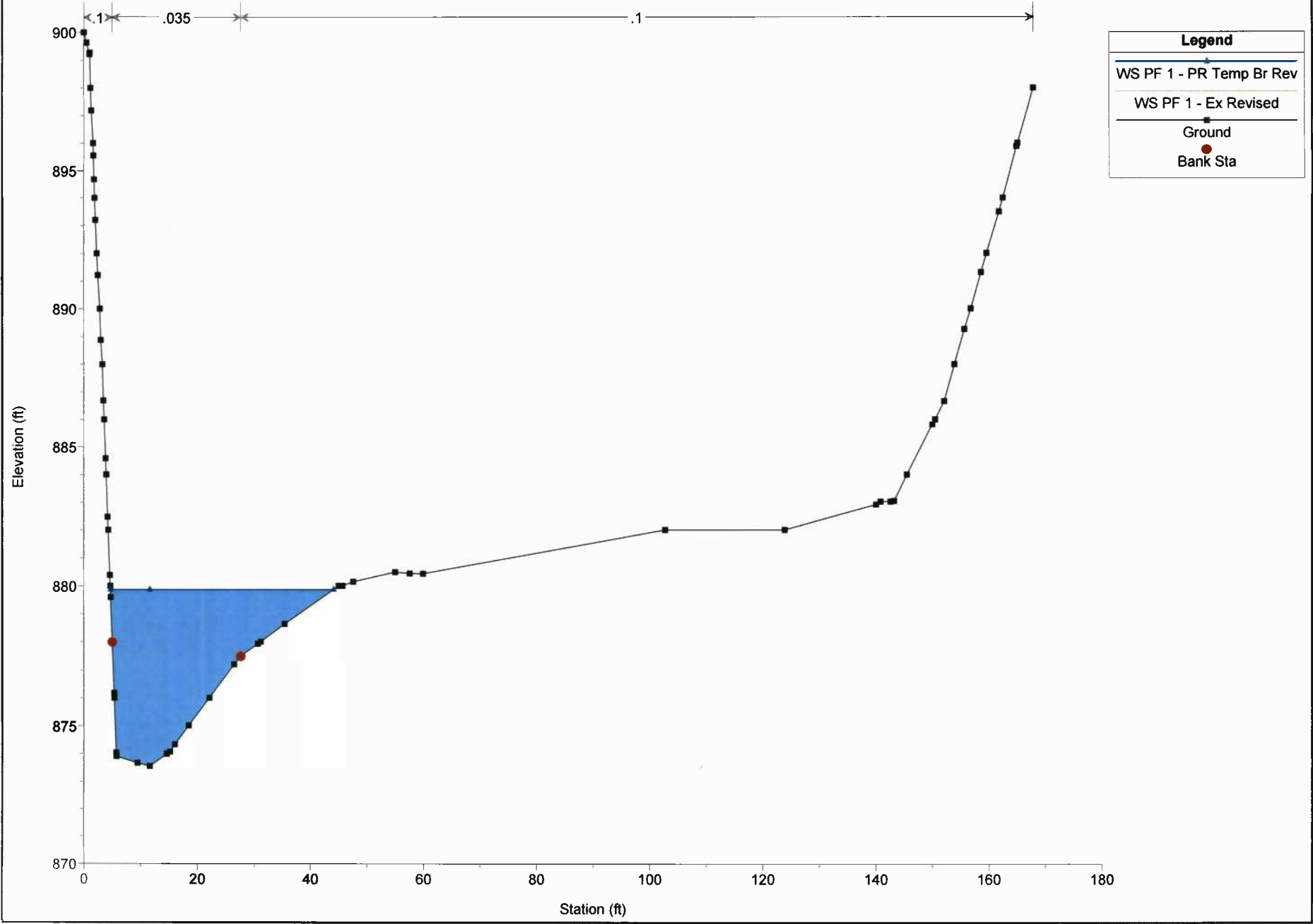


Legend	
	WS PF 1 - PR Temp Br Rev
	WS PF 1 - Ex Revised
	Ground
	Bank Sta

OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
 River = Bluestone Creek Reach = Lower RS = 1387.656

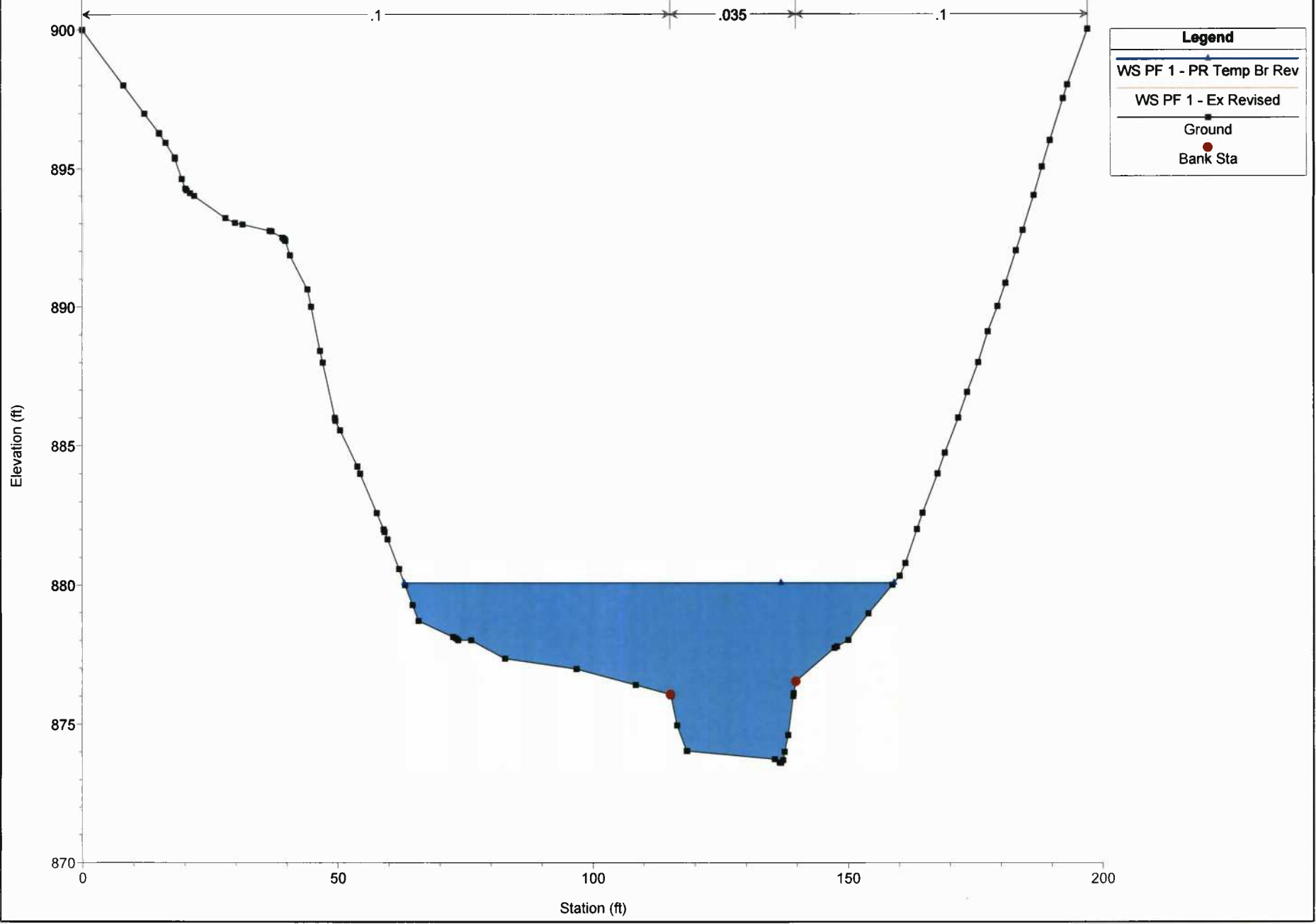


OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
 River = Bluestone Creek Reach = Lower RS = 1246.924



Legend	
WS PF 1 - PR Temp Br Rev	▲
WS PF 1 - Ex Revised	■
Ground	■
Bank Sta	●

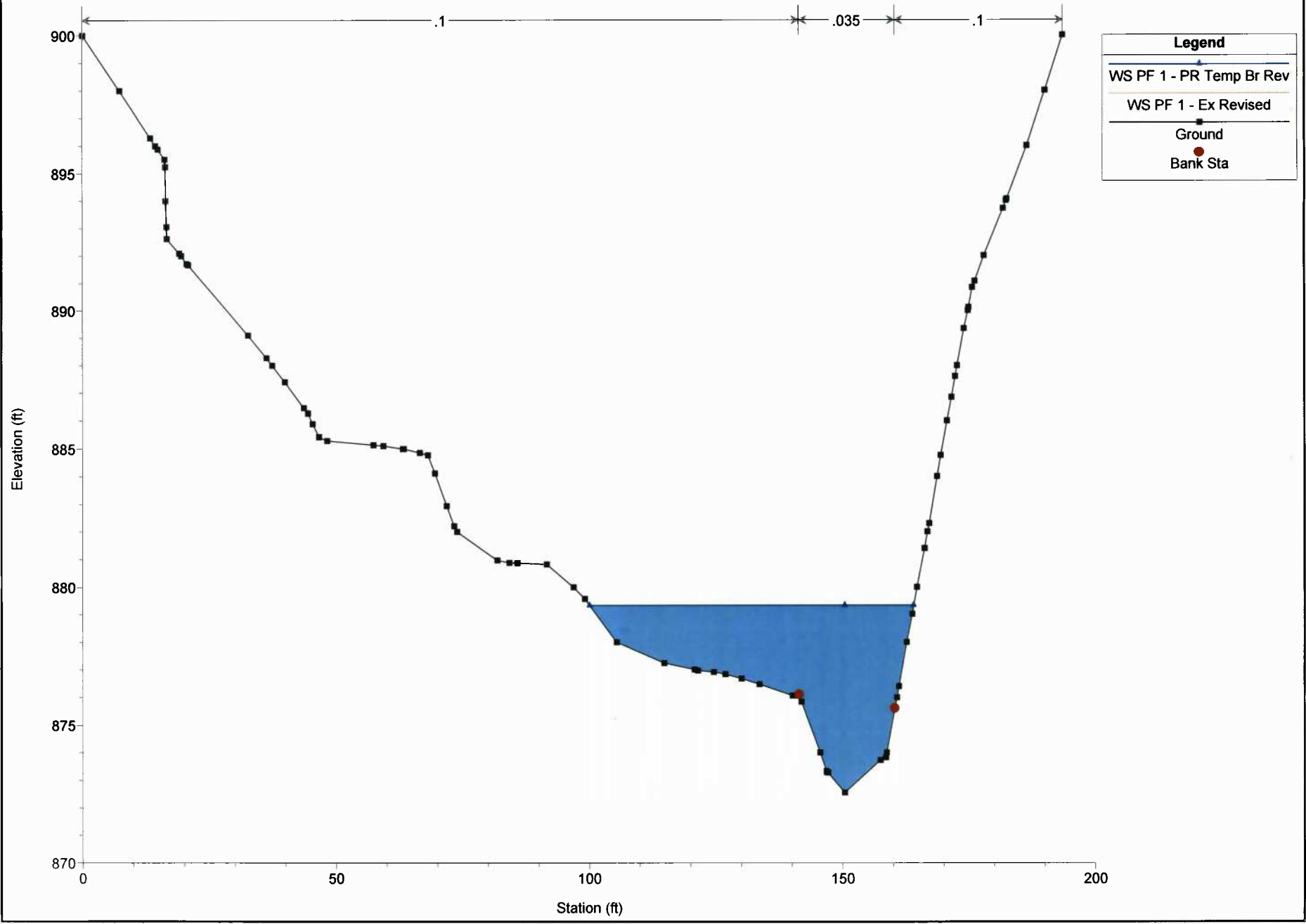
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
River = Bluestone Creek Reach = Lower RS = 1109.636



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

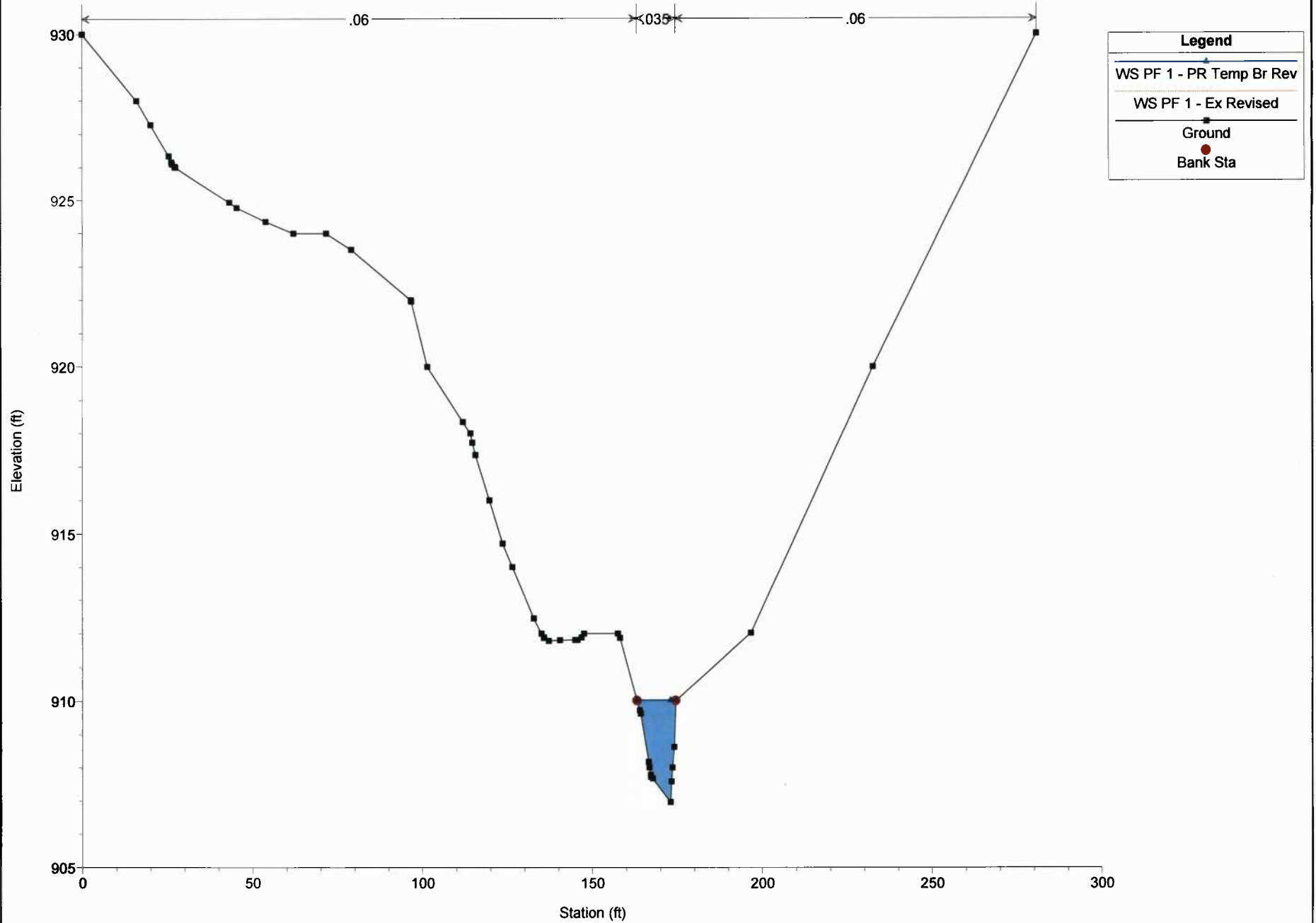
River = Bluestone Creek Reach = Lower RS = 1029.896



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Trib 1 Reach = Trib 1 RS = 1494.636

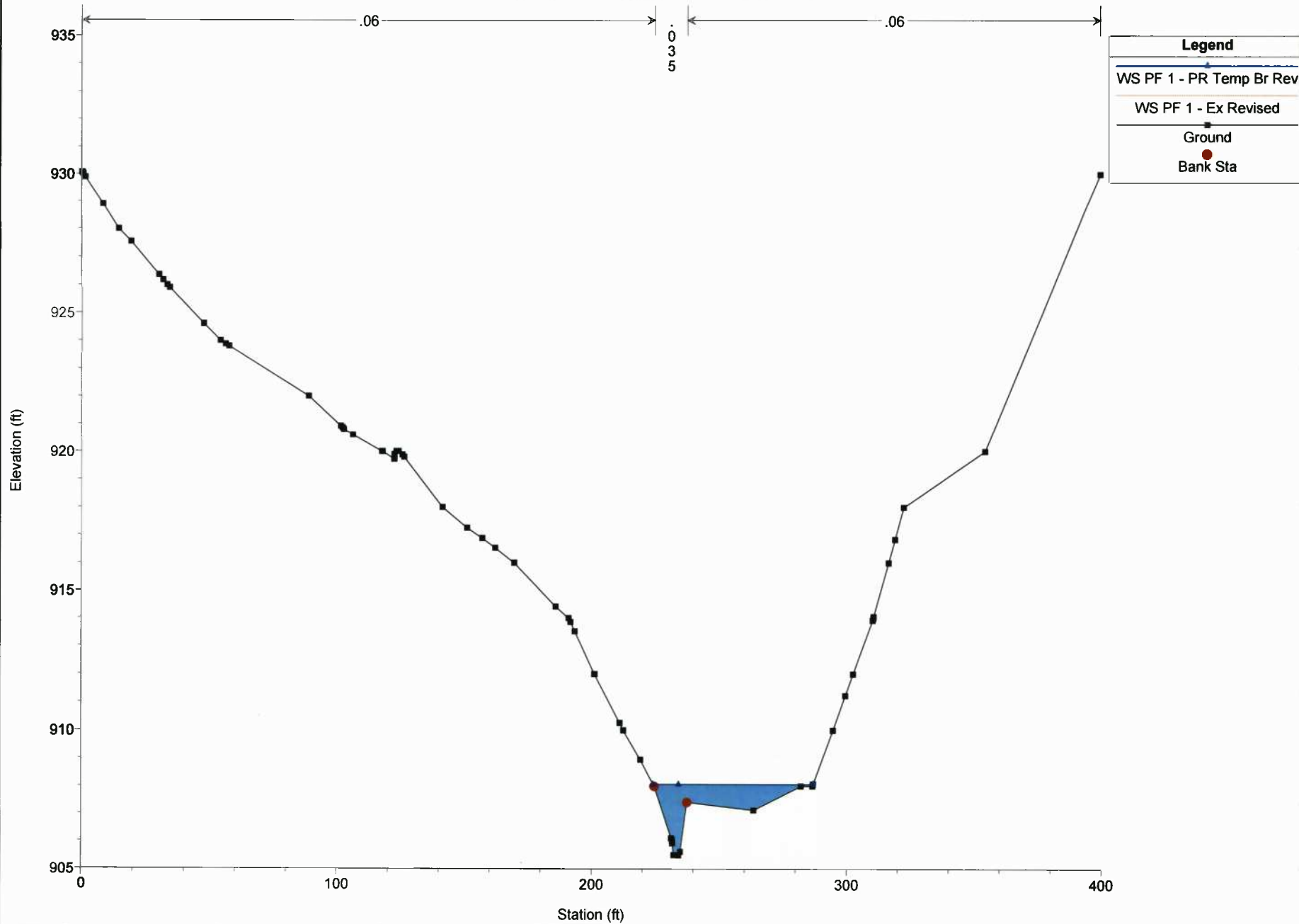


Legend	
WS PF 1 - PR Temp Br Rev	→
WS PF 1 - Ex Revised	←
Ground	■
Bank Sta	●

OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

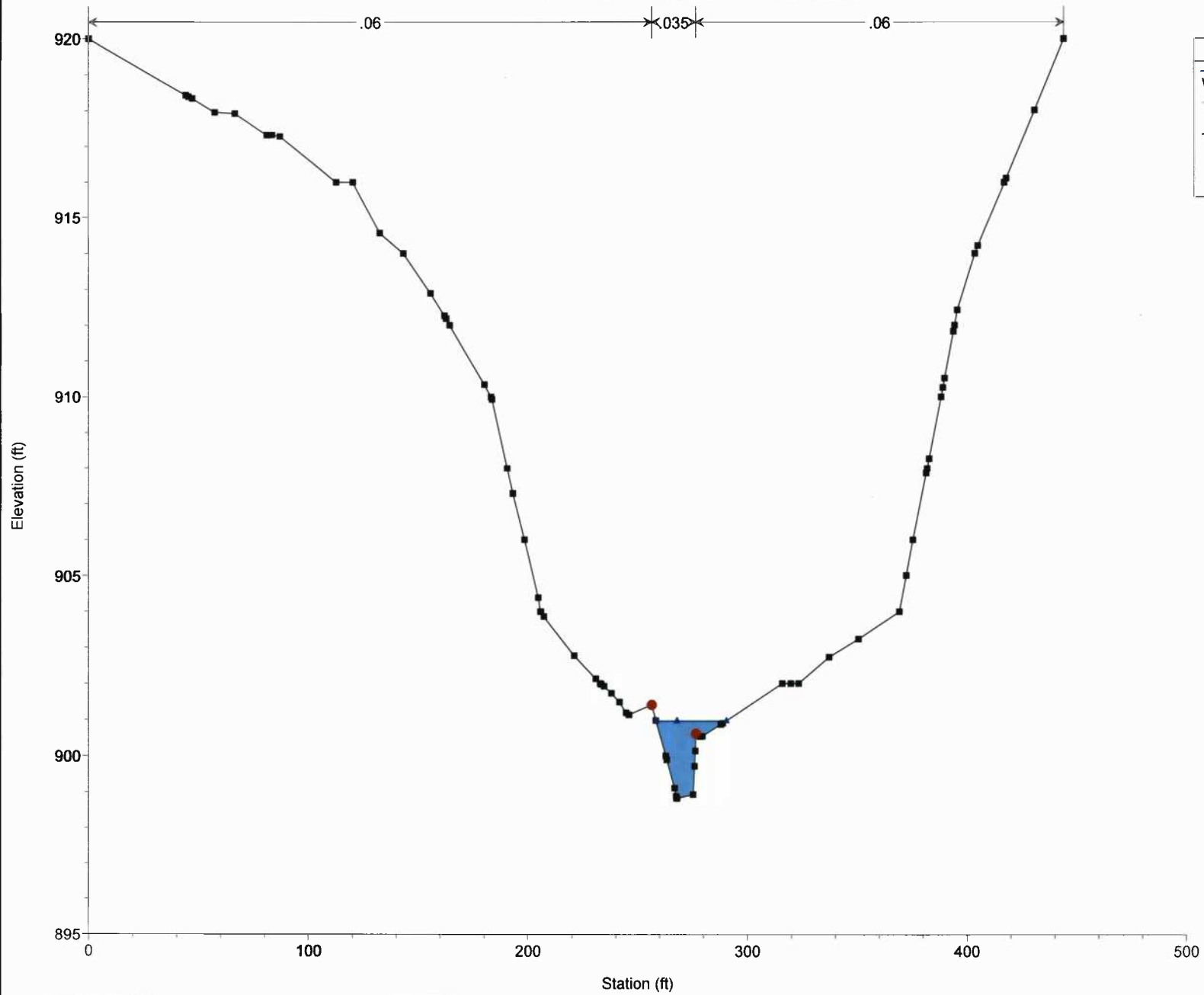
River = Trib 1 Reach = Trib 1 RS = 1352.345



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

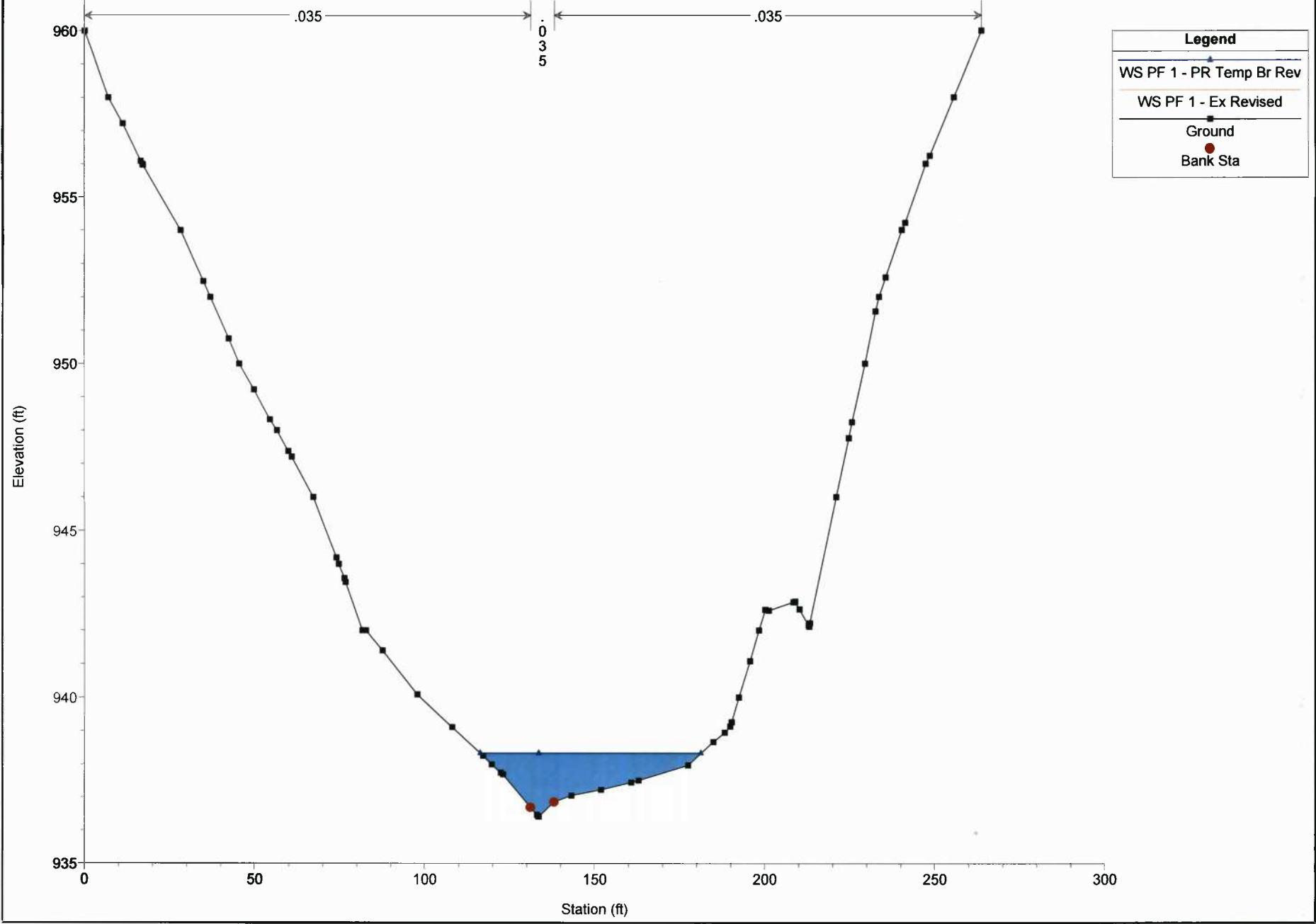
River = Trib 1 Reach = Trib 1 RS = 1083.880



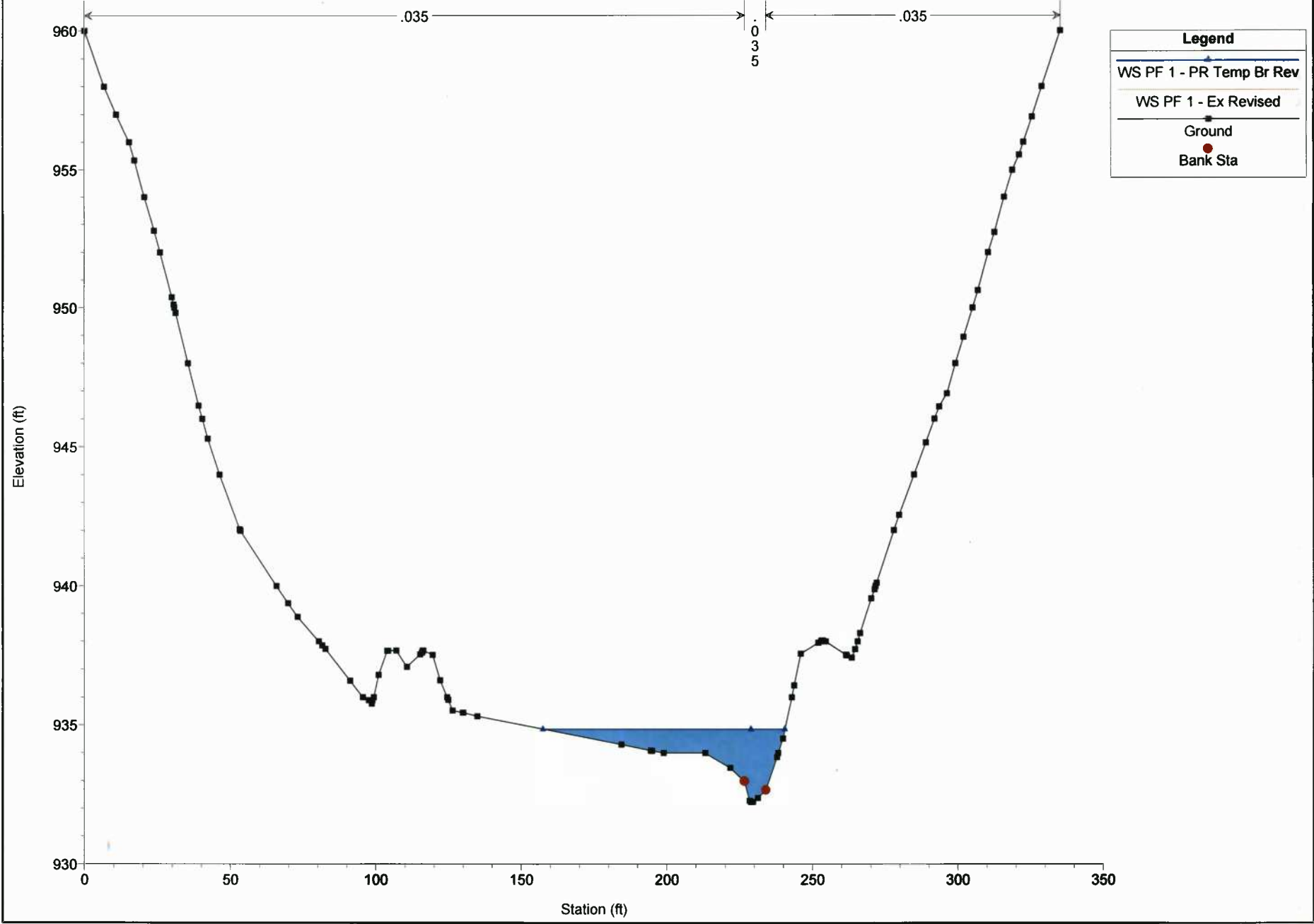
Legend	
WS PF 1 - PR Temp Br Rev	▲
WS PF 1 - Ex Revised	■
Ground	■
Bank Sta	●



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
 River = Trib 2 Reach = Trib 2 RS = 1293.508



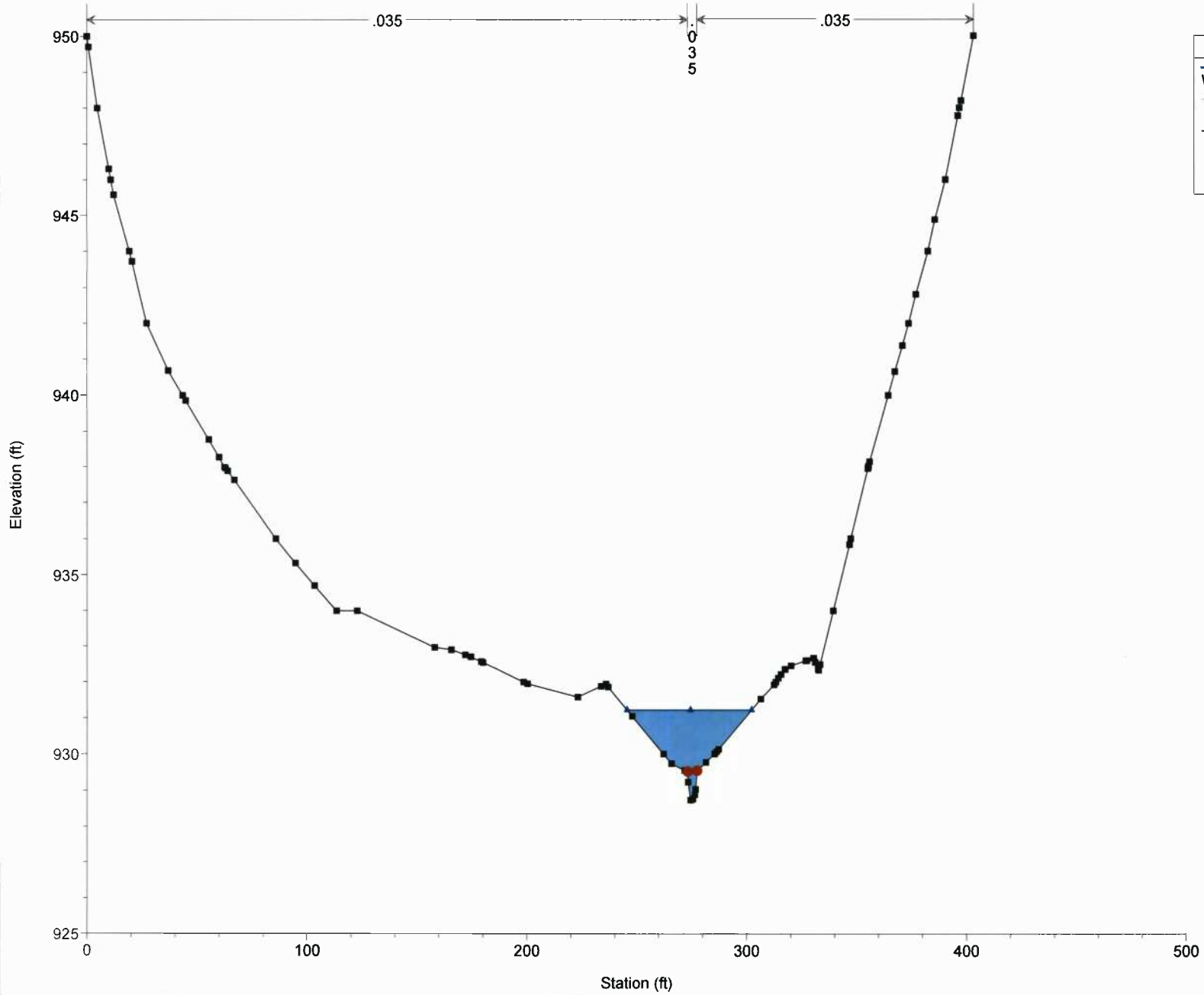
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
 River = Trib 2 Reach = Trib 2 RS = 1159.413



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Trib 2 Reach = Trib 2 RS = 1030.844

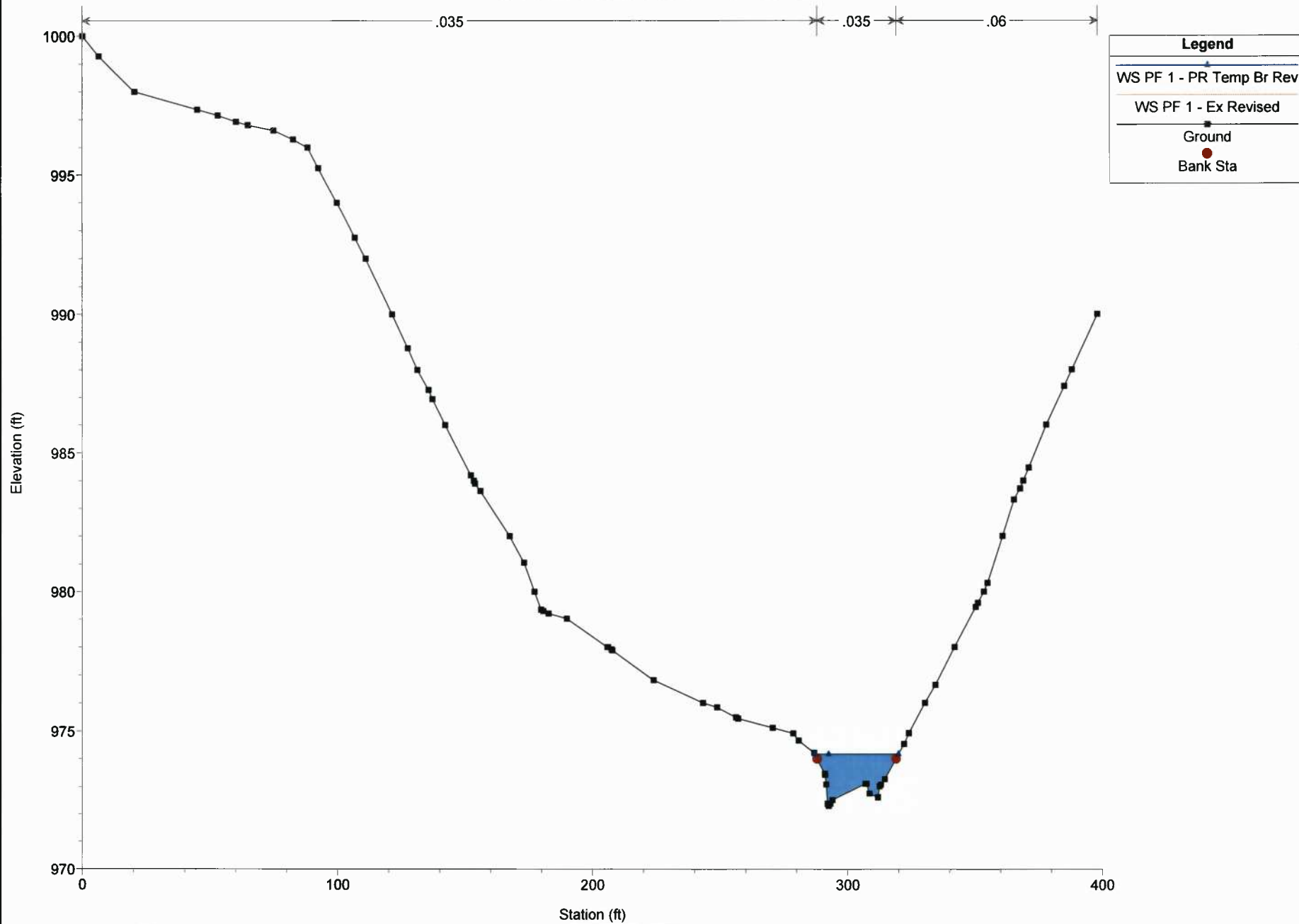


Legend	
WS PF 1 - PR Temp Br Rev	(Blue line with upward-pointing triangles)
WS PF 1 - Ex Revised	(Black line with square markers)
Ground	(Black square)
Bank Sta	(Red circle)

OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

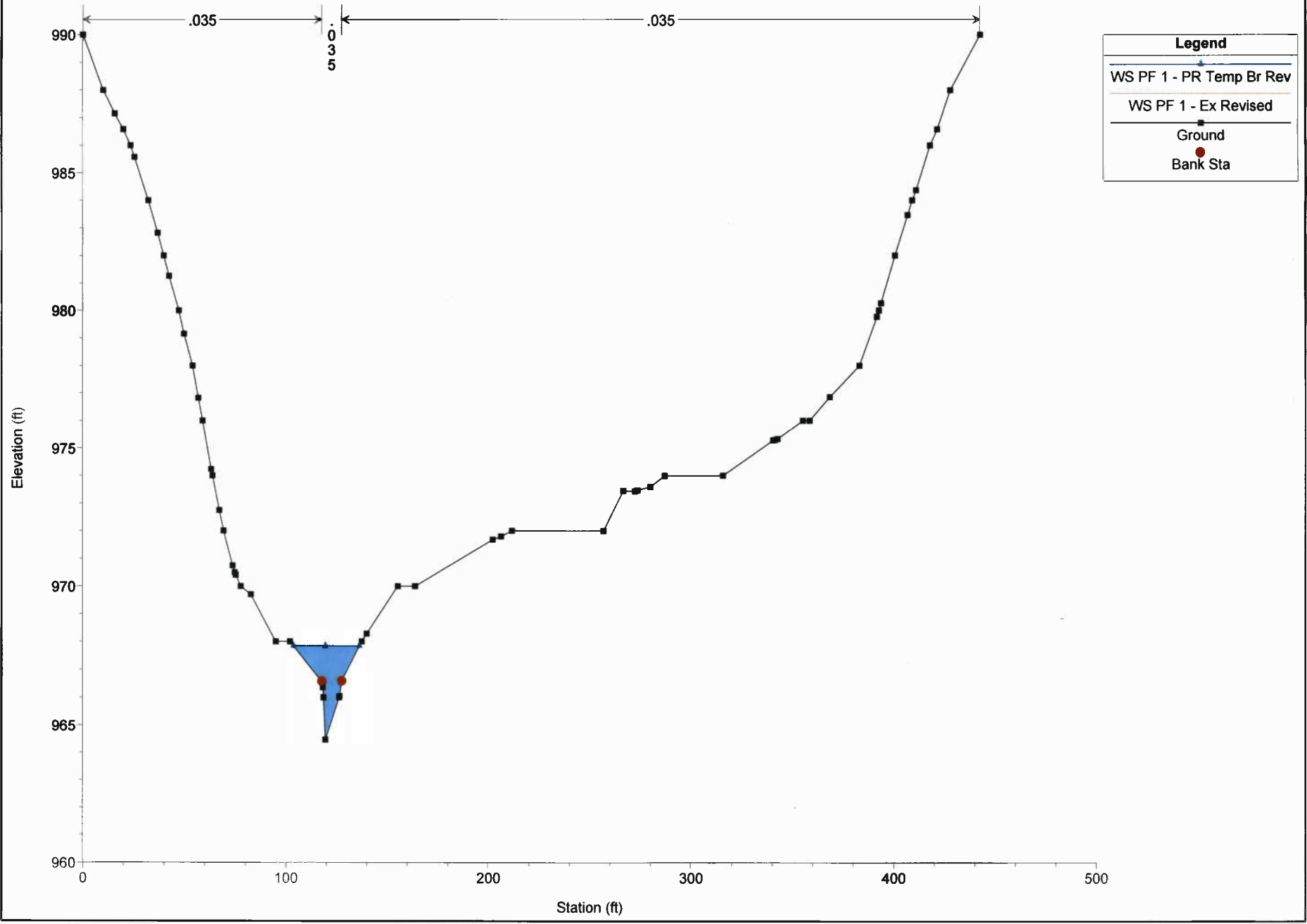
River = Trib 3 Reach = Trib 3 RS = 1842.591



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

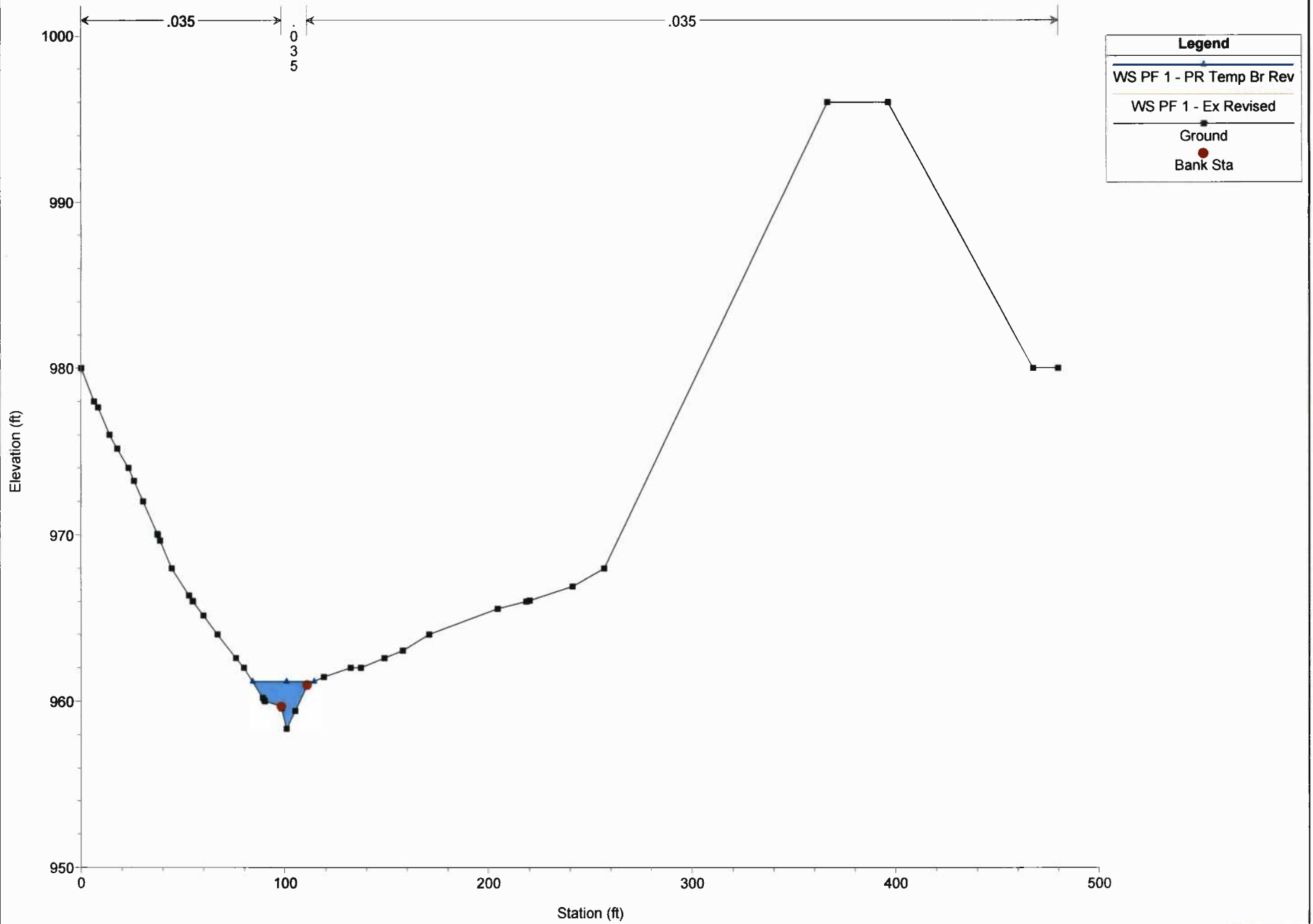
River = Trib 3 Reach = Trib 3 RS = 1574.434



OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

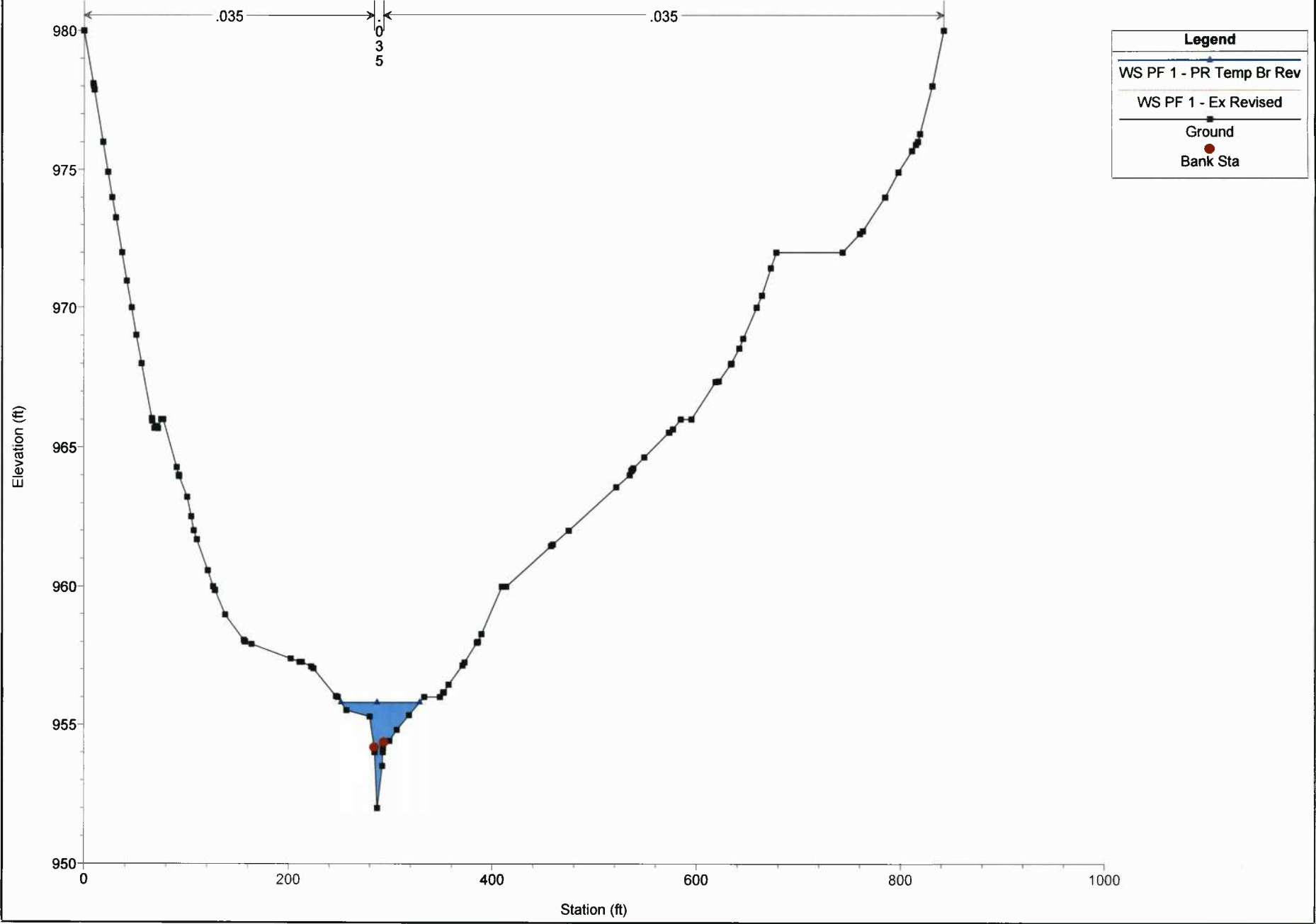
River = Trib 3 Reach = Trib 3 RS = 1370.118



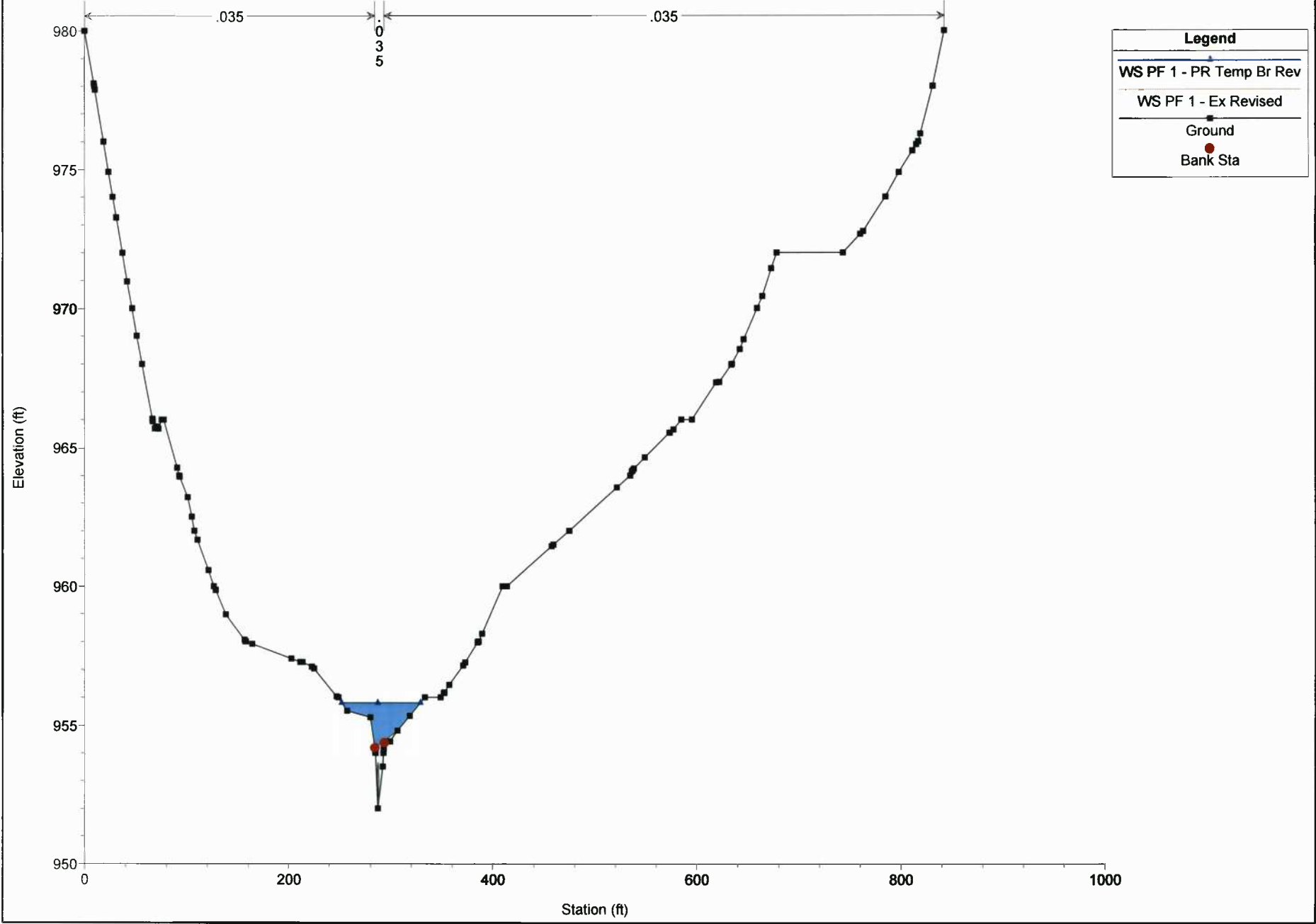
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Trib 3 Reach = Trib 3 RS = 1126.884

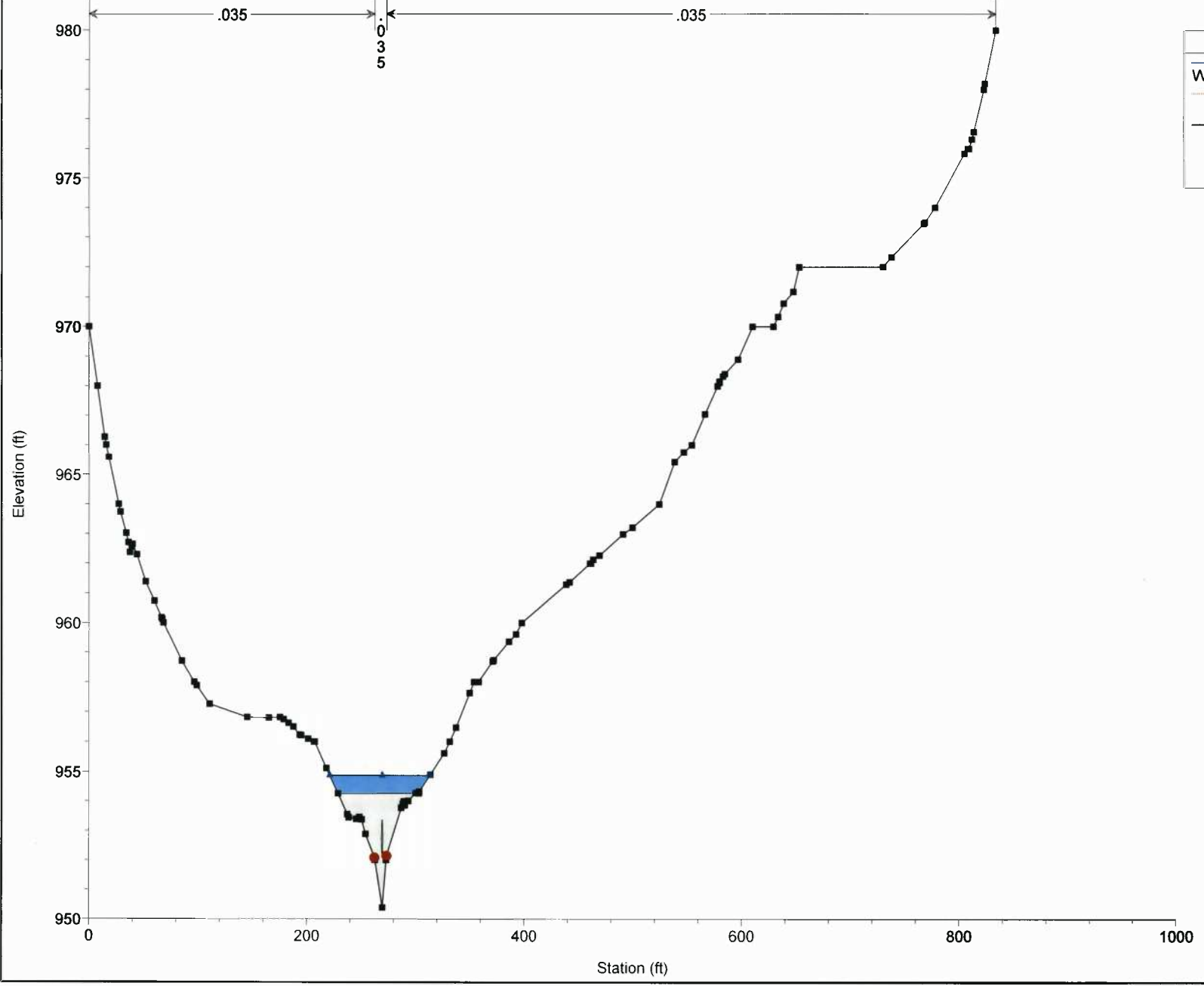


OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
 River = Trib 3 Reach = Trib 3 RS = 1109.439 Culv





OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised  
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised  
 River = Trib 3 Reach = Trib 3 RS = 1109.439 Culv

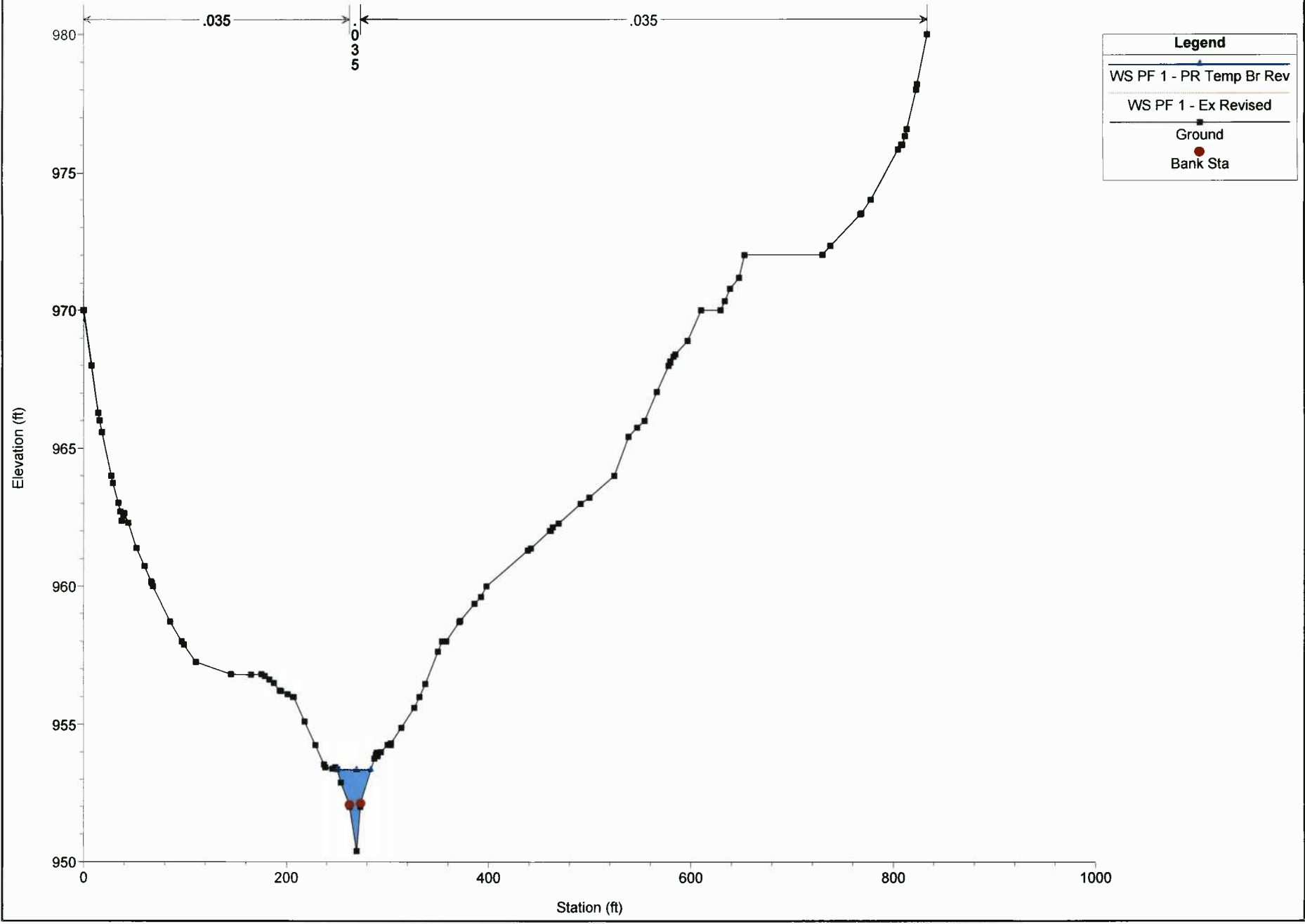


Legend	
—	WS PF 1 - PR Temp Br Rev
—	WS PF 1 - Ex Revised
■	Ground
●	Bank Sta

OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Trib 3 Reach = Trib 3 RS = 1089.963



Legend	
	WS PF 1 - PR Temp Br Rev
	WS PF 1 - Ex Revised
	Ground
	Bank Sta

**Supplement 5**

**HEC-RAS Analysis – Proposed Conditions Summary w/ Cross Sections**

HEC-RAS Version 4.1.0 Jan 2010  
 U.S. Army Corps 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
XXXXXXXX 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: OXF 157-159 Bridges  
 Project File : OXF157-159Bridges.prj  
 Run Date and Time: 5/28/2014 3:57:50 PM

Project in English units

\*\*\*\*\*

PLAN DATA

Plan Title: Ford-Inline  
 Plan File : x:\Navitus Jobfiles\SLS\7889-OXF 159\Engineering\Drainage  
 Comp\Floodplain\Report\Computations\HEC-RAS\Revised2\OXF157-159Bridges.p13

Geometry Title: Ford-Inline  
 Geometry File : x:\Navitus Jobfiles\SLS\7889-OXF 159\Engineering\Drainage  
 Comp\Floodplain\Report\Computations\HEC-RAS\Revised2\OXF157-159Bridges.g08

Flow Title : Structures Revised  
 Flow File : x:\Navitus Jobfiles\SLS\7889-OXF 159\Engineering\Drainage  
 Comp\Floodplain\Report\Computations\HEC-RAS\Revised2\OXF157-159Bridges.f10

Plan Summary Information:

Number of:	Cross Sections = 102	Multiple Openings = 0
	Culverts = 4	Inline Structures = 3
	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: Structures Revised
Flow File : x:\Navitus Jobfiles\SLS\7889-OXF 159\Engineering\Drainage
Comp\Floodplain\Report\Computations\HEC-RAS\Revised2\OXF157-159Bridges.f10

Flow Data (cfs)

Table with 5 columns: River, Reach, RS, PF 1. Rows include Bluestone Creek (Upper, Middle, Lower) and Trib 1, 2, 3.

Boundary Conditions

Table with 5 columns: River, Reach, Profile, Upstream, Downstream. Rows show boundary conditions for Bluestone Creek Upper and Lower reaches.

\*\*\*\*\*

GEOMETRY DATA

Geometry Title: Ford-Inline
Geometry File : x:\Navitus Jobfiles\SLS\7889-OXF 159\Engineering\Drainage
Comp\Floodplain\Report\Computations\HEC-RAS\Revised2\OXF157-159Bridges.g08

Reach Connection Table

OXF157-159Bridges.rep

```

*****
* River          Reach          * Upstream Boundary * Downstream Boundary *
*****
* Bluestone Creek Bluestone Creek *          3          *
* Bluestone Creek Upper          *          2          *
* Bluestone Creek Middle         *          1          *
* Bluestone Creek Lower         *          1          *
* Trib 1          Trib 1         *          1          *
* Trib 2          Trib 2         *          2          *
* Trib 3          Trib 3         *          3          *
*****
    
```

JUNCTION INFORMATION

Name: 1  
 Description:  
 Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Bluestone Creek	Middle	to Bluestone Creek	Lower	20.21	0
Trib 1	Trib 1	to Bluestone Creek	Lower	0	0

Name: 2  
 Description:  
 Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Bluestone Creek	Upper	to Bluestone Creek	Middle	63.02	0
Trib 2	Trib 2	to Bluestone Creek	Middle	0	0

Name: 3  
 Description:  
 Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Bluestone Creek	Bluestone Creek	to Bluestone Creek	Upper	42.49	0
Trib 3	Trib 3	to Bluestone Creek	Upper	0	0

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Bluestone Creek RS: 14659.36

INPUT

Description:  
 Station Elevation Data num= 88  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 \*\*\*\*\*

OXF157-159Bridges.rep

0	979.98	4.21	979.33	10.06	978.32	11.51	978.07	11.89	978
12.03	977.98	13.39	977.69	18.12	976.7	21.11	976	24.01	975.35
29.82	974	32.12	973.48	38.3	972	44.91	971.17	54.84	970
63.61	969.6	88.74	968	111.55	967.08	116.96	966.92	138.27	966.34
148.64	966	150.51	966	155	965.8	166.6	965.4	172.86	965.15
177.28	964.95	187.15	964.54	200.02	964	205.8	964	206.01	963.99
213.75	963.68	217.56	962.24	218.05	961.88	219.92	960.57	220.2	960.33
221.05	960.3	223.73	960.17	226.3	960.42	227.52	961.31	228.49	962
231.18	963.83	231.72	964	236.6	964.52	239.8	964.92	247.61	964.99
251.36	965.15	252.23	965.18	253.23	965.32	253.93	964.97	255.2	964.8
257.08	964.54	259.05	965.7	259.47	966	261.2	967	262.9	968
264.97	969.34	266	970	267.65	970.98	269.44	972	270.97	972.93
272.53	974	274.95	975.59	275.51	976	278.91	976.63	284.65	977.32
290.56	978.05	290.98	978.09	295.97	978.58	296.01	978.57	296.89	978.54
297.25	978.51	297.4	978.51	298.28	978.28	298.98	978	299.52	977.73
300.26	978	300.4	978	301.33	978.4	305.97	980	309.03	980.74
314.88	982	320.93	983.62	322.06	984	322.82	984.25	328.11	986
328.61	986.17	334.23	988	340.27	990				

Manning's n Values num= 3

Sta	n	Val	Sta	n	Val	Sta	n	Val
0	.035	213.75	.035	231.18	.06			

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	213.75	231.18		58.5	87.12	77.46	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 965.44	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.84	* Wt. n-val.	* 0.035	* 0.035	* 0.060
* W.S. Elev (ft)	* 964.60	* Reach Len. (ft)	* 58.50	* 87.12	* 77.46
* Crit W.S. (ft)	* 964.60	* Flow Area (sq ft)	* 13.80	* 53.31	* 2.07
* E.G. Slope (ft/ft)	* 0.008444	* Area (sq ft)	* 13.80	* 53.31	* 2.07
* Q Total (cfs)	* 443.80	* Flow (cfs)	* 33.54	* 408.00	* 2.26
* Top width (ft)	* 52.06	* Top width (ft)	* 28.04	* 17.43	* 6.59
* Vel Total (ft/s)	* 6.42	* Avg. vel. (ft/s)	* 2.43	* 7.65	* 1.09
* Max chl Dpth (ft)	* 4.43	* Hydr. Depth (ft)	* 0.49	* 3.06	* 0.31
* Conv. Total (cfs)	* 4829.5	* Conv. (cfs)	* 365.0	* 4439.9	* 24.6
* Length wtd. (ft)	* 82.94	* Wetted Per. (ft)	* 28.06	* 19.40	* 6.67
* Min Ch El (ft)	* 960.17	* Shear (lb/sq ft)	* 0.26	* 1.45	* 0.16
* Alpha	* 1.32	* Stream Power (lb/ft s)	* 340.27	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.74	* Cum Volume (acre-ft)	* 1.00	* 1.38	* 0.35
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 1.05	* 0.46	* 0.35

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

RIVER: Bluestone Creek  
 REACH: Bluestone Creek RS: 14572.23

INPUT  
 Description:

Station Elevation Data		num= 93		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	980	3.05	979.48	11.86	977.89	13.66	977.59	19.99	976.59		
23.82	976	28.07	975.2	35.99	973.98	37.25	973.76	50.16	972.08		
50.79	972	51.33	971.94	61.97	970.61	66.69	970.19	78.37	969.18		
90.61	968.09	104.42	967.58	113.31	967.22	120.75	966.88	121.99	966.83		
142.46	966.19	143.46	966.17	144.74	966.15	145.6	966.12	148.12	966.01		
165.57	965.26	167.22	965.18	175.77	964.8	177.81	964.75	199.56	964.05		
203.07	963.82	224.89	962.38	227.37	962.19	227.41	962.17	227.75	962		
230.8	961.07	231.1	960.89	231.34	960.8	231.85	960.81	237.82	960		
237.83	960	238.68	960.96	239.58	961.36	242.13	961.61	242.14	961.62		
245.04	962.07	247.43	962.54	248.06	962.61	251.16	962.86	253.9	963.04		
256.99	963.88	260.52	964	267.49	964	269.4	964.06	269.43	964.07		
271.37	964.22	272.66	964.32	272.99	964.1	273.09	964.03	273.13	964		
273.58	963.7	276.12	963.54	276.71	963.69	277.39	964	278.82	964.65		
281.62	966	283.91	966.97	286.11	968	289.1	969.27	290.74	970		
292.5	970.83	295.29	972	299.04	973.61	299.7	973.91	300	974		
303.23	975.6	304.55	976	307.61	977.61	308.36	978	308.79	978.23		
314.53	980	315.77	980.17	318.75	980.52	320.47	980.69	322.26	981.07		
327.17	982	331.85	983.22	333.9	984	337.85	985.53	339.15	986		
343.94	987.73	344.7	988	350.12	990						

Manning's n Values		num= 3		Sta n Val		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.035	227.37	.035	239.58	.06		

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 227.37 239.58 35.73 28.43 82.26 .1 .3

Blocked Obstructions			num= 1
Sta L	Sta R	Elev	
272.66	350.12	964.32	

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 964.62	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.78	* Wt. n-Val.	* 0.035	* 0.035	* 0.060
* W.S. Elev (ft)	* 963.84	* Reach Len. (ft)	* 35.73	* 28.43	* 82.26



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* Crit W.S. (ft)	* 963.84	* Flow Area (sq ft)	* 20.01	* 36.64	* 23.33
* E.G. Slope (ft/ft)	* 0.009567	* Area (sq ft)	* 20.01	* 36.64	* 23.33
* Q Total (cfs)	* 443.80	* Flow (cfs)	* 72.30	* 303.03	* 68.47
* Top Width (ft)	* 54.08	* Top width (ft)	* 24.61	* 12.21	* 17.26
* Vel Total (ft/s)	* 5.55	* Avg. Vel. (ft/s)	* 3.61	* 8.27	* 2.94
* Max chl Dpth (ft)	* 3.84	* Hydr. Depth (ft)	* 0.81	* 3.00	* 1.35
* Conv. Total (cfs)	* 4537.3	* Conv. (cfs)	* 739.2	* 3098.1	* 700.0
* Length Wtd. (ft)	* 28.43	* Wetted Per. (ft)	* 24.67	* 13.03	* 17.49
* Min Ch El (ft)	* 960.00	* Shear (lb/sq ft)	* 0.48	* 1.68	* 0.80
* Alpha	* 1.63	* Stream Power (lb/ft s)	* 350.12	* 0.00	* 0.00
* Frctn Loss (ft)	*	* Cum Volume (acre-ft)	* 0.97	* 1.29	* 0.33
* C & E Loss (ft)	*	* Cum SA (acres)	* 1.01	* 0.43	* 0.33

Warning: During subcritical analysis, the water surface upstream of culvert went to critical depth.

CULVERT

RIVER: Bluestone Creek  
 REACH: Bluestone Creek RS: 14557.54

INPUT

Description:

Distance from Upstream XS = 9.4  
 Deck/Roadway width = 10  
 Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num= 2

Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord

\*\*\*\*\*  
 227.37 962.19 0 245.04 962.07 0

Upstream Bridge Cross Section Data

Station Elevation Data num= 93

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	980	3.05	979.48	11.86	977.89	13.66	977.59	19.99	976.59
23.82	976	28.07	975.2	35.99	973.98	37.25	973.76	50.16	972.08
50.79	972	51.33	971.94	61.97	970.61	66.69	970.19	78.37	969.18
90.61	968.09	104.42	967.58	113.31	967.22	120.75	966.88	121.99	966.83
142.46	966.19	143.46	966.17	144.74	966.15	145.6	966.12	148.12	966.01
165.57	965.26	167.22	965.18	175.77	964.8	177.81	964.75	199.56	964.05
203.07	963.82	224.89	962.38	227.37	962.19	227.41	962.17	227.75	962
230.8	961.07	231.1	960.89	231.34	960.8	231.85	960.81	237.82	960
237.83	960	238.68	960.96	239.58	961.36	242.13	961.61	242.14	961.62
245.04	962.07	247.43	962.54	248.06	962.61	251.16	962.86	253.9	963.04
256.99	963.88	260.52	964	267.49	964	269.4	964.06	269.43	964.07
271.37	964.22	272.66	964.32	272.99	964.1	273.09	964.03	273.13	964
273.58	963.7	276.12	963.54	276.71	963.69	277.39	964	278.82	964.65
281.62	966	283.91	966.97	286.11	968	289.1	969.27	290.74	970
292.5	970.83	295.29	972	299.04	973.61	299.7	973.91	300	974

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303.23	975.6	304.55	976	307.61	977.61	308.36	978	308.79	978.23
314.53	980	315.77	980.17	318.75	980.52	320.47	980.69	322.26	981.07
327.17	982	331.85	983.22	333.9	984	337.85	985.53	339.15	986
343.94	987.73	344.7	988	350.12	990				

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .035 227.37 .035 239.58 .06

Bank Sta: Left Right Coeff Contr. Expan.  
 227.37 239.58 .1 .3

Blocked Obstructions num= 1  
 Sta L Sta R Elev  
 \*\*\*\*\*  
 272.66 350.12 964.32

Downstream Deck/Roadway Coordinates  
 num= 2  
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord  
 \*\*\*\*\*  
 207.08 962.06 0 241.24 962.02 0

Downstream Bridge Cross Section Data  
 Station Elevation Data num= 85  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 \*\*\*\*\*  
 0 980 3.13 978.99 5.82 978 8.91 976.85 9.87 976.63  
 13.32 976 18.7 975.07 24.76 974 34.48 972.4 37.37 972  
 42.13 971.4 53.36 970 58.46 969.48 62.67 969.32 77.6 968.02  
 78 968 85.09 967.69 104.64 966.27 107.8 966.14 113.26 966  
 117.63 966 119.66 965.91 147.18 964.86 159.88 964.37 168.48 964.06  
 169.65 964 178.72 964 199.86 962.55 207.08 962.06 207.19 962.05  
 207.92 962 208.5 962 212.76 961.68 218.2 961.38 221.49 960.52  
 223.39 960 224.91 959.63 225.38 959.45 232.6 959.53 235.66 959.67  
 236.44 960 237.08 960.35 240.36 961.86 240.37 961.88 241.3 962.02  
 243.7 962.34 248.99 963.15 253.81 963.76 255.68 963.83 261.36 963.9  
 266.39 963.96 266.49 963.97 266.64 963.97 268.25 964.01 269.34 964.03  
 269.5 964 272.29 962.65 272.31 962.64 272.32 962.65 273.68 964  
 276.08 965.98 276.09 966 276.11 966.02 276.51 966.41 278.31 968  
 279.53 968.96 280.72 970 282.22 971.46 282.83 972 285.02 973.95  
 285.07 974 285.11 974.03 287.35 976 288.75 977.15 289.72 978  
 291.4 979.61 291.81 980 292.17 980.31 294.19 982 295.94 982.65  
 299.24 984 301.43 984.67 305.63 986 307.39 986.54 307.48 986.57

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .035 218.2 .035 240.36 .035

Bank Sta: Left Right Coeff Contr. Expan.  
 218.2 240.36 .1 .3

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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 Culverts = 1

Culvert Name Shape Rise Span  
 Culvert #1 Circular 1.67  
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert  
 FHWA Scale # 3 - Pipe projecting from fill  
 Solution Criteria = Highest U.S. EG

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	4.94	19.51	.024	.024	0	.9	1

Number of Barrels = 3  
 Upstream Elevation = 960.16  
 Centerline Stations

Sta.	Sta.	Sta.
234.6	236.3	238.3

Downstream Elevation = 959.43  
 Centerline Stations

Sta.	Sta.	Sta.
228.4	230.4	232.6

CULVERT OUTPUT Profile #PF 1 Culv Group: Culvert #1

```
*****
* Q Culv Group (cfs)      * 41.85 * Culv Full Len (ft)    * 19.51 *
* # Barrels              * 3    * Culv Vel US (ft/s)   * 6.37 *
* Q Barrel (cfs)        * 13.95 * Culv Vel DS (ft/s)  * 6.37 *
* E.G. US. (ft)         * 964.58 * Culv Inv El Up (ft) * 960.16 *
* W.S. US. (ft)         * 963.84 * Culv Inv El Dn (ft) * 959.43 *
* E.G. DS (ft)          * 963.35 * Culv Frctn Ls (ft)  * 0.66 *
* W.S. DS (ft)          * 962.51 * Culv Exit Loss (ft) * 0.00 *
* Delta EG (ft)         * 1.23 * Culv Entr Loss (ft) * 0.57 *
* Delta WS (ft)         * 1.33 * Q Weir (cfs)        * 401.95 *
* E.G. IC (ft)          * 964.55 * Weir Sta Lft (ft)   * 182.98 *
* E.G. OC (ft)          * 964.58 * Weir Sta Rgt (ft)   * 278.67 *
* Culvert Control       * Outlet * Weir Submerg        * 0.08 *
* Culv WS Inlet (ft)    * 961.83 * Weir Max Depth (ft) * 2.51 *
* Culv WS Outlet (ft)   * 961.10 * Weir Avg Depth (ft) * 1.24 *
* Culv Nml Depth (ft)   *      * Weir Flow Area (sq ft) * 118.70 *
* Culv Crt Depth (ft)   * 1.40 * Min El Weir Flow (ft) * 962.08 *
*****
```

Warning: During subcritical analysis, the water surface upstream of culvert went to critical depth.

CROSS SECTION

OXF157-159Bridges.rep

RIVER: Bluestone Creek  
 REACH: Bluestone Creek RS: 14543.33

INPUT  
 Description:

Station Elevation Data num= 85

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	980	3.13	978.99	5.82	978	8.91	976.85	9.87	976.63
13.32	976	18.7	975.07	24.76	974	34.48	972.4	37.37	972
42.13	971.4	53.36	970	58.46	969.48	62.67	969.32	77.6	968.02
78	968	85.09	967.69	104.64	966.27	107.8	966.14	113.26	966
117.63	966	119.66	965.91	147.18	964.86	159.88	964.37	168.48	964.06
169.65	964	178.72	964	199.86	962.55	207.08	962.06	207.19	962.05
207.92	962	208.5	962	212.76	961.68	218.2	961.38	221.49	960.52
223.39	960	224.91	959.63	225.38	959.45	232.6	959.53	235.66	959.67
236.44	960	237.08	960.35	240.36	961.86	240.37	961.88	241.3	962.02
243.7	962.34	248.99	963.15	253.81	963.76	255.68	963.83	261.36	963.9
266.39	963.96	266.49	963.97	266.64	963.97	268.25	964.01	269.34	964.03
269.5	964	272.29	962.65	272.31	962.64	272.32	962.65	273.68	964
276.08	965.98	276.09	966	276.11	966.02	276.51	966.41	278.31	968
279.53	968.96	280.72	970	282.22	971.46	282.83	972	285.02	973.95
285.07	974	285.11	974.03	287.35	976	288.75	977.15	289.72	978
291.4	979.61	291.81	980	292.17	980.31	294.19	982	295.94	982.65
299.24	984	301.43	984.67	305.63	986	307.39	986.54	307.48	986.57

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	218.2	.035	240.36	.035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 218.2 240.36 183.08 169.22 151.23 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 963.35	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.84	* Wt. n-val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 962.51	* Reach Len. (ft)	* 183.08	* 169.22	* 151.23
* Crit w.s. (ft)	* 962.51	* Flow Area (sq ft)	* 10.39	* 53.81	* 1.42
* E.G. Slope (ft/ft)	* 0.010300	* Area (sq ft)	* 10.39	* 53.81	* 1.42
* Q Total (cfs)	* 443.80	* Flow (cfs)	* 31.27	* 409.72	* 2.82
* Top width (ft)	* 44.38	* Top width (ft)	* 17.76	* 22.16	* 4.45
* Vel Total (ft/s)	* 6.76	* Avg. vel. (ft/s)	* 3.01	* 7.61	* 1.99
* Max Chl Dpth (ft)	* 3.06	* Hydr. Depth (ft)	* 0.58	* 2.43	* 0.32
* Conv. Total (cfs)	* 4372.9	* Conv. (cfs)	* 308.1	* 4037.1	* 27.8
* Length Wtd. (ft)	* 169.29	* Wetted Per. (ft)	* 17.80	* 22.91	* 4.51
* Min Ch El (ft)	* 959.45	* Shear (lb/sq ft)	* 0.38	* 1.51	* 0.20
* Alpha	* 1.18	* Stream Power (lb/ft s)	* 307.48	* 0.00	* 0.00
* Frctn Loss (ft)	* 1.67	* Cum Volume (acre-ft)	* 0.97	* 1.21	* 0.33
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 0.99	* 0.42	* 0.31

OXF157-159Bridges.rep

\*\*\*\*\*

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: Bluestone Creek

REACH: Bluestone Creek RS: 14371.96

INPUT

Description:

Station Elevation Data		num= 90									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	980	4.57	978	7.82	976.72	9.5	976	11.45	975.19		
14.28	974	17.54	972.62	18.97	972	22.82	970.54	24.67	970		
25.7	969.68	31.45	968	37.99	966.59	41.53	966	54.25	965.08		
74.28	964	96.81	963.17	119.43	962	153.31	960.92	154.77	960.88		
155.61	960.87	182.46	960.38	184.8	960.4	186.96	960.41	200.27	960.12		
201.82	960.13	206.41	960.14	207.51	960.14	223.38	960	230.86	960		
232.26	959.95	233.99	959.9	234.64	959.45	236.77	958	238.6	956.66		
239.74	956	239.85	955.98	240.21	955.75	241.92	955.82	245.81	956		
245.84	956	245.94	956.03	248.24	957.43	249.65	958	249.94	958.16		
250.14	958.24	251.34	958.5	260.99	960	267.46	960	271.67	960.51		
273.63	960.45	274.08	960.47	274.47	960.49	277.38	961.9	277.43	961.91		
277.7	961.91	284.83	962.07	289.89	962.17	290.13	962.09	290.37	962		
291.58	961.57	292.06	961.52	292.07	961.52	294.15	961.07	294.63	960.93		
295.94	961.92	296.04	962	298.32	963.73	298.65	964	299.04	964.29		
301.29	966	303.89	967.96	303.94	968	304	968.05	306.54	970		
307.79	970.93	309.11	972	310.68	972.78	311.33	973.17	312.38	974		
316.38	975.8	316.59	975.9	316.78	976	316.87	976.05	320.66	978		
322.99	979.23	324.41	980	325.88	980.53	330.82	982	338.37	984		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.035	233.99	.035	250.14	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	233.99	250.14		183.56	178.06	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

```

*****
* E.G. Elev (ft)      * 961.13 * Element      * Left OB * Channel * Right OB *
* Vel Head (ft)      * 1.02  * Wt. n-Val.   * 0.035  * 0.035  * 0.060  *
* W.S. Elev (ft)     * 960.11 * Reach Len. (ft) * 183.56 * 178.06 * 171.27 *
* Crit W.S. (ft)     * 959.81 * Flow Area (sq ft) * 2.04  * 51.02  * 11.17  *
* E.G. Slope (ft/ft) * 0.009495 * Area (sq ft) * 2.04  * 51.02  * 11.17  *
* Q Total (cfs)      * 443.80 * Flow (cfs)    * 1.67  * 422.80 * 19.33  *
* Top Width (ft)     * 57.59 * Top width (ft) * 23.20 * 16.15  * 18.24  *
* Vel Total (ft/s)   * 6.91  * Avg. vel. (ft/s) * 0.82  * 8.29  * 1.73  *
* Max Chl Dpth (ft) * 4.36  * Hydr. Depth (ft) * 0.09  * 3.16  * 0.61  *
* Conv. Total (cfs)  * 4554.6 * Conv. (cfs)   * 17.2  * 4339.1 * 198.4  *
* Length Wtd. (ft)  * 178.92 * Wetted Per. (ft) * 23.20 * 17.99 * 18.39 *
* Min Ch El (ft)    * 955.75 * Shear (lb/sq ft) * 0.05  * 1.68  * 0.36  *
* Alpha              * 1.37  * Stream Power (lb/ft s) * 338.37 * 0.00  * 0.00  *
* Frctn Loss (ft)   * 1.71  * Cum Volume (acre-ft) * 0.95  * 1.01  * 0.30  *
* C & E Loss (ft)   * 0.08  * Cum SA (acres) * 0.91  * 0.35  * 0.27  *
*****
    
```

Warning: The energy loss was 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: Bluestone Creek  
 REACH: Bluestone Creek RS: 14193.22

INPUT  
 Description:

Station Elevation Data		num= 76		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	980	6.95	978	8.59	977.51	14.05	976	18.9	974.63
21.16	974	24.63	973.22	30.54	972	39.73	970.11	40.29	970
41.01	969.85	47.1	968	49.93	967.14	54.9	966	55.4	965.9
68.5	964	80.78	963.35	87.43	962.91	90.6	962.78	93.54	962.6
95.37	962.45	105.01	962	108	962	119.05	961.82	119.58	961.82
170.51	961.53	174.83	961.51	176.18	961.51	204.07	960.94	204.59	960.93
235.6	960	268.28	958.19	269.3	958.13	269.55	958.12	271.67	958
272.88	957.94	298.42	956.47	300.15	956.1	300.85	956	301.49	955.85
302.07	955.53	303	955.59	308.33	955.42	309.41	955.97	309.46	956
309.75	956.14	311.76	958	313.6	959.61	315.11	960	317.74	960.39
330.27	961.54	337.68	961.48	343.32	961.45	343.4	961.44	345.03	961.39
346.7	961.11	347.39	960.82	347.62	960.79	348.71	960.6	349.28	961.19
350.05	962	350.94	962.89	352.02	964	353.24	965.42	353.82	966
355.41	967.7	355.71	968	357.65	970.03	360.54	972	362.24	973.58
362.79	974	363.37	974.55	365.01	976	365.96	976.91	367.09	978
369.25	980								

Manning's n Values num= 3

Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .035 298.42 .035 309.75 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 298.42 309.75 191.71 148.15 175.74 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

\*\*\*\*\*  
 \* E.G. Elev (ft) \* 959.34 \* Element \* Left OB \* Channel \* Right OB \*  
 \* Vel Head (ft) \* 0.74 \* Wt. n-Val. \* 0.035 \* 0.035 \* 0.060 \*  
 \* W.S. Elev (ft) \* 958.59 \* Reach Len. (ft) \* 191.71 \* 148.15 \* 175.74 \*  
 \* Crit W.S. (ft) \* 958.59 \* Flow Area (sq ft) \* 39.37 \* 32.44 \* 3.26 \*  
 \* E.G. Slope (ft/ft) \* 0.009609 \* Area (sq ft) \* 39.37 \* 32.44 \* 3.26 \*  
 \* Q Total (cfs) \* 443.80 \* Flow (cfs) \* 169.29 \* 267.15 \* 7.36 \*  
 \* Top Width (ft) \* 51.44 \* Top width (ft) \* 37.42 \* 11.33 \* 2.69 \*  
 \* Vel Total (ft/s) \* 5.91 \* Avg. vel. (ft/s) \* 4.30 \* 8.24 \* 2.26 \*  
 \* Max Chl Dpth (ft) \* 3.17 \* Hydr. Depth (ft) \* 1.05 \* 2.86 \* 1.21 \*  
 \* Conv. Total (cfs) \* 4527.4 \* Conv. (cfs) \* 1727.0 \* 2725.3 \* 75.1 \*  
 \* Length Wtd. (ft) \* 158.60 \* Wetted Per. (ft) \* 37.48 \* 11.65 \* 3.64 \*  
 \* Min Ch El (ft) \* 955.42 \* Shear (lb/sq ft) \* 0.63 \* 1.67 \* 0.54 \*  
 \* Alpha \* 1.37 \* Stream Power (lb/ft s) \* 369.25 \* 0.00 \* 0.00 \*  
 \* Frctn Loss (ft) \* 1.62 \* Cum volume (acre-ft) \* 0.86 \* 0.84 \* 0.28 \*  
 \* C & E Loss (ft) \* 0.00 \* Cum SA (acres) \* 0.78 \* 0.29 \* 0.23 \*  
 \*\*\*\*\*

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.

Warning: The energy loss was 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: Bluestone Creek  
 REACH: Bluestone Creek RS: 14044.56

INPUT

Description:

Station Elevation Data num= 97  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 \*\*\*\*\*  
 0 980 5.84 978 8.26 977.24 11.92 976 14.67 975.3  
 19.55 974 25.61 972.5 27.57 972 34.85 970.19 35.59 970  
 43.36 968.1 43.74 968 45.43 967.66 54.19 966 62.33 964.6

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65.89	964	71.11	963.56	92.69	962	122.77	960.63	130.31	960.3
130.9	960.28	136.43	960	137.62	960	147.5	959.47	159.91	959.06
171.62	958.93	174.03	958.85	197.43	958.5	212.52	958.22	213.19	958.23
224.22	958.11	225.14	958.12	229.45	958.08	229.56	958.08	244.33	958.07
244.66	958.07	250.32	958	269.78	958	276.14	957.68	293.44	956.87
312	956	318.39	955.44	330.15	954.38	332.69	954.03	332.84	954
333.07	954	333.23	953.99	339.66	953.61	339.76	953.73	340	954
340.68	954.68	343.85	956	344.35	956.22	344.81	956.41	368.09	957.67
374.1	957.92	376	958	376.19	958.02	383.73	958.76	383.75	958.76
387.93	958.52	393.62	958.51	394.07	958.61	395.58	958.68	397.3	958.49
397.64	958.44	400.26	959.23	402.02	960	402.93	960.42	406.48	962
410.22	963.66	410.64	963.84	410.74	963.9	413.39	965.8	413.65	966
416.59	967.89	416.75	968	417.29	968.33	420.04	970	421.23	970.76
422.83	972	424.7	973.19	425.76	974	427.37	975.46	428.12	976
430.35	977.71	430.74	978	431.33	978.43	433.67	980	436.35	982
437.61	982.88	438.89	984	440.84	985.6	441.6	986	443	986.63
446.41	988	451.45	990						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	318.39	.035	344.81	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	318.39	344.81		187.81	191.69	193.78	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 957.50	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.74	* Wt. n-Val.	* 0.035	* 0.035	* 0.060
* W.S. Elev (ft)	* 956.75	* Reach Len. (ft)	* 187.81	* 191.69	* 193.78
* Crit W.S. (ft)	* 956.75	* Flow Area (sq ft)	* 12.67	* 56.29	* 1.09
* E.G. Slope (ft/ft)	* 0.010927	* Area (sq ft)	* 12.67	* 56.29	* 1.09
* Q Total (cfs)	* 443.80	* Flow (cfs)	* 38.34	* 404.59	* 0.88
* Top Width (ft)	* 55.26	* Top width (ft)	* 22.48	* 26.42	* 6.36
* Vel Total (ft/s)	* 6.33	* Avg. Vel. (ft/s)	* 3.03	* 7.19	* 0.80
* Max Chl Dpth (ft)	* 3.14	* Hydr. Depth (ft)	* 0.56	* 2.13	* 0.17
* Conv. Total (cfs)	* 4245.5	* Conv. (cfs)	* 366.8	* 3870.4	* 8.4
* Length Wtd. (ft)	* 190.81	* Wetted Per. (ft)	* 22.52	* 27.31	* 6.37
* Min Ch El (ft)	* 953.61	* Shear (lb/sq ft)	* 0.38	* 1.41	* 0.12
* Alpha	* 1.19	* Stream Power (lb/ft s)	* 451.45	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.96	* Cum Volume (acre-ft)	* 0.75	* 0.69	* 0.27
* C & E Loss (ft)	* 0.15	* Cum SA (acres)	* 0.65	* 0.23	* 0.21

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

RIVER: Bluestone Creek  
 REACH: Bluestone Creek RS: 13852.52

INPUT  
 Description:

Station Elevation Data num= 78

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	970	30.62	968.08	31.99	968	33.37	967.9	35.79	967.71
56.67	966.41	63.01	966	65.69	965.81	69.49	965.56	85.32	964.53
90.62	964	107.61	962.8	125.37	962	139.15	961.18	143.88	961.02
154.43	960.54	158.65	960.33	166.86	960	181.94	959.4	214.59	958
249.49	956	258.37	955.38	275.98	954	289.95	954	297.04	953.9
315.85	953.64	316.74	953.64	330.1	953.18	331.71	952.73	333.97	952
336.19	951.36	337.43	950.96	343.64	951.6	343.67	951.6	343.74	951.64
344.71	952	347.16	953.41	347.19	953.43	348.66	953.56	354.9	954
355.38	954	367.24	954.87	376.14	956	380.3	956.54	383.14	956.91
387.74	957.5	393.66	957.71	400.51	957.83	401.16	957.8	401.63	957.77
403.08	957.56	404.37	957.37	404.72	957.67	405.16	958	406.48	959.72
406.73	960	407.14	960.5	408.98	962	409.36	962.25	409.8	962.65
410.36	963.1	411.54	964	413.03	965.34	413.75	966	414.56	966.62
416.14	968	417.99	969.49	418.54	970	419.4	970.67	420.92	972
422.78	973.5	423.34	974	423.86	974.42	425.81	976	427.23	977.24
428.22	978	429.17	978.79	430.49	979.87				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	330.1	.035	347.16	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	330.1	347.16		350.42	192.57	163.42	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 955.21	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.23	* Wt. n-Val.	* 0.035	* 0.035	* 0.060
* W.S. Elev (ft)	* 954.98	* Reach Len. (ft)	* 350.42	* 192.57	* 163.42
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 72.02	* 53.18	* 16.69

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```

* E.G. Slope (ft/ft)      *0.002898 * Area (sq ft)          * 72.02 * 53.18 * 16.69 *
* Q Total (cfs)          * 443.80 * Flow (cfs)           * 173.30 * 251.41 * 19.09 *
* Top Width (ft)        * 104.62 * Top width (ft)       * 66.62 * 17.06 * 20.94 *
* Vel Total (ft/s)      * 3.13 * Avg. vel. (ft/s)    * 2.41 * 4.73 * 1.14 *
* Max Chl Dpth (ft)    * 4.02 * Hydr. Depth (ft)    * 1.08 * 3.12 * 0.80 *
* Conv. Total (cfs)    * 8244.0 * Conv. (cfs)         * 3219.3 * 4670.2 * 354.6 *
* Length Wtd. (ft)     * 240.64 * Wetted Per. (ft)    * 66.67 * 17.87 * 21.01 *
* Min Ch El (ft)       * 950.96 * Shear (lb/sq ft)    * 0.20 * 0.54 * 0.14 *
* Alpha                 * 1.53 * Stream Power (lb/ft s) * 430.49 * 0.00 * 0.00 *
* Frctn Loss (ft)      * 0.94 * Cum Volume (acre-ft) * 0.56 * 0.45 * 0.23 *
* C & E Loss (ft)      * 0.02 * Cum SA (acres)      * 0.45 * 0.13 * 0.15 *
*****

```

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Bluestone Creek RS: 13658.52

INPUT  
 Description:

Station Elevation Data num= 122

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	970	32.38	970	53.21	968.61	63.3	968	86.24	968
126.18	966.33	133.83	966	139.43	966	186.99	964.8	197.68	964.16
197.97	964.16	198.28	964.16	200.43	964	242.42	962.32	250.62	962
255.33	961.67	255.39	961.67	265.89	961.84	267.03	961.85	268.89	961.57
271.07	961.74	271.83	961.7	275.86	961.72	276.42	961.73	282.17	961.59
283.89	961.56	286.87	961.48	296.55	960.97	302.4	960.62	304.38	960.5
310.56	960	311.28	959.94	323.29	958.84	324.6	958.71	328.42	958.3
333.65	957.82	334.04	957.77	340.05	956.92	341.21	956.83	346.28	957.28
346.95	957.35	355.1	957.27	357.8	957.21	359.47	957.1	372.56	956.87
373.87	956.84	400.61	956	416.64	955.63	420.92	955.6	422.93	955.56
427.11	955.47	439.41	954.99	465.06	954	466.62	954	484.41	952.39
487.98	952.1	488.59	952.08	489.24	952	494.97	951.52	495.83	951.44
496.2	951.24	499.84	950.55	499.9	950.54	500.15	950.54	505.58	950.26
505.78	950.26	506.01	950.26	506.88	950.98	507.06	951.18	510.16	951.36
515.51	952	519.8	952	528.38	953.57	530.24	953.78	532.39	954
539.68	954	540.23	954.1	540.26	954.1	540.84	954.12	543.47	954.12
550.74	954.09	550.79	954.09	550.83	954.09	551.74	954	552.02	954
552.95	953.9	553.03	953.89	553.12	953.85	553.15	953.85	558.68	952.61
558.71	952.63	559.8	953.41	560.63	954	562.4	955.22	565.57	957.41
566.03	957.72	566.21	957.82	567.72	958.42	570.28	959.45	571.51	960
573.31	960.72	576.65	962	577.09	962.18	578.11	962.6	579.21	963.15
580.44	964	580.77	964.22	583.44	966	584.19	966.54	586.26	968
588.37	969.43	589.24	970	592.02	971.8	592.3	972	593.37	972.72
595.12	974	596.36	974.9	597.79	976	598.17	976.38	599.94	978
601.46	979.52	601.93	979.88						

Manning's n Values num= 3  
 Sta n Val sta n Val Sta n Val

\*\*\*\*\*  
 0 .035 495.83 .035 507.06 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 495.83 507.06 100.46 106.4 102.7 .1 .3  
 Blocked Obstructions num= 1  
 Sta L Sta R Elev  
 \*\*\*\*\*  
 550.74 601.93 954.09

CROSS SECTION OUTPUT Profile #PF 1

\*\*\*\*\*  
 \* E.G. Elev (ft) \* 954.25 \* Element \* Left OB \* Channel \* Right OB \*  
 \* Vel Head (ft) \* 0.44 \* Wt. n-Val. \* 0.035 \* 0.035 \* 0.060 \*  
 \* W.S. Elev (ft) \* 953.81 \* Reach Len. (ft) \* 100.46 \* 106.40 \* 102.70 \*  
 \* Crit W.S. (ft) \* \* \* Flow Area (sq ft) \* 32.76 \* 35.88 \* 36.15 \*  
 \* E.G. Slope (ft/ft) \* 0.005519 \* Area (sq ft) \* 32.76 \* 35.88 \* 36.15 \*  
 \* Q Total (cfs) \* 443.80 \* Flow (cfs) \* 116.81 \* 238.85 \* 88.14 \*  
 \* Top Width (ft) \* 61.88 \* Top width (ft) \* 27.14 \* 11.23 \* 23.50 \*  
 \* Vel Total (ft/s) \* 4.23 \* Avg. Vel. (ft/s) \* 3.57 \* 6.66 \* 2.44 \*  
 \* Max Chl Dpth (ft) \* 3.55 \* Hydr. Depth (ft) \* 1.21 \* 3.20 \* 1.54 \*  
 \* Conv. Total (cfs) \* 5974.0 \* Conv. (cfs) \* 1572.4 \* 3215.1 \* 1186.5 \*  
 \* Length Wtd. (ft) \* 104.11 \* Wetted Per. (ft) \* 27.25 \* 11.70 \* 23.70 \*  
 \* Min Ch El (ft) \* 950.26 \* Shear (lb/sq ft) \* 0.41 \* 1.06 \* 0.53 \*  
 \* Alpha \* 1.58 \* Stream Power (lb/ft s) \* 601.93 \* 0.00 \* 0.00 \*  
 \* Frctn Loss (ft) \* 0.69 \* Cum Volume (acre-ft) \* 0.14 \* 0.25 \* 0.13 \*  
 \* C & E Loss (ft) \* 0.02 \* Cum SA (acres) \* 0.08 \* 0.07 \* 0.07 \*  
 \*\*\*\*\*

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Bluestone Creek RS: 13552.07

INPUT  
 Description:

Station Elevation Data num= 85  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 \*\*\*\*\*  
 0 970 33.05 968 34.34 968 37.71 967.8 68.32 966  
 105.54 966 106.18 965.99 106.35 965.99 108.85 965.91 111.32 965.81  
 111.77 965.8 120.26 965.45 140.15 964.51 155.5 964 155.66 964  
 168.78 963.41 184.62 962.59 185.01 962.57 194.87 962 210.96 960.67  
 215.23 960.31 221.31 960 225.2 959.81 225.67 959.78 226.21 959.72  
 226.4 959.69 237.78 958 243.61 957.69 269.35 956 305.01 955.02  
 312.14 954.83 346.83 954 350.47 954 356.67 953.6 357.9 953.53  
 358.02 953.52 360.06 953.41 377.25 952 387.59 952 387.98 951.98  
 395.71 951.47 402.64 950.99 402.91 950.74 403.35 950 403.73 949.15  
 403.98 948.65 405.39 948.59 408.97 948.34 410.04 949.91 410.13 950  
 410.21 950.12 410.93 950.97 411.91 951.09 412.12 951.11 422.13 952  
 428.02 952 433.41 952.62 439.14 953.14 447.36 953.11 452.66 952.98

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453.22	952.98	453.97	953.14	456.53	952.05	456.65	952.03	456.67	952.03
457.31	952.33	457.48	952.4	457.88	952.58	458.49	952.82	461.8	954.39
464.21	955.14	467.22	956	472.93	957.64	474.11	958	475.37	958.38
480.55	960	483.2	961.17	486.12	962	487.87	963.22	488.86	964
490.86	965.33	491.66	966	494.15	967.89	494.29	968	497.08	970

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .035 402.64 .035 410.93 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 402.64 410.93 9.06 105.32 16.94 .1 .3  
 Blocked Obstructions num= 1  
 Sta L Sta R Elev  
 \*\*\*\*\*  
 447.36 497.08 953.11

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 953.54	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.63	* Wt. n-Val.	* 0.035	* 0.035	* 0.060
* W.S. Elev (ft)	* 952.92	* Reach Len. (ft)	* 9.06	* 105.32	* 16.94
* Crit W.S. (ft)	* 952.91	* Flow Area (sq ft)	* 35.82	* 32.19	* 24.98
* E.G. Slope (ft/ft)	* 0.008207	* Area (sq ft)	* 35.82	* 32.19	* 24.98
* Q Total (cfs)	* 443.80	* Flow (cfs)	* 135.72	* 253.26	* 54.81
* Top Width (ft)	* 70.58	* Top width (ft)	* 36.55	* 8.29	* 25.74
* Vel Total (ft/s)	* 4.77	* Avg. Vel. (ft/s)	* 3.79	* 7.87	* 2.19
* Max Chl Dpth (ft)	* 4.58	* Hydr. Depth (ft)	* 0.98	* 3.88	* 0.97
* Conv. Total (cfs)	* 4898.9	* Conv. (cfs)	* 1498.2	* 2795.7	* 605.1
* Length Wtd. (ft)	* 83.90	* Wetted Per. (ft)	* 36.62	* 11.00	* 25.83
* Min Ch El (ft)	* 948.34	* Shear (lb/sq ft)	* 0.50	* 1.50	* 0.50
* Alpha	* 1.77	* Stream Power (lb/ft s)	* 497.08	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.81	* Cum Volume (acre-ft)	* 0.06	* 0.17	* 0.06
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 0.00	* 0.04	* 0.01

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Bluestone Creek RS: 13440.10

INPUT

Description:

Station Elevation Data num= 111

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	970	12.72	969	27.53	968	31.27	968	41.62	967.09
57.8	966	58.08	965.97	58.2	965.96	64.34	965.51	89.31	964
94.23	963.89	97.31	963.68	98.31	963.61	99.29	963.57	126.21	962.65
138.26	962.25	141.48	962	156.55	961.63	157.25	961.61	162.24	961.41

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167.54	961.16	176.19	960.75	189.25	960.32	191.55	960.11	193.82	960.02
194.26	960	197.83	960	202.93	959.63	203.69	959.56	213.9	958.84
219.07	958.45	222.38	958.2	225.22	958	239.97	957.01	245.08	956.43
246.38	956.33	249.31	956.27	256.88	956.34	256.99	956.34	260.01	956.41
277.5	956	313.74	956	315.58	955.82	316.21	955.66	318.54	955.52
322.33	955.3	335.01	954.46	341.35	954	341.7	954	352.99	952.92
362.6	952	365.88	951.68	367.23	951.54	367.27	951.52	367.56	951.39
370	950	370.98	949.52	373.28	948.12	373.68	948.17	384.92	949.85
394.14	951.3	395.33	951.47	395.55	951.45	395.69	951.45	395.81	951.49
395.89	951.49	418.27	951.6	418.51	951.61	418.68	951.62	419.21	951.65
419.43	951.65	426.52	951.9	427.51	951.93	430.82	952	431.14	952.01
434.64	952.07	435.16	952	442.6	952	452.39	951.48	453.06	951.52
458.1	952	460.87	952	469.07	952.27	480.97	952.92	487.75	953.1
495.47	953.02	496.65	952.77	497.57	952.72	498.03	952.57	499.47	952.4
501.13	952.65	501.63	952.85	504.56	954	504.71	954.06	510.23	956
514.64	957.65	515.54	958	516.44	958.51	519.28	960	519.68	960.21
523.5	961.68	524.31	962	526.94	963	529.51	964	532.11	965.02
533.04	965.53	533.69	966	533.98	966.19	536.66	968	537.62	968.6
539.9	970								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .035 367.23 .035 395.33 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 367.23 395.33 438.21 42.49 4.26 .1 .3  
 Blocked Obstructions num= 1  
 Sta L Sta R Elev  
 \*\*\*\*\*  
 434.64 539.9 952.07

CROSS SECTION OUTPUT Profile #PF 1  
 \*\*\*\*\*  
 \* E.G. Elev (ft) \* 952.71 \* Element \* Left OB \* Channel \* Right OB \*  
 \* Vel Head (ft) \* 0.80 \* Wt. n-Val. \* 0.035 \* 0.035 \* 0.060 \*  
 \* W.S. Elev (ft) \* 951.91 \* Reach Len. (ft) \* 42.49 \* 42.49 \* 42.49 \*  
 \* Crit W.S. (ft) \* 951.91 \* Flow Area (sq ft) \* 0.66 \* 59.22 \* 9.55 \*  
 \* E.G. Slope (ft/ft) \* 0.011495 \* Area (sq ft) \* 0.66 \* 59.22 \* 9.55 \*  
 \* Q Total (cfs) \* 443.80 \* Flow (cfs) \* 0.95 \* 431.37 \* 11.47 \*  
 \* Top Width (ft) \* 63.11 \* Top width (ft) \* 3.66 \* 28.10 \* 31.36 \*  
 \* Vel Total (ft/s) \* 6.39 \* Avg. Vel. (ft/s) \* 1.45 \* 7.28 \* 1.20 \*  
 \* Max chl Dpth (ft) \* 3.79 \* Hydr. Depth (ft) \* 0.18 \* 2.11 \* 0.30 \*  
 \* Conv. Total (cfs) \* 4139.3 \* Conv. (cfs) \* 8.9 \* 4023.4 \* 107.0 \*  
 \* Length Wtd. (ft) \* 42.49 \* Wetted Per. (ft) \* 3.68 \* 29.26 \* 31.37 \*  
 \* Min ch El (ft) \* 948.12 \* Shear (lb/sq ft) \* 0.13 \* 1.45 \* 0.22 \*  
 \* Alpha \* 1.26 \* Stream Power (lb/ft s) \* 539.90 \* 0.00 \* 0.00 \*  
 \* Frctn Loss (ft) \* 0.08 \* Cum Volume (acre-ft) \* 0.06 \* 0.06 \* 0.05 \*  
 \* C & E Loss (ft) \* 0.22 \* Cum SA (acres) \* \* \*  
 \*\*\*\*\*

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: Bluestone Creek  
 REACH: Upper RS: 13395.79

INPUT  
 Description:

Station Elevation Data num= 105

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	970	8.02	968	12.03	967.03	16.07	966	22.99	964.25
24.37	964	24.51	963.98	25.63	963.82	26.34	963.68	32.43	962.69
34.76	962.32	36.19	962	37.17	961.77	45	960	45.9	960
57.03	959.16	60.05	959.04	61.11	958.97	63.65	958.8	73.53	958
79.81	957.59	98.1	956.47	102.56	956.18	106.08	956	121.96	955.6
123.84	955.56	124.24	955.55	160.05	955.14	163.74	955.16	172.99	955.11
177.9	955.03	183.68	954.89	195.14	954.51	204.38	954.32	210.33	954
225.54	953.63	226.53	953.62	226.86	953.61	238.03	953.41	242.13	953.32
255.99	952	271.7	950.03	273.65	950	281.35	948.9	285.87	948.48
287.28	948.28	287.99	948.23	290.08	948	302.67	948	309.27	948.17
311.54	949.15	314.45	948	318.27	946.43	318.87	946	319.35	946
320.28	946.6	321.07	946.98	323.85	948	325.36	948.5	337.93	949.29
344.78	949.54	345.63	949.6	348.3	949.71	350	949.79	355.54	950
355.55	950	364.5	950.07	364.85	950.09	365.02	950.09	366.77	950.14
369.14	950.2	375.69	950.61	388.03	951.44	389.4	951.53	390.28	951.62
399.78	951.97	400.29	952	402.19	952.07	403.28	952.14	413.63	952.76
416.84	952.8	429.26	952.97	431.97	952.81	433.46	952.41	433.87	952.6
435.21	953.07	435.52	953.18	437.85	954	442.16	955.55	443.43	956
444.09	956.25	449.17	958	451.68	959.25	453.41	960	454.79	960.67
457.89	962	460.28	963.08	462.26	964	464.36	965.01	466.46	965.98
466.53	966	471.34	967.39	472.43	968	472.74	968.16	476.33	970

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	311.54	.035	325.36	.06

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

311.54 325.36

51.65 41.35

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22.86 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

```
*****
* E.G. Elev (ft)      * 951.46 * Element          * Left OB * Channel * Right OB *
* Vel Head (ft)      * 0.07  * Wt. n-Val.      * 0.035  * 0.035  * 0.060  *
* W.S. Elev (ft)     * 951.39 * Reach Len. (ft) * 51.65  * 41.35  * 22.86  *
* Crit W.S. (ft)     * 949.60 * Flow Area (sq ft) * 121.09 * 53.75  * 90.92  *
* E.G. Slope (ft/ft) * 0.000771 * Area (sq ft)    * 121.09 * 53.75  * 90.92  *
* Q Total (cfs)      * 482.70 * Flow (cfs)      * 253.72 * 148.27 * 80.70  *
* Top Width (ft)     * 126.38 * Top width (ft)  * 50.67  * 13.82  * 61.89  *
* Vel Total (ft/s)   * 1.82  * Avg. vel. (ft/s) * 2.10  * 2.76  * 0.89  *
* Max Chl Dpth (ft) * 5.39  * Hydr. Depth (ft) * 2.39  * 3.89  * 1.47  *
* Conv. Total (cfs)  * 17386.9 * Conv. (cfs)     * 9139.0 * 5340.9 * 2907.0 *
* Length Wtd. (ft)   * 41.35  * Wetted Per. (ft) * 51.08  * 15.01  * 61.97  *
* Min ch El (ft)     * 946.00 * Shear (lb/sq ft) * 0.11  * 0.17  * 0.07  *
* Alpha              * 1.45  * Stream Power (lb/ft s) * 476.33 * 0.00  * 0.00  *
* Frctn Loss (ft)   *        * Cum Volume (acre-ft) * 5.82  * 4.23  * 1.13  *
* C & E Loss (ft)   *        * Cum SA (acres)   * 6.24  * 1.21  * 1.02  *
*****
```

CULVERT

RIVER: Bluestone Creek

REACH: Upper

RS: 13372.57

INPUT

Description:

Distance from Upstream XS = 16.8

Deck/Roadway width = 10

Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
273.65	950	0	355.54	950	0

\*\*\*\*\*

Upstream Bridge Cross Section Data

Station Elevation Data num= 105

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	970	8.02	968	12.03	967.03	16.07	966	22.99	964.25
24.37	964	24.51	963.98	25.63	963.82	26.34	963.68	32.43	962.69
34.76	962.32	36.19	962	37.17	961.77	45	960	45.9	960
57.03	959.16	60.05	959.04	61.11	958.97	63.65	958.8	73.53	958
79.81	957.59	98.1	956.47	102.56	956.18	106.08	956	121.96	955.6
123.84	955.56	124.24	955.55	160.05	955.14	163.74	955.16	172.99	955.11
177.9	955.03	183.68	954.89	195.14	954.51	204.38	954.32	210.33	954
225.54	953.63	226.53	953.62	226.86	953.61	238.03	953.41	242.13	953.32
255.99	952	271.7	950.03	273.65	950	281.35	948.9	285.87	948.48
287.28	948.28	287.99	948.23	290.08	948	302.67	948	309.27	948.17

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311.54	949.15	314.45	948	318.27	946.43	318.87	946	319.35	946
320.28	946.6	321.07	946.98	323.85	948	325.36	948.5	337.93	949.29
344.78	949.54	345.63	949.6	348.3	949.71	350	949.79	355.54	950
355.55	950	364.5	950.07	364.85	950.09	365.02	950.09	366.77	950.14
369.14	950.2	375.69	950.61	388.03	951.44	389.4	951.53	390.28	951.62
399.78	951.97	400.29	952	402.19	952.07	403.28	952.14	413.63	952.76
416.84	952.8	429.26	952.97	431.97	952.81	433.46	952.41	433.87	952.6
435.21	953.07	435.52	953.18	437.85	954	442.16	955.55	443.43	956
444.09	956.25	449.17	958	451.68	959.25	453.41	960	454.79	960.67
457.89	962	460.28	963.08	462.26	964	464.36	965.01	466.46	965.98
466.53	966	471.34	967.39	472.43	968	472.74	968.16	476.33	970

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	311.54	.035	325.36	.06

Bank Sta: Left Right Coeff Contr. Expan.

311.54	325.36	.1	.3
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Downstream Deck/Roadway Coordinates num= 2

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
328.66	950	0	377.29	950	0				

Downstream Bridge Cross Section Data Station Elevation Data num= 111

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	970.01	.04	970	1.37	969.68	5.16	968.98	8.99	968
14.69	966.02	14.78	966	14.92	965.96	22.04	964	25.24	963.02
28.91	962	31.95	961.02	35	960	40.28	958.44	41.89	958
45.61	957.22	46.79	957.03	51.39	956.57	53.86	956.22	56.22	956
59.49	955.9	68.64	955.59	79.79	955.27	84.48	955.19	85.68	955.18
94.85	955.08	102.33	955.01	104.73	954.97	124.84	954.54	126.71	954.49
137.31	954.22	139.85	954.14	146.91	954	157.25	954	176.26	953.89
178.14	953.87	182.29	953.83	182.77	953.83	192	953.73	192.53	953.72
201.07	953.61	205.03	953.54	205.36	953.55	220.77	953.41	253.43	952.68
254.46	952.66	268.72	952.43	272.47	952.33	273.93	952.3	285.28	952.21
291.89	952	292.29	951.99	300.35	951.51	306.06	951.17	318.85	950.66
329.66	950	334.91	948.71	337.4	948.12	337.95	948	339.79	947.16
347.87	946.04	348.03	946.03	348.15	946	348.19	946	348.21	946
348.8	946	353.72	946.36	354.27	946.36	361.17	947.17	362.29	947.54
363.77	948	364.69	948.28	366.58	948.61	366.71	948.63	372.88	949.1
377.29	950	380.77	950.05	387.24	950.89	391.46	951.2	394.17	952
394.21	952	399.94	952.5	409.12	953.3	413.64	953.33	423.73	953.41
425.63	953.44	426.08	953.41	428.9	953.22	431.69	952.91	431.98	952.83
432.28	952.96	433.49	953.37	434.08	953.58	435.44	954	441.69	955.9
442.09	956	442.93	956.29	446.05	957.33	447.7	958	449.24	958.85
450.57	959.41	451.74	960	453.83	961.03	455.55	962	456.49	962.51
459.11	964	461.84	965.57	462.63	966	463.42	966.47	466.17	968



469.3 970

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .035 337.4 .035 366.71 .06

Bank Sta: Left Right Coeff Contr. Expan.  
 337.4 366.71 .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 Culverts = 1

Culvert Name Shape Rise Span  
 Culvert #1 Circular 1.25  
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert  
 FHWA Scale # 3 - Pipe projecting from fill  
 Solution Criteria = Highest U.S. EG

Culvert Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
13	20	.024	.024	0	.9	1

Number of Barrels = 4  
 Upstream Elevation = 947.92  
 Centerline Stations

Sta.	Sta.	Sta.	Sta.
315.3	316.7	318.1	319.6

Downstream Elevation = 947.4  
 Centerline Stations

Sta.	Sta.	Sta.	Sta.
341.6	343.3	344.7	346.2

CULVERT OUTPUT Profile #PF 1 Culv Group: Culvert #1

```
*****
* Q Culv Group (cfs) * 17.36 * Culv Full Len (ft) * 20.00 *
* # Barrels * 4 * Culv Vel US (ft/s) * 3.54 *
* Q Barrel (cfs) * 4.34 * Culv Vel DS (ft/s) * 3.54 *
* E.G. US. (ft) * 951.46 * Culv Inv El Up (ft) * 947.92 *
* W.S. US. (ft) * 951.39 * Culv Inv El Dn (ft) * 947.40 *
* E.G. DS (ft) * 950.98 * Culv Frctn Ls (ft) * 0.31 *
* W.S. DS (ft) * 950.77 * Culv Exit Loss (ft) * 0.00 *
* Delta EG (ft) * 0.48 * Culv Entr Loss (ft) * 0.17 *
* Delta WS (ft) * 0.62 * Q weir (cfs) * 465.34 *
* E.G. IC (ft) * 951.39 * Weir Sta Lft (ft) * 260.63 *
* E.G. OC (ft) * 951.46 * Weir Sta Rgt (ft) * 387.70 *
* Culvert Control * Outlet * Weir Submerg * 0.51 *
* Culv WS Inlet (ft) * 949.17 * Weir Max Depth (ft) * 1.42 *
*****
```

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\* Culv WS Outlet (ft) \* 948.65 \* Weir Avg Depth (ft) \* 1.23 \*  
 \* Culv Nm1 Depth (ft) \* \* Weir Flow Area (sq ft) \* 156.36 \*  
 \* Culv Crt Depth (ft) \* 0.84 \* Min El Weir Flow (ft) \* 950.01 \*  
 \*\*\*\*\*

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Upper RS: 13353.46

INPUT  
 Description:

Station Elevation Data num= 111

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	970.01	.04	970	1.37	969.68	5.16	968.98	8.99	968
14.69	966.02	14.78	966	14.92	965.96	22.04	964	25.24	963.02
28.91	962	31.95	961.02	35	960	40.28	958.44	41.89	958
45.61	957.22	46.79	957.03	51.39	956.57	53.86	956.22	56.22	956
59.49	955.9	68.64	955.59	79.79	955.27	84.48	955.19	85.68	955.18
94.85	955.08	102.33	955.01	104.73	954.97	124.84	954.54	126.71	954.49
137.31	954.22	139.85	954.14	146.91	954	157.25	954	176.26	953.89
178.14	953.87	182.29	953.83	182.77	953.83	192	953.73	192.53	953.72
201.07	953.61	205.03	953.54	205.36	953.55	220.77	953.41	253.43	952.68
254.46	952.66	268.72	952.43	272.47	952.33	273.93	952.3	285.28	952.21
291.89	952	292.29	951.99	300.35	951.51	306.06	951.17	318.85	950.66
329.66	950	334.91	948.71	337.4	948.12	337.95	948	339.79	947.16
347.87	946.04	348.03	946.03	348.15	946	348.19	946	348.21	946
348.8	946	353.72	946.36	354.27	946.36	361.17	947.17	362.29	947.54
363.77	948	364.69	948.28	366.58	948.61	366.71	948.63	372.88	949.1
377.29	950	380.77	950.05	387.24	950.89	391.46	951.2	394.17	952
394.21	952	399.94	952.5	409.12	953.3	413.64	953.33	423.73	953.41
425.63	953.44	426.08	953.41	428.9	953.22	431.69	952.91	431.98	952.83
432.28	952.96	433.49	953.37	434.08	953.58	435.44	954	441.69	955.9
442.09	956	442.93	956.29	446.05	957.33	447.7	958	449.24	958.85
450.57	959.41	451.74	960	453.83	961.03	455.55	962	456.49	962.51
459.11	964	461.84	965.57	462.63	966	463.42	966.47	466.17	968
469.3	970								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	337.4	.035	366.71	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 337.4 366.71 13.98 104.53 171.51 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

\*\*\*\*\*  
 \* E.G. Elev (ft) \* 950.98 \* Element \* Left OB \* Channel \* Right OB \*  
 \* Vel Head (ft) \* 0.21 \* wt. n-Val. \* 0.035 \* 0.035 \* 0.060 \*  
 \*\*\*\*\*

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* W.S. Elev (ft)	* 950.77	* Reach Len. (ft)	* 13.98	* 104.53	* 171.51
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 18.26	* 113.56	* 21.78
* E.G. Slope (ft/ft)	* 0.001375	* Area (sq ft)	* 18.26	* 113.56	* 21.78
* Q Total (cfs)	* 482.70	* Flow (cfs)	* 25.68	* 435.70	* 21.32
* Top Width (ft)	* 70.31	* Top width (ft)	* 21.38	* 29.31	* 19.63
* Vel Total (ft/s)	* 3.14	* Avg. Vel. (ft/s)	* 1.41	* 3.84	* 0.98
* Max Chl Dpth (ft)	* 4.77	* Hydr. Depth (ft)	* 0.85	* 3.87	* 1.11
* Conv. Total (cfs)	* 13017.1	* Conv. (cfs)	* 692.4	* 11749.7	* 574.9
* Length Wtd. (ft)	* 88.45	* Wetted Per. (ft)	* 21.62	* 29.85	* 19.78
* Min Ch El (ft)	* 946.00	* Shear (lb/sq ft)	* 0.07	* 0.33	* 0.09
* Alpha	* 1.36	* Stream Power (lb/ft s)	* 469.30	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.26	* Cum Volume (acre-ft)	* 5.82	* 4.03	* 1.13
* C & E Loss (ft)	* 0.06	* Cum SA (acres)	* 6.20	* 1.19	* 1.00

\*\*\*\*\*

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

RIVER: Bluestone Creek

REACH: Upper

RS: 13212.39

INPUT

Description:

Station Elevation Data		num= 92									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	969.99	.1	969.96	5.1	968.88	8.08	968.21	8.72	968.05		
8.84	968.03	8.96	968	9.1	967.95	14.71	966	15.25	965.81		
20.38	964	24.97	962.39	26.31	962	27.27	961.68	32.88	960		
37.16	958.79	38.68	958.34	39.81	958	46.67	956.06	46.86	956		
47.3	955.94	47.37	955.93	57.5	954.61	58.94	954.53	75.6	954		
94.43	953.6	101.41	953.54	111.97	953.53	113.68	953.51	116.37	953.47		
123.82	953.34	129.95	953.23	136.65	953.12	144.3	952.98	160.82	952.67		
170.11	952.49	172.74	952.43	180.28	952.34	196.95	952	241.21	952		
280.43	950.03	280.95	950	283.69	949.81	303.56	948.41	312.35	948.03		
314.77	948	315.29	947.98	316.76	947.88	319.39	946.28	320.4	946		
320.51	945.68	321.07	945.36	321.26	945.37	321.48	945.46	322.75	946		
323.8	946.51	327.34	948.14	334.12	949.35	336.06	950	341.29	951.06		
345.85	952	346.16	952.05	347.38	952.19	356.63	952.23	360.36	952.18		
360.95	952.17	361.46	952.09	361.96	952	364.46	951.63	364.85	951.58		
365.08	951.64	366.19	952.06	369.36	953.6	370.09	954	373.19	955.55		
374.25	956	375.34	956.52	377.47	957.48	377.59	957.85	377.64	958		
378	958.89	378.53	960	379.17	961.23	379.56	962	379.91	962.73		
380.48	964	381.52	965.92	381.55	966	381.7	966.3	382.5	968		
383.02	969.08	383.37	970								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .035 316.76 .035 327.34 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 316.76 327.34 85.56 185.64 187.85 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

\*\*\*\*\*  
 \* E.G. Elev (ft) \* 950.67 \* Element \* Left OB \* Channel \* Right OB \*  
 \* Vel Head (ft) \* 0.77 \* Wt. n-Val. \* 0.035 \* 0.035 \* 0.060 \*  
 \* W.S. Elev (ft) \* 949.90 \* Reach Len. (ft) \* 85.56 \* 185.64 \* 187.85 \*  
 \* Crit W.S. (ft) \* 949.90 \* Flow Area (sq ft) \* 38.80 \* 34.15 \* 8.24 \*  
 \* E.G. Slope (ft/ft) \* 0.009709 \* Area (sq ft) \* 38.80 \* 34.15 \* 8.24 \*  
 \* Q Total (cfs) \* 482.70 \* Flow (cfs) \* 176.03 \* 287.13 \* 19.54 \*  
 \* Top Width (ft) \* 53.28 \* Top width (ft) \* 34.30 \* 10.58 \* 8.41 \*  
 \* Vel Total (ft/s) \* 5.95 \* Avg. vel. (ft/s) \* 4.54 \* 8.41 \* 2.37 \*  
 \* Max chl Dpth (ft) \* 4.54 \* Hydr. Depth (ft) \* 1.13 \* 3.23 \* 0.98 \*  
 \* Conv. Total (cfs) \* 4898.9 \* Conv. (cfs) \* 1786.5 \* 2914.1 \* 198.3 \*  
 \* Length wtd. (ft) \* 154.62 \* wetted Per. (ft) \* 34.36 \* 11.98 \* 8.60 \*  
 \* Min Ch El (ft) \* 945.36 \* Shear (lb/sq ft) \* 0.68 \* 1.73 \* 0.58 \*  
 \* Alpha \* 1.41 \* Stream Power (lb/ft s) \* 383.37 \* 0.00 \* 0.00 \*  
 \* Frctn Loss (ft) \* 1.31 \* Cum Volume (acre-ft) \* 5.81 \* 3.85 \* 1.07 \*  
 \* C & E Loss (ft) \* 0.01 \* Cum SA (acres) \* 6.19 \* 1.14 \* 0.94 \*  
 \*\*\*\*\*

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: Bluestone Creek

REACH: Upper

RS: 13020.26

INPUT

Description:

Station Elevation Data num= 84  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 \*\*\*\*\*  
 0 969.99 2.25 969.68 11.85 968 17.01 966.18 17.64 966  
 21.39 964.74 23.65 964 25.96 963.2 28.84 962.24 29.55 962

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29.85	961.9	31.22	961.55	35.73	960	40.95	958.53	42.79	958
47.12	956.76	49.62	956	57.26	954.42	59.04	954	61.33	953.66
72.92	952	77.95	951.73	80.7	951.74	118.23	950.75	128.84	950.73
175.41	950.42	181.69	950.31	194.29	950.11	194.69	950.11	199.63	950
235.99	949.12	266.38	948.22	273.81	948	278.89	948	282.38	947.79
303.43	946.48	303.55	946.29	303.74	946	304.72	944.21	304.73	944.19
304.82	944.13	305.06	944	305.28	943.98	305.51	944	305.92	944
306.23	944.03	312.17	944.36	313.17	945.95	313.21	946	313.5	946.36
313.51	946.36	322.39	947.86	323.39	948	323.65	948.04	328.16	948.63
334.13	948.71	341.87	948.81	343.59	948.35	343.68	948.33	344.46	948.21
345.68	948.82	348.01	950	350.98	951.59	351.83	952	352.43	952.31
355.66	954	355.83	954.09	356.03	954.19	359.37	955.68	360.08	956
360.86	956.35	364.56	958	365.27	958.33	369.27	960	371.63	961.06
373.58	962	375.53	963.15	376.9	964	379.35	965.47	380.16	966
381.15	966.66	383.22	968	384.34	968.77	386.06	970		

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .035 303.43 .035 313.5 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 303.43 313.5 146.04 191.17 139.06 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 949.25	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.73	* Wt. n-Val.	* 0.035	* 0.035	* 0.060
* W.S. Elev (ft)	* 948.52	* Reach Len. (ft)	* 146.04	* 191.17	* 139.06
* Crit W.S. (ft)	* 948.52	* Flow Area (sq ft)	* 38.77	* 40.73	* 14.58
* E.G. Slope (ft/ft)	* 0.007458	* Area (sq ft)	* 38.77	* 40.73	* 14.58
* Q Total (cfs)	* 482.70	* Flow (cfs)	* 124.32	* 327.48	* 30.89
* Top Width (ft)	* 73.42	* Top width (ft)	* 47.34	* 10.07	* 16.01
* Vel Total (ft/s)	* 5.13	* Avg. vel. (ft/s)	* 3.21	* 8.04	* 2.12
* Max chl Dpth (ft)	* 4.54	* Hydr. Depth (ft)	* 0.82	* 4.04	* 0.91
* Conv. Total (cfs)	* 5589.4	* Conv. (cfs)	* 1439.6	* 3792.1	* 357.7
* Length Wtd. (ft)	* 174.70	* Wetted Per. (ft)	* 47.40	* 12.54	* 16.29
* Min ch El (ft)	* 943.98	* Shear (lb/sq ft)	* 0.38	* 1.51	* 0.42
* Alpha	* 1.78	* Stream Power (lb/ft s)	* 386.06	* 0.00	* 0.00
* Frctn Loss (ft)	* 1.38	* Cum Volume (acre-ft)	* 5.74	* 3.69	* 1.02
* C & E Loss (ft)	* 0.07	* Cum SA (acres)	* 6.11	* 1.10	* 0.89

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 energy loss was 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: Bluestone Creek  
 REACH: Upper RS: 12827.43

INPUT  
 Description:

Station Elevation Data num= 85									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	969.98	2.4	969.16	5.72	968	8.19	967.19	11.53	966
14.97	964.94	17.3	964.35	18.51	964	19.92	963.6	25.38	962
25.99	961.83	29.89	960.66	32.11	960	38.07	958.26	38.89	958
41.38	957.25	45.86	956	46.73	955.76	55.35	954	59.63	953.14
64.22	952	82.05	950.16	83.23	950	88.18	950	120.87	949.28
147.29	948.79	154.78	948.71	155.49	948.7	185.36	948	204.67	948
276.65	946.87	284.42	946.81	287.1	946.79	288.13	946.78	303.19	946.6
327.4	946	349.02	946	377.43	946	379.4	945.96	391.62	945.49
393.01	944.89	394.97	944	396.67	943.22	397.46	942.44	400.14	942.61
402.51	944	404.29	944.95	406.8	946	407.26	946.2	408.78	946.8
410.25	946.94	413.26	947.17	419.51	947.28	424.42	947.42	431.41	947.02
448.74	946.92	453.65	946.89	461.8	947.05	462.09	947.27	462.92	948
463.54	948.56	465.25	950	467.39	951.81	467.63	952	467.95	952.29
469.89	954	470.59	954.56	472.28	956	473.03	956.68	474.18	957.63
474.55	958	474.6	958.05	476.61	959.84	476.68	959.86	476.99	960
478.4	960.53	482.15	962	485.2	963.18	487.34	964	491.01	965.39
492.59	966	498.27	967.91	498.53	967.99	498.57	968	498.6	968

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.035	391.62	.035	408.78	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	391.62	408.78		60.19	131.9	273.42	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 947.26	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.48	* wt. n-Val.	* 0.035	* 0.035	*
* W.S. Elev (ft)	* 946.78	* Reach Len. (ft)	* 60.19	* 131.90	* 273.42
* Crit W.S. (ft)	* 946.78	* Flow Area (sq ft)	* 66.34	* 43.03	*
* E.G. Slope (ft/ft)	* 0.008429	* Area (sq ft)	* 66.34	* 43.03	*
* Q Total (cfs)	* 482.70	* Flow (cfs)	* 192.37	* 290.33	*
* Top Width (ft)	* 120.49	* Top width (ft)	* 103.39	* 17.11	*
* Vel Total (ft/s)	* 4.41	* Avg. Vel. (ft/s)	* 2.90	* 6.75	*
* Max Chl Dpth (ft)	* 4.34	* Hydr. Depth (ft)	* 0.64	* 2.52	*

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```

* Conv. Total (cfs)      * 5257.5 * Conv. (cfs)      * 2095.3 * 3162.3 *
* Length wtd. (ft)     * 110.75 * Wetted Per. (ft) * 103.41 * 18.90 *
* Min Ch El (ft)      * 942.44 * Shear (lb/sq ft) * 0.34 * 1.20 *
* Alpha                * 1.58 * Stream Power (lb/ft s) * 498.60 * 0.00 * 0.00 *
* Frctn Loss (ft)     * 0.53 * Cum Volume (acre-ft) * 5.56 * 3.51 * 1.00 *
* C & E Loss (ft)     * 0.08 * Cum SA (acres) * 5.86 * 1.04 * 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 conveyance ratio (upstream 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: Bluestone Creek

REACH: Upper

RS: 12694.78

INPUT

Description:

Station		Elevation Data		num= 60		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960	2.3	959.3	6.68	958	12.54	956.37	13.83	956				
16.44	955.29	21.93	954	24.78	953.31	30.33	952	35.84	950.7				
38.81	950	41.68	950	61.51	949.54	62.14	949.53	96.34	948.78				
114.1	948	138.17	948	149.94	947.7	153.63	947.61	180.35	946.92				
217.84	946	264.5	945.01	330.4	945.08	395.71	945.16	401.39	941.14				
409.12	940.76	411.21	942	412.87	942.82	423.24	944	433.28	945.5				
433.54	945.56	434.81	946	435.4	946.21	440.37	948	453.19	949.49				
458.58	950	460.4	950	462.47	950.12	465.87	950.33	466.73	950.38				
469	950.53	476.38	951.08	492.5	952	495.48	952	509.44	952.95				
520.9	953.05	527.14	953.46	536.37	954	546.48	954.5	552.15	954.82				
564.55	956	572.77	957.3	576.73	958	592.6	959.07	597.18	959.26				
598.71	959.29	617.28	959.85	618.35	959.88	620.1	959.9	622.31	959.99				

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	395.71	.035	433.28	.035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 395.71 433.28 138.33 186.83 225.35 .1 .3  
 Blocked Obstructions num= 1  
 Sta L Sta R Elev  
 \*\*\*\*\*  
 460 485 955

CROSS SECTION OUTPUT Profile #PF 1

\*\*\*\*\*  
 \* E.G. Elev (ft) \* 945.77 \* Element \* Left OB \* Channel \* Right OB \*  
 \* Vel Head (ft) \* 0.23 \* Wt. n-Val. \* 0.035 \* 0.035 \* 0.035 \*  
 \* W.S. Elev (ft) \* 945.55 \* Reach Len. (ft) \* 138.33 \* 186.83 \* 225.35 \*  
 \* Crit W.S. (ft) \* 944.58 \* Flow Area (sq ft) \* 68.16 \* 93.32 \* 0.01 \*  
 \* E.G. Slope (ft/ft) \* 0.003091 \* Area (sq ft) \* 68.16 \* 93.32 \* 0.01 \*  
 \* Q Total (cfs) \* 482.70 \* Flow (cfs) \* 92.39 \* 390.31 \* 0.00 \*  
 \* Top Width (ft) \* 194.42 \* Top width (ft) \* 156.64 \* 37.57 \* 0.21 \*  
 \* Vel Total (ft/s) \* 2.99 \* Avg. vel. (ft/s) \* 1.36 \* 4.18 \* 0.20 \*  
 \* Max Chl Dpth (ft) \* 4.79 \* Hydr. Depth (ft) \* 0.44 \* 2.48 \* 0.02 \*  
 \* Conv. Total (cfs) \* 8682.2 \* Conv. (cfs) \* 1661.8 \* 7020.4 \* 0.0 \*  
 \* Length Wtd. (ft) \* 182.23 \* Wetted Per. (ft) \* 156.65 \* 39.57 \* 0.22 \*  
 \* Min Ch El (ft) \* 940.76 \* Shear (lb/sq ft) \* 0.08 \* 0.46 \* 0.00 \*  
 \* Alpha \* 1.62 \* Stream Power (lb/ft s) \* 622.31 \* 0.00 \* 0.00 \*  
 \* Frctn Loss (ft) \* 1.07 \* Cum Volume (acre-ft) \* 5.47 \* 3.30 \* 1.00 \*  
 \* C & E Loss (ft) \* 0.12 \* Cum SA (acres) \* 5.68 \* 0.96 \* 0.86 \*  
 \*\*\*\*\*

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

Warning: The conveyance ratio (upstream 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: Bluestone Creek  
 REACH: Upper RS: 12504.92

INPUT  
 Description:

Station Elevation Data num= 96  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 \*\*\*\*\*  
 0 970 .06 969.97 4.25 968.1 4.48 968 4.72 967.9  
 9.44 966.02 9.49 966 9.52 965.99 14.04 964 18.8 962.06  
 23.59 960 27.88 958.14 28.19 958 28.47 957.9 30.06 957.28  
 33.67 956 34.59 955.73 35.88 955.26 39.22 954 41.84 952.94  
 44.16 952 44.42 951.88 52.39 950 62.32 948.69 73.46 948  
 77.84 948 95.85 947.72 106.16 947.58 111.17 947.51 114.13 947.47



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118.21	947.43	224.93	946	240.52	946	259.51	945.48	311.46	944
394.24	944	411.78	943.91	435.64	943.78	452.76	943.98	452.98	943.98
459.78	943.79	460.89	942.78	461.74	942	462.98	940.86	463.86	940.12
464.44	940.06	466.75	940.03	468.15	940	469.73	939.74	475.74	939.14
476.09	939.9	476.2	940	476.7	941.21	477.2	942	477.38	942.27
477.67	942.72	484.95	943.49	489.79	944	497.71	945.04	510.51	946
520.16	947.66	522.09	948	524.06	948.34	529.43	948.62	529.6	948.63
529.65	948.63	529.85	948.66	530.1	948.72	533.76	950.54	536.01	951.64
536.79	952	537.86	952.49	538.48	952.77	541.26	954	543.77	955.27
546.15	956.34	549.74	958	553.49	959.48	557.12	960.92	558.54	961.54
559.73	962	563.01	963.37	563.99	963.78	564.06	963.8	566.74	964.06
571.02	964.46	573.46	964.57	575.86	964.66	588.24	965.85	589.78	966
591.98	966.2	611.56	968	621.29	969.03	630.35	969.71	633.39	970
633.51	970.03								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .035 459.78 .035 477.67 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 459.78 477.67 29.91 278.36 370.21 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 944.59	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 1.41	* Wt. n-Val.	* 0.035	* 0.060	* 0.060
* W.S. Elev (ft)	* 943.18	* Reach Len. (ft)	* 29.91	* 278.36	* 370.21
* Crit W.S. (ft)	* 943.18	* Flow Area (sq ft)	* 50.52	* 50.52	* 0.99
* E.G. Slope (ft/ft)	* 0.015247	* Area (sq ft)	* 50.52	* 0.99	* 0.99
* Q Total (cfs)	* 482.70	* Flow (cfs)	* 481.57	* 1.13	* 1.13
* Top Width (ft)	* 21.54	* Top width (ft)	* 17.22	* 4.32	* 4.32
* Vel Total (ft/s)	* 9.37	* Avg. vel. (ft/s)	* 9.53	* 1.14	* 1.14
* Max Chl Dpth (ft)	* 4.04	* Hydr. Depth (ft)	* 2.93	* 0.23	* 0.23
* Conv. Total (cfs)	* 3909.2	* Conv. (cfs)	* 3900.0	* 9.1	* 9.1
* Length wtd. (ft)	* 210.75	* Wetted Per. (ft)	* 20.60	* 4.35	* 4.35
* Min Ch El (ft)	* 939.14	* Shear (lb/sq ft)	* 2.33	* 0.22	* 0.22
* Alpha	* 1.03	* Stream Power (lb/ft s)	* 633.51	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.96	* Cum Volume (acre-ft)	* 5.36	* 3.00	* 1.00
* C & E Loss (ft)	* 0.39	* Cum SA (acres)	* 5.43	* 0.84	* 0.85

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: Bluestone Creek  
 REACH: Upper RS: 12207.32

INPUT  
 Description:

Station Elevation Data num= 95

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	969.98	.21	969.89	3.66	968	7.09	966.31	7.69	966
11.42	964.07	11.55	964	15.27	962.07	15.4	962	17.59	960.73
18.97	960	20.53	959.47	23.14	958	23.62	957.82	28.89	956
34.81	954.05	34.95	954	40.44	952.12	40.79	952	41.26	951.84
46.52	950	51.47	949.67	74.93	948	76.64	948	96.98	947.62
133.49	946.93	185.5	946.09	187.51	946.06	191.55	946	208.7	945.66
215.54	945.54	231.36	945.28	233.54	945.24	240.79	945.14	281.83	944.37
298.18	944	305.4	943.07	313.46	942	315.5	942	343.41	941.44
354.34	941.25	384.57	940.6	385.76	940.32	386	940.29	387.17	940.22
388.67	940.16	395.65	939.95	397.33	939.92	398.67	939.91	399.86	939.91
400.17	939.91	400.52	939.95	400.82	940.02	400.9	940.03	402.53	940.71
412.99	940.81	443.45	941.08	452.56	941.15	456.61	941.29	457.47	940.59
458.05	940	459.44	938.99	475.51	938.75	476.34	940	482.79	942
490.61	943.31	494.36	944	495.39	944.5	498.6	946	499.96	946.65
502.77	948	505.83	949.41	507.16	950	508.6	950.66	511.43	952
513.53	953.03	515.53	954	519.64	955.96	519.74	956	519.84	956.05
523.12	957.35	524.77	958	526.16	958.56	529.52	960	533.85	961.69
534.63	962	535.29	962.3	538.47	964	539.94	965.18	541.31	966
543.01	966.95	544.68	968	545.42	968.43	546.5	969.3	550.65	970

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	456.61	.035	482.79	.1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 456.61 482.79 138.18 45.27 69.35 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 942.10	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.11	* Wt. n-Val.	* 0.035	* 0.035	* *
* W.S. Elev (ft)	* 941.99	* Reach Len. (ft)	* 138.18	* 45.27	* 69.35
* Crit W.S. (ft)	* *	* Flow Area (sq ft)	* 136.17	* 63.99	* *

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* E.G. Slope (ft/ft)	*0.002164	* Area (sq ft)	* 136.17	* 63.99	*	*
* Q Total (cfs)	* 482.70	* Flow (cfs)	* 263.13	* 219.57	*	*
* Top Width (ft)	* 166.63	* Top width (ft)	* 140.49	* 26.14	*	*
* Vel Total (ft/s)	* 2.41	* Avg. vel. (ft/s)	* 1.93	* 3.43	*	*
* Max Chl Dpth (ft)	* 3.24	* Hydr. Depth (ft)	* 0.97	* 2.45	*	*
* Conv. Total (cfs)	* 10376.2	* Conv. (cfs)	* 5656.2	* 4720.0	*	*
* Length wtd. (ft)	* 96.36	* Wetted Per. (ft)	* 140.70	* 27.94	*	*
* Min Ch El (ft)	* 938.75	* Shear (lb/sq ft)	* 0.13	* 0.31	*	*
* Alpha	* 1.27	* Stream Power (lb/ft s)	* 550.65	* 0.00	* 0.00	*
* Frctn Loss (ft)	* 0.38	* Cum Volume (acre-ft)	* 5.31	* 2.63	* 0.99	*
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 5.38	* 0.70	* 0.83	*

Warning: The conveyance ratio (upstream 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: Bluestone Creek  
 REACH: Upper RS: 12162.04

INPUT

Description:

Station		Elevation Data		num= 72		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960	7.74	958	11.22	957.29	16.62	956	24.03	954.21				
24.92	954	25.51	953.85	40.15	952	41.89	951.92	42.52	951.89				
46.52	951.69	63.87	950.8	75.37	950.18	79.13	950	86.26	949.74				
97.11	949.19	105.14	948.76	120.44	948	128.15	947.74	135.69	947.44				
168.29	946	181.52	945.47	189.08	945.24	197.73	944.89	222.33	944				
236.35	944	236.48	944	244.62	943.47	265.35	942.15	266.58	942.07				
267.58	942	289.5	941.57	355.75	940.25	365.93	940.34	366.89	940.34				
368.17	940.34	370.19	940.34	389.41	940.38	392.13	940.39	411.48	940.79				
412.94	940.8	414.08	940.26	414.22	940	414.88	939.39	415.26	939.23				
416.61	938.37	419.24	938.49	419.71	938.52	421.79	939.18	422	939.23				
428.9	939.98	429.1	940	429.53	940.08	443.26	942	443.69	942.28				
446.38	944	448.8	945.59	449.43	946	450.73	946.92	452.42	948				
454.71	949.5	455.53	950	457.73	951.41	458.75	952	459.14	952.24				
462.03	954	462.57	954.35	464.78	955.78	465.16	956	466.72	957.03				
468.33	958	472.01	960										

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.035	412.94	.035
		429.1	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	412.94	429.1		102.49	86.36	91.08	.1 .3

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CROSS SECTION OUTPUT Profile #PF 1

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*****
* E.G. Elev (ft)      * 941.70 * Element          * Left OB * Channel * Right OB *
* Vel Head (ft)      * 0.36  * Wt. n-Val.      * 0.035  * 0.035  * 0.100  *
* W.S. Elev (ft)     * 941.34 * Reach Len. (ft) * 102.49 * 86.36  * 91.08  *
* Crit W.S. (ft)     * 941.31 * Flow Area (sq ft) * 80.90  * 33.15  * 6.19   *
* E.G. Slope (ft/ft) * 0.009218 * Area (sq ft) * 80.90  * 33.15  * 6.19   *
* Q Total (cfs)      * 482.70 * Flow (cfs)      * 266.03 * 210.04 * 6.64   *
* Top Width (ft)     * 137.21 * Top width (ft)  * 111.65 * 16.16  * 9.41   *
* Vel Total (ft/s)   * 4.01  * Avg. Vel. (ft/s) * 3.29   * 6.34   * 1.07   *
* Max chl Dpth (ft)  * 2.97  * Hydr. Depth (ft) * 0.72   * 2.05   * 0.66   *
* Conv. Total (cfs)  * 5027.5 * Conv. (cfs)     * 2770.8 * 2187.6 * 69.1   *
* Length Wtd. (ft)   * 94.36 * Wetted Per. (ft) * 111.66 * 17.11  * 9.50   *
* Min ch El (ft)     * 938.37 * Shear (lb/sq ft) * 0.42   * 1.12   * 0.37   *
* Alpha              * 1.45  * Stream Power (lb/ft s) * 472.01 * 0.00   * 0.00   *
* Frctn Loss (ft)   * 0.72  * Cum Volume (acre-ft) * 4.97   * 2.58   * 0.99   *
* C & E Loss (ft)   * 0.01  * Cum SA (acres)   * 4.98   * 0.68   * 0.83   *
*****

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CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Upper RS: 12075.53

INPUT  
 Description:

Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960	29.07	958.02	29.28	958.01	29.37	958	36.25	958
41.93	957.55	45.21	957.5	46.73	957.45	65.61	956	67.7	956
81.81	954.95	95.66	954	101.56	953.61	117.97	952.43	120.61	952.24
123.73	952	136.93	951.16	142.43	950.83	144.58	950.69	154.74	950
157.16	950	175.09	949.24	190.41	948.13	197.55	948.02	198.05	948
200.32	947.87	205.43	947.47	213.39	947.1	234.45	946	264.46	944.08
265.5	944.04	266.42	944	270.74	944	281.68	942.04	282.09	942
300.4	942	307.52	941.06	311.62	940.61	321.83	940	334.36	940.54
346.89	940	388.94	939.79	440.26	940	456.9	940.65	462.86	937.01
472.34	937.67	473.24	938.67	475.13	940	475.88	940.72	475.97	940.88
477.39	941.35	479.23	942	484.86	943.97	484.97	944	485.17	944.07
485.34	944.12	489.19	945.12	491.23	946	493.42	946.91	493.88	947.18
496.1	948	497.56	948.81	499.54	949.53	500.62	950	503.25	951.94
503.38	952	504.66	952.7	505.66	952.97	509.42	954	510.99	954.54
514.5	955.74	514.68	955.82	515.11	956	516.52	956.69	518.63	957.78
518.92	958	521.58	959.8	521.82	960	521.98	960.14	524.03	961.66
524.48	962	525.3	962.65	527.18	964	528.6	964.88	529.78	964.77
537.52	965.96	538.01	965.96	539.76	965.94	540.74	965.45	546.36	965.28
553.5	964.98	553.7	964.9	555.1	964.59	555.99	964.5	556.92	965.26
557.9	965.82	558.05	965.91	559.63	967.06	560.95	968	562.78	969.51
563.4	970	563.47	970.06						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .035 456.9 .035 475.88 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 456.9 475.88 204.78 165.56 176.18 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

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*****
* E.G. Elev (ft) * 940.97 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 0.33 * Wt. n-Val. * 0.035 * 0.035 *
* W.S. Elev (ft) * 940.64 * Reach Len. (ft) * 204.78 * 165.56 * 176.18 *
* Crit W.S. (ft) * 940.62 * Flow Area (sq ft) * 87.31 * 46.95 *
* E.G. Slope (ft/ft) * 0.006381 * Area (sq ft) * 87.31 * 46.95 *
* Q Total (cfs) * 482.70 * Flow (cfs) * 210.84 * 271.86 *
* Top Width (ft) * 164.13 * Top width (ft) * 145.25 * 18.88 *
* Vel Total (ft/s) * 3.60 * Avg. vel. (ft/s) * 2.41 * 5.79 *
* Max chl Dpth (ft) * 3.63 * Hydr. Depth (ft) * 0.60 * 2.49 *
* Conv. Total (cfs) * 6042.6 * Conv. (cfs) * 2639.3 * 3403.3 *
* Length wtd. (ft) * 187.12 * Wetted Per. (ft) * 145.31 * 21.04 *
* Min ch El (ft) * 937.01 * Shear (lb/sq ft) * 0.24 * 0.89 *
* Alpha * 1.66 * Stream Power (lb/ft s) * 563.47 * 0.00 * 0.00 *
* Frctn Loss (ft) * 1.14 * Cum Volume (acre-ft) * 4.77 * 2.50 * 0.98 *
* C & E Loss (ft) * 0.03 * Cum SA (acres) * 4.68 * 0.65 * 0.82 *
*****
  
```

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: Bluestone Creek  
 REACH: Upper RS: 11904.55

INPUT

Description:

Station Elevation Data num= 83

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960	2.14	959.57	9.31	958	11.95	957.61	19.02	956
19.61	956	22.47	955.39	30.39	954	44.44	952.06	44.97	952
49.05	952	66.6	950.06	66.74	950.05	67.06	950.01	67.17	950
67.22	949.99	72.01	949.15	78.41	948	78.62	947.96	89.47	946
89.79	945.94	92.19	945.53	100.5	944	102.3	943.67	111.59	942
120.54	940.39	121.43	940.29	121.84	940.28	122.71	940.25	122.85	940.23
124.03	940	169.17	939.27	179.12	939.11	186.55	938.98	199.46	938.75
202.83	938.7	203.67	938.69	207.06	938.64	210.94	938.58	213.81	938.54
221.06	938.43	270.9	938.53	273.4	938.55	283.93	938.63	306.68	938.9

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326.88	939.14	334.13	939.08	339.23	939.31	340.31	938.2	340.51	938
341.46	936.95	341.61	936.8	351.71	936.77	353.46	936.84	353.93	936.78
354.09	936.85	354.81	938	355.4	939.34	355.52	939.56	357.42	939.65
360.44	940	362.43	940.29	364.1	940.58	372.19	942	376.58	943.87
376.89	944	381.59	945.96	381.68	946	381.85	946.07	387.42	948
388.28	948.3	388.47	948.37	393.04	950	395.58	951.46	396.84	952
397.94	952.75	399.93	954	401.35	954.92	403.03	956	405.07	957.47
405.92	958	407.44	958.9	408.91	959.88				

Manning's n values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .035 339.23 .035 355.52 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 339.23 355.52 212.95 131.78 72.41 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 939.80	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.23	* Wt. n-Val.	* 0.035	* 0.035	* 0.000
* W.S. Elev (ft)	* 939.57	* Reach Len. (ft)	* 212.95	* 131.78	* 72.41
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 143.02	* 40.40	* 0.00
* E.G. Slope (ft/ft)	* 0.005835	* Area (sq ft)	* 143.02	* 40.40	* 0.00
* Q Total (cfs)	* 601.90	* Flow (cfs)	* 385.49	* 216.41	* 0.00
* Top width (ft)	* 205.30	* Top width (ft)	* 188.75	* 16.29	* 0.26
* Vel Total (ft/s)	* 3.28	* Avg. Vel. (ft/s)	* 2.70	* 5.36	* 0.04
* Max Chl Dpth (ft)	* 2.80	* Hydr. Depth (ft)	* 0.76	* 2.48	* 0.01
* Conv. Total (cfs)	* 7879.6	* Conv. (cfs)	* 5046.5	* 2833.1	* 0.0
* Length Wtd. (ft)	* 187.77	* Wetted Per. (ft)	* 188.77	* 19.03	* 0.26
* Min Ch El (ft)	* 936.77	* Shear (lb/sq ft)	* 0.28	* 0.77	*
* Alpha	* 1.39	* Stream Power (lb/ft s)	* 408.91	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.58	* Cum Volume (acre-ft)	* 4.23	* 2.33	* 0.98
* C & E Loss (ft)	* 0.04	* Cum SA (acres)	* 3.89	* 0.58	* 0.82

Warning: The conveyance ratio (upstream 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: Bluestone Creek  
 REACH: Upper RS: 11770.60

INPUT

Description:

Station Elevation Data num= 93

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	959.97	3.39	958.76	5.44	958	10.37	956.25	10.84	956.07

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11.06	956	11.31	955.94	11.72	955.84	12.94	955.49	17.73	954
22.4	952.32	23.43	952	27.05	950.68	28.96	950	31.92	948.97
34.63	948	35.15	947.81	40.07	946	40.57	945.82	41.22	945.6
45.63	944	49.18	942.72	51.13	942	55.54	940.47	57.34	940
75.12	938.5	81.19	938	106.77	937.41	128.7	938	141.15	938.12
171.62	938.18	210.62	938	235.66	937.68	258.34	938	272.87	938.28
273	938.15	273.28	938	274.03	937.19	275.22	936	275.9	935.06
276.25	934.71	277.33	934.78	280.57	934.9	280.85	935.04	282.64	936
284.11	936.93	285.06	937.34	285.75	937.45	289.39	938	301.46	939.8
302.78	940	303.94	940.16	319.47	942	320	942.07	320.3	942.11
320.31	942.11	321.61	942.3	326	944	328.22	944.85	331.49	946
334.64	947.13	341.12	949.52	342.44	950	344.29	950.66	348.45	952
352.07	953.31	355.49	954	358.4	954.86	362.46	956	364.72	956.95
368.47	958	383.23	958	386.17	957.05	387.42	956.47	388.06	956.28
389.09	956	389.14	955.98	389.37	955.92	389.81	955.96	393.59	955.94
396.98	956	399.04	956.04	399.21	956.03	399.23	956.04	399.24	956.04
401.62	956.77	401.63	956.77	401.78	956.72	404.26	956.23	404.38	956.31
406.82	957.68	407.27	958.02	410.26	960.03				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	272.87	.035	285.06	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	272.87	285.06		66.99	132.69	134.32	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 939.19	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.10	* Wt. n-Val.	* 0.035	* 0.035	* 0.100
* W.S. Elev (ft)	* 939.09	* Reach Len. (ft)	* 66.99	* 132.69	* 134.32
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 227.19	* 40.12	* 10.14
* E.G. Slope (ft/ft)	* 0.001890	* Area (sq ft)	* 227.19	* 40.12	* 10.14
* Q Total (cfs)	* 601.90	* Flow (cfs)	* 449.27	* 146.71	* 5.93
* Top Width (ft)	* 228.60	* Top width (ft)	* 204.76	* 12.19	* 11.65
* Vel Total (ft/s)	* 2.17	* Avg. Vel. (ft/s)	* 1.98	* 3.66	* 0.58
* Max chl Dpth (ft)	* 4.38	* Hydr. Depth (ft)	* 1.11	* 3.29	* 0.87
* Conv. Total (cfs)	* 13846.1	* Conv. (cfs)	* 10335.0	* 3374.8	* 136.3
* Length wtd. (ft)	* 96.22	* Wetted Per. (ft)	* 204.83	* 14.39	* 11.78
* Min ch El (ft)	* 934.71	* Shear (lb/sq ft)	* 0.13	* 0.33	* 0.10
* Alpha	* 1.31	* Stream Power (lb/ft s)	* 410.26	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.28	* Cum Volume (acre-ft)	* 3.32	* 2.21	* 0.97
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 2.93	* 0.54	* 0.81

Warning: The conveyance ratio (upstream 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: Bluestone Creek  
 REACH: Upper

RS: 11632.87

INPUT  
 Description:

Station Elevation Data		num= 89		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960	3.26	958.93	6.12	958	9.54	957.53	10.66	957.31		
14.77	956	21.02	954.53	23.58	954	32.2	952.02	32.35	951.98		
39.73	950	42.38	949.32	47.66	948	52.6	946.76	55.61	946		
62.93	944.13	63.44	944	64.5	943.72	69.14	942.38	70.43	942		
75.91	941.26	78.88	940	93.6	939.03	109.52	938	131.39	938		
210.03	937.57	240.41	937.41	243	937.31	243.16	937.07	243.96	936		
244.79	934.65	245.78	934	246.03	933.83	246.2	933.83	246.58	933.86		
247.37	934	247.8	934	248.38	934.18	256.29	934.82	257.84	935.84		
258.08	936	258.3	936.14	259.41	937.6	268.24	938	283.83	939.04		
287.82	939.25	292.58	939.5	295.29	939.61	295.81	939.64	300.44	940		
311.72	941.28	317.13	942	329.19	943.58	332.34	944	333.59	944.16		
347.29	945.77	347.37	945.78	347.4	945.79	347.69	946	349.52	946.95		
350.86	948	351.69	948.66	353.47	950	354.52	950.78	355.37	951.44		
359.06	951.82	360.88	952	361.65	952.08	361.71	952.08	363.24	952.12		
372.06	952.3	372.93	952.35	373.7	952.33	373.79	952.33	373.84	952.32		
376.37	951.97	376.49	951.95	376.54	951.97	376.68	952	377.81	952.63		
380.85	954.33	381.67	954.78	381.69	954.8	381.75	954.84	383.23	956		
383.85	956.5	385.88	958	387.01	958.72	388.94	959.89				

Manning's n values		num= 3		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.035	243	.035	259.41	.1		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	243	259.41		286.13	220.98	202.96	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 938.87	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.43	* Wt. n-Val.	* 0.035	* 0.035	* 0.100
* w.s. Elev (ft)	* 938.44	* Reach Len. (ft)	* 286.13	* 220.98	* 202.96
* Crit w.s. (ft)	* 938.44	* Flow Area (sq ft)	* 93.83	* 58.84	* 7.05
* E.G. Slope (ft/ft)	* 0.005172	* Area (sq ft)	* 93.83	* 58.84	* 7.05
* Q Total (cfs)	* 601.90	* Flow (cfs)	* 219.16	* 378.26	* 4.48
* Top width (ft)	* 172.02	* Top width (ft)	* 140.23	* 16.41	* 15.38
* Vel Total (ft/s)	* 3.77	* Avg. Vel. (ft/s)	* 2.34	* 6.43	* 0.63
* Max Chl Dpth (ft)	* 4.61	* Hydr. Depth (ft)	* 0.67	* 3.59	* 0.46
* Conv. Total (cfs)	* 8369.1	* Conv. (cfs)	* 3047.3	* 5259.5	* 62.3
* Length wtd. (ft)	* 248.26	* wetted Per. (ft)	* 140.25	* 19.26	* 15.40
* Min Ch El (ft)	* 933.83	* Shear (lb/sq ft)	* 0.22	* 0.99	* 0.15
* Alpha	* 1.97	* Stream Power (lb/ft s)	* 388.94	* 0.00	* 0.00
* Frctn Loss (ft)	* 1.47	* Cum Volume (acre-ft)	* 3.08	* 2.06	* 0.95



\* C & E Loss (ft) \* 0.01 \* Cum SA (acres) \* 2.66 \* 0.49 \* 0.76 \*  
 \*\*\*\*\*

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.

Warning: The energy loss was 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: Bluestone Creek

REACH: Upper

RS: 11351.13

INPUT

Description:

Station Elevation Data		num= 104		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960	8.69	958	12.73	957.24	16.21	956.63	19.81	956		
24.99	954.96	31.77	954	33.45	953.6	36.16	952.9	37.93	952.4		
39.69	952	46.26	950.46	48.09	950	55.41	948.21	56.25	948		
61.54	946.27	62.07	946	64.18	944.84	65.9	944	68.58	942.6		
69.8	942	70.2	941.91	80.88	940.56	83.09	940.28	85.34	940		
90.77	939.25	99.86	938	100.58	937.89	110.49	936	159.57	936		
196.96	935.86	198.63	935.88	219.49	935.97	227.82	935.95	235	935.96		
242.46	935.94	245.11	935.93	265.79	935.95	299.93	935.98	299.97	935.93		
301.62	934	301.96	933.65	302.06	933.52	302.08	933.52	311.76	933.12		
311.79	933.2	314.29	935.14	314.49	935.31	315.82	935.55	316.68	935.74		
321.25	937.05	323.4	937.62	324.82	938	331.09	939.72	332.17	940		
333.57	940.38	339.6	942	346.3	943.86	346.79	944	347.02	944.08		
348.35	944.33	351.47	944.91	351.53	944.93	356.15	946	358.67	946.58		
364.61	948	369.76	949.48	372.16	950	373	950.27	373.13	950.29		
373.48	950.3	375.58	950.31	376.01	950.34	380.52	950.23	385.22	950.44		
386.2	950.47	387.36	950.55	388.19	950.65	389.93	950.65	399.61	950.3		
399.82	950.28	401.71	950.06	401.94	950.01	401.96	950	402.2	949.93		
404.05	949.55	404.45	949.48	404.56	949.58	405.23	950	405.74	950.54		
406.04	950.9	407.22	951.92	407.32	952	407.35	952.02	408.67	953.23		
408.78	953.3	410.1	954	413.27	955.85	413.54	956	413.84	956.18		
417.29	958	418.56	958.43	423.98	959.29	428.7	959.98				

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	299.93	.035	314.29	.1

OXF157-159Bridges.rep

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 299.93 314.29 158.28 141.28 210.48 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

```
*****
* E.G. Elev (ft) * 937.20 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 0.41 * Wt. n-Val. * 0.060 * 0.035 * 0.100 *
* W.S. Elev (ft) * 936.79 * Reach Len. (ft) * 158.28 * 141.28 * 210.48 *
* Crit W.S. (ft) * 936.79 * Flow Area (sq ft) * 159.57 * 44.71 * 5.04 *
* E.G. Slope (ft/ft) * 0.006855 * Area (sq ft) * 159.57 * 44.71 * 5.04 *
* Q Total (cfs) * 601.90 * Flow (cfs) * 287.58 * 308.99 * 5.33 *
* Top width (ft) * 214.01 * Top width (ft) * 193.59 * 14.36 * 6.06 *
* Vel Total (ft/s) * 2.88 * Avg. Vel. (ft/s) * 1.80 * 6.91 * 1.06 *
* Max Chl Dpth (ft) * 3.67 * Hydr. Depth (ft) * 0.82 * 3.11 * 0.83 *
* Conv. Total (cfs) * 7269.8 * Conv. (cfs) * 3473.4 * 3732.0 * 64.4 *
* Length Wtd. (ft) * 152.71 * Wetted Per. (ft) * 193.66 * 16.21 * 6.31 *
* Min Ch El (ft) * 933.12 * Shear (lb/sq ft) * 0.35 * 1.18 * 0.34 *
* Alpha * 3.15 * Stream Power (lb/ft s) * 428.70 * 0.00 * 0.00 *
* Frctn Loss (ft) * 0.53 * Cum Volume (acre-ft) * 2.25 * 1.80 * 0.92 *
* C & E Loss (ft) * 0.10 * Cum SA (acres) * 1.57 * 0.41 * 0.71 *
*****
```

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 conveyance ratio (upstream 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: Bluestone Creek

REACH: Upper

RS: 11189.95

INPUT

Description:

```
Station Elevation Data num= 95
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
*****
0 949.99 1.6 949.56 8.15 948 13.4 946.56 14.9 946.14
15.46 946 22.5 944.11 22.9 944 26.68 942.99 29.86 942.16
30.47 942 30.99 941.87 38.05 940 44.66 938.3 47.34 938
```

OXF157-159Bridges.rep

59.53	936.64	61.72	936.46	65.02	936	67.37	936	81.56	934.73
89.53	934.14	90.77	934.09	93.56	934.08	97.91	934.12	103.27	934.02
129.26	934.03	134.7	934.06	143.11	934.05	146.21	934.04	149.97	934
151.38	933.98	154.39	934	182.46	934	198.26	934.26	222.23	934.45
236.94	934.63	264.31	934.96	269.77	934.99	269.99	934.65	271.72	932.86
272.02	932.58	272.11	932.45	273.32	932.28	274.87	932.04	275.36	932
275.72	932	275.92	932.09	278.61	932.67	279.21	933.31	280.03	933.82
280.05	933.84	280.45	933.92	283.23	934.5	283.81	934.63	289.66	936
295.2	937.3	300.27	938.53	306.24	940	312.92	941.88	313.26	941.98
313.31	942	313.33	942.01	313.37	942.03	317.66	944	320.94	945.62
321.79	946	322.58	946.36	326.25	948	328.3	948.96	330.59	950.24
330.8	950.36	331.17	950.33	338.76	950.65	344.51	950.72	350.13	950.9
352.54	950.85	352.73	950.83	355.75	950.01	355.77	950	356.2	949.91
356.5	949.9	356.55	949.9	357.28	950.01	357.87	950.25	361.03	951.68
361.62	951.91	362.01	952	363.81	952.69	367.01	954	371.17	955.65
372.07	956	372.89	956.31	377.18	958	382.11	959.96	382.16	959.98

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	269.77	.035	280.03	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	269.77	280.03		65.71	199.34	191.45	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 935.97	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.07	* wt. n-Val.	* 0.060	* 0.035	* 0.100
* w.s. Elev (ft)	* 935.89	* Reach Len. (ft)	* 65.71	* 199.34	* 191.45
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 311.93	* 32.41	* 9.70
* E.G. Slope (ft/ft)	* 0.002088	* Area (sq ft)	* 311.93	* 32.41	* 9.70
* Q Total (cfs)	* 601.90	* Flow (cfs)	* 472.71	* 122.48	* 6.72
* Top Width (ft)	* 220.63	* Top width (ft)	* 201.20	* 10.26	* 9.17
* Vel Total (ft/s)	* 1.70	* Avg. vel. (ft/s)	* 1.52	* 3.78	* 0.69
* Max Chl Dpth (ft)	* 3.89	* Hydr. Depth (ft)	* 1.55	* 3.16	* 1.06
* Conv. Total (cfs)	* 13172.5	* Conv. (cfs)	* 10345.1	* 2680.4	* 147.0
* Length Wtd. (ft)	* 114.62	* Wetted Per. (ft)	* 201.28	* 11.92	* 9.41
* Min Ch El (ft)	* 932.00	* Shear (lb/sq ft)	* 0.20	* 0.35	* 0.13
* Alpha	* 1.63	* Stream Power (lb/ft s)	* 382.16	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.15	* Cum Volume (acre-ft)	* 1.39	* 1.67	* 0.88
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.85	* 0.37	* 0.68

Warning: The conveyance ratio (upstream 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: Bluestone Creek

REACH: Upper

RS: 10974.14

INPUT

Description:

Station Elevation Data		num= 100		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	950.05	.25	950	3.51	949.3	8.79	948.25	9.99	948		
10.53	947.89	13.9	947.11	17.85	946	25.1	944.07	25.34	944		
25.83	943.86	32.12	942	36.48	940.98	40.06	940	46.05	938.56		
48.4	938	52.71	936.98	56.78	936	61.04	934.88	62.48	934.63		
65.55	934	66.62	934	70.28	933.92	128.37	933.37	134.04	933.26		
147.26	933.75	153.2	933.9	155.49	933.96	163.84	933.72	167.89	933.84		
177.32	933.25	180.12	932.05	180.19	932	180.31	931.84	181.14	930.28		
181.96	930.1	182.54	930	188.88	930	191.45	929.91	191.5	930.04		
191.91	930.76	191.97	930.91	192.37	932	192.46	933.02	192.66	933.64		
196	933.57	201.38	933.63	209.25	934	219.98	934	224.45	934.69		
226.67	935.04	230.8	935.61	232.56	936	234.23	936.17	239.67	936.39		
245.58	936.73	266.43	938	271.42	938.51	275.93	938.84	282.18	939.36		
288.93	940	291.42	940.41	303.12	942	305.11	943.34	306.16	944		
306.69	944.33	309.12	946	309.65	946.31	312.06	948	312.69	948.37		
314.72	949.67	315.17	950	315.26	950.04	315.51	950.31	316.28	950.39		
317.29	950.33	318.02	950.29	319.69	950.24	321.98	950.17	330	950.13		
330.36	950.12	330.7	950.11	330.85	950.08	332.05	949.87	332.77	949.72		
334.01	949.45	334.03	949.45	334.29	949.66	336.11	950.7	338.34	951.8		
338.72	952	339.62	952.5	342.66	954	346.35	955.75	346.84	956		
347.3	956.2	350.07	957.27	351.68	958	355.93	959.86	356.27	959.99		

Manning's n Values		num= 3		Sta n Val		Sta n Val		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	177.32	.035	192.66	.06				

Bank Sta:	Left	Right	Lengths: Left Channel		Right	Coeff Contr.	Expan.
	177.32	192.66	205.41	261.21	240.88	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 935.81	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.08	* Element	* 0.060	* 0.035	* 0.060
* W.S. Elev (ft)	* 935.73	* Wt. n-Val.	* 205.41	* 261.21	* 240.88
* Crit W.S. (ft)	*	* Reach Len. (ft)	* 239.54	* 77.49	* 62.05
* E.G. Slope (ft/ft)	* 0.000924	* Flow Area (sq ft)	* 239.54	* 77.49	* 62.05
* Q Total (cfs)	* 601.90	* Area (sq ft)	* 286.31	* 251.73	* 63.86
* Top Width (ft)	* 173.54	* Flow (cfs)	* 119.52	* 15.34	* 38.69
* Vel Total (ft/s)	* 1.59	* Top width (ft)	* 1.20	* 3.25	* 1.03
* Max Chl Dpth (ft)	* 5.82	* Avg. Vel. (ft/s)	* 2.00	* 5.05	* 1.60
* Conv. Total (cfs)	* 19798.9	* Hydr. Depth (ft)	* 9417.9	* 8280.4	* 2100.6
* Length Wtd. (ft)	* 242.94	* Conv. (cfs)	* 119.75	* 19.40	* 38.83
* Min Ch El (ft)	* 929.91	* wetted Per. (ft)	* 0.12	* 0.23	* 0.09
* Alpha	* 2.06	* Shear (lb/sq ft)	* 356.27	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.56	* Stream Power (lb/ft s)	* 0.97	* 1.42	* 0.72
		* Cum Volume (acre-ft)			

\* C & E Loss (ft) \* 0.12 \* Cum SA (acres) \* 0.61 \* 0.32 \* 0.57 \*  
 \*\*\*\*\*

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.

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Upper RS: 10615.35

INPUT  
 Description:

Station Elevation Data		num= 80		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	950.07	.23	950	4.39	948.66	6.24	948.1	6.54	948		
6.93	947.86	12.37	946	12.77	945.86	18.27	944	19.53	943.56		
22.08	942.72	23.81	942.23	24.56	942	25.83	941.56	30.73	940		
45.25	940	53.93	938.94	57	938.25	58.13	938	62.01	937.21		
67.82	936	74.83	934.57	77.59	934	80.19	933.47	87.06	932.33		
87.09	932.32	87.57	932	89.72	930.44	90.33	930	92.18	928.65		
92.27	928.51	92.29	928.53	92.3	928.48	92.41	928.47	92.5	928.47		
93.94	928.71	94.09	928.73	94.45	928.98	94.49	929	94.66	929.25		
96.53	930.72	97.28	931.15	97.66	931.33	97.85	931.42	97.95	931.43		
98.47	931.46	103.32	932	109.19	932.65	109.51	932.66	121.31	933.59		
132.54	934	133.01	934	136.9	934	139.46	934.04	146.56	934.09		
149.6	934.07	151.88	934.01	217.27	935.34	218.13	935.34	253.19	936		
270.87	936	279.41	936.88	290.14	938	291.27	938.1	314.2	940		
323.67	941.2	330.09	941.69	333.34	942	333.49	942	338.41	942.82		
341.29	943.3	345.56	944	345.8	944	353.14	945.47	356.47	946		
364.43	947.54	366.78	948	367.4	948.12	379.99	950	380.02	950.01		

Manning's n Values		num= 3		Sta n Val		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.035	87.06	.035	97.66	.035		

Bank Sta:	Left	Right	Lengths: Left Channel		Right	Coeff Contr.	Expan.
	87.06	97.66	165.46	196.08	242.91	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 935.14	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 1.27	* wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 933.87	* Reach Len. (ft)	* 165.46	* 196.08	* 242.91
* Crit W.S. (ft)	* 933.87	* Flow Area (sq ft)	* 7.06	* 40.57	* 31.71
* E.G. slope (ft/ft)	* 0.012785	* Area (sq ft)	* 7.06	* 40.57	* 31.71

OXF157-159Bridges.rep

```

* Q Total (cfs) * 601.90 * Flow (cfs) * 28.92 * 420.00 * 152.98 *
* Top Width (ft) * 50.78 * Top width (ft) * 8.84 * 10.60 * 31.34 *
* Vel Total (ft/s) * 7.59 * Avg. Vel. (ft/s) * 4.09 * 10.35 * 4.82 *
* Max Chl Dpth (ft) * 5.40 * Hydr. Depth (ft) * 0.80 * 3.83 * 1.01 *
* Conv. Total (cfs) * 5323.1 * Conv. (cfs) * 255.8 * 3714.4 * 1352.9 *
* Length Wtd. (ft) * 195.82 * Wetted Per. (ft) * 8.97 * 12.81 * 31.47 *
* Min Ch El (ft) * 928.47 * Shear (lb/sq ft) * 0.63 * 2.53 * 0.80 *
* Alpha * 1.42 * Stream Power (lb/ft s) * 380.02 * 0.00 * 0.00 *
* Frctn Loss (ft) * 1.19 * Cum Volume (acre-ft) * 0.39 * 1.07 * 0.47 *
* C & E Loss (ft) * 0.28 * Cum SA (acres) * 0.31 * 0.24 * 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 velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream 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: Bluestone Creek

REACH: Upper

RS: 10402.90

INPUT

Description:

Station Elevation Data		num=		98					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	949.98	4.75	949.07	9.99	948	12.35	947.16	13.4	946.71
15.19	946	16.9	945.32	20.16	944	22.21	943.19	25.98	942
27.3	941.58	33.58	940	41.79	938	48.68	936.32	50.12	936
52.93	935.42	59.48	934	66.15	933.44	69.83	933.02	78.61	932
81.03	932	107.82	931.32	108.61	931.3	113.64	931.2	113.78	930.95
114.87	930	115.19	929.31	115.46	929.17	117.12	928	125.15	928
125.65	928.15	125.93	928.39	126.93	929.7	127.14	930	128.2	931.45
128.47	931.79	128.48	931.79	128.85	931.9	130.37	932.31	132.68	933.01
133.56	933.28	139.51	934	163.9	934	177.25	934.27	198.2	934.69
234.32	935.4	256.93	935.77	261.59	935.82	268.68	935.89	276.66	936
278.04	936	295.82	937.17	300.68	937.56	305.09	938	320.66	939.68
324.3	940	330.46	940.55	340.25	941.36	347.45	942	355.87	942.74

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360.6	943.16	370.55	944	371.63	944.09	382.42	944.63	403.27	945.55
406.61	945.77	406.88	945.79	407.7	945.82	410.75	946	414.76	946.39
431.53	948	437.56	948.59	440.88	949.27	442.55	949.54	443.39	949.69
449.98	950	452.83	950.14	453.61	950.21	458.16	950.6	460.13	950.82
469.57	952	479.29	953.24	482.87	953.97	482.96	953.98	483.07	954
484.93	954.28	494.49	955.7	496.35	956	497.23	956.08	497.98	956.22
500.36	956.54	507.37	957.51	509.34	957.74	511.66	958	525.32	958.8
526.25	958.85	533.6	959.6	537.12	959.97				

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .035 113.64 .035 139.51 .035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 113.64 139.51 195.34 212.37 143.13 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 933.66	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.34	* wt. n-Val.	* 0.035	* 0.035	*
* W.S. Elev (ft)	* 933.32	* Reach Len. (ft)	* 195.34	* 212.37	* 143.13
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 66.99	* 72.53	*
* E.G. Slope (ft/ft)	*0.003525	* Area (sq ft)	* 66.99	* 72.53	*
* Q Total (cfs)	* 601.90	* Flow (cfs)	* 215.41	* 386.49	*
* Top width (ft)	* 66.62	* Top width (ft)	* 46.40	* 20.22	*
* Vel Total (ft/s)	* 4.31	* Avg. Vel. (ft/s)	* 3.22	* 5.33	*
* Max Chl Dpth (ft)	* 5.32	* Hydr. Depth (ft)	* 1.44	* 3.59	*
* Conv. Total (cfs)	* 10138.2	* Conv. (cfs)	* 3628.4	* 6509.9	*
* Length Wtd. (ft)	* 188.99	* Wetted Per. (ft)	* 46.49	* 23.60	*
* Min Ch El (ft)	* 928.00	* Shear (lb/sq ft)	* 0.32	* 0.68	*
* Alpha	* 1.18	* Stream Power (lb/ft s)	* 537.12	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.32	* Cum Volume (acre-ft)	* 0.25	* 0.81	* 0.38
* C & E Loss (ft)	* 0.08	* Cum SA (acres)	* 0.20	* 0.17	* 0.29

Warning: The conveyance ratio (upstream 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: Bluestone Creek  
 REACH: Upper RS: 10179.69

INPUT

Description:  
 Station Elevation Data num= 74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	950	7.02	948	7.65	947.79	12.75	946	16.04	944.89

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18.45	944	18.83	943.86	21.31	943.03	24.14	942	24.95	941.72
30	940	30.34	939.88	30.41	939.86	35.66	938	36.55	937.7
41.32	936	43.87	935.16	47.2	934	52.51	933.3	63.17	932
70.31	931.07	73.42	930.68	73.8	930.3	74.91	929.23	75.38	928.56
81.38	928.17	83.78	928.19	84.51	928.78	87.28	930	88.71	930.67
89.62	931.15	100.19	930.83	109.2	930.7	131.77	931.45	139.29	931.7
143.11	931.76	154.22	931.96	156.23	931.97	158.62	931.98	164.24	931.98
166.29	932	205.48	932	211.15	932.07	211.99	932.07	218.22	932.55
222.7	932.85	230.07	933.41	238.55	934	245.91	934.6	253.87	934.91
258.79	935.16	261.36	935.28	263.95	935.43	276.63	936	285.33	936
295.58	936.42	308.18	936.84	318.94	937.07	346.1	937.98	347.82	938.05
350.52	938.17	355.55	938.45	380.49	940	385.34	940.26	406.85	941.41
417.23	942	442.02	943.97	442.54	944	454.48	944.96	464.56	946
474.51	946.87	485.59	948	486.82	948.12	506.82	950		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	73.42	.035	89.62	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	73.42	89.62		111.2	58.47	28.87	.1
							.3

CROSS SECTION OUTPUT Profile #PF 1

	*	933.26	*	Element	*	Left OB	*	Channel	*	Right OB	*
* E.G. Elev (ft)	*	0.09	*	Wt. n-Val.	*	0.035	*	0.035	*	0.035	*
* Vel Head (ft)	*	933.17	*	Reach Len. (ft)	*	111.20	*	58.47	*	28.87	*
* W.S. Elev (ft)	*	932.32	*	Flow Area (sq ft)	*	24.42	*	67.62	*	199.78	*
* Crit W.S. (ft)	*	0.000999	*	Area (sq ft)	*	24.42	*	67.62	*	199.78	*
* E.G. Slope (ft/ft)	*	601.90	*	Flow (cfs)	*	37.45	*	220.24	*	344.21	*
* Q Total (cfs)	*	173.34	*	Top width (ft)	*	19.84	*	16.20	*	137.29	*
* Top Width (ft)	*	2.06	*	Avg. vel. (ft/s)	*	1.53	*	3.26	*	1.72	*
* Vel Total (ft/s)	*	5.00	*	Hydr. Depth (ft)	*	1.23	*	4.17	*	1.46	*
* Max Chl Dpth (ft)	*	19039.8	*	Conv. (cfs)	*	1184.7	*	6966.7	*	10888.3	*
* Conv. Total (cfs)	*	58.47	*	Wetted Per. (ft)	*	20.00	*	17.88	*	137.36	*
* Length Wtd. (ft)	*	928.17	*	Shear (lb/sq ft)	*	0.08	*	0.24	*	0.09	*
* Min Ch El (ft)	*	1.35	*	Stream Power (lb/ft s)	*	506.82	*	0.00	*	0.00	*
* Alpha	*		*	Cum Volume (acre-ft)	*	0.05	*	0.47	*	0.05	*
* Frctn Loss (ft)	*		*	Cum SA (acres)	*	0.05	*	0.08	*	0.07	*
* C & E Loss (ft)	*		*		*		*		*		*

CULVERT

RIVER: Bluestone Creek  
 REACH: Upper RS: 10155.71

INPUT  
 Description:  
 Distance from Upstream XS = 14.5  
 Deck/Roadway width = 17



Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num= 2

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
63.17	932	0	155.61	932	0				

Upstream Bridge Cross Section Data

Station Elevation Data

num= 74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	950	7.02	948	7.65	947.79	12.75	946	16.04	944.89
18.45	944	18.83	943.86	21.31	943.03	24.14	942	24.95	941.72
30	940	30.34	939.88	30.41	939.86	35.66	938	36.55	937.7
41.32	936	43.87	935.16	47.2	934	52.51	933.3	63.17	932
70.31	931.07	73.42	930.68	73.8	930.3	74.91	929.23	75.38	928.56
81.38	928.17	83.78	928.19	84.51	928.78	87.28	930	88.71	930.67
89.62	931.15	100.19	930.83	109.2	930.7	131.77	931.45	139.29	931.7
143.11	931.76	154.22	931.96	156.23	931.97	158.62	931.98	164.24	931.98
166.29	932	205.48	932	211.15	932.07	211.99	932.07	218.22	932.55
222.7	932.85	230.07	933.41	238.55	934	245.91	934.6	253.87	934.91
258.79	935.16	261.36	935.28	263.95	935.43	276.63	936	285.33	936
295.58	936.42	308.18	936.84	318.94	937.07	346.1	937.98	347.82	938.05
350.52	938.17	355.55	938.45	380.49	940	385.34	940.26	406.85	941.41
417.23	942	442.02	943.97	442.54	944	454.48	944.96	464.56	946
474.51	946.87	485.59	948	486.82	948.12	506.82	950		

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	73.42	.035	89.62	.035

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	73.42	89.62	.1		.3

Downstream Deck/Roadway Coordinates

num= 2

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
76.48	932	0	191.31	932					

Downstream Bridge Cross Section Data

Station Elevation Data

num= 94

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	949.98	.99	949.69	3.05	948.99	5.8	948	7.27	947.54
14.25	945.18	17.77	944	20.76	943.12	25.92	942	32.18	940.67
41.53	938.63	44.67	938	50.24	936.88	54.17	936.09	54.63	936
55.48	935.83	64.84	934	70.21	933.14	76.48	932	85.69	930.67
90.55	930	91.37	930	95.59	929.44	96.66	929.56	98.88	929.36
99.87	928.89	100.02	928.83	100.45	928.82	111.15	928.34	112.41	928.5
113.52	928.63	115.72	928.63	118.68	928.83	126.56	929.92	127	930

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128.72	930.19	128.95	930.24	129.4	930.24	139.65	930.26	145.17	930.51
145.53	930.52	154.16	930.43	160.26	930.69	161.88	930.74	167.53	930.9
180.55	931.6	185.13	931.66	186.41	931.78	191.31	932	196.93	932
200.87	931.76	221.57	931.83	225.16	932	227.58	932	233.04	932.16
255.77	932.65	256.55	932.66	263.77	933.02	274.11	933.29	279.11	934
282.89	934	297.09	935.18	310.65	935.92	315.18	936	322.12	936
325.63	936.14	340.23	936.23	341.92	936.25	343.41	936.28	350.49	936.52
360.44	937.28	367.48	937.74	371.77	938	382.05	938	390.77	938.58
414.08	939.62	416.45	939.72	431.9	940.53	452.2	941.54	453.87	941.68
457.84	942	470.95	943.01	480.09	943.75	483.03	944	485.82	944.22
488.38	944.37	510.98	945.88	512.74	946	523.97	946.96	536.1	948
542.07	948.51	543.76	948.68	545.85	948.86	558.19	950.01		

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .035 90.55 .035 129.4 .035

Bank Sta: Left Right Coeff Contr. Expan.  
 90.55 129.4 .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 Culverts = 1

Culvert Name Shape Rise Span  
 Culvert #1 Circular 2  
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert  
 FHWA Scale # 3 - Pipe projecting from fill  
 Solution Criteria = Highest U.S. EG

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
Upstream	4	39	.024	.024	0	.9	1
Elevation =	928.61						
Centerline Station =	79.2						
Downstream	Elevation = 928.54						
Centerline Station =	103.08						

CULVERT OUTPUT Profile #PF 1 Culv Group: Culvert #1

\*\*\*\*\*  
 \* Q Culv Group (cfs) \* 18.61 \* Culv Full Len (ft) \* 39.00 \*  
 \* # Barrels \* 1 \* Culv Vel US (ft/s) \* 5.92 \*  
 \* Q Barrel (cfs) \* 18.61 \* Culv Vel DS (ft/s) \* 5.92 \*  
 \* E.G. US. (ft) \* 933.26 \* Culv Inv El Up (ft) \* 928.61 \*  
 \* W.S. US. (ft) \* 933.17 \* Culv Inv El Dn (ft) \* 928.54 \*  
 \* E.G. DS (ft) \* 931.76 \* Culv Frctn Ls (ft) \* 0.90 \*  
 \* W.S. DS (ft) \* 931.33 \* Culv Exit Loss (ft) \* 0.11 \*

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* Delta EG (ft) * 1.50 * Culv Entr Loss (ft) * 0.49 *
* Delta WS (ft) * 1.84 * Q Weir (cfs) * 583.90 *
* E.G. IC (ft) * 933.25 * Weir Sta Lft (ft) * 52.81 *
* E.G. OC (ft) * 933.26 * Weir Sta Rgt (ft) * 228.14 *
* Culvert Control * Outlet * Weir Submerg * 0.00 *
* Culv WS Inlet (ft) * 930.61 * Weir Max Depth (ft) * 1.30 *
* Culv WS Outlet (ft) * 930.54 * Weir Avg Depth (ft) * 1.16 *
* Culv Nm1 Depth (ft) * * Weir Flow Area (sq ft) * 204.05 *
* Culv Crt Depth (ft) * 1.55 * Min El Weir Flow (ft) * 931.98 *
*****
```

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Upper RS: 10120.86

INPUT  
 Description:

Station Elevation Data num= 94

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	949.98	.99	949.69	3.05	948.99	5.8	948	7.27	947.54
14.25	945.18	17.77	944	20.76	943.12	25.92	942	32.18	940.67
41.53	938.63	44.67	938	50.24	936.88	54.17	936.09	54.63	936
55.48	935.83	64.84	934	70.21	933.14	76.48	932	85.69	930.67
90.55	930	91.37	930	95.59	929.44	96.66	929.56	98.88	929.36
99.87	928.89	100.02	928.83	100.45	928.82	111.15	928.34	112.41	928.5
113.52	928.63	115.72	928.63	118.68	928.83	126.56	929.92	127	930
128.72	930.19	128.95	930.24	129.4	930.24	139.65	930.26	145.17	930.51
145.53	930.52	154.16	930.43	160.26	930.69	161.88	930.74	167.53	930.9
180.55	931.6	185.13	931.66	186.41	931.78	191.31	932	196.93	932
200.87	931.76	221.57	931.83	225.16	932	227.58	932	233.04	932.16
255.77	932.65	256.55	932.66	263.77	933.02	274.11	933.29	279.11	934
282.89	934	297.09	935.18	310.65	935.92	315.18	936	322.12	936
325.63	936.14	340.23	936.23	341.92	936.25	343.41	936.28	350.49	936.52
360.44	937.28	367.48	937.74	371.77	938	382.05	938	390.77	938.58
414.08	939.62	416.45	939.72	431.9	940.53	452.2	941.54	453.87	941.68
457.84	942	470.95	943.01	480.09	943.75	483.03	944	485.82	944.22
488.38	944.37	510.98	945.88	512.74	946	523.97	946.96	536.1	948
542.07	948.51	543.76	948.68	545.85	948.86	558.19	950.01		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	90.55	.035	129.4	.035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 90.55 129.4 24.44 64.93 4.53 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

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* E.G. Elev (ft)	* 931.76	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.43	* Wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 931.33	* Reach Len. (ft)	* 24.44	* 64.93	* 4.53
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 6.32	* 86.21	* 34.14
* E.G. Slope (ft/ft)	* 0.006297	* Area (sq ft)	* 6.32	* 86.21	* 34.14
* Q Total (cfs)	* 601.90	* Flow (cfs)	* 16.22	* 491.54	* 94.14
* Top Width (ft)	* 94.35	* Top width (ft)	* 9.41	* 38.85	* 46.08
* Vel Total (ft/s)	* 4.75	* Avg. Vel. (ft/s)	* 2.57	* 5.70	* 2.76
* Max Chl Dpth (ft)	* 2.99	* Hydr. Depth (ft)	* 0.67	* 2.22	* 0.74
* Conv. Total (cfs)	* 7584.9	* Conv. (cfs)	* 204.4	* 6194.1	* 1186.3
* Length wtd. (ft)	* 52.02	* Wetted Per. (ft)	* 9.51	* 39.15	* 46.11
* Min Ch El (ft)	* 928.34	* Shear (lb/sq ft)	* 0.26	* 0.87	* 0.29
* Alpha	* 1.24	* Stream Power (lb/ft s)	* 558.19	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.32	* Cum volume (acre-ft)	* 0.05	* 0.24	* 0.05
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 0.02	* 0.04	* 0.00

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Upper RS: 10055.03

INPUT  
 Description:

Station Elevation Data		num= 83		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	948	5.36	946.09	5.66	946	5.94	945.91	7.71	945.44
12.65	944	14.95	943.34	19.57	942	20.89	941.67	27.6	940
32.7	938.74	35.61	938	38.21	937.36	44.1	936	50.58	934.61
52.86	934	65.23	932.13	66.07	932	72.32	931.05	74.99	930.58
78	930.52	84.21	930.7	84.32	930.7	90.95	930.51	96.46	930.27
101.25	930	105.17	929.78	117.92	929.06	118.72	928.21	118.75	928
118.79	927.94	118.84	927.85	124.42	927.1	125.29	927.05	130.6	926.98
131.9	927.79	134.05	928.33	136.16	928.87	139.86	929.03	140.44	929.13
140.8	929.2	148.83	930	148.94	930.01	149.01	930	149.06	930
152.14	930	183.83	930.86	210.76	931.59	211.22	931.59	215.97	931.59
236.55	932	261.82	932	280.12	932.82	283.06	932.89	292.78	933.23
312.13	934	313.48	934	336.43	935.1	348.72	935.59	355.34	936
380.2	936	405.69	937.92	405.8	937.93	407.05	938	417.98	938
430.86	938.85	447.39	940	447.76	940	474.23	941.4	474.89	941.43
486.01	942	494.93	942.66	500.74	943.07	513.48	944	527.16	945.01
531.24	945.31	532.15	945.36	542.48	946	555.19	946.86	570.48	948
573.55	948.26	582.3	949.12	592.99	950				

Manning's n Values		num= 3		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val
0	.035	117.92	.035	136.16	.035

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

117.92 136.16

378.38 63.02

3.7

.1

.3

CROSS SECTION OUTPUT Profile #PF 1

```

*****
* E.G. Elev (ft)      * 931.42 * Element      * Left OB * Channel * Right OB *
* Vel Head (ft)      * 0.57  * Wt. n-val.  * 0.035  * 0.035  * 0.035  *
* W.S. Elev (ft)     * 930.85 * Reach Len. (ft) * 63.02 * 63.02 * 63.02 *
* Crit W.S. (ft)     * 930.85 * Flow Area (sq ft) * 32.40 * 59.93 * 35.04 *
* E.G. Slope (ft/ft) * 0.006042 * Area (sq ft) * 32.40 * 59.93 * 35.04 *
* Q Total (cfs)      * 601.90 * Flow (cfs) * 86.46 * 421.07 * 94.36 *
* Top Width (ft)     * 110.20 * Top width (ft) * 44.49 * 18.24 * 47.47 *
* Vel Total (ft/s)   * 4.73  * Avg. vel. (ft/s) * 2.67 * 7.03 * 2.69 *
* Max Chl Dpth (ft) * 3.87  * Hydr. Depth (ft) * 0.73 * 3.29 * 0.74 *
* Conv. Total (cfs)  * 7743.4 * Conv. (cfs) * 1112.3 * 5417.1 * 1214.0 *
* Length Wtd. (ft)  * 63.02 * Wetted Per. (ft) * 44.56 * 19.29 * 47.54 *
* Min Ch El (ft)    * 926.98 * Shear (lb/sq ft) * 0.27 * 1.17 * 0.28 *
* Alpha             * 1.64  * Stream Power (lb/ft s) * 592.99 * 0.00 * 0.00 *
* Frctn Loss (ft)   * 0.49  * Cum volume (acre-ft) * 0.03 * 0.13 * 0.05 *
* C & E Loss (ft)   * 0.04  * Cum SA (acres) * * * *
*****

```

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

RIVER: Bluestone Creek

REACH: Middle

RS: 9989.380

INPUT

Description:

```

Station Elevation Data      num= 118
Sta      Elev      Sta      Elev      Sta      Elev      Sta      Elev      Sta      Elev
*****
0         950       6.78  948.23   7.68   948       12.44  946.77   15.96   946
19.13    945.41   26.98   944      34.58  942.62   38.01   942      47.87  940.48
50.44    940       51.37  939.82   61.13   938      69.54  936.99   79.48   936
90.28    934.88   97.08  934.59  102.68  934.35  108.18   934      114.32  933.52
117.71   933.3     122.23 933.03  149.35   932      156.09   932      163.89  931.38
174.5    930.9     190.54 930.99  191.64  930.96  195.98   930.92   201.84  930.74
206.74   930.71   222.7   930.61  245.44   930      272.47   930      275.63  930.1
275.69   930       276.36   928.6   276.72   928      277.33  926.66   277.37  926.59
277.79   926.51   280.69   926     283.89   926      284.17  926.05   286.59  926.49
289.13   927.66   290.94   927.93  291.31  927.98  293.28   928.05   295.53  928.23
297.27   928.35   300.41   928.54  304.16  928.42  307.66   928.66   309.14  928.69

```

OXF157-159Bridges.rep

312.58	928.73	313.27	928.82	315.76	929.32	316.87	929.39	320.05	930
320.12	930.01	320.55	929.86	340.59	929.99	340.75	930	340.79	930
340.85	930	354.42	930	374.53	930	385.2	929.94	385.46	929.95
408.61	929.97	410.15	929.92	412.39	930	418.73	930.31	433.24	930.38
438.58	930.78	442.61	931.09	455.61	931.69	456.38	931.76	458.09	932
460.76	932	461.29	932.02	461.39	932.02	461.45	932.02	482.89	934
492.29	934	495.58	934.3	498.35	934.64	513.4	936	528.03	936
538.96	936.62	540.05	936.64	541	936.68	542.09	936.69	544.24	936.68
554.1	937.02	567.8	938	580.99	939.15	590.94	940	612.75	941.43
616.44	941.64	620.65	941.87	623.48	942	624.95	942	630.69	942.37
654.37	944	682.42	945.98	682.81	946	683.06	946.02	683.12	946.03
683.3	946.04	686.85	946.3	689.58	946.47	706.49	947.51	713.64	948
725.84	948.97	730.86	949.43	738.37	950				

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .035 275.63 .035 354.42 .035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 275.63 354.42 243.92 311.18 322.32 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 930.84	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.42	* Wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 930.41	* Reach Len. (ft)	* 243.92	* 311.18	* 322.32
* Crit W.S. (ft)	* 930.41	* Flow Area (sq ft)	* 15.37	* 122.15	* 27.81
* E.G. Slope (ft/ft)	* 0.009849	* Area (sq ft)	* 15.37	* 122.15	* 27.81
* Q Total (cfs)	* 763.60	* Flow (cfs)	* 31.42	* 673.89	* 58.28
* Top width (ft)	* 203.51	* Top width (ft)	* 45.49	* 78.79	* 79.23
* Vel Total (ft/s)	* 4.62	* Avg. Vel. (ft/s)	* 2.04	* 5.52	* 2.10
* Max Chl Dpth (ft)	* 4.41	* Hydr. Depth (ft)	* 0.34	* 1.55	* 0.35
* Conv. Total (cfs)	* 7694.5	* Conv. (cfs)	* 316.7	* 6790.6	* 587.3
* Length Wtd. (ft)	* 300.83	* Wetted Per. (ft)	* 45.50	* 81.52	* 79.24
* Min Ch El (ft)	* 926.00	* Shear (lb/sq ft)	* 0.21	* 0.92	* 0.22
* Alpha	* 1.28	* Stream Power (lb/ft s)	* 738.37	* 0.00	* 0.00
* Frctn Loss (ft)	* 1.99	* Cum Volume (acre-ft)	* 7.97	* 7.27	* 4.97
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 6.52	* 2.09	* 5.46

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 conveyance ratio (upstream 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: Bluestone Creek  
 REACH: Middle RS: 9559.249

INPUT  
 Description:

Station Elevation Data		num= 97		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	950	6.5	949.21	14.8	948	25.88	946.28	28.22	946		
30.95	945.56	33.89	945.07	41.12	944	43.72	943.6	55.79	942		
65.88	940.44	69.07	940	75.17	939.16	83.35	938	89.63	937.13		
92.44	936.79	93.97	936.54	96.92	936	103.97	934.92	109.98	934		
111.51	933.76	122.74	932	139.9	930.98	143.92	930.71	157.27	930		
158.2	930	163.18	929.83	170.63	929.52	176.59	929.28	203.7	928		
218.28	928	238.44	927.52	238.98	927.51	241.46	927.49	242.08	927.49		
254	927.32	267.36	927.3	269.93	927.35	278.42	927.39	283.01	927.46		
296.59	927.39	304.78	927.39	309.38	927.41	310.75	927.41	311.24	927.41		
312.58	927.41	316.06	927.34	318.72	927.37	320.4	927.34	322.96	927.36		
355.93	926.89	396.93	926.29	398.44	926.27	403.58	926.19	406.77	926.19		
406.83	926.09	407	926	407.94	924.21	408.12	923.89	408.27	923.69		
408.28	923.69	413.07	923.36	418.12	923.03	418.58	923.27	418.93	923.48		
420.16	923.98	420.18	924	420.2	924.03	421.52	924.69	436.31	926		
449.91	927.02	468.93	927.91	470.78	928	472.99	928.18	476.74	930		
478.04	930.63	480.87	932	482.09	932.59	485.05	934	486.2	934.6		
489.71	935.73	490.51	936	495.97	937.99	496	938	496.06	938.03		
496.13	938.04	502.74	939.21	507.61	940	516.5	941.42	519.96	942		
528.21	943.34	532.23	944	535.88	944.63	543.57	946	554.66	948		
556.84	948.4	564.97	950								

Manning's n Values		num= 3		Sta n val	
Sta	n val	Sta	n val	Sta	n val
0	.035	406.77	.035	421.52	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 406.77 421.52 20.59 105.55 110.93 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 928.15	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.43	* wt. n-Val.	* 0.035	* 0.035	* 0.060
* W.S. Elev (ft)	* 927.72	* Reach Len. (ft)	* 20.59	* 105.55	* 110.93
* Crit W.S. (ft)	* 927.72	* Flow Area (sq ft)	* 109.21	* 60.14	* 56.68
* E.G. Slope (ft/ft)	* 0.004765	* Area (sq ft)	* 109.21	* 60.14	* 56.68
* Q Total (cfs)	* 763.60	* Flow (cfs)	* 232.31	* 415.51	* 115.78

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* Top width (ft)	* 234.63	* Top width (ft)	* 176.60	* 14.75	* 43.28
* Vel Total (ft/s)	* 3.38	* Avg. Vel. (ft/s)	* 2.13	* 6.91	* 2.04
* Max Chl Dpth (ft)	* 4.69	* Hydr. Depth (ft)	* 0.62	* 4.08	* 1.31
* Conv. Total (cfs)	* 11061.8	* Conv. (cfs)	* 3365.4	* 6019.2	* 1677.3
* Length Wtd. (ft)	* 71.23	* Wetted Per. (ft)	* 176.61	* 16.61	* 43.39
* Min Ch El (ft)	* 923.03	* Shear (lb/sq ft)	* 0.18	* 1.08	* 0.39
* Alpha	* 2.45	* Stream Power (lb/ft s)	* 564.97	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.27	* Cum Volume (acre-ft)	* 7.63	* 6.62	* 4.66
* C & E Loss (ft)	* 0.07	* Cum SA (acres)	* 5.90	* 1.76	* 5.01

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: 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: Bluestone Creek  
 REACH: Middle RS: 9443.656

INPUT

Description:

Station Elevation Data		num= 81		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	950	9.42	949.2	13.68	949.06	22.03	948	23.64	948
36.19	946.21	37.43	946	37.7	945.94	49.78	944	51.74	943.62
56.79	942.62	60	942	63.03	941.39	70.06	940	76.42	938.77
80.23	938	83.91	937.26	91.51	936	101.53	934.31	103.35	934
104.43	933.82	107.18	933.45	118.38	932	133.24	931.12	150.69	930
184.84	928.74	203.94	928	211.18	927.33	214.92	927.13	236.02	926
250.9	925.39	274.3	925.56	292.5	926	295.2	926.06	314.99	926.06
340.53	926	342.39	925.93	363.18	925.08	363.37	924.92	364.26	924
364.29	924	365.42	922.91	365.43	922.9	365.46	922.86	366.4	922.89
366.63	922.91	380.44	924	381.13	924.16	382.1	924.15	382.12	924.17
382.9	925.03	383.93	926	383.94	926.01	398.08	926	426	926.42
439.72	926	445.48	926	447.38	928	448.15	928.45	450.82	930
451.47	930.36	454.14	932	454.84	932.4	457.62	933.98	457.65	934
457.94	934.19	460.71	936	460.9	936.1	463.56	938	467.83	939.62
468.69	940	470.48	940.71	473.58	942	476.5	943.1	478.82	944
483.26	945.76	483.89	946	484.96	946.45	488.7	948	492.64	948.96
495.25	950								

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



0 .035 363.18 .035 383.93 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 363.18 383.93 30.34 114.86 56.64 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

```

*****
* E.G. Elev (ft) * 927.16 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 0.22 * Wt. n-Val. * 0.035 * 0.035 * 0.100 *
* W.S. Elev (ft) * 926.94 * Reach Len. (ft) * 30.34 * 114.86 * 56.64 *
* Crit W.S. (ft) * * * Flow Area (sq ft) * 157.56 * 67.76 * 49.73 *
* E.G. Slope (ft/ft) *0.003104 * Area (sq ft) * 157.56 * 67.76 * 49.73 *
* Q Total (cfs) * 763.60 * Flow (cfs) * 394.16 * 334.22 * 35.22 *
* Top Width (ft) * 227.99 * Top width (ft) * 144.79 * 20.75 * 62.45 *
* Vel Total (ft/s) * 2.78 * Avg. Vel. (ft/s) * 2.50 * 4.93 * 0.71 *
* Max chl Dpth (ft) * 4.08 * Hydr. Depth (ft) * 1.09 * 3.27 * 0.80 *
* Conv. Total (cfs) * 13705.3 * Conv. (cfs) * 7074.5 * 5998.7 * 632.1 *
* Length wtd. (ft) * 77.41 * Wetted Per. (ft) * 144.86 * 22.50 * 62.87 *
* Min Ch El (ft) * 922.86 * Shear (lb/sq ft) * 0.21 * 0.58 * 0.15 *
* Alpha * 1.80 * Stream Power (lb/ft s) * 495.25 * 0.00 * 0.00 *
* Frctn Loss (ft) * 0.14 * Cum Volume (acre-ft) * 7.56 * 6.46 * 4.52 *
* C & E Loss (ft) * 0.02 * Cum SA (acres) * 5.82 * 1.71 * 4.87 *
*****
    
```

Warning: The conveyance ratio (upstream 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: Bluestone Creek  
 REACH: Middle RS: 9322.807

INPUT

Description:

Station		Elevation Data		num=	90					
Sta	Elev	Sta	Elev		Sta	Elev	Sta	Elev	Sta	Elev
0	950	7.9	948		11.64	947.11	17.81	946.58	25.16	946
33.26	944.66	37.57	944		44.54	942.84	50.6	942	54.42	941.51
55.76	941.3	56.25	941.19		61.72	940.41	63.05	940.19	64.11	940
66.09	939.59	75.08	938		75.31	938	85.85	936.6	90.37	936
91.41	935.87	107.67	934		110.02	933.72	124.66	932	138.91	931.12
150.94	930	168.9	929.36		182.99	929.07	217.18	928	224.14	927.19
225.41	927.18	236.93	926.73		238.25	926.66	245.34	926	248.86	926
280.73	925.57	301.42	925.29		315.41	925.14	316.42	924.79	317.04	924.39
317.5	924.03	317.54	924		319.17	922.5	319.97	922	326.91	921.73
332.46	921.52	335.76	921.44		338.49	921.28	338.92	921.9	340.13	923.5
340.28	923.71	342.76	923.61		360.65	923.1	370.45	923.93	371.05	924
371.21	924	371.29	924		403.15	925.77	403.45	925.79	405.9	925.96
407.61	926	408.21	926.16		414.2	928	416.35	928.68	420.64	930

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426.69	931.84	426.94	932	427.08	932.09	429.92	934	431.63	935.02
433.14	936	434.72	937.03	436.09	938	438.21	939.59	438.53	939.81
438.79	940	439.08	940.2	439.67	940.6	441.71	942	443.29	943.14
444.01	943.67	444.43	944	445.03	944.41	446.74	945.72	447.16	946
448.27	946.82	449.8	947.89	449.94	948	450.02	948.06	452.79	950

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .035 315.41 .035 340.28 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 315.41 340.28 111.46 51.15 47.84 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 927.00	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.15	* Wt. n-Val.	* 0.035	* 0.035	* 0.100
* W.S. Elev (ft)	* 926.85	* Reach Len. (ft)	* 111.46	* 51.15	* 47.84
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 93.57	* 118.35	* 173.84
* E.G. Slope (ft/ft)	* 0.001154	* Area (sq ft)	* 93.57	* 118.35	* 173.84
* Q Total (cfs)	* 763.60	* Flow (cfs)	* 147.77	* 455.51	* 160.32
* Top Width (ft)	* 176.71	* Top width (ft)	* 81.65	* 24.87	* 70.19
* Vel Total (ft/s)	* 1.98	* Avg. Vel. (ft/s)	* 1.58	* 3.85	* 0.92
* Max Chl Dpth (ft)	* 5.57	* Hydr. Depth (ft)	* 1.15	* 4.76	* 2.48
* Conv. Total (cfs)	* 22474.4	* Conv. (cfs)	* 4349.2	* 13406.8	* 4718.4
* Length Wtd. (ft)	* 57.21	* Wetted Per. (ft)	* 81.69	* 27.15	* 70.42
* Min Ch El (ft)	* 921.28	* Shear (lb/sq ft)	* 0.08	* 0.31	* 0.18
* Alpha	* 2.42	* Stream Power (lb/ft s)	* 452.79	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.15	* Cum Volume (acre-ft)	* 7.47	* 6.22	* 4.38
* C & E Loss (ft)	* 0.09	* Cum SA (acres)	* 5.74	* 1.65	* 4.79

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

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Middle

RS: 9266.019

INPUT

Description:

Station Elevation Data num= 109

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960	5.85	958.49	7.59	958	14.2	956.24	15.08	956
22.2	954.1	22.59	954	23.37	953.83	31.46	952	39.97	950.18

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40.8	950	41.55	949.84	46.07	948.82	49.6	948	52.03	947.44
57.65	946	60.77	945.15	64.95	944	71.43	942.27	72.41	942
73.15	941.87	80.54	940	88.93	938.02	89	938	89.07	937.98
89.83	937.8	97.28	936	103.59	934.47	105.66	934	112.59	933.03
118.67	932	122.18	931.78	122.82	931.76	123.97	931.73	124.43	931.71
128.31	931.52	148.38	930.62	164.16	930.31	170.99	930	174.47	929.89
179.69	929.7	185.99	929.59	199.65	929.15	206.54	929.01	211.15	928.92
234.74	928.32	244.3	928	249.75	928	252.28	927.87	300.08	926
322.02	926	343.87	925.87	348.04	925.86	353.31	925.84	354.41	925.83
359.99	925.84	365.96	925.79	374.02	925.72	388.44	925.09	392.14	925.1
394.8	924.76	397.19	924.27	398.04	924.17	399.58	924	404.99	923.41
406.68	923.3	407.05	922.98	409.08	922	409.17	921.94	409.18	921.93
409.42	921.93	410.45	921.88	421.24	921.33	421.57	922	421.6	922.06
422.79	924.47	422.82	924.53	423.39	924.5	424.51	924.57	426.3	924.61
426.87	924.63	428.38	924.67	469.04	925.82	475.23	926	476.61	926.63
479.59	928	481.78	929.01	483.99	930	486.57	931.22	488.01	932
491.21	933.97	491.25	934	491.7	934.31	494.19	936	496.36	937.66
496.82	938	498.42	938.96	499.89	940	501.53	941.13	502.68	942
504.3	943.1	505.42	943.89	505.58	944	508.1	945.84	508.33	946
511.92	947.99	511.92	948	511.93	948.01	515.43	950		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	392.14	.035	422.79	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	392.14	422.79		19.4	235.37	285.83	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 926.76	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 1.02	* wt. n-Val.	* 0.035	* 0.035	* 0.100
* W.S. Elev (ft)	* 925.74	* Reach Len. (ft)	* 19.40	* 235.37	* 285.83
* Crit W.S. (ft)	* 925.74	* Flow Area (sq ft)	* 7.33	* 85.91	* 26.86
* E.G. Slope (ft/ft)	* 0.010847	* Area (sq ft)	* 7.33	* 85.91	* 26.86
* Q Total (cfs)	* 763.60	* Flow (cfs)	* 16.10	* 717.43	* 30.07
* Top Width (ft)	* 95.15	* Top width (ft)	* 20.92	* 30.65	* 43.57
* Vel Total (ft/s)	* 6.36	* Avg. vel. (ft/s)	* 2.20	* 8.35	* 1.12
* Max Chl Dpth (ft)	* 4.41	* Hydr. Depth (ft)	* 0.35	* 2.80	* 0.62
* Conv. Total (cfs)	* 7331.7	* Conv. (cfs)	* 154.6	* 6888.3	* 288.8
* Length Wtd. (ft)	* 177.07	* Wetted Per. (ft)	* 20.94	* 33.10	* 43.63
* Min Ch El (ft)	* 921.33	* Shear (lb/sq ft)	* 0.24	* 1.76	* 0.42
* Alpha	* 1.62	* Stream Power (lb/ft s)	* 515.43	* 0.00	* 0.00
* Frctn Loss (ft)	* 1.60	* Cum Volume (acre-ft)	* 7.35	* 6.10	* 4.27
* C & E Loss (ft)	* 0.18	* Cum SA (acres)	* 5.61	* 1.62	* 4.72

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.

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

sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the

need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water

surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program

defaulted to critical depth.

CROSS SECTION

RIVER: Bluestone Creek

REACH: Middle

RS: 9003.470

INPUT

Description:

Station Elevation Data		num= 95		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960	6.15	958.34	7.4	958	8.55	957.67	14.61	956		
16.54	955.46	21.78	954	28.56	952.15	29.08	952	30	951.71		
35.24	950	40.03	948.77	43.57	948	44.69	947.75	47.3	947.19		
53.18	946	57.13	945.19	62.98	944	65.85	943.28	69.78	942		
75.12	940.36	77.89	939.37	81.74	938	83.87	937.27	87.45	936		
92.18	934.33	93.28	934	95.4	933.4	98.41	932.51	100.31	932		
107.12	930.29	108.33	930	111.33	929.79	124.47	929.19	150.31	928		
162.33	927.31	167.22	927.22	182.56	926	183.29	926	206.7	924.02		
206.87	924	210.21	924	287.67	923.39	288.83	923.38	307.05	923.27		
327.91	923.23	329.31	922.93	329.48	922.89	329.96	922.27	330.12	922		
332.94	920.67	334.1	920.45	336.2	921.07	337.6	921.41	338.95	921.49		
339.73	921.53	339.84	921.54	341.8	921.95	342.66	922.14	350.23	923.93		
358.7	925.87	359.21	926	359.25	926	359.43	926.04	360.41	926.18		
361.49	926.73	363.5	927	363.79	927.05	364.79	927.3	367.44	928		
371.24	929.02	373.54	929.63	374.91	930	376.77	930.5	382.17	932		
385.61	933.13	387.14	934	389.87	935.58	390.58	936	393.04	937.42		
394.79	938	396.08	938.43	400.75	940	404.45	941.23	406.81	942		
408.16	942.43	412.87	944	414.75	944.55	415.61	944.8	416.74	945.07		
418.95	946	420.22	946.49	424.13	948	425.93	948.69	429.35	950		

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	327.91	.035	350.23	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	327.91	350.23		59.54	96.43		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

\*\*\*\*\*  
 \* E.G. Elev (ft) \* 924.92 \* Element \* Left OB \* Channel \* Right OB \*

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* Vel Head (ft)	* 0.41	* wt. n-Val.	* 0.035	* 0.035	* 0.100
* W.S. Elev (ft)	* 924.51	* Reach Len. (ft)	* 59.54	* 96.43	* 71.30
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 115.85	* 55.13	* 0.74
* E.G. Slope (ft/ft)	* 0.007603	* Area (sq ft)	* 115.85	* 55.13	* 0.74
* Q Total (cfs)	* 763.60	* Flow (cfs)	* 403.25	* 359.93	* 0.41
* Top width (ft)	* 151.90	* Top width (ft)	* 127.03	* 22.32	* 2.54
* Vel Total (ft/s)	* 4.45	* Avg. vel. (ft/s)	* 3.48	* 6.53	* 0.56
* Max Chl Dpth (ft)	* 4.06	* Hydr. Depth (ft)	* 0.91	* 2.47	* 0.29
* Conv. Total (cfs)	* 8757.4	* Conv. (cfs)	* 4624.7	* 4127.9	* 4.8
* Length wtd. (ft)	* 74.42	* wetted Per. (ft)	* 127.06	* 23.54	* 2.61
* Min ch El (ft)	* 920.45	* Shear (lb/sq ft)	* 0.43	* 1.11	* 0.13
* Alpha	* 1.34	* Stream Power (lb/ft s)	* 429.35	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.47	* Cum Volume (acre-ft)	* 7.32	* 5.72	* 4.17
* C & E Loss (ft)	* 0.04	* Cum SA (acres)	* 5.58	* 1.48	* 4.57

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Middle RS: 8906.253

INPUT

Description:

Station Elevation Data		num= 94		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960	6.61	958	10.17	956.91	13.21	956	19.69	954		
19.7	954	29.67	952	34.64	950.95	40.87	950	49.14	948.51		
52.04	948	53.52	947.71	58.39	946.76	60.42	946.35	62.05	946		
63.76	945.64	71.39	944	79.47	942.29	80.81	942	81.92	941.71		
88.79	940	89.59	939.76	95.56	938	97.22	937.52	102.61	936		
107.34	934.8	110.63	934	115.38	932.94	117.23	932.51	119.18	932		
123.86	930.79	126.87	930	134.56	928.15	135.14	928	150.82	926.26		
153.19	926	153.36	925.97	153.55	925.94	160.26	924.87	165.42	924		
178.5	924	217.3	923.2	271.94	922.69	298.77	922.44	299.61	922.44		
311.14	922.54	311.16	922.31	311.28	922	311.28	920.72	311.65	920.37		
311.74	920	311.84	919.8	311.98	919.77	312.18	919.73	312.52	919.75		
312.79	919.78	314.05	919.84	315.84	919.8	316.35	920	317.06	920.3		
319.49	921.3	321.29	921.81	321.94	921.85	327.01	922	336.16	922		
338.01	923.04	339.62	924	340.68	924.36	349.46	926	353	927.26		
354.34	927.7	355.24	928	358.77	929.23	361.15	930	363.74	930.87		
366.7	932	369.46	933.33	370.87	934	375.22	935.95	375.33	936		
375.6	936.13	379.33	938	380.1	938.35	383.39	940	384.22	940.4		
387.29	942	388.66	942.28	392.47	944	395.71	945.04	398.78	946		
404.01	947.68	405.06	948	407	948.59	412.03	950				

Manning's n Values		num= 3		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.035	311.14	.035	321.29	.1		

Bank Sta: Left Right Lengths: Left Channel Right Right Coeff Contr. Expan.  
 311.14 321.29 95.99 63.07 70.55 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

```

*****
* E.G. Elev (ft) * 924.42 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 0.29 * Wt. n-Val. * 0.035 * 0.035 * 0.100 *
* W.S. Elev (ft) * 924.13 * Reach Len. (ft) * 95.99 * 63.07 * 70.55 *
* Crit W.S. (ft) * * * Flow Area (sq ft) * 148.90 * 37.37 * 36.09 *
* E.G. slope (ft/ft) * 0.005342 * Area (sq ft) * 148.90 * 37.37 * 36.09 *
* Q Total (cfs) * 763.60 * Flow (cfs) * 467.05 * 237.00 * 59.56 *
* Top width (ft) * 175.32 * Top width (ft) * 146.47 * 10.15 * 18.70 *
* Vel Total (ft/s) * 3.43 * Avg. Vel. (ft/s) * 3.14 * 6.34 * 1.65 *
* Max chl dpth (ft) * 4.40 * Hydr. Depth (ft) * 1.02 * 3.68 * 1.93 *
* Conv. Total (cfs) * 10448.0 * Conv. (cfs) * 6390.4 * 3242.7 * 814.9 *
* Length wtd. (ft) * 83.95 * Wetted Per. (ft) * 146.49 * 12.79 * 19.26 *
* Min ch El (ft) * 919.73 * Shear (lb/sq ft) * 0.34 * 0.97 * 0.62 *
* Alpha * 1.59 * Stream Power (lb/ft s) * 412.03 * 0.00 * 0.00 *
* Frctn Loss (ft) * 0.41 * Cum Volume (acre-ft) * 7.14 * 5.61 * 4.14 *
* C & E Loss (ft) * 0.00 * Cum SA (acres) * 5.39 * 1.44 * 4.55 *
*****
    
```

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Middle RS: 8843.186

INPUT

Description:

Station Elevation Data		num= 88		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	950	3.8	949.23	9.69	948	11.38	947.62	18.83	946		
25.3	944.48	27.41	944	33.34	942.59	35.89	942	39.92	941.07		
44.58	940	47.35	939.33	52.42	938	57.21	936.72	59.59	936		
60.72	935.67	66.33	934	66.79	933.86	73.81	932	79.88	930.39		
81.48	930	86.49	928.72	89.61	928	90.62	927.77	98.5	926		
109.9	925.11	128.5	924	128.7	924	197.13	922.4	202.18	922.29		
211.57	922	229.36	922	243.55	922	246.14	922.01	263.96	922.07		
263.97	922.03	264.02	922	264.14	921.67	264.67	920	264.72	919.95		
265.1	919.53	265.28	919.47	265.37	919.39	266.79	919.52	269.36	919.63		
269.61	919.37	271.23	919.61	272.08	920	274.31	921.23	274.32	921.23		
283.46	921.78	287.45	922	293.84	923.51	295.06	923.77	296.23	924		
300.2	924.7	302.18	925.08	302.85	925.21	304.39	926	307.66	927.89		
308.11	928	311.37	929.74	311.85	930	312.45	930.34	315.65	932		
318.25	933.45	319.32	934	319.62	934.17	322.77	936	323.38	936.36		
324.5	936.94	326.17	938	327.31	938.72	329.3	940	330.4	940.67		
332.57	942	335.05	943.17	335.41	943.17	339.74	943.03	346.3	943.66		
346.84	943.73	347.85	943.84	348.41	944	348.97	944.22	353.75	946		
356.68	947.16	358.94	948	364.07	950						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .035 263.96 .035 274.31 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 263.96 274.31 78.94 118.84 128.57 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

\*\*\*\*\*  
 \* E.G. Elev (ft) \* 924.01 \* Element \* Left OB \* Channel \* Right OB \*  
 \* Vel Head (ft) \* 0.28 \* Wt. n-Val. \* 0.035 \* 0.035 \* 0.100 \*  
 \* W.S. Elev (ft) \* 923.73 \* Reach Len. (ft) \* 78.94 \* 118.84 \* 128.57 \*  
 \* Crit W.S. (ft) \* \* \* Flow Area (sq ft) \* 149.62 \* 39.67 \* 34.05 \*  
 \* E.G. Slope (ft/ft) \* 0.004389 \* Area (sq ft) \* 149.62 \* 39.67 \* 34.05 \*  
 \* Q Total (cfs) \* 763.60 \* Flow (cfs) \* 477.64 \* 239.38 \* 46.58 \*  
 \* Top Width (ft) \* 154.63 \* Top width (ft) \* 123.71 \* 10.35 \* 20.56 \*  
 \* Vel Total (ft/s) \* 3.42 \* Avg. Vel. (ft/s) \* 3.19 \* 6.03 \* 1.37 \*  
 \* Max chl Dpth (ft) \* 4.36 \* Hydr. Depth (ft) \* 1.21 \* 3.83 \* 1.66 \*  
 \* Conv. Total (cfs) \* 11525.6 \* Conv. (cfs) \* 7209.4 \* 3613.1 \* 703.0 \*  
 \* Length wtd. (ft) \* 103.50 \* Wetted Per. (ft) \* 123.74 \* 12.63 \* 20.78 \*  
 \* Min Ch El (ft) \* 919.37 \* Shear (lb/sq ft) \* 0.33 \* 0.86 \* 0.45 \*  
 \* Alpha \* 1.53 \* Stream Power (lb/ft s) \* 364.07 \* 0.00 \* 0.00 \*  
 \* Frctn Loss (ft) \* 0.28 \* Cum Volume (acre-ft) \* 6.81 \* 5.56 \* 4.09 \*  
 \* C & E Loss (ft) \* 0.01 \* Cum SA (acres) \* 5.09 \* 1.43 \* 4.52 \*  
 \*\*\*\*\*

Warning: The conveyance ratio (upstream 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: Bluestone Creek  
 REACH: Middle RS: 8712.623

INPUT  
 Description:

Station Elevation Data num= 79  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 \*\*\*\*\*  
 0 950 9.85 948 14.24 947 18.37 946 22.09 945.07  
 26.34 944 29.65 943.09 33.32 942 37.38 940.85 40.02 940  
 42.24 939.27 46.19 938 48.98 937.12 52.54 936 55.87 934.97  
 58.94 934 64.89 932.06 65.09 932 65.25 931.95 71.91 930  
 77.03 928.73 80.07 928 86.32 926.94 91.75 926 105.6 925.45  
 108.02 925.39 149.01 924 159.02 924 162.97 923.65 170.08 923.55  
 183.95 922.99 184.61 922.98 214.4 922 229.09 922 237.23 922  
 244.86 920.77 249.7 920 257.02 918.83 258.23 918.56 261.74 918.51  
 261.89 918.52 262 918.51 272.22 918.4 272.38 918.68 273.2 920.15  
 273.28 920.26 273.44 920.07 274.06 920.4 276.69 922 278.85 922.94

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279.81	923.57	280.72	924	282.33	924.76	286.44	926	290.65	928
293.9	929.42	295.07	930	298.47	931.59	299.29	932	300.91	932.75
304.2	933.62	305.64	934	309.99	935.15	313.25	936	323.21	936.98
331.46	938	334.47	938.54	342.42	940	344.45	940.52	350.22	942
351.64	942.37	352.97	942.71	356.5	943.65	357.82	944	358.86	944.32
364.96	946	367.36	946.9	370.22	948	375.55	950		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	237.23	.035	276.69	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	237.23	276.69		179.1	165.74	140.27	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 923.72	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.25	* Wt. n-Val.	* 0.035	* 0.035	* 0.100
* W.S. Elev (ft)	* 923.47	* Reach Len. (ft)	* 179.10	* 165.74	* 140.27
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 65.69	* 148.90	* 2.36
* E.G. Slope (ft/ft)	* 0.001869	* Area (sq ft)	* 65.69	* 148.90	* 2.36
* Q Total (cfs)	* 763.60	* Flow (cfs)	* 121.30	* 641.09	* 1.21
* Top Width (ft)	* 107.50	* Top width (ft)	* 65.08	* 39.46	* 2.96
* Vel Total (ft/s)	* 3.52	* Avg. vel. (ft/s)	* 1.85	* 4.31	* 0.51
* Max Chl Dpth (ft)	* 5.07	* Hydr. Depth (ft)	* 1.01	* 3.77	* 0.80
* Conv. Total (cfs)	* 17662.4	* Conv. (cfs)	* 2805.7	* 14828.7	* 28.0
* Length wtd. (ft)	* 171.05	* Wetted Per. (ft)	* 65.10	* 41.44	* 3.32
* Min Ch El (ft)	* 918.40	* Shear (lb/sq ft)	* 0.12	* 0.42	* 0.08
* Alpha	* 1.30	* Stream Power (lb/ft s)	* 375.55	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.27	* Cum Volume (acre-ft)	* 6.61	* 5.30	* 4.03
* C & E Loss (ft)	* 0.04	* Cum SA (acres)	* 4.92	* 1.36	* 4.49

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Middle RS: 8542.514

INPUT  
 Description:

Station	Elevation	Data	num=	52						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	930	15.6	928	20.7	927.39	33.6	926	39.69	925.33	
42.53	925.1	51.88	924.16	53.32	924	54.75	923.85	56.09	923.74	
66.89	922.65	73.01	922	96.1	920.8	127.27	921.08	161.78	921.96	
188.75	921.47	189.21	920.81	189.79	920	190.62	918.96	191.62	918.22	
195.91	918.11	197.2	918.08	197.64	918.33	200.72	920	201.63	920.64	
201.8	920.78	213.92	921.89	214.12	922	214.68	922.27	219.08	924	
220.07	924.36	223.63	925.7	224.41	926	228.92	927.76	229.8	928	



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230.63	928.23	236.77	930	238.66	930.54	243.97	932	245.45	932.41
250.42	933.53	252.52	934	262.73	935.17	267.43	935.7	268.87	935.85
271.24	936	283.7	936	287.85	936.53	289.75	936.63	293.22	938
296.52	939.3	298.17	939.95						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .035 188.75 .035 201.8 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 188.75 201.8 234.69 160.81 130.54 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 923.40	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.12	* Wt. n-Val.	* 0.035	* 0.035	* 0.100
* W.S. Elev (ft)	* 923.28	* Reach Len. (ft)	* 234.69	* 160.81	* 130.54
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 227.47	* 57.20	* 25.82
* E.G. slope (ft/ft)	* 0.001383	* Area (sq ft)	* 227.47	* 57.20	* 25.82
* Q Total (cfs)	* 763.60	* Flow (cfs)	* 526.24	* 217.56	* 19.81
* Top Width (ft)	* 156.64	* Top width (ft)	* 128.13	* 13.05	* 15.46
* Vel Total (ft/s)	* 2.46	* Avg. vel. (ft/s)	* 2.31	* 3.80	* 0.77
* Max chl Dpth (ft)	* 5.20	* Hydr. Depth (ft)	* 1.78	* 4.38	* 1.67
* Conv. Total (cfs)	* 20534.0	* Conv. (cfs)	* 14151.0	* 5850.3	* 532.7
* Length Wtd. (ft)	* 202.01	* Wetted Per. (ft)	* 128.25	* 15.30	* 15.79
* Min ch El (ft)	* 918.08	* Shear (lb/sq ft)	* 0.15	* 0.32	* 0.14
* Alpha	* 1.29	* Stream Power (lb/ft s)	* 298.17	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.50	* Cum Volume (acre-ft)	* 6.01	* 4.91	* 3.99
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 4.53	* 1.26	* 4.46

Warning: The conveyance ratio (upstream 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: Bluestone Creek  
 REACH: Middle RS: 8379.502

INPUT  
 Description:

Station	Elevation	Data	num=	65							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
0	929.99	1.37	929.86	2	929.81	6.43	929.38	11.59	928.86		
20.74	928	27.84	927.51	51.79	926	70.04	925.39	82.11	925.12		
103.62	924.48	131.5	924	132.66	924	137.78	923.92	138.07	923.91		
149.17	923.7	153.48	923.6	175.63	923.07	205.41	922.39	218.41	922		
231.41	921.91	245.45	921.79	308.74	921.33	315.6	921.29	316.52	921.28		

OXF157-159Bridges.rep

345.72	920.83	346.18	920.2	346.32	920	346.61	919.66	347.98	918
348.05	917.92	348.63	917.1	354.42	917.74	354.6	917.75	354.68	917.78
355.09	918	355.7	918.23	356.96	918.96	358.64	920	359.67	920.56
360.55	921.1	360.93	921.33	384.61	921.96	385.87	922	386.22	922.16
390.19	924	390.38	924.09	392.19	924.95	393.22	925.44	394.35	926
394.81	926.28	398.16	928	399.11	928.54	401.53	930	403.65	931.22
405.03	932	407.32	933.35	408.52	934	410.94	935.72	411.41	936
411.95	936.44	414.22	938	416.48	939.57	417.07	939.89	417.22	939.97

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .035 345.72 .035 360.93 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 345.72 360.93 54.15 191.61 366.55 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 922.87	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.45	* Wt. n-Val.	* 0.035	* 0.035	* 0.100
* W.S. Elev (ft)	* 922.42	* Reach Len. (ft)	* 54.15	* 191.61	* 366.55
* Crit W.S. (ft)	* 922.40	* Flow Area (sq ft)	* 120.31	* 58.54	* 19.17
* E.G. Slope (ft/ft)	* 0.005537	* Area (sq ft)	* 120.31	* 58.54	* 19.17
* Q Total (cfs)	* 763.60	* Flow (cfs)	* 340.71	* 405.58	* 17.31
* Top width (ft)	* 182.80	* Top width (ft)	* 141.74	* 15.21	* 25.86
* Vel Total (ft/s)	* 3.86	* Avg. Vel. (ft/s)	* 2.83	* 6.93	* 0.90
* Max Chl Dpth (ft)	* 5.32	* Hydr. Depth (ft)	* 0.85	* 3.85	* 0.74
* Conv. Total (cfs)	* 10261.7	* Conv. (cfs)	* 4578.6	* 5450.4	* 232.6
* Length Wtd. (ft)	* 202.83	* Wetted Per. (ft)	* 141.75	* 18.02	* 25.96
* Min Ch El (ft)	* 917.10	* Shear (lb/sq ft)	* 0.29	* 1.12	* 0.26
* Alpha	* 1.96	* Stream Power (lb/ft s)	* 417.22	* 0.00	* 0.00
* Frctn Loss (ft)	* 1.29	* Cum Volume (acre-ft)	* 5.07	* 4.69	* 3.92
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 3.80	* 1.21	* 4.40

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.

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Middle RS: 8109.907

INPUT

Description:

Station Elevation Data num= 75

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	930	7.95	929.2	19.72	928	44.1	926.29	48.51	926

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91.2	924.68	111.71	924	112.56	924	119.49	923.75	141.98	923.18
142.75	923.18	231.99	922	304.72	922	321.57	922	343.78	920.19
345.75	920	351.71	920	358.84	920.37	361.48	920.5	362.42	920.47
362.48	920.57	363.64	918.05	363.67	918	364.19	916.86	364.2	916.84
365.79	916.84	368.97	916.84	369.05	916.84	369.09	916.88	370.67	918
373.15	919.36	373.7	919.76	373.84	919.85	373.87	919.85	377.03	920
381.99	920.23	383.39	920.32	389.05	920.56	390.33	920.61	406.68	920.77
412.66	920.95	417.17	920.69	420.19	920.62	431.69	920.52	475.33	920.15
490.51	920	514.63	920	515.65	920.1	517.3	920.19	524.52	920.68
528.33	920.91	530.66	921.05	542.57	921.56	545	922	553.73	923.63
555.76	924	556.91	924.22	558.4	924.49	567.11	926	574.43	927.04
582.06	928	588.4	929.17	593.95	930	609.47	930	612.68	931.24
614.68	932	618.91	933.62	619.92	934	622.18	934.87	625.73	936
626.68	936.33	630.69	938	631.42	938.38	632.59	938.98	634.84	939.95

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.035	362.48	.035	373.87	.035	542.57	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	362.48	373.87		237.06	210.48	130.06	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 921.56	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.37	* Wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 921.19	* Reach Len. (ft)	* 237.06	* 210.48	* 130.06
* Crit W.S. (ft)	* 921.19	* Flow Area (sq ft)	* 25.20	* 38.81	* 129.44
* E.G. Slope (ft/ft)	* 0.007440	* Area (sq ft)	* 25.20	* 38.81	* 129.44
* Q Total (cfs)	* 763.60	* Flow (cfs)	* 80.24	* 271.99	* 411.37
* Top Width (ft)	* 202.36	* Top width (ft)	* 30.95	* 11.39	* 160.02
* Vel Total (ft/s)	* 3.95	* Avg. Vel. (ft/s)	* 3.18	* 7.01	* 3.18
* Max Chl Dpth (ft)	* 4.35	* Hydr. Depth (ft)	* 0.81	* 3.41	* 0.81
* Conv. Total (cfs)	* 8853.0	* Conv. (cfs)	* 930.3	* 3153.4	* 4769.3
* Length Wtd. (ft)	* 163.18	* Wetted Per. (ft)	* 31.07	* 14.66	* 160.09
* Min Ch El (ft)	* 916.84	* Shear (lb/sq ft)	* 0.38	* 1.23	* 0.38
* Alpha	* 1.54	* Stream Power (lb/ft s)	* 634.84	* 0.00	* 0.00
* Frctn Loss (ft)	* 1.20	* Cum Volume (acre-ft)	* 4.98	* 4.48	* 3.30
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 3.69	* 1.15	* 3.61

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: Bluestone Creek  
 REACH: Middle

RS: 7770.441

INPUT

Description:

Station Elevation Data		num=		98							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	940	9.71	938.57	13.6	938	15.77	937.74	23.51	936.71		
29.11	936	35.65	935.3	47.86	934	51.79	933.68	56.81	933.28		
73.67	932	93.25	930.9	101.17	930.52	106.76	930.2	107.16	930.19		
112.82	930	136.4	929.24	142.92	929.12	154.49	928.83	166.92	928.46		
184.67	928.11	188.89	928	189.47	928	192.94	927.91	195.37	927.82		
203.38	927.54	212.63	927.18	219.51	926.91	248.3	926	259.1	925.67		
259.96	925.64	268.71	925.33	315.38	924	316.23	923.97	316.34	923.97		
316.93	923.95	317.19	923.94	322.63	923.75	334.49	923.28	338.7	923.1		
369.55	922	378.44	920.53	381.36	920	384.59	919.42	385.67	919.25		
385.87	918.77	386.48	918	387.67	916.49	388.06	916.02	388.08	916.01		
388.45	915.97	390.36	916	393.11	916	394.44	916.18	394.62	916.44		
396.23	917.79	396.5	917.99	396.51	918	398.09	919.2	456.78	919.62		
471.53	919.53	515.67	918.28	521.85	918	535.46	919.52	561.54	918.51		
592.86	918.71	618.57	920	633.45	920	646.56	920.3	648.41	920.3		
654.78	920.28	655.28	920.28	663.87	920.19	666.05	920.2	670.79	920.25		
680.82	920.78	684.5	920.95	687.89	921.16	694.13	921.48	701.54	922		
702.39	922	706.35	923.93	706.67	924.09	710.75	926	714.38	927.7		
715.02	928	715.39	928.17	718.83	930	719.77	930.52	722.23	932		
722.73	932.28	724.96	933.56	725.79	934	725.84	934.03	729.55	936		
733.14	937.9	733.34	938	737.04	939.96						

Manning's n Values		num=		4					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.035	385.67	.035	398.09	.035	680.82	.1		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	385.67	398.09		60.47	240.54	355.76	.1
							.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 920.16	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.32	* wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 919.84	* Reach Len. (ft)	* 60.47	* 240.54	* 355.76
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 1.04	* 37.47	* 168.28
* E.G. Slope (ft/ft)	* 0.007284	* Area (sq ft)	* 1.04	* 37.47	* 168.28
* Q Total (cfs)	* 763.60	* Flow (cfs)	* 1.68	* 247.95	* 513.97
* Top width (ft)	* 233.12	* Top width (ft)	* 3.42	* 12.42	* 217.28
* Vel Total (ft/s)	* 3.69	* Avg. vel. (ft/s)	* 1.62	* 6.62	* 3.05

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* Max Chl Dpth (ft)	* 3.87	* Hydr. Depth (ft)	* 0.30	* 3.02	* 0.77
* Conv. Total (cfs)	* 8947.2	* Conv. (cfs)	* 19.6	* 2905.3	* 6022.3
* Length Wtd. (ft)	* 214.75	* Wetted Per. (ft)	* 3.47	* 15.18	* 217.44
* Min Ch El (ft)	* 915.97	* Shear (lb/sq ft)	* 0.14	* 1.12	* 0.35
* Alpha	* 1.50	* Stream Power (lb/ft s)	* 737.04	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.63	* Cum Volume (acre-ft)	* 4.91	* 4.30	* 2.85
* C & E Loss (ft)	* 0.06	* Cum SA (acres)	* 3.60	* 1.09	* 3.05

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

RIVER: Bluestone Creek  
 REACH: Middle RS: 7438.793

INPUT  
 Description:

Station Elevation Data num= 109

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	940	16.63	938	19.14	937.72	23.78	937.2	34.3	936
44.11	935.29	59.53	934	75.52	933.33	82.58	933.09	98.14	932.45
108.23	932.2	108.84	932.18	114.29	932	117.12	932	129.37	931.72
132.62	931.61	141.96	931.33	146.53	931.18	182.86	930	197.1	929.6
199.67	929.53	204.14	929.39	208.43	929.25	245.62	928.06	247.4	928
274.27	927.1	285.61	926.7	301.46	926.14	306.33	926	313.9	925.46
320.25	925.08	326.1	924.7	340.91	924	359	922.93	363.42	922.72
376.3	922	376.73	921.92	376.84	921.89	381.08	920.82	382.67	920
384.2	919.07	384.63	918.93	386.33	918	386.98	917.7	396.37	917.35
424.77	917.6	455.06	917.55	486.41	917.42	507.09	918	521.66	918.38
522.05	918.39	522.07	918.25	522.37	918	523.33	916.72	523.95	916.07
523.98	916	524.53	915.22	525.22	915.21	530.56	915.16	531.05	915.43
532.83	916.66	534.65	917.53	540.1	918	540.31	918.02	542.15	918.04
555.68	918.76	561.02	918.95	565.18	919.14	582.07	919.69	582.6	919.72
587.3	919.91	590.17	920	609.32	920.85	623.01	921.46	626.73	921.6
629.18	921.66	639.8	922	650.79	922.3	654.85	922.38	659.76	922.39
666.4	922.52	671.68	922.64	712.7	923.9	715.7	924	732.96	924
748.88	924.61	757.11	925.2	757.74	925.23	759.18	925.39	761.01	925.59
763.68	926	765.89	926.34	776.89	928	791.76	929.74	793.92	930
799.74	930.98	802.44	931.48	805.4	932	807.19	932.38	814.76	934
825.1	935.78	826.63	936	827.55	936.36	829.14	937.27	830.57	938
832.31	939	834.49	939.97	834.55	940	834.69	939.98		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	522.05	.035	534.65	.035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 522.05 534.65 435.42 145.52 25.67 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

```

*****
* E.G. Elev (ft) * 919.47 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 0.10 * Wt. n-Val. * 0.035 * 0.035 * 0.035 *
* W.S. Elev (ft) * 919.36 * Reach Len. (ft) * 435.42 * 145.52 * 25.67 *
* Crit W.S. (ft) * * * Flow Area (sq ft) * 238.19 * 43.51 * 29.24 *
* E.G. Slope (ft/ft) * 0.001559 * Area (sq ft) * 238.19 * 43.51 * 29.24 *
* Q Total (cfs) * 763.60 * Flow (cfs) * 572.51 * 149.48 * 41.61 *
* Top Width (ft) * 188.28 * Top width (ft) * 138.33 * 12.60 * 37.35 *
* Vel Total (ft/s) * 2.46 * Avg. Vel. (ft/s) * 2.40 * 3.44 * 1.42 *
* Max chl dpth (ft) * 4.20 * Hydr. Depth (ft) * 1.72 * 3.45 * 0.78 *
* Conv. Total (cfs) * 19336.8 * Conv. (cfs) * 14497.8 * 3785.3 * 1053.7 *
* Length wtd. (ft) * 260.11 * Wetted Per. (ft) * 138.76 * 14.83 * 37.40 *
* Min ch El (ft) * 915.16 * Shear (lb/sq ft) * 0.17 * 0.29 * 0.08 *
* Alpha * 1.12 * Stream Power (lb/ft s) * 834.69 * 0.00 * 0.00 *
* Frctn Loss (ft) * 0.67 * Cum Volume (acre-ft) * 4.75 * 4.07 * 2.04 *
* C & E Loss (ft) * 0.03 * Cum SA (acres) * 3.50 * 1.02 * 2.01 *
*****
    
```

Warning: The conveyance ratio (upstream 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: Bluestone Creek  
 REACH: Middle RS: 7150.429

INPUT  
 Description:

Station Elevation Data		num=		77							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	940	1.43	939.31	4.02	938	6.22	936.97	8.31	936		
11.04	934.79	12.69	934	14.35	933.2	18.22	932	19.69	931.46		
22.43	930	24.92	928.71	26.26	928	27.78	927.21	32.8	926		
38.16	925.16	45.94	924	49.34	922.8	51.37	922	52.83	921.41		
56.39	920	59.71	918.68	60.85	918.53	65.8	918	66.62	918		
67.96	917.93	70	917.86	70.24	917.85	110.28	916.16	113.59	916.02		
114.02	916	114.22	915.99	114.39	915.97	114.4	915.96	115.45	915.12		
116.07	914.42	116.24	914.24	116.51	914.24	126.06	914.6	129.8	914.74		
130.94	915.99	130.96	916	131.75	917.53	134.95	917.66	158.58	918		
182.07	918.33	203.14	918	230.5	917.53	281.5	917.51	305.6	918		
322.5	918.5	333.42	919.26	338.97	919.43	345.58	920	367.04	921.32		
377.22	922	382.54	922.18	403.49	922.59	410.44	922.67	434.16	923.26		
447.57	923.43	458.92	924	466.41	925.64	468.06	926	469.38	926.29		
478.61	928	483	928.81	489.41	930	493.34	930.71	499.95	932		
504.19	932.81	511.15	934	518.93	935.28	522.09	936	527.42	937.19		

531.06 938 540.27 940

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .06 113.59 .035 131.75 .035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 113.59 131.75 253.96 243.08 108.87 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

\*\*\*\*\*  
 \* E.G. Elev (ft) \* 918.77 \* Element \* Left OB \* Channel \* Right OB \*  
 \* Vel Head (ft) \* 0.40 \* Wt. n-Val. \* 0.060 \* 0.035 \* 0.035 \*  
 \* W.S. Elev (ft) \* 918.37 \* Reach Len. (ft) \* 253.96 \* 243.08 \* 108.87 \*  
 \* Crit W.S. (ft) \* 918.37 \* Flow Area (sq ft) \* 64.94 \* 65.28 \* 101.98 \*  
 \* E.G. Slope (ft/ft) \* 0.004994 \* Area (sq ft) \* 64.94 \* 65.28 \* 101.98 \*  
 \* Q Total (cfs) \* 763.60 \* Flow (cfs) \* 132.93 \* 426.06 \* 204.61 \*  
 \* Top Width (ft) \* 255.89 \* Top width (ft) \* 51.27 \* 18.16 \* 186.46 \*  
 \* Vel Total (ft/s) \* 3.29 \* Avg. vel. (ft/s) \* 2.05 \* 6.53 \* 2.01 \*  
 \* Max Chl Dpth (ft) \* 4.13 \* Hydr. Depth (ft) \* 1.27 \* 3.59 \* 0.55 \*  
 \* Conv. Total (cfs) \* 10805.0 \* Conv. (cfs) \* 1881.0 \* 6028.8 \* 2895.3 \*  
 \* Length Wtd. (ft) \* 195.20 \* Wetted Per. (ft) \* 51.34 \* 20.35 \* 186.48 \*  
 \* Min Ch El (ft) \* 914.24 \* Shear (lb/sq ft) \* 0.39 \* 1.00 \* 0.17 \*  
 \* Alpha \* 2.36 \* Stream Power (lb/ft s) \* 540.27 \* 0.00 \* 0.00 \*  
 \* Frctn Loss (ft) \* 1.17 \* Cum Volume (acre-ft) \* 3.23 \* 3.89 \* 2.01 \*  
 \* C & E Loss (ft) \* 0.00 \* Cum SA (acres) \* 2.55 \* 0.97 \* 1.95 \*  
 \*\*\*\*\*

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: Bluestone Creek  
 REACH: Middle RS: 6893.619

INPUT

Description:  
 Station Elevation Data num= 82  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 \*\*\*\*\*

OXF157-159Bridges.rep

0	940	.63	939.87	9.41	938	12.99	937.14	17.91	936
20.37	935.42	26.13	934	27.78	933.6	30.03	933.05	33.04	932.2
34.28	931.84	40.09	930	40.82	929.59	43.84	928	45.33	927.25
47.62	926	50.25	925.61	59.48	924.26	59.94	924.25	61.68	924
61.79	923.95	65.65	922	65.82	921.91	66.02	921.82	69.61	920
70.09	919.75	73.76	918	77.08	916.27	77.83	915.83	78.32	915.46
78.37	915.44	78.69	915.29	79.16	915.16	81.46	914.3	81.96	914.11
82.11	914	83.8	913.28	83.84	913.26	84.09	913.26	95.28	913.18
97.26	913.16	97.44	913.3	98.13	914	99.65	915.5	100.08	916
100.09	916.21	103.23	916	108.05	915.57	141.24	916	147.363	916.03
149.52	916	170.28	915.43	220.71	915.66	245.16	916	256.9	916.87
272.3	918	275.45	918.35	289.44	920	303.62	921.66	306.58	922
320.13	923.58	323.84	924	332.93	925.7	334.13	925.91	334.61	926
341.03	927.74	341.98	928	342.57	928.16	347.76	929.6	349.24	930
350.19	930.26	356.83	932	364.7	933.97	364.94	934	377.68	935.85
378.87	936	388.73	936.78	392.9	938	395.7	939.36	405.9	939.89
416.1	939.61	418.77	938						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	77.08	.035	100.09	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	77.08	100.09		109.73	264.07	195.16	.1
							.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 916.94	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.44	* Wt. n-Val.	* 0.060	* 0.035	* 0.035
* W.S. Elev (ft)	* 916.51	* Reach Len. (ft)	* 109.73	* 264.07	* 195.16
* Crit W.S. (ft)	* 916.51	* Flow Area (sq ft)	* 0.05	* 62.11	* 115.87
* E.G. Slope (ft/ft)	* 0.007307	* Area (sq ft)	* 0.05	* 62.11	* 115.87
* Q Total (cfs)	* 763.60	* Flow (cfs)	* 0.03	* 412.61	* 350.96
* Top width (ft)	* 175.36	* Top width (ft)	* 0.45	* 23.01	* 151.90
* Vel Total (ft/s)	* 4.29	* Avg. Vel. (ft/s)	* 0.47	* 6.64	* 3.03
* Max Chl Dpth (ft)	* 3.35	* Hydr. Depth (ft)	* 0.12	* 2.70	* 0.76
* Conv. Total (cfs)	* 8932.9	* Conv. (cfs)	* 0.3	* 4826.9	* 4105.7
* Length Wtd. (ft)	* 221.10	* Wetted Per. (ft)	* 0.51	* 25.07	* 151.96
* Min Ch El (ft)	* 913.16	* Shear (lb/sq ft)	* 0.05	* 1.13	* 0.35
* Alpha	* 1.53	* Stream Power (lb/ft s)	* 418.77	* 0.00	* 0.00
* Frctn Loss (ft)	* 1.47	* Cum Volume (acre-ft)	* 3.04	* 3.54	* 1.73
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 2.40	* 0.86	* 1.52

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: Bluestone Creek  
 REACH: Middle RS: 6579.154

INPUT  
 Description:

Station Elevation Data num= 86											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	940.02	.06	940	5.43	938.33	6.49	938	7.82	937.59		
9.98	936.87	12.85	936	15.15	935.26	19.28	934	28.1	934		
37.5	934	75.8	922	85.2	920.68	89.31	920	92.03	919.7		
99.86	918	108.56	916.32	111.03	916	120.18	915.34	121.45	915.25		
124.67	915.08	125.63	915.04	143.77	914.2	145.78	914.18	153.28	914.17		
154.3	914	170.48	914	175.12	914.07	178.78	914	179.5	914		
187.84	914	196.89	913.99	199.42	913.99	211.43	913.71	213.31	913.69		
214.23	913.67	223.82	913.36	224	913.28	226.75	912	227.03	911.87		
229.01	910.95	230.34	910.97	240.31	910.57	240.32	910.58	240.84	911.5		
241.04	912	241.93	913.85	241.94	913.9	248.99	914	249.09	914		
262.21	914	268.01	914.23	269.61	914.28	270.41	914.3	271.49	914.33		
275.32	914.47	276.64	914.53	277.25	914.56	303.38	916	309.91	917.22		
314.26	918	315.84	918.36	319.68	919.08	320.18	920	331.35	925.6		
341.64	926.27	351.93	926.13	356.6	924	358.4	924	358.64	924.24		
360.5	925.5	361.05	925.92	361.53	926.39	363.07	927.8	363.41	928		
363.81	928.11	367.54	930	369.07	930.42	374.67	932	378.16	933.01		
381.86	934	387.36	935.49	388.93	936	389.8	936.28	395.37	938		
401.81	940										

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.035	223.82	.035	241.93	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	223.82	241.93		97.68	95.13	91.27	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 915.39	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.51	* Wt. n-val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 914.87	* Reach Len. (ft)	* 97.68	* 95.13	* 91.27
* Crit W.S. (ft)	* 914.87	* Flow Area (sq ft)	* 80.10	* 64.61	* 27.91
* E.G. Slope (ft/ft)	* 0.006048	* Area (sq ft)	* 80.10	* 64.61	* 27.91
* Q Total (cfs)	* 763.60	* Flow (cfs)	* 236.66	* 455.70	* 71.25
* Top width (ft)	* 153.70	* Top width (ft)	* 94.59	* 18.11	* 41.00

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* Vel Total (ft/s)	* 4.42	* Avg. Vel. (ft/s)	* 2.95	* 7.05	* 2.55
* Max Chl Dpth (ft)	* 4.30	* Hydr. Depth (ft)	* 0.85	* 3.57	* 0.68
* Conv. Total (cfs)	* 9818.7	* Conv. (cfs)	* 3043.0	* 5859.5	* 916.1
* Length Wtd. (ft)	* 95.66	* Wetted Per. (ft)	* 94.63	* 20.69	* 41.06
* Min Ch El (ft)	* 910.57	* Shear (lb/sq ft)	* 0.32	* 1.18	* 0.26
* Alpha	* 1.69	* Stream Power (lb/ft s)	* 401.81	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.71	* Cum Volume (acre-ft)	* 2.94	* 3.15	* 1.41
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 2.28	* 0.73	* 1.09

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: Bluestone Creek  
 REACH: Middle RS: 6481.438

INPUT

Description:

Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	930	15.6	934	33.2	934	89.5	916	111.84	914
140.07	912.86	143.41	912.75	165.44	912.38	179.04	912.18	179.22	912.18
182.55	912.22	183.12	912.21	207.49	912.64	207.61	912.42	207.83	912
208.27	911.12	208.84	910	208.86	909.96	208.97	909.95	209.04	909.95
210.26	909.96	212.74	910	214.24	910	214.55	910.02	217.56	910.23
219.96	911.8	220.65	912	221.21	912.16	221.72	912.3	238.67	912.73
239.95	912.76	248.15	912.99	280.34	914	283.77	915.56	294.27	916.35
304.77	916.28	306.06	916	318.37	916.71	319.29	917.42	321.35	918.98
322.57	920	324.99	921.72	325.98	921.87	326.3	922	327.59	922.32
331.31	924	335.39	925.87	335.66	926	340.01	927.82	340.4	928
341.02	928.29	344.66	930						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	207.49	.035	221.72	.035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 207.49 221.72 241.25 133.84 29.29 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

```
*****
* E.G. Elev (ft)      * 914.23 * Element          * Left OB * Channel * Right OB *
* Vel Head (ft)      * 0.53  * Wt. n-Val.      * 0.035  * 0.035  * 0.035  *
* W.S. Elev (ft)     * 913.70 * Reach Len. (ft) * 241.25 * 133.84 * 29.29  *
* Crit W.S. (ft)     * 913.70 * Flow Area (sq ft) * 93.29 * 44.55  * 36.14  *
* E.G. Slope (ft/ft) * 0.008958 * Area (sq ft)    * 93.29 * 44.55  * 36.14  *
* Q Total (cfs)      * 855.60 * Flow (cfs)      * 388.94 * 348.28 * 118.38 *
* Top Width (ft)     * 151.55 * Top width (ft)  * 88.24 * 14.23  * 49.08  *
* Vel Total (ft/s)   * 4.92  * Avg. Vel. (ft/s) * 4.17  * 7.82   * 3.28   *
* Max Chl Dpth (ft) * 3.75  * Hydr. Depth (ft) * 1.06  * 3.13   * 0.74   *
* Conv. Total (cfs) * 9040.0 * Conv. (cfs)     * 4109.4 * 3679.8 * 1250.8 *
* Length Wtd. (ft)  * 144.54 * Wetted Per. (ft) * 88.27 * 16.42  * 49.10  *
* Min Ch El (ft)    * 909.95 * Shear (lb/sq ft) * 0.59  * 1.52   * 0.41   *
* Alpha             * 1.42  * Stream Power (lb/ft s) * 344.66 * 0.00   * 0.00   *
* Frctn Loss (ft)   * 1.06  * Cum Volume (acre-ft) * 2.75  * 3.03   * 1.34   *
* C & E Loss (ft)   * 0.04  * Cum SA (acres)   * 2.08  * 0.70   * 1.00   *
*****
```

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: The energy loss was 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: Bluestone Creek

REACH: Middle

RS: 6323.723

INPUT

Description:

Station Elevation Data

num= 113

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	930	5.5	928.8	15.94	926.55	16.03	926.53	16.13	926.51
16.25	926.48	18.64	926	18.75	925.98	22.73	924.95	24.61	924.93
25.2	924.94	26	925.11	26.07	925.11	29.27	924.79	31.88	924.59
38.62	924	38.73	923.99	41.83	923.78	42.04	923.76	55.69	922
56.39	921.95	56.84	921.91	64.77	920.83	64.91	920.77	66.93	920
67.61	919.73	69.48	919.06	70.58	918.58	71.86	918	73.8	917.24
74.84	916.79	75.56	915.95	77.31	914	78.59	912.47	78.76	912.22
78.99	912.31	82.22	914	82.66	914.3	83.33	914.5	85.67	914.33
85.82	914.38	86.93	914.36	89.4	914.25	97.18	914.07	110.38	912.81

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112.69	912.51	116.01	912	120.99	911.26	121.12	911.25	121.66	911.23
126.53	911.07	129.58	910.97	139.3	910.64	144.92	910.19	146.28	910.16
147.41	910	150.01	910	153.07	909.91	153.88	909.82	154.53	909.75
154.9	909.63	154.92	909.62	156.8	908.56	156.91	908.41	157.83	908.41
163.61	908.84	164.93	909.5	165.33	909.89	165.37	909.9	166.36	909.86
170.63	910	175.08	910.22	177.04	910.27	179.21	910.3	184.74	910.31
190.64	910.23	192.48	910.24	197.7	910.54	222.31	911.91	226.5	912
226.72	912	234.67	912	251.65	912.28	251.9	912.28	264.42	912.49
281.17	912.8	294.59	913.03	301.95	913.19	307.2	913.27	320.01	913.2
320.65	913.2	321.01	913.16	324.87	912.66	327.12	913.1	328.95	913.86
328.97	913.86	329.43	914	330.9	914.45	335.98	916	341.81	917.78
342.5	918	348.7	919.85	349.18	920	352.14	920.8	356.3	922
356.96	922.17	363.59	924	364.92	924.36	371.16	926	373.35	926.59
376.99	928	379.87	929.8	380.19	930				

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .035 153.07 .035 165.33 .035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 153.07 165.33 34.18 34.13 38.06 .1 .3

Blocked Obstructions num= 1  
 Sta L Sta R Elev  
 \*\*\*\*\*  
 0 83.33 914.5

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 912.64	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.41	* Wt. n-val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 912.23	* Reach Len. (ft)	* 34.18	* 34.13	* 38.06
* Crit W.S. (ft)	* 911.86	* Flow Area (sq ft)	* 54.92	* 40.25	* 94.88
* E.G. Slope (ft/ft)	* 0.006089	* Area (sq ft)	* 54.92	* 40.25	* 94.88
* Q Total (cfs)	* 855.60	* Flow (cfs)	* 229.77	* 283.63	* 342.19
* Top Width (ft)	* 134.29	* Top Width (ft)	* 38.58	* 12.26	* 83.46
* Vel Total (ft/s)	* 4.50	* Avg. Vel. (ft/s)	* 4.18	* 7.05	* 3.61
* Max Chl Dpth (ft)	* 3.82	* Hydr. Depth (ft)	* 1.42	* 3.28	* 1.14
* Conv. Total (cfs)	* 10965.0	* Conv. (cfs)	* 2944.7	* 3634.9	* 4385.4
* Length wtd. (ft)	* 34.13	* Wetted Per. (ft)	* 38.69	* 12.97	* 83.52
* Min Ch El (ft)	* 908.41	* Shear (lb/sq ft)	* 0.54	* 1.18	* 0.43
* Alpha	* 1.30	* Stream Power (lb/ft s)	* 380.19	* 0.00	* 0.00
* Frctn Loss (ft)	*	* Cum Volume (acre-ft)	* 2.34	* 2.90	* 1.30
* C & E Loss (ft)	*	* Cum SA (acres)	* 1.73	* 0.66	* 0.95

INLINE STRUCTURE

RIVER: Bluestone Creek  
 REACH: Middle RS: 6303.78

INPUT

Description:

Distance from Upstream XS = 9.94  
 Deck/Roadway Width = 20  
 Weir Coefficient = 2.6

Weir Embankment Coordinates num = 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
2.06	920	33.51	918	56.8	916	77.59	914	99.1	912
127.18	910	156.91	908.41	157.83	908.41	213.58	910	267.58	912
324.73	914	340.94	916	353.03	918	365.53	920		

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 =  
 Weir crest shape = Broad Crested

INLINE STRUCTURE OUTPUT Profile #PF 1 Inl Struct:

* E.G. Elev (ft)	* 912.64	* Q Gates (cfs)	* *
* W.S. Elev (ft)	* 912.23	* Q Gate Group (cfs)	* 0.00
* Q Total (cfs)	* 855.60	* Gate Open Ht (ft)	* 912.12
* Q Weir (cfs)	* 855.60	* Gate #Open	* *
* Weir Flow Area (sq ft)	* 250.62	* Gate Area (sq ft)	* 1.00
* Weir Sta Lft (ft)	* 111.67	* Gate Submerg	* 0.00
* Weir Sta Rgt (ft)	* 272.65	* Gate Invert (ft)	* 0.00
* Weir Max Depth (ft)	* 4.23	* Gate weir Coef	* 0.000
* Weir Avg Depth (ft)	* 1.56		
* Weir Coef (ft <sup>1/2</sup> )	* 2.600	* Q Breach (cfs)	* *
* Weir Submerg	* 0.82	* Breach Avg Velocity (ft/s)	* *
* Min El Weir Flow (ft)	* 908.42	* Breach Flow Area (sq ft)	* *
* Wr Top Wdth (ft)	* 160.97		

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Middle RS: 6289.579

INPUT

Description:

Station Elevation Data num= 96

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	930	2.09	929.42	9.69	928	12.16	927.53	19.82	926
23.34	925.29	29.64	924	33.21	923.4	38.81	922.59	39.96	922.33
40.07	922.32	41.54	921.9	42.12	921.71	47.2	920	50.39	918.97
53.23	918	56.03	917.13	56.12	917.1	56.3	917.04	56.45	917.01
59.85	916	61.22	915.67	61.95	915.44	63.02	915.65	64.63	915.48

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65.01	915.6	67.94	915.63	69.32	915.44	85.09	914.42	89.83	914.14
90.65	914.07	91.93	913.92	96.45	913.47	110.72	912	113.27	911.89
122.89	911.32	136.15	910.55	144.19	910	151.88	910	151.96	909.98
153.75	909.85	153.93	909.82	154.32	909.7	155.74	908.86	158.89	908.68
162.03	908.07	162.07	908.07	163.96	909.05	164.95	910	165.11	910.17
165.38	910.41	170.27	910.24	172.12	910.24	185.12	910.15	194.99	910.48
195.18	910.49	214.79	911.67	220.68	911.85	223.65	911.89	224.21	912
228.6	912.86	234.42	914	244.04	914	251.31	913.07	259.69	912
264.12	912	265.03	911.99	265.27	911.99	266.25	911.89	271.28	911.54
273.09	911.97	274.66	912.26	290.64	913.16	298.76	913.58	299.89	913.66
306.57	914	308.83	914	313.63	915.46	314.88	916	315.63	916.34
319.4	918	321.08	918.69	324.05	920	328.49	921.98	328.52	922
328.6	922.03	336.51	924	342.41	925.47	343.41	925.69	344.64	926
349.12	927.1	353.22	928	353.66	928.11	360.84	929.85	361.34	929.96
361.44	930								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .035 151.88 .035 165.38 .035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 151.88 165.38 17.53 109.18 143.43 .1 .3  
 Blocked Obstructions num= 1  
 Sta L Sta R Elev  
 \*\*\*\*\*  
 251.31 361.44 912.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 912.58	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.46	* Wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 912.12	* Reach Len. (ft)	* 17.53	* 109.18	* 143.43
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 52.26	* 42.05	* 78.71
* E.G. Slope (ft/ft)	*0.007049	* Area (sq ft)	* 52.26	* 42.05	* 78.71
* Q Total (cfs)	* 855.60	* Flow (cfs)	* 214.19	* 303.35	* 338.06
* Top width (ft)	* 115.24	* Top width (ft)	* 42.31	* 13.50	* 59.43
* Vel Total (ft/s)	* 4.95	* Avg. Vel. (ft/s)	* 4.10	* 7.21	* 4.30
* Max Chl Dpth (ft)	* 4.05	* Hydr. Depth (ft)	* 1.24	* 3.11	* 1.32
* Conv. Total (cfs)	* 10190.6	* Conv. (cfs)	* 2551.1	* 3613.0	* 4026.5
* Length wtd. (ft)	* 80.55	* Wetted Per. (ft)	* 42.38	* 14.61	* 59.50
* Min Ch El (ft)	* 908.07	* Shear (lb/sq ft)	* 0.54	* 1.27	* 0.58
* Alpha	* 1.22	* Stream Power (lb/ft s)	* 361.44	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.36	* Cum Volume (acre-ft)	* 2.34	* 2.72	* 1.30
* C & E Loss (ft)	* 0.05	* Cum SA (acres)	* 1.69	* 0.65	* 0.89

Warning: The conveyance ratio (upstream 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: Bluestone Creek  
 REACH: Middle

RS: 6179.412

INPUT

Description:

Station Elevation Data		num= 54		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	930	8.88	928	12.35	927.22	14.32	926	35.49	915.41		
38.53	916.9	48.65	917.23	58.76	916.77	61.8	915.27	63.34	916		
67.67	916	70.76	915.48	78.89	914	85.43	912.88	90.57	912		
108.94	911.38	118.83	911.12	141.25	910.41	153.13	910	156.13	910		
167.3	909.85	171.02	909.73	178.21	909.49	179.13	909.47	187.07	908.78		
193.08	908.55	193.12	908.55	193.19	908.11	193.38	908	194.36	907.7		
194.84	907.57	194.88	907.5	199.31	907.31	202.22	907	203.35	907.3		
204.73	908	206.5	908.91	206.88	909.12	209.4	909.46	209.79	909.5		
215.96	910	219.41	910.28	228.03	911	239.97	912	241.45	912.26		
245.51	912.69	256.67	914	259	914.44	260.59	914.81	265.03	916		
268.28	916.83	274.05	918	281.01	919.43	285.04	920				

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	193.08	.035	206.88	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	193.08	206.88		87.02	117.95	167.42	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 912.17	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.31	* Wt. n-val.	* 0.035	* 0.035	* 0.100
* W.S. Elev (ft)	* 911.86	* Reach Len. (ft)	* 87.02	* 117.95	* 167.42
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 147.85	* 58.90	* 41.29
* E.G. Slope (ft/ft)	* 0.003150	* Area (sq ft)	* 147.85	* 58.90	* 41.29
* Q Total (cfs)	* 855.60	* Flow (cfs)	* 462.06	* 352.33	* 41.21
* Top width (ft)	* 143.59	* Top width (ft)	* 98.37	* 13.80	* 31.42
* Vel Total (ft/s)	* 3.45	* Avg. vel. (ft/s)	* 3.13	* 5.98	* 1.00
* Max Chl Dpth (ft)	* 4.86	* Hydr. Depth (ft)	* 1.50	* 4.27	* 1.31
* Conv. Total (cfs)	* 15244.6	* Conv. (cfs)	* 8232.7	* 6277.7	* 734.3
* Length wtd. (ft)	* 107.45	* Wetted Per. (ft)	* 98.44	* 14.81	* 31.54
* Min Ch El (ft)	* 907.00	* Shear (lb/sq ft)	* 0.30	* 0.78	* 0.26
* Alpha	* 1.69	* Stream Power (lb/ft s)	* 285.04	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.50	* Cum Volume (acre-ft)	* 2.30	* 2.59	* 1.10
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 1.67	* 0.61	* 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

RIVER: Bluestone Creek  
 REACH: Middle RS: 6057.761

INPUT  
 Description:

Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	928	18.3	918.75	21.3	920.25	31.3	920.64	41.3	920.25
44.3	918.75	49.99	918	55.17	916.03	55.34	915.96	55.76	915.81
60.39	914.21	61	914	65.83	912.37	66.88	912	80.17	910.38
81.59	910	111.1	910	135.84	909.62	150.99	909.39	152.18	909.38
152.92	908.51	153.44	908	153.72	907.6	154.58	906.63	161.44	906.51
161.65	906.52	161.71	906.58	164.13	907.84	164.88	908.23	164.99	908.24
181.89	909.37	190.82	909.97	191.69	910	191.83	910.1	194.46	912
195.42	912.66	197.28	914	198.66	914.96	200.15	916	201.62	917.02
203.04	918	204.33	918.89	205.91	920	207.22	920.89	208.98	922
211.36	923.24	212.96	924	216.28	925.7	217.16	926	217.75	926.2
223.08	928	225.16	928.7	230.24	929.99				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	152.18	.035	164.99	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	152.18	164.99		141.72	156.04	142.63	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 911.64	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.65	* Wt. n-Val.	* 0.035	* 0.035	* 0.100
* W.S. Elev (ft)	* 910.99	* Reach Len. (ft)	* 141.72	* 156.04	* 142.63
* Crit W.S. (ft)	* 910.99	* Flow Area (sq ft)	* 85.30	* 50.33	* 50.20
* E.G. Slope (ft/ft)	* 0.007526	* Area (sq ft)	* 85.30	* 50.33	* 50.20
* Q Total (cfs)	* 855.60	* Flow (cfs)	* 336.10	* 424.99	* 94.51
* Top width (ft)	* 117.87	* Top width (ft)	* 77.00	* 12.81	* 28.07
* Vel Total (ft/s)	* 4.60	* Avg. vel. (ft/s)	* 3.94	* 8.44	* 1.88
* Max Chl Dpth (ft)	* 4.48	* Hydr. Depth (ft)	* 1.11	* 3.93	* 1.79
* Conv. Total (cfs)	* 9862.4	* Conv. (cfs)	* 3874.2	* 4898.8	* 1089.4
* Length Wtd. (ft)	* 148.20	* Wetted Per. (ft)	* 77.09	* 14.50	* 28.45
* Min Ch El (ft)	* 906.51	* Shear (lb/sq ft)	* 0.52	* 1.63	* 0.83
* Alpha	* 1.98	* Stream Power (lb/ft s)	* 230.24	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.63	* Cum Volume (acre-ft)	* 2.06	* 2.44	* 0.93
* C & E Loss (ft)	* 0.12	* Cum SA (acres)	* 1.49	* 0.58	* 0.63

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 conveyance ratio (upstream 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: Bluestone Creek  
 REACH: Middle RS: 5898.334

INPUT  
 Description:

Station Elevation Data		num= 64		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	929	13.89	921.7	16.9	923.01	26.9	923.41	36.9	923		
38.9	922	39.68	921.47	45.97	920.47	46.03	920.46	46.48	920.33		
47.81	919.83	52.47	918.16	52.91	918	52.98	917.98	58.25	916		
58.59	915.87	64.02	914	65.46	913.5	69.75	912	73.12	910.8		
75.35	910	76.13	910	113.99	908.58	129.63	908	148.93	908		
158.14	908	162.61	907.98	166.9	907.94	167.03	907.88	168.45	907.34		
170.7	906.45	171.48	906.1	171.89	906.09	176.56	906	178.35	905.89		
178.4	905.89	178.52	906.02	178.78	906.32	184.56	907.77	184.97	907.9		
188.65	909.84	188.97	910	189.53	910.3	192.8	912	193.29	912.27		
196.2	913.63	197.01	914	197.24	914.09	198.57	914.65	201.8	916		
204.34	917.2	206.05	918	208.55	919.11	210.95	919.71	212.06	920		
212.84	920.2	220.11	922	224.99	923.25	228.06	924	232.84	925.42		
235.06	926	240.78	927.75	241.6	928	248.22	930				

Manning's n Values		num= 3		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.035	166.9	.035	184.97	.1		

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 166.9 184.97 150.38 175.2 214.49 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

```
*****
* E.G. Elev (ft) * 910.60 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 0.26 * Wt. n-Val. * 0.035 * 0.035 * 0.100 *
* W.S. Elev (ft) * 910.34 * Reach Len. (ft) * 150.38 * 175.20 * 214.49 *
*****
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* Crit W.S. (ft)	*	* Flow Area (sq ft)	*	* 159.72	*	* 66.69	*	* 5.65	*
* E.G. Slope (ft/ft)	*0.002715	* Area (sq ft)	*	* 159.72	*	* 66.69	*	* 5.65	*
* Q Total (cfs)	* 855.60	* Flow (cfs)	*	* 508.14	*	* 342.86	*	* 4.60	*
* Top Width (ft)	* 115.21	* Top Width (ft)	*	* 92.50	*	* 18.07	*	* 4.64	*
* Vel Total (ft/s)	* 3.69	* Avg. Vel. (ft/s)	*	* 3.18	*	* 5.14	*	* 0.81	*
* Max Chl Dpth (ft)	* 4.45	* Hydr. Depth (ft)	*	* 1.73	*	* 3.69	*	* 1.22	*
* Conv. Total (cfs)	* 16421.3	* Conv. (cfs)	*	* 9752.5	*	* 6580.4	*	* 88.4	*
* Length Wtd. (ft)	* 166.93	* Wetted Per. (ft)	*	* 92.60	*	* 18.82	*	* 5.24	*
* Min Ch El (ft)	* 905.89	* Shear (lb/sq ft)	*	* 0.29	*	* 0.60	*	* 0.18	*
* Alpha	* 1.22	* Stream Power (lb/ft s)	*	* 248.22	*	* 0.00	*	* 0.00	*
* Frctn Loss (ft)	* 0.70	* Cum Volume (acre-ft)	*	* 1.66	*	* 2.23	*	* 0.84	*
* C & E Loss (ft)	* 0.05	* Cum SA (acres)	*	* 1.21	*	* 0.52	*	* 0.57	*

Warning: The conveyance ratio (upstream 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: Bluestone Creek  
 REACH: Middle RS: 5722.175

INPUT

Description:

Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	930	10.6	928	31.02	917.4	34.8	918.89	44.8	919.26
54.87	918.86	61.8	918	61.98	918	63.84	917.81	66.98	917.58
67	917.58	67.97	917.13	70.44	916	72.19	915.2	74.87	914
78.51	912.34	80.13	911.64	83.91	910	86.01	910	126.88	908.85
133.69	908.68	157.43	908	163.87	908	169.8	907.7	187.43	906.82
187.56	906.82	188.64	906.77	188.68	906.74	189.15	906.47	189.82	906
192.1	904.7	192.24	904.61	192.25	904.61	192.28	904.61	198.7	904.46
199.65	904.94	201.87	905.82	201.91	905.84	202.06	905.85	203.87	905.95
204.99	906	208.9	906.22	215.57	906.89	221.25	907.51	223.79	907.79
225.77	908	226.24	908.23	228.37	909.16	230.31	910	232.68	910.98
235.01	912	239.07	913.9	239.27	914	239.44	914.08	244.79	916
247.92	917.15	250.26	918	257.27	920				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	188.64	.035	201.87	.1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 188.64 201.87 128.15 130.09 113.52 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

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* E.G. Elev (ft)      * 909.85 * Element      * Left OB * Channel * Right OB *
* Vel Head (ft)      * 0.76  * Wt. n-Val.  * 0.035  * 0.035  * 0.100  *
* W.S. Elev (ft)     * 909.10 * Reach Len. (ft) * 128.15 * 130.09 * 113.52 *
* Crit W.S. (ft)     * 909.10 * Flow Area (sq ft) * 70.85 * 54.23 * 56.65 *
* E.G. Slope (ft/ft) * 0.007242 * Area (sq ft) * 70.85 * 54.23 * 56.65 *
* Q Total (cfs)      * 855.60 * Flow (cfs) * 256.74 * 480.55 * 118.31 *
* Top width (ft)     * 110.08 * Top width (ft) * 70.49 * 13.23 * 26.35 *
* Vel Total (ft/s)   * 4.71  * Avg. Vel. (ft/s) * 3.62 * 8.86 * 2.09 *
* Max Chl Dpth (ft)  * 4.64  * Hydr. Depth (ft) * 1.01 * 4.10 * 2.15 *
* Conv. Total (cfs)  * 10054.2 * Conv. (cfs) * 3017.0 * 5647.0 * 1390.3 *
* Length Wtd. (ft)   * 128.33 * Wetted Per. (ft) * 70.54 * 14.12 * 26.70 *
* Min Ch El (ft)     * 904.46 * Shear (lb/sq ft) * 0.45 * 1.74 * 0.96 *
* Alpha              * 2.19  * Stream Power (lb/ft s) * 257.27 * 0.00 * 0.00 *
* Frctn Loss (ft)    * 1.04  * Cum Volume (acre-ft) * 1.27 * 1.99 * 0.68 *
* C & E Loss (ft)    * 0.02  * Cum SA (acres) * 0.93 * 0.46 * 0.50 *
*****

```

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: Bluestone Creek

REACH: Middle

RS: 5588.448

INPUT

Description:

```

Station Elevation Data      num=      90
Sta      Elev      Sta      Elev      Sta      Elev      Sta      Elev      Sta      Elev
*****
0         913       3.91  910.87   6.92  912.35   16.98  912.67   27.04  912.23
30.05    910.61   32.82   912     36.72  912.23   37.74  911.58   38.06  911.4
38.71    911.01   38.75   911     39.48  911.14   40.59  911.3    40.87  911.34
41.17    911.36   41.53  911.38   42     911.37   42.05  911.37   42.07  911.37
42.56    911.33   45.98  911.03   48.99  910.78   50.38  910.78   55.17  910.81
55.26    910.81   55.3    910.81   55.91  910.77   56.13  910.9    56.43  910.87
56.84    911.17   57     911.18   57.06  911.18   57.42  911.17   57.72  911.16
62.55    910.83   67.1    910.53   68.61  910.55   84.21  910     117.64  910
131.69   908.56   136.31  908     142.34  907.54   146.77  907.22   160.08  906
166.09   905.9    168.39  905.87   182.31  905.44   184     904.54   184.7  904
185.43   903.63   185.6   903.47   193.71  903.52   194.45  903.52   194.61  903.52
194.8    903.69   196.3   904.13   197.49  904.46   197.66  904.52   197.69  904.53

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197.7	904.54	200.59	905.84	200.84	905.99	200.92	906	200.96	906.03
203.35	908	204.59	909.17	205.56	910	206.42	910.81	207.65	912
208.84	913.25	209.59	914	211.63	915.97	211.65	916	211.7	916.04
215.49	918	215.67	918.1	218.62	919.66	219.3	920	220.77	920.74
222.1	920.94	225.87	922	226.83	922.85	228.31	924	233.49	925.98
233.52	926	233.6	926.02	237.98	927.24	241.22	928	247.9	930

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	182.31	.035	200.59	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	182.31	200.59		6.34	82.42	137.81	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 908.57	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 1.00	* Wt. n-Val.	* 0.035	* 0.035	* 0.100
* W.S. Elev (ft)	* 907.57	* Reach Len. (ft)	* 6.34	* 82.42	* 137.81
* Crit W.S. (ft)	* 907.57	* Flow Area (sq ft)	* 54.02	* 64.51	* 2.05
* E.G. Slope (ft/ft)	* 0.009191	* Area (sq ft)	* 54.02	* 64.51	* 2.05
* Q Total (cfs)	* 855.60	* Flow (cfs)	* 266.49	* 586.77	* 2.34
* Top Width (ft)	* 60.93	* Top width (ft)	* 40.40	* 18.28	* 2.24
* Vel Total (ft/s)	* 7.10	* Avg. vel. (ft/s)	* 4.93	* 9.10	* 1.14
* Max Chl Dpth (ft)	* 4.10	* Hydr. Depth (ft)	* 1.34	* 3.53	* 0.91
* Conv. Total (cfs)	* 8924.5	* Conv. (cfs)	* 2779.7	* 6120.4	* 24.4
* Length Wtd. (ft)	* 70.62	* Wetted Per. (ft)	* 40.48	* 19.31	* 2.85
* Min Ch El (ft)	* 903.47	* Shear (lb/sq ft)	* 0.77	* 1.92	* 0.41
* Alpha	* 1.28	* Stream Power (lb/ft s)	* 247.90	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.53	* Cum Volume (acre-ft)	* 1.08	* 1.81	* 0.61
* C & E Loss (ft)	* 0.06	* Cum SA (acres)	* 0.77	* 0.41	* 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 energy loss was 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: Bluestone Creek  
 REACH: Middle

RS: 5493.950

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INPUT  
Description:

Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	913	6.15	910.19	9.59	911.54	21.06	911.48	32.55	910.58
36.05	908.93	45.06	912	46.83	912	50.46	910.89	53.21	910
58.87	908.16	59	908.11	59.27	907.98	60.09	907.56	62.18	906.46
62.29	906.47	64.84	906.92	64.86	906.92	66.46	907.04	66.87	907.08
66.88	907.08	69.8	906.97	78.97	906.91	81.24	906.89	81.55	906.89
82.46	906.89	82.57	906.91	82.63	906.92	83.6	907.56	83.9	907.76
84.11	907.77	84.37	907.76	90.94	907.5	108.56	907.53	121.88	907.79
123.56	907.82	124.18	907.83	125.34	907.81	130.84	907.49	133.17	907.3
134.06	907.19	143.77	906.03	144.52	905.92	144.75	905.85	145.56	905.44
148.31	904	150.76	902.84	177.58	902.84	177.93	903.81	178.08	904
178.63	904.89	179.9	906	180.29	906.36	181.5	907.58	182.44	908
183.34	908.39	185.77	910	187.37	911.06	188.77	912	191.1	913.02
191.27	913.1	192.75	913.15	193.08	913.18	196.13	913.25	201.35	913.5
203.48	914	206.31	914.64	212.25	916	215.76	916.48	221.29	918
222.05	918.31	222.67	918.52	224.05	918.81	229.45	920	232.81	920.78
235.86	921.46	236.62	921.6	237.43	921.7	238.45	922	245.15	922
249.34	922.59	260.51	924	272.91	924	285.23	926		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	143.77	.035	179.9	.1

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

143.77	179.9	6.86	80.28	173.13	.1	.3
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Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	124.18	907.83

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 907.42	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.79	* Wt. n-val.	* 0.035	* 0.035	* 0.100
* W.S. Elev (ft)	* 906.63	* Reach Len. (ft)	* 6.86	* 80.28	* 173.13
* Crit w.s. (ft)	*	* Flow Area (sq ft)	* 1.50	* 120.43	* 0.21
* E.G. slope (ft/ft)	* 0.006234	* Area (sq ft)	* 1.50	* 120.43	* 0.21
* Q Total (cfs)	* 865.00	* Flow (cfs)	* 2.23	* 862.67	* 0.09
* Top width (ft)	* 41.79	* Top width (ft)	* 5.01	* 36.13	* 0.66
* Vel Total (ft/s)	* 7.08	* Avg. vel. (ft/s)	* 1.49	* 7.16	* 0.44
* Max chl dpth (ft)	* 3.79	* Hydr. Depth (ft)	* 0.30	* 3.33	* 0.32
* Conv. Total (cfs)	* 10955.9	* Conv. (cfs)	* 28.3	* 10926.5	* 1.2
* Length wtd. (ft)	* 60.78	* Wetted Per. (ft)	* 5.04	* 38.55	* 0.91
* Min Ch El (ft)	* 902.84	* Shear (lb/sq ft)	* 0.12	* 1.22	* 0.09
* Alpha	* 1.02	* Stream Power (lb/ft s)	* 285.23	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.12	* Cum Volume (acre-ft)	* 1.08	* 1.64	* 0.60
* C & E Loss (ft)	* 0.20	* Cum SA (acres)	* 0.77	* 0.36	* 0.45

OXF157-159Bridges.rep

\*\*\*\*\*

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

Warning: The conveyance ratio (upstream 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: Bluestone Creek

REACH: Middle

RS: 5409.687

INPUT

Description:

Station Elevation Data num= 86

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	920	5.97	919.19	15.3	918	16.27	917.87	18.28	917.67
23.57	916.75	28.28	916	29.77	915.75	35.94	914.9	42.46	914
44.97	913.48	53.42	912	60.65	910.19	61.41	910	62.29	909.78
69.13	908	70.23	907.86	79.98	906.91	87.19	906.17	87.39	906.15
88.31	906	93.38	905.78	117.22	904.61	118.79	904.19	121.7	903.48
121.83	903.47	121.98	903.47	124.86	903.62	125.45	903.65	126.05	903.67
127.72	903.71	127.78	903.71	128.07	903.71	129.5	903.67	136.55	903.5
151.53	903.14	153.62	903.4	156.1	903.47	156.68	903.48	163.29	903.61
163.83	903.52	165.5	903.54	168.36	903.16	168.56	903.14	169.18	902.69
174.3	902.42	179	902.42	180.56	902.71	181.94	903.62	183.06	903.7
187.61	904	193.91	904.79	207.91	905.82	208.23	905.85	209.86	905.97
210.14	906	211.43	906.16	214.58	906.51	228.12	908	233.03	908.92
238.83	910	247.65	911.68	248.22	911.77	250.1	912.05	258.61	912.78
270.46	914	272.58	914	279.31	914.41	289.5	915	294.01	915.29
306.55	916	315.77	916.78	329.83	918	333.55	918.5	336.92	918.96
344	920	348.21	920.65	354.66	922	359.29	923.05	363.61	924
368.9	925.16	372.66	926	379.67	927.58	381.64	928	382.34	928.17
390.15	930								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	165.5	.035	181.94	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	165.5	181.94		34.62	29.59	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 907.09	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.12	* Wt. n-val.	* 0.035	* 0.035	* 0.060
* W.S. Elev (ft)	* 906.98	* Reach Len. (ft)	* 34.62	* 29.59	* 30.52
* Crit w.s. (ft)	* 905.15	* Flow Area (sq ft)	* 219.12	* 69.87	* 64.20

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```

* E.G. Slope (ft/ft) *0.001010 * Area (sq ft) * 219.12 * 69.87 * 64.20 *
* Q Total (cfs) * 865.00 * Flow (cfs) * 549.45 * 242.66 * 72.89 *
* Top Width (ft) * 139.55 * Top width (ft) * 86.22 * 16.44 * 36.89 *
* Vel Total (ft/s) * 2.45 * Avg. vel. (ft/s) * 2.51 * 3.47 * 1.14 *
* Max chl Dpth (ft) * 4.56 * Hydr. Depth (ft) * 2.54 * 4.25 * 1.74 *
* Conv. Total (cfs) * 27218.6 * Conv. (cfs) * 17289.4 * 7635.7 * 2293.6 *
* Length Wtd. (ft) * 29.59 * Wetted Per. (ft) * 86.48 * 16.92 * 37.05 *
* Min Ch El (ft) * 902.42 * Shear (lb/sq ft) * 0.16 * 0.26 * 0.11 *
* Alpha * 1.25 * Stream Power (lb/ft s) * 390.15 * 0.00 * 0.00 *
* Frctn Loss (ft) * * Cum Volume (acre-ft) * 1.06 * 1.46 * 0.47 *
* C & E Loss (ft) * * Cum SA (acres) * 0.76 * 0.31 * 0.38 *
*****

```

INLINE STRUCTURE

RIVER: Bluestone Creek  
 REACH: Middle RS: 5395.59

INPUT

Description:

Distance from Upstream XS = 3.96  
 Deck/Roadway width = 20  
 Weir Coefficient = 2.6

Weir Embankment Coordinates num = 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	914	9.33	912	28.77	910	49.87	908	73.97	906
110.92	904	174.3	902.42	179	902.42	213.39	904	235.66	906
252.9	908	272.68	910	319.16	912	352.77	914		

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 =  
 Weir crest shape = Broad Crested

INLINE STRUCTURE OUTPUT Profile #PF 1 Inl Struct:

```

*****
* E.G. Elev (ft) * 907.09 * Q Gates (cfs) * *
* W.S. Elev (ft) * 906.98 * Q Gate Group (cfs) * 0.00 *
* Q Total (cfs) * 865.00 * Gate Open Ht (ft) * 906.96 *
* Q Weir (cfs) * 865.00 * Gate #Open * *
* Weir Flow Area (sq ft) * 368.91 * Gate Area (sq ft) * 1.00 *
* Weir Sta Lft (ft) * 78.09 * Gate Submerg * 0.00 *
* Weir Sta Rgt (ft) * 219.89 * Gate Invert (ft) * 0.00 *
* Weir Max Depth (ft) * 4.67 * Gate Weir Coef * 0.000 *
* Weir Avg Depth (ft) * 2.60 * * *
* Weir Coef (ft^1/2) * 2.600 * Q Breach (cfs) * *
* Weir Submerg * 0.98 * Breach Avg Velocity (ft/s) * *
* Min El Weir Flow (ft) * 902.43 * Breach Flow Area (sq ft) * *
*****

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\* Wr Top Wdth (ft) \* 141.80 \*  
 \*\*\*\*\*

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Middle RS: 5379.960

INPUT  
 Description:

Station Elevation Data num= 87

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	920	12.21	918.02	12.33	918	12.55	917.96	13.33	917.84
24.8	916	27.19	915.3	32.83	914	37.1	912.81	40.41	912
41.59	911.71	48.6	910	55.02	908.42	57.66	908	60.99	907.48
67.25	906.71	81.75	906	82.38	906	84.85	905.91	86.04	905.86
90.51	905.69	110.36	904.81	128.86	904	131.97	904	132.49	903.97
136.65	903.66	142.64	903.21	144.16	903.07	146.19	902.95	147.3	902.28
147.76	902.28	154.61	902.28	158.14	902.78	160.66	902.98	163.53	902.97
166.25	902.99	182.57	904	183.92	904	186.47	904.17	195.73	904.78
201.54	905.08	201.58	905.09	204.88	905.38	205.6	905.43	206.29	905.52
210.11	905.88	211.77	905.9	213.29	906.18	213.5	906.21	223.57	907.06
224.47	907.23	227.48	907.72	229.15	908	233.24	908.65	234.62	908.88
241.66	909.42	244.66	909.7	245.61	910	246.97	910.31	256.6	912
261.91	912.67	266.32	913.24	267.75	913.38	268.65	913.46	270.11	913.55
273.67	913.66	281.28	914	297.54	914.72	300.24	914.83	306.74	915.57
307.23	915.63	310.03	916	318.92	917.19	324.9	918	326.6	918.26
336.44	920	344.94	921.86	345.19	921.92	345.58	922	346.12	922.12
354.96	924	360.71	925.22	364.36	926	373.34	927.95	373.5	928
373.58	928.02	380.55	930						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	146.19	.035	158.14	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	146.19	158.14		110.49	88.75	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 907.06	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.10	* Wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 906.96	* Reach Len. (ft)	* 110.49	* 88.75	* 69.17
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 158.75	* 54.68	* 154.68
* E.G. Slope (ft/ft)	* 0.000912	* Area (sq ft)	* 158.75	* 54.68	* 154.68
* Q Total (cfs)	* 865.00	* Flow (cfs)	* 318.53	* 190.89	* 355.58
* Top Width (ft)	* 157.19	* Top width (ft)	* 80.98	* 11.95	* 64.26
* Vel Total (ft/s)	* 2.35	* Avg. Vel. (ft/s)	* 2.01	* 3.49	* 2.30
* Max Chl Dpth (ft)	* 4.68	* Hydr. Depth (ft)	* 1.96	* 4.58	* 2.41



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* Conv. Total (cfs)      * 28642.0 * Conv. (cfs)          * 10547.0 * 6320.8 * 11774.1 *
* Length Wtd. (ft)     * 85.15  * Wetted Per. (ft)   * 81.10  * 12.17  * 64.43  *
* Min ch El (ft)      * 902.28 * Shear (lb/sq ft)  * 0.11   * 0.26   * 0.14   *
* Alpha                * 1.15   * Stream Power (lb/ft s) * 380.55 * 0.00   * 0.00   *
* Frctn Loss (ft)     * 0.18   * Cum Volume (acre-ft) * 1.06   * 1.21   * 0.47   *
* C & E Loss (ft)     * 0.09   * Cum SA (acres)     * 0.69   * 0.30   * 0.34   *
*****
```

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

Warning: The conveyance ratio (upstream 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: Bluestone Creek

REACH: Middle

RS: 5291.039

INPUT

Description:

Station Elevation Data

num= 83

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	930	8.82	927.33	13.47	926	15.58	925.37	20.07	924
23.56	922.92	26.52	922	29.93	920.97	32.98	920	36.72	918.86
39.71	918	44.38	916.68	46.9	916	50.23	915.03	53.91	914
55.43	913.55	56.03	913.37	60.48	912	64.01	910.98	67.49	910
71.69	908.81	74.32	908	76.93	907.23	79.67	906	80.44	905.69
82.39	905.1	83.1	904.14	83.64	903.63	84.78	902.21	85.91	902.06
86.8	902.01	86.86	902	91.4	902	92.16	901.97	97.1	901.85
97.14	901.88	97.31	902	97.51	902.16	98.35	902.62	108.24	903.37
111.01	903.6	116.97	904	119.26	904	124.72	904.14	132.29	904.33
190.11	906	203.24	906	204.47	906.18	210.19	907.08	218.24	907.27
224.81	907.25	231.41	907.28	231.96	907.25	232.54	907.24	233.62	907.31
235.81	907.56	236.52	907.72	237.47	908	240.12	908.68	243.69	909.08
247.1	909.4	253.72	910	260.3	912	261.4	912.43	271.4	912.87
281.6	912.51	284.7	911	290.7	914	295.35	916	301.76	917.82
302.38	918	305.04	918.75	309.62	920	310.02	920.11	316.91	922
317.92	922.28	324.25	924	327.85	924.98	331.58	926	337.2	927.52
339.02	928	346.3	929.96	346.44	930				

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	83.64	.035	98.35	.06

Bank Sta: Left 83.64 Right 98.35 Lengths: Left Channel 221.48 Right 200.96 Right 67.86 Coeff Contr. .1 Expan. .3

CROSS SECTION OUTPUT Profile #PF 1

OXF157-159Bridges.rep

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*****
* E.G. Elev (ft)      * 906.79 * Element          * Left OB * Channel * Right OB *
* Vel Head (ft)      * 0.97  * Wt. n-Val.      * 0.060  * 0.035  * 0.060  *
* W.S. Elev (ft)     * 905.82 * Reach Len. (ft) * 221.48 * 200.96 * 67.86  *
* Crit W.S. (ft)     * 905.82 * Flow Area (sq ft) * 2.73  * 55.02  * 110.20 *
* E.G. Slope (ft/ft) * 0.009910 * Area (sq ft)    * 2.73  * 55.02  * 110.20 *
* Q Total (cfs)      * 865.00 * Flow (cfs)      * 4.96  * 538.13 * 321.90 *
* Top Width (ft)     * 103.59 * Top width (ft)  * 3.51  * 14.71  * 85.37  *
* Vel Total (ft/s)   * 5.15  * Avg. vel. (ft/s) * 1.82  * 9.78   * 2.92   *
* Max Chl Dpth (ft) * 3.97  * Hydr. Depth (ft) * 0.78  * 3.74   * 1.29   *
* Conv. Total (cfs)  * 8689.3 * Conv. (cfs)     * 49.9  * 5405.8 * 3233.6 *
* Length Wtd. (ft)  * 178.05 * Wetted Per. (ft) * 4.31  * 15.63  * 85.44  *
* Min Ch El (ft)    * 901.85 * Shear (lb/sq ft) * 0.39  * 2.18   * 0.80   *
* Alpha             * 2.36  * Stream Power (lb/ft s) * 346.44 * 0.00   * 0.00   *
* Frctn Loss (ft)   * 1.75  * Cum Volume (acre-ft) * 0.86  * 1.10   * 0.26   *
* C & E Loss (ft)   * 0.03  * Cum SA (acres)   * 0.59  * 0.27   * 0.22   *
*****

```

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Middle RS: 5071.499

INPUT

Description:

```

Station Elevation Data      num=      84
Sta      Elev      Sta      Elev      Sta      Elev      Sta      Elev      Sta      Elev
*****
0        928        7.24      926      12.79    924.51    14.65      924      19.89    922.6
22.02    922        22.68    921.82    29.64      920      35.52    918.09    36.11      918
38.46    916.9      40.86    916      45.98    914.02    46.02      914      46.37    913.87
51.36    912        54.51    910.82    56.76      910      59.93    908.75    61.46    908.18
61.94    908        62.33    907.86    67.25      906      70.79    904.71    72.66      904
76.36    902.58     76.86    902.39    79.73    902.44    87.4      902.49    98.15    902.55
120.15   902.03        124     902.03    132.07    902.09    162.54    902.28    162.88     902
163.21   901.74     165.24     900     165.88    899.46    173.45    899.36    173.49    899.36
173.5    899.36     173.56    899.39    175.21     900     175.74    900.18    180.99     902
183.34   902.53     183.37    902.54    183.42    902.69    183.45    902.67    183.8     902.69
187.71   902.94     202.09     904     203.46    904.22    205.42    904.54    214.36     906

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219.18	907.21	221.54	908	222.48	908.31	225.28	909.27	228.91	909.72
230.44	909.73	230.56	909.66	230.6	909.65	230.65	909.65	232.1	910
242.4	914.78	253.1	915.14	263.6	914.66	266.8	913.1	272.6	916
276.37	916.92	282.45	918	295.83	919.65	298.25	920	301.81	920.42
304.18	920.73	311.42	922	316.52	922.83	323.9	924	332.34	925.32
336.58	926	345.99	927.67	347.61	928	356.94	930		

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .1 162.54 .035 183.42 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 162.54 183.42 160.74 187.46 109.68 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 904.62	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.87	* Wt. n-Val.	* 0.100	* 0.035	* 0.060
* W.S. Elev (ft)	* 903.75	* Reach Len. (ft)	* 160.74	* 187.46	* 109.68
* Crit W.S. (ft)	* 903.75	* Flow Area (sq ft)	* 128.97	* 69.00	* 8.44
* E.G. Slope (ft/ft)	* 0.009743	* Area (sq ft)	* 128.97	* 69.00	* 8.44
* Q Total (cfs)	* 865.00	* Flow (cfs)	* 241.35	* 609.74	* 13.90
* Top Width (ft)	* 125.31	* Top width (ft)	* 89.22	* 20.88	* 15.21
* Vel Total (ft/s)	* 4.19	* Avg. vel. (ft/s)	* 1.87	* 8.84	* 1.65
* Max Chl Dpth (ft)	* 4.39	* Hydr. Depth (ft)	* 1.45	* 3.30	* 0.55
* Conv. Total (cfs)	* 8763.5	* Conv. (cfs)	* 2445.2	* 6177.4	* 140.9
* Length Wtd. (ft)	* 180.19	* Wetted Per. (ft)	* 89.47	* 22.53	* 15.26
* Min Ch El (ft)	* 899.36	* Shear (lb/sq ft)	* 0.88	* 1.86	* 0.34
* Alpha	* 3.19	* Stream Power (lb/ft s)	* 356.94	* 0.00	* 0.00
* Frctn Loss (ft)	* 1.68	* Cum volume (acre-ft)	* 0.52	* 0.81	* 0.17
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 0.35	* 0.19	* 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: The energy loss was 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: Bluestone Creek  
 REACH: Middle

RS: 4871.481

INPUT  
Description:

Station Elevation Data num= 89

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	920	5.38	918.05	5.52	918	5.65	917.95	6.96	917.66
14.19	916	14.84	915.84	16.08	915.49	21.68	914	27	912.5
28.76	912	29.54	911.78	35.84	910	36.65	909.77	42.81	908
44.16	907.61	49.71	906	50.94	905.74	56.53	904	60.94	904
69.34	902.62	70.81	902.36	72.03	902.12	74.17	902.15	75.16	902
91.05	900.95	96.24	900.59	104.87	900	116.51	900	121.21	900.24
121.94	900.27	122.18	900.26	122.62	900	123.59	899.18	125.37	898
127.08	896.91	127.24	896.83	127.26	896.82	128.12	896.82	133.39	896.92
138.5	897.09	139.63	897.09	139.85	897.26	140.85	898	143.15	898.84
144.54	899.3	148.46	899.69	151.33	900	155.81	900.45	157.29	900.57
162.61	901.04	164.17	901.17	173.26	902	181.15	903.92	181.64	904
181.77	904.05	182.09	904.15	186.95	905.39	189.36	906	193.81	907.46
195.35	908	196.48	908.53	197.15	908.71	199.51	908.7	206.49	909.63
207.01	909.69	209.35	910	215.49	910.78	218.92	911.32	226.36	912
235.6	910	250.9	907.12	255.7	909.18	271.8	911.35	287.9	912.67
292.5	911.65	303.8	916	305.43	917.28	306.45	917.32	313.58	917.91
315.05	918.09	315.71	918.19	318.09	918.6	318.65	918.7	318.97	918.85
319.74	918.8	319.9	918.81	322.9	919.16	331.86	920		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	121.94	.035	144.54	.06

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

121.94	144.54	69.08	159.41	62.66	.1	.3
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CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 902.51	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 1.17	* Wt. n-val.	* 0.100	* 0.035	* 0.060
* W.S. Elev (ft)	* 901.33	* Reach Len. (ft)	* 69.08	* 159.41	* 62.66
* Crit W.S. (ft)	* 901.33	* Flow Area (sq ft)	* 35.06	* 83.61	* 21.01
* E.G. Slope (ft/ft)	* 0.008976	* Area (sq ft)	* 35.06	* 83.61	* 21.01
* Q Total (cfs)	* 865.00	* Flow (cfs)	* 47.82	* 768.70	* 48.48
* Top Width (ft)	* 80.75	* Top width (ft)	* 36.71	* 22.60	* 21.43
* Vel Total (ft/s)	* 6.19	* Avg. vel. (ft/s)	* 1.36	* 9.19	* 2.31
* Max chl Dpth (ft)	* 4.51	* Hydr. Depth (ft)	* 0.95	* 3.70	* 0.98
* Conv. Total (cfs)	* 9129.9	* Conv. (cfs)	* 504.7	* 8113.5	* 511.7
* Length Wtd. (ft)	* 141.65	* Wetted Per. (ft)	* 36.76	* 24.19	* 21.53
* Min ch El (ft)	* 896.82	* Shear (lb/sq ft)	* 0.53	* 1.94	* 0.55
* Alpha	* 1.97	* Stream Power (lb/ft s)	* 331.86	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.39	* Cum Volume (acre-ft)	* 0.22	* 0.48	* 0.13
* C & E Loss (ft)	* 0.29	* Cum SA (acres)	* 0.12	* 0.10	* 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 velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.  
 Warning: The conveyance ratio (upstream 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: Bluestone Creek  
 REACH: Middle RS: 4704.612

INPUT

Description:

Station Elevation Data num= 85

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	920	6.12	918	11.82	916.1	12.05	916.02	12.11	916
12.18	915.98	12.67	915.81	17.89	914	18.59	913.76	23.43	912
26.69	910.83	28.98	910	31.63	909.1	34.77	908	39.93	906.25
42.28	905.44	46.09	904	50.34	902.55	79.78	902	83.92	902
85.5	901.94	85.63	901.93	87.7	901.86	126.62	900	127.08	899.98
163.96	899.13	184.07	898.84	184.77	898.84	186.1	898.85	196.14	898.95
216.37	898.45	216.84	898.06	216.92	898	217.06	897.9	220.4	895.93
220.52	895.93	222.96	895.93	228.08	895.82	232.21	896	234.43	896
241.37	895.98	241.97	896	242.38	896	245.38	896.67	245.66	896.72
245.67	896.73	245.72	896.86	246.47	898	246.78	898.58	247.3	899.21
248.11	899.35	248.78	899.38	254.05	899.58	262.24	899.88	266.41	900
269.5	898	280.9	900.95	295.1	900.99	309.25	900.1	326.35	900
332.5	900	351.13	900.28	351.64	900.28	354.96	900.44	355.72	900.49
357.73	900.61	369.61	901.34	384.31	901.84	385.5	901.85	385.91	901.85
389.33	902	391.17	902.11	395.29	902.22	396.91	902.4	402.22	903.04
409.88	904	417.49	905.7	418.44	905.84	419.24	906	420.08	906.21
427.14	908	432.77	909.39	435.08	910	439.61	911.14	443.09	912

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	216.37	.035	247.3	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 216.37 247.3 434.52 20.21 9.46 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

```

*****
* E.G. Elev (ft)      * 901.29 * Element          * Left OB * Channel * Right OB *
* Vel Head (ft)      * 0.20  * Wt. n-Val.      * 0.100  * 0.035  * 0.060  *
* W.S. Elev (ft)     * 901.08 * Reach Len. (ft) * 20.21  * 20.21  * 20.21  *
* Crit W.S. (ft)     *        * Flow Area (sq ft) * 186.17 * 149.45 * 109.14 *
* E.G. Slope (ft/ft) * 0.001326 * Area (sq ft)    * 186.17 * 149.45 * 109.14 *
* Q Total (cfs)      * 865.00 * Flow (cfs)      * 140.95 * 631.23 * 92.82  *
* Top Width (ft)     * 261.53 * Top width (ft)  * 112.45 * 30.93  * 118.15 *
* Vel Total (ft/s)   * 1.94  * Avg. Vel. (ft/s) * 0.76  * 4.22  * 0.85  *
* Max Chl Dpth (ft) * 5.26  * Hydr. Depth (ft) * 1.66  * 4.83  * 0.92  *
* Conv. Total (cfs)  * 23752.6 * Conv. (cfs)     * 3870.5 * 17333.3 * 2548.8 *
* Length Wtd. (ft)  * 20.21  * Wvtted Per. (ft) * 112.49 * 33.10  * 119.20 *
* Min Ch El (ft)    * 895.82 * Shear (lb/sq ft) * 0.14  * 0.37  * 0.08  *
* Alpha             * 3.49  * Stream Power (lb/ft s) * 443.09 * 0.00  * 0.00  *
* Frctn Loss (ft)   * 0.05  * Cum Volume (acre-ft) * 0.04  * 0.06  * 0.04  *
* C & E Loss (ft)   * 0.07  * Cum SA (acres)   *        *        *        *
*****
    
```

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: Bluestone Creek  
 REACH: Lower RS: 4682.971

INPUT

Description:

Station		Elevation Data		num= 82		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	920	9.22	919.66	22.51	919.17	53.59	918.21	59.01	918.14
66.49	918	71.31	917.9	80.09	917.67	92.38	917.46	109.04	917.19
114.13	917.03	114.23	917.02	115.56	916.96	131.81	916.19	135.66	916
136.23	915.97	136.46	915.97	136.57	915.97	169.06	914.22	177.76	914
215.95	914	221.22	912.92	231.97	912.39	233.6	912.25	234.03	912.2
237.36	912	250.48	910.82	258.7	910	261.37	909.19	262.26	908.92
264.33	908.46	267.07	908	270.57	907.39	273.05	906.83	276.19	906
281.78	904.64	284.26	904	287.24	903.23	291.8	902	295.03	901.07
296.56	900.68	296.66	900.64	297.85	900	298.67	899.51	301.33	898
303.53	896.58	303.92	896.41	305.07	896.25	307.47	895.75	315.99	895.75
318.38	896.44	320.75	896.6	327.55	900	333.66	901.15	343.69	901
351.37	898.44	354.79	897.73	364.69	897.93	365.67	898.34	385.26	899.45
418.85	899.45	427.33	900	437.81	900.66	445.51	900.94	453.48	901.08
456.11	901.08	458.98	901.21	470.76	902	471.32	902	475.53	902.58
476.66	902.76	487.83	904	487.89	904.01	497.58	906	504.19	907.69
505.3	908	509.99	909.28	511.93	910	512.44	910.19	517.29	912
520.43	913.17	522.73	914						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .1 297.85 .035 327.55 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 297.85 327.55 12.96 56.5 9.53 .1 .3  
 Blocked Obstructions num= 1  
 Sta L Sta R Elev  
 \*\*\*\*\*  
 343.69 522.73 899.45

CROSS SECTION OUTPUT Profile #PF 1

\*\*\*\*\*  
 \* E.G. Elev (ft) \* 901.17 \* Element \* Left OB \* Channel \* Right OB \*  
 \* Vel Head (ft) \* 0.86 \* Wt. n-Val. \* 0.100 \* 0.035 \* 0.060 \*  
 \* W.S. Elev (ft) \* 900.31 \* Reach Len. (ft) \* 12.96 \* 56.50 \* 9.53 \*  
 \* Crit W.S. (ft) \* 900.31 \* Flow Area (sq ft) \* 0.09 \* 99.10 \* 67.38 \*  
 \* E.G. Slope (ft/ft) \* 0.007717 \* Area (sq ft) \* 0.09 \* 99.10 \* 67.38 \*  
 \* Q Total (cfs) \* 914.40 \* Flow (cfs) \* 0.03 \* 790.97 \* 123.40 \*  
 \* Top width (ft) \* 118.31 \* Top width (ft) \* 0.57 \* 29.70 \* 88.04 \*  
 \* Vel Total (ft/s) \* 5.49 \* Avg. vel. (ft/s) \* 0.34 \* 7.98 \* 1.83 \*  
 \* Max Chl Dpth (ft) \* 4.56 \* Hydr. Depth (ft) \* 0.15 \* 3.34 \* 0.77 \*  
 \* Conv. Total (cfs) \* 10408.8 \* Conv. (cfs) \* 0.3 \* 9003.8 \* 1404.7 \*  
 \* Length Wtd. (ft) \* 56.50 \* Wetted Per. (ft) \* 0.65 \* 31.66 \* 88.24 \*  
 \* Min Ch El (ft) \* 895.75 \* Shear (lb/sq ft) \* 0.06 \* 1.51 \* 0.37 \*  
 \* Alpha \* 1.84 \* Stream Power (lb/ft s) \* 522.73 \* 0.00 \* 0.00 \*  
 \* Frctn Loss (ft) \* \* Cum volume (acre-ft) \* 3.72 \* 8.09 \* 4.61 \*  
 \* C & E Loss (ft) \* \* Cum SA (acres) \* 2.19 \* 1.76 \* 2.55 \*  
 \*\*\*\*\*

Warning: Critical depth in the cross section upstream of the inline structure produced too much flow past the inline structure. This means there is not a valid subcritical answer. The upstream cross section defaulted to critical depth.

INLINE STRUCTURE

RIVER: Bluestone Creek  
 REACH: Lower RS: 4657.42

INPUT

Description:  
 Distance from Upstream XS = 15.55  
 Deck/Roadway width = 20  
 Weir Coefficient = 2.6  
 Weir Embankment Coordinates num = 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	938	12.1	936	25.4	934	38.53	932	51.82	930
64.82	928	77.93	926	91	924	104.33	922	118.01	920
132.1	918	146.61	916	161.9	914	177.26	912	192.57	910

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207.9	908	223.38	906	238.89	904	254.38	902	271.25	900
292.44	898	303.92	895.75	320.78	895.75	337.99	896.19	407.13	898
430.15	900	448.1	902	463.13	904	477.62	906	491.92	908
506.19	910	520.25	912						

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 =  
 Weir crest shape = Broad Crested

INLINE STRUCTURE OUTPUT Profile #PF 1 Inl Struct:

```

*****
* E.G. Elev (ft) * 901.17 * Q Gates (cfs) * *
* W.S. Elev (ft) * 900.31 * Q Gate Group (cfs) * 0.00 *
* Q Total (cfs) * 914.40 * Gate Open Ht (ft) * 899.72 *
* Q Weir (cfs) * 914.40 * Gate #Open * *
* Weir Flow Area (sq ft) * 277.48 * Gate Area (sq ft) * 1.00 *
* Weir Sta Lft (ft) * 294.69 * Gate Submerg * 0.00 *
* Weir Sta Rgt (ft) * 440.64 * Gate Invert (ft) * 0.00 *
* Weir Max Depth (ft) * 5.42 * Gate Weir Coef * 0.000 *
* Weir Avg Depth (ft) * 1.90 * * *
* Weir Coef (ft^1/2) * 2.600 * Q Breach (cfs) * *
* Weir Submerg * 0.45 * Breach Avg Velocity (ft/s) * *
* Min El Weir Flow (ft) * 895.76 * Breach Flow Area (sq ft) * *
* Wr Top Wdth (ft) * 145.95 * * *
*****
    
```

Warning: Critical depth in the cross section upstream of the inline structure produced too much flow past the inline structure. This means there is not a valid subcritical answer. The upstream cross section defaulted to critical depth.

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Lower RS: 4626.456

INPUT  
 Description:

Station Elevation Data num= 74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	920	4.75	919.82	65	918.01	65.42	918	65.48	918
73.2	917.77	106.68	916.75	115.06	916.45	120.58	916.21	120.95	916.19
126.43	916	130.05	915.87	131.14	915.83	154.3	914.65	155.22	914.58
157.11	914.48	175.44	914	180.58	914	192.42	913.71	199.82	913.68
203.08	913.53	208.93	913.4	211.35	913.3	218.7	912.93	220.99	912.87
230.75	912.64	243.69	912	251.45	911.21	253.52	911	262.94	910
267.91	909.44	280.8	908	284.95	907.46	287.19	907.18	288.2	907.03
292.15	906.32	293.96	906	302.29	904.49	304.83	904.03	310.11	902.97



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310.51	902.89	310.66	902.86	319.01	900.9	321.81	900	327.68	898
335.96	897.69	339.6	896.86	340	895.59	353	895.59	354.18	897.59
356.51	897.89	362.55	898	379.6	898.84	400.44	898.75	429.33	898.11
453.96	899.38	466	900	480.88	901.64	481.74	902	483.75	902
490.29	902.92	491.36	903	492.05	903.23	494.45	904	495.17	904.24
500.02	906	501.42	906.53	505.66	908	509.19	909.41	510.78	910
514.31	911.3	516.18	912	517.5	912.49	521.7	914		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	335.96	.035	356.51	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	335.96	356.51		4.13	67.17	17.78	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 900.47	* Element	* Left OB	* Channel	* Right OB	*	*
* Vel Head (ft)	* 0.74	* Wt. n-Val.	* 0.100	* 0.035	* 0.060	*	*
* W.S. Elev (ft)	* 899.72	* Reach Len. (ft)	* 4.13	* 67.17	* 17.78	*	*
* Crit W.S. (ft)	* 899.72	* Flow Area (sq ft)	* 19.92	* 72.38	* 115.02	*	*
* E.G. Slope (ft/ft)	* 0.008239	* Area (sq ft)	* 19.92	* 72.38	* 115.02	*	*
* Q Total (cfs)	* 914.40	* Flow (cfs)	* 34.61	* 603.65	* 276.14	*	*
* Top Width (ft)	* 138.03	* Top width (ft)	* 13.34	* 20.55	* 104.14	*	*
* Vel Total (ft/s)	* 4.41	* Avg. vel. (ft/s)	* 1.74	* 8.34	* 2.40	*	*
* Max chl dpth (ft)	* 4.13	* Hydr. Depth (ft)	* 1.49	* 3.52	* 1.10	*	*
* Conv. Total (cfs)	* 10073.6	* Conv. (cfs)	* 381.3	* 6650.3	* 3042.1	*	*
* Length Wtd. (ft)	* 41.67	* Wetted Per. (ft)	* 13.63	* 22.74	* 104.21	*	*
* Min Ch El (ft)	* 895.59	* Shear (lb/sq ft)	* 0.75	* 1.64	* 0.57	*	*
* Alpha	* 2.46	* Stream Power (lb/ft s)	* 521.70	* 0.00	* 0.00	*	*
* Frctn Loss (ft)	* 0.24	* Cum Volume (acre-ft)	* 3.72	* 7.74	* 4.61	*	*
* C & E Loss (ft)	* 0.13	* Cum SA (acres)	* 2.19	* 1.72	* 2.53	*	*

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: Bluestone Creek

REACH: Lower

RS: 4559.288

INPUT  
Description:

Station Elevation Data num= 108

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	920	64.35	918	100.99	916.65	104.22	916.55	115.22	916.19
120.33	916	143.04	914.83	149.21	914.29	150.91	914.05	151.34	914
152.1	913.89	152.45	913.84	152.55	913.83	152.88	913.8	164.46	912.66
171.03	912.24	173.83	912	181.24	911.35	181.57	911.33	181.79	911.32
184.27	911.38	188.28	911.53	192.62	911.57	198.13	911.6	202.76	911.39
206.19	911.18	214.5	910.81	221.03	910.41	230.41	910	232.75	909.87
235.67	909.64	242.98	908.88	247.63	908.36	250.82	908	261.99	906.58
266.54	906	268.26	905.78	280.4	904.64	285.57	904.15	287.07	904
294.17	903.28	294.32	903.26	294.33	903.26	294.34	903.26	294.37	903.25
294.38	903.25	298.64	902	305.23	900.14	305.82	900	305.97	899.96
310.59	898.89	314.92	898.97	325.06	899.49	329.32	899.76	330.59	899.81
331.29	899.8	339.39	899.47	340.56	899.42	358.16	898.68	372.95	898
374.45	897.93	381.56	897.59	386.91	896.15	387.89	896	389.37	895.78
389.59	895.75	389.62	895.75	389.96	895.74	398.29	895.42	398.44	895.41
398.45	895.43	398.55	895.63	398.97	896	399.1	896.1	399.42	896.33
400.94	897.55	403.11	897.5	412.05	897.55	413.56	897.54	421.19	897.35
424.22	897.34	432.24	897.65	435.33	897.6	441.6	897.19	447.14	897.13
452.67	897.08	459.34	897.21	475.11	896.79	477.93	896.97	482.04	897.2
484.93	898	491.22	899.83	491.87	900	492.45	900.15	499.95	902
502.87	902.77	506.53	904	510.13	905.29	512.09	906	513.59	906.57
517.42	908	519.55	908.82	522.69	910	524.94	910.83	528.08	912
529.98	912.77	533.3	914	538.72	916				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	381.56	.035	400.94	.035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 381.56 400.94 20.28 144.92 262.06 .1 .3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	329.32	899.76

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 899.29	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.30	* Wt. n-Val.	* 0.035	* 0.035	* 0.035
* w.s. Elev (ft)	* 898.99	* Reach Len. (ft)	* 20.28	* 144.92	* 262.06
* Crit w.s. (ft)	*	* Flow Area (sq ft)	* 21.10	* 55.78	* 145.34
* E.G. Slope (ft/ft)	* 0.004288	* Area (sq ft)	* 21.10	* 55.78	* 145.34
* Q Total (cfs)	* 914.40	* Flow (cfs)	* 45.53	* 303.00	* 565.87
* Top width (ft)	* 137.60	* Top width (ft)	* 30.82	* 19.38	* 87.40
* Vel Total (ft/s)	* 4.12	* Avg. vel. (ft/s)	* 2.16	* 5.43	* 3.89
* Max Chl Dpth (ft)	* 3.58	* Hydr. Depth (ft)	* 0.68	* 2.88	* 1.66

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```
* Conv. Total (cfs)      * 13963.5 * Conv. (cfs)      * 695.2 * 4627.1 * 8641.2 *
* Length Wtd. (ft)     * 163.36 * Wetted Per. (ft) * 30.85 * 20.42 * 87.69 *
* Min ch El (ft)      * 895.41 * Shear (lb/sq ft) * 0.18 * 0.73 * 0.44 *
* Alpha                * 1.15 * Stream Power (lb/ft s) * 538.72 * 0.00 * 0.00 *
* Frctn Loss (ft)     * 0.60 * Cum Volume (acre-ft) * 3.71 * 7.65 * 4.56 *
* C & E Loss (ft)     * 0.01 * Cum SA (acres) * 2.19 * 1.69 * 2.49 *
*****
```

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Lower RS: 4258.834

INPUT  
 Description:

Station Elevation Data num= 98

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	920	44.91	918.39	58.07	918	76.38	917.28	111.69	916
117.03	916	132.44	914.79	136.26	914.48	141.38	914	143.17	913.63
147.63	912.72	148.91	912.43	151.02	912	159.23	910.18	160.19	910
161.8	909.69	169.8	908	176.95	906.3	178.71	906	190.33	904
191.11	903.83	201.6	902	202.78	901.82	214.24	900	214.66	899.94
215.66	899.78	216.92	899.12	220.33	898.42	221.8	898	223.13	897.62
223.57	897.53	223.77	897.56	224.36	897.63	226.72	897.85	226.79	897.85
227.18	897.86	234.97	898	236.3	898	239.31	898.06	245.85	898.2
248.13	898.07	249.49	898	250.5	898	259.83	897.72	260.27	897.71
276.78	897.54	276.99	897.54	281.84	897.47	284.23	897.46	287.06	897.47
300.35	896.94	302.59	896.77	306.79	896.59	307.57	896.55	307.7	896.55
310.14	896.49	312.03	896.48	312.52	896.45	329.02	896.49	330.17	896.45
332.69	896.28	332.72	896.28	332.74	896.28	333.18	896	333.43	895.47
333.63	895.38	334.55	894.21	334.67	894.21	337.29	894	340.82	894
343.98	893.86	347.4	893.67	347.97	893.62	356.14	893.17	356.31	893.32
357.06	894	357.64	894.78	360.58	897.43	362.16	898.68	362.21	898.71
362.24	898.73	362.73	898.97	370.08	902	371.3	902.49	375.03	904
378.1	905.18	380.37	906	384.94	907.74	385.62	908	390.7	909.9
390.96	910	397.71	912	399.17	912.4	404.67	914	407.08	914.73
411.46	916	414.31	916.9	415.64	917.01				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	329.02	.035	360.58	.1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 329.02 360.58 15.43 180.39 150.97 .1 .3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	215.4	898.9

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CROSS SECTION OUTPUT Profile #PF 1

```

*****
* E.G. Elev (ft)      * 898.68 * Element          * Left OB * Channel * Right OB *
* Vel Head (ft)      * 0.40  * Wt. n-Val.      * 0.035  * 0.035  * 0.100  *
* W.S. Elev (ft)     * 898.29 * Reach Len. (ft) * 15.43  * 180.39 * 150.97 *
* Crit W.S. (ft)     *        * Flow Area (sq ft) * 97.00  * 123.84 * 0.46   *
* E.G. Slope (ft/ft) * 0.003189 * Area (sq ft)    * 97.00  * 123.84 * 0.46   *
* Q Total (cfs)      * 914.40 * Flow (cfs)      * 215.96 * 698.25 * 0.19   *
* Top Width (ft)     * 140.87 * Top width (ft)  * 108.23 * 31.56  * 1.08   *
* Vel Total (ft/s)   * 4.13  * Avg. Vel. (ft/s) * 2.23  * 5.64  * 0.41   *
* Max chl Dpth (ft)  * 5.12  * Hydr. Depth (ft) * 0.90  * 3.92  * 0.43   *
* Conv. Total (cfs)  * 16192.9 * Conv. (cfs)     * 3824.3 * 12365.2 * 3.3    *
* Length Wtd. (ft)   * 156.68 * Wetted Per. (ft) * 108.38 * 34.33  * 1.38   *
* Min Ch El (ft)     * 893.17 * Shear (lb/sq ft) * 0.18  * 0.72  * 0.07   *
* Alpha              * 1.49  * Stream Power (lb/ft s) * 415.64 * 0.00  * 0.00   *
* Frctn Loss (ft)    * 0.77  * Cum Volume (acre-ft) * 3.69  * 7.35  * 4.12   *
* C & E Loss (ft)    * 0.05  * Cum SA (acres)   * 2.16  * 1.61  * 2.22   *
*****
    
```

Warning: The conveyance ratio (upstream 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: Bluestone Creek  
 REACH: Lower RS: 4054.239

INPUT  
 Description:

Station		Elevation Data		num=	84					
Sta	Elev	Sta	Elev		Sta	Elev	Sta	Elev	Sta	Elev
0	920	.91	919.97		1.33	919.96	1.69	919.95	4.22	919.84
47.79	918	49.49	918		60.25	917.17	78.95	916	79.54	916
92.08	914.78	95.42	914.44		100.98	914	116.74	912.15	118.15	912
118.27	911.98	129.78	910		133.83	909.22	139.49	908	144.08	906.89
147.77	906	150.29	905.37		154.89	904	158.96	902.78	161.63	902
163.42	901.65	167.9	900.1		168.23	900	168.33	899.97	170.93	899.46
172.43	899.16	173.37	898.09		173.48	898	174.76	896.89	175.07	896.57
175.08	896.55	177.58	896.93		178.34	897.07	189.06	897.63	190.1	897.66
192.29	897.99	192.41	898		192.51	898.01	197.05	898.53	197.25	898.21
197.42	898	198.69	896.34		198.99	896	199.28	895.62	200.48	894.24
200.67	894.03	200.72	894		200.75	893.97	203.14	892.27	203.15	892.26
204.75	892.04	205.09	892		207.15	892	212.47	892.46	213.4	892.52
215.45	893.9	215.58	894		216.7	894.75	216.75	895.24	251.3	895.96
280.14	895.55	300.45	894.88		320.61	896	324.34	897.74	324.85	898
325.58	898.33	329.21	900		332.69	901.61	333.58	902	334	902.2
336.17	903.15	336.93	903.53		337.87	904	338.87	904.36	342.86	906
344.62	906.52	349.59	908		352.14	908.78	356.1	910		

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .035 197.05 .035 216.75 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 197.05 216.75 224.35 114.06 104.56 .1 .3  
 Blocked Obstructions num= 1  
 Sta L Sta R Elev  
 \*\*\*\*\*  
 0 197.05 898.53

CROSS SECTION OUTPUT Profile #PF 1

\*\*\*\*\*  
 \* E.G. Elev (ft) \* 897.86 \* Element \* Left OB \* Channel \* Right OB \*  
 \* Vel Head (ft) \* 0.88 \* Wt. n-Val. \* \* 0.035 \* 0.100 \*  
 \* W.S. Elev (ft) \* 896.99 \* Reach Len. (ft) \* 224.35 \* 114.06 \* 104.56 \*  
 \* Crit W.S. (ft) \* 896.99 \* Flow Area (sq ft) \* \* 73.60 \* 151.47 \*  
 \* E.G. Slope (ft/ft) \* 0.008511 \* Area (sq ft) \* \* 73.60 \* 151.47 \*  
 \* Q Total (cfs) \* 914.40 \* Flow (cfs) \* \* 651.39 \* 263.01 \*  
 \* Top Width (ft) \* 124.53 \* Top width (ft) \* \* 18.55 \* 105.97 \*  
 \* Vel Total (ft/s) \* 4.06 \* Avg. Vel. (ft/s) \* \* 8.85 \* 1.74 \*  
 \* Max Chl Dpth (ft) \* 4.99 \* Hydr. Depth (ft) \* \* 3.97 \* 1.43 \*  
 \* Conv. Total (cfs) \* 9911.8 \* Conv. (cfs) \* \* 7060.9 \* 2850.9 \*  
 \* Length Wtd. (ft) \* 111.32 \* Wetted Per. (ft) \* \* 21.67 \* 106.24 \*  
 \* Min Ch El (ft) \* 892.00 \* Shear (lb/sq ft) \* \* 1.80 \* 0.76 \*  
 \* Alpha \* 3.43 \* Stream Power (lb/ft s) \* 356.10 \* 0.00 \* 0.00 \*  
 \* Frctn Loss (ft) \* 1.00 \* Cum Volume (acre-ft) \* 3.67 \* 6.94 \* 3.85 \*  
 \* C & E Loss (ft) \* 0.01 \* Cum SA (acres) \* 2.14 \* 1.50 \* 2.04 \*  
 \*\*\*\*\*

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.  
 warning: The energy loss was 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: Bluestone Creek  
 REACH: Lower RS: 3934.570

INPUT  
 Description:  
 Station Elevation Data num= 78

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Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	920	7.4	918	8.75	917.63	14.18	916	17.7	914.95
20.85	914	27.03	912.09	27.43	912	28.15	911.82	35.71	910
36.44	909.81	41.66	908	43.33	907.29	46.37	906	49.14	904.82
51.01	904	52.95	903.17	55.71	902	60.46	900.01	60.49	900
66.92	898	68.08	897.65	75.56	896.41	76.23	896.21	77.07	896.33
81.92	897.29	82.78	897.31	83.34	897.3	95.75	897.03	96.58	897.04
96.59	897.04	97.84	896.97	102.52	896.85	103.03	896.33	103.35	896
105.15	894.12	105.28	894	105.42	893.85	107.47	892.34	107.49	892.34
116.39	892	120.34	891.78	121.35	891.76	121.7	891.98	121.72	892
121.83	892.17	124.65	894	125.79	894.56	142.86	895.29	147.07	895.48
150.66	895.53	166.39	895.38	168.67	895.15	171.33	895.23	174.72	895.27
176.02	895.09	182.46	894.32	182.99	894.28	183.93	894.19	186.22	894
231.86	894	235.51	895.61	236.43	896	240.77	897.91	240.99	898
245.34	899.85	245.73	900	245.85	900.05	248.47	901.14	250.26	901.85
250.59	902	256.43	903.44	258.41	904	268.48	905.99	268.54	906
268.57	906.01	279.91	908	297.63	910				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	102.52	.035	125.79	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	102.52	125.79		111.8	133.81	33.19	.1
							.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 896.84	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.85	* Wt. n-Val.	* 0.035	* 0.100	*
* W.S. Elev (ft)	* 896.00	* Reach Len. (ft)	* 111.80	* 133.81	* 33.19
* Crit W.S. (ft)	* 896.00	* Flow Area (sq ft)	*	* 74.90	* 149.34
* E.G. Slope (ft/ft)	* 0.009534	* Area (sq ft)	*	* 74.90	* 149.34
* Q Total (cfs)	* 914.40	* Flow (cfs)	*	* 650.58	* 263.82
* Top Width (ft)	* 133.07	* Top width (ft)	*	* 22.44	* 110.63
* Vel Total (ft/s)	* 4.08	* Avg. vel. (ft/s)	*	* 8.69	* 1.77
* Max Chl Dpth (ft)	* 4.24	* Hydr. Depth (ft)	*	* 3.34	* 1.35
* Conv. Total (cfs)	* 9364.7	* Conv. (cfs)	*	* 6662.8	* 2701.9
* Length Wtd. (ft)	* 93.49	* Wetted Per. (ft)	*	* 24.69	* 111.15
* Min Ch El (ft)	* 891.76	* Shear (lb/sq ft)	*	* 1.81	* 0.80
* Alpha	* 3.28	* Stream Power (lb/ft s)	* 297.63	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.32	* Cum Volume (acre-ft)	* 3.67	* 6.74	* 3.49
* C & E Loss (ft)	* 0.19	* Cum SA (acres)	* 2.14	* 1.45	* 1.78

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: 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: Bluestone Creek  
 REACH: Lower RS: 3797.323

INPUT  
 Description:

Station Elevation Data num= 95

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	920	7.71	918	12.86	916.64	15.31	916	18.69	914.98
21.42	914	23.92	913.3	29.27	912	35.07	910.58	36.27	910.23
36.67	910.09	37.37	909.65	39.78	908.08	40.17	908	40.26	907.99
40.3	908	41.46	908.31	41.74	908.35	41.75	908.35	42.15	908.36
43.67	908.38	52.69	908.51	52.73	908.5	56.65	908	56.68	908
56.96	907.96	57.05	907.89	59.43	906	61.96	904.02	61.98	904
62.16	903.85	64.27	902	65.06	901.32	66.56	900	68.26	898.65
68.99	898	70.2	896.83	71.17	896	72.66	894.5	73.28	894
73.81	893.66	73.84	893.65	73.85	893.65	74.04	893.66	75.43	893.8
76.13	893.86	76.77	893.73	77.13	893.63	82.34	892.55	82.69	892.48
84.91	893.39	86.57	893.81	89.23	893.93	90.96	894	99.91	894
99.93	893.96	100.26	893.55	101.3	892	101.96	891.2	102.39	890.6
102.56	890.58	102.62	890.58	102.65	890.57	102.66	890.56	114.28	890.71
114.57	890.7	117.54	891.94	117.64	892.03	118.64	892.14	118.77	892.15
119.83	892.18	137.23	892.86	164.72	893.94	166.29	894	174.51	894
178.03	894.62	179.07	894.76	183.39	896.78	185.93	898	186.07	898.06
186.56	898.28	189.81	899.61	190.9	900	193.23	900.55	201.13	902
202	902	204.31	902.32	206.94	902.58	214.8	903.37	218.22	904
225.57	905.37	230.3	906	232.72	906.25	250.41	908	274.46	910

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	99.91	.035	117.64	.035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 99.91 117.64 110.31 113.41 135.84 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

```
*****
* E.G. Elev (ft) * 895.85 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 0.21 * Wt. n-Val. * 0.060 * 0.035 * 0.035 *
* W.S. Elev (ft) * 895.64 * Reach Len. (ft) * 110.31 * 113.41 * 135.84 *
*****
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* Crit W.S. (ft) * * Flow Area (sq ft) * 54.74 * 82.46 * 146.06 *
* E.G. Slope (ft/ft) *0.001741 * Area (sq ft) * 54.74 * 82.46 * 146.06 *
* Q Total (cfs) * 914.40 * Flow (cfs) * 85.38 * 378.70 * 450.32 *
* Top Width (ft) * 109.42 * Top width (ft) * 28.38 * 17.73 * 63.31 *
* Vel Total (ft/s) * 3.23 * Avg. Vel. (ft/s) * 1.56 * 4.59 * 3.08 *
* Max Chl Dpth (ft) * 5.08 * Hydr. Depth (ft) * 1.93 * 4.65 * 2.31 *
* Conv. Total (cfs) * 21915.8 * Conv. (cfs) * 2046.3 * 9076.5 * 10793.1 *
* Length wtd. (ft) * 118.49 * Wetted Per. (ft) * 29.52 * 19.75 * 63.61 *
* Min Ch El (ft) * 890.56 * Shear (lb/sq ft) * 0.20 * 0.45 * 0.25 *
* Alpha * 1.31 * Stream Power (lb/ft s) * 274.46 * 0.00 * 0.00 *
* Frctn Loss (ft) * 0.23 * Cum Volume (acre-ft) * 3.60 * 6.50 * 3.38 *
* C & E Loss (ft) * 0.01 * Cum SA (acres) * 2.10 * 1.39 * 1.71 *
*****

```

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Lower RS: 3679.344

INPUT  
 Description:

Station Elevation Data num= 86

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	920	5.03	918	9.15	916.32	9.89	916	10.4	915.8
15.02	914	18.14	912.71	19.95	912	27.19	909.14	28.54	908.6
29.4	908.72	33.48	909.46	33.49	909.46	36.83	909.43	37.88	909.42
40.97	909.44	40.99	909.44	43.66	909.32	44.26	909.29	45.58	909.2
45.72	909.18	45.81	909.15	46.28	908.85	47.42	908	48.61	907.25
50.45	906	53.35	904.03	53.4	904	56.66	902	57.83	901.27
59.85	900	61.27	899.07	63.05	898	65.03	896.76	66.09	896
66.61	895.7	68.77	894.44	69.03	894.41	72.17	894	76.19	893.47
76.6	893.46	83.62	892.54	85.68	892.63	86.96	892.39	87.28	892.38
87.45	892.38	101.05	893.07	121.9	893.22	127.66	893.26	130.6	892.28
131.49	892	133.66	891.27	139.17	890.11	139.69	890.05	140.04	890
149.06	890	152.35	890.26	154.2	890.43	155.22	891.76	155.42	892
155.63	892.2	156.5	893.66	156.98	893.71	158.35	893.85	160.46	894
166.62	894.48	170.66	894.89	181.56	896	184.14	896.48	191.23	898
197.13	899.68	198.21	900	199.35	900.32	204.29	902	208.51	902.96
212.33	904	221.63	905.77	222.81	906	227.86	906.97	231	907.55
233.33	908	233.6	908.05	234.13	908.14	241.32	909.64	242.93	909.92
243.8	910								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	127.66	.035	156.5	.1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 127.66 156.5 90.48 111.12 141.6 .1 .3



CROSS SECTION OUTPUT Profile #PF 1

```

*****
* E.G. Elev (ft)      * 895.62 * Element          * Left OB * Channel * Right OB *
* Vel Head (ft)      * 0.30  * Wt. n-Val.      * 0.060  * 0.035  * 0.100  *
* W.S. Elev (ft)     * 895.32 * Reach Len. (ft) * 90.48  * 111.12 * 141.60 *
* Crit W.S. (ft)     *        * Flow Area (sq ft) * 130.90 * 130.33 * 15.90  *
* E.G. Slope (ft/ft) * 0.002082 * Area (sq ft)    * 130.90 * 130.33 * 15.90  *
* Q Total (cfs)      * 914.40 * Flow (cfs)      * 246.67 * 657.95 * 9.77   *
* Top Width (ft)     * 107.58 * Top width (ft)  * 60.39  * 28.84  * 18.35  *
* Vel Total (ft/s)   * 3.30  * Avg. Vel. (ft/s) * 1.88  * 5.05  * 0.61  *
* Max chl Dpth (ft) * 5.32  * Hydr. Depth (ft) * 2.17  * 4.52  * 0.87  *
* Conv. Total (cfs)  * 20037.9 * Conv. (cfs)     * 5405.5 * 14418.2 * 214.2  *
* Length Wtd. (ft)  * 111.13 * Wetted Per. (ft) * 60.80  * 30.99  * 18.43  *
* Min ch El (ft)    * 890.00 * Shear (lb/sq ft) * 0.28  * 0.55  * 0.11  *
* Alpha             * 1.77  * Stream Power (lb/ft s) * 243.80 * 0.00  * 0.00  *
* Frctn Loss (ft)   * 0.36  * Cum Volume (acre-ft) * 3.36  * 6.22  * 3.13  *
* C & E Loss (ft)   * 0.05  * Cum SA (acres)   * 1.99  * 1.33  * 1.59  *
*****
    
```

Warning: The conveyance ratio (upstream 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: Bluestone Creek

REACH: Lower

RS: 3568.220

INPUT

Description:

Station Elevation Data

num= 74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	910	3.04	908	5.88	906.17	6.13	906	6.15	905.99
6.21	905.95	6.38	905.84	8.35	904.53	8.82	904.2	8.87	904.17
8.94	904.18	9.91	904.32	11.3	904.49	12.46	904.68	13.07	904.61
14.97	904.39	15.01	904.38	15.07	904.38	22.89	903.92	22.93	903.92
23.21	903.93	25.03	903.94	25.29	903.94	33.95	904.02	34.35	904.02
36.03	903.97	38.62	902.02	38.63	902	38.9	901.8	41.38	900
42.01	899.51	44.29	898	45.11	897.45	47.26	896	48.64	895.12
50.32	894	51.25	893.35	51.63	893.09	53.9	892.71	57.21	892.16
58.22	892	59.62	891.79	62.87	891.46	65.93	890.81	67.99	890
69.28	889.4	70.79	889.26	74.47	889.18	76.96	889.19	77.18	889.54
78.55	890.71	79.66	891.4	93.83	891.58	104.42	891.72	108.05	892
109.92	892	125.74	893.73	128.13	894	142.95	895.6	144.52	895.76
147.17	896	153.48	897.16	157	898	162.83	899.38	165.33	900
167.02	900.42	173.69	902	179.27	903.57	180.67	904	182.35	904.52
187.1	906	192.78	907.83	193.31	908	199.65	910		

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val

\*\*\*\*\*  
 0 .06 62.87 .035 79.66 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 62.87 79.66 84.06 127.97 121.99 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

\*\*\*\*\*  
 \* E.G. Elev (ft) \* 895.21 \* Element \* Left OB \* Channel \* Right OB \*  
 \* Vel Head (ft) \* 0.75 \* Wt. n-Val. \* 0.060 \* 0.035 \* 0.100 \*  
 \* W.S. Elev (ft) \* 894.46 \* Reach Len. (ft) \* 84.06 \* 127.97 \* 121.99 \*  
 \* Crit W.S. (ft) \* \* \* Flow Area (sq ft) \* 26.80 \* 75.66 \* 113.48 \*  
 \* E.G. Slope (ft/ft) \* 0.005604 \* Area (sq ft) \* 26.80 \* 75.66 \* 113.48 \*  
 \* Q Total (cfs) \* 914.40 \* Flow (cfs) \* 77.42 \* 626.93 \* 210.05 \*  
 \* Top Width (ft) \* 82.75 \* Top width (ft) \* 13.24 \* 16.79 \* 52.73 \*  
 \* Vel Total (ft/s) \* 4.23 \* Avg. Vel. (ft/s) \* 2.89 \* 8.29 \* 1.85 \*  
 \* Max chl Dpth (ft) \* 5.28 \* Hydr. Depth (ft) \* 2.02 \* 4.51 \* 2.15 \*  
 \* Conv. Total (cfs) \* 12214.6 \* Conv. (cfs) \* 1034.2 \* 8374.5 \* 2805.9 \*  
 \* Length wtd. (ft) \* 119.69 \* wetted Per. (ft) \* 13.79 \* 17.97 \* 52.87 \*  
 \* Min ch El (ft) \* 889.18 \* Shear (lb/sq ft) \* 0.68 \* 1.47 \* 0.75 \*  
 \* Alpha \* 2.71 \* Stream Power (lb/ft s) \* 199.65 \* 0.00 \* 0.00 \*  
 \* Frctn Loss (ft) \* 0.59 \* Cum Volume (acre-ft) \* 3.20 \* 5.96 \* 2.92 \*  
 \* C & E Loss (ft) \* 0.05 \* Cum SA (acres) \* 1.91 \* 1.27 \* 1.47 \*  
 \*\*\*\*\*

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Lower RS: 3438.299

INPUT  
 Description:

Station		Elevation Data		num=	89				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	920	7	918	8.77	917.5	13.97	916	17.61	915.1
21.61	914	28.86	912.31	30.16	912	36.84	910.38	38.42	910
46.44	908.12	46.92	908	48.28	907.68	52.95	906.58	55.13	906
55.3	905.95	58.55	905.12	58.59	905.09	59.96	904	62.63	902.24
62.93	902	63.19	901.78	65.64	900	66.29	899.54	68.33	898
70.47	896.58	70.94	896.21	72.61	895.03	72.62	895.02	74.94	895.76
76.47	896.23	76.54	896.23	77.08	896.22	77.61	896.21	79.62	896.25
79.72	896.25	86.95	896.11	87.57	896.09	88.27	896.08	89.84	896.08
90.37	896.06	91.91	896.16	95.3	896.49	96.55	896.11	96.78	896
101.12	894.65	103.13	894	103.68	893.87	105.18	893.4	141.78	892.44
149.76	892.17	155.05	892	156.57	892	166.51	891.96	177.29	891.92
178.99	891.91	180.36	891.37	187.51	888.64	187.6	888.58	187.7	888.56
187.79	888.55	187.82	888.55	192.76	888.21	193.05	888.22	193.62	888.5
194.72	889	196.89	890	200.32	891.58	201.2	892	205.23	893.86
205.58	894.16	205.7	894.21	209.4	896	209.81	896.21	213.5	898
214.47	898.45	215.49	898.95	217.63	900	221.32	901.8	221.73	902

223.5 902.85 225.96 903.74 226.64 904 227.33 904.25 231.9 906  
 237.38 907.73 238.22 908 239.71 908.48 244.87 910

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .06 178.99 .035 201.2 .035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 178.99 201.2 128.72 150.25 115.25 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

\*\*\*\*\*  
 \* E.G. Elev (ft) \* 894.57 \* Element \* Left OB \* Channel \* Right OB \*  
 \* Vel Head (ft) \* 0.58 \* Wt. n-Val. \* 0.060 \* 0.035 \* 0.035 \*  
 \* W.S. Elev (ft) \* 893.99 \* Reach Len. (ft) \* 128.72 \* 150.25 \* 115.25 \*  
 \* Crit W.S. (ft) \* 893.60 \* Flow Area (sq ft) \* 111.98 \* 94.44 \* 4.29 \*  
 \* E.G. Slope (ft/ft) \* 0.004360 \* Area (sq ft) \* 111.98 \* 94.44 \* 4.29 \*  
 \* Q Total (cfs) \* 914.40 \* Flow (cfs) \* 237.27 \* 665.73 \* 11.40 \*  
 \* Top Width (ft) \* 102.22 \* Top width (ft) \* 75.82 \* 22.21 \* 4.18 \*  
 \* Vel Total (ft/s) \* 4.34 \* Avg. Vel. (ft/s) \* 2.12 \* 7.05 \* 2.66 \*  
 \* Max chl Dpth (ft) \* 5.78 \* Hydr. Depth (ft) \* 1.48 \* 4.25 \* 1.02 \*  
 \* Conv. Total (cfs) \* 13848.1 \* Conv. (cfs) \* 3593.4 \* 10082.1 \* 172.7 \*  
 \* Length wtd. (ft) \* 146.61 \* Wetted Per. (ft) \* 75.93 \* 23.68 \* 4.64 \*  
 \* Min ch El (ft) \* 888.21 \* Shear (lb/sq ft) \* 0.40 \* 1.09 \* 0.25 \*  
 \* Alpha \* 1.99 \* Stream Power (lb/ft s) \* 244.87 \* 0.00 \* 0.00 \*  
 \* Frctn Loss (ft) \* 0.91 \* Cum Volume (acre-ft) \* 3.07 \* 5.71 \* 2.75 \*  
 \* C & E Loss (ft) \* 0.07 \* Cum SA (acres) \* 1.83 \* 1.21 \* 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 conveyance ratio (upstream 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: Bluestone Creek

REACH: Lower

RS: 3282.877

INPUT

Description:

Station Elevation Data num= 74  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 \*\*\*\*\*  
 0 910 4.37 908.5 5.75 908 6.31 907.81 11.97 906  
 16.07 904.54 17.7 904 19.81 903.26 23.62 902 26.06 901.11  
 29.43 900 31.4 899.31 35.21 898 35.57 897.93 43.31 896  
 46.31 895.49 48.43 895.13 48.66 895.1 48.73 895.07 48.83 895.03  
 52.47 893.64 53.25 893.57 54.66 893.81 55.36 894.04 56.72 894.51

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59.32	894.69	66.65	894.76	69.14	894.74	69.58	894.82	71.26	895.01
86.76	894.24	91.81	894	127.63	892.86	141.05	892.33	144.37	892.2
149.62	892	152.84	891.8	157.55	891.51	157.83	891.11	158.65	890
159.49	888.77	160.25	888	160.32	887.85	160.34	887.83	167.31	887.94
170.19	887.97	170.87	888	173.27	888.1	173.41	888.1	173.56	888.14
178.77	889.38	180.85	890	182.32	890.38	183.56	890.74	189.69	891.12
198.43	891.65	205.03	892	214.64	893.93	215.04	894	217.75	895.8
218.04	896	220.84	897.86	221.04	898	221.25	898.14	223.89	900
225.25	900.92	226.98	902	227.68	902.44	230.45	904	232.54	904.97
234.77	906	238.21	907.66	238.96	908	243.2	910		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	157.55	.035	183.56	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	157.55	183.56		131.38	138.39	148.67	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 893.59	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 1.29	* Wt. n-Val.	* 0.035	* 0.035	* 0.100
* W.S. Elev (ft)	* 892.30	* Reach Len. (ft)	* 131.38	* 138.39	* 148.67
* Crit W.S. (ft)	* 892.30	* Flow Area (sq ft)	* 5.53	* 94.34	* 19.80
* E.G. Slope (ft/ft)	* 0.009580	* Area (sq ft)	* 5.53	* 94.34	* 19.80
* Q Total (cfs)	* 914.40	* Flow (cfs)	* 11.42	* 876.95	* 26.02
* Top Width (ft)	* 64.76	* Top width (ft)	* 15.78	* 26.01	* 22.97
* Vel Total (ft/s)	* 7.64	* Avg. Vel. (ft/s)	* 2.06	* 9.30	* 1.31
* Max chl dpth (ft)	* 4.47	* Hydr. Depth (ft)	* 0.35	* 3.63	* 0.86
* Conv. Total (cfs)	* 9342.4	* Conv. (cfs)	* 116.7	* 8959.8	* 265.9
* Length wtd. (ft)	* 138.49	* Wetted Per. (ft)	* 15.80	* 28.20	* 23.04
* Min Ch El (ft)	* 887.83	* Shear (lb/sq ft)	* 0.21	* 2.00	* 0.51
* Alpha	* 1.42	* Stream Power (lb/ft s)	* 243.20	* 0.00	* 0.00
* Frctn Loss (ft)	* 1.16	* Cum Volume (acre-ft)	* 2.89	* 5.39	* 2.72
* C & E Loss (ft)	* 0.09	* Cum SA (acres)	* 1.69	* 1.13	* 1.35

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: Bluestone Creek  
 REACH: Lower

RS: 3129.654

INPUT  
 Description:

Station Elevation Data num= 74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	910	8.57	908	14.45	906.66	17.22	906	25.46	904.05
25.7	904	25.92	903.96	28.5	903.52	35.6	902	38.6	901.43
46.03	900	47.73	899.68	54.17	898.43	55.85	898	56.7	897.78
63.57	896	67.36	895.05	71.48	894	76.42	892.73	77.39	892.47
78.66	892.15	80.42	891.74	85.24	890.69	92.28	890.66	94.46	890.63
94.47	890.63	95.65	890.83	97.65	890.9	98.64	890.9	107.86	891.19
109.72	891.31	119.23	892	124.68	892.4	128.93	892.69	139.1	892.94
144.81	893.18	155.08	893.45	156.96	893.46	178.83	893.05	183.17	892.94
185.79	892.9	185.98	892.89	194.86	892.4	195.22	892.17	195.41	892
197.77	890.47	198.53	890	200.07	888	201	886.61	225	886.61
226.81	888.84	228.08	890	228.93	890.81	230.23	892	231.22	892.85
232.47	894	234.48	895.57	235	896	236.24	897.08	236.96	897.71
237.3	898	239.49	899.89	239.61	900	239.79	900.16	240.99	901.2
241.87	902	243.65	903.61	244.07	904	244.33	904.22	246.1	906
247.29	907.04	248.37	908	250.21	909.58	251.32	910		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	194.86	.035	230.23	.1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 194.86 230.23 41.42 177.15 191.92 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 891.78	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.98	* Wt. n-Val.	* 0.060	* 0.035	*
* W.S. Elev (ft)	* 890.80	* Reach Len. (ft)	* 41.42	* 177.15	* 191.92
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 1.33	* 114.73	*
* E.G. Slope (ft/ft)	* 0.007349	* Area (sq ft)	* 1.33	* 114.73	*
* Q Total (cfs)	* 914.40	* Flow (cfs)	* 0.70	* 913.70	*
* Top width (ft)	* 42.39	* Top width (ft)	* 10.73	* 31.66	*
* Vel Total (ft/s)	* 7.88	* Avg. Vel. (ft/s)	* 0.53	* 7.96	*
* Max Chl Dpth (ft)	* 4.19	* Hydr. Depth (ft)	* 0.12	* 3.62	*
* Conv. Total (cfs)	* 10666.7	* Conv. (cfs)	* 8.1	* 10658.5	*
* Length Wtd. (ft)	* 155.22	* Wetted Per. (ft)	* 10.76	* 35.45	*
* Min Ch El (ft)	* 886.61	* Shear (lb/sq ft)	* 0.06	* 1.48	*
* Alpha	* 1.02	* Stream Power (lb/ft s)	* 251.32	* 0.00	* 0.00
* Frctn Loss (ft)	* 1.15	* Cum Volume (acre-ft)	* 2.88	* 5.05	* 2.69
* C & E Loss (ft)	* 0.07	* Cum SA (acres)	* 1.65	* 1.04	* 1.32

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

RIVER: Bluestone Creek  
 REACH: Lower

RS: 2951.927

INPUT

Description:

Station Elevation Data		num= 60	
Sta	Elev	Sta	Elev
0	908.12	1.19	908
14.65	904.26	15.46	904
49.32	891.77	60.49	891.95
83.4	886.54	90.81	886.38
101.1	886.12	105.46	886.83
133.31	889.2	135.43	889
137.9	886	138.17	885.73
155.46	887.19	156.45	888
162.78	891.13	165.23	892
175.09	895.58	176.25	896
190.02	900	191.17	900.32
202.74	903.5	204.78	904

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.1	135.43	.035
		157.77	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	135.43	157.77		200.61	168.64	176.27	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 890.56	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.76	* Wt. n-val.	* 0.100	* 0.035	* 0.100
* W.S. Elev (ft)	* 889.80	* Reach Len. (ft)	* 200.61	* 168.64	* 176.27
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 139.95	* 85.54	* 0.49
* E.G. Slope (ft/ft)	* 0.007514	* Area (sq ft)	* 139.95	* 85.54	* 0.49
* Q Total (cfs)	* 1021.20	* Flow (cfs)	* 312.06	* 708.88	* 0.27
* Top Width (ft)	* 84.40	* Top width (ft)	* 60.57	* 22.34	* 1.49
* Vel Total (ft/s)	* 4.52	* Avg. vel. (ft/s)	* 2.23	* 8.29	* 0.55
* Max chl Dpth (ft)	* 4.61	* Hydr. Depth (ft)	* 2.31	* 3.83	* 0.33
* Conv. Total (cfs)	* 11780.5	* Conv. (cfs)	* 3599.9	* 8177.6	* 3.1
* Length Wtd. (ft)	* 175.27	* Wetted Per. (ft)	* 61.45	* 25.31	* 1.74
* Min ch El (ft)	* 885.19	* Shear (lb/sq ft)	* 1.07	* 1.59	* 0.13
* Alpha	* 2.41	* Stream Power (lb/ft s)	* 255.68	* 0.00	* 0.00

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\* Frctn Loss (ft) \* 0.51 \* Cum Volume (acre-ft) \* 2.82 \* 4.65 \* 2.69 \*  
 \* C & E Loss (ft) \* 0.16 \* Cum SA (acres) \* 1.62 \* 0.93 \* 1.31 \*  
 \*\*\*\*\*

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.

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Lower RS: 2773.556

INPUT  
 Description:

Station Elevation Data num= 91

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	910	4	908	4.48	907.77	8.06	906	9.5	905.28
12.21	904	15.94	902.15	16.25	902	17.11	901.56	19.32	900.6
20.71	900	23.17	898.85	25.11	898	25.22	897.96	28.87	896.36
29.33	896.15	29.36	896.13	29.5	896	29.67	895.82	31.56	894
32.23	893.28	33.63	892	34.36	891.29	35.47	890.54	36.27	890
38.33	888.36	38.82	888	40.75	886.63	41.65	886	42.36	885.47
42.46	885.39	44.53	883.92	44.55	883.92	55.28	883.97	56.85	883.94
59.19	883.92	59.38	884	61.44	885.34	62.51	886	62.59	886.06
63.53	886.67	63.59	886.68	67.7	886.75	83.72	887.08	108.82	887.61
114.4	887.88	116.96	887.99	117.2	888.02	118.35	888.13	118.7	888.09
120.41	888.05	122.41	888	132.03	887.71	132.28	887.71	132.47	887.72
133.6	887.83	134.39	888	134.41	888.01	136.58	888.43	147.1	889.99
147.25	890	151.47	890.44	161.43	891.34	167.16	892	168.77	892.19
175.61	892.74	184.55	893.47	191.29	894	197.1	894.44	214.17	896
225.81	897.12	234.71	898	237.32	898.26	240.34	898.55	245.76	899.11
254	900	257.03	900.33	260.59	900.71	267.68	901.29	269.97	901.48
274.29	902	274.87	902.05	275.61	902.1	288.68	903.12	294.64	903.52
296.09	903.61	296.82	903.66	298.27	903.79	300.53	904	318.38	905.66
322.01	906								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	40.75	.035	63.53	.035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 40.75 63.53 88.56 82.82 18.59 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

\*\*\*\*\*  
 \* E.G. Elev (ft) \* 889.90 \* Element \* Left OB \* Channel \* Right OB \*

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* Vel Head (ft)	* 0.24	* Wt. n-val.	* 0.100	* 0.035	* 0.035	*
* W.S. Elev (ft)	* 889.66	* Reach Len. (ft)	* 88.56	* 82.82	* 18.59	*
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 6.30	* 119.32	* 167.92	*
* E.G. Slope (ft/ft)	* 0.001516	* Area (sq ft)	* 6.30	* 119.32	* 167.92	*
* Q Total (cfs)	* 1021.20	* Flow (cfs)	* 4.22	* 567.52	* 449.47	*
* Top Width (ft)	* 108.15	* Top width (ft)	* 4.05	* 22.78	* 81.32	*
* Vel Total (ft/s)	* 3.48	* Avg. Vel. (ft/s)	* 0.67	* 4.76	* 2.68	*
* Max Chl Dpth (ft)	* 5.74	* Hydr. Depth (ft)	* 1.56	* 5.24	* 2.06	*
* Conv. Total (cfs)	* 26224.2	* Conv. (cfs)	* 108.3	* 14573.7	* 11542.2	*
* Length Wtd. (ft)	* 65.26	* Wetted Per. (ft)	* 5.06	* 24.45	* 81.51	*
* Min Ch El (ft)	* 883.92	* Shear (lb/sq ft)	* 0.12	* 0.46	* 0.20	*
* Alpha	* 1.30	* Stream Power (lb/ft s)	* 322.01	* 0.00	* 0.00	*
* Frctn Loss (ft)	* 0.20	* Cum Volume (acre-ft)	* 2.48	* 4.25	* 2.35	*
* C & E Loss (ft)	* 0.12	* Cum SA (acres)	* 1.47	* 0.84	* 1.14	*

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.

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Lower

RS: 2690.443

INPUT

Description:

Station Elevation Data		num=		94					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	910	7.23	907.07	9.64	906	12.9	904.66	15.2	904
17.27	903.42	17.87	903.18	17.93	903.16	18.52	902.66	19.52	901.8
19.72	901.63	21.59	900	22.47	899.26	24	898	24.89	897.21
26.31	896	27.35	895.03	28.55	894	29.91	892.83	30.74	892
31.41	891.45	33.29	890	35.18	888.26	35.52	888	35.84	887.72
37.88	886	40.12	884.1	40.24	884	40.81	883.53	40.84	883.5
42.71	883.5	56.6	883.34	56.73	883.57	57.01	884	57.57	884.92
58.02	886	58.29	886.56	58.32	886.58	58.41	886.57	58.49	886.57
58.52	886.56	58.57	886.56	69.58	886.77	77.51	887.56	79.69	887.95
79.79	887.95	79.91	887.95	79.97	887.96	79.98	887.96	80.04	888
80.1	888.03	80.24	888.04	82.17	888.19	99.08	889.56	99.56	889.6
105.18	890	114.5	890	122.33	890.39	123.68	890.37	125.51	890.33
127.03	890.14	128.16	889.81	129.89	889.24	132.14	889.2	141.54	888.95
145	889.23	150.7	889.55	162.15	889.74	165.26	890	177.63	891.13
187.62	892	189.6	892.21	192.53	892.49	199.61	892.94	214.4	894
222.63	894.97	224.75	895.27	230.48	896.12	242.42	898	243.63	898.19
255.15	900	255.48	900.05	255.65	900.07	255.89	900.1	259.21	900.64
269.52	902	273.7	902.47	286.83	904	292.36	904.64	297.29	905.22
308.37	905.98	308.41	905.99	308.48	905.99	308.6	906		



Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .1 37.88 .035 58.29 .035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 37.88 58.29 143.99 173.74 92.68 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

\*\*\*\*\*  
 \* E.G. Elev (ft) \* 889.58 \* Element \* Left OB \* Channel \* Right OB \*  
 \* Vel Head (ft) \* 1.45 \* Wt. n-Val. \* 0.100 \* 0.035 \* 0.035 \*  
 \* W.S. Elev (ft) \* 888.13 \* Reach Len. (ft) \* 143.99 \* 173.74 \* 92.68 \*  
 \* Crit W.S. (ft) \* 888.13 \* Flow Area (sq ft) \* 2.69 \* 89.67 \* 25.16 \*  
 \* E.G. Slope (ft/ft) \* 0.009431 \* Area (sq ft) \* 2.69 \* 89.67 \* 25.16 \*  
 \* Q Total (cfs) \* 1021.20 \* Flow (cfs) \* 3.38 \* 908.36 \* 109.47 \*  
 \* Top width (ft) \* 46.04 \* Top width (ft) \* 2.53 \* 20.41 \* 23.10 \*  
 \* Vel Total (ft/s) \* 8.69 \* Avg. Vel. (ft/s) \* 1.26 \* 10.13 \* 4.35 \*  
 \* Max Chl Dpth (ft) \* 4.79 \* Hydr. Depth (ft) \* 1.06 \* 4.39 \* 1.09 \*  
 \* Conv. Total (cfs) \* 10515.7 \* Conv. (cfs) \* 34.8 \* 9353.7 \* 1127.2 \*  
 \* Length Wtd. (ft) \* 168.30 \* Wetted Per. (ft) \* 3.31 \* 23.28 \* 23.21 \*  
 \* Min Ch El (ft) \* 883.34 \* Shear (lb/sq ft) \* 0.48 \* 2.27 \* 0.64 \*  
 \* Alpha \* 1.24 \* Stream Power (lb/ft s) \* 308.60 \* 0.00 \* 0.00 \*  
 \* Frctn Loss (ft) \* 1.30 \* Cum Volume (acre-ft) \* 2.47 \* 4.05 \* 2.30 \*  
 \* C & E Loss (ft) \* 0.12 \* Cum SA (acres) \* 1.46 \* 0.80 \* 1.12 \*  
 \*\*\*\*\*

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

RIVER: Bluestone Creek  
 REACH: Lower RS: 2515.269

INPUT

Description:

Station Elevation Data num= 73  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 \*\*\*\*\*  
 0 910 7.06 908 11.47 906.79 14.7 906 20.49 904.53

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20.84	904.43	27.19	902.78	30.1	902	31.92	901.53	37.75	900
41.22	898.37	42.08	898	45.84	896.17	46.19	896	47.68	895.27
49.99	894	50.43	893.75	53.57	892	54.47	891.48	57.12	890
58.34	889.31	60.69	888	62.18	887.15	68.07	886	71.85	885.28
75.35	884.61	77.1	884.27	87.55	884.1	87.98	883.82	89.91	882.68
90.2	882.5	91.58	881.57	91.7	881.47	92.28	881.25	99.15	881.3
104.87	881.69	107.35	881.59	107.45	881.74	107.7	882	109.16	883.43
109.6	884	111.33	885.7	111.64	886	112.38	886.9	113.08	886.88
131.72	886.8	140.18	886.76	144.29	886.84	144.83	886.71	147.47	886.33
147.55	886.32	147.68	886.31	149.36	886.28	150	886.27	155.8	886.17
157.03	886.18	157.46	886.19	157.51	886.2	157.79	886.27	161.85	887.31
164.61	888	166.38	888.47	168.76	888.95	173.79	889.7	177.59	890
183.28	890.64	194.83	892	201.18	892.85	203.5	894	228.69	906
243.7	906	291.75	891	299.36	891				

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .1 87.55 .035 112.38 .035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 87.55 112.38 217.05 95.01 46.45 .1 .3  
 Blocked Obstructions num= 1  
 Sta L Sta R Elev  
 \*\*\*\*\*  
 144.29 299.36 886.84

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 887.74	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 1.07	* Wt. n-Val.	* 0.100	* 0.035	*
* W.S. Elev (ft)	* 886.68	* Reach Len. (ft)	* 217.05	* 95.01	* 46.45
* Crit W.S. (ft)	* 885.92	* Flow Area (sq ft)	* 41.11	* 110.72	*
* E.G. Slope (ft/ft)	* 0.006419	* Area (sq ft)	* 41.11	* 110.72	*
* Q Total (cfs)	* 1021.20	* Flow (cfs)	* 71.73	* 949.47	*
* Top Width (ft)	* 47.59	* Top width (ft)	* 22.95	* 24.65	*
* Vel Total (ft/s)	* 6.73	* Avg. Vel. (ft/s)	* 1.74	* 8.58	*
* Max chl Dpth (ft)	* 5.43	* Hydr. Depth (ft)	* 1.79	* 4.49	*
* Conv. Total (cfs)	* 12745.6	* Conv. (cfs)	* 895.2	* 11850.4	*
* Length Wtd. (ft)	* 118.00	* Wetted Per. (ft)	* 23.18	* 27.66	*
* Min Ch El (ft)	* 881.25	* Shear (lb/sq ft)	* 0.71	* 1.60	*
* Alpha	* 1.52	* Stream Power (lb/ft s)	* 299.36	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.67	* Cum Volume (acre-ft)	* 2.40	* 3.65	* 2.28
* C & E Loss (ft)	* 0.13	* Cum SA (acres)	* 1.42	* 0.71	* 1.10

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Lower

RS: 2420.230

INPUT  
Description:

Station Elevation Data		num= 70									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	900	6.78	898.19	7.43	898	7.69	897.93	14.61	896		
16.11	895.54	18.15	895.29	18.16	895.29	25.17	894	25.92	893.86		
35.82	892	38.47	891.48	41.89	891.3	43.02	891.21	46.41	890.81		
55.27	890	62.34	889.35	67.04	889.14	70.08	888.77	71.17	888.69		
85.13	888.1	87.25	887.97	91.86	887.62	96.72	887.47	103.59	887.02		
112.19	886	115.5	885.77	135.66	884.76	146.19	884.24	148.91	884.1		
149.37	884.08	150.87	884	152.68	884	159.92	883.04	162.94	883.02		
163.48	882.96	164.66	882.47	170.46	880.81	177.08	882.43	177.92	882.89		
178.66	883.08	181.26	883.17	183.38	884	183.39	884	185.51	884.4		
186.08	884.51	187.72	884.94	195.67	885.8	196.94	885.82	199.54	886		
201	886	205.22	886.39	217.76	887.56	221.55	888	228.1	889.97		
228.21	890	228.23	890.01	234.18	892	241.38	893.92	241.63	894		
242.18	894.14	248.31	896	249.89	896.48	254.87	898	259.66	899.02		
262.77	900	274.5	902	282.52	906	297.55	906	347.84	891		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.035	162.94	.035	178.66	.035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 162.94 178.66 144.52 97.6 53.98 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 886.94	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.64	* Wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 886.30	* Reach Len. (ft)	* 144.52	* 97.60	* 53.98
* Crit W.S. (ft)	* 886.00	* Flow Area (sq ft)	* 86.05	* 69.57	* 32.13
* E.G. Slope (ft/ft)	* 0.005074	* Area (sq ft)	* 86.05	* 69.57	* 32.13
* Q Total (cfs)	* 1021.20	* Flow (cfs)	* 357.57	* 551.56	* 112.08
* Top width (ft)	* 94.63	* Top width (ft)	* 53.30	* 15.72	* 25.61
* Vel Total (ft/s)	* 5.44	* Avg. Vel. (ft/s)	* 4.16	* 7.93	* 3.49
* Max Chl Dpth (ft)	* 5.49	* Hydr. Depth (ft)	* 1.61	* 4.43	* 1.25
* Conv. Total (cfs)	* 14336.4	* Conv. (cfs)	* 5019.8	* 7743.2	* 1573.4
* Length Wtd. (ft)	* 104.93	* Wetted Per. (ft)	* 53.43	* 16.39	* 25.94
* Min Ch El (ft)	* 880.81	* Shear (lb/sq ft)	* 0.51	* 1.34	* 0.39
* Alpha	* 1.40	* Stream Power (lb/ft s)	* 347.84	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.61	* Cum Volume (acre-ft)	* 2.08	* 3.46	* 2.26
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 1.23	* 0.67	* 1.08

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Lower

RS: 2319.762

INPUT

Description:

Station Elevation Data		num= 73		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	910	5.56	908	9.72	906.56	11.26	906	15.56	904.36
16.47	904	16.72	903.9	20.77	902	21.67	901.54	24.85	900
27.95	898.55	29.6	898	36.72	896.22	37.81	895.88	43.72	894
48.89	892.36	50.03	892	51.97	891.38	57.28	890	61.53	888.89
74.36	888	83.71	887.49	86.45	887.33	99.49	886.49	103.36	886.23
106.95	886	121	885.4	133.84	884.89	146.15	884.28	148.29	884.17
148.54	884.16	151.75	884	157.82	883.7	165.14	883.33	165.25	883.33
166.93	882.54	167.8	882	169.81	881.1	171.05	880.36	173.1	880.39
181.14	880.74	183.94	880.76	184.09	880.76	184.12	880.77	184.61	881.21
185.1	882	186.07	883.3	186.49	884	186.59	884.1	186.61	884.13
195.87	884.07	200.81	884.36	207.24	884.57	217.44	885.79	219.21	886
223.87	887.45	225.89	888	228.71	888.86	232.47	890	236.4	891.25
238.77	892	241.44	892.83	244.71	894	245.76	894.36	247.45	894.92
251.29	896	254.61	896.84	259.13	898	264.23	900	276.42	906
291.66	906	350.15	898	356.46	899				

Manning's n Values		num= 4		Sta n Val		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.1	61.53	.035	165.14	.035	186.59	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	165.14	186.59		134.94	150.07	126.66	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 886.31	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.90	* Wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 885.40	* Reach Len. (ft)	* 134.94	* 150.07	* 126.66
* Crit W.S. (ft)	* 885.40	* Flow Area (sq ft)	* 43.67	* 91.25	* 26.87
* E.G. Slope (ft/ft)	* 0.006756	* Area (sq ft)	* 43.67	* 91.25	* 26.87
* Q Total (cfs)	* 1021.20	* Flow (cfs)	* 151.06	* 778.24	* 91.90
* Top Width (ft)	* 93.25	* Top width (ft)	* 44.19	* 21.45	* 27.61
* Vel Total (ft/s)	* 6.31	* Avg. Vel. (ft/s)	* 3.46	* 8.53	* 3.42
* Max Chl Dpth (ft)	* 5.04	* Hydr. Depth (ft)	* 0.99	* 4.25	* 0.97
* Conv. Total (cfs)	* 12424.3	* Conv. (cfs)	* 1837.8	* 9468.3	* 1118.1
* Length Wtd. (ft)	* 145.02	* Wetted Per. (ft)	* 44.24	* 23.88	* 27.68
* Min Ch El (ft)	* 880.36	* Shear (lb/sq ft)	* 0.42	* 1.61	* 0.41
* Alpha	* 1.46	* Stream Power (lb/ft s)	* 356.46	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.56	* Cum Volume (acre-ft)	* 1.87	* 3.28	* 2.22
* C & E Loss (ft)	* 0.16	* Cum SA (acres)	* 1.07	* 0.62	* 1.05

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: Bluestone Creek

REACH: Lower

RS: 2130.340

INPUT

Description:

Station Elevation Data		num= 59		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	900	4.24	898	8.45	896.17	8.83	896	12.36	894.31		
13.06	894	15.34	892.93	17.51	892	18.83	891.4	21.78	890		
23.73	889.09	26.16	888	28.82	886.83	30.68	886	34.3	884.08		
34.44	884	46.93	884	64.55	883.35	66.26	883.33	83.85	882.83		
87.75	882.82	92.7	882.85	97.42	882.44	102.24	882.02	102.28	882		
102.47	882	103.93	881.54	108.79	880	108.8	880	110.72	879.17		
121.83	879.34	122.47	879.47	123.34	879.66	123.86	880	124.7	880.89		
125.46	881.67	128.94	881.96	129.47	882	139.26	882.8	139.78	882.84		
150.18	883.68	154.28	884	155.67	884.2	171.07	886	174.76	887.33		
176.62	888	179.69	889.07	182.27	890	187.27	891.74	188.04	892		
188.57	892.19	190.3	892.82	193.28	894	194.19	894.34	198.38	896		
202.82	897.67	203.62	898	204.93	898.28	211.79	900				

Manning's n Values

num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.1	34.3	.035	102.24	.035	125.46	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	102.24	125.46		155.78	149.95	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 885.21	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.38	* Wt. n-Val.	* 0.035	* 0.035	* 0.100
* W.S. Elev (ft)	* 884.82	* Reach Len. (ft)	* 155.78	* 149.95	* 51.80
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 104.71	* 113.77	* 59.67

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```

* E.G. Slope (ft/ft)      *0.002468 * Area (sq ft)          * 104.71 * 113.77 * 59.67 *
* Q Total (cfs)          * 1021.20 * Flow (cfs)            * 292.22 * 666.92 * 62.07 *
* Top Width (ft)         * 128.10 * Top width (ft)        * 69.34 * 23.22 * 35.54 *
* Vel Total (ft/s)       * 3.67   * Avg. vel. (ft/s)     * 2.79 * 5.86 * 1.04 *
* Max Chl Dpth (ft)     * 5.65   * Hydr. Depth (ft)     * 1.51 * 4.90 * 1.68 *
* Conv. Total (cfs)     * 20554.4 * Conv. (cfs)          * 5881.6 * 13423.5 * 1249.2 *
* Length Wtd. (ft)      * 137.17 * Wetted Per. (ft)     * 69.60 * 24.55 * 35.68 *
* Min Ch El (ft)        * 879.17 * Shear (lb/sq ft)     * 0.23 * 0.71 * 0.26 *
* Alpha                  * 1.84   * Stream Power (lb/ft s) * 211.79 * 0.00 * 0.00 *
* Frctn Loss (ft)       * 0.55   * Cum Volume (acre-ft) * 1.64 * 2.92 * 2.10 *
* C & E Loss (ft)       * 0.07   * Cum SA (acres)       * 0.89 * 0.55 * 0.96 *
*****

```

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: Bluestone Creek

REACH: Lower

RS: 1966.255

INPUT

Description:

Station Elevation Data

num= 69

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	900	5.23	898.17	5.74	898	6.1	897.83	9.72	896
10.42	895.66	13.86	894	18.05	892.1	18.28	892	18.61	891.84
22.42	890	22.94	889.75	24.79	888.87	26.62	888	26.82	887.92
30.62	886	34.59	884.14	34.88	884	35.54	883.71	35.6	883.68
35.66	883.6	37.04	882.73	38.14	882	40.64	880.32	41.13	880
43.41	878.48	43.71	878.29	44.34	878.22	47.69	878	49.52	878.11
51.47	878.2	52.64	878.27	53.05	878.3	55.22	879.85	55.49	880
57.33	881.17	57.56	881.3	69.86	881.66	74.97	881.81	82.02	882
92.59	882	125.94	883.3	129.75	883.43	140.41	883.78	144.43	883.86
148.98	884	149.2	884	153.88	884.37	154.56	884.41	172.42	886
173.13	886	177.73	887.75	178.35	888	178.88	888.23	182.01	889.49
183.05	889.85	183.44	890	188.03	891.62	189.05	892	193.51	893.68
194.39	894	200.37	895.88	200.85	896	209.78	897.95	210.04	898
210.89	898.12	212.9	898.4	223.91	899.32	225.35	900		

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	38.14	.035	57.56	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 38.14 57.56 33.8 57.56 130.71 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

```

*****
* E.G. Elev (ft)      * 884.58 * Element          * Left OB * Channel * Right OB *
* Vel Head (ft)      * 1.09  * Wt. n-Val.      * 0.100  * 0.035  * 0.060  *
* W.S. Elev (ft)     * 883.49 * Reach Len. (ft) * 33.80  * 57.56  * 130.71 *
* Crit W.S. (ft)     * 883.49 * Flow Area (sq ft) * 1.70  * 85.11  * 89.44  *
* E.G. Slope (ft/ft) * 0.007780 * Area (sq ft)    * 1.70  * 85.11  * 89.44  *
* Q Total (cfs)      * 1021.20 * Flow (cfs)      * 1.62  * 798.24 * 221.34 *
* Top Width (ft)     * 95.86  * Top width (ft)  * 2.31  * 19.42  * 74.13  *
* Vel Total (ft/s)   * 5.79  * Avg. Vel. (ft/s) * 0.95  * 9.38   * 2.47   *
* Max chl Dpth (ft)  * 5.49  * Hydr. Depth (ft) * 0.74  * 4.38   * 1.21   *
* Conv. Total (cfs)  * 11577.9 * Conv. (cfs)     * 18.4  * 9050.0 * 2509.4 *
* Length Wtd. (ft)   * 72.84  * Wetted Per. (ft) * 2.75  * 21.47  * 74.17  *
* Min Ch El (ft)     * 878.00 * Shear (lb/sq ft) * 0.30  * 1.93   * 0.59   *
* Alpha              * 2.09  * Stream Power (lb/ft s) * 225.35 * 0.00   * 0.00   *
* Frctn Loss (ft)   * 0.19  * Cum Volume (acre-ft) * 1.45  * 2.58   * 2.01   *
* C & E Loss (ft)   * 0.26  * Cum SA (acres)   * 0.76  * 0.47   * 0.89   *
*****
    
```

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: 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: Bluestone Creek

REACH: Lower

RS: 1908.167

INPUT

Description:

```

Station Elevation Data      num=      81
Sta      Elev      Sta      Elev      Sta      Elev      Sta      Elev      Sta      Elev
*****
0         900       6.66      898       8.03     897.41    11.86     896       16.69     894.16
17.12     894       17.24     893.96    22.26     892       23.12     891.67    26.71     890.09
26.88     890.01    26.9      890.01    26.92     890       29.73     888.38    30.4      888
33.57     886.35    34.21     886       35.42     885.36    37.92     884       39.31     883.24
41.52     882       44.01     881.35    46.29     880.76    50.01     880       53.95     879.61
54.92     878.73    55.93     878.24    56.63     878.12    57.1      878       61.21     878
77.12     877.81    77.27     877.8     77.36     877.78    77.46     877.82    77.9      878
    
```

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80.52	878.95	83.57	880	84.35	880.32	89.59	881.2	91.5	881.22
94.15	881.22	95.79	881.2	96.06	881.2	112.43	881.4	114.15	881.36
118.34	881.27	119.74	881.25	144.62	880.97	146.08	880.98	148.15	881.01
152.97	881.08	194.89	882	200.34	882	201.4	882.58	203.89	884
204.97	884.61	207.37	886	209.07	886.97	210.69	888	214.09	889.86
214.36	890	217.02	891.57	217.73	892	220.62	893.66	221.2	894
222.22	894.55	224.63	896	228.07	897.86	228.29	898	228.43	898.08
231.64	900	234.56	901.47	235.77	902	241.04	903.8	241.61	904
242.37	904.27	247.31	906	252.84	907.9	253.14	908	253.89	908.27
258.89	910								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	53.95	.035	89.59	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	53.95	89.59		32.1	87.51	147.51	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 883.77	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.22	* Wt. n-Val.	* 0.100	* 0.035	* 0.100
* W.S. Elev (ft)	* 883.55	* Reach Len. (ft)	* 32.10	* 87.51	* 147.51
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 39.00	* 175.63	* 244.57
* E.G. slope (ft/ft)	* 0.001302	* Area (sq ft)	* 39.00	* 175.63	* 244.57
* Q Total (cfs)	* 1021.20	* Flow (cfs)	* 38.10	* 764.88	* 218.22
* Top Width (ft)	* 164.35	* Top width (ft)	* 15.20	* 35.64	* 113.51
* Vel Total (ft/s)	* 2.22	* Avg. vel. (ft/s)	* 0.98	* 4.36	* 0.89
* Max chl Dpth (ft)	* 5.77	* Hydr. Depth (ft)	* 2.57	* 4.93	* 2.15
* Conv. Total (cfs)	* 28299.9	* Conv. (cfs)	* 1055.7	* 21196.7	* 6047.5
* Length Wtd. (ft)	* 94.87	* Wetted Per. (ft)	* 15.86	* 36.64	* 113.93
* Min ch El (ft)	* 877.78	* Shear (lb/sq ft)	* 0.20	* 0.39	* 0.17
* Alpha	* 2.91	* Stream Power (lb/ft s)	* 258.89	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.12	* Cum Volume (acre-ft)	* 1.43	* 2.41	* 1.51
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.76	* 0.44	* 0.61

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Lower RS: 1819.717

INPUT

Description:

Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	900	3.28	898.86	5.79	898	7.47	897.42	11.46	896
15.35	894.44	16.75	894	17.93	893.63	22.92	892	26.61	890.88
29.17	890	35.05	888.36	36.29	888	38.23	887.43	43.17	886



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47.53	884.74	49.95	884	50.68	883.76	50.98	883.66	54.2	882.79
56.79	882	66.45	882	87.72	881.89	89.13	881.88	91.71	881.97
93.19	881.92	96.73	881.7	102.39	881.33	103.96	881.22	111.98	880.66
117.45	880.15	119.05	880	121.35	879.74	122.15	879.66	125.56	878.42
126.41	878	127.09	877.64	128.26	877.31	148.11	877.31	148.72	877.89
148.84	878	150.38	879.83	150.57	880	150.62	880.03	151.26	880.79
153.89	880.71	161.76	880.36	169.9	880	194.12	880	196.25	881.53
196.59	882	197.12	882.39	199.36	884	199.94	884.42	202.08	886
202.95	886.61	204.89	888	206.62	889.18	207.73	890	210.57	891.97
210.61	892	210.69	892.05	213.29	894	214.63	894.92	216.1	896
218.26	897.56	218.82	898	219	898.12	219.13	898.23	221.6	900

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	122.15	.035	151.26	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	122.15	151.26		135.34	155.41	187.82	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 883.65	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.25	* Wt. n-Val.	* 0.100	* 0.035	* 0.100
* W.S. Elev (ft)	* 883.40	* Reach Len. (ft)	* 135.34	* 155.41	* 187.82
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 127.67	* 164.60	* 145.37
* E.G. Slope (ft/ft)	*0.001281	* Area (sq ft)	* 127.67	* 164.60	* 145.37
* Q Total (cfs)	* 1021.20	* Flow (cfs)	* 100.91	* 759.46	* 160.83
* Top width (ft)	* 146.56	* Top width (ft)	* 70.19	* 29.11	* 47.26
* Vel Total (ft/s)	* 2.33	* Avg. vel. (ft/s)	* 0.79	* 4.61	* 1.11
* Max Chl Dpth (ft)	* 6.09	* Hydr. Depth (ft)	* 1.82	* 5.65	* 3.08
* Conv. Total (cfs)	* 28527.1	* Conv. (cfs)	* 2818.8	* 21215.5	* 4492.7
* Length Wtd. (ft)	* 153.97	* Wetted Per. (ft)	* 70.48	* 31.11	* 48.46
* Min Ch El (ft)	* 877.31	* Shear (lb/sq ft)	* 0.14	* 0.42	* 0.24
* Alpha	* 2.95	* Stream Power (lb/ft s)	* 221.60	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.41	* Cum Volume (acre-ft)	* 1.37	* 2.07	* 0.85
* C & E Loss (ft)	* 0.10	* Cum SA (acres)	* 0.73	* 0.37	* 0.34

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

Warning: The conveyance ratio (upstream 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: Bluestone Creek  
 REACH: Lower

RS: 1647.228

INPUT

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Description:

Station Elevation Data		num= 67		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	900	5.62	898	5.64	897.99	6.01	897.86	11.02	896		
13.79	894.81	15.33	894.08	15.49	894	15.57	893.95	19.28	892		
19.79	891.74	23.17	890	23.49	889.83	26.85	888	28.44	887.18		
30.7	886	32.6	884.99	34.41	884	52.25	882.38	58.78	882		
63	882	69.97	881.71	70.39	881.7	74.85	881.57	117.71	880		
142.63	880	149.45	879.86	156.13	879.51	168.98	878.82	169.85	878.78		
170.32	878.75	170.34	878.74	171.41	878	172.53	876.88	172.73	876.72		
174.68	876.66	179.39	876.45	179.95	876.39	182.33	876.57	182.38	876.58		
183.21	877.91	183.27	878	183.52	878.58	184.43	880	184.56	880.3		
185.37	881.86	185.45	882	185.56	882.2	186.63	884	186.83	884.36		
187.79	886	188.06	886.48	189.01	888	189.6	889.12	190.21	890		
190.49	890.65	191.23	892	191.47	892.49	191.55	892.63	192.42	892.97		
195.03	894	197.53	894.93	198.32	895.24	200.28	896	204.32	897.5		
205.62	898	210.98	900								

Manning's n Values		num= 3		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.1	170.32	.035	183.52	.1		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	170.32	183.52		90.87	130.82	89.72	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 883.14	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 1.21	* Wt. n-val.	* 0.100	* 0.035	* 0.100
* W.S. Elev (ft)	* 881.93	* Reach Len. (ft)	* 90.87	* 130.82	* 89.72
* Crit W.S. (ft)	* 881.93	* Flow Area (sq ft)	* 167.15	* 66.77	* 3.32
* E.G. Slope (ft/ft)	* 0.008552	* Area (sq ft)	* 167.15	* 66.77	* 3.32
* Q Total (cfs)	* 1021.20	* Flow (cfs)	* 311.92	* 705.15	* 4.13
* Top Width (ft)	* 120.64	* Top width (ft)	* 105.55	* 13.20	* 1.89
* Vel Total (ft/s)	* 4.30	* Avg. Vel. (ft/s)	* 1.87	* 10.56	* 1.24
* Max Chl Dpth (ft)	* 5.54	* Hydr. Depth (ft)	* 1.58	* 5.06	* 1.76
* Conv. Total (cfs)	* 11042.5	* Conv. (cfs)	* 3372.9	* 7625.0	* 44.6
* Length Wtd. (ft)	* 119.92	* Wetted Per. (ft)	* 105.61	* 15.14	* 3.85
* Min Ch El (ft)	* 876.39	* Shear (lb/sq ft)	* 0.84	* 2.36	* 0.46
* Alpha	* 4.21	* Stream Power (lb/ft s)	* 210.98	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.52	* Cum Volume (acre-ft)	* 0.91	* 1.65	* 0.53
* C & E Loss (ft)	* 0.23	* Cum SA (acres)	* 0.45	* 0.30	* 0.23

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.

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

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than

1.4. This may indicate the need for additional cross sections.  
 Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.  
 Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Lower RS: 1512.215

INPUT

Description:

Station Elevation Data		num= 70		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	900	4.06	898	4.96	897.58	7.92	896	10.21	894.86		
11.9	894	14.4	892.76	17.98	892	23.23	890.92	26.38	890		
27.28	890	29.42	889.53	32.27	888.87	35.54	888	35.81	887.92		
42.16	886	44.62	885.22	46.31	884.61	48.34	884	50.87	883.19		
54.4	882	55.84	881.82	57.99	881.66	76.45	880	88.83	880		
99.97	880	107.35	879.87	107.92	879.88	108.29	879.1	108.63	879.06		
108.74	878.8	108.82	878	109.1	877.43	109.85	876	112.59	875.15		
113.7	874.99	114.86	875.32	118.78	875.52	118.98	875.64	120.38	875.68		
120.97	875.7	123.59	876	131.62	876.57	131.89	876.64	132.17	877.22		
133.25	877.3	142.04	878	142.11	878	142.17	878	164.5	878.9		
181.21	880	183.49	881.16	185.2	882	187.6	883.19	189.15	884		
191.65	885.25	193.09	886	194.99	886.91	197.15	888	200.1	889.57		
200.94	890	204.32	891.7	204.93	892	208.51	893.79	208.93	894		
212.62	895.82	212.97	896	214.73	896.89	217.35	898	222.08	900		

Manning's n Values		num= 3		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val
0	.1	107.92	.035	132.17	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	107.92	132.17		138.12	114.24	88.5	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 881.78	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.45	* Wt. n-Val.	* 0.100	* 0.035	* 0.100
* W.S. Elev (ft)	* 881.33	* Reach Len. (ft)	* 138.12	* 114.24	* 88.50
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 52.45	* 129.37	* 134.87
* E.G. slope (ft/ft)	*0.002595	* Area (sq ft)	* 52.45	* 129.37	* 134.87

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* Q Total (cfs)          * 1021.20 * Flow (cfs)            * 43.10 * 785.57 * 192.53 *
* Top Width (ft)        * 122.24 * Top width (ft)       * 46.31 * 24.25 * 51.68 *
* Vel Total (ft/s)      * 3.22  * Avg. Vel. (ft/s)    * 0.82  * 6.07  * 1.43  *
* Max Chl Dpth (ft)     * 6.34  * Hydr. Depth (ft)    * 1.13  * 5.33  * 2.61  *
* Conv. Total (cfs)     * 20045.8 * Conv. (cfs)         * 846.0 * 15420.4 * 3779.4 *
* Length Wtd. (ft)     * 112.91 * Wetted Per. (ft)    * 46.37 * 27.50 * 52.08 *
* Min Ch El (ft)       * 874.99 * Shear (lb/sq ft)    * 0.18  * 0.76  * 0.42  *
* Alpha                 * 2.77  * Stream Power (lb/ft s) * 222.08 * 0.00 * 0.00 *
* Frctn Loss (ft)      * 0.22  * Cum Volume (acre-ft) * 0.68  * 1.36  * 0.38  *
* C & E Loss (ft)      * 0.03  * Cum SA (acres)      * 0.30  * 0.24  * 0.18  *
*****

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CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Lower RS: 1387.656

INPUT  
 Description:

Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	900	4.63	898.25	5.26	898	8.92	896.57	10.39	896
11.02	895.6	12.7	894	14.59	892.2	14.78	892	15.33	891.36
17.11	890	17.57	889.6	19.84	888	20.99	887.14	22.45	886
23.88	884.9	25.09	884	26.09	883.25	27.84	882	28.85	881.22
30.33	880	47.89	878.16	49.68	878	57.7	878	62.24	877.92
69.27	877.79	71.24	877.78	74.42	877.78	74.47	877.77	74.53	877.77
75.04	876.93	75.75	876	76.14	875.31	76.95	874.61	82.68	874.55
82.72	874.55	95.38	874.69	96.98	875.11	97.58	876	97.87	876.48
98.07	876.74	106.69	877.83	107.19	877.9	111.17	878	112.77	878
117.81	879.51	120.18	879.73	123.39	880	126.53	880	127.15	880.32
127.37	880.34	129.09	880.54	132.08	882	136.9	882	168.4	883.21
185.85	884	195.97	885.49	198.86	886	199.36	886.28	202.59	888
203.55	888.6	206	890	207.69	890.91	209.6	892	211.61	893.16
213.15	894	216.36	895.85	216.62	896	217.31	896.4	222.27	900

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	74.42	.035	98.07	.1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 74.42 98.07 183.7 132.16 32.28 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

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*****
* E.G. Elev (ft)      * 881.53 * Element              * Left OB * Channel * Right OB *
* Vel Head (ft)      * 0.35  * Wt. n-Val.          * 0.100  * 0.035  * 0.100  *
* W.S. Elev (ft)     * 881.18 * Reach Len. (ft)     * 183.70 * 132.16 * 32.28  *
* Crit W.S. (ft)     *        * Flow Area (sq ft)   * 124.38 * 149.83 * 79.61  *
*****

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* E.G. Slope (ft/ft) *0.001534 * Area (sq ft) * 124.38 * 149.83 * 79.61 *
* Q Total (cfs) * 1021.20 * Flow (cfs) * 140.39 * 797.29 * 83.53 *
* Top Width (ft) * 101.51 * Top width (ft) * 45.52 * 23.65 * 32.34 *
* Vel Total (ft/s) * 2.89 * Avg. vel. (ft/s) * 1.13 * 5.32 * 1.05 *
* Max Chl Dpth (ft) * 6.63 * Hydr. Depth (ft) * 2.73 * 6.34 * 2.46 *
* Conv. Total (cfs) * 26071.0 * Conv. (cfs) * 3584.0 * 20354.6 * 2132.5 *
* Length Wtd. (ft) * 130.35 * Wetted Per. (ft) * 46.05 * 26.17 * 32.89 *
* Min Ch El (ft) * 874.55 * Shear (lb/sq ft) * 0.26 * 0.55 * 0.23 *
* Alpha * 2.69 * Stream Power (lb/ft s) * 222.27 * 0.00 * 0.00 *
* Frctn Loss (ft) * 0.36 * Cum Volume (acre-ft) * 0.40 * 0.99 * 0.17 *
* C & E Loss (ft) * 0.09 * Cum SA (acres) * 0.15 * 0.18 * 0.09 *
*****

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

Warning: The conveyance ratio (upstream 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: Bluestone Creek  
 REACH: Lower

RS: 1246.924

INPUT  
 Description:

Station Elevation Data num= 71

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	900	.46	899.63	.97	899.22	1.04	899.28	1.16	898
1.31	897.19	1.63	896	1.68	895.55	1.77	894.69	1.87	894
2.01	893.2	2.24	892	2.43	891.22	2.77	890	2.97	888.88
3.22	888	3.39	886.69	3.56	886	3.81	884.58	3.93	884
4.16	882.47	4.27	882	4.58	880.38	4.65	880	4.72	879.59
5	878	5.3	876.17	5.35	876	5.69	874.04	5.7	874
5.71	873.91	9.41	873.67	11.57	873.55	14.56	873.99	14.6	874
15.17	874.07	16.01	874.34	18.45	875.01	22.1	876	26.47	877.2
27.68	877.49	27.7	877.5	30.68	877.93	31.18	878	35.41	878.63
44.98	880	45.65	880	47.55	880.14	54.95	880.49	57.54	880.44
59.91	880.43	102.71	882	123.84	882	140	882.91	140.8	883.02
142.57	883.02	143.19	883.05	145.47	884	149.95	885.81	150.42	886
152.06	886.66	153.84	888	155.64	889.27	156.75	890	158.57	891.31
159.51	892	161.72	893.49	162.4	894	164.83	895.88	165	896
167.77	898								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	5	.035	27.68	.1

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

5 27.68

43.62 127.93 114.54

.1 .3

CROSS SECTION OUTPUT Profile #PF 1

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*****
* E.G. Elev (ft)      * 881.08 * Element      * Left OB * Channel * Right OB *
* Vel Head (ft)      * 1.21  * wt. n-Val.   * 0.100  * 0.035  * 0.100  *
* W.S. Elev (ft)     * 879.87 * Reach Len. (ft) * 43.62 * 127.93 * 114.54 *
* Crit W.S. (ft)     * 879.01 * Flow Area (sq ft) * 0.31 * 111.29 * 19.35 *
* E.G. Slope (ft/ft) * 0.006591 * Area (sq ft) * 0.31 * 111.29 * 19.35 *
* Q Total (cfs)      * 1021.20 * Flow (cfs) * 0.11 * 995.19 * 25.90 *
* Top Width (ft)     * 39.39 * Top width (ft) * 0.33 * 22.68 * 16.38 *
* Vel Total (ft/s)   * 7.80  * Avg. vel. (ft/s) * 0.36 * 8.94 * 1.34 *
* Max Chl Dpth (ft) * 6.32  * Hydr. Depth (ft) * 0.94 * 4.91 * 1.18 *
* Conv. Total (cfs) * 12578.3 * Conv. (cfs) * 1.4 * 12258.0 * 319.0 *
* Length Wtd. (ft)  * 120.36 * Wetted Per. (ft) * 1.90 * 26.63 * 16.56 *
* Min Ch El (ft)    * 873.55 * Shear (lb/sq ft) * 0.07 * 1.72 * 0.48 *
* Alpha             * 1.28  * Stream Power (lb/ft s) * 167.77 * 0.00 * 0.00 *
* Frctn Loss (ft)   * 0.37  * Cum Volume (acre-ft) * 0.14 * 0.60 * 0.13 *
* C & E Loss (ft)   * 0.25  * Cum SA (acres) * 0.05 * 0.11 * 0.08 *
*****

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

Warning: The conveyance ratio (upstream 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: Bluestone Creek

REACH: Lower

RS: 1109.636

INPUT

Description:

Station Elevation Data

num= 91

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	900	7.99	898	12.11	896.99	14.98	896.29	15.03	896.27
16.24	895.94	18.02	895.4	18.05	895.39	18.1	895.36	19.43	894.63
20.13	894.27	20.36	894.21	21.06	894.1	21.82	894	27.98	893.2
29.82	893.02	31.32	892.97	36.62	892.73	36.95	892.72	39.12	892.49
39.4	892.44	39.56	892.42	39.71	892.37	40.58	891.85	44.04	890.63
44.75	890	46.51	888.42	47.03	888	49.37	886	49.49	885.9
50.43	885.55	53.8	884.26	54.33	884	57.59	882.59	58.93	882
59.12	881.92	59.71	881.65	61.96	880.57	63.13	880	64.59	879.28
65.77	878.7	65.78	878.7	72.55	878.12	73.12	878.07	73.51	878
76.08	878	82.72	877.34	96.73	876.97	108.34	876.4	115.12	876.06
115.23	876	115.24	876	116.47	874.96	118.35	874.04	118.39	874.04
118.43	874.04	135.55	873.74	136.55	873.62	136.63	873.62	136.8	873.61
137.2	873.71	137.46	874	138.18	874.61	139.17	876	139.24	876.1
139.69	876.53	147.24	877.72	147.73	877.77	149.98	878	153.88	878.96

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158.65	880	160.03	880.32	161.17	880.78	163.42	882	164.58	882.59
167.5	884	168.94	884.73	171.57	886	173.32	886.92	175.49	888
177.39	889.1	179.26	890	180.83	890.83	182.91	892	184.23	892.73
186.38	894	188	895.04	189.55	896	192.14	897.52	193.01	898
196.98	900								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .1 115.12 .035 139.69 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 115.12 139.69 24.9 75.62 108.89 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 880.46	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.39	* Wt. n-Val.	* 0.100	* 0.035	* 0.100
* W.S. Elev (ft)	* 880.08	* Reach Len. (ft)	* 24.90	* 75.62	* 108.89
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 142.94	* 146.11	* 37.47
* E.G. Slope (ft/ft)	* 0.001758	* Area (sq ft)	* 142.94	* 146.11	* 37.47
* Q Total (cfs)	* 1021.20	* Flow (cfs)	* 173.49	* 811.80	* 35.91
* Top width (ft)	* 96.02	* Top width (ft)	* 52.15	* 24.57	* 19.30
* Vel Total (ft/s)	* 3.13	* Avg. vel. (ft/s)	* 1.21	* 5.56	* 0.96
* Max chl Dpth (ft)	* 6.47	* Hydr. Depth (ft)	* 2.74	* 5.95	* 1.94
* Conv. Total (cfs)	* 24356.1	* Conv. (cfs)	* 4137.8	* 19361.8	* 856.5
* Length Wtd. (ft)	* 68.43	* Wetted Per. (ft)	* 52.56	* 26.50	* 19.64
* Min Ch El (ft)	* 873.61	* Shear (lb/sq ft)	* 0.30	* 0.61	* 0.21
* Alpha	* 2.54	* Stream Power (lb/ft s)	* 196.98	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.18	* Cum Volume (acre-ft)	* 0.07	* 0.22	* 0.06
* C & E Loss (ft)	* 0.05	* Cum SA (acres)	* 0.03	* 0.04	* 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.

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Lower RS: 1029.896

INPUT  
 Description:

Station Elevation Data num= 92

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	900	7.29	898	13.38	896.29	14.35	896	14.84	895.88
16.19	895.51	16.3	895.23	16.34	894	16.53	893.06	16.58	892.62

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19.03	892.09	19.43	892	20.5	891.71	20.81	891.67	32.61	889.1
36.25	888.27	37.36	888	39.87	887.4	43.63	886.46	44.41	886.27
45.34	885.89	46.6	885.42	46.61	885.41	48.24	885.28	57.34	885.13
59.31	885.1	63.18	884.99	63.32	884.99	66.5	884.85	68.1	884.77
69.5	884.11	71.81	882.94	73.31	882.21	73.88	882	81.81	880.97
84.22	880.88	85.77	880.87	91.58	880.82	96.85	880	99.09	879.57
105.37	878	114.77	877.24	120.75	877.01	121.4	876.97	124.53	876.92
126.83	876.83	130	876.68	133.54	876.47	140.12	876.07	140.32	876.07
140.72	876.07	141.15	876.07	141.33	876.08	141.37	876.11	141.84	875.84
145.57	874	146.81	873.34	146.86	873.3	146.87	873.3	147.13	873.28
150.42	872.55	157.45	873.73	158.52	873.83	158.68	874	160.27	875.61
160.69	876	161.06	876.4	162.58	878	163.7	879.02	164.65	880
166.2	881.4	166.78	882	167.1	882.3	168.66	884	169.37	884.76
170.62	886	171.51	886.85	172.25	887.61	172.63	888	173.98	889.35
174.77	890	174.91	890.12	175.63	890.85	176.14	891.08	177.95	892
181.74	893.71	182.34	894	182.46	894.06	186.44	896	190.02	898
190.03	898	193.54	900						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	141.37	.035	160.27	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	141.37	160.27		1	1	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 880.23	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.90	* wt. n-Val.	* 0.100	* 0.035	* 0.100
* W.S. Elev (ft)	* 879.34	* Reach Len. (ft)	*	*	*
* Crit W.S. (ft)	* 878.39	* Flow Area (sq ft)	* 89.87	* 105.74	* 6.87
* E.G. Slope (ft/ft)	* 0.004203	* Area (sq ft)	* 89.87	* 105.74	* 6.87
* Q Total (cfs)	* 1021.20	* Flow (cfs)	* 144.72	* 868.60	* 7.89
* Top Width (ft)	* 63.99	* Top width (ft)	* 41.35	* 18.90	* 3.74
* Vel Total (ft/s)	* 5.04	* Avg. vel. (ft/s)	* 1.61	* 8.21	* 1.15
* Max Chl Dpth (ft)	* 6.79	* Hydr. Depth (ft)	* 2.17	* 5.59	* 1.84
* Conv. Total (cfs)	* 15751.3	* Conv. (cfs)	* 2232.1	* 13397.5	* 121.6
* Length wtd. (ft)	*	* Wetted Per. (ft)	* 41.59	* 20.51	* 5.28
* Min Ch El (ft)	* 872.55	* Shear (lb/sq ft)	* 0.57	* 1.35	* 0.34
* Alpha	* 2.27	* Stream Power (lb/ft s)	* 193.54	* 0.00	* 0.00
* Frctn Loss (ft)	*	* Cum Volume (acre-ft)	*	*	*
* C & E Loss (ft)	*	* Cum SA (acres)	*	*	*

CROSS SECTION

RIVER: Trib 1  
 REACH: Trib 1

RS: 1494.636

INPUT



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Description:

Station Elevation Data		num= 52		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	930	15.95	928	20.13	927.28	25.47	926.34	26.17	926.15		
26.4	926.1	27.13	926.02	27.39	926	43.3	924.94	45.42	924.77		
53.91	924.35	62.06	924	71.7	924	79.1	923.52	96.59	922		
96.73	921.96	101.41	920	111.87	918.35	114.12	918	114.62	917.71		
115.54	917.35	119.67	916	123.52	914.71	126.42	914	132.68	912.45		
134.98	912	135.64	911.88	135.72	911.87	137.14	911.78	140.39	911.8		
144.88	911.81	145.55	911.81	146.78	911.88	147.48	912	157.45	912		
158.05	911.87	163.08	910	163.87	909.72	164.15	909.62	166.55	908.17		
166.75	908	167.1	907.78	167.17	907.72	167.74	907.67	172.91	906.96		
173.22	907.58	173.49	908	173.99	908.62	174.47	910	196.54	912.02		
232.54	920	280.78	930								

Manning's n Values		num= 3		Sta n Val		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	163.08	.035	174.47	.06		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	163.08	174.47		103.09	138.9	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 910.99	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.98	* Wt. n-Val.	* 0.000	* 0.035	* 0.000
* W.S. Elev (ft)	* 910.02	* Reach Len. (ft)	* 103.09	* 138.90	* 61.92
* Crit W.S. (ft)	* 910.02	* Flow Area (sq ft)	* 0.00	* 22.14	* 0.00
* E.G. Slope (ft/ft)	* 0.018884	* Area (sq ft)	* 0.00	* 22.14	* 0.00
* Q Total (cfs)	* 175.70	* Flow (cfs)	* 0.00	* 175.70	* 0.00
* Top Width (ft)	* 11.61	* Top width (ft)	* 0.04	* 11.39	* 0.18
* Vel Total (ft/s)	* 7.94	* Avg. Vel. (ft/s)	* 0.13	* 7.94	* 0.14
* Max chl Dpth (ft)	* 3.06	* Hydr. Depth (ft)	* 0.01	* 1.94	* 0.01
* Conv. Total (cfs)	* 1278.6	* Conv. (cfs)	* 0.0	* 1278.6	* 0.0
* Length wtd. (ft)	* 125.42	* Wetted Per. (ft)	* 0.05	* 13.95	* 0.18
* Min Ch El (ft)	* 906.96	* Shear (lb/sq ft)	*	* 1.87	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 280.78	* 0.00	* 0.00
* Frctn Loss (ft)	* 1.87	* Cum Volume (acre-ft)	* 0.00	* 0.19	* 0.07
* C & E Loss (ft)	* 0.18	* Cum SA (acres)	* 0.00	* 0.12	* 0.13

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: Trib 1  
 REACH: Trib 1 RS: 1352.345

INPUT  
 Description:

Station Elevation Data		num= 66		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	930.07	.26	930.04	.51	930	1.32	929.89	8.29	928.89		
14.32	928	19.16	927.54	30.08	926.36	31.67	926.17	33.3	926		
34.34	925.9	47.73	924.61	54.2	924	56.3	923.88	57.59	923.81		
88.84	922	101.43	920.92	102.13	920.86	102.61	920.8	106.2	920.6		
117.63	920	117.81	919.99	122.46	919.72	122.55	919.89	123.3	920		
124.15	920	125.63	919.88	126.31	919.79	141.39	918	151.12	917.25		
157.08	916.89	162.18	916.54	169.68	916	185.93	914.42	190.97	914		
191.68	913.86	193.38	913.52	200.99	912	201.2	912	211.09	910.26		
212.47	910	219.17	908.95	224.59	908	231.28	906.11	231.61	906.05		
231.65	906.04	231.78	905.93	232.27	905.51	234.19	905.5	234.81	905.62		
237.41	907.41	263.56	907.12	282.04	908	286.65	908	286.91	908.07		
294.68	910	299.45	911.23	302.52	912	310.2	913.92	310.44	914		
310.6	914.06	316.43	916	318.9	916.85	322.3	918	354.21	920		
399.33	930										

Manning's n Values		num= 3		Sta n Val		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	224.59	.035	237.41	.06		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	224.59	237.41		147.16	222.54	129.92	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 908.44	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.37	* Wt. n-Val.	* 0.060	* 0.035	* 0.060
* W.S. Elev (ft)	* 908.07	* Reach Len. (ft)	* 147.16	* 222.54	* 129.92
* Crit W.S. (ft)	* 908.07	* Flow Area (sq ft)	* 0.02	* 19.52	* 30.99
* E.G. Slope (ft/ft)	* 0.012014	* Area (sq ft)	* 0.02	* 19.52	* 30.99
* Q Total (cfs)	* 175.70	* Flow (cfs)	* 0.00	* 114.18	* 61.51
* Top Width (ft)	* 62.75	* Top width (ft)	* 0.42	* 12.82	* 49.51
* Vel Total (ft/s)	* 3.48	* Avg. Vel. (ft/s)	* 0.30	* 5.85	* 1.99
* Max Chl Dpth (ft)	* 2.57	* Hydr. Depth (ft)	* 0.04	* 1.52	* 0.63
* Conv. Total (cfs)	* 1603.0	* Conv. (cfs)	* 0.0	* 1041.7	* 561.2
* Length Wtd. (ft)	* 205.20	* Wetted Per. (ft)	* 0.43	* 13.85	* 49.55

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```
* Min Ch El (ft)      * 905.50 * Shear (lb/sq ft)  * 0.03 * 1.06 * 0.47 *
* Alpha              * 1.95  * Stream Power (lb/ft s) * 399.33 * 0.00 * 0.00 *
* Frctn Loss (ft)    * 2.68  * Cum Volume (acre-ft)  * 0.00 * 0.12 * 0.05 *
* C & E Loss (ft)    * 0.02  * Cum SA (acres)        * 0.00 * 0.08 * 0.09 *
*****
```

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: Trib 1  
 REACH: Trib 1                      RS: 1083.880

INPUT  
 Description:

Station Elevation Data		num= 76		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	920	44.13	918.43	45.34	918.39	46.98	918.34	57.29	917.96		
66.46	917.92	80.97	917.33	81.51	917.32	83.4	917.33	86.95	917.29		
112.61	916	120.2	916	132.51	914.57	143.16	914	155.57	912.89		
161.95	912.27	162.68	912.19	164.29	912	180.16	910.34	183.14	910		
183.62	909.93	190.54	908	193.1	907.29	198.47	906	204.66	904.39		
205.66	904	205.84	904	207.25	903.86	221.11	902.77	230.86	902.13		
232.89	902	233.34	901.98	234.66	901.92	238.04	901.73	241.72	901.49		
244.78	901.19	246.01	901.14	256.41	901.41	258.24	900.98	262.76	900		
263.22	899.89	266.87	899.11	267.49	898.88	267.55	898.83	267.97	898.82		
275.19	898.93	275.88	899.71	276.17	900.13	276.44	900.62	278.38	900.53		
279.41	900.54	287.83	900.87	288.68	900.9	315.81	902	319.65	902		
323.28	902	337.1	902.73	350.54	903.23	369.17	904	372.26	905.01		
375.23	906	381.3	907.86	381.75	908	382.61	908.27	388.05	910		
388.86	910.26	389.69	910.52	393.66	911.83	394.18	912	395.5	912.43		
403.48	914	404.87	914.21	416.95	916	417.75	916.12	430.76	918.03		
443.96	920										

Manning's n Values		num= 3		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	256.41	.035	276.44	.06		

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

256.41 276.44

516.84

78.3

187.93

.1

.3

CROSS SECTION OUTPUT Profile #PF 1

```

*****
* E.G. Elev (ft)      * 901.58 * Element      * Left OB * Channel * Right OB *
* Vel Head (ft)      * 0.61  * Wt. n-Val.   *         * 0.035  * 0.060  *
* W.S. Elev (ft)     * 900.97 * Reach Len. (ft) * 0.00 * 0.00 * 0.00 *
* Crit W.S. (ft)     * 900.97 * Flow Area (sq ft) *         * 27.00 * 3.59 *
* E.G. Slope (ft/ft) * 0.014263 * Area (sq ft) *         * 27.00 * 3.59 *
* Q Total (cfs)      * 175.70 * Flow (cfs) *         * 171.41 * 4.29 *
* Top Width (ft)     * 32.15 * Top width (ft) *         * 18.16 * 13.99 *
* Vel Total (ft/s)   * 5.74  * Avg. vel. (ft/s) *         * 6.35 * 1.19 *
* Max Chl Dpth (ft) * 2.15  * Hydr. Depth (ft) *         * 1.49 * 0.26 *
* Conv. Total (cfs)  * 1471.2 * Conv. (cfs) *         * 1435.3 * 35.9 *
* Length Wtd. (ft)  * 0.00  * Wetted Per. (ft) *         * 19.28 * 14.00 *
* Min Ch El (ft)    * 898.82 * Shear (lb/sq ft) *         * 1.25 * 0.23 *
* Alpha             * 1.19  * Stream Power (lb/ft s) * 443.96 * 0.00 * 0.00 *
* Frctn Loss (ft)   * 0.00  * Cum Volume (acre-ft) *         *         *         *
* C & E Loss (ft)   * 0.03  * Cum SA (acres) *         *         *         *
*****

```

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

RIVER: Trib 2  
REACH: Trib 2

RS: 1293.508

INPUT  
Description:

```

Station Elevation Data      num=      68
Sta      Elev      Sta      Elev      Sta      Elev      Sta      Elev      Sta      Elev
*****
0         960        6.92      958      11.17     957.22     16.47     956.09     16.9       956
17.06    955.97     28.07      954      34.79     952.48     36.86      952        42.25     950.75
45.35    950         49.67     949.22     54.37     948.32     56.43      948        59.81     947.38
60.81    947.21     67.14      946      73.98     944.19     74.69      944        76.35     943.57
76.69    943.45     81.66      942      82.68     942        87.59     941.4      97.87     940.09
108.08   939.12    117.15     938.26   119.68     938        122.4     937.75    123.11     937.7
131.08   936.69    133.07     936.46   133.37     936.42    133.57     936.41    138.05     936.85
143.16   937.04    151.89     937.22   160.8      937.45    162.89     937.51    177.41     937.97
184.86   938.67    188.18     938.95   189.84     939.14    190.24     939.27    192.38     940
195.61   941.08    198.24      942      200.07     942.62    201.12     942.59    208.36     942.85
208.86   942.87    210.15     942.63   212.83     942.15    213.01     942.11    213.21     942.21

```

220.91	946	224.58	947.76	225.54	948.24	229.35	950	232.44	951.57
233.44	952	235.43	952.59	240.17	954	241.17	954.21	247.19	956
248.37	956.24	255.48	958	263.61	960				

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .035 131.08 .035 138.05 .035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 131.08 138.05 76.04 126.88 76.93 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

```
*****
* E.G. Elev (ft) * 938.78 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 0.44 * Wt. n-Val. * 0.035 * 0.035 * 0.035 *
* W.S. Elev (ft) * 938.33 * Reach Len. (ft) * 76.04 * 126.88 * 76.93 *
* Crit W.S. (ft) * 938.33 * Flow Area (sq ft) * 11.31 * 12.09 * 37.64 *
* E.G. Slope (ft/ft) * 0.013633 * Area (sq ft) * 11.31 * 12.09 * 37.64 *
* Q Total (cfs) * 303.00 * Flow (cfs) * 46.83 * 86.18 * 169.99 *
* Top Width (ft) * 64.92 * Top width (ft) * 14.71 * 6.97 * 43.24 *
* Vel Total (ft/s) * 4.96 * Avg. Vel. (ft/s) * 4.14 * 7.13 * 4.52 *
* Max Chl Dpth (ft) * 1.92 * Hydr. Depth (ft) * 0.77 * 1.73 * 0.87 *
* Conv. Total (cfs) * 2595.1 * Conv. (cfs) * 401.1 * 738.1 * 1455.9 *
* Length wtd. (ft) * 94.05 * Wetted Per. (ft) * 14.81 * 7.01 * 43.27 *
* Min Ch El (ft) * 936.41 * Shear (lb/sq ft) * 0.65 * 1.47 * 0.74 *
* Alpha * 1.16 * Stream Power (lb/ft s) * 263.61 * 0.00 * 0.00 *
* Frctn Loss (ft) * 1.03 * Cum Volume (acre-ft) * 0.09 * 0.08 * 0.06 *
* C & E Loss (ft) * 0.01 * Cum SA (acres) * 0.12 * 0.04 * 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 energy loss was 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: Trib 2  
 REACH: Trib 2 RS: 1159.413

INPUT  
 Description:  
 Station Elevation Data num= 105

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Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960	6.65	958	10.82	957	15.24	956	17.08	955.33
20.5	954	23.7	952.78	25.76	952	29.85	950.38	30.51	950.11
30.77	950	31.21	949.82	35.43	948	39.11	946.47	40.38	946
42.21	945.29	46.26	944	53.16	942.04	53.33	942	53.41	941.98
65.75	940	69.76	939.37	73.05	938.88	80.28	938	81.51	937.85
82.62	937.73	91.12	936.59	95.48	936	97.49	935.89	98.47	935.77
98.8	935.89	99.19	936	100.9	936.79	103.82	937.66	104.11	937.66
106.98	937.67	110.63	937.08	115.17	937.53	115.82	937.6	115.85	937.61
116.02	937.67	116.25	937.67	119.44	937.51	122.06	936.6	124.49	936
124.83	935.91	126.37	935.52	129.8	935.45	130.01	935.45	134.79	935.31
184.34	934.3	194.41	934.09	194.89	934.08	198.88	934	213.13	934
221.76	933.47	226.62	932.98	228.42	932.27	228.87	932.22	229.53	932.23
231.22	932.37	233.97	932.66	237.73	933.86	238.17	934	239.79	934.52
242.86	936	243.61	936.42	245.86	937.56	251.91	937.95	252.94	938.02
253.26	938.03	253.47	938.03	253.9	938	254.46	938	261.43	937.52
261.45	937.51	261.68	937.5	263.42	937.41	264.59	937.72	265.39	938
266.3	938.3	270.1	939.55	271.25	939.88	271.6	940	271.98	940.11
277.9	942	279.69	942.55	284.82	944	288.89	945.15	291.92	946
293.54	946.44	296.18	946.91	299.1	948	301.91	948.95	305.01	950
306.79	950.62	310.34	952	312.48	952.72	315.83	954	318.57	954.98
320.92	955.53	322.41	956	325.37	956.92	328.76	958	335.19	960

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	226.62	.035	233.97	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	226.62	233.97		41.58	119.28	71.28	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 935.27	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.42	* Wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 934.85	* Reach Len. (ft)	* 41.58	* 119.28	* 71.28
* Crit W.S. (ft)	* 934.85	* Flow Area (sq ft)	* 47.16	* 17.63	* 7.44
* E.G. Slope (ft/ft)	* 0.008935	* Area (sq ft)	* 47.16	* 17.63	* 7.44
* Q Total (cfs)	* 303.00	* Flow (cfs)	* 146.48	* 124.99	* 31.52
* Top Width (ft)	* 83.05	* Top width (ft)	* 69.20	* 7.35	* 6.50
* Vel Total (ft/s)	* 4.19	* Avg. vel. (ft/s)	* 3.11	* 7.09	* 4.23
* Max chl Dpth (ft)	* 2.63	* Hydr. Depth (ft)	* 0.68	* 2.40	* 1.14
* Conv. Total (cfs)	* 3205.5	* Conv. (cfs)	* 1549.7	* 1322.3	* 333.5
* Length wtd. (ft)	* 73.88	* Wetted Per. (ft)	* 69.25	* 7.51	* 6.87
* Min ch El (ft)	* 932.22	* Shear (lb/sq ft)	* 0.38	* 1.31	* 0.60
* Alpha	* 1.55	* Stream Power (lb/ft s)	* 335.19	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.80	* Cum Volume (acre-ft)	* 0.04	* 0.04	* 0.02
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 0.05	* 0.02	* 0.03

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical

depth for the water surface and continued on with the calculations.  
 Warning: The energy loss was 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: Trib 2  
 REACH: Trib 2 RS: 1030.844

INPUT  
 Description:

Station Elevation Data num= 86

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	950	.77	949.7	4.69	948	10.01	946.3	10.87	946
12.24	945.59	19.11	944	20.32	943.72	27.09	942	36.87	940.69
43.4	940	44.81	939.85	55.29	938.77	59.92	938.28	62.39	938
62.88	937.96	63.9	937.89	66.83	937.63	85.74	936	94.69	935.33
103.34	934.7	113.41	934	122.81	934	158.02	932.96	165.66	932.9
171.97	932.76	174.56	932.7	179.24	932.57	180.02	932.54	198.58	932
200.3	931.95	223.22	931.58	233.8	931.88	235.97	931.94	237.04	931.86
247.93	931.05	262.23	930	265.81	929.74	271.79	929.55	273.11	929.52
273.38	929.23	274.44	928.73	275.49	928.76	276.43	928.88	276.7	929.03
277.45	929.54	281.45	929.77	285.33	930	285.43	930.01	286.29	930.07
287.2	930.13	306.48	931.52	312.44	931.92	313.28	932	314.42	932.11
315.51	932.21	317.32	932.35	317.47	932.36	320.2	932.45	326.81	932.59
327.27	932.6	330.31	932.67	330.39	932.67	331.1	932.55	332.38	932.37
332.64	932.33	333.27	932.49	339.31	934	346.64	935.84	347.25	936
355.05	937.95	355.24	938	355.37	938.03	355.89	938.15	364.33	940
367.31	940.66	370.78	941.39	373.55	942	376.93	942.81	382.38	944
385.59	944.88	390.35	946	395.96	947.78	396.69	948	397.39	948.2
403.1	950								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	273.11	.035	277.45	.035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 273.11 277.45 724.28 31.12 41.67 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

\* E.G. Elev (ft) \* 931.72 \* Element \* Left OB \* Channel \* Right OB \*

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```

* Vel Head (ft) * 0.50 * wt. n-Val. * 0.035 * 0.035 *
* W.S. Elev (ft) * 931.22 * Reach Len. (ft) * 0.00 * 0.00 *
* Crit W.S. (ft) * 931.22 * Flow Area (sq ft) * 26.63 * 9.79 *
* E.G. Slope (ft/ft) * 0.013317 * Area (sq ft) * 26.63 * 9.79 *
* Q Total (cfs) * 303.00 * Flow (cfs) * 127.58 * 77.37 *
* Top Width (ft) * 56.69 * Top width (ft) * 27.48 * 4.34 *
* Vel Total (ft/s) * 5.20 * Avg. vel. (ft/s) * 4.79 * 7.90 *
* Max Chl Dpth (ft) * 2.49 * Hydr. Depth (ft) * 0.97 * 2.26 *
* Conv. Total (cfs) * 2625.7 * Conv. (cfs) * 1105.6 * 670.5 *
* Length Wtd. (ft) * 0.00 * Wetted Per. (ft) * 27.53 * 4.78 *
* Min Ch El (ft) * 928.73 * Shear (lb/sq ft) * 0.80 * 1.70 *
* Alpha * 1.19 * Stream Power (lb/ft s) * 403.10 * 0.00 *
* Frctn Loss (ft) * 0.00 * Cum Volume (acre-ft) * * *
* C & E Loss (ft) * 0.02 * Cum SA (acres) * * *
*****

```

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

RIVER: Trib 3  
 REACH: Trib 3 RS: 1842.591

INPUT  
 Description:

Station		Elevation Data		num=	81	Station		Elevation Data		
Sta	Elev	Sta	Elev		Sta	Elev	Sta	Elev	Sta	Elev
0	1000	6.4	999.28		20.27	998	20.42	998	44.98	997.36
52.96	997.15	60.15	996.93		64.74	996.81	74.8	996.62	82.49	996.29
88.19	996	92.42	995.25		99.72	994	106.71	992.75	110.98	992
121.35	990	127.51	988.78		131.29	988	135.66	987.27	137.17	986.94
142.11	986	152.25	984.2		153.42	984	153.82	983.9	155.97	983.64
167.51	982	173.15	981.05		177.24	980	179.83	979.35	180.72	979.3
182.8	979.21	189.91	979.03		205.77	978	206.05	978	207.36	977.92
207.76	977.89	223.86	976.82		243.23	976	248.81	975.84	256.19	975.49
257.03	975.45	270.58	975.11		278.56	974.91	280.77	974.66	286.86	974.22
287.94	974	291.06	973.47		291.14	973.42	291.54	973.07	292.08	972.37
292.27	972.34	292.53	972.29		293.2	972.37	293.92	972.5	306.91	973.1
307.39	973.1	308.53	972.74		311.83	972.59	311.86	972.61	312.46	973.01
313	973.06	314.5	973.26		318.97	974	322.06	974.54	323.99	974.92
330.34	976	334.36	976.65		341.86	978	350.17	979.44	351.08	979.59
353.42	980	354.85	980.31		360.68	982	365.18	983.32	367.59	983.72
368.88	984	371	984.46		377.87	986	384.9	987.4	387.97	988



397.92 990

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .035 287.94 .035 318.97 .06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 287.94 318.97 232.84 249 40.66 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

\*\*\*\*\*  
 \* E.G. Elev (ft) \* 974.76 \* Element \* Left OB \* Channel \* Right OB \*  
 \* Vel Head (ft) \* 0.59 \* Wt. n-Val. \* 0.035 \* 0.035 \* 0.060 \*  
 \* W.S. Elev (ft) \* 974.17 \* Reach Len. (ft) \* 232.84 \* 249.00 \* 40.66 \*  
 \* Crit W.S. (ft) \* 974.17 \* Flow Area (sq ft) \* 0.07 \* 35.92 \* 0.08 \*  
 \* E.G. Slope (ft/ft) \* 0.018019 \* Area (sq ft) \* 0.07 \* 35.92 \* 0.08 \*  
 \* Q Total (cfs) \* 221.90 \* Flow (cfs) \* 0.07 \* 221.77 \* 0.05 \*  
 \* Top Width (ft) \* 32.82 \* Top width (ft) \* 0.83 \* 31.03 \* 0.96 \*  
 \* Vel Total (ft/s) \* 6.15 \* Avg. vel. (ft/s) \* 1.08 \* 6.17 \* 0.63 \*  
 \* Max Chl Dpth (ft) \* 1.88 \* Hydr. Depth (ft) \* 0.08 \* 1.16 \* 0.08 \*  
 \* Conv. Total (cfs) \* 1653.1 \* Conv. (cfs) \* 0.6 \* 1652.1 \* 0.4 \*  
 \* Length Wtd. (ft) \* 239.14 \* Wetted Per. (ft) \* 0.84 \* 31.86 \* 0.98 \*  
 \* Min Ch El (ft) \* 972.29 \* Shear (lb/sq ft) \* 0.09 \* 1.27 \* 0.09 \*  
 \* Alpha \* 1.01 \* Stream Power (lb/ft s) \* 397.92 \* 0.00 \* 0.00 \*  
 \* Frctn Loss (ft) \* 3.40 \* Cum Volume (acre-ft) \* 0.24 \* 0.53 \* 0.08 \*  
 \* C & E Loss (ft) \* 0.01 \* Cum SA (acres) \* 0.26 \* 0.23 \* 0.03 \*  
 \*\*\*\*\*

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.  
 Warning: The energy loss was 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: Trib 3  
 REACH: Trib 3 RS: 1574.434

INPUT

Description:  
 Station Elevation Data num= 70  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 \*\*\*\*\*

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0	990	10	988	15.71	987.15	19.89	986.59	23.54	986
25.41	985.57	32.23	984	36.68	982.82	39.63	982	42.32	981.26
47.1	980	49.68	979.16	53.9	978	56.77	976.83	58.83	976
63.08	974.23	63.71	974	67.16	972.75	69.22	972	73.69	970.74
74.68	970.49	75.24	970.4	77.74	970	82.68	969.7	95.02	968
102.03	968	117.68	966.58	117.78	966.58	118.1	966.54	118.17	966.36
118.51	966.01	118.52	966	118.54	965.99	119.41	964.47	126.22	966
126.42	966.04	127.48	966.59	137.35	968	139.81	968.28	155.28	970
163.75	970	163.78	970	202.11	971.68	206.2	971.8	211.52	972
256.73	972	266.44	973.46	272.28	973.45	273.54	973.48	279.85	973.6
286.83	974	315.66	974	340.26	975.28	341.26	975.3	342.57	975.33
355.08	976	358.38	976	368.38	976.86	382.99	978	391.58	979.77
392.53	980	393.63	980.26	400.41	982	406.71	983.46	408.96	984
410.89	984.37	417.72	986	421.38	986.59	427.73	988	442.56	990

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	117.68	.035	127.48	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	117.68	127.48		206.74	191.29	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 968.56	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.70	* Wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 967.85	* Reach Len. (ft)	* 206.74	* 191.29	* 82.26
* Crit W.S. (ft)	* 967.85	* Flow Area (sq ft)	* 8.93	* 23.37	* 5.58
* E.G. Slope (ft/ft)	* 0.011533	* Area (sq ft)	* 8.93	* 23.37	* 5.58
* Q Total (cfs)	* 221.90	* Flow (cfs)	* 30.04	* 173.26	* 18.61
* Top Width (ft)	* 32.67	* Top width (ft)	* 14.03	* 9.80	* 8.84
* Vel Total (ft/s)	* 5.86	* Avg. Vel. (ft/s)	* 3.36	* 7.41	* 3.33
* Max Chl Dpth (ft)	* 3.38	* Hydr. Depth (ft)	* 0.64	* 2.38	* 0.63
* Conv. Total (cfs)	* 2066.3	* Conv. (cfs)	* 279.7	* 1613.3	* 173.3
* Length Wtd. (ft)	* 190.24	* Wetted Per. (ft)	* 14.09	* 11.27	* 8.93
* Min Ch El (ft)	* 964.47	* Shear (lb/sq ft)	* 0.46	* 1.49	* 0.45
* Alpha	* 1.32	* Stream Power (lb/ft s)	* 442.56	* 0.00	* 0.00
* Frctn Loss (ft)	* 2.45	* Cum Volume (acre-ft)	* 0.22	* 0.36	* 0.08
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 0.22	* 0.11	* 0.03

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth

for the water surface and continued on with the calculations.

Warning: The energy loss was 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: Trib 3  
 REACH: Trib 3 RS: 1370.118

INPUT  
 Description:

Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	980	6.3	978	8.38	977.64	13.94	976	17.71	975.16
23.15	974	25.83	973.24	30.31	972	37.29	970.07	37.52	970
38.72	969.66	44.36	968	52.77	966.36	54.46	966.03	54.63	966
54.66	966	59.8	965.14	66.71	964	75.77	962.58	79.73	962
88.98	960.2	89.65	960.07	89.95	960	98.13	959.7	98.24	959.57
100.71	958.34	104.95	959.42	110.62	960.9	110.78	960.98	119.04	961.45
132.13	962	137.13	962	148.73	962.58	157.81	963.03	170.75	964
204.44	965.56	218.52	966	218.77	966	220.23	966.05	241.28	966.9
256.7	968	366.5	996	396.2	996	467.6	980	479.77	980

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	98.13	.035	110.78	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	98.13	110.78		227.21	215.79	21.44	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 961.82	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.64	* Wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 961.18	* Reach Len. (ft)	* 227.21	* 215.79	* 21.44
* Crit W.S. (ft)	* 961.18	* Flow Area (sq ft)	* 14.36	* 21.21	* 0.34
* E.G. Slope (ft/ft)	* 0.014524	* Area (sq ft)	* 14.36	* 21.21	* 0.34
* Q Total (cfs)	* 221.90	* Flow (cfs)	* 73.70	* 147.83	* 0.38
* Top Width (ft)	* 30.30	* Top width (ft)	* 14.18	* 12.65	* 3.48
* Vel Total (ft/s)	* 6.18	* Avg. vel. (ft/s)	* 5.13	* 6.97	* 1.09
* Max Chl Dpth (ft)	* 2.84	* Hydr. Depth (ft)	* 1.01	* 1.68	* 0.10
* Conv. Total (cfs)	* 1841.3	* Conv. (cfs)	* 611.5	* 1226.6	* 3.1
* Length Wtd. (ft)	* 188.26	* Wetted Per. (ft)	* 14.30	* 13.34	* 3.48
* Min Ch El (ft)	* 958.34	* Shear (lb/sq ft)	* 0.91	* 1.44	* 0.09
* Alpha	* 1.08	* Stream Power (lb/ft s)	* 479.77	* 0.00	* 0.00
* Frctn Loss (ft)	* 1.40	* Cum Volume (acre-ft)	* 0.16	* 0.26	* 0.07
* C & E Loss (ft)	* 0.11	* Cum SA (acres)	* 0.15	* 0.06	* 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 conveyance ratio (upstream 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: Trib 3  
 REACH: Trib 3

RS: 1126.884

INPUT

Description:

Station Elevation Data		num= 115		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	980	9.03	978.1	9.52	978	10.1	977.88	18.57	976
23.53	974.92	27.67	974	30.94	973.26	36.86	972	41.73	970.97
46.43	970	50.91	969.02	56.12	968	66.26	966.03	66.41	966
66.48	965.99	66.71	965.94	68.56	965.69	70.27	965.75	71.33	965.71
72.12	965.68	75.26	966	77.3	966	90.43	964.28	92.56	964
92.72	963.98	92.87	963.96	100.81	963.21	104.88	962.51	107.18	962
110.33	961.68	120.99	960.57	126.29	960	127.9	959.87	128.13	959.85
138.1	958.98	156.3	958.07	157.07	958.02	157.15	958.01	157.32	958.01
157.68	958	163.84	957.92	202.16	957.39	210.95	957.27	212.49	957.27
213.32	957.27	222.3	957.1	224.62	957.03	246.62	956.03	248.38	956
256.86	955.52	279.62	955.29	284.16	954.19	284.47	954.05	284.65	954
287.2	952	291.87	953.51	292.71	954	292.85	954.16	293.42	954.37
299.08	954.41	299.22	954.41	306.22	954.81	318.34	955.34	333.26	956
348.54	956	351.7	956.16	352.19	956.16	352.37	956.17	357.02	956.45
370.63	957.14	372.78	957.25	384.84	957.97	385.08	957.98	385.38	958
385.86	958	389.33	958.28	409.3	960	413.52	960	457.56	961.45
459.36	961.51	474.72	962	474.93	962	521.34	963.57	534.61	964
536.11	964.15	537.07	964.19	538.1	964.25	548.77	964.64	572.95	965.53
573.22	965.53	576.97	965.64	584.38	966	594.95	966	618.72	967.34
621.77	967.36	633.66	967.97	634.12	968	641.73	968.53	645.69	968.89
658.74	970	663.93	970.44	672.77	971.43	677.96	972	742.87	972
759.83	972.67	762.87	972.77	784.57	974	797.65	974.9	811.04	975.67
814.8	975.9	816.69	976	818.77	976.28	831.01	978	842.35	980

Manning's n Values		num= 3		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val
0	.035	284.16	.035	293.42	.035

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Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 284.16 293.42 54.31 34.66 9.68 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

```

*****
* E.G. Elev (ft) * 956.08 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 0.27 * Wt. n-Val. * 0.035 * 0.035 * 0.035 *
* W.S. Elev (ft) * 955.81 * Reach Len. (ft) * 54.31 * 34.66 * 9.68 *
* Crit W.S. (ft) * 955.65 * Flow Area (sq ft) * 14.82 * 25.13 * 28.04 *
* E.G. Slope (ft/ft) * 0.004521 * Area (sq ft) * 14.82 * 25.13 * 28.04 *
* Q Total (cfs) * 221.90 * Flow (cfs) * 25.03 * 128.59 * 68.29 *
* Top Width (ft) * 77.23 * Top width (ft) * 32.42 * 9.26 * 35.54 *
* Vel Total (ft/s) * 3.26 * Avg. vel. (ft/s) * 1.69 * 5.12 * 2.44 *
* Max Chl Dpth (ft) * 3.81 * Hydr. Depth (ft) * 0.46 * 2.71 * 0.79 *
* Conv. Total (cfs) * 3300.1 * Conv. (cfs) * 372.2 * 1912.3 * 1015.6 *
* Length wtd. (ft) * 34.66 * Wetted Per. (ft) * 32.56 * 10.47 * 35.58 *
* Min Ch El (ft) * 952.00 * Shear (lb/sq ft) * 0.13 * 0.68 * 0.22 *
* Alpha * 1.63 * Stream Power (lb/ft s) * 842.35 * 0.00 * 0.00 *
* Frctn Loss (ft) * * Cum volume (acre-ft) * 0.09 * 0.14 * 0.06 *
* C & E Loss (ft) * * Cum SA (acres) * 0.03 * 0.01 * 0.01 *
*****
    
```

CULVERT

RIVER: Trib 3  
 REACH: Trib 3 RS: 1109.439

INPUT

Description:  
 Distance from Upstream XS = 11  
 Deck/Roadway width = 10  
 Weir Coefficient = 2.6  
 Upstream Deck/Roadway Coordinates  
 num= 2  
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord  
 \*\*\*\*\*  
 284.16 954.19 0 306.22 954.81 0

Upstream Bridge Cross Section Data

Station Elevation Data num= 115

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	980	9.03	978.1	9.52	978	10.1	977.88	18.57	976
23.53	974.92	27.67	974	30.94	973.26	36.86	972	41.73	970.97
46.43	970	50.91	969.02	56.12	968	66.26	966.03	66.41	966
66.48	965.99	66.71	965.94	68.56	965.69	70.27	965.75	71.33	965.71
72.12	965.68	75.26	966	77.3	966	90.43	964.28	92.56	964
92.72	963.98	92.87	963.96	100.81	963.21	104.88	962.51	107.18	962
110.33	961.68	120.99	960.57	126.29	960	127.9	959.87	128.13	959.85
138.1	958.98	156.3	958.07	157.07	958.02	157.15	958.01	157.32	958.01

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157.68	958	163.84	957.92	202.16	957.39	210.95	957.27	212.49	957.27
213.32	957.27	222.3	957.1	224.62	957.03	246.62	956.03	248.38	956
256.86	955.52	279.62	955.29	284.16	954.19	284.47	954.05	284.65	954
287.2	952	291.87	953.51	292.71	954	292.85	954.16	293.42	954.37
299.08	954.41	299.22	954.41	306.22	954.81	318.34	955.34	333.26	956
348.54	956	351.7	956.16	352.19	956.16	352.37	956.17	357.02	956.45
370.63	957.14	372.78	957.25	384.84	957.97	385.08	957.98	385.38	958
385.86	958	389.33	958.28	409.3	960	413.52	960	457.56	961.45
459.36	961.51	474.72	962	474.93	962	521.34	963.57	534.61	964
536.11	964.15	537.07	964.19	538.1	964.25	548.77	964.64	572.95	965.53
573.22	965.53	576.97	965.64	584.38	966	594.95	966	618.72	967.34
621.77	967.36	633.66	967.97	634.12	968	641.73	968.53	645.69	968.89
658.74	970	663.93	970.44	672.77	971.43	677.96	972	742.87	972
759.83	972.67	762.87	972.77	784.57	974	797.65	974.9	811.04	975.67
814.8	975.9	816.69	976	818.77	976.28	831.01	978	842.35	980

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	284.16	.035	293.42	.035

Bank Sta: Left Right Coeff Contr. Expan.

284.16	293.42	.1	.3
--------	--------	----	----

Downstream Deck/Roadway Coordinates num= 2

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
228.78	954.26	0	300.13	954.27	0				

Downstream Bridge Cross Section Data Station Elevation Data num= 114

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	970	7.75	968	14.33	966.27	15.77	966	18.18	965.58
27.24	964	28.93	963.74	34.28	963.02	36.34	962.71	37.55	962.38
37.58	962.38	39.35	962.55	40	962.65	44.1	962.3	52.15	961.38
59.99	960.73	66.63	960.17	67.26	960.12	68.38	960	85.41	958.71
96.78	958	98.95	957.89	110.89	957.26	145.41	956.82	165.27	956.8
175.54	956.82	178.9	956.75	183.31	956.63	187.82	956.5	193.61	956.23
194.94	956.21	201.39	956.1	206.69	956	207.42	956	218.14	955.11
228.78	954.26	237.22	953.56	238.57	953.45	245.56	953.4	248.36	953.46
250.52	953.38	253.9	952.89	262.36	952.08	262.66	952	262.87	952
269.68	950.39	273.17	952	273.53	952.14	286.94	953.77	288.62	953.92
289.42	953.99	289.43	953.99	289.76	953.86	289.96	953.86	290.36	953.87
293.53	954	300.13	954.27	302.74	954.29	303.16	954.26	303.27	954.27
303.36	954.27	303.73	954.33	313.71	954.89	326.65	955.61	331.76	956
337.5	956.47	349.95	957.63	353.91	958	358.14	958	371.05	958.7
372.07	958.74	386.07	959.36	392.59	959.61	397.93	960	438.81	961.29
441.87	961.37	460.75	962	461.51	962	463.53	962.14	469.25	962.28
490.96	962.99	499.69	963.21	524.28	964	538.22	965.41	546.78	965.74
546.93	965.75	554.09	966	566.14	967.05	577.89	968	579.37	968.11

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579.54	968.13	579.73	968.15	582.66	968.33	584.56	968.41	596.64	968.9
609.91	970	629.18	970	633.26	970.34	638.47	970.79	647.29	971.19
652.77	972	729.9	972	737.49	972.32	767.13	973.45	768.34	973.49
777.47	974	804.59	975.83	807.59	976	808.71	976	811.35	976.32
813.23	976.57	822.26	978	823.4	978.2	833.21	980		

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 \*\*\*\*\*  
 0 .035 262.36 .035 273.53 .035

Bank Sta: Left Right Coeff Contr. Expan.  
 262.36 273.53 .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 Culverts = 1

Culvert Name Shape Rise Span  
 Culvert #1 Circular 1.25  
 FHWA Chart # 2 - Corrugated Metal Pipe Culvert  
 FHWA Scale # 3 - Pipe projecting from fill  
 Solution Criteria = Highest U.S. EG

Culvert Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
6.7	21.4	.024	.024	0	.9	1

Upstream Elevation = 952.39  
 Centerline Station = 287.2  
 Downstream Elevation = 952.12  
 Centerline Station = 269.5

CULVERT OUTPUT Profile #PF 1 Culv Group: Culvert #1

\*\*\*\*\*  
 \* Q Culv Group (cfs) \* 8.54 \* Culv Full Len (ft) \* 21.40 \*  
 \* # Barrels \* 1 \* Culv Vel US (ft/s) \* 6.96 \*  
 \* Q Barrel (cfs) \* 8.54 \* Culv Vel DS (ft/s) \* 6.96 \*  
 \* E.G. US. (ft) \* 956.08 \* Culv Inv El Up (ft) \* 952.39 \*  
 \* W.S. US. (ft) \* 955.81 \* Culv Inv El Dn (ft) \* 952.12 \*  
 \* E.G. DS (ft) \* 954.05 \* Culv Frctn Ls (ft) \* 1.27 \*  
 \* W.S. DS (ft) \* 953.38 \* Culv Exit Loss (ft) \* 0.08 \*  
 \* Delta EG (ft) \* 2.04 \* Culv Entr Loss (ft) \* 0.68 \*  
 \* Delta WS (ft) \* 2.43 \* Q Weir (cfs) \* 212.96 \*  
 \* E.G. IC (ft) \* 956.08 \* Weir Sta Lft (ft) \* 245.45 \*  
 \* E.G. OC (ft) \* 956.08 \* Weir Sta Rgt (ft) \* 350.18 \*  
 \* Culvert Control \* Outlet \* Weir Submerg \* 0.00 \*  
 \* Culv WS Inlet (ft) \* 953.64 \* Weir Max Depth (ft) \* 1.89 \*  
 \* Culv WS Outlet (ft) \* 953.37 \* Weir Avg Depth (ft) \* 0.75 \*

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\* Culv Nm1 Depth (ft) \* \* Weir Flow Area (sq ft) \* 79.05 \*  
 \* Culv Crt Depth (ft) \* 1.14 \* Min El Weir Flow (ft) \* 954.27 \*  
 \*\*\*\*\*

CROSS SECTION

RIVER: Trib 3  
 REACH: Trib 3 RS: 1089.963

INPUT  
 Description:

Station Elevation Data		num= 114		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	970	7.75	968	14.33	966.27	15.77	966	18.18	965.58		
27.24	964	28.93	963.74	34.28	963.02	36.34	962.71	37.55	962.38		
37.58	962.38	39.35	962.55	40	962.65	44.1	962.3	52.15	961.38		
59.99	960.73	66.63	960.17	67.26	960.12	68.38	960	85.41	958.71		
96.78	958	98.95	957.89	110.89	957.26	145.41	956.82	165.27	956.8		
175.54	956.82	178.9	956.75	183.31	956.63	187.82	956.5	193.61	956.23		
194.94	956.21	201.39	956.1	206.69	956	207.42	956	218.14	955.11		
228.78	954.26	237.22	953.56	238.57	953.45	245.56	953.4	248.36	953.46		
250.52	953.38	253.9	952.89	262.36	952.08	262.66	952	262.87	952		
269.68	950.39	273.17	952	273.53	952.14	286.94	953.77	288.62	953.92		
289.42	953.99	289.43	953.99	289.76	953.86	289.96	953.86	290.36	953.87		
293.53	954	300.13	954.27	302.74	954.29	303.16	954.26	303.27	954.27		
303.36	954.27	303.73	954.33	313.71	954.89	326.65	955.61	331.76	956		
337.5	956.47	349.95	957.63	353.91	958	358.14	958	371.05	958.7		
372.07	958.74	386.07	959.36	392.59	959.61	397.93	960	438.81	961.29		
441.87	961.37	460.75	962	461.51	962	463.53	962.14	469.25	962.28		
490.96	962.99	499.69	963.21	524.28	964	538.22	965.41	546.78	965.74		
546.93	965.75	554.09	966	566.14	967.05	577.89	968	579.37	968.11		
579.54	968.13	579.73	968.15	582.66	968.33	584.56	968.41	596.64	968.9		
609.91	970	629.18	970	633.26	970.34	638.47	970.79	647.29	971.19		
652.77	972	729.9	972	737.49	972.32	767.13	973.45	768.34	973.49		
777.47	974	804.59	975.83	807.59	976	808.71	976	811.35	976.32		
813.23	976.57	822.26	978	823.4	978.2	833.21	980				

Manning's n Values		num= 3		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.035	262.36	.035	273.53	.035		

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 262.36 273.53 482.6 81.36 254.05 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

\*\*\*\*\*  
 \* E.G. Elev (ft) \* 954.05 \* Element \* Left OB \* Channel \* Right OB \*  
 \* Vel Head (ft) \* 0.67 \* Wt. n-Val. \* 0.035 \* 0.035 \* 0.035 \*  
 \* W.S. Elev (ft) \* 953.38 \* Reach Len. (ft) \* 0.00 \* 0.00 \* 0.00 \*  
 \*\*\*\*\*



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* Crit W.S. (ft)	* 953.38	* Flow Area (sq ft)	* 8.39	* 23.66	* 6.32
* E.G. Slope (ft/ft)	* 0.011404	* Area (sq ft)	* 8.39	* 23.66	* 6.32
* Q Total (cfs)	* 221.90	* Flow (cfs)	* 30.12	* 171.07	* 20.71
* Top Width (ft)	* 33.20	* Top width (ft)	* 11.83	* 11.17	* 10.19
* Vel Total (ft/s)	* 5.78	* Avg. Vel. (ft/s)	* 3.59	* 7.23	* 3.28
* Max Chl Dpth (ft)	* 2.99	* Hydr. Depth (ft)	* 0.71	* 2.12	* 0.62
* Conv. Total (cfs)	* 2077.9	* Conv. (cfs)	* 282.0	* 1601.9	* 194.0
* Length Wtd. (ft)	* 0.00	* Wetted Per. (ft)	* 11.91	* 11.75	* 10.27
* Min Ch El (ft)	* 950.39	* Shear (lb/sq ft)	* 0.50	* 1.43	* 0.44
* Alpha	* 1.29	* Stream Power (lb/ft s)	* 833.21	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.00	* Cum Volume (acre-ft)	*	*	*
* C & E Loss (ft)	* 0.18	* Cum SA (acres)	*	*	*

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.

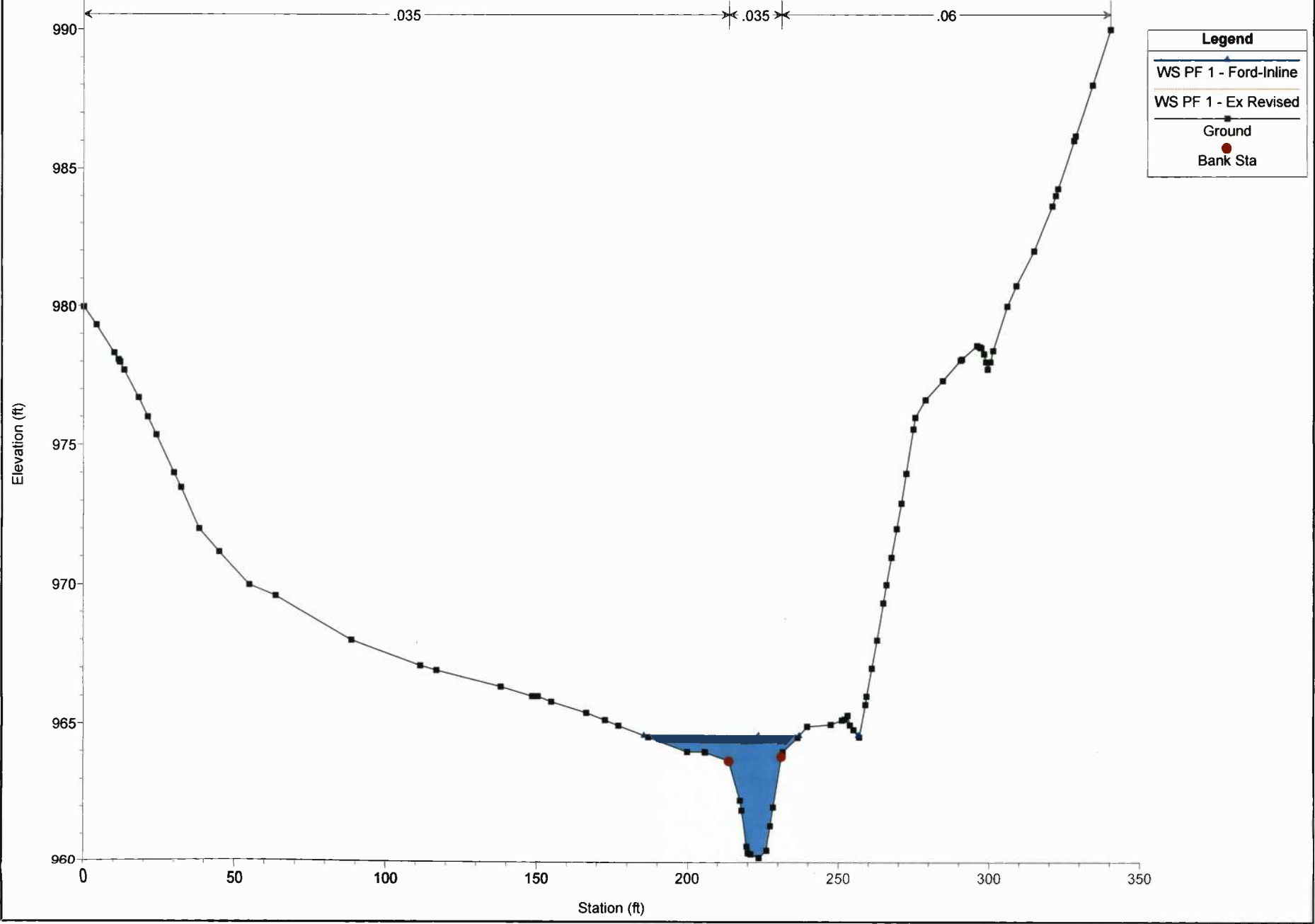
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water

surface came back below critical depth. This indicates that there is not a valid subcritical answer. The

program

defaulted to critical depth.

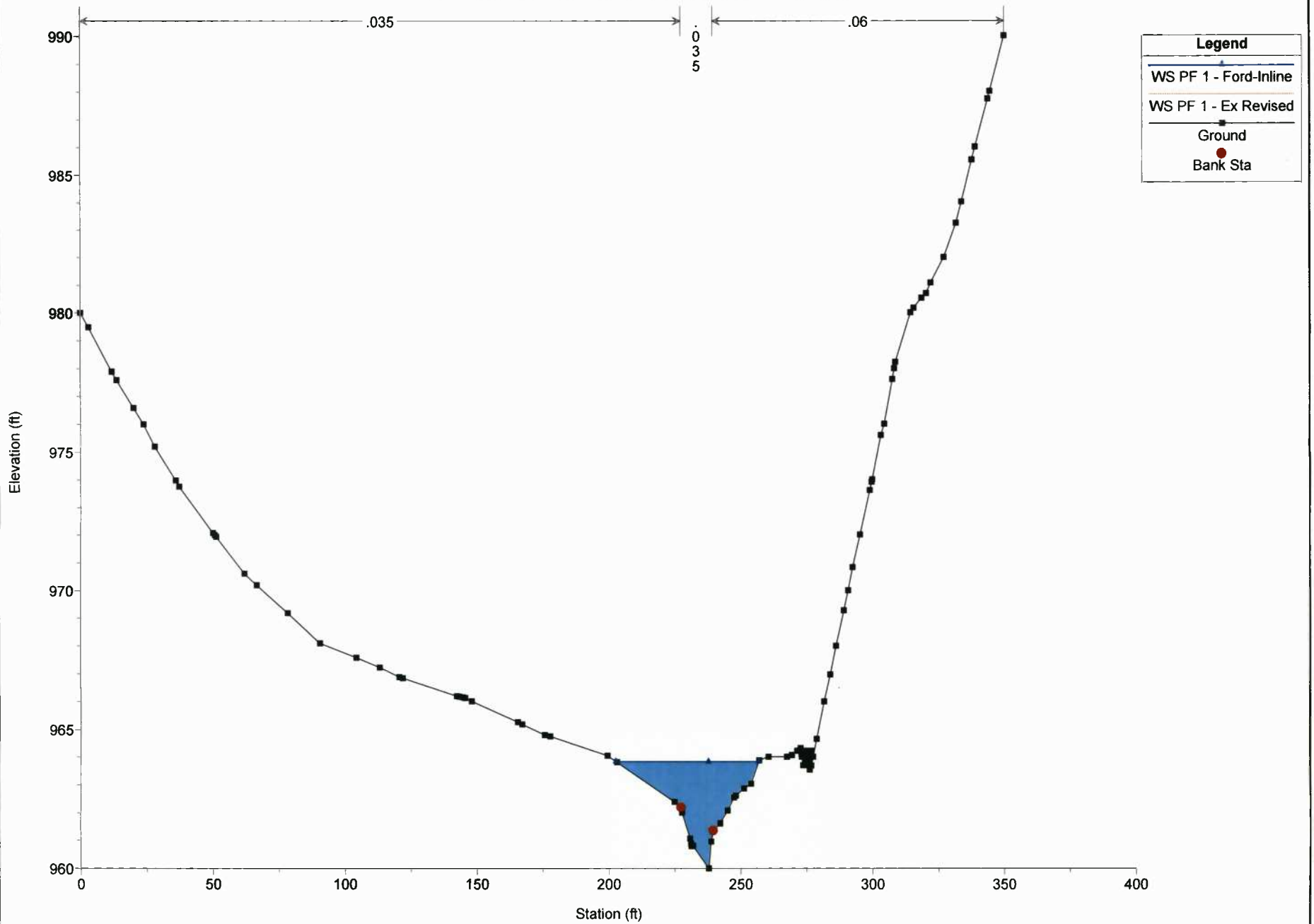
OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised  
Geom: Ford-Inline Flow: Structures Revised  
River = Bluestone Creek Reach = Bluestone Creek RS = 14659.36



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

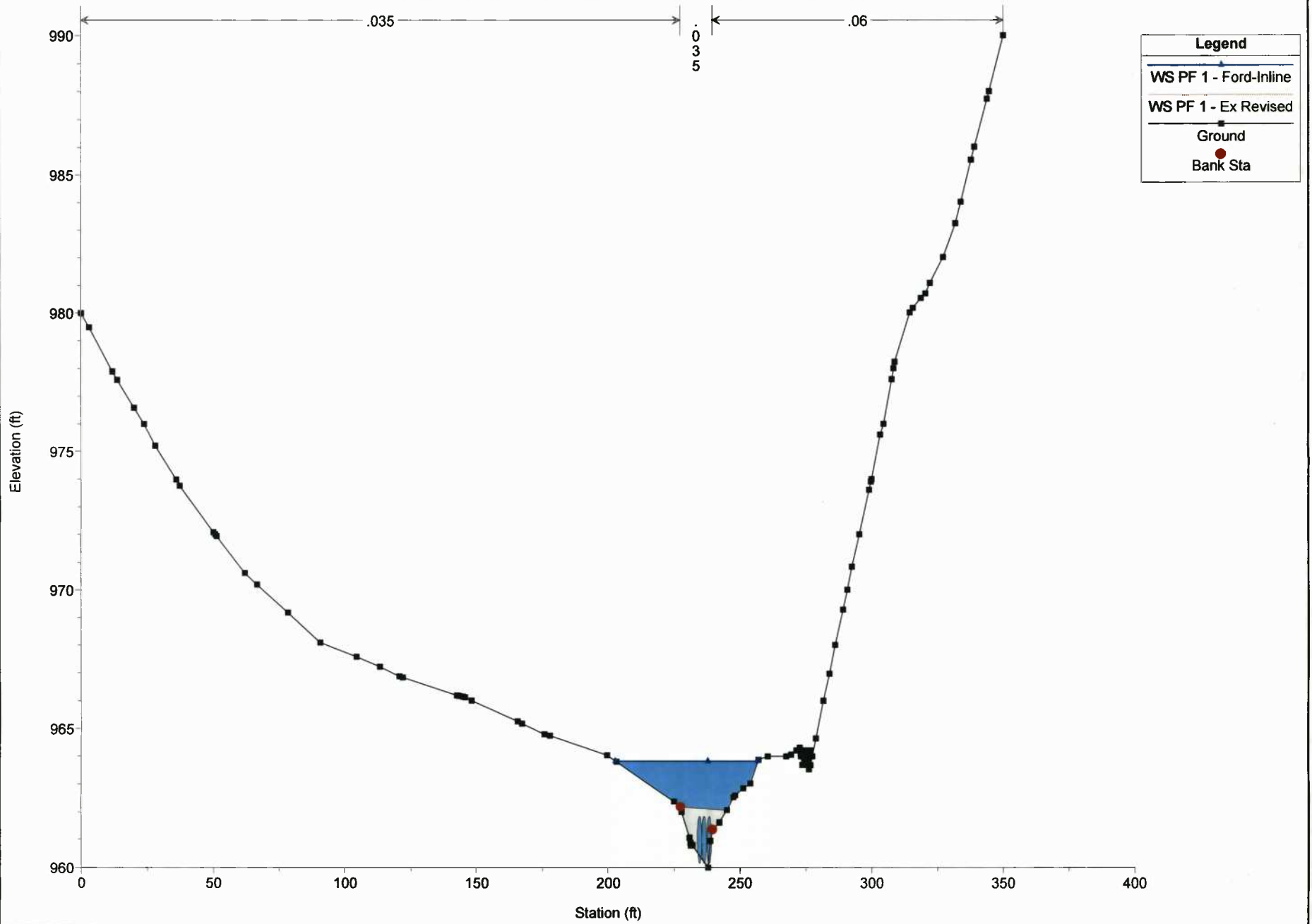
River = Bluestone Creek Reach = Bluestone Creek RS = 14572.23



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

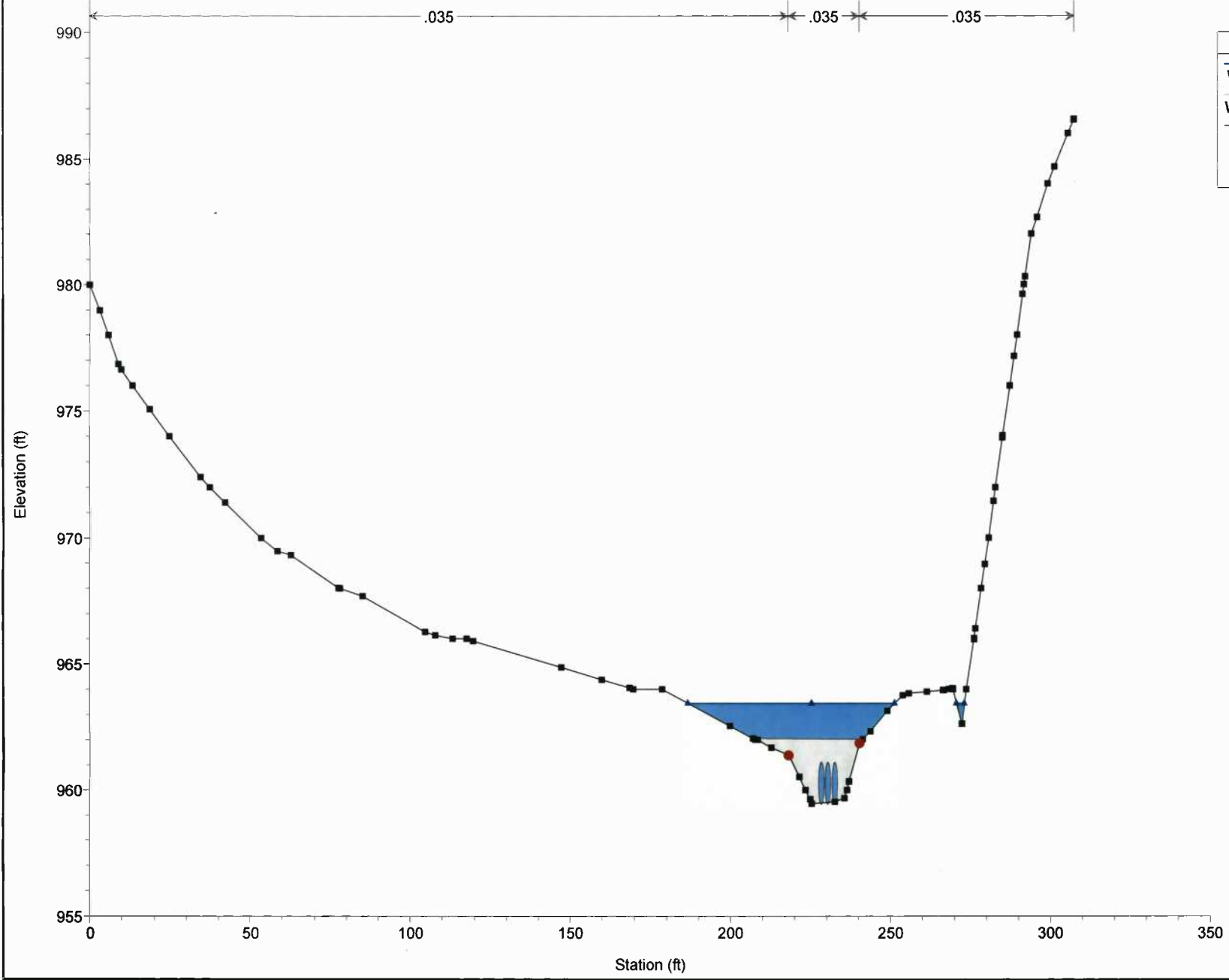
Geom: Ford-Inline Flow: Structures Revised

River = Bluestone Creek Reach = Bluestone Creek RS = 14557.54 Culv



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised  
 Geom: Ford-Inline Flow: Structures Revised  
 River = Bluestone Creek Reach = Bluestone Creek RS = 14557.54 Culv

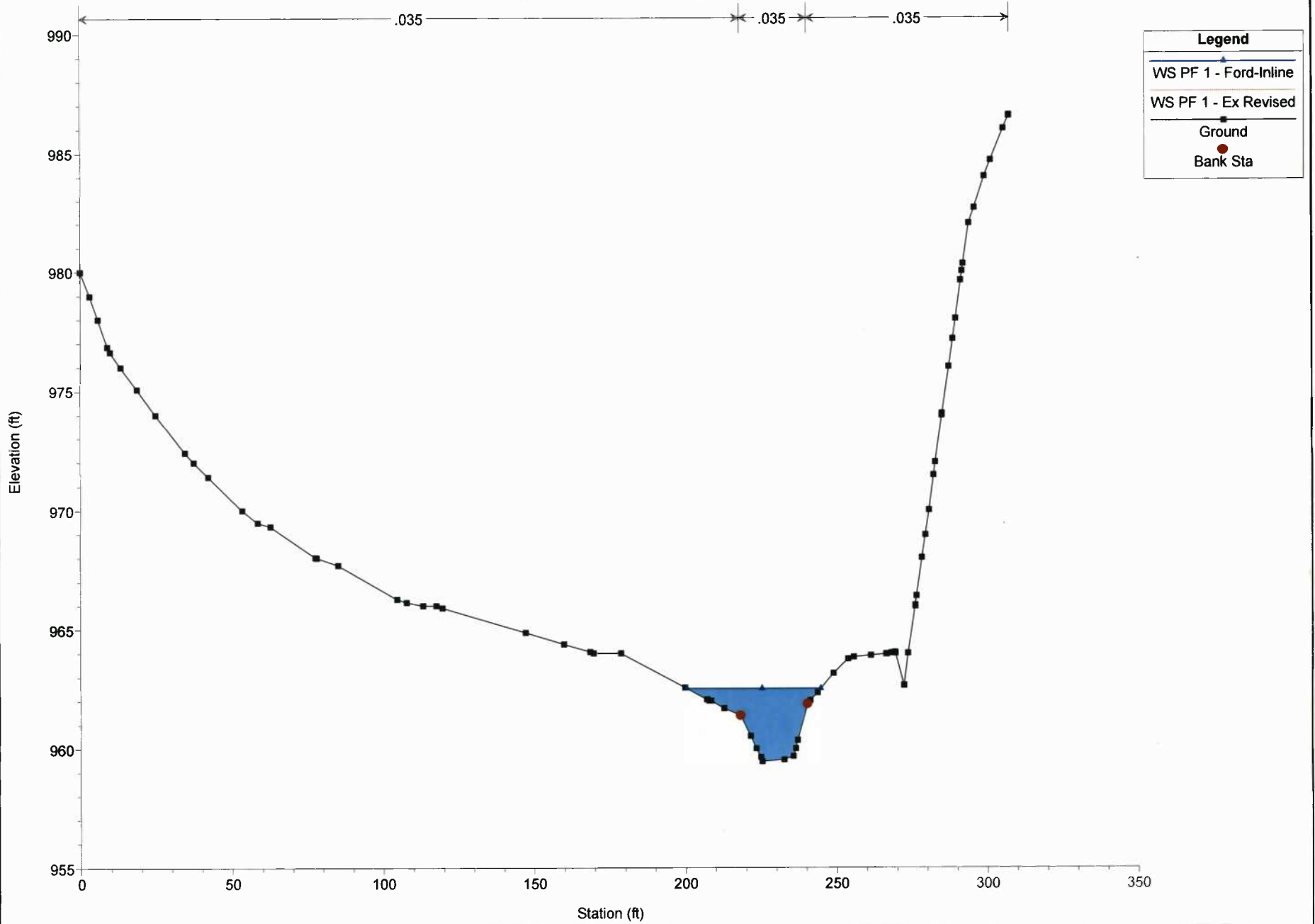
Legend	
—●—	WS PF 1 - Ford-Inline
—■—	WS PF 1 - Ex Revised
■	Ground
●	Bank Sta



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

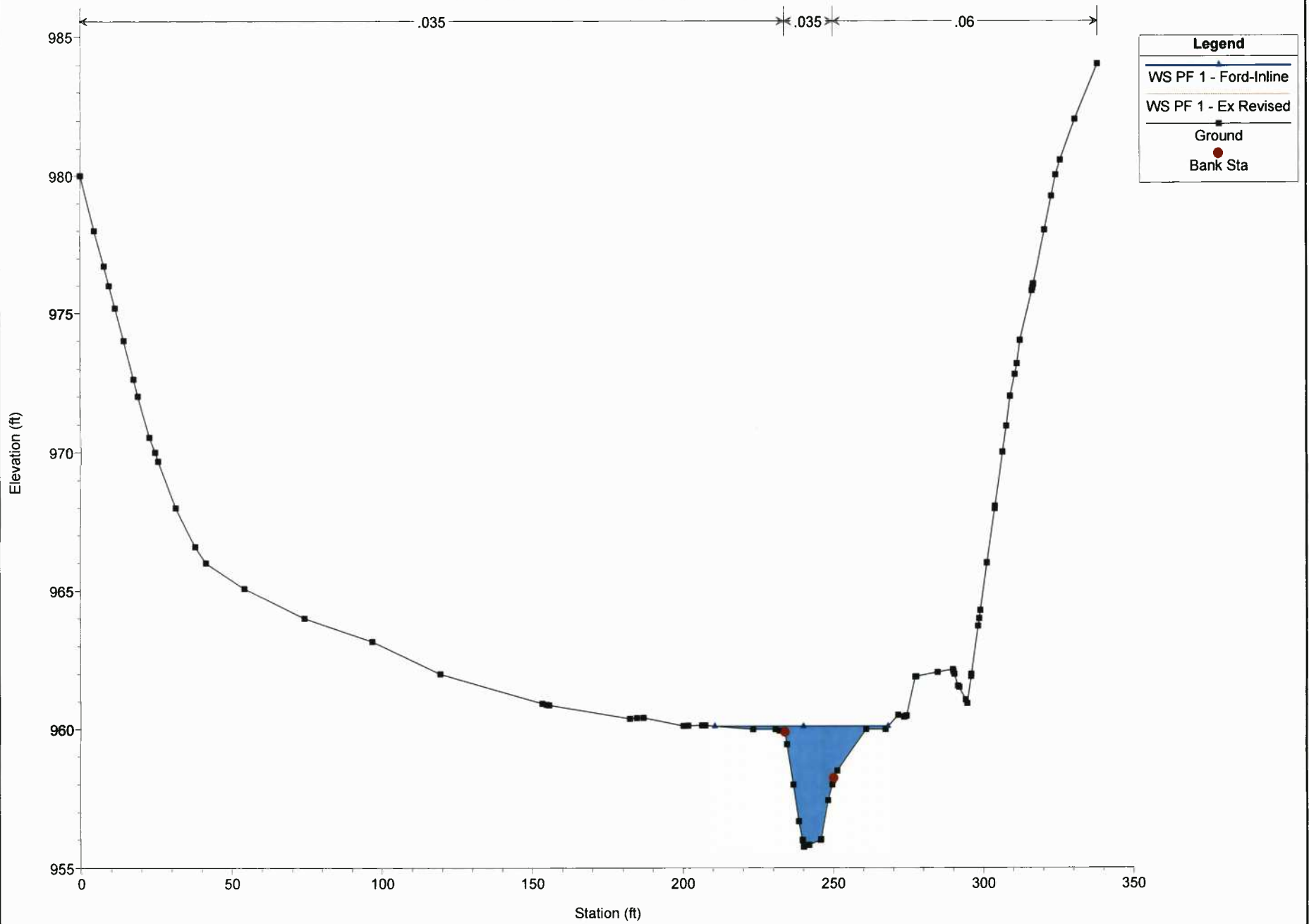
River = Bluestone Creek Reach = Bluestone Creek RS = 14543.33



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

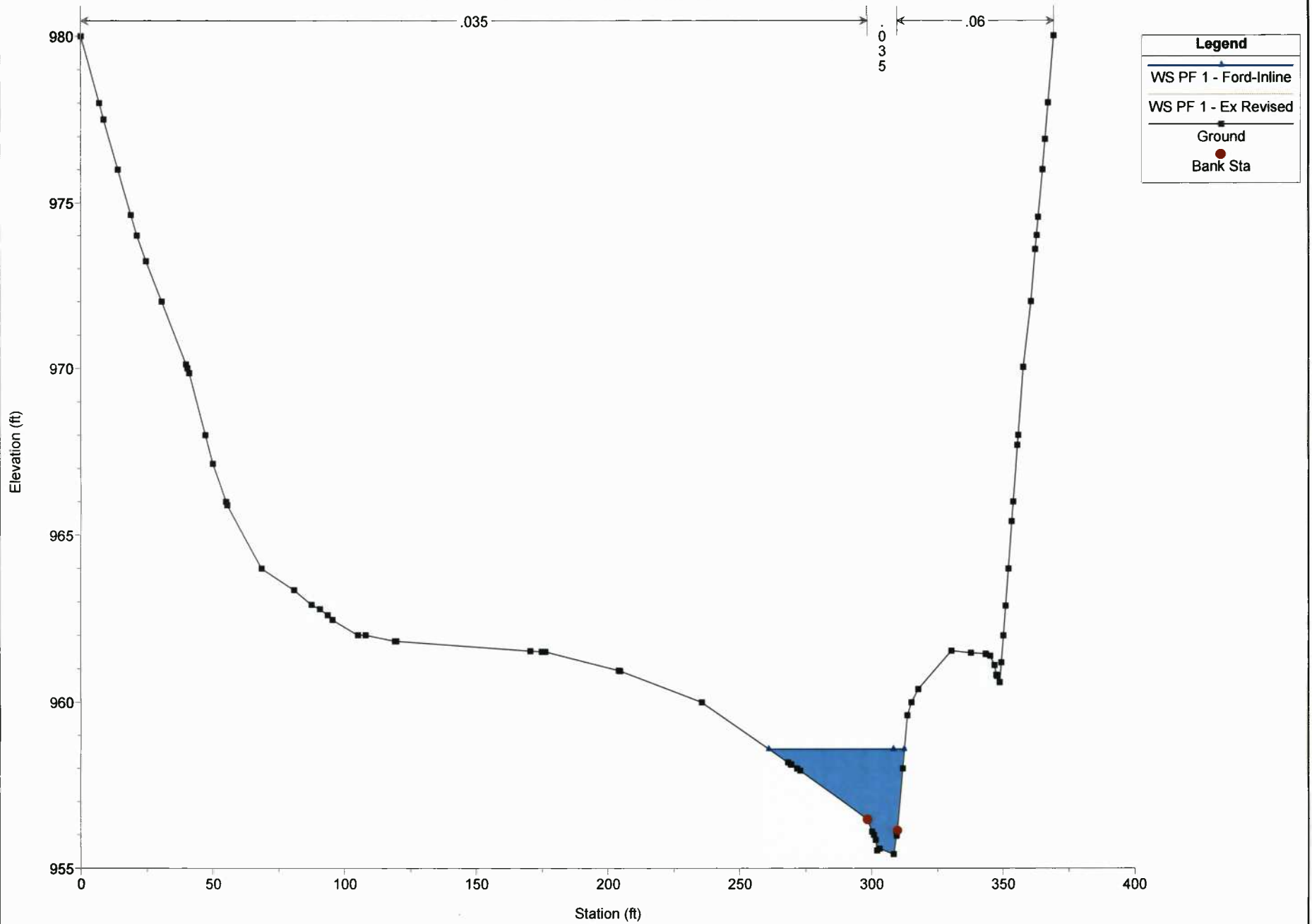
River = Bluestone Creek Reach = Bluestone Creek RS = 14371.96



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

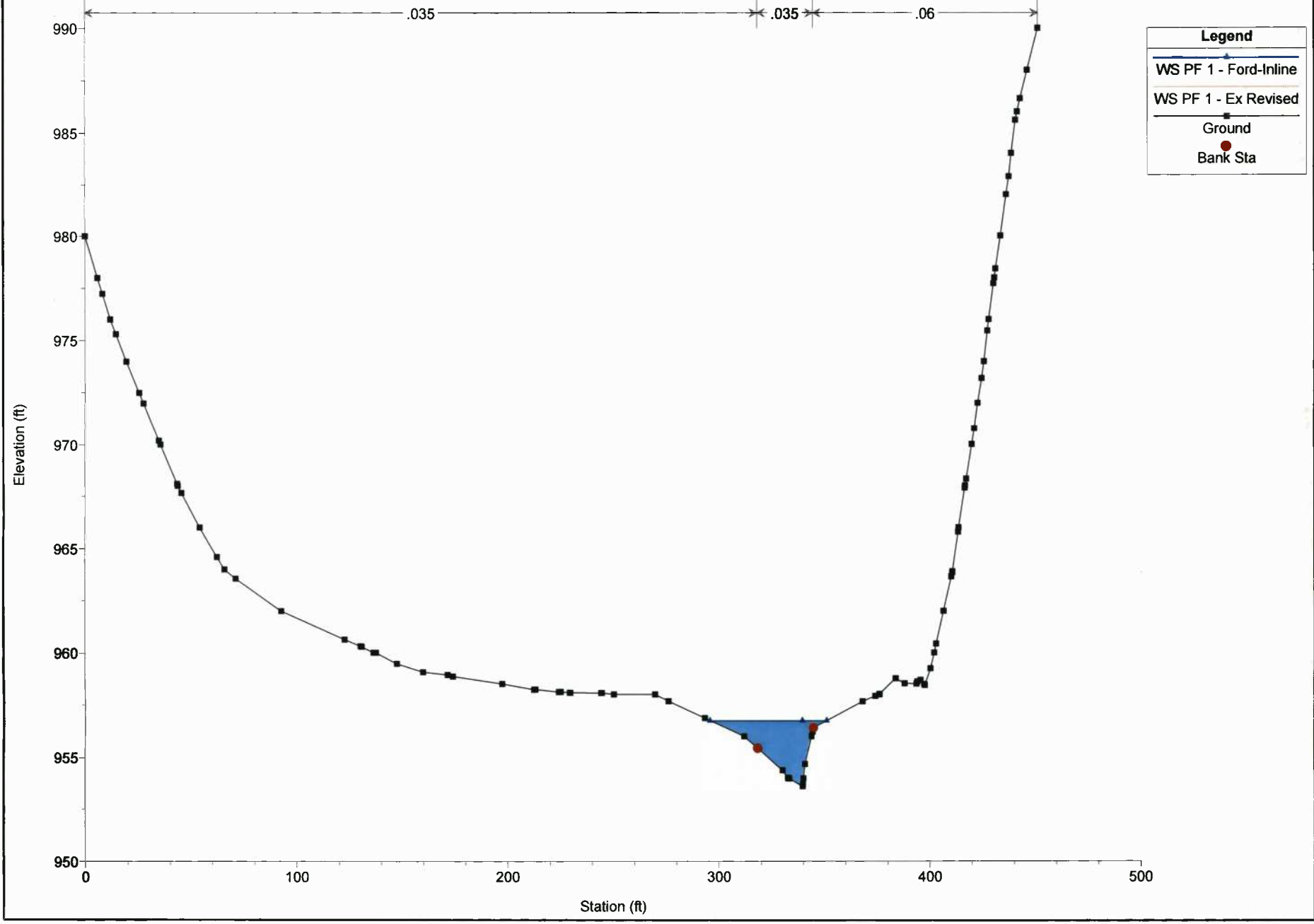
Geom: Ford-Inline Flow: Structures Revised

River = Bluestone Creek Reach = Bluestone Creek RS = 14193.22



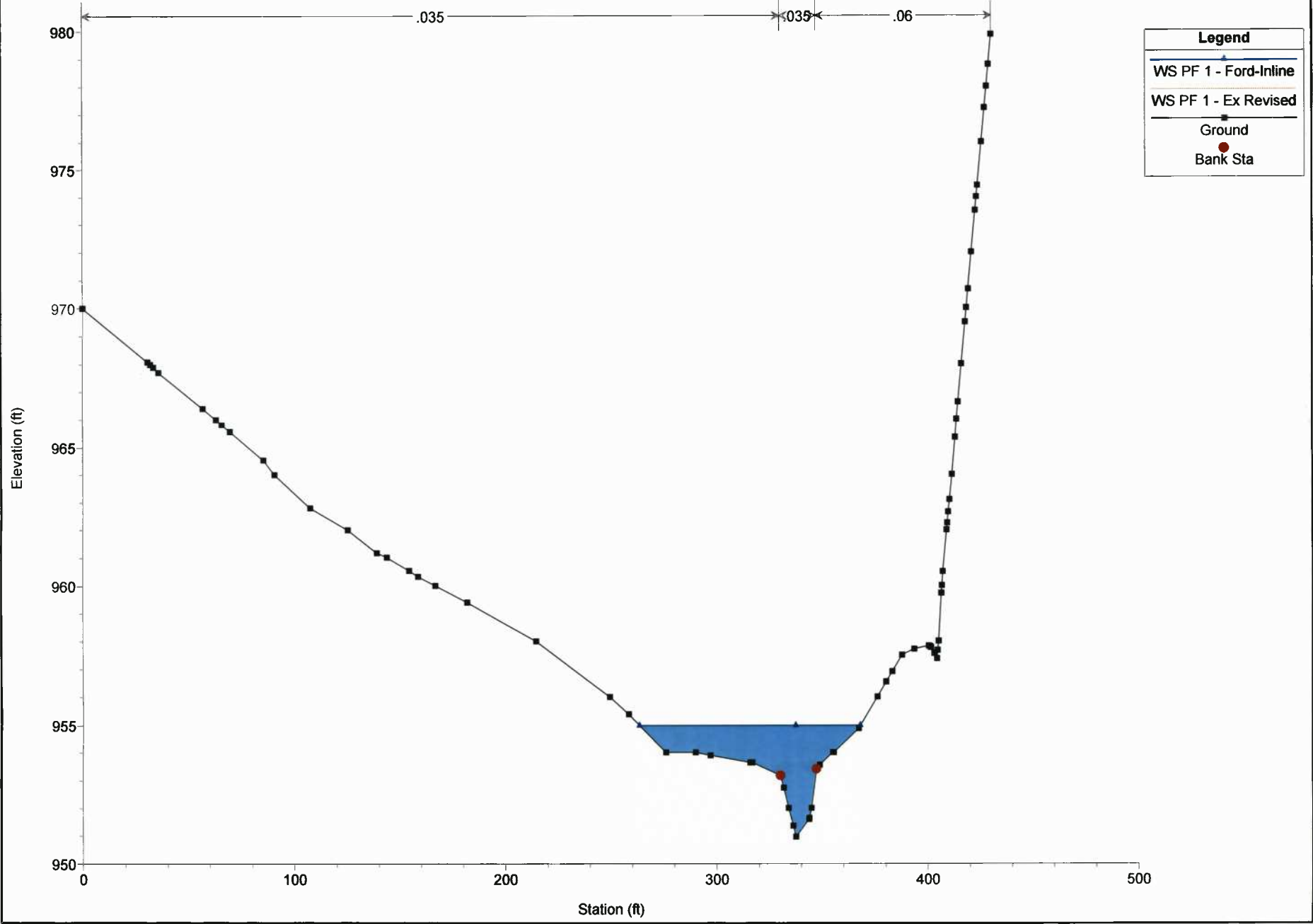


OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised  
Geom: Ford-Inline Flow: Structures Revised  
River = Bluestone Creek Reach = Bluestone Creek RS = 14044.56



Legend	
WS PF 1 - Ford-Inline	▲
WS PF 1 - Ex Revised	■
Ground	■
Bank Sta	●

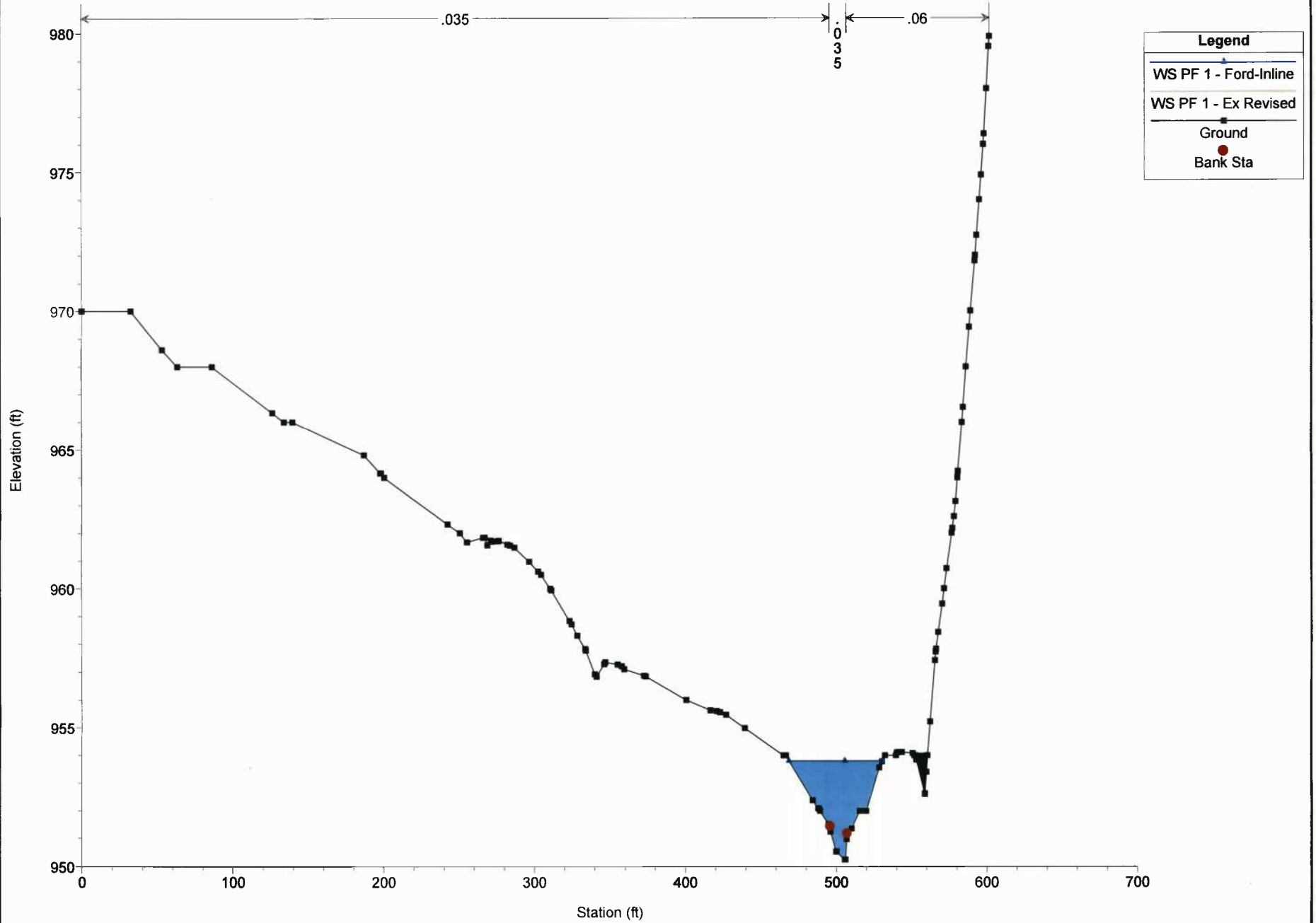
OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised  
Geom: Ford-Inline Flow: Structures Revised  
River = Bluestone Creek Reach = Bluestone Creek RS = 13852.52



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

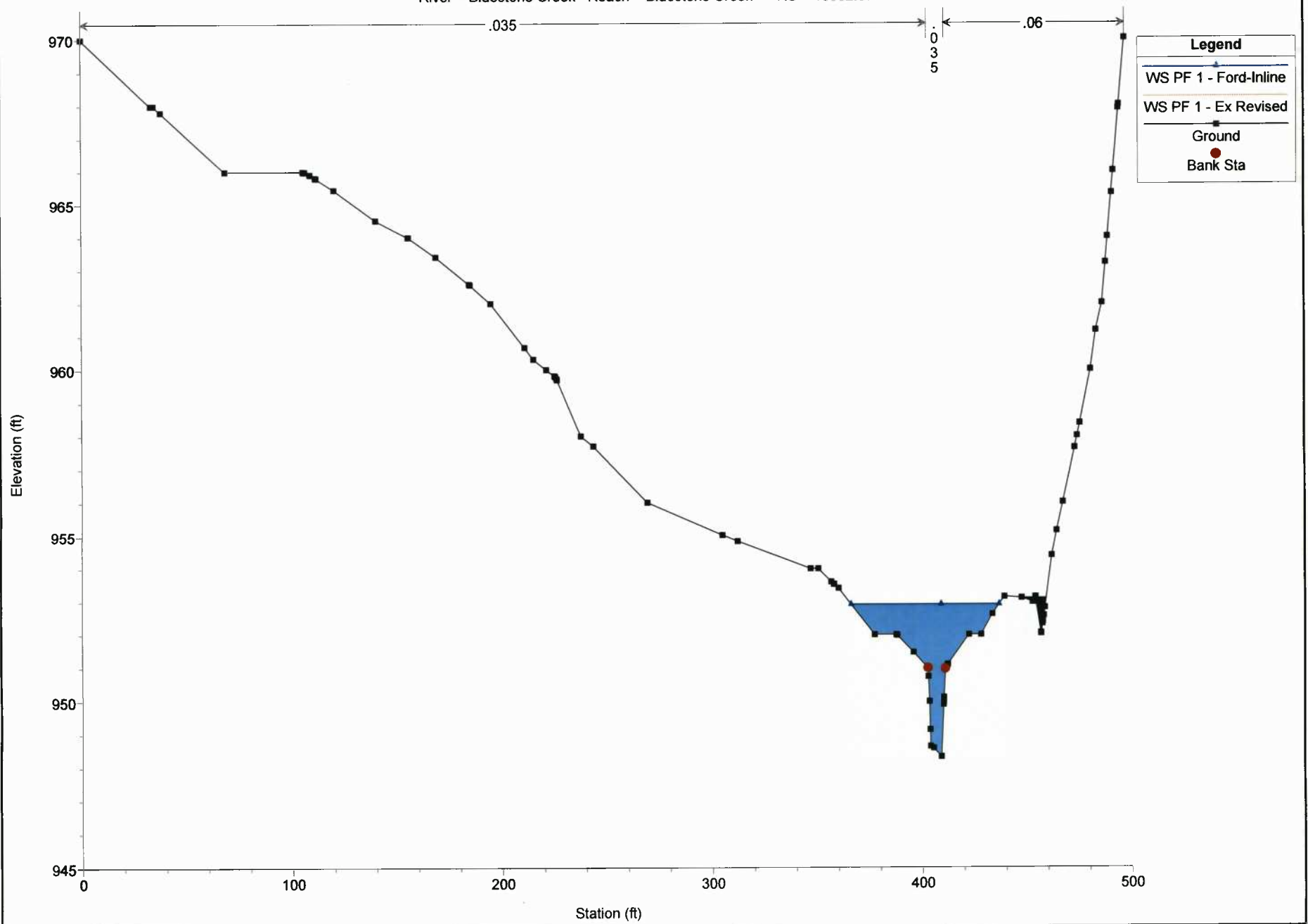
River = Bluestone Creek Reach = Bluestone Creek RS = 13658.52



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

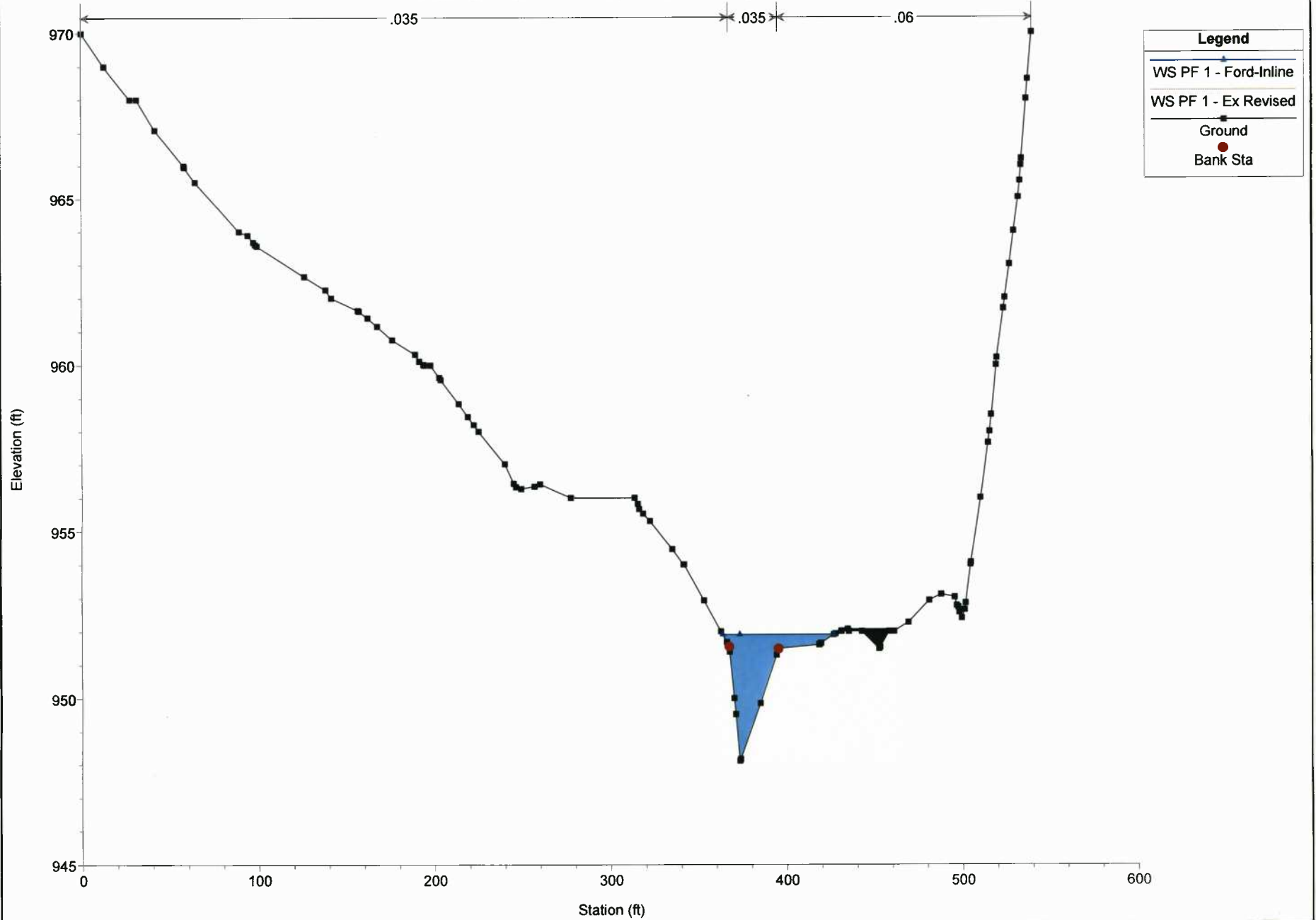
River = Bluestone Creek Reach = Bluestone Creek RS = 13552.07



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

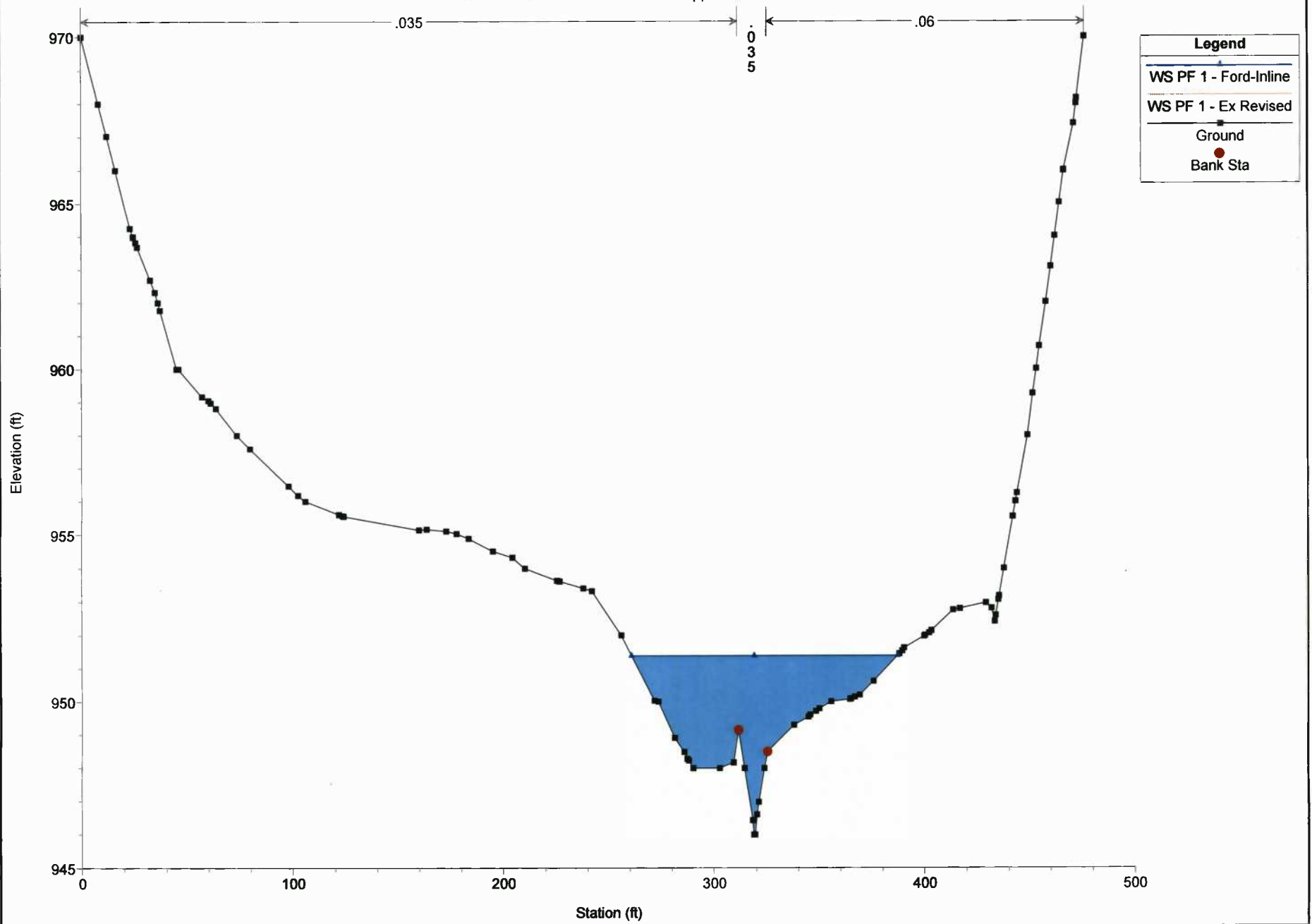
River = Bluestone Creek Reach = Bluestone Creek RS = 13440.10



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

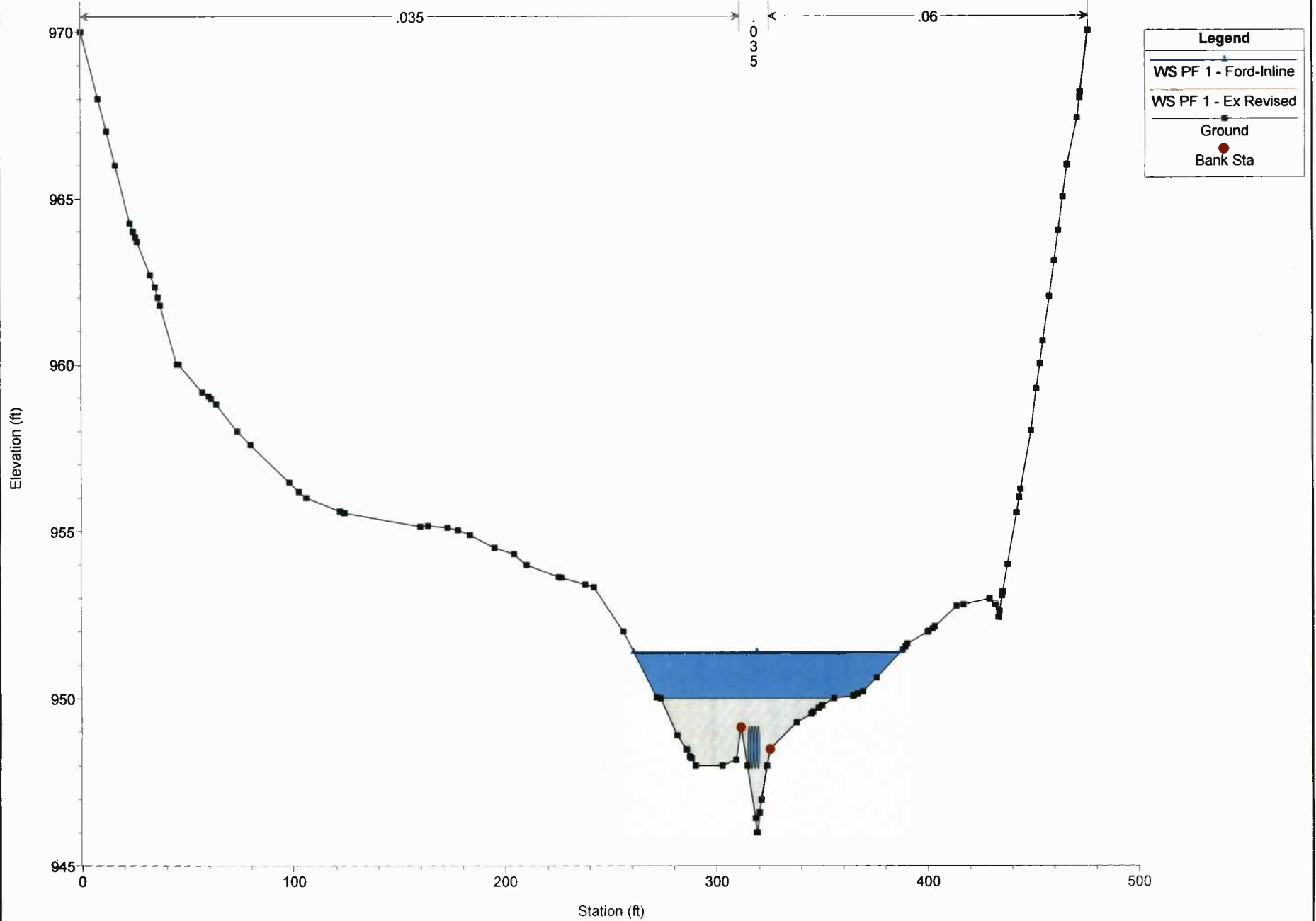
River = Bluestone Creek Reach = Upper RS = 13395.79



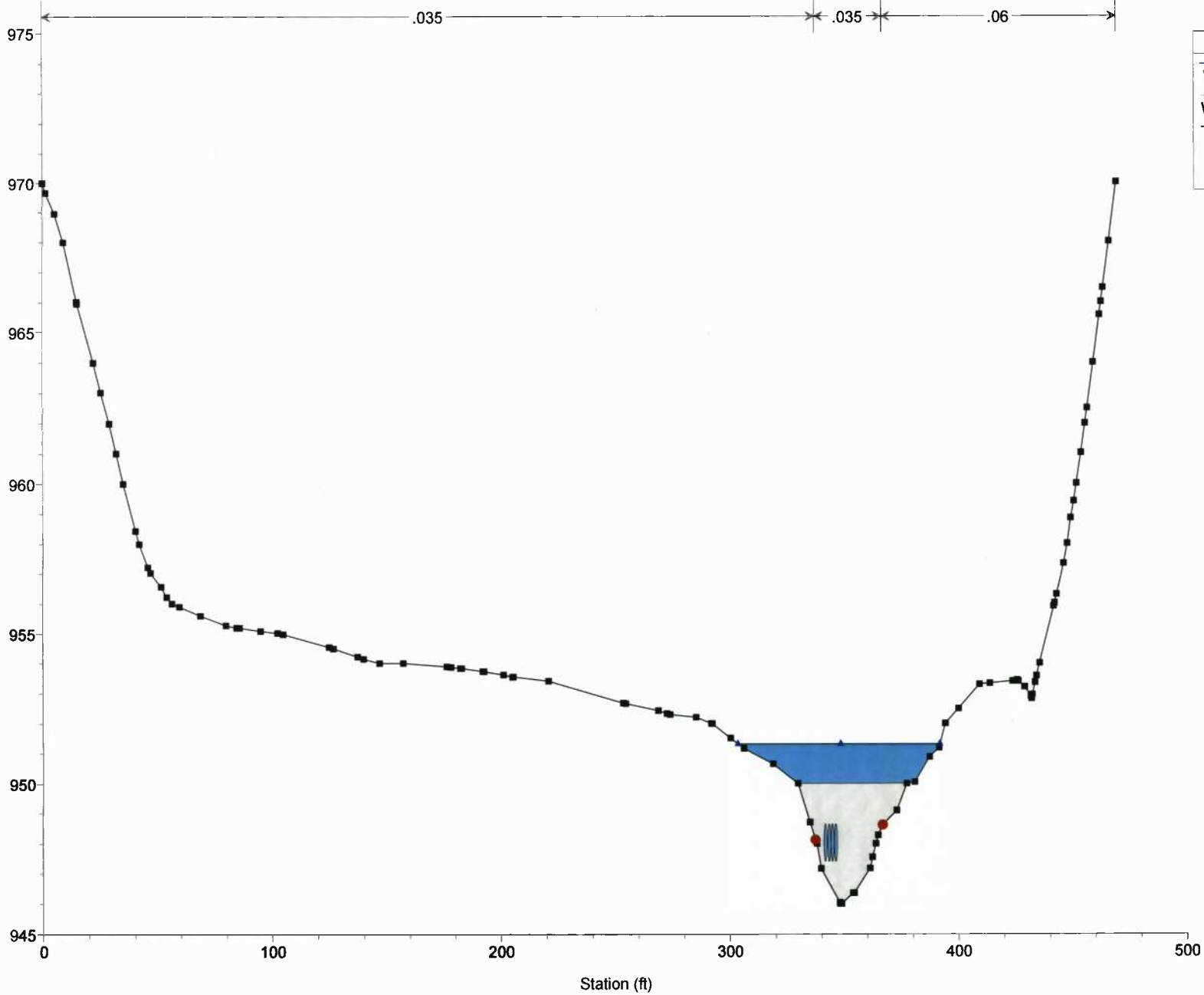
OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 13372.57 Culv



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised  
Geom: Ford-Inline Flow: Structures Revised  
River = Bluestone Creek Reach = Upper RS = 13372.57 Culv

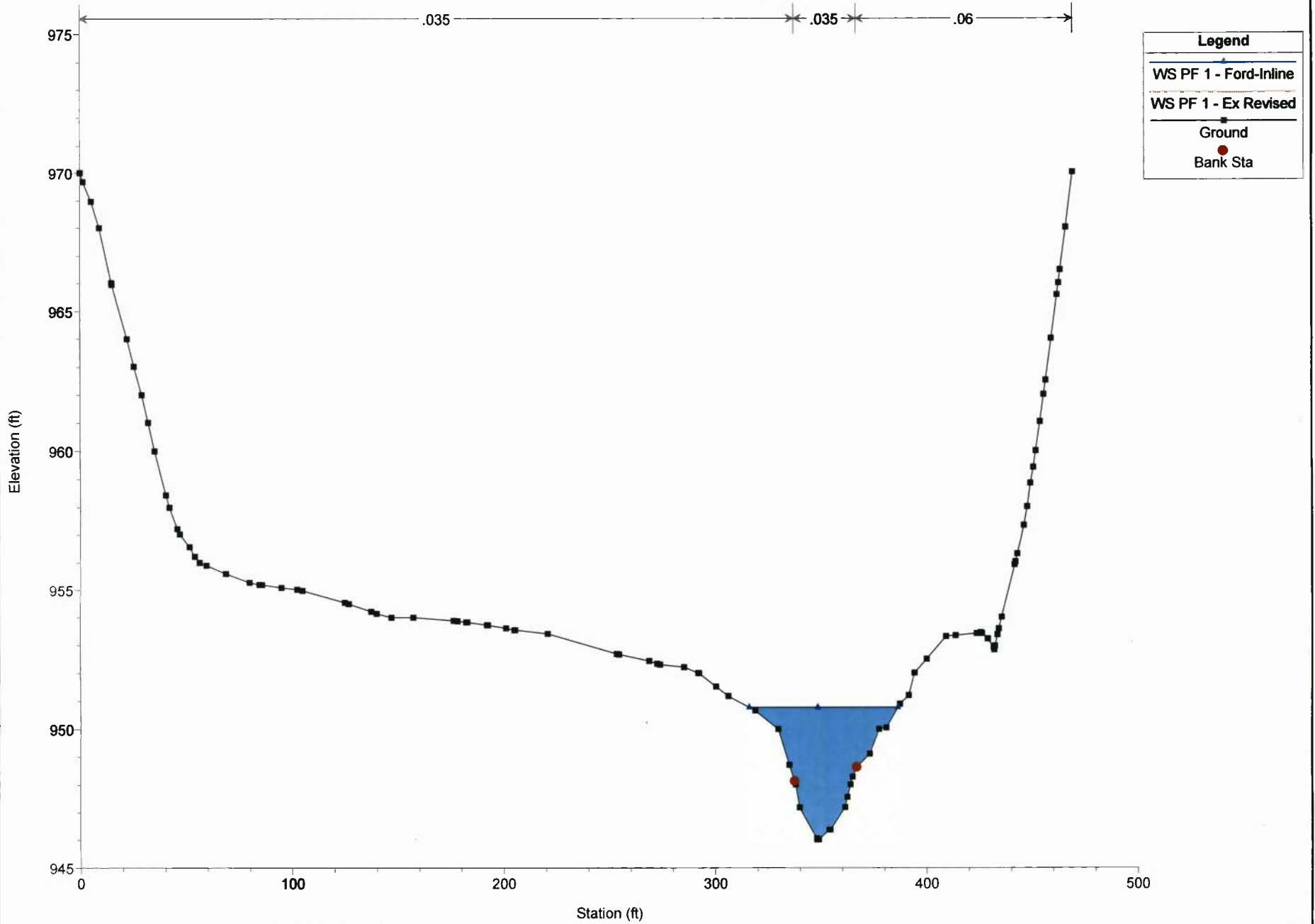




OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

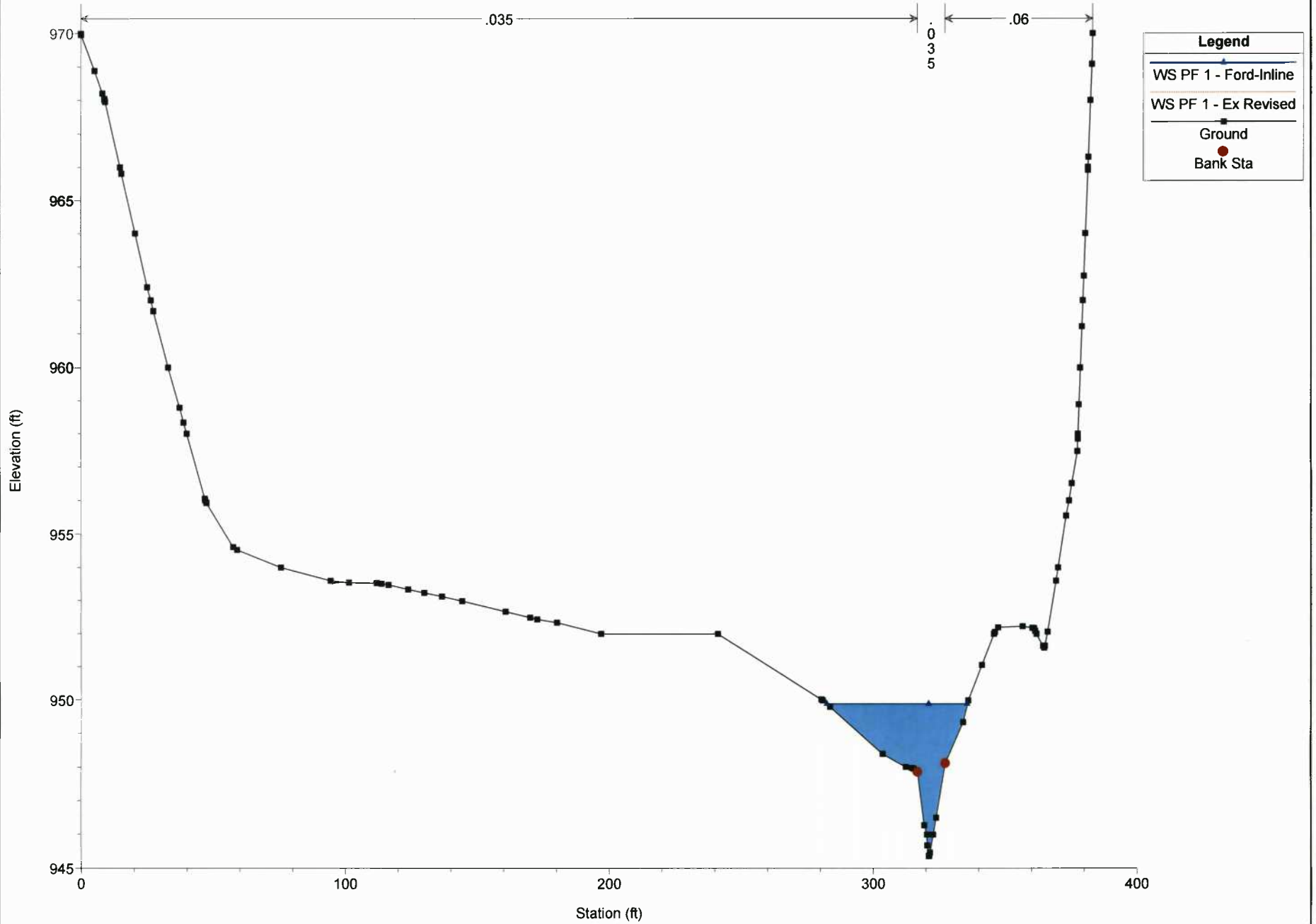
River = Bluestone Creek Reach = Upper RS = 13353.46



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

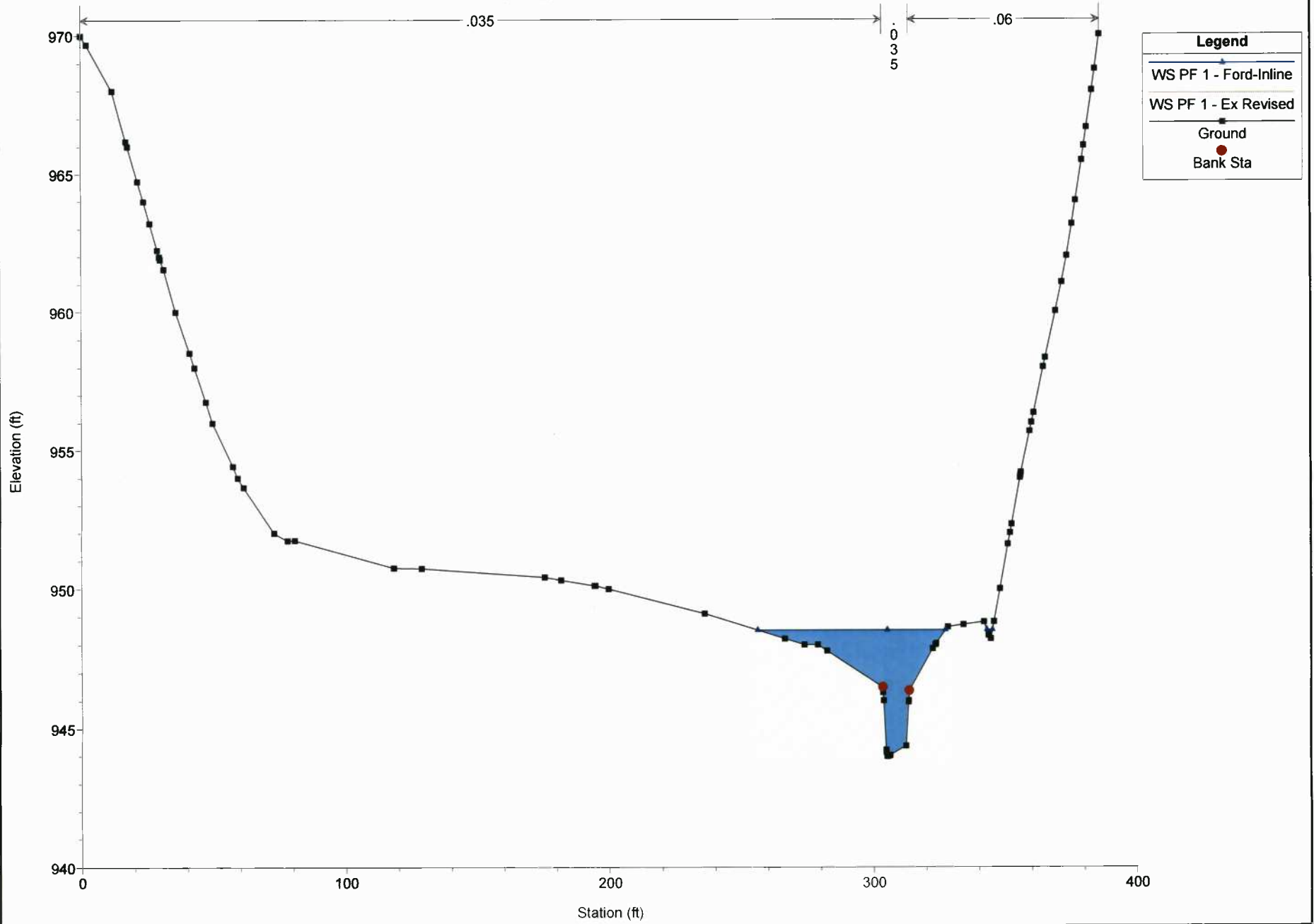
River = Bluestone Creek Reach = Upper RS = 13212.39



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

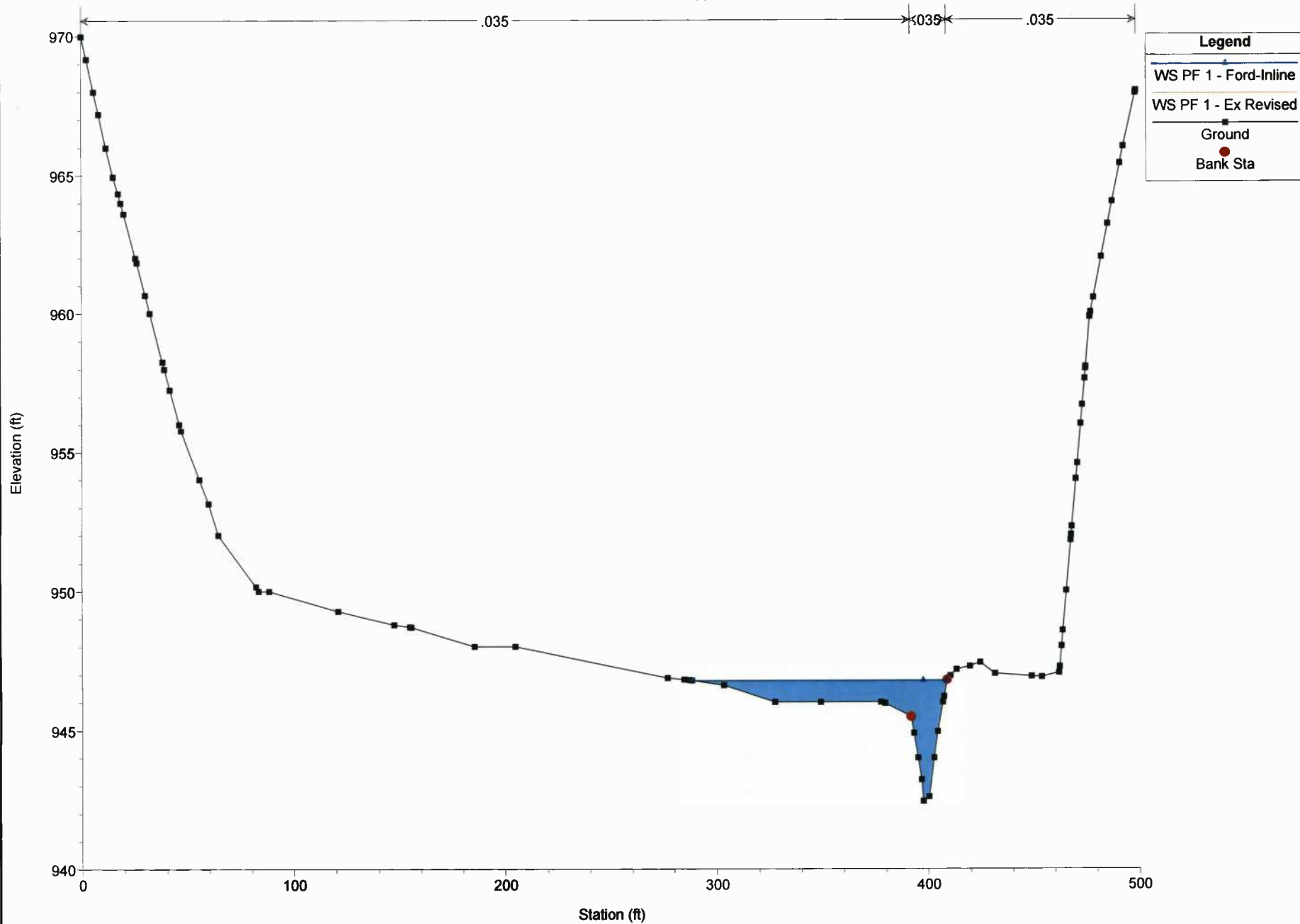
River = Bluestone Creek Reach = Upper RS = 13020.26



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

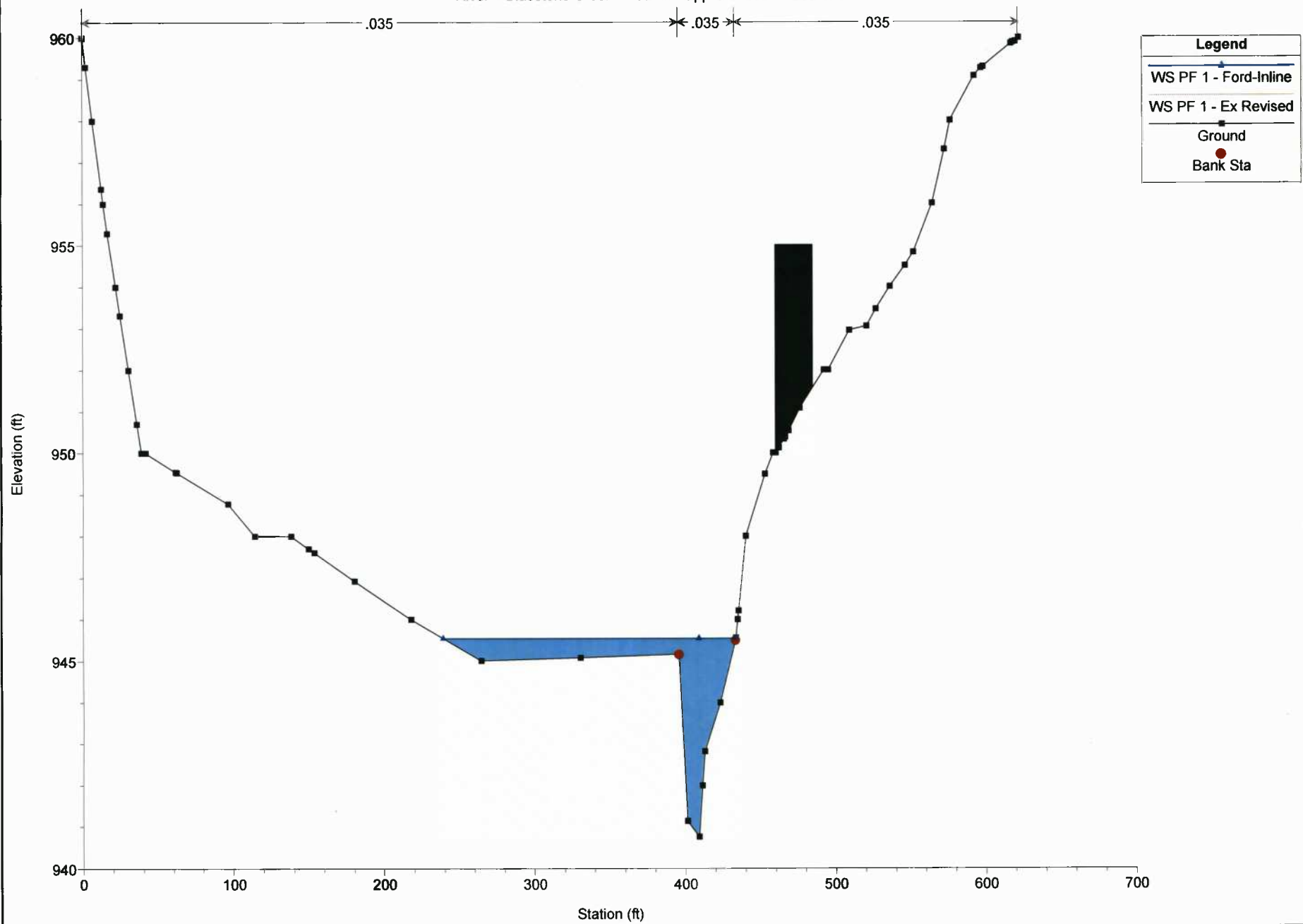
River = Bluestone Creek Reach = Upper RS = 12827.43



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

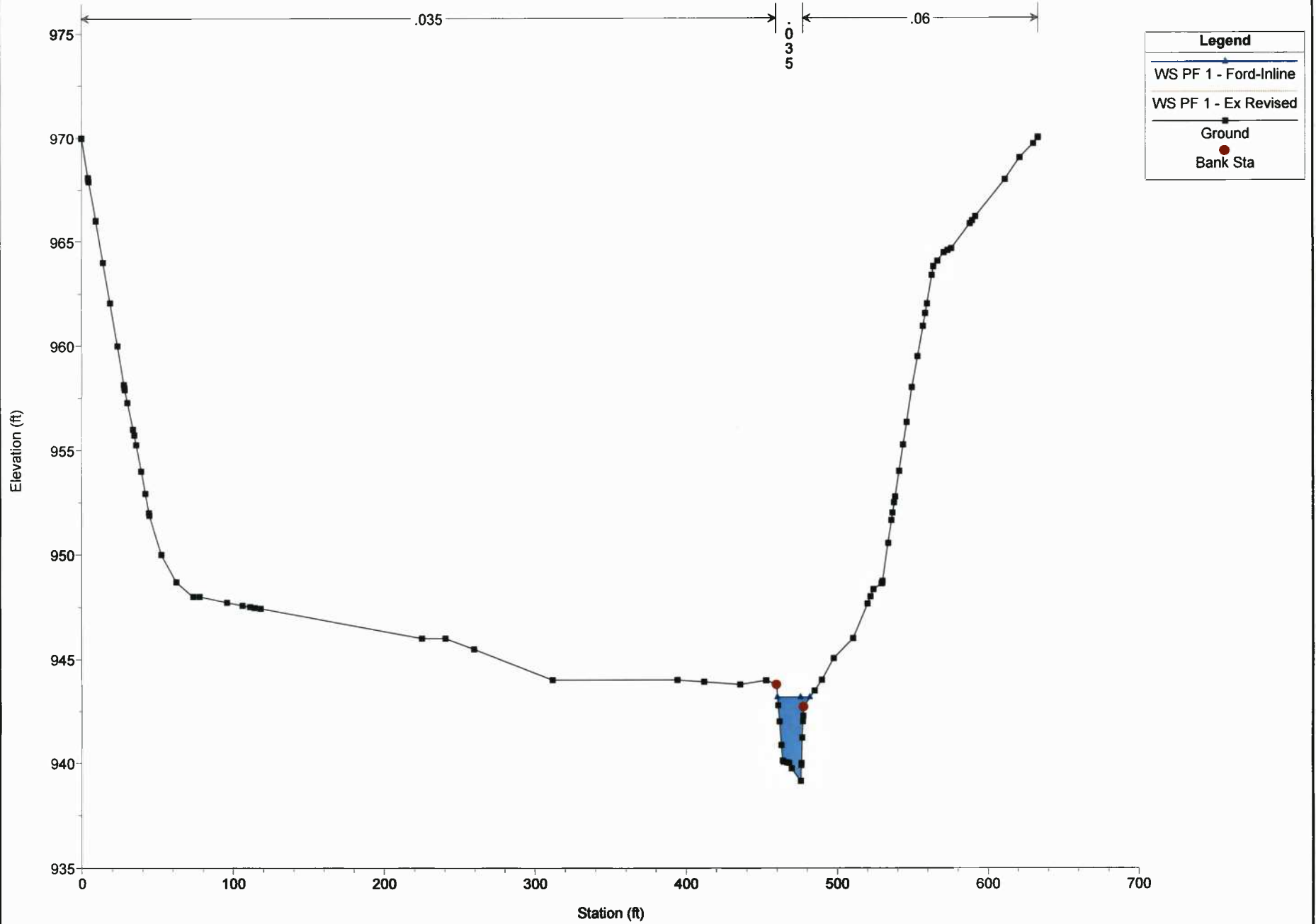
River = Bluestone Creek Reach = Upper RS = 12694.78



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

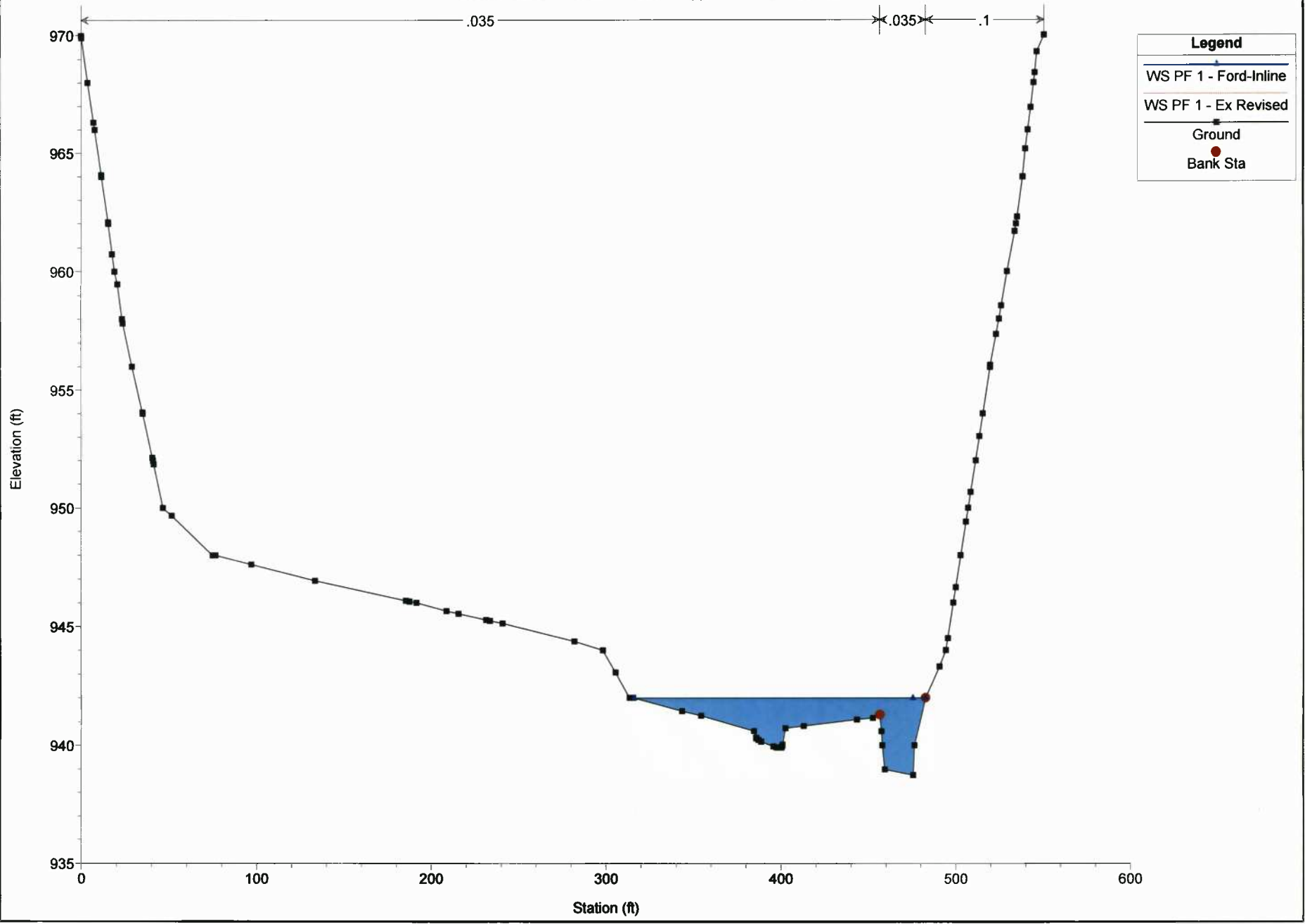
River = Bluestone Creek Reach = Upper RS = 12504.92



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

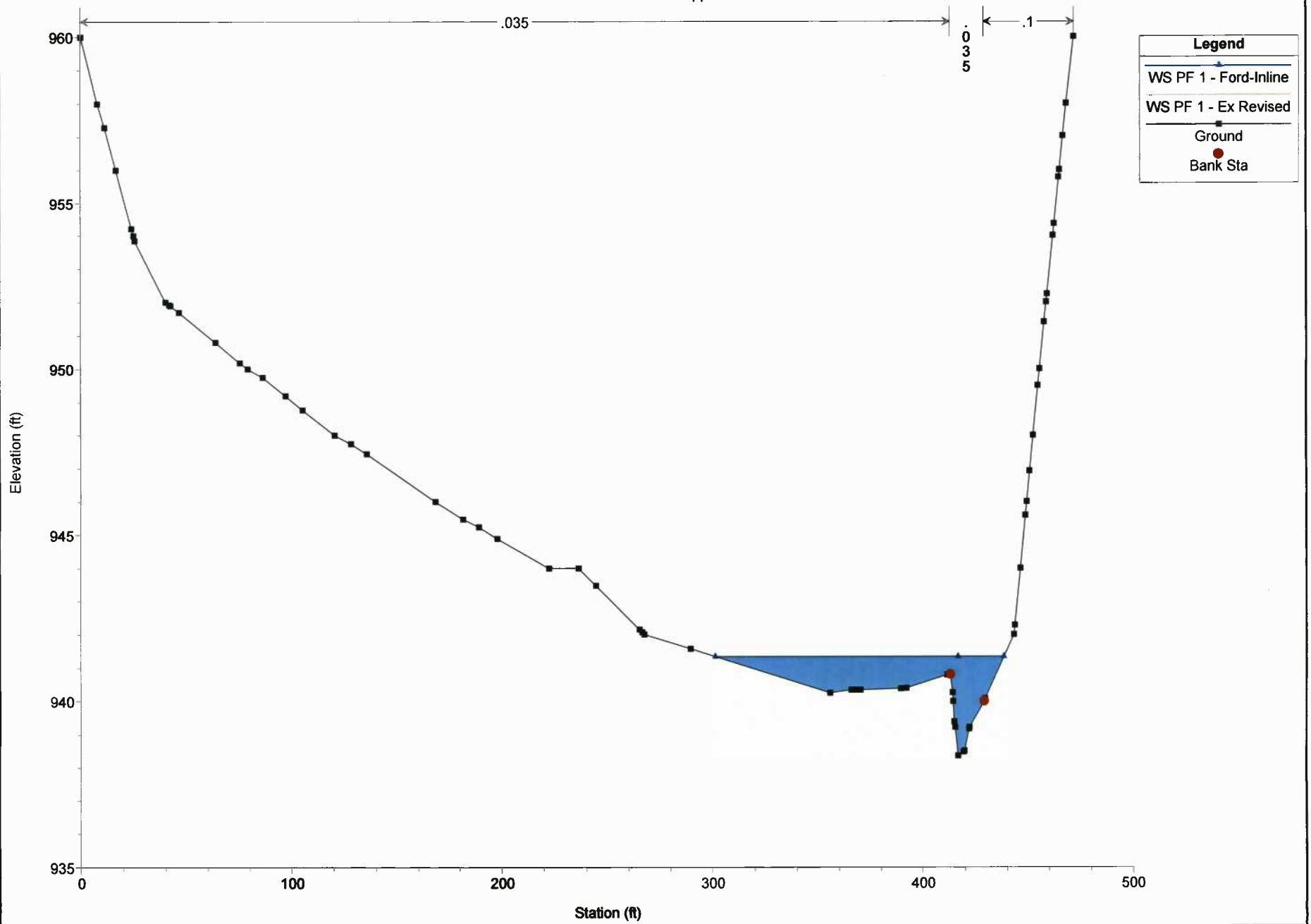
River = Bluestone Creek Reach = Upper RS = 12207.32



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

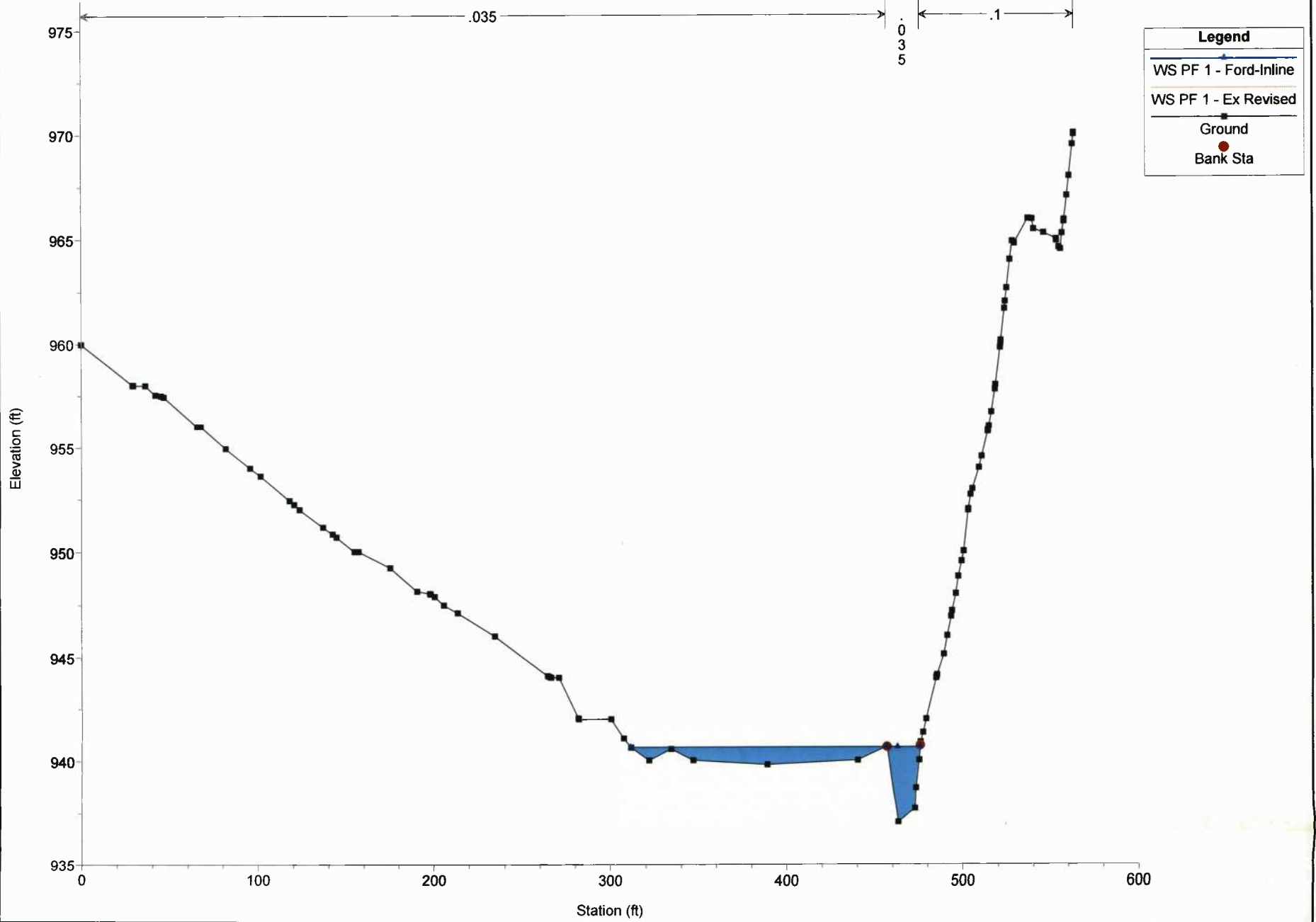
Geom: Ford-Inline Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 12162.04



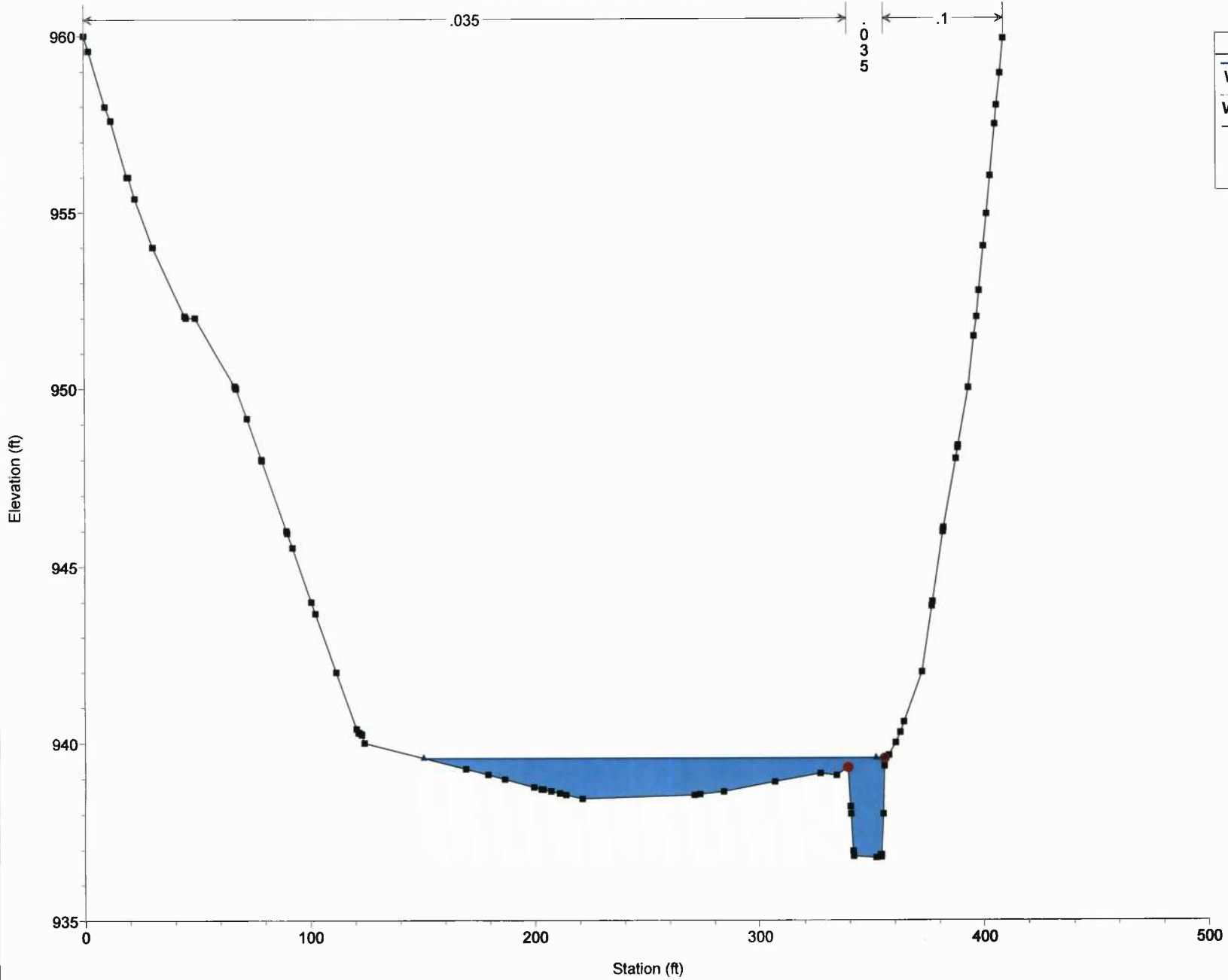


OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised  
Geom: Ford-Inline Flow: Structures Revised  
River = Bluestone Creek Reach = Upper RS = 12075.53



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised  
River = Bluestone Creek Reach = Upper RS = 11904.55

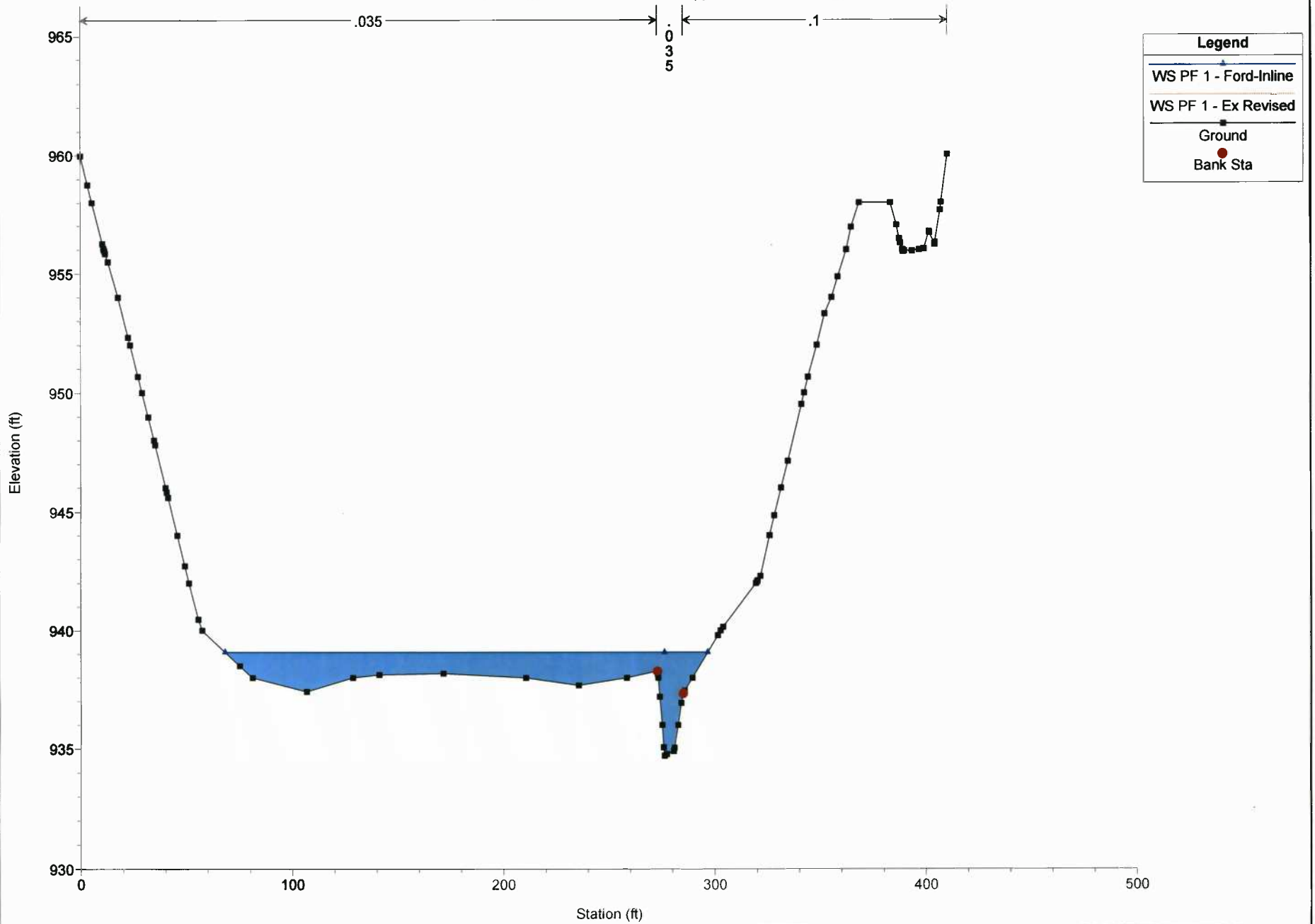


Legend	
WS PF 1 - Ford-Inline	—●—
WS PF 1 - Ex Revised	—■—
Ground	■
Bank Sta	●

OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

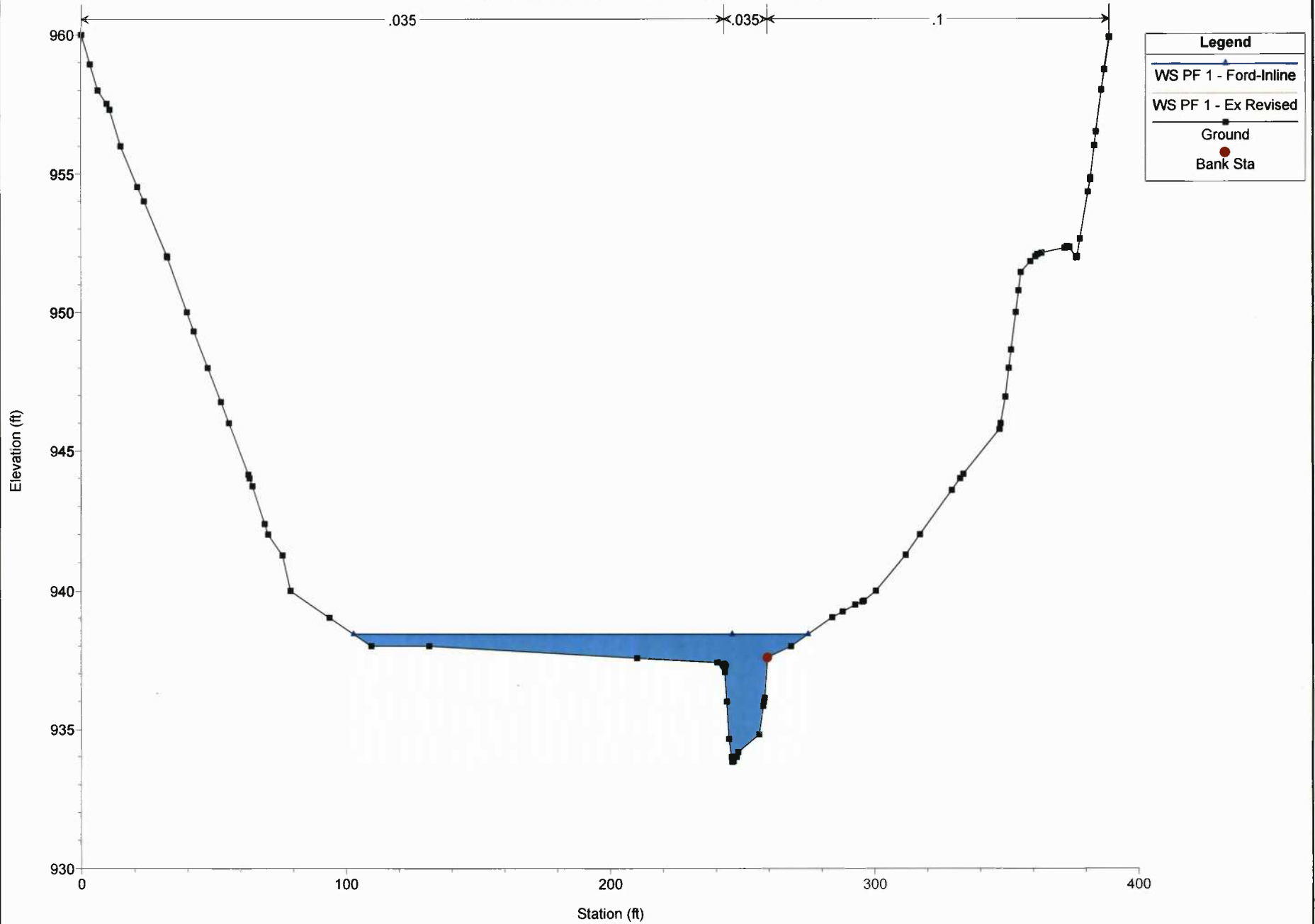
River = Bluestone Creek Reach = Upper RS = 11770.60



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

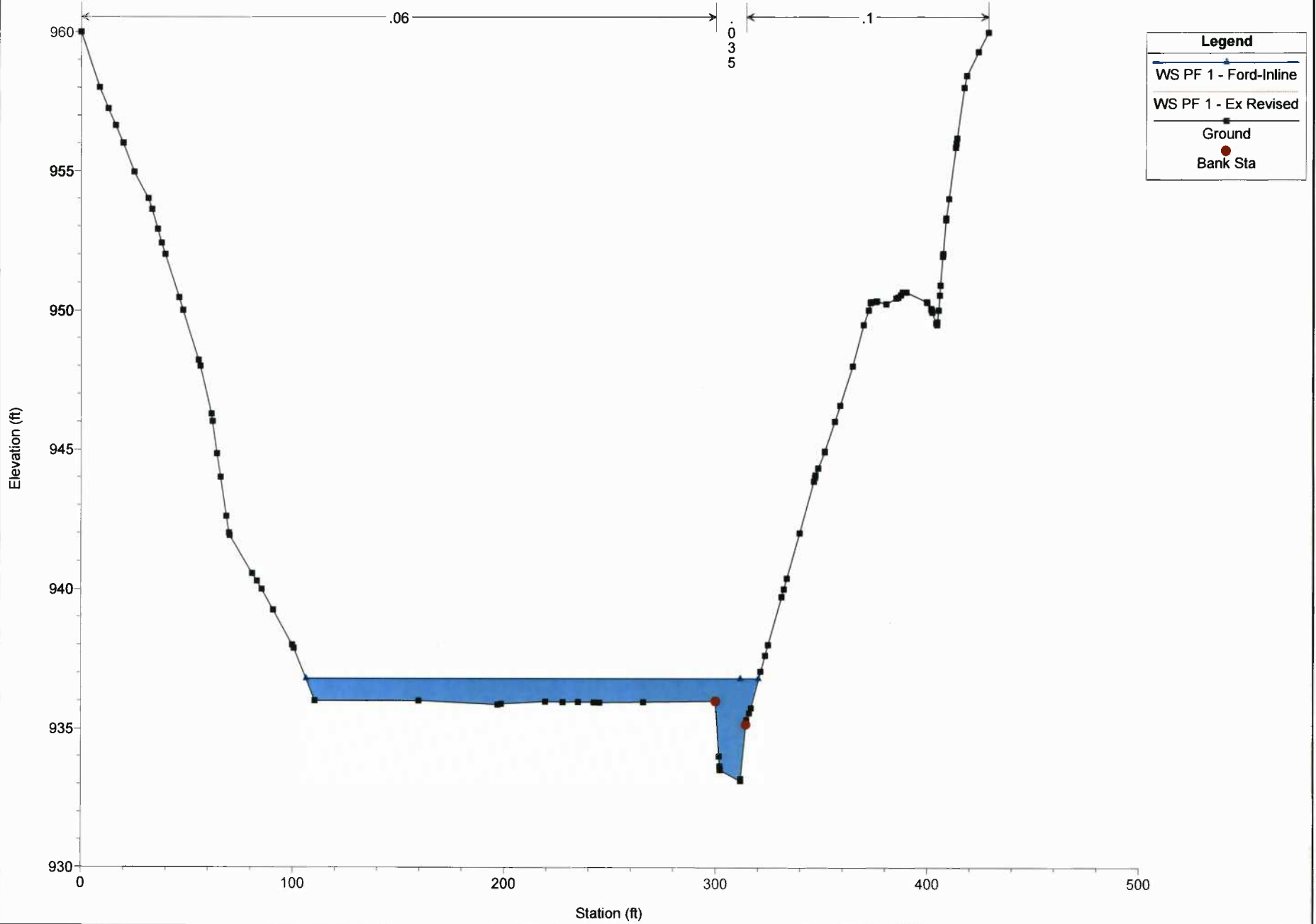
River = Bluestone Creek Reach = Upper RS = 11632.87



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

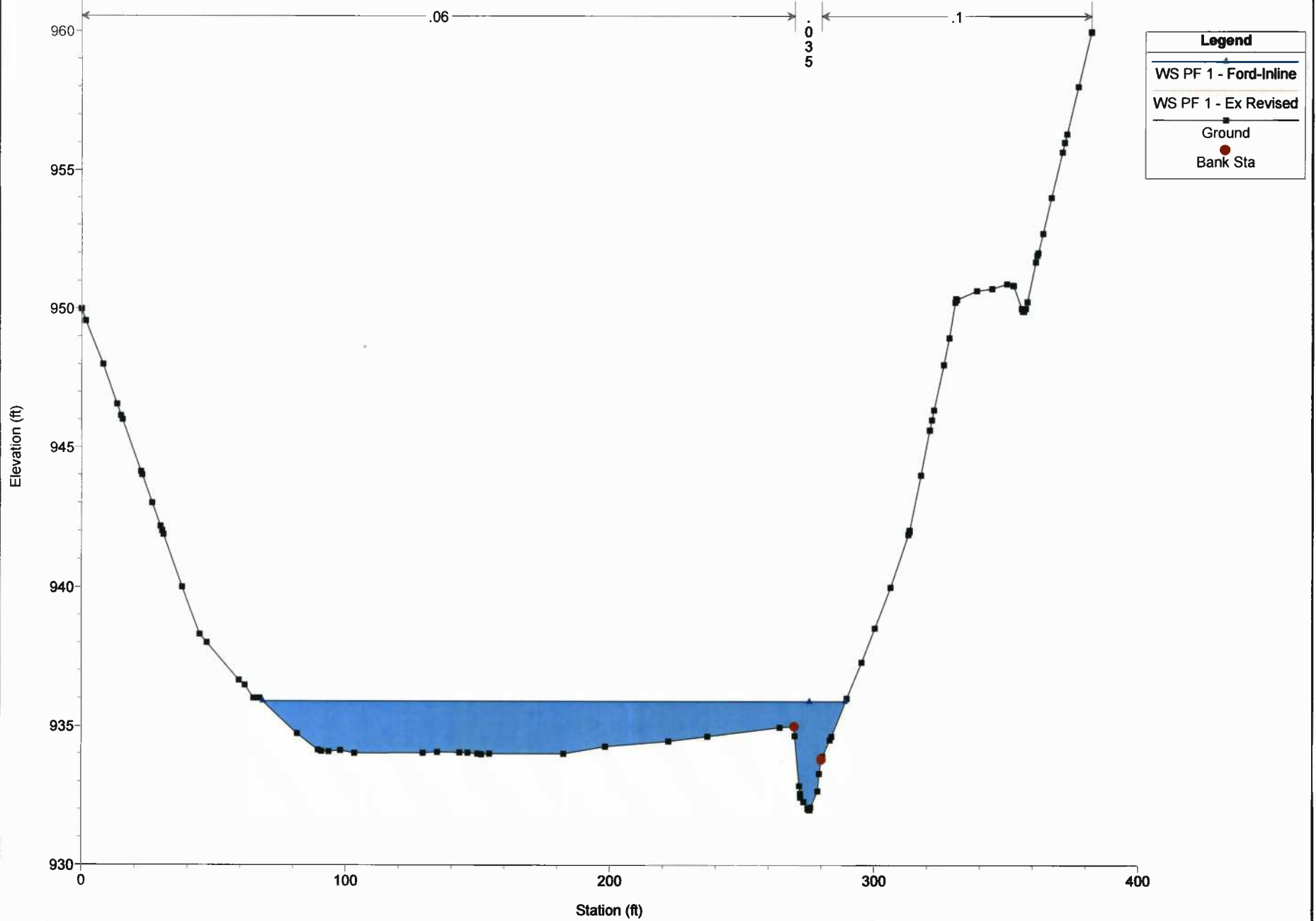
River = Bluestone Creek Reach = Upper RS = 11351.13



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

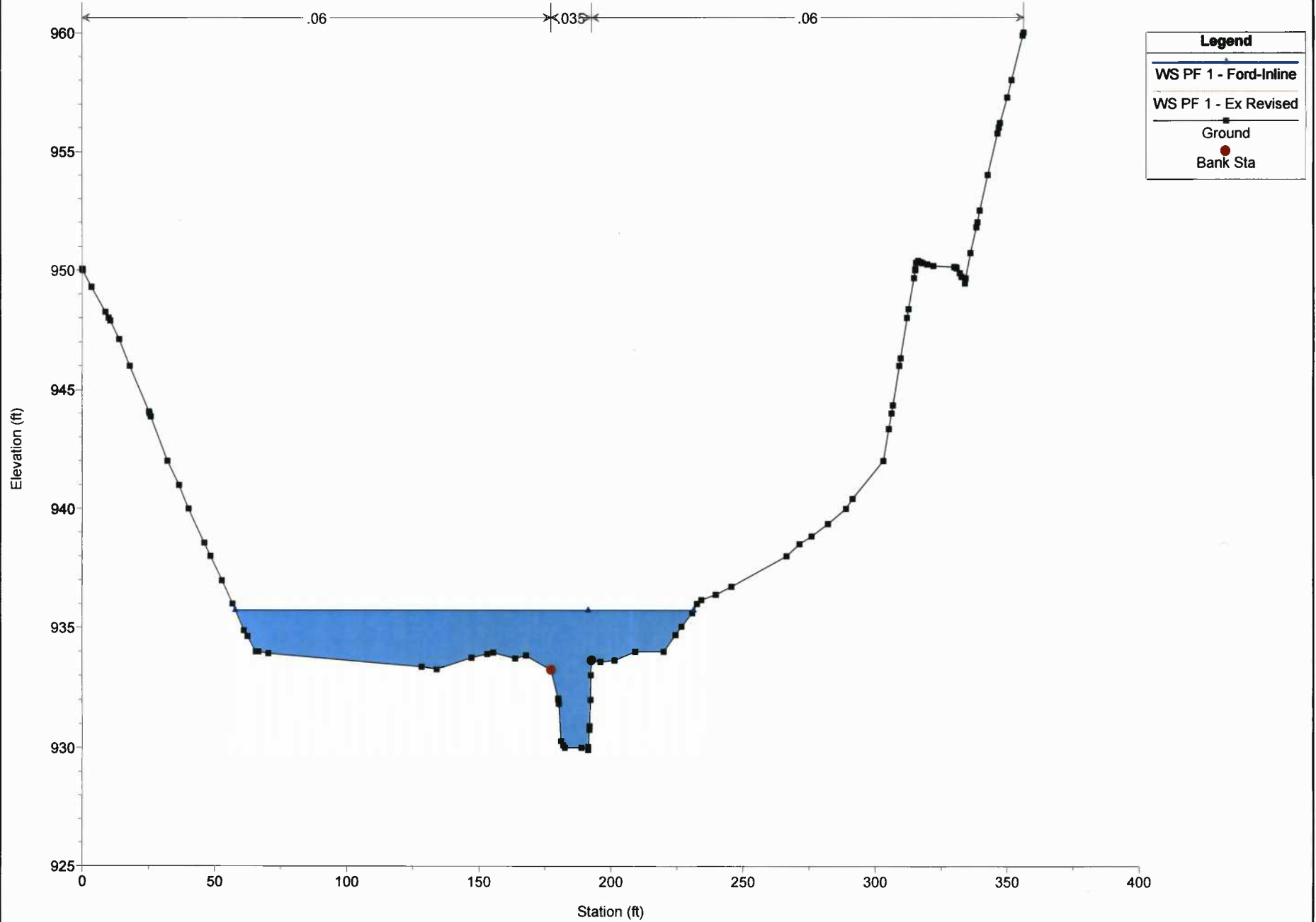
River = Bluestone Creek Reach = Upper RS = 11189.95



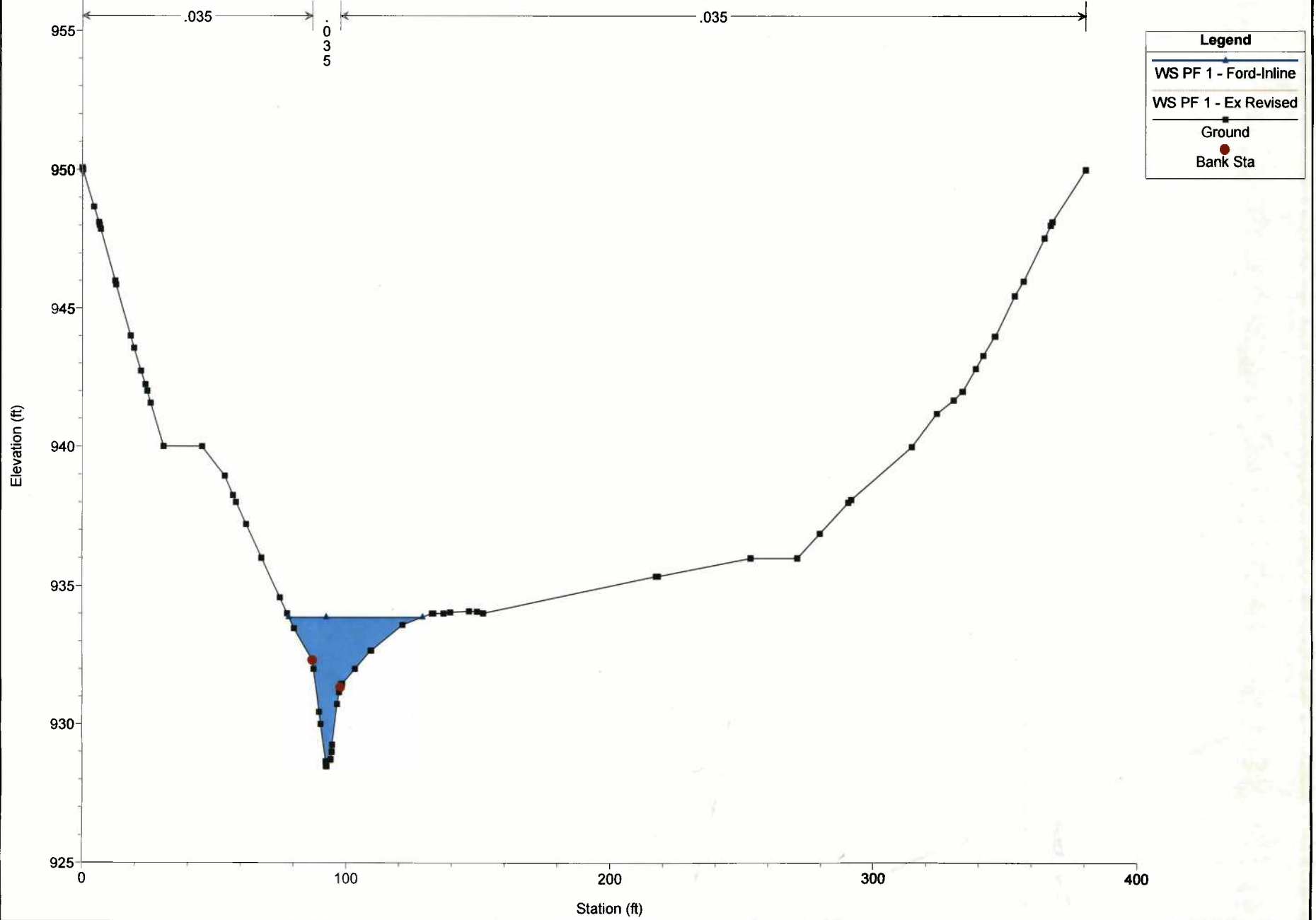
OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 10974.14



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised  
Geom: Ford-Inline Flow: Structures Revised  
River = Bluestone Creek Reach = Upper RS = 10615.35

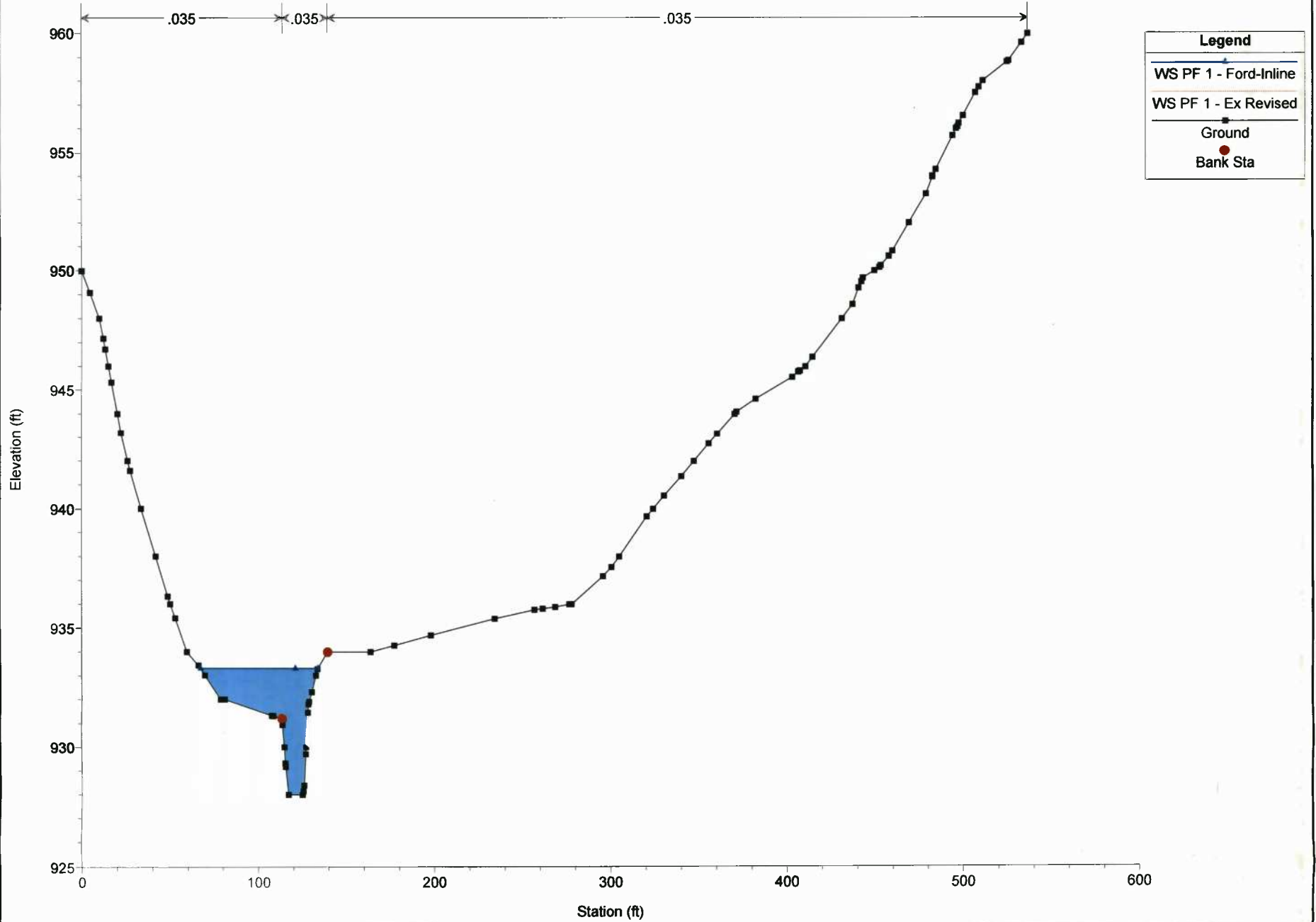




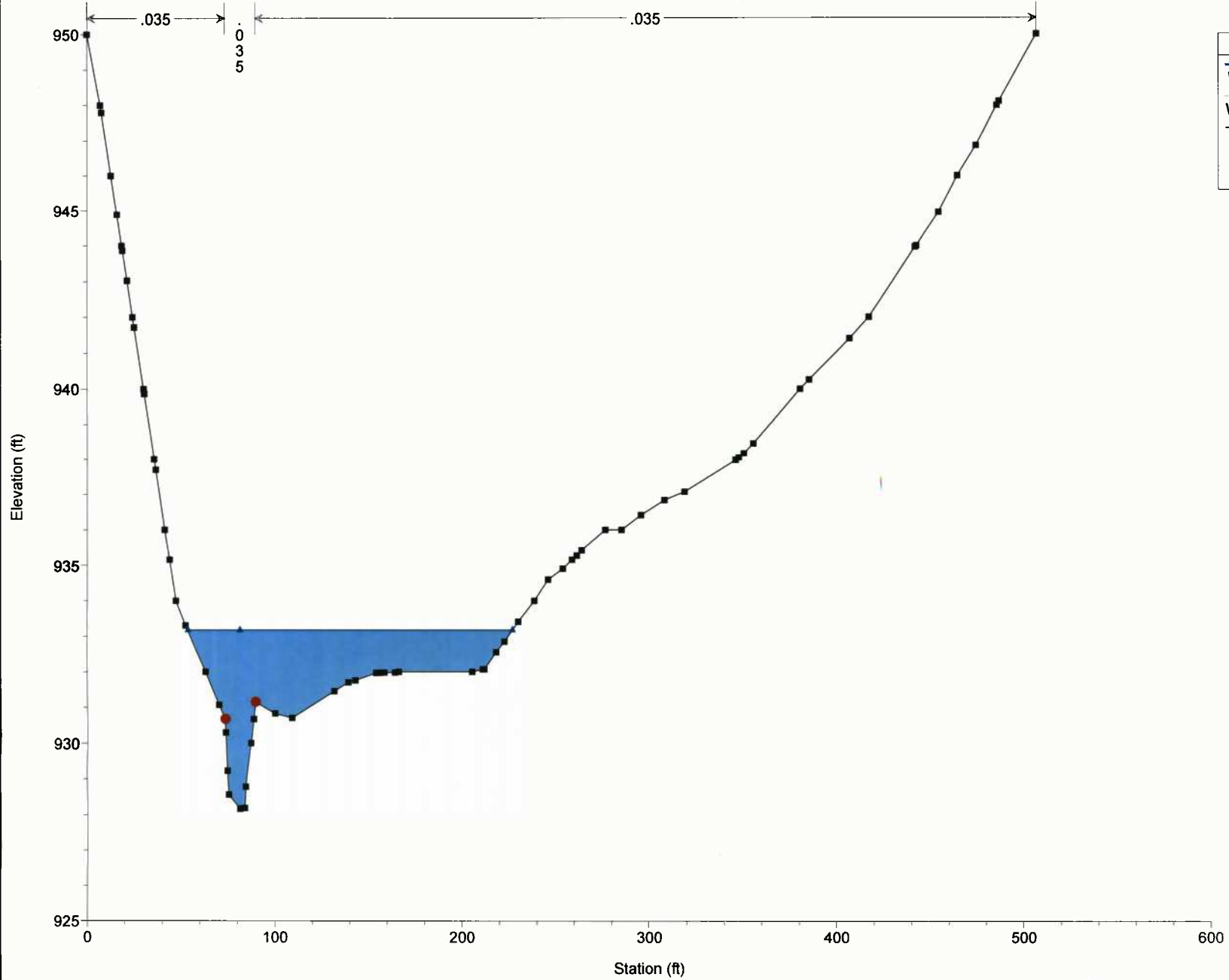
OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 10402.90



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised  
Geom: Ford-Inline Flow: Structures Revised  
River = Bluestone Creek Reach = Upper RS = 10179.69

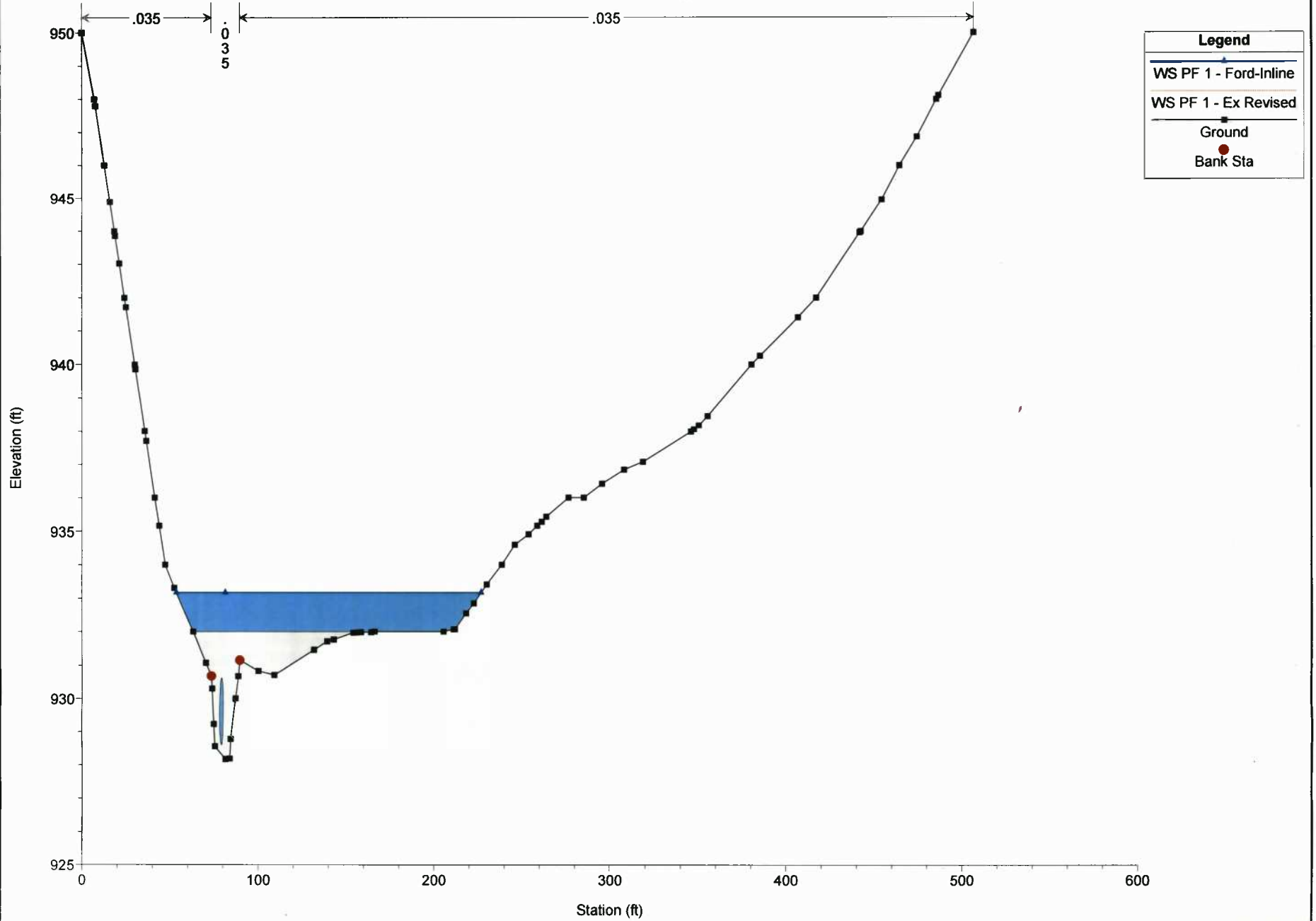


Legend	
WS PF 1 - Ford-Inline	◆
WS PF 1 - Ex Revised	■
Ground	■
Bank Sta	●

OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 10155.71 Culv

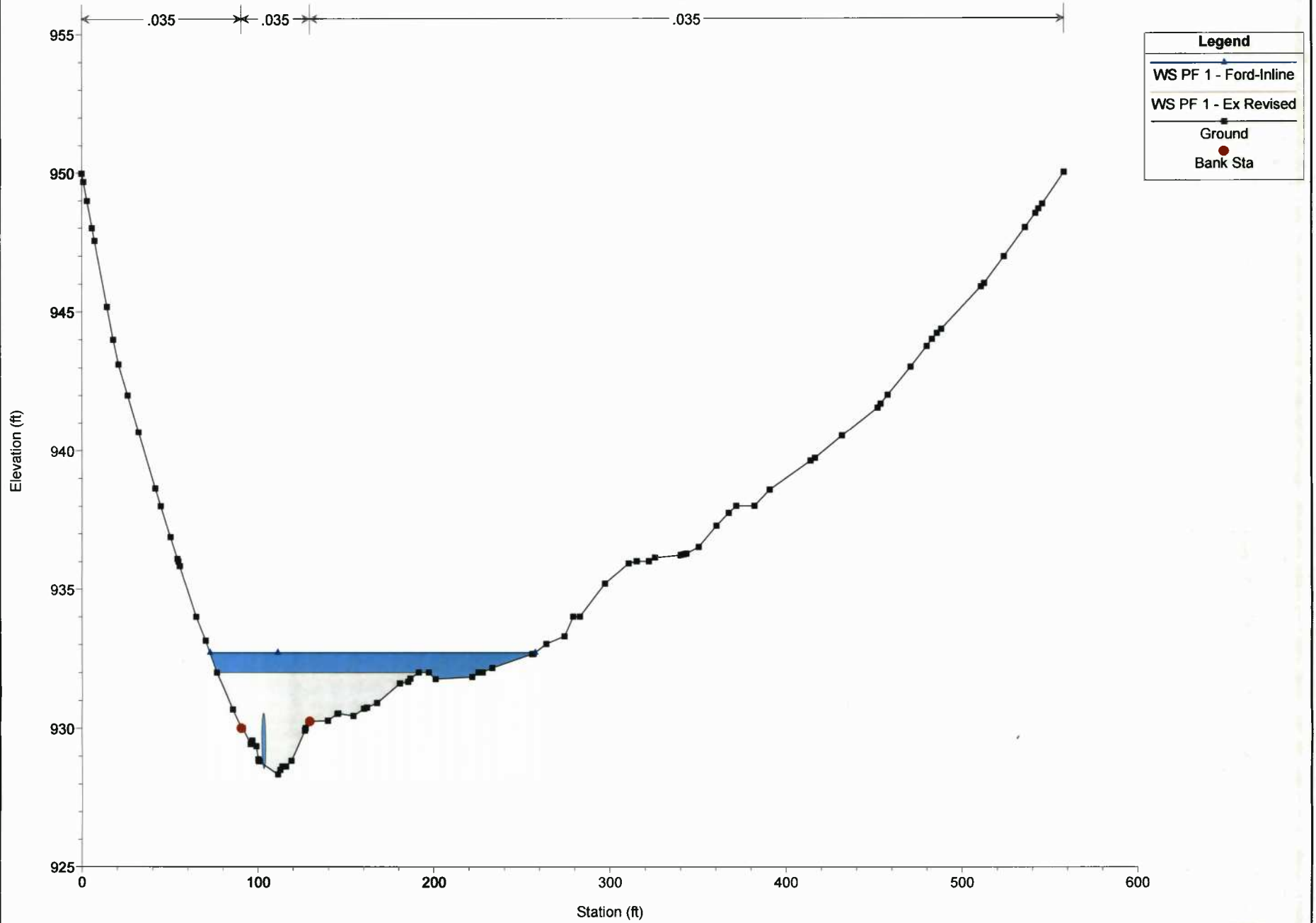


Legend	
WS PF 1 - Ford-Inline	▲
WS PF 1 - Ex Revised	■
Ground	■
Bank Sta	●

OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

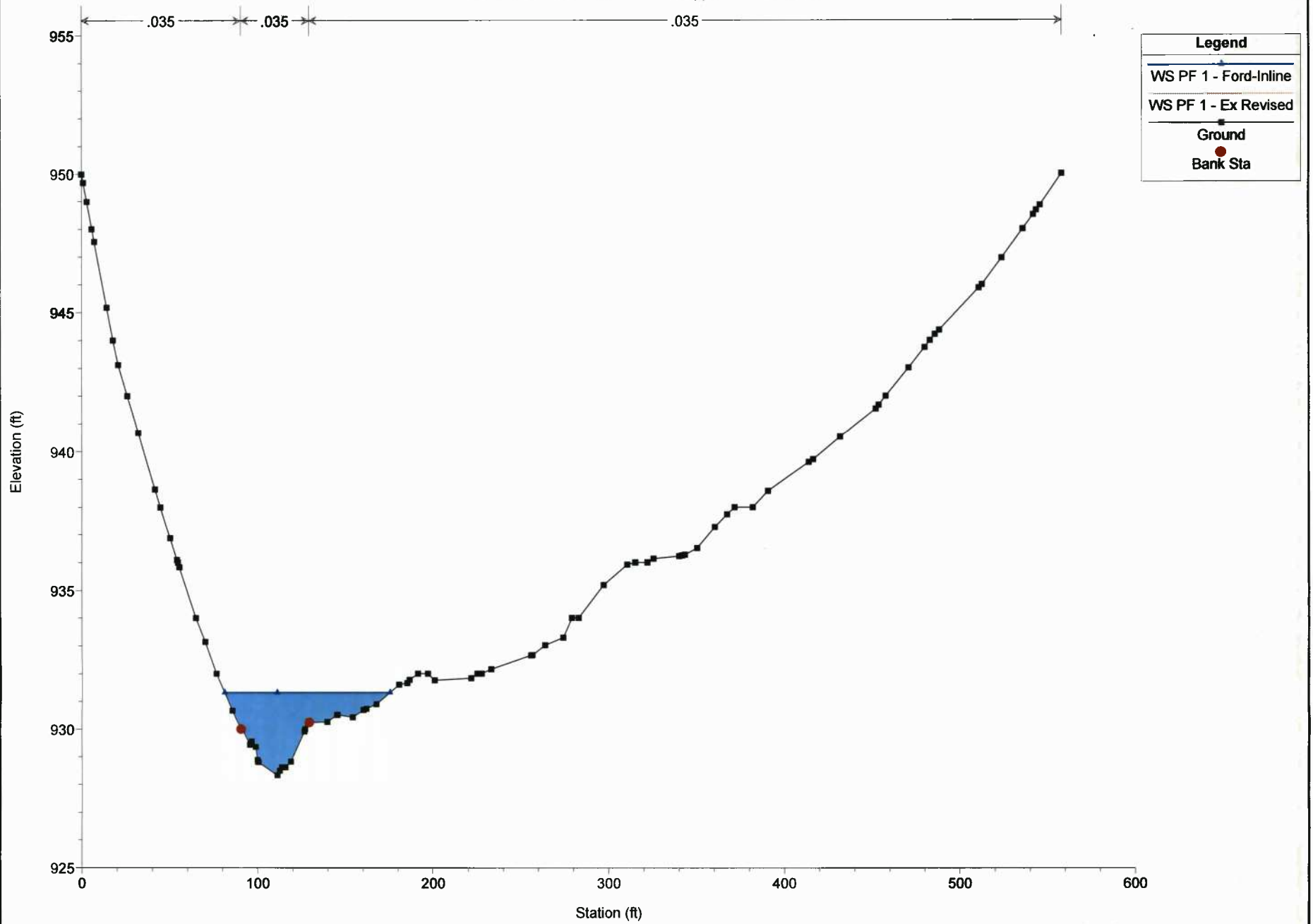
River = Bluestone Creek Reach = Upper RS = 10155.71 Culv



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

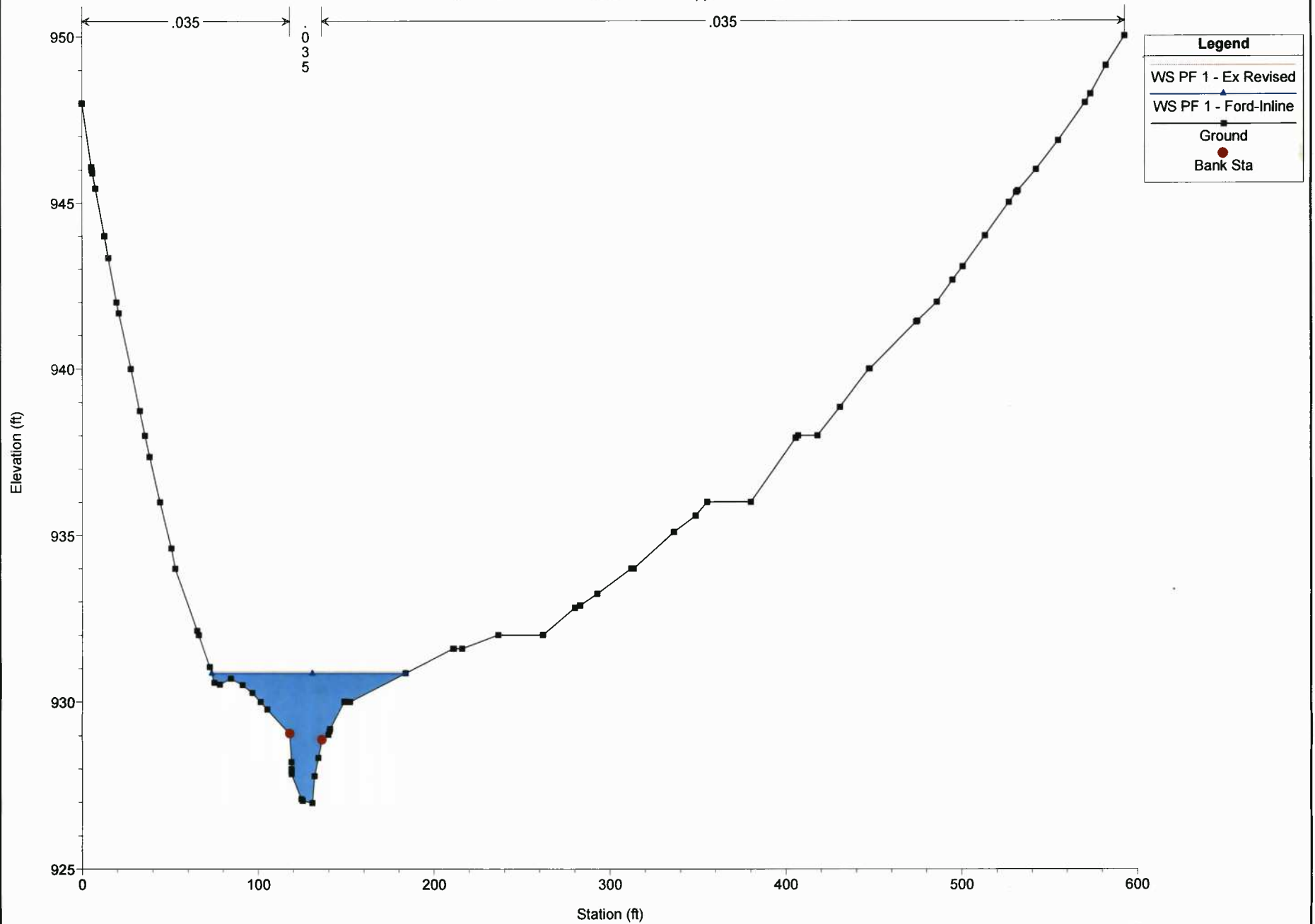
River = Bluestone Creek Reach = Upper RS = 10120.86



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

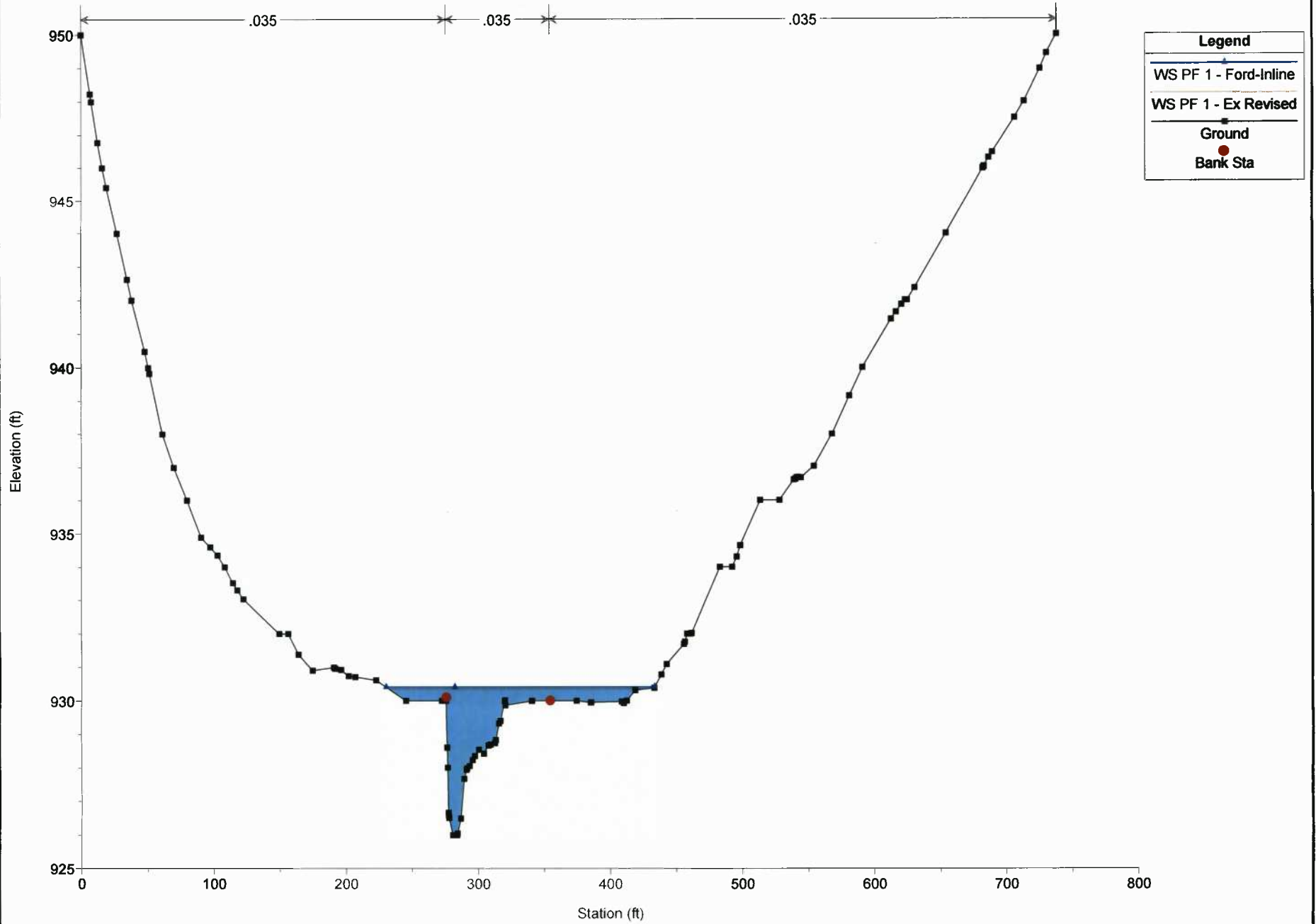
River = Bluestone Creek Reach = Upper RS = 10055.03



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

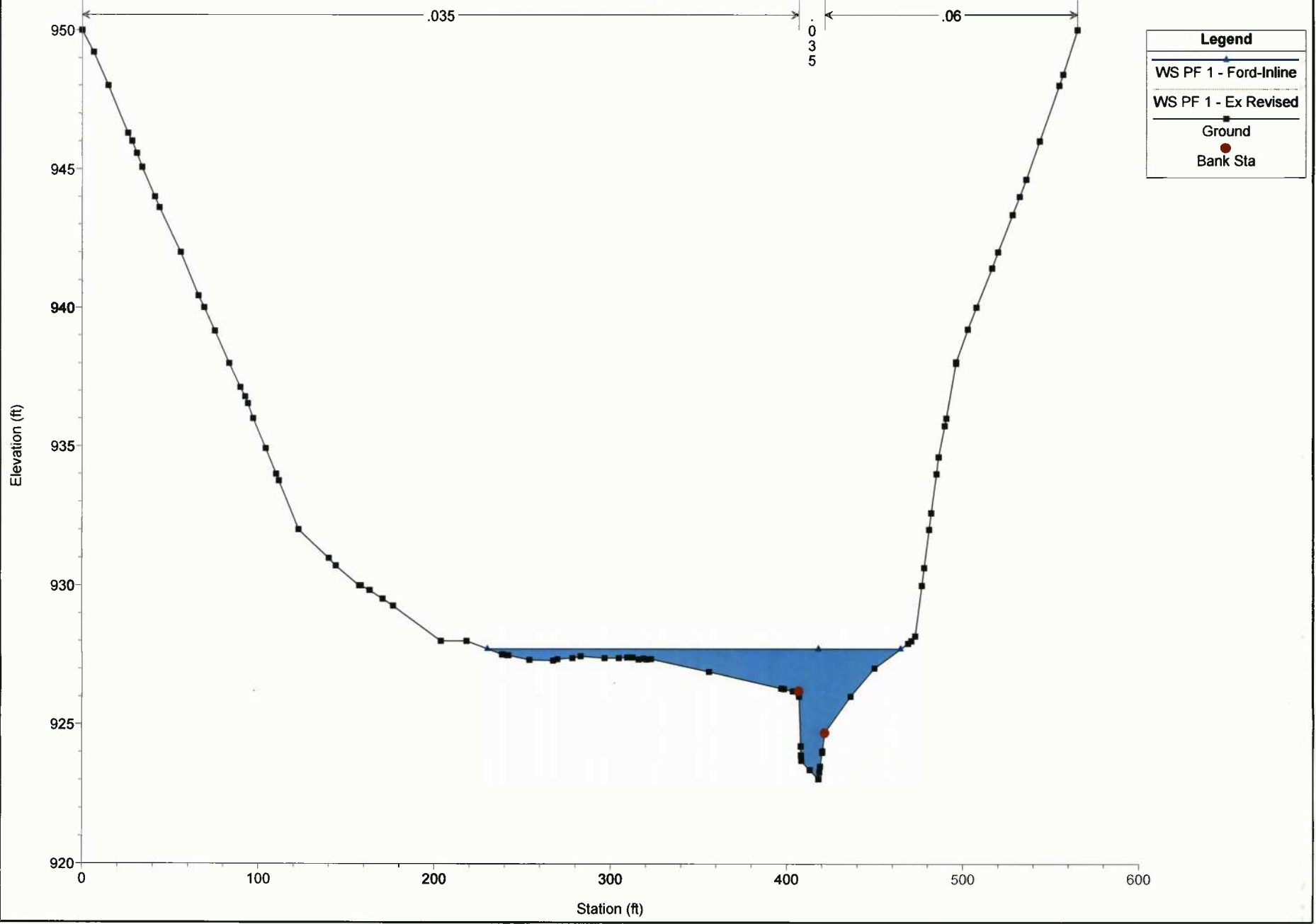
River = Bluestone Creek Reach = Middle RS = 9989.380



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 9559.249



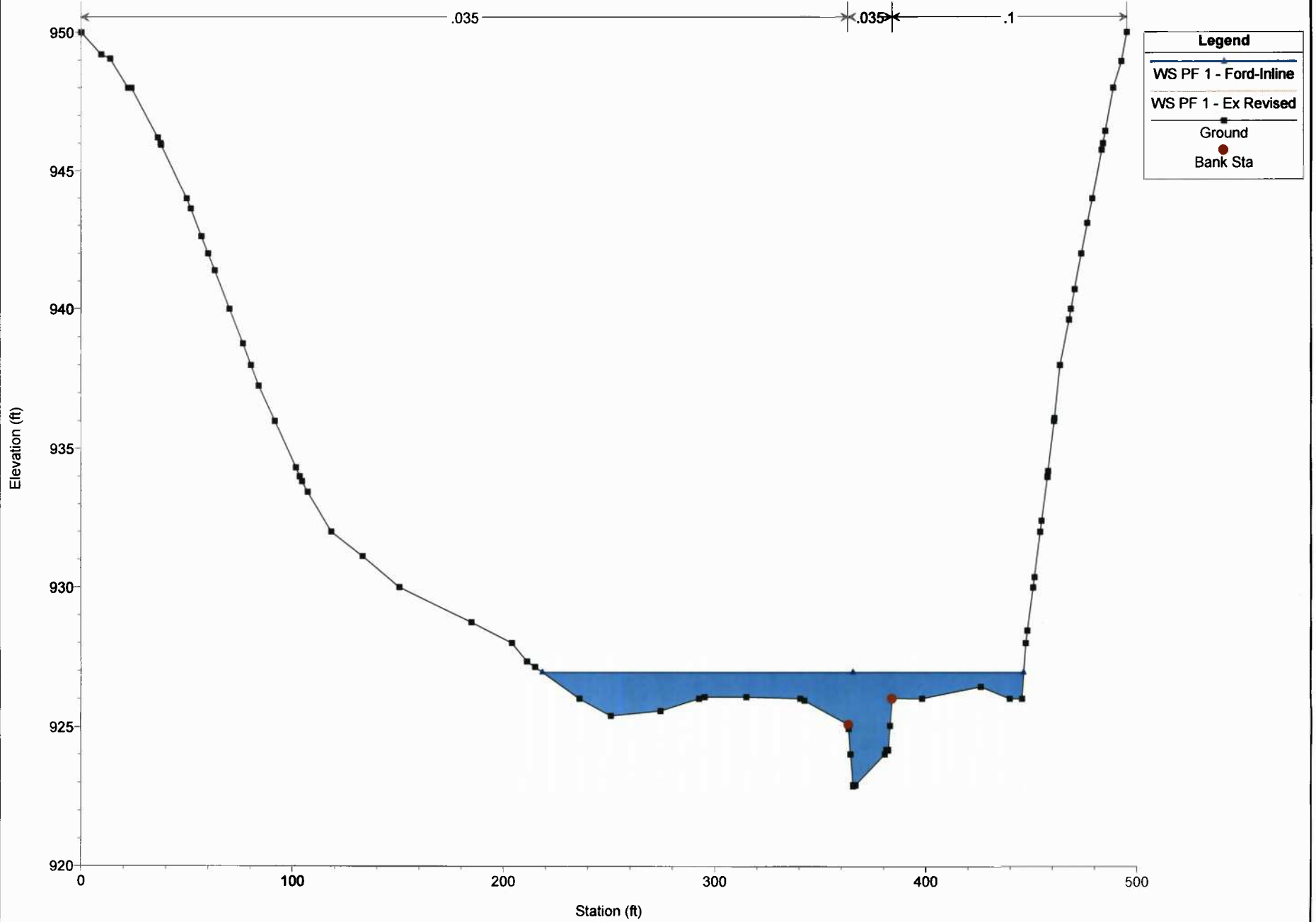
Legend	
—	WS PF 1 - Ford-Inline
- - -	WS PF 1 - Ex Revised
■	Ground
●	Bank Sta



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

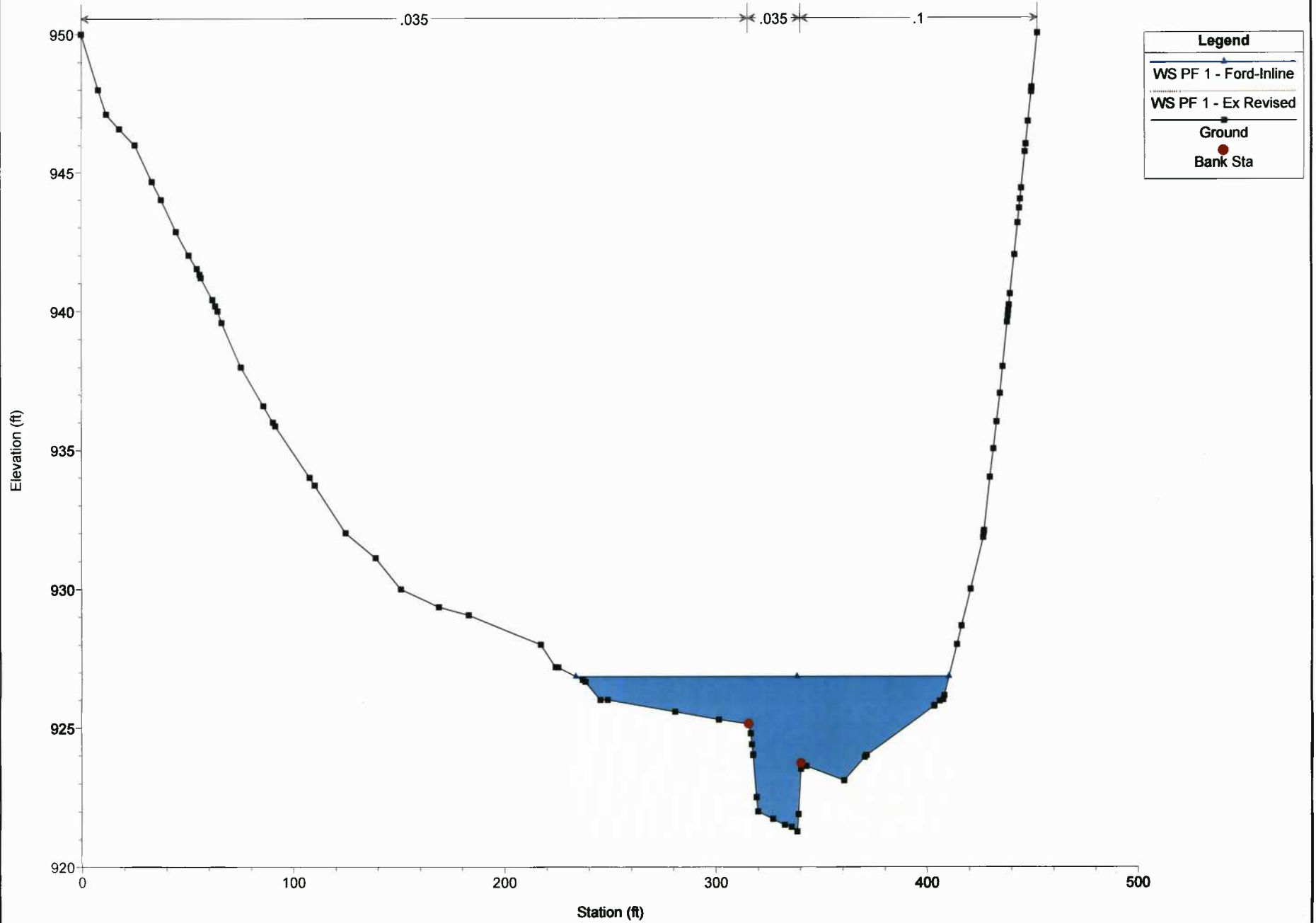
River = Bluestone Creek Reach = Middle RS = 9443.656



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 9322.807



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

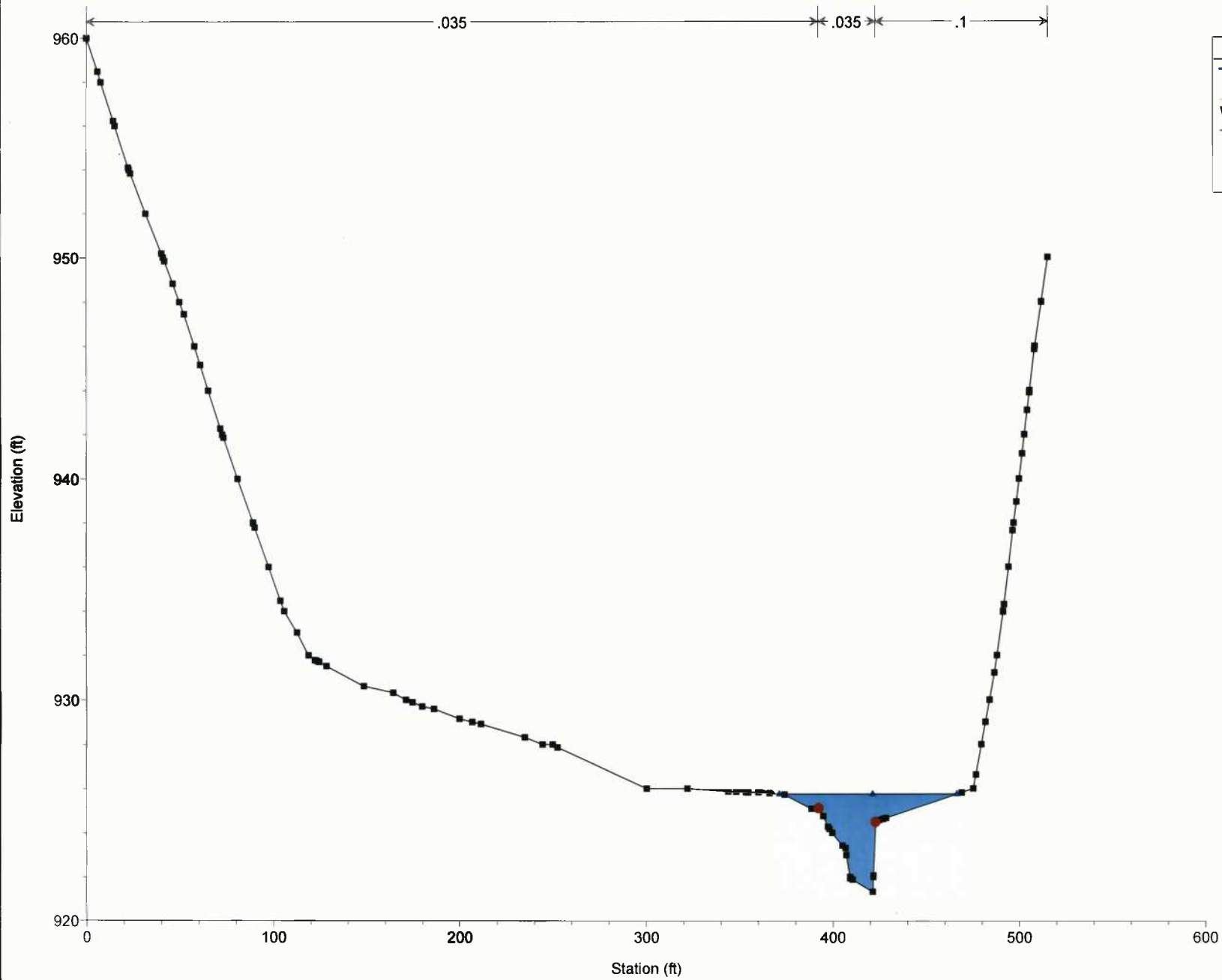
Geom: Ford-Inline Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 9266.019

.035

.035

.1



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 9003.470

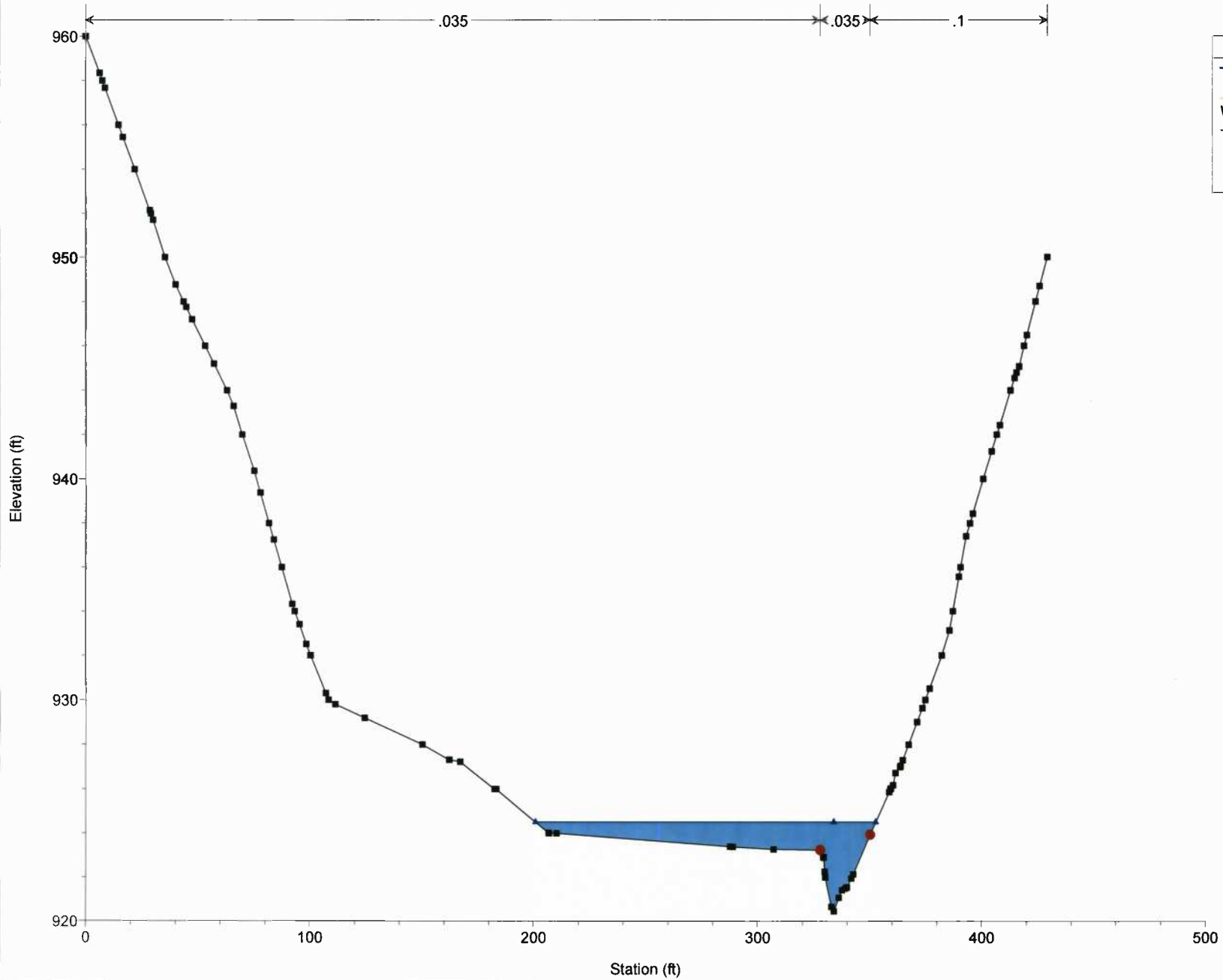
Legend

WS PF 1 - Ford-Inline

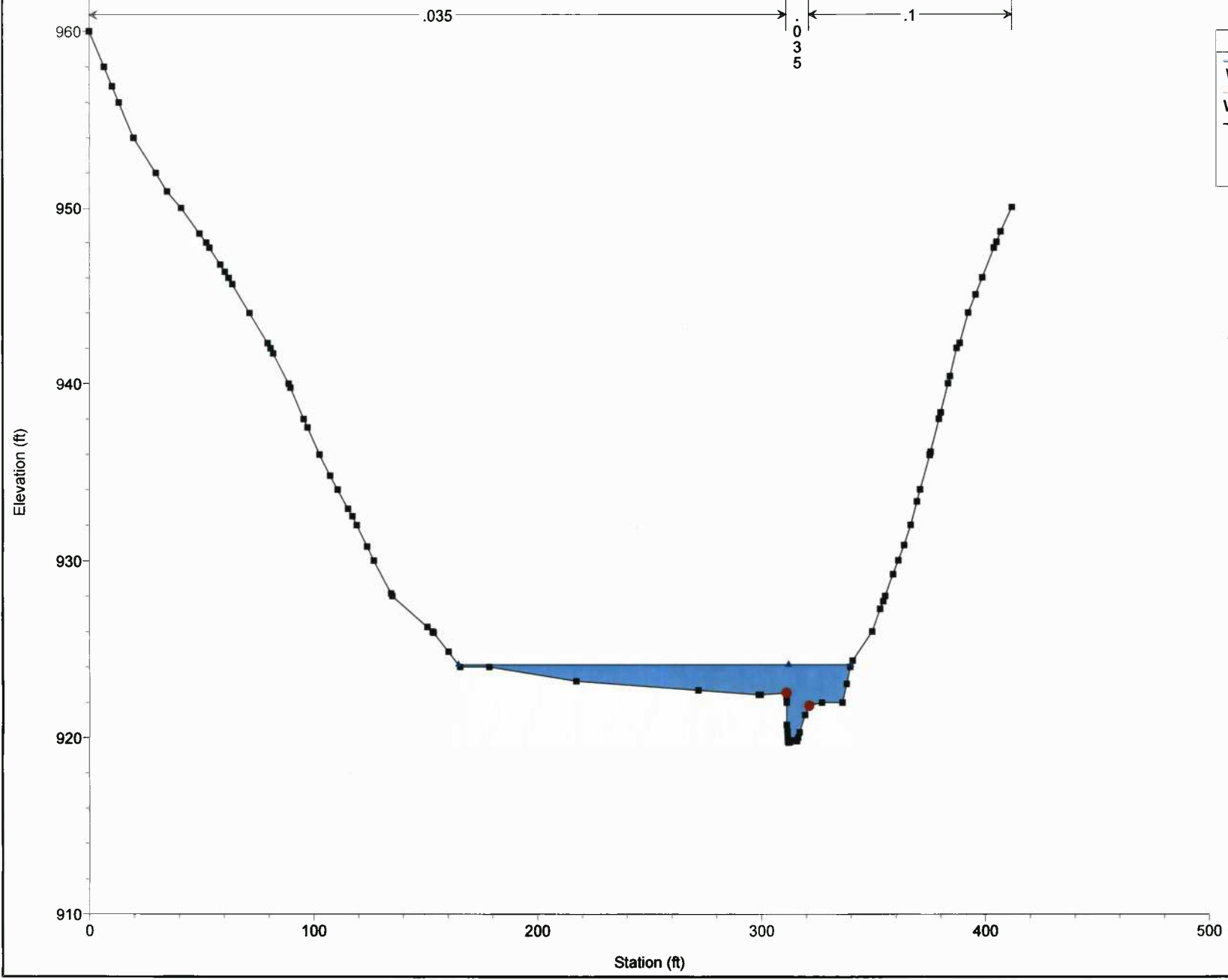
WS PF 1 - Ex Revised

Ground

Bank Sta



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised  
Geom: Ford-Inline Flow: Structures Revised  
River = Bluestone Creek Reach = Middle RS = 8906.253

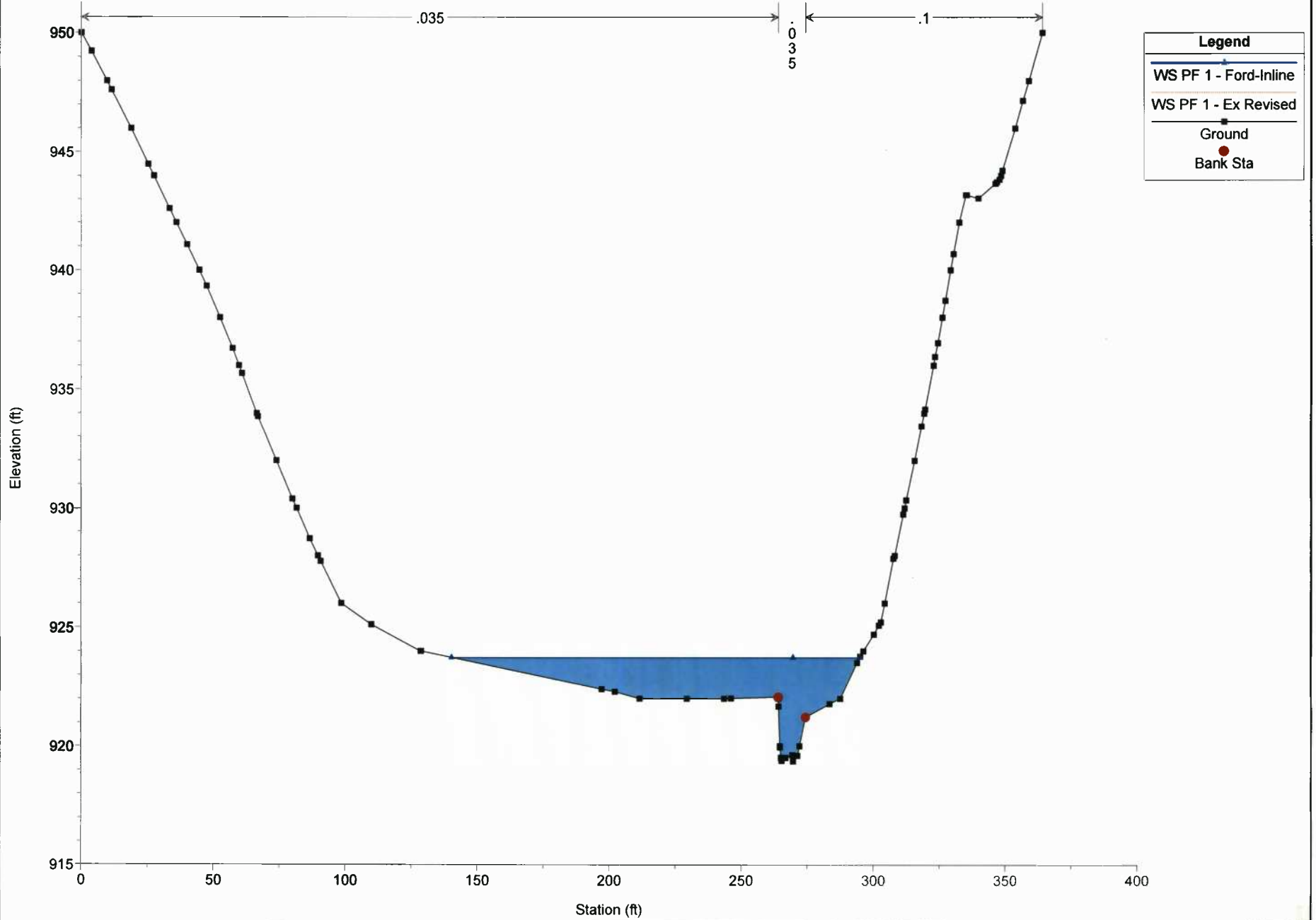


Legend	
WS PF 1 - Ford-Inline	(Blue line)
WS PF 1 - Ex Revised	(Black line)
Ground	(Black square)
Bank Sta	(Red circle)

OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

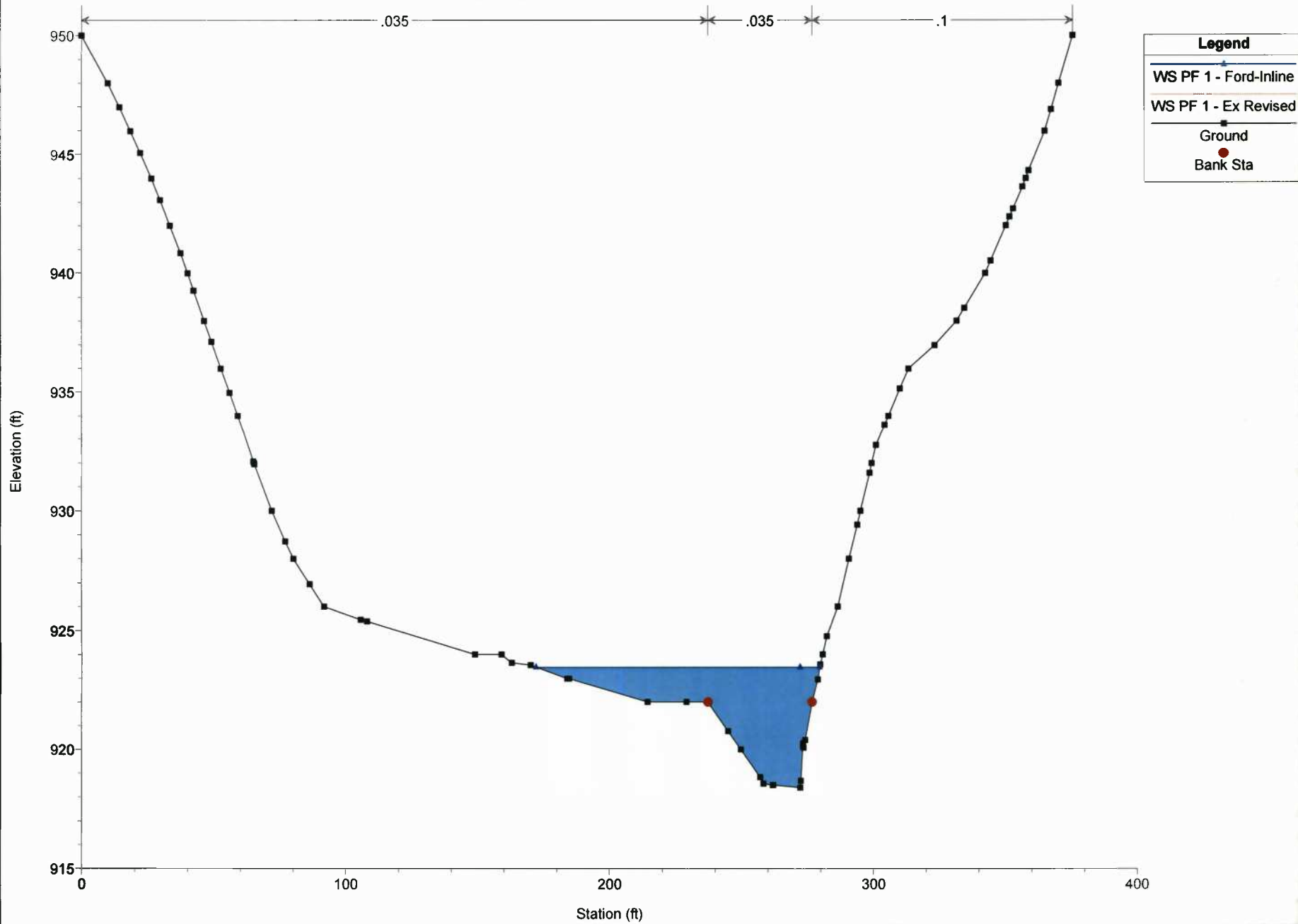
River = Bluestone Creek Reach = Middle RS = 8843.186



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

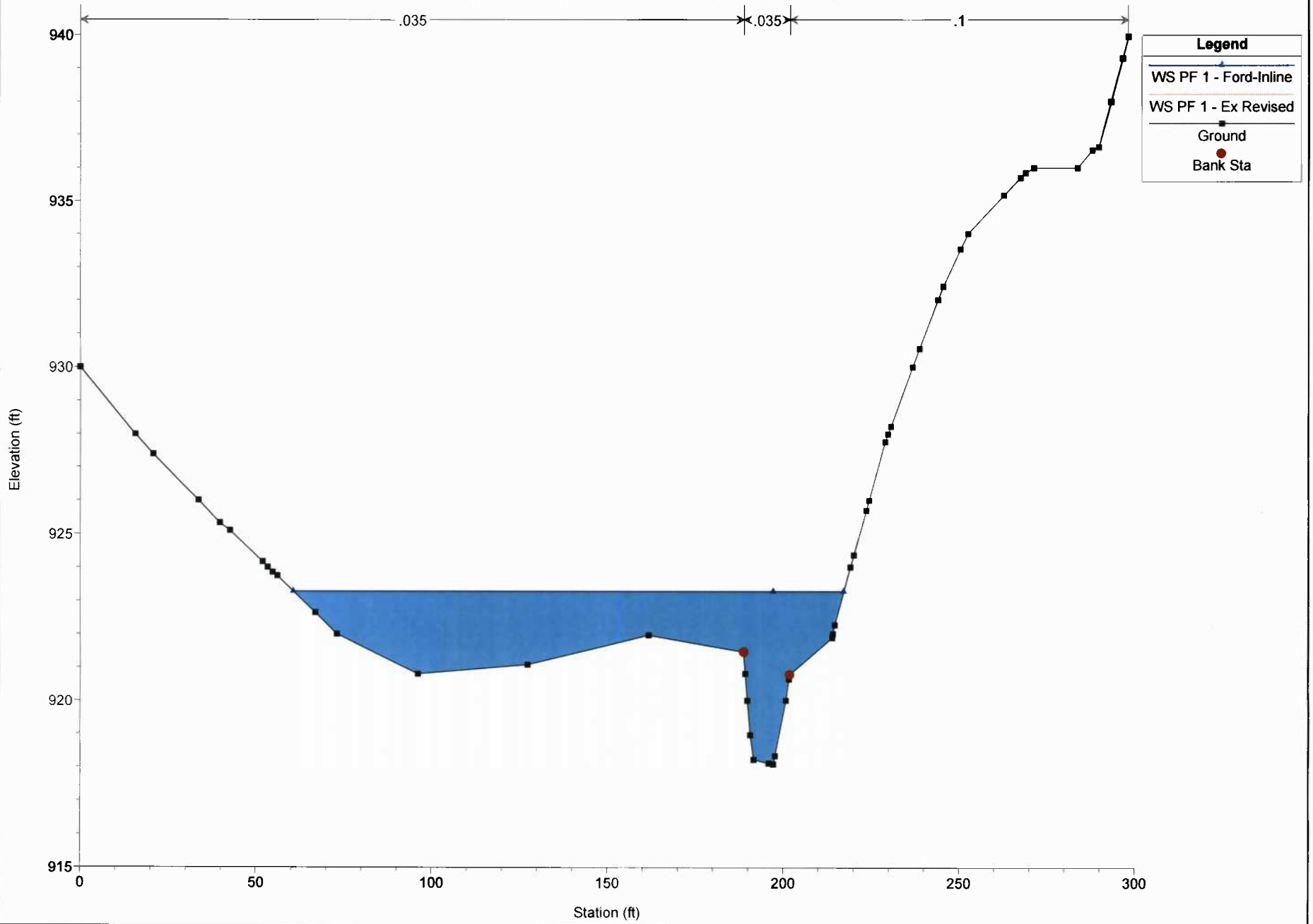
River = Bluestone Creek Reach = Middle RS = 8712.623



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 8542.514

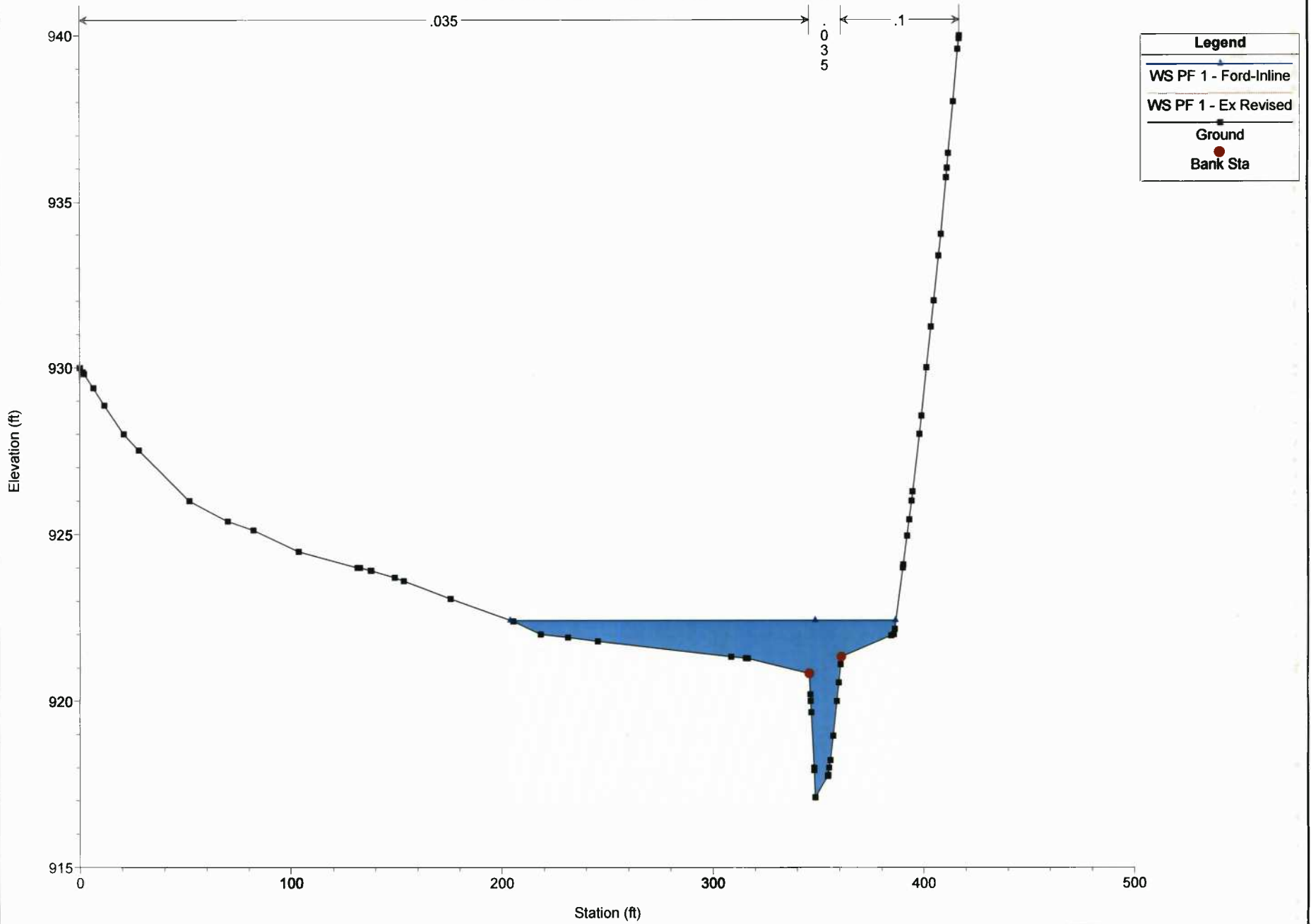




OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

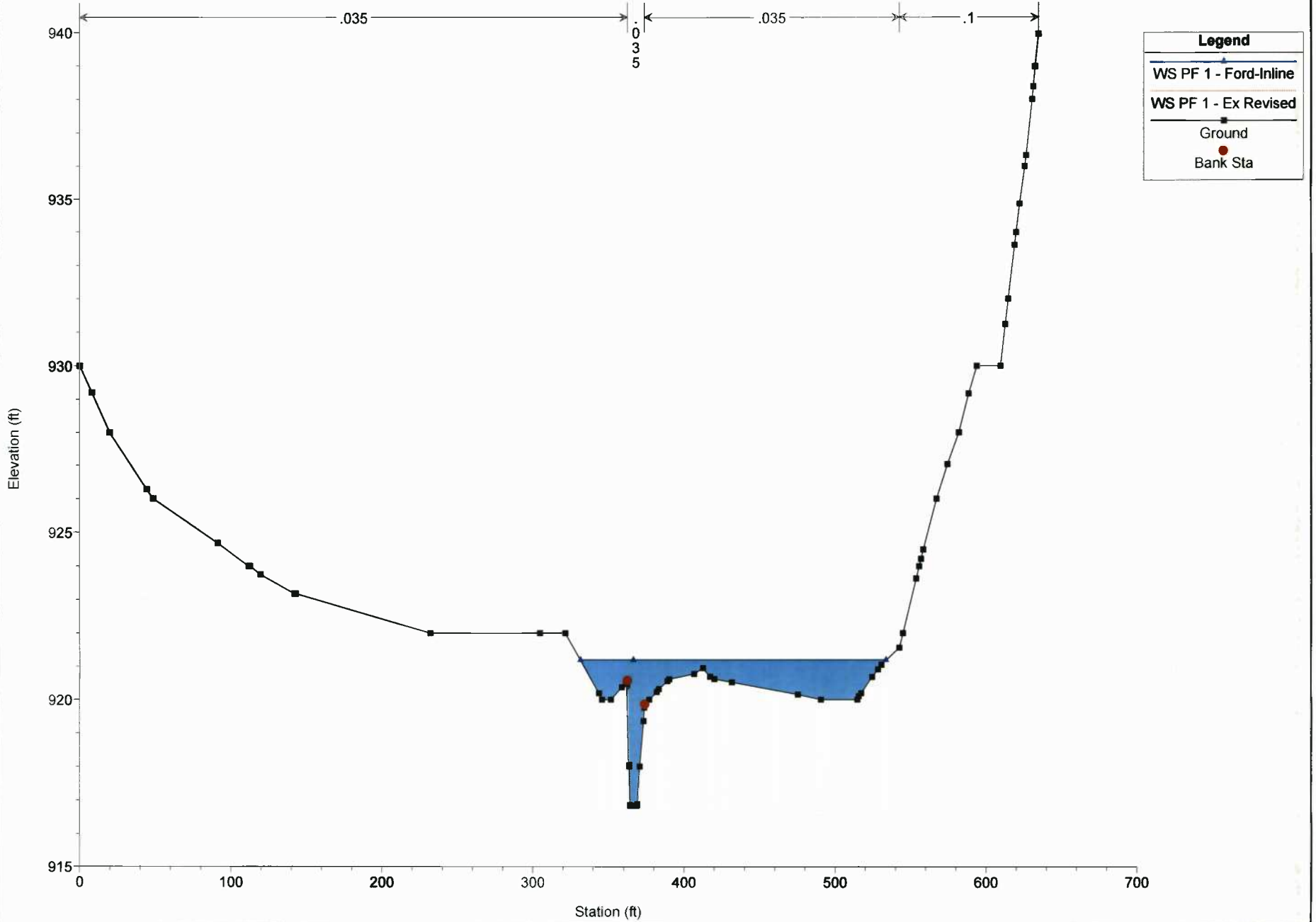
River = Bluestone Creek Reach = Middle RS = 8379.502



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

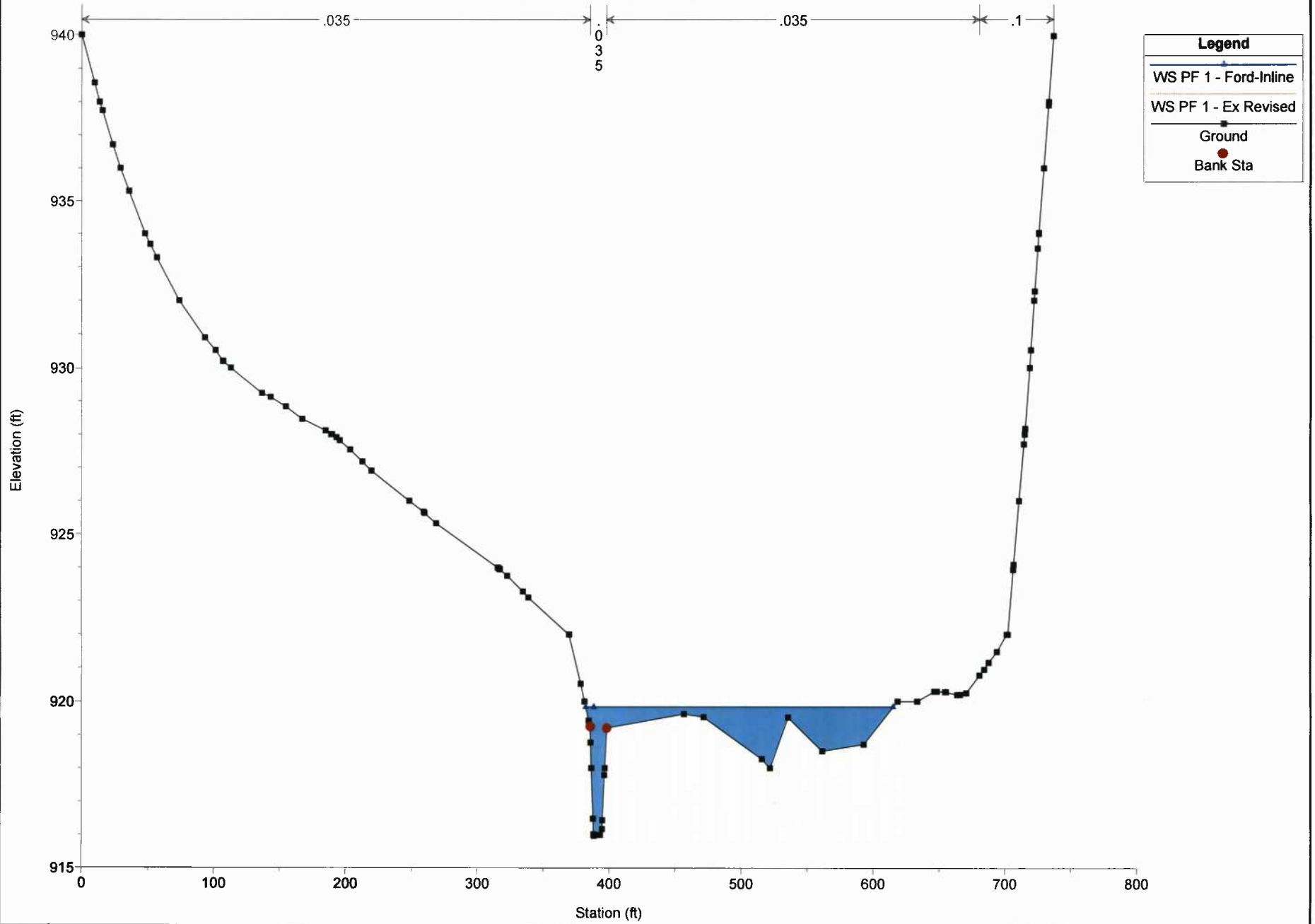
River = Bluestone Creek Reach = Middle RS = 8109.907



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

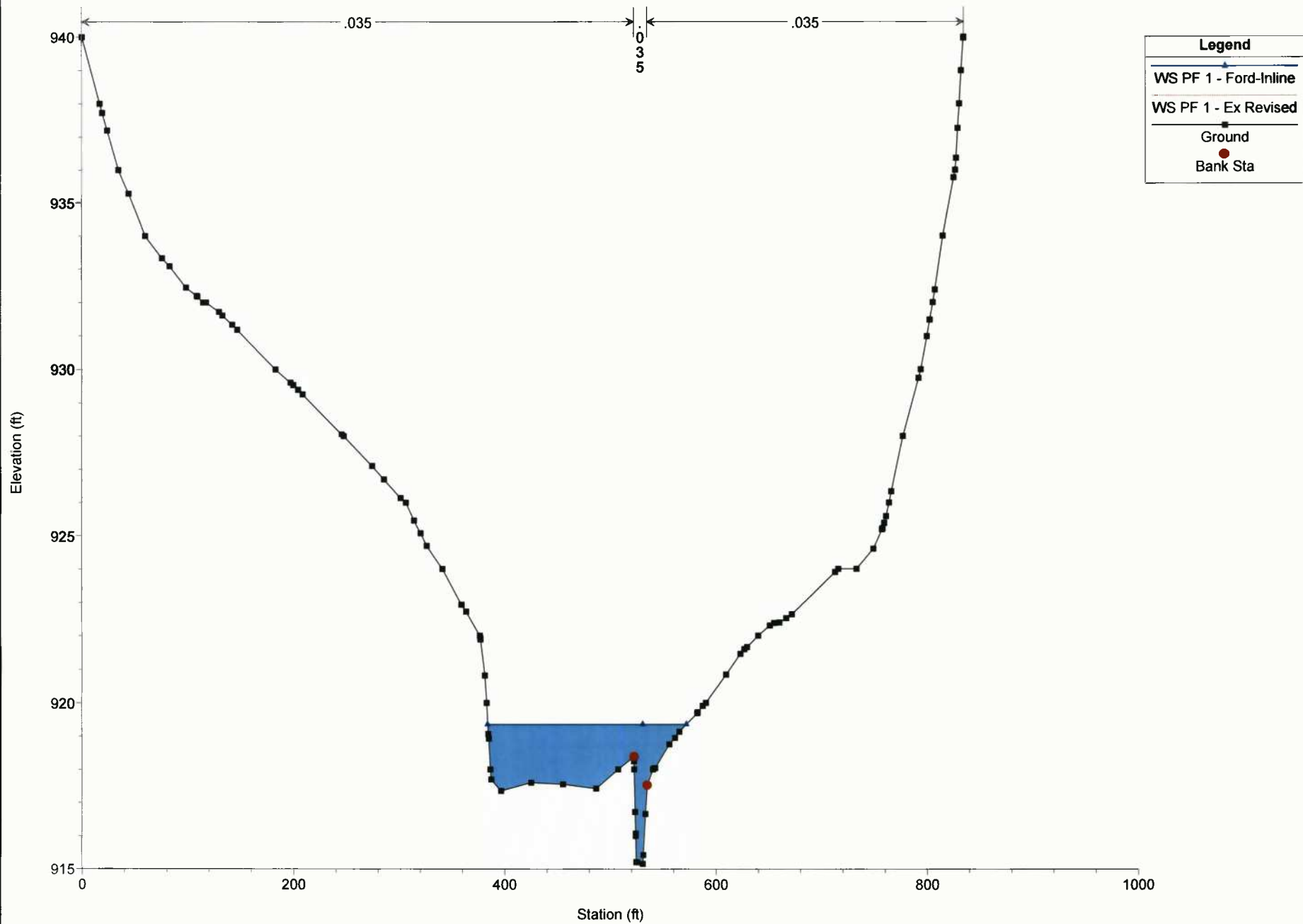
River = Bluestone Creek Reach = Middle RS = 7770.441



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

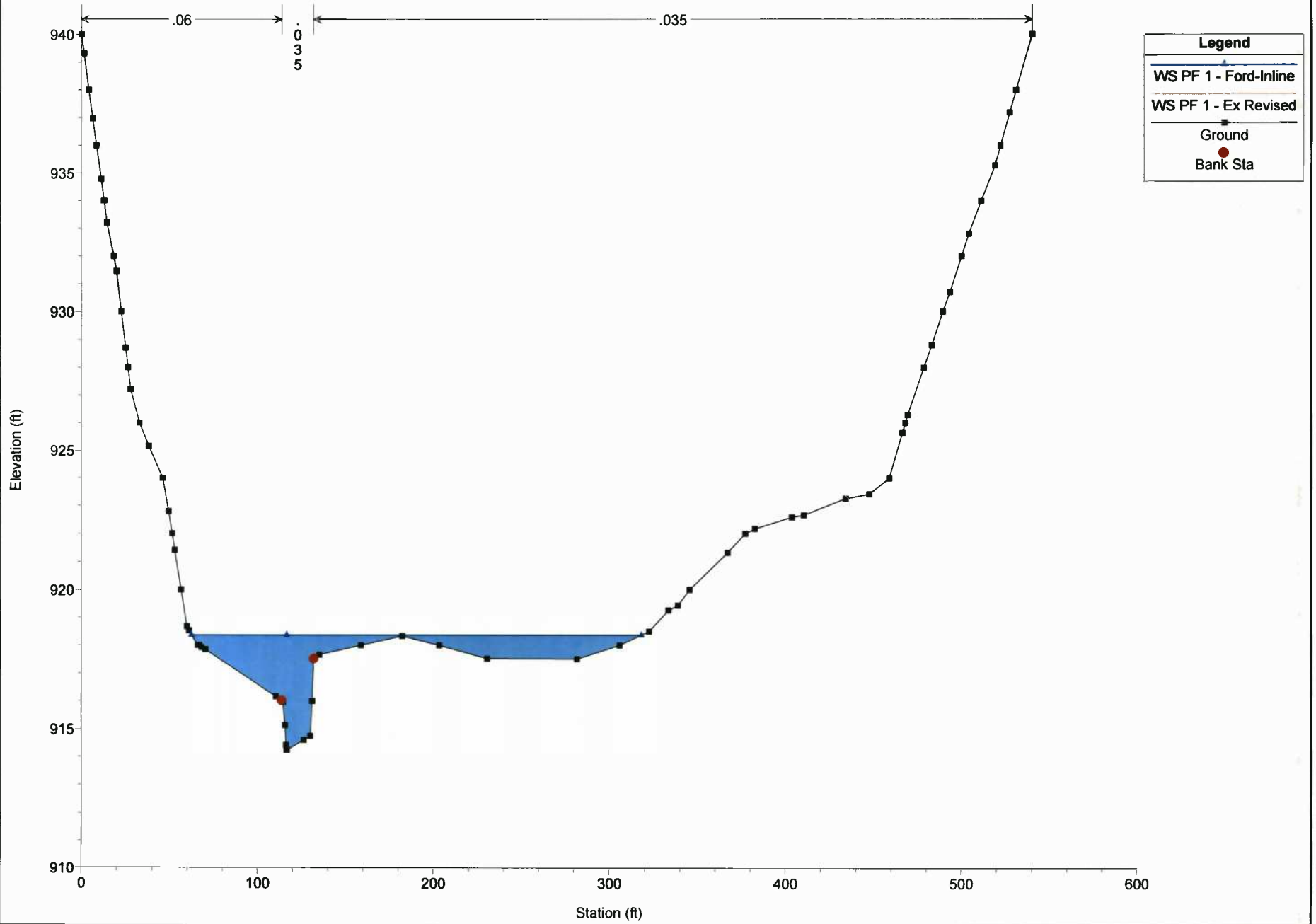
River = Bluestone Creek Reach = Middle RS = 7438.793



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

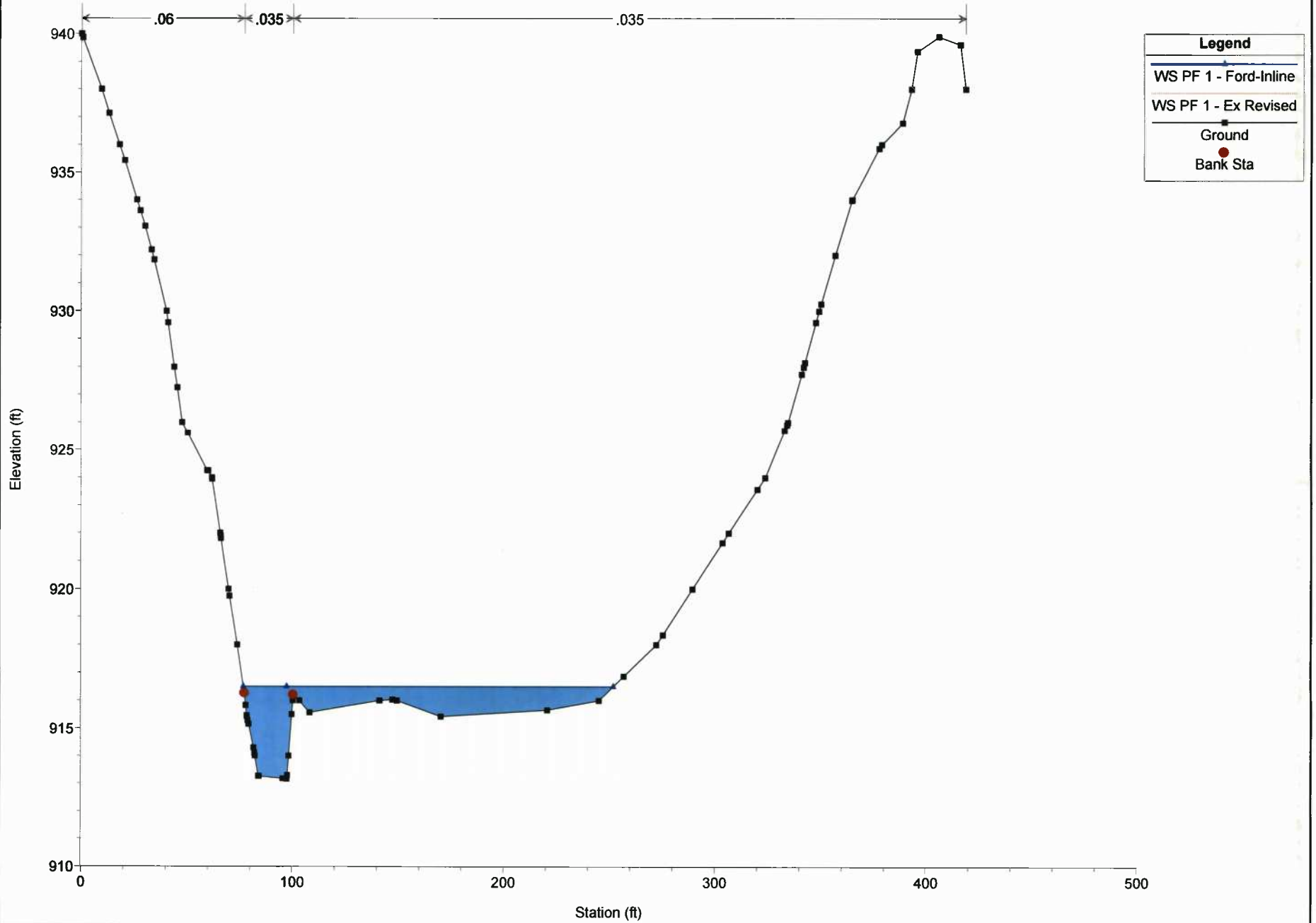
River = Bluestone Creek Reach = Middle RS = 7150.429



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

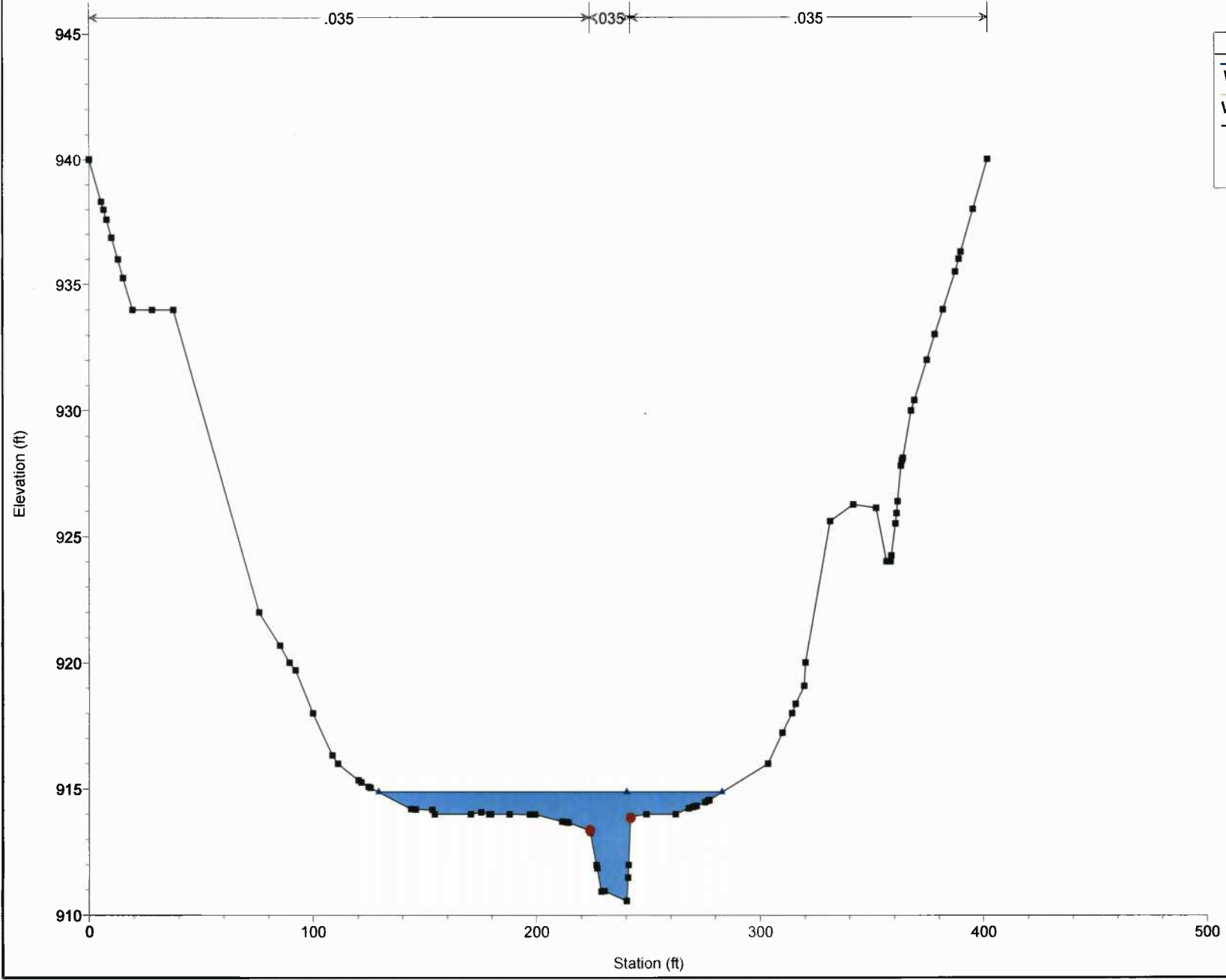
River = Bluestone Creek Reach = Middle RS = 6893.619



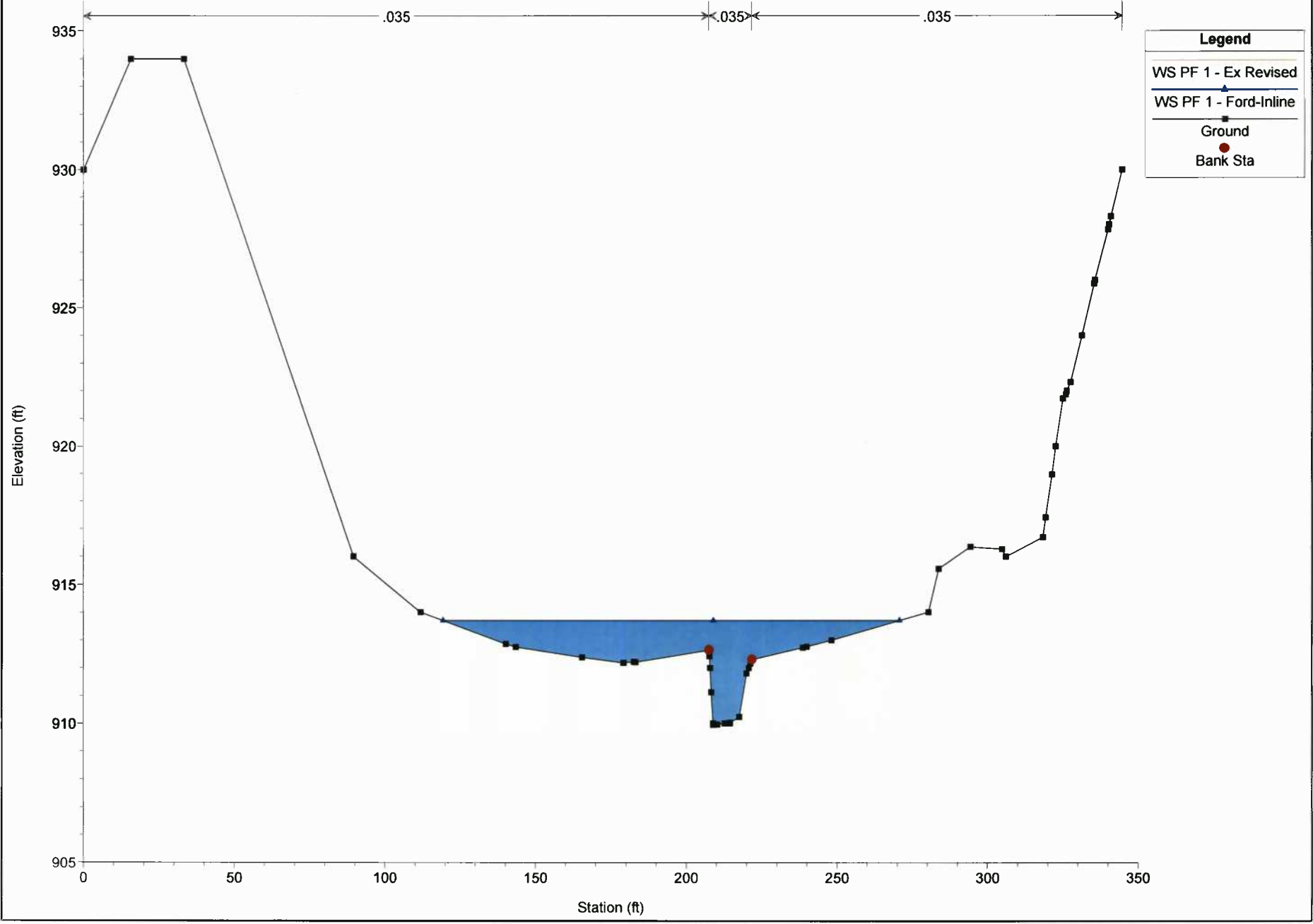
Legend	
WS PF 1 - Ford-Inline	—
WS PF 1 - Ex Revised	—
Ground	■
Bank Sta	●

OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised  
Geom: Ford-Inline Flow: Structures Revised  
River = Bluestone Creek Reach = Middle RS = 6579.154

Legend	
—	WS PF 1 - Ford-Inline
—	WS PF 1 - Ex Revised
■	Ground
●	Bank Sta



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised  
 Geom: Ford-Inline Flow: Structures Revised  
 River = Bluestone Creek Reach = Middle RS = 6481.438



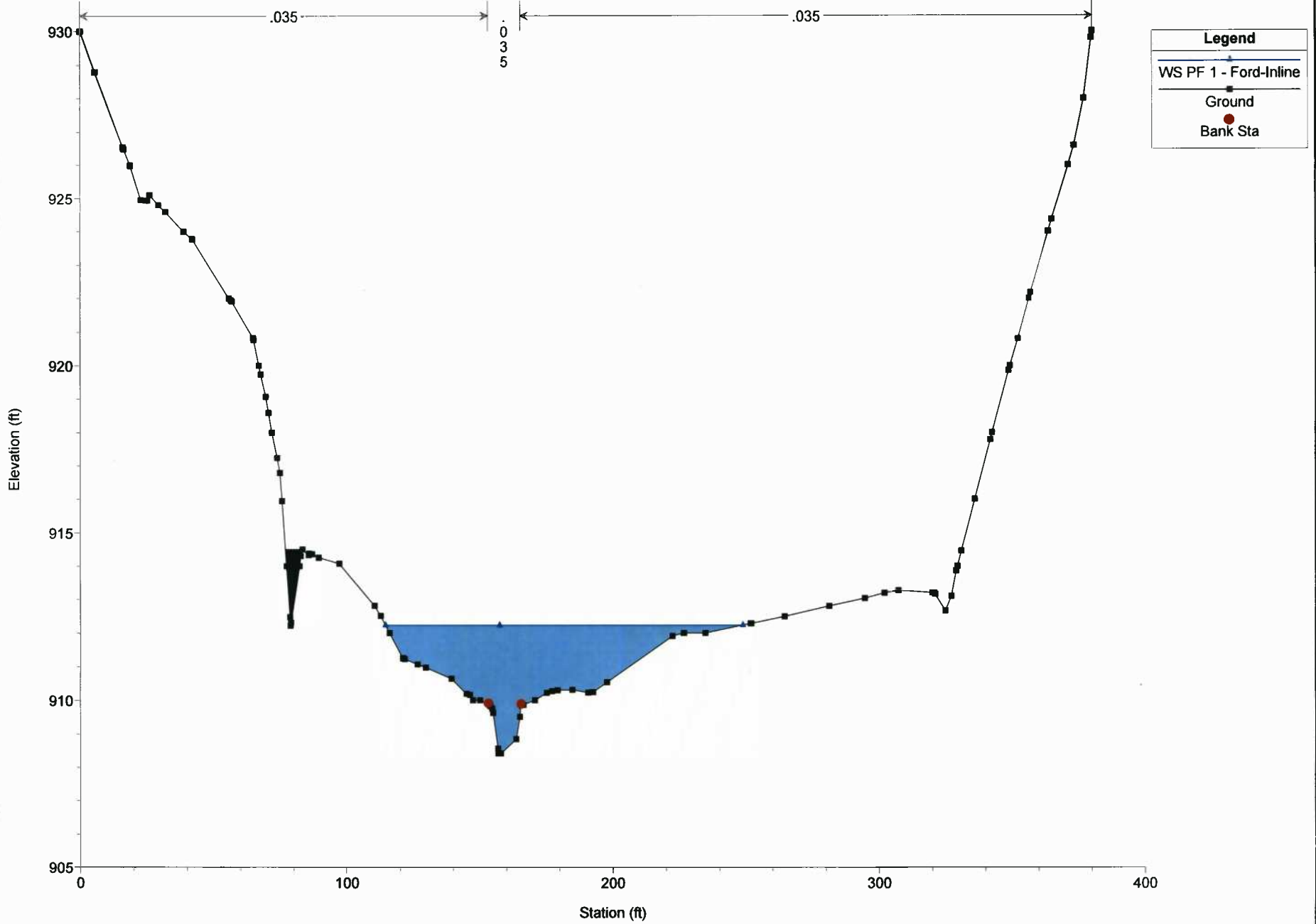
Legend	
WS PF 1 - Ex Revised	▲
WS PF 1 - Ford-Inline	■
Ground	■
Bank Sta	●



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 6323.723

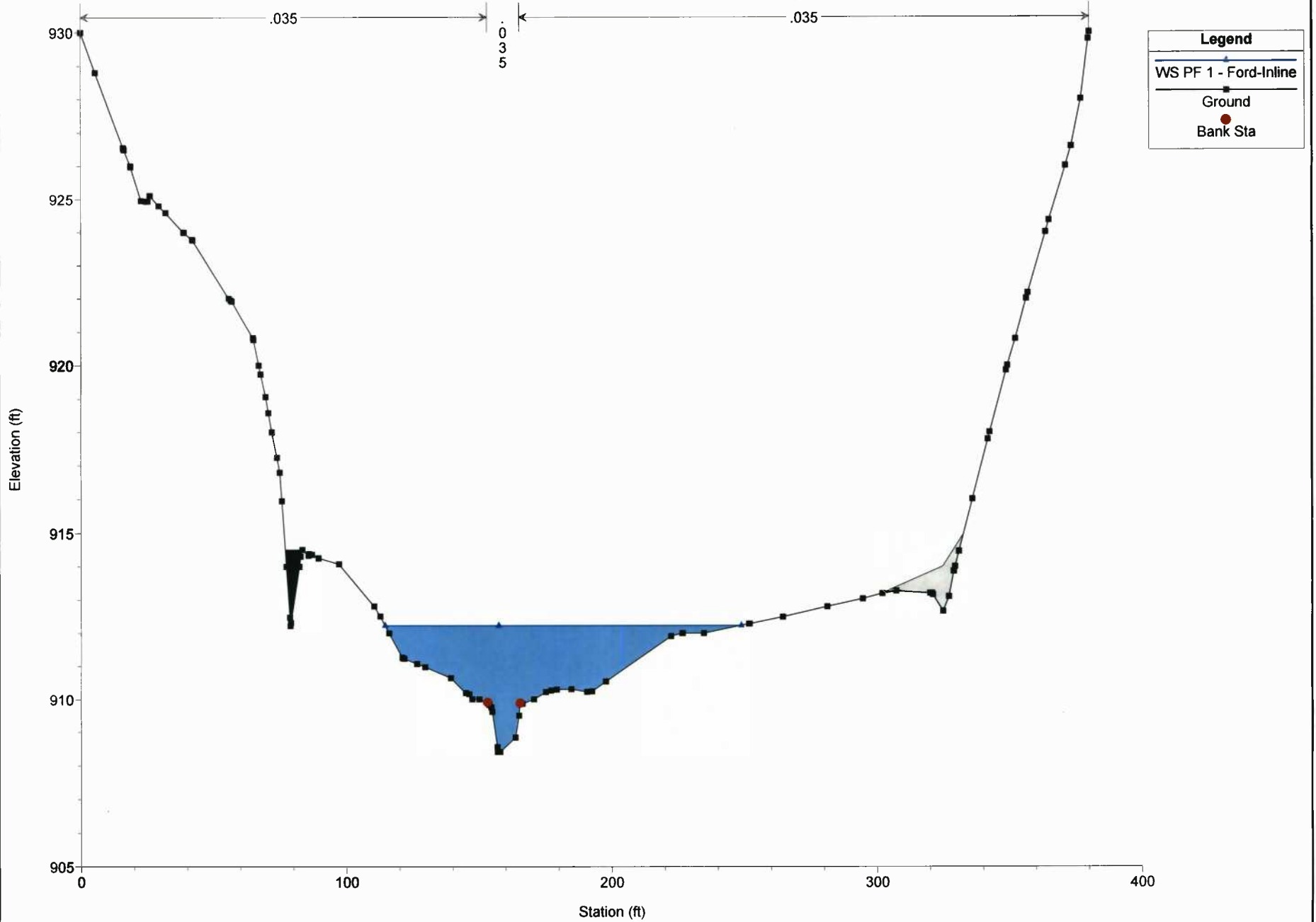


Legend	
WS PF 1 - Ford-Inline	—■—
Ground	—■—
Bank Sta	●

OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

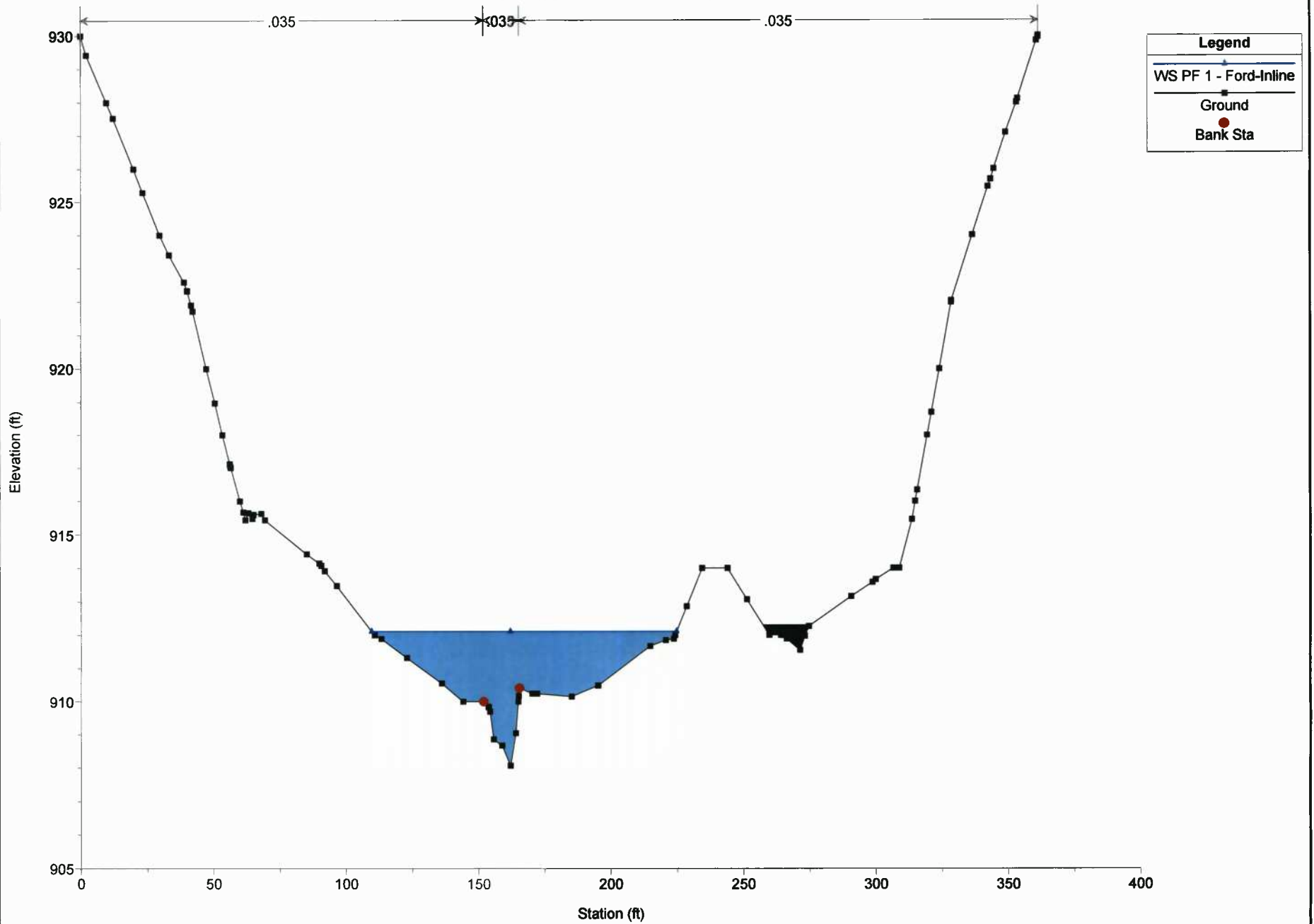
River = Bluestone Creek Reach = Middle RS = 6303.78 IS



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

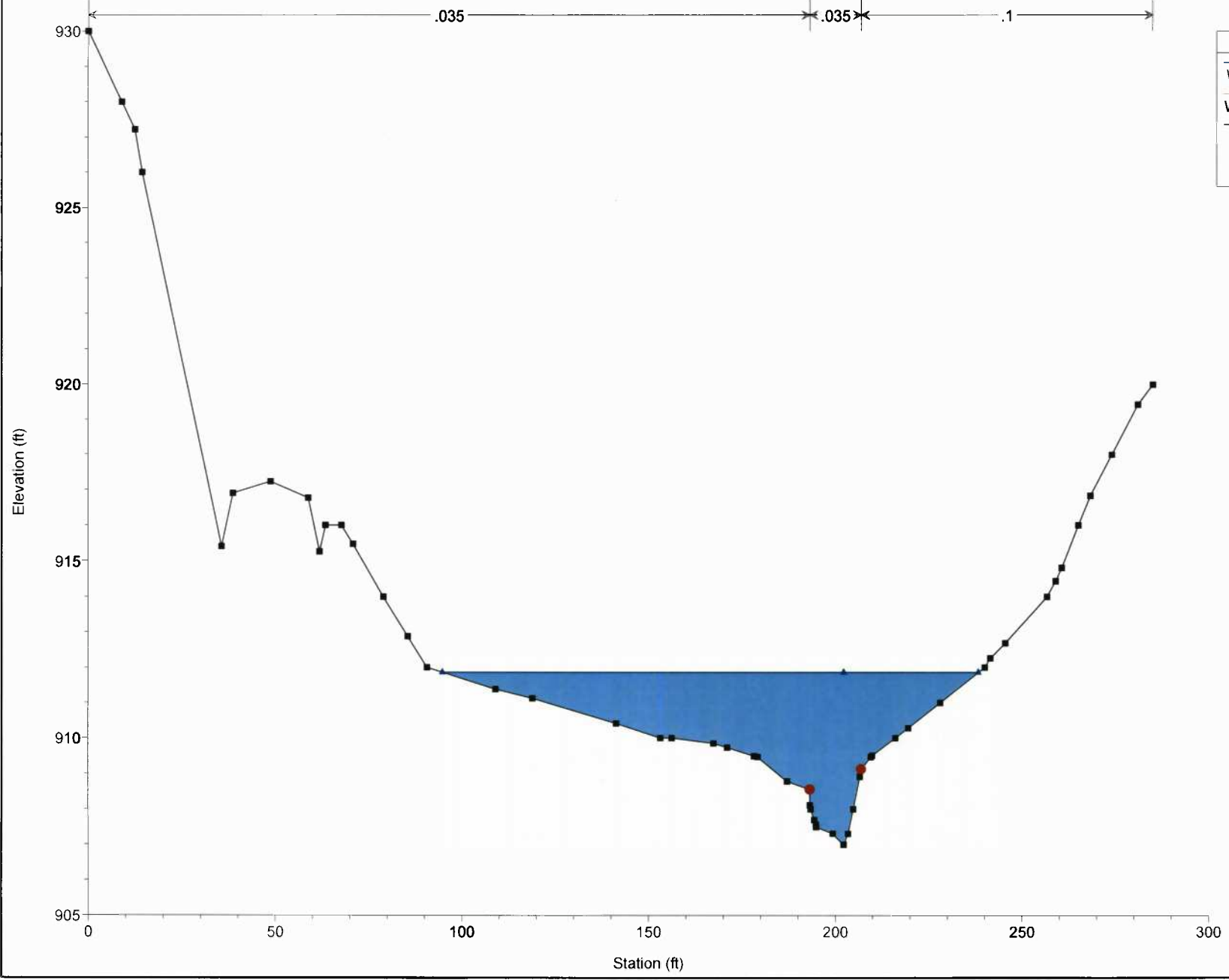
Geom: Ford-Inline Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 6289.579



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised  
Geom: Ford-Inline Flow: Structures Revised  
River = Bluestone Creek Reach = Middle RS = 6179.412

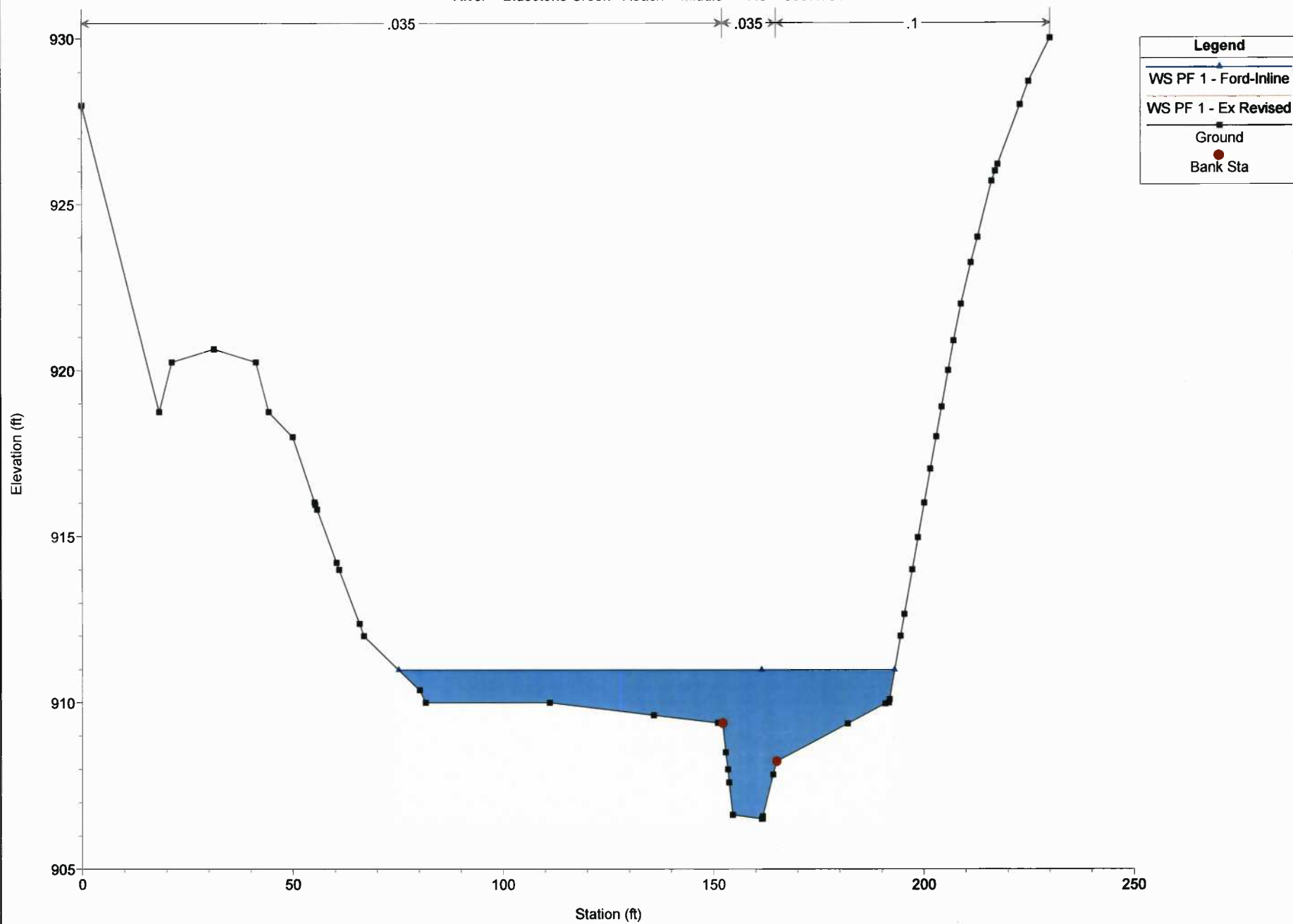
Legend	
WS PF 1 - Ford-Inline	—▲—
WS PF 1 - Ex Revised	—■—
Ground	■
Bank Sta	●



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

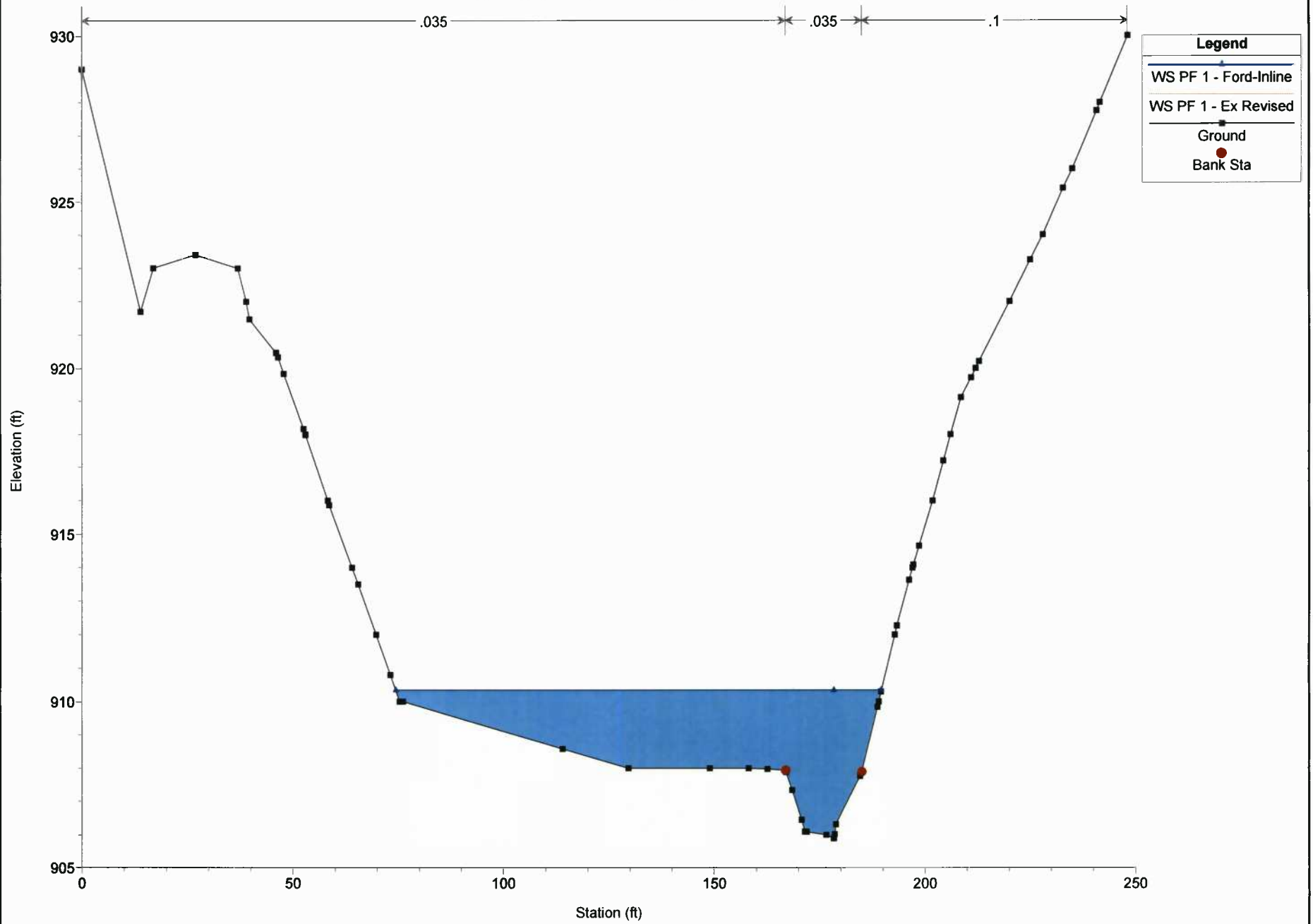
River = Bluestone Creek Reach = Middle RS = 6057.761



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

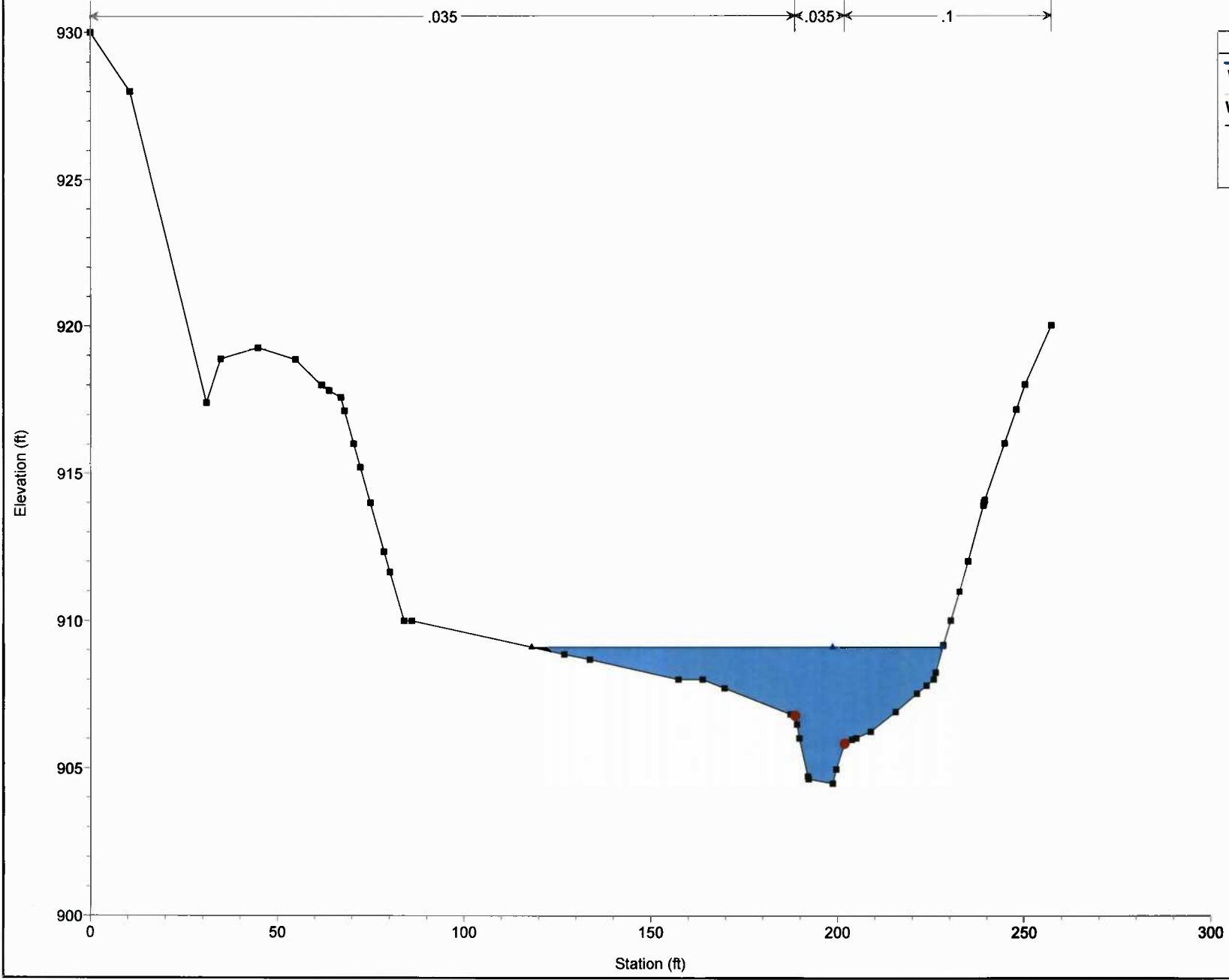
Geom: Ford-Inline Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 5898.334



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised  
 Geom: Ford-Inline Flow: Structures Revised  
 River = Bluestone Creek Reach = Middle RS = 5722.175

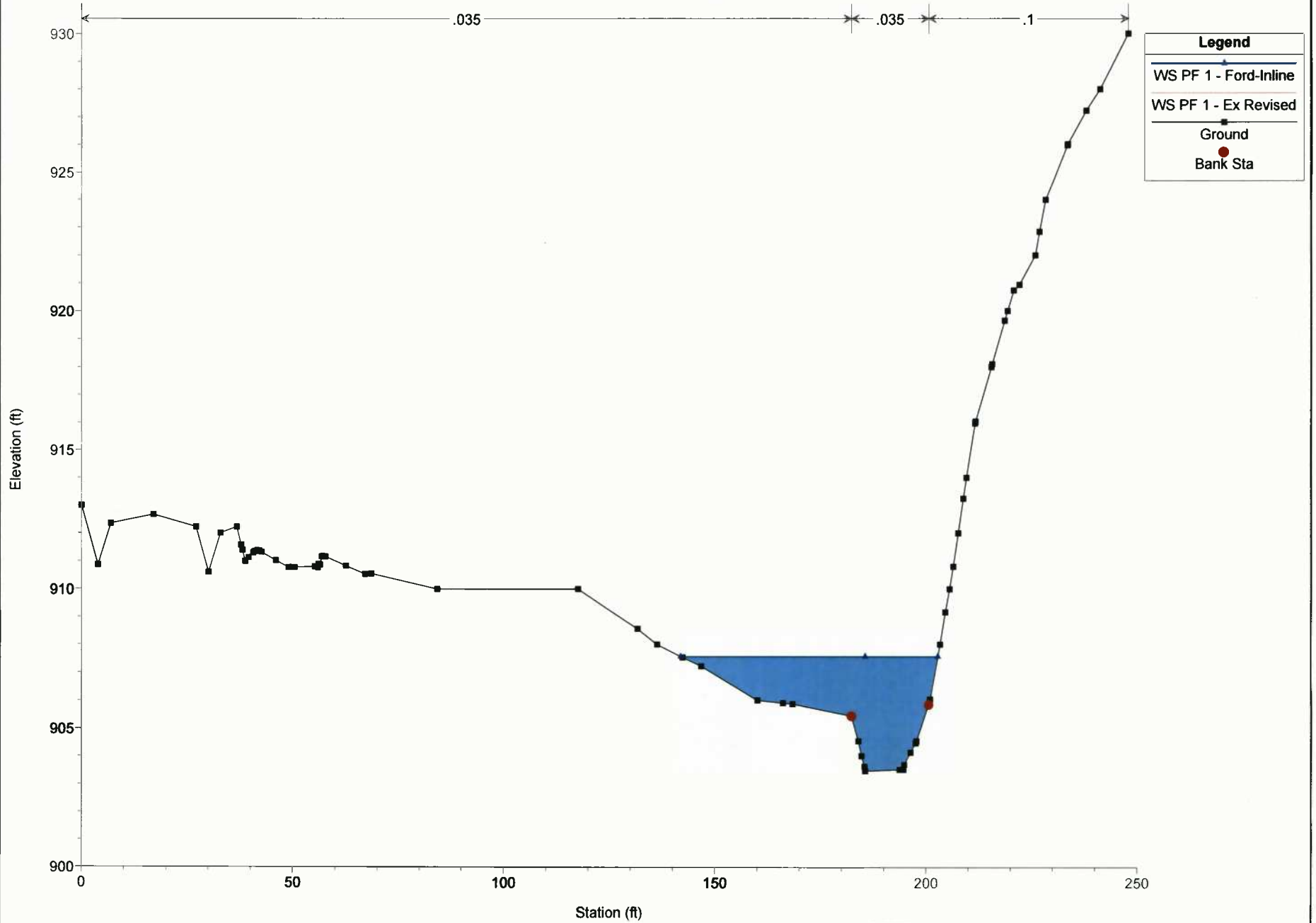
Legend	
—	WS PF 1 - Ford-Inline
—	WS PF 1 - Ex Revised
■	Ground
●	Bank Sta



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 5588.448



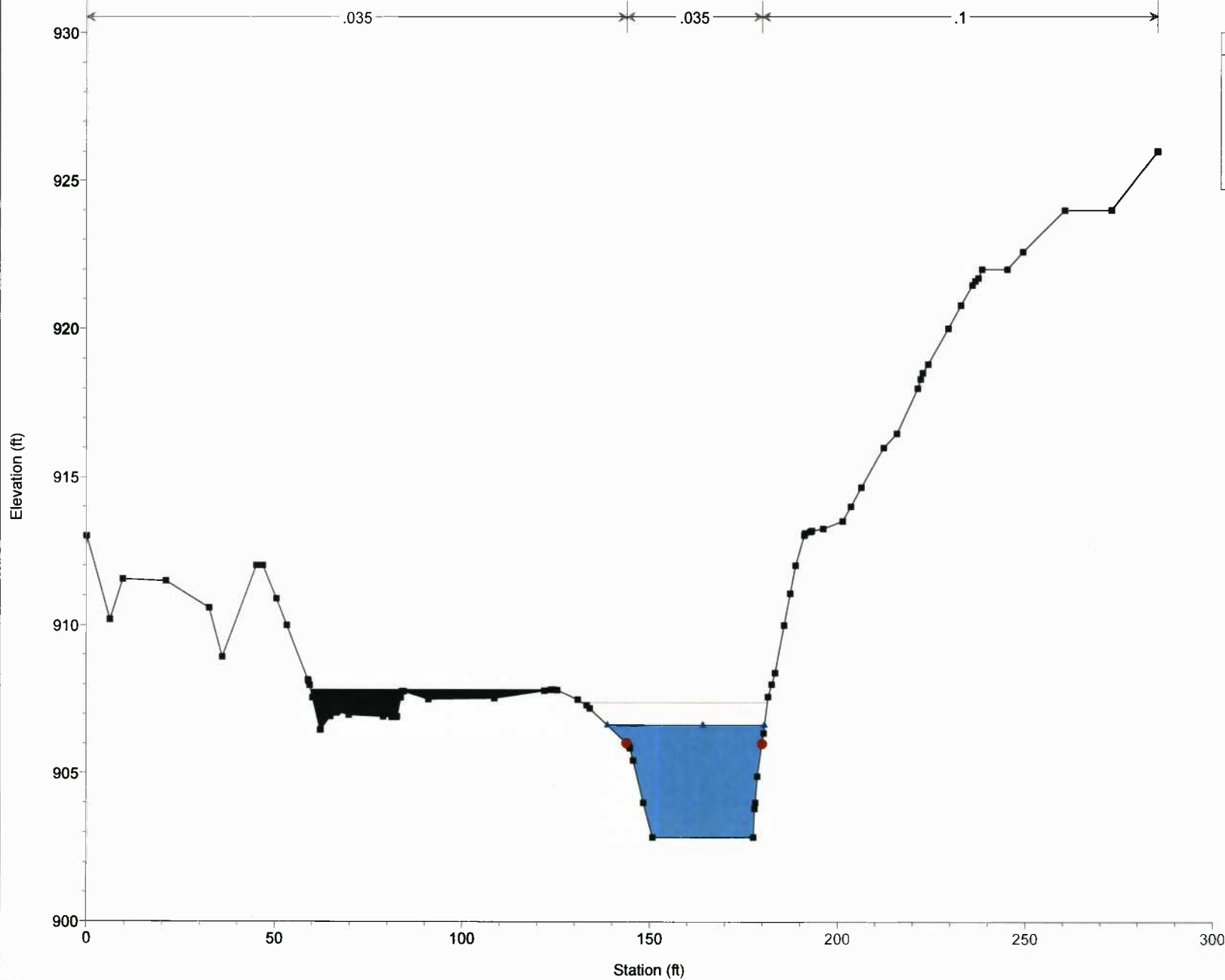


OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

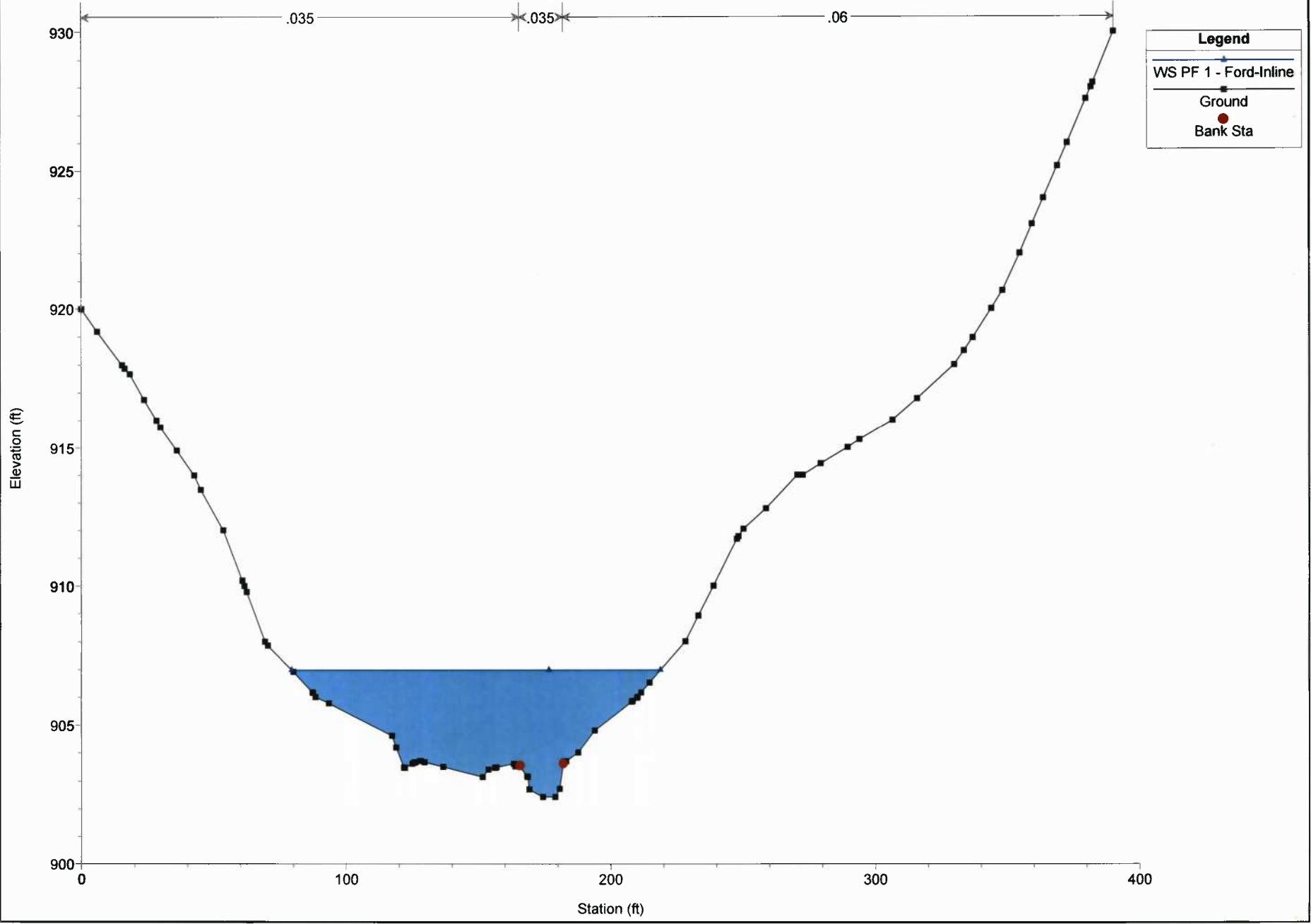
River = Bluestone Creek Reach = Middle RS = 5493.950

Legend	
WS PF 1 - Ex Revised	▲
WS PF 1 - Ford-Inline	■
Ground	■
Bank Sta	●

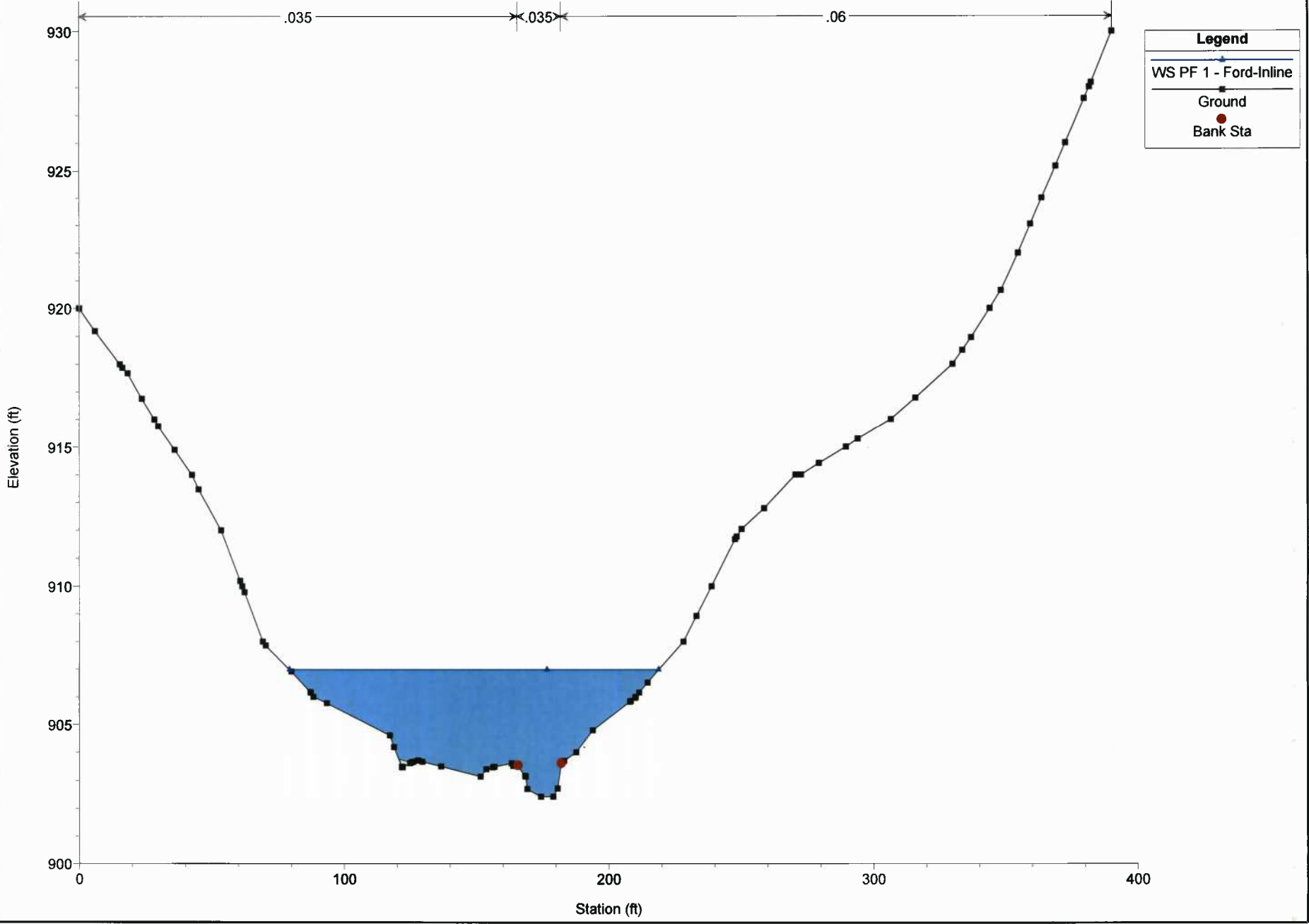


OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised  
River = Bluestone Creek Reach = Middle RS = 5409.687



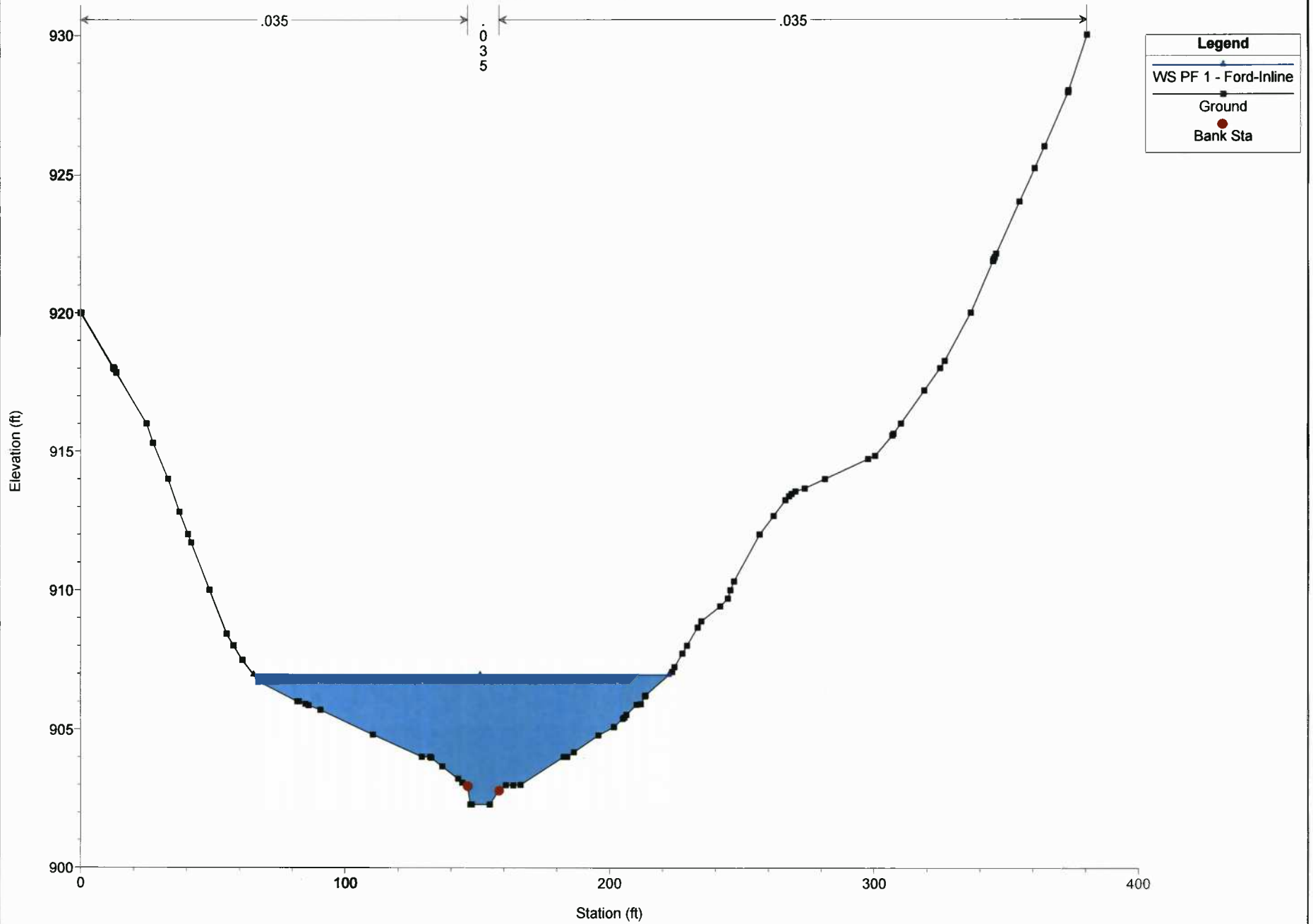
OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised  
Geom: Ford-Inline Flow: Structures Revised  
River = Bluestone Creek Reach = Middle RS = 5395.59 IS



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

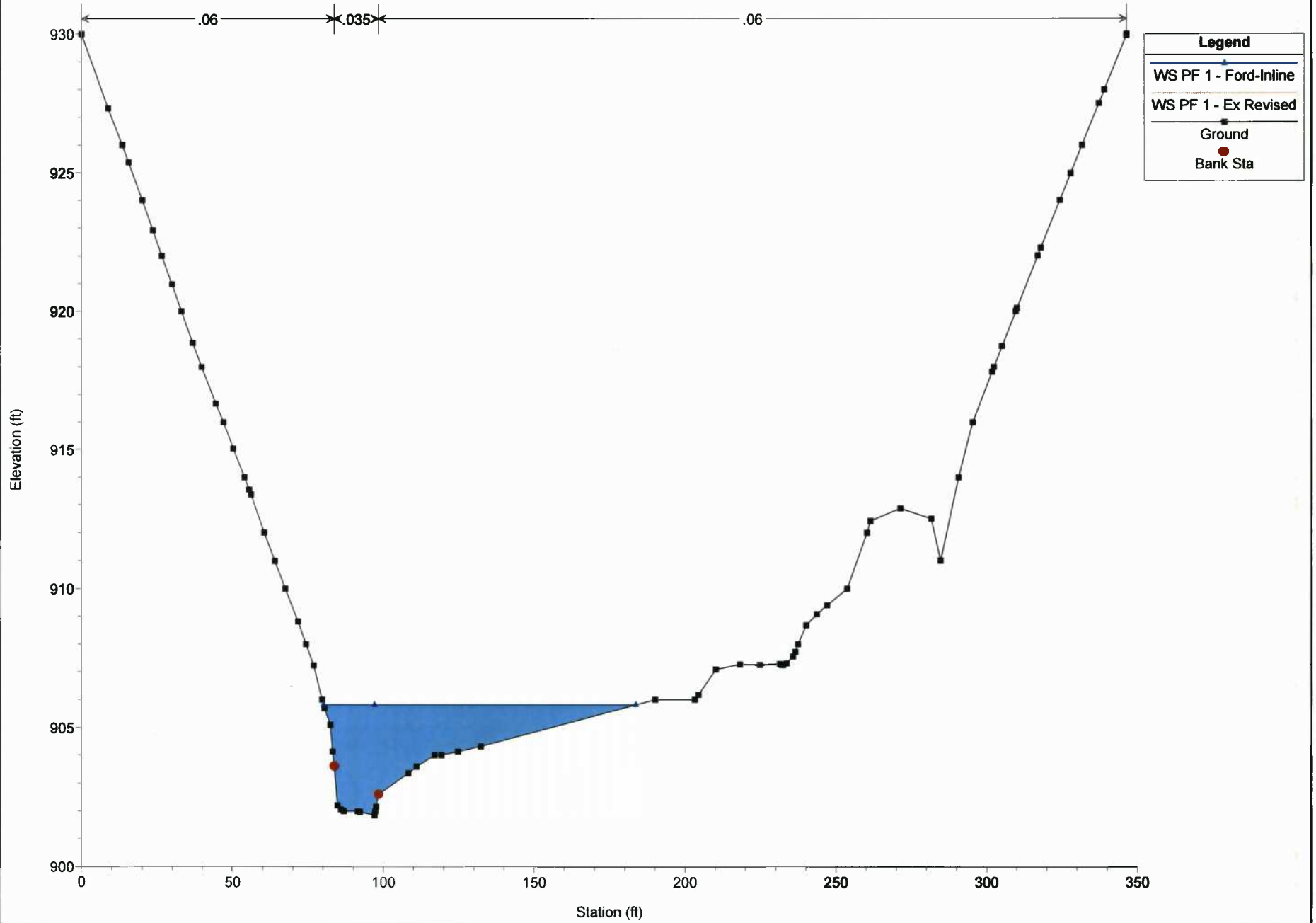
River = Bluestone Creek Reach = Middle RS = 5379.960



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

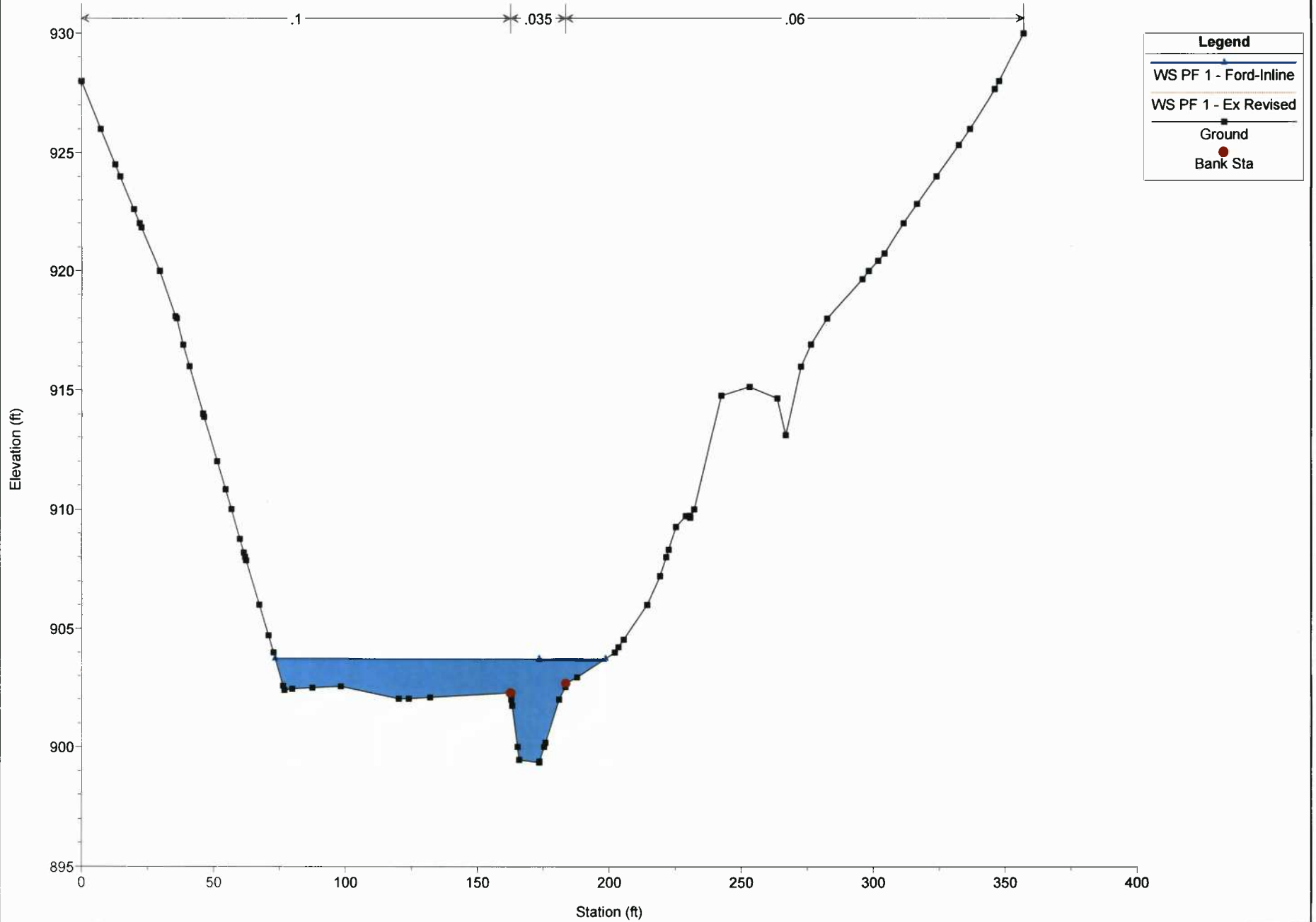
River = Bluestone Creek Reach = Middle RS = 5291.039



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

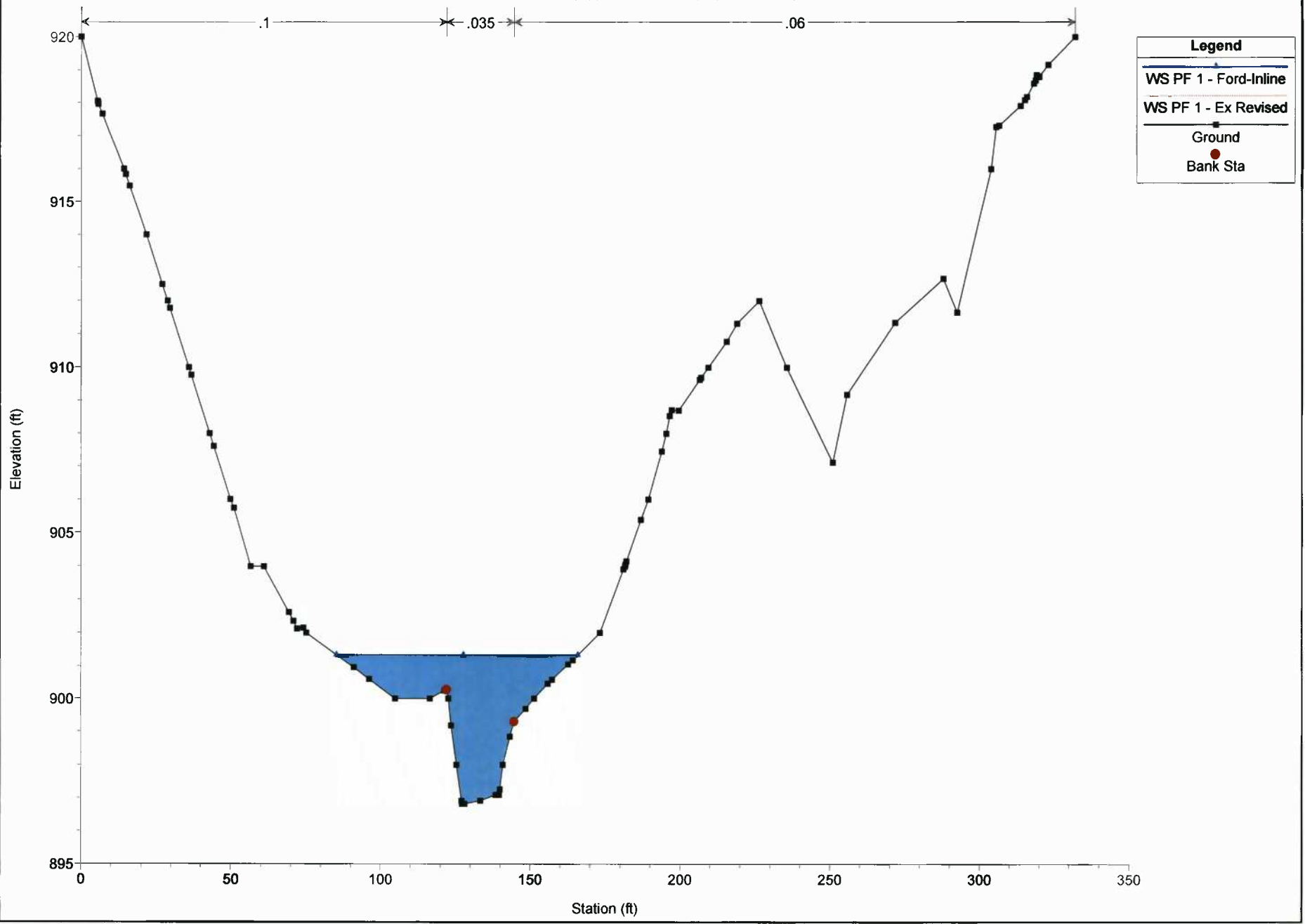
River = Bluestone Creek Reach = Middle RS = 5071.499



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

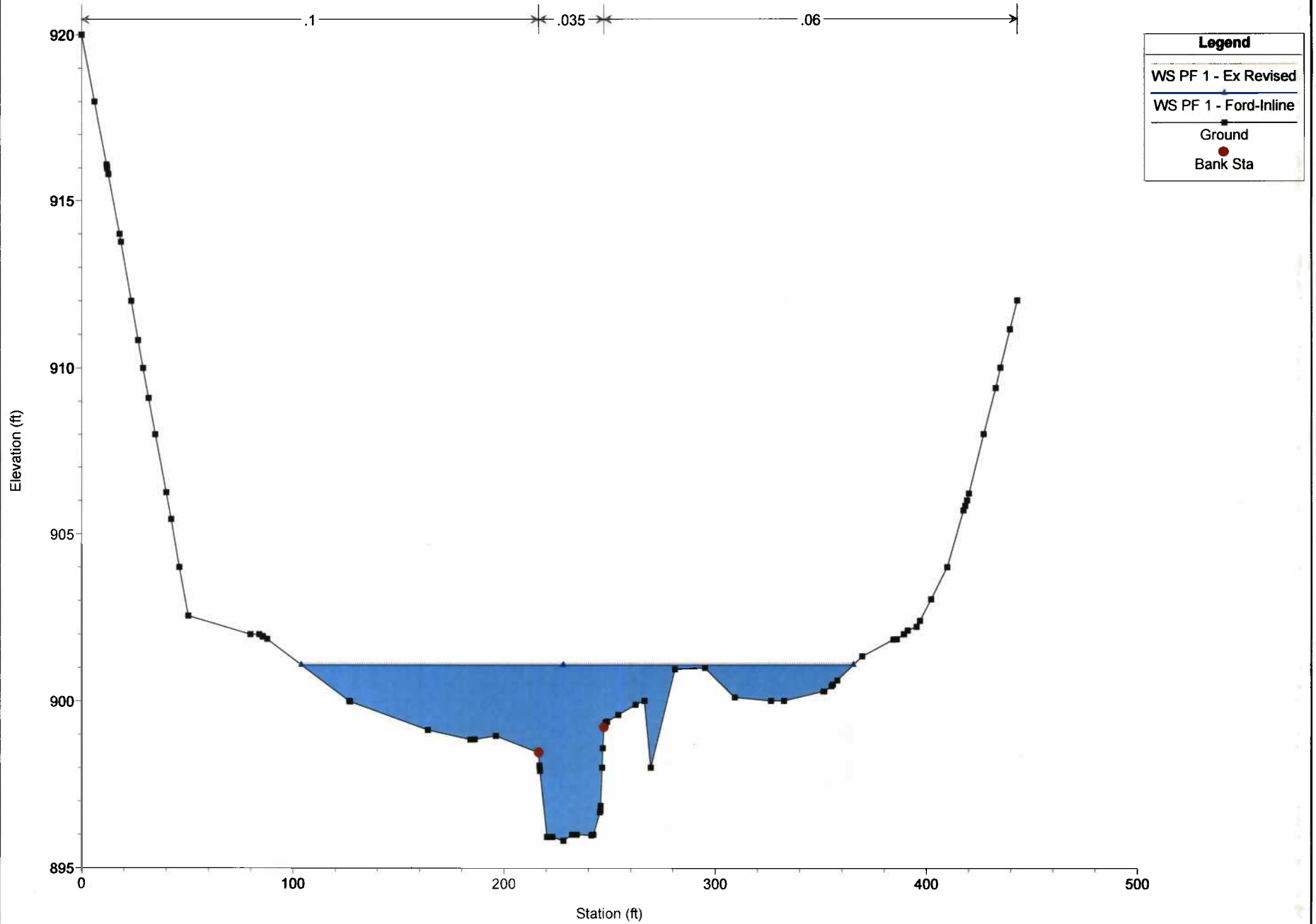
River = Bluestone Creek Reach = Middle RS = 4871.481



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 4704.612

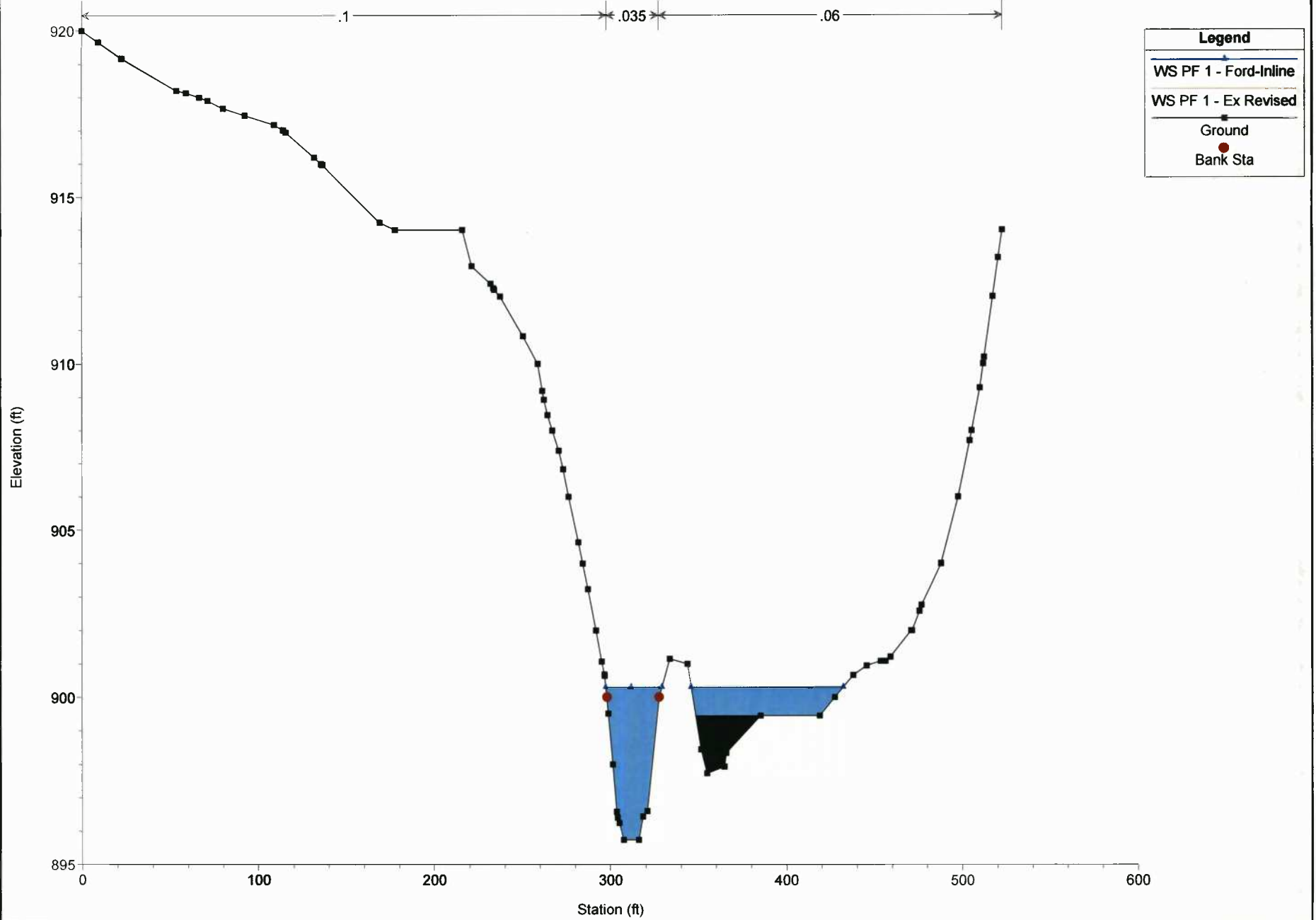




OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

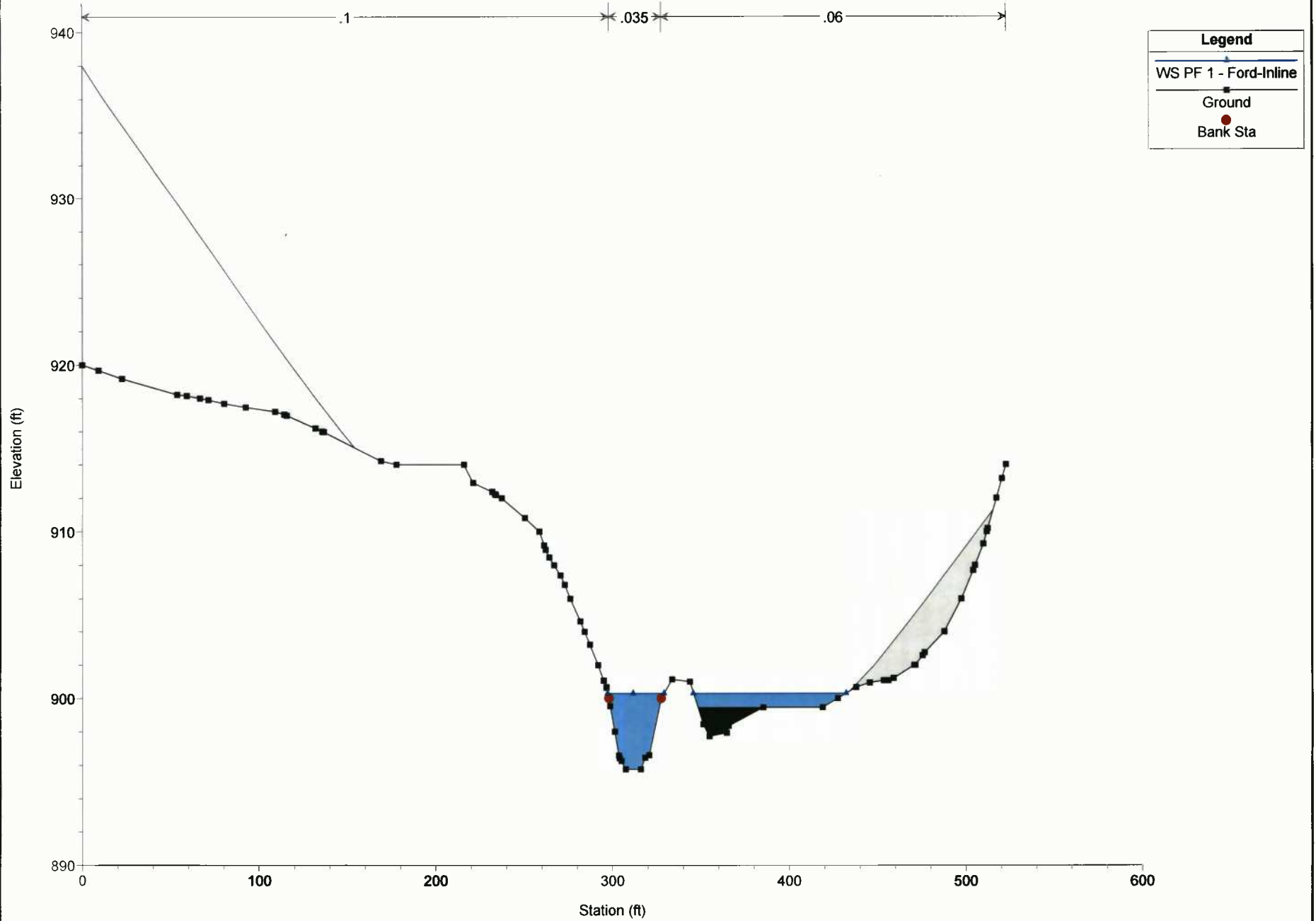
River = Bluestone Creek Reach = Lower RS = 4682.971



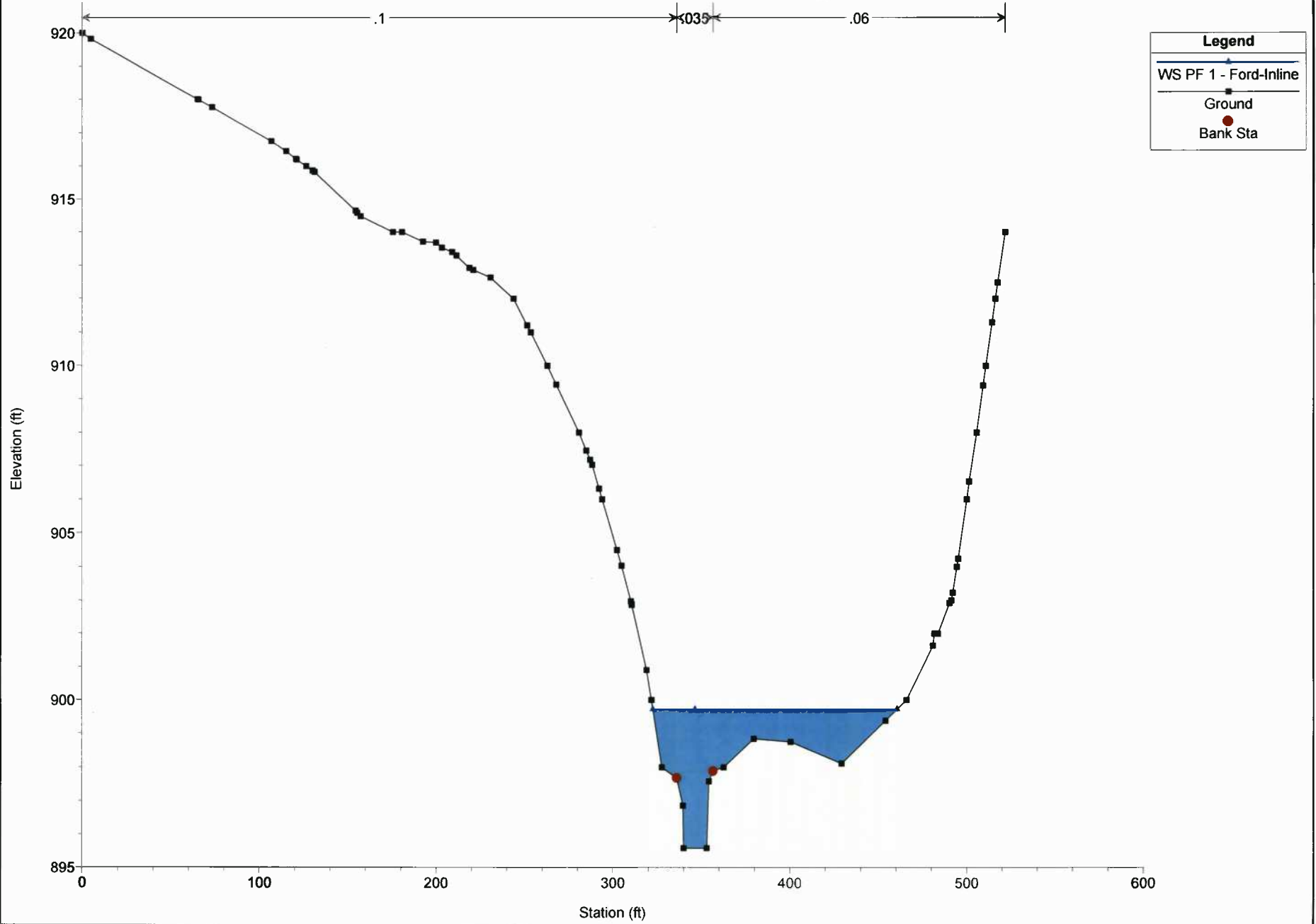
OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 4657.42 IS



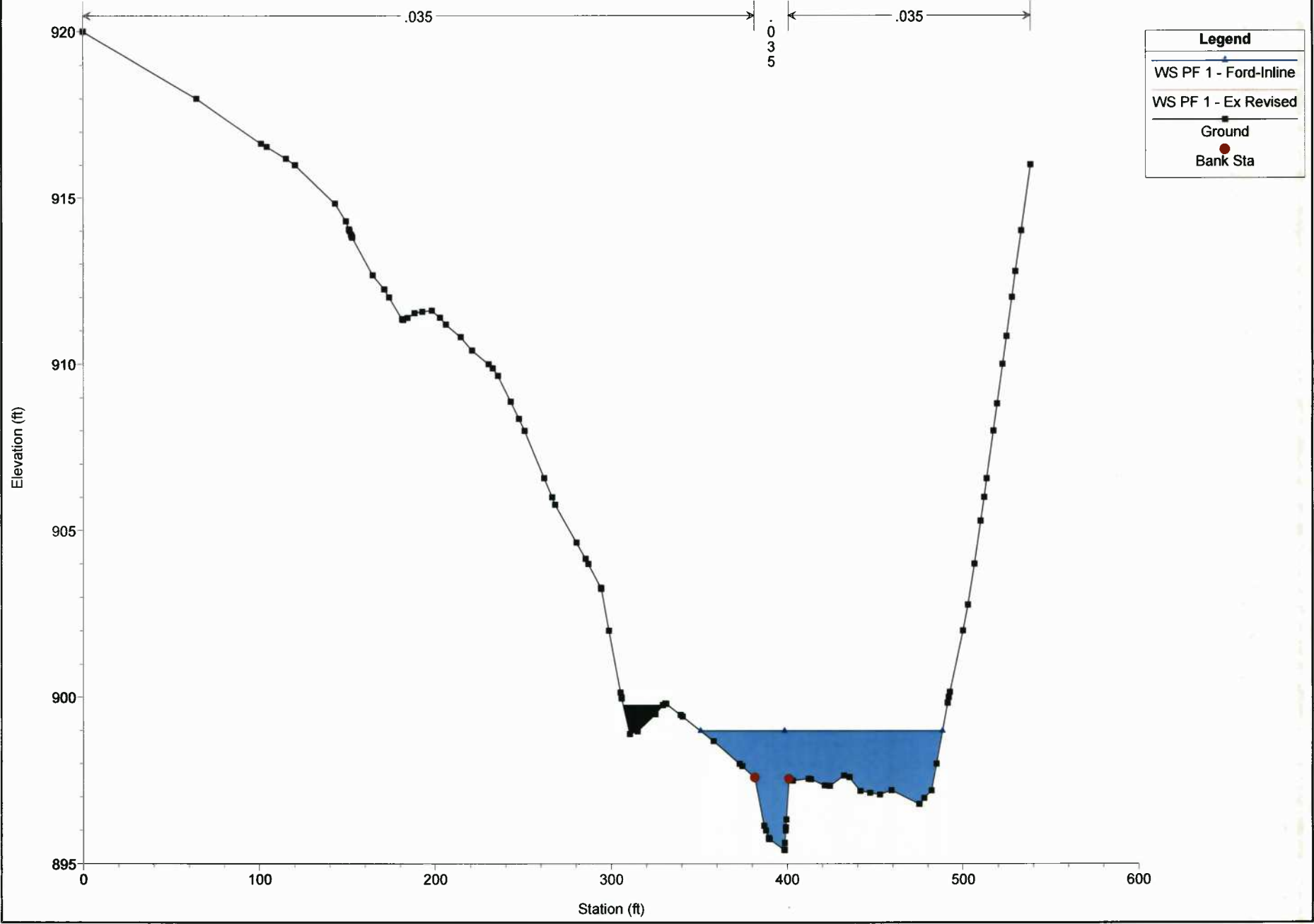
OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised  
Geom: Ford-Inline Flow: Structures Revised  
River = Bluestone Creek Reach = Lower RS = 4626.456



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

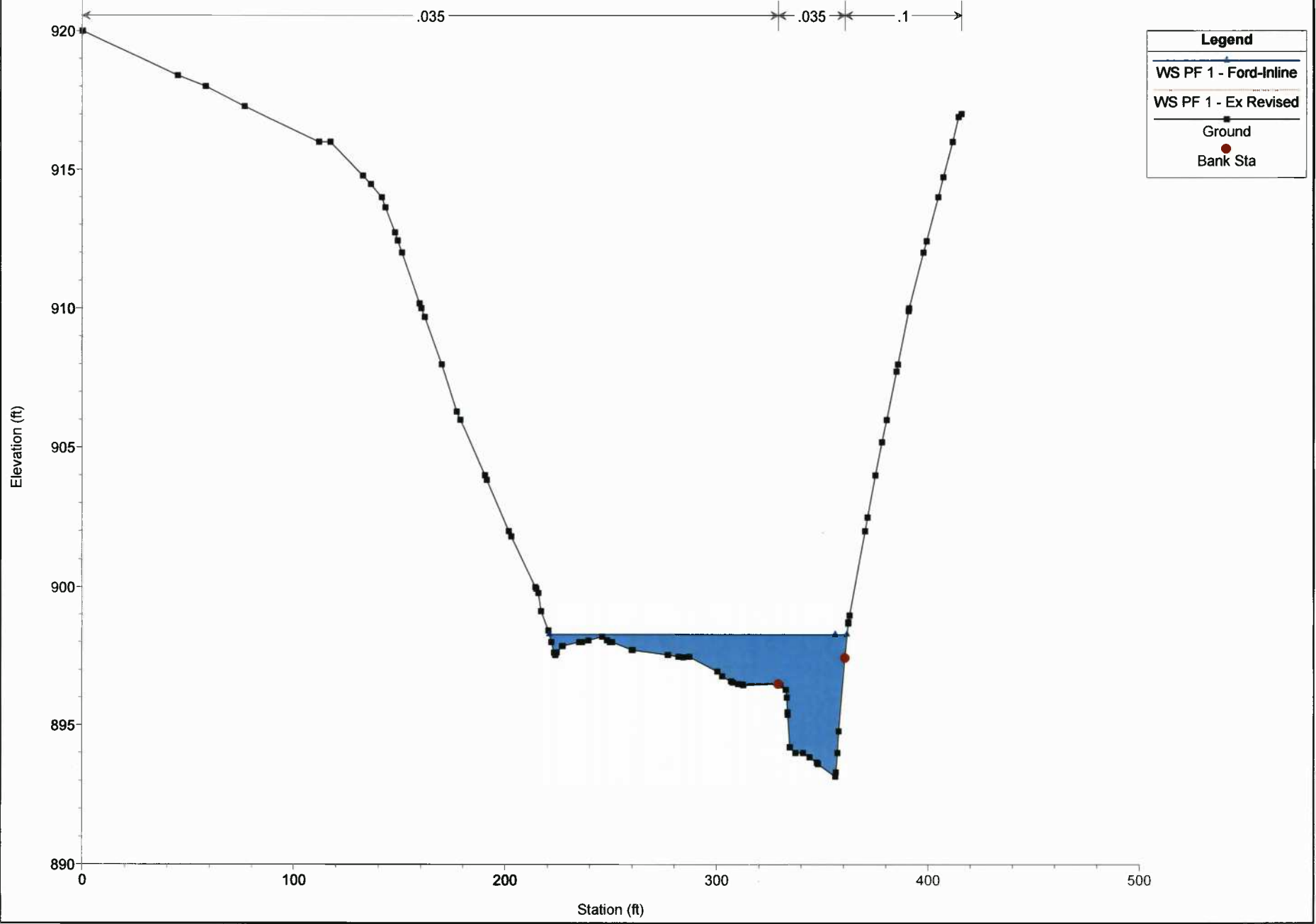
River = Bluestone Creek Reach = Lower RS = 4559.288



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

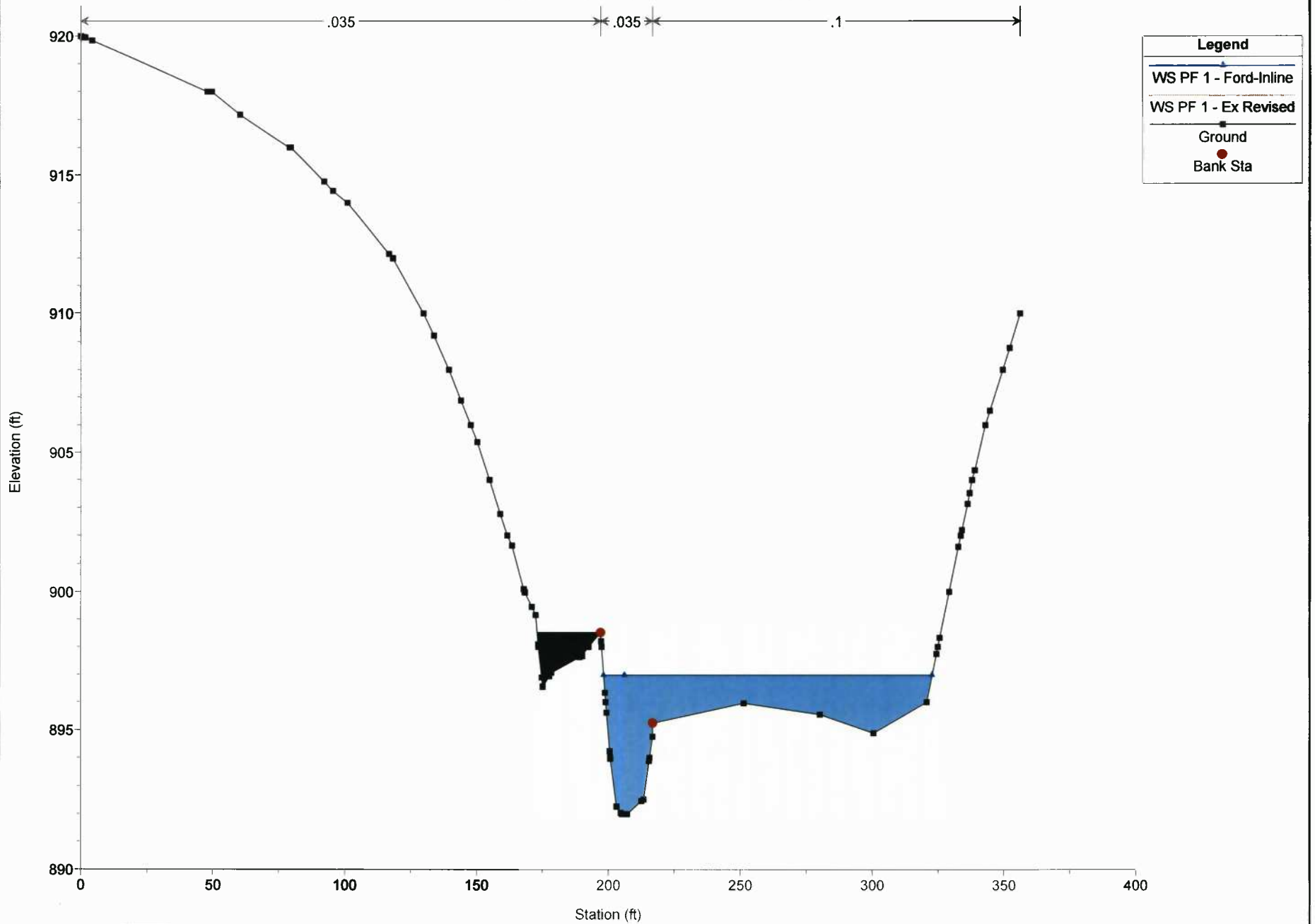
River = Bluestone Creek Reach = Lower RS = 4258.834



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

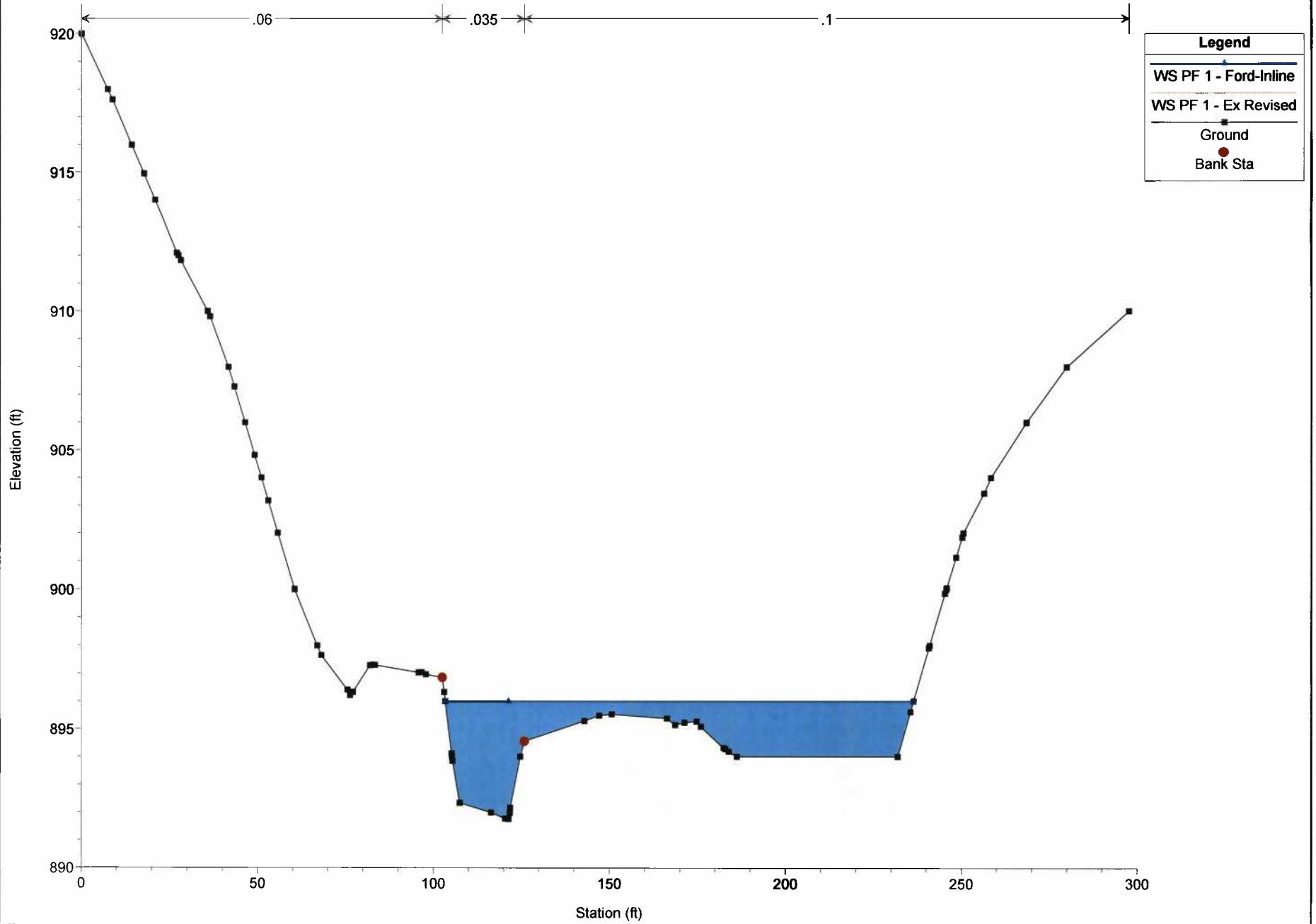
River = Bluestone Creek Reach = Lower RS = 4054.239



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

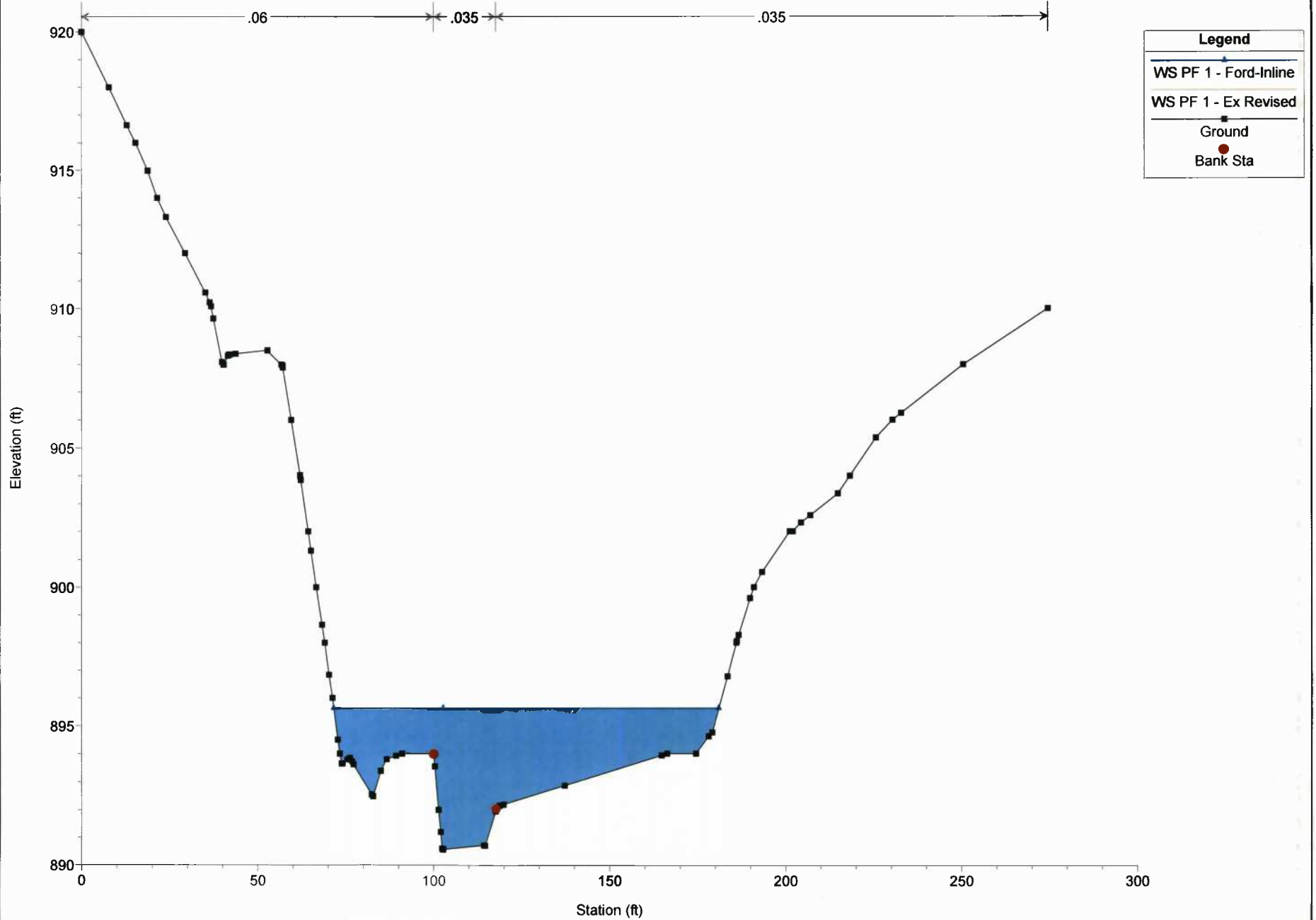
River = Bluestone Creek Reach = Lower RS = 3934.570



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 3797.323



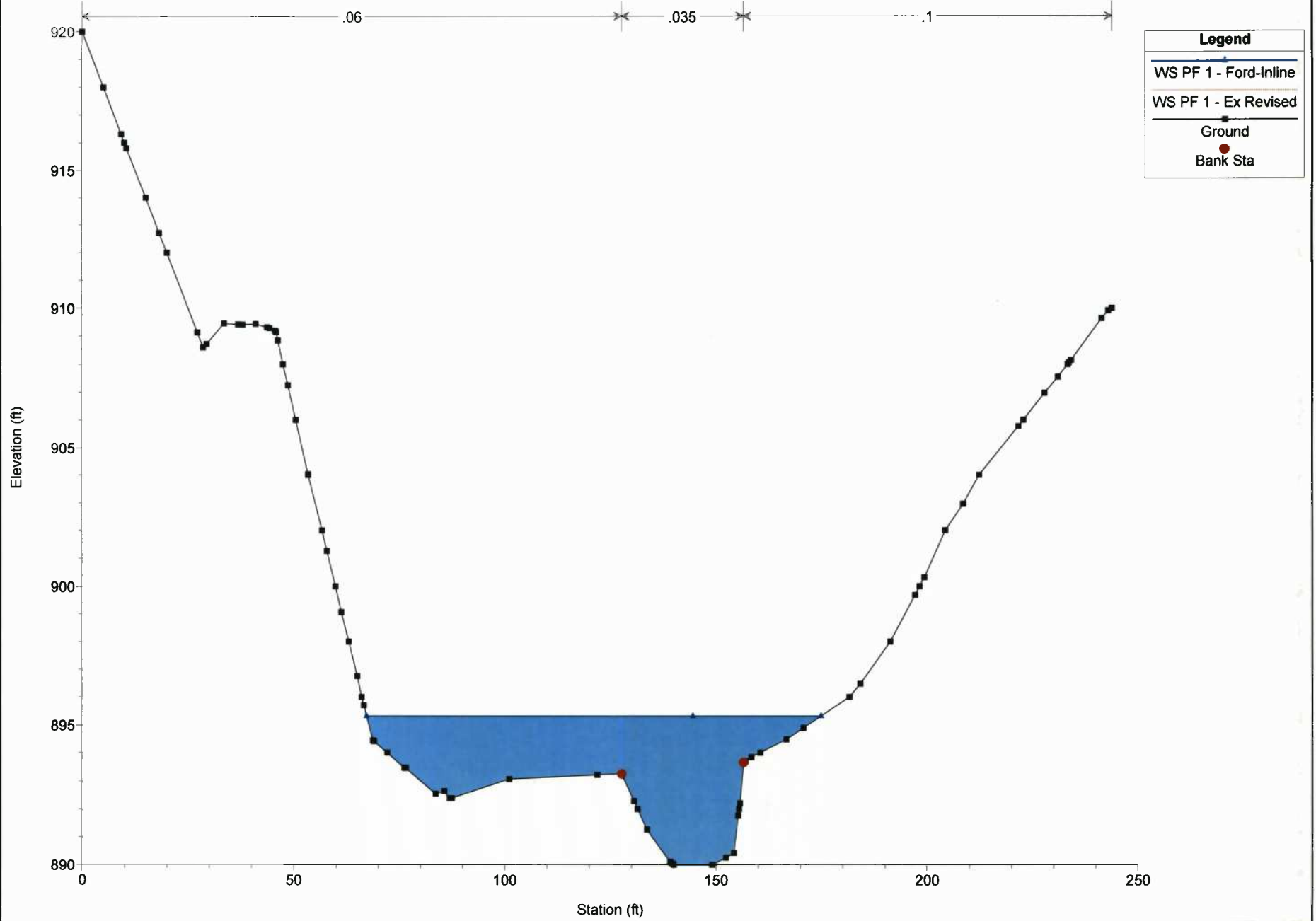
Legend	
WS PF 1 - Ford-Inline	▲
WS PF 1 - Ex Revised	■
Ground	■
Bank Sta	●



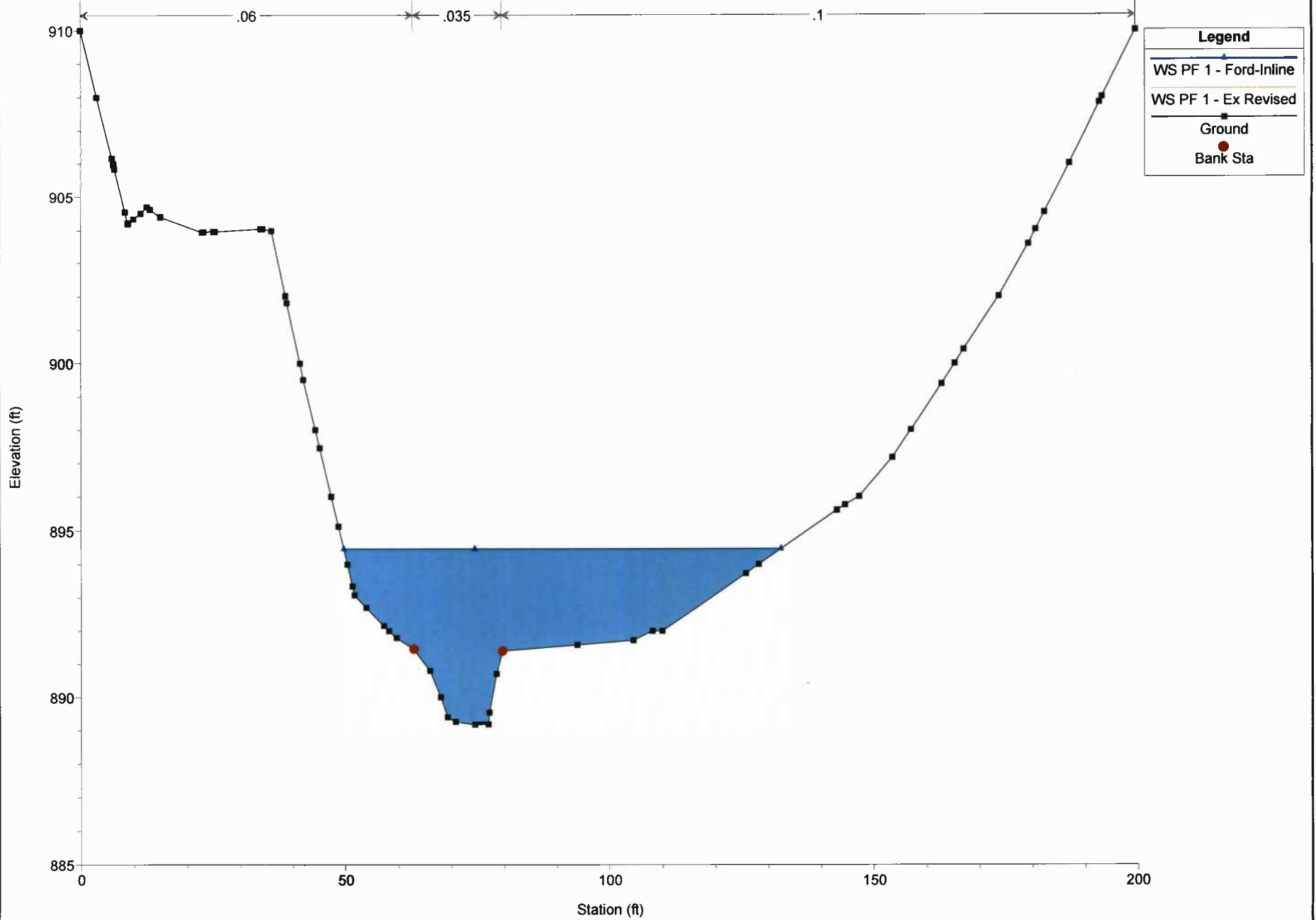
OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 3679.344



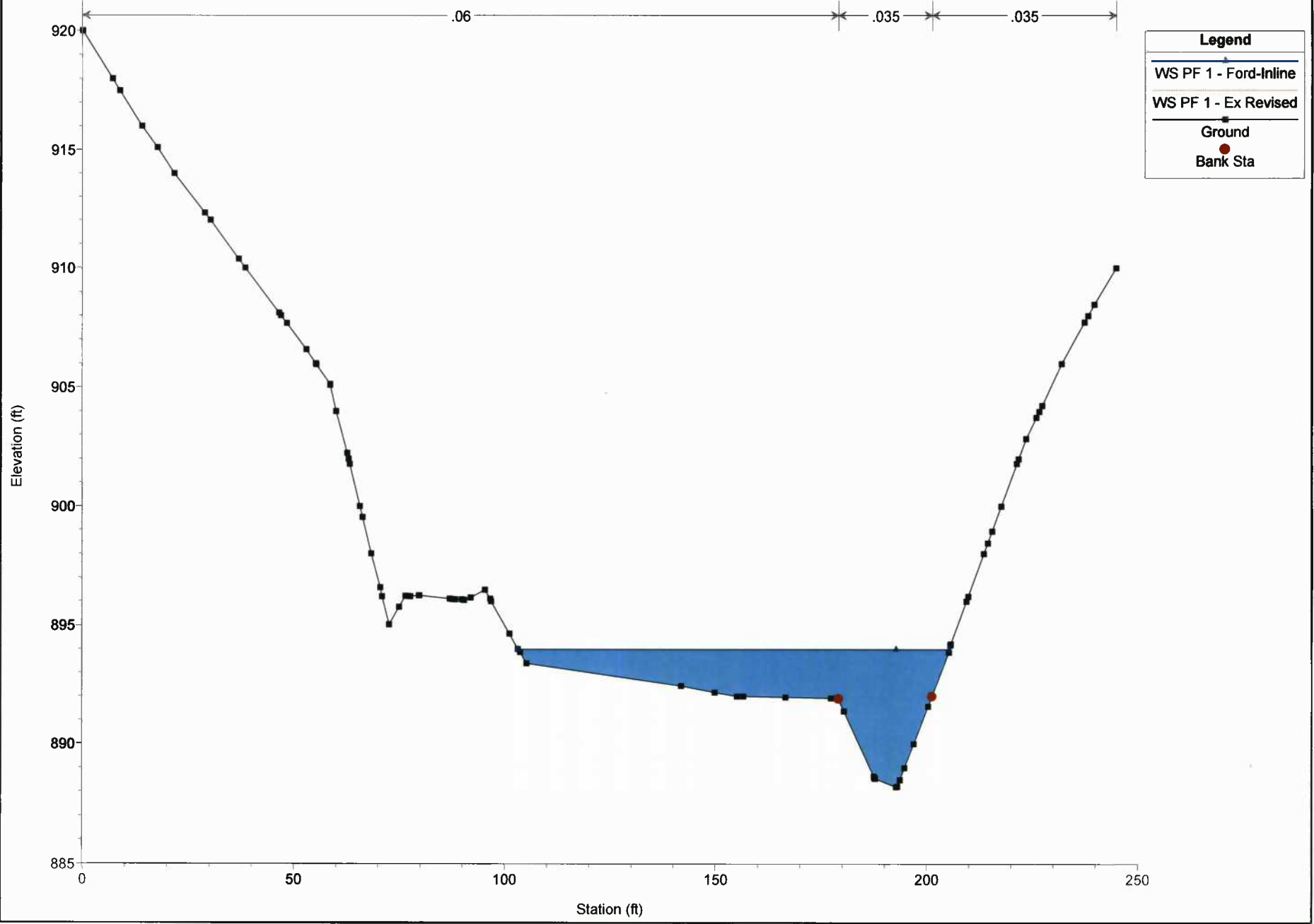
OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised  
Geom: Ford-Inline Flow: Structures Revised  
River = Bluestone Creek Reach = Lower RS = 3568.220



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

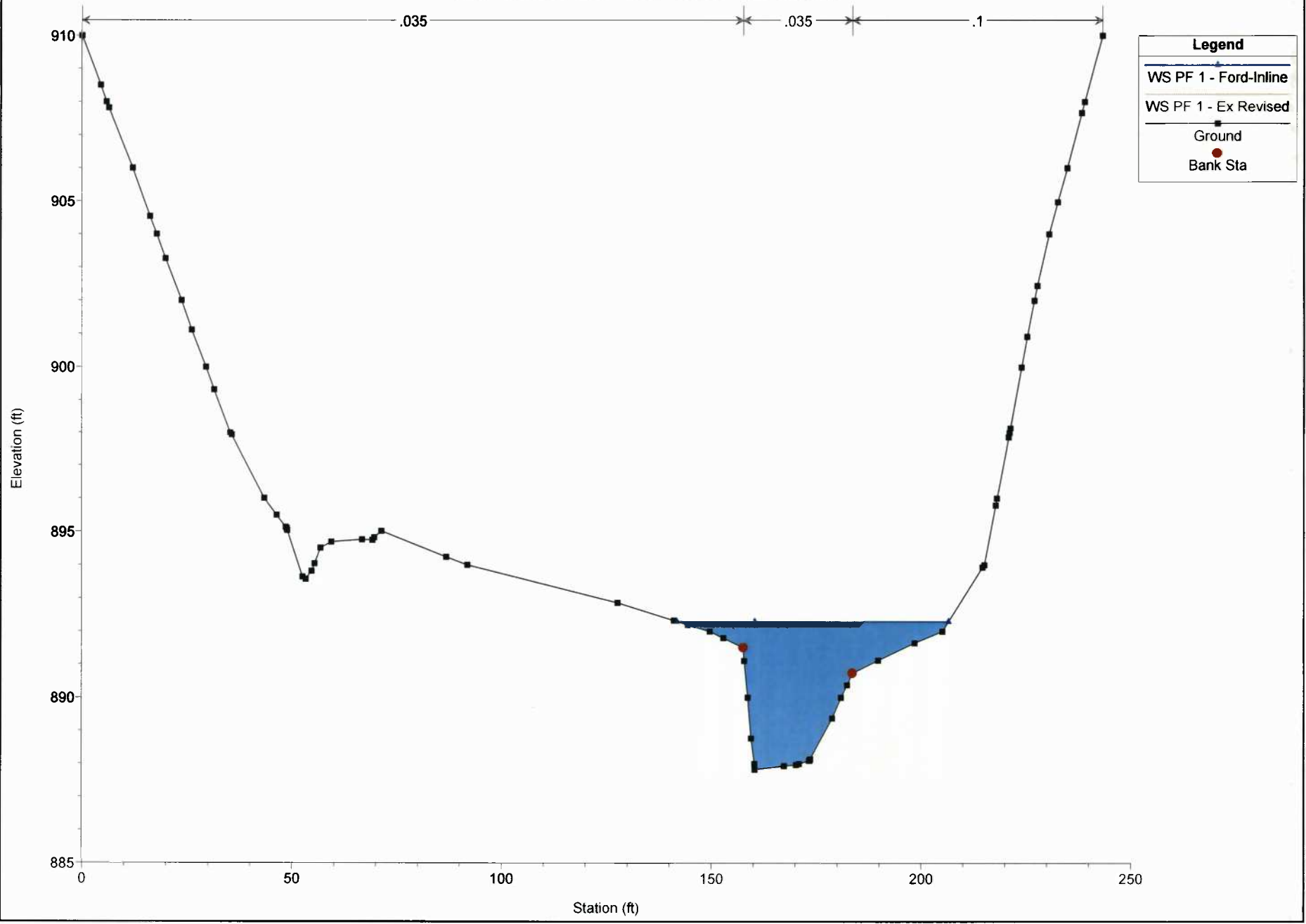
River = Bluestone Creek Reach = Lower RS = 3438.299



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

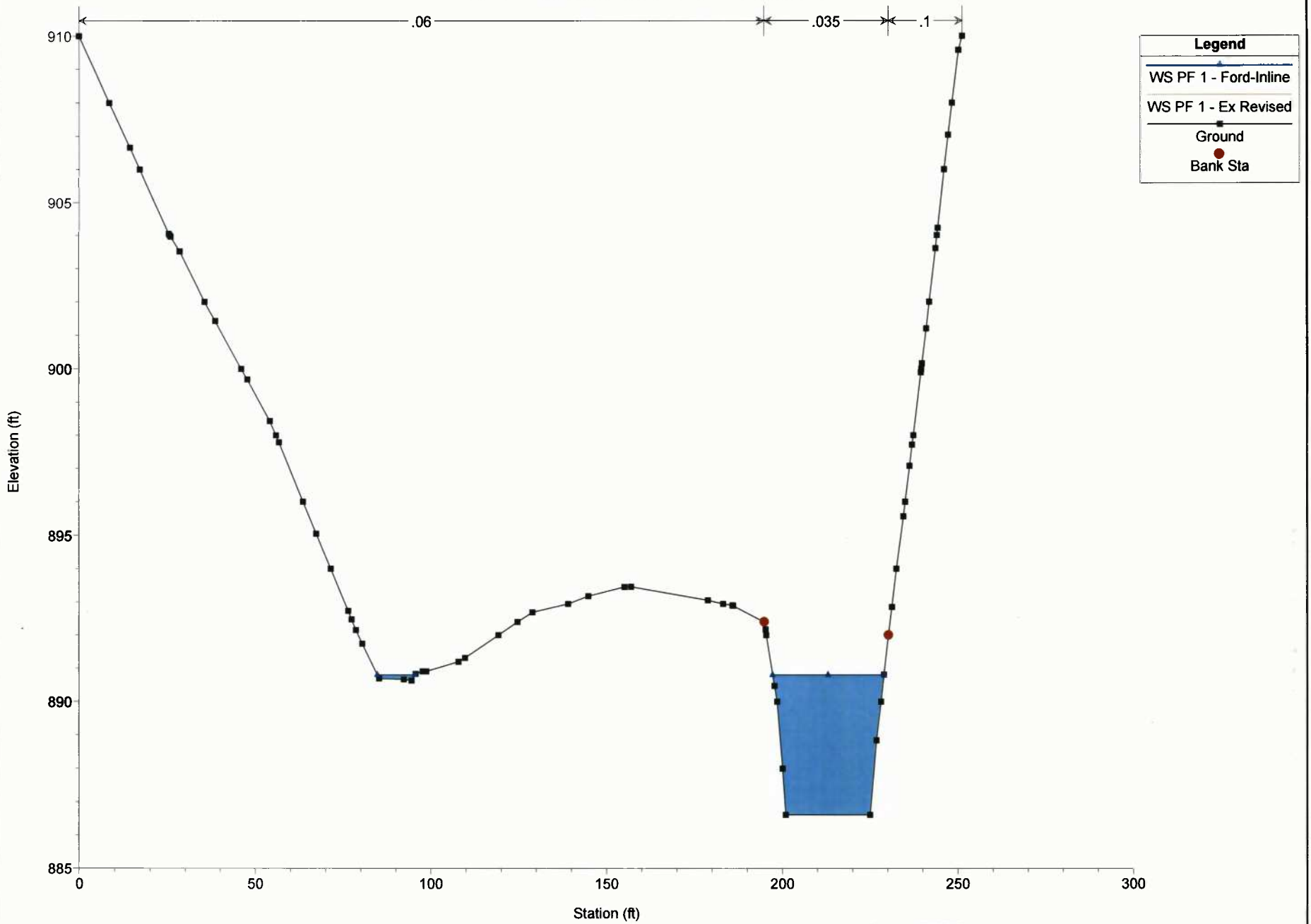
River = Bluestone Creek Reach = Lower RS = 3282.877



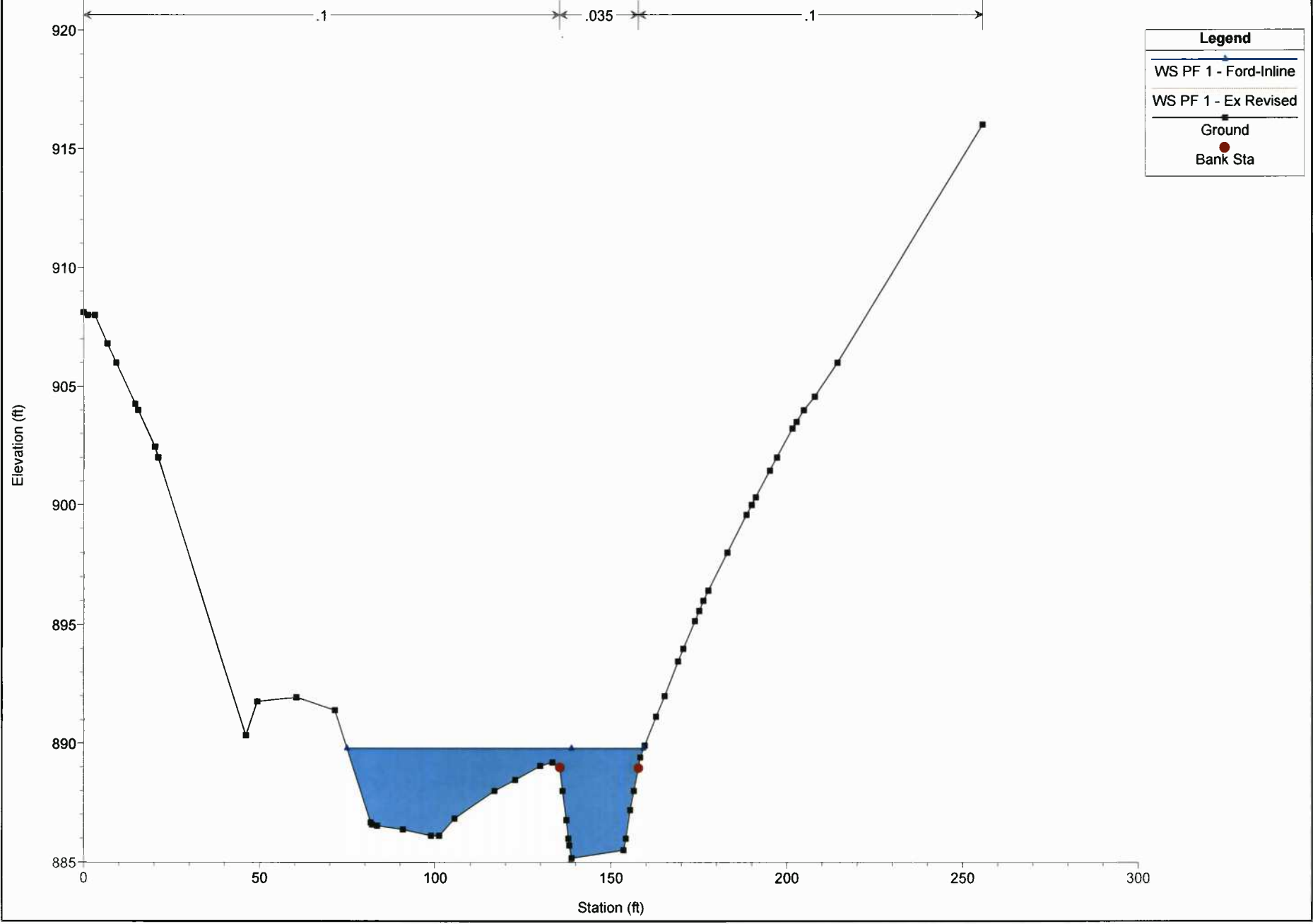
OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

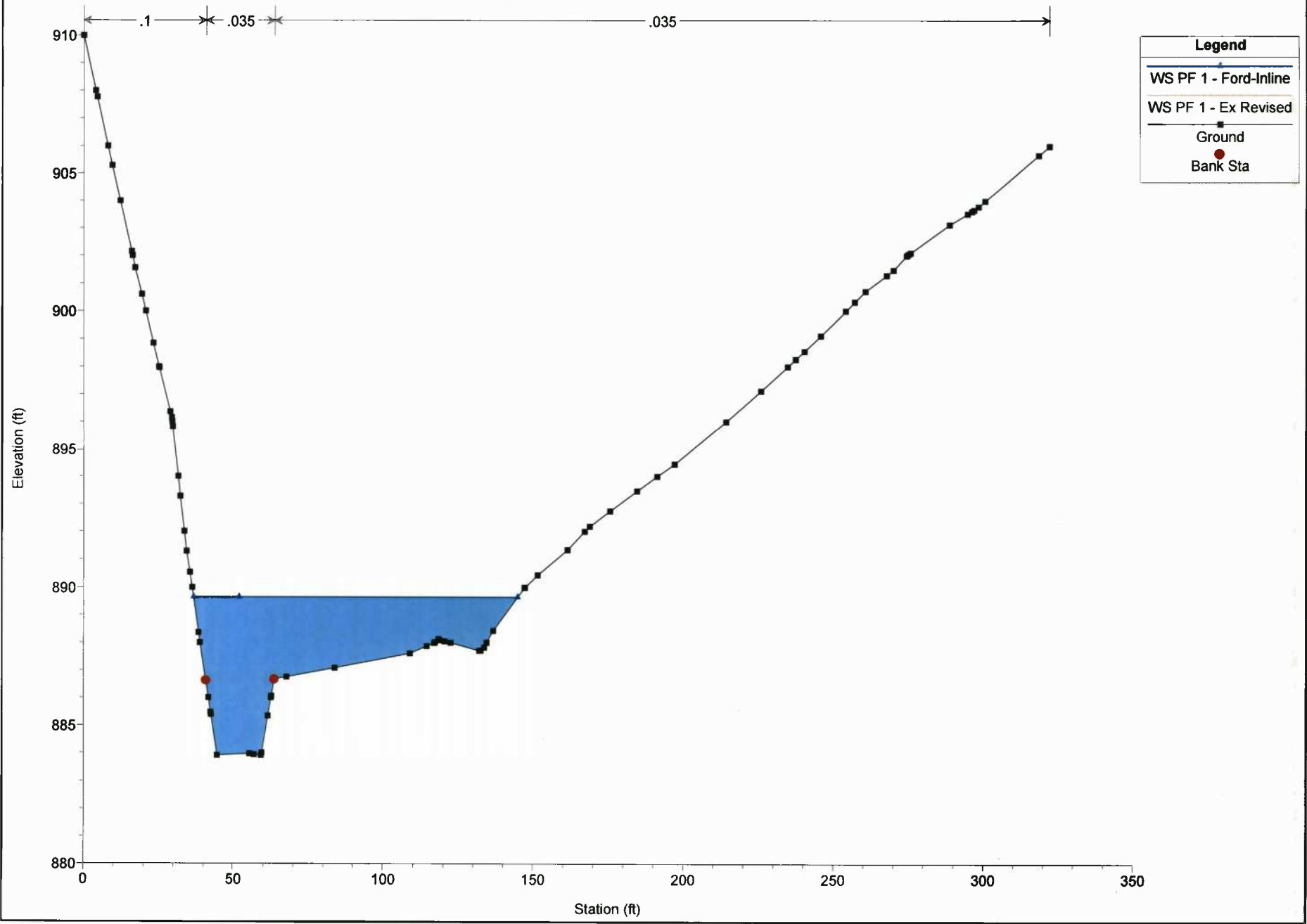
River = Bluestone Creek Reach = Lower RS = 3129.654



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised  
Geom: Ford-Inline Flow: Structures Revised  
River = Bluestone Creek Reach = Lower RS = 2951.927

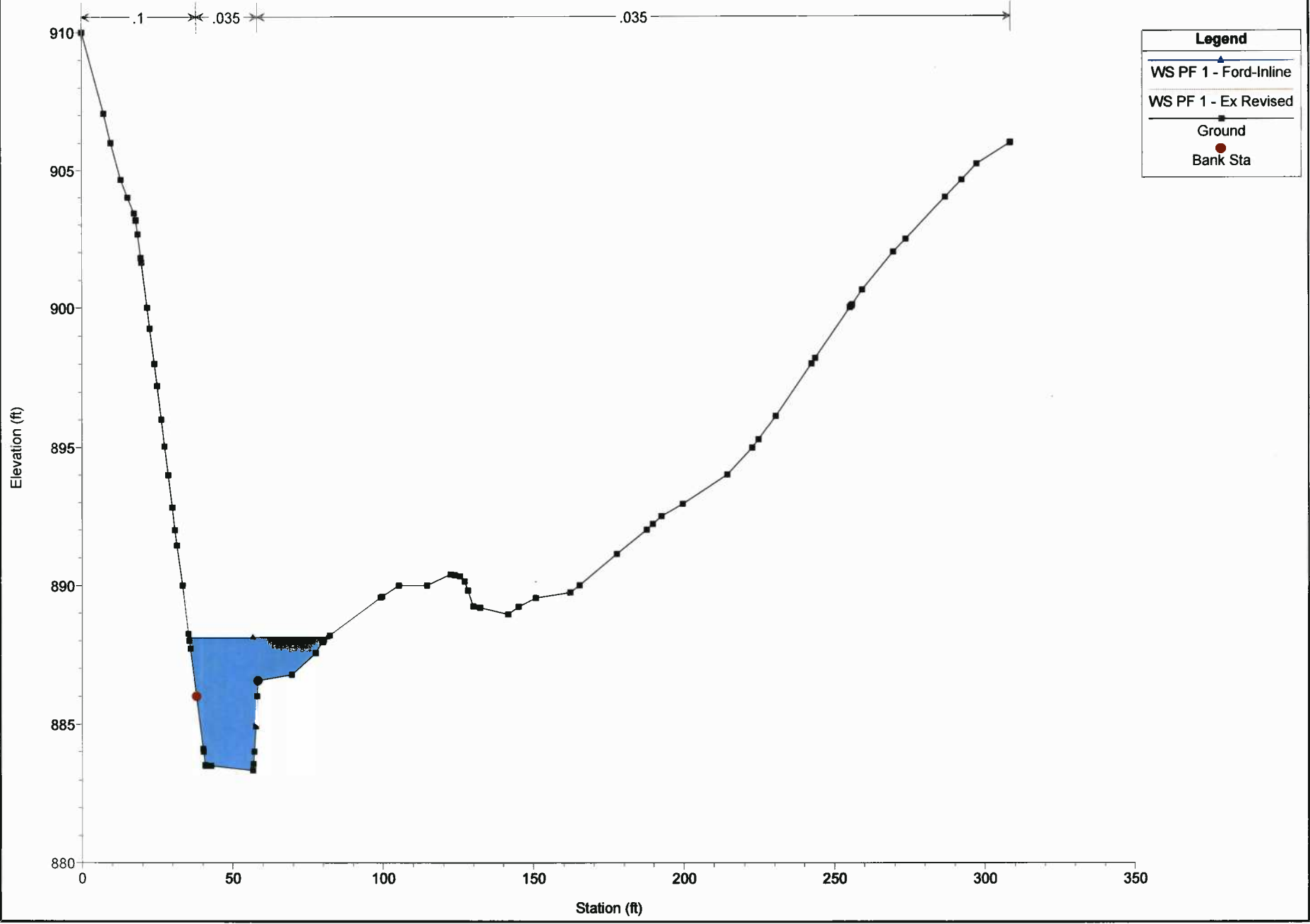


OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised  
 Geom: Ford-Inline Flow: Structures Revised  
 River = Bluestone Creek Reach = Lower RS = 2773.556



Legend	
—●—	WS PF 1 - Ford-Inline
—●—	WS PF 1 - Ex Revised
—■—	Ground
●	Bank Sta

OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised  
Geom: Ford-Inline Flow: Structures Revised  
River = Bluestone Creek Reach = Lower RS = 2690.443

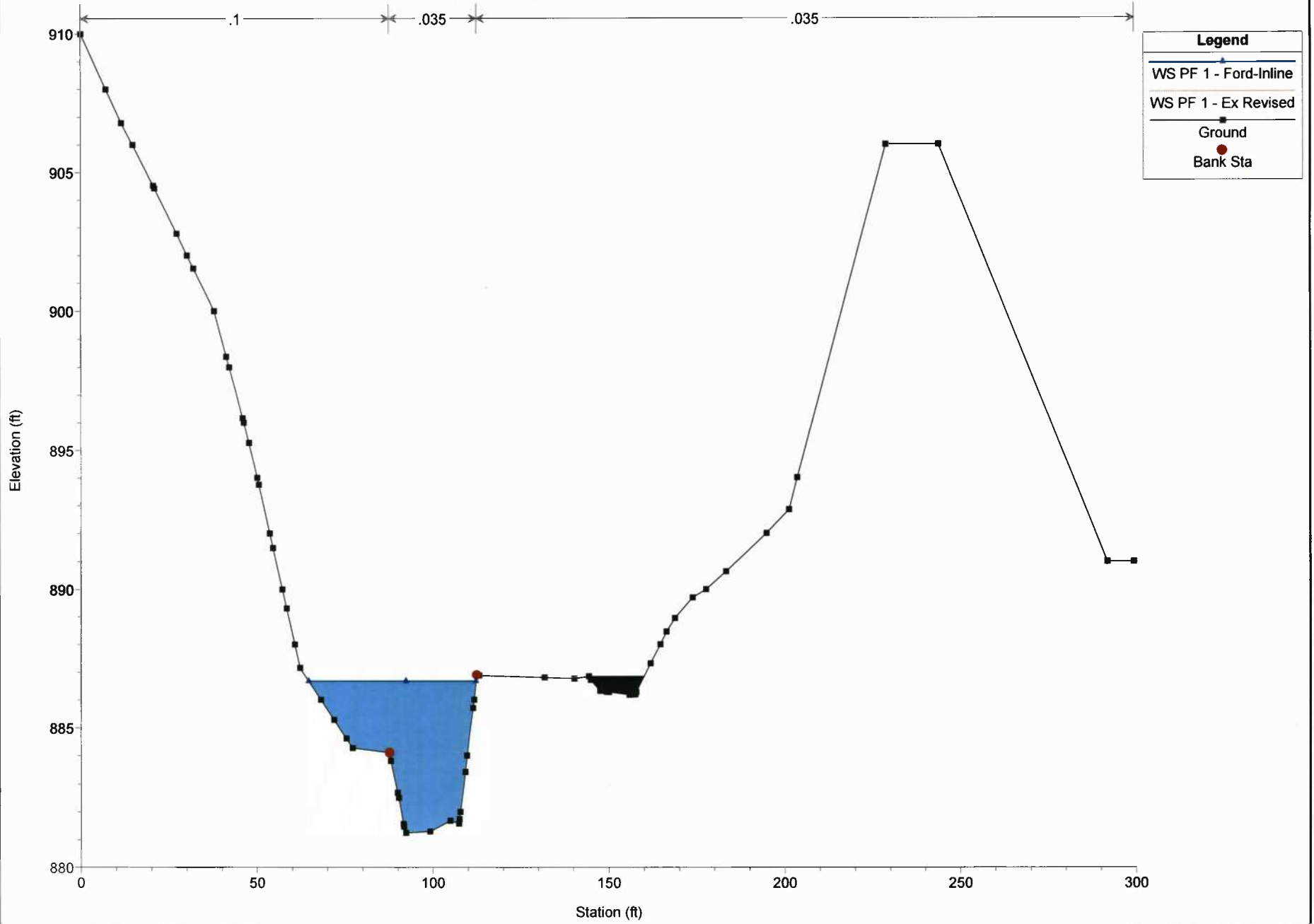




OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

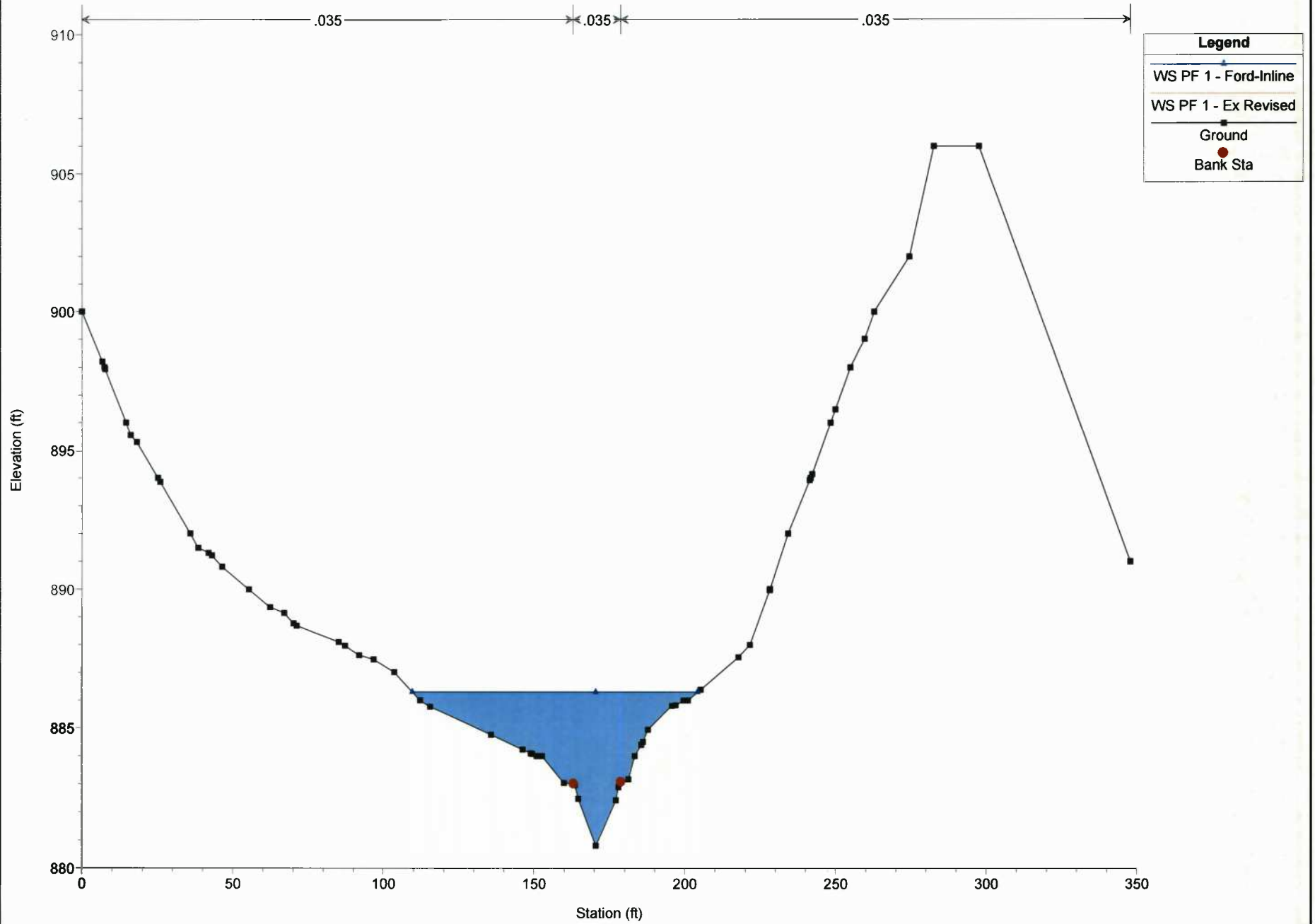
River = Bluestone Creek Reach = Lower RS = 2515.269



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

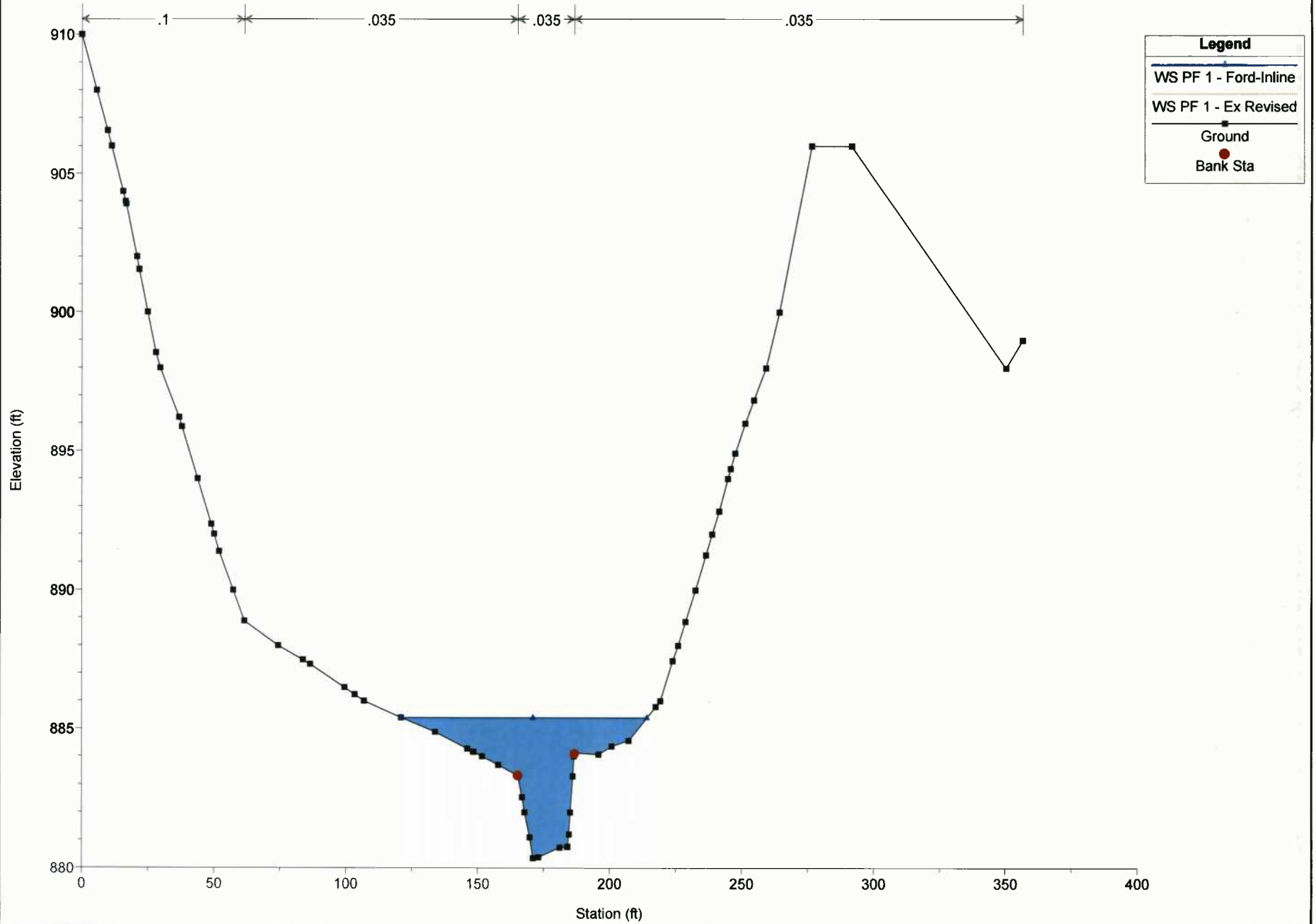
River = Bluestone Creek Reach = Lower RS = 2420.230



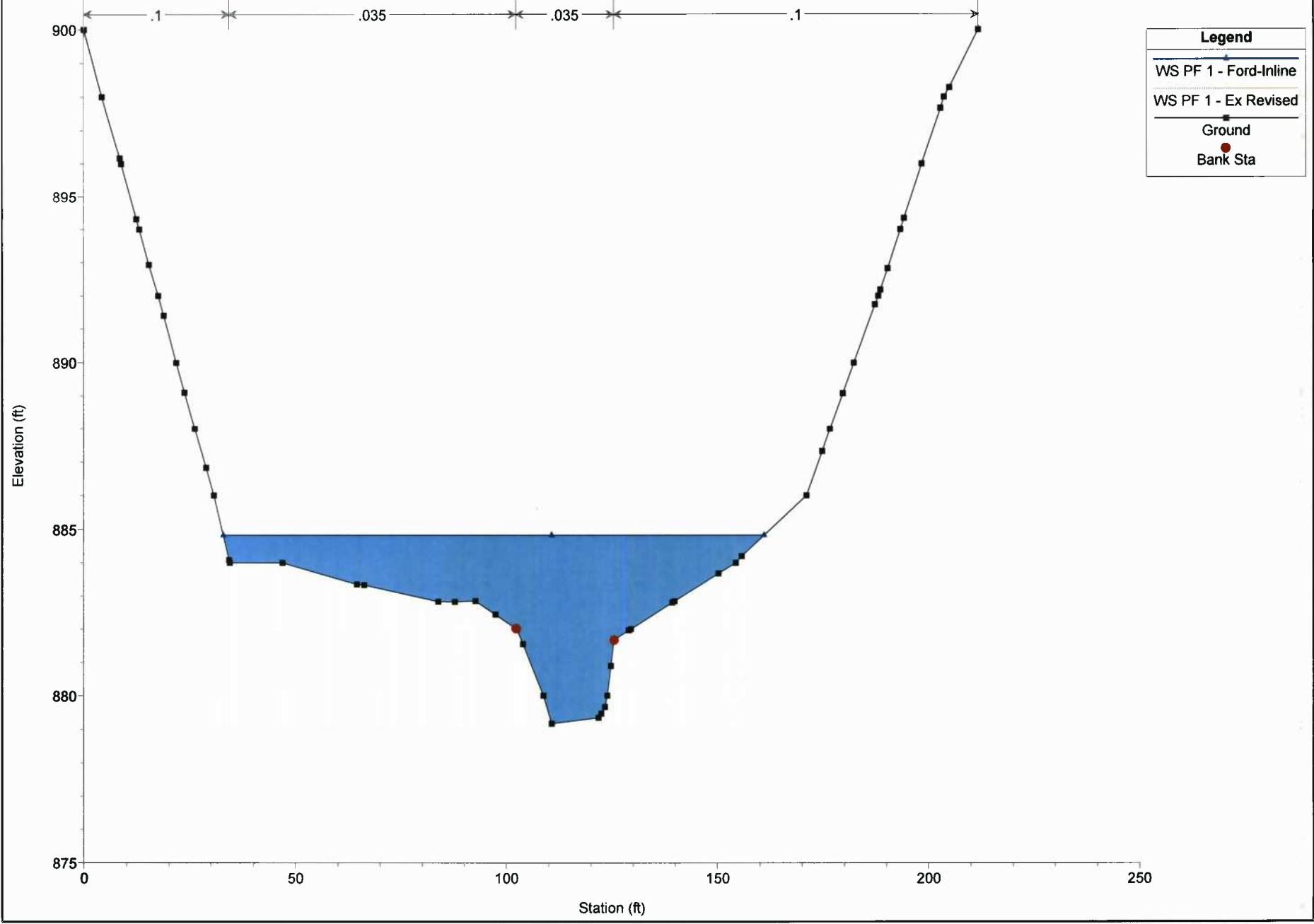
OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 2319.762



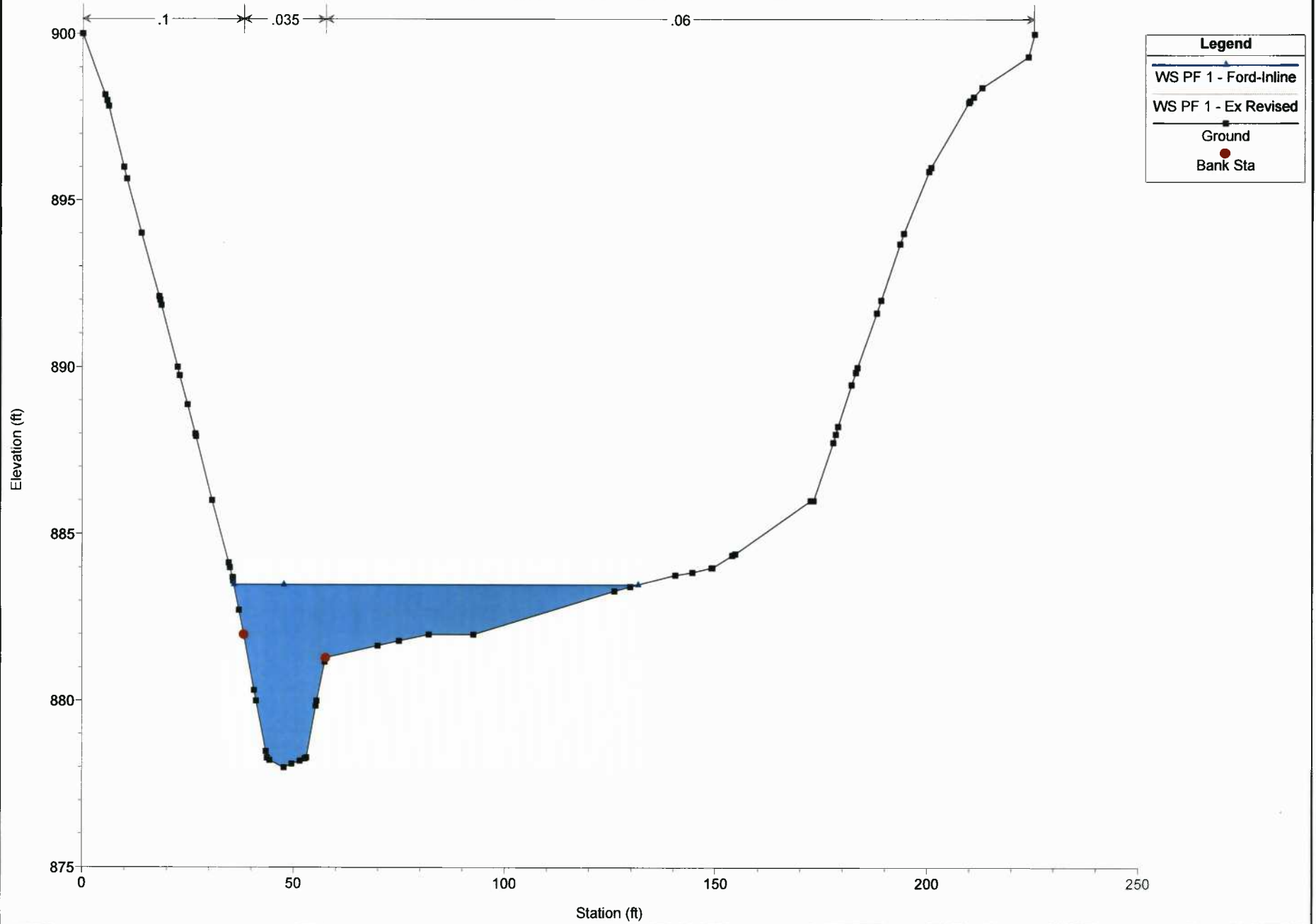
OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised  
Geom: Ford-Inline Flow: Structures Revised  
River = Bluestone Creek Reach = Lower RS = 2130.340



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

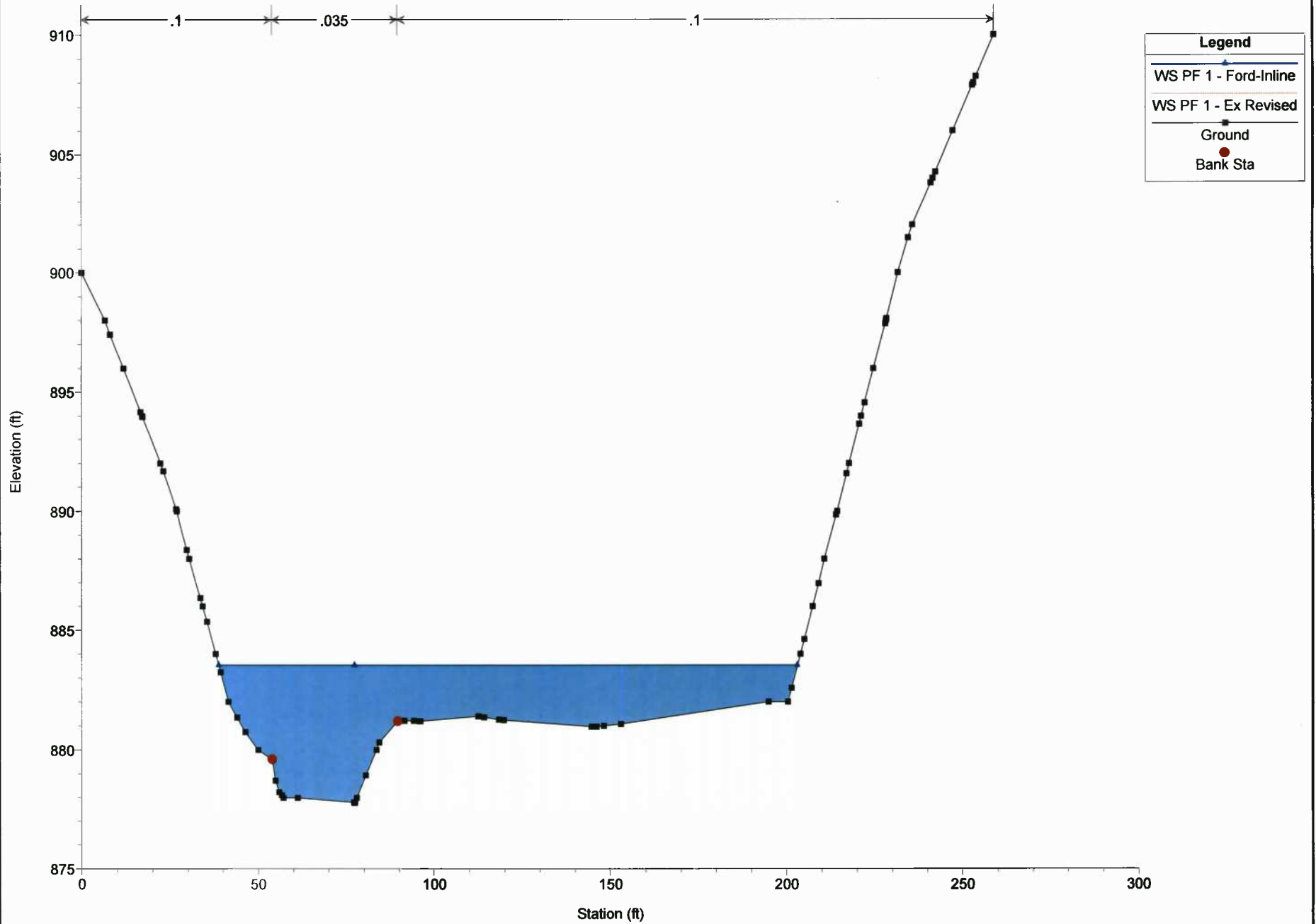
River = Bluestone Creek Reach = Lower RS = 1966.255



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

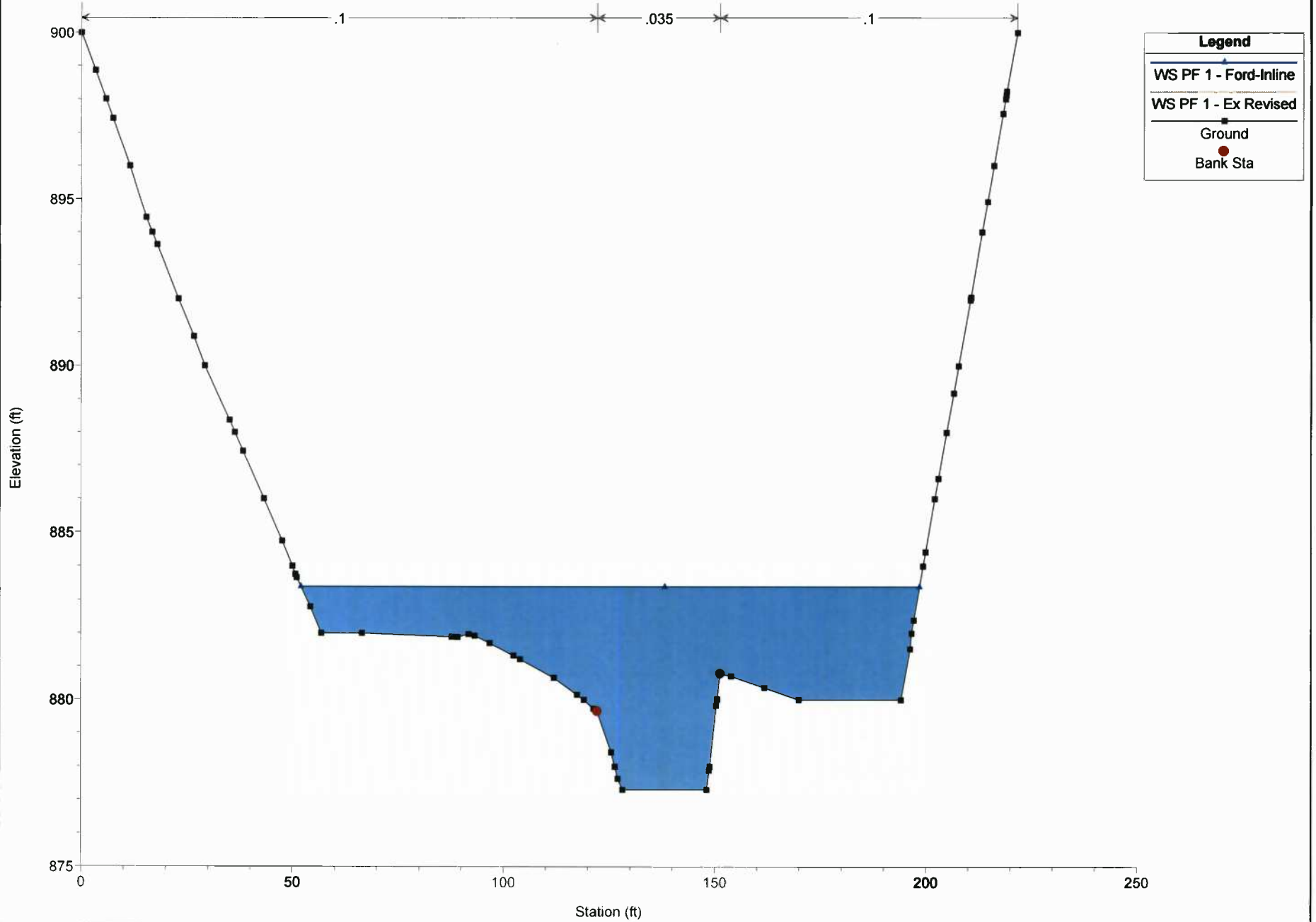
River = Bluestone Creek Reach = Lower RS = 1908.167



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

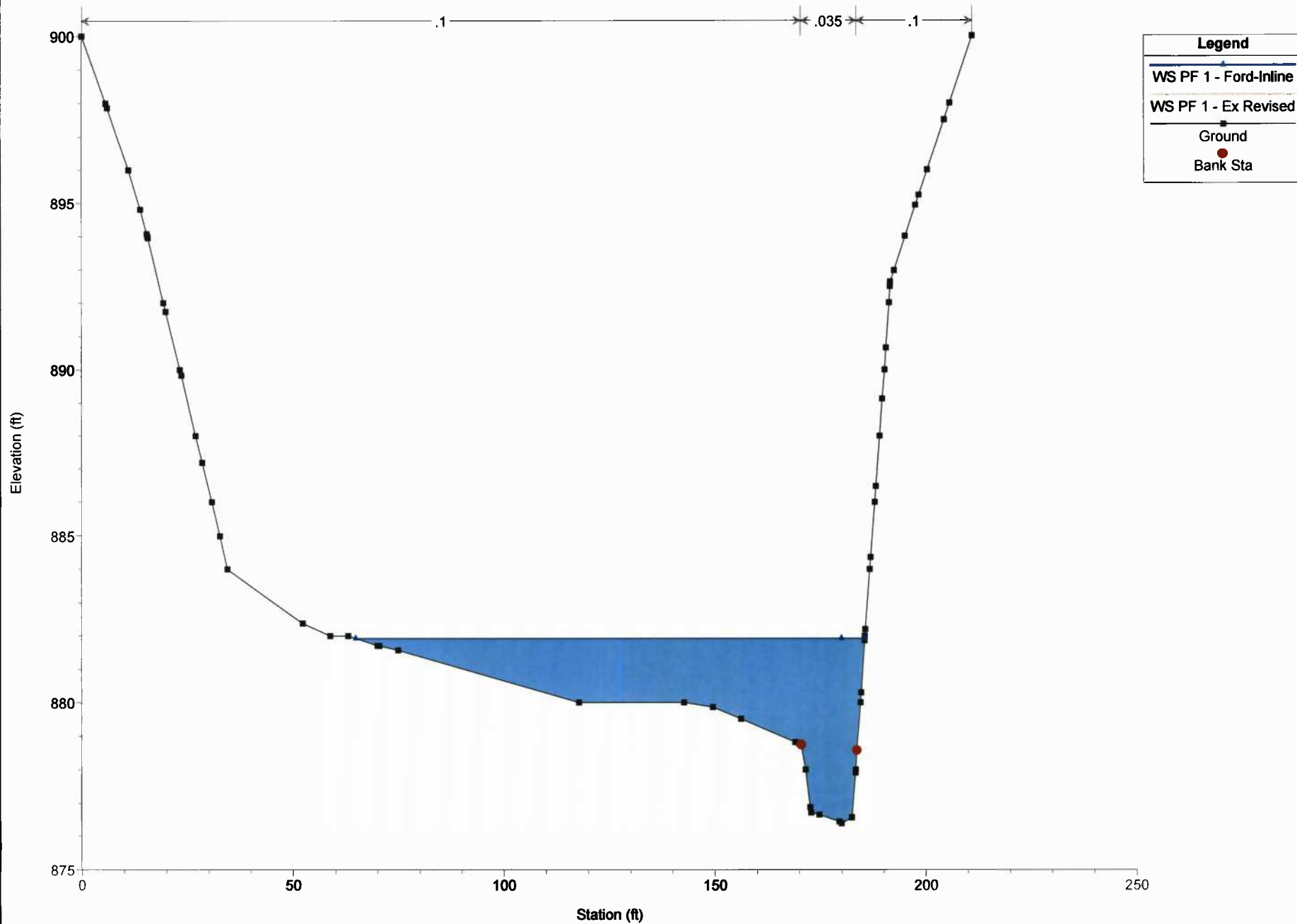
River = Bluestone Creek Reach = Lower RS = 1819.717



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 1647.228

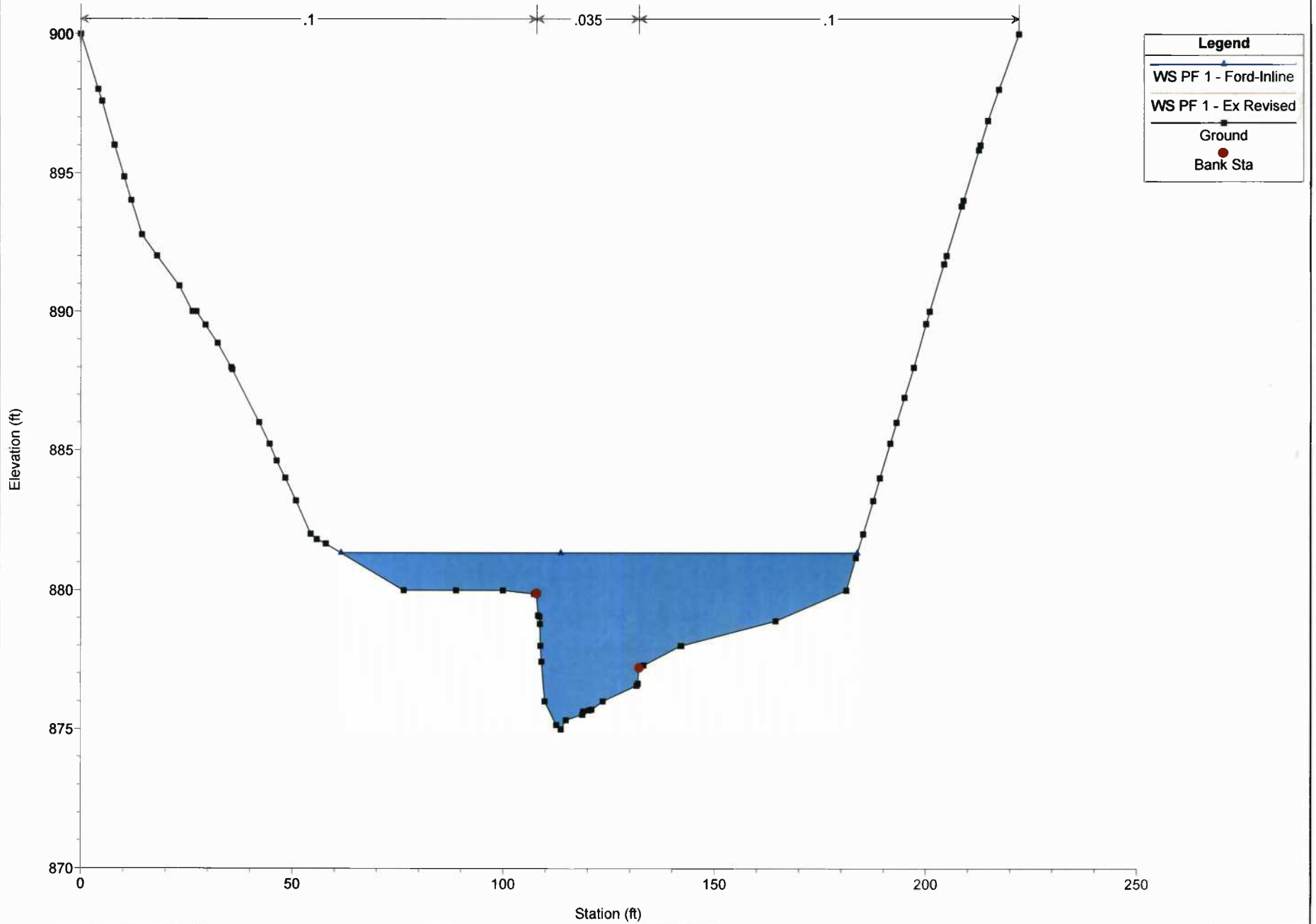




OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

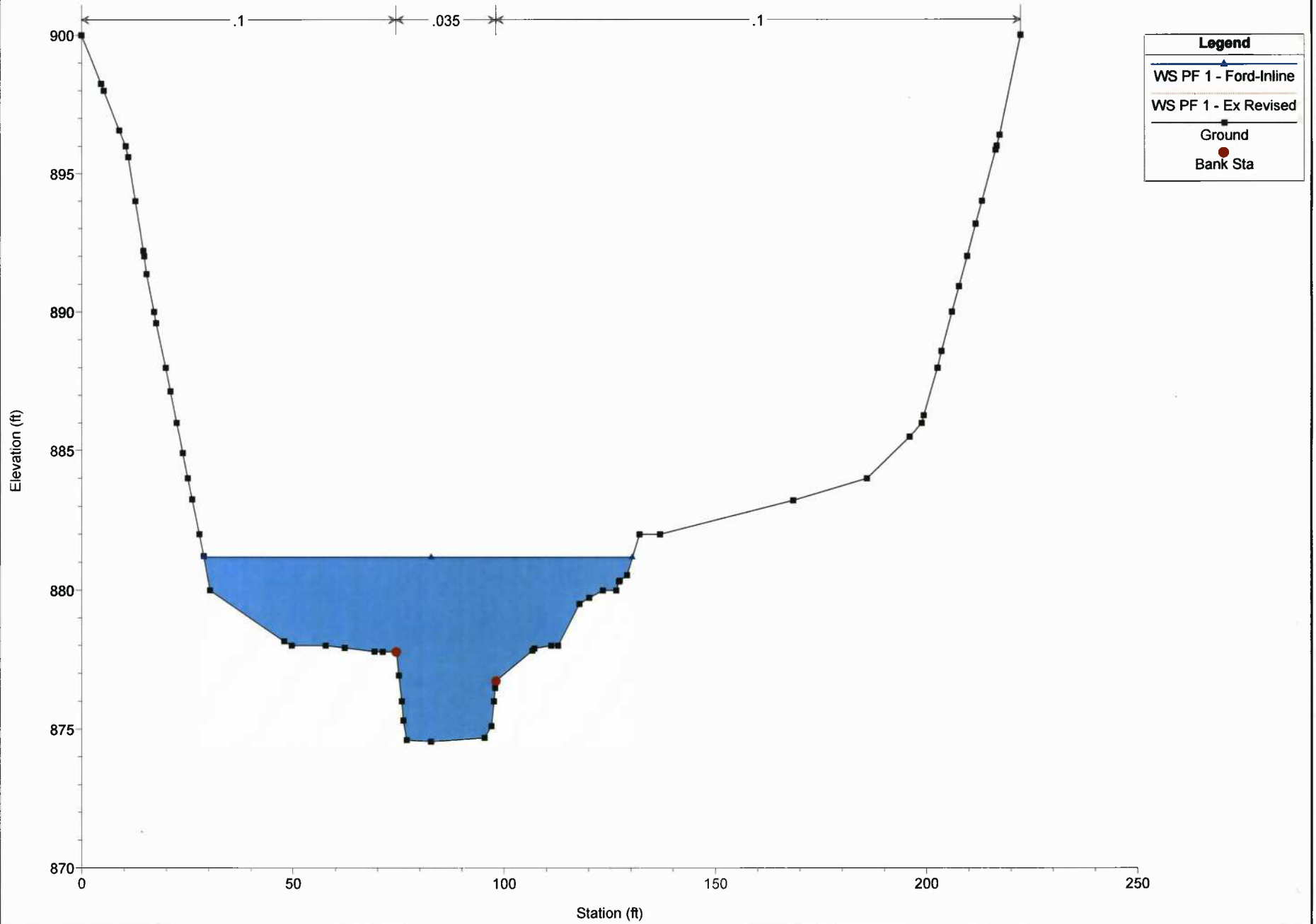
River = Bluestone Creek Reach = Lower RS = 1512.215



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

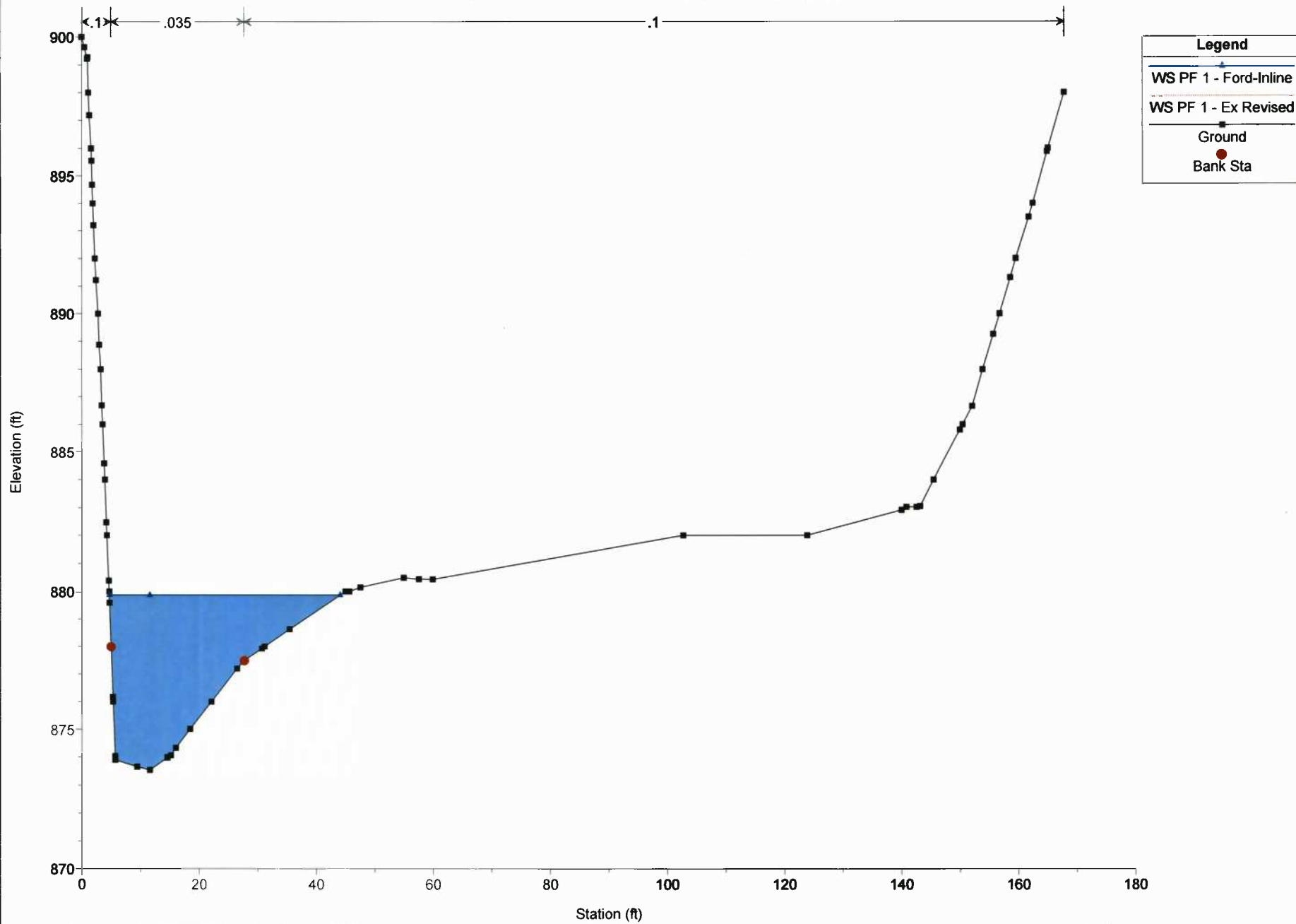
River = Bluestone Creek Reach = Lower RS = 1387.656



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

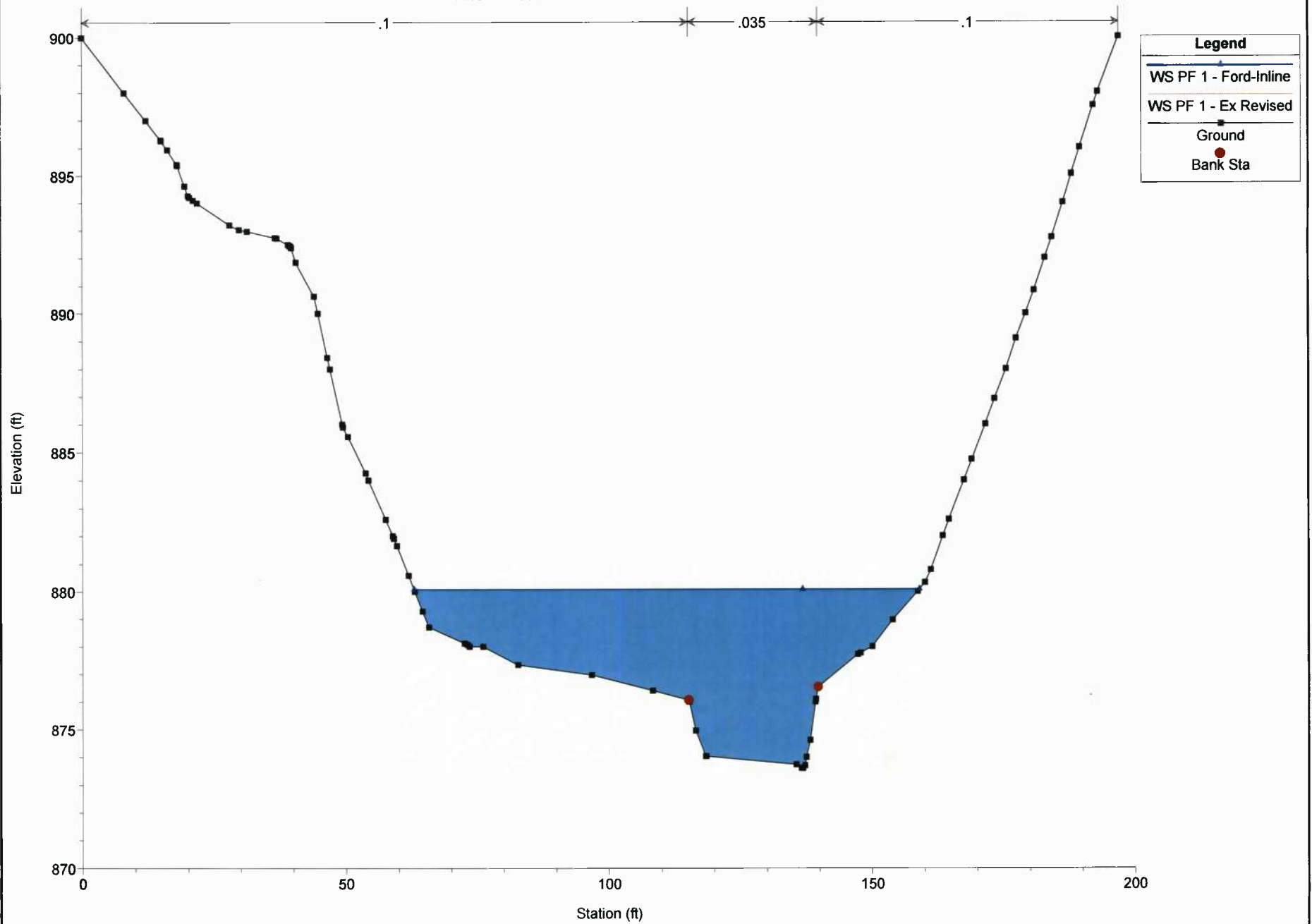
Geom: Ford-Inline Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 1246.924



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

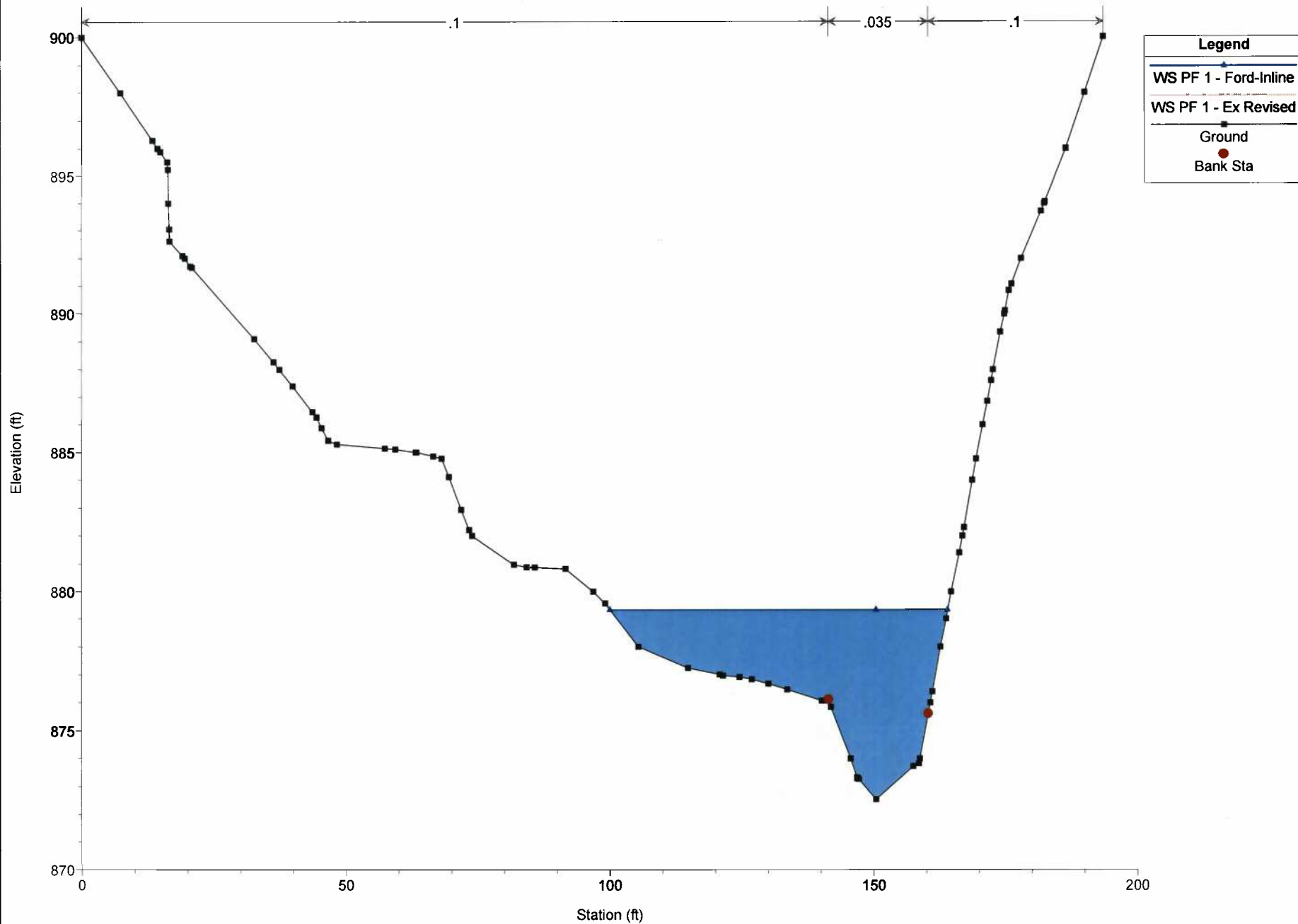
Geom: Ford-Inline Flow: Structures Revised  
River = Bluestone Creek Reach = Lower RS = 1109.636



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

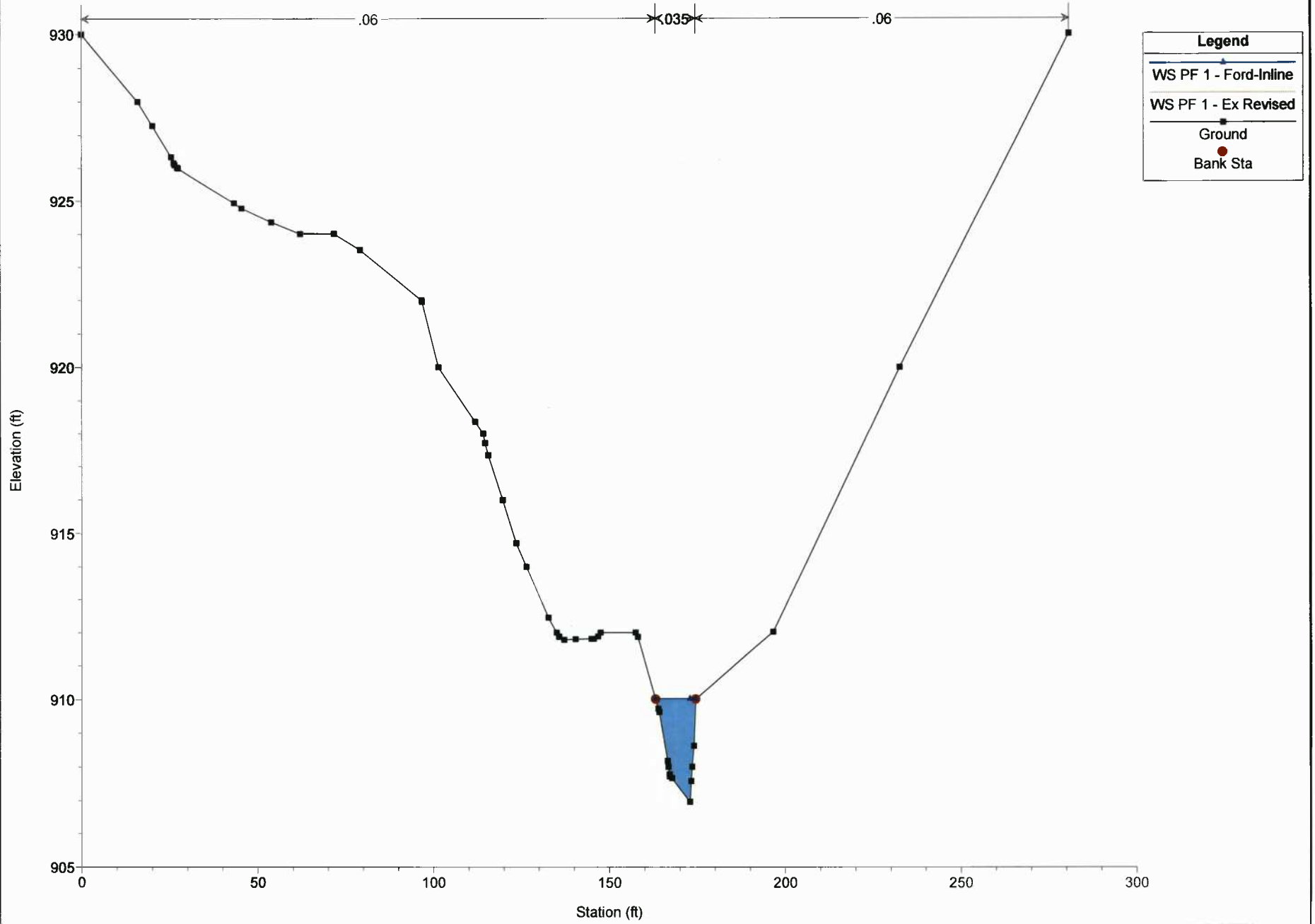
Geom: Ford-Inline Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 1029.896



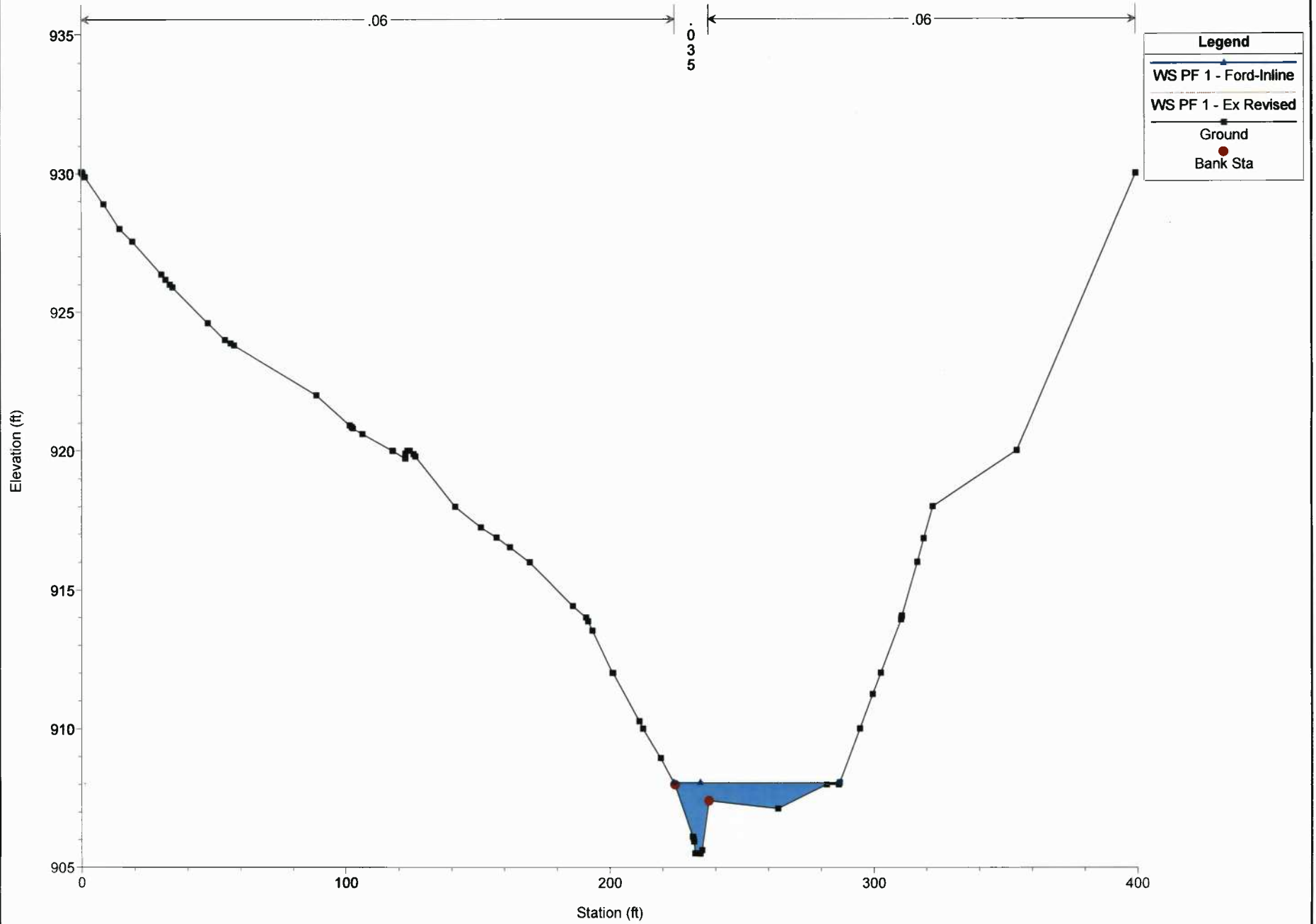
OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised  
River = Trib 1 Reach = Trib 1 RS = 1494.636



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

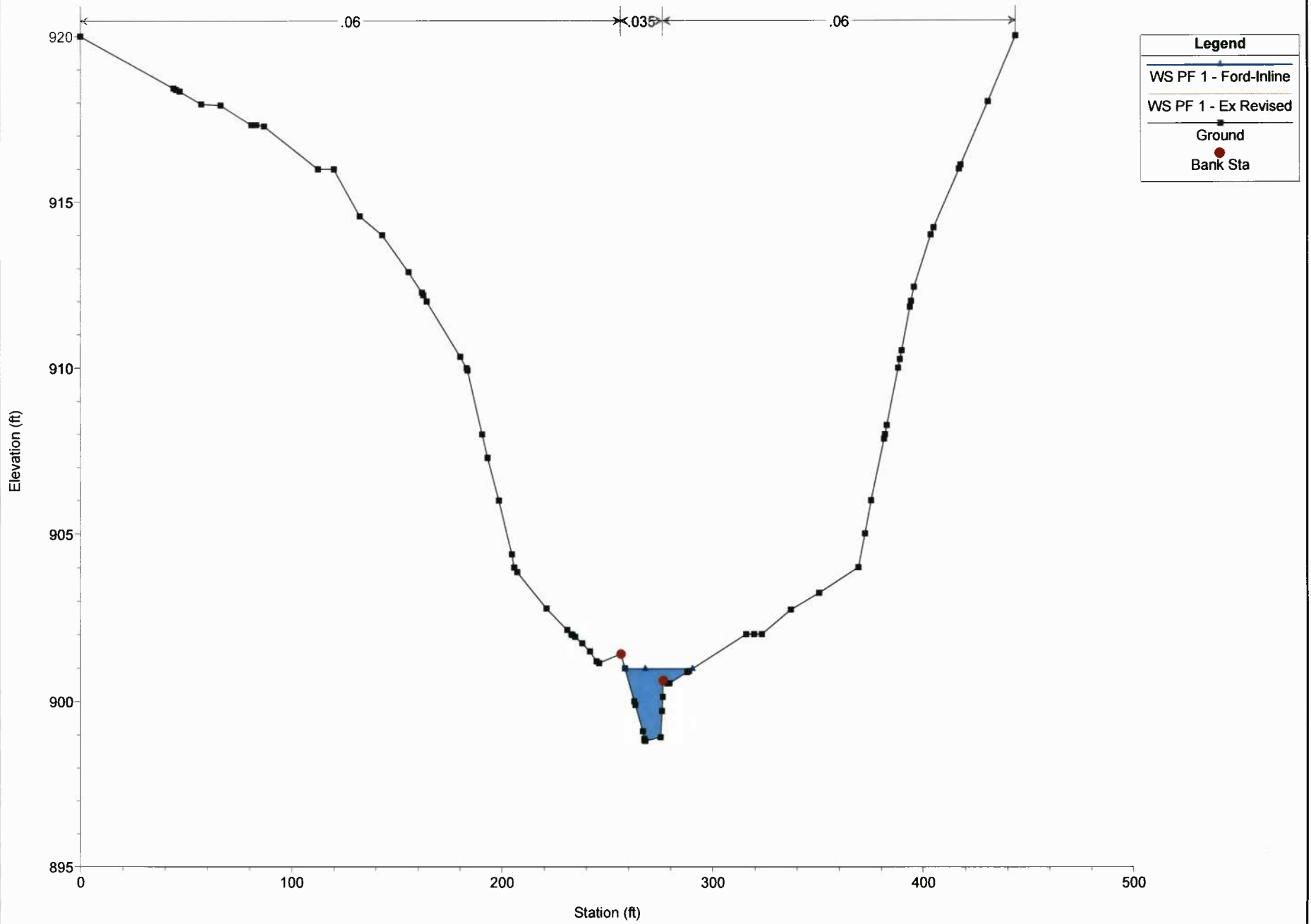
Geom: Ford-Inline Flow: Structures Revised  
River = Trib 1 Reach = Trib 1 RS = 1352.345



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

River = Trib 1 Reach = Trib 1 RS = 1083.880

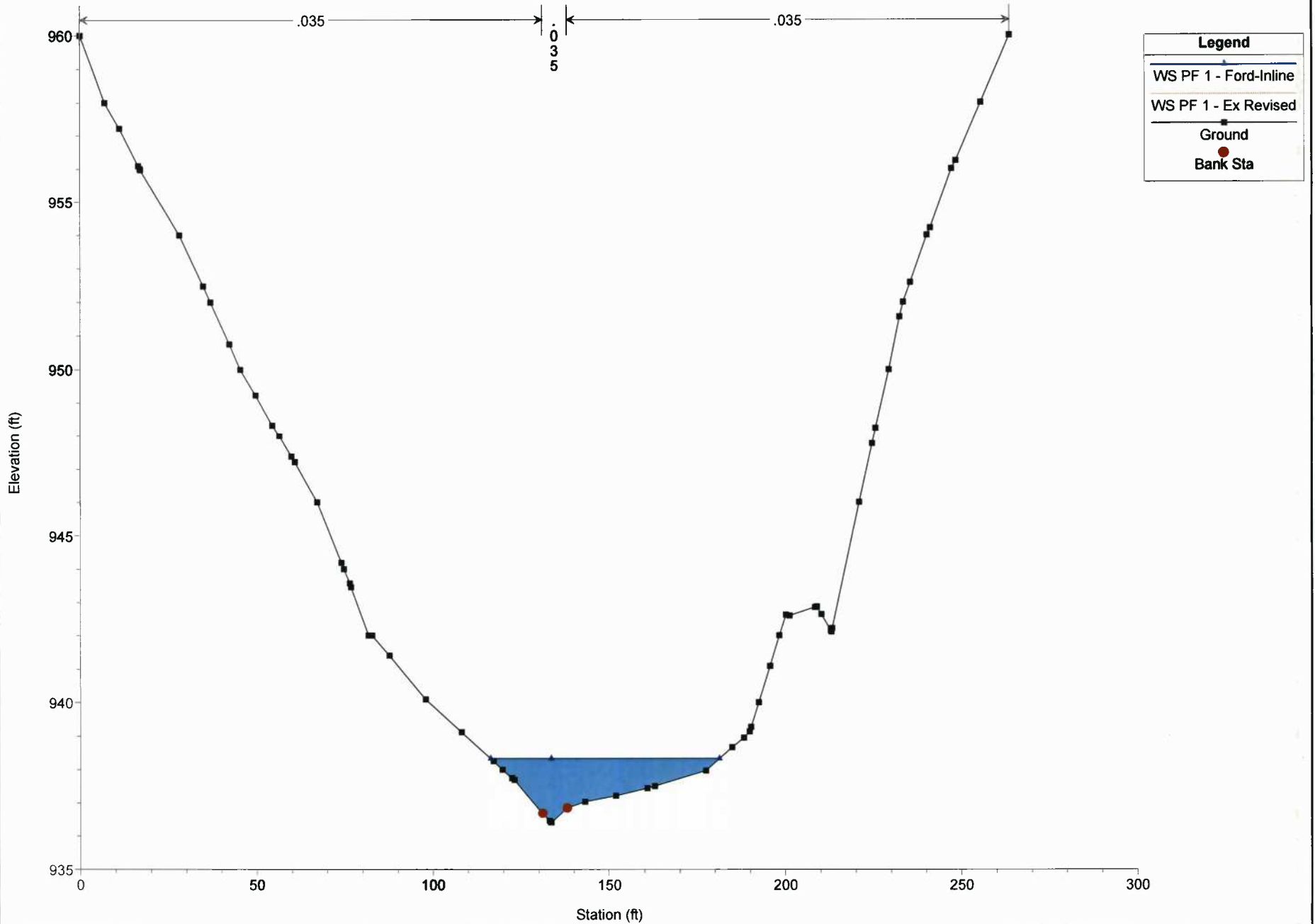




OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

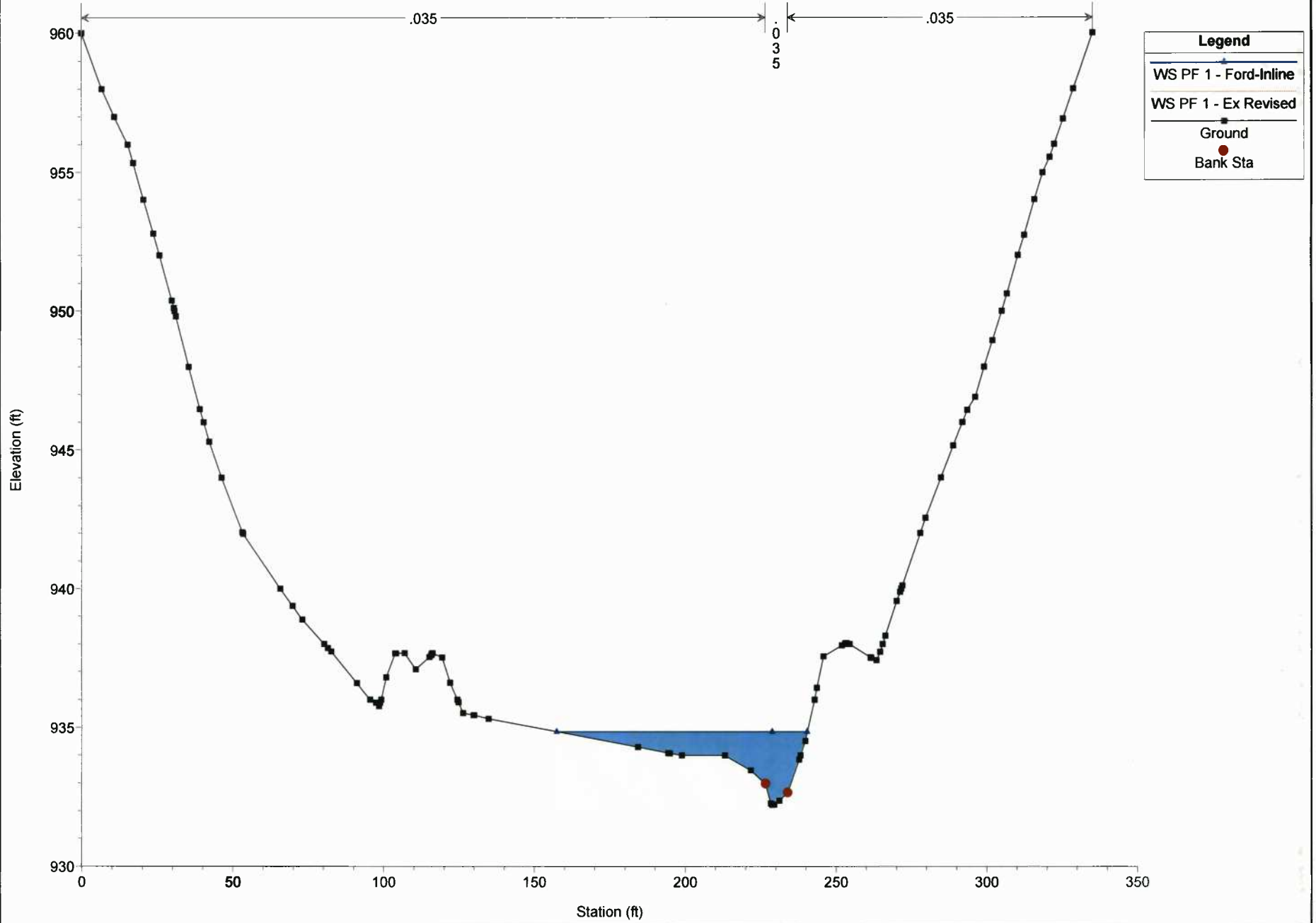
River = Trib 2 Reach = Trib 2 RS = 1293.508



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

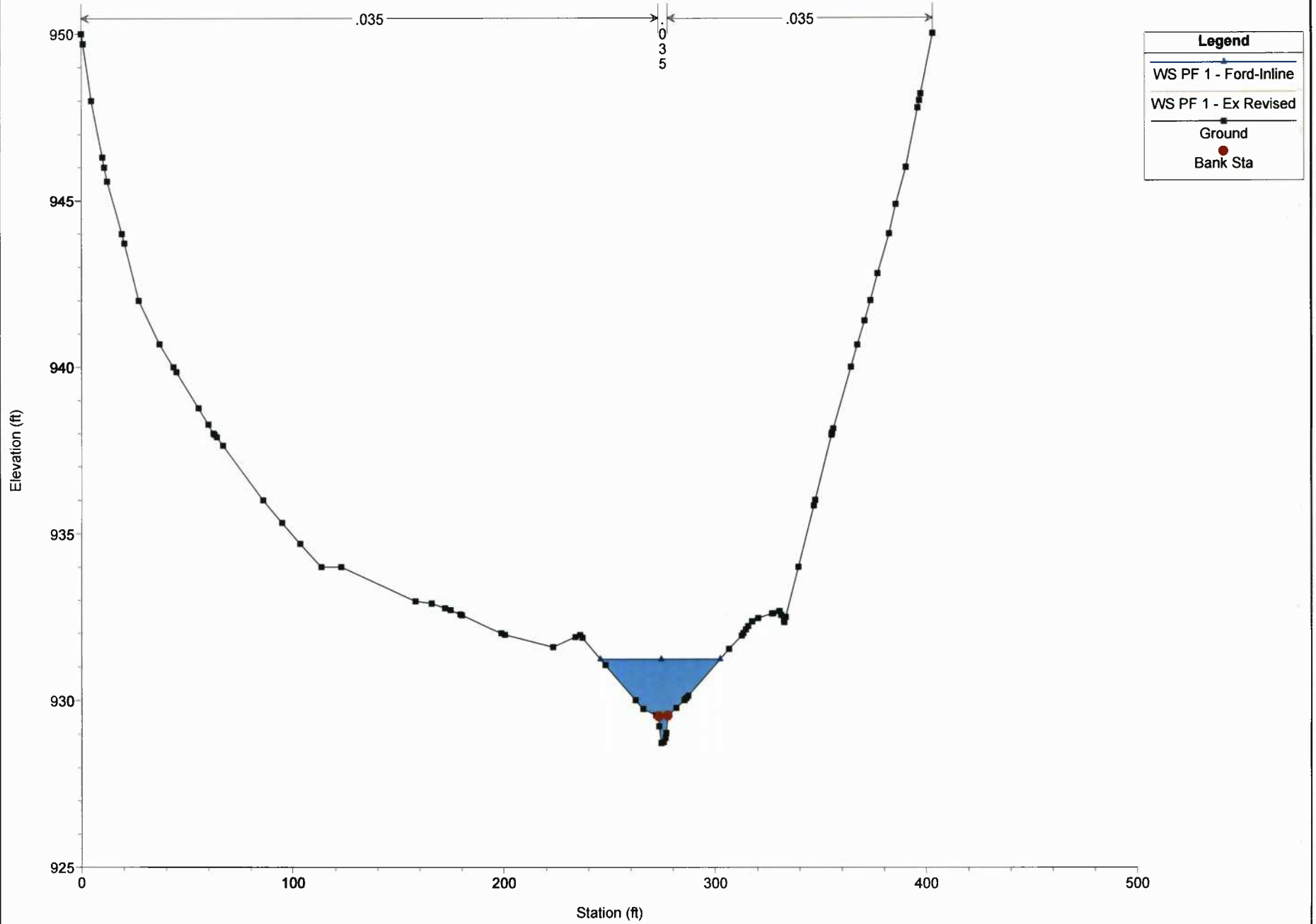
River = Trib 2 Reach = Trib 2 RS = 1159.413



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

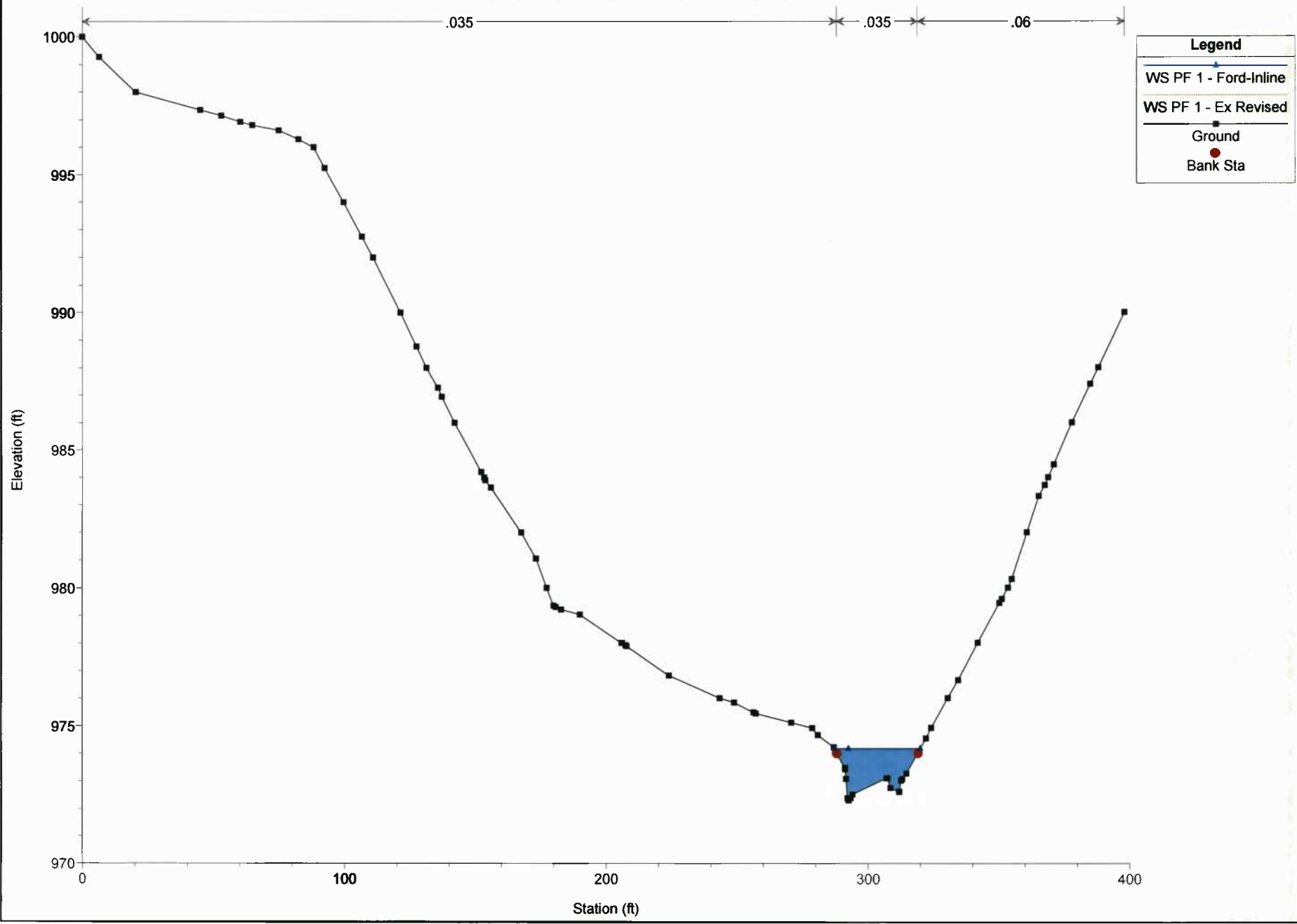
River = Trib 2 Reach = Trib 2 RS = 1030.844



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

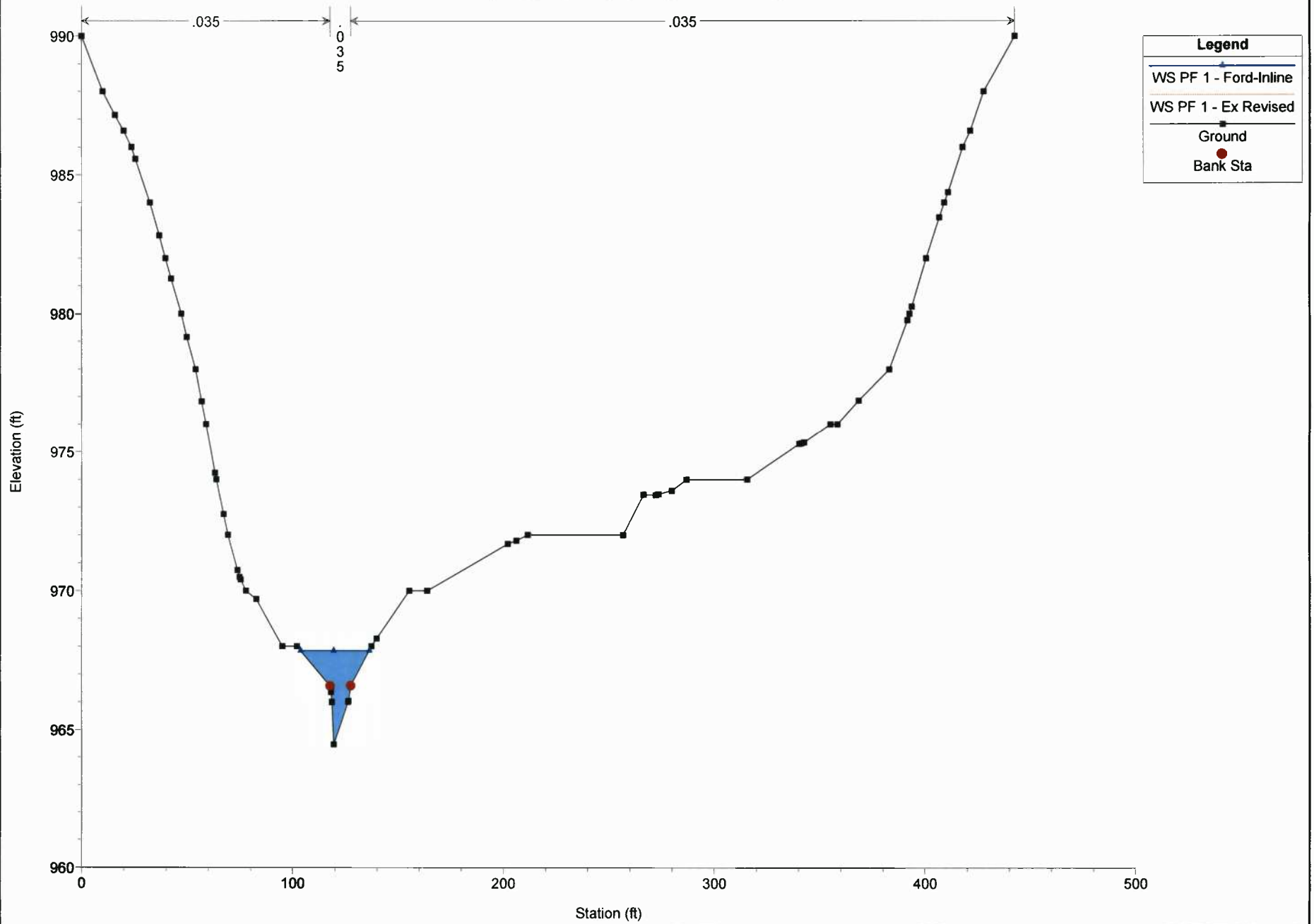
River = Trib 3 Reach = Trib 3 RS = 1842.591



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

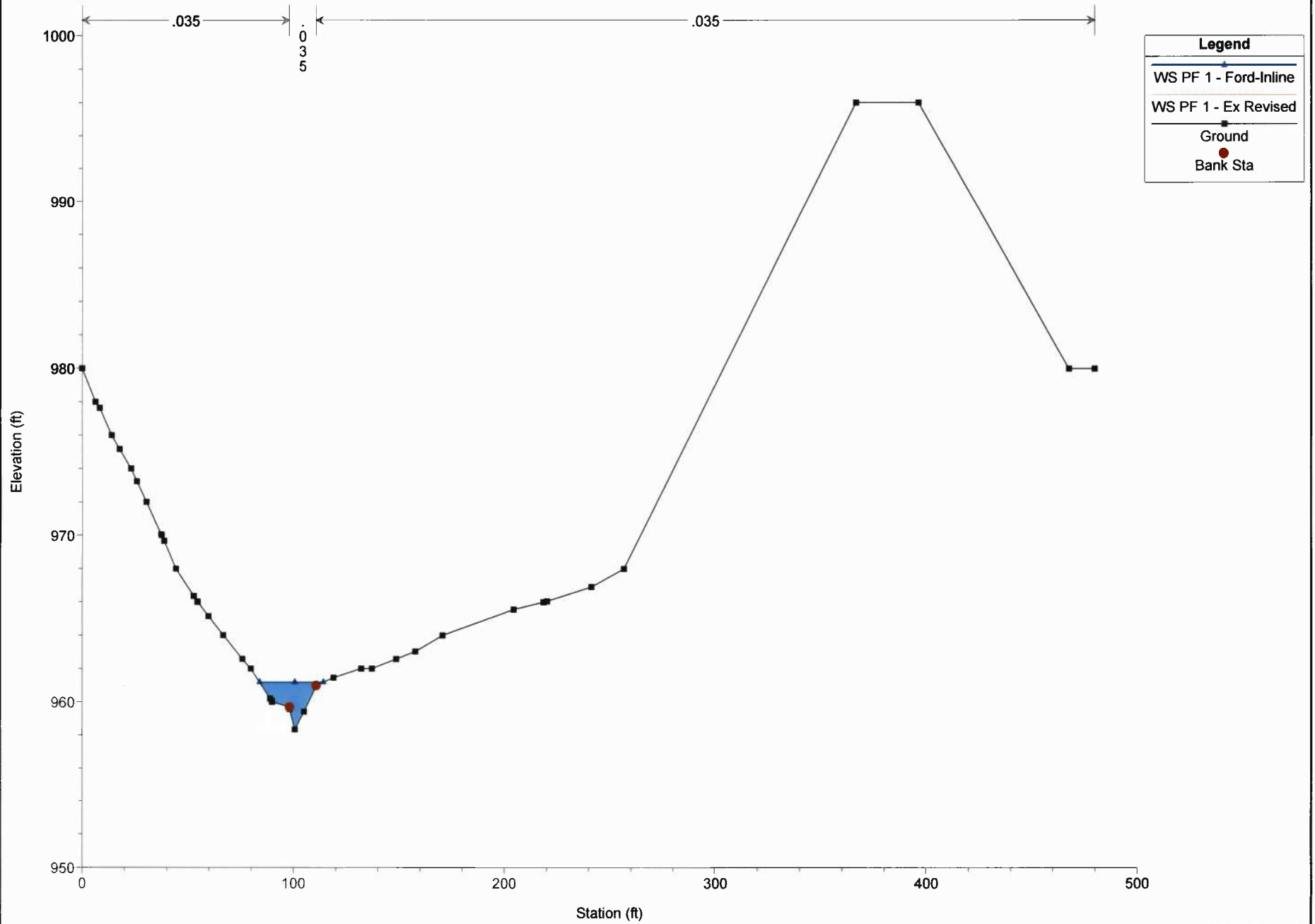
River = Trib 3 Reach = Trib 3 RS = 1574.434



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

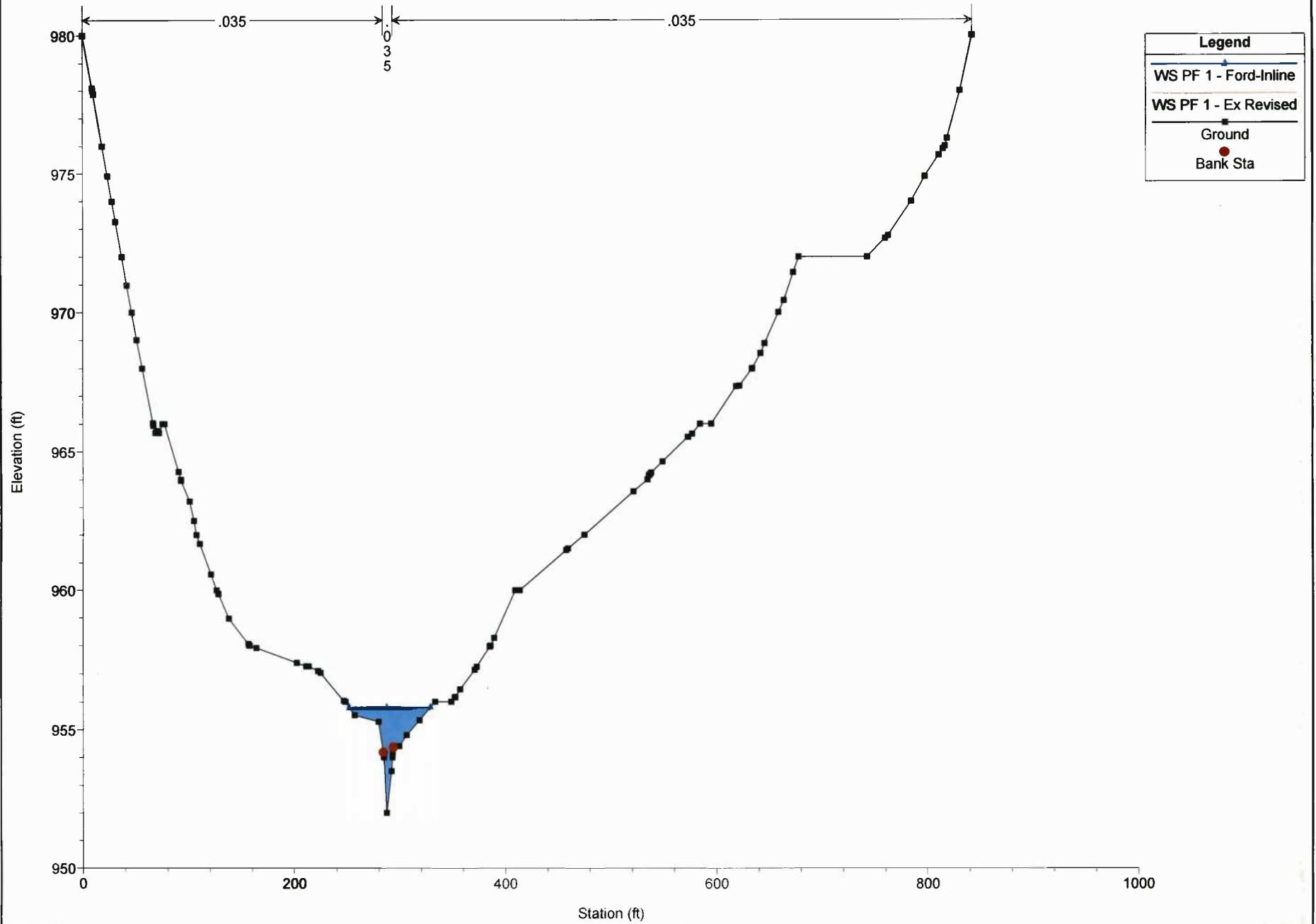
River = Trib 3 Reach = Trib 3 RS = 1370.118



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

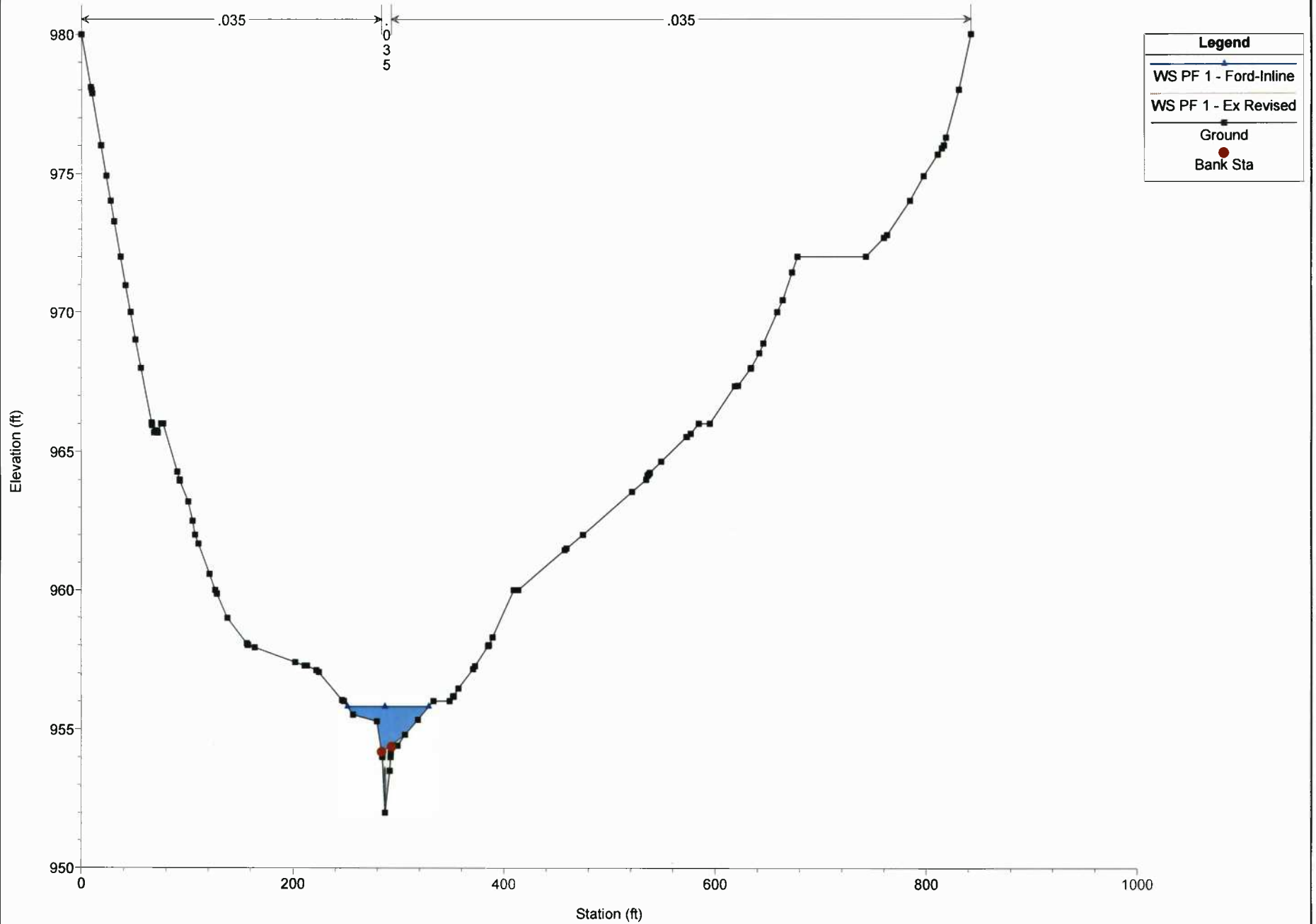
River = Trib 3 Reach = Trib 3 RS = 1126.884



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

River = Trib 3 Reach = Trib 3 RS = 1109.439 Culv

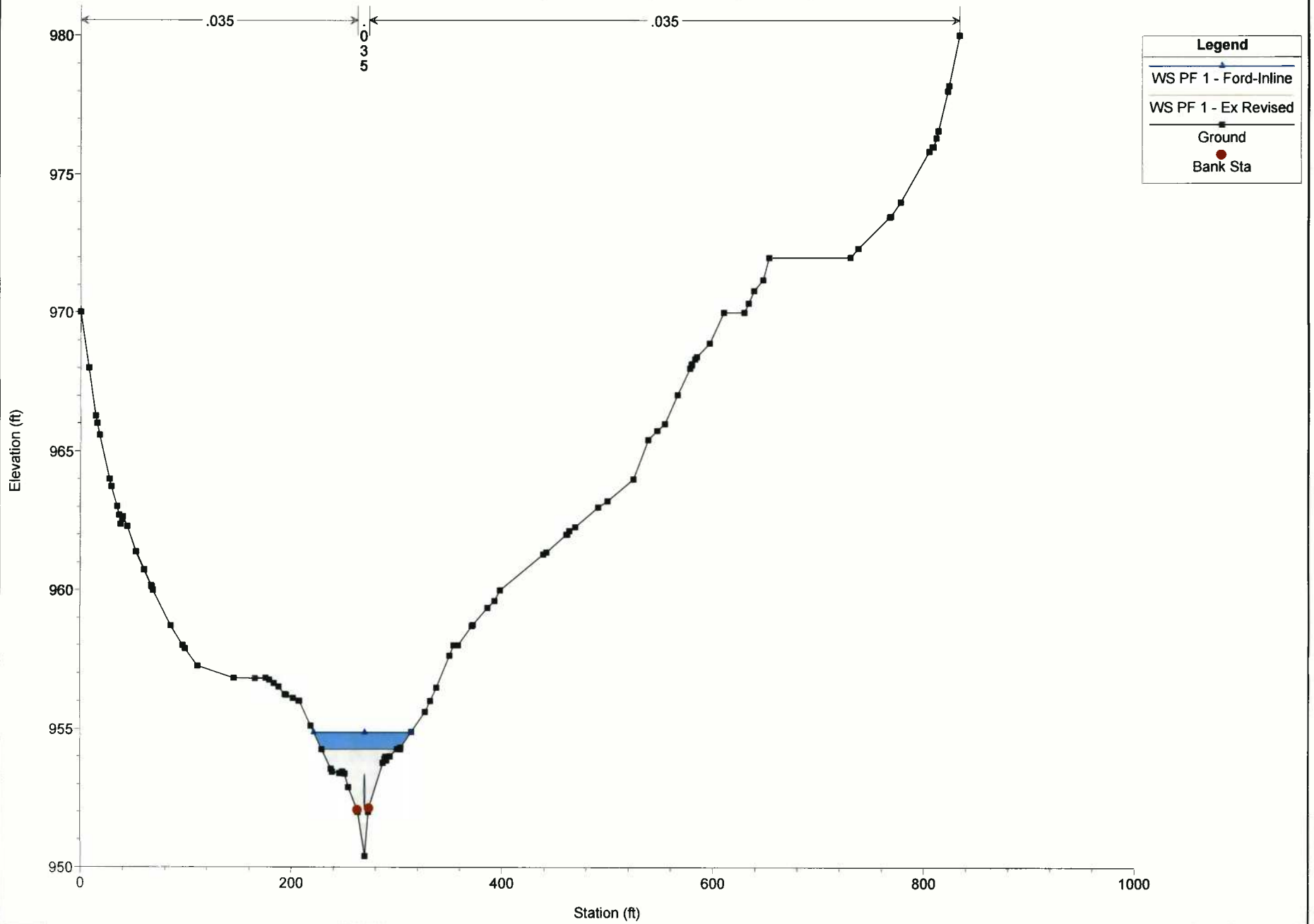




OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised

River = Trib 3 Reach = Trib 3 RS = 1109.439 Culv



OXF 157-159 Bridges Plan: 1) Ford-Inline 2) Ex Revised

Geom: Ford-Inline Flow: Structures Revised  
River = Trib 3 Reach = Trib 3 RS = 1089.963

