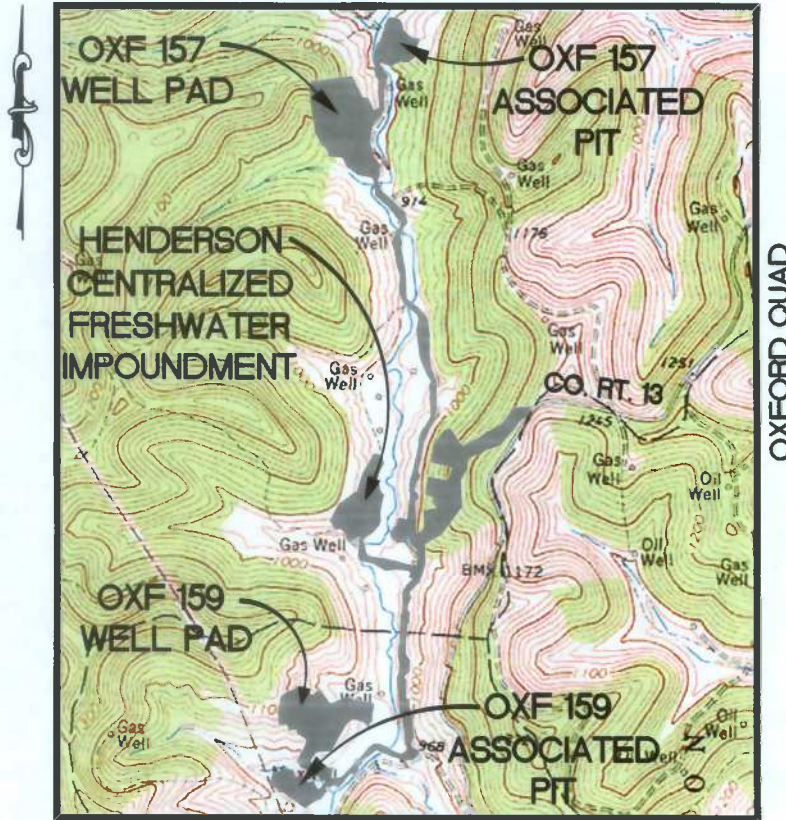


FLOODPLAIN ANALYSIS OF
 BLUESTONE CREEK
 OXF 157/159 WELL PAD
 HENDERSON CENTRALIZED FRESHWATER
 IMPOUNDMENT



VICINITY MAP
 1" = 2,000'



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Prepared For:
 EQT Production Company
 115 Professional Place
 P.O. Box 280
 Bridgeport, WV 26330

Contact:
 Victoria J. Roark
 Permitting Supervisor
 (304) 848-0076

Designed By:
 Navitus Engineering Inc.

Project Manager:
 Cyrus Kump, PE
 ckump@navituseng.com



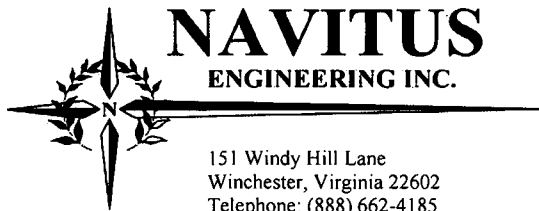
Surface Owner (s)
 Justin L. Henderson

Tax Parcel:
 Map 6 Parcel 1

Location:
 West Union District, Doddridge
 County
 West Virginia

Date: December 4, 2013

FN# 7889



December 4, 2013

Doddridge County Commission
118 East Court Street
West Union, WV 26456

Attn: Dan Wellings, Doddridge County Floodplain Administrator

Re: OXF 157/159 Well Pad and Henderson Centralized Freshwater Impoundment Access Road Stream Crossings - Floodplain Analysis

Dear Mr. Wellings:

Navitus Engineering has completed a floodplain analysis of the proposed OXF 157 and OXF 159 Well Pad sites, Henderson Centralized Freshwater Impoundment and access road stream crossings over Bluestone Creek located south of West Union, along a well access road adjacent to County Route 13 in Doddridge County, West Virginia. Portions of these two sites are located within a FEMA Flood Zone "A", as shown on the Flood Insurance Rate Map (FIRM) from the National Flood Insurance Program (NFIP), Map Number 54017C0225C dated October 4, 2011. Being that the site is located in a Flood Zone "A", base flood elevations for this area have not been established and detailed study information was not found in the Flood Insurance Study for Doddridge County, dated October 4, 2011.

In order to establish base flood elevations for this site, a hydrologic and hydraulic analysis was performed as outlined in the current Doddridge County Floodplain Ordinance, enacted May 21st, 2013. Using field shot data, 10-foot interval topography converted from 3 meter West Virginia GIS Technical Center DEM data, and information taken from USGS 7.5 Minute Series Topographic Maps, a drainage analysis was performed for the Bluestone Creek drainage shed. Upon establishing the peak flow drainage calculations for the 100-year storm event, a HEC-RAS river analysis was conducted for a section of Bluestone Creek adjacent to the OXF 157 and OXF 159 Well Pad Sites and Base Flood Elevations (BFE) were established. The resulting BFEs were used to establish adjusted floodplain boundaries for the segment of Bluestone Creek being studied. These boundaries are shown on the attached Existing Conditions Plan. In addition to establishing BFEs, a temporary and proposed conditions analysis was performed to determine the impacts of proposed grading from pads, pits and stockpiles as well as the proposed access roads, and stream crossings over Bluestone Creek. The temporary condition analysis represents the use of temporary 40' steel bridges placed on timber abutments with a 32' opening at stream crossing locations. The permanent condition analysis represents the use of 18 inch culverts embedded 6 inches with 8 inches of concrete cover as low water crossings at stream crossing locations. The proposed grading, culverts and bridges were added into the cross sections of the respective models and the manning's "n" values were adjusted where necessary. The models were run with these changes to determine the proposed impacts to the floodplain.

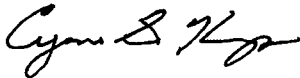
The results of this analysis indicate that the proposed improvements in the temporary condition will cause a maximum increase of 0.7' in the BFEs in this area and no upstream or downstream properties will be adversely impacted. The maximum increase in the BFE occurs at River Station 99+89.380. Impacts occur

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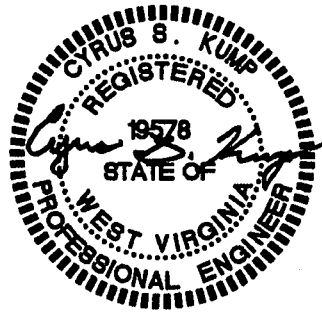
immediately upstream from the temporary bridge crossing locations and BFE increases return to 0.0' downstream quickly. In the permanent condition the results of the analysis indicate that the proposed improvements will cause a maximum increase of 0.4' in the BFEs in this area and no upstream or downstream properties will be adversely impacted. The maximum increase in the BFE occurs at River Station 46+82.971. Impacts occur immediately upstream from the temporary bridge crossing locations and BFE increases return to 0.0'

Should any questions or comments arise during the review, please let us know and we will work to address them. Copies of all permits required for this site will be provided by the operator. Please let me know if you should need additional information. You can reach me by phone (888) 662-4185 or email: ckump@navituseng.com.

Sincerely,
Navitus Engineering, Inc.



Cyrus S. Kump, PE



Enclosure:
Floodplain Analysis of Bluestone Creek

1. Objective

The objective of this floodplain analysis was to establish boundaries for the existing, temporary and proposed conditions of the 100 year base flood elevations (BFE). The temporary condition includes 40' bridges at all stream crossing locations and proposed grading impacts from the OXF 157 and OXF 159 Well Pad Plans and the Henderson Centralized Freshwater Impoundment. The proposed permanent condition includes replacing all proposed stream crossing locations with low water crossings and proposed grading impacts from the OXF 157 and OXF 159 Well Pad Plans and Henderson Centralized Freshwater Impoundment. Crossing locations, access roads and portions of the site plans are located within the FEMA Flood Zone "A".

2. Existing Conditions

2.1. Property Description

This site is located in Doddridge County, West Virginia along Bluestone Creek and existing well access roads south of West Union in the Southwest and West Union Districts. Proposed access roads tie into existing well access roads, County Route 13 (Maxwell Rd) and County Route 23/2 (Big Run Rd).

2.2. Floodplain Delineation

The approximate limit of the 100-year floodplain (a flood event that has a 1% chance of being equaled or exceeded in any given year) is shown on FEMA Flood Insurance Rate Map (FIRM) for Doddridge County on panels 54017C0225C effective October 4, 2011. This floodplain is located in flood zone designation "A" and base flood elevations have not been established. Detailed study information was not found in the Flood Insurance Study for Doddridge County, dated October 4, 2011.

2.3. Floodplain Ordinance

This site is administered under the Doddridge County Floodplain Ordinance, enacted May 31st, 2013.

Per Section 4.4.A of the ordinance, when a site is located in FEMA Flood Zone designation "A" the Floodplain Administrator shall use elevation and floodway information from Federal, State, or other acceptable sources when available to determine the elevation above which development will reasonably safe from flooding.

Per Section 4.4.B. of the ordinance, when data from an acceptable source is not available, the Floodplain Administrator shall review, or shall cause to be reviewed; all proposed development to determine (1) the amount being invested and (2) the specific flood risk at the site. The Floodplain Administrator shall then require the applicant to determine the elevation above which the development and adjacent properties including but not limited to existing buildings will be reasonably safe from flooding using hydrologic and hydraulic analyses or

other techniques. When hydrologic and hydraulic analyses are required, they shall only be prepared by a registered professional engineer who shall certify that the methods used correctly reflect currently accepted technical concepts. The resulting study shall include a cover letter, signed by the responsible professional, providing a statement of findings in basic terms. In addition, studies, analyses, computations, etc. shall be submitted in sufficient detail to allow a thorough review by the Floodplain Administrator.

Per Section 4.4.C. of the ordinance, any development and/or use of land shall be permitted provided that all such uses, activities and/or development shall be undertaken in strict compliance with the flood-proofing and related provisions contained herein and in all other applicable Federal and State Laws, Ordinances and Regulations.

Per Section 4.4.D. of the ordinance, within any apportioned Floodplain Zone (Zone A) without Floodway Area, no new construction or development shall be allowed unless it is demonstrated that the cumulative impact of the proposed development, when combined with all other existing and anticipated development, will not increase the elevation of the 100-year flood more than one (1) foot at any point.

Per Section 4.5.A of the ordinance, any developer shall notify in writing, by certified mail, Doddridge County's Floodplain Administrator, the State Coordinating Office, and adjacent communities and any adjacent property owners of all such intended activities prior to the alteration of the stream. Copies of all required notifications must be submitted to the Federal Insurance Administration. In addition prior to issuing the local permit the Floodplain Administrator shall require copies of all necessary permits from those government agencies from which Federal or State Law requires approval.

Per Section 4.5.B a stream crossing analyses for the proposed permanent crossings of Bluestone Creek have been provided under separate cover and include a cover letter signed by the responsible professional, a detailed report, hydraulic and hydrologic computations and a sitemap detailing the planned construction.

Per Section 4.5.C of this ordinance the stream crossings have been designed with "best practice" techniques in mind. In the temporary condition, Bluestone Creek will be crossed at five different locations within the mapped limits of FEMA Floodplain Zone "A" by a 40' steel bridge that has a 32' clear opening. The bridges are placed on timber abutments directly on top of the existing stream banks and anchored down. All fill utilized will be 2-4" clean rock aggregate with a 4-6" large angular durable rock base to minimize erosion during storm events. In the proposed permanent condition, 18 inch culverts imbedded 6 inches with 8 inches of concrete fill will be utilized as a low water crossing in the permanent case. These crossings are designed to only pass the normal flow in the stream. During storm events flow will overtop the culverts. Sandbag cofferdams and a dewatering bag system will be utilized during construction to minimize erosion and allow for construction in the stream channel.

Per Section 4.5.D of this ordinance the bridges and low water crossings will be properly anchored as required.

Per Section 4.5.E of this ordinance the Developer shall provide Doddridge County with all required legal agreements detailing inspections and maintenance.

Per Section 5.1 of this ordinance Permits are required for the construction of the temporary and permanent stream crossings. The format of the permit will coincide with the requirements set forth in Section 5.2 of the ordinance.

Per Section 6.1E of this ordinance the fill associated with this plan has been designed to not adversely affect adjacent properties. The access roads, grading impacts and crossings were located to minimize floodway constriction and the height above the existing grade was minimized to allow as much flow as possible to be unimpeded. Impacts to the 100 year base flood elevation are demonstrated later in this report, however, increases to the 100 year base flood elevations were limited to a maximum increase of 0.7' in the temporary condition and a maximum increase of 0.4' during the permanent condition. Fill as stated above shall consist of 2-4" clean rock aggregate with a 4-6" large angular durable rock base. No less than 2:1 slopes will be utilized in the construction of the proposed crossing.

Per Section 6.1F structures have been placed with the longitudinal axis parallel to the direction of flood flow and to maintain the same flood-flow lines of the adjoining structures.

Per Section 6.1.K of this ordinance, positive drainage has been taken into account along all access roads and at each crossing location to reduce exposure to flood hazard.

All other specific requirements covered in Section 6.1 of this ordinance are not applicable to this design. (Sections 6.1.A, 6.1.B, 6.1.C, 6.1.D, 6.1.F, 6.1.G, 6.1.H, 6.1.I, 6.1.J, and 6.1.L)

The developer shall conform with all administrative procedures as outline in Article 7 of this ordinance.

2.4. Bluestone Creek Characteristics

Bluestone Creek is located in the Southwest and West Union Districts of Doddridge County and flows in a northern direction. The drainage area flowing to Bluestone Creek at the furthest downstream crossing area is approximately 2.219 square miles of forested and agricultural land with an average basin slope of 31.92%.

3. Analysis Information

3.1. HEC-RAS

A HEC-RAS hydraulic analysis was performed for the portion of the Bluestone Creek that has an impact on the BFE's across the property. HEC-RAS is designed to perform one-dimensional hydraulic calculations for a full network of natural and constructed channels. The steady flow system is designed for applications in floodplain management and flood insurance studies.

3.2. Analysis Limits

The analysis information is based upon two foot interval field shot topography by Smith Land Surveying. The upstream analysis limit for Bluestone Creek is located approximately 2,025 feet upstream from the furthest upstream stream crossing and represents the 146+59.362 section. The downstream analysis limit for Bluestone Creek is located approximately 1,832 feet downstream of the furthest downstream proposed stream crossing and represents the 10+29.831 section. These limits were selected so that the HEC-RAS model would accurately determine the base flood elevations on site and off site.

3.3. Flow Data

The hydrologic analysis utilized USDA soil surveys for computation of drainage shed curve numbers, 2 ft field shot topography by Smith Land Survey and 3 meter West Virginia GIS Technical Center DEM to determine the drainage area(s) and time of concentration path(s). The peak 100-year discharge within the inundation area was determined through TR-55 SCS methodology. Time of concentration paths were calculated utilizing the SCS lag method. The hydrologic calculations for the drainage area were performed using HEC-HMS. See the table below for a summary of the flow conditions, and see Supplement 1 for the complete Drainage Computations.

Stream	Drainage Area	Flow (cfs)	Note
Bluestone Creek	564.47 Ac.	443.8	Upstream
Bluestone Creek	834.55 Ac.	601.9	Sta. 11+904.55
Bluestone Creek	1,066.87 Ac.	763.6	Sta. 99+89.380
Bluestone Creek	1,249.91 Ac.	855.6	Sta. 61+79.412
Bluestone Creek	1,420.15 Ac.	914.4	Sta. 47+04.612
Bluestone Creek	1,692.15 Ac.	1021.2	Downstream

3.4. Cross Section Data

The cross sections were employed at significant changes in site features. This includes major bends in the stream channel, areas of major contraction and expansion of the floodplain area, upstream and downstream of existing culverts, and at building obstructions (cross sections were compiled using field shot topography by Smith Land Survey).

3.5. Manning's n-value

The channel and overbank areas were assigned manning's n-values based on field review, site photographs, and close inspection of existing aerial photography. The chart below describes the manning's n values used in this study.

Manning's n value	Description	Portion Used
.035	Clean, straight, full, no rifts or deep pools, stones and weeds	Main Channel
.1	Heavy stand of timber, few down trees, little undergrowth, flow below branches	Floodplains (Normal)
.013	Asphalt	Floodplains
.035	High grass	Floodplains
.033	Rip Rap Dry Rubble	Floodplains
.06	Light Brush and trees, in summer	Floodplains

4. Results

4.1. Existing Conditions

Since the site is in Zone "A" floodplain area as shown on the FIRM, there has not been a detailed study analysis with one foot interval base flood elevations established within the Doddridge County Flood Insurance Study (FIS) effective October 4, 2011. An existing conditions model was prepared based upon field shot topography and existing drainage computations. This information was processed in HEC-RAS to determine the existing conditions of the Base Flood Elevations.

4.2. Proposed Conditions

The temporary conditions model was based on the proposed topography for the bridge crossings, access roads and grading from the Well Pad sites and Henderson Centralized Freshwater Impoundment. For the permanent proposed conditions the model was based upon the proposed topography for the low water crossings, access roads and grading from the Well Pad sites and Henderson Centralized Freshwater Impoundment. The low water crossing culverts were modeled as being completely blocked. This information was added into the existing conditions cross sections, and then was processed in HEC-RAS to determine the temporary and proposed conditions of the Base Flood Elevations. A summary of elevation changes showing the existing and proposed BFEs at the various cross sections has been provided in the appendix. As shown in the table, the temporary development will not increase the existing BFEs more than 0.7' throughout the project area and return to 0.0' at the upstream and downstream termini of the study area. The permanent proposed development will not increase the existing BFEs more than 0.4' throughout the project area and return to 0.0' at the upstream and downstream termini of the study area.

5. Conclusion

The results of this floodplain analysis indicate that there will be minimal changes in the 100 year base flood elevation and no impacts to upstream and downstream adjacent properties along Bluestone Creek. The largest increase in base flood elevation is 0.7' in the temporary condition and 0.4' in the proposed permanent condition all impacts are located on site directly upstream of the proposed temporary and permanent stream crossing locations.

APPENDIX

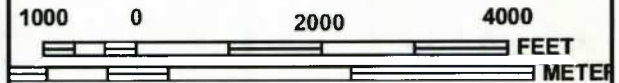
Exhibit A	FIRM Panel 54017C0225C
Exhibit B	Overall Plan
Exhibit C	Existing Conditions Plan
Exhibit D	Temporary Conditions Plan
Exhibit E	Proposed Conditions Plan
Supplement 1	Drainage Computations
Supplement 2	Summary of Computed Elevations
Supplement 3	HEC-RAS Analysis –Existing Conditions Summary
Supplement 4	HEC-RAS Analysis –Temporary Conditions Summary w/ Cross Sections
Supplement 5	HEC-RAS Analysis –Proposed Conditions Summary w/ Cross Sections

Exhibit A

FIRM Panel 54017C0225C



MAP SCALE 1" = 2000'



NATIONAL FLOOD INSURANCE PROGRAM
 FIRM

PANEL 0225C

FIRM

FLOOD INSURANCE RATE MAP
 DODDRIDGE COUNTY,
 WEST VIRGINIA
 AND INCORPORATED AREAS

PANEL 225 OF 325
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
DODDRIDGE COUNTY	540024	0225	C

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.



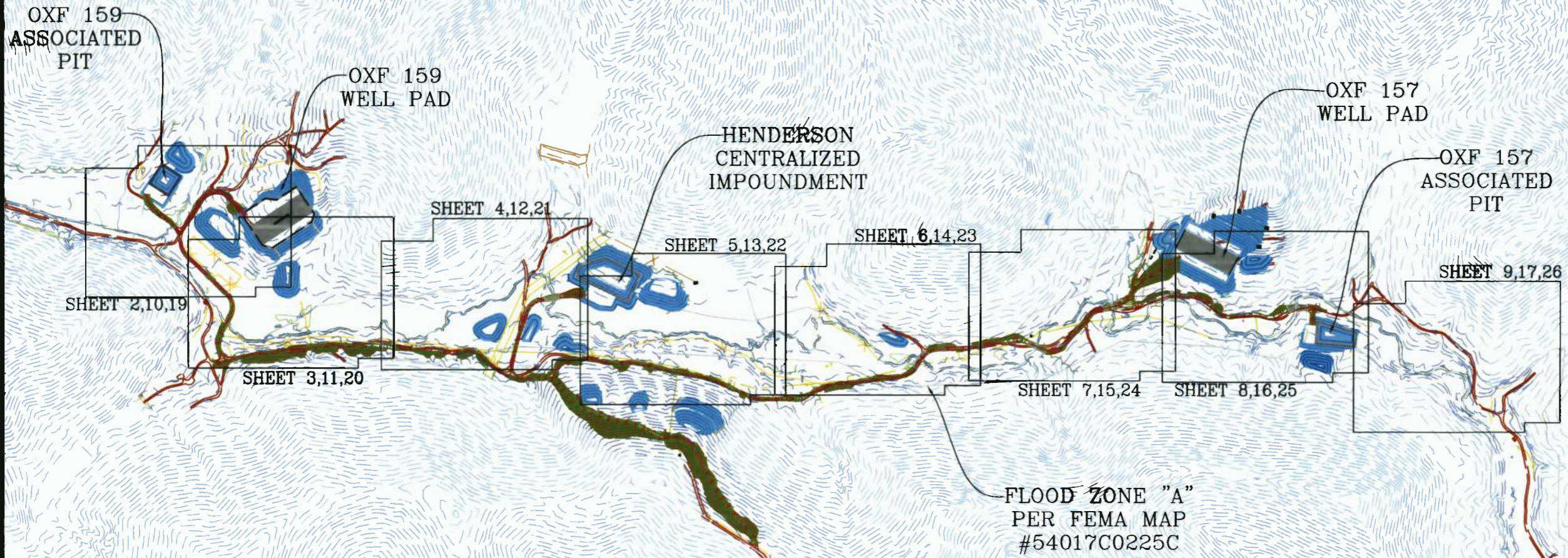
MAP NUMBER
 54017C0225C
MAP REVISED
 OCTOBER 4, 2011

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Exhibit B
Overall Plan

GRID NORTH AND ELEVATIONS
SHOWN HEREON WERE ESTABLISHED
BY SURVEY GRADE GPS



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12/4/2013

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OVERALL PLAN

**OXF 157/159 WELL PADS AND
HENDERSON CENTRALIZED
FRESHWATER IMPOUNDMENT
FLOODPLAIN STUDY**

WEST UNION DISTRICT
DODDRIDGE COUNTY, WV

SHEET 1 OF 26

OXF 157/159
JOB NO. 7889


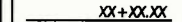



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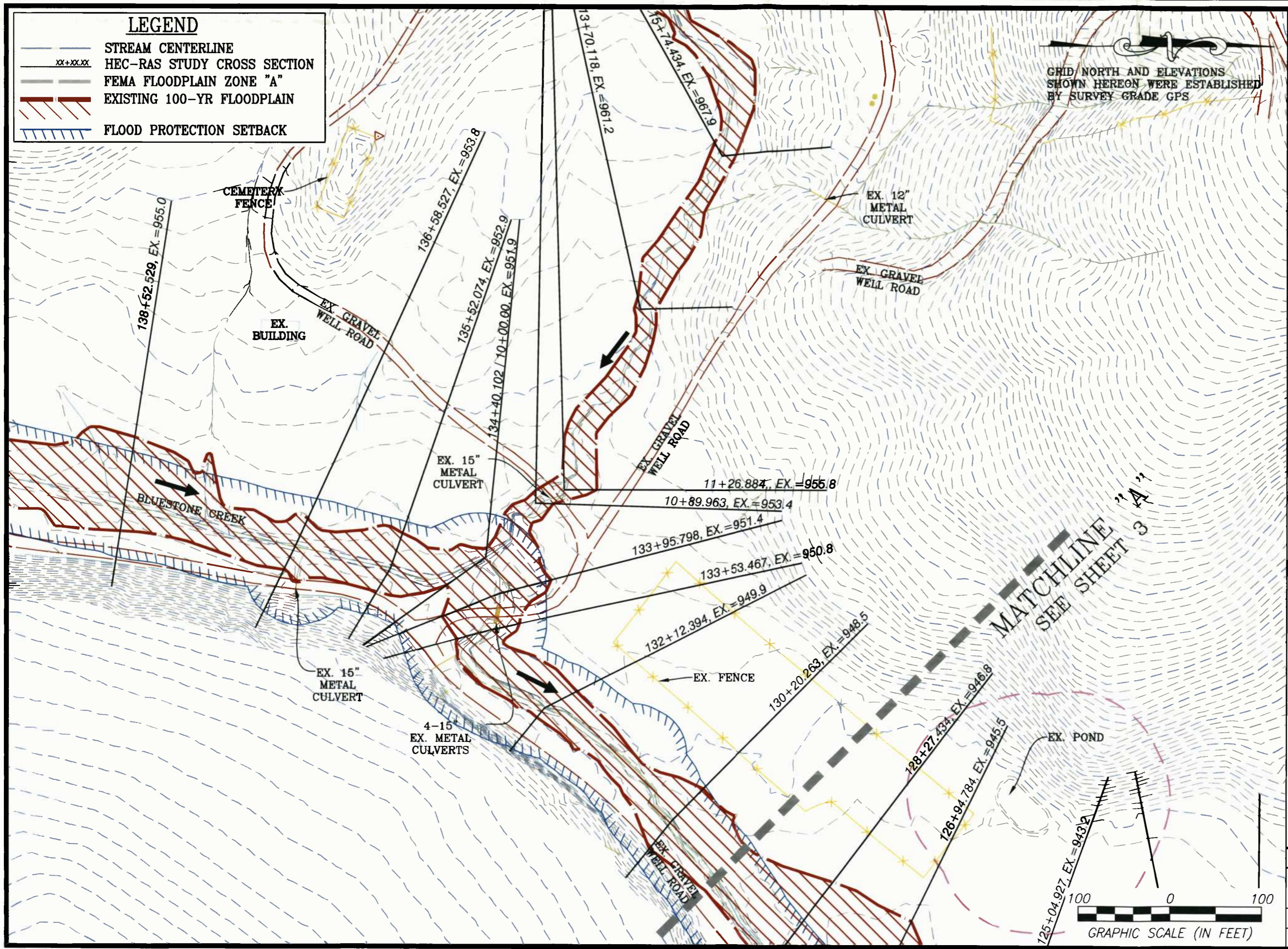


Exhibit C
Existing Conditions Plan

LEGEND

-  STREAM CENTERLINE
-  HEC-RAS STUDY CROSS SECTION
-  FEMA FLOODPLAIN ZONE "A"
-  EXISTING 100-YR FLOODPLAIN
-  FLOOD PROTECTION SETBACK

GRID NORTH AND ELEVATIONS SHOWN HEREON WERE ESTABLISHED BY SURVEY GRADE GPS



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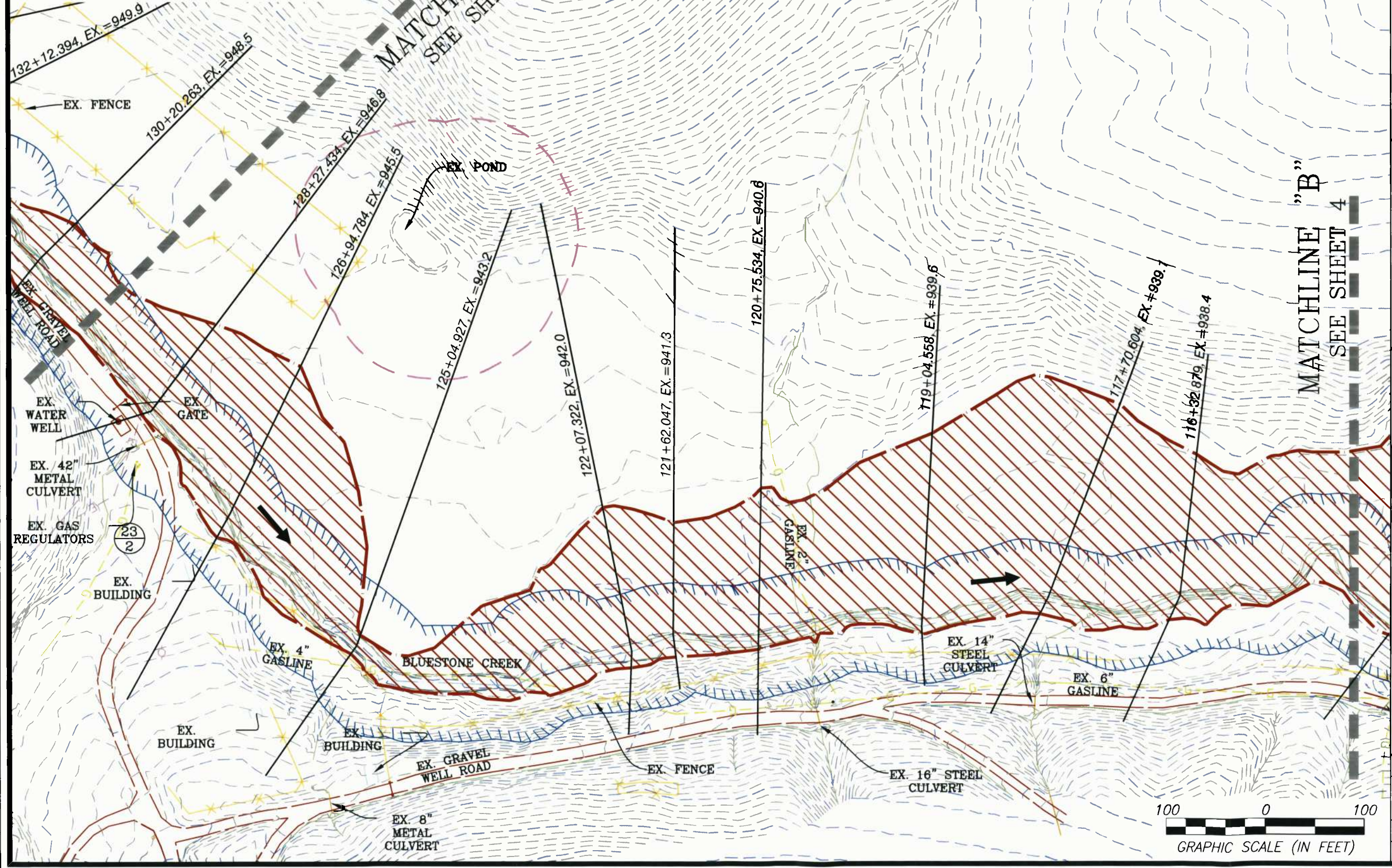
EXISTING CONDITIONS PLAN
OXF 157/159 WELL PADS AND
HENDERSON CENTRALIZED
FRESHWATER IMPOUNDMENT
FLOODPLAIN STUDY
WEST UNION DISTRICT
DODDRIDGE COUNTY, WV

SHEET 2 OF 26
OXF 157/159
JOB NO. 7889
DATE: 12/4/13
SCALE: 1" = 100'

LEGEND

-  STREAM CENTERLINE
-  HEC-RAS STUDY CROSS SECTION
-  FEMA FLOODPLAIN ZONE "A"
-  EXISTING 100-YR FLOODPLAIN
-  FLOOD PROTECTION SETBACK

GRID NORTH AND ELEVATIONS SHOWN HEREON WERE ESTABLISHED BY SURVEY GRADE GPS



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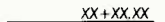



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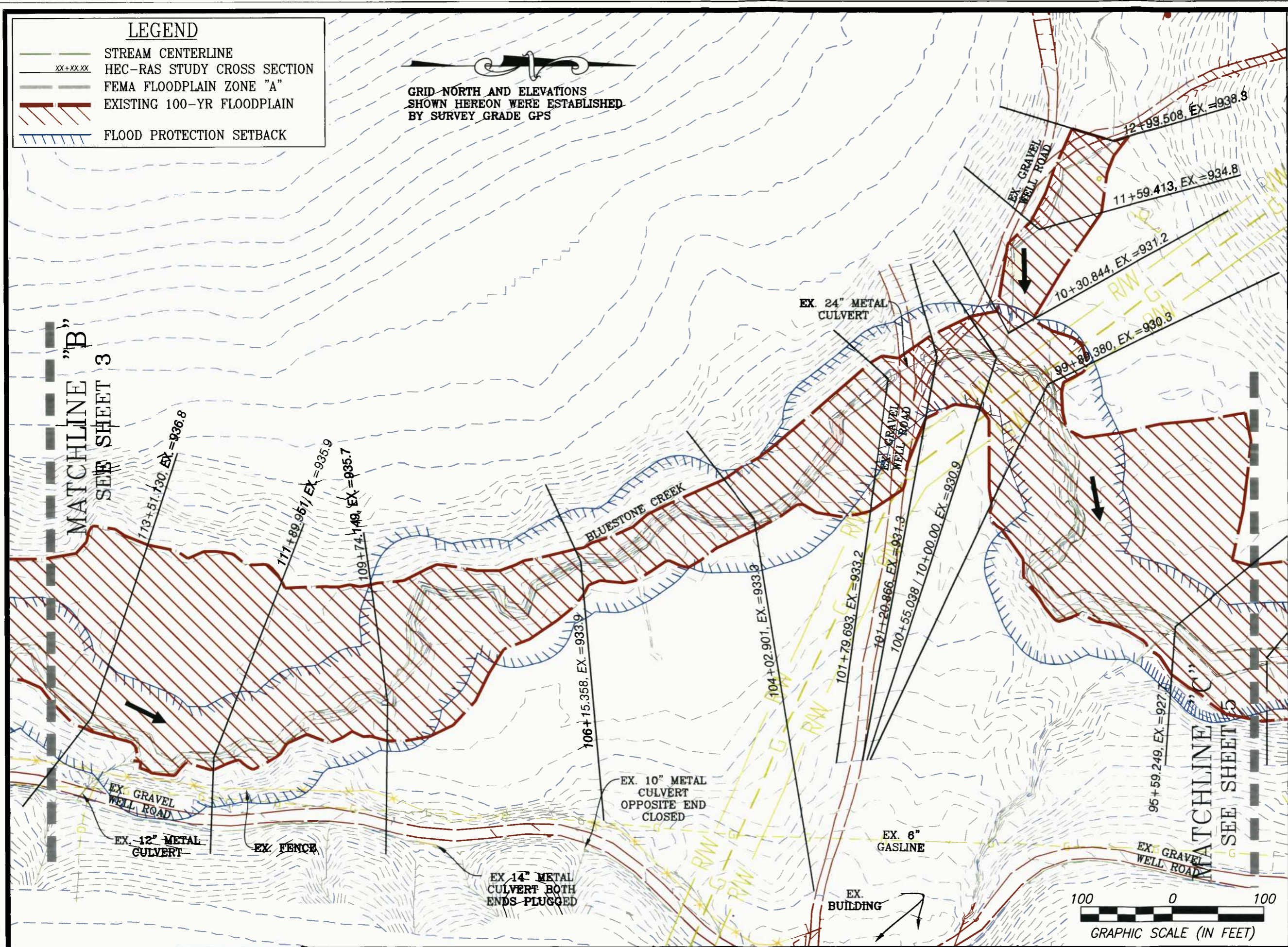
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SHEET 3 OF 26
 OXF 157/159
 JOB NO. 7889
 DATE: 12/4/13
 SCALE: 1" = 100'

LEGEND

-  STREAM CENTERLINE
-  HEC-RAS STUDY CROSS SECTION
-  FEMA FLOODPLAIN ZONE "A"
-  EXISTING 100-YR FLOODPLAIN
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GRID NORTH AND ELEVATIONS SHOWN HEREON WERE ESTABLISHED BY SURVEY GRADE GPS



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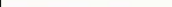
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WEST UNION DISTRICT
DODDRIDGE COUNTY, WV

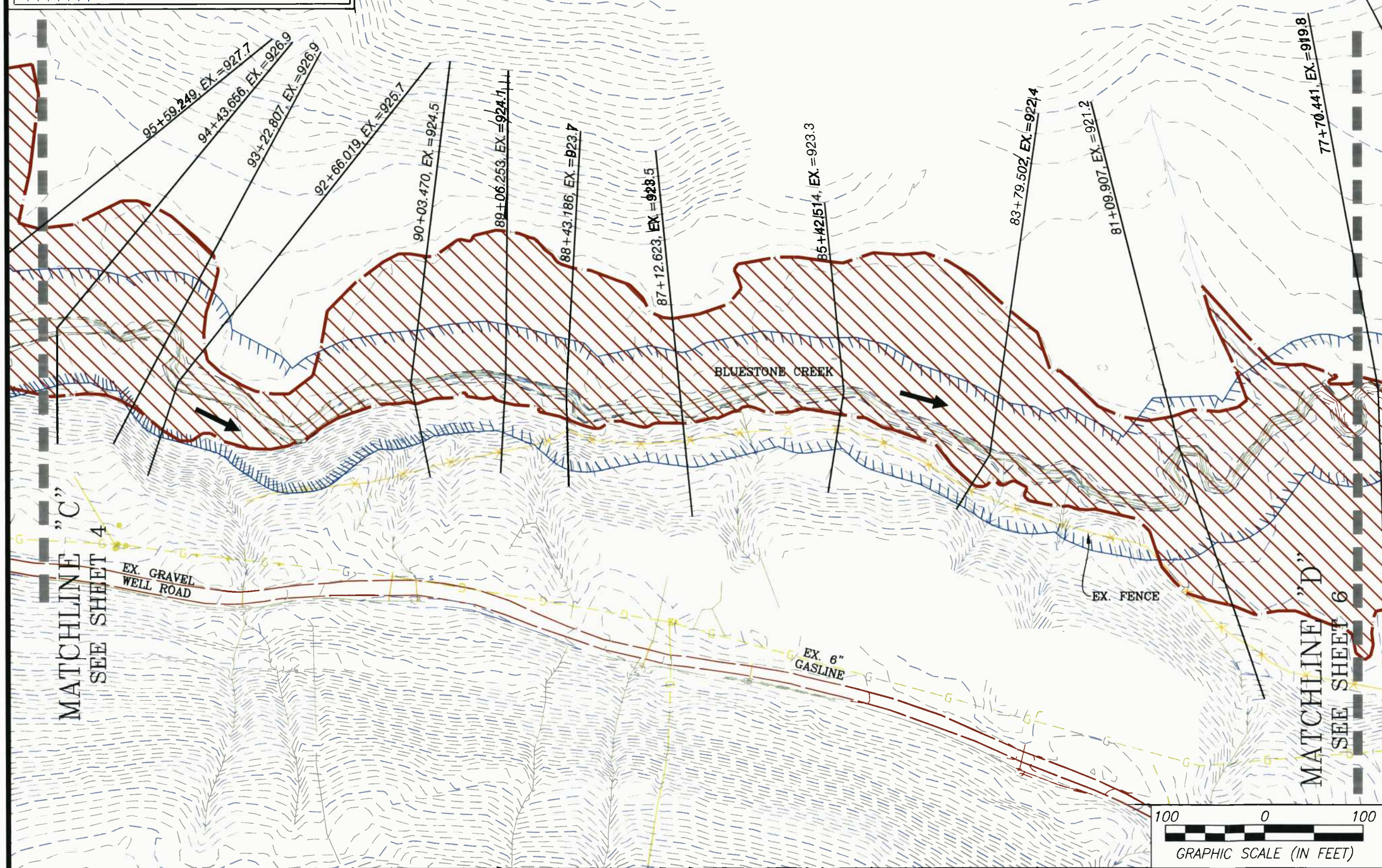
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OXF 157/159
JOB NO. 7889
DATE: 12/4/13
SCALE: 1" = 100'



LEGEND

-  STREAM CENTERLINE
-  HEC-RAS STUDY CROSS SECTION
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GRID NORTH AND ELEVATIONS SHOWN HEREON WERE ESTABLISHED BY SURVEY GRADE GPS



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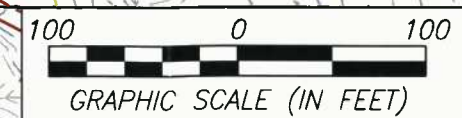
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SHEET 5 OF 26

OXF 157/159
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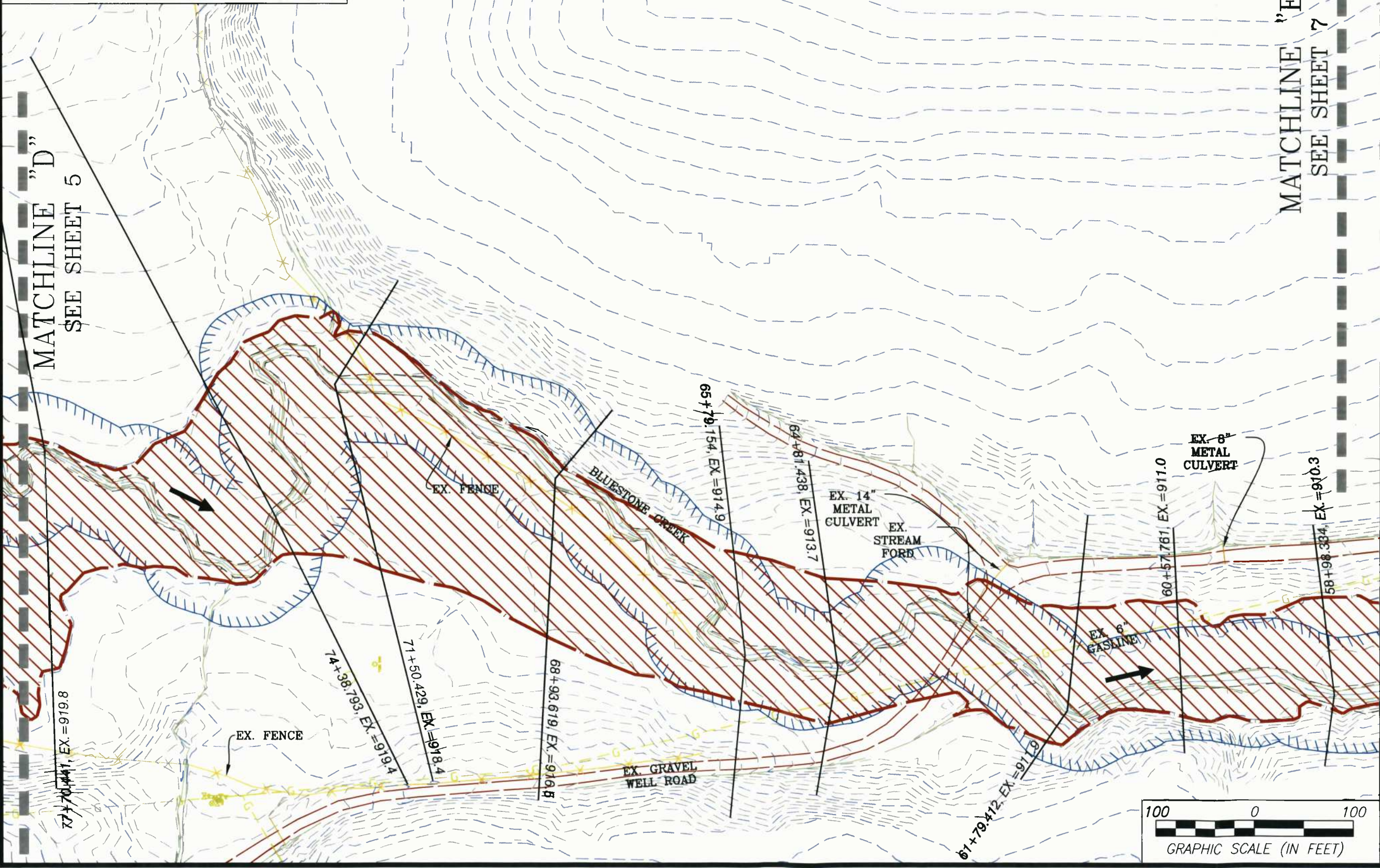


LEGEND

- STREAM CENTERLINE
- HEC-RAS STUDY CROSS SECTION
- FEMA FLOODPLAIN ZONE "A"
- EXISTING 100-YR FLOODPLAIN
- FLOOD PROTECTION SETBACK



GRID NORTH AND ELEVATIONS
SHOWN HEREON WERE ESTABLISHED
BY SURVEY GRADE GPS



MATCHLINE "D"
SEE SHEET 5

MATCHLINE "E"
SEE SHEET 7

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DODDRIDGE COUNTY, WV



SHEET 6 OF 26
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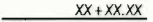



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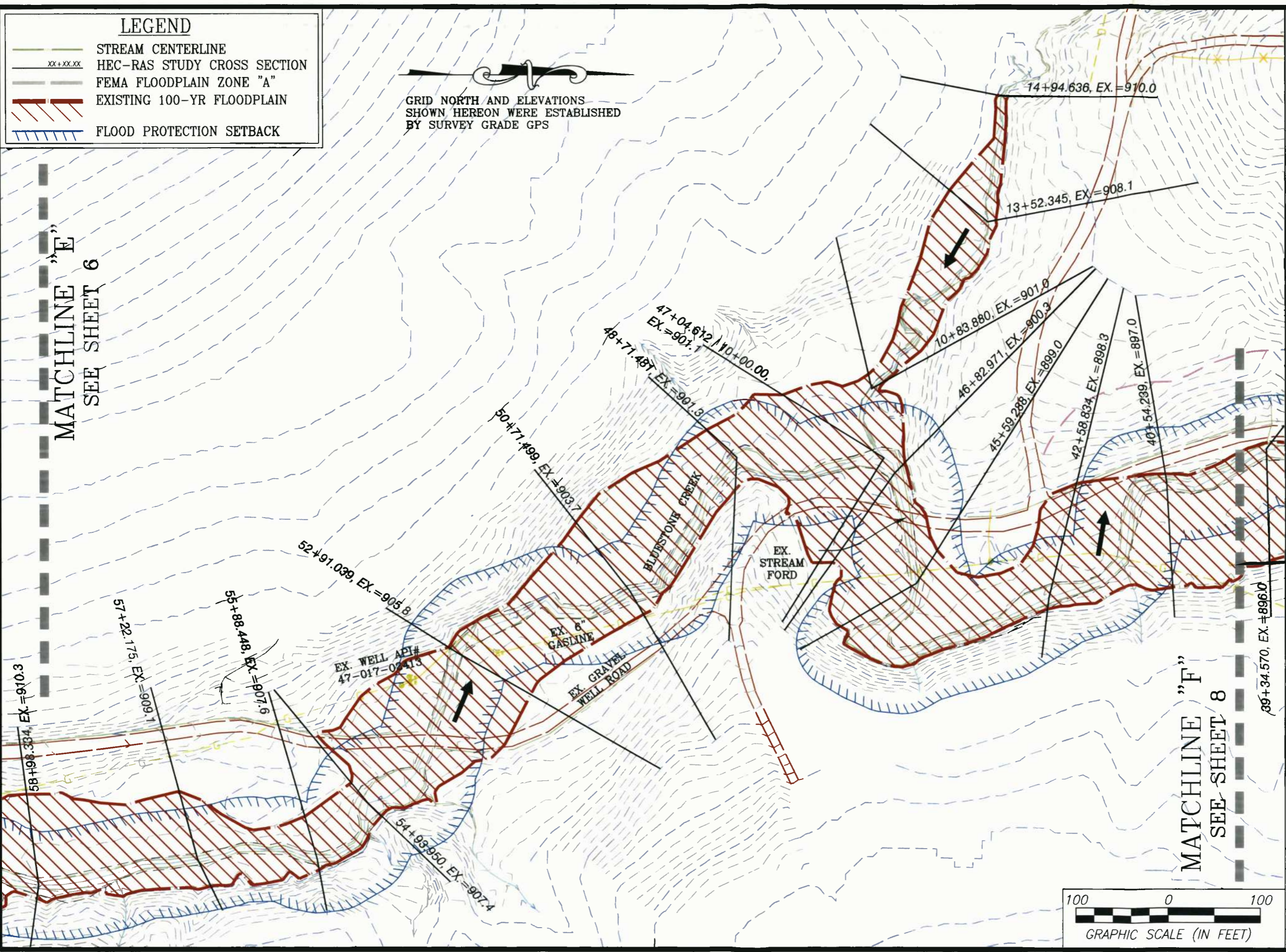
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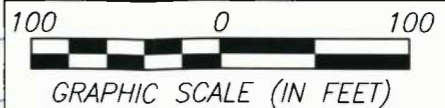
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-  HEC-RAS STUDY CROSS SECTION
-  FEMA FLOODPLAIN ZONE "A"
-  EXISTING 100-YR FLOODPLAIN
-  FLOOD PROTECTION SETBACK

GRID NORTH AND ELEVATIONS SHOWN HEREON WERE ESTABLISHED BY SURVEY GRADE GPS



MATCHLINE "E"
SEE SHEET 6

MATCHLINE "F"
SEE SHEET 8



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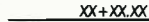



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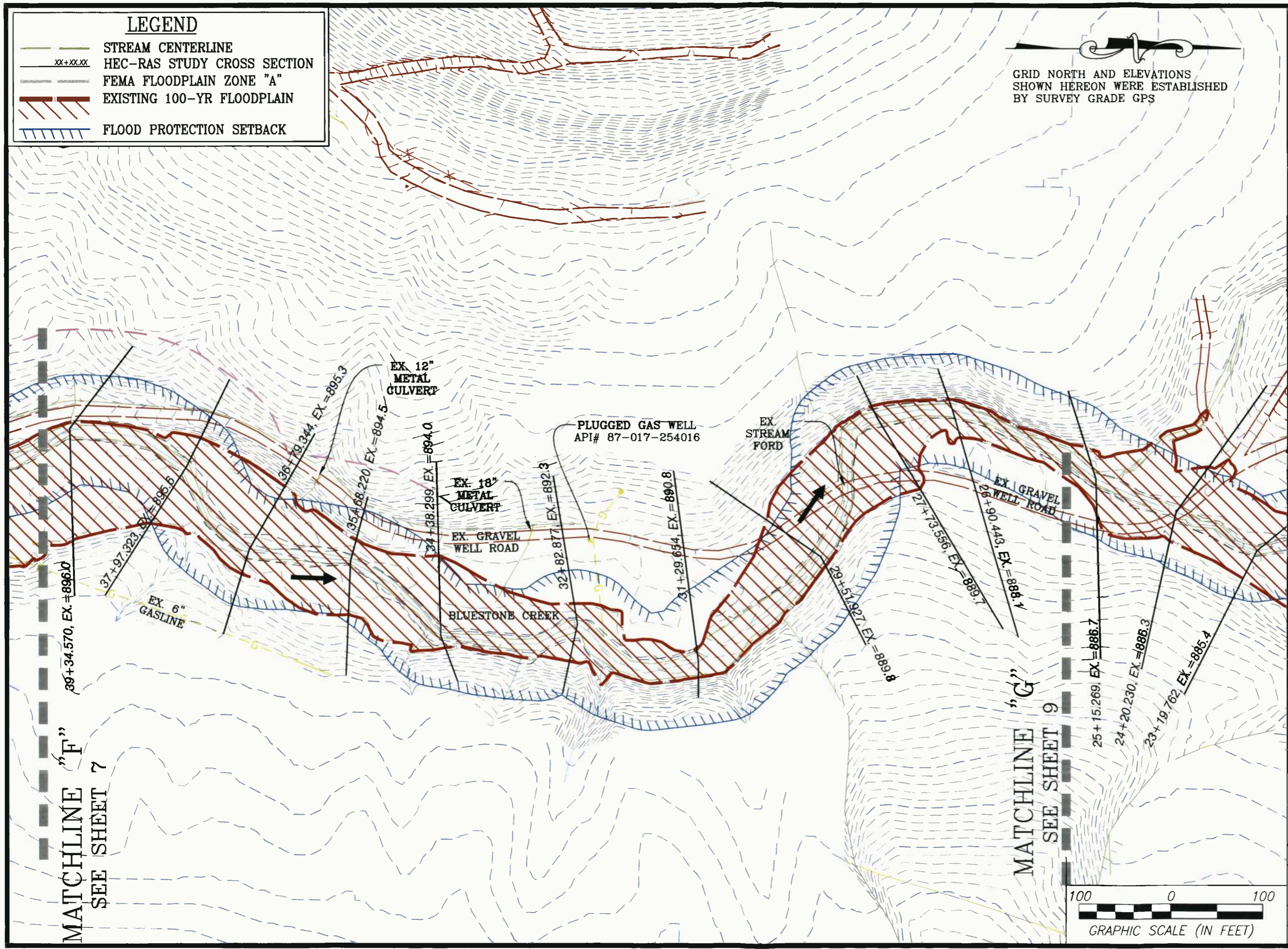
EXISTING CONDITIONS PLAN
**OXF 157/159 WELL PADS AND
 HENDERSON CENTRALIZED
 FRESHWATER IMPOUNDMENT
 FLOODPLAIN STUDY**
 WEST UNION DISTRICT
 DODDRIDGE COUNTY, WV

SHEET 7 OF 26
 OXF 157/159
 JOB NO. 7889
 DATE: 12/4/13
 SCALE: 1" = 100'

LEGEND

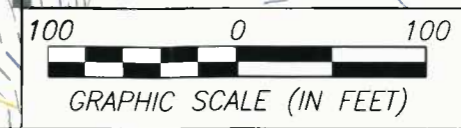
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-  HEC-RAS STUDY CROSS SECTION
-  FEMA FLOODPLAIN ZONE "A"
-  EXISTING 100-YR FLOODPLAIN
-  FLOOD PROTECTION SETBACK

GRID NORTH AND ELEVATIONS SHOWN HEREON WERE ESTABLISHED BY SURVEY GRADE GPS



MATCHLINE "F" SEE SHEET 7

MATCHLINE "G" SEE SHEET 9



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WEST UNION DISTRICT
DODDRIDGE COUNTY, WV






SHEET 8 OF 26

OXF 157/159
JOB NO. 7889

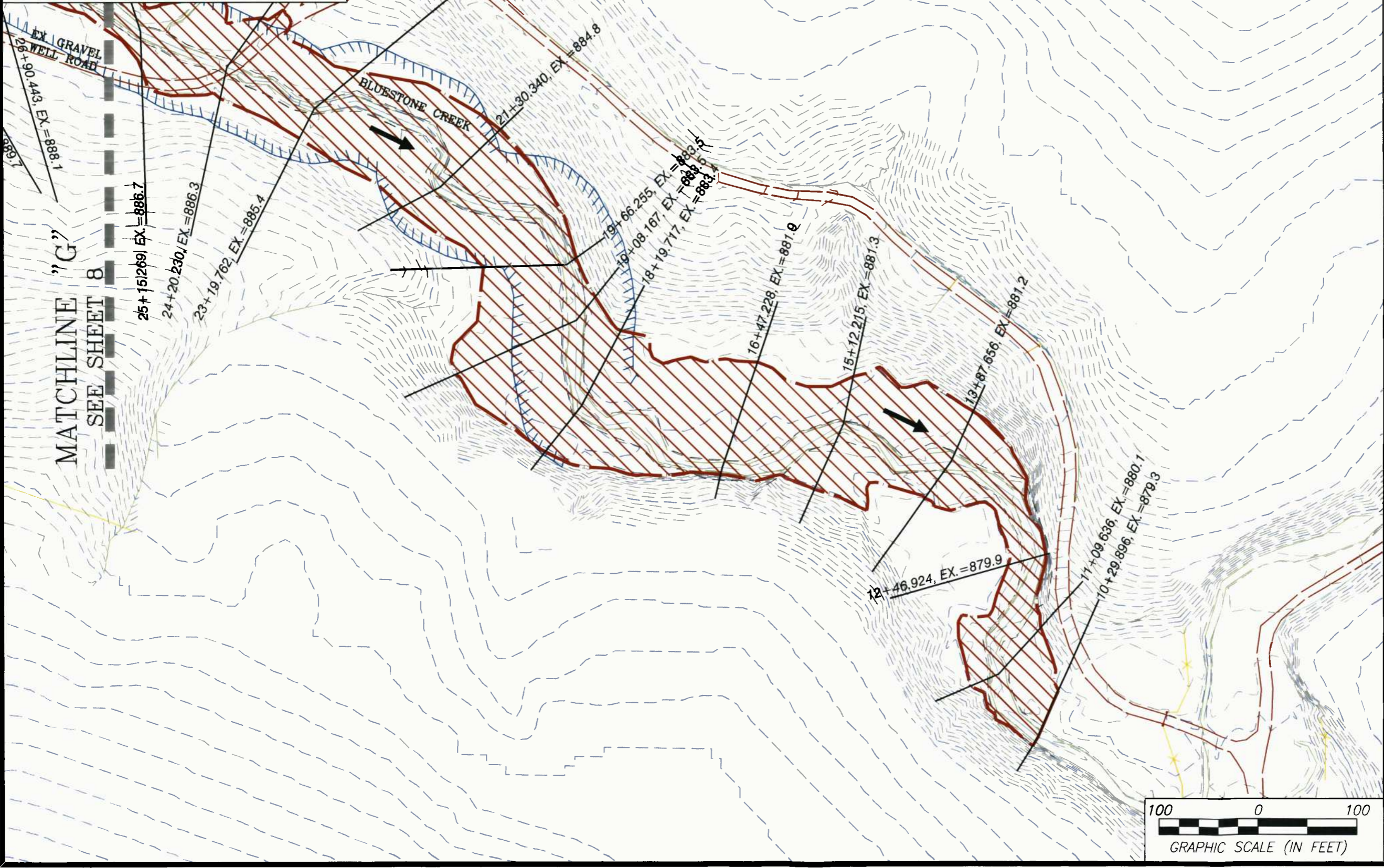
DATE: 12/4/13

SCALE: 1" = 100'

LEGEND

-  STREAM CENTERLINE
-  HEC-RAS STUDY CROSS SECTION
-  FEMA FLOODPLAIN ZONE "A"
-  EXISTING 100-YR FLOODPLAIN
-  FLOOD PROTECTION SETBACK

GRID NORTH AND ELEVATIONS SHOWN HEREON WERE ESTABLISHED BY SURVEY GRADE-GPS



MATCHLINE "G"
SEE SHEET 8

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FRESHWATER IMPOUNDMENT
FLOODPLAIN STUDY**

WEST UNION DISTRICT
DODDRIDGE COUNTY, WV

SHEET 9 OF 26

OXF 157/159
JOB NO. 7889

DATE: 12/4/13

SCALE: 1" = 100'

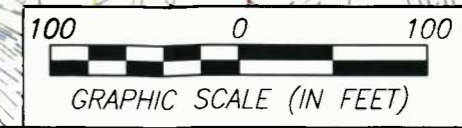
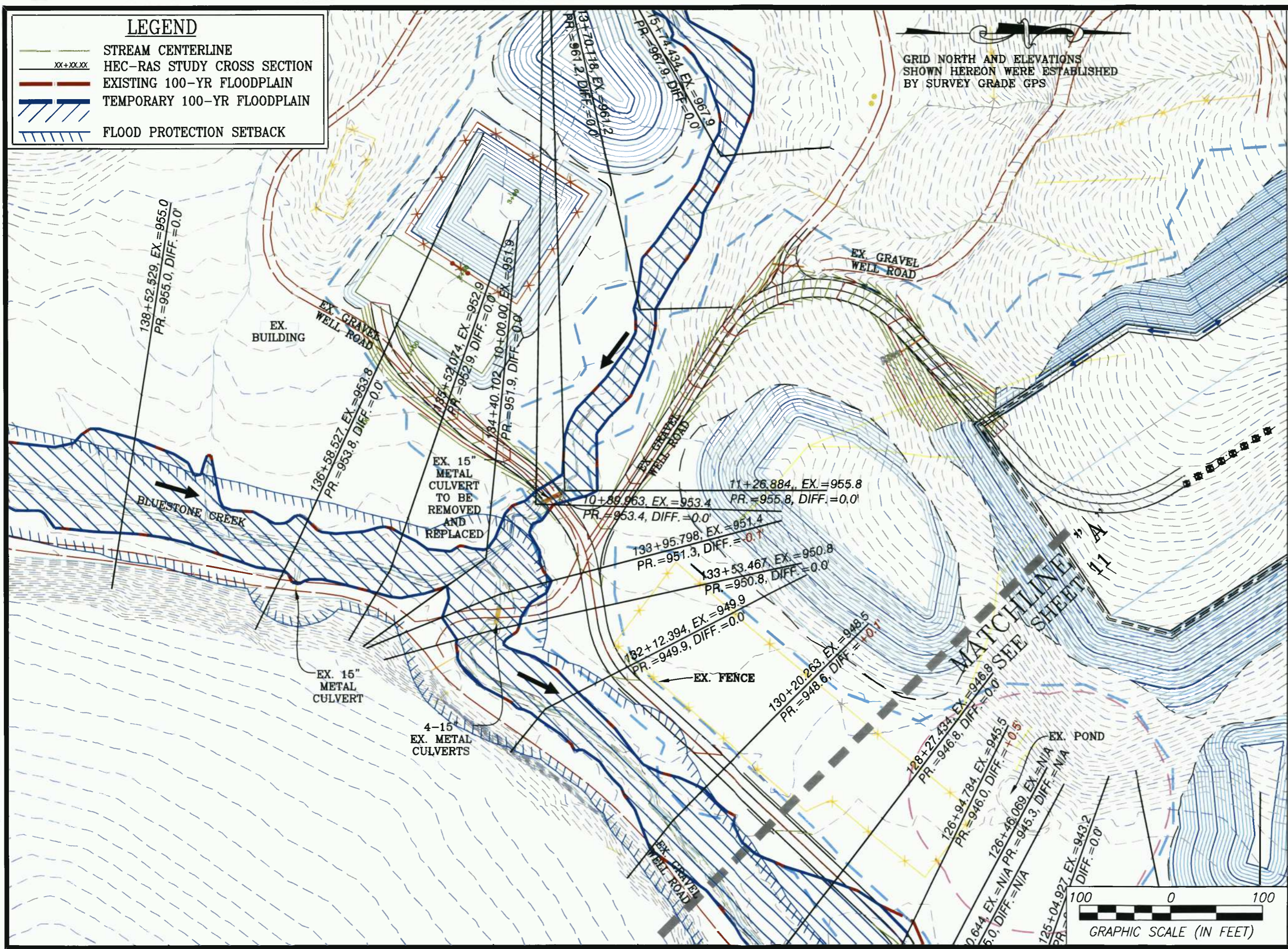


Exhibit D
Temporary Conditions Plan

LEGEND

- STREAM CENTERLINE
- HEC-RAS STUDY CROSS SECTION
- EXISTING 100-YR FLOODPLAIN
- TEMPORARY 100-YR FLOODPLAIN
- FLOOD PROTECTION SETBACK

GRID NORTH AND ELEVATIONS SHOWN HEREON WERE ESTABLISHED BY SURVEY GRADE GPS



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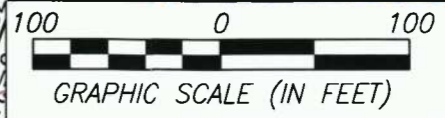
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WEST UNION DISTRICT
DODDRIDGE COUNTY, WV

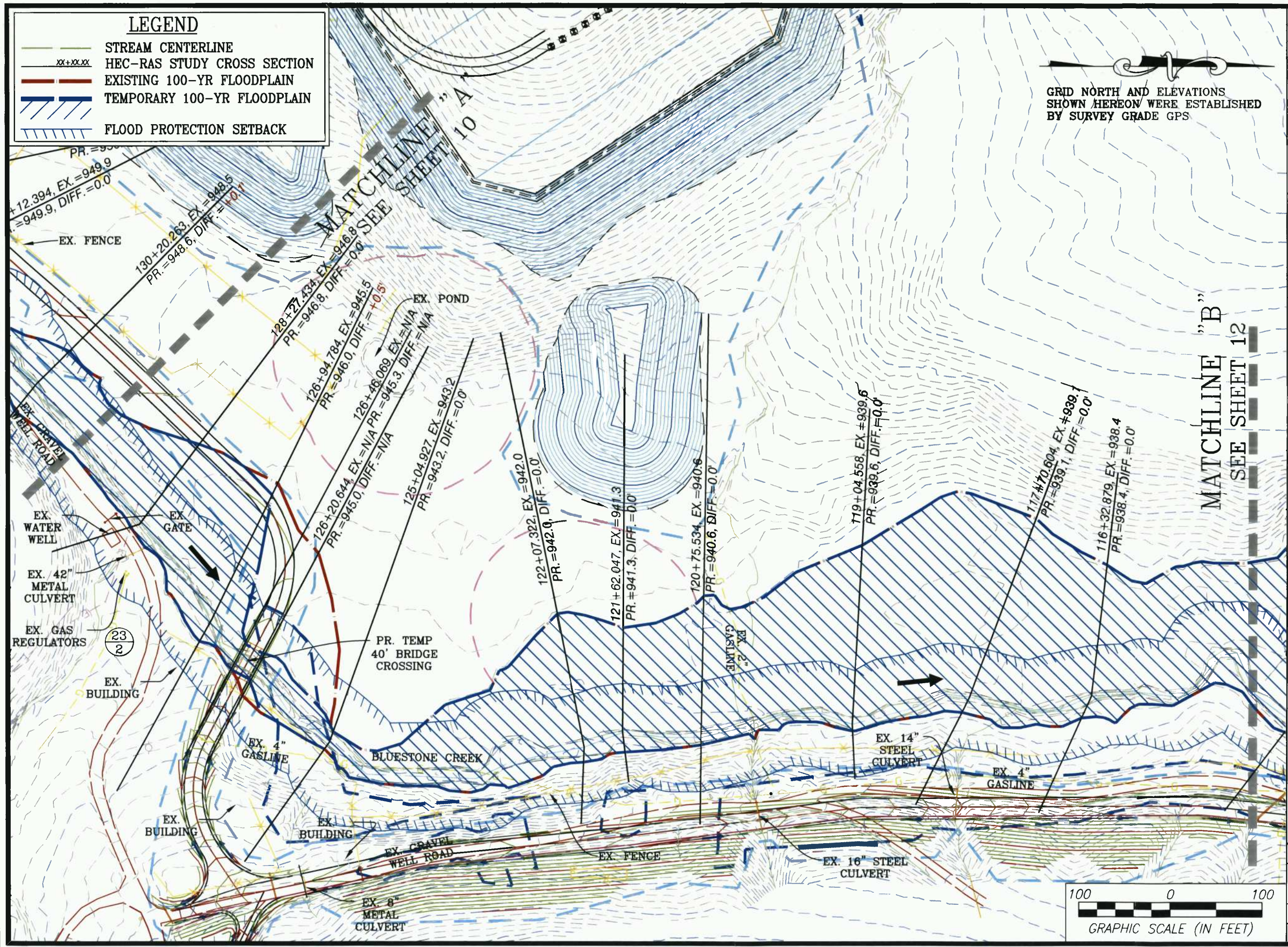
SHEET 10 OF 26
OXF 157/159
JOB NO. 7889
DATE: 12/4/13
SCALE: 1" = 100'



LEGEND

- STREAM CENTERLINE
- HEC-RAS STUDY CROSS SECTION
- EXISTING 100-YR FLOODPLAIN
- TEMPORARY 100-YR FLOODPLAIN
- FLOOD PROTECTION SETBACK

GRID NORTH AND ELEVATIONS SHOWN HEREON WERE ESTABLISHED BY SURVEY GRADE GPS



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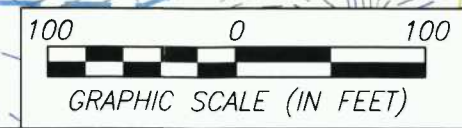
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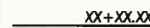



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HENDERSON CENTRALIZED
FRESHWATER IMPOUNDMENT
FLOODPLAIN STUDY
WEST UNION DISTRICT
DODDRIDGE COUNTY, WV

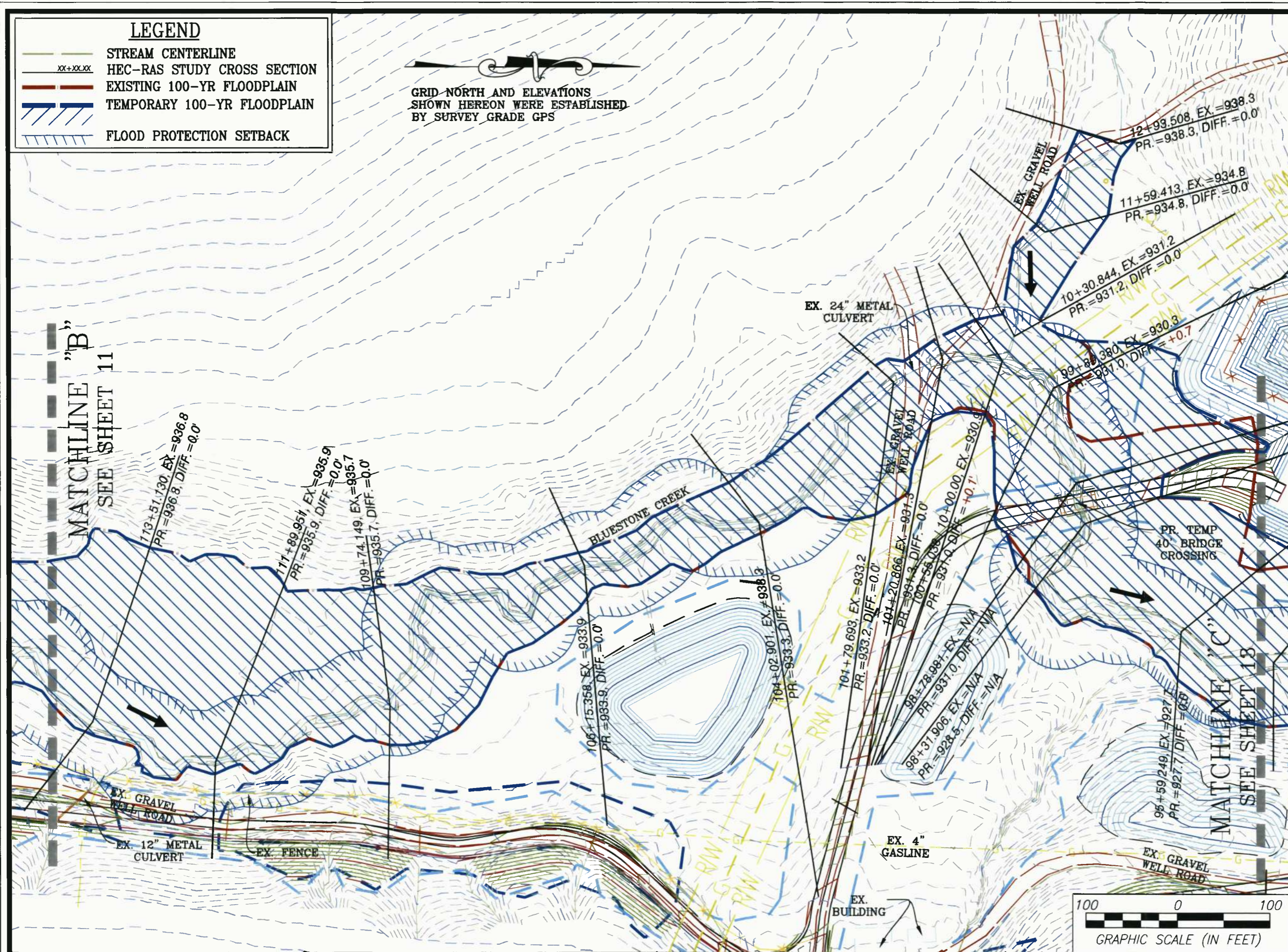
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OXF 157/159
JOB NO. 7889
DATE: 12/4/13
SCALE: 1" = 100'



LEGEND

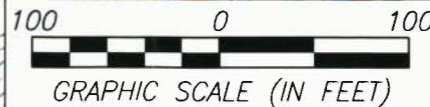
-  STREAM CENTERLINE
-  HEC-RAS STUDY CROSS SECTION
-  EXISTING 100-YR FLOODPLAIN
-  TEMPORARY 100-YR FLOODPLAIN
-  FLOOD PROTECTION SETBACK

GRID NORTH AND ELEVATIONS SHOWN HEREON WERE ESTABLISHED BY SURVEY GRADE GPS



MATCHLINE "B"
SEE SHEET 11

MATCHLINE "C"
SEE SHEET 13



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FRESHWATER IMPOUNDMENT
FLOODPLAIN STUDY**

WEST UNION DISTRICT
DODDRIDGE COUNTY, WV


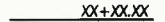



SHEET 12 OF 26

OXF 157/159
JOB NO. 7889

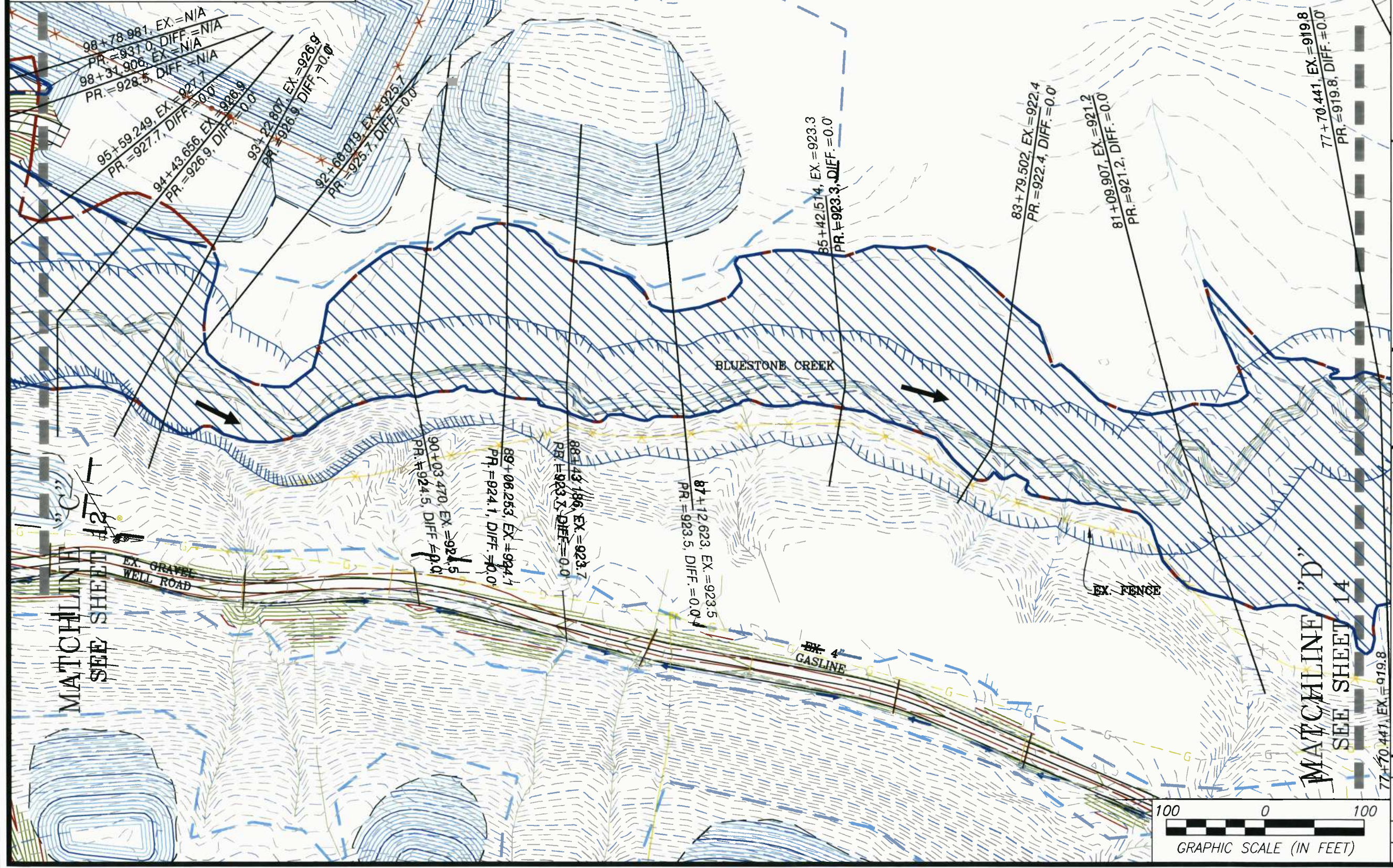
DATE: 12/4/13

SCALE: 1" = 100'

LEGEND

-  STREAM CENTERLINE
-  HEC-RAS STUDY CROSS SECTION
-  EXISTING 100-YR FLOODPLAIN
-  TEMPORARY 100-YR FLOODPLAIN
-  FLOOD PROTECTION SETBACK

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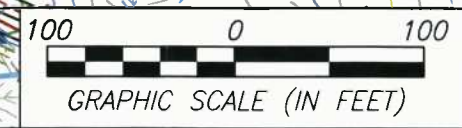
OXF 157/159 WELL PADS AND HENDERSON CENTRALIZED FRESHWATER IMPOUNDMENT FLOODPLAIN STUDY

WEST UNION DISTRICT
DODDRIDGE COUNTY, WV

SHEET 13 OF 26

OXF 157/159
JOB NO. 7889

DATE: 12/4/13
SCALE: 1" = 100'

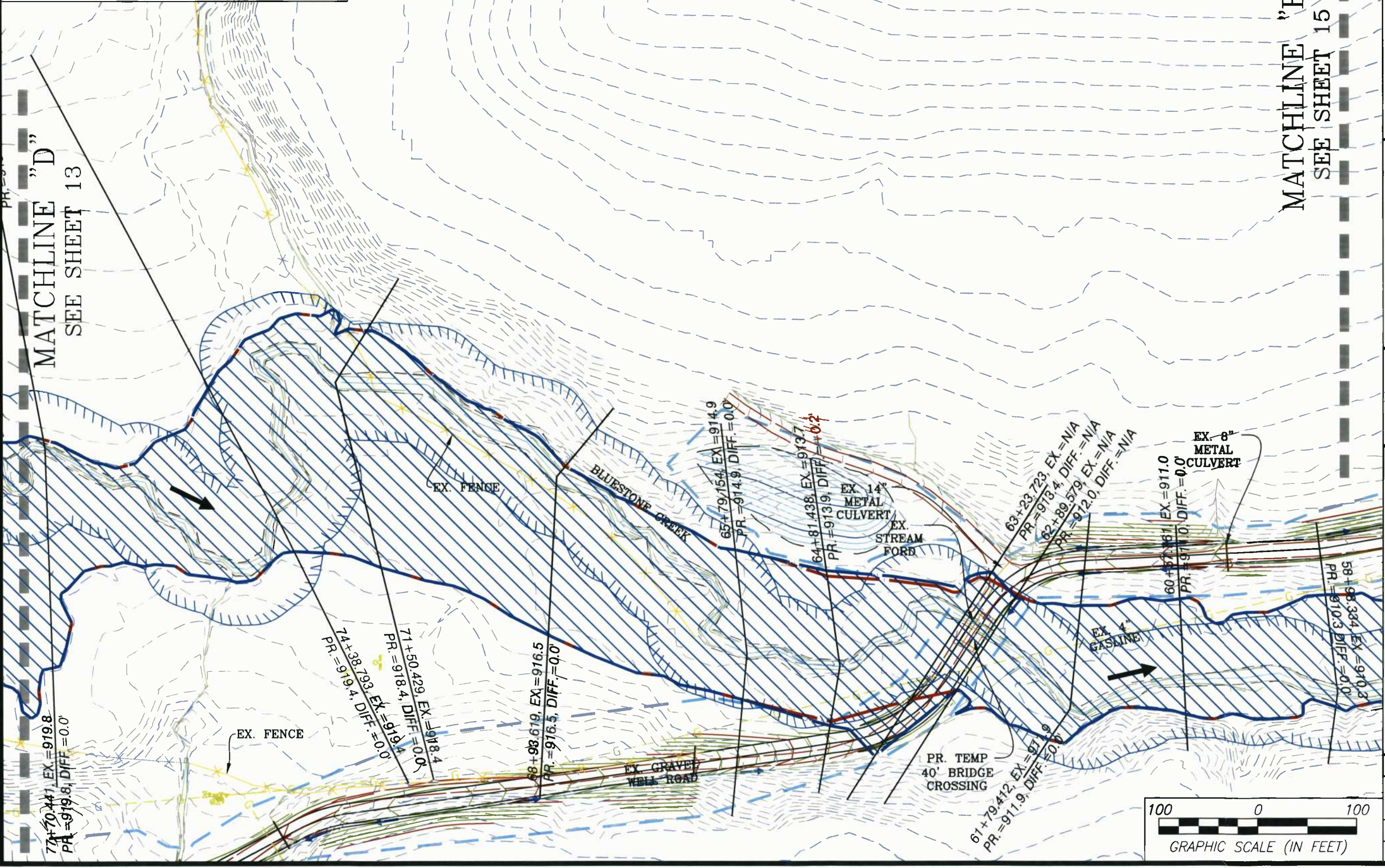


LEGEND

- STREAM CENTERLINE
- XX+XX.XX HEC-RAS STUDY CROSS SECTION
- EXISTING 100-YR FLOODPLAIN
- TEMPORARY 100-YR FLOODPLAIN
- FLOOD PROTECTION SETBACK



GRID NORTH AND ELEVATIONS SHOWN HEREON WERE ESTABLISHED BY SURVEY GRADE GPS



MATCHLINE "D"
SEE SHEET 13

MATCHLINE "E"
SEE SHEET 15



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FRESHWATER IMPOUNDMENT
FLOODPLAIN STUDY
WEST UNION DISTRICT
DODDRIDGE COUNTY, WV

SHEET 14 OF 26
OXF 157/159
JOB NO. 7889
DATE: 12/4/13
SCALE: 1" = 100'

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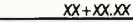



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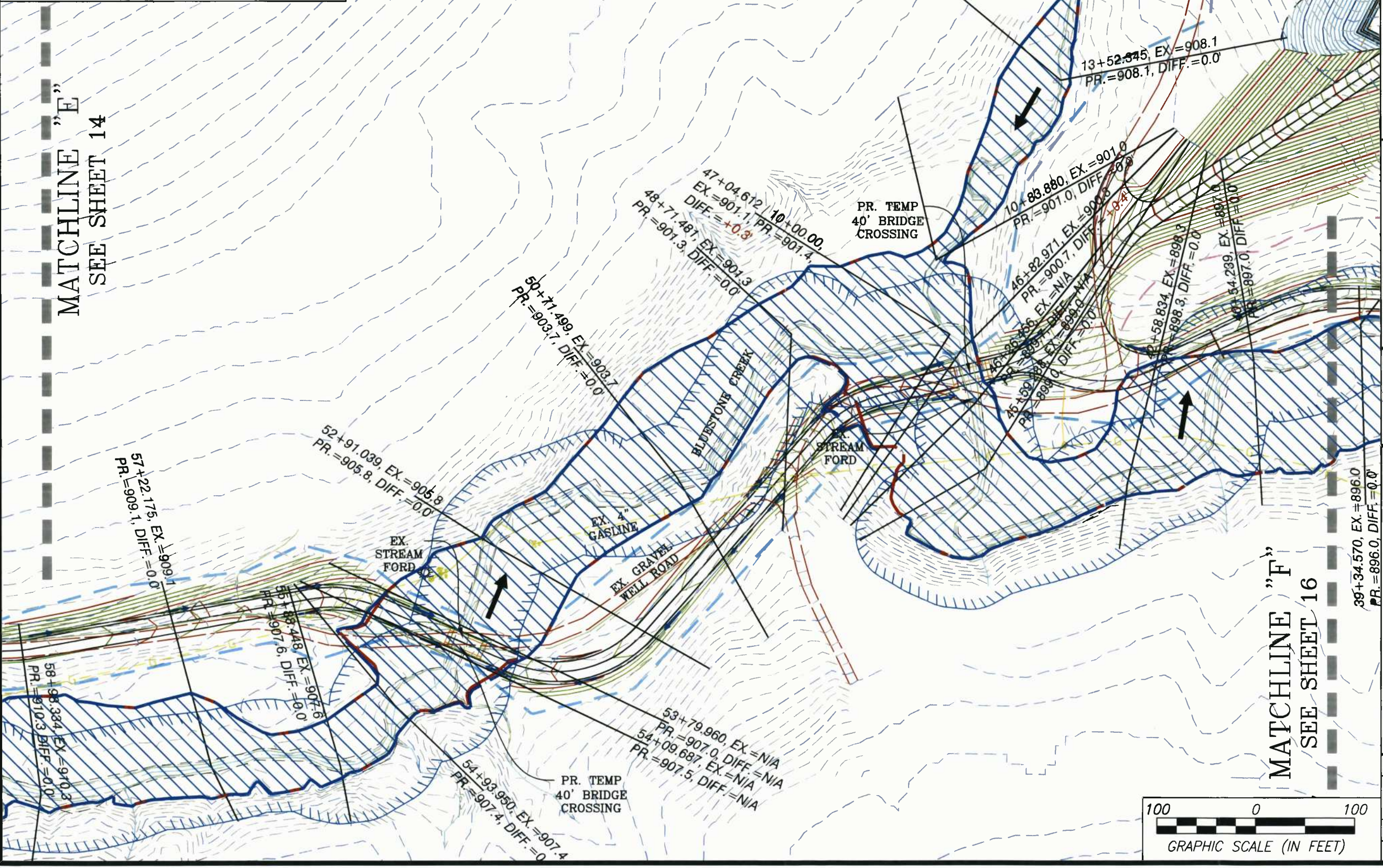
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DATE: 12/4/13
DRAWN BY: JMM
CHECKED BY: JMM

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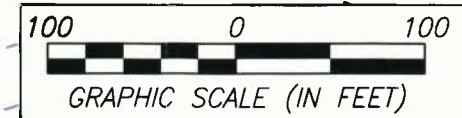
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-  HEC-RAS STUDY CROSS SECTION
-  EXISTING 100-YR FLOODPLAIN
-  TEMPORARY 100-YR FLOODPLAIN
-  FLOOD PROTECTION SETBACK

GRID NORTH AND ELEVATIONS SHOWN HEREON WERE ESTABLISHED BY SURVEY GRADE GPS



MATCHLINE "E"
SEE SHEET 14

MATCHLINE "F"
SEE SHEET 16



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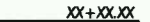



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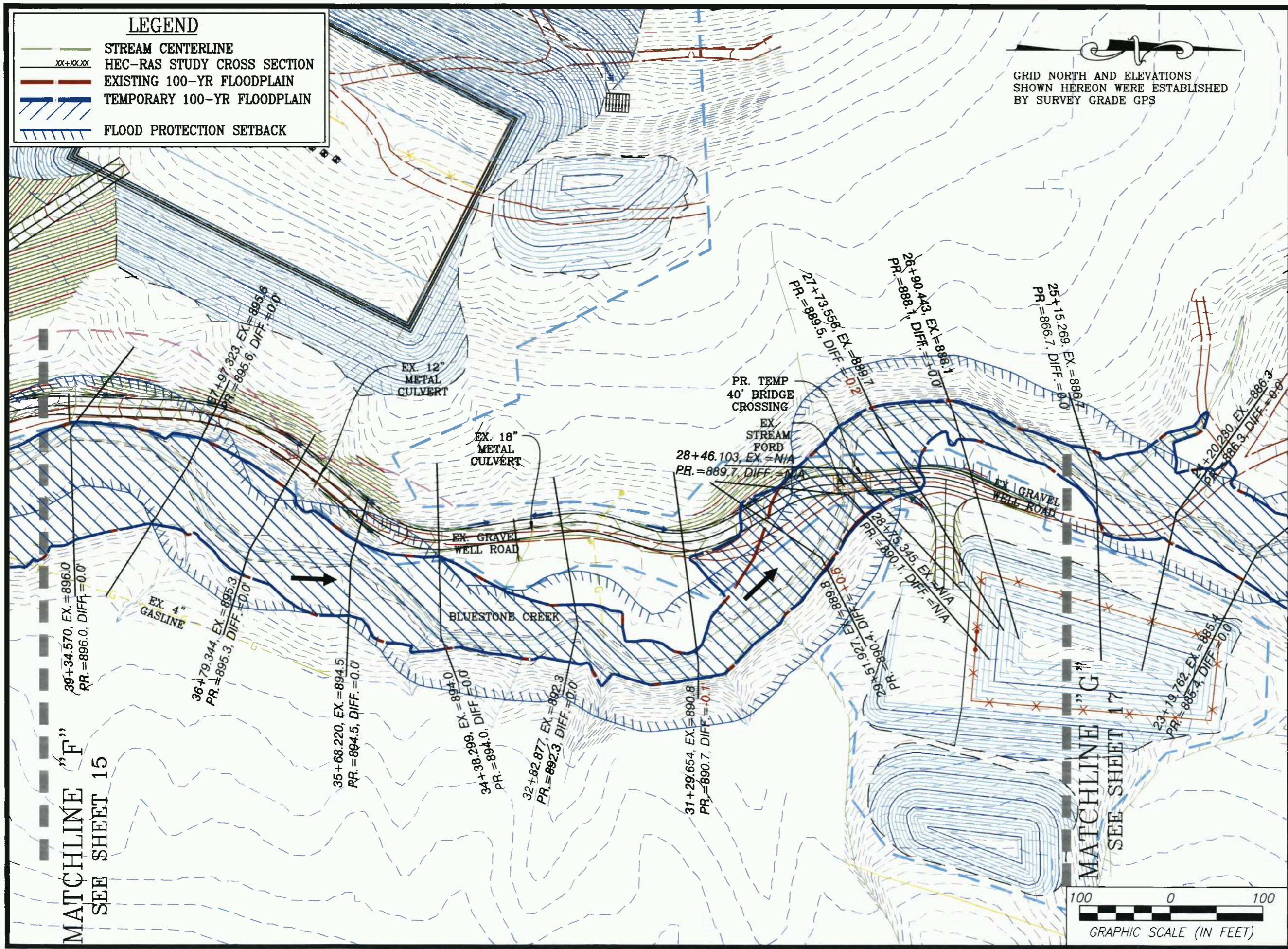
OXF 157/159 WELL PADS AND
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FRESHWATER IMPOUNDMENT
FLOODPLAIN STUDY
WEST UNION DISTRICT
DODDRIDGE COUNTY, WV

SHEET 15 OF 26
OXF 157/159
JOB NO. 7889
DATE: 12/4/13
SCALE: 1" = 100'

LEGEND

-  STREAM CENTERLINE
-  HEC-RAS STUDY CROSS SECTION
-  EXISTING 100-YR FLOODPLAIN
-  TEMPORARY 100-YR FLOODPLAIN
-  FLOOD PROTECTION SETBACK

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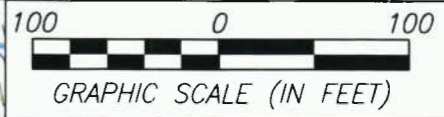
WEST UNION DISTRICT
DODDRIDGE COUNTY, WV

SHEET 16 OF 26

OXF 157/159
JOB NO. 7889

DATE: 12/4/13


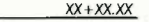



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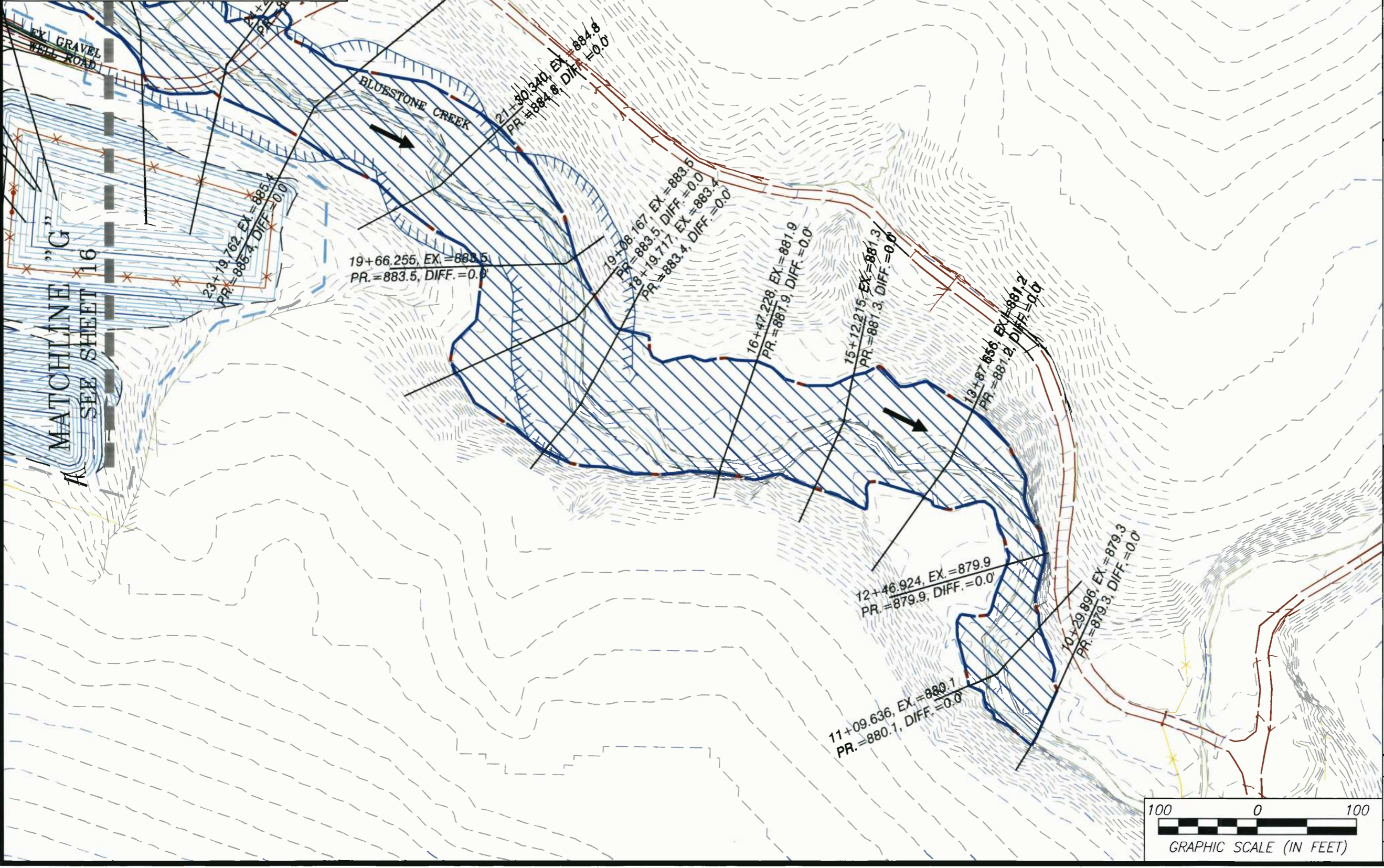
MATCHLINE "G" SEE SHEET 17

MATCHLINE "F" SEE SHEET 15

LEGEND

-  STREAM CENTERLINE
-  HEC-RAS STUDY CROSS SECTION
-  EXISTING 100-YR FLOODPLAIN
-  TEMPORARY 100-YR FLOODPLAIN
-  FLOOD PROTECTION SETBACK

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FRESHWATER IMPOUNDMENT
FLOODPLAIN STUDY**

WEST UNION DISTRICT
DODDRIDGE COUNTY, WV

SHEET 17 OF 26


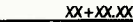



OXF 157/159
JOB NO. 7889

DATE: 12/4/13

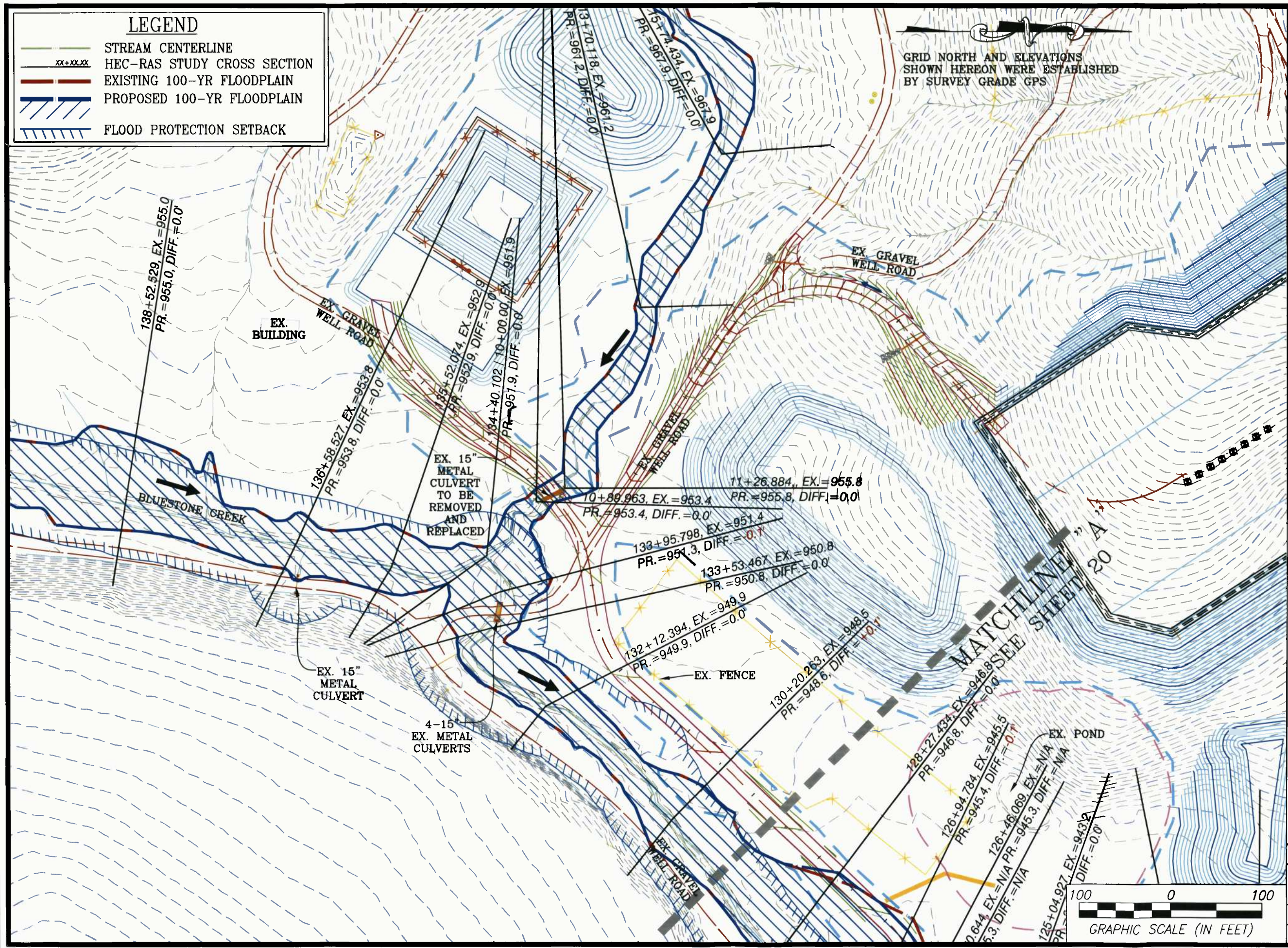
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Exhibit E
Proposed Conditions Plan

LEGEND

-  STREAM CENTERLINE
-  HEC-RAS STUDY CROSS SECTION
-  EXISTING 100-YR FLOODPLAIN
-  PROPOSED 100-YR FLOODPLAIN
-  FLOOD PROTECTION SETBACK

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**OXF 157/159 WELL PADS AND
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 FLOODPLAIN STUDY**

WEST UNION DISTRICT
 DODDRIDGE COUNTY, WV

SHEET 19 OF 26
OXF 157/159 JOB NO. 7889
DATE: 12/4/13
SCALE: 1" = 100'

LEGEND

- STREAM CENTERLINE
- XX+XX.XX HEC-RAS STUDY CROSS SECTION
- FEMA FLOODPLAIN ZONE "A"
- EXISTING 100-YR FLOODPLAIN
- FLOOD PROTECTION SETBACK

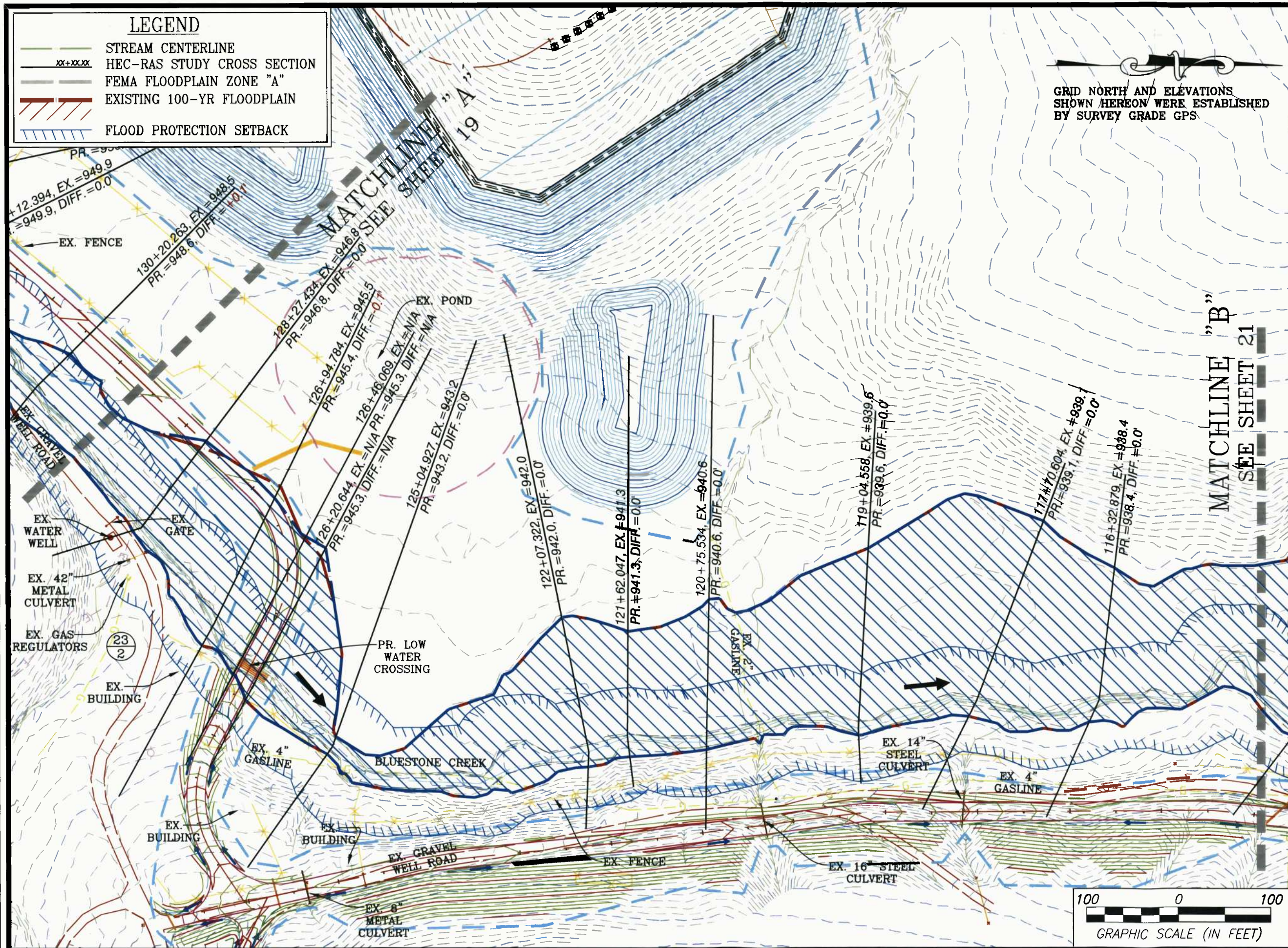
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CYRUS B. KUMP
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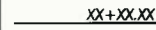



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OXF 157/159 WELL PADS AND
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FRESHWATER IMPOUNDMENT
FLOODPLAIN STUDY
WEST UNION DISTRICT
DODDRIDGE COUNTY, WV

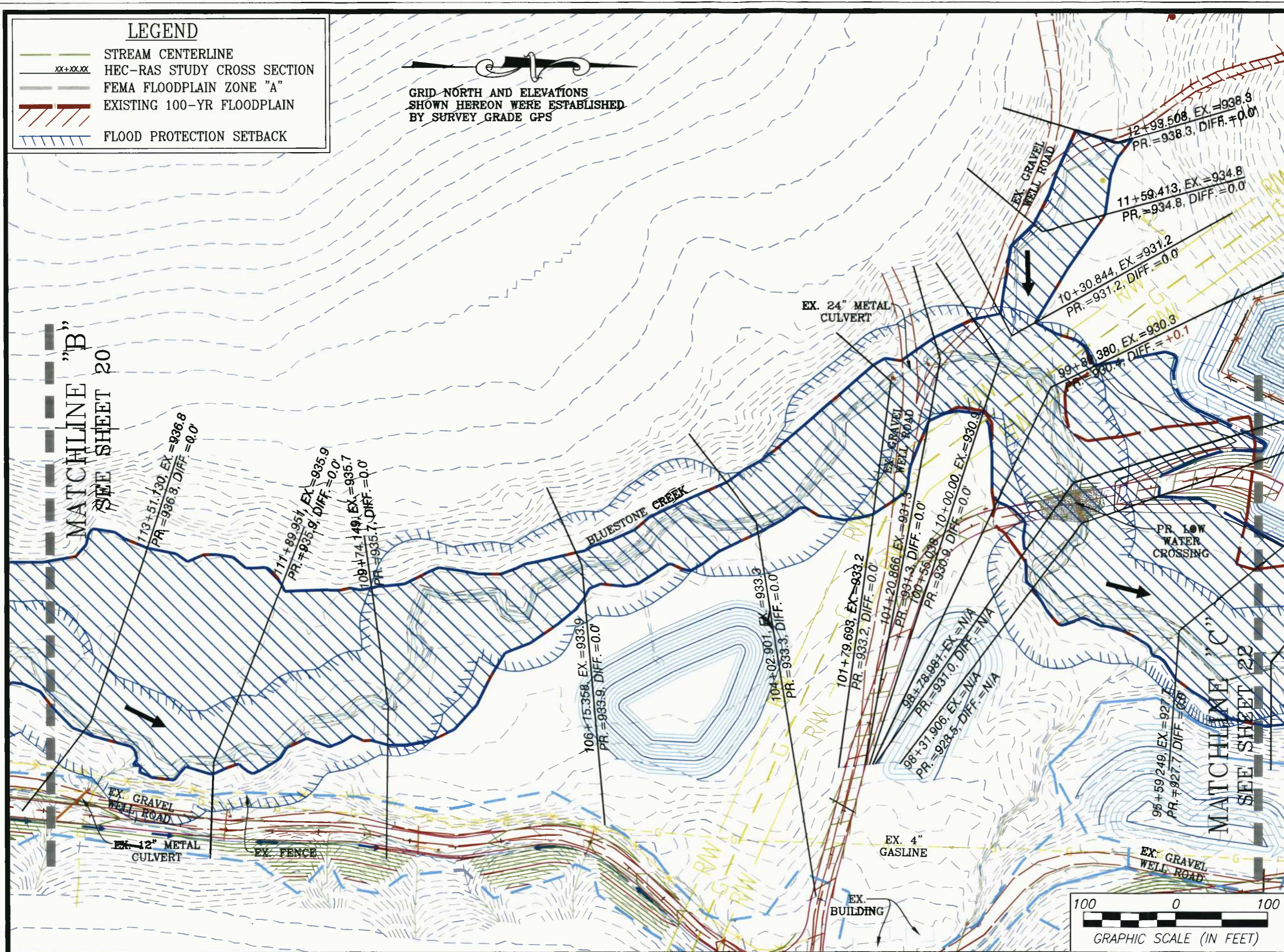
SHEET 20 OF 26
OXF 157/159
JOB NO. 7889
DATE: 12/4/13
SCALE: 1" = 100'



LEGEND

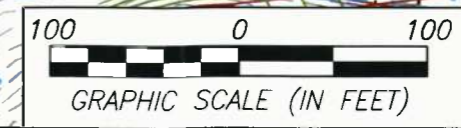
-  STREAM CENTERLINE
-  HEC-RAS STUDY CROSS SECTION
-  FEMA FLOODPLAIN ZONE "A"
-  EXISTING 100-YR FLOODPLAIN
-  FLOOD PROTECTION SETBACK

GRID NORTH AND ELEVATIONS SHOWN HEREON WERE ESTABLISHED BY SURVEY GRADE GPS



MATCHLINE "B"
SEE SHEET 20

MATCHLINE "C"
SEE SHEET 22



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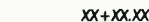

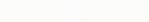

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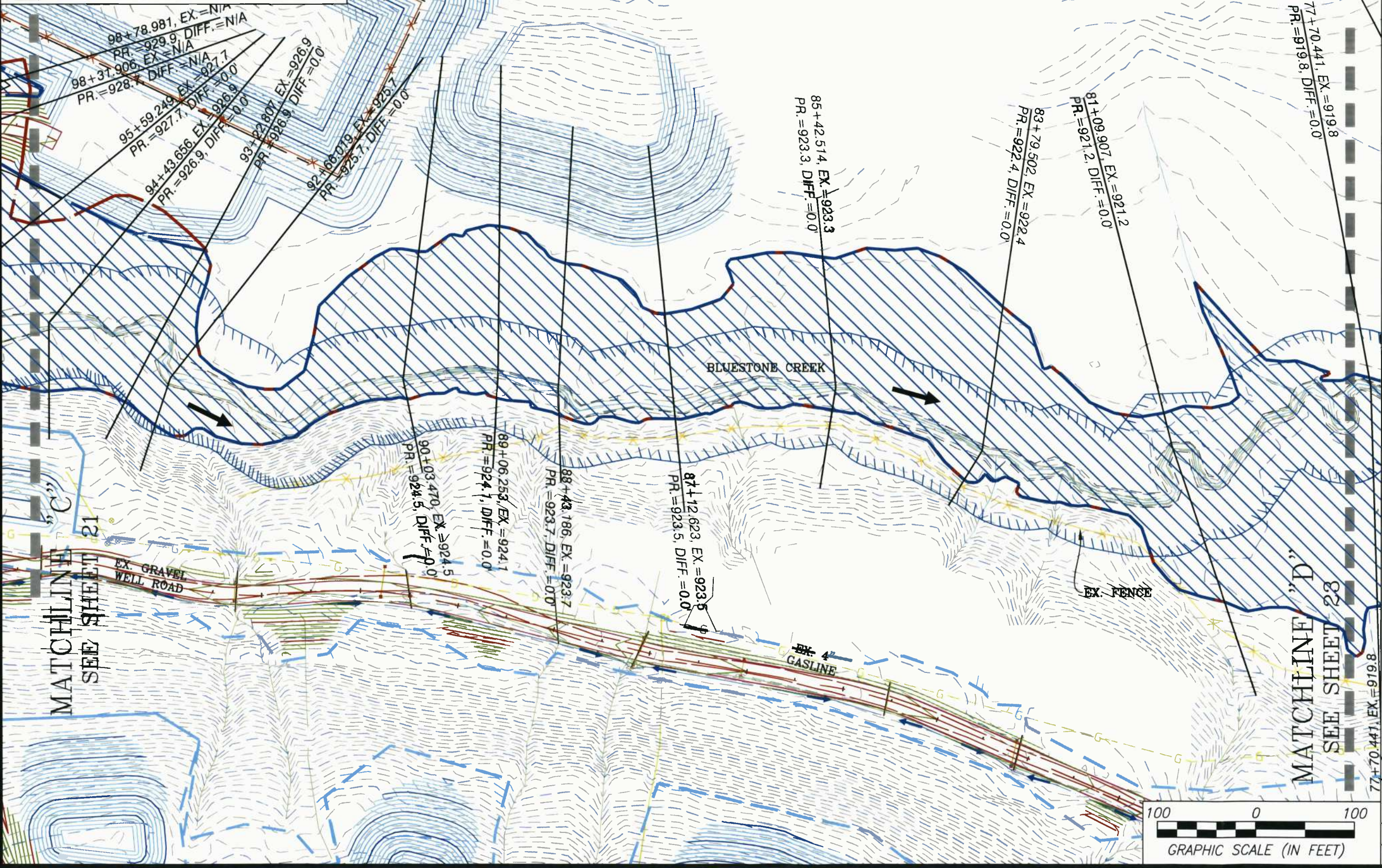
TEMPORARY CONDITIONS PLAN
OXF 157/159 WELL PADS AND
HENDERSON CENTRALIZED
FRESHWATER IMPOUNDMENT
FLOODPLAIN STUDY
WEST UNION DISTRICT
DODDRIDGE COUNTY, WV

SHEET 21 OF 26
OXF 157/159
JOB NO. 7889
DATE: 12/4/13
SCALE: 1" = 100'

LEGEND

-  STREAM CENTERLINE
-  HEC-RAS STUDY CROSS SECTION
-  FEMA FLOODPLAIN ZONE "A"
-  EXISTING 100-YR FLOODPLAIN
-  FLOOD PROTECTION SETBACK

GRID NORTH AND ELEVATIONS SHOWN HEREON WERE ESTABLISHED BY SURVEY GRADE GPS



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TEMPORARY CONDITIONS PLAN

**OXF 157/159 WELL PADS AND
HENDERSON CENTRALIZED
FRESHWATER IMPOUNDMENT
FLOODPLAIN STUDY**

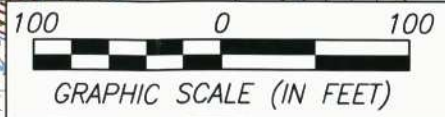
WEST UNION DISTRICT
DODDRIDGE COUNTY, WV

SHEET 22 OF 26


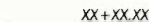



OXF 157/159
JOB NO. 7889

DATE: 12/4/13

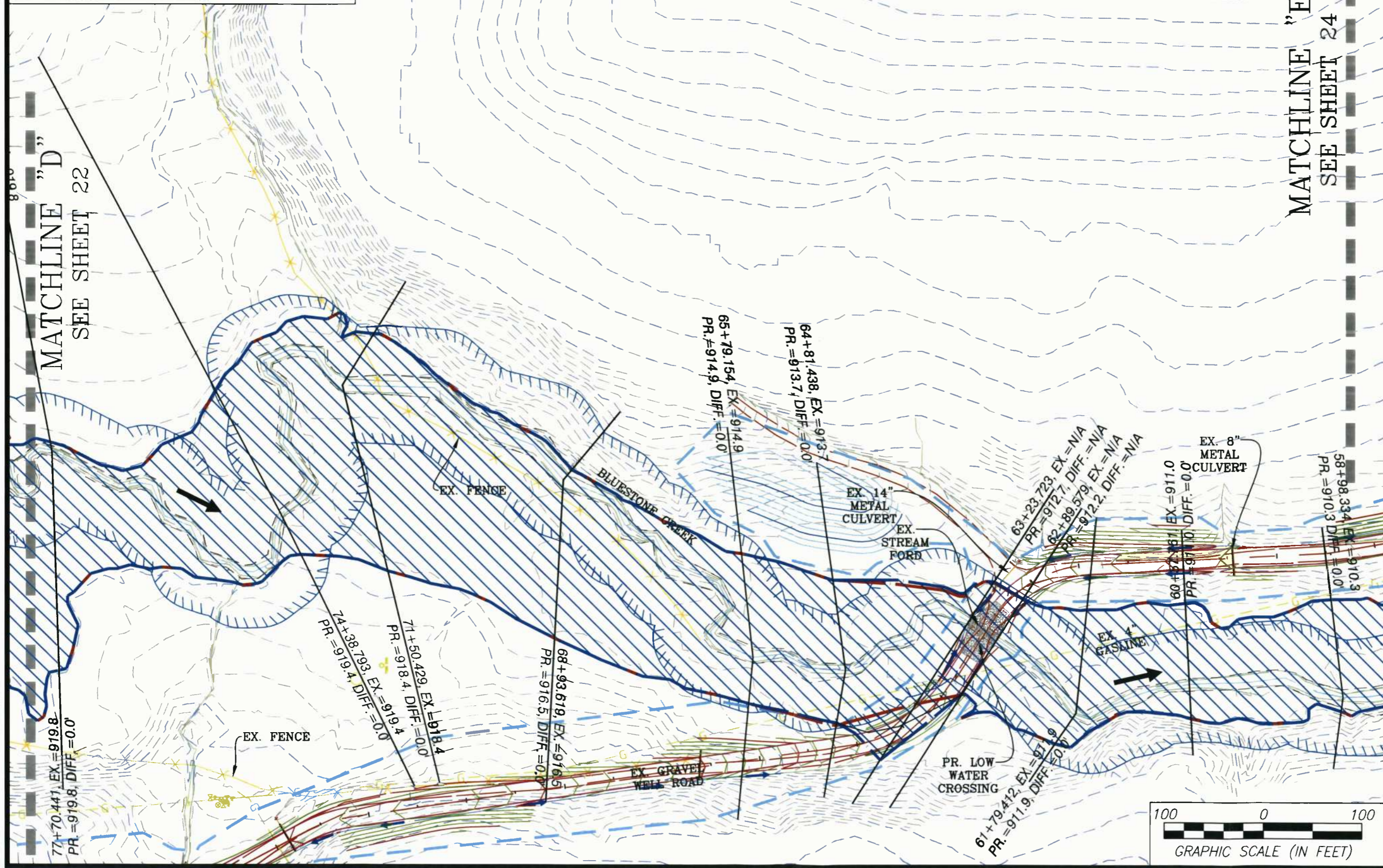
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LEGEND

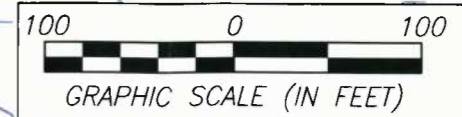
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-  HEC-RAS STUDY CROSS SECTION
-  FEMA FLOODPLAIN ZONE "A"
-  EXISTING 100-YR FLOODPLAIN
-  FLOOD PROTECTION SETBACK

GRID NORTH AND ELEVATIONS
SHOWN HEREON WERE ESTABLISHED
BY SURVEY GRADE GPS



MATCHLINE "D"
SEE SHEET 22

MATCHLINE "E"
SEE SHEET 24



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TEMPORARY CONDITIONS PLAN
**OXF 157/159 WELL PADS AND
HENDERSON CENTRALIZED
FRESHWATER IMPOUNDMENT
FLOODPLAIN STUDY**
WEST UNION DISTRICT
DODDRIDGE COUNTY, WV

SHEET 23 OF 26
OXF 157/159
JOB NO. 7889
DATE: 12/4/13
SCALE: 1" = 100'

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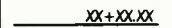



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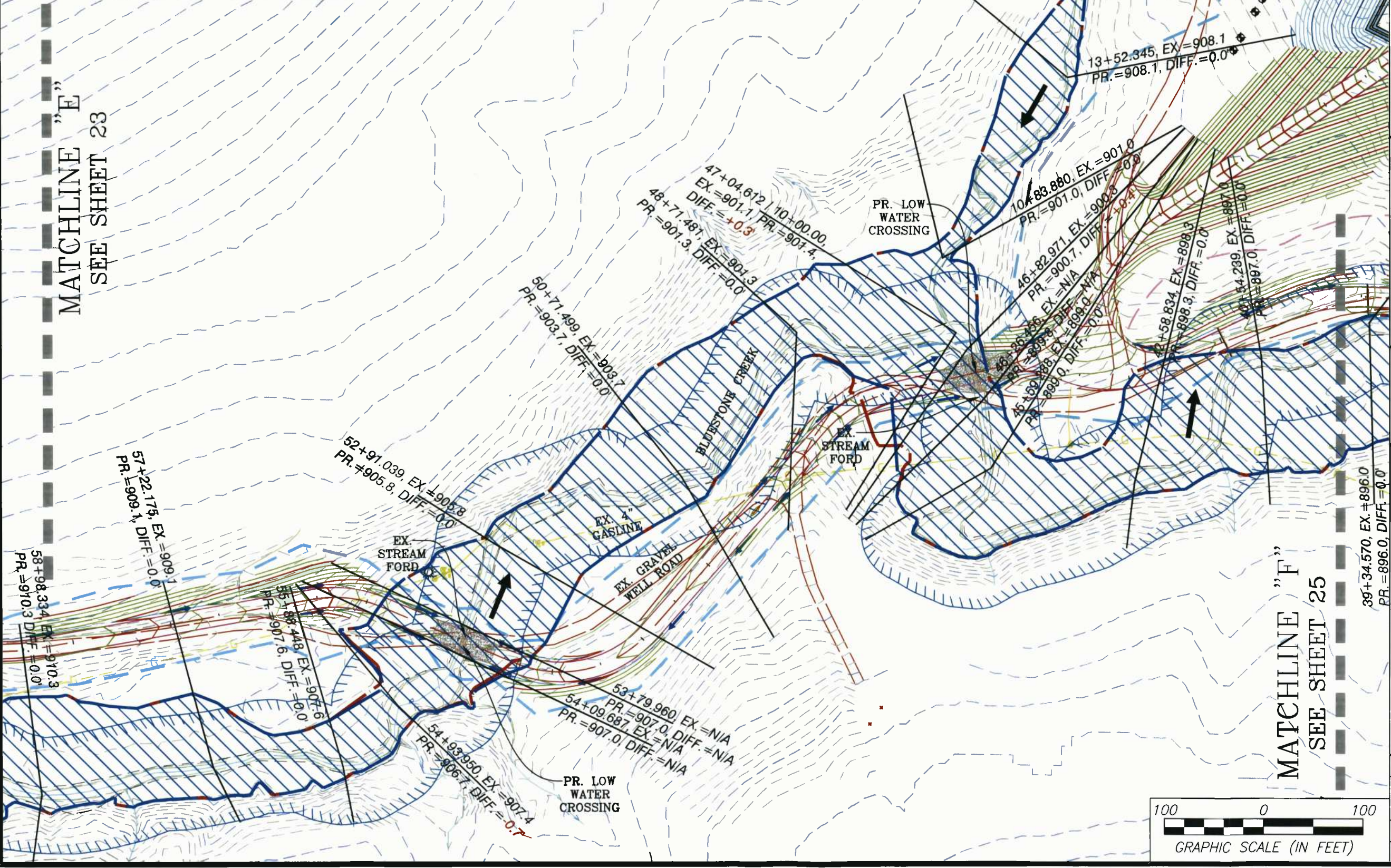
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12/4/2013

LEGEND

-  STREAM CENTERLINE
-  HEC-RAS STUDY CROSS SECTION
-  FEMA FLOODPLAIN ZONE "A"
-  EXISTING 100-YR FLOODPLAIN
-  FLOOD PROTECTION SETBACK

GRID NORTH AND ELEVATIONS SHOWN HEREON WERE ESTABLISHED BY SURVEY GRADE GPS



MATCHLINE "E"
SEE SHEET 23

MATCHLINE "F"
SEE SHEET 25



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19578
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PROFESSIONAL ENGINEER
12/4/2013

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TEMPORARY CONDITIONS PLAN

**OXF 157/159 WELL PADS AND
HENDERSON CENTRALIZED
FRESHWATER IMPOUNDMENT
FLOODPLAIN STUDY**

WEST UNION DISTRICT
DODDRIDGE COUNTY, WV

SHEET 24 OF 26


OXF 157/159
JOB NO. 7889

DATE: 12/4/13

SCALE: 1" = 100'

LEGEND

- STREAM CENTERLINE
- HEC-RAS STUDY CROSS SECTION
- FEMA FLOODPLAIN ZONE "A"
- EXISTING 100-YR FLOODPLAIN
- FLOOD PROTECTION SETBACK


 GRID NORTH AND ELEVATIONS
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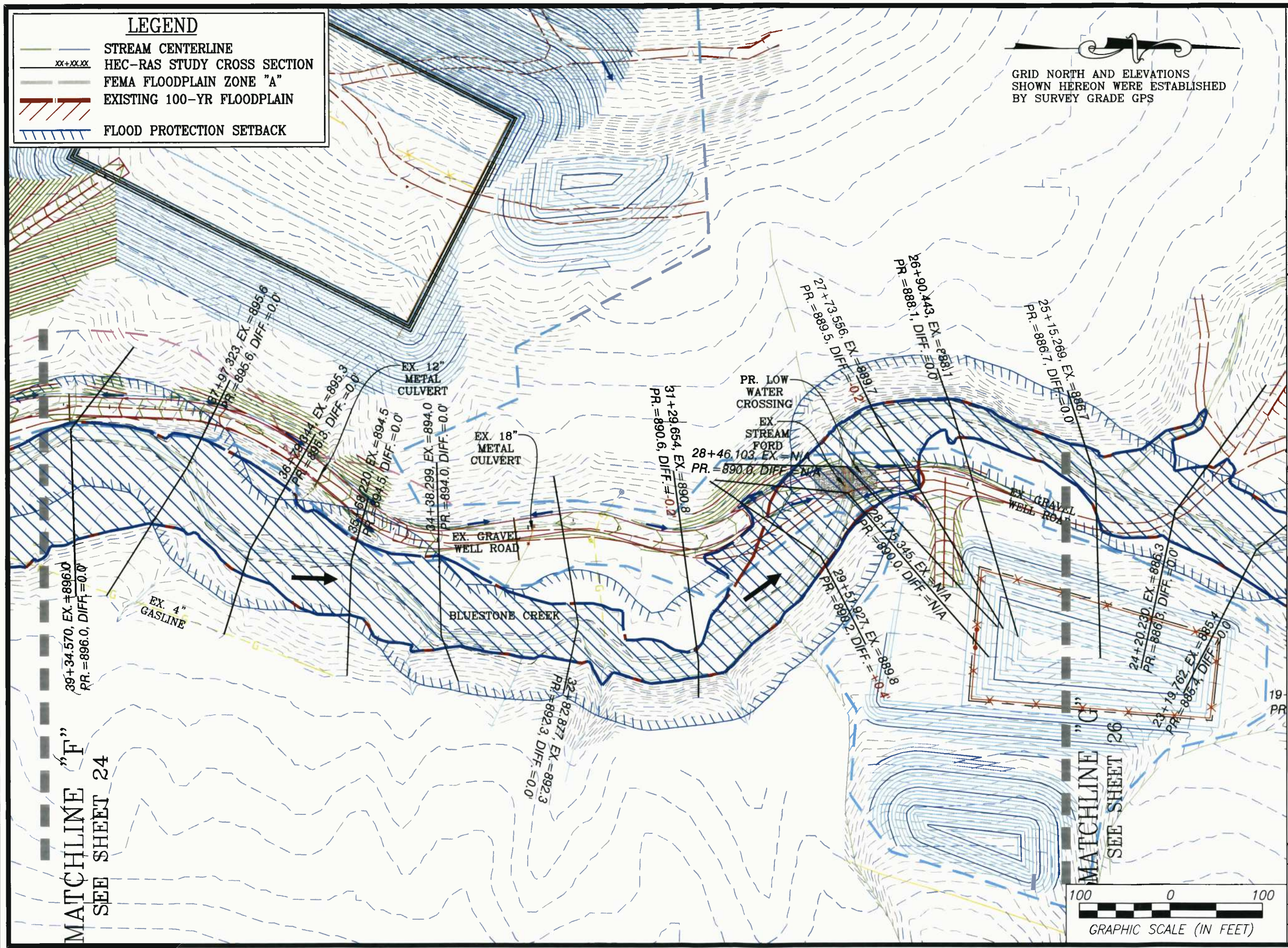
TEMPORARY CONDITIONS PLAN
**OXF 157/159 WELL PADS AND
 HENDERSON CENTRALIZED
 FRESHWATER IMPOUNDMENT
 FLOODPLAIN STUDY**
 WEST UNION DISTRICT
 DODDRIDGE COUNTY, WV

SHEET 25 OF 26

OXF 157/159
 JOB NO. 7889

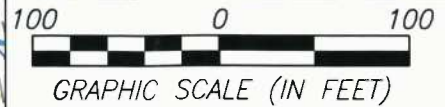
DATE: 12/4/13

SCALE: 1" = 100'








MATCHLINE "F"
 SEE SHEET 24

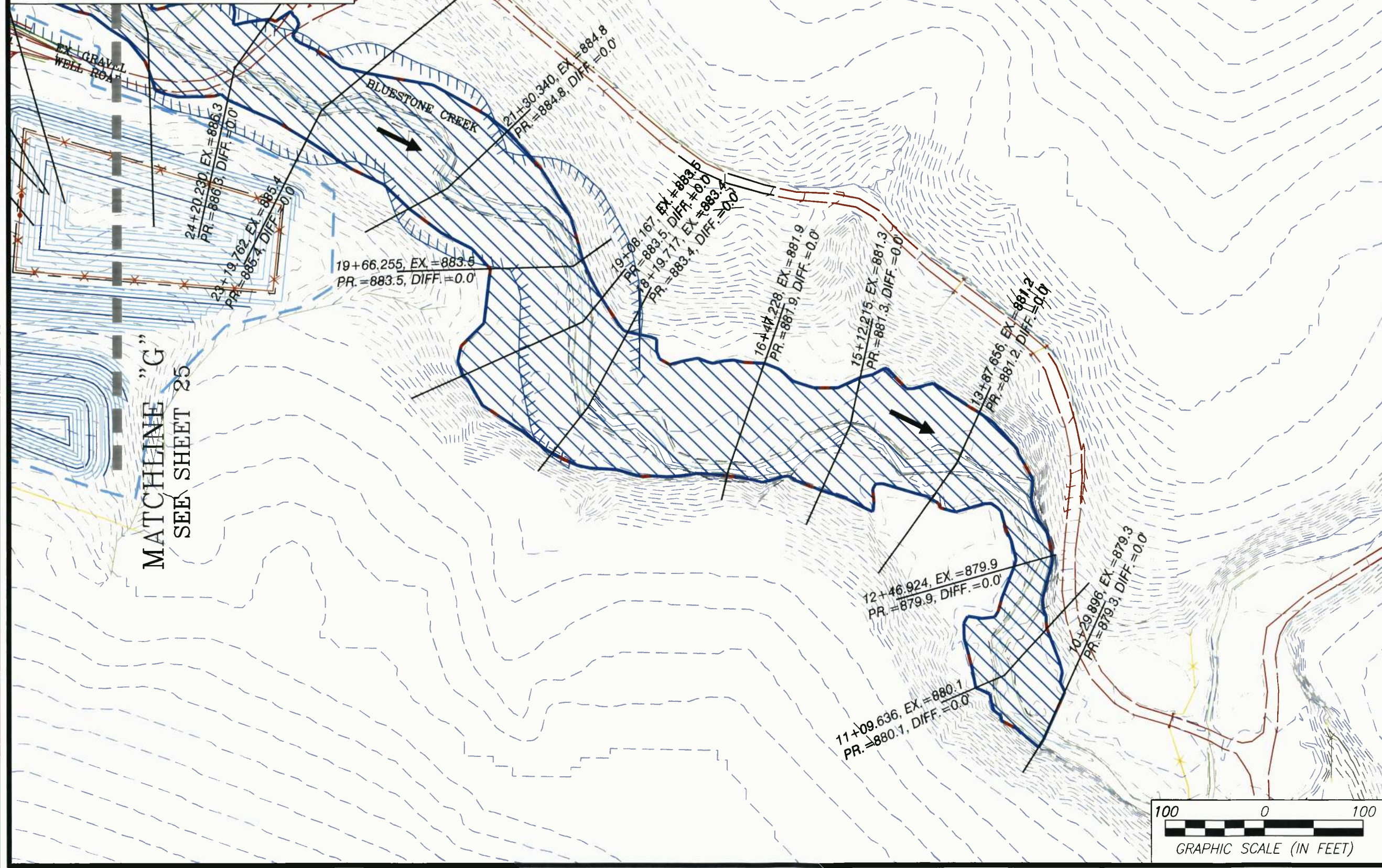
MATCHLINE "G"
 SEE SHEET 26



LEGEND

-  STREAM CENTERLINE
-  HEC-RAS STUDY CROSS SECTION
-  FEMA FLOODPLAIN ZONE "A"
-  EXISTING 100-YR FLOODPLAIN
-  FLOOD PROTECTION SETBACK

GRID NORTH AND ELEVATIONS SHOWN HEREON WERE ESTABLISHED BY SURVEY GRADE GPS



MATCHLINE "G"
SEE SHEET 25

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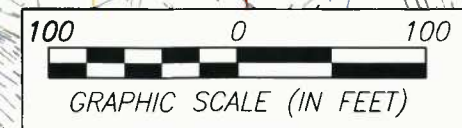
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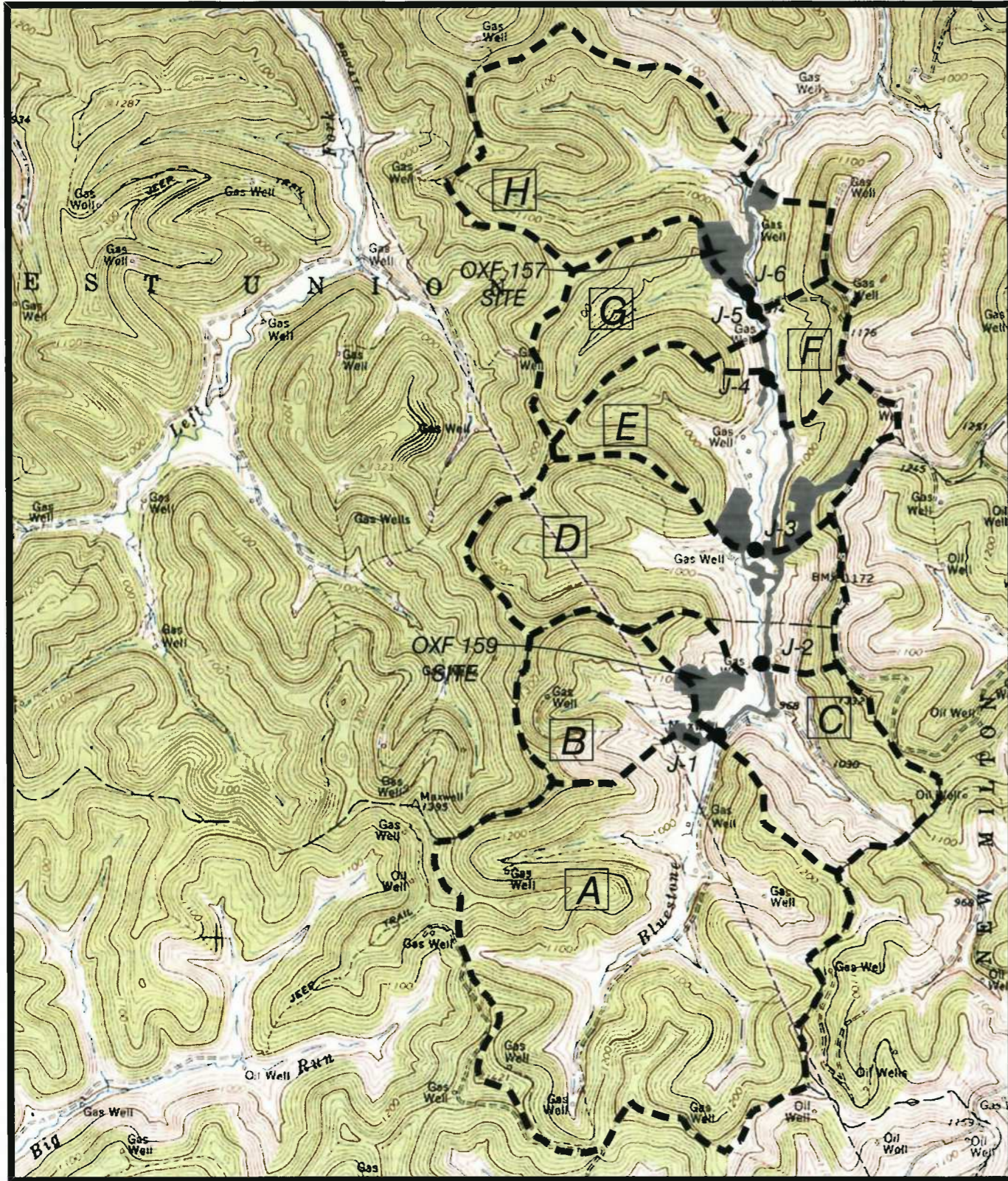
TEMPORARY CONDITIONS PLAN
OXF 157/159 WELL PADS AND
HENDERSON CENTRALIZED
FRESHWATER IMPOUNDMENT
FLOODPLAIN STUDY
WEST UNION DISTRICT
DODDRIDGE COUNTY, WV

SHEET 26 OF 26
OXF 157/159
JOB NO. 7889
DATE: 12/4/13
SCALE: 1" = 100'



Supplement 1
Drainage Computations

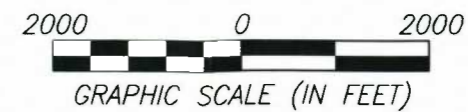
DRAINAGE MAP



WEST VIRGINIA STATE PLANE
 COORDINATE SYSTEM
 NORTH ZONE, NAD83
 ELEVATION BASED ON NAVD88
 & OPUS POST-PROCESSING

KEY	HYDROLOGIC ELEMENT	DRAINAGE AREA (SQ. MI.)
A	UPPER BLUESTONE	0.882
B	UPPER1 BLUESTONE	0.170
C	MIDDLE1 BLUESTONE	0.252
D	MIDDLE BLUESTONE	0.363
E	LOWER BLUESTONE	0.286
F	LOWER1 BLUESTONE	0.078
G	LOWER2 BLUESTONE	0.188
H	LOWER3 BLUESTONE	0.425
TOTAL		2.644

J-1	=	JUNCTION 1
J-2	=	JUNCTION 2
J-3	=	JUNCTION 3
J-4	=	JUNCTION 4
J-5	=	JUNCTION 5
J-6	=	JUNCTION 6



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DRAINAGE MAP
 OXF 157/159 WELL PADS AND
 HENDERSON CENTRALIZED
 FRESHWATER IMPOUNDMENT
 FLOODPLAIN STUDY
 WEST UNION DISTRICT
 DODDRIDGE COUNTY, WV

SHEET 1 OF 1

OXF 157/159
 JOB NO. 7889

DATE: 12/4/13

SCALE: 1" = 2000'

Project: OXF 159/157

Simulation Run: 100 YR

Start of Run: 04Sep2013, 00:00

Basin Model: Existing

End of Run: 05Sep2013, 00:05

Meteorologic Model: 100 YR

Compute Time: 04Sep2013, 09:58

Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
Upper Bluestone	0.882	443.8	04Sep2013, 12:55	95.5
Upper1 Bluestone	0.17	221.9	04Sep2013, 12:10	20.3
Junction-1	1.052	482.7	04Sep2013, 12:50	115.8
Reach-1	1.052	482.7	04Sep2013, 13:00	115.4
Middle1 Bluestone	0.252	189.6	04Sep2013, 12:30	28.7
Junction-2	1.304	601.9	04Sep2013, 12:50	144.1
Reach-2	1.304	601	04Sep2013, 13:10	143.1
Middle Bluestone	0.363	303	04Sep2013, 12:25	41.4
Junction-3	1.667	763.6	04Sep2013, 12:40	184.5
Reach-3	1.667	762	04Sep2013, 13:00	183.2
Lower Bluestone	0.286	238.7	04Sep2013, 12:20	31.4
Junction-4	1.953	855.6	04Sep2013, 13:00	214.6
Reach-4	1.953	853.6	04Sep2013, 13:05	214.2
Lower1 Bluestone	0.078	130	04Sep2013, 12:00	9
Junction-5	2.031	865	04Sep2013, 13:05	223.1
Reach-5	2.031	865	04Sep2013, 13:10	222.7
Lower2 Bluestone	0.188	175.7	04Sep2013, 12:20	22.3
Junction-6	2.219	914.4	04Sep2013, 13:10	245
Reach-6	2.219	910.4	04Sep2013, 13:25	243.8
Lower3 Bluestone	0.425	337.3	04Sep2013, 12:30	50.2
Downstream	2.644	1021.2	04Sep2013, 13:20	294

Supplement 2
Summary of Computed Elevations

**OXF-157-159 WELL PAD
FLOODPLAIN STUDY
SUMMARY OF COMPUTED ELEVATIONS**

CROSS SECTION STATION	RIVER NAME	EXISTING CONDITIONS MODEL	TEMPORARY CONDITIONS BRIDGE MODEL	PROPOSED DIFFERENCE	PERMENANT CONDITION-LOW WATER CROSSING MODEL	PROPOSED DIFFERENCE	
14659.36	Bluestone Creek	964.6	964.6	0.0	964.6	0.0	
14572.23	Bluestone Creek	963.8	963.8	0.0	963.8	0.0	
14557.54	Bluestone Creek	Culvert					
14543.33	Bluestone Creek	962.5	962.5	0.0	962.5	0.0	
14371.96	Bluestone Creek	960.1	960.1	0.0	960.1	0.0	
14193.22	Bluestone Creek	958.6	958.6	0.0	958.6	0.0	
14044.56	Bluestone Creek	956.8	956.8	0.0	956.8	0.0	
13852.52	Bluestone Creek	955	955	0.0	955	0.0	
13658.52	Bluestone Creek	953.8	953.8	0.0	953.8	0.0	
13552.07	Bluestone Creek	952.9	952.9	0.0	952.9	0.0	
13440.1	Bluestone Creek	951.9	951.9	0.0	951.9	0.0	
1842.591	Tributary 3	974.2	974.2	0.0	974.2	0.0	
1574.434	Tributary 3	967.9	967.9	0.0	967.9	0.0	
1370.118	Tributary 3	961.2	961.2	0.0	961.2	0.0	
1126.884	Tributary 3	955.8	955.8	0.0	955.8	0.0	
1109.439	Tributary 3	Culvert					
1089.963	Tributary 3	953.4	953.4	0.0	953.4	0.0	
13395.79	Bluestone Creek-Upper	951.4	951.3	- 0.1	951.3	- 0.1	
13372.57	Bluestone Creek-Upper	Culvert					
13353.46	Bluestone Creek-Upper	950.8	950.8	0.0	950.8	0.0	
13212.39	Bluestone Creek-Upper	949.9	949.9	0.0	949.9	0.0	
13020.26	Bluestone Creek-Upper	948.5	948.6	+ 0.1	948.6	+ 0.1	
12827.43	Bluestone Creek-Upper	946.8	946.8	0.0	946.8	0.0	
12694.78	Bluestone Creek-Upper	945.5	946	+ 0.5	945.4	- 0.1	
12646.06	Bluestone Creek-Upper	N/A	945.3	N/A	945.3	N/A	
12633.65	Bluestone Creek-Upper				Bridge		Weir
12620.64	Bluestone Creek-Upper	N/A	945	N/A	945.3	N/A	
12504.92	Bluestone Creek-Upper	943.2	943.2	0.0	943.2	0.0	
12207.32	Bluestone Creek-Upper	942	942	0.0	942	0.0	
12162.04	Bluestone Creek-Upper	941.3	941.3	0.0	941.3	0.0	
12075.53	Bluestone Creek-Upper	940.6	940.6	0.0	940.6	0.0	
11904.55	Bluestone Creek-Upper	939.6	939.6	0.0	939.6	0.0	
11770.6	Bluestone Creek-Upper	939.1	939.1	0.0	939.1	0.0	
11632.87	Bluestone Creek-Upper	938.4	938.4	0.0	938.4	0.0	
11351.13	Bluestone Creek-Upper	936.8	936.8	0.0	936.8	0.0	
11189.95	Bluestone Creek-Upper	935.9	935.9	0.0	935.9	0.0	
10974.14	Bluestone Creek-Upper	935.7	935.7	0.0	935.7	0.0	
10615.35	Bluestone Creek-Upper	933.9	933.9	0.0	933.9	0.0	
10402.9	Bluestone Creek-Upper	933.3	933.3	0.0	933.3	0.0	
10179.69	Bluestone Creek-Upper	933.2	933.2	0.0	933.2	0.0	
10155.71	Bluestone Creek-Upper	Culvert					

**OXF-157-159 WELL PAD
FLOODPLAIN STUDY
SUMMARY OF COMPUTED ELEVATIONS**

CROSS SECTION STATION	RIVER NAME	EXISTING CONDITIONS MODEL	TEMPORARY CONDITIONS BRIDGE MODEL	PROPOSED DIFFERENCE	PERMENANT CONDITION-LOW WATER CROSSING MODEL	PROPOSED DIFFERENCE
10120.86	Bluestone Creek-Upper	931.3	931.3	0.0	931.3	0.0
10055.03	Bluestone Creek-Upper	930.9	931	+ 0.1	930.9	0.0
1293.508	Tributary 2	938.3	938.3	0.0	938.3	0.0
1159.413	Tributary 2	934.8	934.8	0.0	934.8	0.0
1030.844	Tributary 2	931.2	931.2	0.0	931.2	0.0
9989.38	Bluestone Creek-Middle	930.3	931	+ 0.7	930.4	+ 0.1
9878.981	Bluestone Creek-Middle	N/A	931	N/A	929.9	N/A
9855.351	Bluestone Creek-Middle			Bridge		Weir
9831.906	Bluestone Creek-Middle	N/A	928.5	N/A	928.7	N/A
9559.249	Bluestone Creek-Middle	927.7	927.7	0.0	927.7	0.0
9443.656	Bluestone Creek-Middle	926.9	926.9	0.0	926.9	0.0
9322.807	Bluestone Creek-Middle	926.9	926.9	0.0	926.9	0.0
9266.019	Bluestone Creek-Middle	925.7	925.7	0.0	925.7	0.0
9003.47	Bluestone Creek-Middle	924.5	924.5	0.0	924.5	0.0
8906.253	Bluestone Creek-Middle	924.1	924.1	0.0	924.1	0.0
8843.186	Bluestone Creek-Middle	923.7	923.7	0.0	923.7	0.0
8712.623	Bluestone Creek-Middle	923.5	923.5	0.0	923.5	0.0
8542.514	Bluestone Creek-Middle	923.3	923.3	0.0	923.3	0.0
8379.502	Bluestone Creek-Middle	922.4	922.4	0.0	922.4	0.0
8109.907	Bluestone Creek-Middle	921.2	921.2	0.0	921.2	0.0
7770.441	Bluestone Creek-Middle	919.8	919.8	0.0	919.8	0.0
7438.793	Bluestone Creek-Middle	919.4	919.4	0.0	919.4	0.0
7150.429	Bluestone Creek-Middle	918.4	918.4	0.0	918.4	0.0
6893.619	Bluestone Creek-Middle	916.5	916.5	0.0	916.5	0.0
6579.154	Bluestone Creek-Middle	914.9	914.9	0.0	914.9	0.0
6481.438	Bluestone Creek-Middle	913.7	913.9	+ 0.2	913.7	0.0
6323.723	Bluestone Creek-Middle	N/A	913.4	N/A	912.7	N/A
6303.783	Bluestone Creek-Middle			Bridge		Weir
6289.579	Bluestone Creek-Middle	N/A	912	N/A	912.2	N/A
6179.412	Bluestone Creek-Middle	911.9	911.9	0.0	911.9	0.0
6057.761	Bluestone Creek-Middle	911	911	0.0	911	0.0
5898.334	Bluestone Creek-Middle	910.3	910.3	0.0	910.3	0.0
5722.175	Bluestone Creek-Middle	909.1	909.1	0.0	909.1	0.0
5588.448	Bluestone Creek-Middle	907.6	907.6	0.0	907.6	0.0
5493.95	Bluestone Creek-Middle	907.4	907.4	0.0	906.7	- 0.7
5409.687	Bluestone Creek-Middle	N/A	907.5	N/A	907	N/A
5395.595	Bluestone Creek-Middle			Bridge		Weir
5379.96	Bluestone Creek-Middle	N/A	907	N/A	907	N/A
5291.039	Bluestone Creek-Middle	905.8	905.8	0.0	905.8	0.0
5071.499	Bluestone Creek-Middle	903.7	903.7	0.0	903.7	0.0
4871.481	Bluestone Creek-Middle	901.3	901.3	0.0	901.3	0.0

**OXF-157-159 WELL PAD
FLOODPLAIN STUDY
SUMMARY OF COMPUTED ELEVATIONS**

CROSS SECTION STATION	RIVER NAME	EXISTING CONDITIONS MODEL	TEMPORARY CONDITIONS BRIDGE MODEL	PROPOSED DIFFERENCE	PERMENANT CONDITION-LOW WATER CROSSING MODEL	PROPOSED DIFFERENCE
4704.612	Bluestone Creek-Middle	901.1	901.4	+ 0.3	901.4	+ 0.3
1494.636	Tributary 1	910	910	0.0	910	0.0
1352.345	Tributary 1	908.1	908.1	0.0	908.1	0.0
1083.88	Tributary 1	901	901	0.0	901	0.0
4682.971	Bluestone Creek-Lower	900.3	900.7	+ 0.4	900.7	+ 0.4
4657.419	Bluestone Creek-Lower			Bridge		Weir
4626.456	Bluestone Creek-Lower	N/A	899.7	N/A	899.8	N/A
4559.288	Bluestone Creek-Lower	899	899	0.0	899	0.0
4258.834	Bluestone Creek-Lower	898.3	898.3	0.0	898.3	0.0
4054.239	Bluestone Creek-Lower	897	897	0.0	897	0.0
3934.57	Bluestone Creek-Lower	896	896	0.0	896	0.0
3797.323	Bluestone Creek-Lower	895.6	895.6	0.0	895.6	0.0
3679.344	Bluestone Creek-Lower	895.3	895.3	0.0	895.3	0.0
3568.22	Bluestone Creek-Lower	894.5	894.5	0.0	894.5	0.0
3438.299	Bluestone Creek-Lower	894	894	0.0	894	0.0
3282.877	Bluestone Creek-Lower	892.3	892.3	0.0	892.3	0.0
3129.654	Bluestone Creek-Lower	890.8	890.7	- 0.1	890.6	- 0.2
2951.927	Bluestone Creek-Lower	889.8	890.4	+ 0.6	890.2	+ 0.4
2875.345	Bluestone Creek-Lower	N/A	890.1	N/A	890	N/A
2862.727	Bluestone Creek-Lower			Bridge		Weir
2846.103	Bluestone Creek-Lower	N/A	889.7	N/A	890	N/A
2773.556	Bluestone Creek-Lower	889.7	889.5	- 0.2	889.5	- 0.2
2690.443	Bluestone Creek-Lower	888.1	888.1	0.0	888.1	0.0
2515.269	Bluestone Creek-Lower	886.7	886.7	0.0	886.7	0.0
2420.23	Bluestone Creek-Lower	886.3	886.3	0.0	886.3	0.0
2319.762	Bluestone Creek-Lower	885.4	885.4	0.0	885.4	0.0
2130.34	Bluestone Creek-Lower	884.8	884.8	0.0	884.8	0.0
1966.255	Bluestone Creek-Lower	883.5	883.5	0.0	883.5	0.0
1908.167	Bluestone Creek-Lower	883.5	883.5	0.0	883.5	0.0
1819.717	Bluestone Creek-Lower	883.4	883.4	0.0	883.4	0.0
1647.228	Bluestone Creek-Lower	881.9	881.9	0.0	881.9	0.0
1512.215	Bluestone Creek-Lower	881.3	881.3	0.0	881.3	0.0
1387.656	Bluestone Creek-Lower	881.2	881.2	0.0	881.2	0.0
1246.924	Bluestone Creek-Lower	879.9	879.9	0.0	879.9	0.0
1109.636	Bluestone Creek-Lower	880.1	880.1	0.0	880.1	0.0
1029.896	Bluestone Creek-Lower	879.3	879.3	0.0	879.3	0.0

Supplement 3

HEC-RAS Analysis –Existing Conditions Summary

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      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      X  XXXXXX   XXXX     X  X      X  X      XXXXX

```

PROJECT DATA

Project Title: OXF157-159 Bridges
Project File : OXF157-159Bridges.prj
Run Date and Time: 11/6/2013 3:01:13 PM

Project in English units

PLAN DATA

Plan Title: Existing Revised
Plan File : x:\Navitus Jobfiles\SLS\7889-OXF 159\Engineering\Drainage
Comp\Floodplain\Report\Computations\HEC-RAS\Revised2\OXF157-159Bridges.p10

Geometry Title: Existing Revised
Geometry File : x:\Navitus Jobfiles\SLS\7889-OXF 159\Engineering\Drainage
Comp\Floodplain\Report\Computations\HEC-RAS\Revised2\OXF157-159Bridges.g03

Flow Title : Existing Revised
Flow File : x:\Navitus Jobfiles\SLS\7889-OXF 159\Engineering\Drainage
Comp\Floodplain\Report\Computations\HEC-RAS\Revised2\OXF157-159Bridges.f09

Plan Summary Information:

Number of: Cross Sections =	97	Multiple Openings =	0
Culverts =	4	Inline Structures =	0
Bridges =	0	Lateral Structures =	0

Computational Information

Water surface calculation tolerance =	0.01
Critical depth calculation tolerance =	0.01
Maximum number of iterations =	20
Maximum difference tolerance =	0.3

Flow tolerance factor = 0.001

Computation Options

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

FLOW DATA

Flow Title: Existing Revised
Flow File : x:\Navitus Jobfiles\SLS\7889-OXF 159\Engineering\Drainage
Comp\Floodplain\Report\Computations\HEC-RAS\Revised2\OXF157-159Bridges.f09

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 4 columns: River, Reach, Profile, Upstream, Downstream. Rows include Bluestone Creek Upper and Lower with Normal S values.

GEOMETRY DATA

Geometry Title: Existing Revised
Geometry File : x:\Navitus Jobfiles\SLS\7889-OXF 159\Engineering\Drainage
Comp\Floodplain\Report\Computations\HEC-RAS\Revised2\OXF157-159Bridges.g03

Reach Connection Table

OXF157-159Bridges.rep

```

*****
* River      Reach      * Upstream Boundary * Downstream Boundary *
*****
* Bluestone Creek Bluestone Creek *      *      *
* Bluestone Creek Upper      *      3      *      2      *
* Bluestone Creek Middle     *      2      *      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	Tributary	Length	Angle
River Reach	River Reach		
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	Tributary	Length	Angle
River Reach	River Reach		
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	Tributary	Length	Angle
River Reach	River Reach		
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)	* 1.04	* 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:

Table with 11 columns: Station, Elevation, Data, num=, 93, Sta, Elev, Sta, Elev, Sta, Elev. Contains elevation data for 93 stations.

Table with 6 columns: Manning's n Values, num=, 3, Sta, n Val, Sta, n Val. Contains Manning's n values for 3 stations.

Table with 7 columns: Bank Sta, Left, Right, Lengths, Left Channel, Right, Coeff Contr., Expan. Contains channel dimensions and coefficients.

CROSS SECTION OUTPUT Profile #PF 1

Table with 7 columns: E.G. Elev (ft), 964.62, Element, Left OB, Channel, Right OB, Vel Head (ft), 0.78, wt. n-Val., 0.035, W.S. Elev (ft), 963.84, Reach Len. (ft), 35.73, 28.43, 82.26.

OXF157-159Bridges.rep

```

* 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	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		

OXF157-159Bridges.rep

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
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
-------	--------	----	----

OXF157-159Bridges.rep

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 Nm1 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

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

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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	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	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	171.27	.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
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
0	970	32.38	970
126.18	966.33	133.83	966
197.97	964.16	198.28	964.16
255.33	961.67	255.39	961.67
271.07	961.74	271.83	961.7
283.89	961.56	286.87	961.48
310.56	960	311.28	959.94
333.65	957.82	334.04	957.77
346.95	957.35	355.1	957.27
373.87	956.84	400.61	956
427.11	955.47	439.41	954.99
487.98	952.1	488.59	952.08
496.2	951.24	499.84	950.55
505.78	950.26	506.01	950.26
515.51	952	519.8	952
539.68	954	540.23	954.1
550.74	954.09	550.79	954.09
552.95	953.9	553.03	953.89
558.71	952.63	559.8	953.41
566.03	957.72	566.21	957.82
573.31	960.72	576.65	962
580.44	964	580.77	964.22
588.37	969.43	589.24	970
595.12	974	596.36	974.9
601.46	979.52	601.93	979.88

Manning's n values		num= 3	
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

OXF157-159Bridges.rep

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

OXF157-159Bridges.rep
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) * 5.81  * 4.24  * 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	Sta Hi	Cord Lo
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 Nml 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	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	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)	* 5.81	* 4.04	* 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	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) * 5.80 * 3.86 * 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

 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)	* 5.73	* 3.70	* 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) * 5.55 * 3.52 * 1.00 *
* C & E Loss (ft)     * 0.08 * Cum SA (acres) * 5.85 * 1.04 * 0.86 *
*****

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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
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)	* 5.46	* 3.31	* 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	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	*
* 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	* 0.99	*
* E.G. Slope (ft/ft)	* 0.015247	* Area (sq ft)	* 50.52	* 0.99	*
* Q Total (cfs)	* 482.70	* Flow (cfs)	* 481.57	* 1.13	*
* Top Width (ft)	* 21.54	* Top width (ft)	* 17.22	* 4.32	*
* Vel Total (ft/s)	* 9.37	* Avg. vel. (ft/s)	* 9.53	* 1.14	*
* Max Chl Dpth (ft)	* 4.04	* Hydr. Depth (ft)	* 2.93	* 0.23	*
* Conv. Total (cfs)	* 3909.2	* Conv. (cfs)	* 3900.0	* 9.1	*
* Length Wtd. (ft)	* 210.75	* Wetted Per. (ft)	* 20.60	* 4.35	*
* Min Ch El (ft)	* 939.14	* Shear (lb/sq ft)	* 2.33	* 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)	* 5.35	* 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	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)	* 5.30	* 2.64	* 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
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	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

```

*****
* 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) * 4.96   * 2.59   * 0.99   *
* C & E Loss (ft)         * 0.01   * Cum SA (acres)    * 4.98   * 0.68   * 0.83   *
*****
    
```

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

```

*****
* 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) * 4.76  * 2.51 * 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)	* 4.22	* 2.34	* 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	* 2.22	* 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

OXF157-159Bridges.rep

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
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
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)	* 3.07	* 2.07	* 0.94

* 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
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

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

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*****
* 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) * 2.24 * 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

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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
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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)	* 1.38	* 1.68	* 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
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
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	* wt. n-Val.	* 0.060	* 0.035	* 0.060
* W.S. Elev (ft)	* 935.73	* Reach Len. (ft)	* 205.41	* 261.21	* 240.88
* Crit w.s. (ft)	*	* Flow Area (sq ft)	* 239.54	* 77.49	* 62.05
* E.G. Slope (ft/ft)	* 0.000924	* Area (sq ft)	* 239.54	* 77.49	* 62.05
* Q Total (cfs)	* 601.90	* Flow (cfs)	* 286.31	* 251.73	* 63.86
* Top width (ft)	* 173.54	* Top width (ft)	* 119.52	* 15.34	* 38.69
* Vel Total (ft/s)	* 1.59	* Avg. Vel. (ft/s)	* 1.20	* 3.25	* 1.03
* Max Chl Dpth (ft)	* 5.82	* Hydr. Depth (ft)	* 2.00	* 5.05	* 1.60
* Conv. Total (cfs)	* 19798.9	* Conv. (cfs)	* 9417.9	* 8280.4	* 2100.6
* Length wtd. (ft)	* 242.94	* Wetted Per. (ft)	* 119.75	* 19.40	* 38.83
* Min Ch El (ft)	* 929.91	* Shear (lb/sq ft)	* 0.12	* 0.23	* 0.09
* Alpha	* 2.06	* Stream Power (lb/ft s)	* 356.27	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.56	* Cum Volume (acre-ft)	* 0.96	* 1.43	* 0.72

* 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
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
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	.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

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* 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) * 0.38 * 1.07 * 0.46 *
* C & E Loss (ft) * 0.28 * Cum SA (acres) * 0.31 * 0.24 * 0.38 *
*****

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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	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		.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)	*	10137.9	*	Conv. (cfs)	*	3628.1	*	6509.8	*		*
*	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)	*	0.24	*	0.82	*	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
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

* E.G. Elev (ft)	* 933.26	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.09	* Wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 933.17	* Reach Len. (ft)	* 111.20	* 58.47	* 28.87
* Crit W.S. (ft)	* 932.32	* Flow Area (sq ft)	* 24.42	* 67.62	* 199.78
* E.G. Slope (ft/ft)	* 0.000999	* Area (sq ft)	* 24.42	* 67.62	* 199.78
* Q Total (cfs)	* 601.90	* Flow (cfs)	* 37.45	* 220.24	* 344.21
* Top width (ft)	* 173.34	* Top width (ft)	* 19.84	* 16.20	* 137.29
* Vel Total (ft/s)	* 2.06	* Avg. Vel. (ft/s)	* 1.53	* 3.26	* 1.72
* Max chl Dpth (ft)	* 5.00	* Hydr. Depth (ft)	* 1.23	* 4.17	* 1.46
* Conv. Total (cfs)	* 19039.8	* Conv. (cfs)	* 1184.7	* 6966.7	* 10888.3
* Length wtd. (ft)	* 58.47	* Wetted Per. (ft)	* 20.00	* 17.88	* 137.36
* Min ch El (ft)	* 928.17	* Shear (lb/sq ft)	* 0.08	* 0.24	* 0.09
* Alpha	* 1.35	* Stream Power (lb/ft s)	* 506.82	* 0.00	* 0.00
* Frctn Loss (ft)	*	* Cum Volume (acre-ft)	* 0.04	* 0.48	* 0.05
* C & E Loss (ft)	*	* Cum SA (acres)	* 0.05	* 0.08	* 0.07

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
 4 39 .024 .024 0 .9 1
 Upstream 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) * 18.77 * Culv Full Len (ft) * 39.00 *
 * # Barrels * 1 * Culv Vel US (ft/s) * 5.97 *
 * Q Barrel (cfs) * 18.77 * Culv vel DS (ft/s) * 5.97 *
 * 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) * 931.75 * Culv Frctn Ls (ft) * 0.92 *
 * W.S. DS (ft) * 931.29 * Culv Exit Loss (ft) * 0.10 *

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```
* Delta EG (ft) * 1.51 * Culv Entr Loss (ft) * 0.50 *
* Delta WS (ft) * 1.88 * 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) * 1.56 * 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	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	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)	* 931.75	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.46	* wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 931.29	* Reach Len. (ft)	* 24.44	* 64.93	* 4.53
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 6.01	* 84.93	* 32.63
* E.G. Slope (ft/ft)	* 0.006719	* Area (sq ft)	* 6.01	* 84.93	* 32.63
* Q Total (cfs)	* 601.90	* Flow (cfs)	* 15.68	* 495.23	* 90.99
* Top width (ft)	* 93.51	* Top width (ft)	* 9.19	* 38.85	* 45.47
* Vel Total (ft/s)	* 4.87	* Avg. Vel. (ft/s)	* 2.61	* 5.83	* 2.79
* Max Chl Dpth (ft)	* 2.95	* Hydr. Depth (ft)	* 0.65	* 2.19	* 0.72
* Conv. Total (cfs)	* 7342.9	* Conv. (cfs)	* 191.3	* 6041.6	* 1110.1
* Length Wtd. (ft)	* 51.81	* Wetted Per. (ft)	* 9.28	* 39.15	* 45.50
* Min Ch El (ft)	* 928.34	* Shear (lb/sq ft)	* 0.27	* 0.91	* 0.30
* Alpha	* 1.24	* Stream Power (lb/ft s)	* 558.19	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.31	* Cum Volume (acre-ft)	* 0.04	* 0.25	* 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
0	948	5.36	946.09
12.65	944	14.95	943.34
32.7	938.74	35.61	938
52.86	934	65.23	932.13
78	930.52	84.21	930.7
101.25	930	105.17	929.78
118.79	927.94	118.84	927.85
131.9	927.79	134.05	928.33
140.8	929.2	148.83	930
152.14	930	183.83	930.86
236.55	932	261.82	932
312.13	934	313.48	934
380.2	936	405.69	937.92
430.86	938.85	447.39	940
486.01	942	494.93	942.66
531.24	945.31	532.15	945.36
573.55	948.26	582.3	949.12

Manning's n Values

num= 3

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

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3.7 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

```
*****
* E.G. Elev (ft)      * 931.43 * Element          * Left OB * Channel * Right OB *
* Vel Head (ft)      * 0.52  * Wt. n-Val.      * 0.035  * 0.035  * 0.035  *
* W.S. Elev (ft)     * 930.91 * Reach Len. (ft) * 63.02  * 63.02  * 63.02  *
* Crit W.S. (ft)     * 930.85 * Flow Area (sq ft) * 34.75  * 60.89  * 37.59  *
* E.G. Slope (ft/ft) * 0.005474 * Area (sq ft)    * 34.75  * 60.89  * 37.59  *
* Q Total (cfs)      * 601.90 * Flow (cfs)      * 92.06  * 411.53 * 98.31  *
* Top Width (ft)     * 112.44 * Top width (ft)  * 44.79  * 18.24  * 49.41  *
* Vel Total (ft/s)   * 4.52  * Avg. vel. (ft/s) * 2.65  * 6.76  * 2.62  *
* Max Chl Dpth (ft) * 3.93  * Hydr. Depth (ft) * 0.78  * 3.34  * 0.76  *
* Conv. Total (cfs)  * 8135.5 * Conv. (cfs)     * 1244.3 * 5562.4 * 1328.8 *
* Length Wtd. (ft)   * 63.02 * Wetted Per. (ft) * 44.86  * 19.29  * 49.48  *
* Min Ch El (ft)    * 926.98 * Shear (lb/sq ft) * 0.26  * 1.08  * 0.26  *
* Alpha             * 1.64  * Stream Power (lb/ft s) * 592.99 * 0.00  * 0.00  *
* Frctn Loss (ft)   * 0.59  * Cum Volume (acre-ft) * 0.03  * 0.14  * 0.04  *
* C & E Loss (ft)   * 0.02  * Cum SA (acres)   *      *      *      *
*****
```

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
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
```

OXF157-159Bridges.rep

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	206.74	.035	354.42	.06

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	206.74	354.42		243.92	311.18	322.32	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

	*	930.82	*	Element	*	Left OB	*	Channel	*	Right OB	*
* E.G. Elev (ft)	*	0.47	*	Wt. n-Val.	*	243.92	*	0.035	*	0.060	*
* Vel Head (ft)	*	930.35	*	Reach Len. (ft)	*		*	311.18	*	322.32	*
* W.S. Elev (ft)	*	930.35	*	Flow Area (sq ft)	*		*	129.94	*	23.05	*
* Crit w.S. (ft)	*	0.016550	*	Area (sq ft)	*		*	129.94	*	23.05	*
* E.G. Slope (ft/ft)	*	763.60	*	Flow (cfs)	*		*	729.36	*	34.24	*
* Q Total (cfs)	*	194.35	*	Top width (ft)	*		*	121.99	*	72.37	*
* Top width (ft)	*	4.99	*	Avg. Vel. (ft/s)	*		*	5.61	*	1.49	*
* Vel Total (ft/s)	*	4.35	*	Hydr. Depth (ft)	*		*	1.07	*	0.32	*
* Max Chl Dpth (ft)	*	5935.6	*	Conv. (cfs)	*		*	5669.4	*	266.1	*
* Conv. Total (cfs)	*	302.04	*	wetted Per. (ft)	*		*	124.72	*	72.38	*
* Length wtd. (ft)	*	926.00	*	Shear (lb/sq ft)	*		*	1.08	*	0.33	*
* Min Ch El (ft)	*	1.21	*	Stream Power (lb/ft s)	*	738.37	*	0.00	*	0.00	*
* Alpha	*	2.44	*	Cum Volume (acre-ft)	*	8.10	*	7.14	*	4.97	*
* Frctn Loss (ft)	*	0.01	*	Cum SA (acres)	*	6.46	*	2.28	*	5.43	*
* C & E Loss (ft)	*		*		*		*		*		*

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

for the water surface and continued on with the calculations.

Warning: The 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
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	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
* 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)	* 7.79	* 6.46	* 4.68
* C & E Loss (ft)	* 0.07	* Cum SA (acres)	* 5.96	* 1.79	* 5.00

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: 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
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		.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

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* 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)	* 7.73	* 6.30	* 4.54
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 5.89	* 1.75	* 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
0	950	7.9	948
33.26	944.66	37.57	944
55.76	941.3	56.25	941.19
66.09	939.59	75.08	938
91.41	935.87	107.67	934
150.94	930	168.9	929.36
225.41	927.18	236.93	926.73
280.73	925.57	301.42	925.29
317.5	924.03	317.54	924
332.46	921.52	335.76	921.44
340.28	923.71	342.76	923.61
371.21	924	371.29	924
407.61	926	408.21	926.16
426.69	931.84	426.94	932
433.14	936	434.72	937.03
438.79	940	439.08	940.2
444.01	943.67	444.43	944
448.27	946.82	449.8	947.89

Manning's n Values		num= 3	
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) * 7.64  * 6.06  * 4.40  *
* C & E Loss (ft)   * 0.09  * Cum SA (acres) * 5.81  * 1.69  * 4.78  *
*****
    
```

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

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

This may indicate the need for additional cross sections.

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	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		
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		

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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)	* 7.52	* 5.94	* 4.29
* C & E Loss (ft)	* 0.18	* Cum SA (acres)	* 5.68	* 1.66	* 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
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	71.3	.1	.3
--------	--------	-------	-------	------	----	----

CROSS SECTION OUTPUT Profile #PF 1

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

OXF157-159Bridges.rep

```
* 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) * 7.49 * 5.56 * 4.20 *
* C & E Loss (ft)     * 0.04 * Cum SA (acres)     * 5.64 * 1.51 * 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
0	.035	311.14	.035	321.29	.1

Bank Sta: Left Right Lengths: Left Channel 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 *
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OXF157-159Bridges.rep

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* 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) * 7.31 * 5.46 * 4.17 *
* C & E Loss (ft) * 0.00 * Cum SA (acres) * 5.46 * 1.48 * 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
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

OXF157-159Bridges.rep

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*****
* 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) * 6.98  * 5.40  * 4.11  *
* C & E Loss (ft)   * 0.01  * Cum SA (acres)   * 5.16  * 1.46  * 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	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
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
 Sta n Val Sta num= 3 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) * 6.78 * 5.14 * 4.06 *
 * C & E Loss (ft) * 0.04 * Cum SA (acres) * 4.99 * 1.39 * 4.48 *

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
 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

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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) * 6.18  * 4.75  * 4.01  *
* C & E Loss (ft)       * 0.03  * Cum SA (acres)   * 4.59  * 1.29  * 4.45  *
*****
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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	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
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) * 5.24 * 4.54 * 3.94 *
* C & E Loss (ft) * 0.02 * Cum SA (acres) * 3.86 * 1.24 * 4.39 *

Warning: The energy loss was 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
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

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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)	* 5.15	* 4.32	* 3.32
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 3.76	* 1.18	* 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	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	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
* 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)	* 5.08	* 4.14	* 2.87
* C & E Loss (ft)	* 0.06	* Cum SA (acres)	* 3.66	* 1.13	* 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	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
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	.1	.3
					25.67		

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

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* 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)	* 4.92	* 3.92	* 2.07
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 3.57	* 1.06	* 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	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
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) * 3.40  * 3.73  * 2.03  *
* C & E Loss (ft)    * 0.00  * Cum SA (acres) * 2.62  * 1.01  * 1.94  *
*****
    
```

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: Middle RS: 6893.619

INPUT

Description:

```

Station Elevation Data      num=      97
  Sta   Elev   Sta   Elev   Sta   Elev   Sta   Elev   Sta   Elev
*****
    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
    
```

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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	393.45	936.47	395.28	936.16	395.37	936.12
395.5	936.03	395.53	936.02	396.1	935.97	396.43	935.95	398.54	935.91
405.71	935.73	405.75	935.73	406.4	935.66	408.89	935.38	409.35	935.68
410.22	936.14	413.07	937.55	416.22	939.12	416.24	939.12	417.99	939.77
418.65	940	418.77	940.04						

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)	* 3.21	* 3.38	* 1.76
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 2.47	* 0.89	* 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= 110		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
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	24.51	932.39		
26.48	932	33.16	930.63	35.95	930	41.36	928.77	44.91	928		
50.75	926.68	54.1	926	61.48	924.41	63.44	924	67.81	923.23		
74.83	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	323.93	920	324.86	920.22	332	922		
336.07	922.99	342.14	924.5	342.25	924.52	342.27	924.52	342.43	924.52		
344.95	924.54	352.42	924.65	352.51	924.65	352.57	924.64	353.09	924.6		
354.47	924.34	354.7	924.29	355.16	924.22	356.1	924	357.49	923.65		
357.69	923.63	357.7	923.63	357.87	923.64	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	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
* 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

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* 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)     * 0.69 * Cum Volume (acre-ft) * 3.11 * 2.99 * 1.43 *
* C & E Loss (ft)     * 0.00 * Cum SA (acres)      * 2.35 * 0.77 * 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= 85									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	930	.35	929.96	.41	929.95	.61	929.91	1.02	929.72		
1.89	929.31	4.76	928	5	927.9	9.63	926	12.3	925.4		
15.61	924	18.56	923.45	24.55	922	28.55	920.85	31.48	920		
34.57	919.09	37.91	918	58.58	916.25	61.52	916	69.42	915.67		
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	284.56	914	286.43	914		
299.14	914.56	299.25	914.56	299.3	914.57	299.63	914.58	308.83	915.26		
310.26	915.37	310.29	915.37	310.33	915.37	311.18	915.27	311.6	915.22		
311.71	915.2	312.17	915.12	314.42	914.72	315.01	914.58	315.07	914.59		
315.14	914.6	315.77	914.93	316.77	915.52	317.16	915.75	317.21	915.78		
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.
 207.49 221.72 292.96 277.15 210.78 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

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*****
* E.G. Elev (ft) * 914.23 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 0.51 * Wt. n-Val. * 0.035 * 0.035 * 0.035 *
* W.S. Elev (ft) * 913.72 * Reach Len. (ft) * 292.96 * 277.15 * 210.78 *
* Crit W.S. (ft) * 913.72 * Flow Area (sq ft) * 94.65 * 44.77 * 38.00 *
* E.G. slope (ft/ft) * 0.008637 * Area (sq ft) * 94.65 * 44.77 * 38.00 *
* Q Total (cfs) * 855.60 * Flow (cfs) * 390.12 * 344.80 * 120.68 *
* Top Width (ft) * 155.45 * Top width (ft) * 88.62 * 14.23 * 52.60 *
* Vel Total (ft/s) * 4.82 * Avg. Vel. (ft/s) * 4.12 * 7.70 * 3.18 *
* Max chl Dpth (ft) * 3.77 * Hydr. Depth (ft) * 1.07 * 3.15 * 0.72 *
* Conv. Total (cfs) * 9206.2 * Conv. (cfs) * 4197.7 * 3710.0 * 1298.5 *
* Length Wtd. (ft) * 278.74 * Wetted Per. (ft) * 88.65 * 16.42 * 52.62 *
* Min Ch El (ft) * 909.95 * Shear (lb/sq ft) * 0.58 * 1.47 * 0.39 *
* Alpha * 1.42 * Stream Power (lb/ft s) * 344.66 * 0.00 * 0.00 *
* Frctn Loss (ft) * 1.37 * Cum Volume (acre-ft) * 2.91 * 2.87 * 1.36 *
* C & E Loss (ft) * 0.06 * Cum SA (acres) * 2.14 * 0.73 * 0.99 *
*****
    
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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: 6179.412

INPUT

Description:

Station Elevation Data		num= 80	
Sta	Elev	Sta	Elev
0	930	8.88	928
23.58	924.67	23.82	924.61
12.35	927.22	17.73	926
23.9	924.58	25.3	924
20.28	925.44	27.3	923.16

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30.09	922	32.33	921.04	34.75	920	38.38	918.49	40.34	917.68
40.83	917.49	40.96	917.42	41.91	916.91	42.32	916.62	42.38	916.61
42.4	916.61	42.59	916.72	43.73	917.42	43.76	917.43	43.94	917.48
44.6	917.75	44.65	917.75	44.79	917.75	47.14	917.74	57.78	917.67
58.32	917.68	58.34	917.68	60.31	917.49	60.94	917.43	60.97	917.43
62.77	916.87	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)	* 2.10	* 2.54	* 1.17
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 1.51	* 0.64	* 0.78

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

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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	Sta	Elev
0	930	4.5	929.18	10.56	928.02	10.82	927.95	12.82	927.13		
15.59	926	18.6	924.76	20.41	924	24.3	922.45	25.1	922.09		
25.18	922.06	25.63	921.77	27.49	920.15	27.51	920.15	27.74	920.24		
28.6	920.55	28.66	920.54	29.19	920.4	38.07	920.88	39.99	920.93		
42.89	920.61	43.23	920.6	43.77	920.4	44.81	920	46.03	919.5		
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
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)	* 1.87	* 2.40	* 1.00
* C & E Loss (ft)	* 0.12	* Cum SA (acres)	* 1.34	* 0.61	* 0.67

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= 85

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	930	.06	929.99	4.41	928.14	4.71	928	6.51	927.22
9.28	926	13.19	924.33	13.91	924.02	13.94	924	13.98	923.98
16.4	922.91	17.24	922.03	17.27	922	17.32	921.96	17.43	921.83
18.02	921.95	18.15	921.99	18.96	922.16	18.97	922.16	19.41	922.14
19.49	922.15	20.68	922.15	33.42	922.23	34.17	922.23	34.18	922.23
34.33	922.22	35.91	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
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

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* W.S. Elev (ft)	* 910.34	* Reach Len. (ft)	* 150.38	* 175.20	* 214.49
* 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)	* 1.47	* 2.19	* 0.90
* C & E Loss (ft)	* 0.05	* Cum SA (acres)	* 1.06	* 0.55	* 0.62

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= 82	
Sta	Elev	Sta	Elev
0	930	12.15	928
28.37	925.29	30.85	924.1
37.45	922.01	37.47	922
43.47	918.67	44.27	918.11
46.88	917.74	47.34	917.77
53.86	918	56.76	918.09
61.8	918	61.98	918
67.97	917.13	70.44	916
80.13	911.64	83.91	910
157.43	908	163.87	908
188.64	906.77	188.68	906.74
192.24	904.61	192.25	904.61
201.87	905.82	201.91	905.84
208.9	906.22	215.57	906.89
226.24	908.23	228.37	909.16
239.07	913.9	239.27	914
250.26	918	257.27	920

Manning's n Values		num= 3	
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

```

*****
* 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) * 1.07  * 1.94  * 0.75  *
* C & E Loss (ft)   * 0.02  * Cum SA (acres) * 0.78  * 0.49  * 0.54  *
*****
    
```

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=      93
  Sta   Elev   Sta   Elev   Sta   Elev   Sta   Elev   Sta   Elev
*****
   0  919.97   9.97  918.11  10.57   918   10.68  917.98   20.7   916
  31.9  914.01  31.95   914   32.67   914   35.67  912.9   35.94  912.73
  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
    
```

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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	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)	* 70.11	* 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)	* 0.34	* Cum Volume (acre-ft)	* 0.89	* 1.77	* 0.67
* C & E Loss (ft)	* 0.15	* Cum SA (acres)	* 0.62	* 0.44	* 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 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: Middle RS: 5493.950

INPUT
 Description:

Station Elevation Data num= 85

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	920	9.49	918.37	11.73	918	20.78	916.43	23.92	916
37.96	914.33	40.59	914	41.17	913.82	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.
 143.77 179.9 151.97 198.62 272.82 .1 .3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	124.18	907.83

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 907.90	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.50	* Wt. n-Val.	* 0.035	* 0.035	* 0.100
* W.S. Elev (ft)	* 907.40	* Reach Len. (ft)	* 151.97	* 198.62	* 272.82
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 7.85	* 148.26	* 1.01
* E.G. Slope (ft/ft)	* 0.003030	* Area (sq ft)	* 7.85	* 148.26	* 1.01
* Q Total (cfs)	* 865.00	* Flow (cfs)	* 13.91	* 850.56	* 0.52
* Top width (ft)	* 49.36	* Top width (ft)	* 11.81	* 36.13	* 1.42
* Vel Total (ft/s)	* 5.51	* Avg. Vel. (ft/s)	* 1.77	* 5.74	* 0.52

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* Max Chl Dpth (ft)	* 4.56	* Hydr. Depth (ft)	* 0.66	* 4.10	* 0.71
* Conv. Total (cfs)	* 15713.1	* Conv. (cfs)	* 252.8	* 15450.8	* 9.5
* Length Wtd. (ft)	* 211.94	* Wetted Per. (ft)	* 11.89	* 38.55	* 1.99
* Min Ch El (ft)	* 902.84	* Shear (lb/sq ft)	* 0.12	* 0.73	* 0.10
* Alpha	* 1.07	* Stream Power (lb/ft s)	* 285.23	* 0.00	* 0.00
* Frctn Loss (ft)	* 1.07	* Cum volume (acre-ft)	* 0.88	* 1.57	* 0.67
* C & E Loss (ft)	* 0.05	* Cum SA (acres)	* 0.61	* 0.39	* 0.50

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: Middle

RS: 5291.039

INPUT

Description:

Station Elevation Data		num= 82		Sta		Elev		Sta		Elev	
Sta	Elev	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	261.89	910.75	275.64	912	285.25	913.35		
288.02	914	290.68	914.72	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	Sta	n Val	Sta	n Val
0	.06	83.64	.035	98.35	.06		

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

CROSS SECTION OUTPUT Profile #PF 1

```

*****
* 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  * 0.32  *
* C & E Loss (ft)   * 0.03  * Cum SA (acres) * 0.59  * 0.27  * 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: Middle

RS: 5071.499

INPUT

Description:

Station Elevation Data		num= 96		Sta Elev		Sta Elev		Sta Elev	
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

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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
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	234.66	909.6
238.58	909.55	239.52	909.6	239.57	909.61	239.92	909.65	241.08	910
242.62	910.45	242.87	910.48	243.05	910.47	244.3	910.08	244.51	910.1
251	912	253.58	912.77	253.72	912.81	254.25	912.9	260.33	914
265.61	914.97	271.33	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)	* 0.53	* 0.82	* 0.23
* 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= 98

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	225.82	912
227.55	912.18	233.28	912.44	234.11	912.29	239.41	911.51	241.29	911.32
241.45	911.31	241.76	911.33	247.07	911.81	249.24	912	251.43	912
261.01	913.15	267.15	914	276.91	915.4	281.09	916	284.91	916
292.8	916.41	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	.1	.3

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)	* 137.91	* Wetted Per. (ft)	* 36.76	* 24.19	* 21.53

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```
* 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)    * 0.32 * Cum Volume (acre-ft) * 0.23 * 0.49 * 0.19 *
* C & E Loss (ft)    * 0.31 * 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= 99		Sta Elev		Sta Elev		Sta Elev	
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
274.19	900	274.71	899.98	275.65	899.93	278.21	899.77	284.41	898.85
285.95	898.45	287.03	898.14	287.46	898.1	287.48	898.1	290.84	898.18
293.87	898.23	297.03	898.3	297.08	898.31	297.13	898.36	297.17	898.34
298	898.65	298.31	898.75	314.91	899.8	317.49	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) * 0.15 * Wt. n-Val. * 0.100 * 0.035 * 0.060 *
 * W.S. Elev (ft) * 901.14 * Reach Len. (ft) * 20.21 * 20.21 * 20.21 *
 * Crit W.S. (ft) * * * Flow Area (sq ft) * 192.44 * 151.16 * 169.82 *
 * E.G. Slope (ft/ft) * 0.001023 * Area (sq ft) * 192.44 * 151.16 * 169.82 *
 * Q Total (cfs) * 865.00 * Flow (cfs) * 129.92 * 565.00 * 170.08 *
 * Top width (ft) * 263.59 * Top width (ft) * 113.61 * 30.93 * 119.06 *
 * Vel Total (ft/s) * 1.68 * Avg. vel. (ft/s) * 0.68 * 3.74 * 1.00 *
 * Max Chl Dpth (ft) * 5.32 * Hydr. Depth (ft) * 1.69 * 4.89 * 1.43 *
 * Conv. Total (cfs) * 27046.7 * Conv. (cfs) * 4062.2 * 17666.3 * 5318.1 *
 * Length wtd. (ft) * 20.21 * wetted Per. (ft) * 113.65 * 33.10 * 119.42 *
 * Min Ch El (ft) * 895.82 * Shear (lb/sq ft) * 0.11 * 0.29 * 0.09 *
 * Alpha * 3.31 * Stream Power (lb/ft s) * 443.09 * 0.00 * 0.00 *
 * Frctn Loss (ft) * 0.05 * Cum Volume (acre-ft) * 0.04 * 0.06 * 0.06 *
 * 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

 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

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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 17.09 123.67 27.31 .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)	* 17.09	* 123.67	* 27.31
* 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)	* 84.70	* 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)	* 0.48	* Cum Volume (acre-ft)	* 3.72	* 7.87	* 4.62
* C & E Loss (ft)	* 0.17	* Cum SA (acres)	* 2.20	* 1.76	* 2.55

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

for the water surface and continued on with the calculations.

Warning: Divided flow computed for this cross-section.

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

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

need for additional cross sections.

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

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

CROSS SECTION

RIVER: Bluestone Creek
REACH: Lower RS: 4559.288

INPUT
Description:

Table with 12 columns: Station, Elevation, Data, num=108, Sta, Elev, Sta, Elev, Sta, Elev, Sta, Elev. Contains 108 rows of data points.

Table with 6 columns: Manning's n Values, num=3, Sta, n Val, Sta, n Val, Sta, n Val. Contains 3 rows of data.

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

Table with 3 columns: Blocked Obstructions, num=1, Sta L, Sta R, Elev. Contains 1 row of data.

CROSS SECTION OUTPUT Profile #PF 1

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* 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
* 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	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	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

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
0	920	.91	919.97
47.79	918	49.49	918
92.08	914.78	95.42	914.44
118.27	911.98	129.78	910
147.77	906	150.29	905.37
163.42	901.65	167.9	900.1
172.43	899.16	173.37	898.09
175.08	896.55	177.58	896.93
192.29	897.99	192.41	898
197.42	898	198.69	896.34
200.67	894.03	200.72	894
204.75	892.04	205.09	892
215.45	893.9	215.58	894

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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

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 *
* 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	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

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*****
* 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

OXF157-159Bridges.rep

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

	*	894.57	*	Element	*	Left OB	*	Channel	*	Right OB	*
* E.G. Elev (ft)	*	0.58	*	Wt. n-Val.	*	0.060	*	0.035	*	0.035	*
* Vel Head (ft)	*	893.99	*	Reach Len. (ft)	*	128.72	*	150.25	*	115.25	*
* W.S. Elev (ft)	*	893.60	*	Flow Area (sq ft)	*	111.98	*	94.44	*	4.29	*
* Crit W.S. (ft)	*	0.004360	*	Area (sq ft)	*	111.98	*	94.44	*	4.29	*
* E.G. slope (ft/ft)	*	914.40	*	Flow (cfs)	*	237.27	*	665.73	*	11.40	*
* Q Total (cfs)	*	102.22	*	Top width (ft)	*	75.82	*	22.21	*	4.18	*
* Top Width (ft)	*	4.34	*	Avg. Vel. (ft/s)	*	2.12	*	7.05	*	2.66	*
* Vel Total (ft/s)	*	5.78	*	Hydr. Depth (ft)	*	1.48	*	4.25	*	1.02	*
* Max chl Dpth (ft)	*	13848.1	*	Conv. (cfs)	*	3593.4	*	10082.1	*	172.7	*
* Conv. Total (cfs)	*	146.61	*	Wetted Per. (ft)	*	75.93	*	23.68	*	4.64	*
* Length Wtd. (ft)	*	888.21	*	Shear (lb/sq ft)	*	0.40	*	1.09	*	0.25	*
* Min ch El (ft)	*	1.99	*	Stream Power (lb/ft s)	*	244.87	*	0.00	*	0.00	*
* Alpha	*	0.91	*	Cum Volume (acre-ft)	*	3.07	*	5.71	*	2.75	*
* Frctn Loss (ft)	*	0.07	*	Cum SA (acres)	*	1.83	*	1.21	*	1.39	*
* C & E Loss (ft)	*		*		*		*		*		*

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
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****

OXF157-159Bridges.rep

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
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	.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	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	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	*

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* 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	Sta	Elev	Sta	Elev	Sta	Elev
0	908.12	1.19	908	3.23	908	6.78	906.8	9.26	906
14.65	904.26	15.46	904	20.29	902.44	21.17	902	46.06	890.34
49.32	891.77	60.49	891.95	71.4	891.4	81.63	886.67	81.99	886.58
83.4	886.54	90.81	886.38	98.79	886.12	101.06	886.12	101.09	886.12
101.1	886.12	105.46	886.83	116.85	888	122.73	888.47	129.85	889.05
133.31	889.2	135.43	889	135.45	888.99	136.26	888	137.32	886.78
137.9	886	138.17	885.73	138.81	885.19	153.57	885.52	154.19	886
155.46	887.19	156.45	888	157.77	888.97	158.24	889.41	159.55	889.91
162.78	891.13	165.23	892	169.05	893.47	170.53	894	173.86	895.16
175.09	895.58	176.25	896	177.64	896.43	183.13	898	188.56	899.58
190.02	900	191.17	900.32	195.17	901.45	197.15	902	201.59	903.22
202.74	903.5	204.78	904	207.94	904.56	214.36	906	255.68	916

Manning's n values num= 3

Sta	n Val	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

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

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

CROSS SECTION OUTPUT Profile #PF 1

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

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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= 85		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	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		
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	205.5	894	209.56	895.07		
213.12	896	222.94	897.97	223.09	898	228.37	899.21	231.44	900		
233.83	900.39	243.65	902	248.88	902.83	256.26	904	264.49	905.1		
271.17	906	284.46	907.78	285.98	908	286.8	908.12	299.36	910		

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	.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= 76		Sta Elev		Sta Elev		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	274.55	901.42	278.96	902	282.24	902.45	294.36	904
304.13	905.06	312.57	906	322.44	907.08	330.78	908	341.39	909.31
347.84	910								

Manning's n Values		num= 3		Sta n Val	
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= 79

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	266.53	899.9	267.32	900
269.15	900.24	282.5	902	293.71	903.53	298.21	904	318.37	905.77
320.48	906	324.58	906.5	337.05	908	356.46	910		

Manning's n Values num= 4

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

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* 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
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 51.8 .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  *
* 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	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:

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Station Elevation Data		num=		81							
Sta	Elev	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		
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	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
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	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
 Description:

Station Elevation Data		num= 67		Sta Elev		Sta Elev		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	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		.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
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 *
* 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 *
*****
```

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

OXF157-159Bridges.rep

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

```
*****
* 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 *
* 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 *
*****
```

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

OXF157-159Bridges.rep

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

 * 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 *

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

OXF157-159Bridges.rep

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
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 Val. (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	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		
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	.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)	*	*	*

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* C & E Loss (ft) * * Cum SA (acres) * * * * *

CROSS SECTION

RIVER: Trib 1
 REACH: Trib 1 RS: 1494.636

INPUT
 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
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	61.92	.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
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
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 *

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* 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
* 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

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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

 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

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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		.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

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	.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

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* 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 *
*****
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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	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 *
 * Vel Head (ft) * 0.50 * Wt. n-Val. * 0.035 * 0.035 * 0.035 *
 * W.S. Elev (ft) * 931.22 * Reach Len. (ft) * 0.00 * 0.00 * 0.00 *
 * Crit W.S. (ft) * 931.22 * Flow Area (sq ft) * 26.63 * 9.79 * 21.85 *
 * E.G. Slope (ft/ft) * 0.013317 * Area (sq ft) * 26.63 * 9.79 * 21.85 *
 * Q Total (cfs) * 303.00 * Flow (cfs) * 127.58 * 77.37 * 98.04 *
 * Top width (ft) * 56.69 * Top width (ft) * 27.48 * 4.34 * 24.88 *
 * Vel Total (ft/s) * 5.20 * Avg. Vel. (ft/s) * 4.79 * 7.90 * 4.49 *
 * Max chl Dpth (ft) * 2.49 * Hydr. Depth (ft) * 0.97 * 2.26 * 0.88 *
 * Conv. Total (cfs) * 2625.7 * Conv. (cfs) * 1105.6 * 670.5 * 849.6 *
 * Length Wtd. (ft) * 0.00 * Wetted Per. (ft) * 27.53 * 4.78 * 24.94 *
 * Min Ch El (ft) * 928.73 * Shear (lb/sq ft) * 0.80 * 1.70 * 0.73 *
 * Alpha * 1.19 * Stream Power (lb/ft s) * 403.10 * 0.00 * 0.00 *
 * Frctn Loss (ft) * 0.00 * Cum Volume (acre-ft) * * * *
 * C & E Loss (ft) * 0.01 * 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
 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

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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
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	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= 58		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	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		
267.46	967.92	268.94	968	274.65	968.18	306.35	968.78	311.04	968.88		
328.46	970	344.5	970	370.97	971.22	388.26	972	395.26	972.5		
401.3	972.91	416.44	974	422.1	974.37	437.35	975.25	449.91	976		
452.05	976.31	467.65	978	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

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* 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
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		

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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 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
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
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Downstream Deck/Roadway Coordinates num= 2

Sta Hi	Cord Lo	Sta Hi	Cord Lo
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

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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

 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 *

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* # 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 *
* Culv Nml 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
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

 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 *
 * 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.

Supplement 4

HEC-RAS Analysis –Temporary 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
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  XXXXXX   XXXX       X      X       X      X     XXXX
```

PROJECT DATA

Project Title: OXF 157-159 Bridges
Project File : OXF157-159Bridges.prj
Run Date and Time: 11/6/2013 3:25:03 PM

Project in English units

PLAN DATA

Plan Title: Low Water 100YR
Plan File : x:\Navitus Jobfiles\SLS\7889-OXF 159\Engineering\Drainage
Comp\Floodplain\Report\Computations\HEC-RAS\Revised2\OXF157-159Bridges.p06

Geometry Title: Low Water Revised
Geometry File : x:\Navitus Jobfiles\SLS\7889-OXF 159\Engineering\Drainage
Comp\Floodplain\Report\Computations\HEC-RAS\Revised2\OXF157-159Bridges.g05

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 = 108	Multiple Openings = 0
	Culverts = 4	Inline Structures = 6
	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, and values. 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 and Lower Bluestone Creek.

GEOMETRY DATA

Geometry Title: Low Water Revised
Geometry File : x:\Navitus Jobfiles\SLS\7889-OXF 159\Engineering\Drainage
Comp\Floodplain\Report\Computations\HEC-RAS\Revised2\OXF157-159Bridges.g05

Reach Connection Table

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```

*****
* 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	Tributary	Length	Angle
River Reach	River Reach		
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	Tributary	Length	Angle
River Reach	River Reach		
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	Tributary	Length	Angle
River Reach	River Reach		
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

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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)	* 1.04	* 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
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
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	* 0.32
* 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	Sta	n Val
0	.035	227.37	.035	239.58	.06

Bank Sta: Left Right Coeff Contr. Expan.

227.37	239.58	.1	.3
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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

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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	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	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	* 0.32
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 0.99	* 0.42	* 0.31

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

for the water surface and continued on with the calculations.

Warning: The energy loss was 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 * 0.27 *
 * 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)	* 0.74	* 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)	* 72.07	* 53.19	* 16.71

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* E.G. Slope (ft/ft)	*0.002894	* Area (sq ft)	* 72.07	* 53.19	* 16.71
* Q Total (cfs)	* 443.80	* Flow (cfs)	* 173.36	* 251.33	* 19.10
* Top Width (ft)	* 104.64	* Top width (ft)	* 66.63	* 17.06	* 20.95
* 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)	* 8249.7	* Conv. (cfs)	* 3222.6	* 4672.0	* 355.1
* Length Wtd. (ft)	* 240.58	* Wetted Per. (ft)	* 66.68	* 17.87	* 21.02
* 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= 108

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	970	7.18	966	27.28	964	53.6	962	79.9	960
111.22	958	115.26	960	135.36	970	150.67	970	226.56	970
231.61	967.53	238.5	969.4	252.3	969.64	265.57	969.01	282.5	962
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) * 0.45 * Wt. n-Val. * 0.035 * 0.035 * 0.060 *
 * W.S. Elev (ft) * 953.80 * Reach Len. (ft) * 100.46 * 106.40 * 102.70 *
 * Crit W.S. (ft) * * Flow Area (sq ft) * 32.50 * 35.77 * 35.93 *
 * E.G. Slope (ft/ft) * 0.005597 * Area (sq ft) * 32.50 * 35.77 * 35.93 *
 * Q Total (cfs) * 443.80 * Flow (cfs) * 116.39 * 239.33 * 88.08 *
 * Top width (ft) * 61.67 * Top width (ft) * 27.04 * 11.23 * 23.41 *
 * Vel Total (ft/s) * 4.26 * Avg. Vel. (ft/s) * 3.58 * 6.69 * 2.45 *
 * Max chl Dpth (ft) * 3.54 * Hydr. Depth (ft) * 1.20 * 3.19 * 1.53 *
 * Conv. Total (cfs) * 5931.9 * Conv. (cfs) * 1555.6 * 3199.0 * 1177.3 *
 * Length wtd. (ft) * 104.11 * Wetted Per. (ft) * 27.14 * 11.70 * 23.61 *
 * Min ch El (ft) * 950.26 * Shear (lb/sq ft) * 0.42 * 1.07 * 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= 69
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

 0 950 29.9 950 50.45 960 71.17 970 86.64 970
 163.81 970 176.39 964 200.59 961.48 208.14 964.71 219.16 964.84
 230.18 964.23 243.2 958 269.35 956 305.01 955.02 312.14 954.83
 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
 433.41 952.62 439.14 953.14 447.36 953.11 452.66 952.98 453.22 952.98
 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
 Left Levee Station= 350.47 Elevation= 954
 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) * 0.61 * Wt. n-Val. * 0.035 * 0.035 * 0.060 *
 * W.S. Elev (ft) * 952.93 * Reach Len. (ft) * 9.06 * 105.32 * 16.94 *
 * Crit W.S. (ft) * 952.93 * Flow Area (sq ft) * 36.34 * 32.31 * 25.35 *
 * E.G. slope (ft/ft) * 0.008006 * Area (sq ft) * 36.34 * 32.31 * 25.35 *
 * Q Total (cfs) * 443.80 * Flow (cfs) * 136.88 * 251.67 * 55.25 *
 * Top Width (ft) * 70.91 * Top width (ft) * 36.72 * 8.29 * 25.89 *
 * Vel Total (ft/s) * 4.72 * Avg. vel. (ft/s) * 3.77 * 7.79 * 2.18 *
 * Max Chl Dpth (ft) * 4.59 * Hydr. Depth (ft) * 0.99 * 3.90 * 0.98 *
 * Conv. Total (cfs) * 4960.1 * Conv. (cfs) * 1529.9 * 2812.8 * 617.4 *
 * Length Wtd. (ft) * 83.60 * Wetted Per. (ft) * 36.80 * 11.00 * 25.99 *
 * Min Ch El (ft) * 948.34 * Shear (lb/sq ft) * 0.49 * 1.47 * 0.49 *
 * Alpha * 1.77 * Stream Power (lb/ft s) * 497.08 * 350.47 * 0.00 *
 * Frctn Loss (ft) * 0.78 * Cum Volume (acre-ft) * 0.06 * 0.17 * 0.05 *
 * C & E Loss (ft) * 0.02 * Cum SA (acres) * 0.00 * 0.04 * 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: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water

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

program

defaulted to critical depth.

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

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Bluestone Creek RS: 13440.10

INPUT

Description:
 Station Elevation Data num= 85

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Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	950	6.16	950	49.43	960	83.03	970	100.38	970
125.15	970	159.43	962	194.5	960	225.2	958	234.2	957.4
242.7	960.83	254.19	960.93	265.51	960.21	270.54	958	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
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Left Levee Station= 313.74 Elevation= 956

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)	* 0.78	* wt. n-Val.	* 0.035	* 0.035	* 0.060
* W.S. Elev (ft)	* 951.93	* Reach Len. (ft)	* 42.49	* 42.49	* 42.49
* Crit W.S. (ft)	* 951.93	* Flow Area (sq ft)	* 0.75	* 59.91	* 10.33
* E.G. Slope (ft/ft)	* 0.010995	* Area (sq ft)	* 0.75	* 59.91	* 10.33
* Q Total (cfs)	* 443.80	* Flow (cfs)	* 1.11	* 430.11	* 12.58
* Top width (ft)	* 64.18	* Top width (ft)	* 3.91	* 28.10	* 32.17
* Vel Total (ft/s)	* 6.25	* Avg. vel. (ft/s)	* 1.48	* 7.18	* 1.22
* Max Chl Dpth (ft)	* 3.81	* Hydr. Depth (ft)	* 0.19	* 2.13	* 0.32
* Conv. Total (cfs)	* 4232.5	* Conv. (cfs)	* 10.6	* 4101.9	* 119.9
* Length wtd. (ft)	* 42.49	* wetted Per. (ft)	* 3.93	* 29.26	* 32.18
* Min Ch El (ft)	* 948.12	* Shear (lb/sq ft)	* 0.13	* 1.41	* 0.22
* Alpha	* 1.28	* Stream Power (lb/ft s)	* 539.90	* 313.74	* 0.00
* Frctn Loss (ft)	* 0.08	* Cum volume (acre-ft)	* 0.06	* 0.06	* 0.05
* C & E Loss (ft)	* 0.21	* 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.

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

CROSS SECTION

RIVER: Bluestone Creek

REACH: Upper

RS: 13395.79

INPUT

Description:

Station Elevation Data

num= 101

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	208.38	954.32	218.43	954.11
228.49	953.89	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 22.86 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

```

*****
* E.G. Elev (ft) * 951.42 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 0.08 * Wt. n-Val. * 0.035 * 0.035 * 0.060 *
* W.S. Elev (ft) * 951.34 * Reach Len. (ft) * 51.65 * 41.35 * 22.86 *
* Crit W.S. (ft) * 949.60 * Flow Area (sq ft) * 118.79 * 53.12 * 88.12 *
* E.G. Slope (ft/ft) * 0.000815 * Area (sq ft) * 118.79 * 53.12 * 88.12 *
* Q Total (cfs) * 482.70 * Flow (cfs) * 253.88 * 149.48 * 79.34 *
* Top width (ft) * 125.34 * Top width (ft) * 50.30 * 13.82 * 61.22 *
* Vel Total (ft/s) * 1.86 * Avg. Vel. (ft/s) * 2.14 * 2.81 * 0.90 *
* Max Chl Dpth (ft) * 5.34 * Hydr. Depth (ft) * 2.36 * 3.84 * 1.44 *
* Conv. Total (cfs) * 16911.4 * Conv. (cfs) * 8894.6 * 5237.2 * 2779.7 *
* Length Wtd. (ft) * 41.35 * Wetted Per. (ft) * 50.72 * 15.01 * 61.30 *
* Min Ch El (ft) * 946.00 * Shear (lb/sq ft) * 0.12 * 0.18 * 0.07 *
* Alpha * 1.45 * Stream Power (lb/ft s) * 476.33 * 0.00 * 0.00 *
* Frctn Loss (ft) * * Cum Volume (acre-ft) * 5.86 * 4.26 * 1.18 *
* C & E Loss (ft) * * Cum SA (acres) * 6.29 * 1.19 * 1.07 *
*****
    
```

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= 101

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	208.38	954.32	218.43	954.11

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228.49	953.89	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 Coeff Contr. Expan.

311.54	325.36	.1	.3
--------	--------	----	----

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= 113

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	221.63	953.63	231.85	953.42
241.86	953.21	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) * 16.58 * Culv Full Len (ft) * 20.00 *
 * # Barrels * 4 * Culv Vel US (ft/s) * 3.38 *
 * Q Barrel (cfs) * 4.14 * Culv Vel DS (ft/s) * 3.38 *
 * E.G. US. (ft) * 951.42 * Culv Inv El Up (ft) * 947.92 *
 * W.S. US. (ft) * 951.34 * Culv Inv El Dn (ft) * 947.40 *
 * E.G. DS (ft) * 950.98 * Culv Frctn Ls (ft) * 0.28 *
 * W.S. DS (ft) * 950.77 * Culv Exit Loss (ft) * 0.00 *
 * Delta EG (ft) * 0.44 * Culv Entr Loss (ft) * 0.16 *
 * Delta WS (ft) * 0.57 * Q Weir (cfs) * 467.19 *
 * E.G. IC (ft) * 951.39 * Weir Sta Lft (ft) * 260.60 *

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```
* E.G. OC (ft)          * 951.42 * Weir Sta Rgt (ft)    * 387.76 *
* Culvert Control      * Outlet * Weir Submerg       * 0.51  *
* Culv WS Inlet (ft)   * 949.17 * Weir Max Depth (ft) * 1.42  *
* Culv WS Outlet (ft)  * 948.65 * Weir Avg Depth (ft) * 1.23  *
* Culv Nml Depth (ft)  *        * Weir Flow Area (sq ft) * 156.80 *
* Culv Crt Depth (ft)  * 0.82  * Min El Weir Flow (ft) * 950.01 *
*****
```

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Upper RS: 13353.46

INPUT
 Description:

Station Elevation Data num= 113

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	221.63	953.63	231.85	953.42
241.86	953.21	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

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```

*****
* 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  *
* 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  * 113.57 * 21.78  *
* E.G. Slope (ft/ft) * 0.001375 * Area (sq ft)    * 18.26  * 113.57 * 21.78  *
* Q Total (cfs)      * 482.70 * Flow (cfs)      * 25.68  * 435.69 * 21.32  *
* Top width (ft)     * 70.32  * 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)  * 13019.1 * Conv. (cfs)     * 692.7  * 11751.3 * 575.1  *
* Length wtd. (ft)  * 88.45  * Wetted Per. (ft) * 21.63  * 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) * 5.86   * 4.06   * 1.18   *
* C & E Loss (ft)    * 0.06   * Cum SA (acres)   * 6.24   * 1.17   * 1.04   *
*****

```

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
 Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
 This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Upper RS: 13212.39

INPUT
 Description:

Station Elevation Data		num= 95									
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	217.67	952		
221.39	952.35	231.52	952.19	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) * 154.09 * 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) * 1.26 * Cum Volume (acre-ft) * 5.85 * 3.89 * 1.12 *
 * C & E Loss (ft) * 0.03 * Cum SA (acres) * 6.24 * 1.12 * 0.99 *

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
 Warning: The energy loss was 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= 86
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

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```

*****
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
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
215.19 949.79 225.19 949.59 235.19 949.4 266.38 948.22 273.81 948
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

 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) * 949.24 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 0.68 * Wt. n-Val. * 0.035 * 0.035 * 0.060 *
* W.S. Elev (ft) * 948.56 * Reach Len. (ft) * 146.04 * 191.17 * 139.06 *
* Crit w.s. (ft) * 948.56 * Flow Area (sq ft) * 40.01 * 41.08 * 15.14 *
* E.G. Slope (ft/ft) * 0.007007 * Area (sq ft) * 40.01 * 41.08 * 15.14 *
* Q Total (cfs) * 482.70 * Flow (cfs) * 129.40 * 321.97 * 31.33 *
* Top width (ft) * 72.57 * Top width (ft) * 46.02 * 10.07 * 16.47 *
* Vel Total (ft/s) * 5.02 * Avg. Vel. (ft/s) * 3.23 * 7.84 * 2.07 *
* Max chl Dpth (ft) * 4.58 * Hydr. Depth (ft) * 0.87 * 4.08 * 0.92 *
* Conv. Total (cfs) * 5766.6 * Conv. (cfs) * 1545.9 * 3846.4 * 374.3 *
* Length wtd. (ft) * 174.15 * Wetted Per. (ft) * 46.08 * 12.54 * 16.77 *
* Min Ch El (ft) * 943.98 * Shear (lb/sq ft) * 0.38 * 1.43 * 0.40 *
* Alpha * 1.75 * Stream Power (lb/ft s) * 386.06 * 0.00 * 0.00 *
* Frctn Loss (ft) * 1.28 * Cum Volume (acre-ft) * 5.77 * 3.72 * 1.07 *
* C & E Loss (ft) * 0.07 * Cum SA (acres) * 6.16 * 1.08 * 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: 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= 86

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
269.9	946.96	271.8	946.98	281.9	946.76	291.9	946.53	294.3	946.7
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)	* 947.25	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.44	* Wt. n-Val.	* 0.035	* 0.035	* 0.000
* W.S. Elev (ft)	* 946.81	* Reach Len. (ft)	* 60.19	* 131.90	* 273.42
* Crit W.S. (ft)	* 946.81	* Flow Area (sq ft)	* 71.53	* 43.59	* 0.00

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* E.G. slope (ft/ft)	*0.007773	* Area (sq ft)	* 71.53	* 43.59	* 0.00
* Q Total (cfs)	* 482.70	* Flow (cfs)	* 198.41	* 284.29	* 0.00
* Top width (ft)	* 129.36	* Top width (ft)	* 112.08	* 17.16	* 0.12
* Vel Total (ft/s)	* 4.19	* Avg. Vel. (ft/s)	* 2.77	* 6.52	* 0.12
* Max Chl Dpth (ft)	* 4.37	* Hydr. Depth (ft)	* 0.64	* 2.54	* 0.01
* Conv. Total (cfs)	* 5475.1	* Conv. (cfs)	* 2250.5	* 3224.6	* 0.0
* Length wtd. (ft)	* 115.19	* Wetted Per. (ft)	* 112.11	* 18.95	* 0.12
* Min Ch El (ft)	* 942.44	* Shear (lb/sq ft)	* 0.31	* 1.12	*
* Alpha	* 1.60	* Stream Power (lb/ft s)	* 498.60	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.72	* Cum Volume (acre-ft)	* 5.58	* 3.54	* 1.05
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 5.89	* 1.02	* 0.91

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: 12694.78

INPUT

Description:

Station Elevation Data		num= 65									
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	946.1	252.99	946.1	253.72	946	254.4	946.29	265.85	946.07		
277.7	945.84	280.04	945.51	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

Sta n Val Sta n Val Sta n Val

num= 3

 0 .035 395.71 .035 433.28 .035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 395.71 433.28 62.63 48.67 81.28 .1 .3
 Blocked Obstructions num= 1
 Sta L Sta R Elev

 460 485 955

CROSS SECTION OUTPUT Profile #PF 1

 * E.G. Elev (ft) * 945.79 * Element * Left OB * Channel * Right OB *
 * Vel Head (ft) * 0.40 * Wt. n-Val. * 0.035 * 0.035 * *
 * W.S. Elev (ft) * 945.39 * Reach Len. (ft) * 62.63 * 48.67 * 81.28 *
 * Crit W.S. (ft) * 944.59 * Flow Area (sq ft) * 23.35 * 87.40 * *
 * E.G. Slope (ft/ft) * 0.005122 * Area (sq ft) * 23.35 * 87.40 * *
 * Q Total (cfs) * 482.70 * Flow (cfs) * 26.60 * 456.10 * *
 * Top Width (ft) * 138.56 * Top width (ft) * 101.72 * 36.84 * *
 * Vel Total (ft/s) * 4.36 * Avg. vel. (ft/s) * 1.14 * 5.22 * *
 * Max Chl Dpth (ft) * 4.63 * Hydr. Depth (ft) * 0.23 * 2.37 * *
 * Conv. Total (cfs) * 6744.9 * Conv. (cfs) * 371.6 * 6373.3 * *
 * Length Wtd. (ft) * 53.33 * Wetted Per. (ft) * 101.72 * 38.83 * *
 * Min Ch El (ft) * 940.76 * Shear (lb/sq ft) * 0.07 * 0.72 * *
 * Alpha * 1.36 * Stream Power (lb/ft s) * 622.31 * 0.00 * 0.00 *
 * Frctn Loss (ft) * 0.28 * Cum Volume (acre-ft) * 5.52 * 3.34 * 1.05 *
 * C & E Loss (ft) * 0.07 * Cum SA (acres) * 5.74 * 0.94 * 0.91 *

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Upper RS: 12646.06

INPUT

Description:

Station Elevation Data num= 89

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960	.49	959.8	5.04	958	7.77	956.79	9.62	956
13.33	954.36	14.17	954	16.27	953.38	20.76	952	23.85	951.01
27.22	950	31.97	948.57	32.54	948.39	32.58	948.38	32.59	948.38
33.04	948	35.78	946.22	36.11	946	36.96	945.49	37.02	945.45
44.25	945.25	67.31	944.63	68.49	945.69	69.08	946.47	70.31	948
70.66	948.46	70.87	948.73	73.6	948.24	74.63	948	81.68	948
101.28	947.57	205.18	946	231.02	946	235.16	945.9	238.23	945.84
239.46	945.83	241.26	945.8	241.83	945.8	254.14	945.62	345.78	944
353.56	944	385.06	944	391.04	944.29	394.82	944.04	398.26	943.76
398.32	943.75	401.31	942.32	409.48	942.25	411.88	942	413.44	941.46
414.4	941.06	416.19	940.34	416.36	940.34	417.06	942	418.11	943.76
418.26	944	418.31	944.08	418.69	944.94	423.5	944.9	424.98	945.48

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426.11	946	429.63	947.28	431.49	948	434.08	949.02	436.65	950
437.65	950.38	439.35	950.84	442.33	951.27	443.47	951.47	446.97	952
450.48	952.43	450.7	952.45	451.83	952.53	455.66	952.76	460.7	953.03
462.68	953.14	466.25	953.42	472.93	954	481.15	954.63	492.9	955.51
499.54	956	507.86	957.51	510.28	958	511.08	958.16	511.51	958.22
518.65	958.77	525.27	959.2	534.09	959.81	535.7	960		

Manning's n values num= 3
 Sta n Val Sta n Val Sta n Val

 0 .035 391.04 .035 418.31 .035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 391.04 418.31 25.79 25.37 26.92 .1 .3

Ineffective Flow num= 1
 Sta L Sta R Elev Permanent
 0 418.3 943.39 T

Blocked Obstructions num= 1
 Sta L Sta R Elev

 0 70.87 948.75

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 945.44	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.18	* wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 945.26	* Reach Len. (ft)	* 25.79	* 25.37	* 26.92
* Crit W.S. (ft)	* 944.91	* Flow Area (sq ft)	* 101.58	* 46.13	* 2.11
* E.G. Slope (ft/ft)	* 0.005403	* Area (sq ft)	* 101.58	* 71.49	* 2.11
* Q Total (cfs)	* 482.70	* Flow (cfs)	* 288.82	* 190.84	* 3.04
* Top Width (ft)	* 150.17	* Top width (ft)	* 116.78	* 27.27	* 6.12
* Vel Total (ft/s)	* 3.22	* Avg. vel. (ft/s)	* 2.84	* 4.14	* 1.44
* Max Chl Dpth (ft)	* 4.92	* Hydr. Depth (ft)	* 0.87	* 1.69	* 0.35
* Conv. Total (cfs)	* 6566.7	* Conv. (cfs)	* 3929.1	* 2596.3	* 41.3
* Length Wtd. (ft)	* 25.37	* Wetted Per. (ft)	* 116.80	* 30.22	* 6.75
* Min Ch El (ft)	* 940.34	* Shear (lb/sq ft)	* 0.29	* 0.51	* 0.11
* Alpha	* 1.12	* Stream Power (lb/ft s)	* 535.70	* 0.00	* 0.00
* Frctn Loss (ft)	*	* Cum Volume (acre-ft)	* 5.43	* 3.25	* 1.05
* C & E Loss (ft)	*	* Cum SA (acres)	* 5.59	* 0.90	* 0.90

INLINE STRUCTURE

RIVER: Bluestone Creek
 REACH: Upper RS: 12633.65

INPUT
 Description:
 Distance from Upstream XS = 2.2
 Deck/Roadway width = 20
 weir Coefficient = 2.6

Weir Embankment Coordinates num = 3
 Sta Elev Sta Elev Sta Elev

 344.9 944 405.2 943.39 432.1 944

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

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Upper RS: 12620.64

INPUT

Description:

Station Elevation Data num= 89

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960	3.86	958.01	3.88	958	3.99	957.95	7.66	956
9.65	955.32	13.5	954	16.77	952.83	19.15	952	20.44	951.55
24.94	950	30.99	948.48	32.56	948.24	32.67	948.24	33.14	947.98
34.35	947.37	36.85	946	37.29	945.79	37.48	945.74	37.79	945.71
40.17	945.6	56.42	945.6	57.24	945.98	57.3	946	57.59	946.12
58.64	946.74	60.13	948	60.51	948.41	60.74	948.47	64.17	948.02
64.31	948	125.24	947.2	129.74	947.14	204.91	946	215.75	946
256.82	945.04	258.5	945.01	266.4	944.91	277.96	944.74	281.59	944.7
331.66	944	352.33	944	361.73	944	366.82	944.25	368.73	944.28
391.55	944.75	392.44	944.26	392.92	944	394.84	942.94	395.95	942
396.02	941.87	396.68	941.24	404.34	940.13	409.38	940.84	409.86	941.77
410.03	942	410.8	943.2	411.3	943.73	411.37	943.74	416.83	943.73
418.21	943.82	420.42	944	420.87	944	429.35	944.57	436.52	945.05
438.12	945.47	443.08	946	455.96	947.44	457.61	947.63	460.42	948
473.48	949.79	474.51	950	480.14	951.25	483.59	952	485.09	952.33
490.99	953.56	492.15	954	492.87	954.27	493.89	954.64	494.86	954.88
496.15	955.02	504.75	955.85	506.14	956	506.91	956.27	509.18	957.02
511.98	958	515.97	959.34	517.54	959.73	518.13	959.99		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	391.55	.035	411.3	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	391.55	411.3	49.91	112.79	117.15	.1	.3
Ineffective Flow	num= 1						
Sta L	Sta R	Elev	Permanent				
0	411.2	943.39	T				

Blocked Obstructions num= 1
 Sta L Sta R Elev

 0 60.74 948.5

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 945.38	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.13	* wt. n-Val.	* 0.035	* 0.035	* 0.035	*
* W.S. Elev (ft)	* 945.26	* Reach Len. (ft)	* 49.91	* 112.79	* 117.15	*
* Crit W.S. (ft)	* 944.91	* Flow Area (sq ft)	* 118.52	* 35.14	* 25.54	*
* E.G. Slope (ft/ft)	* 0.004153	* Area (sq ft)	* 118.52	* 74.90	* 25.54	*
* Q Total (cfs)	* 482.70	* Flow (cfs)	* 284.72	* 129.08	* 68.90	*
* Top width (ft)	* 189.78	* Top width (ft)	* 144.02	* 19.75	* 26.01	*
* Vel Total (ft/s)	* 2.69	* Avg. vel. (ft/s)	* 2.40	* 3.67	* 2.70	*
* Max Chl Dpth (ft)	* 5.13	* Hydr. Depth (ft)	* 0.82	* 1.78	* 0.98	*
* Conv. Total (cfs)	* 7490.0	* Conv. (cfs)	* 4418.0	* 2002.9	* 1069.1	*
* Length wtd. (ft)	* 94.56	* Wetted Per. (ft)	* 144.04	* 22.59	* 26.08	*
* Min Ch El (ft)	* 940.13	* Shear (lb/sq ft)	* 0.21	* 0.40	* 0.25	*
* Alpha	* 1.11	* Stream Power (lb/ft s)	* 518.13	* 0.00	* 0.00	*
* Frctn Loss (ft)	* 0.68	* Cum volume (acre-ft)	* 5.43	* 3.15	* 1.05	*
* C & E Loss (ft)	* 0.13	* Cum SA (acres)	* 5.51	* 0.89	* 0.89	*

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

OXF157-159Bridges.rep

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	*
* 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	* 0.99	*
* E.G. Slope (ft/ft)	* 0.015247	* Area (sq ft)	* 50.52	* 0.99	*
* Q Total (cfs)	* 482.70	* Flow (cfs)	* 481.57	* 1.13	*
* Top Width (ft)	* 21.54	* Top width (ft)	* 17.22	* 4.32	*
* Vel Total (ft/s)	* 9.37	* Avg. vel. (ft/s)	* 9.53	* 1.14	*
* Max Chl Dpth (ft)	* 4.04	* Hydr. Depth (ft)	* 2.93	* 0.23	*
* Conv. Total (cfs)	* 3909.2	* Conv. (cfs)	* 3900.0	* 9.1	*
* Length Wtd. (ft)	* 210.75	* Wetted Per. (ft)	* 20.60	* 4.35	*
* Min Ch El (ft)	* 939.14	* Shear (lb/sq ft)	* 2.33	* 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	* 2.99	* 1.01
* 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	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	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	*	*
* 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	*	*

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* 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  * 2.62 * 1.01 *
* C & E Loss (ft)     * 0.02  * Cum SA (acres)    * 5.38  * 0.70 * 0.83 *
*****

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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= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	995	66.4	994	158.8	948	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	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

CROSS SECTION OUTPUT Profile #PF 1

```

*****
* 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  *
*****

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* 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 * 2.57 * 1.00 *
* 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  * 2.49  * 0.99 *
* 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
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 * 2.32 * 0.99 *
 * 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
 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

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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)	* 3.33	* 2.20	* 0.99
* 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

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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
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	* 2.05	* 0.96
* 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	Sta	n val
0	.06	299.93	.035	314.29	.1

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

OXF157-159Bridges.rep

* 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	* 1.79	* 0.93
* 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	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		
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		

OXF157-159Bridges.rep

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	* 1.66	* 0.90
* 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
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

OXF157-159Bridges.rep

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

 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	* Wt. n-Val.	* 0.060	* 0.035	* 0.060
* W.S. Elev (ft)	* 935.73	* Reach Len. (ft)	* 205.41	* 261.21	* 240.88
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 239.54	* 77.49	* 62.05
* E.G. Slope (ft/ft)	* 0.000924	* Area (sq ft)	* 239.54	* 77.49	* 62.05
* Q Total (cfs)	* 601.90	* Flow (cfs)	* 286.31	* 251.73	* 63.86
* Top Width (ft)	* 173.54	* Top width (ft)	* 119.52	* 15.34	* 38.69
* Vel Total (ft/s)	* 1.59	* Avg. Vel. (ft/s)	* 1.20	* 3.25	* 1.03
* Max Chl Dpth (ft)	* 5.82	* Hydr. Depth (ft)	* 2.00	* 5.05	* 1.60
* Conv. Total (cfs)	* 19798.9	* Conv. (cfs)	* 9417.9	* 8280.4	* 2100.6
* Length wtd. (ft)	* 242.94	* wetted Per. (ft)	* 119.75	* 19.40	* 38.83
* Min Ch El (ft)	* 929.91	* Shear (lb/sq ft)	* 0.12	* 0.23	* 0.09
* Alpha	* 2.06	* Stream Power (lb/ft s)	* 356.27	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.56	* Cum volume (acre-ft)	* 0.97	* 1.41	* 0.74
* 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= 78

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	207.6	936	241.9	946	260.8	946
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
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
* 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	* 1.06	* 0.48

* 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= 94

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
222	936	244.6	942	273.4	942	290.7	938	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	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 * 0.80 * 0.39 *
 * 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
 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

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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	*	0.46	*	0.06	*
* 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
-----	------	-----	------	-----	------	-----	------

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```
*****
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	.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
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
4	39	.024	.024	0	.9	1	

Upstream 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
* 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 Nml 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	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	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

* 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

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```
* 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 * 0.23 * 0.06 *
* 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= 84

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	315.96	934	321.4	932.5	326.6	934.19
346.8	935.37	379.9	937.29	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
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 *
*****
```

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* 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)	* 0.39	* Cum Volume (acre-ft)	* 0.04	* 0.12	* 0.06
* 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: Bluestone Creek
 REACH: Middle RS: 9989.380

INPUT

Description:

Station Elevation Data		num= 116									
Sta	Elev	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		
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	430.01	931.64		
442.98	932.41	456.83	933.25	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 .035 320.05 .035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 275.63 320.05 195.82 107.19 3.14 .1 .3
 Ineffective Flow num= 1
 Sta L Sta R Elev Permanent
 377.89 738.37 929.84 T

CROSS SECTION OUTPUT Profile #PF 1

```

*****
* E.G. Elev (ft) * 930.91 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 0.46 * Wt. n-Val. * 0.035 * 0.035 * 0.035 *
* W.S. Elev (ft) * 930.45 * Reach Len. (ft) * 195.82 * 107.19 * 3.14 *
* Crit W.S. (ft) * 930.45 * Flow Area (sq ft) * 17.18 * 108.25 * 46.43 *
* E.G. Slope (ft/ft) * 0.006384 * Area (sq ft) * 17.18 * 108.25 * 46.43 *
* Q Total (cfs) * 763.60 * Flow (cfs) * 29.82 * 639.28 * 94.50 *
* Top width (ft) * 191.23 * Top width (ft) * 46.95 * 44.42 * 99.86 *
* Vel Total (ft/s) * 4.44 * Avg. Vel. (ft/s) * 1.74 * 5.91 * 2.04 *
* Max Chl Dpth (ft) * 4.45 * Hydr. Depth (ft) * 0.37 * 2.44 * 0.46 *
* Conv. Total (cfs) * 9556.9 * Conv. (cfs) * 373.2 * 8001.0 * 1182.7 *
* Length wtd. (ft) * 111.51 * Wetted Per. (ft) * 46.96 * 47.12 * 99.91 *
* Min Ch El (ft) * 926.00 * Shear (lb/sq ft) * 0.15 * 0.92 * 0.19 *
* Alpha * 1.51 * Stream Power (lb/ft s) * 738.37 * 0.00 * 0.00 *
* Frctn Loss (ft) * 0.15 * Cum Volume (acre-ft) * 8.39 * 7.52 * 5.19 *
* C & E Loss (ft) * 0.13 * Cum SA (acres) * 6.65 * 1.97 * 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: 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: 9878.981

INPUT

Description:

Station Elevation Data		num= 128		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	950	4.8	949.53	7.9	949.15	13.94	948.68	14.57	948.65		
19.82	948.64	22.92	948.43	28.6	948	36.23	947.42	38.01	947.28		
40.52	947.05	43.32	946.8	49.84	946	65.68	944.08	66.29	944		
68.72	943.53	77.49	942.88	85.06	942	90.53	941.35	92.76	941.02		
99.15	940	109.22	938.39	111.6	938	112.08	937.92	114.63	937.49		
122.08	936.19	123.13	936	130.87	934.55	133.79	934	134.08	933.94		
144.55	932	154.05	931.31	159.25	931.06	164.49	930.83	172.69	930		
190.8	930	241.47	929.03	242.52	929.03	246.37	928.91	252.9	928.72		
254.26	928.69	256.02	928.64	257.24	928.6	265.38	928.43	270.83	928.46		
272.2	928.45	302.77	928	328.21	928	351.67	928	357.35	928.03		
359.64	928.03	363.81	928	371.82	928	374.99	928.06	386.33	928.34		
396.74	928.95	396.9	928.63	397.31	928	397.65	927.15	397.67	927.13		
397.83	927.11	401.97	926.16	402.03	926.15	402.57	925.98	408.69	925.9		
408.75	925.9	421.17	925.64	421.31	925.63	422.27	925.77	423.32	926		
430.06	927.37	432.58	928	433.75	928.27	434.69	928.51	440.55	928.22		
443.31	928.17	449.78	928	477.57	928	480.12	928.03	484.5	928.02		
490.05	928.01	490.7	928.01	491.25	928	493.62	928.3	510.08	930		
516.31	931	518.01	930.99	522.1	932	523.47	932	527.88	933.02		
531.88	934	532.08	934	534.58	934.59	540.76	936	542.41	936		
554.21	936.98	557.73	937.17	562.44	937.36	572.35	938	586.11	938.71		
597.72	938.97	600.91	938.94	608.51	939.18	612.38	939.43	614.73	939.43		
615.77	939.46	624.09	940	638.78	940.69	640.88	940.79	644.35	940.93		
649.05	941.09	659.4	941.52	666.33	942	692.47	943.99	692.53	943.99		
692.59	943.99	692.88	944.01	725.52	946	737.66	946.97	739.81	947.16		
746.09	947.63	746.61	947.66	752.55	948	754.92	948.16	758.84	948.44		
773.85	949.46	776.43	949.67	781.45	950						

Manning's n Values		num= 3		Sta		n Val	
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.035	396.74	.035	434.69	.035		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	396.74	434.69		38.17	45.78	26.43	
						.1	.3

Ineffective Flow		num= 2		Sta		Elev		Permanent	
Sta L	Sta R	Elev	Permanent	Sta	Elev	Sta	Elev		
0	421.1	926.61	T						
421.2	781.45	926.61	T						

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 929.97	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.04	* wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 929.93	* Reach Len. (ft)	* 38.17	* 45.78	* 26.43
* Crit W.S. (ft)	* 928.74	* Flow Area (sq ft)	* 283.80	* 116.38	* 122.56
* E.G. Slope (ft/ft)	* 0.000552	* Area (sq ft)	* 283.80	* 134.31	* 122.56
* Q Total (cfs)	* 763.60	* Flow (cfs)	* 355.04	* 238.58	* 169.97

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* Top width (ft)	* 314.76	* Top width (ft)	* 202.13	* 37.95	* 74.68	*
* Vel Total (ft/s)	* 1.46	* Avg. vel. (ft/s)	* 1.25	* 2.05	* 1.39	*
* Max Chl Dpth (ft)	* 4.30	* Hydr. Depth (ft)	* 1.40	* 3.07	* 1.64	*
* Conv. Total (cfs)	* 32486.9	* Conv. (cfs)	* 15105.1	* 10150.4	* 7231.5	*
* Length wtd. (ft)	* 45.78	* Wetted Per. (ft)	* 202.17	* 39.52	* 74.80	*
* Min Ch El (ft)	* 925.63	* Shear (lb/sq ft)	* 0.05	* 0.10	* 0.06	*
* Alpha	* 1.16	* Stream Power (lb/ft s)	* 781.45	* 0.00	* 0.00	*
* Frctn Loss (ft)	*	* Cum Volume (acre-ft)	* 7.71	* 7.22	* 5.19	*
* C & E Loss (ft)	*	* Cum SA (acres)	* 6.09	* 1.87	* 5.46	*

INLINE STRUCTURE

RIVER: Bluestone Creek
 REACH: Middle RS: 9855.351

INPUT

Description:

Distance from Upstream XS = 12.5
 Deck/Roadway width = 20
 Weir Coefficient = 2.6

Weir Embankment Coordinates num = 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
65.68	944.08	201.4	944	235.1	942	257.5	940	278.5	938
300.9	936	321.4	934	341.7	932	361.8	930	382.3	928
395.5	927	405.07	926.61	434	927	447.1	928	470.92	930
495.6	932	525.1	934	564.5	936				

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

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Middle RS: 9831.906

INPUT

Description:

Station Elevation Data num= 103

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	950	.62	949.94	1.97	949.77	2.65	949.68	12.72	948.44
16.26	948	24.3	947.03	31.67	946.22	33.25	946.14	36.05	946
46.56	945.46	48.89	945.34	50.99	945.18	55.91	944.9	57.95	944.68
60.1	944.52	63.02	944.39	65.19	944.24	68.53	944	77.67	943.2

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87.53	942	88.02	941.94	88.59	941.86	92.27	941.19	98.96	940
100.01	939.81	102.09	939.46	109.74	938	113.2	937.35	117.77	936.75
122.15	936.19	123.91	936	135.87	934.87	139.96	934.13	140.13	934.11
140.69	934	142.26	933.7	147.64	932.68	151.24	932	153.9	931.83
158.53	931.45	177.34	930	179.69	930	189.56	929.72	208.57	929.28
210.24	929.31	275.59	928	362.44	928	413.03	928	430.29	928.49
430.85	928.5	434.04	928.55	434.11	928.43	434.38	928	435.37	926.06
435.42	926	435.96	925.22	436.02	925.17	436.53	925.03	440.72	924
441.16	924	443.57	924.61	447.27	924.94	448.43	925.87	450.36	926
454.8	926.27	459.96	926.65	528.73	928.39	528.77	928.41	528.82	928.43
533.83	930	538.24	931.38	540.23	932	541.75	932.49	546.66	934
548.26	934.51	553.19	936	554.61	936.46	559.48	938	577.6	939.07
590.07	939.69	591.24	939.73	595.65	940	597.48	940	613.88	940.57
624.97	940.82	637.69	941.46	647.48	942	656.53	942.42	661.12	942.55
670.37	942.89	676.39	943.05	679.98	943.21	684.39	943.31	688.66	943.57
694.37	944	723.14	945.97	723.56	946	723.64	946.01	723.7	946.01
723.86	946.02	753.12	948	771.15	950				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	434.04	.035	459.96	.06

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

434.04	459.96	9.93	158.21	292.75	.1	.3
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	440.7	926.61	T
440.8	771.15	926.61	T

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 928.93	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.22	* Wt. n-Val.	* 0.035	* 0.035	* 0.060
* W.S. Elev (ft)	* 928.71	* Reach Len. (ft)	* 9.93	* 158.21	* 292.75
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 118.90	* 53.62	* 81.99
* E.G. Slope (ft/ft)	* 0.006632	* Area (sq ft)	* 118.90	* 82.73	* 81.99
* Q Total (cfs)	* 763.60	* Flow (cfs)	* 296.71	* 282.85	* 184.04
* Top width (ft)	* 289.54	* Top width (ft)	* 193.87	* 25.92	* 69.75
* Vel Total (ft/s)	* 3.00	* Avg. Vel. (ft/s)	* 2.50	* 5.27	* 2.24
* Max Chl Dpth (ft)	* 4.71	* Hydr. Depth (ft)	* 0.61	* 2.07	* 1.18
* Conv. Total (cfs)	* 9376.7	* Conv. (cfs)	* 3643.5	* 3473.3	* 2259.9
* Length Wtd. (ft)	* 133.44	* Wetted Per. (ft)	* 193.88	* 28.46	* 69.83
* Min Ch El (ft)	* 924.00	* Shear (lb/sq ft)	* 0.25	* 0.78	* 0.49
* Alpha	* 1.55	* Stream Power (lb/ft s)	* 771.15	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.74	* Cum Volume (acre-ft)	* 7.71	* 6.89	* 5.19
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 5.92	* 1.83	* 5.41

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Middle

RS: 9559.249

INPUT
 Description:

Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	924	57.9	924	101.99	944	228.9	944	264.2	928
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	518.5	942	564.97	957

Manning's n Values num= 3

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	
Left Levee		Station=	228.9	Elevation=	944	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 928.16	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.44	* 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)	* 99.58	* 60.22	* 56.90
* E.G. Slope (ft/ft)	* 0.004763	* Area (sq ft)	* 99.58	* 60.22	* 56.90
* Q Total (cfs)	* 763.60	* Flow (cfs)	* 230.98	* 416.30	* 116.32
* Top width (ft)	* 199.46	* Top width (ft)	* 141.31	* 14.75	* 43.39
* Vel Total (ft/s)	* 3.52	* Avg. vel. (ft/s)	* 2.32	* 6.91	* 2.04
* Max Chl Dpth (ft)	* 4.69	* Hydr. Depth (ft)	* 0.70	* 4.08	* 1.31
* Conv. Total (cfs)	* 11063.9	* Conv. (cfs)	* 3346.6	* 6031.8	* 1685.4
* Length wtd. (ft)	* 75.03	* wetted Per. (ft)	* 141.37	* 16.61	* 43.50
* Min Ch El (ft)	* 923.03	* Shear (lb/sq ft)	* 0.21	* 1.08	* 0.39
* Alpha	* 2.28	* Stream Power (lb/ft s)	* 564.97	* 228.90	* 0.00
* Frctn Loss (ft)	* 0.36	* Cum Volume (acre-ft)	* 7.69	* 6.63	* 4.72
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 5.88	* 1.76	* 5.03

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.

OXF157-159Bridges.rep

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

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

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Middle RS: 9443.656

INPUT

Description:

Station Elevation Data		num= 55	
Sta	Elev	Sta	Elev
0	924	60.05	924
274.3	925.56	292.5	926
342.39	925.93	363.18	925.08
365.42	922.91	365.43	922.9
380.44	924	381.13	924.16
383.93	926	383.94	926.01
445.48	926	447.38	928
454.14	932	454.84	932.4
460.71	936	460.9	936.1
470.48	940.71	473.58	942
483.89	946	484.96	946.45

Manning's n Values		num= 3	
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
Left Levee	Station=	219.6	Elevation=	944		

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 927.23	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.35	* Wt. n-Val.	* 0.035	* 0.035	* 0.100
* W.S. Elev (ft)	* 926.88	* Reach Len. (ft)	* 30.34	* 114.86	* 56.64
* Crit W.S. (ft)	* 926.74	* Flow Area (sq ft)	* 110.78	* 66.38	* 45.60
* E.G. slope (ft/ft)	* 0.004727	* Area (sq ft)	* 110.78	* 66.38	* 45.60
* Q Total (cfs)	* 763.60	* Flow (cfs)	* 327.34	* 398.61	* 37.65
* Top Width (ft)	* 191.67	* Top width (ft)	* 108.54	* 20.75	* 62.38
* Vel Total (ft/s)	* 3.43	* Avg. vel. (ft/s)	* 2.95	* 6.00	* 0.83
* Max Chl Dpth (ft)	* 4.02	* Hydr. Depth (ft)	* 1.02	* 3.20	* 0.73
* Conv. Total (cfs)	* 11106.0	* Conv. (cfs)	* 4760.9	* 5797.5	* 547.6

OXF157-159Bridges.rep

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* Length Wtd. (ft)      * 80.93 * Wetted Per. (ft)    * 108.77 * 22.50 * 62.78 *
* Min Ch El (ft)      * 922.86 * Shear (lb/sq ft)   * 0.30 * 0.87 * 0.21 *
* Alpha                * 1.92 * Stream Power (lb/ft s) * 495.25 * 219.60 * 0.00 *
* Frctn Loss (ft)     * 0.17 * Cum Volume (acre-ft) * 7.64 * 6.48 * 4.59 *
* C & E Loss (ft)     * 0.06 * Cum SA (acres)     * 5.82 * 1.71 * 4.90 *
*****
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Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.

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

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Middle RS: 9322.807

INPUT
 Description:

Station Elevation Data num= 63

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	924	102.02	944	191.63	944	226.4	928	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	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
 Left Levee Station= 191.63 Elevation= 944

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 *
*****
```

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* Crit W.S. (ft)	* 925.06	* Flow Area (sq ft)	* 93.49	* 118.36	* 173.89
* E.G. Slope (ft/ft)	* 0.001147	* Area (sq ft)	* 93.49	* 118.36	* 173.89
* Q Total (cfs)	* 763.60	* Flow (cfs)	* 149.67	* 454.09	* 159.84
* Top width (ft)	* 174.57	* Top width (ft)	* 79.51	* 24.87	* 70.19
* Vel Total (ft/s)	* 1.98	* Avg. vel. (ft/s)	* 1.60	* 3.84	* 0.92
* Max Chl Dpth (ft)	* 5.57	* Hydr. Depth (ft)	* 1.18	* 4.76	* 2.48
* Conv. Total (cfs)	* 22549.9	* Conv. (cfs)	* 4420.0	* 13409.7	* 4720.3
* Length wtd. (ft)	* 57.28	* Wetted Per. (ft)	* 79.56	* 27.15	* 70.42
* Min Ch El (ft)	* 921.28	* Shear (lb/sq ft)	* 0.08	* 0.31	* 0.18
* Alpha	* 2.41	* Stream Power (lb/ft s)	* 452.79	* 191.63	* 0.00
* Frctn Loss (ft)	* 0.15	* Cum Volume (acre-ft)	* 7.57	* 6.24	* 4.45
* C & E Loss (ft)	* 0.09	* Cum SA (acres)	* 5.76	* 1.65	* 4.81

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

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

This may indicate the need for additional cross sections.

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

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Middle

RS: 9266.019

INPUT

Description:

Station Elevation Data		num= 72		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	952	56.9	946	64.95	944	75.5	944	158.53	944
201.45	930	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) * 7.44 * 6.12 * 4.34 *
* C & E Loss (ft) * 0.18 * Cum SA (acres) * 5.63 * 1.62 * 4.75 *
*****
```

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= 73
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 64.3 950
123.3 930 124.47 929.19 150.31 928 162.33 927.31 167.22 927.22
```

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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	71.3	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 924.92	* Element	* Left OB	* Channel	* Right OB
* 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)	* 7.41	* 5.74	* 4.25
* C & E Loss (ft)	* 0.04	* Cum SA (acres)	* 5.60	* 1.48	* 4.60

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Middle RS: 8906.253

INPUT

Description:

Station Elevation Data num= 63

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	976	46.1	976	144.2	928	150.82	926.26
						153.19	926

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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
0	.035	311.14	.035	321.29	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	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)	* 7.23	* 5.63	* 4.22
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 5.41	* 1.44	* 4.58

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Middle RS: 8843.186

INPUT

Description:

Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	976	103.93	926	109.9	925.11	128.5	924	128.7	924

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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)	* 6.90	* 5.58	* 4.16
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 5.11	* 1.43	* 4.55

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:

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Station Elevation Data		num= 57		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	975	99.94	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	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	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)	* 6.71	* 5.32	* 4.11
* C & E Loss (ft)	* 0.04	* Cum SA (acres)	* 4.94	* 1.36	* 4.52

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Middle RS: 8542.514

INPUT
 Description:
 Station Elevation Data num= 52

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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
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		.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)	* 6.10	* 4.93	* 4.06
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 4.54	* 1.26	* 4.49

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	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
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	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)	* 5.17	* 4.71	* 3.99
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 3.82	* 1.21	* 4.42

Warning: The energy loss was 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
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
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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	* Wvtd. 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)	* 5.08	* 4.50	* 3.37
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 3.71	* 1.15	* 3.64

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

depth for the water surface and continued on with the calculations.
 Warning: The energy loss was 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	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	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

OXF157-159Bridges.rep

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*****
* 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   *
* 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) * 5.00   * 4.32   * 2.92   *
* C & E Loss (ft)   * 0.06  * Cum SA (acres)   * 3.61   * 1.09   * 3.08   *
*****
    
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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	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

 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)	* 4.84	* 4.09	* 2.12
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 3.52	* 1.02	* 2.04

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	
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
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	

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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)	* 3.32	* 3.91	* 2.08
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 2.57	* 0.97	* 1.97

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

for the water surface and continued on with the calculations.

Warning: The energy loss was 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
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)	* 3.13	* 3.56	* 1.81
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 2.42	* 0.86	* 1.55

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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	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	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  *
* 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)    * 0.70  * Cum Volume (acre-ft) * 3.03  * 3.17  * 1.48  *
* C & E Loss (ft)    * 0.00  * Cum SA (acres)   * 2.30  * 0.73  * 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: 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)	* 93.32	* 44.55	* 36.16	*
* E.G. Slope (ft/ft)	* 0.008952	* Area (sq ft)	* 93.32	* 44.55	* 36.16	*
* Q Total (cfs)	* 855.60	* Flow (cfs)	* 388.97	* 348.22	* 118.41	*
* Top Width (ft)	* 151.57	* Top Width (ft)	* 88.25	* 14.23	* 49.09	*
* 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)	* 9043.1	* Conv. (cfs)	* 4111.2	* 3680.4	* 1251.5	*
* Length Wtd. (ft)	* 142.11	* Wetted Per. (ft)	* 88.27	* 16.42	* 49.11	*
* 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)	* 0.86	* Cum Volume (acre-ft)	* 2.84	* 3.05	* 1.42	*
* C & E Loss (ft)	* 0.09	* Cum SA (acres)	* 2.09	* 0.70	* 1.02	*

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

for the water surface and continued on with the calculations.

Warning: 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: 6323.723

INPUT
 Description:

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Station Elevation Data		num= 113		Sta		Elev		Sta		Elev	
Sta	Elev	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		
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	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

Ineffective Flow		num= 2		Sta		Elev		Permanent	
Sta L	Sta R	Elev	Permanent	Sta	Elev	Sta	Elev		
0	165.3	910.26	T						
165.38	380.19	910.26	T						

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

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 912.89	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.22	* wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 912.67	* Reach Len. (ft)	* 34.18	* 34.13	* 38.06
* Crit W.S. (ft)	* 911.92	* Flow Area (sq ft)	* 70.36	* 29.53	* 134.19
* E.G. Slope (ft/ft)	* 0.004363	* Area (sq ft)	* 72.32	* 45.58	* 136.82
* Q Total (cfs)	* 855.60	* Flow (cfs)	* 279.43	* 143.26	* 432.91
* Top width (ft)	* 162.63	* Top width (ft)	* 41.59	* 12.26	* 108.78

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* Vel Total (ft/s)      * 3.66 * Avg. Vel. (ft/s)    * 3.97 * 4.85 * 3.23 *
* Max Chl Dpth (ft)    * 4.26 * Hydr. Depth (ft)   * 1.69 * 2.41 * 1.23 *
* Conv. Total (cfs)    * 12953.8 * Conv. (cfs)        * 4230.6 * 2168.9 * 6554.3 *
* Length Wtd. (ft)     * 34.13 * Wetted Per. (ft)   * 41.74 * 12.97 * 108.85 *
* Min Ch El (ft)       * 908.41 * Shear (lb/sq ft)   * 0.46 * 0.62 * 0.34 *
* Alpha                 * 1.07 * Stream Power (lb/ft s) * 380.19 * 0.00 * 0.00 *
* Frctn Loss (ft)      *      * Cum Volume (acre-ft) * 2.38 * 2.91 * 1.36 *
* C & E Loss (ft)      *      * Cum SA (acres)     * 1.73 * 0.66 * 0.97 *
*****

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INLINE STRUCTURE

RIVER: Bluestone Creek
 REACH: Middle RS: 6303.783

INPUT

Description:

Distance from Upstream XS = 10
 Deck/Roadway width = 20
 Weir Coefficient = 2.6

Weir Embankment Coordinates num = 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
104.9	912	160.65	910.26	192.05	910.78	234.9	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

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	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		
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		

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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
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 165.35 910.26 T
 165.41 361.44 910.26 T
 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)	* 912.64	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.46	* Wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 912.18	* Reach Len. (ft)	* 17.53	* 109.18	* 143.43
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 52.28	* 25.87	* 81.16
* E.G. Slope (ft/ft)	* 0.010471	* Area (sq ft)	* 54.77	* 42.85	* 82.23
* Q Total (cfs)	* 855.60	* Flow (cfs)	* 258.90	* 164.56	* 432.14
* Top width (ft)	* 116.12	* Top width (ft)	* 42.88	* 13.50	* 59.74
* Vel Total (ft/s)	* 5.37	* Avg. Vel. (ft/s)	* 4.95	* 6.36	* 5.32
* Max Chl Dpth (ft)	* 4.11	* Hydr. Depth (ft)	* 1.22	* 1.92	* 1.36
* Conv. Total (cfs)	* 8361.4	* Conv. (cfs)	* 2530.1	* 1608.2	* 4223.1
* Length Wtd. (ft)	* 80.04	* wetted Per. (ft)	* 42.95	* 14.61	* 59.81
* Min Ch El (ft)	* 908.07	* Shear (lb/sq ft)	* 0.80	* 1.16	* 0.89
* Alpha	* 1.02	* Stream Power (lb/ft s)	* 361.44	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.42	* Cum Volume (acre-ft)	* 2.38	* 2.72	* 1.36
* C & E Loss (ft)	* 0.04	* Cum SA (acres)	* 1.70	* 0.65	* 0.90

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
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)	* 2.34	* 2.59	* 1.16
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 1.67	* 0.61	* 0.75

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)	* 2.11	* 2.44	* 0.98
* C & E Loss (ft)	* 0.12	* Cum SA (acres)	* 1.50	* 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
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
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

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* W.S. Elev (ft)	* 910.34	* Reach Len. (ft)	* 150.38	* 175.20	* 214.49
* 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)	* 1.71	* 2.23	* 0.89
* C & E Loss (ft)	* 0.05	* Cum SA (acres)	* 1.22	* 0.52	* 0.58

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	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
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) * 1.31 * 1.99 * 0.74 *
* C & E Loss (ft)   * 0.02  * Cum SA (acres)   * 0.94 * 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	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		

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194.8	903.69	196.3	904.13	197.49	904.46	197.66	904.52	197.69	904.53
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)	* 70.57	* 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)	* 0.50	* Cum volume (acre-ft)	* 1.13	* 1.81	* 0.66	*
* C & E Loss (ft)	* 0.08	* Cum SA (acres)	* 0.78	* 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

INPUT

Description:

Station Elevation Data		num= 84		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	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	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

Blocked Obstructions		num= 1		Sta L Sta R Elev	
Sta L	Sta R	Elev			
0	124.18	907.83			

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 907.48	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.74	* wt. n-val.	* 0.035	* 0.035	* 0.100
* w.s. Elev (ft)	* 906.74	* Reach Len. (ft)	* 6.86	* 80.28	* 173.13
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 2.10	* 124.43	* 0.29
* E.G. Slope (ft/ft)	* 0.005575	* Area (sq ft)	* 2.10	* 124.43	* 0.29
* Q Total (cfs)	* 865.00	* Flow (cfs)	* 3.32	* 861.54	* 0.13
* Top Width (ft)	* 42.83	* Top width (ft)	* 5.93	* 36.13	* 0.77
* Vel Total (ft/s)	* 6.82	* Avg. vel. (ft/s)	* 1.58	* 6.92	* 0.47
* Max Chl Dpth (ft)	* 3.90	* Hydr. Depth (ft)	* 0.35	* 3.44	* 0.38
* Conv. Total (cfs)	* 11585.0	* Conv. (cfs)	* 44.5	* 11538.7	* 1.8
* Length wtd. (ft)	* 59.55	* wetted Per. (ft)	* 5.98	* 38.55	* 1.06
* Min Ch El (ft)	* 902.84	* Shear (lb/sq ft)	* 0.12	* 1.12	* 0.09
* Alpha	* 1.03	* Stream Power (lb/ft s)	* 285.23	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.14	* Cum volume (acre-ft)	* 1.12	* 1.63	* 0.66

* C & E Loss (ft) * 0.19 * Cum SA (acres) * 0.77 * 0.36 * 0.46 *

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

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

This may indicate the need for additional cross sections.

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	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	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 30.52 .1 .3

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 174.3 903.71 T
 174.4 390.15 903.71 T

CROSS SECTION OUTPUT Profile #PF 1

OXF157-159Bridges.rep

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*****
* E.G. Elev (ft)      * 907.15 * Element          * Left OB * Channel * Right OB *
* Vel Head (ft)      * 0.12  * Wt. n-Val.      * 0.035  * 0.035  * 0.060  *
* W.S. Elev (ft)     * 907.03 * Reach Len. (ft) * 34.62  * 29.59  * 30.52  *
* Crit W.S. (ft)     * 905.45 * Flow Area (sq ft) * 212.90 * 54.71  * 66.07  *
* E.G. Slope (ft/ft) * 0.001313 * Area (sq ft) * 223.62 * 70.73  * 66.13  *
* Q Total (cfs)      * 865.00 * Flow (cfs)      * 594.57 * 183.99 * 86.44  *
* Top width (ft)     * 140.55 * Top width (ft)  * 86.75  * 16.44  * 37.36  *
* Vel Total (ft/s)   * 2.59  * Avg. vel. (ft/s) * 2.79  * 3.36  * 1.31  *
* Max Chl Dpth (ft) * 4.61  * Hydr. Depth (ft) * 2.45  * 3.33  * 1.77  *
* Conv. Total (cfs)  * 23875.6 * Conv. (cfs)     * 16411.3 * 5078.5 * 2385.9 *
* Length wtd. (ft)   * 29.59  * Wetted Per. (ft) * 87.02  * 16.92  * 37.53  *
* Min Ch El (ft)    * 902.42 * Shear (lb/sq ft) * 0.20  * 0.26  * 0.14  *
* Alpha              * 1.18  * Stream Power (lb/ft s) * 390.15 * 0.00  * 0.00  *
* Frctn Loss (ft)   *        * Cum Volume (acre-ft) * 1.10  * 1.45  * 0.52  *
* C & E Loss (ft)   *        * Cum SA (acres)   * 0.77  * 0.31  * 0.38  *
*****

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INLINE STRUCTURE

RIVER: Bluestone Creek
 REACH: Middle RS: 5395.595

INPUT

Description:

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

Weir Embankment Coordinates num = 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
88.31	906	150.4	904	170.68	903.71	190.8	904

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

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
-----	------	-----	------	-----	------	-----	------	-----	------

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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 69.17 .1 .3
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 158.1 903.71 T
 158.2 380.55 903.71 T

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 907.10	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.10	* Wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 907.00	* Reach Len. (ft)	* 110.49	* 88.75	* 69.17
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 158.11	* 39.37	* 146.99
* E.G. Slope (ft/ft)	* 0.001210	* Area (sq ft)	* 162.07	* 55.17	* 157.31
* Q Total (cfs)	* 865.00	* Flow (cfs)	* 363.45	* 127.19	* 374.36
* Top width (ft)	* 158.00	* Top width (ft)	* 81.31	* 11.95	* 64.74
* Vel Total (ft/s)	* 2.51	* Avg. Vel. (ft/s)	* 2.30	* 3.23	* 2.55
* Max Chl Dpth (ft)	* 4.72	* Hydr. Depth (ft)	* 1.94	* 3.29	* 2.27
* Conv. Total (cfs)	* 24865.2	* Conv. (cfs)	* 10447.8	* 3656.2	* 10761.2
* Length wtd. (ft)	* 85.50	* Wetted Per. (ft)	* 81.43	* 12.17	* 64.91
* Min ch El (ft)	* 902.28	* Shear (lb/sq ft)	* 0.15	* 0.24	* 0.17
* Alpha	* 1.04	* Stream Power (lb/ft s)	* 380.55	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.23	* Cum Volume (acre-ft)	* 1.10	* 1.23	* 0.52
* C & E Loss (ft)	* 0.09	* Cum SA (acres)	* 0.70	* 0.30	* 0.35

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

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

This may indicate the need for additional cross sections.

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

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

CROSS SECTION OUTPUT Profile #PF 1

* 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

OXF157-159Bridges.rep

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* 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) * 0.90 * 1.12 * 0.31 *
* C & E Loss (ft)     * 0.03 * Cum SA (acres)      * 0.59 * 0.27 * 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: Middle

RS: 5071.499

INPUT
 Description:

Station Elevation Data		num= 84									
Sta	Elev	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		
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) * 0.56  * 0.84   * 0.22  *
* C & E Loss (ft)   * 0.03  * Cum SA (acres)   * 0.36  * 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	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		

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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

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)	* 139.18	* 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)	* 0.29	* Cum Volume (acre-ft)	* 0.26	* 0.51	* 0.18
* C & E Loss (ft)	* 0.31	* 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: 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	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	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	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 901.56	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.14	* Wt. n-Val.	* 0.100	* 0.035	* 0.060
* W.S. Elev (ft)	* 901.41	* Reach Len. (ft)	* 20.21	* 20.21	* 20.21
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 224.17	* 159.59	* 148.80
* E.G. Slope (ft/ft)	* 0.000919	* Area (sq ft)	* 224.17	* 159.59	* 148.80
* Q Total (cfs)	* 865.00	* Flow (cfs)	* 153.69	* 586.17	* 125.14
* Top Width (ft)	* 274.68	* Top width (ft)	* 119.31	* 30.93	* 124.44
* Vel Total (ft/s)	* 1.62	* Avg. vel. (ft/s)	* 0.69	* 3.67	* 0.84
* Max chl Dpth (ft)	* 5.59	* Hydr. Depth (ft)	* 1.88	* 5.16	* 1.20
* Conv. Total (cfs)	* 28536.9	* Conv. (cfs)	* 5070.5	* 19338.1	* 4128.3

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* Length wtd. (ft)      * 20.21 * Wetted Per. (ft)      * 119.36 * 33.10 * 125.49 *
* Min Ch El (ft)      * 895.82 * Shear (lb/sq ft)      * 0.11 * 0.28 * 0.07 *
* Alpha                * 3.54 * Stream Power (lb/ft s) * 443.09 * 0.00 * 0.00 *
* Frctn Loss (ft)     * 0.05 * Cum Volume (acre-ft)  * 0.05 * 0.06 * 0.06 *
* C & E Loss (ft)     * 0.06 * 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
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

Ineffective Flow num= 1
 Sta L Sta R Elev Permanent
 0 327.5 897.88 T

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)      * 901.45 * Element          * Left OB * Channel * Right OB *
* Vel Head (ft)      * 0.72  * Wt. n-Val.      * 0.100  * 0.035  * 0.060  *
* W.S. Elev (ft)     * 900.73 * Reach Len. (ft) * 12.96  * 56.50  * 9.53   *
* Crit W.S. (ft)     * 900.73 * Flow Area (sq ft) * 0.51  * 76.42  * 107.38 *
* E.G. Slope (ft/ft) * 0.011127 * Area (sq ft)    * 0.51  * 111.83 * 107.38 *
* Q Total (cfs)      * 914.40 * Flow (cfs)      * 0.36  * 615.82 * 298.23 *
* Top Width (ft)     * 130.49 * Top width (ft)  * 1.50  * 29.70  * 99.28  *
* Vel Total (ft/s)   * 4.96  * Avg. vel. (ft/s) * 0.70  * 8.06   * 2.78   *
* Max Chl Dpth (ft) * 4.98  * Hydr. Depth (ft) * 0.34  * 2.57   * 1.08   *
* Conv. Total (cfs)  * 8668.4 * Conv. (cfs)     * 3.4   * 5837.9 * 2827.2 *
* Length Wtd. (ft)   * 56.50 * Wetted Per. (ft) * 1.68  * 31.66  * 99.60  *
* Min Ch El (ft)     * 895.75 * Shear (lb/sq ft) * 0.21  * 1.68   * 0.75   *
* Alpha              * 1.88  * Stream Power (lb/ft s) * 522.73 * 0.00   * 0.00   *
* Frctn Loss (ft)   *        * Cum Volume (acre-ft) * 3.76  * 8.29   * 4.34   *
* C & E Loss (ft)   *        * Cum SA (acres)    * 2.17  * 1.74   * 2.46   *
*****
    
```

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: 4657.419

INPUT

Description:
 Distance from Upstream XS = 15.5
 Deck/Roadway width = 20
 Weir Coefficient = 2.6
 Weir Embankment Coordinates num = 3

Sta	Elev	Sta	Elev	Sta	Elev
300.5	898	311.7	897.88	330.9	898

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

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	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		
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
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Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	356.5	897.88	T

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 900.45	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.63	* Wt. n-Val.	* 0.100	* 0.035	* 0.060
* W.S. Elev (ft)	* 899.81	* Reach Len. (ft)	* 4.13	* 67.17	* 17.78
* Crit w.s. (ft)	* 899.81	* Flow Area (sq ft)	* 20.65	* 39.74	* 124.43
* E.G. Slope (ft/ft)	* 0.021215	* Area (sq ft)	* 21.13	* 74.23	* 124.43
* Q Total (cfs)	* 914.40	* Flow (cfs)	* 58.16	* 356.61	* 499.63
* Top width (ft)	* 140.03	* Top width (ft)	* 13.60	* 20.55	* 105.88
* Vel Total (ft/s)	* 4.95	* Avg. Vel. (ft/s)	* 2.82	* 8.97	* 4.02
* Max Chl Dpth (ft)	* 4.22	* Hydr. Depth (ft)	* 1.52	* 1.93	* 1.18
* Conv. Total (cfs)	* 6277.9	* Conv. (cfs)	* 399.3	* 2448.3	* 3430.2
* Length wtd. (ft)	* 34.84	* Wetted Per. (ft)	* 13.91	* 22.74	* 105.95
* Min Ch El (ft)	* 895.59	* Shear (lb/sq ft)	* 1.97	* 2.32	* 1.56
* Alpha	* 1.66	* Stream Power (lb/ft s)	* 521.70	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.29	* Cum Volume (acre-ft)	* 3.76	* 7.91	* 4.34
* C & E Loss (ft)	* 0.10	* Cum SA (acres)	* 2.17	* 1.71	* 2.44

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

for the water surface and continued on with the calculations.

warning: The 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: 4559.288

INPUT

Description:

Station Elevation Data

num= 76

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	924	72.03	930.3	104.95	926.46	241.39	907.97	272.23	903.38
282.37	902.24	285.46	900.75	287.95	902	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) * 20.93  * 55.67  * 144.85 *
* E.G. slope (ft/ft) * 0.004331 * Area (sq ft)    * 20.93  * 55.67  * 144.85 *
* Q Total (cfs)      * 914.40 * Flow (cfs)       * 45.27  * 303.53 * 565.60 *
* Top width (ft)     * 137.45 * Top width (ft)   * 30.69  * 19.38  * 87.38  *
* Vel Total (ft/s)   * 4.13  * Avg. Vel. (ft/s) * 2.16  * 5.45  * 3.90  *
* Max chl Dpth (ft) * 3.58  * Hydr. Depth (ft) * 0.68  * 2.87  * 1.66  *
* Conv. Total (cfs) * 13894.5 * Conv. (cfs)      * 687.8  * 4612.2 * 8594.5 *
* Length wtd. (ft)  * 163.17 * Wetted Per. (ft) * 30.72  * 20.42  * 87.67  *
* Min ch El (ft)    * 895.41 * Shear (lb/sq ft) * 0.18  * 0.74  * 0.45  *
* Alpha             * 1.15  * Stream Power (lb/ft s) * 538.72 * 0.00  * 0.00  *
* Frctn Loss (ft)   * 0.60  * Cum Volume (acre-ft) * 3.76  * 7.81  * 4.29  *
* C & E Loss (ft)   * 0.01  * Cum SA (acres)    * 2.17  * 1.68  * 2.40  *
*****
    
```

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Lower RS: 4258.834

INPUT
 Description:

Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	934	20.62	938.5	35.4	937.2	50.14	935.47	91	918
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	198.6	902	209.6	897.34	212.8	898.89	228.3	899.52
240.6	899.28	243.8	898.16	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

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) * 898.28 * Reach Len. (ft) * 15.43 * 180.39 * 150.97 *
 * Crit W.S. (ft) * * * Flow Area (sq ft) * 89.06 * 123.71 * 0.46 *
 * E.G. Slope (ft/ft) * 0.003174 * Area (sq ft) * 89.06 * 123.71 * 0.46 *
 * Q Total (cfs) * 914.40 * Flow (cfs) * 218.71 * 695.51 * 0.19 *
 * Top Width (ft) * 118.21 * Top width (ft) * 85.57 * 31.56 * 1.08 *
 * Vel Total (ft/s) * 4.29 * Avg. vel. (ft/s) * 2.46 * 5.62 * 0.40 *
 * Max Chl Dpth (ft) * 5.11 * Hydr. Depth (ft) * 1.04 * 3.92 * 0.43 *
 * Conv. Total (cfs) * 16229.5 * Conv. (cfs) * 3881.8 * 12344.4 * 3.3 *
 * Length Wtd. (ft) * 156.43 * Wetted Per. (ft) * 85.62 * 34.33 * 1.38 *
 * Min Ch El (ft) * 893.17 * Shear (lb/sq ft) * 0.21 * 0.71 * 0.07 *
 * Alpha * 1.39 * Stream Power (lb/ft s) * 415.64 * 0.00 * 0.00 *
 * Frctn Loss (ft) * 0.77 * Cum volume (acre-ft) * 3.73 * 7.51 * 3.85 *
 * C & E Loss (ft) * 0.05 * Cum SA (acres) * 2.14 * 1.60 * 2.13 *

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

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Lower RS: 4054.239

INPUT
 Description:

Station Elevation Data num= 65
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

 0 941.3 10.99 941.26 21.99 940.09 66.66 918 78.95 916
 79.54 916 92.08 914.78 95.42 914.44 100.98 914 116.74 912.15
 118.15 912 118.27 911.98 129.78 910 133.83 909.22 134.88 908
 158.33 896.61 161.4 898.11 171.8 898.4 182.2 897.89 189.06 897.63
 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

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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)	* 3.72	* 7.11	* 3.59
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 2.13	* 1.49	* 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

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RIVER: Bluestone Creek
 REACH: Lower RS: 3934.570

INPUT
 Description:

Station Elevation Data num= 64

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	34.88	910
65.74	896.02	69.4	897.35	81.65	897.24	93.89	896.45	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	* 149.37
* E.G. Slope (ft/ft)	* 0.009531	* Area (sq ft)	*	* 74.90	* 149.37
* Q Total (cfs)	* 914.40	* Flow (cfs)	*	* 650.54	* 263.86
* 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)	* 9366.2	* Conv. (cfs)	*	* 6663.5	* 2702.7
* Length Wtd. (ft)	* 93.49	* wetted Per. (ft)	*	* 24.69	* 111.15
* Min Ch El (ft)	* 891.76	* Shear (lb/sq ft)	*	* 1.80	* 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)	* 3.72	* 6.91	* 3.23
* C & E Loss (ft)	* 0.19	* Cum SA (acres)	* 2.13	* 1.44	* 1.69

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

depth for the water surface and continued on with the calculations.
 Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
 Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
 This may indicate the need for additional cross sections.
 Warning: 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= 80									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	920	7.71	918	12.86	916.64	13.48	916	29.86	907.75		
32.98	909.13	43.2	909.32	53.45	908.81	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 *

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* 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
* 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)	* 3.65	* 6.67	* 3.11
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 2.09	* 1.38	* 1.62

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Lower RS: 3679.344

INPUT
 Description:

Station Elevation Data		num= 74		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	917	17.8	908.03	20.8	909.5	30.95	909.83	41.1	909.35
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	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

OXF157-159Bridges.rep

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*****
* 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) * 3.41  * 6.39  * 2.86  *
* C & E Loss (ft)   * 0.05  * Cum SA (acres)   * 1.98  * 1.32  * 1.49  *
*****
    
```

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= 56		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	904	1.5	902.83	4.8	904.23	15.9	904.25	26.9	903.5
30.2	901.9	35.15	904	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	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

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.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) * 3.25  * 6.13  * 2.65  *
* C & E Loss (ft)   * 0.05  * Cum SA (acres)   * 1.90  * 1.26  * 1.38  *
*****
```

CROSS SECTION

RIVER: Bluestone Creek

REACH: Lower

RS: 3438.299

INPUT

Description:

```
Station Elevation Data      num=      74
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
72.61     896         75.5      897.44     85.5      897.3      95.5      897.4      98.2      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
```

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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) * 3.11 * 5.88 * 2.49 *
* C & E Loss (ft) * 0.07 * Cum SA (acres) * 1.82 * 1.20 * 1.30 *
*****
```

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
 Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
 This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Lower RS: 3282.877

INPUT
 Description:

Station Elevation Data		num=		66							
Sta	Elev	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	41.7	897.73		
51.7	898.13	61.7	897.74	65.2	896	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) * 1.24 * Cum Volume (acre-ft) * 2.94 * 5.55 * 2.45 *
 * C & E Loss (ft) * 0.06 * Cum SA (acres) * 1.68 * 1.12 * 1.26 *

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

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Lower RS: 3129.654

INPUT
 Description:

Station Elevation Data num= 69
 Sta Elev Sta Elev Sta Elev Sta Elev

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```
*****
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   55.1    898    64.6    893.2
67.7    894.7   77.7    895.06   87.6    894.63   92.9    892    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) * 891.72 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 1.08 * wt. n-Val. * * 0.035 * *
* W.S. Elev (ft) * 890.63 * Reach Len. (ft) * 41.42 * 177.15 * 191.92 *
* Crit W.S. (ft) * * * Flow Area (sq ft) * * 109.52 * *
* E.G. Slope (ft/ft) * 0.008418 * Area (sq ft) * 0.00 * 109.52 * *
* Q Total (cfs) * 914.40 * Flow (cfs) * * 914.40 * *
* Top width (ft) * 31.26 * Top width (ft) * 0.04 * 31.23 * *
* Vel Total (ft/s) * 8.35 * Avg. vel. (ft/s) * * 8.35 * *
* Max chl Dpth (ft) * 4.02 * Hydr. Depth (ft) * * 3.51 * *
* Conv. Total (cfs) * 9966.2 * Conv. (cfs) * * 9966.2 * *
* Length Wtd. (ft) * 150.42 * Wetted Per. (ft) * * 34.90 * *
* Min Ch El (ft) * 886.61 * Shear (lb/sq ft) * * 1.65 * *
* Alpha * 1.00 * Stream Power (lb/ft s) * 251.32 * 0.00 * 0.00 *
* Frctn Loss (ft) * 0.88 * Cum volume (acre-ft) * 2.93 * 5.23 * 2.42 *
* C & E Loss (ft) * 0.19 * Cum SA (acres) * 1.66 * 1.03 * 1.22 *
*****
```

Warning: Divided flow computed for this cross-section.

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

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

This may indicate the need for additional cross sections.

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

need for additional cross sections.

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Lower RS: 2951.927

INPUT

Description:

Station Elevation Data		num= 57		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	908.12	1.19	908	3.23	908	6.78	906.8	9.26	906
46	887.85	49.3	889.23	60.36	888.93	71.4	888.11	72.05	888
81.63	886.67	81.99	886.58	83.4	886.54	90.81	886.38	98.79	886.12
101.06	886.12	101.09	886.12	101.1	886.12	105.46	886.83	116.85	888
122.73	888.47	129.85	889.05	133.31	889.2	135.43	889	135.45	888.99
136.26	888	137.32	886.78	137.9	886	138.17	885.73	138.81	885.19
153.57	885.52	154.19	886	155.46	887.19	156.45	888	157.77	888.97
158.24	889.41	159.55	889.91	162.78	891.13	165.23	892	169.05	893.47
170.53	894	173.86	895.16	175.09	895.58	176.25	896	177.64	896.43
183.13	898	188.56	899.58	190.02	900	191.17	900.32	195.17	901.45
197.15	902	201.59	903.22	202.74	903.5	204.78	904	207.94	904.56
214.36	906	255.68	916						

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	.1	135.43	.035	157.77	.1		

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 135.43 157.77 5.71 75.59 135.21 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 890.65	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.47	* Wt. n-Val.	* 0.100	* 0.035	* 0.100
* W.S. Elev (ft)	* 890.18	* Reach Len. (ft)	* 5.71	* 75.59	* 135.21
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 220.27	* 94.13	* 1.25
* E.G. Slope (ft/ft)	* 0.004441	* Area (sq ft)	* 220.27	* 94.13	* 1.25
* Q Total (cfs)	* 1021.20	* Flow (cfs)	* 381.27	* 639.21	* 0.72
* Top width (ft)	* 119.00	* Top width (ft)	* 94.16	* 22.34	* 2.51
* Vel Total (ft/s)	* 3.24	* Avg. vel. (ft/s)	* 1.73	* 6.79	* 0.58
* Max Chl Dpth (ft)	* 4.99	* Hydr. Depth (ft)	* 2.34	* 4.21	* 0.50
* Conv. Total (cfs)	* 15324.6	* Conv. (cfs)	* 5721.4	* 9592.3	* 10.8
* Length Wtd. (ft)	* 49.00	* Wetted Per. (ft)	* 95.30	* 25.31	* 2.82
* Min Ch El (ft)	* 885.19	* Shear (lb/sq ft)	* 0.64	* 1.03	* 0.12
* Alpha	* 2.86	* Stream Power (lb/ft s)	* 255.68	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.21	* Cum Volume (acre-ft)	* 2.83	* 4.82	* 2.42
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 1.61	* 0.92	* 1.22

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Lower RS: 2875.345

INPUT
 Description:

Station Elevation Data		num= 63		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	908	7.92	906	11.54	905.11	15.9	904	18.25	903.39
23.72	902	23.78	901.98	23.84	901.97	29.02	900.38	30.28	900
35.56	898.45	37.08	898	38.58	897.57	43.81	896	46.71	895.29
51.08	894	55.6	892.88	59.25	892	63.64	890.93	67.52	890
71.69	888.98	75.83	888	118.56	886.06	138.34	885.52	140.27	884.64
152.36	884.64	154.47	886	154.8	886.19	156.01	887.08	157.94	887.16
168.75	887.95	168.94	888	175.31	889.65	176.66	890	180.14	890.92
183.87	891.85	184.49	892	191.42	893.77	192.43	894	195.55	894.73
200.18	895.7	201.94	896	214.35	897.62	224.9	899.03	227.92	899.42
233.12	900	254.5	901.9	255.52	902	268.07	903.27	271.36	903.54
276.96	904	292.96	905.2	306.22	906	322.22	906.92	330.2	907.24
355.28	908	359.55	908.13	360.14	908.16	361.76	908.26	364.83	908.43
368	908.69	375.23	909.27	383.06	910				

Manning's n Values		num= 3		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val
0	.1	138.34	.035	156.01	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	138.34	156.01		20.87	29.24	34.41	.1 .3
Ineffective Flow	num= 1		Permanent				
Sta L	Sta R	Elev					
0	156	885.78					

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 890.42	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.41	* Wt. n-Val.	* 0.100	* 0.035	* 0.100
* W.S. Elev (ft)	* 890.01	* Reach Len. (ft)	* 20.87	* 29.24	* 34.41
* Crit W.S. (ft)	* 888.83	* Flow Area (sq ft)	* 218.05	* 73.57	* 40.31
* E.G. Slope (ft/ft)	* 0.004300	* Area (sq ft)	* 219.29	* 89.71	* 40.31
* Q Total (cfs)	* 1021.20	* Flow (cfs)	* 448.28	* 512.23	* 60.69
* Top width (ft)	* 109.22	* Top width (ft)	* 70.86	* 17.67	* 20.69
* Vel Total (ft/s)	* 3.08	* Avg. vel. (ft/s)	* 2.06	* 6.96	* 1.51
* Max Chl Dpth (ft)	* 5.37	* Hydr. Depth (ft)	* 3.08	* 4.16	* 1.95
* Conv. Total (cfs)	* 15572.3	* Conv. (cfs)	* 6835.8	* 7811.0	* 925.5
* Length wtd. (ft)	* 29.24	* Wetted Per. (ft)	* 71.15	* 18.60	* 20.98
* Min Ch El (ft)	* 884.64	* Shear (lb/sq ft)	* 0.82	* 1.06	* 0.52
* Alpha	* 2.78	* Stream Power (lb/ft s)	* 383.06	* 0.00	* 0.00
* Frctn Loss (ft)	*	* Cum Volume (acre-ft)	* 2.80	* 4.66	* 2.35

* C & E Loss (ft) * * Cum SA (acres) * 1.60 * 0.88 * 1.18 *

INLINE STRUCTURE

RIVER: Bluestone Creek
 REACH: Lower RS: 2862.727

INPUT

Description:

Distance from Upstream XS = 2.6
 Deck/Roadway width = 20
 Weir Coefficient = 2.6
 Weir Embankment Coordinates num = 3
 Sta Elev Sta Elev Sta Elev

 120.9 886 145.8 885.78 181.6 886

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

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Lower RS: 2846.103

INPUT

Description:

Station Elevation Data num= 75
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

 0 910 6.22 908.17 6.82 908 13.37 906.07 13.62 906
 16.31 905.2 20.55 904 20.86 903.91 27.43 901.99 34.42 900
 34.85 899.88 41.47 898 48.23 896.15 48.76 896 56.9 894.11
 57.4 894.01 57.45 894 66.03 892.22 67.09 892 70.75 891.25
 76.81 890 82.15 888.91 85.39 888 91.5 886.3 116.35 886.05
 119.95 886 124.93 885.92 125 885.91 127.77 884.44 141.02 884.44
 144.39 886.93 148.49 887.01 148.96 886.91 151.56 886.9 155.53 886.61
 160.15 886 163.43 885.54 164.73 886 165.23 886 165.68 886.22
 166.67 887 172.27 887.34 176.91 887.62 179.55 888 184.89 888.81
 190.72 890 197.52 891.37 200.59 892 204.67 892.81 207.71 893.41
 211.26 894 213.32 894.31 217.45 894.79 229.11 896 239.25 897.09
 242.76 897.4 250.7 898.01 267.78 899.11 279.26 900 285.83 900.52
 293.51 901.1 299.82 901.53 306.61 902 306.93 902.02 313.94 902.57
 322.97 903.16 327.48 903.48 333.23 903.78 333.62 903.79 334.09 903.82
 338.43 904 348.61 904.37 349.75 904.41 355.81 904.66 374.49 906

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

 0 .1 124.93 .035 144.39 .035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 124.93 144.39 174.03 63.81 6.65 .1 .3
 Ineffective Flow num= 1
 Sta L Sta R Elev Permanent
 0 144.3 885.78 T

CROSS SECTION OUTPUT Profile #PF 1

 * E.G. Elev (ft) * 890.21 * Element * Left OB * Channel * Right OB *
 * Vel Head (ft) * 0.21 * Wt. n-Val. * 0.100 * 0.035 * 0.035 *
 * W.S. Elev (ft) * 890.00 * Reach Len. (ft) * 174.03 * 63.81 * 6.65 *
 * Crit W.S. (ft) * * * Flow Area (sq ft) * 154.84 * 81.21 * 123.67 *
 * E.G. Slope (ft/ft) * 0.001877 * Area (sq ft) * 154.84 * 101.87 * 123.67 *
 * Q Total (cfs) * 1021.20 * Flow (cfs) * 215.84 * 372.19 * 433.17 *
 * Top Width (ft) * 113.92 * Top width (ft) * 48.12 * 19.46 * 46.33 *
 * Vel Total (ft/s) * 2.84 * Avg. Vel. (ft/s) * 1.39 * 4.58 * 3.50 *
 * Max chl Dpth (ft) * 5.56 * Hydr. Depth (ft) * 3.22 * 4.17 * 2.67 *
 * Conv. Total (cfs) * 23572.0 * Conv. (cfs) * 4982.0 * 8591.2 * 9998.8 *
 * Length wtd. (ft) * 56.92 * wetted Per. (ft) * 48.59 * 20.65 * 47.05 *
 * Min Ch El (ft) * 884.44 * Shear (lb/sq ft) * 0.37 * 0.46 * 0.31 *
 * Alpha * 1.65 * Stream Power (lb/ft s) * 374.49 * 0.00 * 0.00 *
 * Frctn Loss (ft) * 0.14 * Cum Volume (acre-ft) * 2.80 * 4.41 * 2.35 *
 * C & E Loss (ft) * 0.04 * Cum SA (acres) * 1.57 * 0.87 * 1.15 *

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Lower RS: 2773.556

INPUT

Description:

Station Elevation Data num= 61
 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
 113.71 888 115.9 889 127.1 889.42 138.2 889.04 150.02 890

163.82	892	175.78	894	188.14	896	195.99	897.38	201.3	898
215.1	899.67	228.13	898.26	234.72	900	254.56	906	280.39	906
322.01	898								

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

Ineffective Flow num= 1
 Sta L Sta R Elev Permanent
 95.4 322.01 889.05 T

Blocked Obstructions num= 1
 Sta L Sta R Elev

 127.1 322.01 889.42

CROSS SECTION OUTPUT Profile #PF 1

```

*****
* E.G. Elev (ft) * 890.03 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 0.56 * Wt. n-Val. * 0.100 * 0.035 * 0.035 *
* W.S. Elev (ft) * 889.47 * Reach Len. (ft) * 88.56 * 82.82 * 18.59 *
* Crit W.S. (ft) * * * Flow Area (sq ft) * 5.57 * 115.10 * 91.28 *
* E.G. Slope (ft/ft) * 0.003205 * Area (sq ft) * 5.57 * 115.10 * 119.83 *
* Q Total (cfs) * 1021.20 * Flow (cfs) * 5.20 * 776.92 * 239.08 *
* Top Width (ft) * 106.57 * Top width (ft) * 3.82 * 22.78 * 79.98 *
* Vel Total (ft/s) * 4.82 * Avg. Vel. (ft/s) * 0.93 * 6.75 * 2.62 *
* Max Chl Dpth (ft) * 5.55 * Hydr. Depth (ft) * 1.46 * 5.05 * 1.14 *
* Conv. Total (cfs) * 18039.6 * Conv. (cfs) * 91.9 * 13724.3 * 4223.4 *
* Length Wtd. (ft) * 71.89 * Wetted Per. (ft) * 4.76 * 24.45 * 80.23 *
* Min Ch El (ft) * 883.92 * Shear (lb/sq ft) * 0.23 * 0.94 * 0.23 *
* Alpha * 1.56 * Stream Power (lb/ft s) * 322.01 * 0.00 * 0.00 *
* Frctn Loss (ft) * 0.37 * Cum Volume (acre-ft) * 2.48 * 4.25 * 2.33 *
* C & E Loss (ft) * 0.09 * 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:

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Station Elevation Data		num= 72		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	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	114.8	890	120.4	887.63	125.1	889.12	136.4	889.4		
147.4	888.96	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	197.36	894	225.94	906		
243.74	906	308.6	892								

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	.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	.1	.3
Right Levee		Station=	105.18	Elevation=	890		

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)	* 2.68	* 89.63	* 25.12
* E.G. Slope (ft/ft)	* 0.009447	* Area (sq ft)	* 2.68	* 89.63	* 25.12
* Q Total (cfs)	* 1021.20	* Flow (cfs)	* 3.37	* 908.50	* 109.33
* Top Width (ft)	* 46.02	* Top Width (ft)	* 2.53	* 20.41	* 23.08
* Vel Total (ft/s)	* 8.70	* Avg. Vel. (ft/s)	* 1.26	* 10.14	* 4.35
* Max chl Dpth (ft)	* 4.79	* Hydr. Depth (ft)	* 1.06	* 4.39	* 1.09
* Conv. Total (cfs)	* 10506.7	* Conv. (cfs)	* 34.7	* 9347.2	* 1124.8
* Length wtd. (ft)	* 168.31	* Wetted Per. (ft)	* 3.30	* 23.28	* 23.19
* 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	* 105.18
* 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.
 Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

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	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		
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	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 *

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* 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	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	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
------------------	----------	-----------	-----------	-----------	------------

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* 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
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
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

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*****
* 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
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		

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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	51.8	.1

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
* 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
0	900	5.23	898.17
		5.74	898
		6.1	897.83
		9.72	896

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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	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		
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	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

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```
* 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
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 *
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* 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
 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

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*****
* 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 *
*****

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* 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
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		

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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
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
* 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

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Lower

RS: 1387.656

INPUT

Description:

Station Elevation Data		num= 70	
Sta	Elev	Sta	Elev
0	900	4.63	898.25
11.02	895.6	12.7	894
17.11	890	17.57	889.6
23.88	884.9	25.09	884
30.33	880	47.89	878.16
69.27	877.79	71.24	877.78
75.04	876.93	75.75	876
82.72	874.55	95.38	874.69

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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		.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* 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	*
* 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	*

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

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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

* 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

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	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		
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

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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: 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
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)	*	*	*

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* 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

Description:

Station Elevation Data		num= 52									
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
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	61.92	.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

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* 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
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

 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 *
 * 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

 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

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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

 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.	* 0.00	* 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	* 27.00	* 3.59
* E.G. Slope (ft/ft)	* 0.014263	* Area (sq ft)	* 27.00	* 27.00	* 3.59
* Q Total (cfs)	* 175.70	* Flow (cfs)	* 171.41	* 171.41	* 4.29
* Top Width (ft)	* 32.15	* Top width (ft)	* 18.16	* 18.16	* 13.99
* Vel Total (ft/s)	* 5.74	* Avg. vel. (ft/s)	* 6.35	* 6.35	* 1.19
* Max Chl Dpth (ft)	* 2.15	* Hydr. Depth (ft)	* 1.49	* 1.49	* 0.26
* Conv. Total (cfs)	* 1471.2	* Conv. (cfs)	* 1435.3	* 1435.3	* 35.9
* Length Wtd. (ft)	* 0.00	* Wetted Per. (ft)	* 19.28	* 19.28	* 14.00
* Min Ch El (ft)	* 898.82	* Shear (lb/sq ft)	* 1.25	* 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)	* 0.01	* 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

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
    
```

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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
* Vel Head (ft)	* 0.50	* Wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 931.22	* Reach Len. (ft)	* 0.00	* 0.00	* 0.00
* Crit W.S. (ft)	* 931.22	* Flow Area (sq ft)	* 26.63	* 9.79	* 21.85
* E.G. slope (ft/ft)	* 0.013317	* Area (sq ft)	* 26.63	* 9.79	* 21.85
* Q Total (cfs)	* 303.00	* Flow (cfs)	* 127.58	* 77.37	* 98.04
* Top Width (ft)	* 56.69	* Top width (ft)	* 27.48	* 4.34	* 24.88
* Vel Total (ft/s)	* 5.20	* Avg. Vel. (ft/s)	* 4.79	* 7.90	* 4.49
* Max Chl Dpth (ft)	* 2.49	* Hydr. Depth (ft)	* 0.97	* 2.26	* 0.88
* Conv. Total (cfs)	* 2625.7	* Conv. (cfs)	* 1105.6	* 670.5	* 849.6
* Length Wtd. (ft)	* 0.00	* wetted Per. (ft)	* 27.53	* 4.78	* 24.94
* Min Ch El (ft)	* 928.73	* Shear (lb/sq ft)	* 0.80	* 1.70	* 0.73
* Alpha	* 1.19	* Stream Power (lb/ft s)	* 403.10	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.00	* Cum Volume (acre-ft)	*	*	*
* C & E Loss (ft)	* 0.01	* 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		Sta Elev		Sta Elev		Sta Elev	
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	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
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 82.26 .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

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* 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
*****
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
    
```

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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
0	.035	284.16	.035	293.42	.035

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
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

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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 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 *
 * 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

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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

 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
* 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

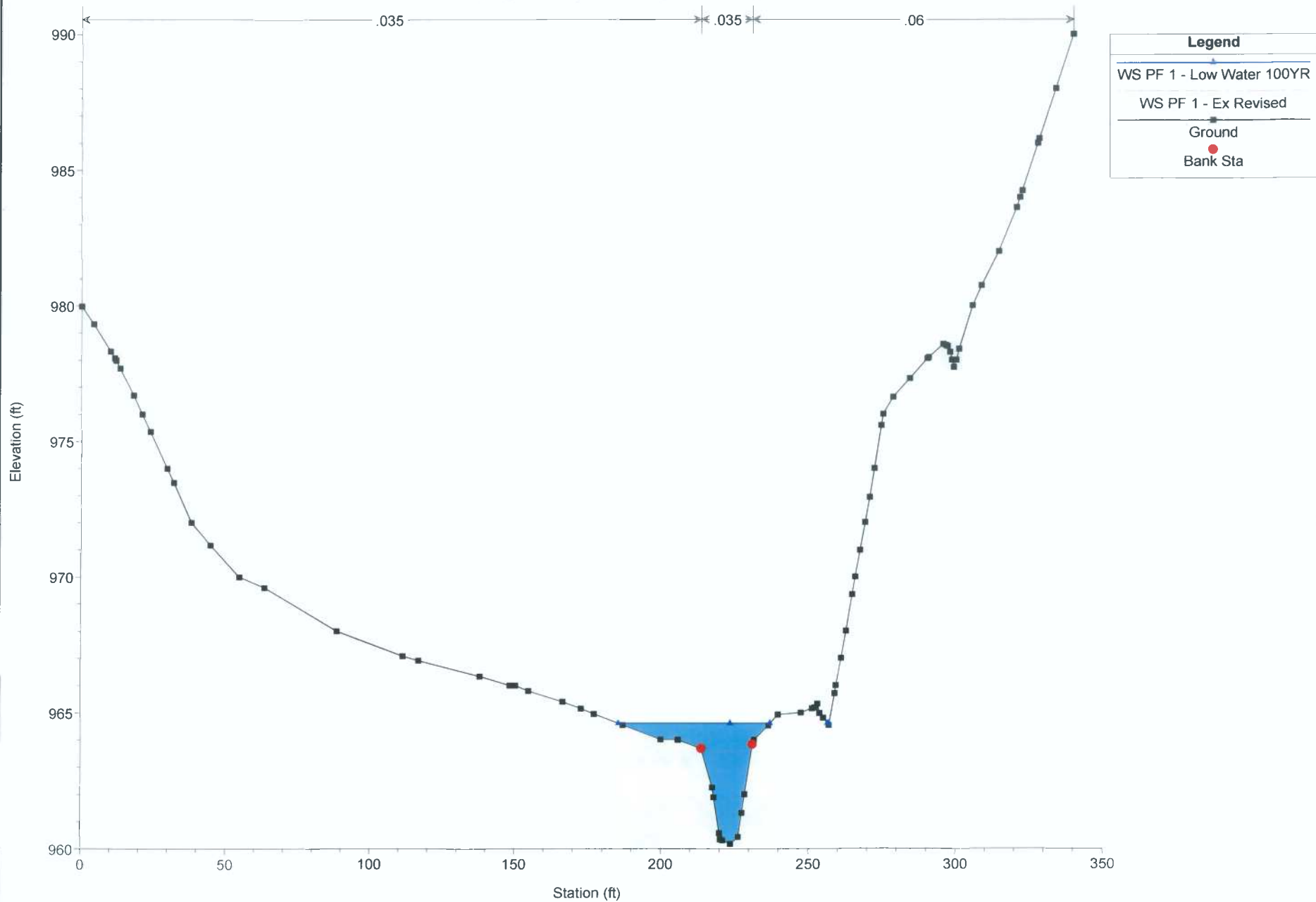
program

defaulted to critical depth.

OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

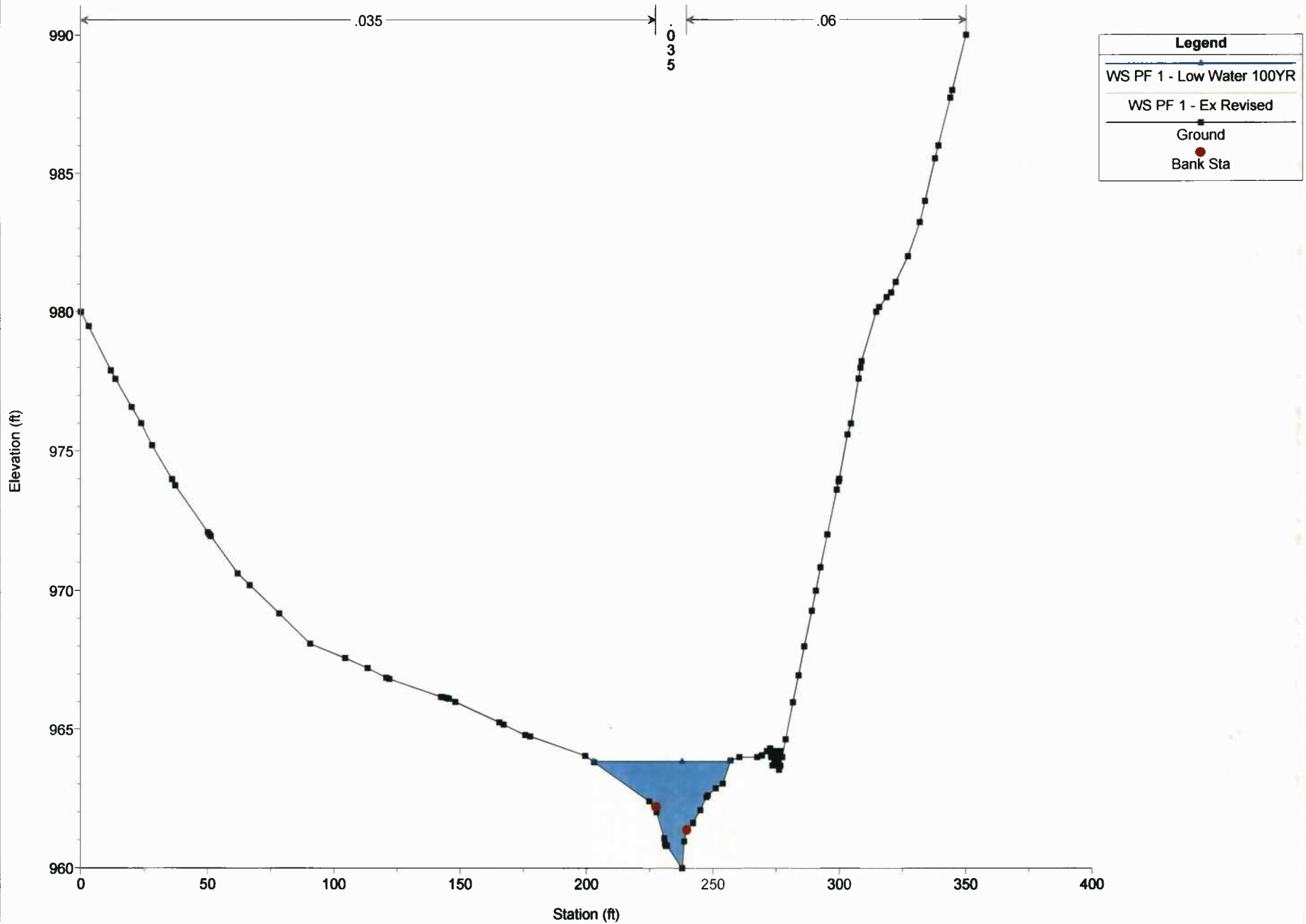
River = Bluestone Creek Reach = Bluestone Creek RS = 14659.36



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Bluestone Creek RS = 14572.23



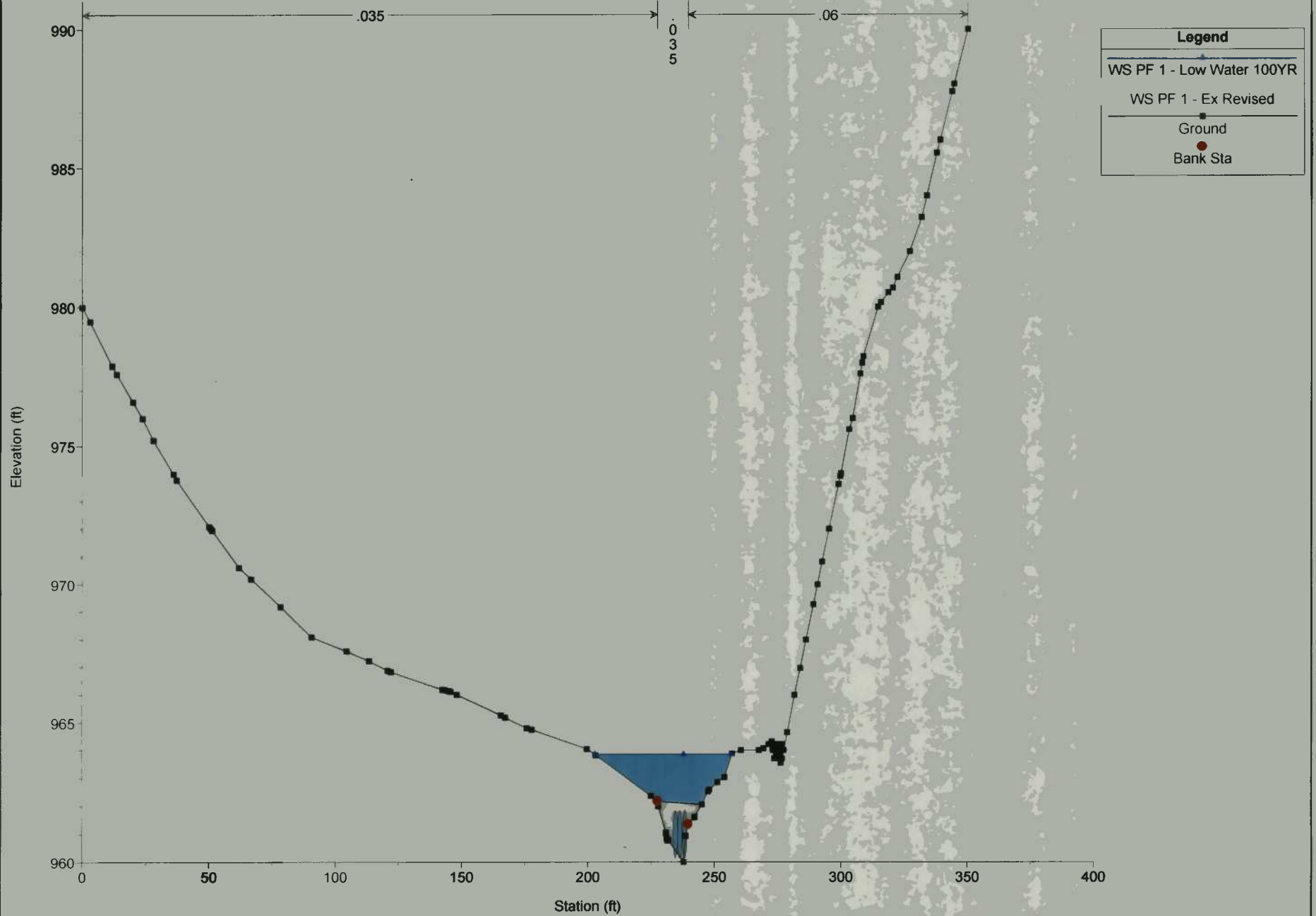
Legend

- WS PF 1 - Low Water 100YR
- WS PF 1 - Ex Revised
- Ground
- Bank Sta

OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

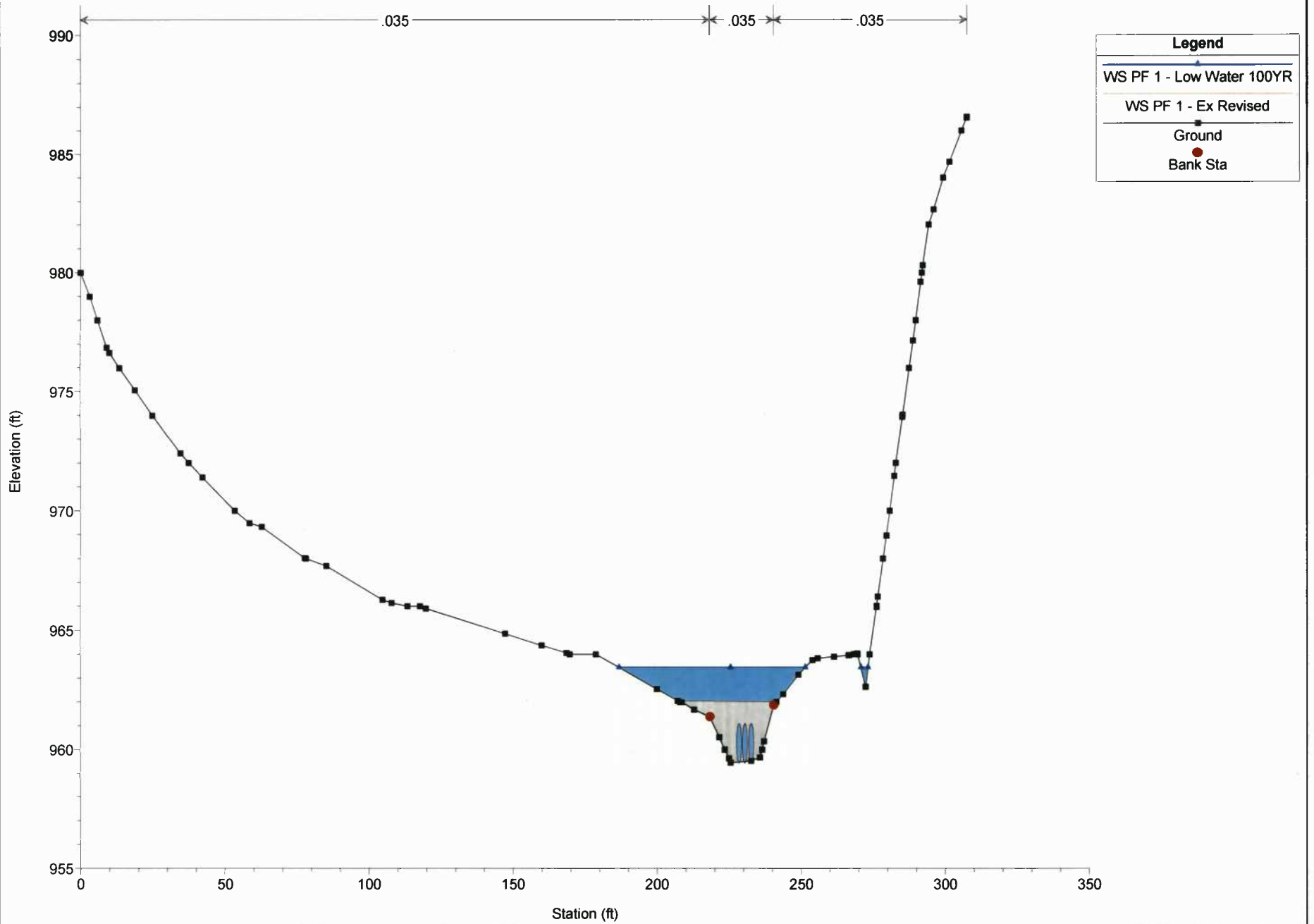
River = Bluestone Creek Reach = Bluestone Creek RS = 14557.54 Culv



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

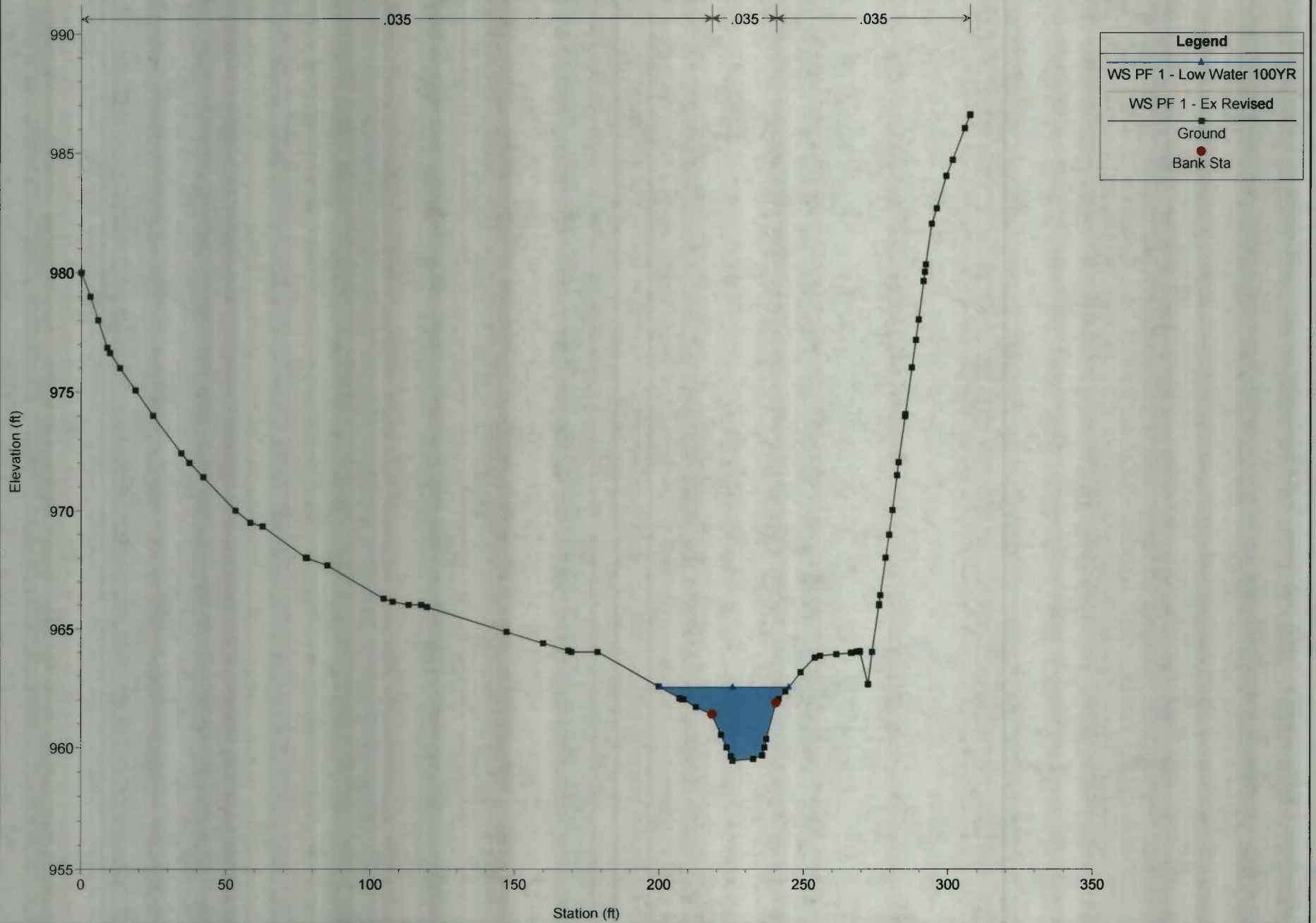
River = Bluestone Creek Reach = Bluestone Creek RS = 14557.54 Culv



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

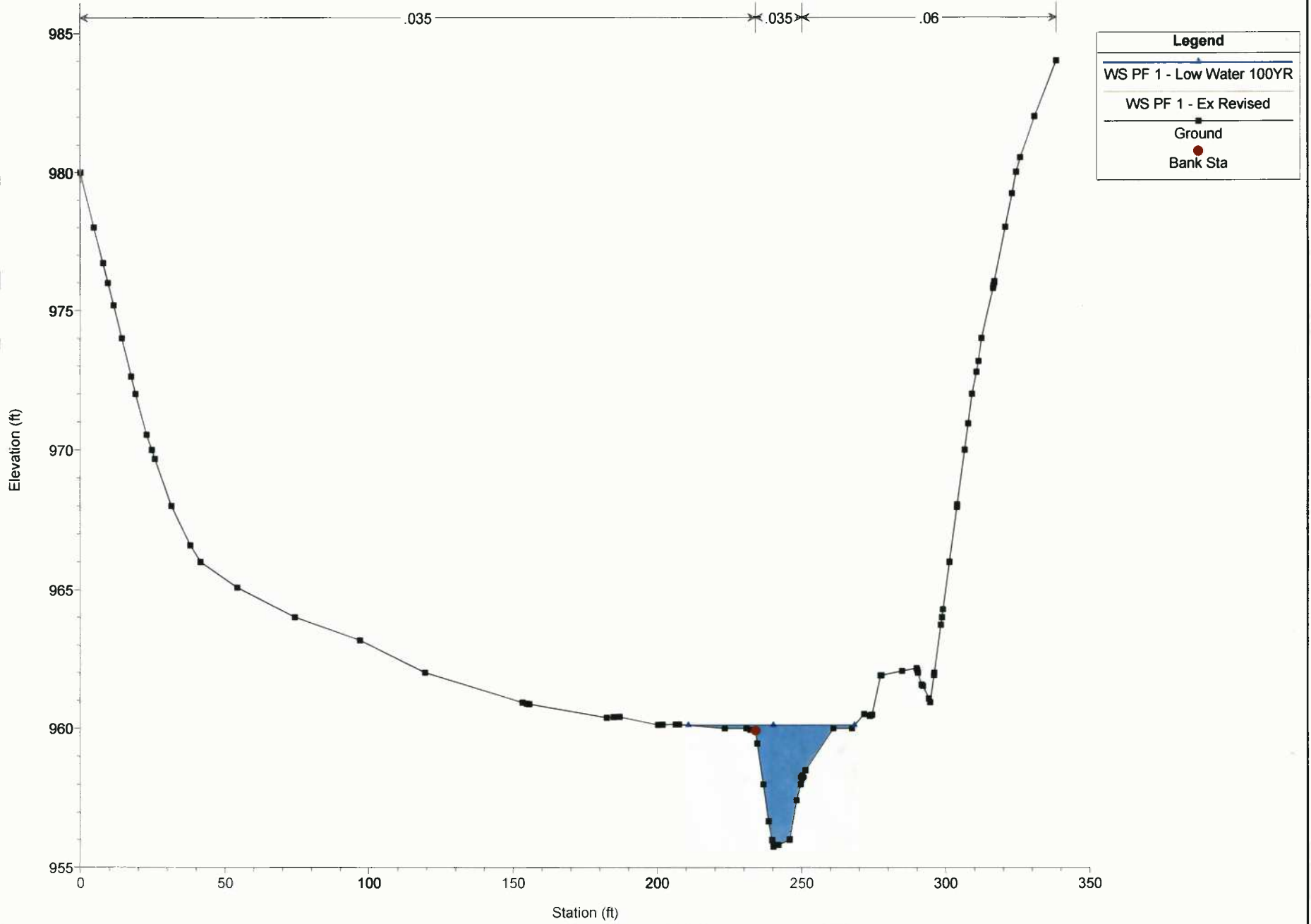
River = Bluestone Creek Reach = Bluestone Creek RS = 14543.33



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

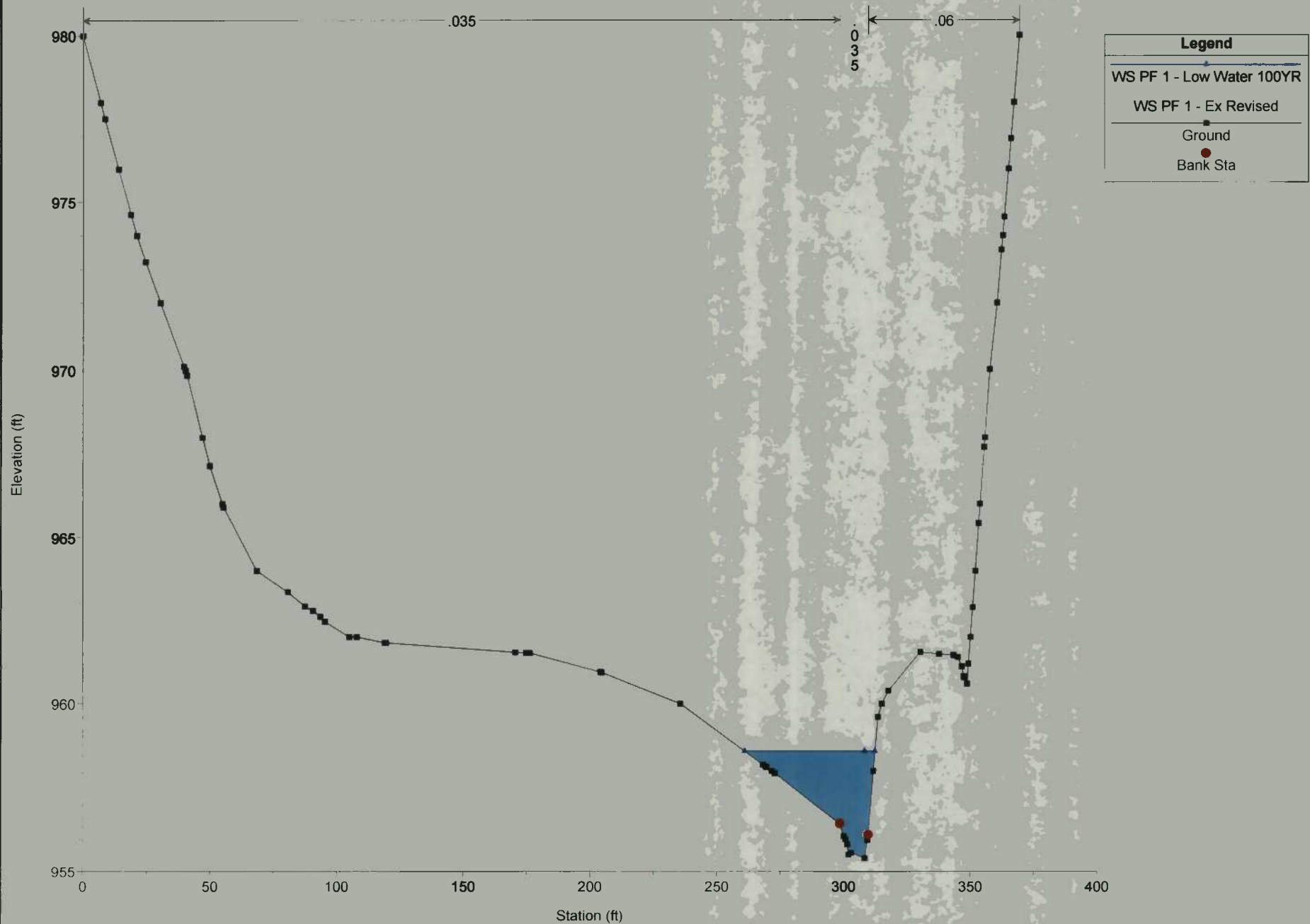
River = Bluestone Creek Reach = Bluestone Creek RS = 14371.96



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

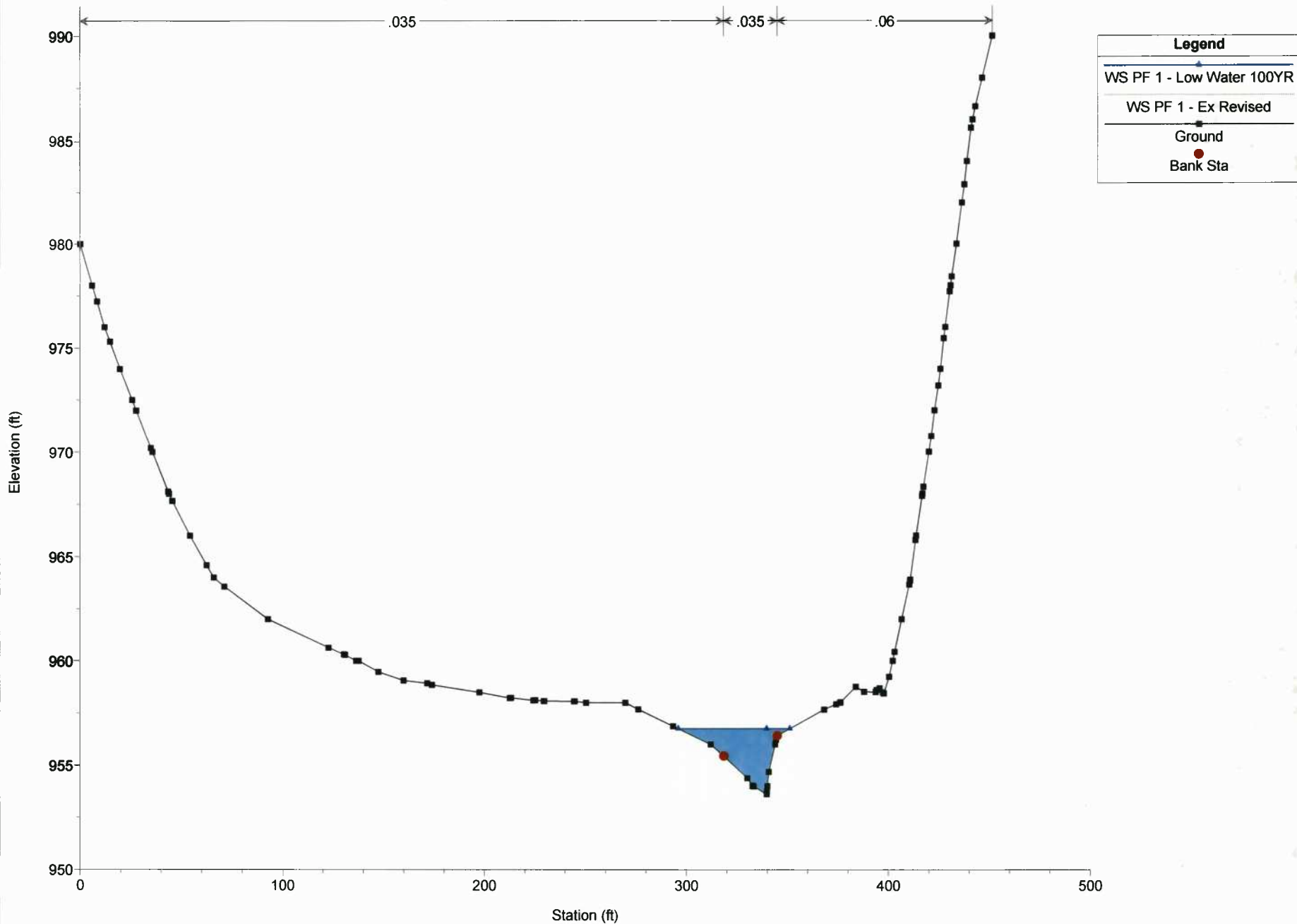
River = Bluestone Creek Reach = Bluestone Creek RS = 14193.22



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Bluestone Creek RS = 14044.56



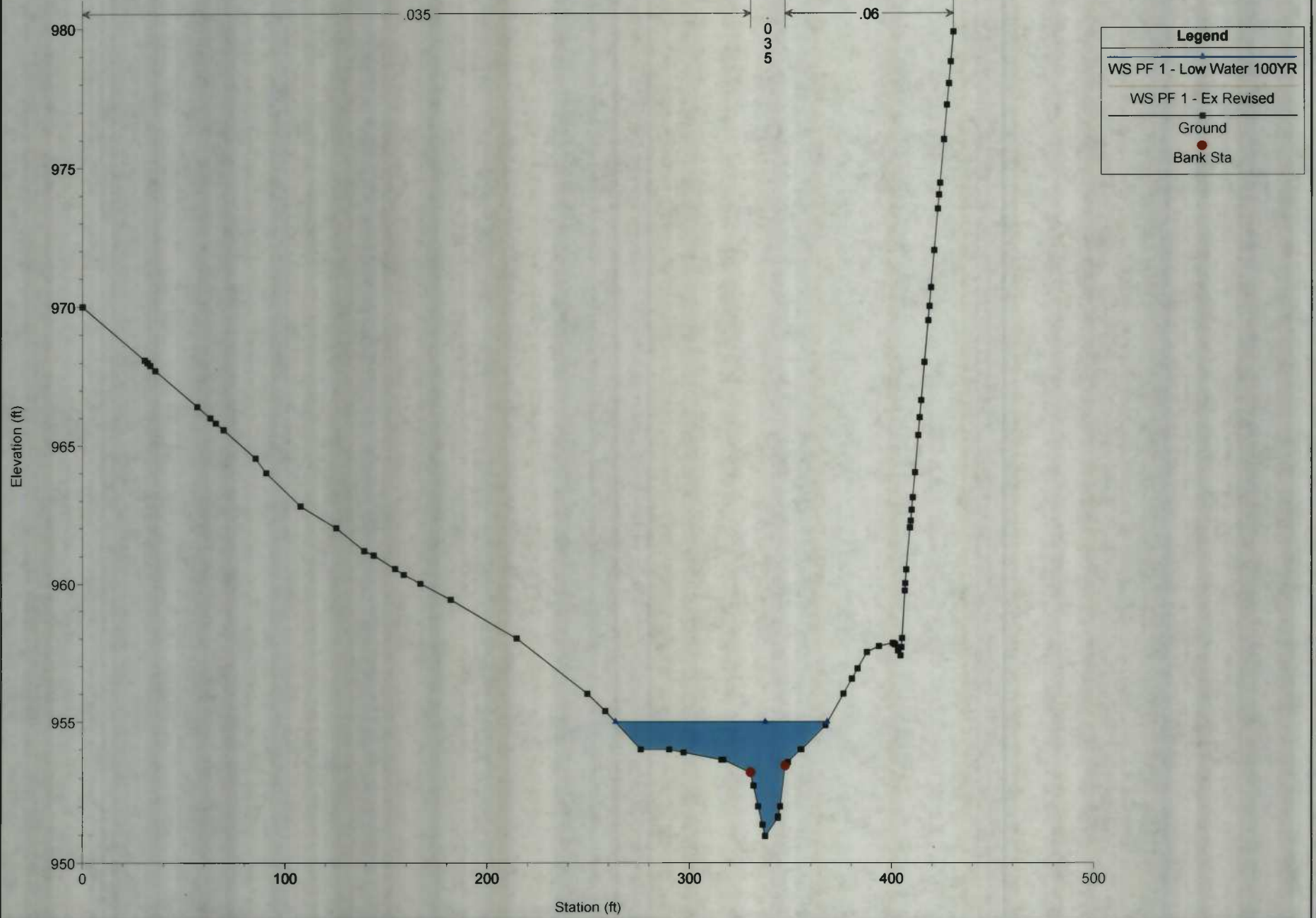
Legend

- WS PF 1 - Low Water 100YR
- WS PF 1 - Ex Revised
- Ground
- Bank Sta

OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

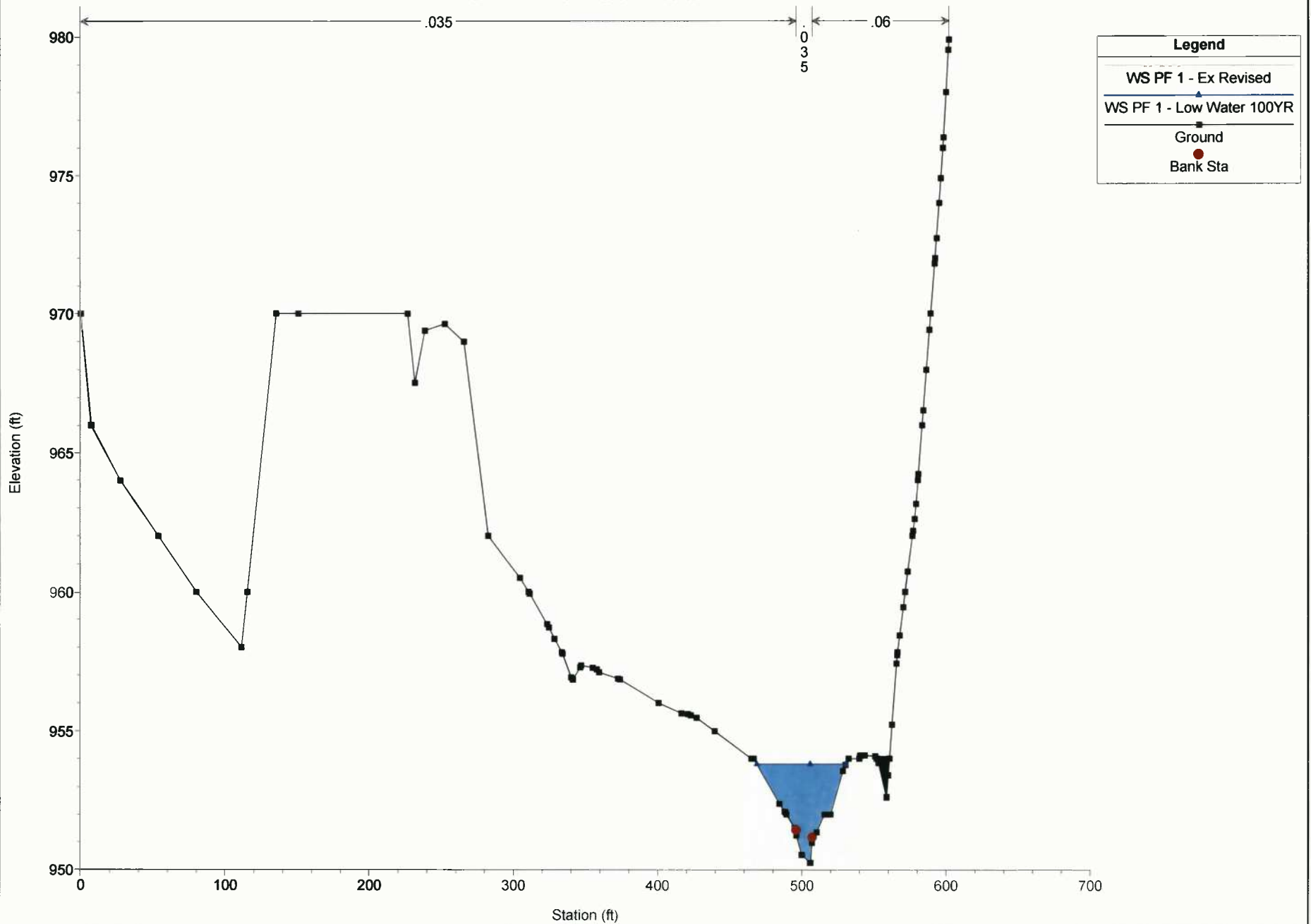
River = Bluestone Creek Reach = Bluestone Creek RS = 13852.52



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

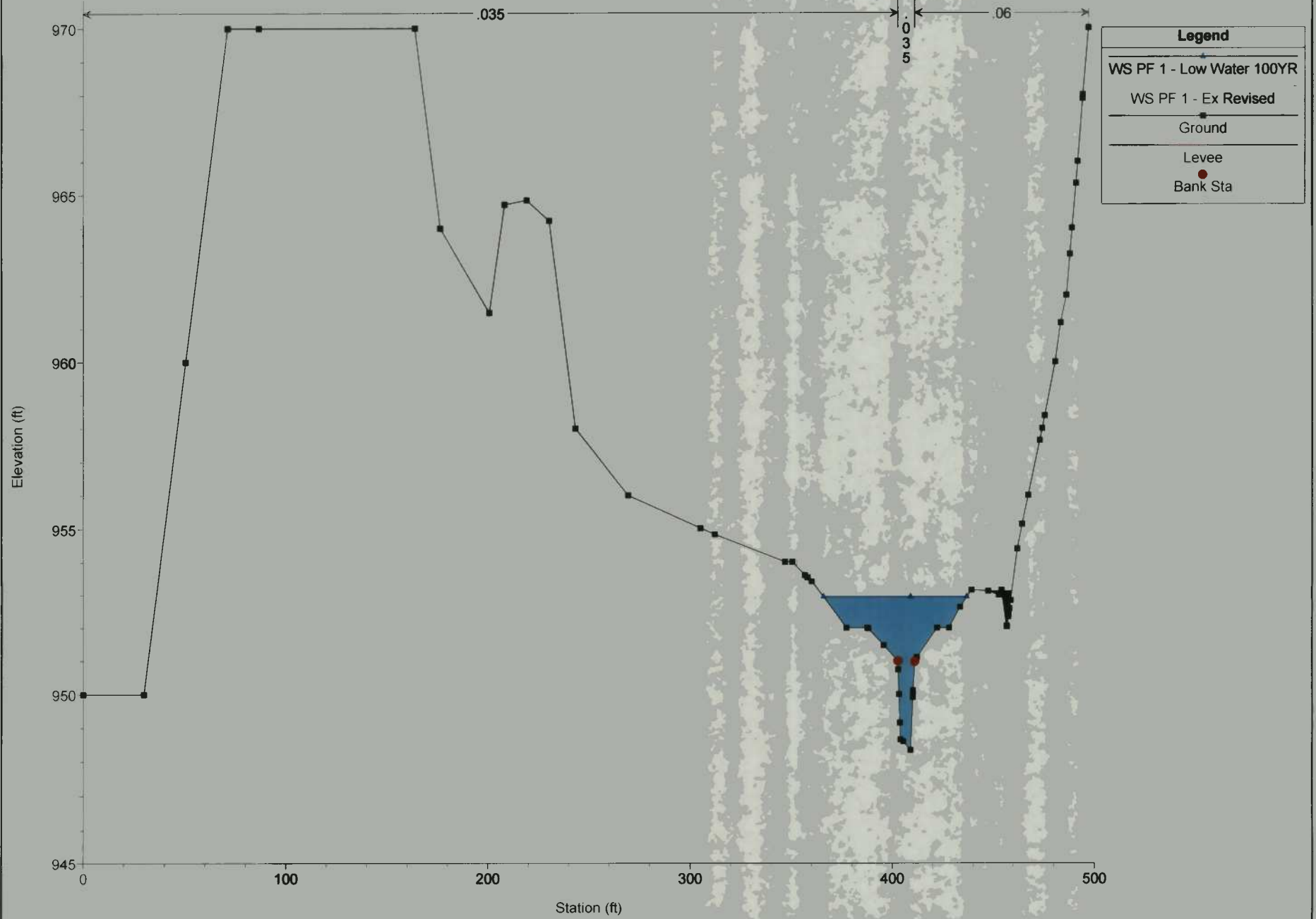
River = Bluestone Creek Reach = Bluestone Creek RS = 13658.52



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

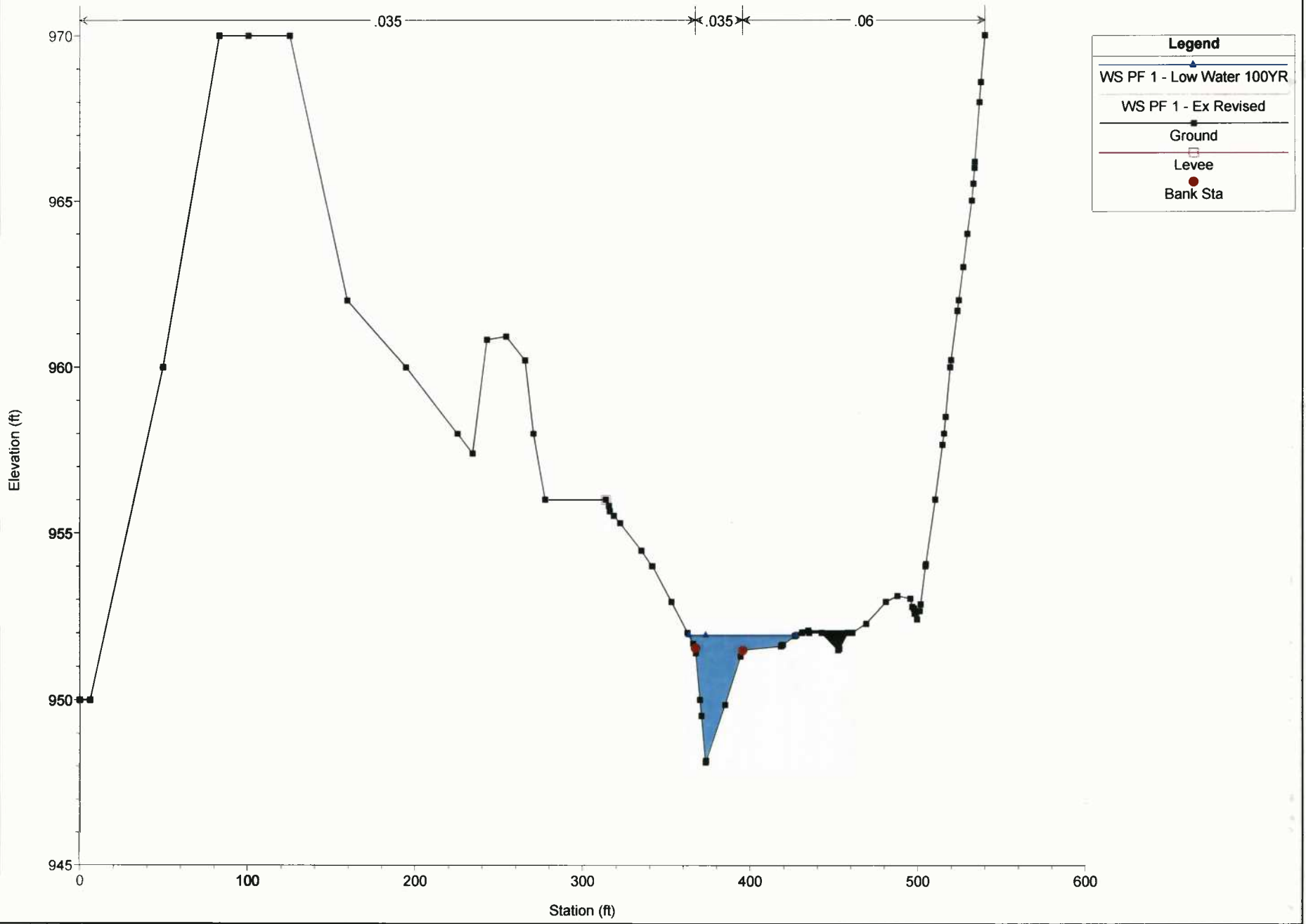
River = Bluestone Creek Reach = Bluestone Creek RS = 13552.07



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Bluestone Creek RS = 13440.10

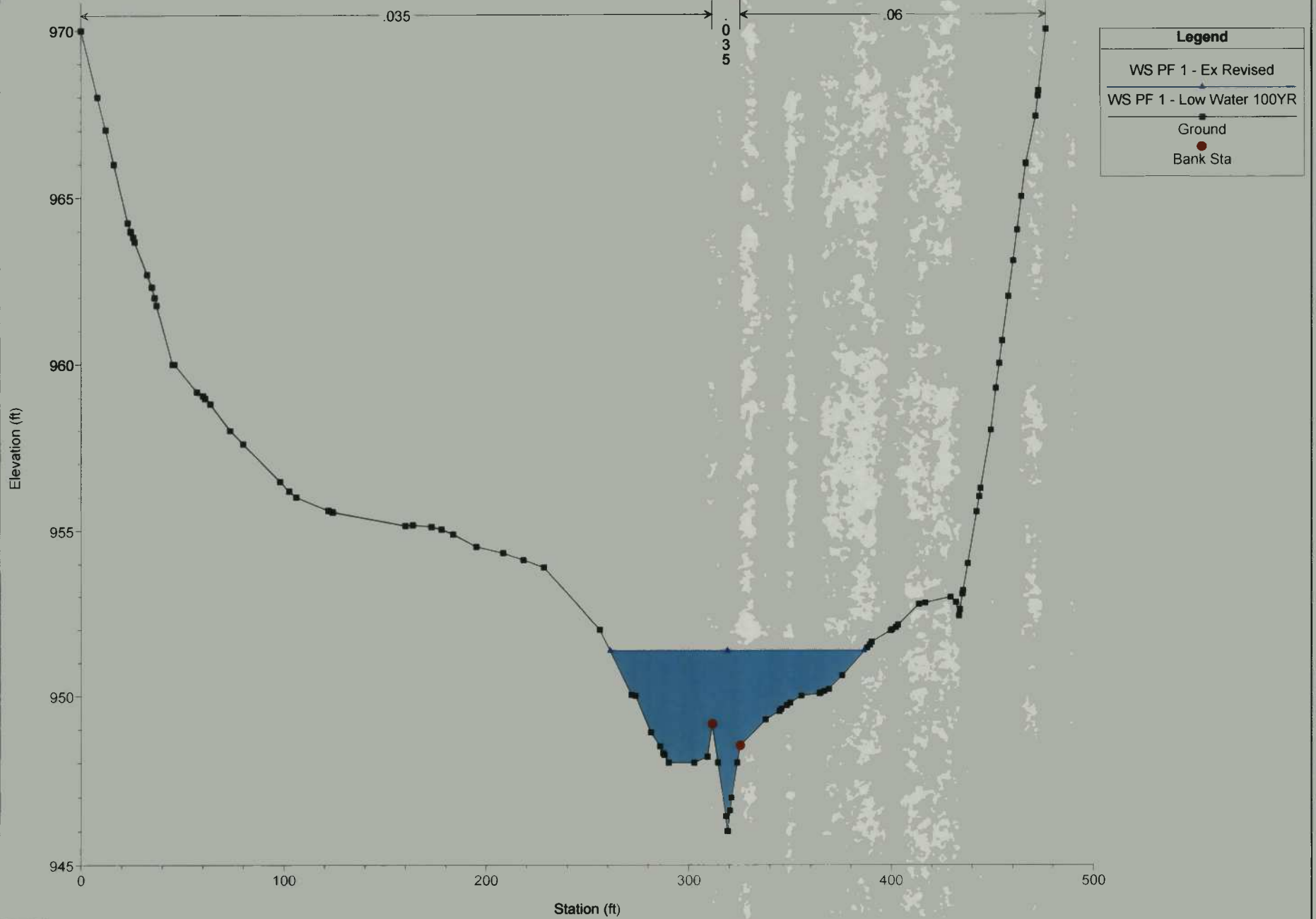


Legend

- WS PF 1 - Low Water 100YR
- WS PF 1 - Ex Revised
- Ground
- Levee
- Bank Sta

OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

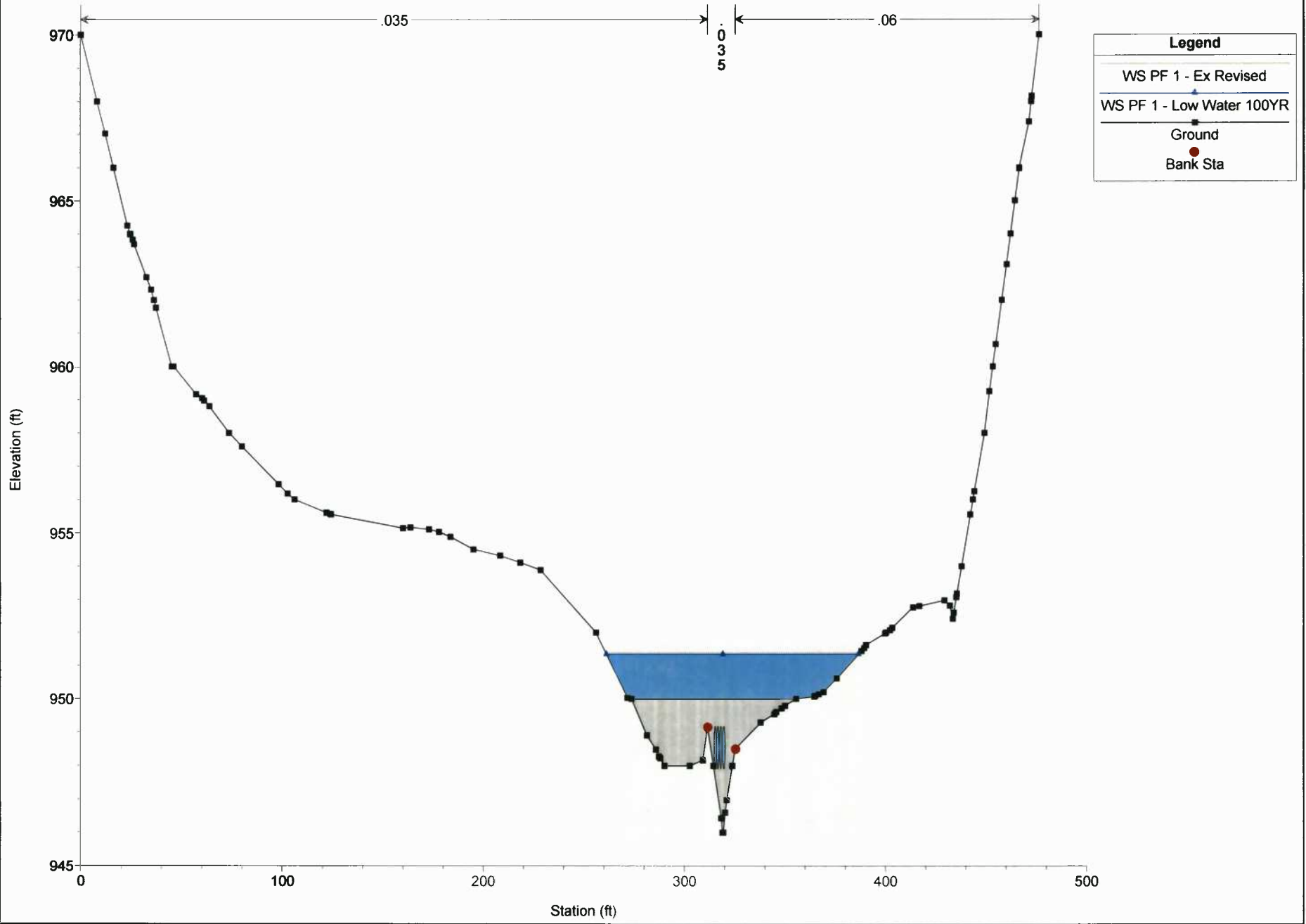
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Upper RS = 13395.79



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 13372.57 Culv

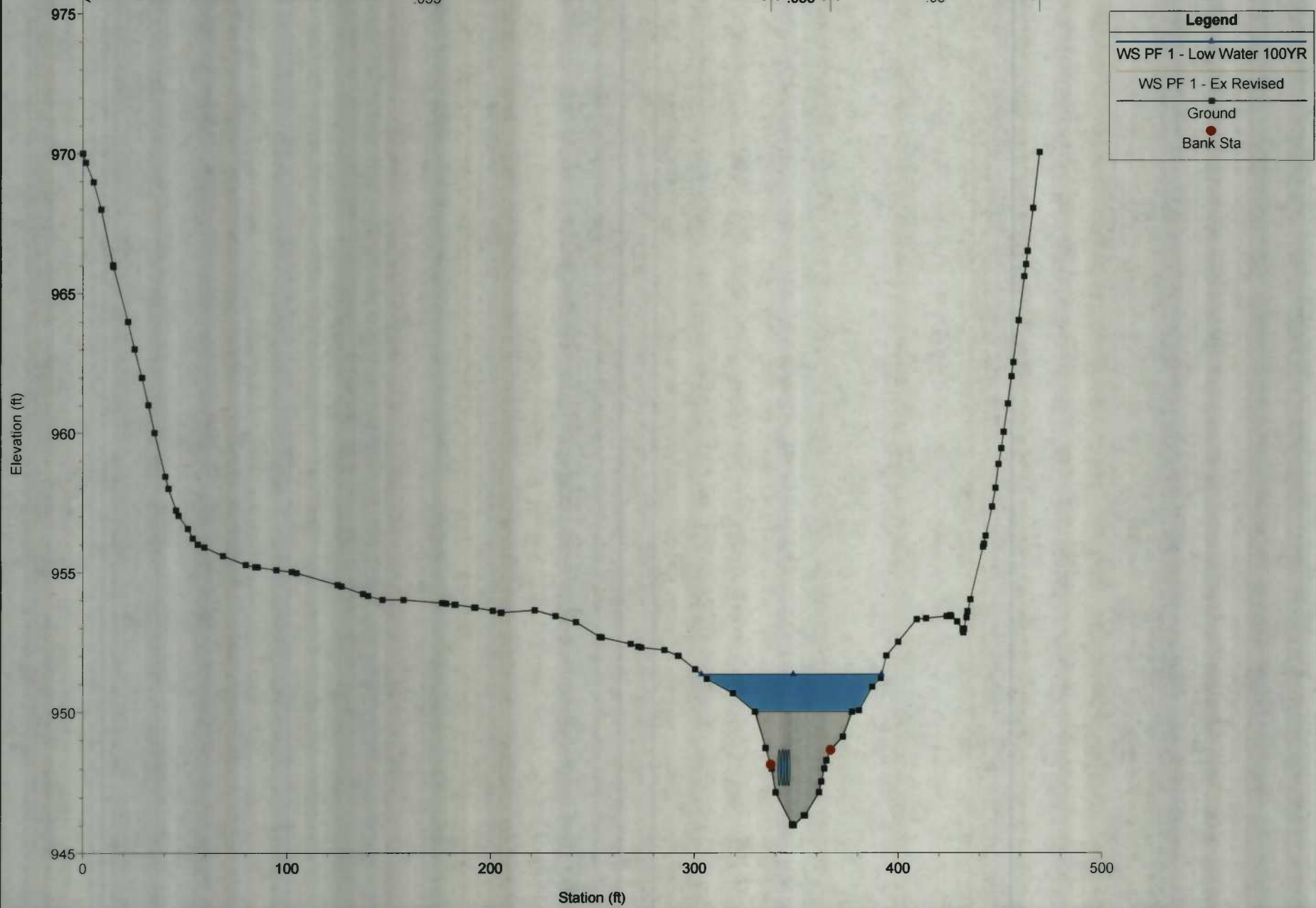


OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

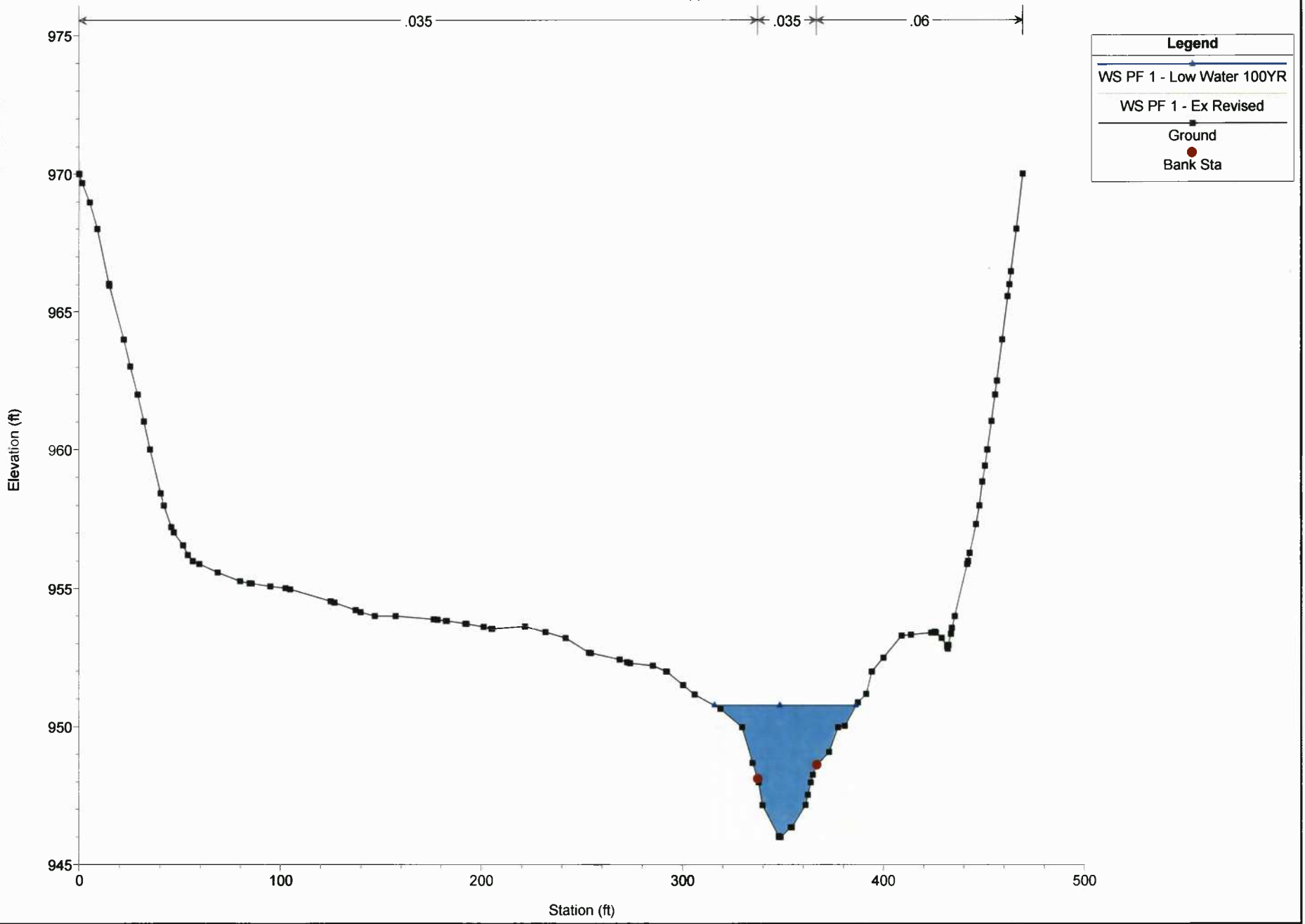
River = Bluestone Creek Reach = Upper RS = 13372.57 Culv

← .035 † .035 † .06 →



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

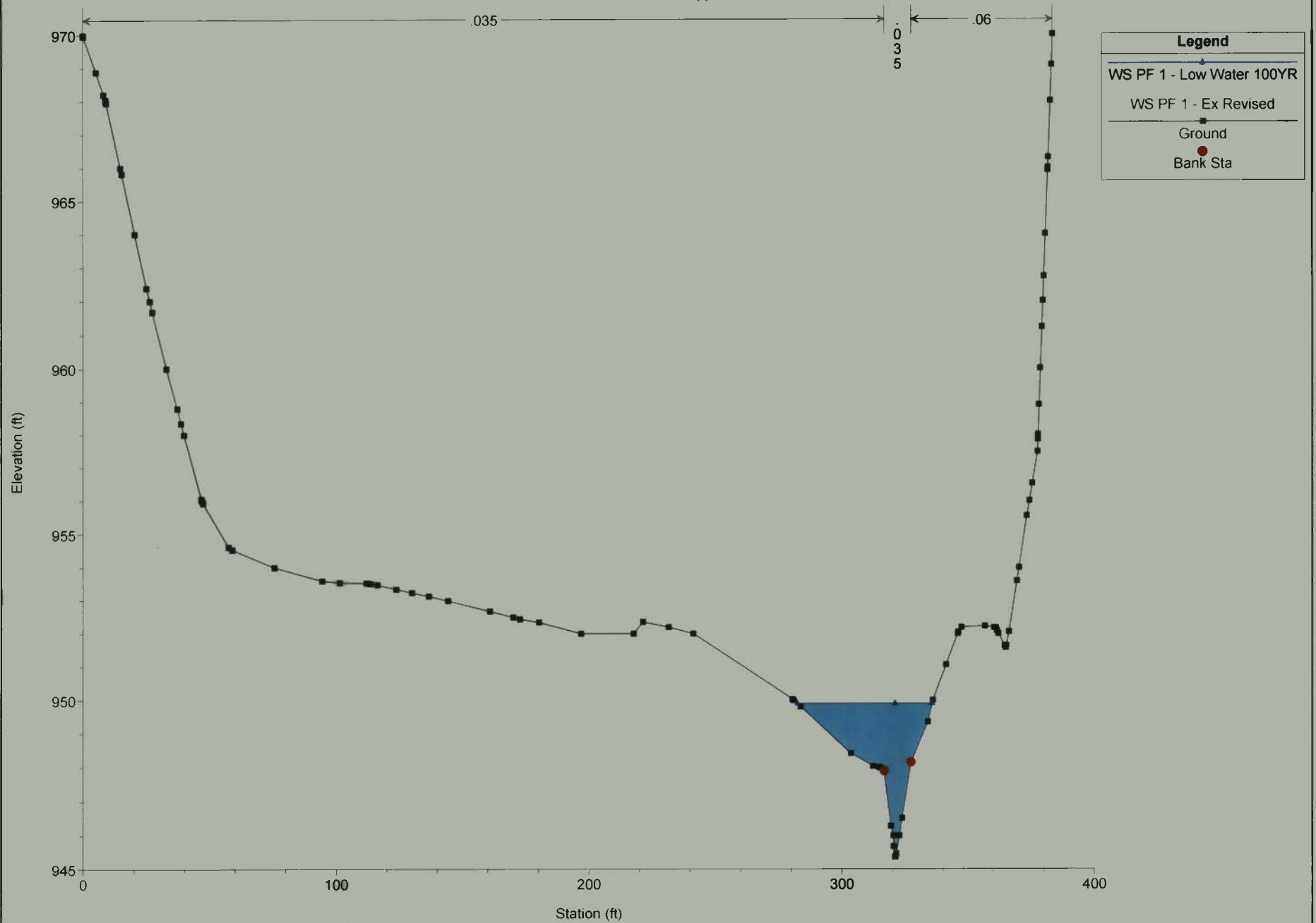
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Upper RS = 13353.46



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

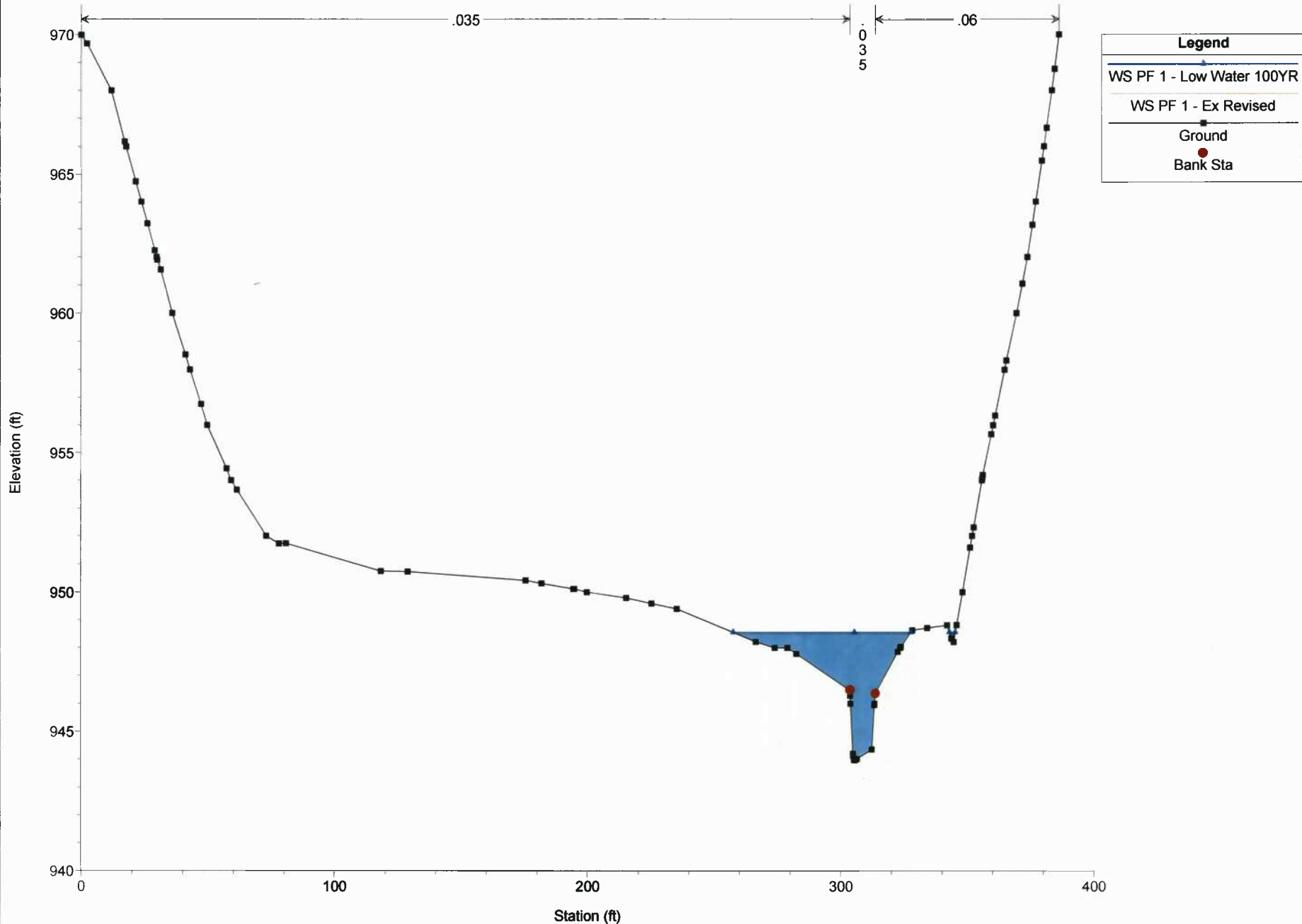
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 13212.39



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

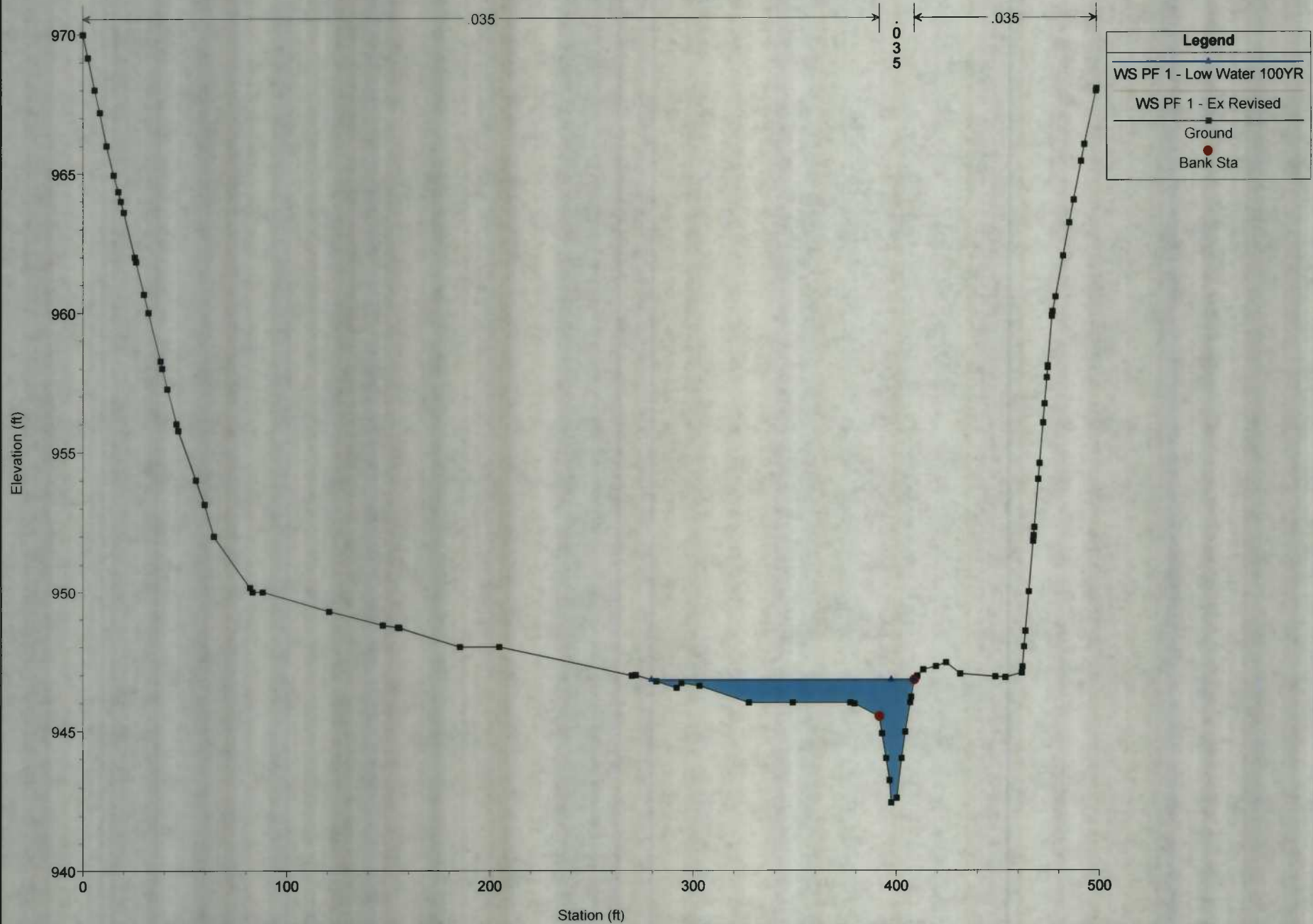
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Upper RS = 13020.26



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

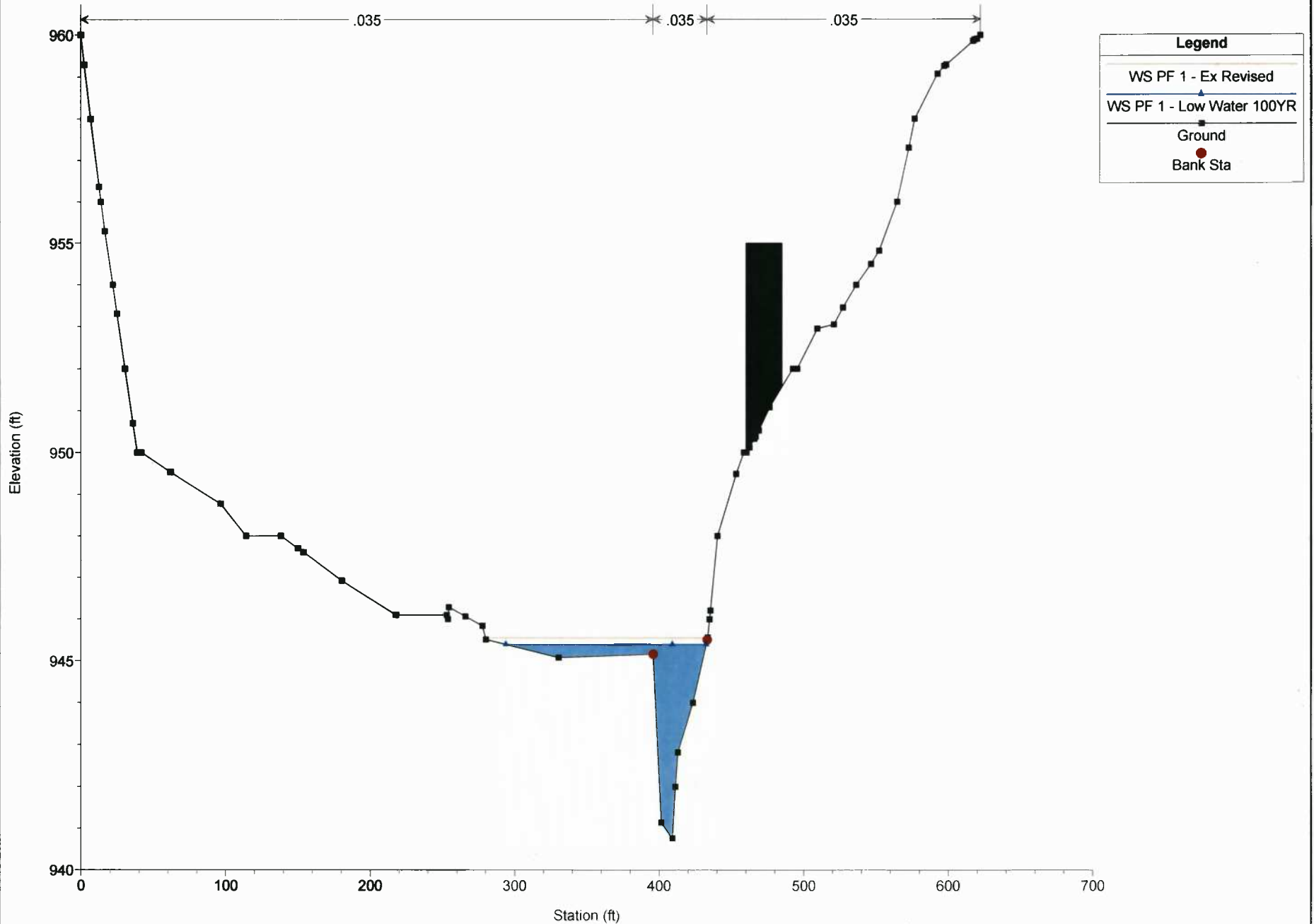
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 12827.43



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

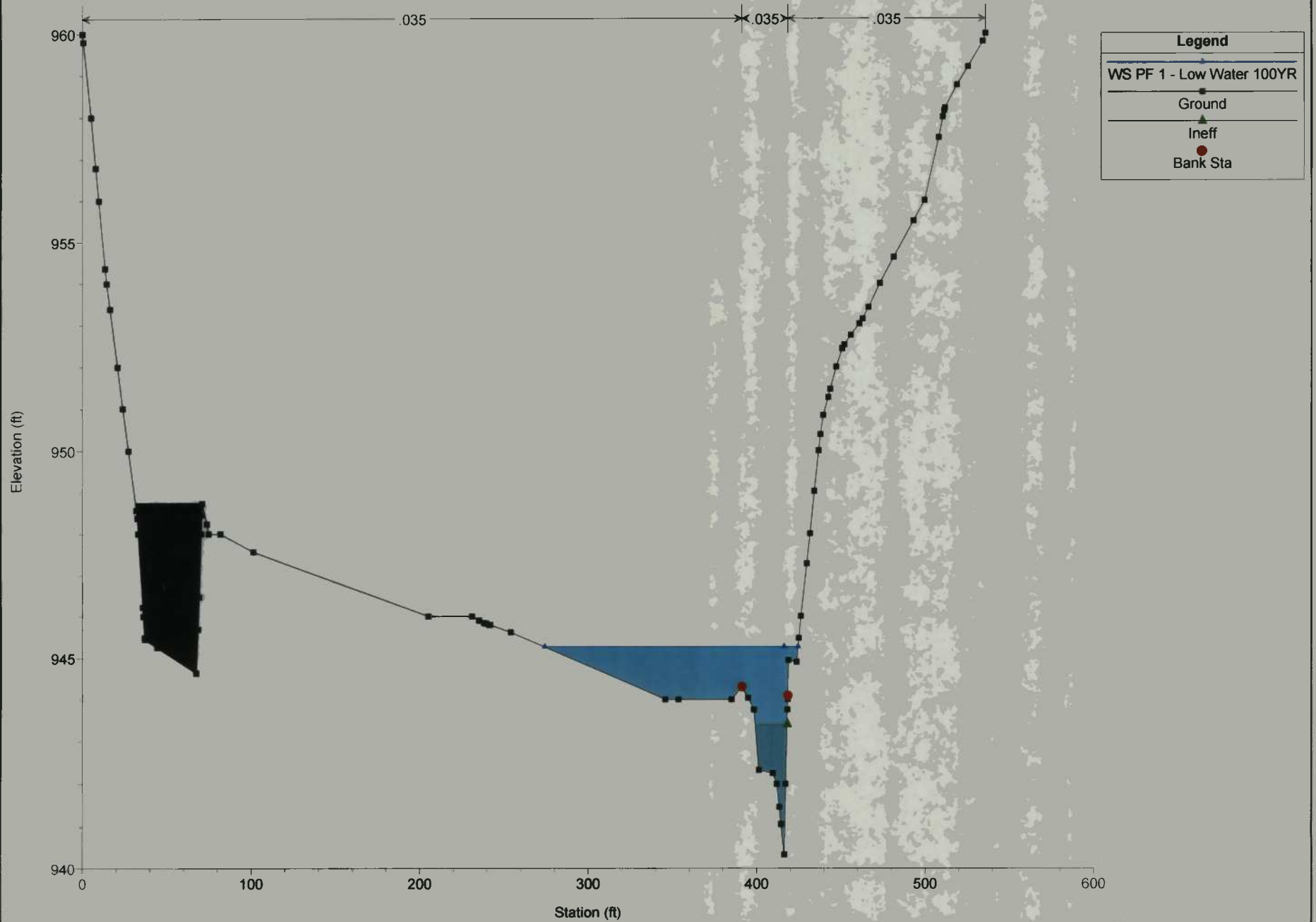
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Upper RS = 12694.78



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

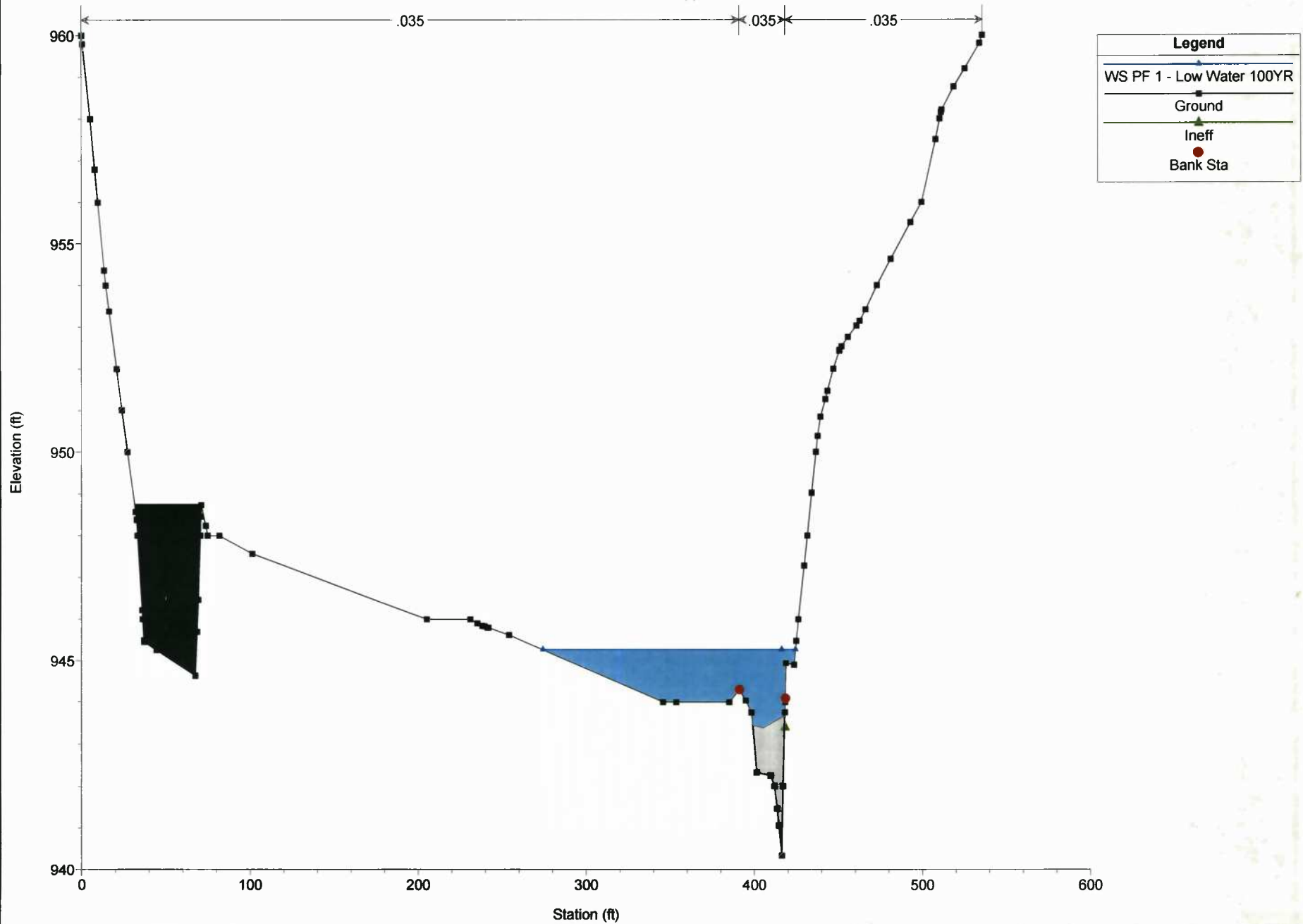
River = Bluestone Creek Reach = Upper RS = 12646.06



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

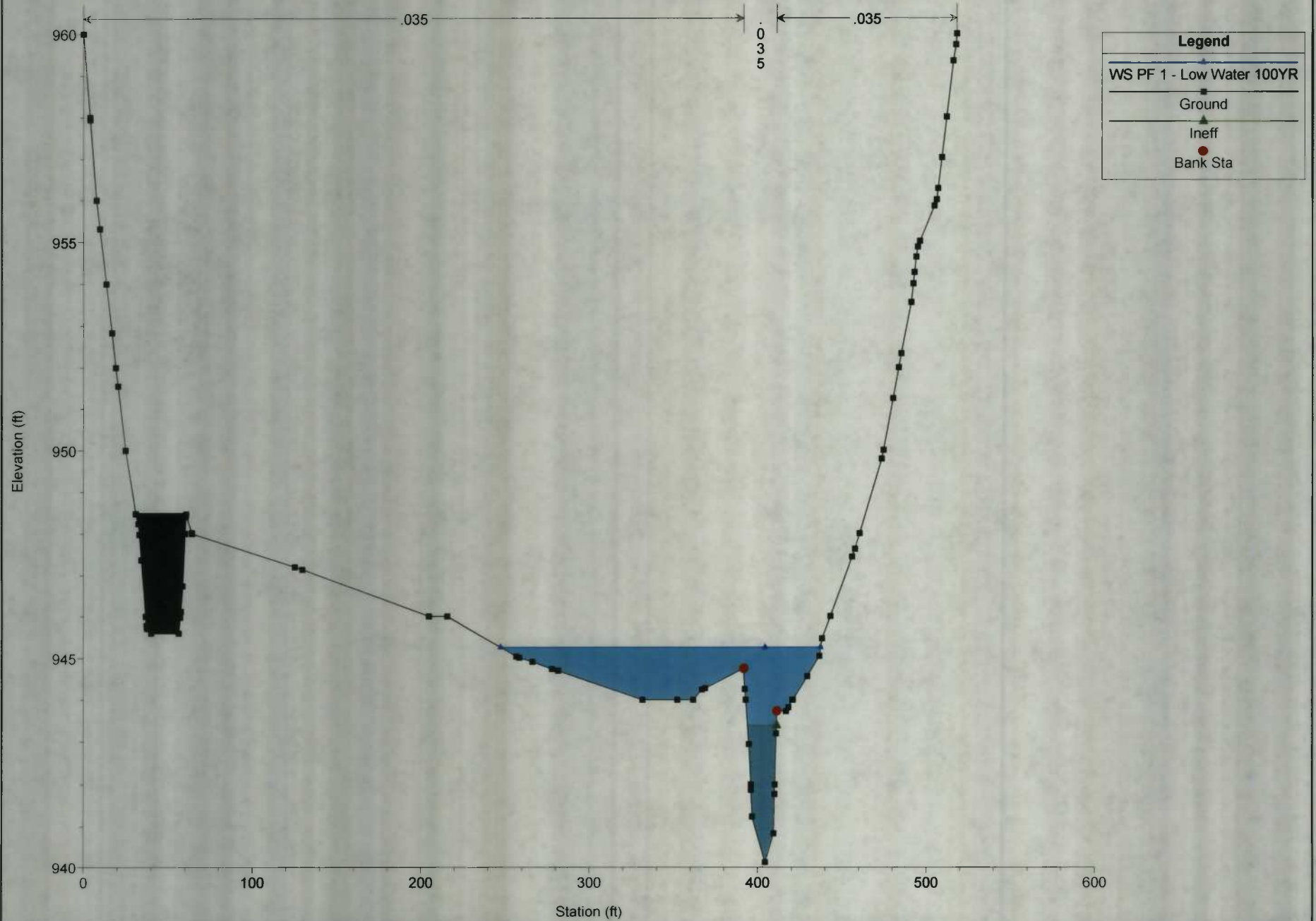
River = Bluestone Creek Reach = Upper RS = 12633.65 IS



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

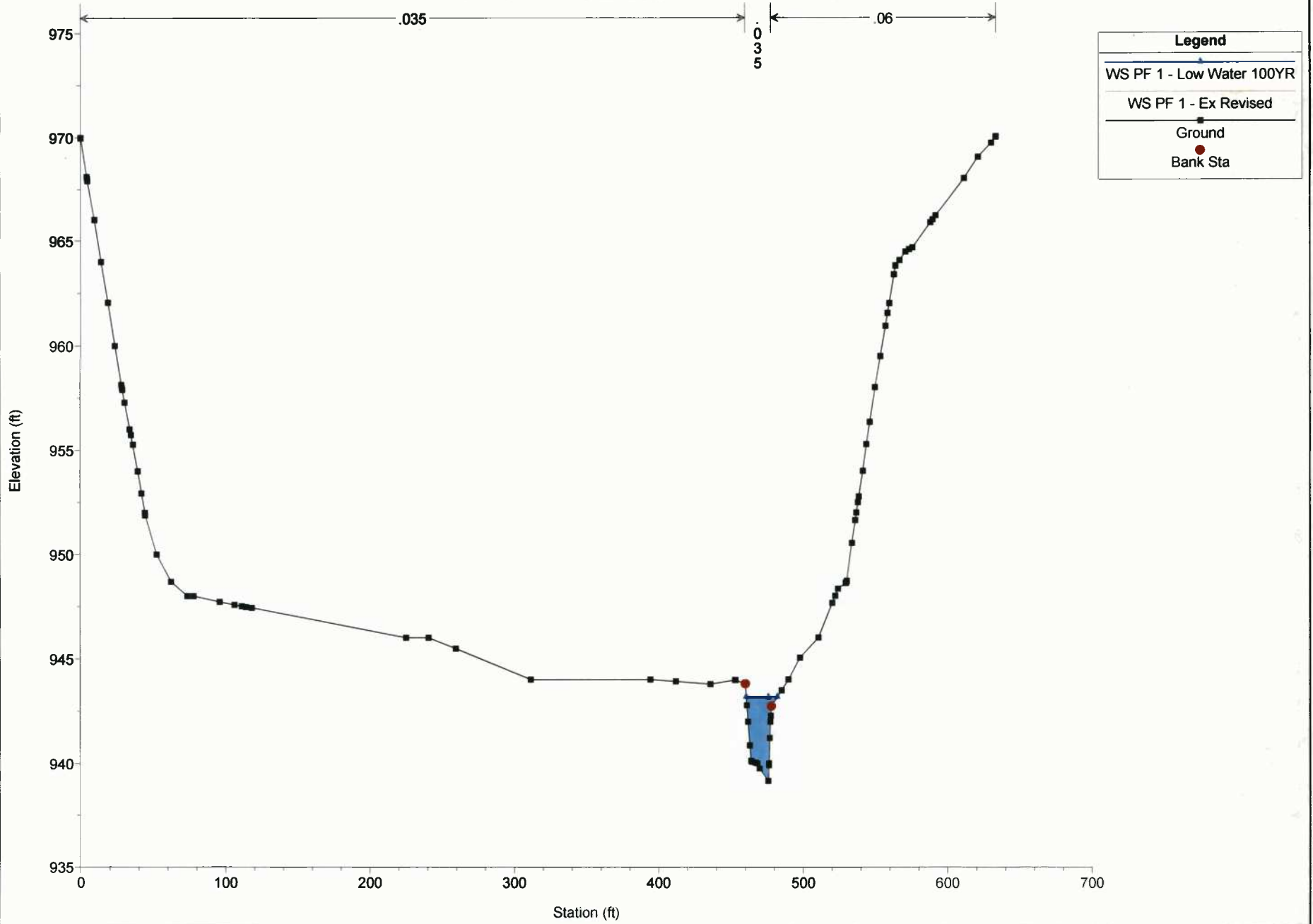
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 12620.64



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

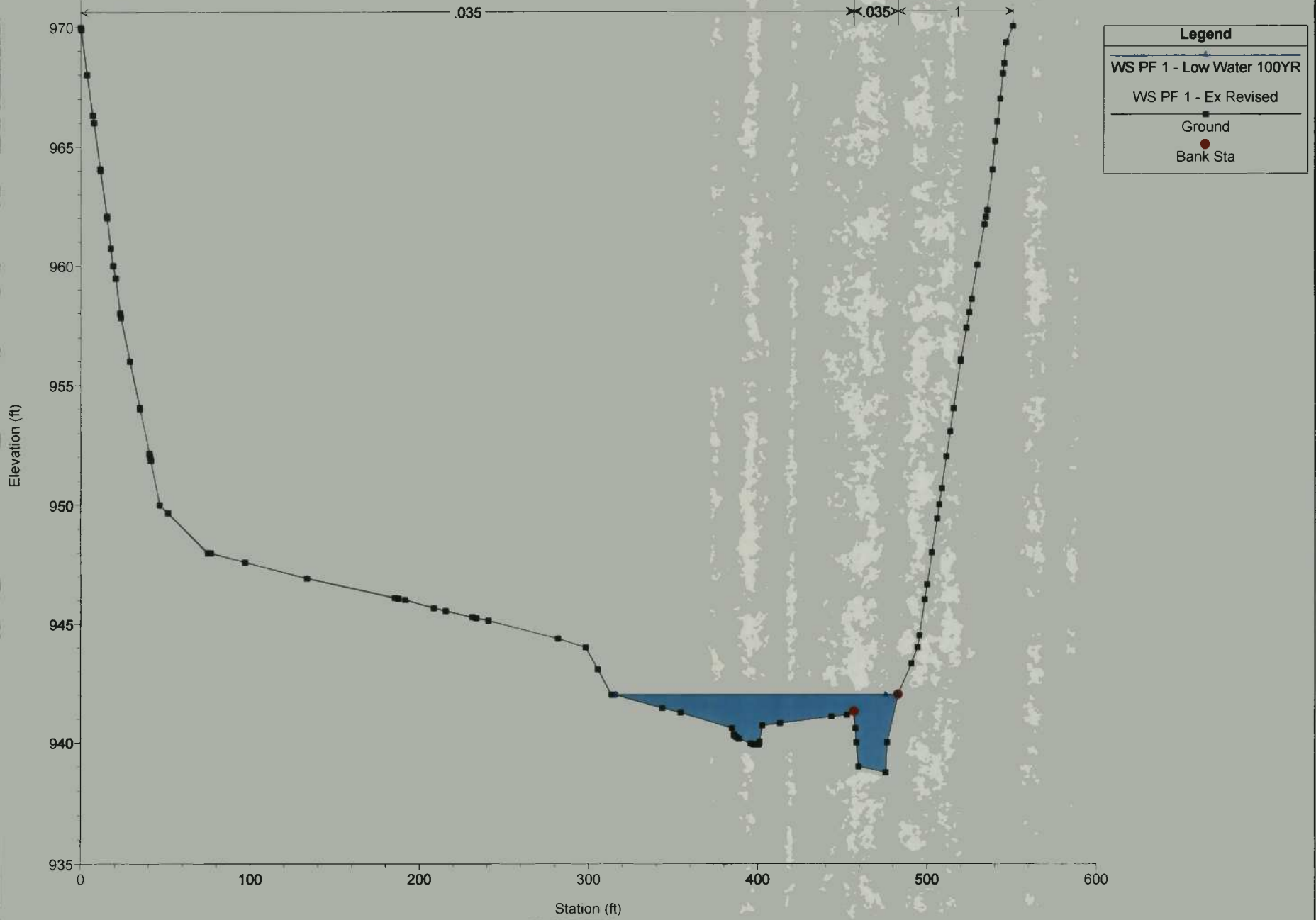
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Upper RS = 12504.92



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

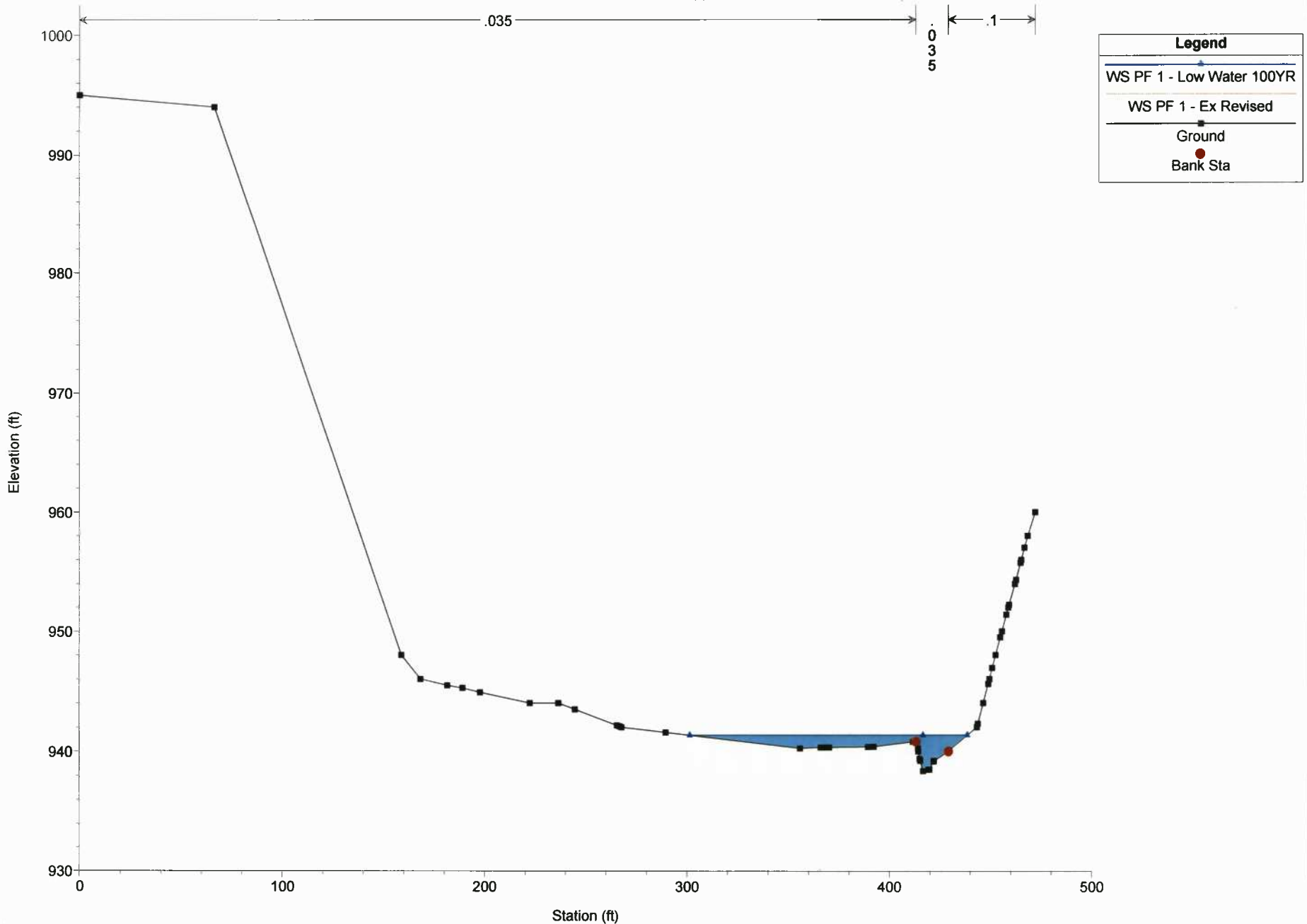
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 12207.32



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Upper RS = 12162.04



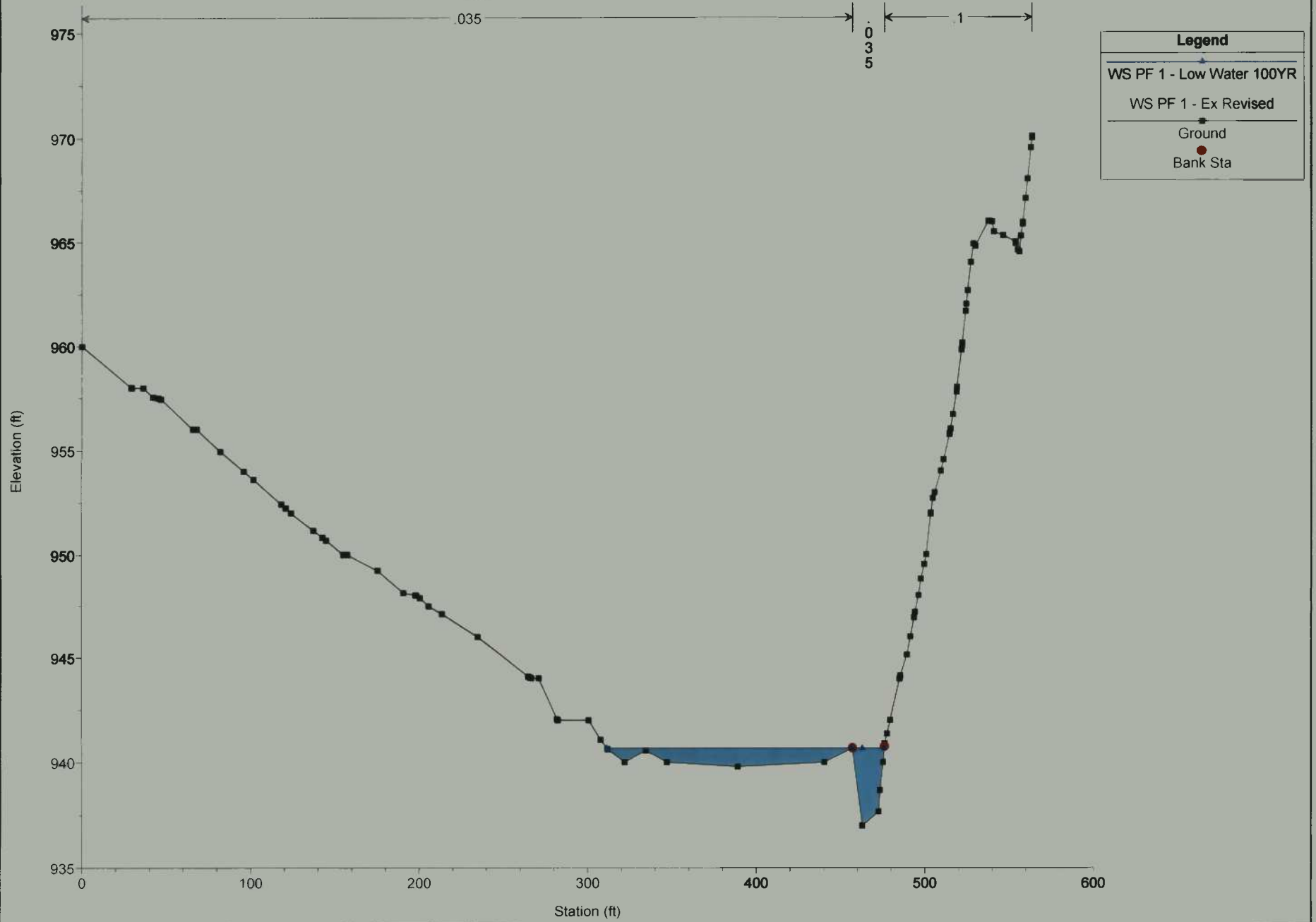
Legend

- WS PF 1 - Low Water 100YR
- WS PF 1 - Ex Revised
- Ground
- Bank Sta

OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

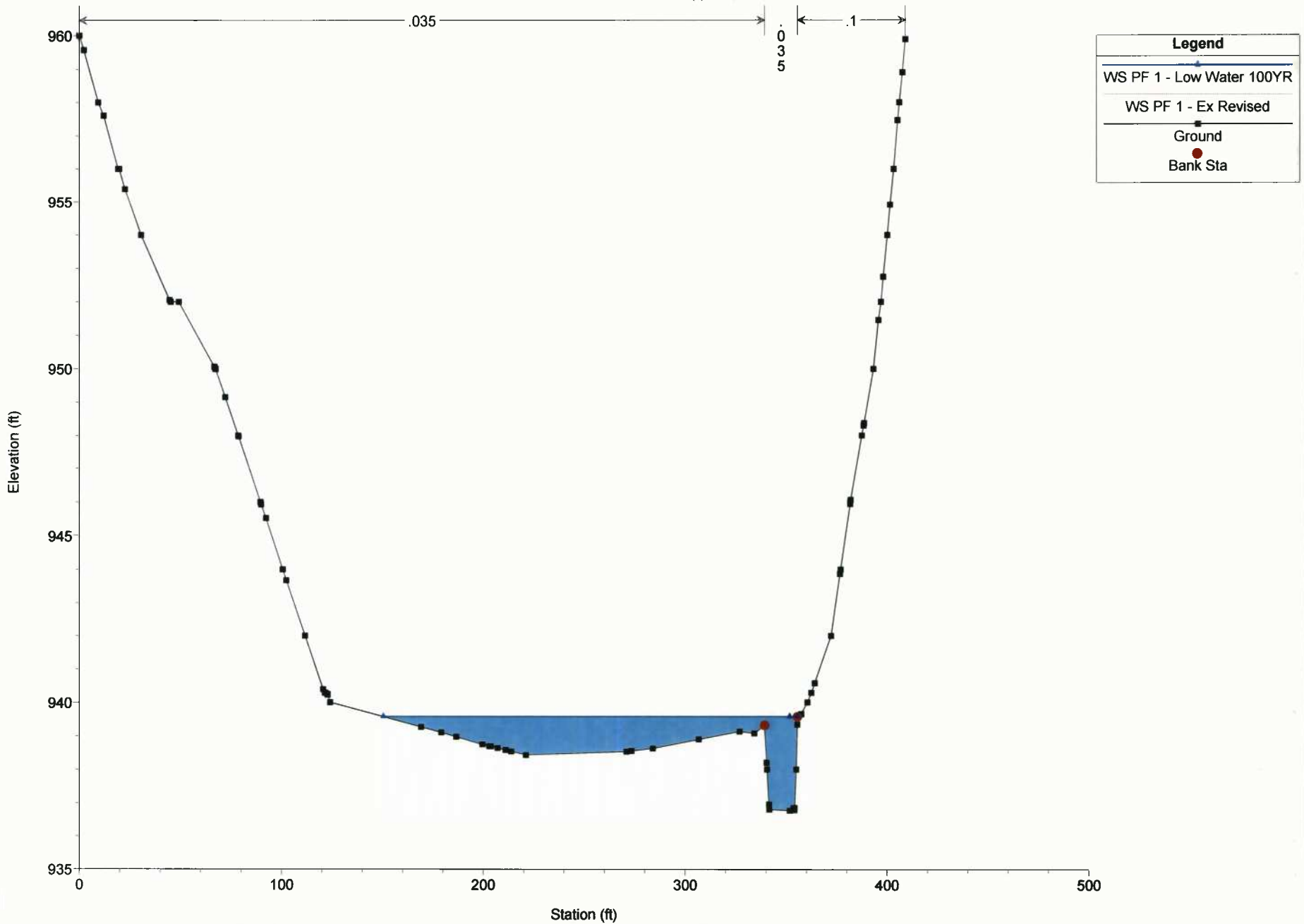
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 12075.53



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Upper RS = 11904.55



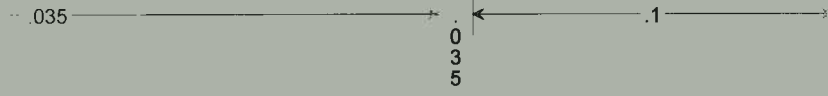
Legend

- WS PF 1 - Low Water 100YR
- WS PF 1 - Ex Revised
- Ground
- Bank Sta

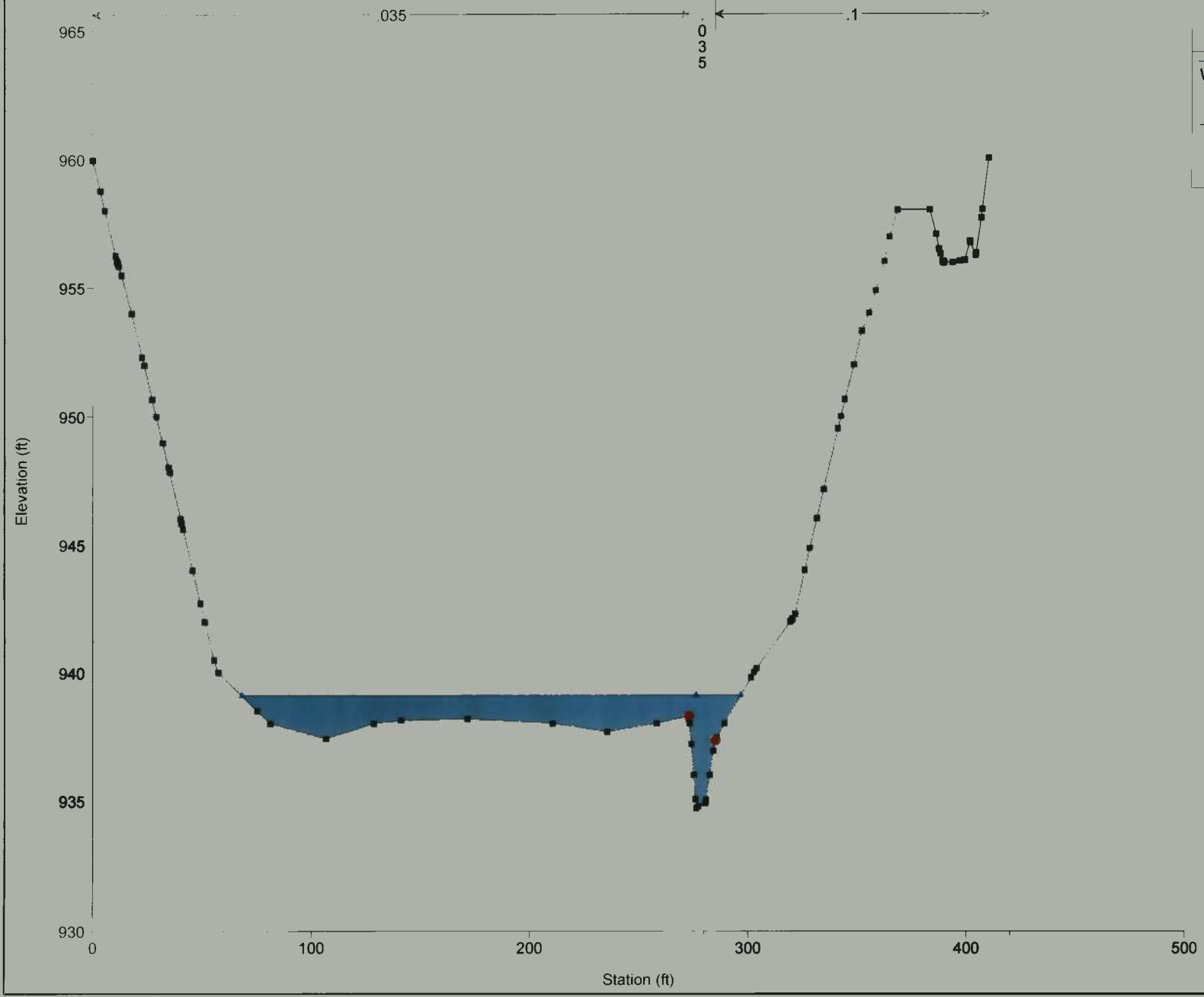
OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 11770.60

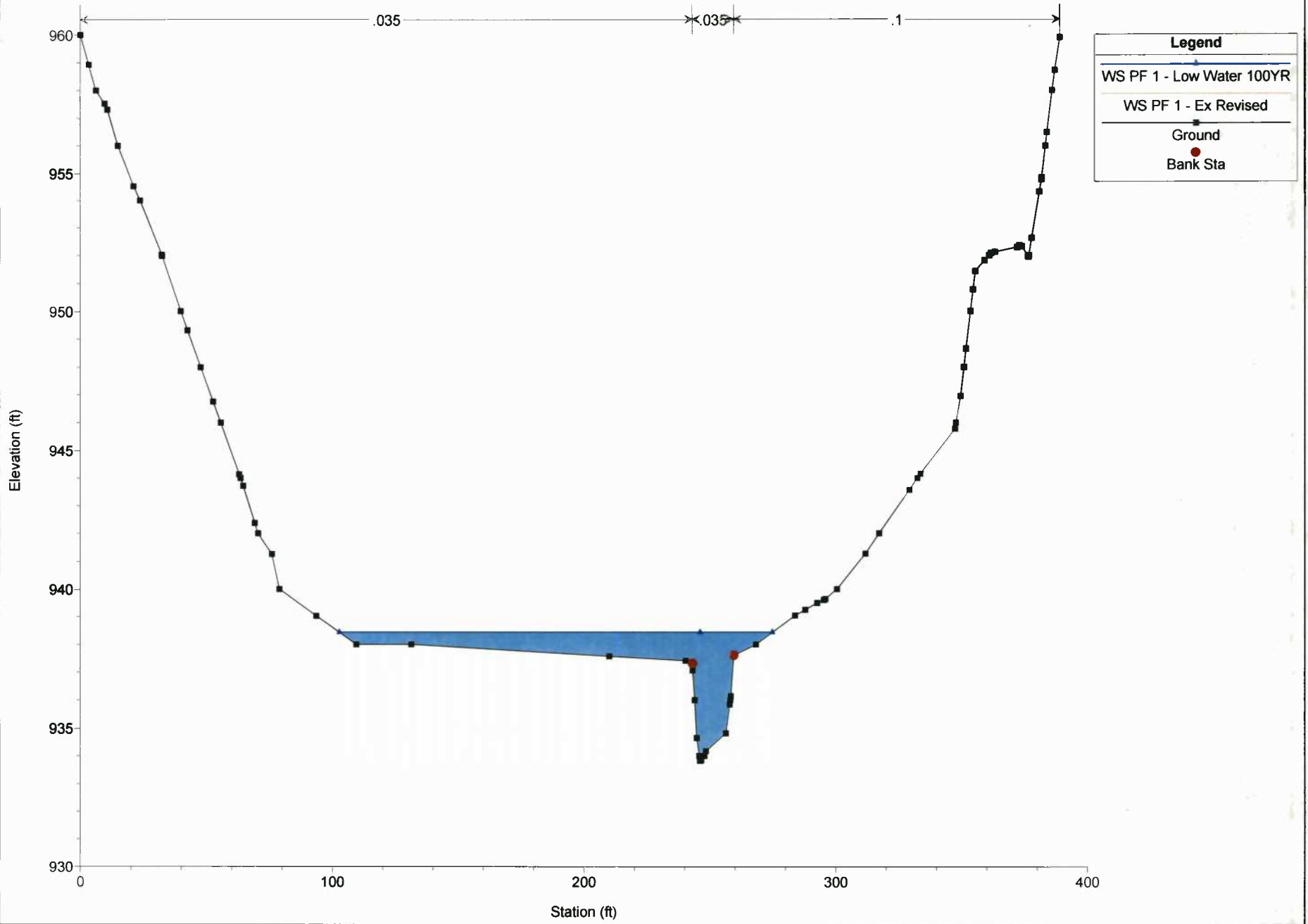


Legend	
▲	WS PF 1 - Low Water 100YR
■	WS PF 1 - Ex Revised
■	Ground
●	Bank Sta



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

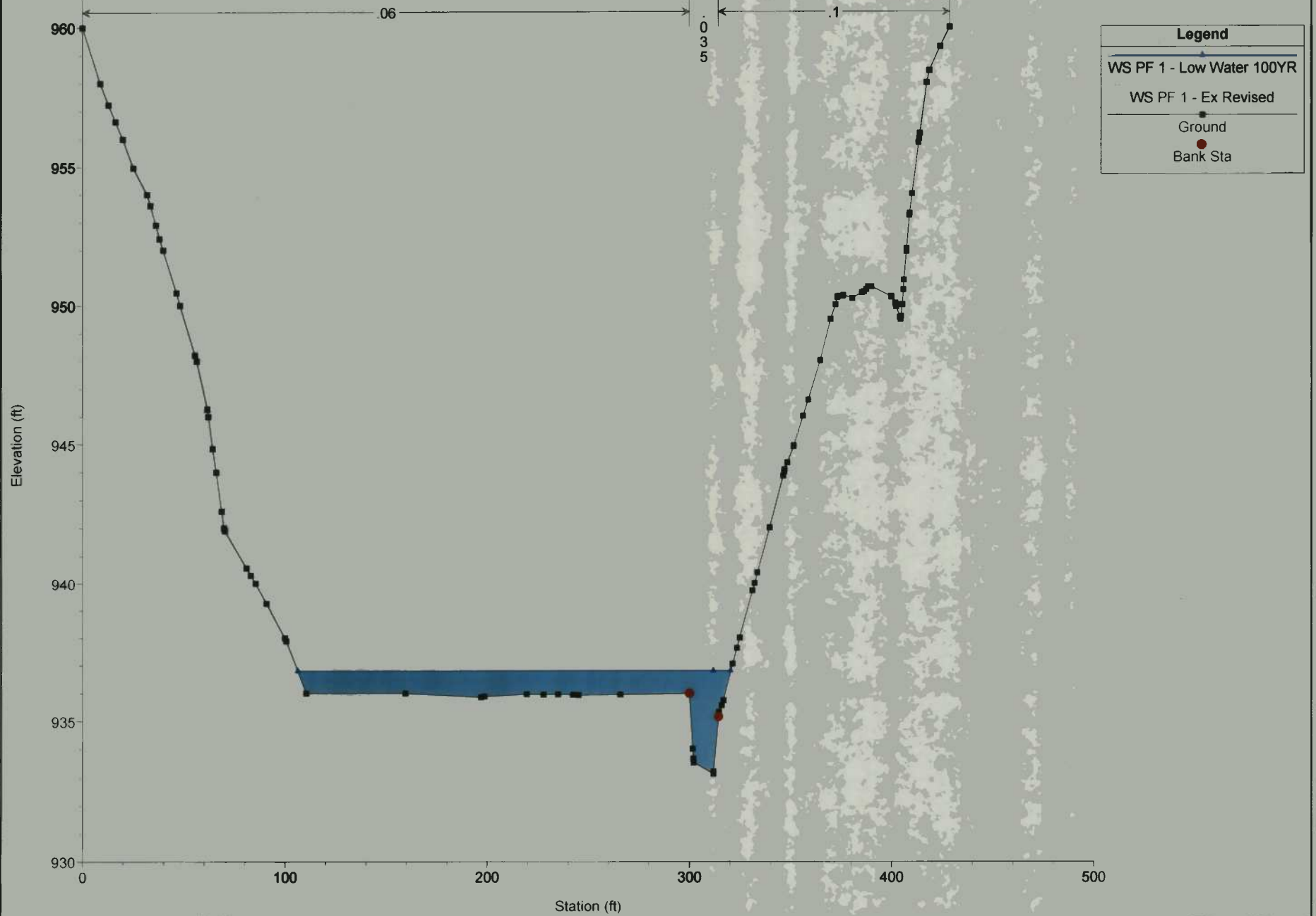
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Upper RS = 11632.87



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

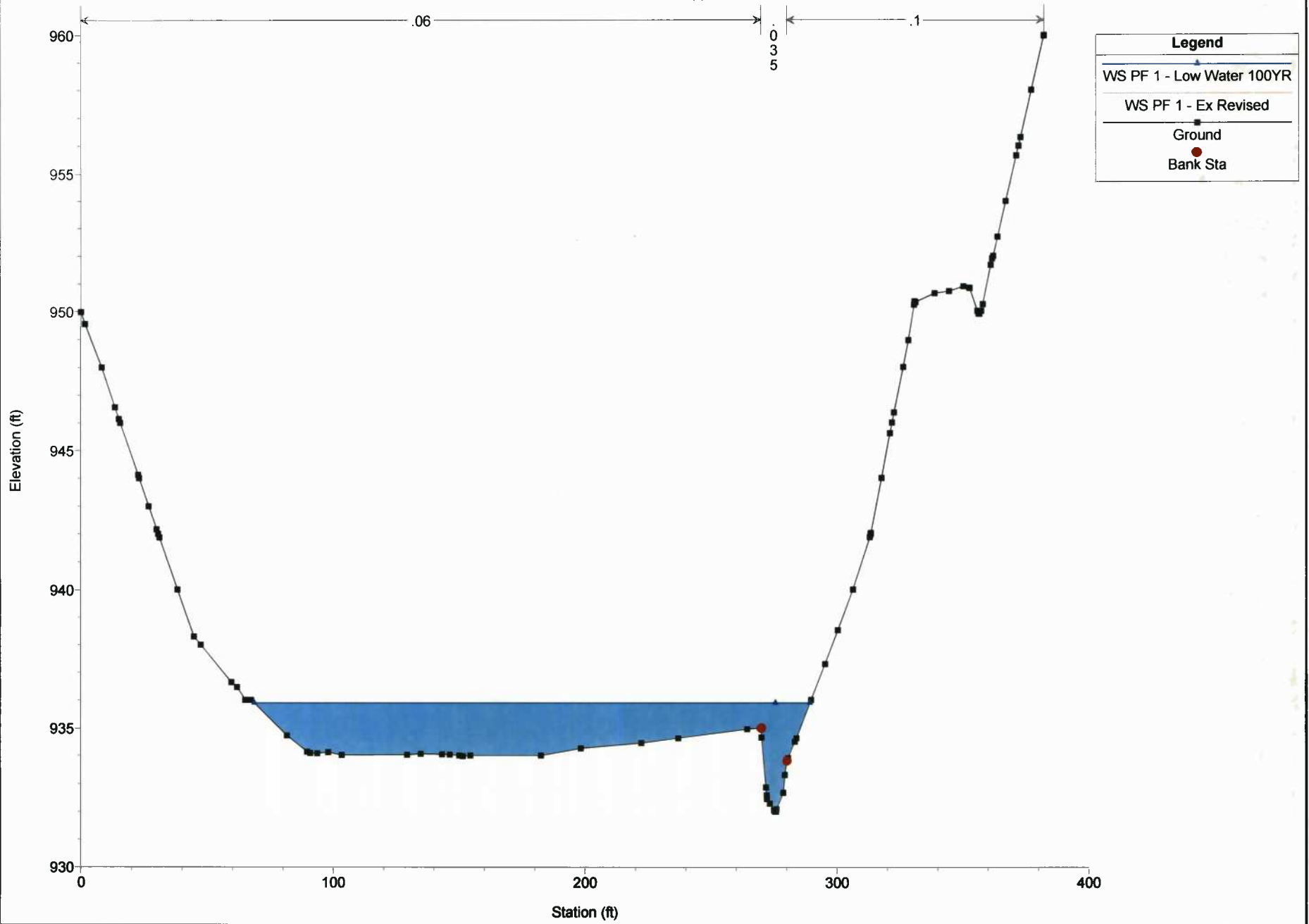
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 11351.13



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

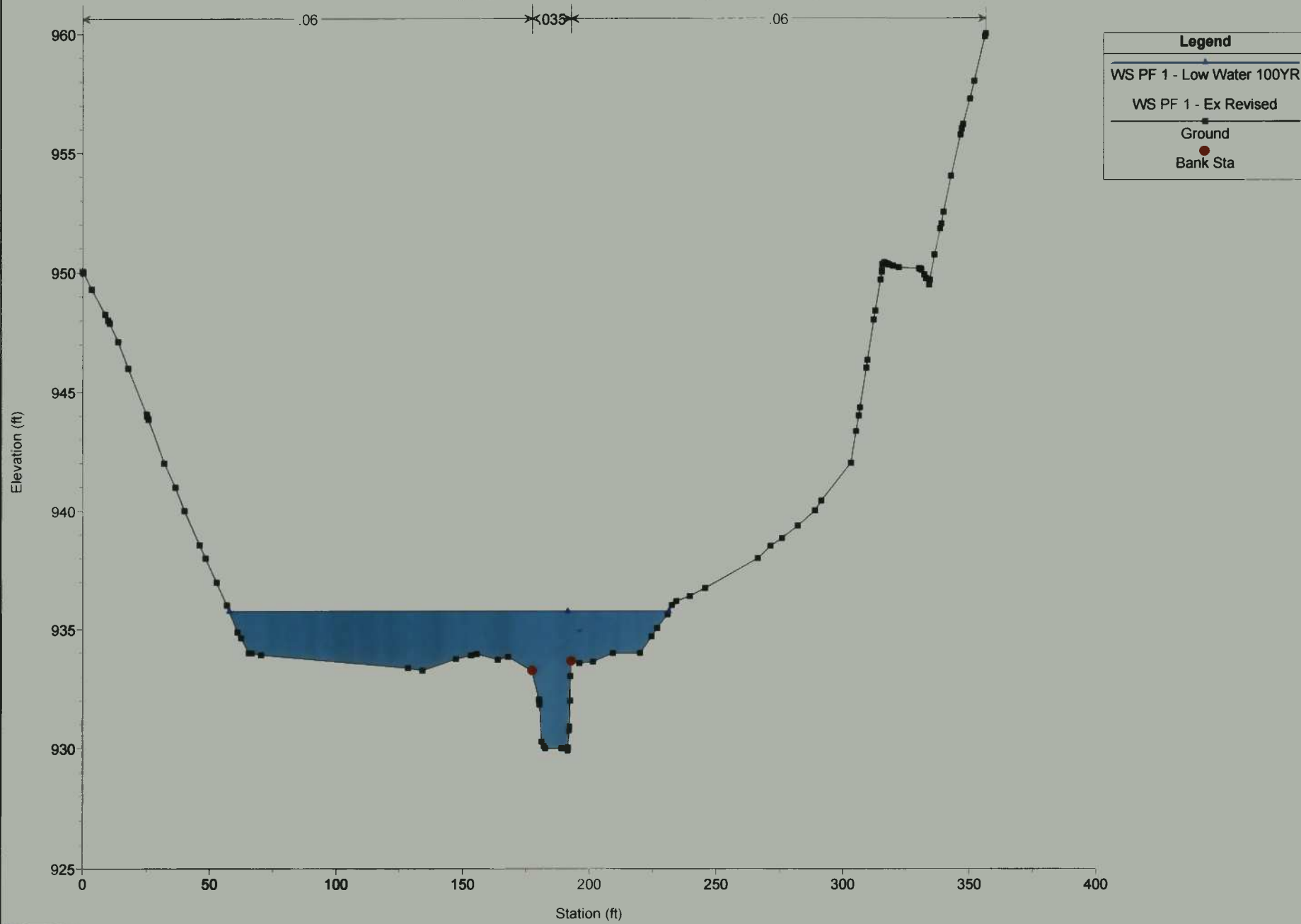
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Upper RS = 11189.95



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

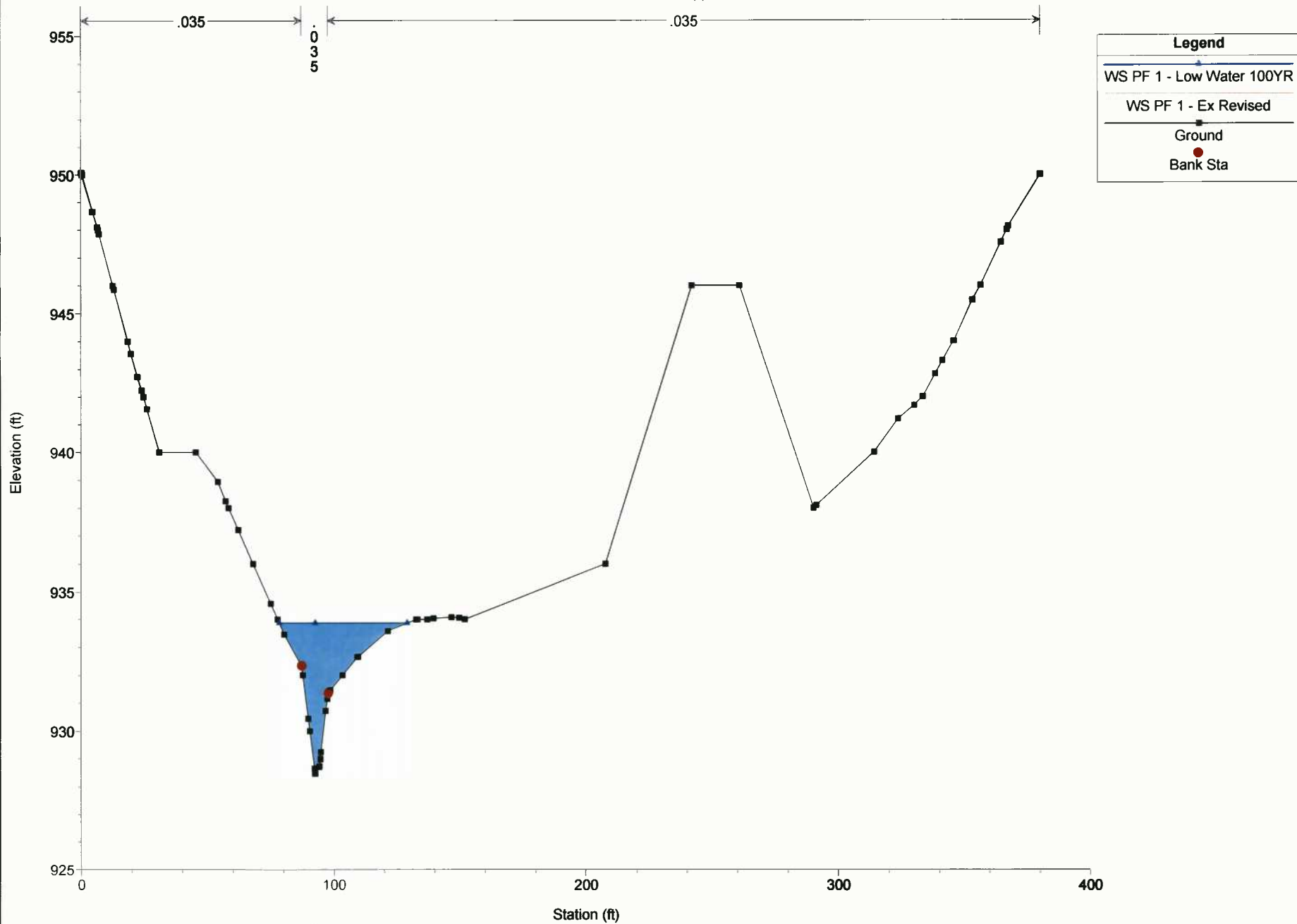
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 10974.14



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

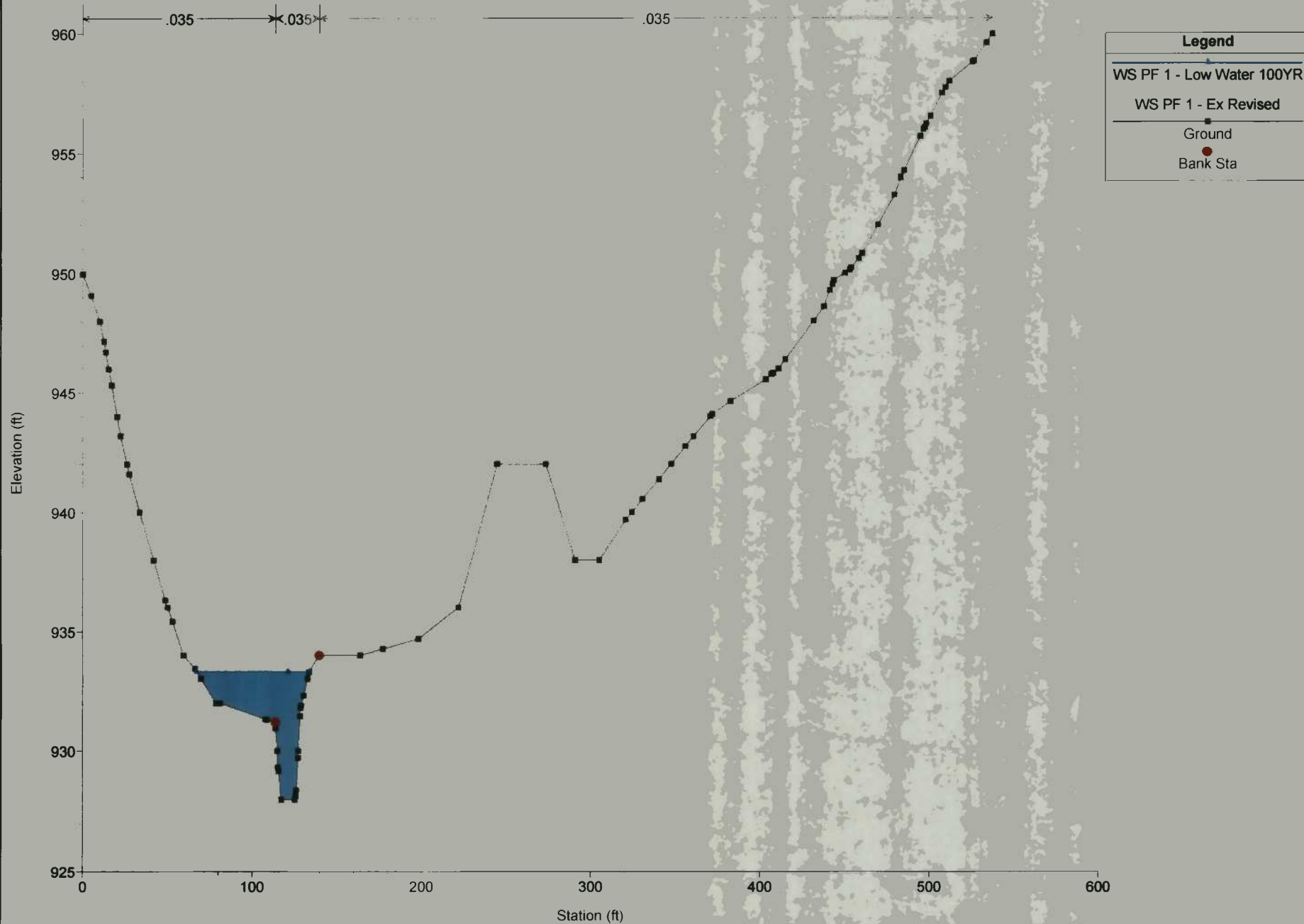
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Upper RS = 10615.35



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 10402.90

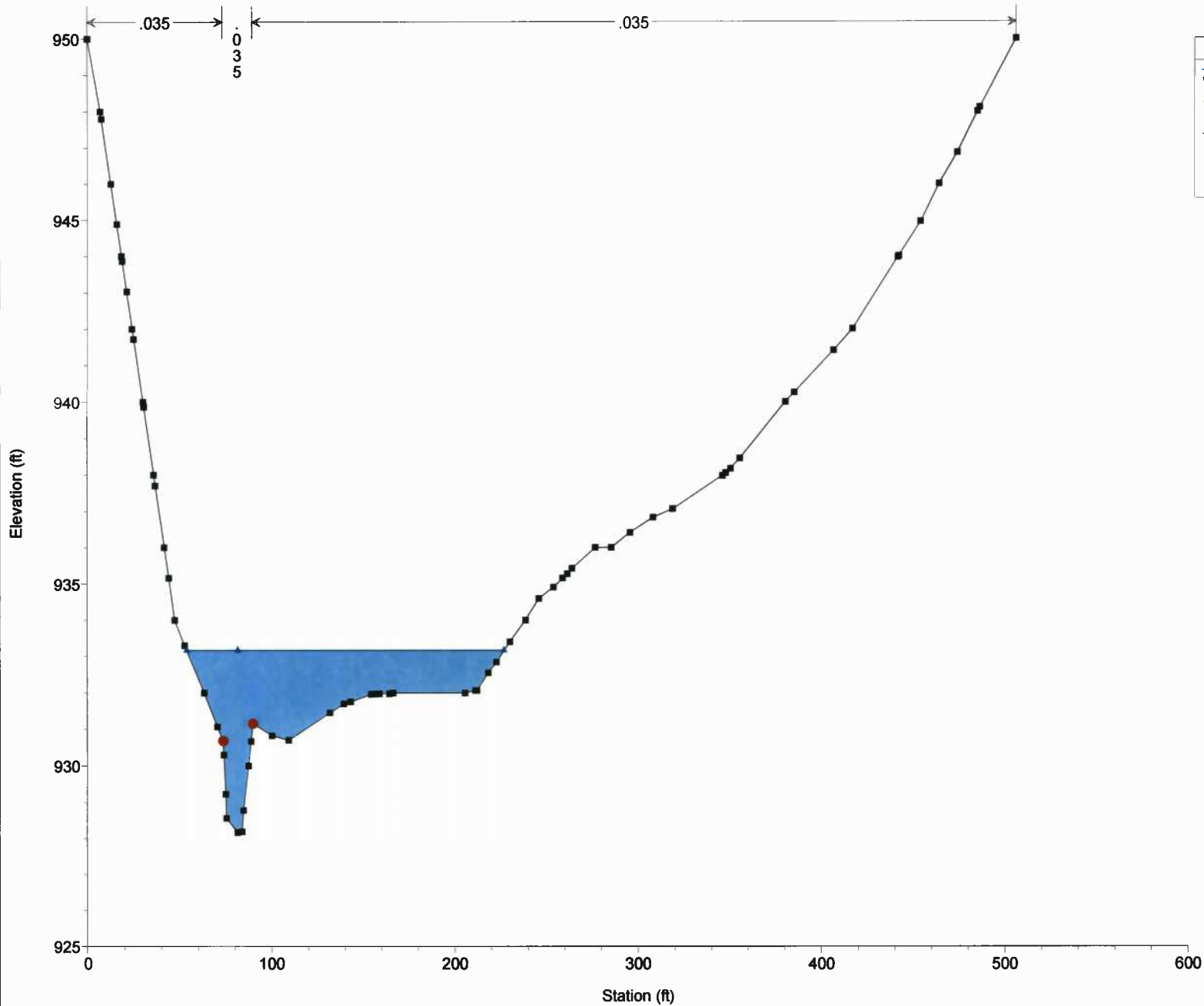


Legend

- WS PF 1 - Low Water 100YR
- WS PF 1 - Ex Revised
- Ground
- Bank Sta

OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Upper RS = 10179.69



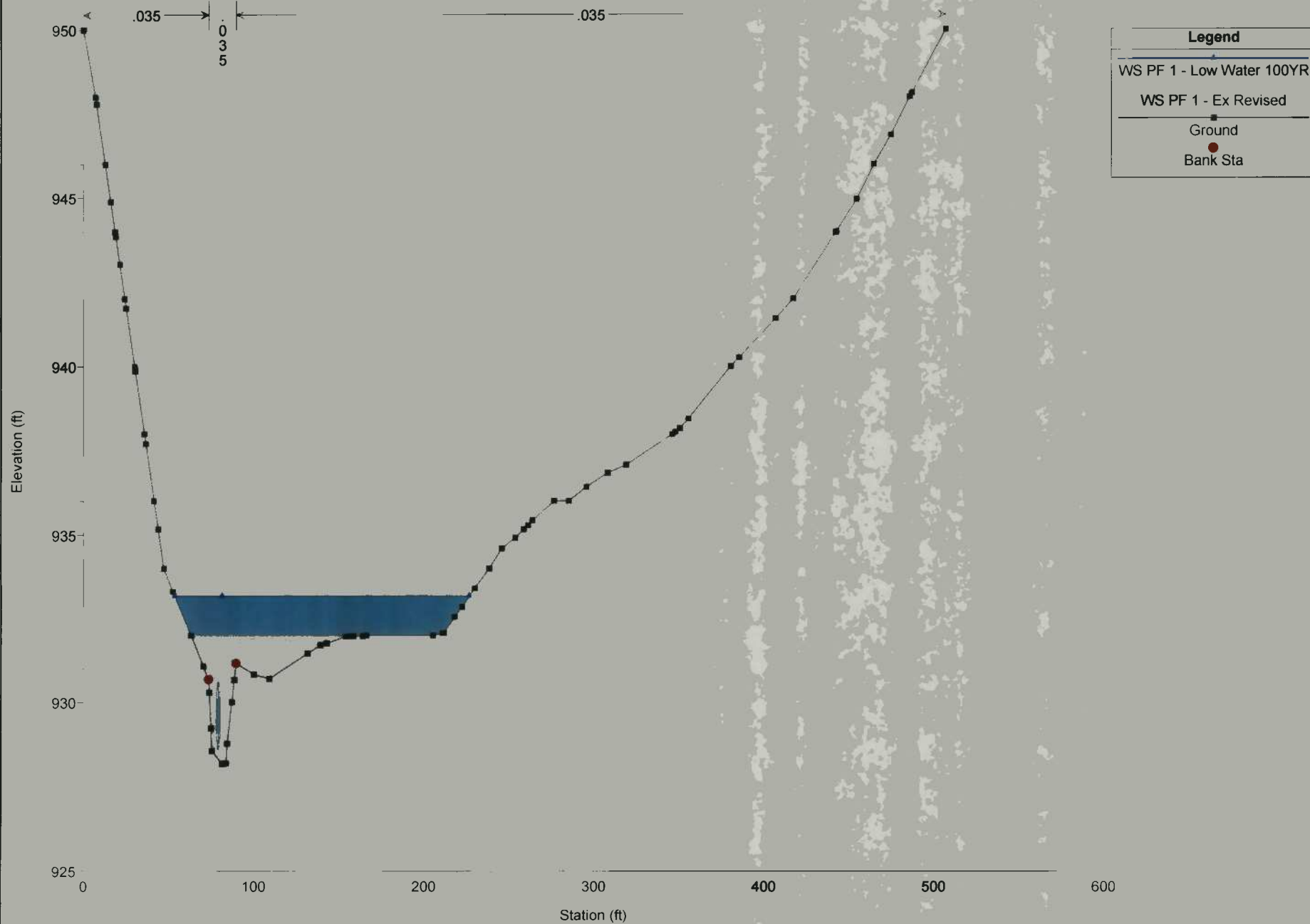
Legend

- WS PF 1 - Low Water 100YR
- WS PF 1 - Ex Revised
- Ground
- Bank Sta

OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

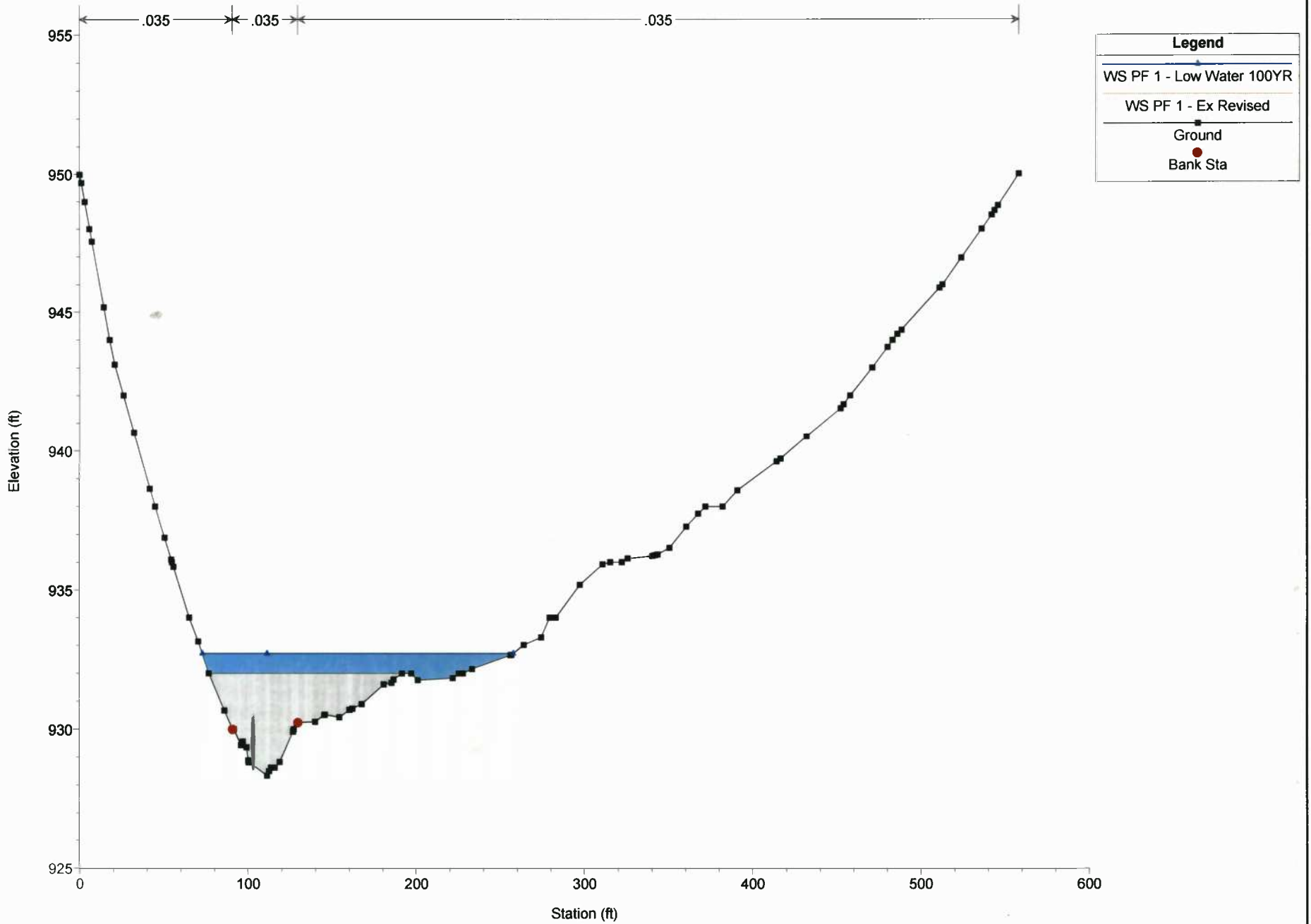
River = Bluestone Creek Reach = Upper RS = 10155.71 Culv



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 10155.71 Culv



Legend

WS PF 1 - Low Water 100YR

WS PF 1 - Ex Revised

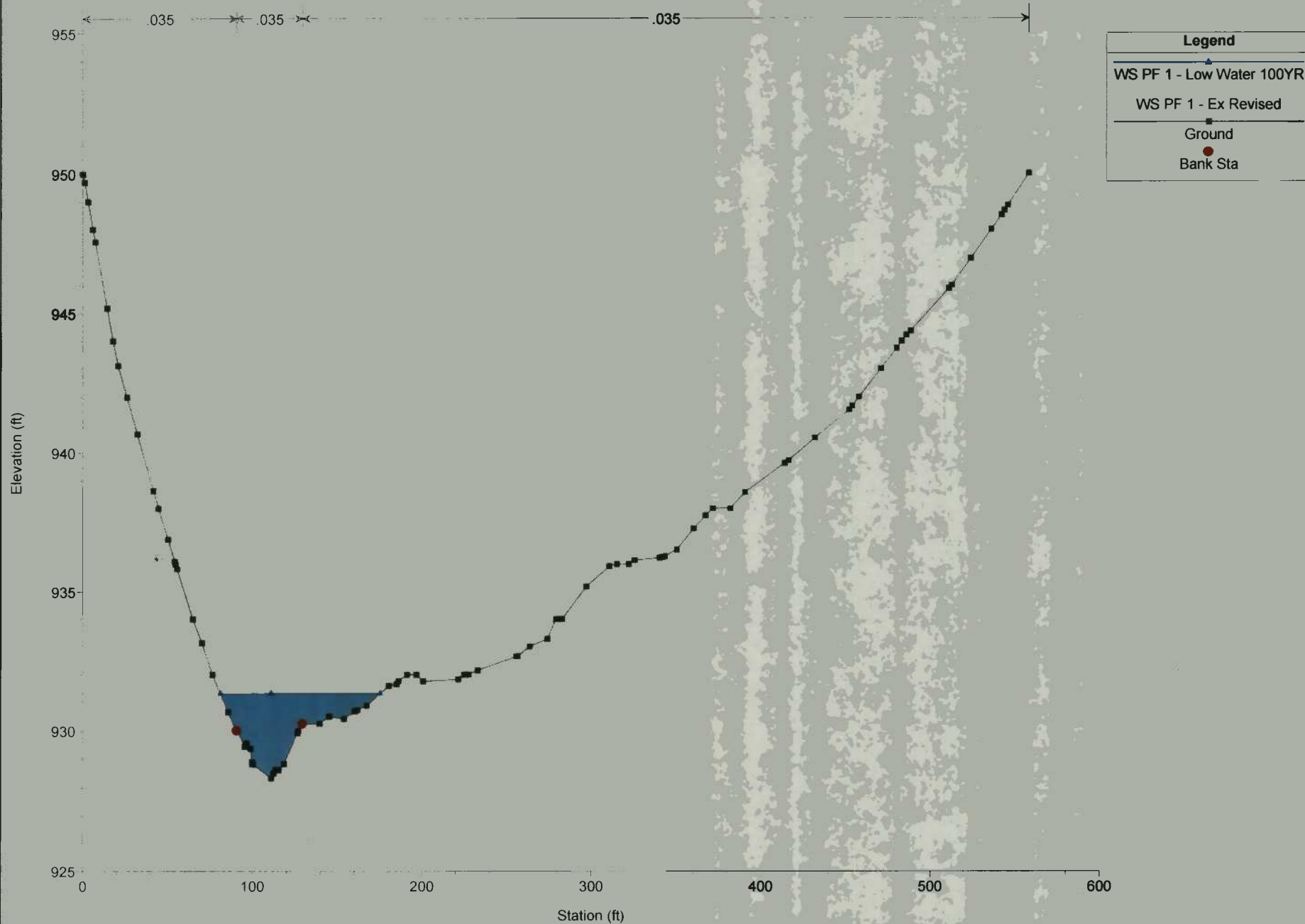
Ground

Bank Sta

OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

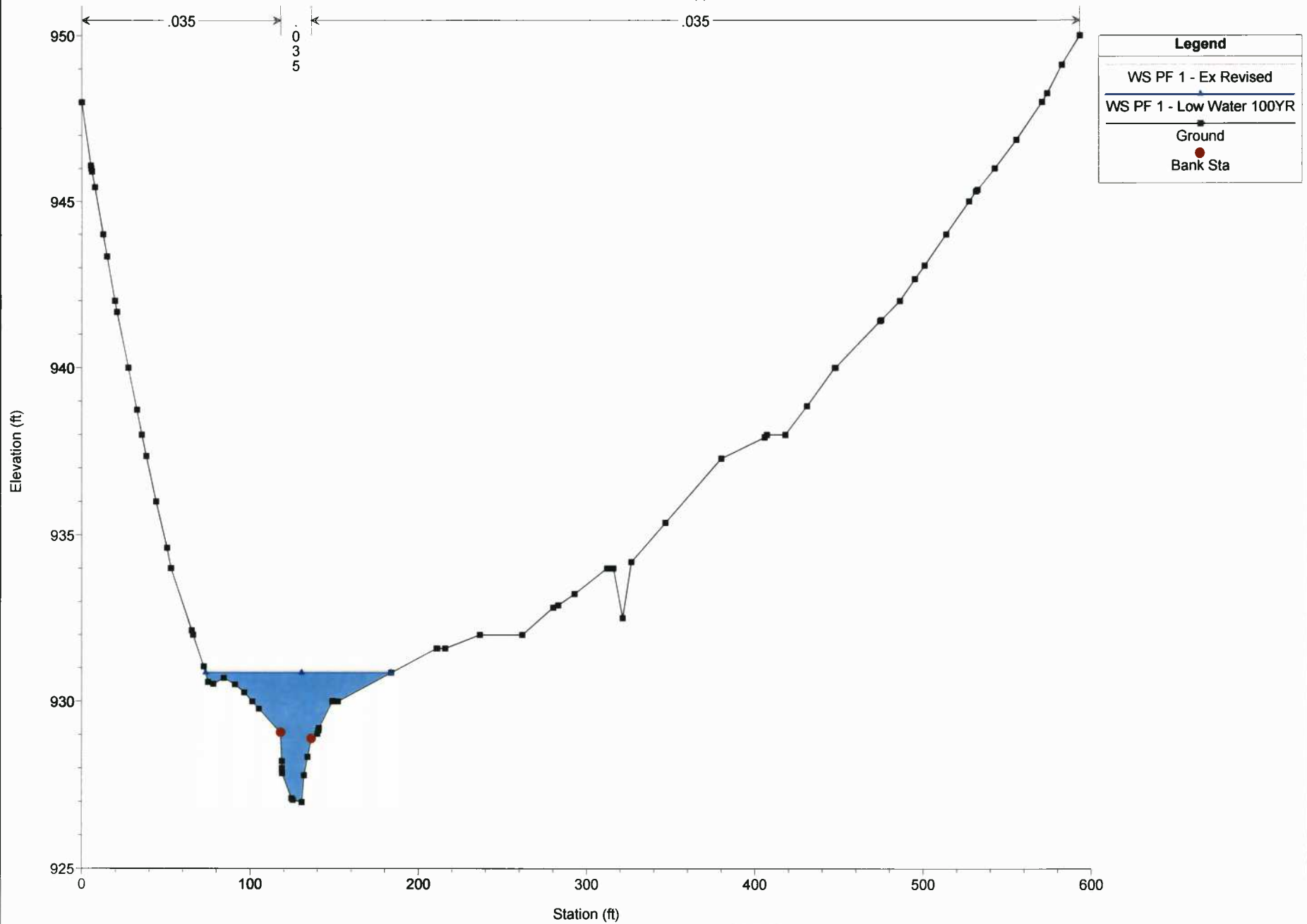
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 10120.86



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

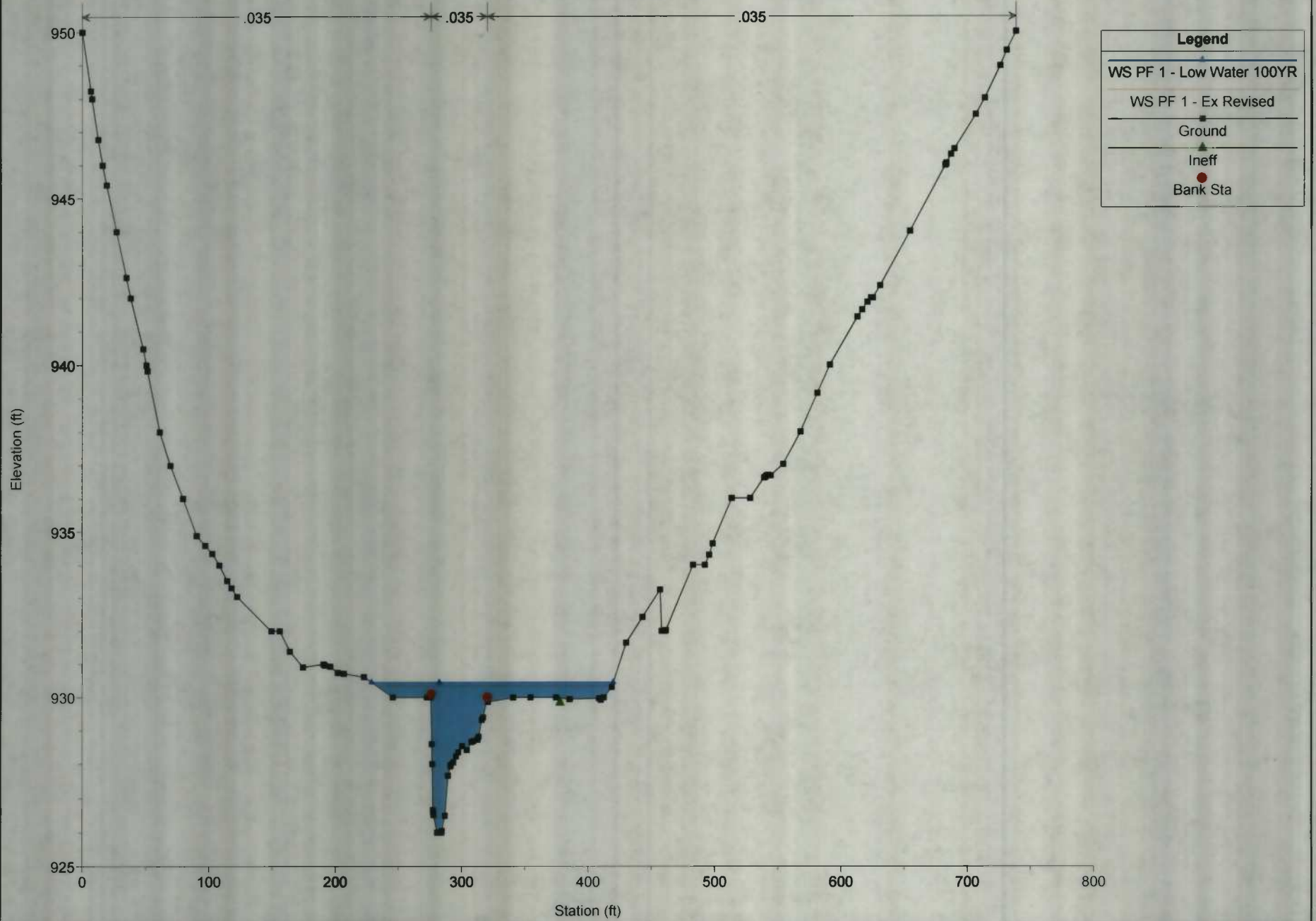
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Upper RS = 10055.03



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

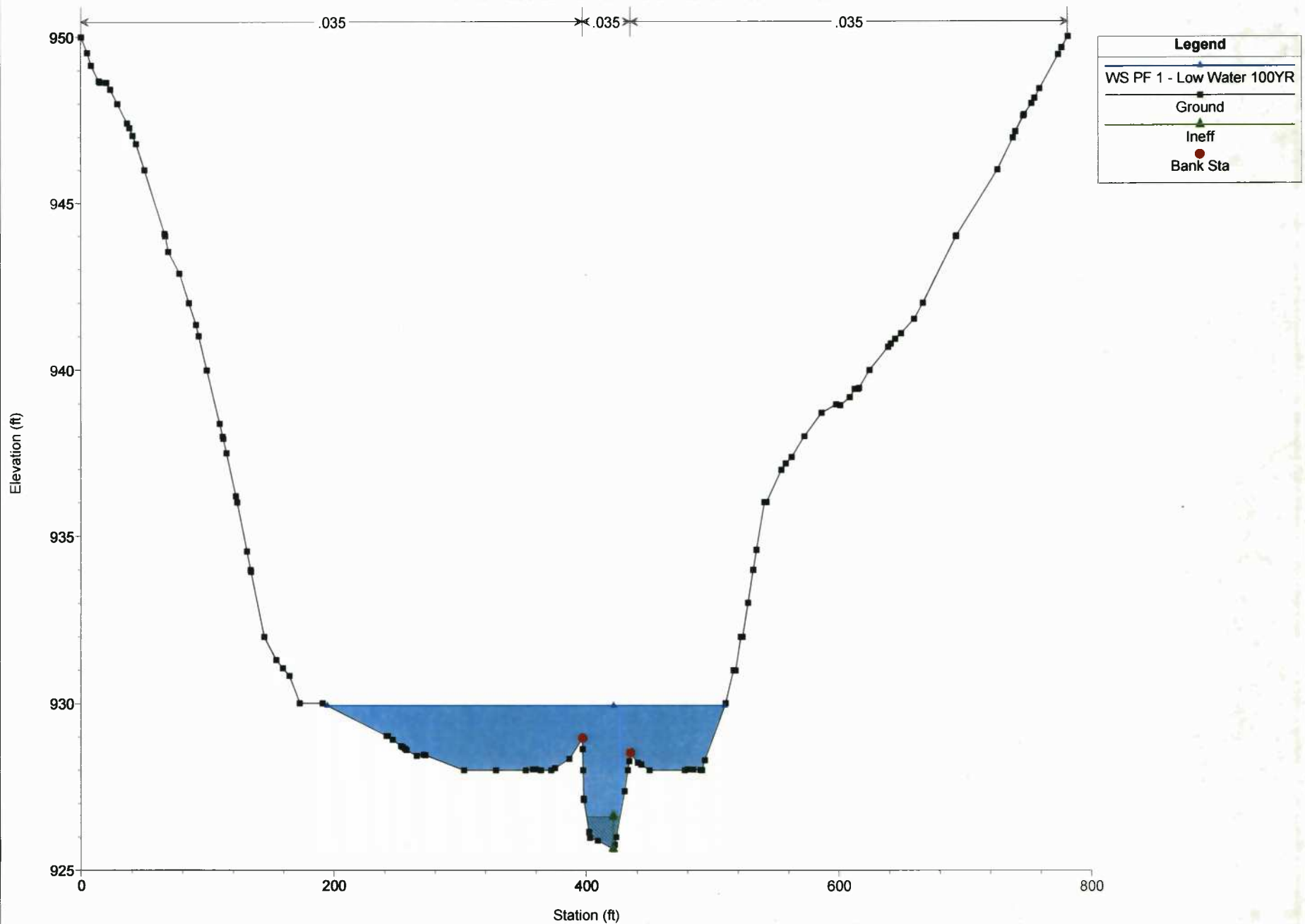
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 9989.380



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

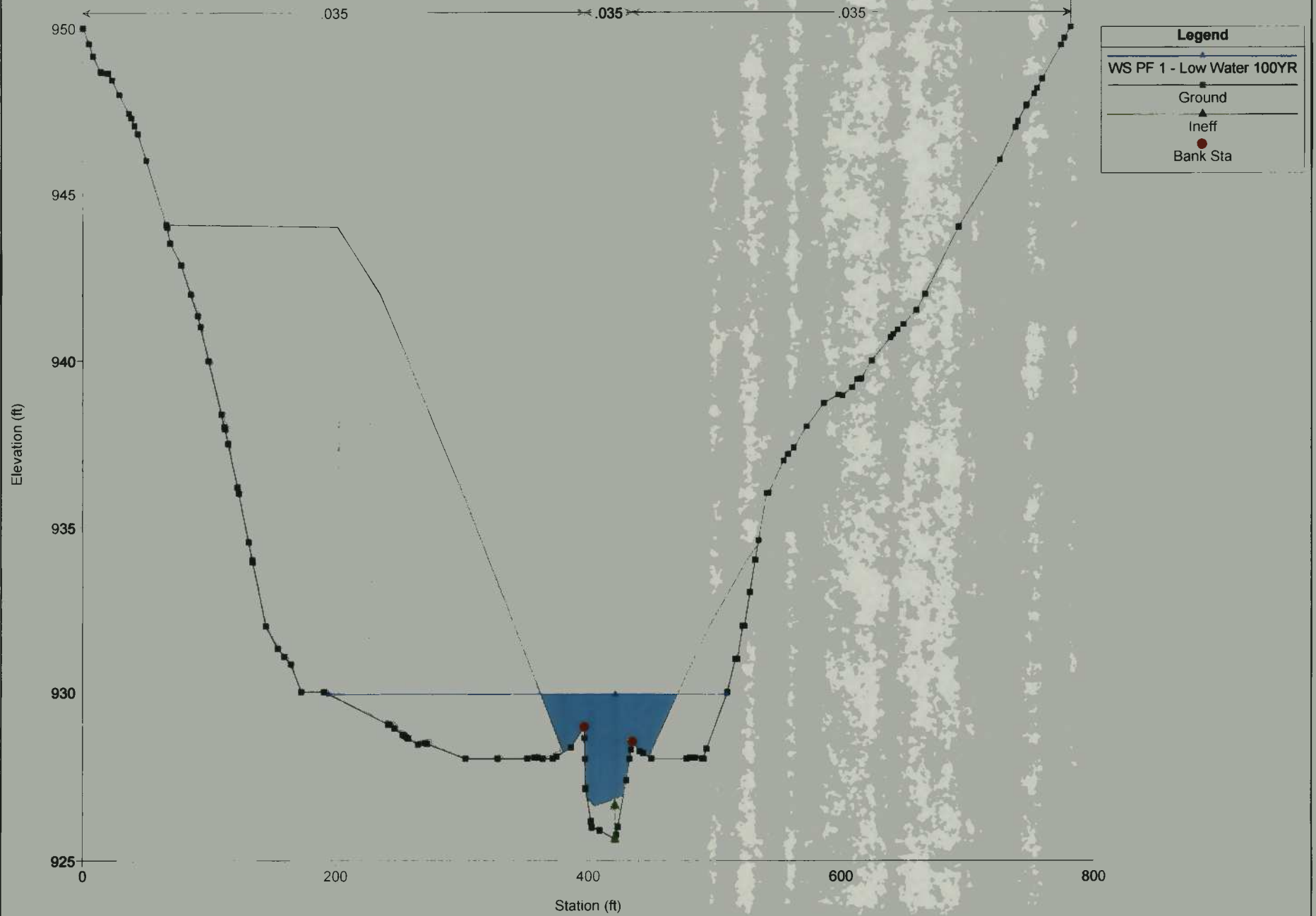
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Middle RS = 9878.981



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

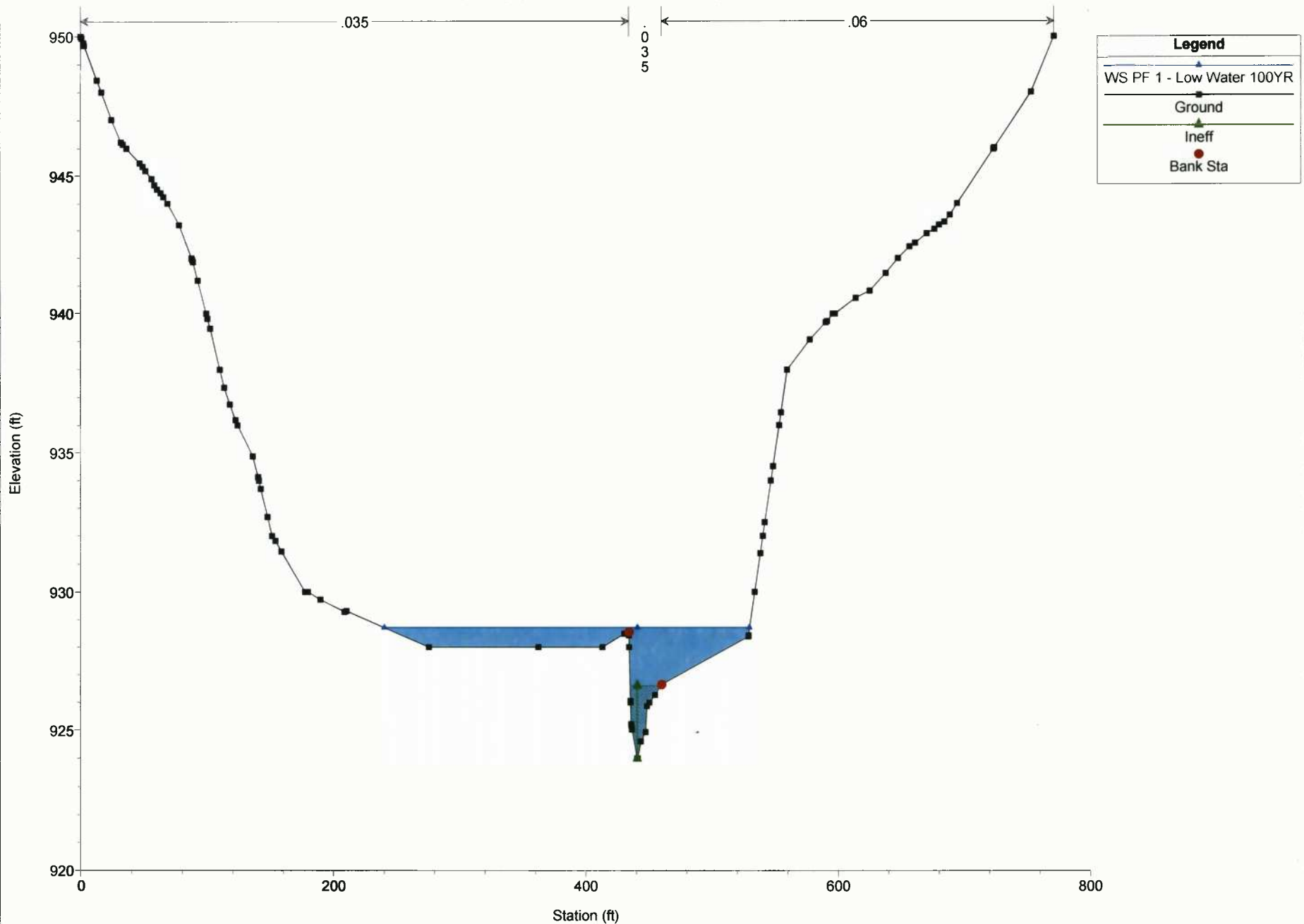
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 9855.351 IS



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

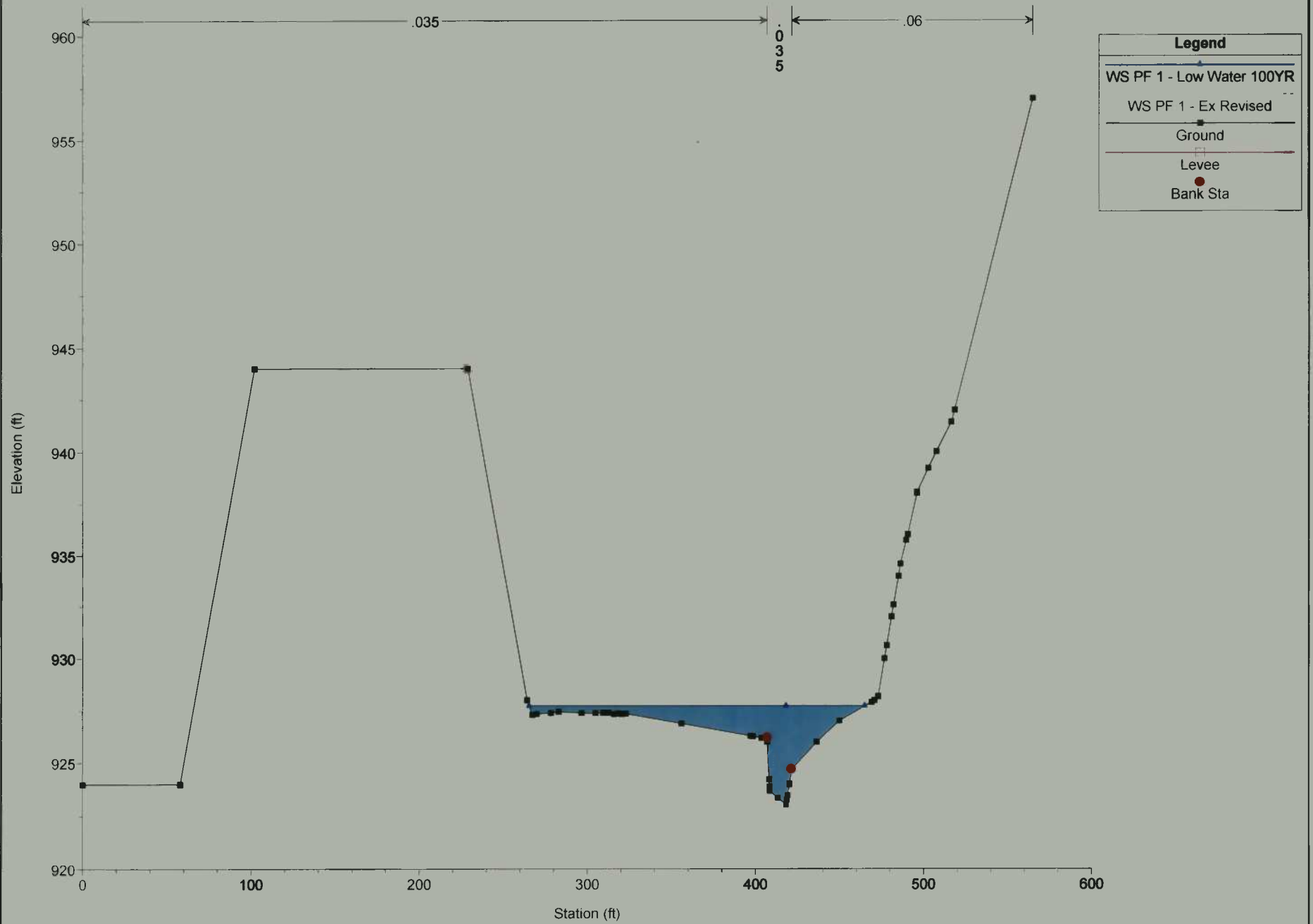
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Middle RS = 9831.906



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 9559.249

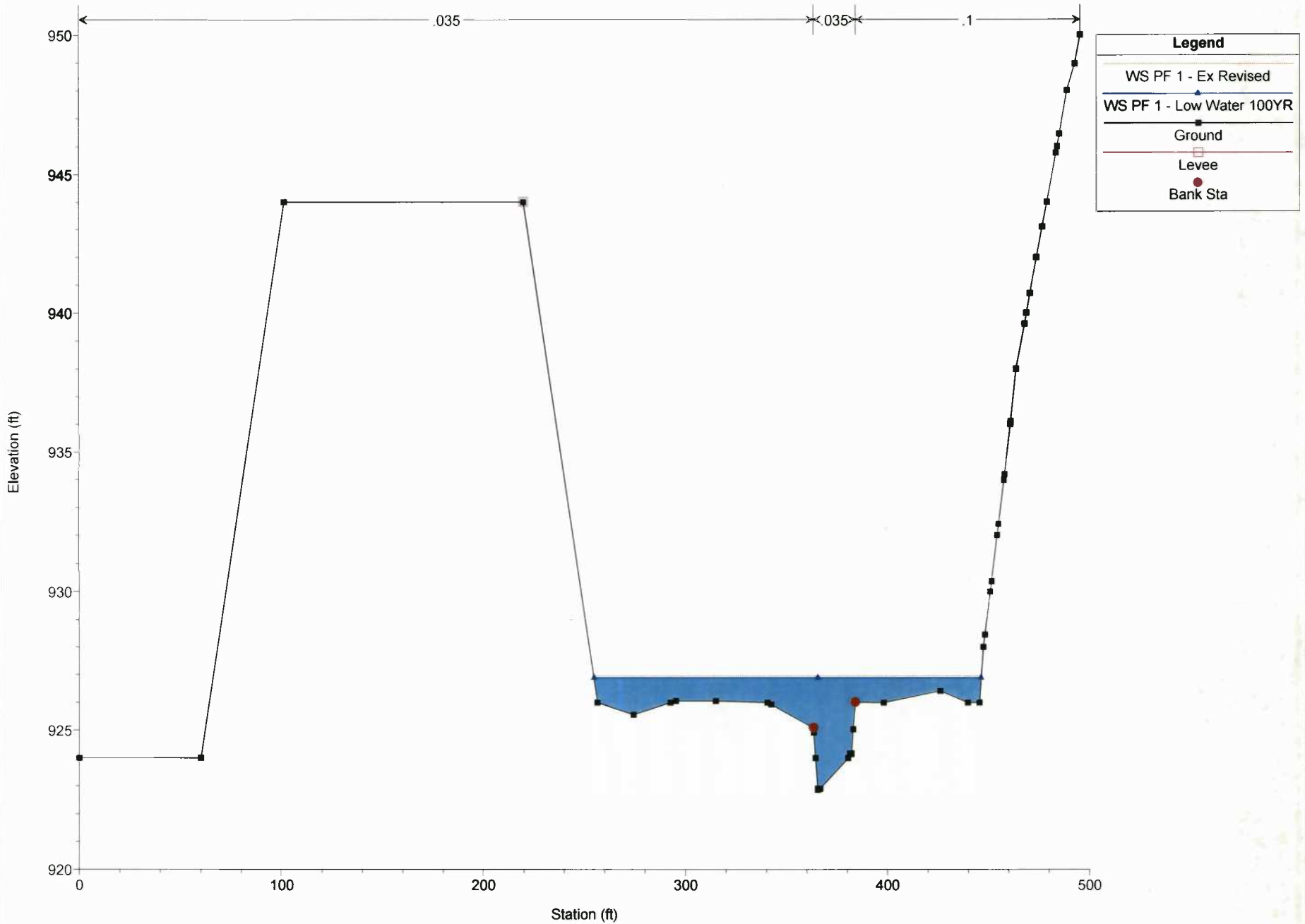


Legend

- WS PF 1 - Low Water 100YR (dashed line with square markers)
- WS PF 1 - Ex Revised (solid line with square markers)
- Ground (black line with square markers)
- Levee (red line with square markers)
- Bank Sta (red dot)

OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

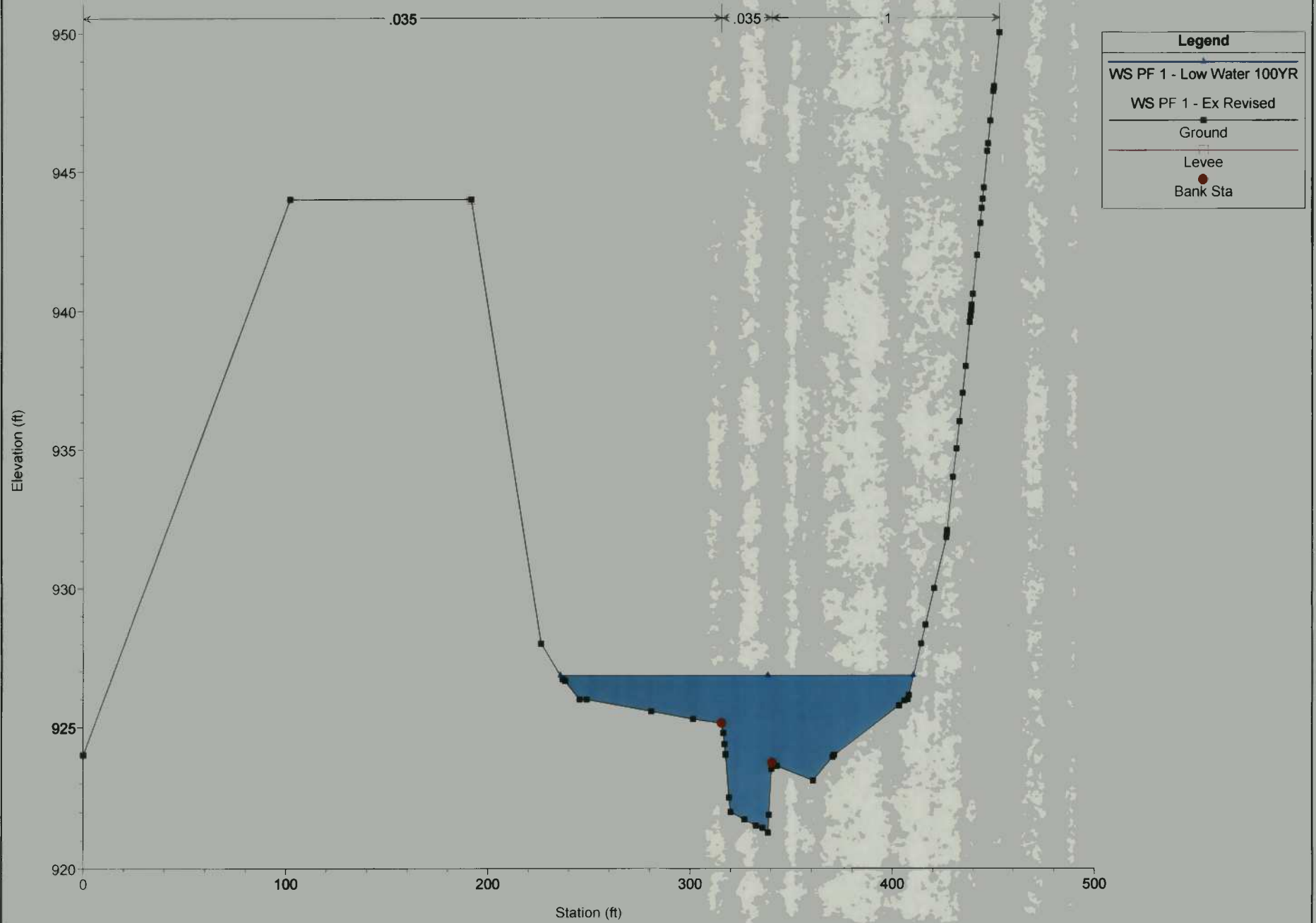
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Middle RS = 9443.656



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 9322.807

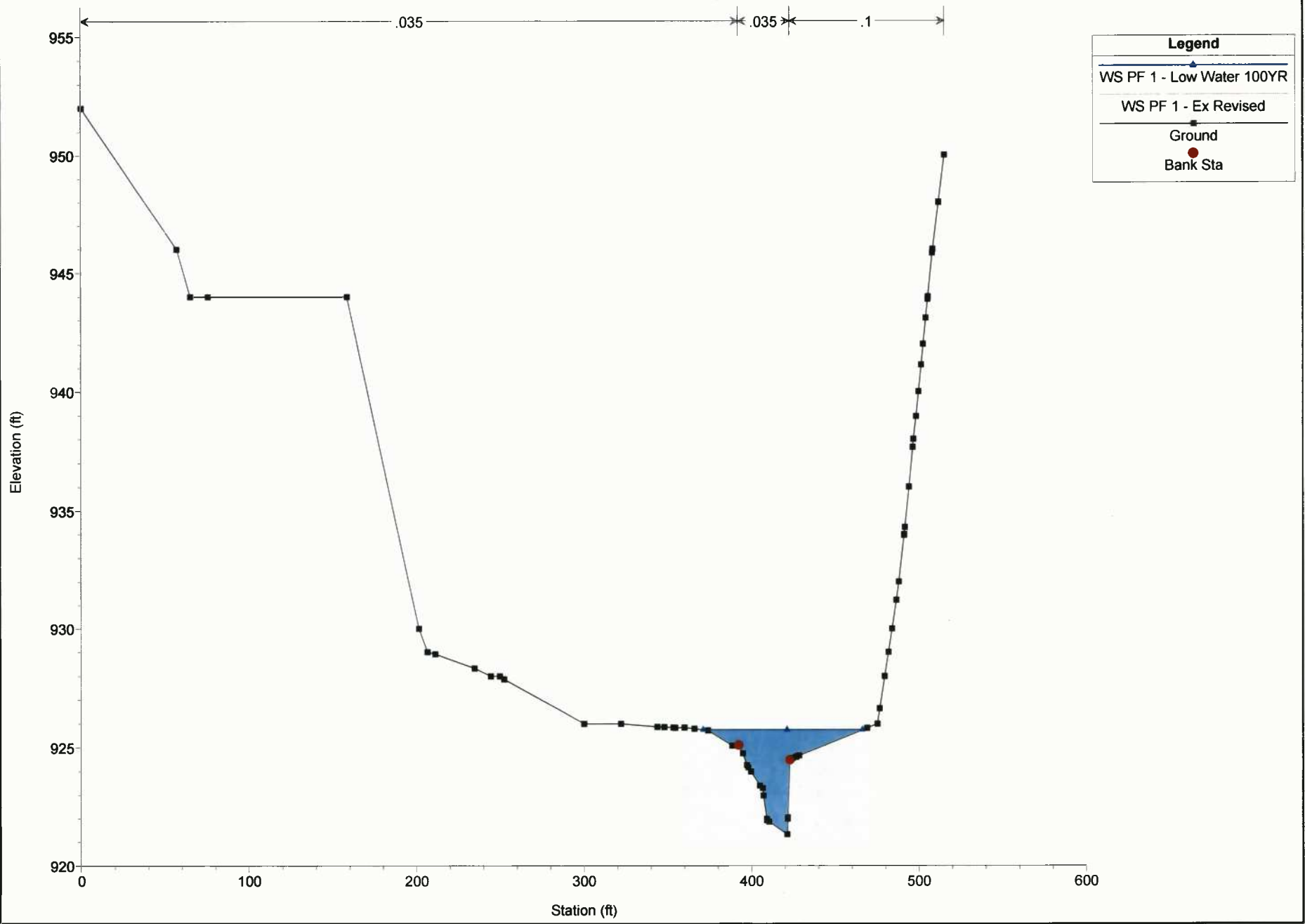


Legend

- WS PF 1 - Low Water 100YR
- WS PF 1 - Ex Revised
- Ground
- Levee
- Bank Sta

OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Middle RS = 9266.019



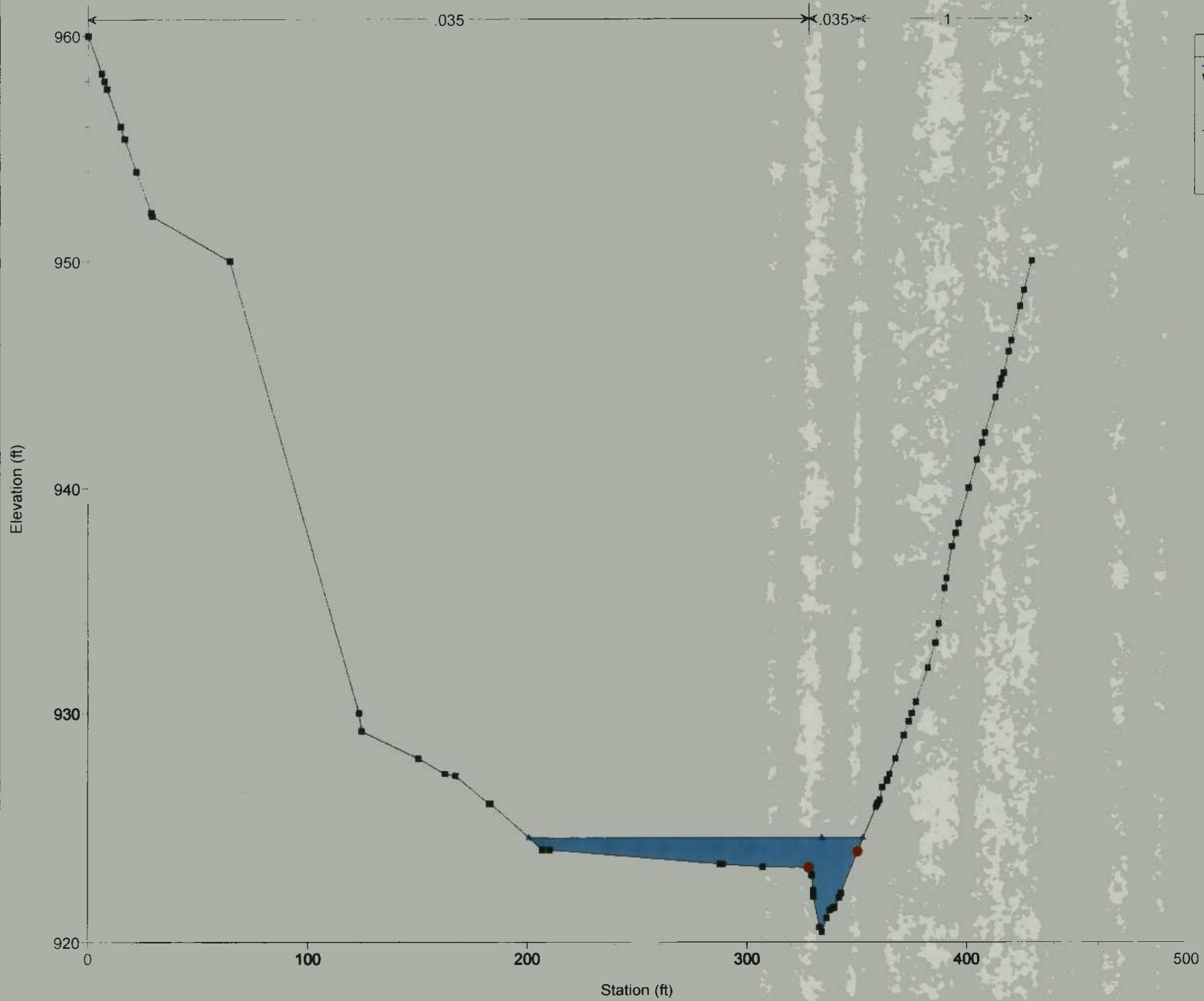
OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 9003.470

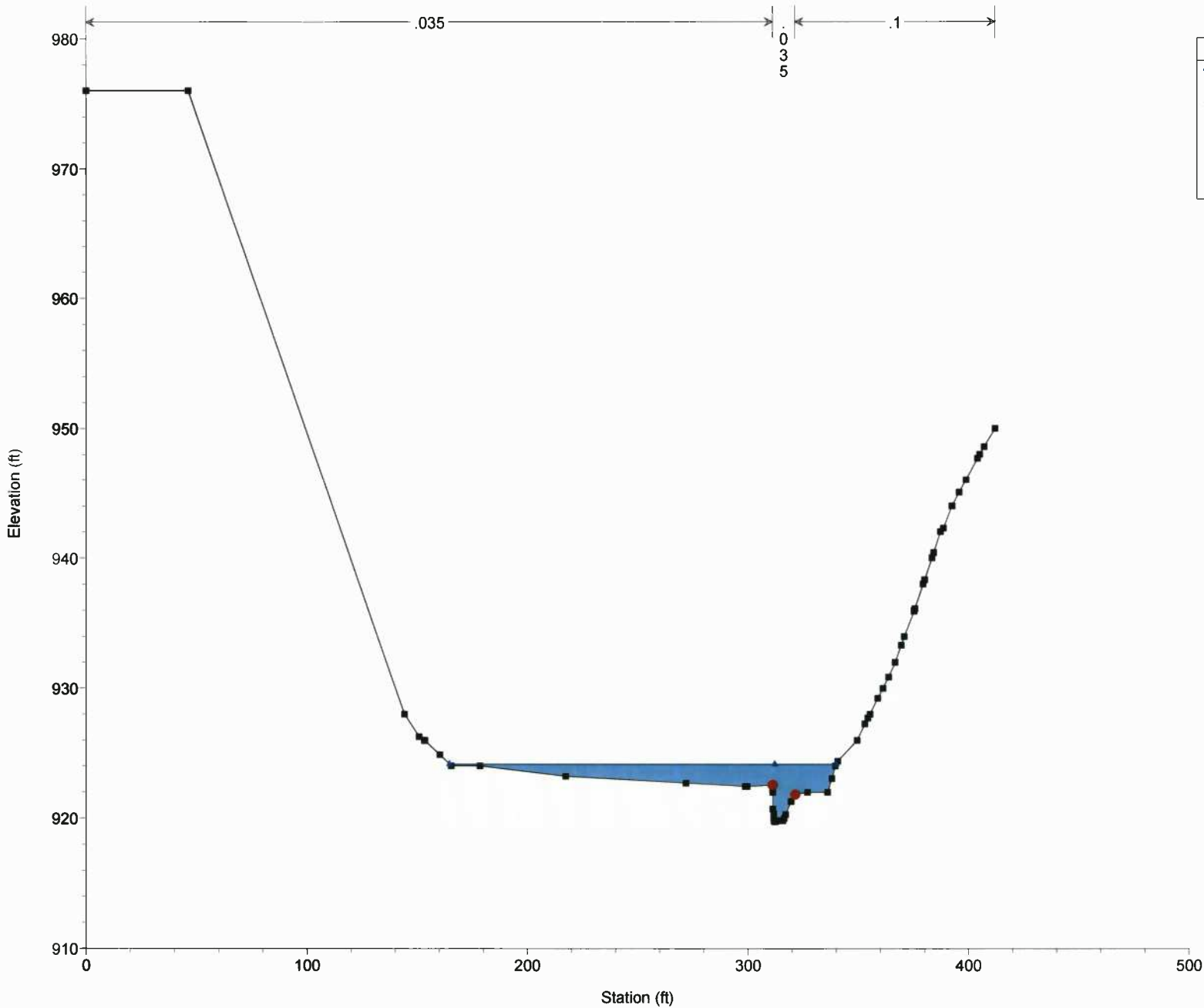
← .035 * .035 * 1 →

Legend	
WS PF 1 - Low Water 100YR	▲
WS PF 1 - Ex Revised	■
Ground	●
Bank Sta	●



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Middle RS = 8906.253



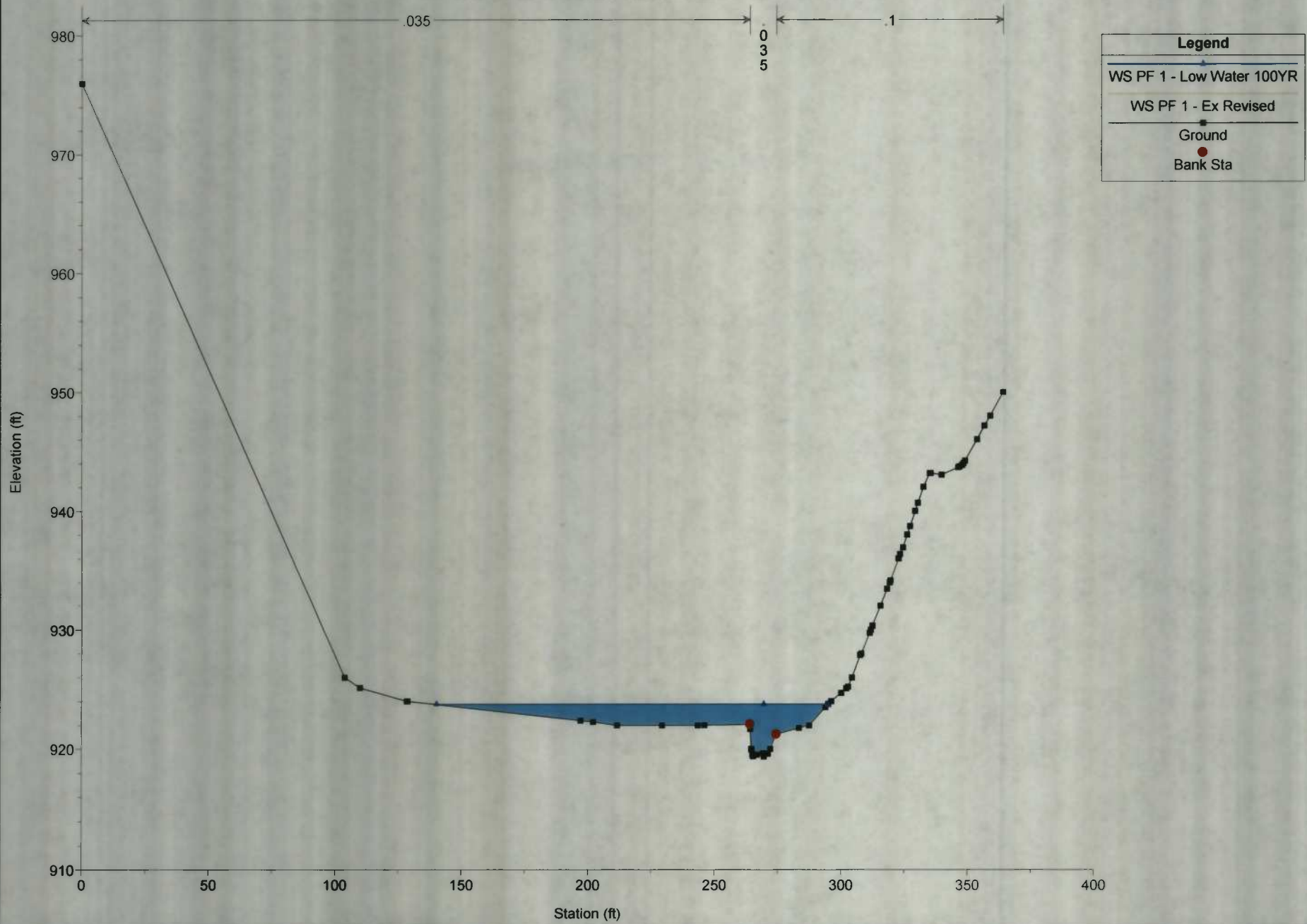
Legend

- WS PF 1 - Low Water 100YR (Blue line with triangle marker)
- WS PF 1 - Ex Revised (Black line with square marker)
- Ground (Black line with square marker)
- Bank Sta (Red circle marker)

OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

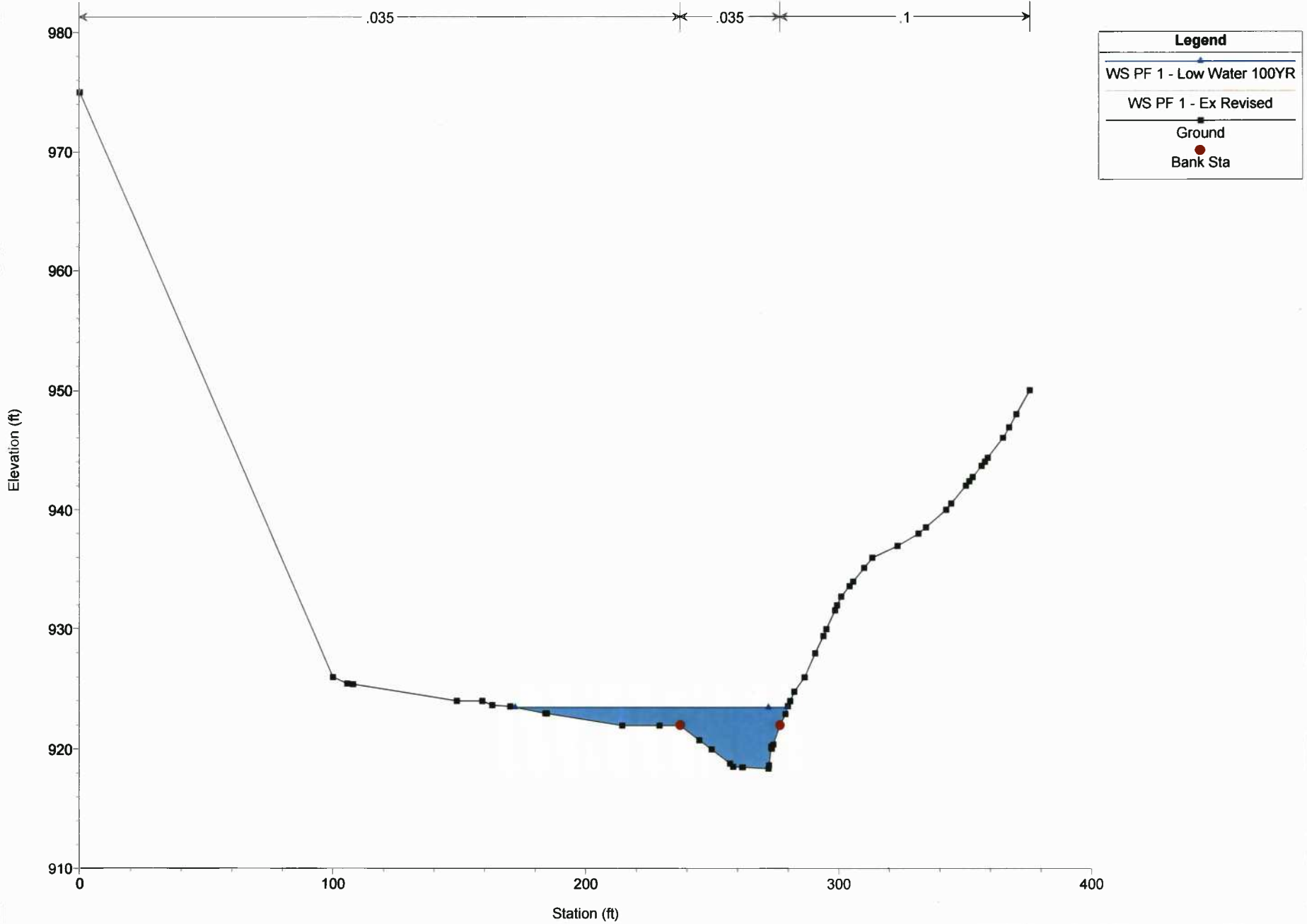
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 8843.186



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Middle RS = 8712.623



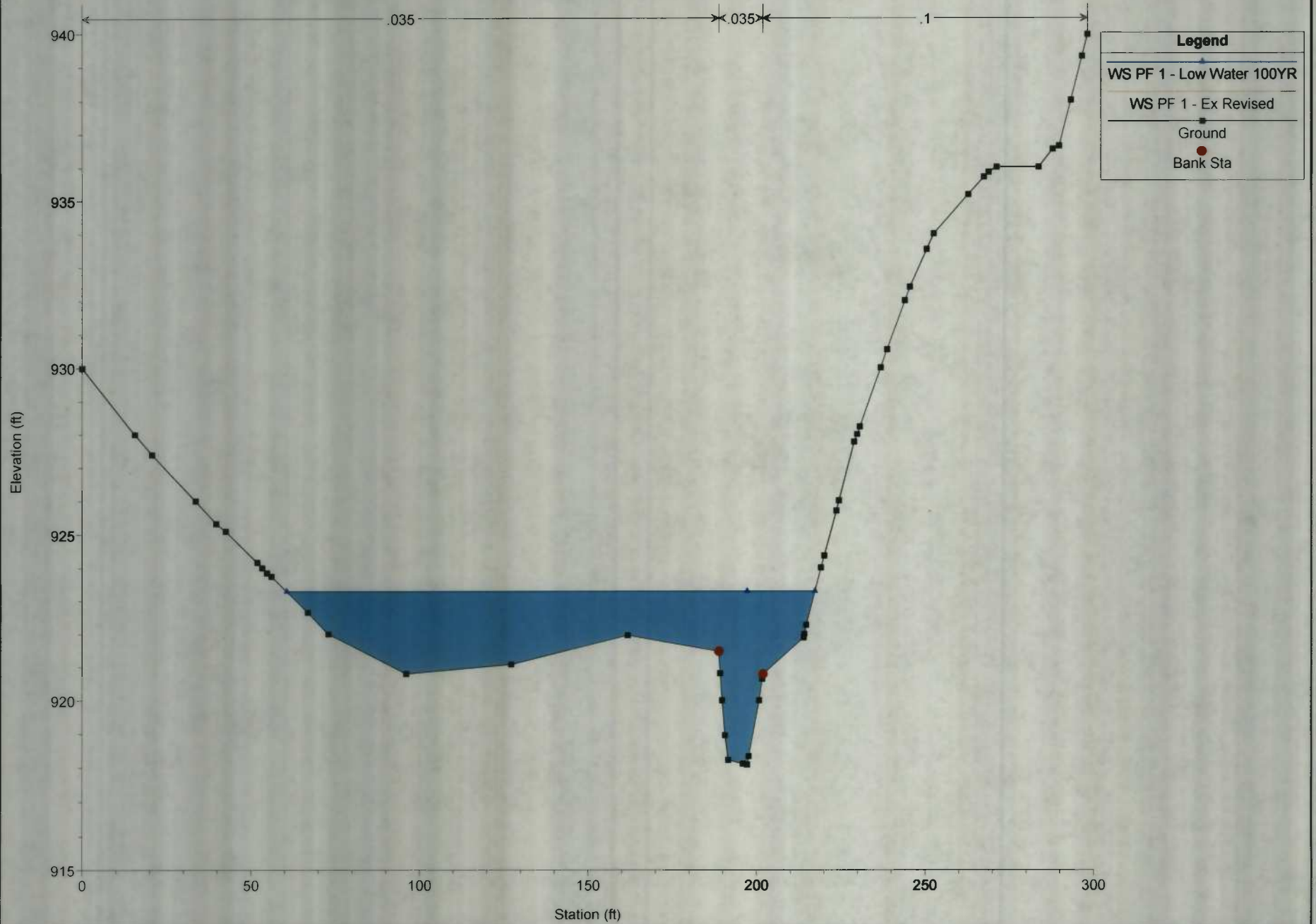
Legend

- WS PF 1 - Low Water 100YR
- WS PF 1 - Ex Revised
- Ground
- Bank Sta

OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

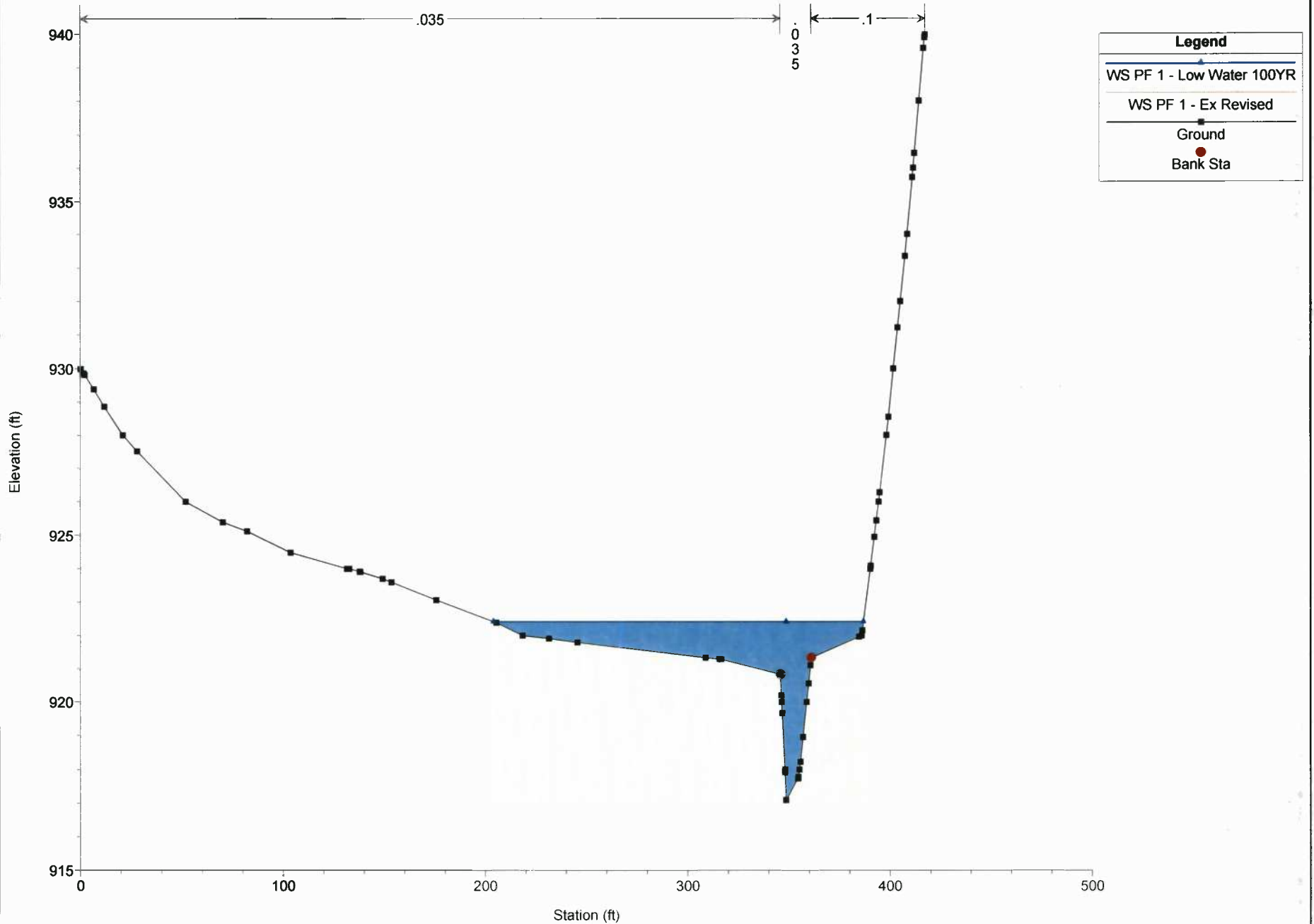
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 8542.514



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

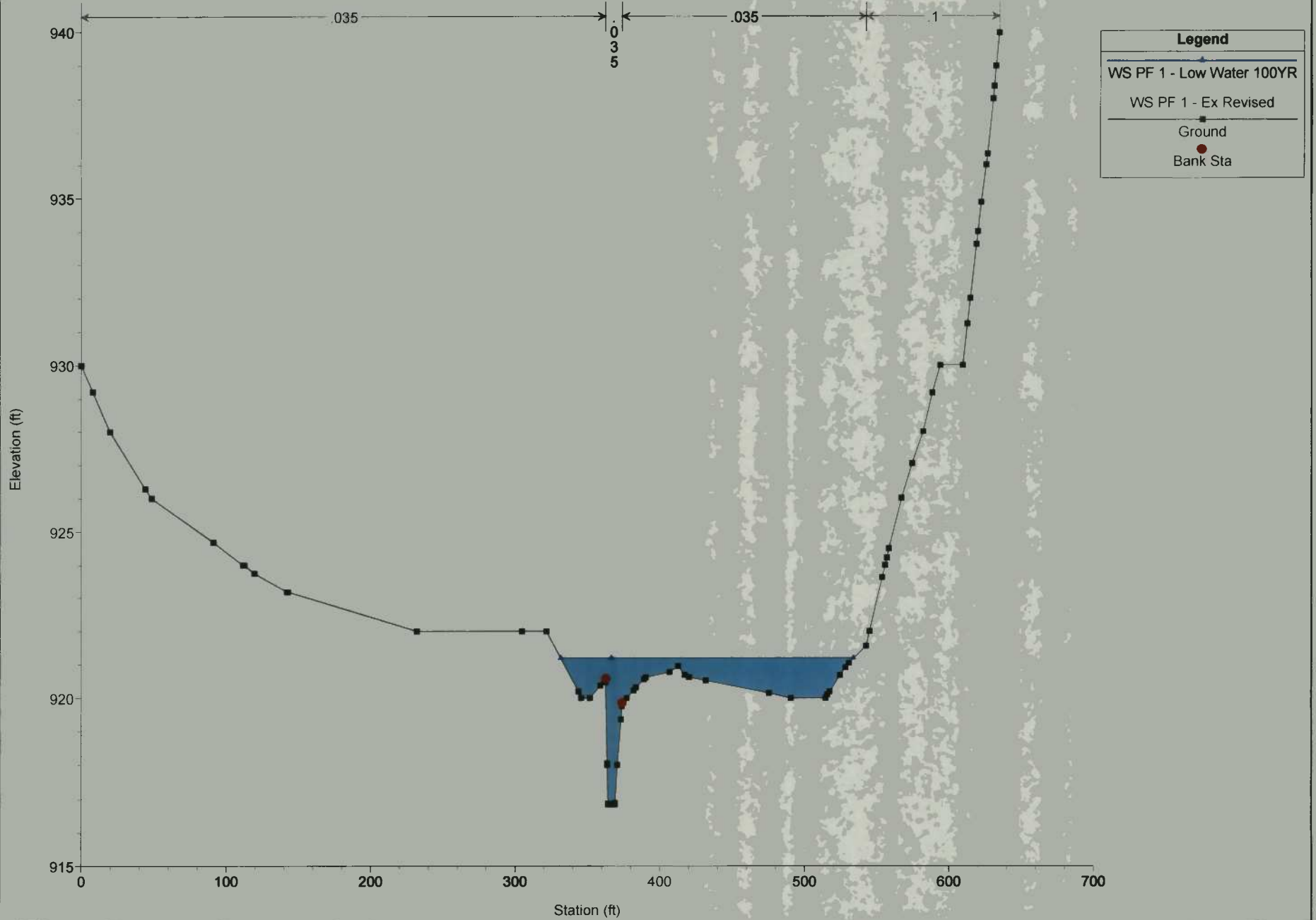
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Middle RS = 8379.502



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

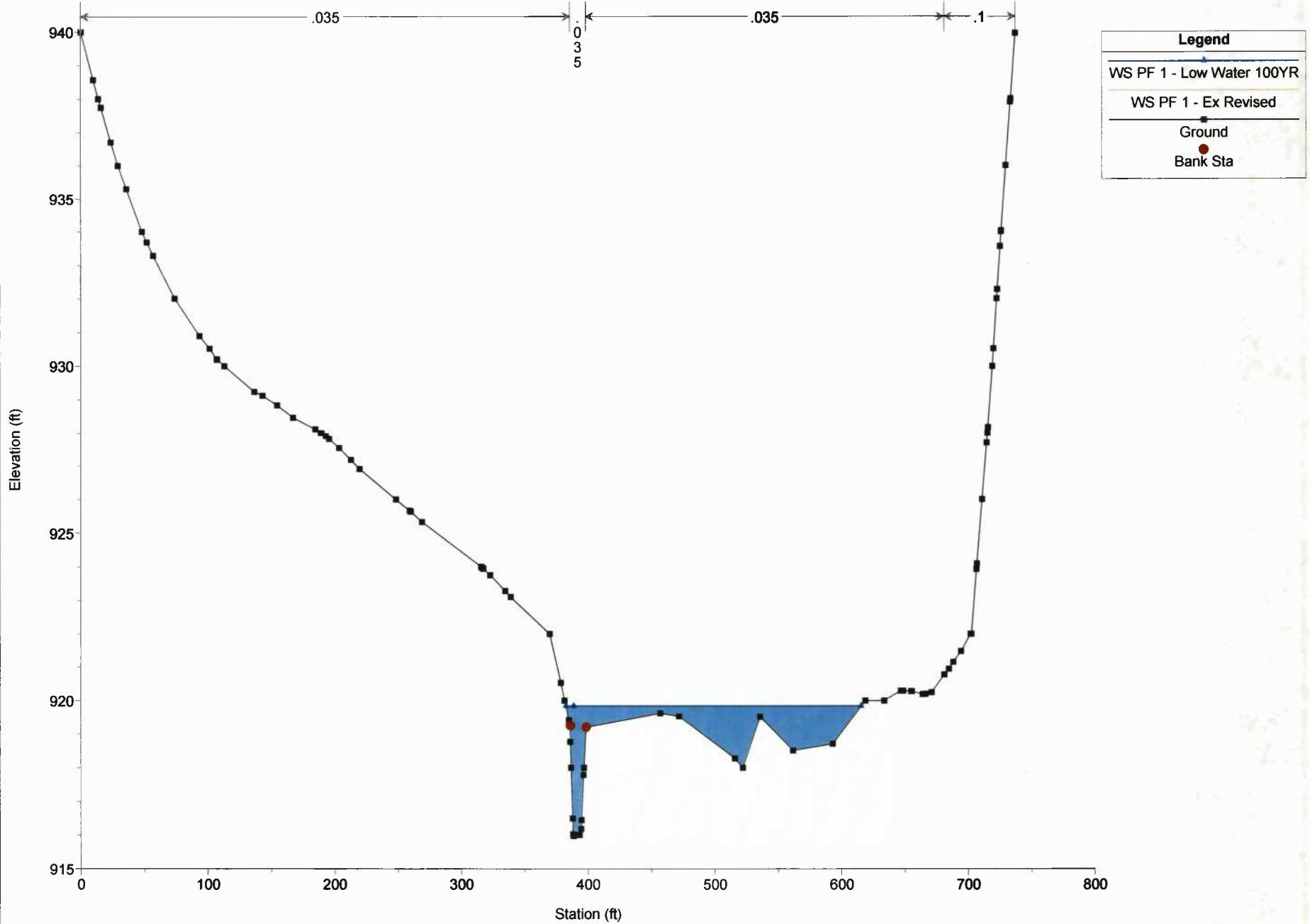
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 8109.907



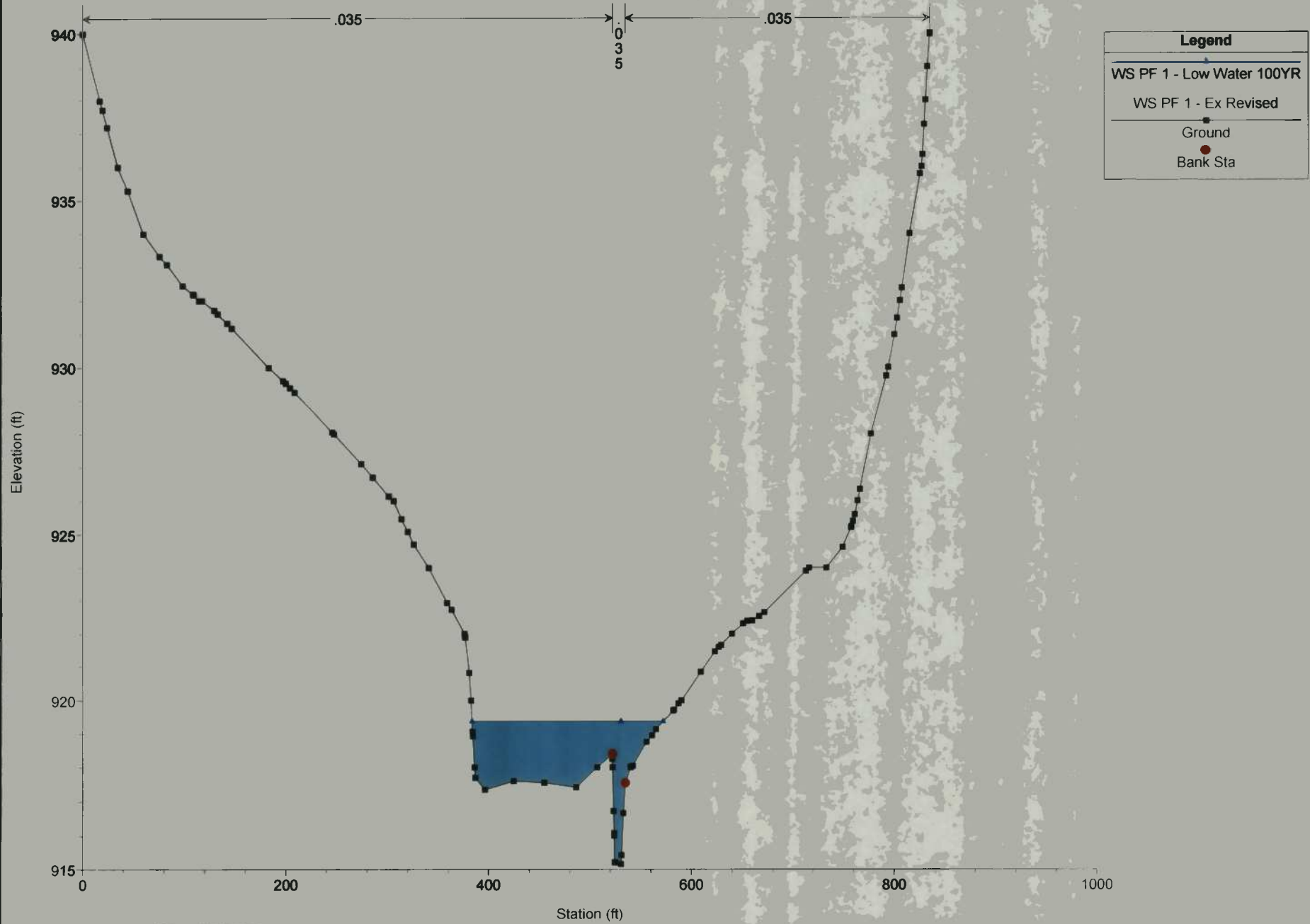
OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Middle RS = 7770.441



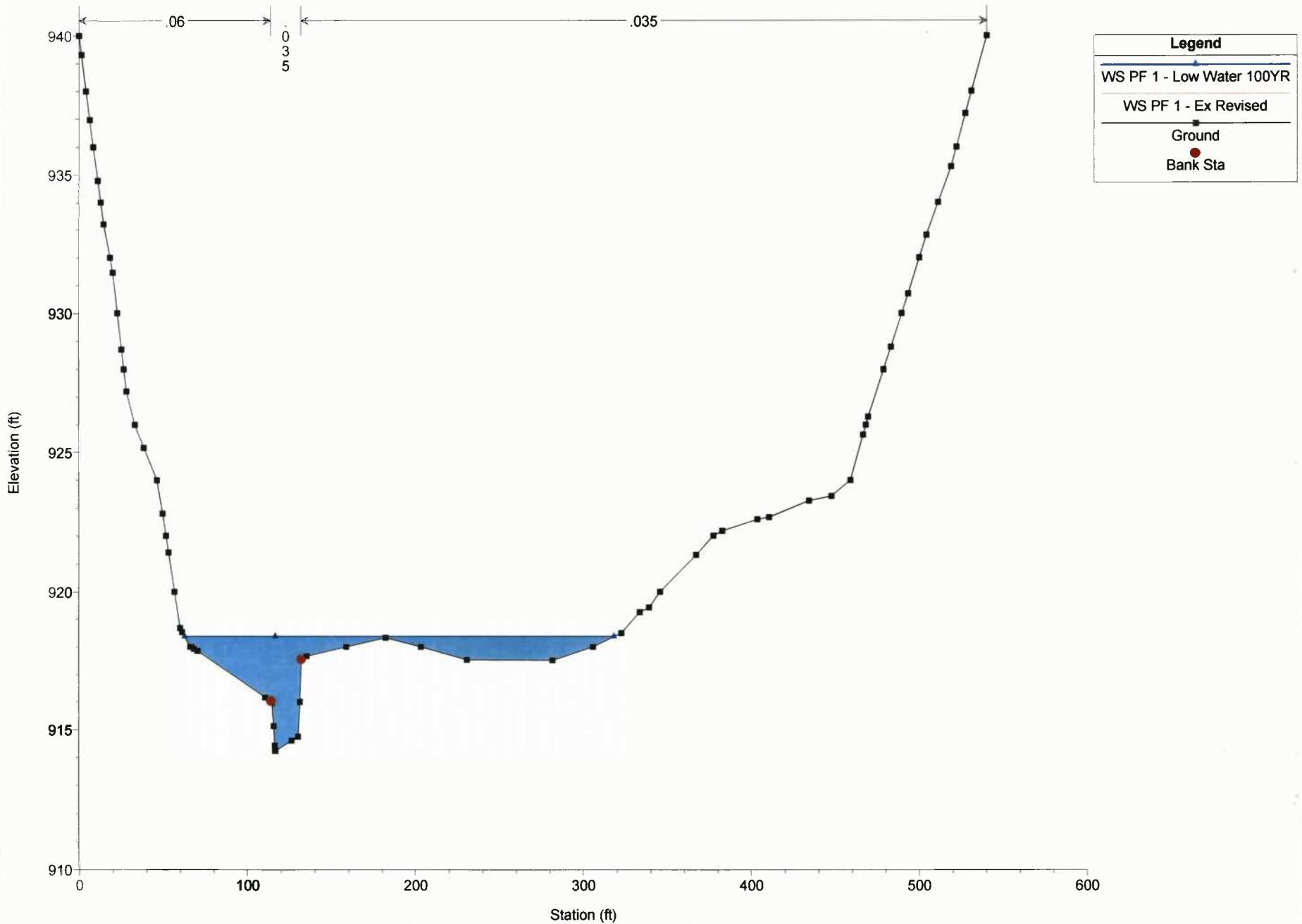
OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Middle RS = 7438.793



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Middle RS = 7150.429



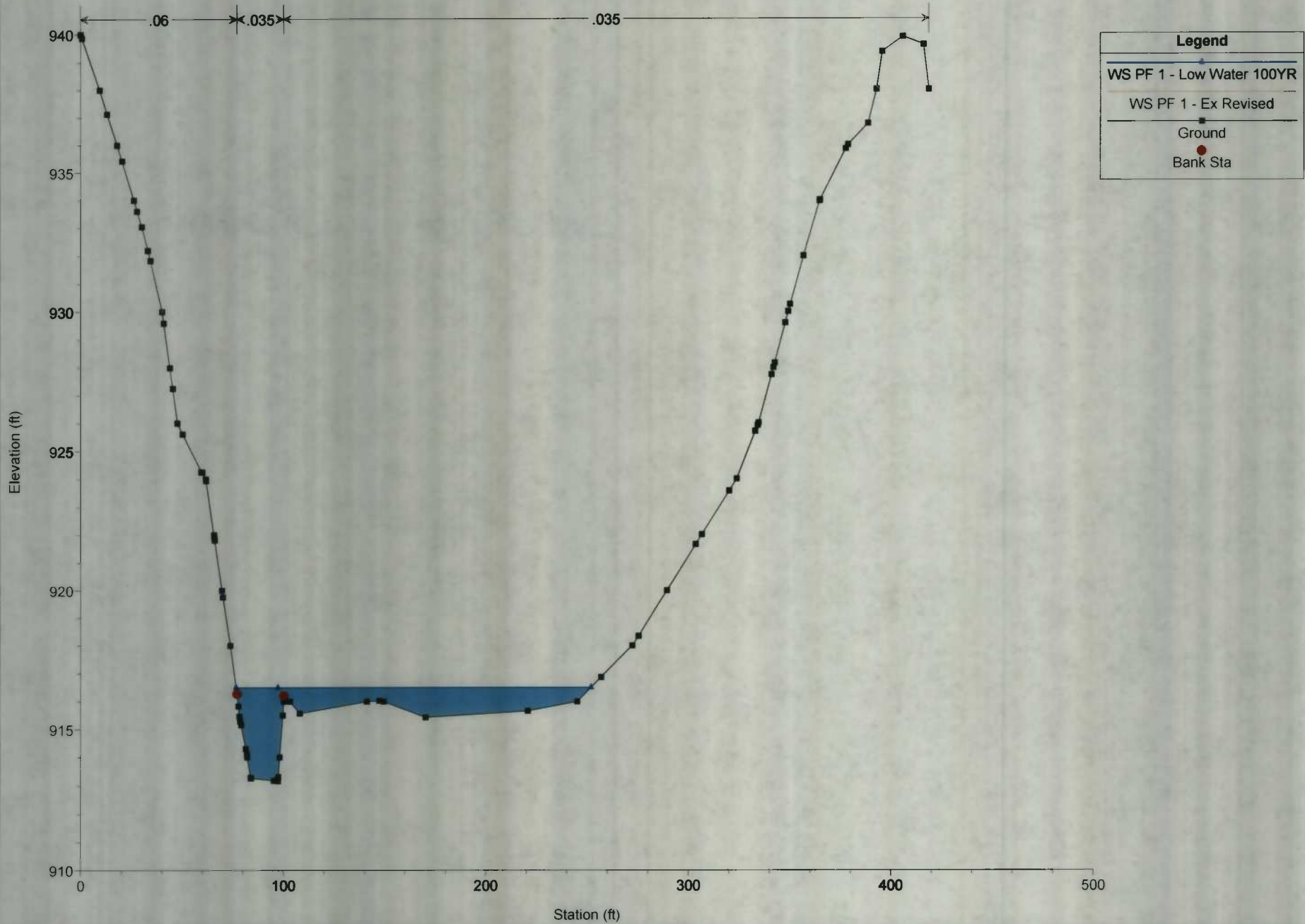
Legend

- WS PF 1 - Low Water 100YR
- WS PF 1 - Ex Revised
- Ground
- Bank Sta

OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

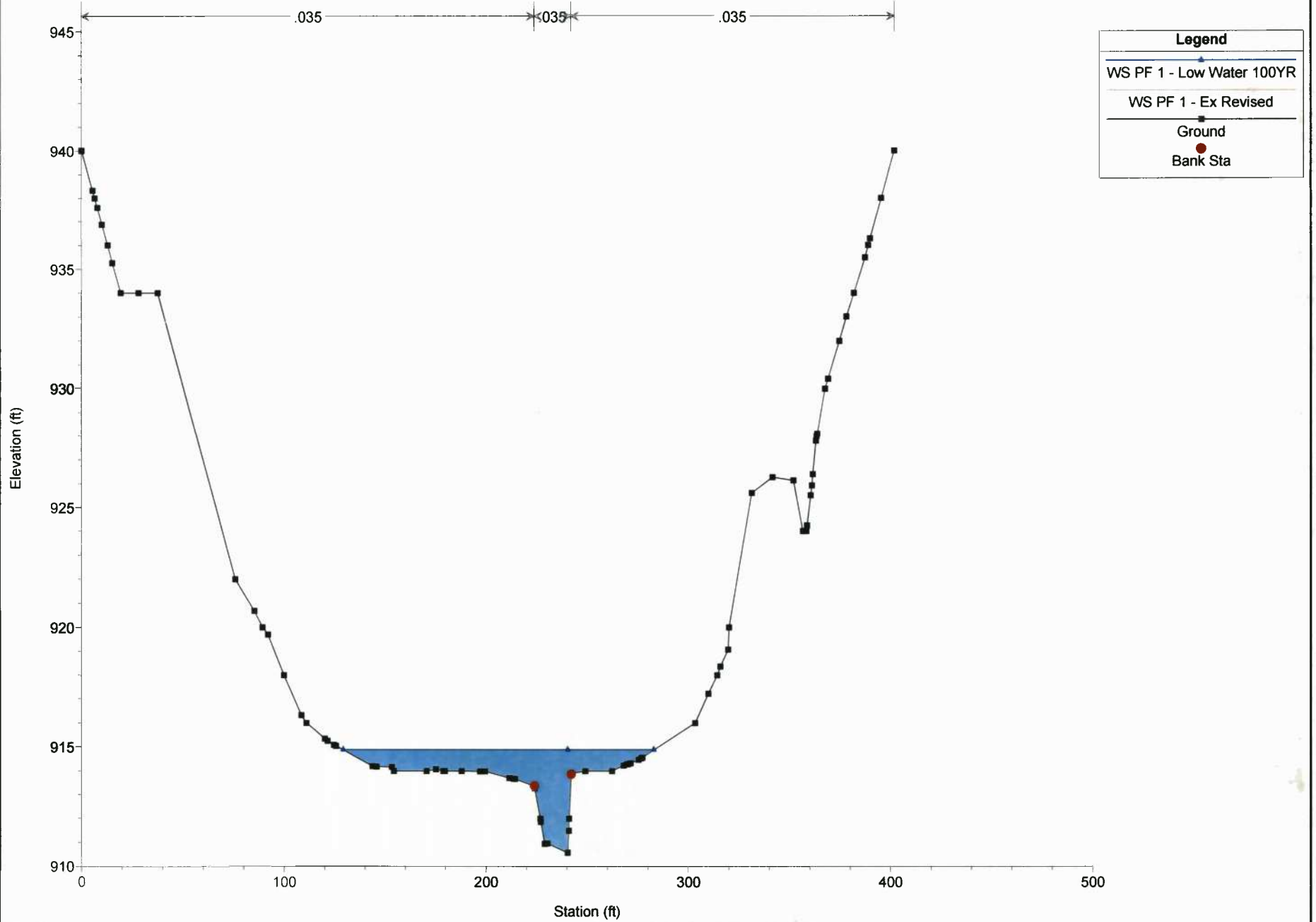
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 6893.619



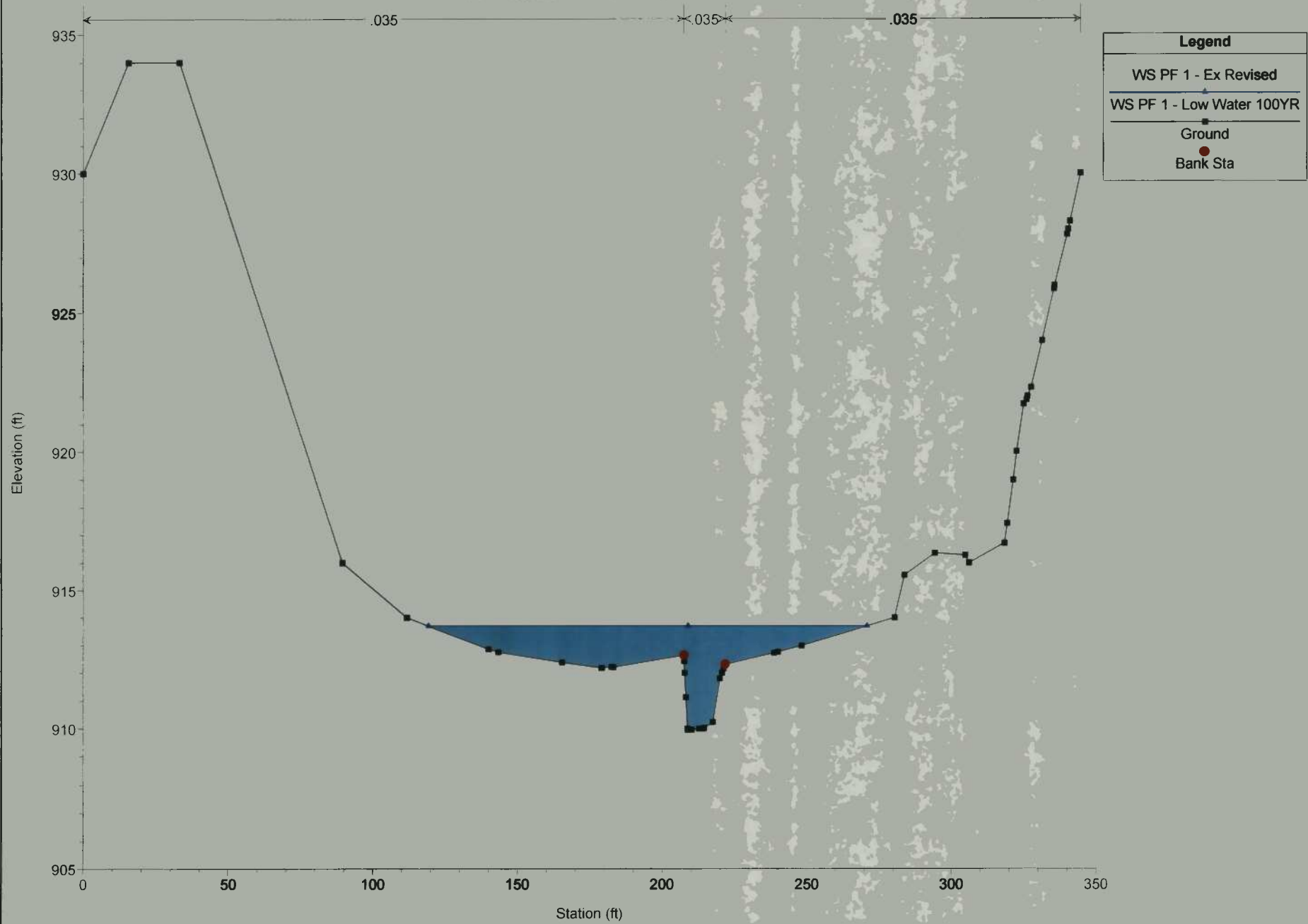
OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Middle RS = 6579.154



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Middle RS = 6481.438

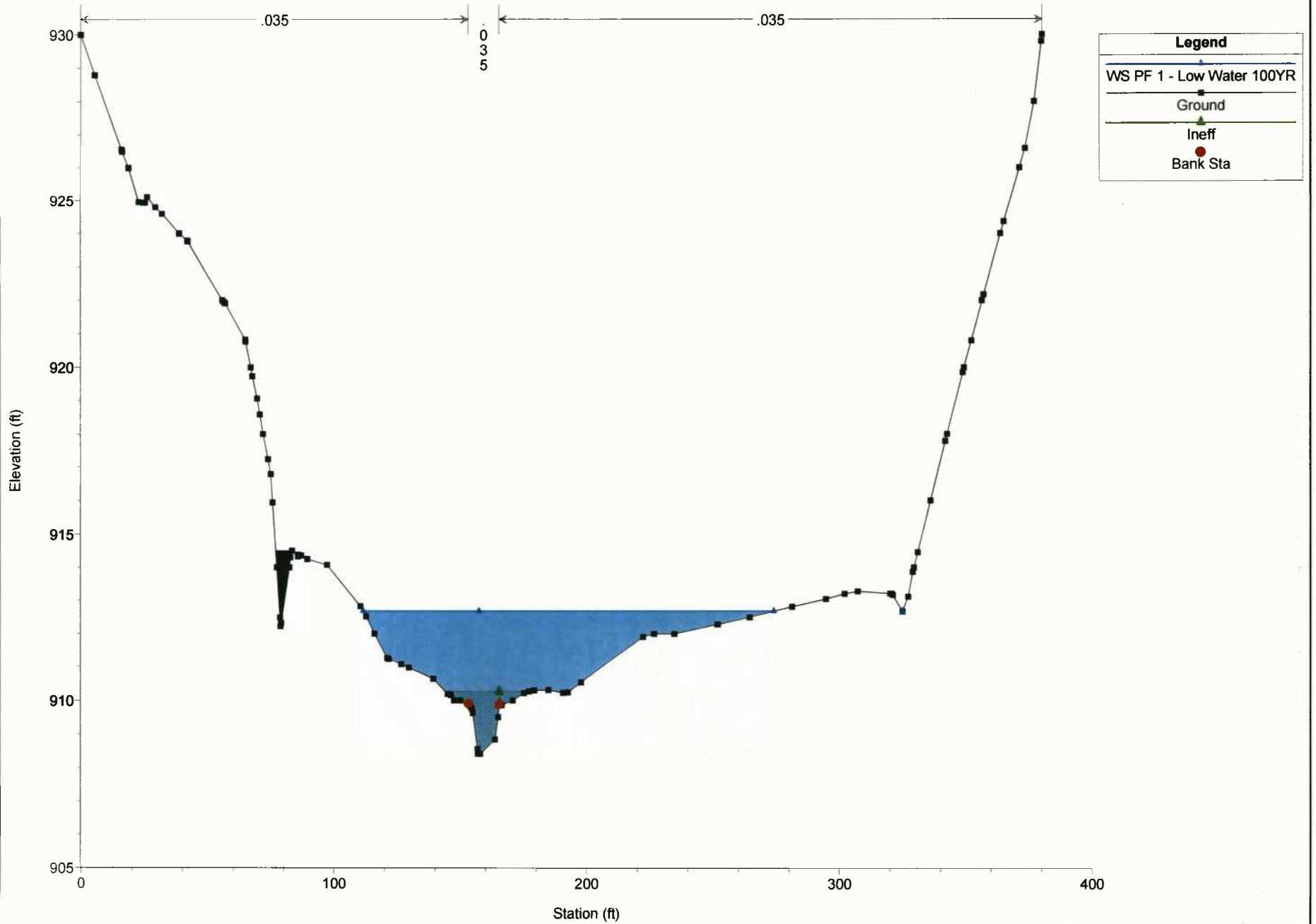


Legend	
WS PF 1 - Ex Revised	▲
WS PF 1 - Low Water 100YR	■
Ground	●
Bank Sta	●

OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

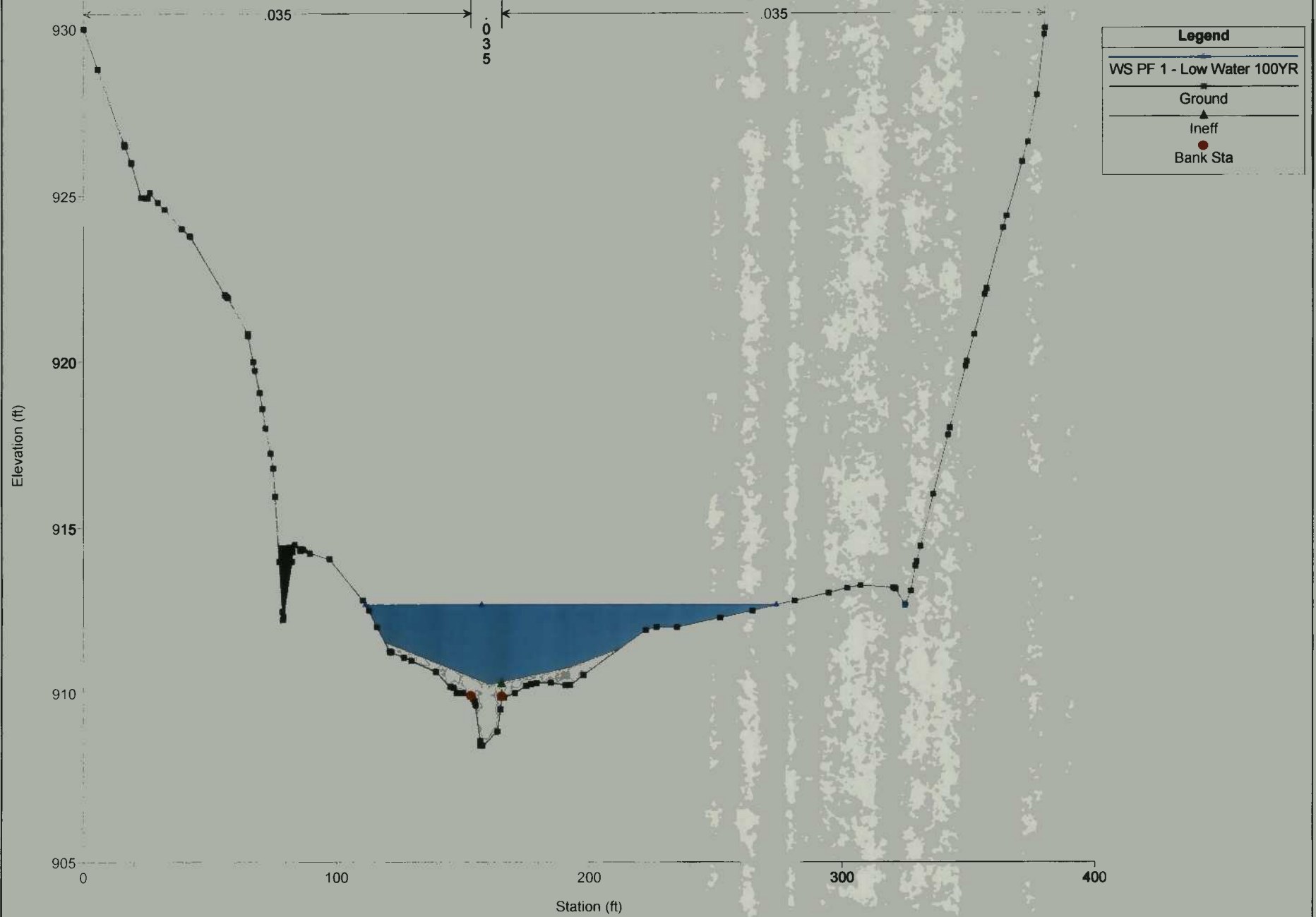
River = Bluestone Creek Reach = Middle RS = 6323.723



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

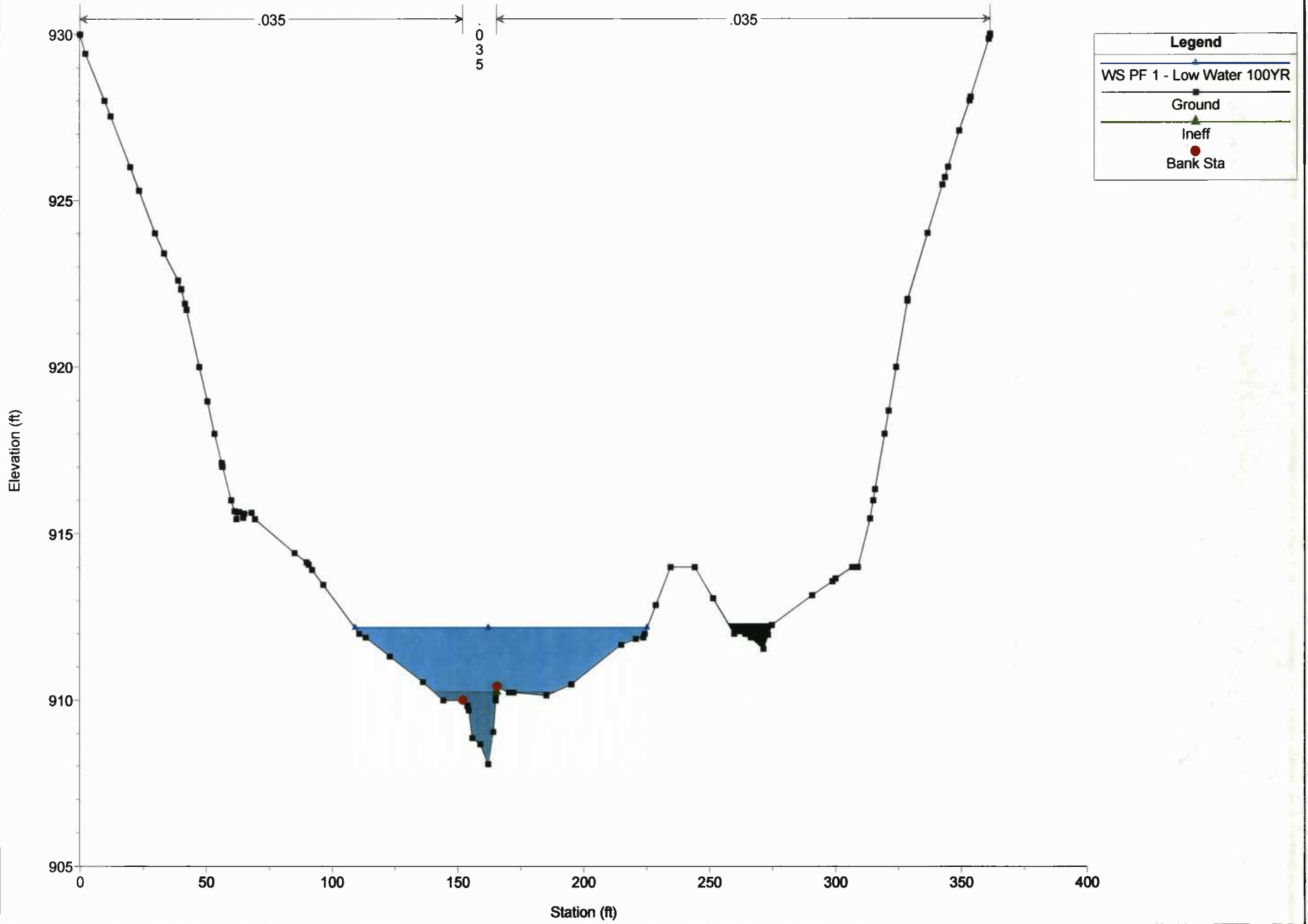
River = Bluestone Creek Reach = Middle RS = 6303.783 IS



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 6289.579



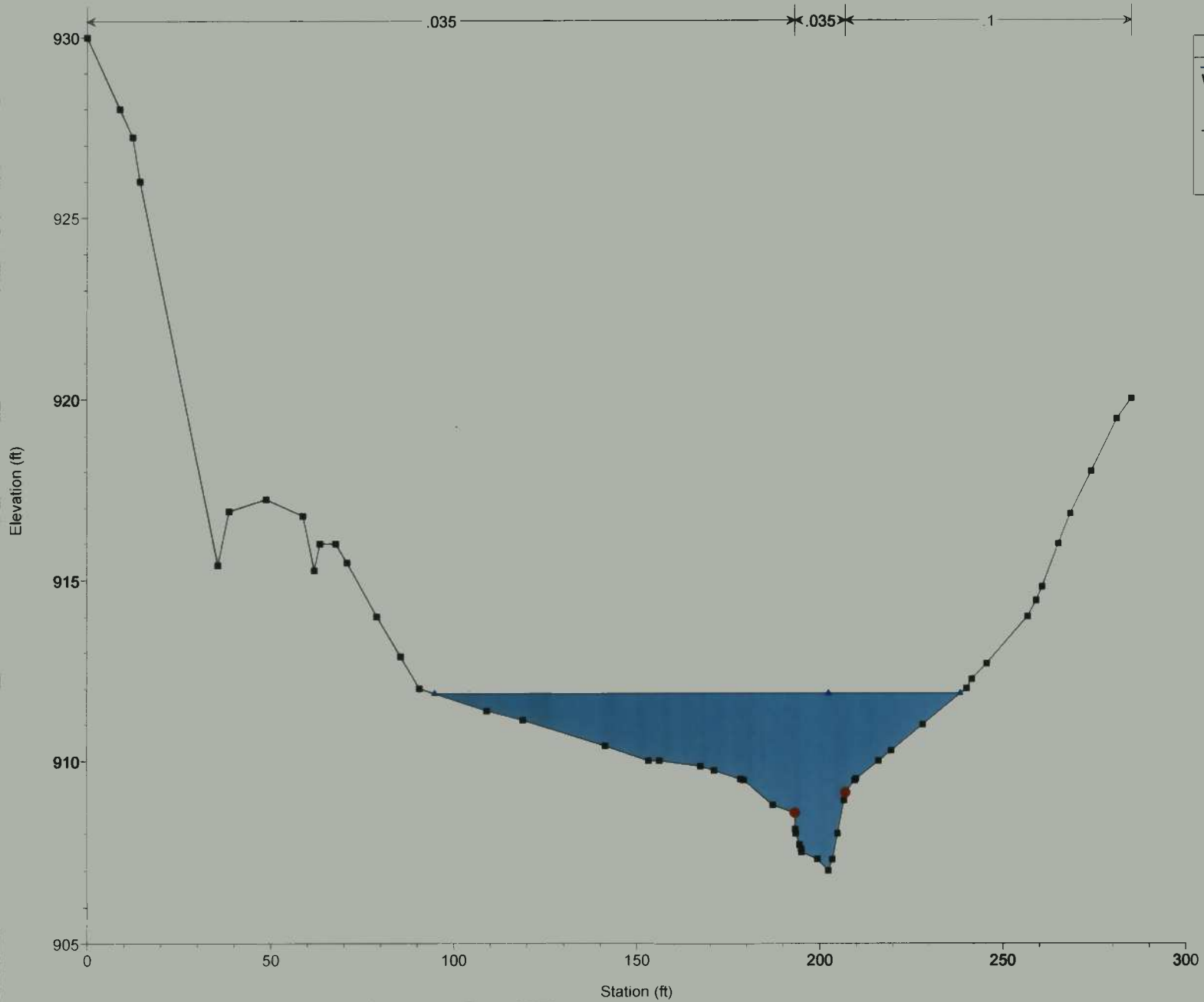
OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 6179.412

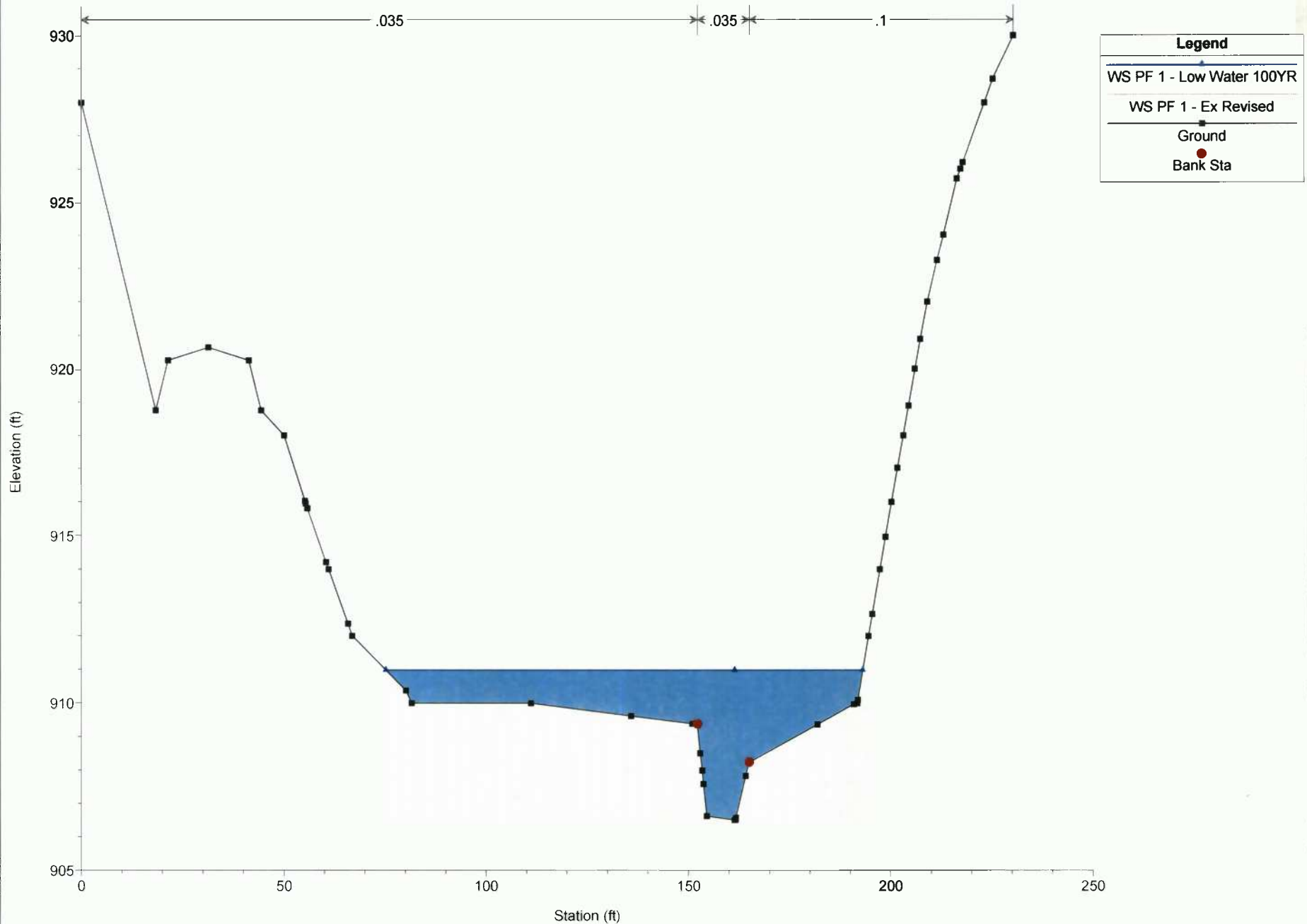
.035 .035 1

Legend	
WS PF 1 - Low Water 100YR	▲
WS PF 1 - Ex Revised	■
Ground	■
Bank Sta	●



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Middle RS = 6057.761

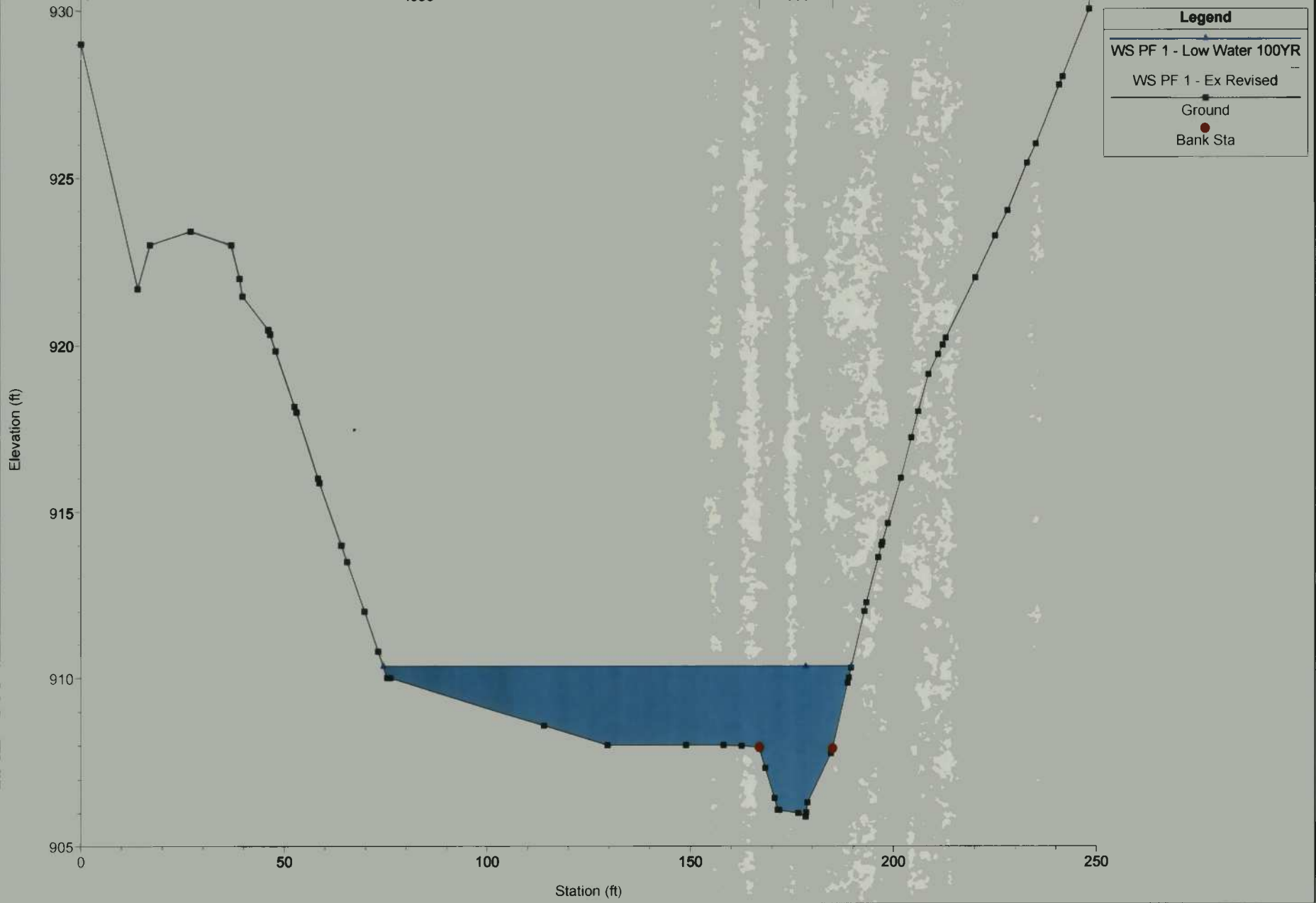


OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

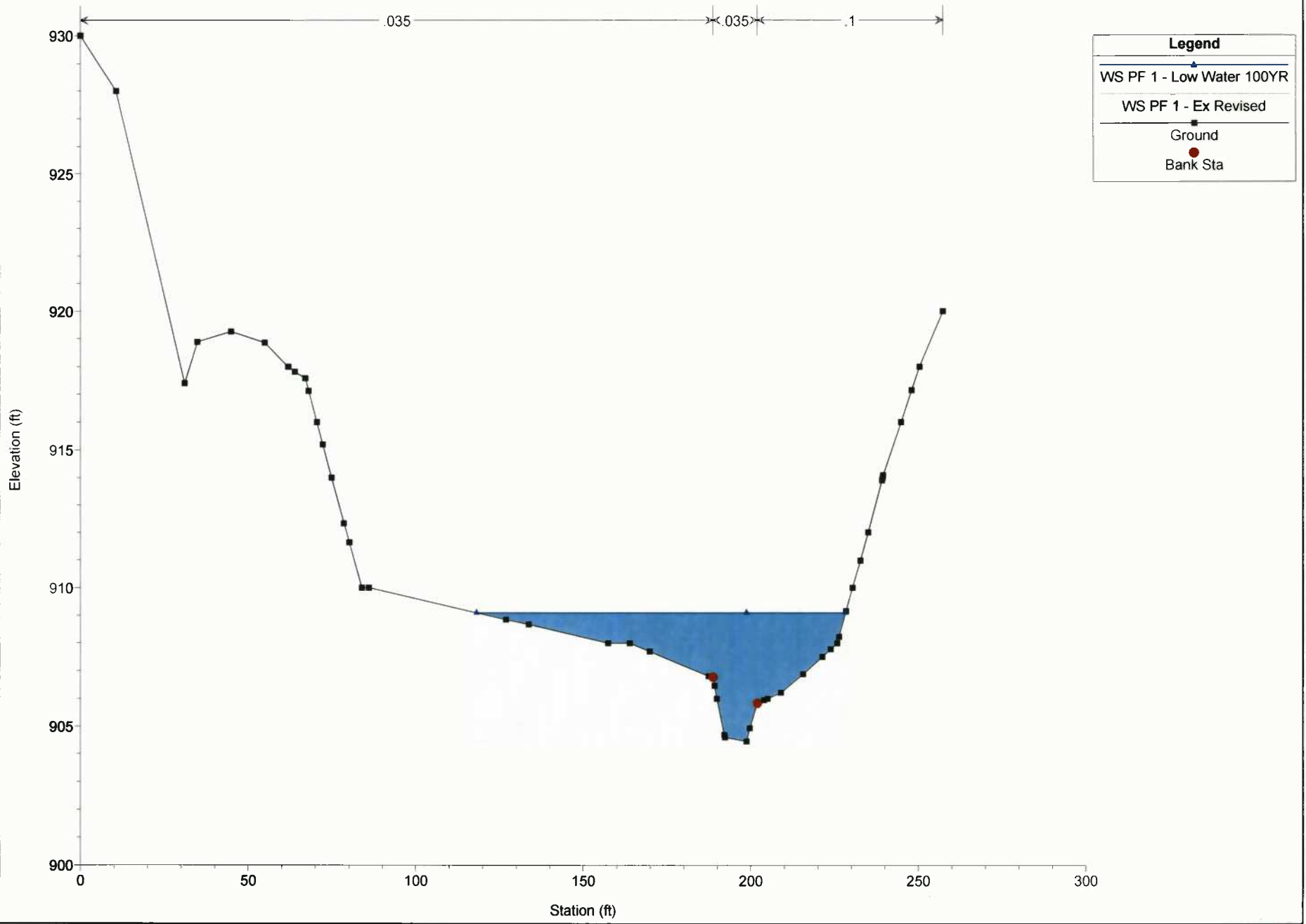
River = Bluestone Creek Reach = Middle RS = 5898.334

.035 .035 1



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

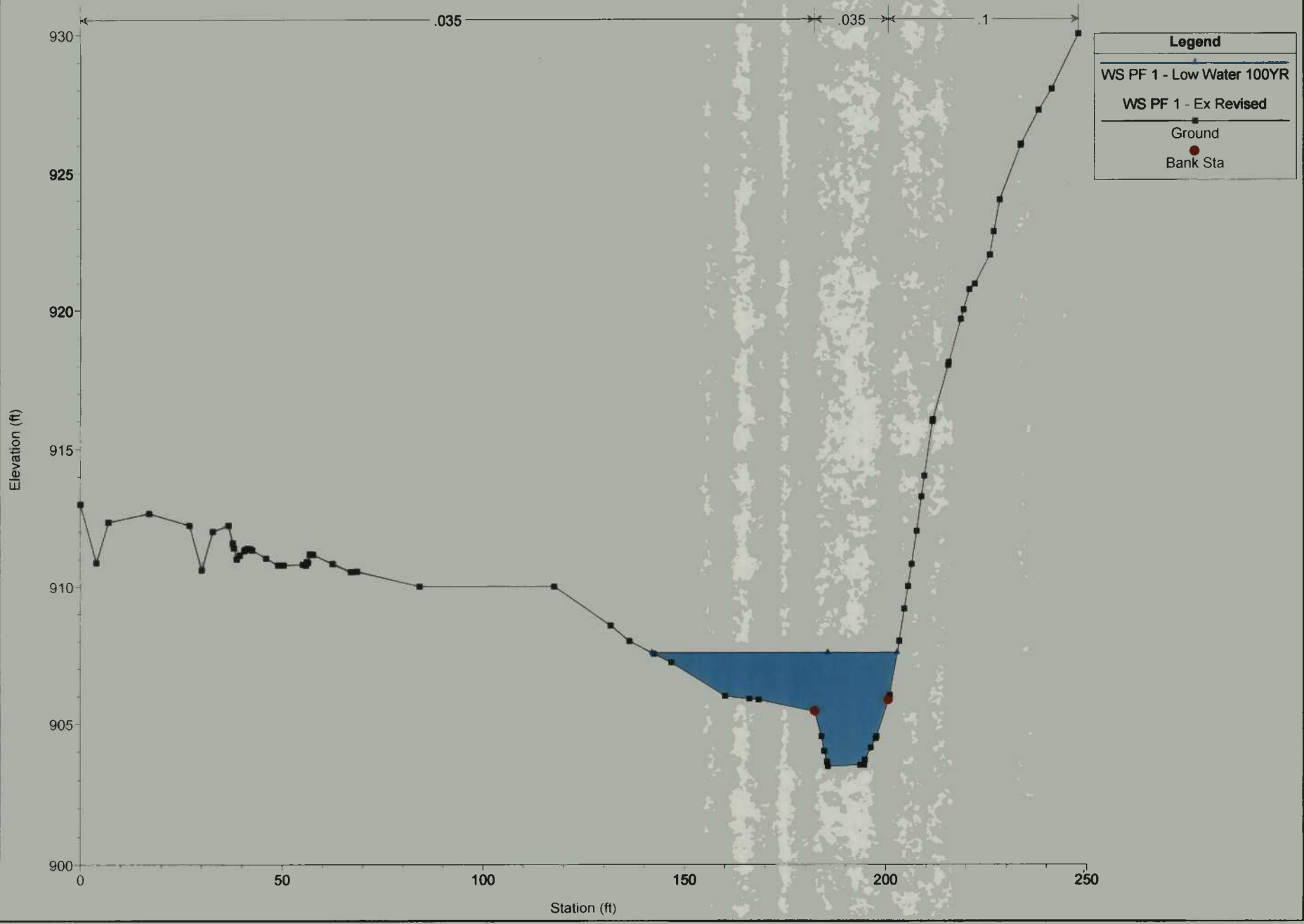
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Middle RS = 5722.175



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

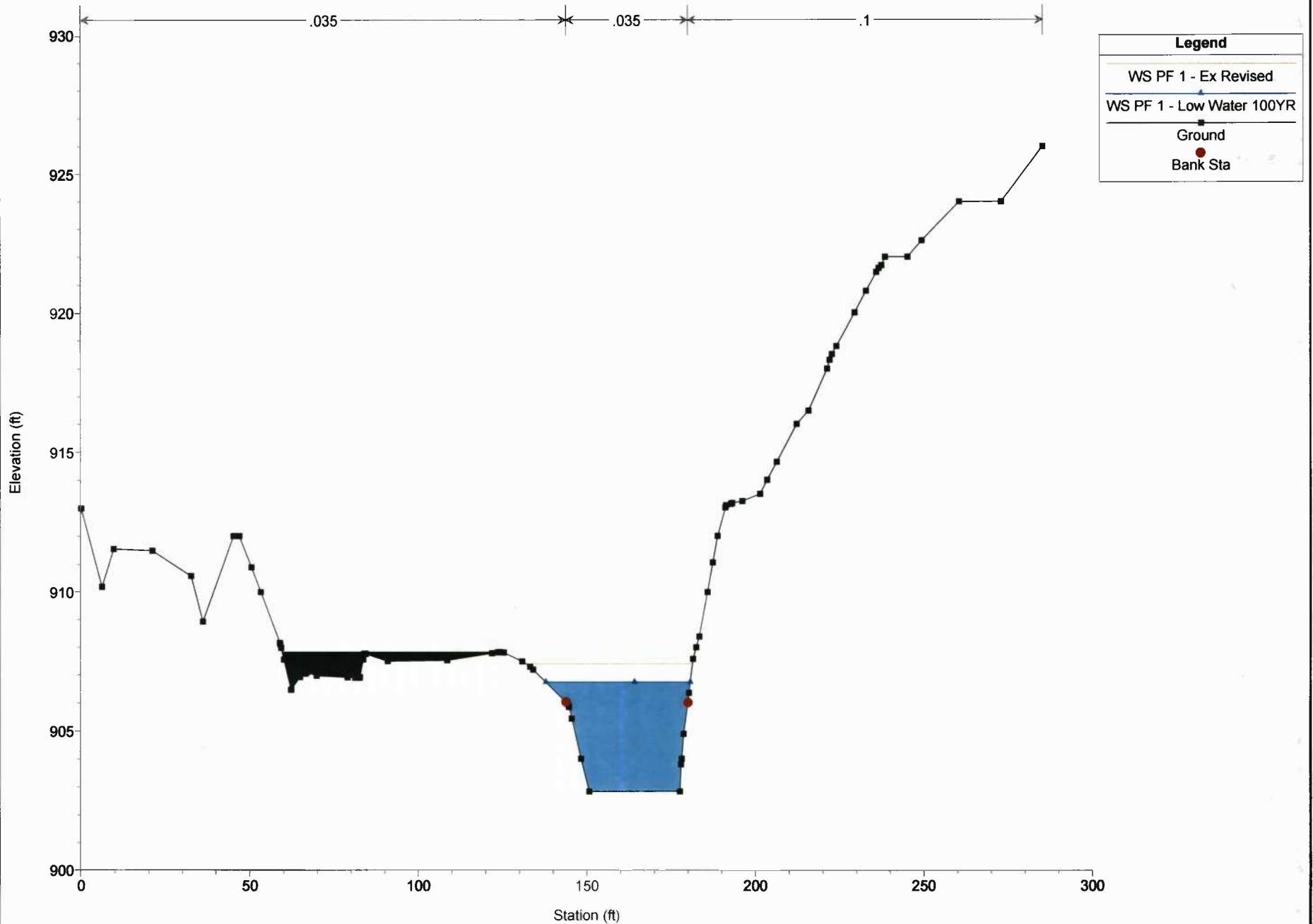
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 5588.448



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

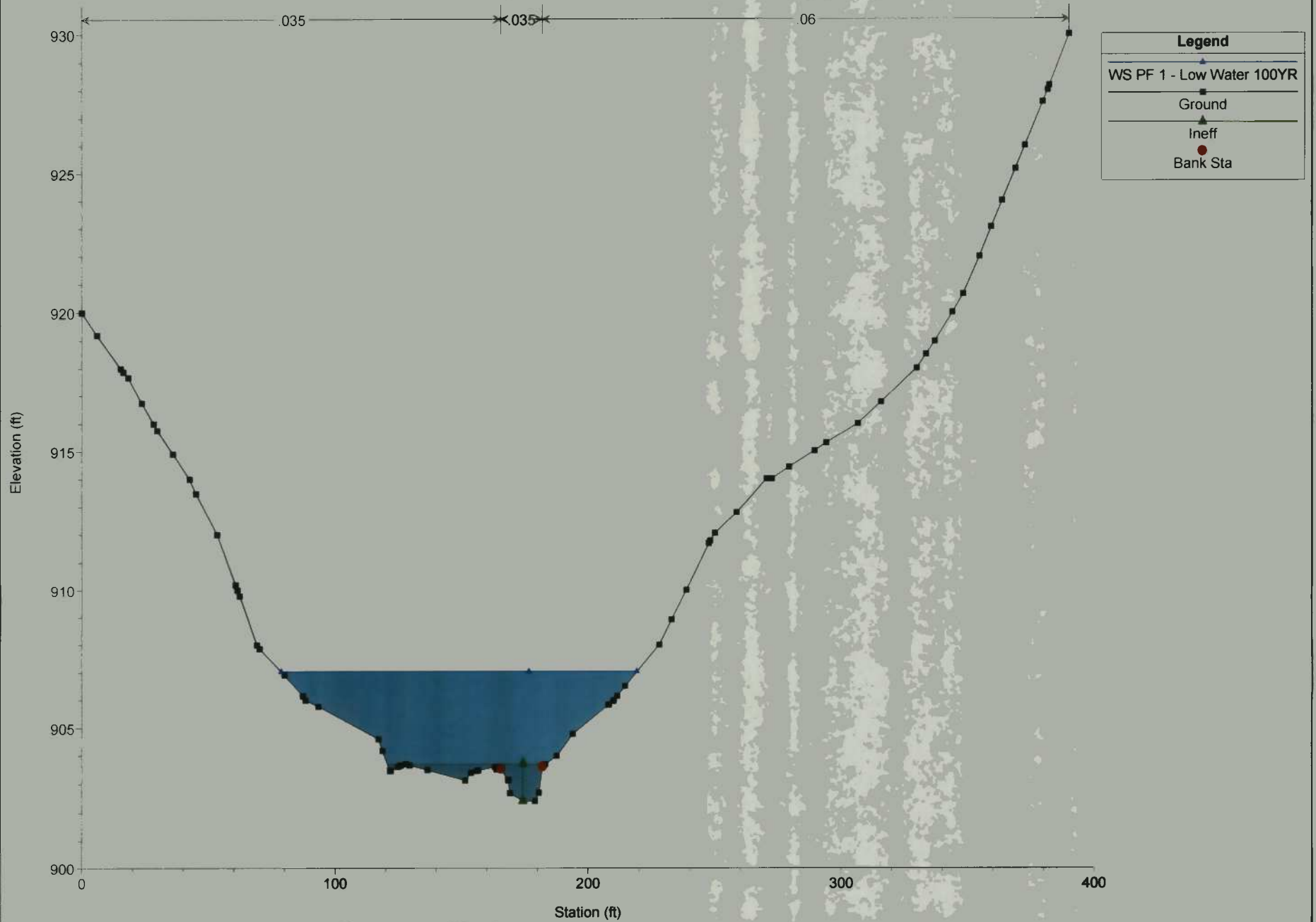
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Middle RS = 5493.950



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

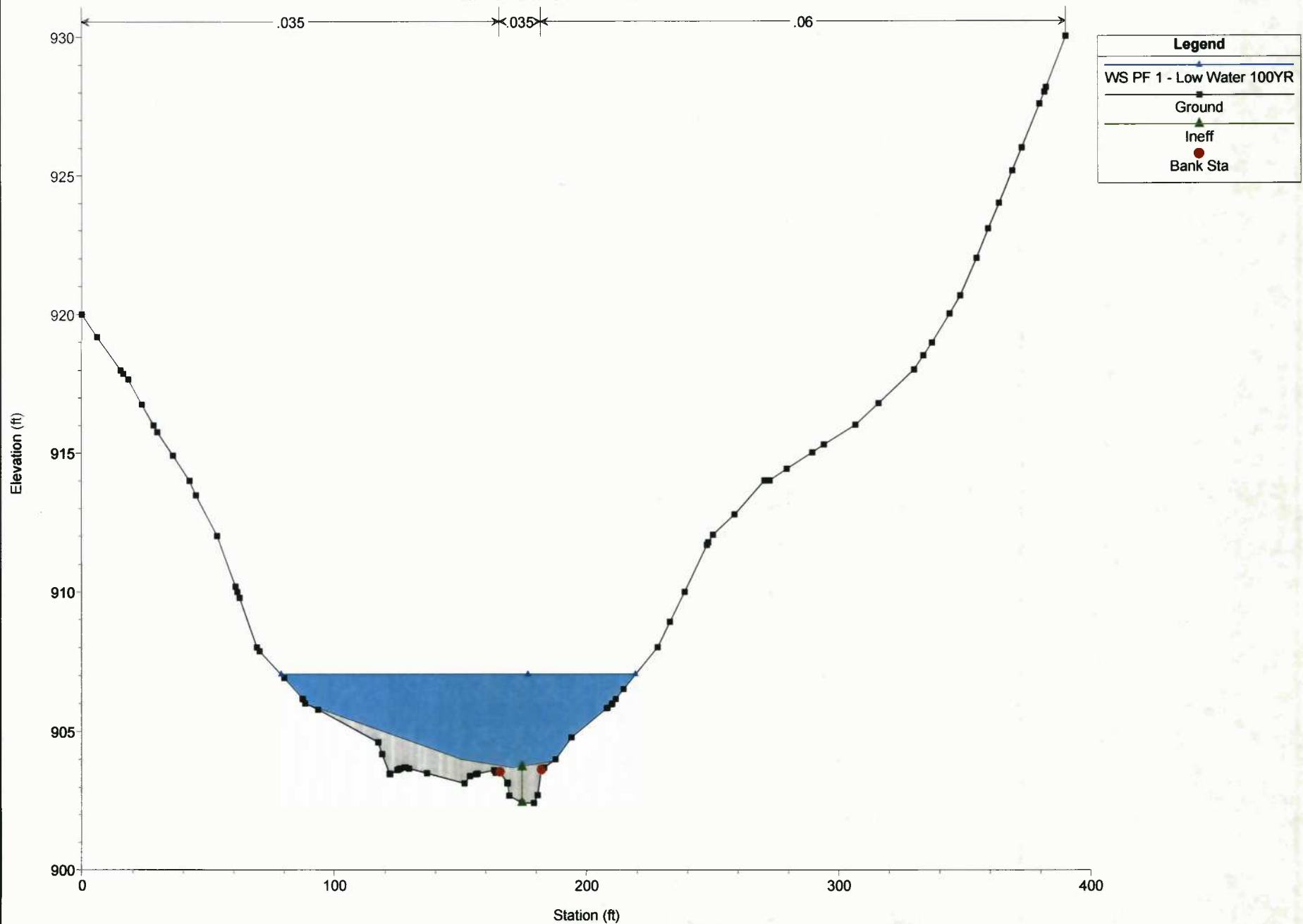
River = Bluestone Creek Reach = Middle RS = 5409.687



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

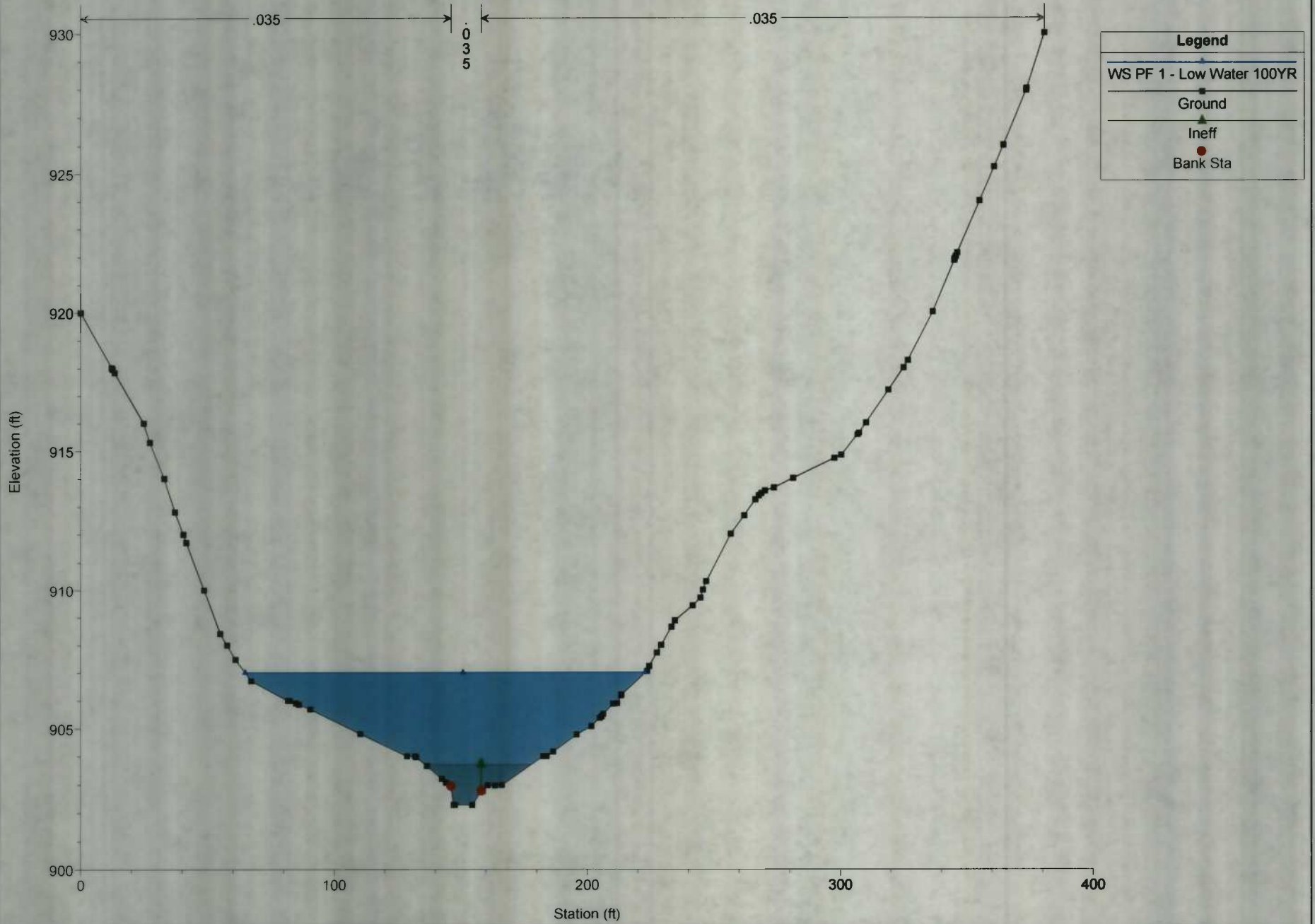
River = Bluestone Creek Reach = Middle RS = 5395.595 IS



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

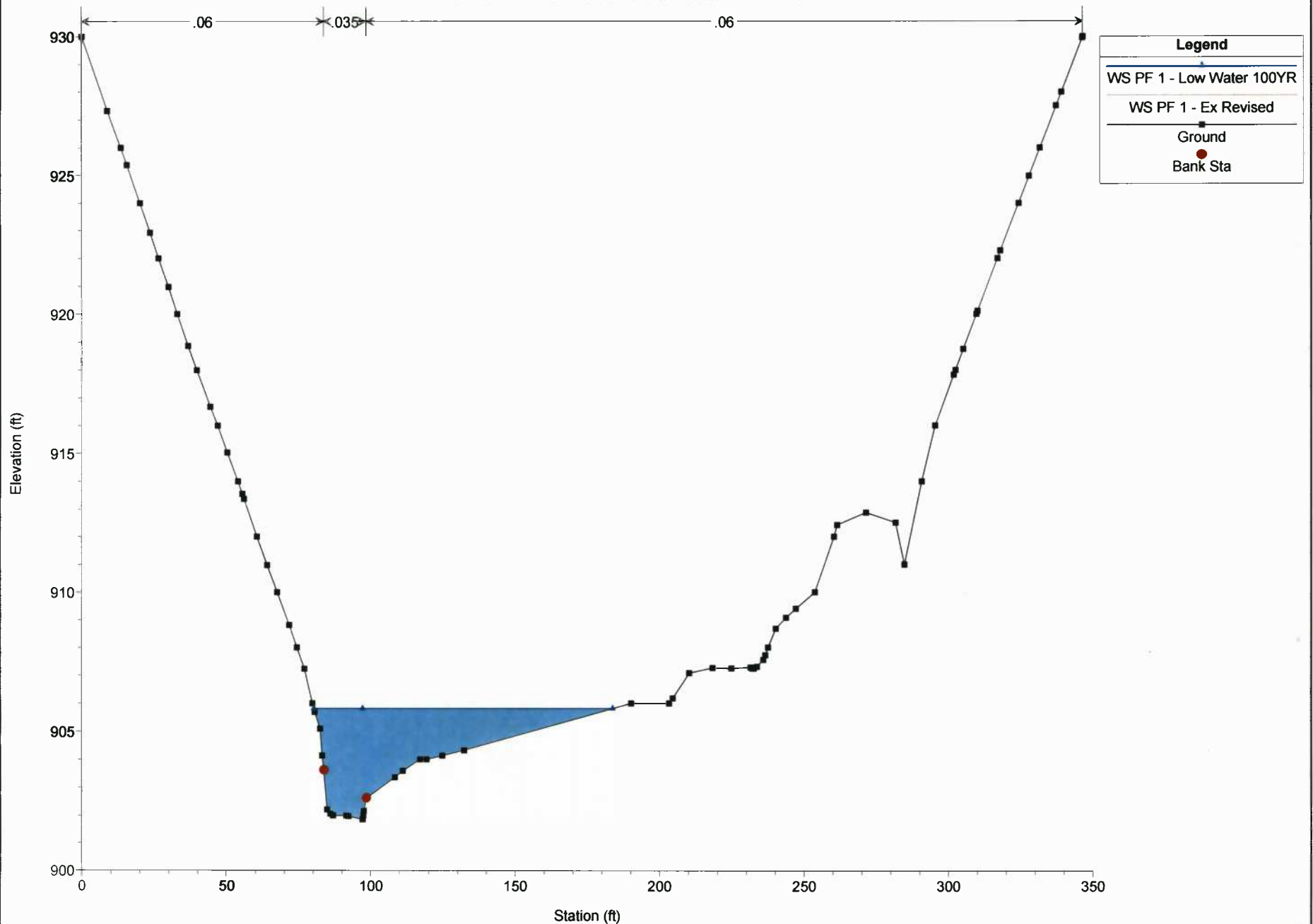
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 5379.960



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

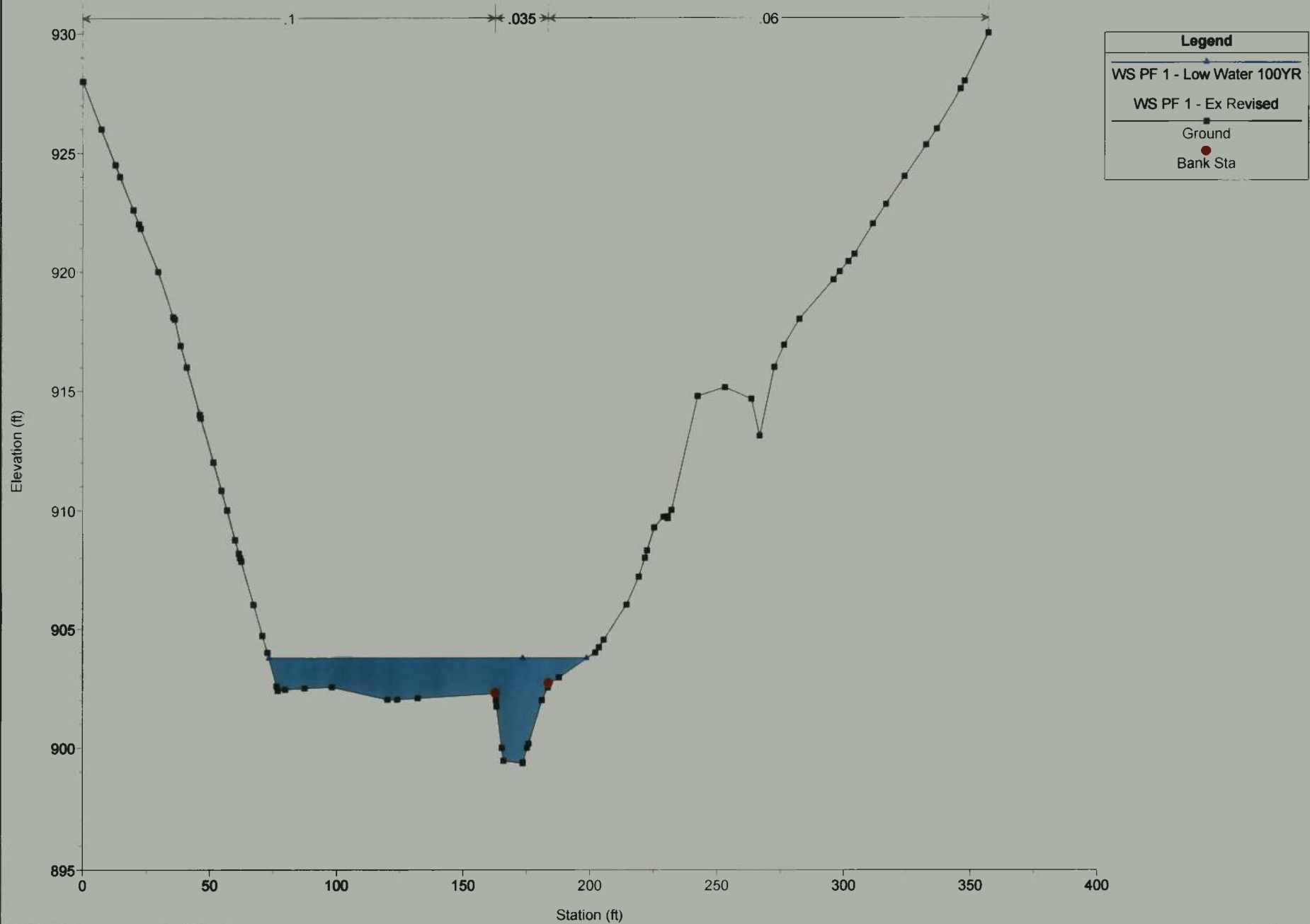
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Middle RS = 5291.039



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

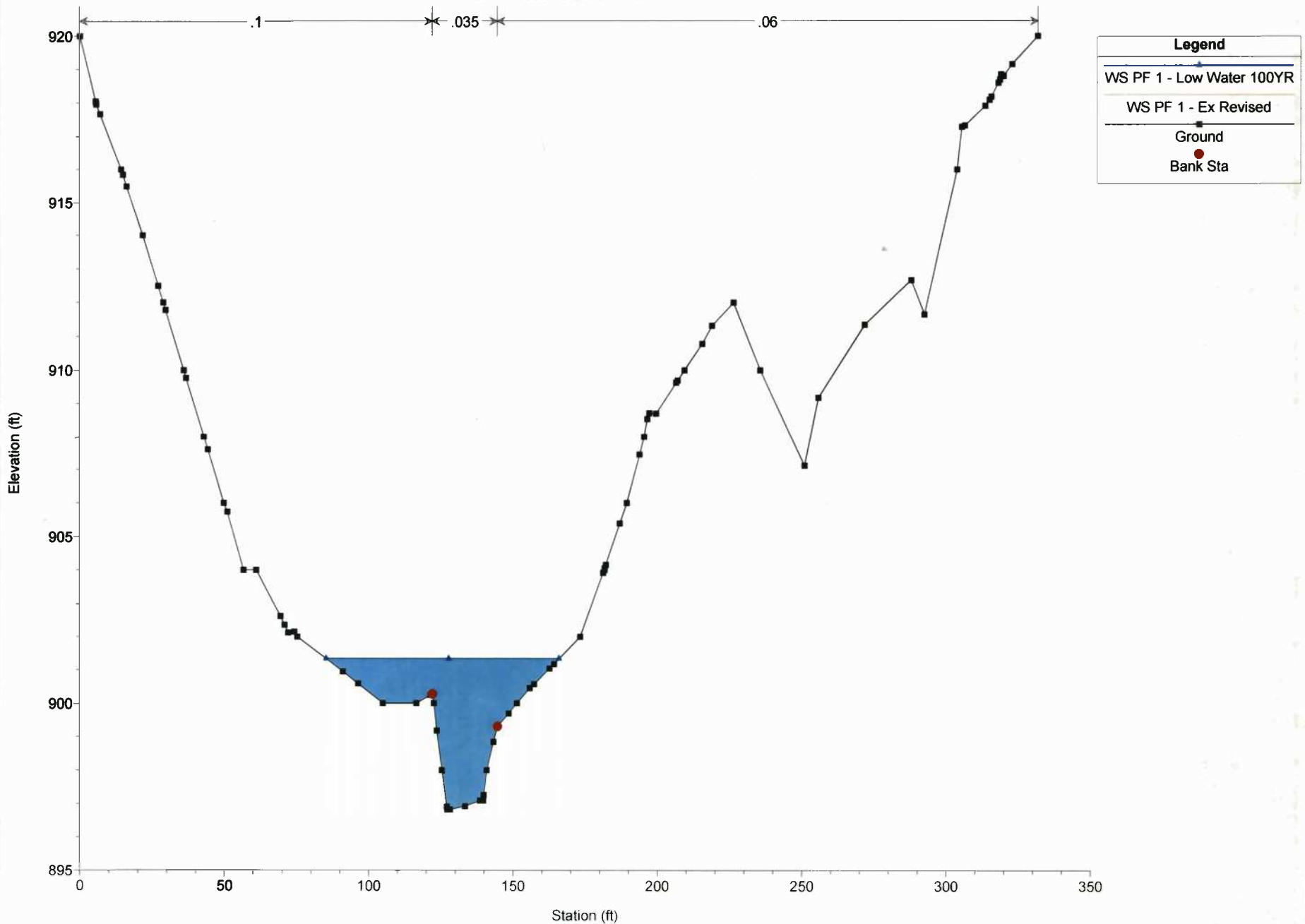
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 5071.499



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

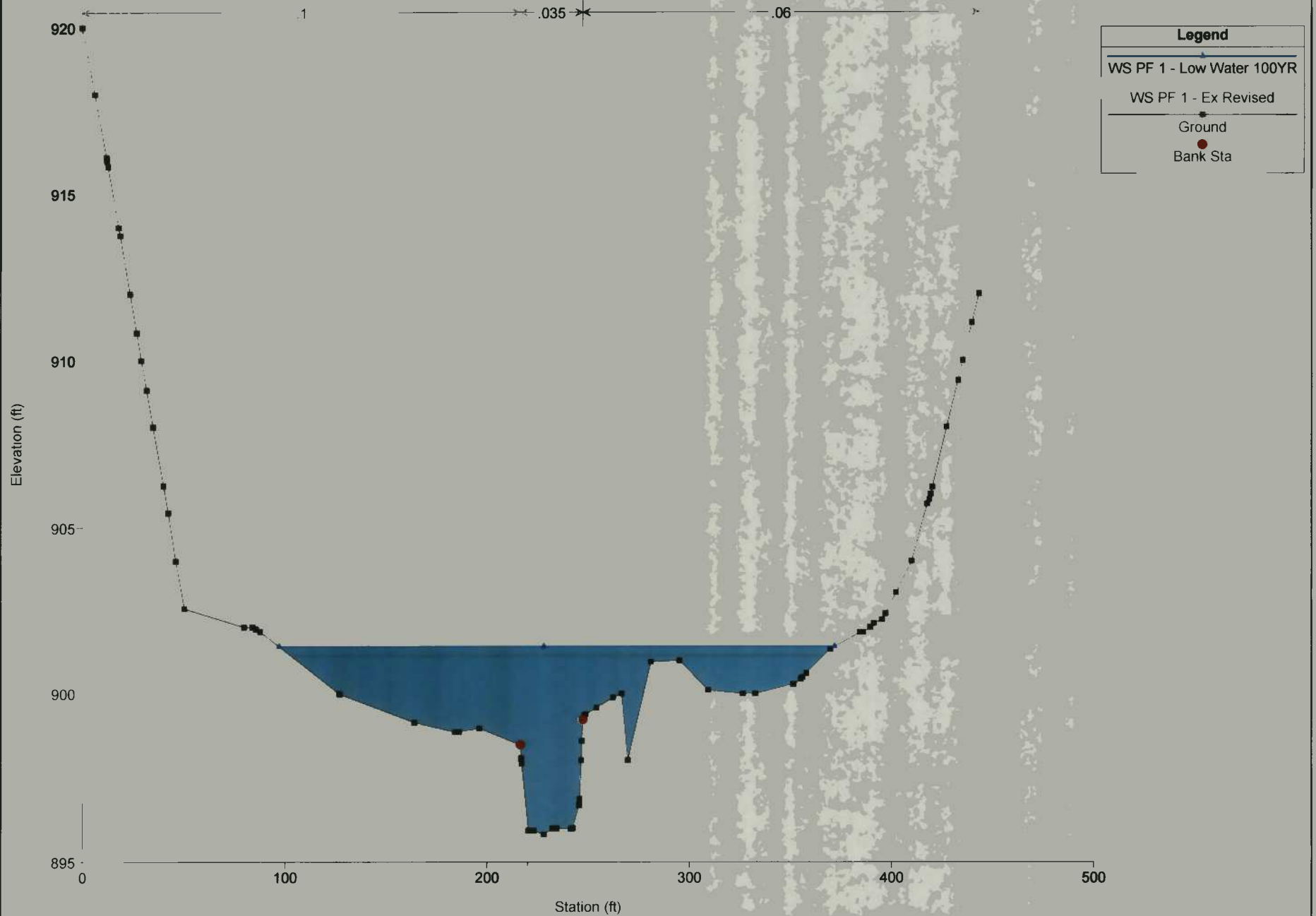
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Middle RS = 4871.481



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

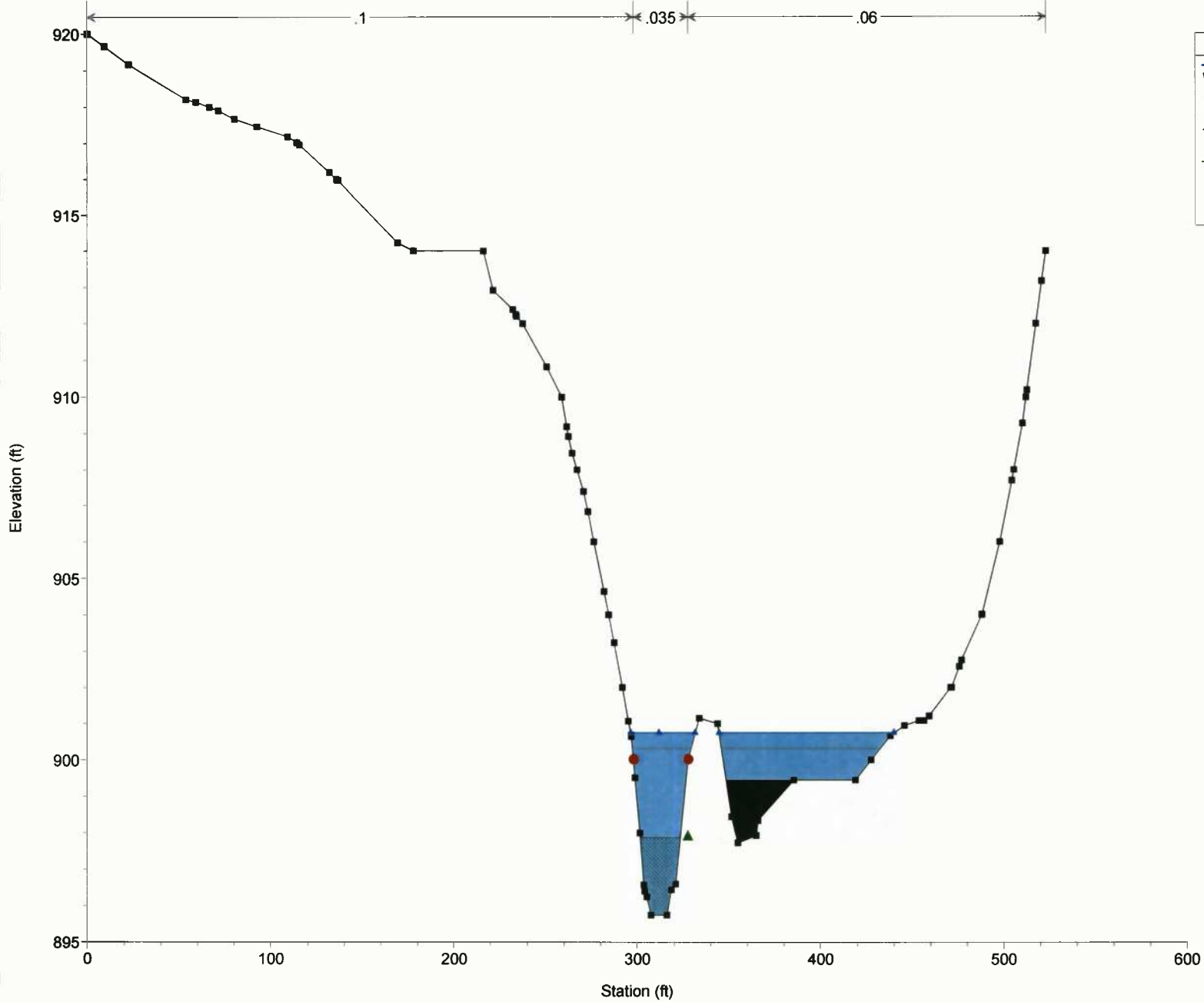
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 4704.612



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

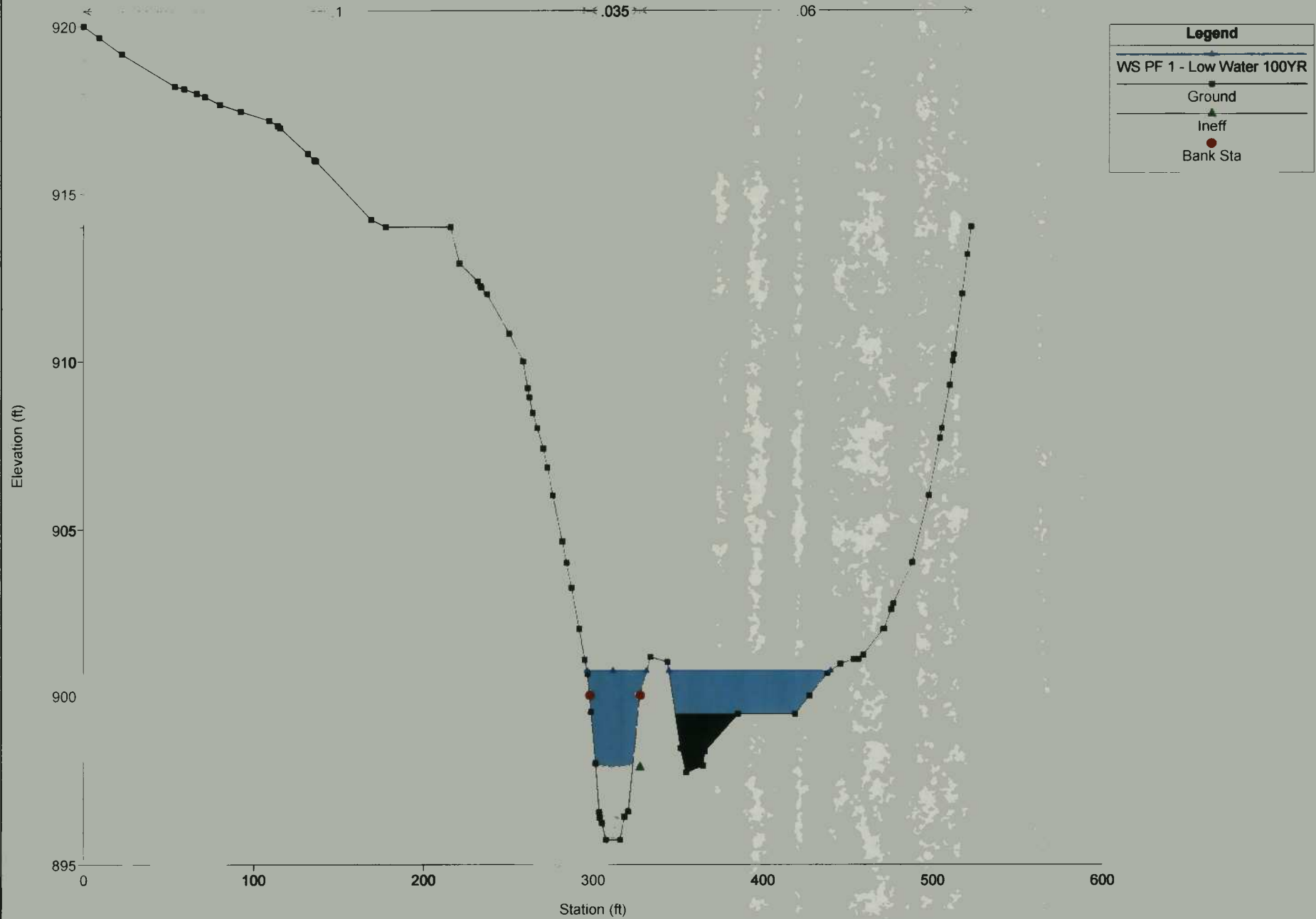
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Lower RS = 4682.971



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

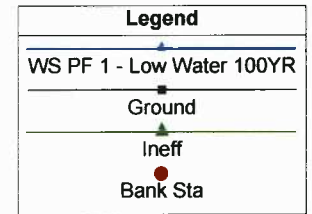
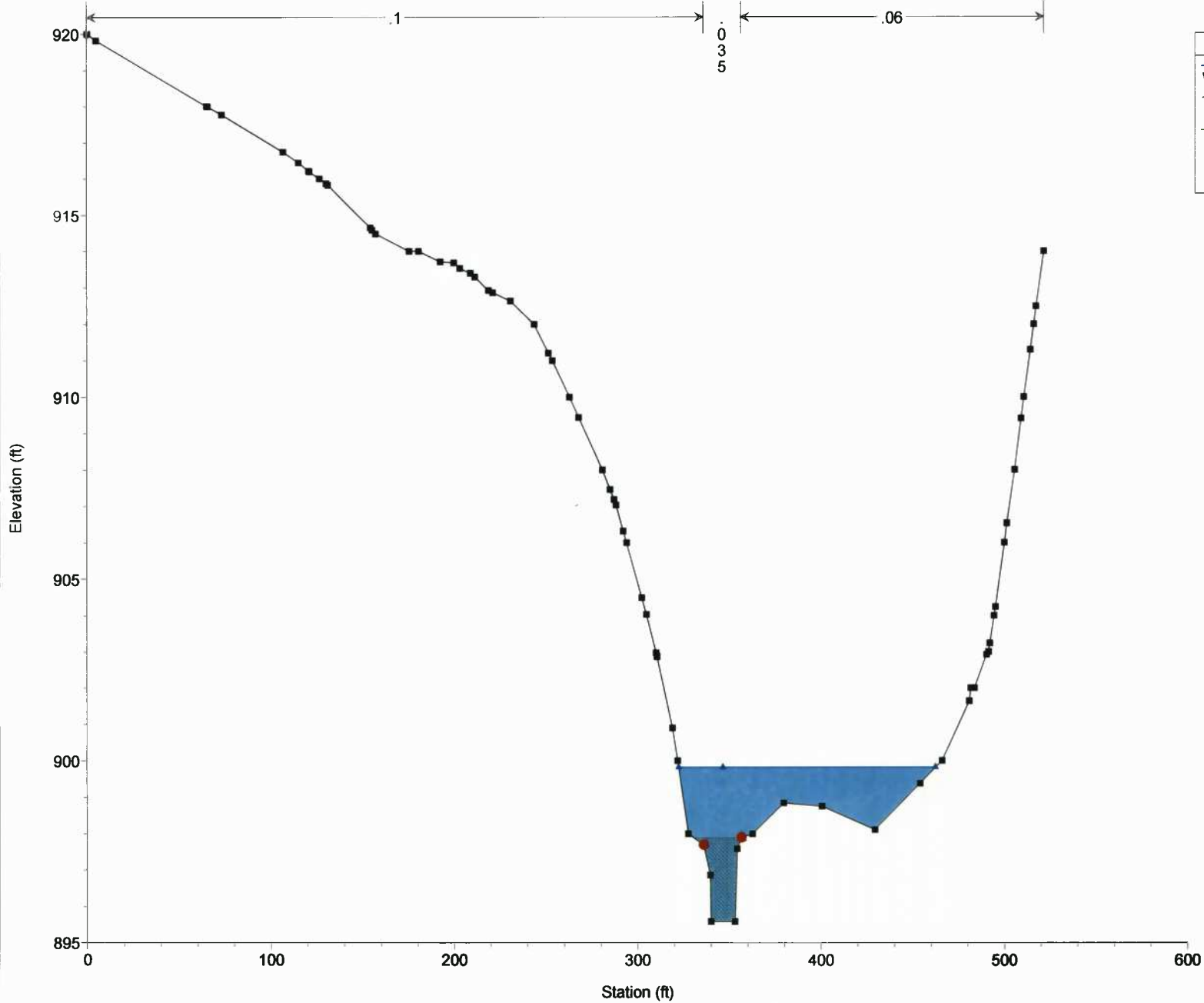
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 4657.419 IS



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

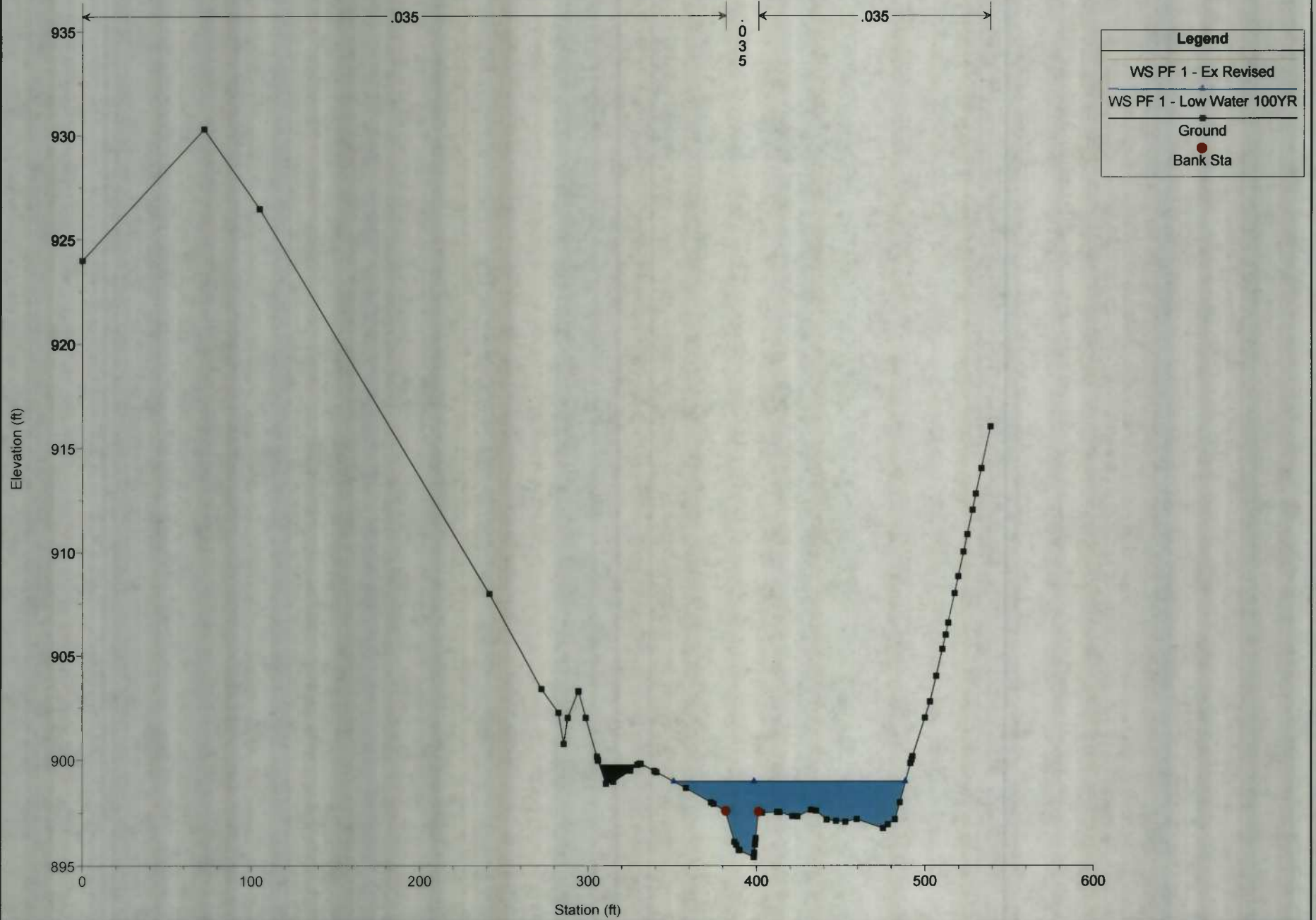
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Lower RS = 4626.456



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

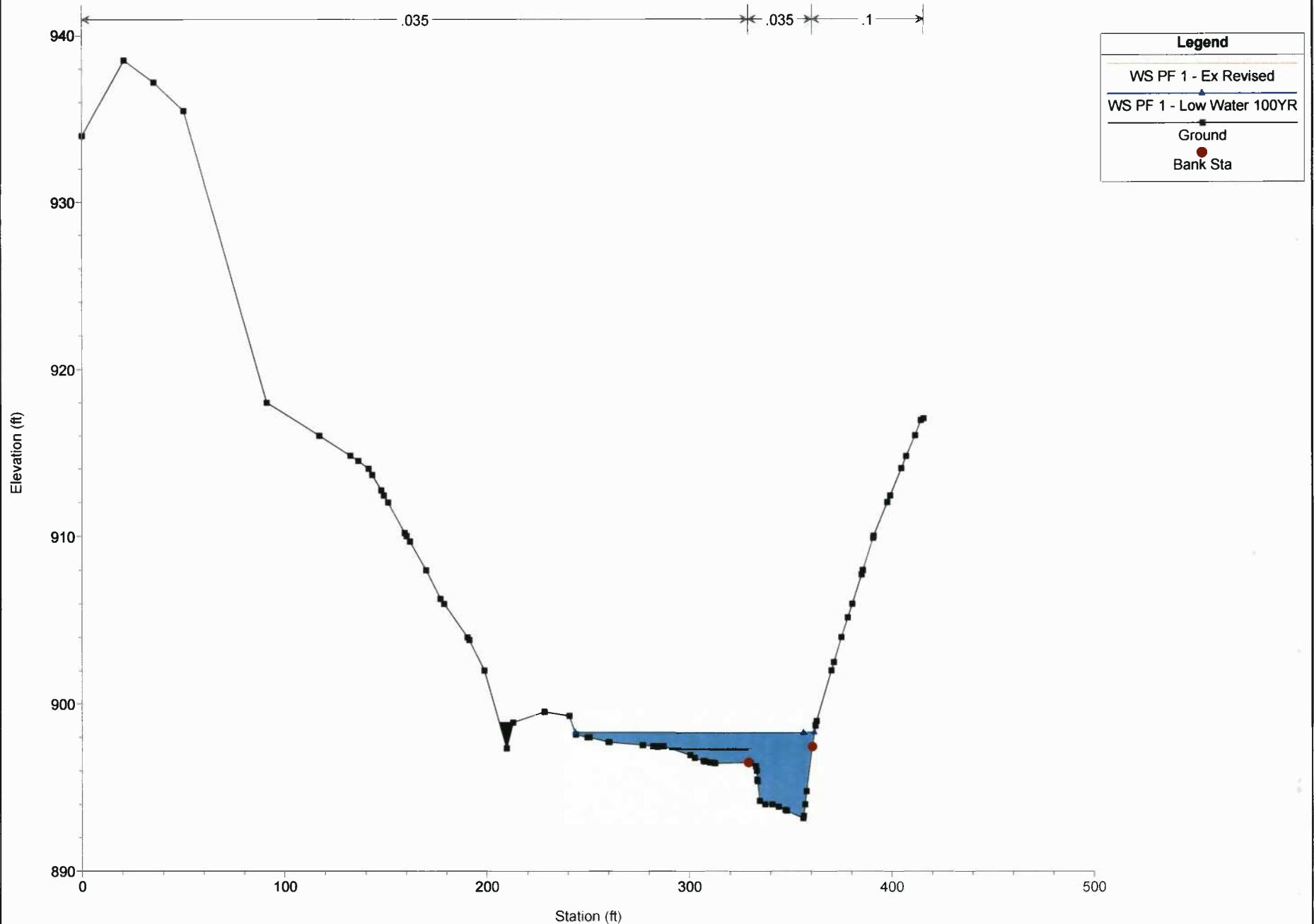
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 4559.288



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

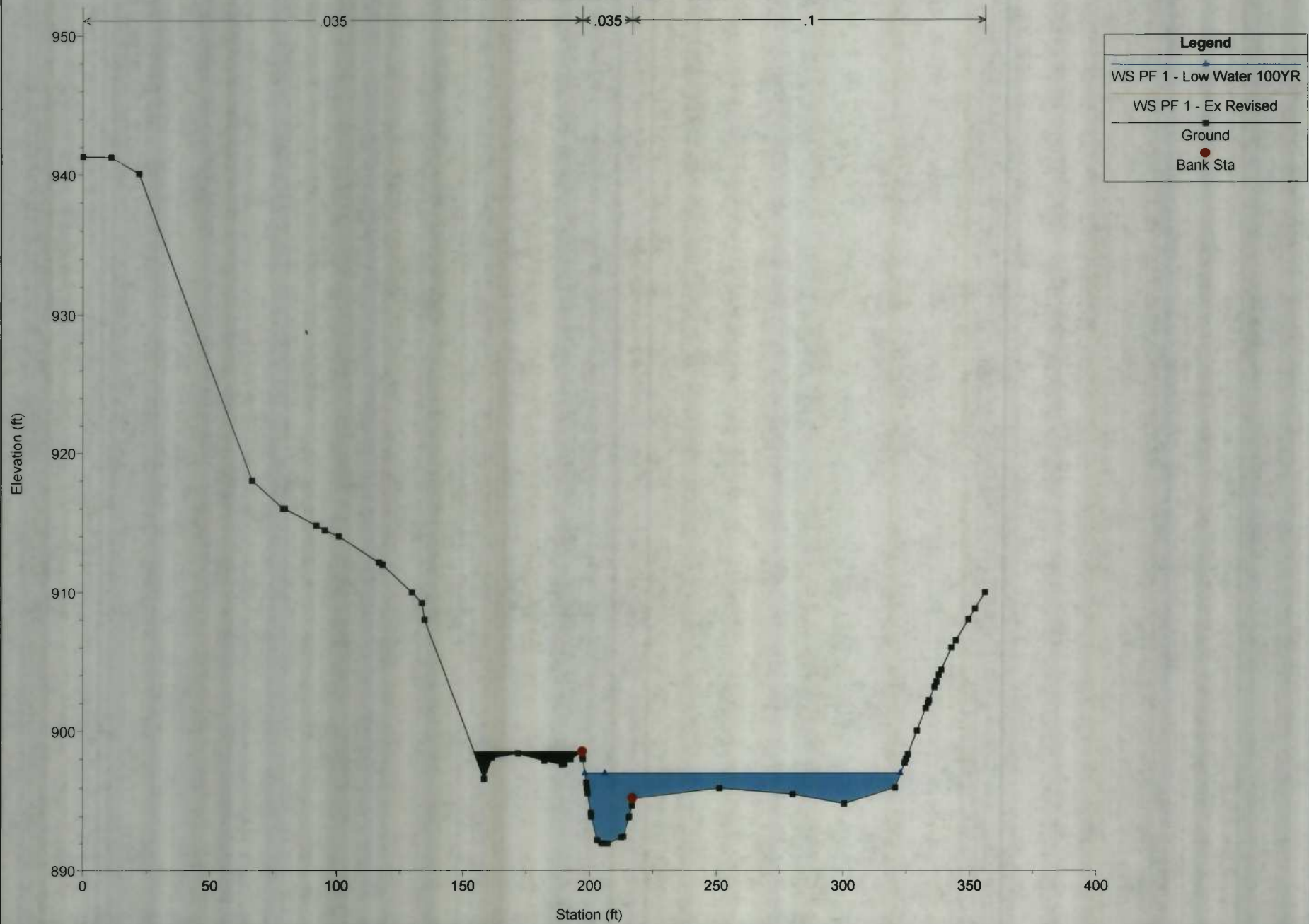
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Lower RS = 4258.834



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

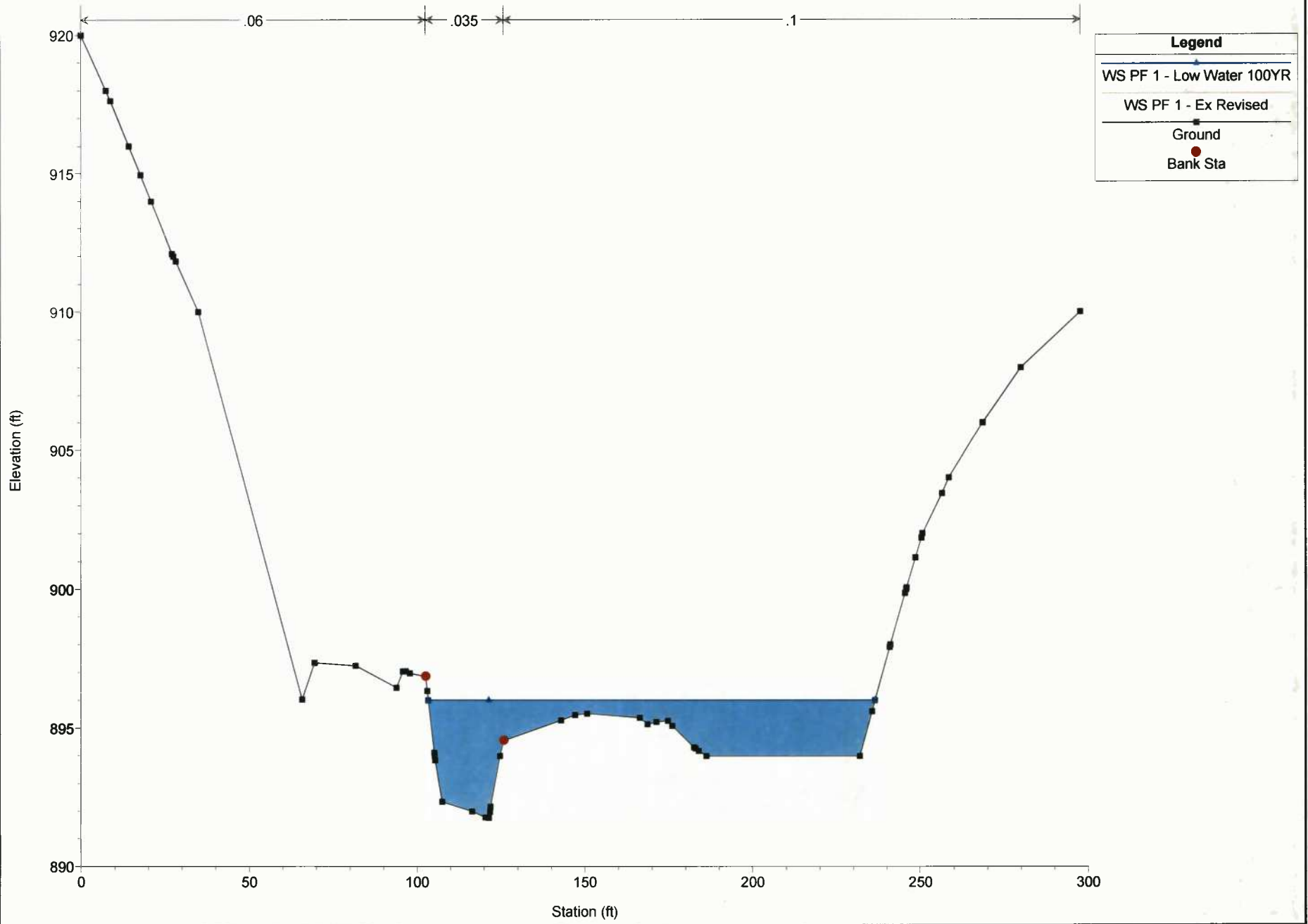
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 4054.239



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

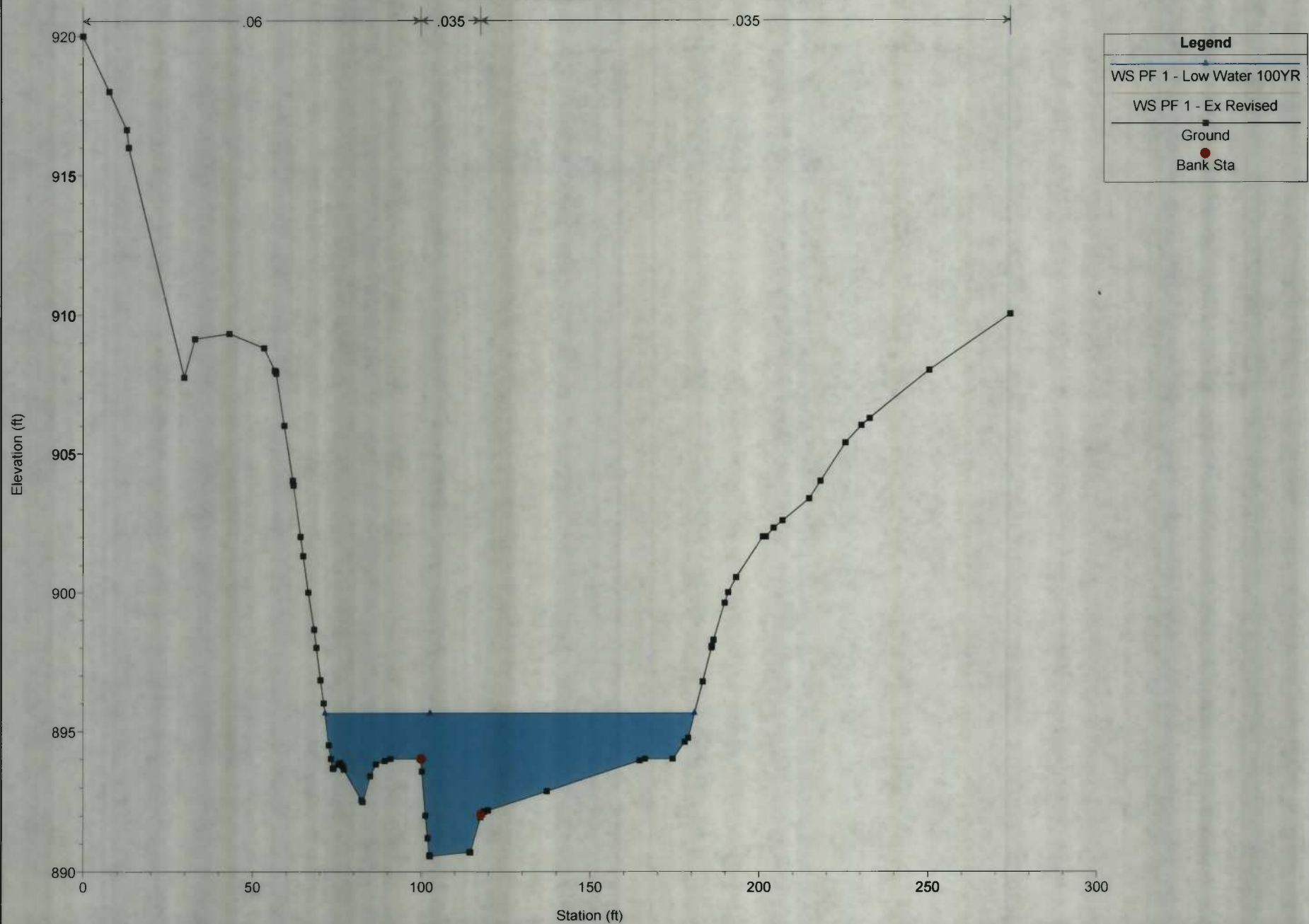
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Lower RS = 3934.570



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

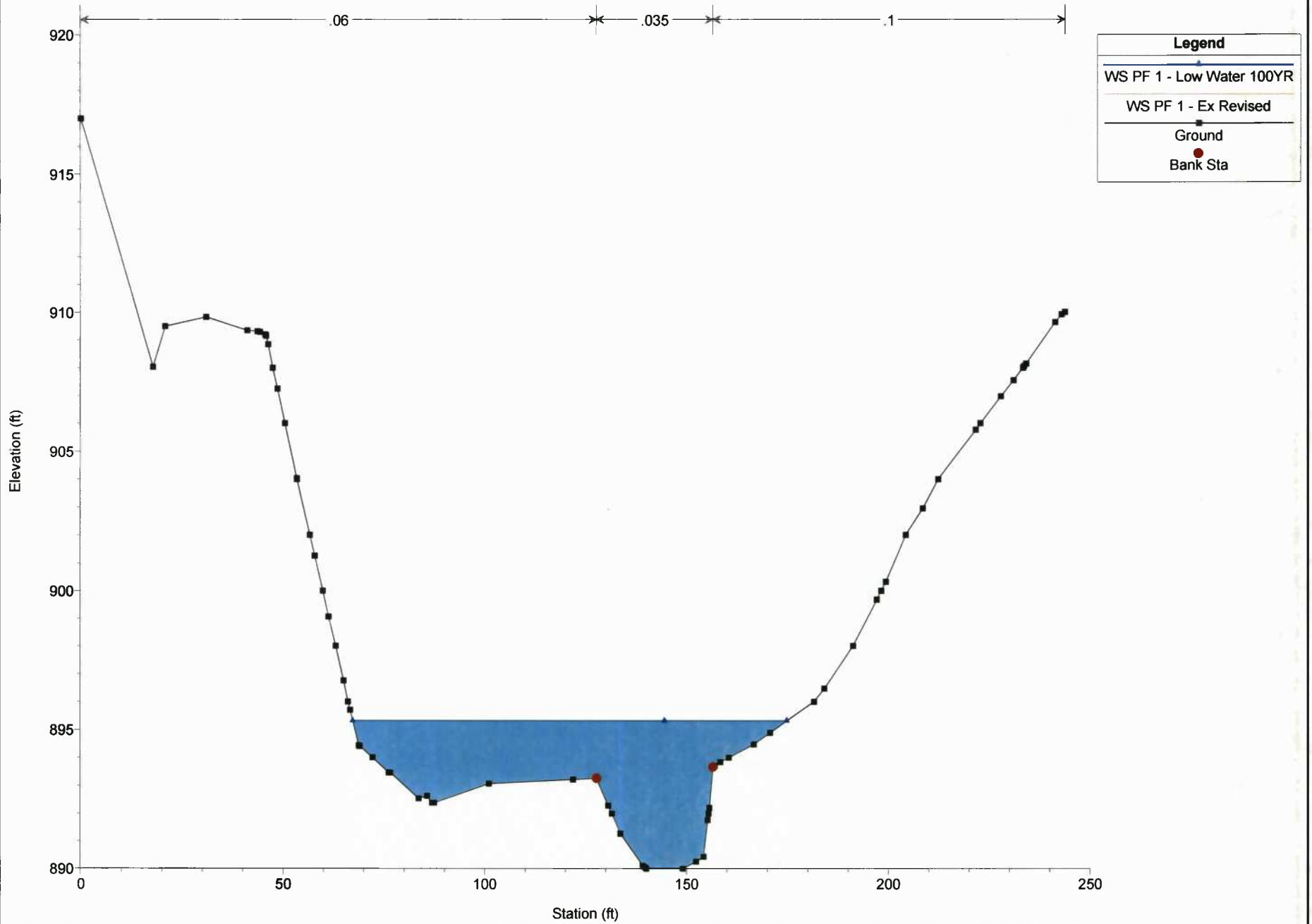
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 3797.323



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

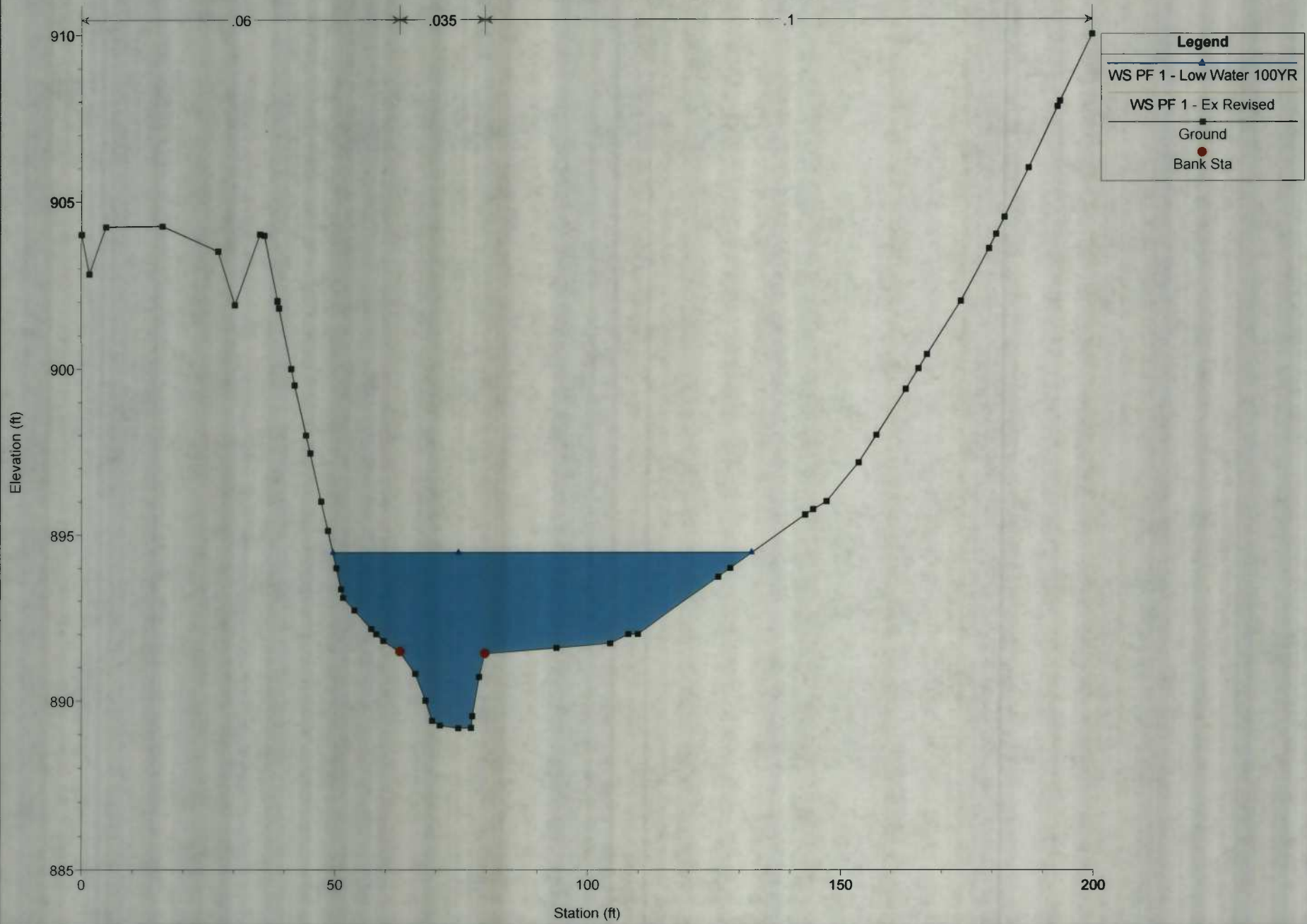
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Lower RS = 3679.344



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 3568.220

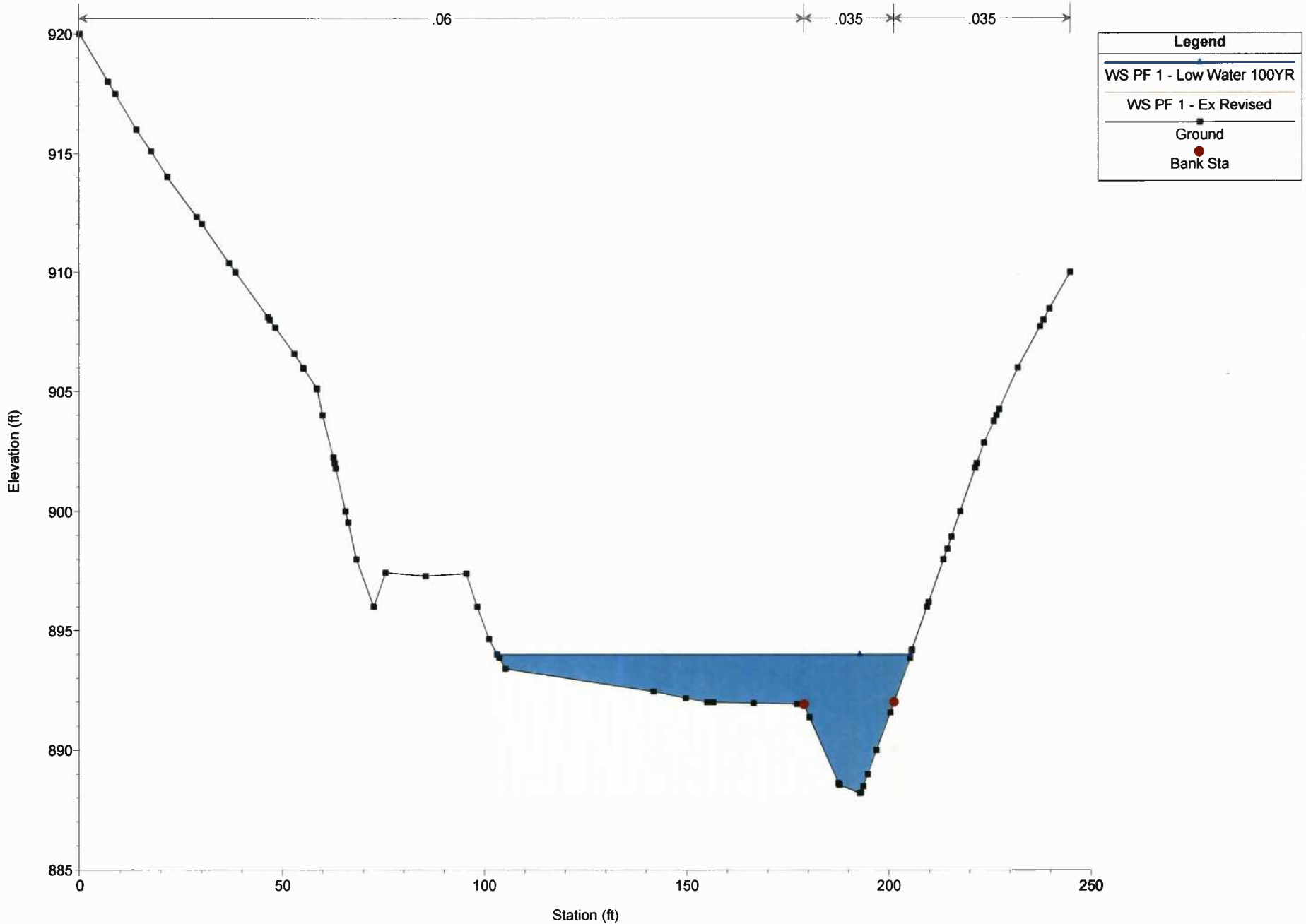


Legend

- WS PF 1 - Low Water 100YR
- WS PF 1 - Ex Revised
- Ground
- Bank Sta

OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

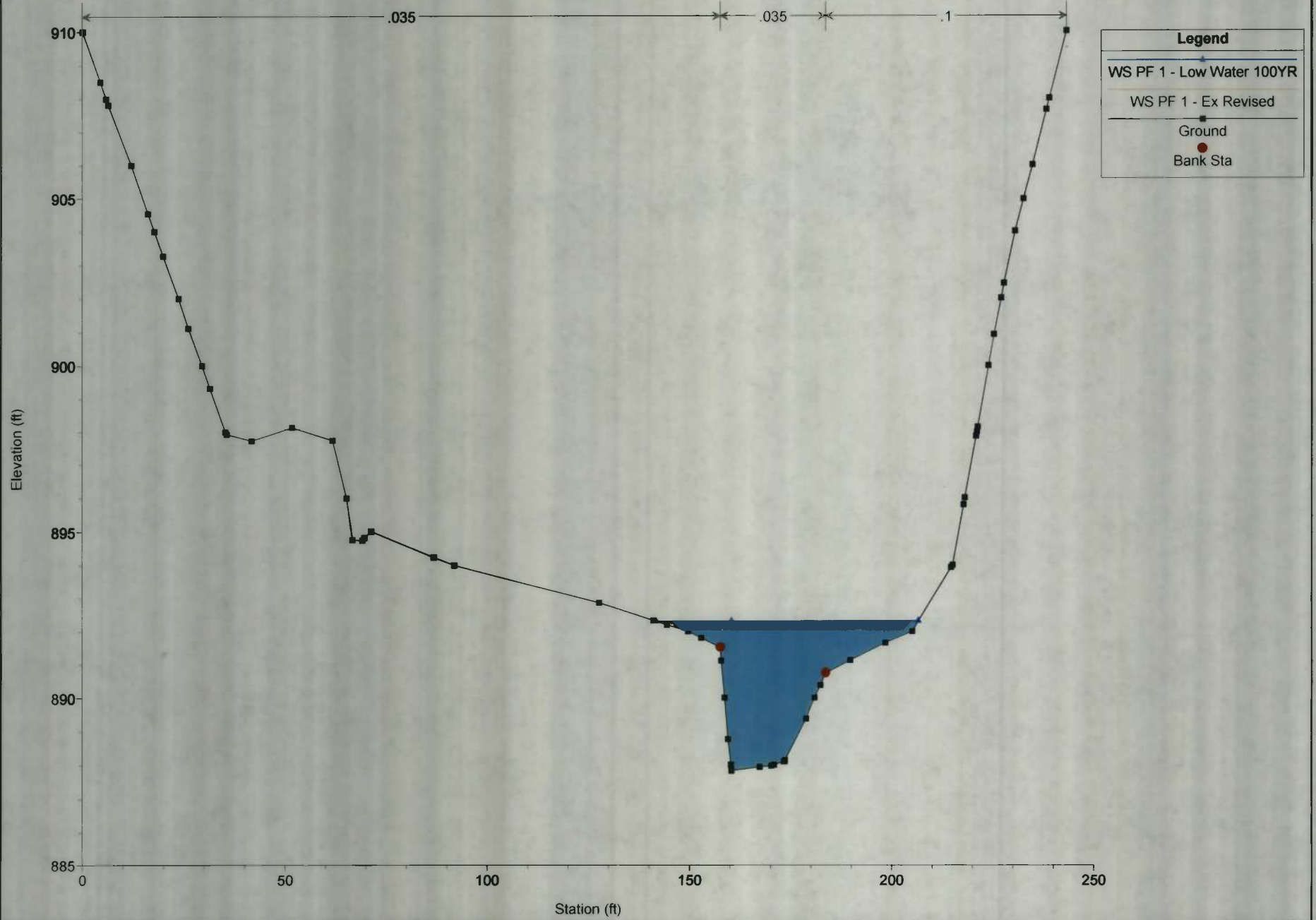
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Lower RS = 3438.299



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

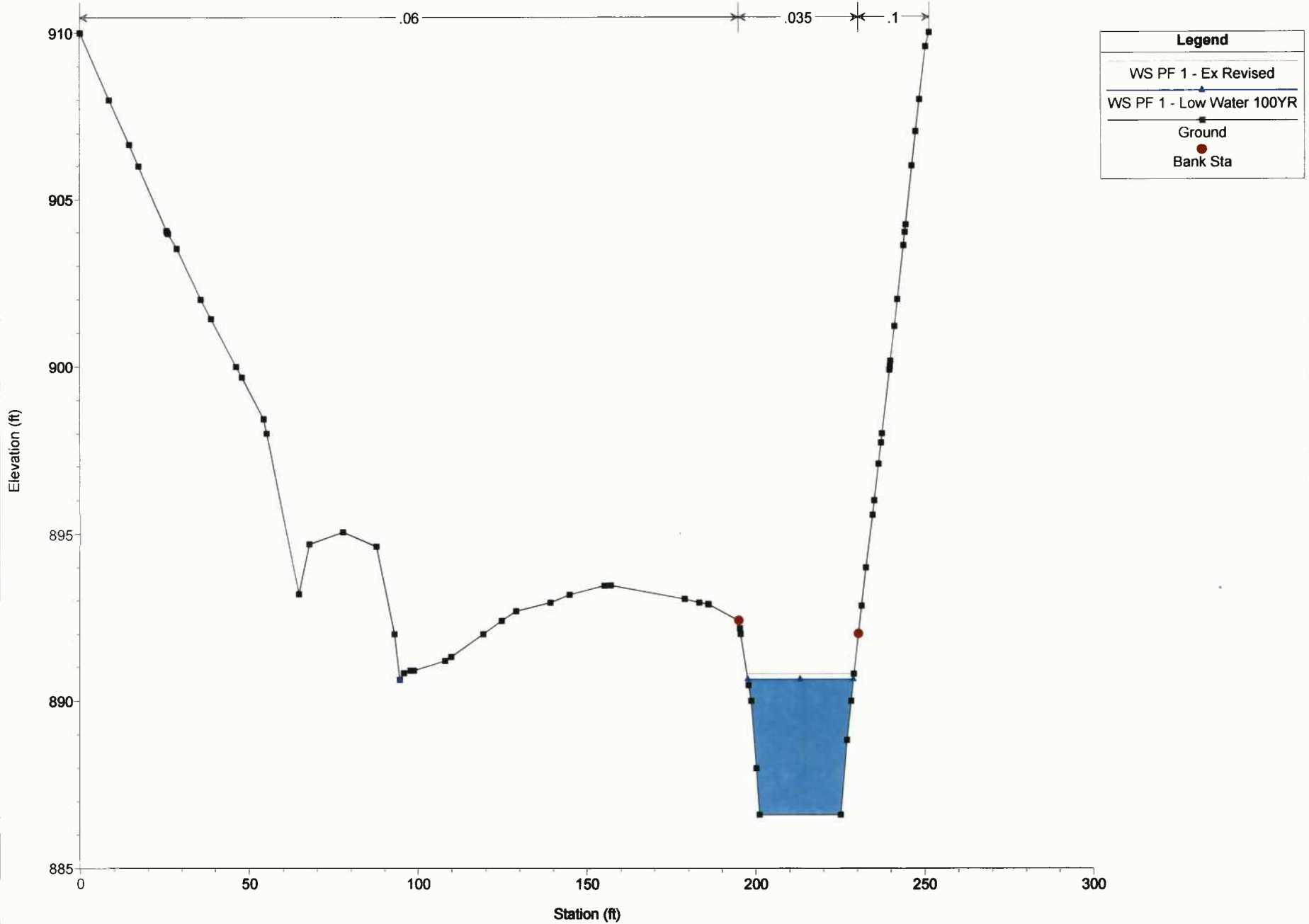
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 3282.877



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

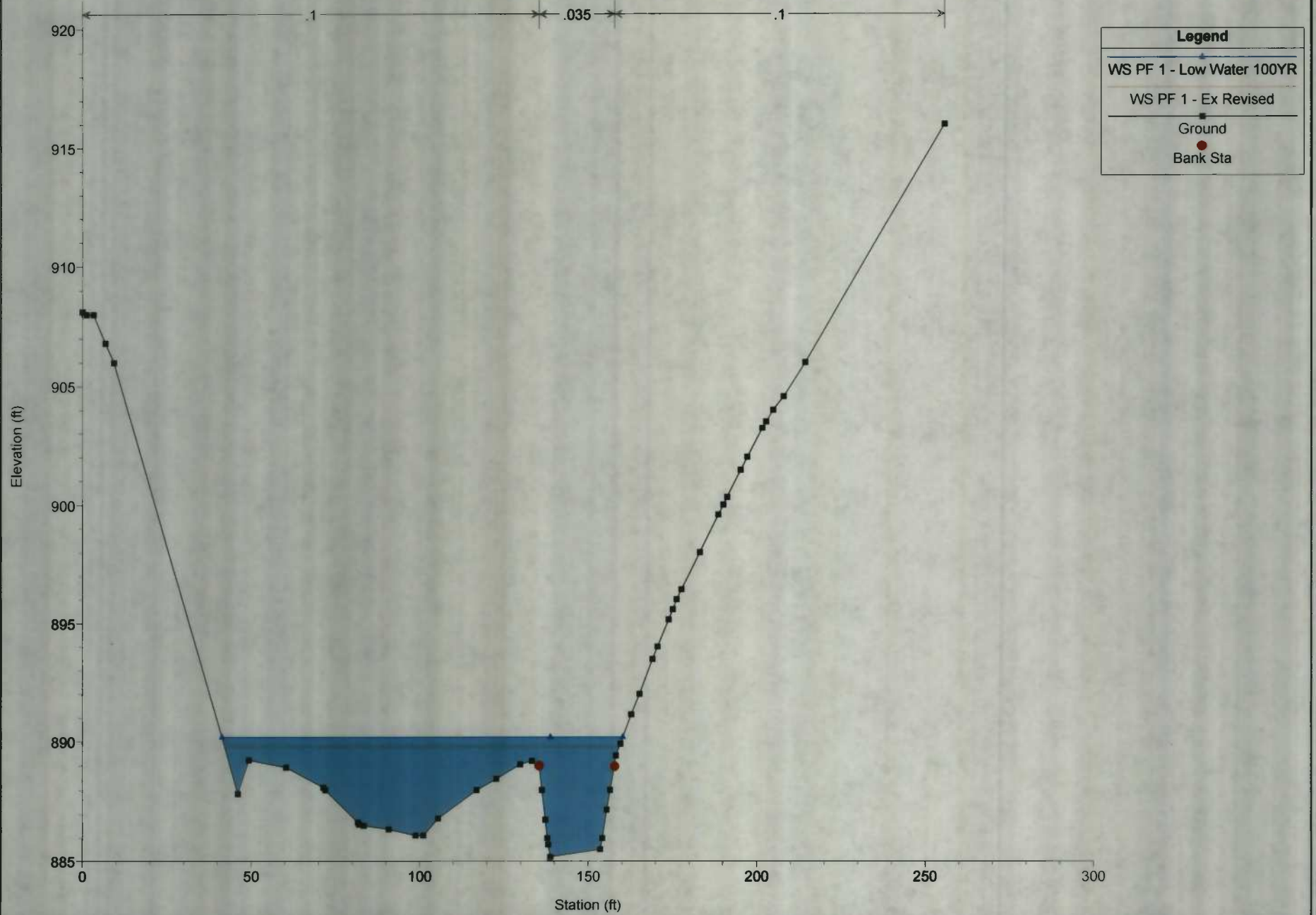
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Lower RS = 3129.654



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

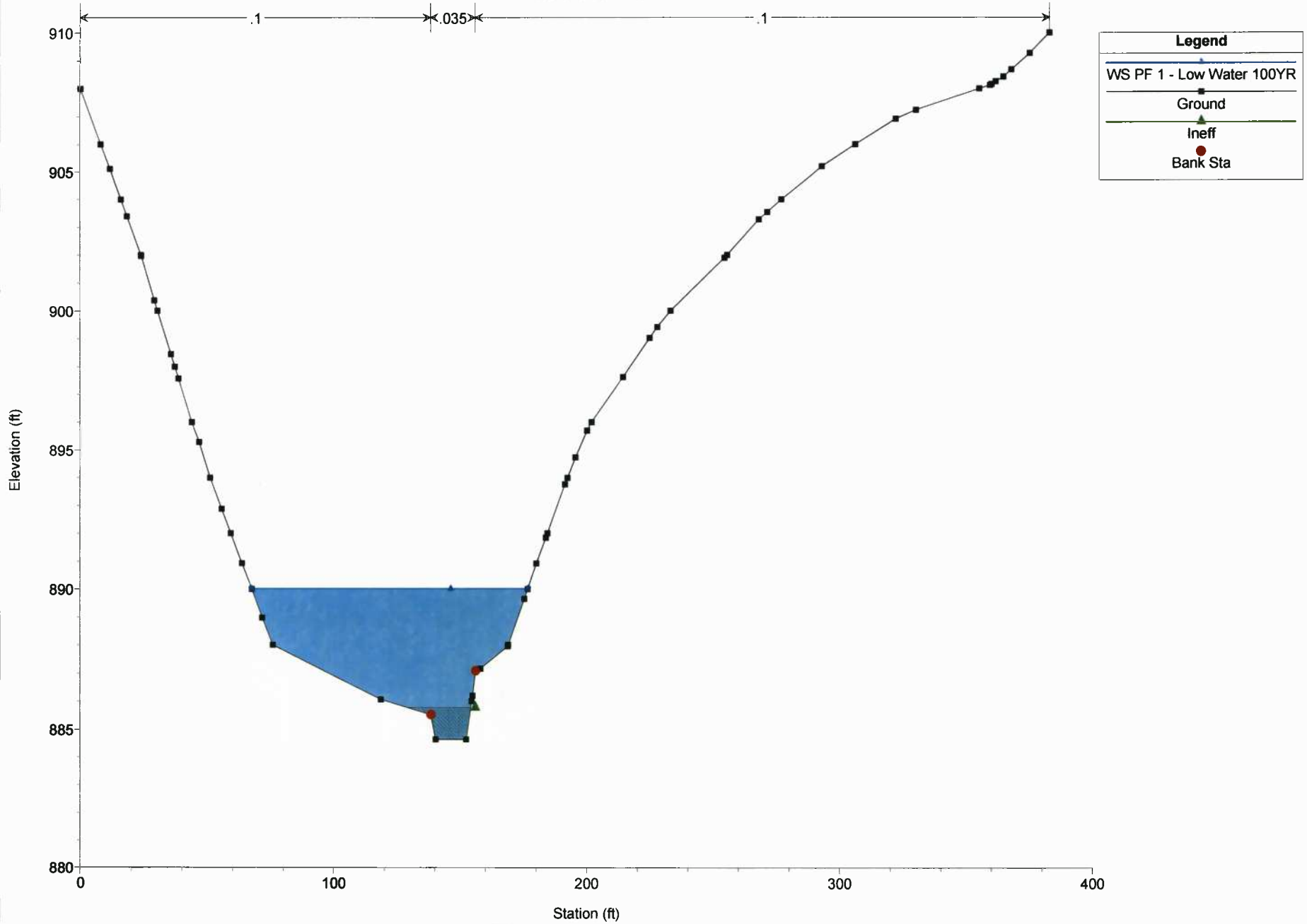
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 2951.927



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

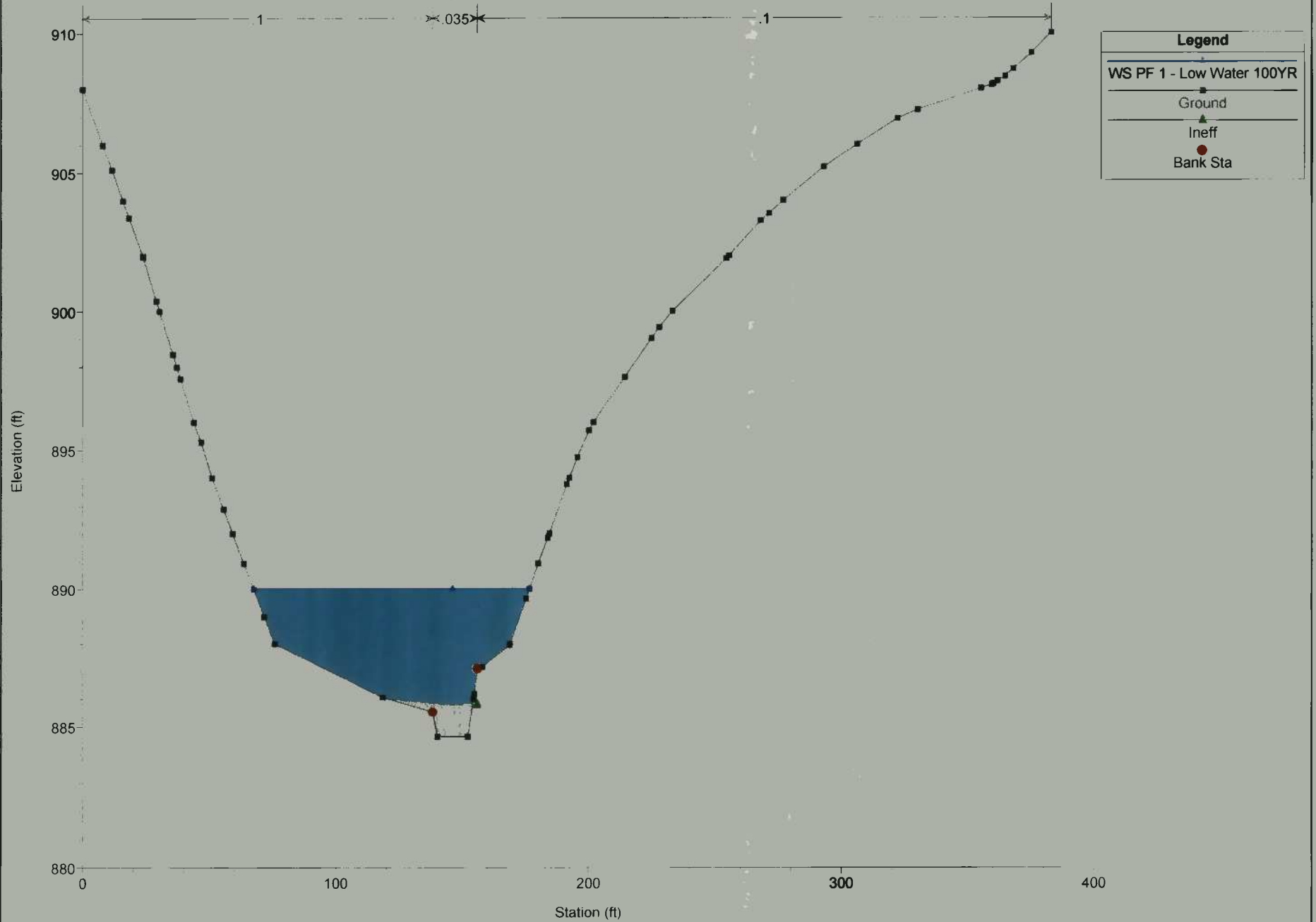
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Lower RS = 2875.345



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

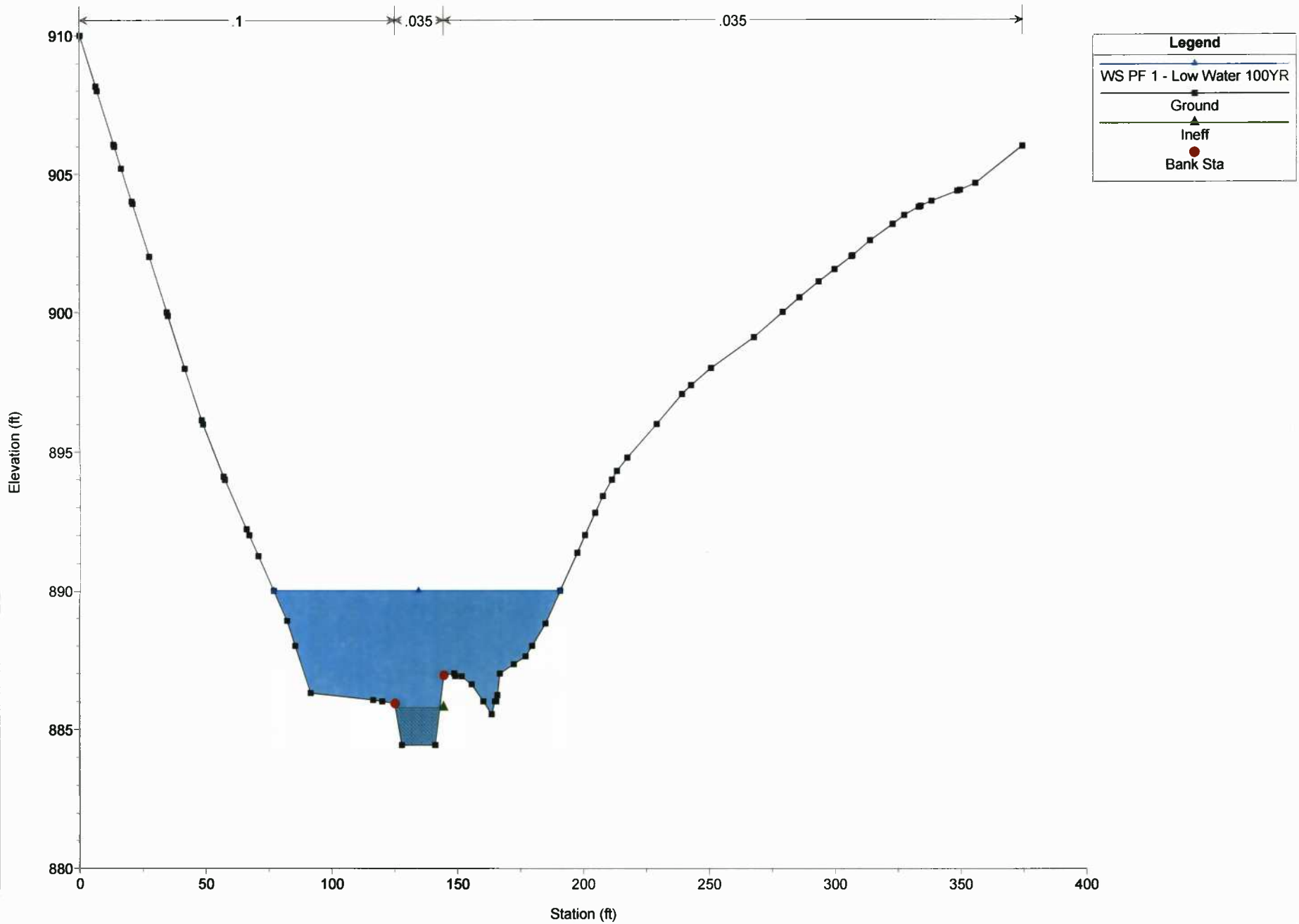
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 2862.727 IS



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

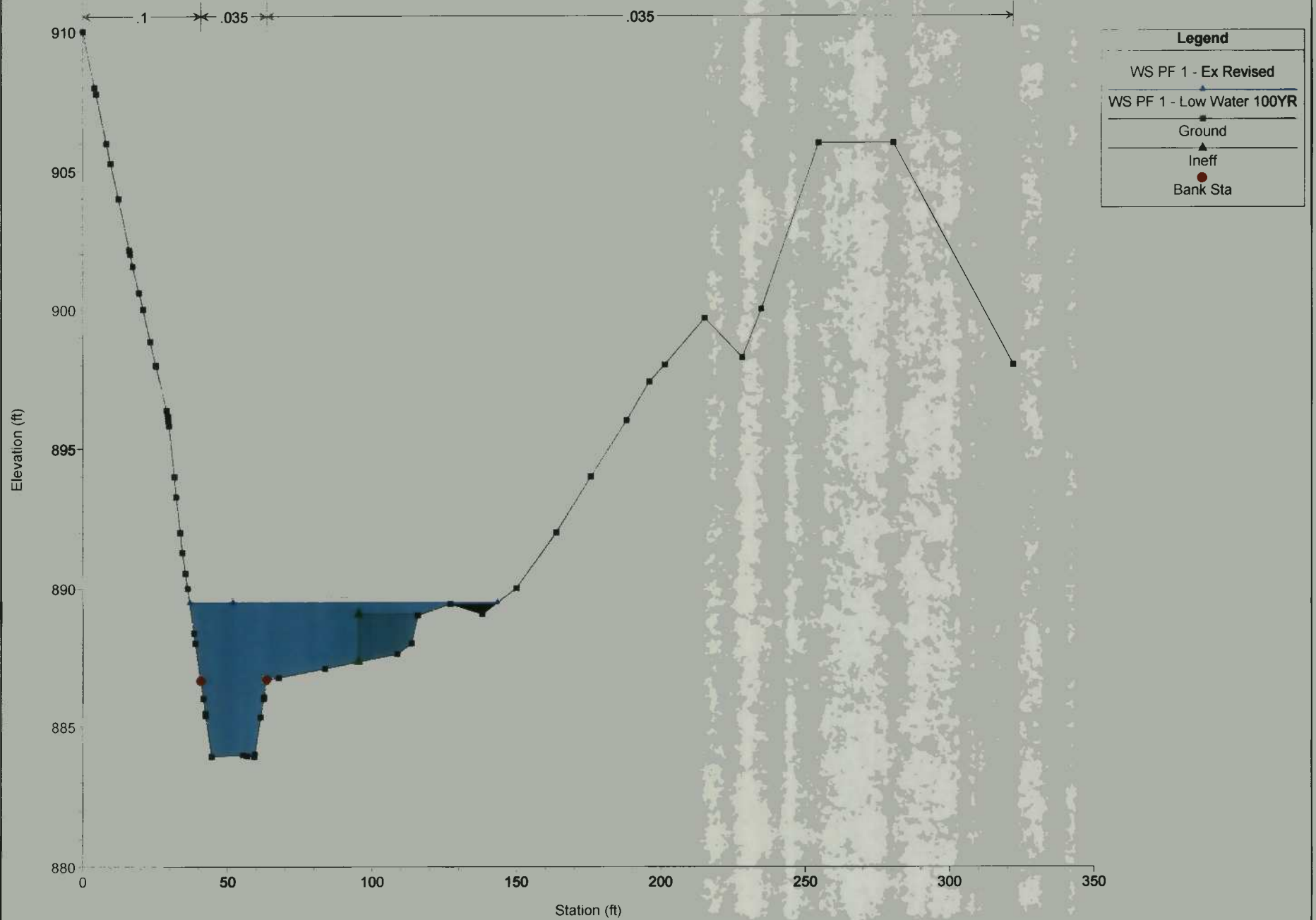
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Lower RS = 2846.103



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

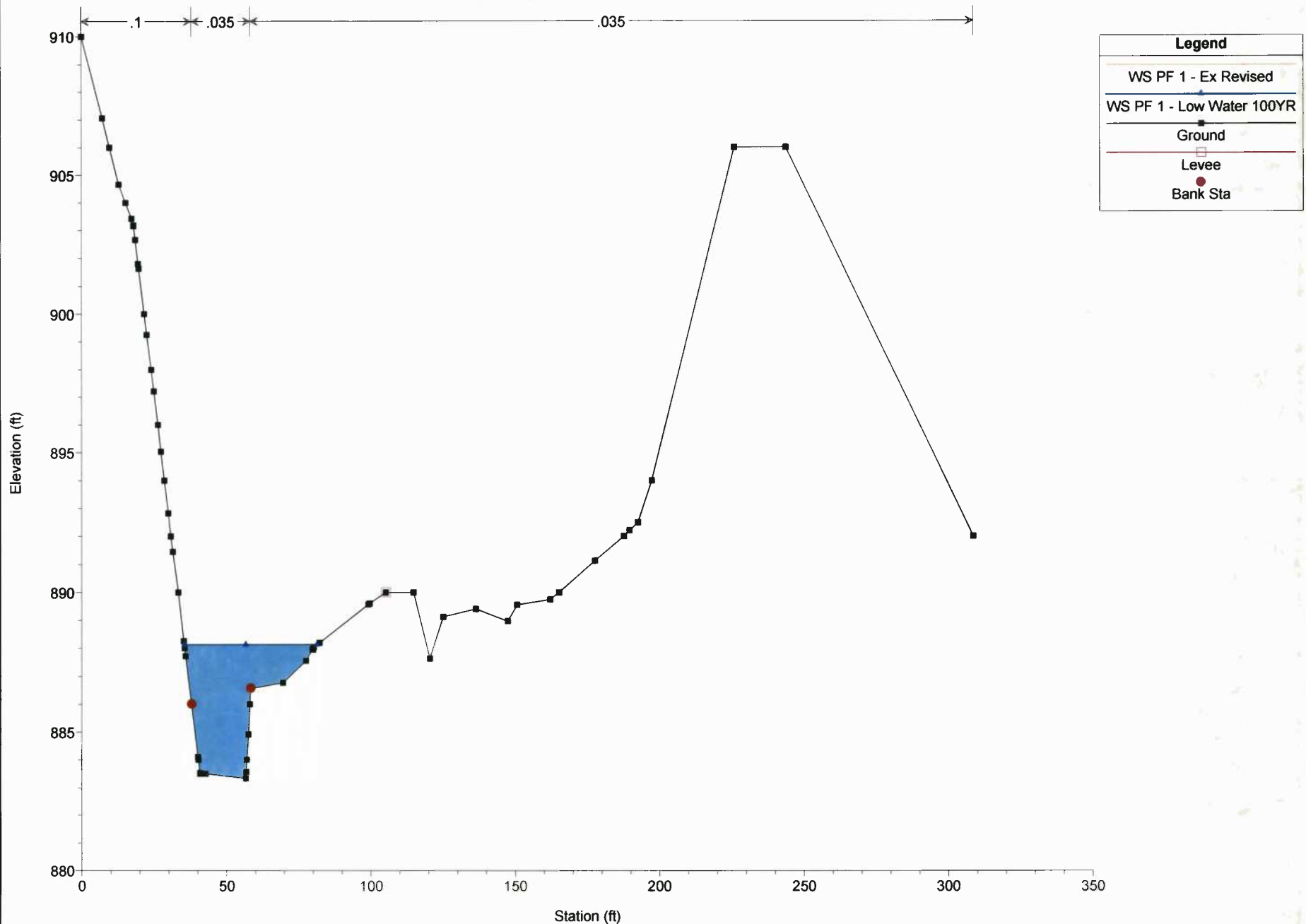
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 2773.556



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

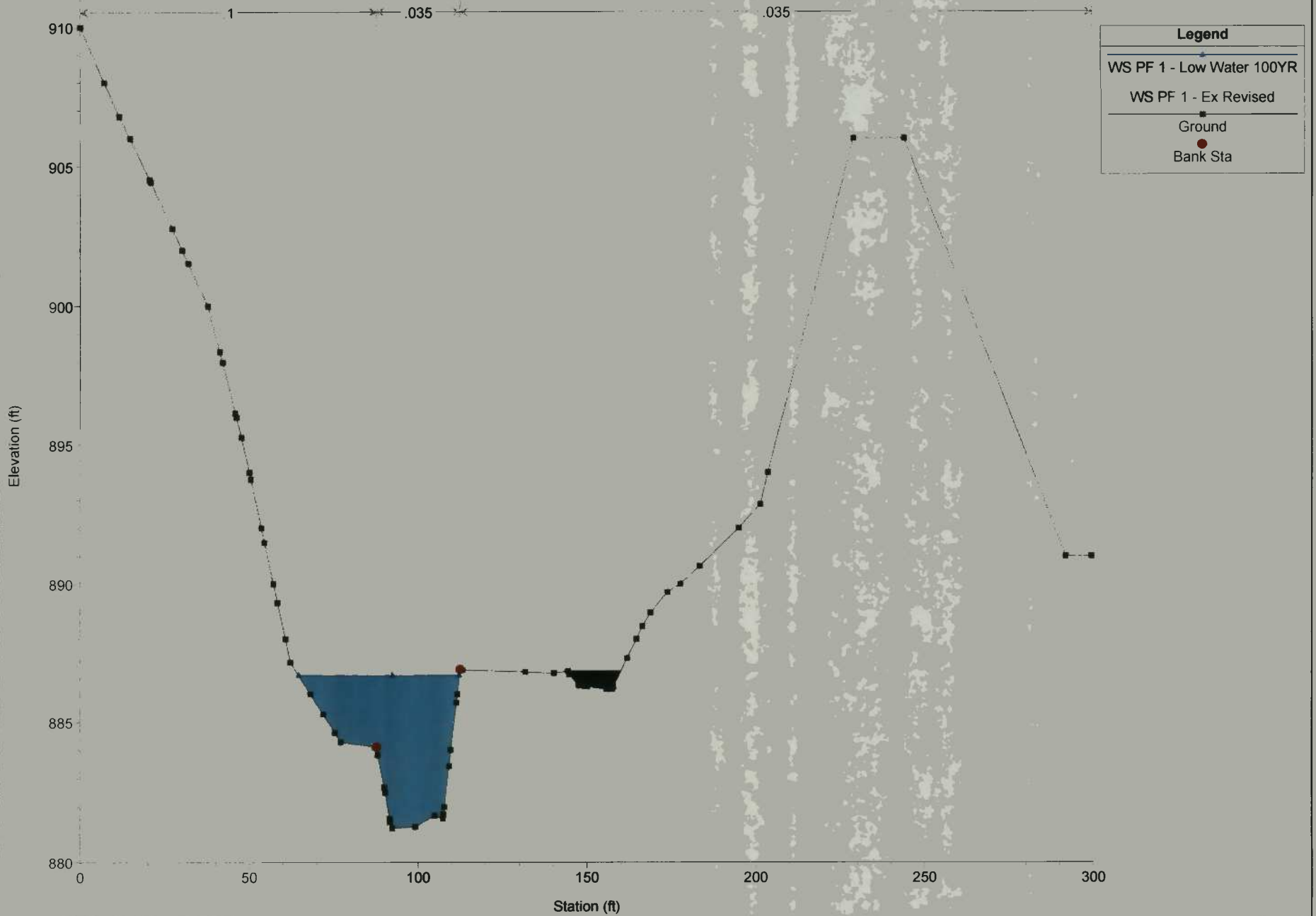
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Lower RS = 2690.443



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

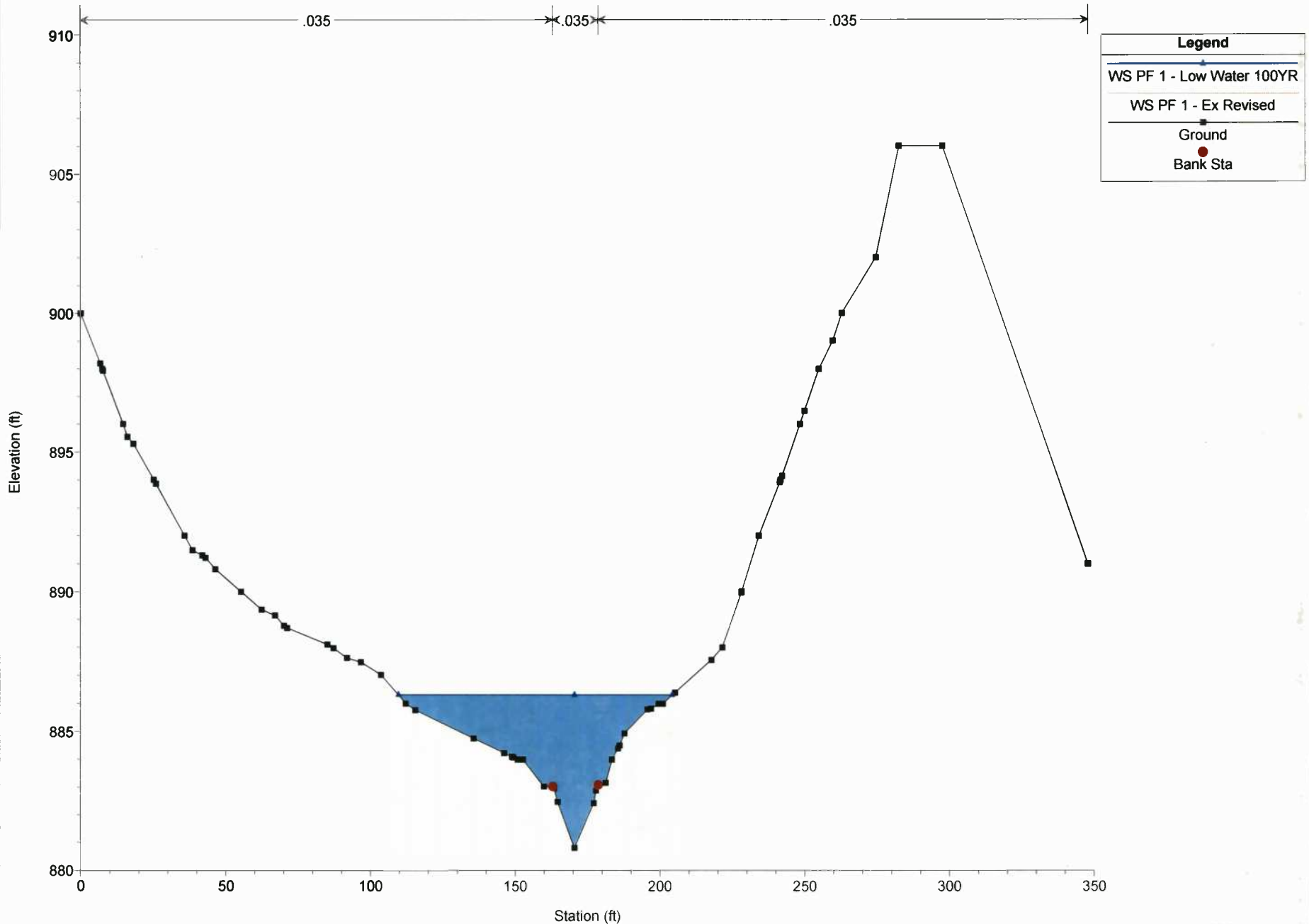
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 2515.269



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

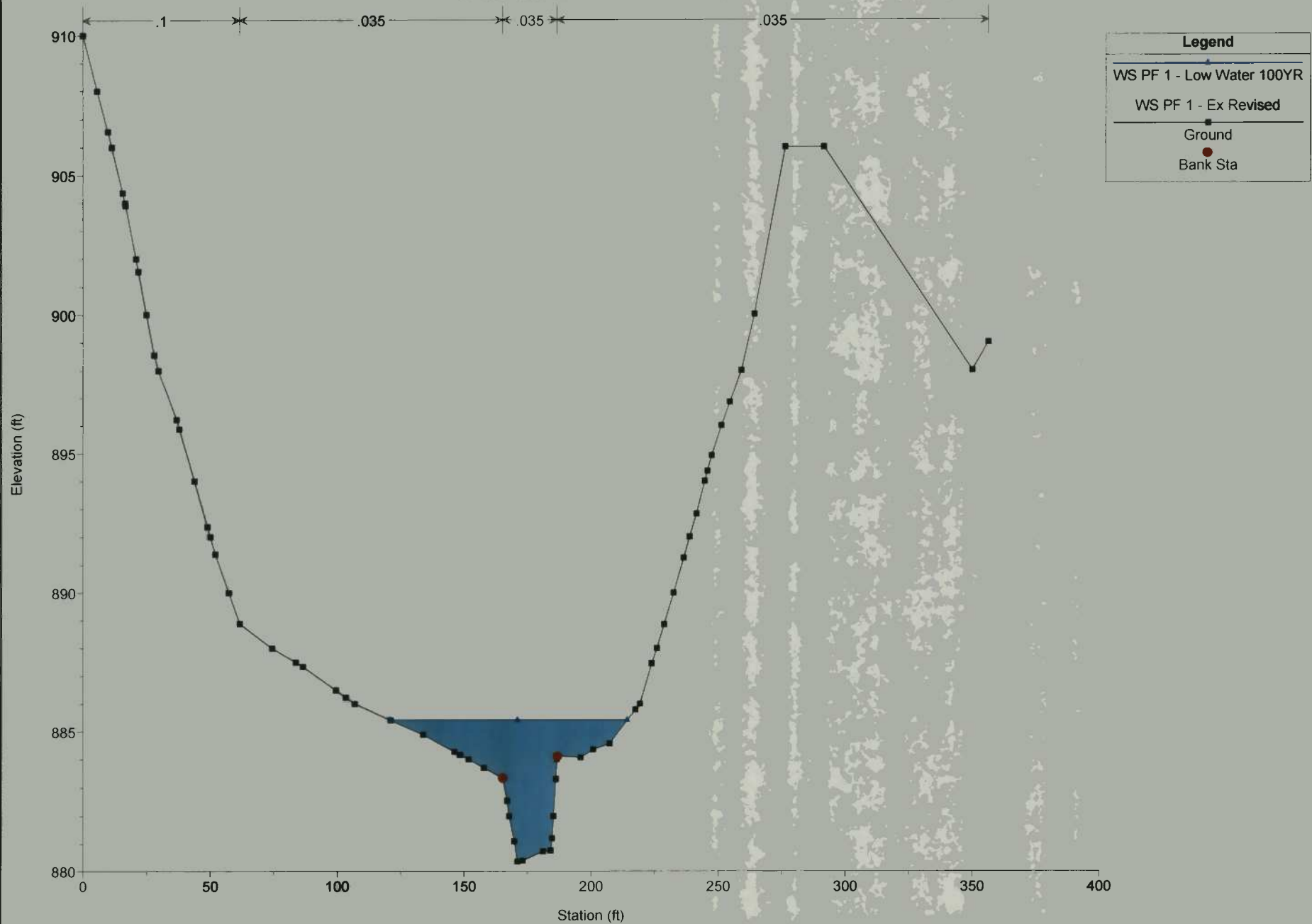
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Lower RS = 2420.230



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

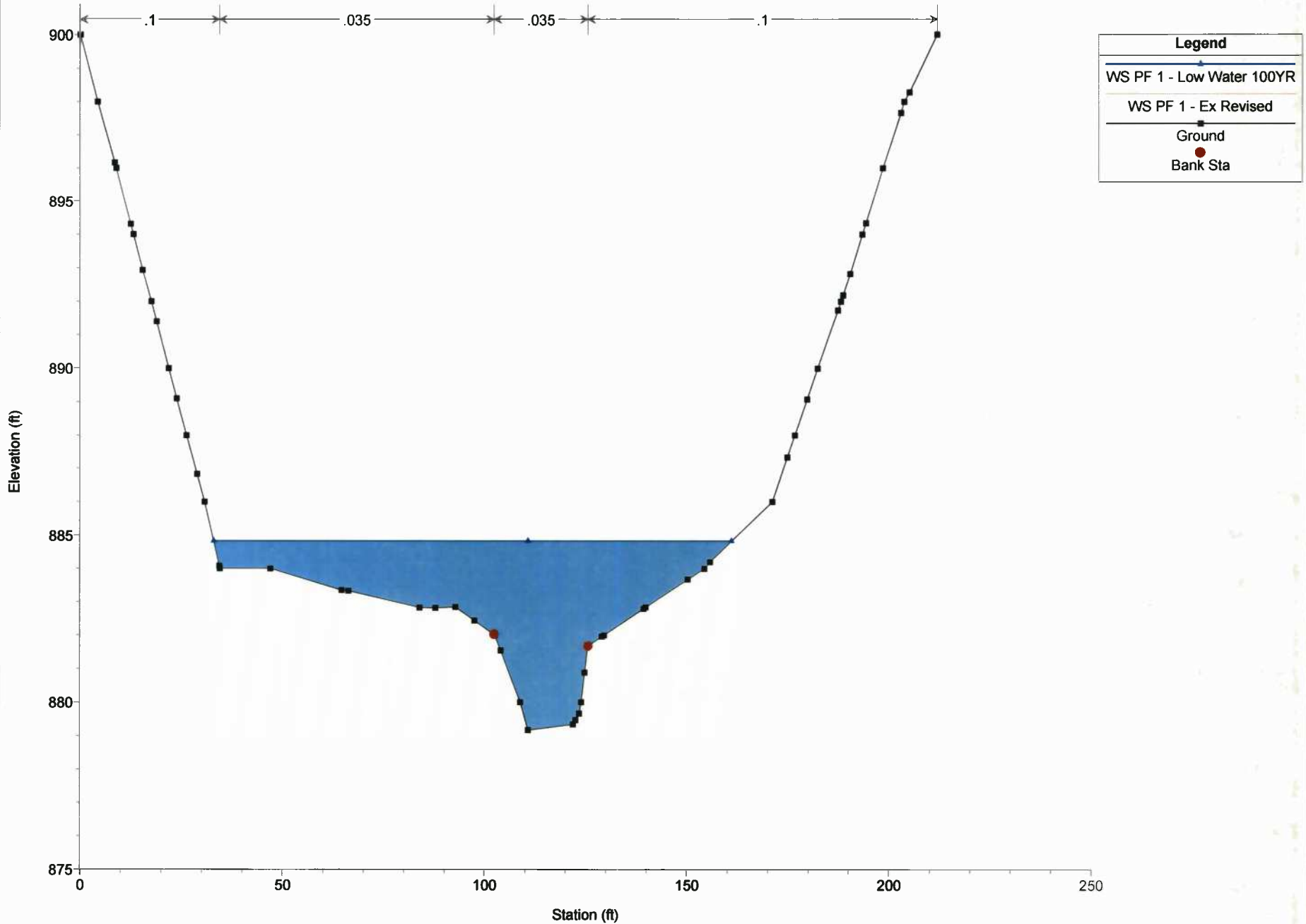
River = Bluestone Creek Reach = Lower RS = 2319.762



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

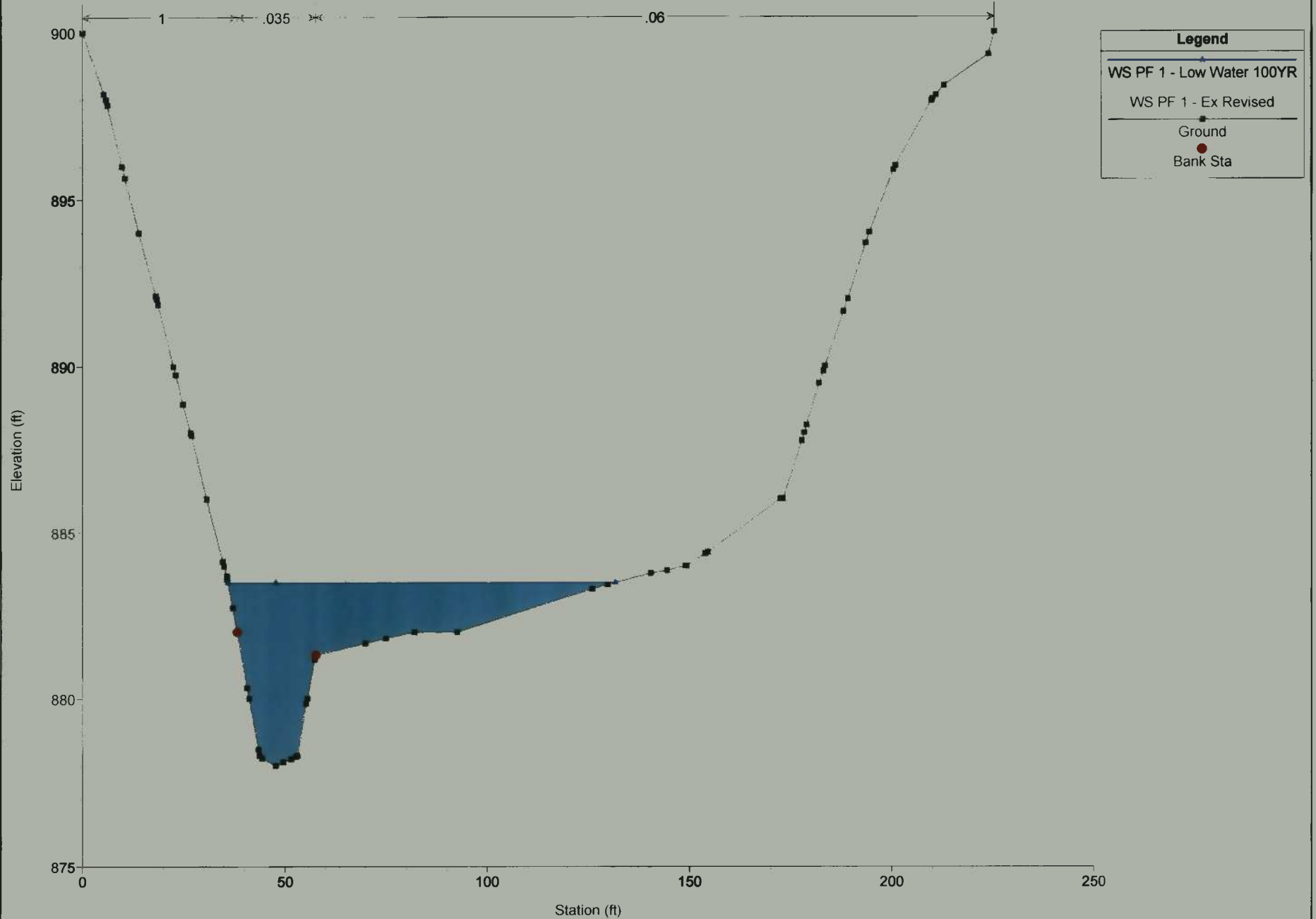
River = Bluestone Creek Reach = Lower RS = 2130.340



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

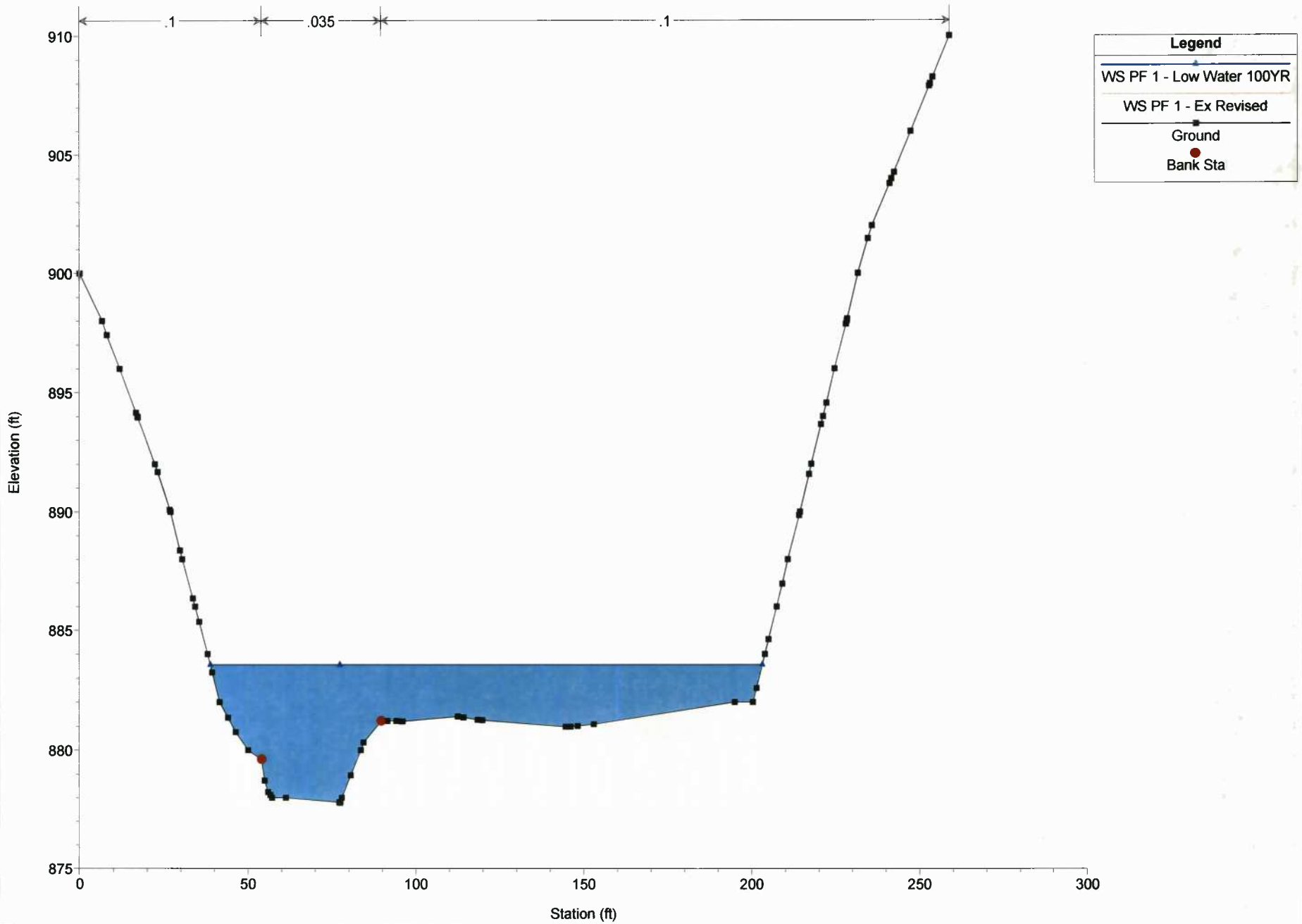
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 1966.255



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

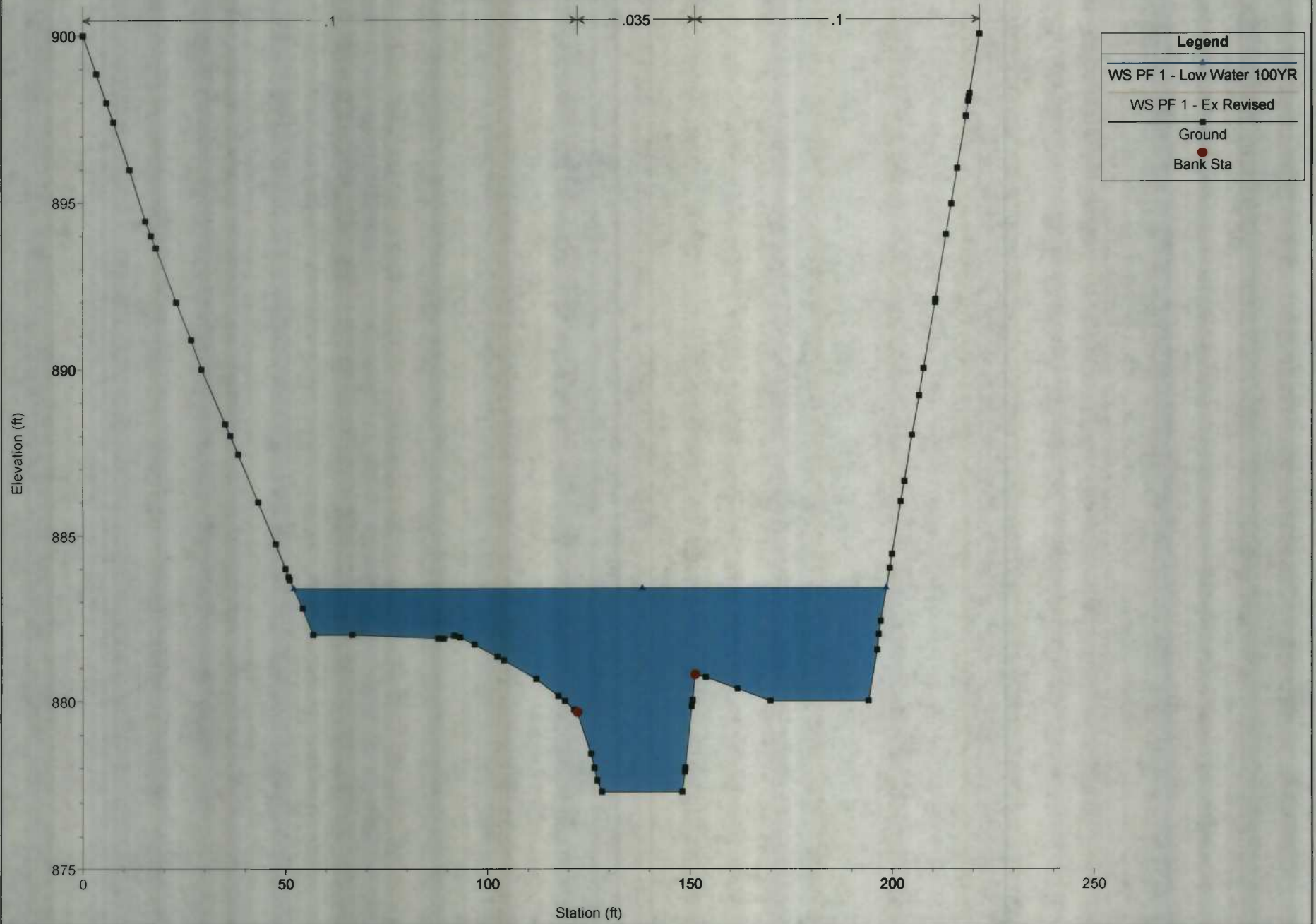
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Lower RS = 1908.167



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

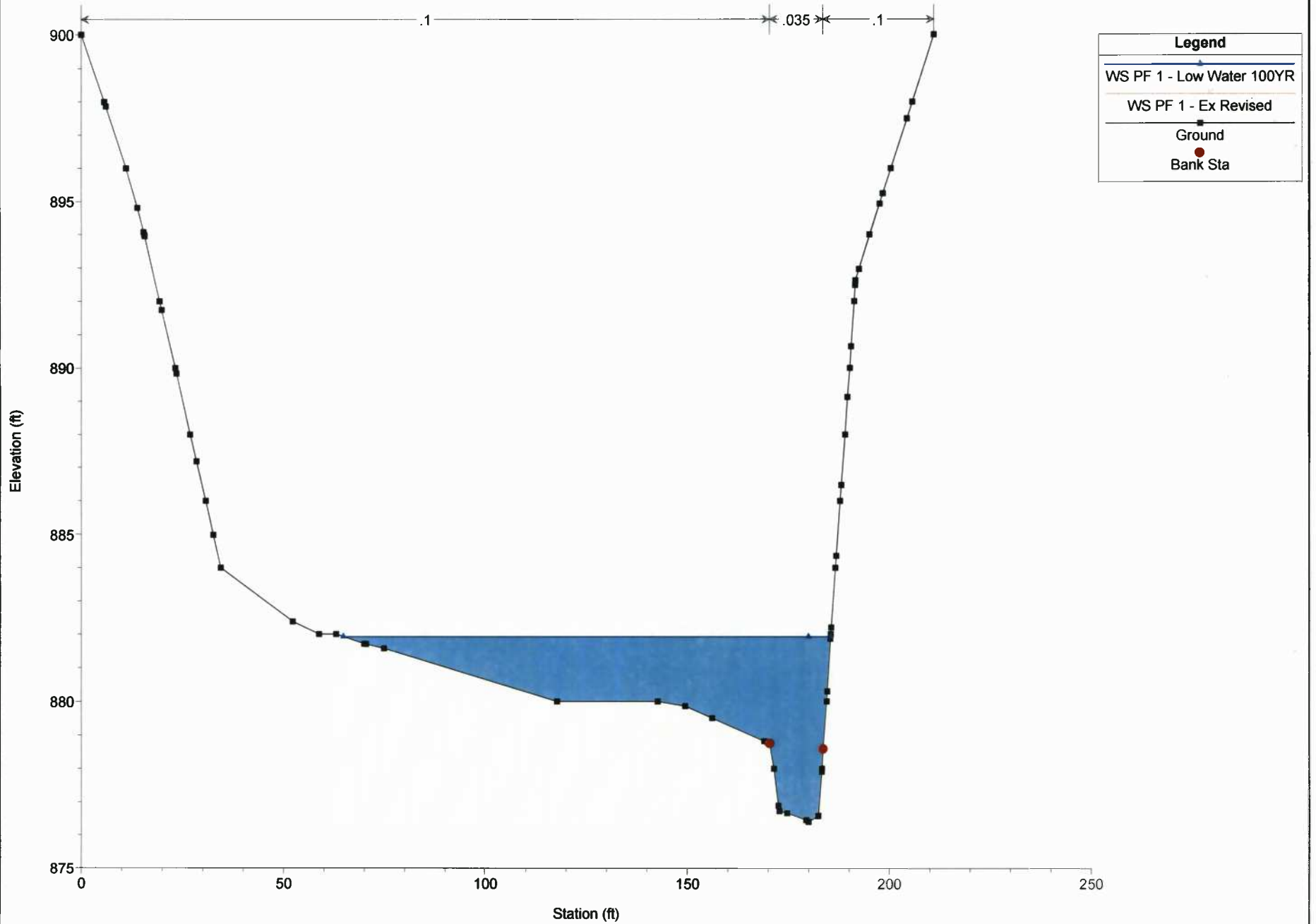
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 1819.717



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Lower RS = 1647.228



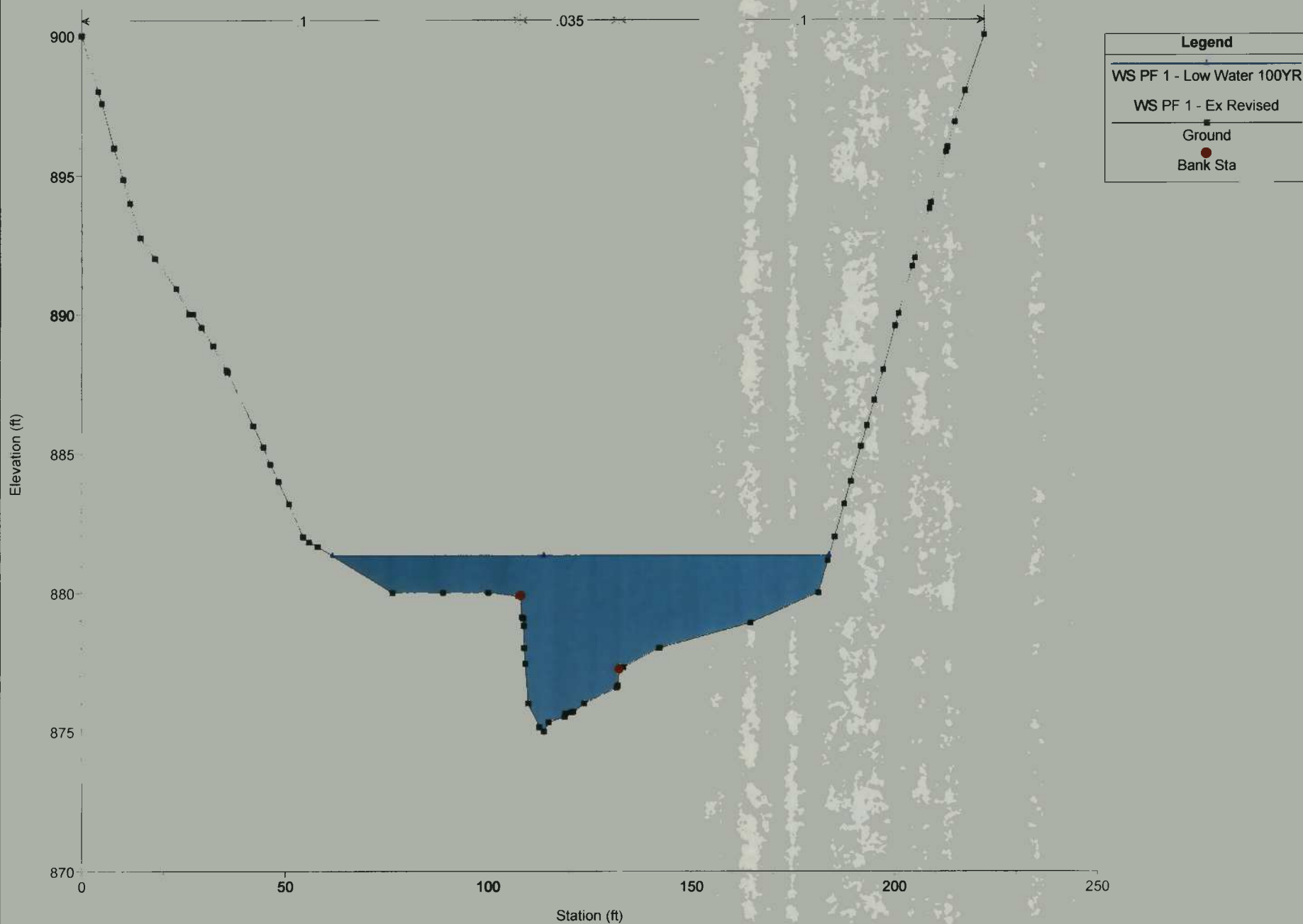
Legend

- WS PF 1 - Low Water 100YR
- WS PF 1 - Ex Revised
- Ground
- Bank Sta

OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

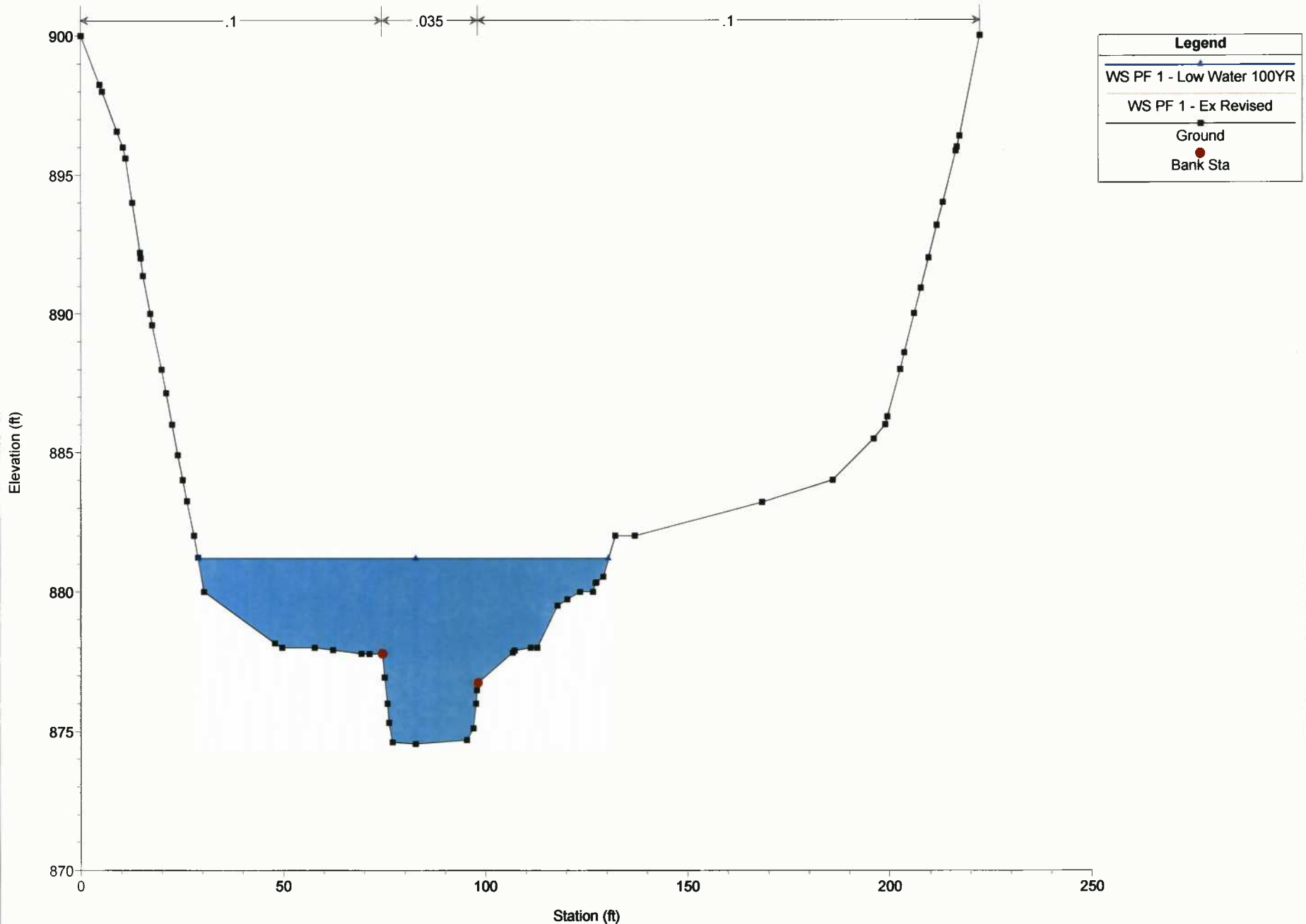
River = Bluestone Creek Reach = Lower RS = 1512.215



Legend	
WS PF 1 - Low Water 100YR	■
WS PF 1 - Ex Revised	■
Ground	■
Bank Sta	●

OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

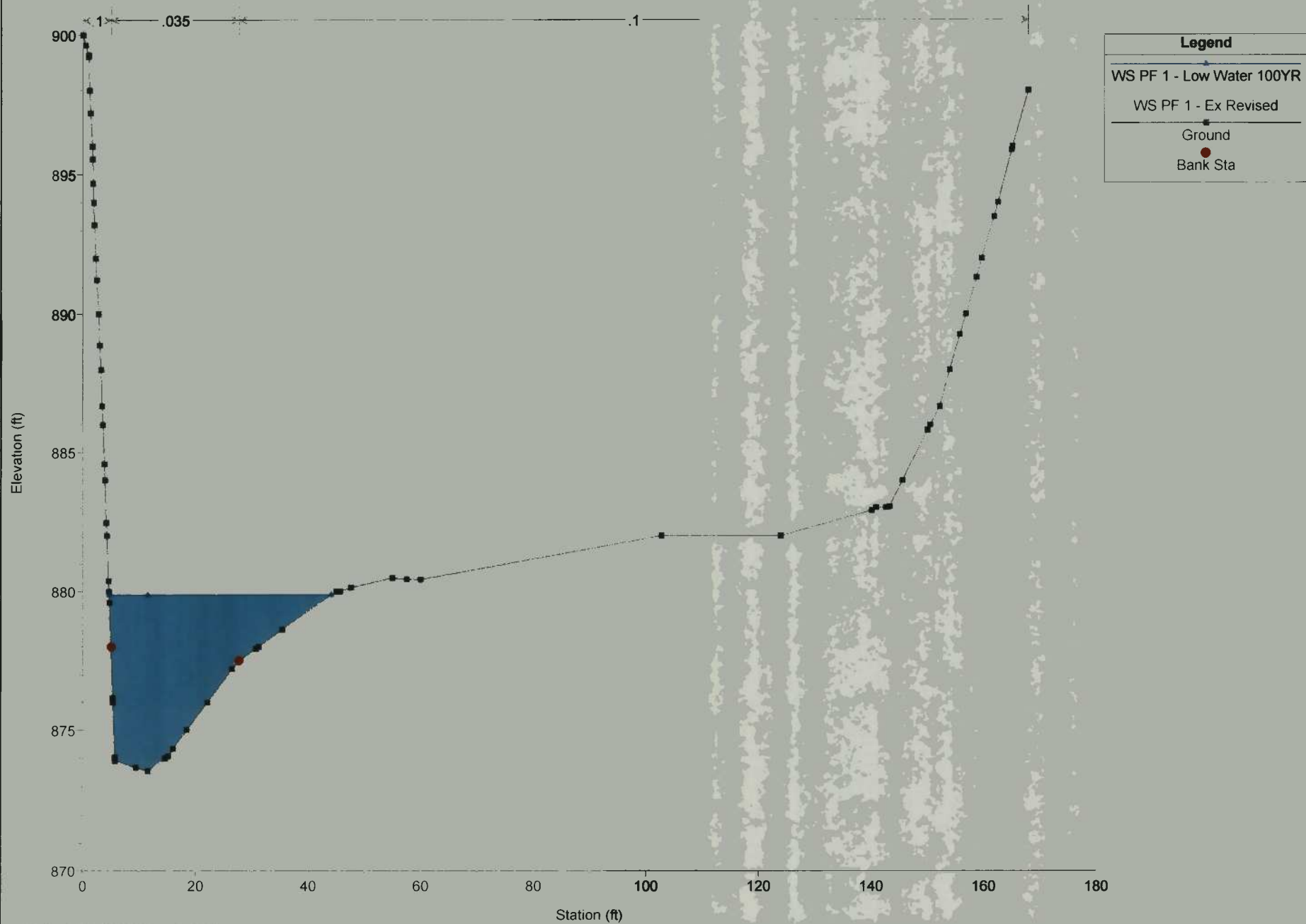
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Lower RS = 1387.656



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

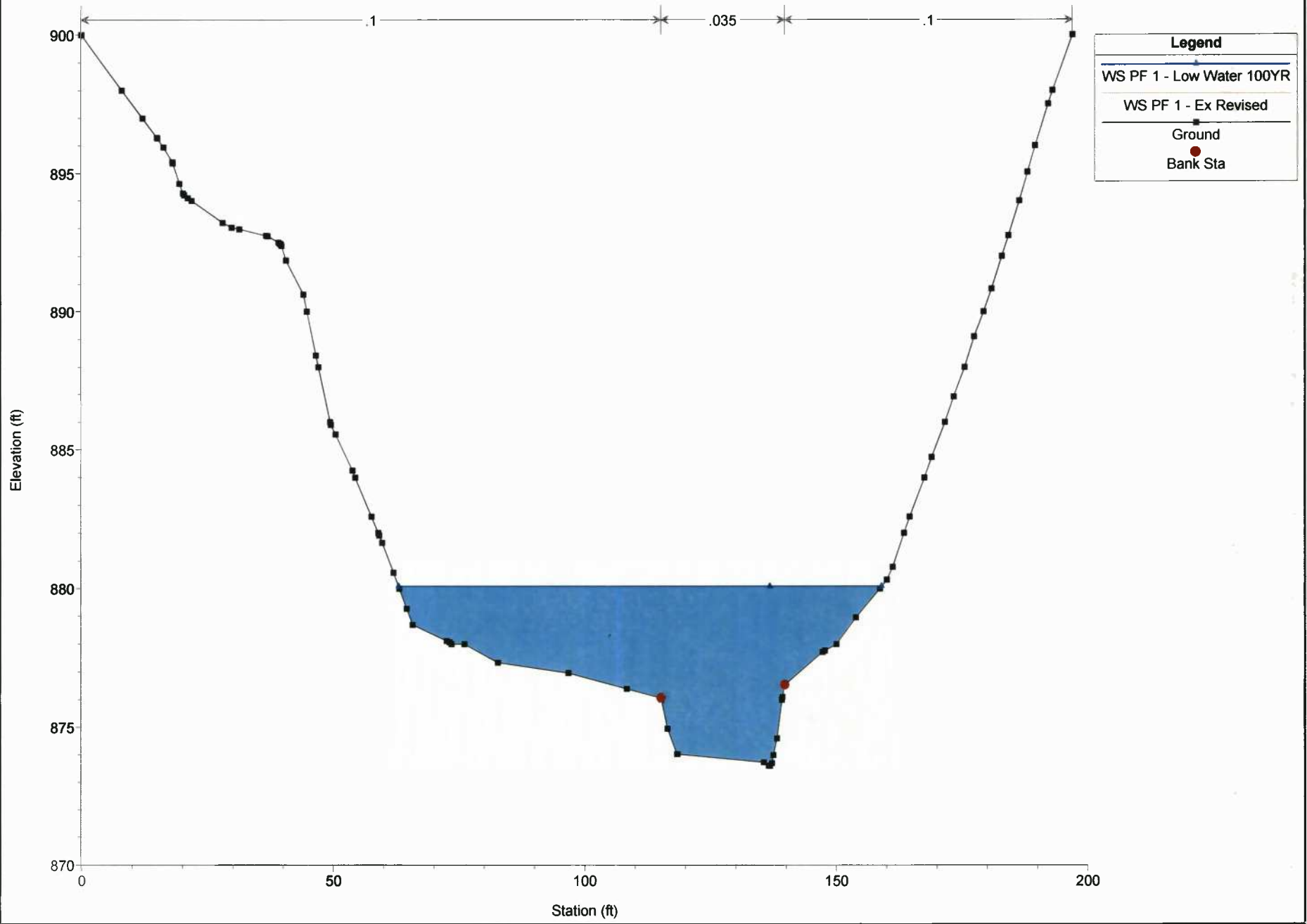
Geom: Low Water Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 1246.924



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

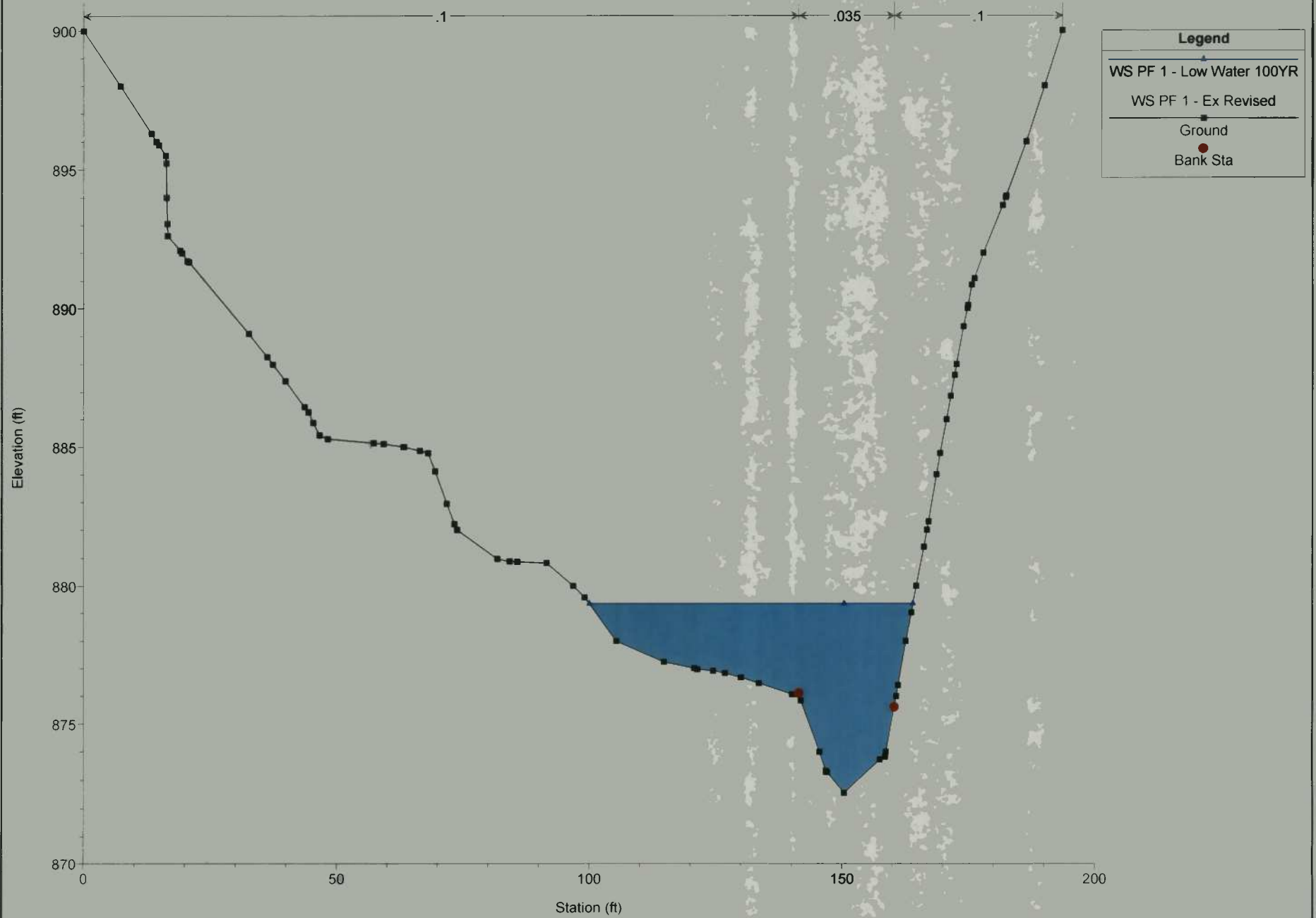
Geom: Low Water Revised Flow: Structures Revised
River = Bluestone Creek Reach = Lower RS = 1109.636



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

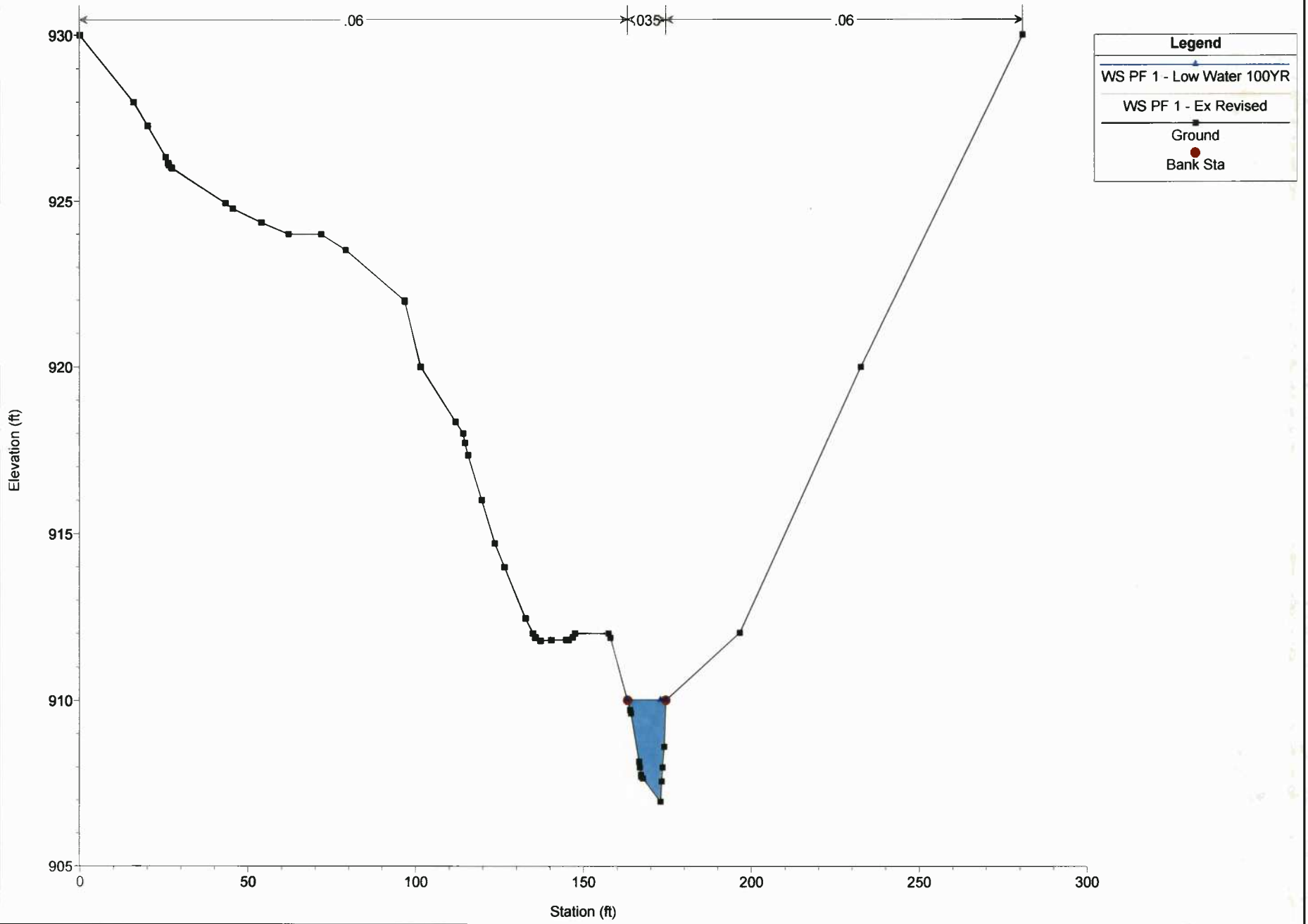
River = Bluestone Creek Reach = Lower RS = 1029.896



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

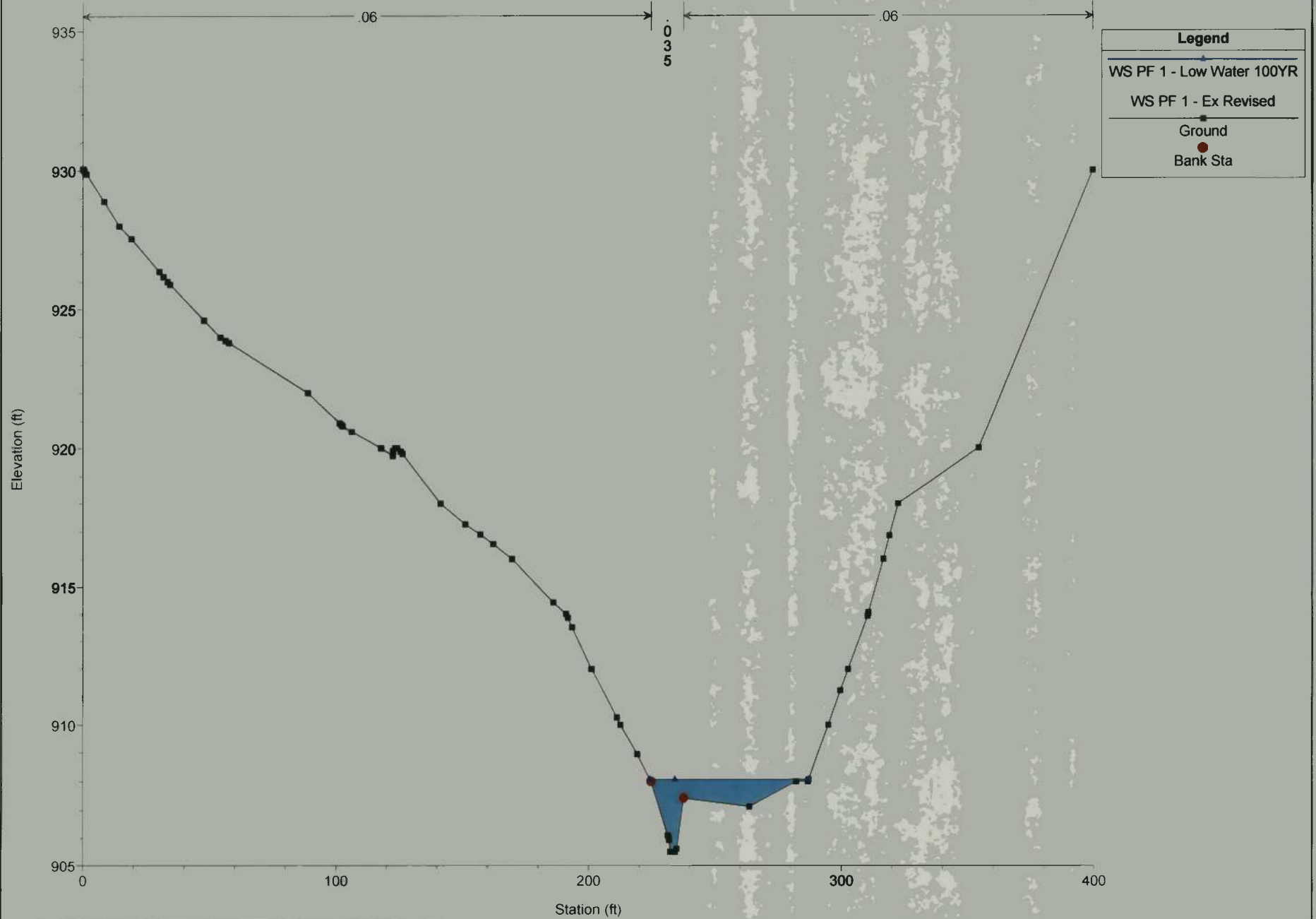
River = Trib 1 Reach = Trib 1 RS = 1494.636



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

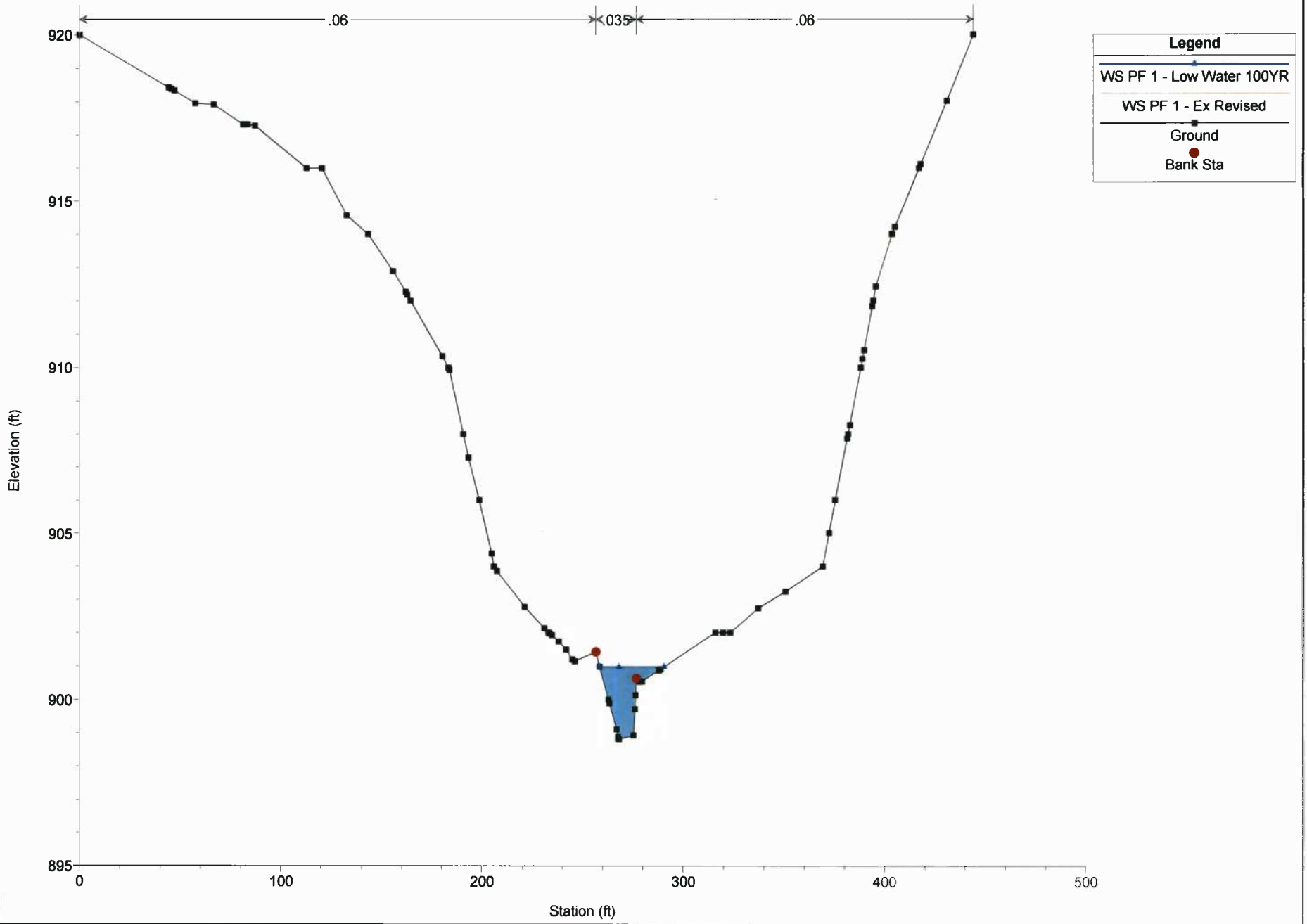
River = Trib 1 Reach = Trib 1 RS = 1352.345



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

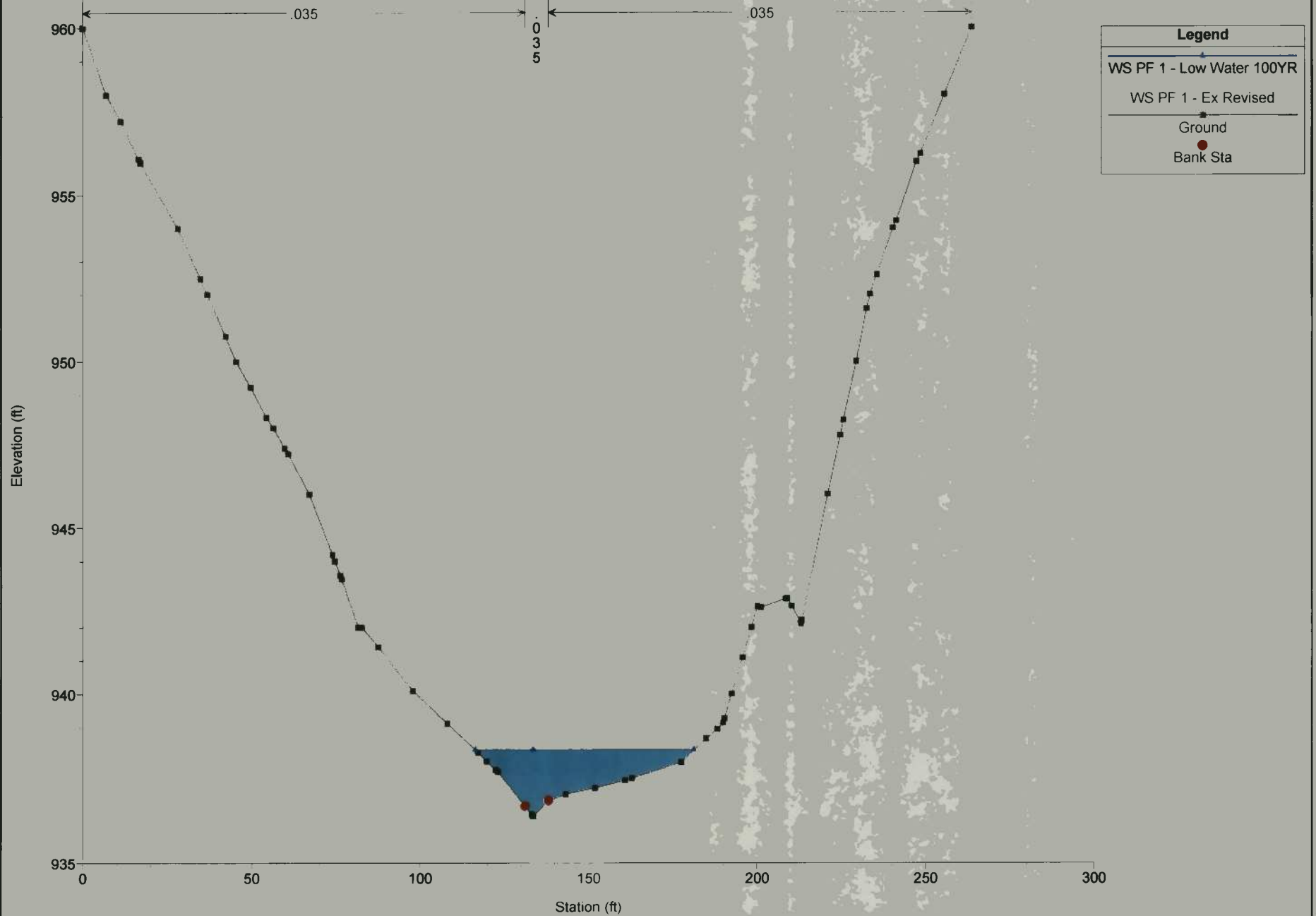
River = Trib 1 Reach = Trib 1 RS = 1083.880



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

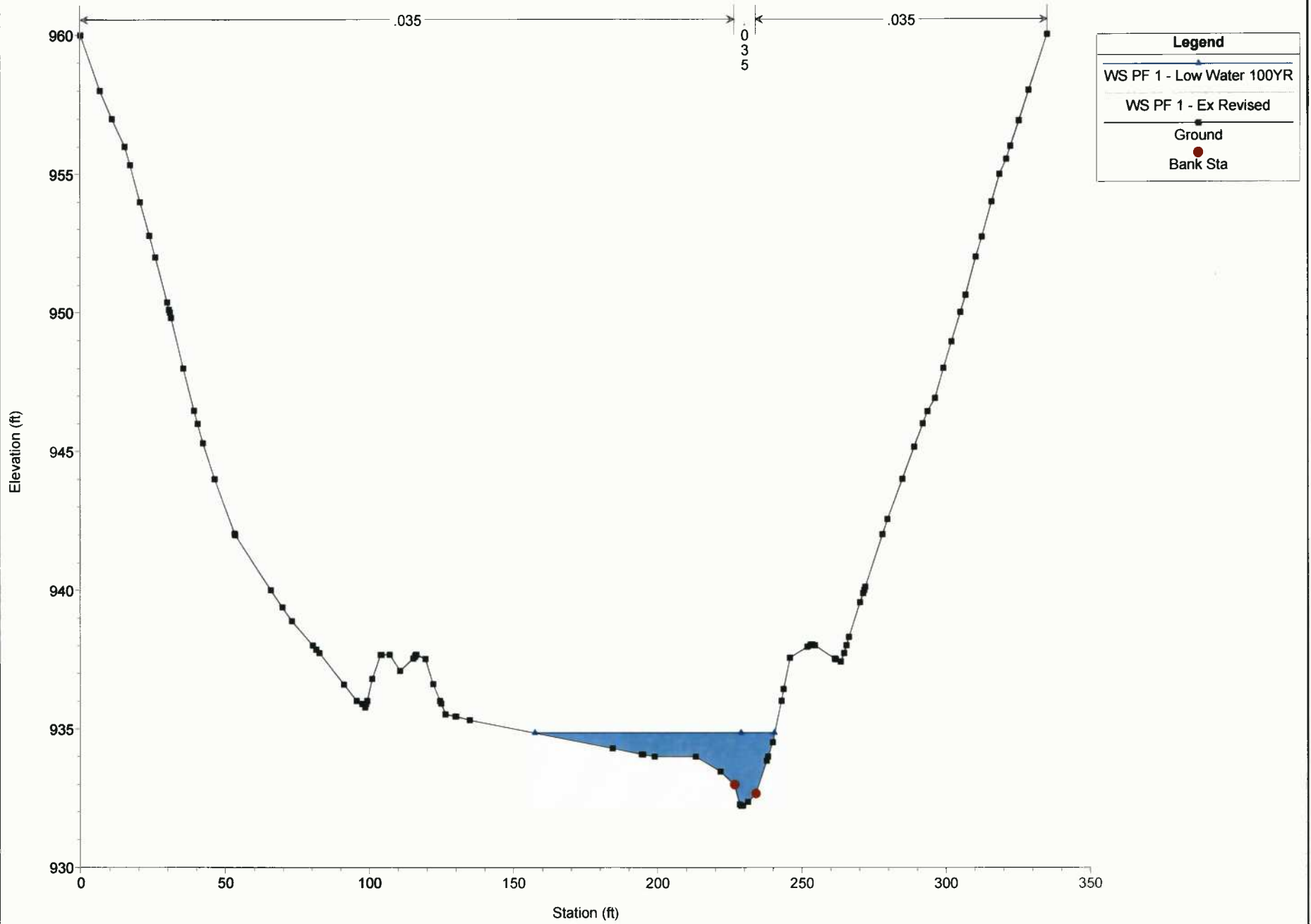
River = Trib 2 Reach = Trib 2 RS = 1293.508



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

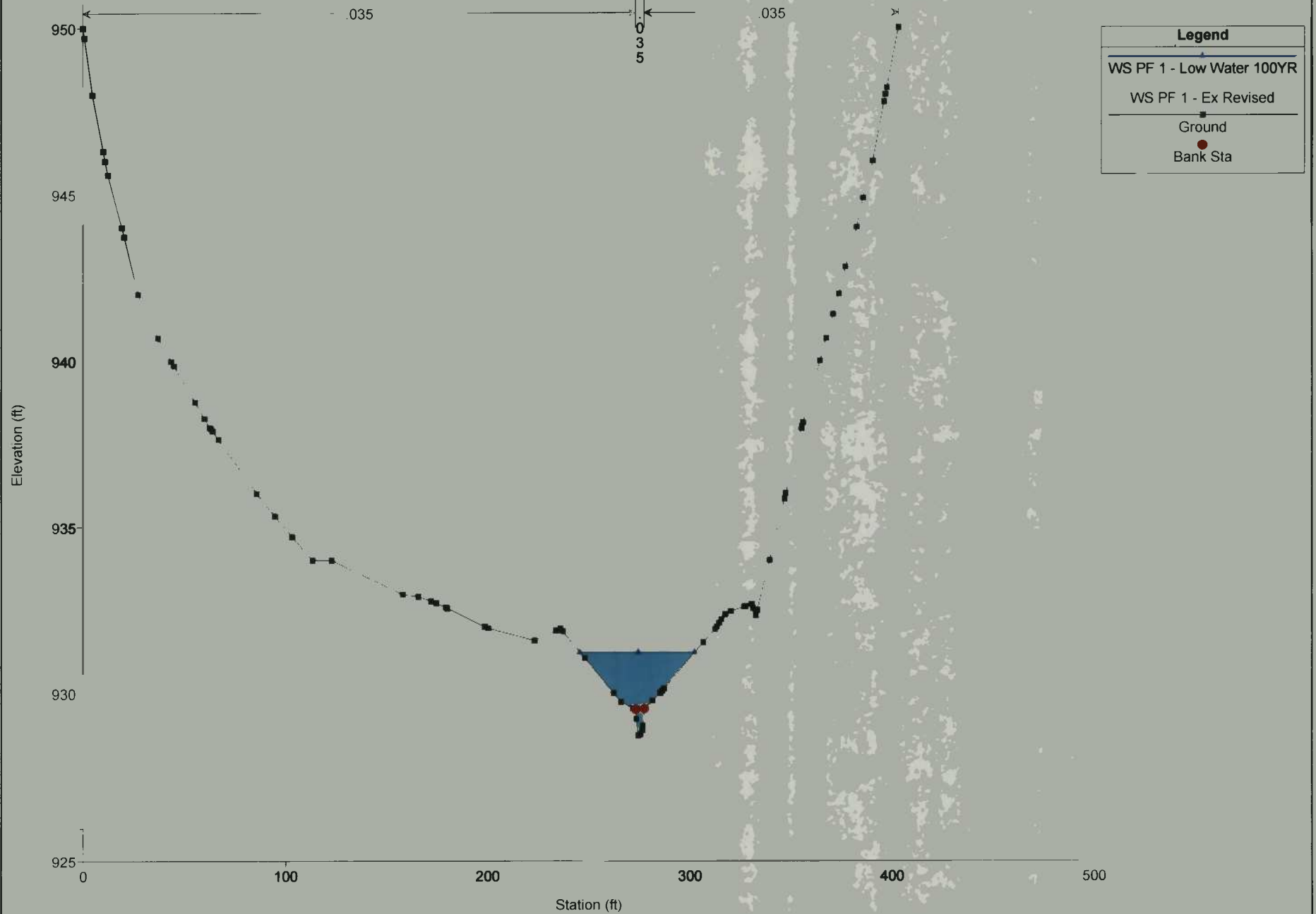
River = Trib 2 Reach = Trib 2 RS = 1159.413



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

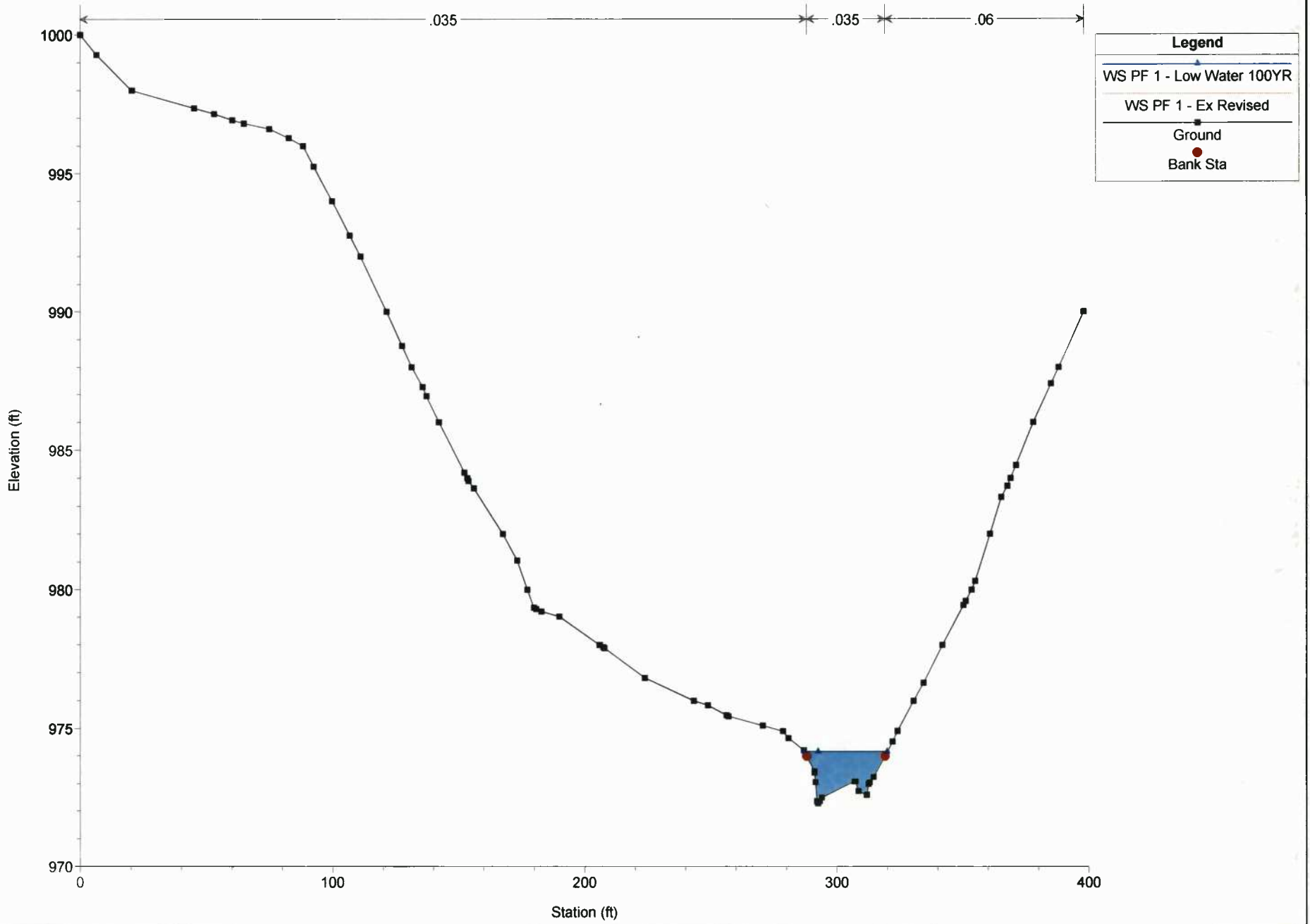
River = Trib 2 Reach = Trib 2 RS = 1030.844



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

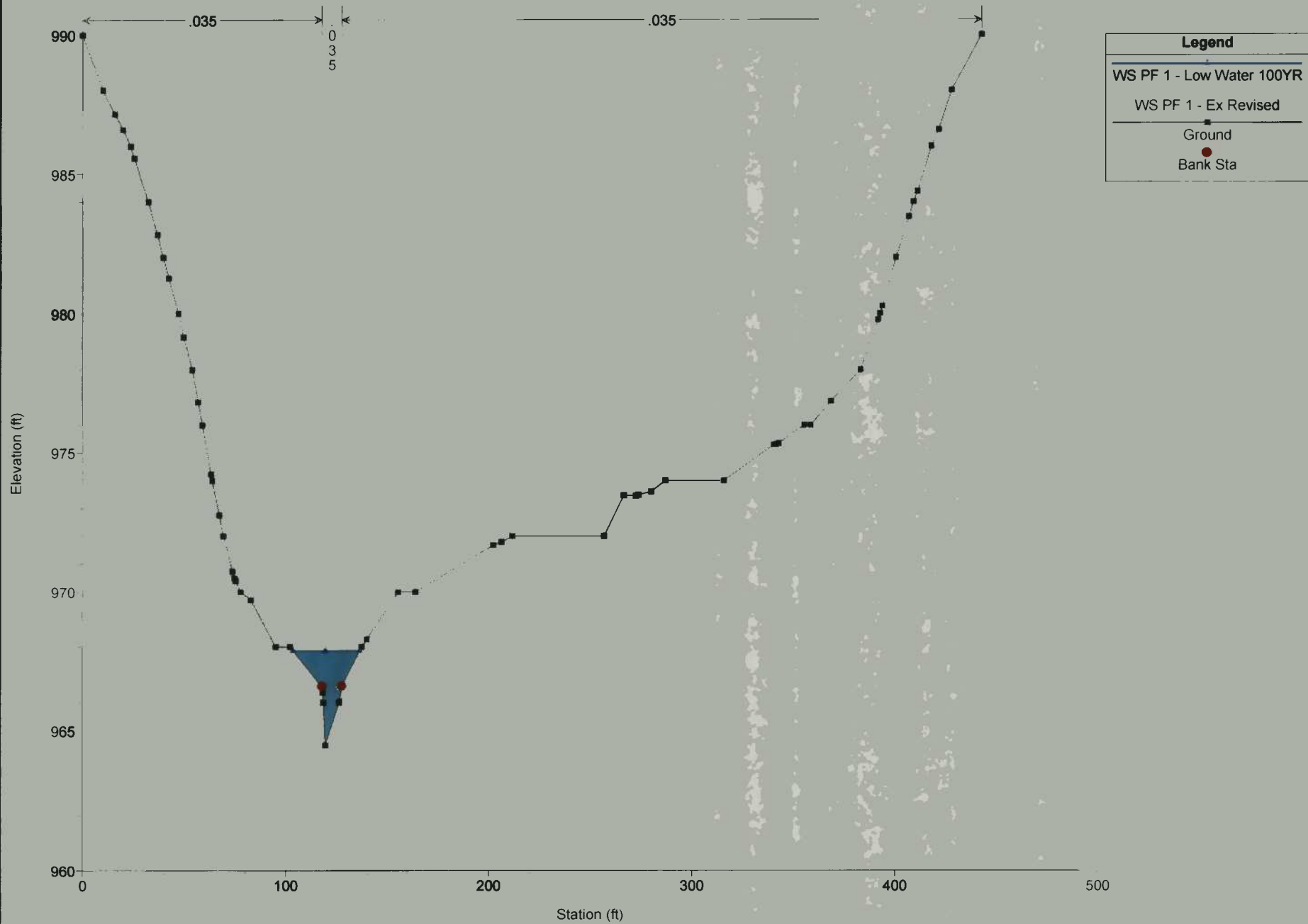
River = Trib 3 Reach = Trib 3 RS = 1842.591



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

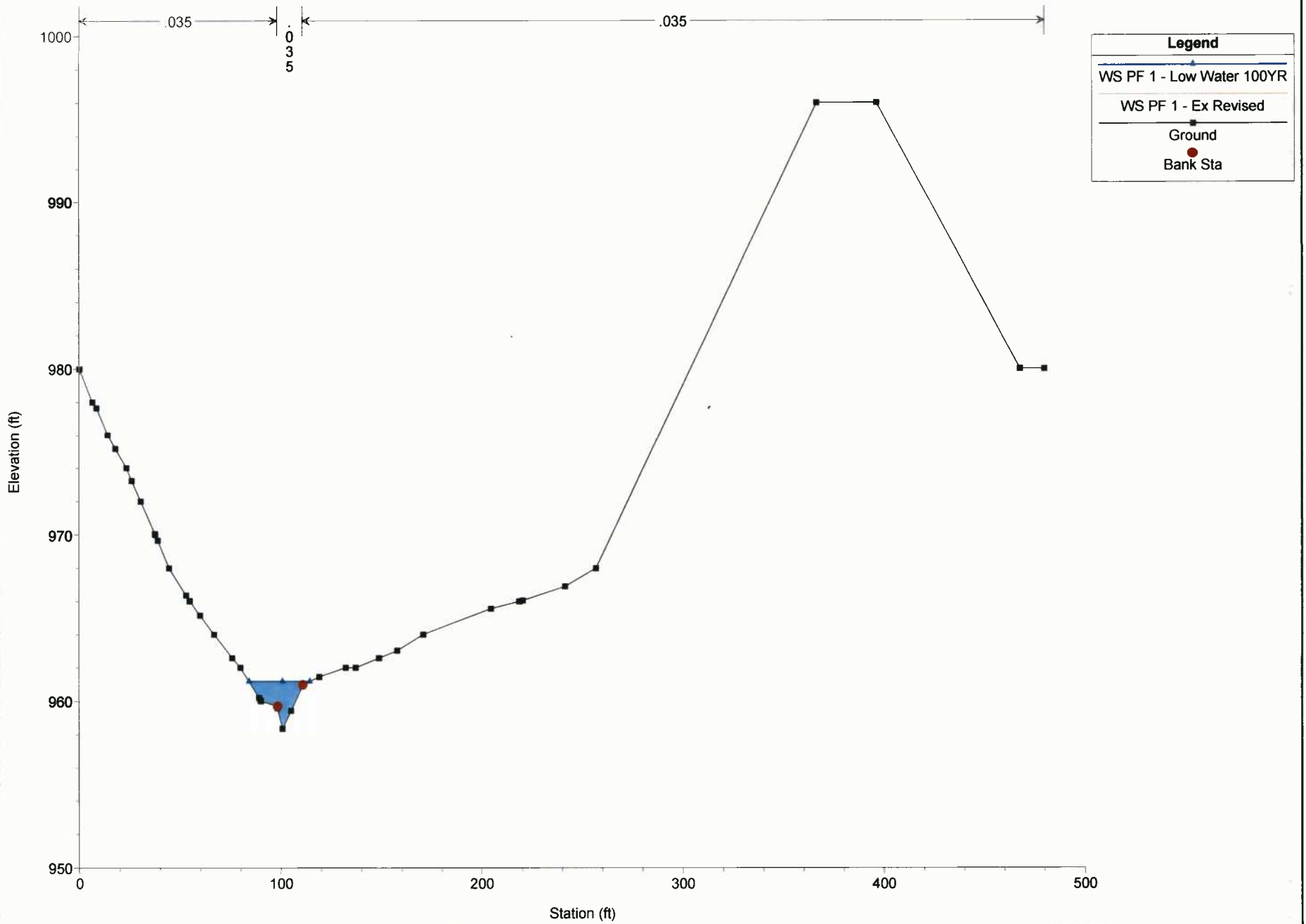
River = Trib 3 Reach = Trib 3 RS = 1574.434



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

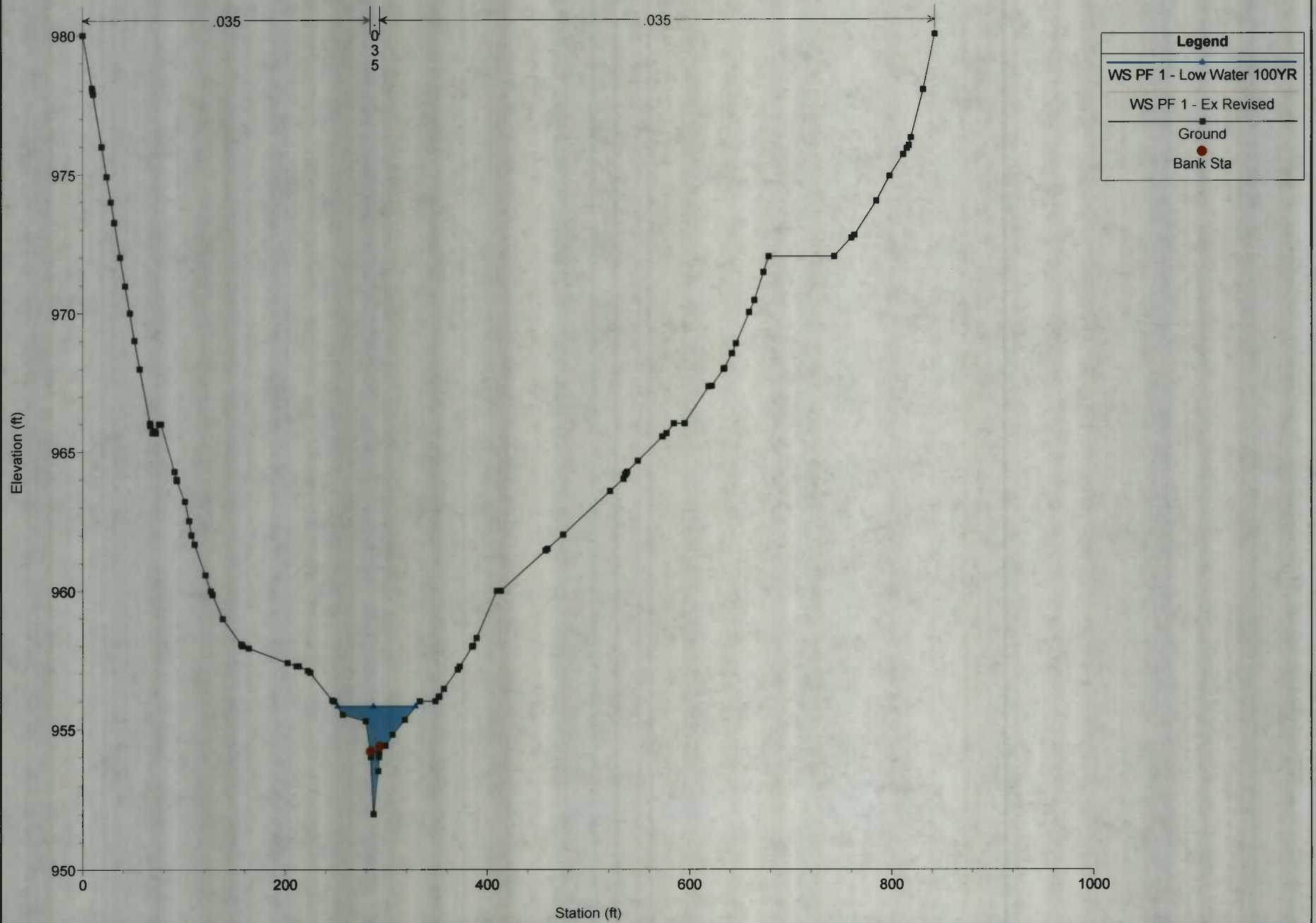
River = Trib 3 Reach = Trib 3 RS = 1370.118



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

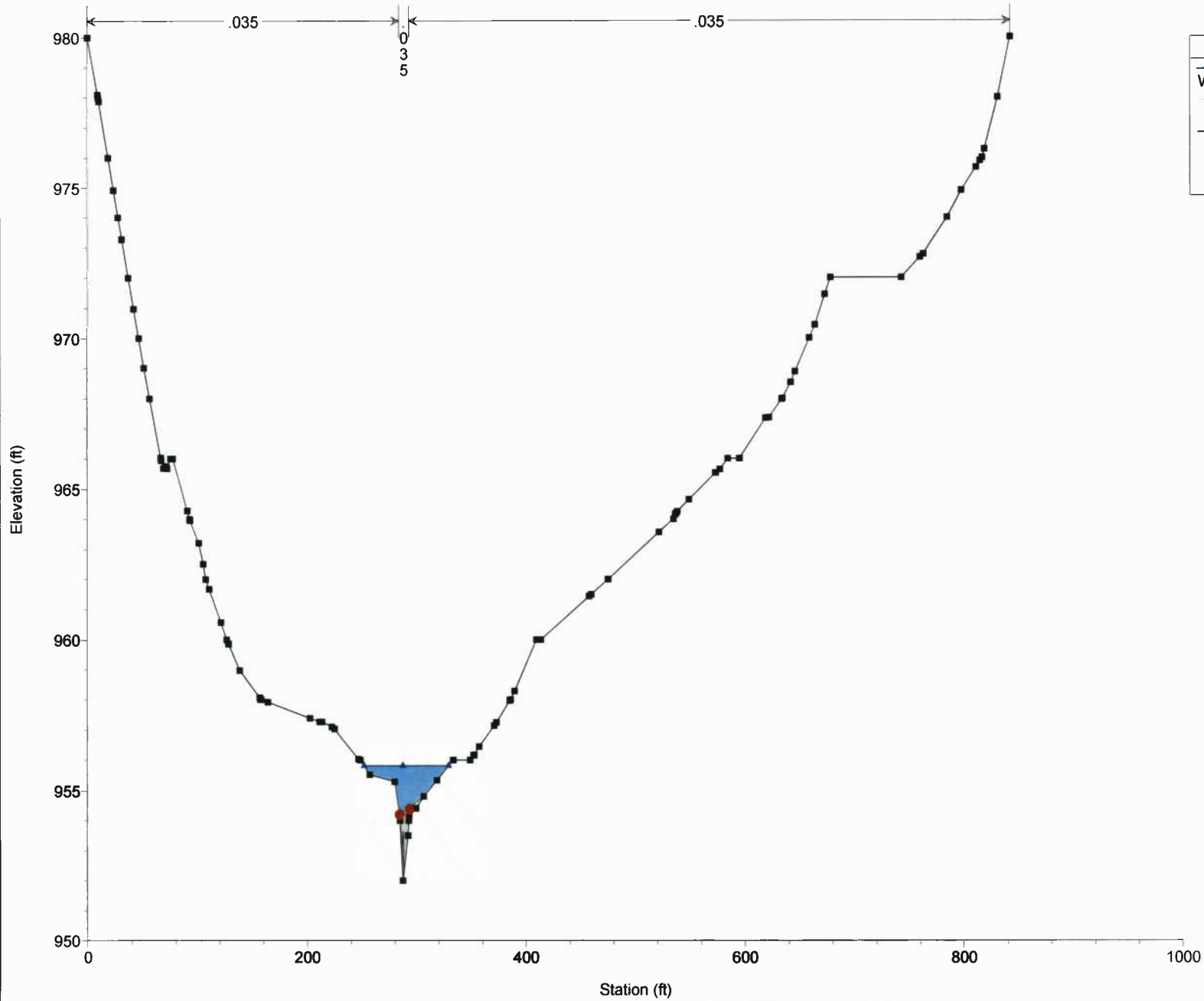
River = Trib 3 Reach = Trib 3 RS = 1126.884



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

River = Trib 3 Reach = Trib 3 RS = 1109.439 Culv



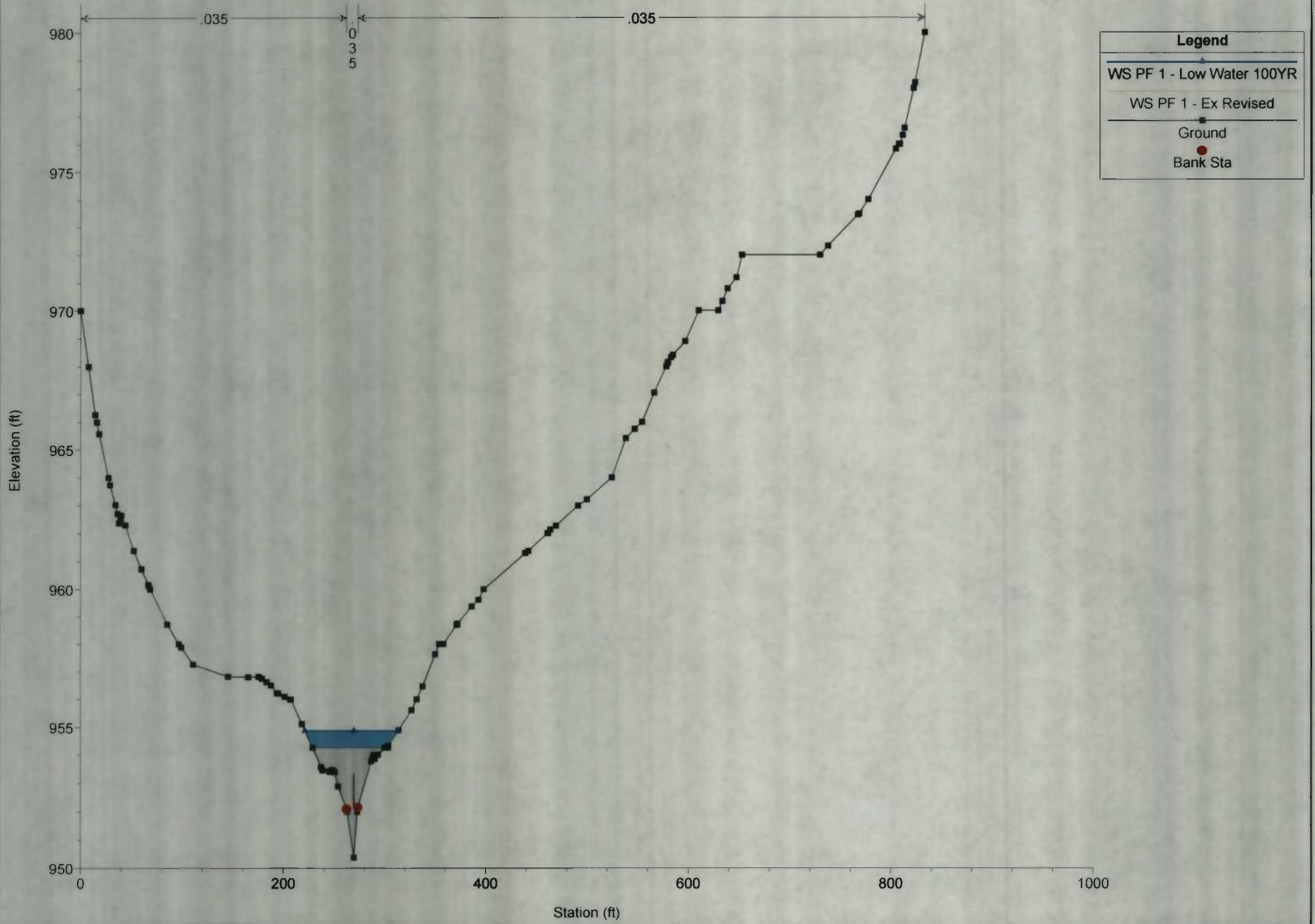
Legend

- WS PF 1 - Low Water 100YR
- WS PF 1 - Ex Revised
- Ground
- Bank Sta

OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

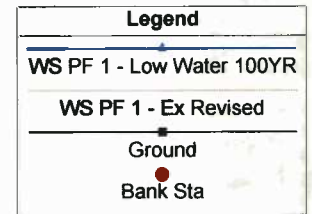
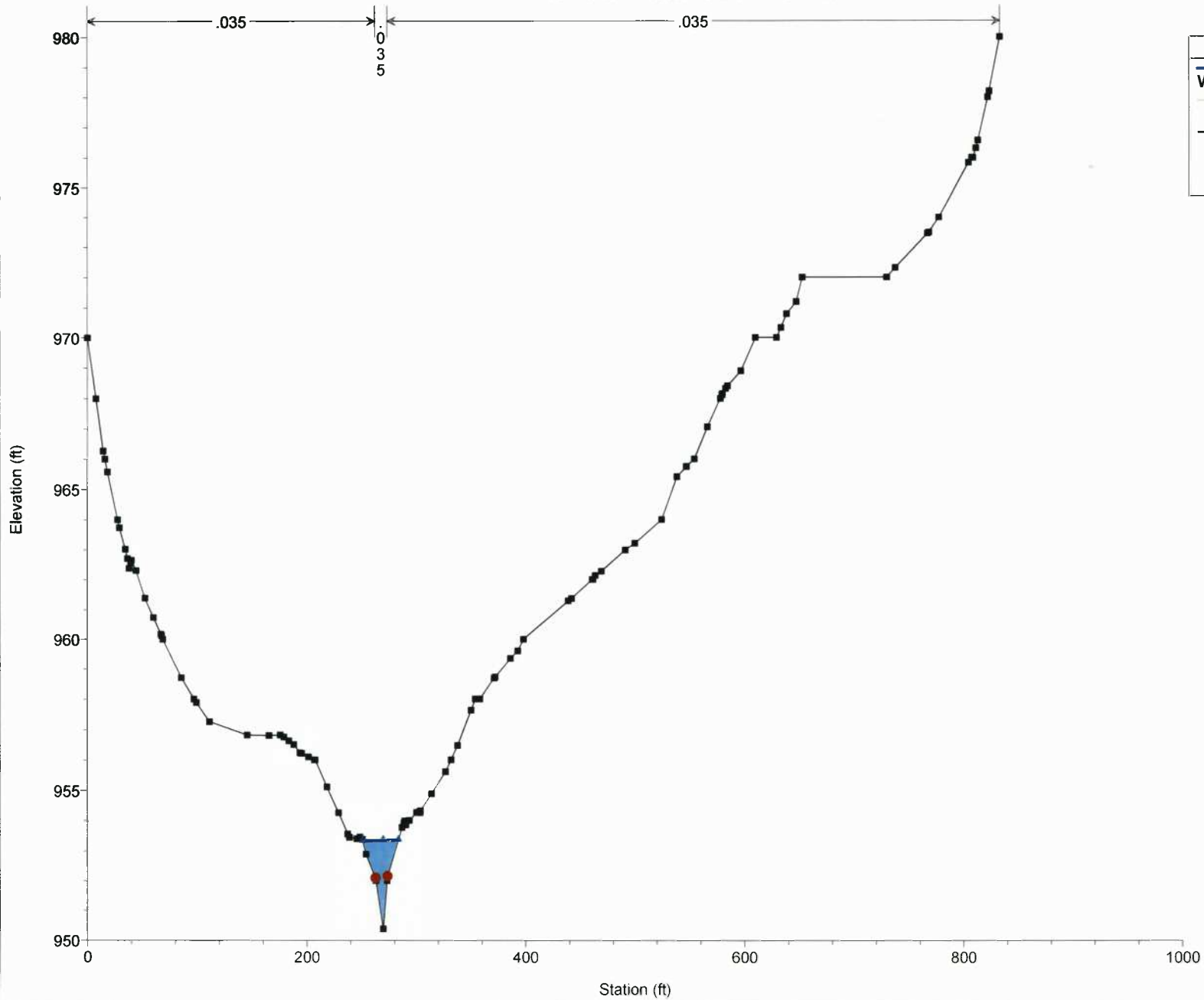
River = Trib 3 Reach = Trib 3 RS = 1109.439 Culv



OXF 157-159 Bridges Plan: 1) Low Water 100YR 2) Ex Revised

Geom: Low Water Revised Flow: Structures Revised

River = Trib 3 Reach = Trib 3 RS = 1089.963



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: 11/6/2013 3:23:30 PM

Project in English units

PLAN DATA

Plan Title: Proposed Temp Bridge Revised
Plan File : x:\Navitus Jobfiles\SLS\7889-OXF 159\Engineering\Drainage
Comp\Floodplain\Report\Computations\HEC-RAS\Revised2\OXF157-159Bridges.p09

Geometry Title: Proposed Temp Bridge Revised
Geometry File : x:\Navitus Jobfiles\SLS\7889-OXF 159\Engineering\Drainage
Comp\Floodplain\Report\Computations\HEC-RAS\Revised2\OXF157-159Bridges.g02

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 =	108	Multiple Openings =	0
Culverts =	4	Inline Structures =	0
Bridges =	6	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, and *. Rows include Bluestone Creek Upper, Middle, Lower and Trib 1, 2, 3.

Boundary Conditions

Table with 5 columns: River, Reach, Profile, Upstream, and Downstream. Rows show Bluestone Creek Upper and Lower with Normal S values.

GEOMETRY DATA

Geometry Title: Proposed Temp Bridge Revised
Geometry File : x:\Navitus Jobfiles\SLS\7889-OXF 159\Engineering\Drainage
Comp\Floodplain\Report\Computations\HEC-RAS\Revised2\OXF157-159Bridges.g02

Reach Connection Table

OXF157-159Bridges.rep

```

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

JUNCTION INFORMATION

Name: 1
 Description:
 Energy computation Method

Length across Junction	Tributary	Length	Angle
River Reach	River Reach		
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	Tributary	Length	Angle
River Reach	River Reach		
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	Tributary	Length	Angle
River Reach	River Reach		
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)	* 1.04	* 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
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
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	* 0.32
* 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	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 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

OXF157-159Bridges.rep

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

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	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	* 0.32
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 0.99	* 0.42	* 0.31

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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	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	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	171.27	.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
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 * 0.27 *
 * 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)	* 0.74	* 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)	* 72.07	* 53.19	* 16.71

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* E.G. Slope (ft/ft)	*0.002894	* Area (sq ft)	* 72.07	* 53.19	* 16.71
* Q Total (cfs)	* 443.80	* Flow (cfs)	* 173.36	* 251.33	* 19.10
* Top width (ft)	* 104.64	* Top width (ft)	* 66.63	* 17.06	* 20.95
* 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)	* 8249.7	* Conv. (cfs)	* 3222.6	* 4672.0	* 355.1
* Length wtd. (ft)	* 240.58	* Wetted Per. (ft)	* 66.68	* 17.87	* 21.02
* 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= 108											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	970	7.18	966	27.28	964	53.6	962	79.9	960		
111.22	958	115.26	960	135.36	970	150.67	970	226.56	970		
231.61	967.53	238.5	969.4	252.3	969.64	265.57	969.01	282.5	962		
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) * 0.45 * Wt. n-Val. * 0.035 * 0.035 * 0.060 *
 * W.S. Elev (ft) * 953.80 * Reach Len. (ft) * 100.46 * 106.40 * 102.70 *
 * Crit W.S. (ft) * * * Flow Area (sq ft) * 32.50 * 35.77 * 35.93 *
 * E.G. Slope (ft/ft) * 0.005597 * Area (sq ft) * 32.50 * 35.77 * 35.93 *
 * Q Total (cfs) * 443.80 * Flow (cfs) * 116.39 * 239.33 * 88.08 *
 * Top Width (ft) * 61.67 * Top width (ft) * 27.04 * 11.23 * 23.41 *
 * Vel Total (ft/s) * 4.26 * Avg. vel. (ft/s) * 3.58 * 6.69 * 2.45 *
 * Max Chl Dpth (ft) * 3.54 * Hydr. Depth (ft) * 1.20 * 3.19 * 1.53 *
 * Conv. Total (cfs) * 5931.9 * Conv. (cfs) * 1555.6 * 3199.0 * 1177.3 *
 * Length Wtd. (ft) * 104.11 * Wetted Per. (ft) * 27.14 * 11.70 * 23.61 *
 * Min Ch El (ft) * 950.26 * Shear (lb/sq ft) * 0.42 * 1.07 * 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= 69
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

 0 950 29.9 950 50.45 960 71.17 970 86.64 970
 163.81 970 176.39 964 200.59 961.48 208.14 964.71 219.16 964.84
 230.18 964.23 243.2 958 269.35 956 305.01 955.02 312.14 954.83
 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
 433.41 952.62 439.14 953.14 447.36 953.11 452.66 952.98 453.22 952.98
 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
 Left Levee Station= 350.47 Elevation= 954
 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) * 0.61 * Wt. n-Val. * 0.035 * 0.035 * 0.060 *
 * W.S. Elev (ft) * 952.93 * Reach Len. (ft) * 9.06 * 105.32 * 16.94 *
 * Crit W.S. (ft) * 952.93 * Flow Area (sq ft) * 36.34 * 32.31 * 25.35 *
 * E.G. Slope (ft/ft) * 0.008006 * Area (sq ft) * 36.34 * 32.31 * 25.35 *
 * Q Total (cfs) * 443.80 * Flow (cfs) * 136.88 * 251.67 * 55.25 *
 * Top width (ft) * 70.91 * Top width (ft) * 36.72 * 8.29 * 25.89 *
 * Vel Total (ft/s) * 4.72 * Avg. Vel. (ft/s) * 3.77 * 7.79 * 2.18 *
 * Max Chl Dpth (ft) * 4.59 * Hydr. Depth (ft) * 0.99 * 3.90 * 0.98 *
 * Conv. Total (cfs) * 4960.1 * Conv. (cfs) * 1529.9 * 2812.8 * 617.4 *
 * Length Wtd. (ft) * 83.60 * Wetted Per. (ft) * 36.80 * 11.00 * 25.99 *
 * Min Ch El (ft) * 948.34 * Shear (lb/sq ft) * 0.49 * 1.47 * 0.49 *
 * Alpha * 1.77 * Stream Power (lb/ft s) * 497.08 * 350.47 * 0.00 *
 * Frctn Loss (ft) * 0.78 * Cum Volume (acre-ft) * 0.06 * 0.17 * 0.05 *
 * C & E Loss (ft) * 0.02 * Cum SA (acres) * 0.00 * 0.04 * 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: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water

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

program

defaulted to critical depth.

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

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Bluestone Creek RS: 13440.10

INPUT

Description:
 Station Elevation Data num= 85

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Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	950	6.16	950	49.43	960	83.03	970	100.38	970
125.15	970	159.43	962	194.5	960	225.2	958	234.2	957.4
242.7	960.83	254.19	960.93	265.51	960.21	270.54	958	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
--------	--------	--------	-------	------	----	----

Left Levee Station= 313.74 Elevation= 956

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)	* 0.78	* Wt. n-Val.	* 0.035	* 0.035	* 0.060
* W.S. Elev (ft)	* 951.93	* Reach Len. (ft)	* 42.49	* 42.49	* 42.49
* Crit W.S. (ft)	* 951.93	* Flow Area (sq ft)	* 0.75	* 59.91	* 10.33
* E.G. Slope (ft/ft)	* 0.010995	* Area (sq ft)	* 0.75	* 59.91	* 10.33
* Q Total (cfs)	* 443.80	* Flow (cfs)	* 1.11	* 430.11	* 12.58
* Top width (ft)	* 64.18	* Top width (ft)	* 3.91	* 28.10	* 32.17
* Vel Total (ft/s)	* 6.25	* Avg. vel. (ft/s)	* 1.48	* 7.18	* 1.22
* Max Chl Dpth (ft)	* 3.81	* Hydr. Depth (ft)	* 0.19	* 2.13	* 0.32
* Conv. Total (cfs)	* 4232.5	* Conv. (cfs)	* 10.6	* 4101.9	* 119.9
* Length Wtd. (ft)	* 42.49	* Wetted Per. (ft)	* 3.93	* 29.26	* 32.18
* Min Ch El (ft)	* 948.12	* Shear (lb/sq ft)	* 0.13	* 1.41	* 0.22
* Alpha	* 1.28	* Stream Power (lb/ft s)	* 539.90	* 313.74	* 0.00
* Frctn Loss (ft)	* 0.08	* Cum Volume (acre-ft)	* 0.06	* 0.06	* 0.05
* C & E Loss (ft)	* 0.21	* 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.

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

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Upper

RS: 13395.79

INPUT

Description:

Station Elevation Data		num= 101		Sta Elev		Sta Elev		Sta Elev	
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	208.38	954.32	218.43	954.11
228.49	953.89	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	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 22.86 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

```

*****
* E.G. Elev (ft) * 951.42 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 0.08 * Wt. n-Val. * 0.035 * 0.035 * 0.060 *
* W.S. Elev (ft) * 951.34 * Reach Len. (ft) * 51.65 * 41.35 * 22.86 *
* Crit W.S. (ft) * 949.60 * Flow Area (sq ft) * 118.79 * 53.12 * 88.12 *
* E.G. Slope (ft/ft) * 0.000815 * Area (sq ft) * 118.79 * 53.12 * 88.12 *
* Q Total (cfs) * 482.70 * Flow (cfs) * 253.88 * 149.48 * 79.34 *
* Top Width (ft) * 125.34 * Top width (ft) * 50.30 * 13.82 * 61.22 *
* Vel Total (ft/s) * 1.86 * Avg. vel. (ft/s) * 2.14 * 2.81 * 0.90 *
* Max chl Dpth (ft) * 5.34 * Hydr. Depth (ft) * 2.36 * 3.84 * 1.44 *
* Conv. Total (cfs) * 16911.4 * Conv. (cfs) * 8894.6 * 5237.2 * 2779.7 *
* Length wtd. (ft) * 41.35 * Wetted Per. (ft) * 50.72 * 15.01 * 61.30 *
* Min ch El (ft) * 946.00 * Shear (lb/sq ft) * 0.12 * 0.18 * 0.07 *
* Alpha * 1.45 * Stream Power (lb/ft s) * 476.33 * 0.00 * 0.00 *
* Frctn Loss (ft) * * Cum Volume (acre-ft) * 5.99 * 4.26 * 1.23 *
* C & E Loss (ft) * * Cum SA (acres) * 6.26 * 1.19 * 1.06 *
*****
    
```

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= 101
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
177.9 955.03 183.68 954.89 195.14 954.51 208.38 954.32 218.43 954.11
    
```

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228.49	953.89	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 Coeff Contr. Expan.

311.54	325.36	.1	.3
--------	--------	----	----

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 num= 113

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	221.63	953.63	231.85	953.42
241.86	953.21	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

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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) * 16.58 * Culv Full Len (ft) * 20.00 *
 * # Barrels * 4 * Culv Vel US (ft/s) * 3.38 *
 * Q Barrel (cfs) * 4.14 * Culv Vel DS (ft/s) * 3.38 *
 * E.G. US. (ft) * 951.42 * Culv Inv El Up (ft) * 947.92 *
 * W.S. US. (ft) * 951.34 * Culv Inv El Dn (ft) * 947.40 *
 * E.G. DS (ft) * 950.98 * Culv Frctn Ls (ft) * 0.28 *
 * W.S. DS (ft) * 950.77 * Culv Exit Loss (ft) * 0.00 *
 * Delta EG (ft) * 0.44 * Culv Entr Loss (ft) * 0.16 *
 * Delta WS (ft) * 0.57 * Q weir (cfs) * 467.19 *
 * E.G. IC (ft) * 951.39 * Weir Sta Lft (ft) * 260.60 *

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```

* E.G. OC (ft)          * 951.42 * Weir Sta Rgt (ft)      * 387.76 *
* Culvert Control      * Outlet * Weir Submerg         * 0.51 *
* Culv WS Inlet (ft)   * 949.17 * Weir Max Depth (ft)  * 1.42 *
* Culv WS Outlet (ft)  * 948.65 * Weir Avg Depth (ft)  * 1.23 *
* Culv Nml Depth (ft)  *        * Weir Flow Area (sq ft) * 156.80 *
* Culv Crt Depth (ft)  * 0.82  * Min El Weir Flow (ft) * 950.01 *
*****
  
```

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Upper RS: 13353.46

INPUT
 Description:

Station Elevation Data		num= 113		Sta		Elev		Sta		Elev	
Sta	Elev	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	221.63	953.63	231.85	953.42		
241.86	953.21	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
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

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```

*****
* 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  *
* 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  * 113.57 * 21.78  *
* E.G. Slope (ft/ft) * 0.001375 * Area (sq ft)    * 18.26  * 113.57 * 21.78  *
* Q Total (cfs)      * 482.70 * Flow (cfs)      * 25.68  * 435.69 * 21.32  *
* Top Width (ft)     * 70.32  * 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)  * 13019.1 * Conv. (cfs)     * 692.7  * 11751.3 * 575.1  *
* Length Wtd. (ft)  * 88.45  * Wetted Per. (ft) * 21.63  * 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) * 5.99   * 4.06   * 1.23   *
* C & E Loss (ft)   * 0.06   * Cum SA (acres)    * 6.22   * 1.17   * 1.04   *
*****

```

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

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

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Upper

RS: 13212.39

INPUT

Description:

```

Station Elevation Data      num=      95
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          217.67      952
221.39      952.35      231.52      952.19      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) * 154.09 * 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) * 1.26 * Cum Volume (acre-ft) * 5.98 * 3.88 * 1.17 *
 * C & E Loss (ft) * 0.03 * Cum SA (acres) * 6.21 * 1.12 * 0.99 *

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

for the water surface and continued on with the calculations.

Warning: The energy loss was 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= 86
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

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```

*****
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
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
215.19 949.79 225.19 949.59 235.19 949.4 266.38 948.22 273.81 948
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) * 949.24 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 0.68 * Wt. n-Val. * 0.035 * 0.035 * 0.060 *
* W.S. Elev (ft) * 948.56 * Reach Len. (ft) * 146.04 * 191.17 * 139.06 *
* Crit W.S. (ft) * 948.56 * Flow Area (sq ft) * 40.01 * 41.08 * 15.14 *
* E.G. Slope (ft/ft) * 0.007007 * Area (sq ft) * 40.01 * 41.08 * 15.14 *
* Q Total (cfs) * 482.70 * Flow (cfs) * 129.40 * 321.97 * 31.33 *
* Top width (ft) * 72.57 * Top width (ft) * 46.02 * 10.07 * 16.47 *
* Vel Total (ft/s) * 5.02 * Avg. vel. (ft/s) * 3.23 * 7.84 * 2.07 *
* Max Chl Dpth (ft) * 4.58 * Hydr. Depth (ft) * 0.87 * 4.08 * 0.92 *
* Conv. Total (cfs) * 5766.6 * Conv. (cfs) * 1545.9 * 3846.4 * 374.3 *
* Length Wtd. (ft) * 174.15 * Wetted Per. (ft) * 46.08 * 12.54 * 16.77 *
* Min Ch El (ft) * 943.98 * Shear (lb/sq ft) * 0.38 * 1.43 * 0.40 *
* Alpha * 1.75 * Stream Power (lb/ft s) * 386.06 * 0.00 * 0.00 *
* Frctn Loss (ft) * 1.28 * Cum Volume (acre-ft) * 5.91 * 3.72 * 1.12 *
* C & E Loss (ft) * 0.07 * Cum SA (acres) * 6.13 * 1.08 * 0.93 *
*****

```

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= 86		Sta		Elev		Sta		Elev	
Sta	Elev	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		
269.9	946.96	271.8	946.98	281.9	946.76	291.9	946.53	294.3	946.7		
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	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)	* 947.25	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.44	* Wt. n-Val.	* 0.035	* 0.035	* 0.000
* W.S. Elev (ft)	* 946.81	* Reach Len. (ft)	* 60.19	* 131.90	* 273.42
* Crit W.S. (ft)	* 946.81	* Flow Area (sq ft)	* 71.53	* 43.59	* 0.00

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* E.G. Slope (ft/ft)	*0.007773	* Area (sq ft)	* 71.53	* 43.59	* 0.00	*
* Q Total (cfs)	* 482.70	* Flow (cfs)	* 198.41	* 284.29	* 0.00	*
* Top Width (ft)	* 129.36	* Top width (ft)	* 112.08	* 17.16	* 0.12	*
* Vel Total (ft/s)	* 4.19	* Avg. vel. (ft/s)	* 2.77	* 6.52	* 0.12	*
* Max Chl Dpth (ft)	* 4.37	* Hydr. Depth (ft)	* 0.64	* 2.54	* 0.01	*
* Conv. Total (cfs)	* 5475.1	* Conv. (cfs)	* 2250.5	* 3224.6	* 0.0	*
* Length Wtd. (ft)	* 107.64	* Wetted Per. (ft)	* 112.11	* 18.95	* 0.12	*
* Min Ch El (ft)	* 942.44	* Shear (lb/sq ft)	* 0.31	* 1.12	*	*
* Alpha	* 1.60	* Stream Power (lb/ft s)	* 498.60	* 0.00	* 0.00	*
* Frctn Loss (ft)	* 0.30	* Cum Volume (acre-ft)	* 5.72	* 3.54	* 1.09	*
* C & E Loss (ft)	* 0.09	* Cum SA (acres)	* 5.86	* 1.02	* 0.91	*

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= 65		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	946.1	252.99	946.1	253.72	946	254.4	946.29	265.85	946.07
277.7	945.84	280.04	945.51	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 62.63 48.67 81.28 .1 .3
 Blocked Obstructions num= 1
 Sta L Sta R Elev

 460 485 955

CROSS SECTION OUTPUT Profile #PF 1

 * E.G. Elev (ft) * 946.14 * Element * Left OB * Channel * Right OB *
 * Vel Head (ft) * 0.12 * Wt. n-Val. * 0.035 * 0.035 * 0.035 *
 * W.S. Elev (ft) * 946.02 * Reach Len. (ft) * 62.63 * 48.67 * 81.28 *
 * Crit W.S. (ft) * * * Flow Area (sq ft) * 96.35 * 110.83 * 0.43 *
 * E.G. Slope (ft/ft) * 0.001431 * Area (sq ft) * 96.35 * 110.83 * 0.43 *
 * Q Total (cfs) * 482.70 * Flow (cfs) * 128.69 * 353.73 * 0.28 *
 * Top width (ft) * 166.34 * Top width (ft) * 127.20 * 37.57 * 1.57 *
 * Vel Total (ft/s) * 2.33 * Avg. Vel. (ft/s) * 1.34 * 3.19 * 0.65 *
 * Max Chl Dpth (ft) * 5.26 * Hydr. Depth (ft) * 0.76 * 2.95 * 0.27 *
 * Conv. Total (cfs) * 12758.0 * Conv. (cfs) * 3401.4 * 9349.3 * 7.3 *
 * Length Wtd. (ft) * 50.78 * Wetted Per. (ft) * 127.23 * 39.57 * 1.66 *
 * Min Ch El (ft) * 940.76 * Shear (lb/sq ft) * 0.07 * 0.25 * 0.02 *
 * Alpha * 1.47 * Stream Power (lb/ft s) * 622.31 * 0.00 * 0.00 *
 * Frctn Loss (ft) * 0.14 * Cum Volume (acre-ft) * 5.60 * 3.30 * 1.09 *
 * C & E Loss (ft) * 0.05 * Cum SA (acres) * 5.70 * 0.94 * 0.90 *

Warning: Divided flow computed for this cross-section.
 Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
 Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
 This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Upper RS: 12646.06

INPUT
 Description:
 Station Elevation Data num= 89
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

 0 960 .49 959.8 5.04 958 7.77 956.79 9.62 956
 13.33 954.36 14.17 954 16.27 953.38 20.76 952 23.85 951.01

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27.22	950	31.97	948.57	32.54	948.39	32.58	948.38	32.59	948.38
33.04	948	35.78	946.22	36.11	946	36.96	945.49	37.02	945.45
44.25	945.25	67.31	944.63	68.49	945.69	69.08	946.47	70.31	948
70.66	948.46	70.87	948.73	73.6	948.24	74.63	948	81.68	948
101.28	947.57	205.18	946	231.02	946	235.16	945.9	238.23	945.84
239.46	945.83	241.26	945.8	241.83	945.8	254.14	945.62	345.78	944
353.56	944	385.06	944	391.04	944.29	394.82	944.04	398.26	943.76
398.32	943.75	401.31	942.32	409.48	942.25	411.88	942	413.44	941.46
414.4	941.06	416.19	940.34	416.36	940.34	417.06	942	418.11	943.76
418.26	944	418.31	944.08	418.69	944.94	423.5	944.9	424.98	945.48
426.11	946	429.63	947.28	431.49	948	434.08	949.02	436.65	950
437.65	950.38	439.35	950.84	442.33	951.27	443.47	951.47	446.97	952
450.48	952.43	450.7	952.45	451.83	952.53	455.66	952.76	460.7	953.03
462.68	953.14	466.25	953.42	472.93	954	481.15	954.63	492.9	955.51
499.54	956	507.86	957.51	510.28	958	511.08	958.16	511.51	958.22
518.65	958.77	525.27	959.2	534.09	959.81	535.7	960		

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

 0 .035 391.04 .035 418.31 .035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 391.04 418.31 25.79 25.37 26.92 .1 .3

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 389.3 945.98 F
 425.3 535.7 948.44 F

Blocked Obstructions num= 1
 Sta L Sta R Elev

 0 70.87 948.75

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 945.95	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.65	* Wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 945.30	* Reach Len. (ft)	* 5.80	* 5.80	* 5.80
* Crit W.S. (ft)	* 944.80	* Flow Area (sq ft)	* 1.83	* 72.45	* 2.33
* E.G. Slope (ft/ft)	* 0.007330	* Area (sq ft)	* 105.73	* 72.45	* 2.33
* Q Total (cfs)	* 482.70	* Flow (cfs)	* 6.87	* 471.70	* 4.13
* Top width (ft)	* 152.26	* Top width (ft)	* 118.78	* 27.27	* 6.21
* Vel Total (ft/s)	* 6.30	* Avg. Vel. (ft/s)	* 3.76	* 6.51	* 1.77
* Max Chl Dpth (ft)	* 4.96	* Hydr. Depth (ft)	* 1.05	* 2.66	* 0.38
* Conv. Total (cfs)	* 5638.2	* Conv. (cfs)	* 80.3	* 5509.7	* 48.2
* Length Wtd. (ft)	* 5.80	* Wetted Per. (ft)	* 1.74	* 30.22	* 6.85
* Min Ch El (ft)	* 940.34	* Shear (lb/sq ft)	* 0.48	* 1.10	* 0.16
* Alpha	* 1.05	* Stream Power (lb/ft s)	* 535.70	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.06	* Cum Volume (acre-ft)	* 5.46	* 3.20	* 1.09
* C & E Loss (ft)	* 0.04	* Cum SA (acres)	* 5.52	* 0.90	* 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.

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

BRIDGE

RIVER: Bluestone Creek

REACH: Upper

RS: 12633.65

INPUT

Description:

Distance from Upstream XS = 5.8

Deck/Roadway width = 13

Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num= 9

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
231.02		946			292.6		946			297.7		945.98		
352.1		948			387.3	948.44				391.3	948.44		946.6	
423.3	948.44		946.6		427.3	948.44				463.1		950		

Upstream Bridge Cross Section Data

Station Elevation Data

num= 89

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960	.49	959.8	5.04	958	7.77	956.79	9.62	956
13.33	954.36	14.17	954	16.27	953.38	20.76	952	23.85	951.01
27.22	950	31.97	948.57	32.54	948.39	32.58	948.38	32.59	948.38
33.04	948	35.78	946.22	36.11	946	36.96	945.49	37.02	945.45
44.25	945.25	67.31	944.63	68.49	945.69	69.08	946.47	70.31	948
70.66	948.46	70.87	948.73	73.6	948.24	74.63	948	81.68	948
101.28	947.57	205.18	946	231.02	946	235.16	945.9	238.23	945.84
239.46	945.83	241.26	945.8	241.83	945.8	254.14	945.62	345.78	944
353.56	944	385.06	944	391.04	944.29	394.82	944.04	398.26	943.76
398.32	943.75	401.31	942.32	409.48	942.25	411.88	942	413.44	941.46
414.4	941.06	416.19	940.34	416.36	940.34	417.06	942	418.11	943.76
418.26	944	418.31	944.08	418.69	944.94	423.5	944.9	424.98	945.48
426.11	946	429.63	947.28	431.49	948	434.08	949.02	436.65	950
437.65	950.38	439.35	950.84	442.33	951.27	443.47	951.47	446.97	952
450.48	952.43	450.7	952.45	451.83	952.53	455.66	952.76	460.7	953.03
462.68	953.14	466.25	953.42	472.93	954	481.15	954.63	492.9	955.51
499.54	956	507.86	957.51	510.28	958	511.08	958.16	511.51	958.22
518.65	958.77	525.27	959.2	534.09	959.81	535.7	960		

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	391.04	.035	418.31	.035

Bank Sta: Left Right Coeff Contr. Expan.
 391.04 418.31 .1 .3

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 389.3 945.98 F
 425.3 535.7 948.44 F

Blocked Obstructions num= 1
 Sta L Sta R Elev

 0 70.87 948.75

Downstream Deck/Roadway Coordinates
 num= 11

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
215.75	946		285.5	946		290.6	945.98	
345	948		380.2	948.44		384.2	948.44	946.6
416.2	948.44	946.6	420.2	948.44		456	950	
476.9	952		493.2	954				

Downstream Bridge Cross Section Data

Station	Elevation	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960	3.86	958.01	3.88	958	3.99	957.95	7.66	956
9.65	955.32	13.5	954	16.77	952.83	19.15	952	20.44	951.55
24.94	950	30.99	948.48	32.56	948.24	32.67	948.24	33.14	947.98
34.35	947.37	36.85	946	37.29	945.79	37.48	945.74	37.79	945.71
40.17	945.6	56.42	945.6	57.24	945.98	57.3	946	57.59	946.12
58.64	946.74	60.13	948	60.51	948.41	60.74	948.47	64.17	948.02
64.31	948	125.24	947.2	129.74	947.14	204.91	946	215.75	946
256.82	945.04	258.5	945.01	266.4	944.91	277.96	944.74	281.59	944.7
331.66	944	352.33	944	361.73	944	366.82	944.25	368.73	944.28
391.55	944.75	392.44	944.26	392.92	944	394.84	942.94	395.95	942
396.02	941.87	396.68	941.24	404.34	940.13	409.38	940.84	409.86	941.77
410.03	942	410.8	943.2	411.3	943.73	411.37	943.74	416.83	943.73
418.21	943.82	420.42	944	420.87	944	429.35	944.57	436.52	945.05
438.12	945.47	443.08	946	455.96	947.44	457.61	947.63	460.42	948
473.48	949.79	474.51	950	480.14	951.25	483.59	952	485.09	952.33
490.99	953.56	492.15	954	492.87	954.27	493.89	954.64	494.86	954.88
496.15	955.02	504.75	955.85	506.14	956	506.91	956.27	509.18	957.02
511.98	958	515.97	959.34	517.54	959.73	518.13	959.99		

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

 0 .035 391.55 .035 411.3 .035

Bank Sta: Left Right Coeff Contr. Expan.
 391.55 411.3 .1 .3
 Ineffective Flow num= 2

```

Sta L   Sta R   Elev   Permanent
  0     378.7  945.98   F
421.7  518.13  948.44   F
Blocked Obstructions num=      1
Sta L   Sta R   Elev
*****
  0     60.74  948.5
    
```

```

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 Bridge Coefficient Sets = 1

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

High Flow Method
 Energy Only

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

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Upper RS: 12620.64

INPUT
 Description:

Station Elevation Data		num= 89									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	960	3.86	958.01	3.88	958	3.99	957.95	7.66	956		
9.65	955.32	13.5	954	16.77	952.83	19.15	952	20.44	951.55		
24.94	950	30.99	948.48	32.56	948.24	32.67	948.24	33.14	947.98		
34.35	947.37	36.85	946	37.29	945.79	37.48	945.74	37.79	945.71		
40.17	945.6	56.42	945.6	57.24	945.98	57.3	946	57.59	946.12		
58.64	946.74	60.13	948	60.51	948.41	60.74	948.47	64.17	948.02		
64.31	948	125.24	947.2	129.74	947.14	204.91	946	215.75	946		
256.82	945.04	258.5	945.01	266.4	944.91	277.96	944.74	281.59	944.7		
331.66	944	352.33	944	361.73	944	366.82	944.25	368.73	944.28		

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391.55	944.75	392.44	944.26	392.92	944	394.84	942.94	395.95	942
396.02	941.87	396.68	941.24	404.34	940.13	409.38	940.84	409.86	941.77
410.03	942	410.8	943.2	411.3	943.73	411.37	943.74	416.83	943.73
418.21	943.82	420.42	944	420.87	944	429.35	944.57	436.52	945.05
438.12	945.47	443.08	946	455.96	947.44	457.61	947.63	460.42	948
473.48	949.79	474.51	950	480.14	951.25	483.59	952	485.09	952.33
490.99	953.56	492.15	954	492.87	954.27	493.89	954.64	494.86	954.88
496.15	955.02	504.75	955.85	506.14	956	506.91	956.27	509.18	957.02
511.98	958	515.97	959.34	517.54	959.73	518.13	959.99		

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

 0 .035 391.55 .035 411.3 .035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 391.55 411.3 49.91 112.79 117.15 .1 .3

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 378.7 945.98 F
 421.7 518.13 948.44 F

Blocked Obstructions num= 1
 Sta L Sta R Elev

 0 60.74 948.5

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 945.55	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.56	* Wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 945.00	* Reach Len. (ft)	* 49.91	* 112.79	* 117.15
* Crit W.S. (ft)	* 944.25	* Flow Area (sq ft)	* 4.88	* 69.77	* 12.33
* E.G. slope (ft/ft)	* 0.004787	* Area (sq ft)	* 82.56	* 69.77	* 18.93
* Q Total (cfs)	* 482.70	* Flow (cfs)	* 7.52	* 434.67	* 40.51
* Top width (ft)	* 176.24	* Top width (ft)	* 132.06	* 19.75	* 24.44
* Vel Total (ft/s)	* 5.55	* Avg. Vel. (ft/s)	* 1.54	* 6.23	* 3.29
* Max chl Dpth (ft)	* 4.87	* Hydr. Depth (ft)	* 0.38	* 3.53	* 1.19
* Conv. Total (cfs)	* 6976.6	* Conv. (cfs)	* 108.6	* 6282.5	* 585.5
* Length wtd. (ft)	* 112.49	* Wetted Per. (ft)	* 12.85	* 22.59	* 10.41
* Min ch El (ft)	* 940.13	* Shear (lb/sq ft)	* 0.11	* 0.92	* 0.35
* Alpha	* 1.17	* Stream Power (lb/ft s)	* 518.13	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.88	* Cum Volume (acre-ft)	* 5.45	* 3.16	* 1.09
* C & E Loss (ft)	* 0.09	* Cum SA (acres)	* 5.50	* 0.89	* 0.89

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

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

This may indicate the need for additional cross sections.

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

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Upper

RS: 12504.92

INPUT

Description:

Station Elevation Data		num= 96		Sta Elev		Sta Elev		Sta Elev	
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
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	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	
* 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	* 0.99	
* E.G. Slope (ft/ft)	* 0.015247	* Area (sq ft)	* 50.52	* 0.99	
* Q Total (cfs)	* 482.70	* Flow (cfs)	* 481.57	* 1.13	
* Top Width (ft)	* 21.54	* Top width (ft)	* 17.22	* 4.32	
* Vel Total (ft/s)	* 9.37	* Avg. vel. (ft/s)	* 9.53	* 1.14	
* Max chl Dpth (ft)	* 4.04	* Hydr. Depth (ft)	* 2.93	* 0.23	

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* Conv. Total (cfs)      * 3909.2 * Conv. (cfs)      * 3900.0 * 9.1 *
* Length Wtd. (ft)     * 210.75 * Wetted Per. (ft) * 20.60 * 4.35 *
* Min Ch El (ft)      * 939.14 * Shear (lb/sq ft) * 2.33 * 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) * 5.40 * 3.01 * 1.06 *
* 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	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	*
* 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)	* 5.35	* 2.64	* 1.06
* 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=	55	Sta	Elev	Sta	Elev	Sta	Elev
0	995	66.4	994	158.8	948	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	

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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 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

CROSS SECTION OUTPUT Profile #PF 1

* 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)	* 5.01	* 2.59	* 1.05
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 4.98	* 0.68	* 0.83

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

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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

* 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)	* 4.81	* 2.51	* 1.04
* 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

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INPUT

Description:

Station Elevation Data		num= 83		Sta		Elev		Sta		Elev	
Sta	Elev	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		
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	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)	* 4.27	* 2.34	* 1.04
* 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	Sta	Elev
0	959.97	3.39	958.76	5.44	958	10.37	956.25	10.84	956.07		
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

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* 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) * 3.36 * 2.22 * 1.04 *
* C & E Loss (ft)     * 0.03  * Cum SA (acres)    * 2.93 * 0.54 * 0.81 *
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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	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
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

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* 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)	* 3.12	* 2.07	* 1.01
* 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
0	960	8.69	958
24.99	954.96	31.77	954
39.69	952	46.26	950.46
61.54	946.27	62.07	946
69.8	942	70.2	941.91
90.77	939.25	99.86	938
196.96	935.86	198.63	935.88
242.46	935.94	245.11	935.93
301.62	934	301.96	933.65
311.79	933.2	314.29	935.14
321.25	937.05	323.4	937.62
333.57	940.38	339.6	942
			942
			958
			954
			950
			946
			944
			940
			936
			935
			935
			935
			933
			935
			935
			938
			944
			944

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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

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)	* 2.28	* 1.81	* 0.98
* 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	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
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	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

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* 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)  * 1.43 * 1.68 * 0.95 *
* C & E Loss (ft)    * 0.00  * Cum SA (acres)        * 0.85 * 0.37 * 0.68 *
*****
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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
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
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

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* E.G. Elev (ft)	* 935.81	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.08	* Wt. n-Val.	* 0.060	* 0.035	* 0.060
* W.S. Elev (ft)	* 935.73	* Reach Len. (ft)	* 205.41	* 261.21	* 240.88
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 239.54	* 77.49	* 62.05
* E.G. Slope (ft/ft)	* 0.000924	* Area (sq ft)	* 239.54	* 77.49	* 62.05
* Q Total (cfs)	* 601.90	* Flow (cfs)	* 286.31	* 251.73	* 63.86
* Top width (ft)	* 173.54	* Top width (ft)	* 119.52	* 15.34	* 38.69
* Vel Total (ft/s)	* 1.59	* Avg. Vel. (ft/s)	* 1.20	* 3.25	* 1.03
* Max Chl Dpth (ft)	* 5.82	* Hydr. Depth (ft)	* 2.00	* 5.05	* 1.60
* Conv. Total (cfs)	* 19798.9	* Conv. (cfs)	* 9417.9	* 8280.4	* 2100.6
* Length wtd. (ft)	* 242.94	* Wetted Per. (ft)	* 119.75	* 19.40	* 38.83
* Min Ch El (ft)	* 929.91	* Shear (lb/sq ft)	* 0.12	* 0.23	* 0.09
* Alpha	* 2.06	* Stream Power (lb/ft s)	* 356.27	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.56	* Cum Volume (acre-ft)	* 1.01	* 1.43	* 0.79
* 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	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	207.6	936	241.9	946	260.8	946
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

 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 *
 * 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) * 0.43 * 1.08 * 0.53 *
 * 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= 94

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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
222	936	244.6	942	273.4	942	290.7	938	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	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)	* 933.31	* Reach Len. (ft)	* 195.34	* 212.37	* 143.13
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 66.91	* 72.50	*
* E.G. Slope (ft/ft)	* 0.003531	* Area (sq ft)	* 66.91	* 72.50	*
* Q Total (cfs)	* 601.90	* Flow (cfs)	* 215.22	* 386.68	*
* Top width (ft)	* 66.59	* Top width (ft)	* 46.39	* 20.20	*
* Vel Total (ft/s)	* 4.32	* Avg. vel. (ft/s)	* 3.22	* 5.33	*
* Max Chl Dpth (ft)	* 5.31	* Hydr. Depth (ft)	* 1.44	* 3.59	*
* Conv. Total (cfs)	* 10129.3	* Conv. (cfs)	* 3622.0	* 6507.3	*
* Length wtd. (ft)	* 189.01	* Wetted Per. (ft)	* 46.48	* 23.58	*
* 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)	* 0.29	* 0.82	* 0.44
* 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	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	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

* E.G. Elev (ft)	* 933.26	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.09	* Wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 933.17	* Reach Len. (ft)	* 111.20	* 58.47	* 28.87
* Crit W.S. (ft)	* 932.32	* Flow Area (sq ft)	* 24.38	* 67.58	* 199.48
* E.G. Slope (ft/ft)	* 0.001003	* Area (sq ft)	* 24.38	* 67.58	* 199.48
* Q Total (cfs)	* 601.90	* Flow (cfs)	* 37.43	* 220.45	* 344.02
* Top width (ft)	* 173.29	* Top width (ft)	* 19.83	* 16.20	* 137.26
* Vel Total (ft/s)	* 2.07	* Avg. vel. (ft/s)	* 1.54	* 3.26	* 1.72
* Max Chl Dpth (ft)	* 5.00	* Hydr. Depth (ft)	* 1.23	* 4.17	* 1.45
* Conv. Total (cfs)	* 19005.0	* Conv. (cfs)	* 1181.9	* 6960.6	* 10862.5
* Length Wtd. (ft)	* 58.47	* Wetted Per. (ft)	* 19.98	* 17.88	* 137.33
* Min Ch El (ft)	* 928.17	* Shear (lb/sq ft)	* 0.08	* 0.24	* 0.09
* Alpha	* 1.35	* Stream Power (lb/ft s)	* 506.82	* 0.00	* 0.00
* Frctn Loss (ft)	*	* Cum volume (acre-ft)	* 0.08	* 0.48	* 0.11

* C & E Loss (ft) * * Cum SA (acres) * 0.05 * 0.08 * 0.07 *

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	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
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
4	39	.024	.024
Depth Blocked	Entrance Loss Coef	Exit Loss Coef	
0	.9	1	

Upstream Elevation = 928.61

Centerline Station = 79.2
Downstream Elevation = 928.54
Centerline Station = 103.08

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

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*****
* Q Culv Group (cfs)      * 18.88 * Culv Full Len (ft)    * 39.00 *
* # Barrels              * 1     * Culv Vel US (ft/s)   * 6.01  *
* Q Barrel (cfs)        * 18.88 * Culv Vel DS (ft/s)   * 6.01  *
* 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)          * 931.74 * Culv Frctn Ls (ft)   * 0.93  *
* W.S. DS (ft)          * 931.27 * Culv Exit Loss (ft)  * 0.09  *
* Delta EG (ft)         * 1.52  * Culv Entr Loss (ft)  * 0.50  *
* Delta WS (ft)         * 1.90  * Q Weir (cfs)        * 582.53 *
* E.G. IC (ft)          * 933.25 * Weir Sta Lft (ft)   * 52.83  *
* E.G. OC (ft)          * 933.26 * Weir Sta Rgt (ft)   * 228.11 *
* Culvert Control      * Outlet * Weir Submerg        * 0.00  *
* Culv WS Inlet (ft)    * 930.61 * Weir Max Depth (ft) * 1.29  *
* Culv WS outlet (ft)   * 930.54 * Weir Avg Depth (ft) * 1.16  *
* Culv Nm1 Depth (ft)  *      * Weir Flow Area (sq ft) * 203.72 *
* Culv Crt Depth (ft)  * 1.56  * Min El Weir Flow (ft) * 931.98 *
*****

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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	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

 * E.G. Elev (ft) * 931.74 * Element * Left OB * Channel * Right OB *
 * Vel Head (ft) * 0.47 * Wt. n-Val. * 0.035 * 0.035 * 0.035 *
 * W.S. Elev (ft) * 931.27 * Reach Len. (ft) * 24.44 * 64.93 * 4.53 *
 * Crit W.S. (ft) * * Flow Area (sq ft) * 5.79 * 83.98 * 31.53 *
 * E.G. Slope (ft/ft) *0.007053 * Area (sq ft) * 5.79 * 83.98 * 31.53 *
 * Q Total (cfs) * 601.90 * Flow (cfs) * 15.28 * 497.99 * 88.63 *
 * Top width (ft) * 92.88 * Top width (ft) * 9.02 * 38.85 * 45.02 *
 * Vel Total (ft/s) * 4.96 * Avg. Vel. (ft/s) * 2.64 * 5.93 * 2.81 *
 * Max Chl Dpth (ft) * 2.93 * Hydr. Depth (ft) * 0.64 * 2.16 * 0.70 *
 * Conv. Total (cfs) * 7167.1 * Conv. (cfs) * 181.9 * 5929.8 * 1055.4 *
 * Length Wtd. (ft) * 51.19 * Wetted Per. (ft) * 9.11 * 39.15 * 45.04 *
 * Min Ch El (ft) * 928.34 * Shear (lb/sq ft) * 0.28 * 0.94 * 0.31 *
 * Alpha * 1.24 * Stream Power (lb/ft s) * 558.19 * 0.00 * 0.00 *
 * Frctn Loss (ft) * 0.28 * Cum Volume (acre-ft) * 0.08 * 0.25 * 0.11 *
 * C & E Loss (ft) * 0.01 * Cum SA (acres) * 0.02 * 0.04 * 0.01 *

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Upper RS: 10055.03

INPUT

Description:

Station Elevation Data num= 84
 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

OXF157-159Bridges.rep

312.13	934	313.48	934	315.96	934	321.4	932.5	326.6	934.19
346.8	935.37	379.9	937.29	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
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)	* 931.45	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.43	* wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 931.01	* Reach Len. (ft)	* 63.02	* 63.02	* 63.02
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 39.57	* 62.84	* 43.09
* E.G. Slope (ft/ft)	* 0.004494	* Area (sq ft)	* 39.57	* 62.84	* 43.09
* Q Total (cfs)	* 601.90	* Flow (cfs)	* 102.65	* 393.00	* 106.25
* Top Width (ft)	* 117.00	* Top width (ft)	* 45.40	* 18.24	* 53.36
* Vel Total (ft/s)	* 4.14	* Avg. Vel. (ft/s)	* 2.59	* 6.25	* 2.47
* Max chl Dpth (ft)	* 4.03	* Hydr. Depth (ft)	* 0.87	* 3.45	* 0.81
* Conv. Total (cfs)	* 8979.0	* Conv. (cfs)	* 1531.3	* 5862.7	* 1585.0
* Length wtd. (ft)	* 63.02	* Wetted Per. (ft)	* 45.48	* 19.29	* 53.43
* Min Ch El (ft)	* 926.98	* Shear (lb/sq ft)	* 0.24	* 0.91	* 0.23
* Alpha	* 1.62	* Stream Power (lb/ft s)	* 592.99	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.16	* Cum Volume (acre-ft)	* 0.07	* 0.14	* 0.11
* C & E Loss (ft)	* 0.08	* Cum SA (acres)	*	*	*

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Middle

RS: 9989.380

INPUT

Description:

Station Elevation Data num= 116

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

OXF157-159Bridges.rep

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
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	430.01	931.64
442.98	932.41	456.83	933.25	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 .035 320.05 .035

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 275.63 320.05 195.82 107.19 3.14 .1 .3
 Ineffective Flow num= 1
 Sta L Sta R Elev Permanent
 377.89 738.37 929.84 T

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 931.19	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.15	* Wt. n-val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 931.04	* Reach Len. (ft)	* 195.82	* 107.19	* 3.14
* Crit w.s. (ft)	*	* Flow Area (sq ft)	* 59.55	* 134.69	* 107.39
* E.G. slope (ft/ft)	* 0.001823	* Area (sq ft)	* 59.55	* 134.69	* 107.39
* Q Total (cfs)	* 763.60	* Flow (cfs)	* 74.27	* 491.73	* 197.60
* Top width (ft)	* 253.67	* Top width (ft)	* 104.33	* 44.42	* 104.91
* Vel Total (ft/s)	* 2.53	* Avg. vel. (ft/s)	* 1.25	* 3.65	* 1.84
* Max chl dpth (ft)	* 5.04	* Hydr. Depth (ft)	* 0.57	* 3.03	* 1.02
* Conv. Total (cfs)	* 17885.0	* Conv. (cfs)	* 1739.5	* 11517.3	* 4628.1
* Length wtd. (ft)	* 109.30	* Wetted Per. (ft)	* 104.35	* 47.12	* 104.99
* Min Ch El (ft)	* 926.00	* Shear (lb/sq ft)	* 0.06	* 0.33	* 0.12
* Alpha	* 1.50	* Stream Power (lb/ft s)	* 738.37	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.08	* Cum Volume (acre-ft)	* 9.48	* 7.09	* 5.43
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 6.82	* 1.97	* 5.53

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: 9878.981

INPUT
 Description:

Station Elevation Data num= 128

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	950	4.8	949.53	7.9	949.15	13.94	948.68	14.57	948.65
19.82	948.64	22.92	948.43	28.6	948	36.23	947.42	38.01	947.28
40.52	947.05	43.32	946.8	49.84	946	65.68	944.08	66.29	944
68.72	943.53	77.49	942.88	85.06	942	90.53	941.35	92.76	941.02
99.15	940	109.22	938.39	111.6	938	112.08	937.92	114.63	937.49
122.08	936.19	123.13	936	130.87	934.55	133.79	934	134.08	933.94
144.55	932	154.05	931.31	159.25	931.06	164.49	930.83	172.69	930
190.8	930	241.47	929.03	242.52	929.03	246.37	928.91	252.9	928.72
254.26	928.69	256.02	928.64	257.24	928.6	265.38	928.43	270.83	928.46
272.2	928.45	302.77	928	328.21	928	351.67	928	357.35	928.03
359.64	928.03	363.81	928	371.82	928	374.99	928.06	386.33	928.34
396.74	928.95	396.9	928.63	397.31	928	397.65	927.15	397.67	927.13
397.83	927.11	401.97	926.16	402.03	926.15	402.57	925.98	408.69	925.9
408.75	925.9	421.17	925.64	421.31	925.63	422.27	925.77	423.32	926
430.06	927.37	432.58	928	433.75	928.27	434.69	928.51	440.55	928.22
443.31	928.17	449.78	928	477.57	928	480.12	928.03	484.5	928.02
490.05	928.01	490.7	928.01	491.25	928	493.62	928.3	510.08	930
516.31	931	518.01	930.99	522.1	932	523.47	932	527.88	933.02
531.88	934	532.08	934	534.58	934.59	540.76	936	542.41	936
554.21	936.98	557.73	937.17	562.44	937.36	572.35	938	586.11	938.71
597.72	938.97	600.91	938.94	608.51	939.18	612.38	939.43	614.73	939.43
615.77	939.46	624.09	940	638.78	940.69	640.88	940.79	644.35	940.93
649.05	941.09	659.4	941.52	666.33	942	692.47	943.99	692.53	943.99
692.59	943.99	692.88	944.01	725.52	946	737.66	946.97	739.81	947.16
746.09	947.63	746.61	947.66	752.55	948	754.92	948.16	758.84	948.44
773.85	949.46	776.43	949.67	781.45	950				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	396.74	.035	434.69	.035

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

396.74	434.69	38.17	45.78	26.43	.1	.3
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	376.9	929.84	T
431.25	781.45	929.84	T

CROSS SECTION OUTPUT Profile #PF 1

OXF157-159Bridges.rep

* E.G. Elev (ft)	* 931.08	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.05	* Wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 931.03	* Reach Len. (ft)	* 16.20	* 16.20	* 16.20
* Crit W.S. (ft)	* 928.82	* Flow Area (sq ft)	* 297.23	* 170.30	* 93.31
* E.G. Slope (ft/ft)	* 0.000402	* Area (sq ft)	* 535.95	* 176.32	* 209.40
* Q Total (cfs)	* 763.60	* Flow (cfs)	* 294.29	* 383.90	* 85.40
* Top Width (ft)	* 358.35	* Top width (ft)	* 236.90	* 37.95	* 83.50
* Vel Total (ft/s)	* 1.36	* Avg. vel. (ft/s)	* 0.99	* 2.25	* 0.92
* Max Chl Dpth (ft)	* 5.40	* Hydr. Depth (ft)	* 1.25	* 4.49	* 1.12
* Conv. Total (cfs)	* 38079.0	* Conv. (cfs)	* 14675.8	* 19144.3	* 4258.9
* Length Wtd. (ft)	* 16.20	* Wetted Per. (ft)	* 236.99	* 39.52	* 83.70
* Min Ch El (ft)	* 925.63	* Shear (lb/sq ft)	* 0.03	* 0.11	* 0.03
* Alpha	* 1.63	* Stream Power (lb/ft s)	* 781.45	* 0.00	* 0.00
* Frctn Loss (ft)	*	* Cum volume (acre-ft)	* 8.14	* 6.71	* 5.42
* C & E Loss (ft)	*	* Cum SA (acres)	* 6.06	* 1.86	* 5.52

BRIDGE

RIVER: Bluestone Creek
 REACH: Middle RS: 9855.351

INPUT

Description:

Distance from Upstream XS = 16.2
 Deck/Roadway width = 13
 Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates
 num= 12

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
65.68		944		208.1		944		300.9		936				
322.8		934		345.4		932		387.9		929.84				
391.9	929.84		928	423.9	929.84		928	427.9	929.84					
485.36		932		521.7		934		564.5		936				

Upstream Bridge Cross Section Data

Station Elevation Data num= 128									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	950	4.8	949.53	7.9	949.15	13.94	948.68	14.57	948.65
19.82	948.64	22.92	948.43	28.6	948	36.23	947.42	38.01	947.28
40.52	947.05	43.32	946.8	49.84	946	65.68	944.08	66.29	944
68.72	943.53	77.49	942.88	85.06	942	90.53	941.35	92.76	941.02
99.15	940	109.22	938.39	111.6	938	112.08	937.92	114.63	937.49
122.08	936.19	123.13	936	130.87	934.55	133.79	934	134.08	933.94
144.55	932	154.05	931.31	159.25	931.06	164.49	930.83	172.69	930
190.8	930	241.47	929.03	242.52	929.03	246.37	928.91	252.9	928.72
254.26	928.69	256.02	928.64	257.24	928.6	265.38	928.43	270.83	928.46
272.2	928.45	302.77	928	328.21	928	351.67	928	357.35	928.03
359.64	928.03	363.81	928	371.82	928	374.99	928.06	386.33	928.34

OXF157-159Bridges.rep

396.74	928.95	396.9	928.63	397.31	928	397.65	927.15	397.67	927.13
397.83	927.11	401.97	926.16	402.03	926.15	402.57	925.98	408.69	925.9
408.75	925.9	421.17	925.64	421.31	925.63	422.27	925.77	423.32	926
430.06	927.37	432.58	928	433.75	928.27	434.69	928.51	440.55	928.22
443.31	928.17	449.78	928	477.57	928	480.12	928.03	484.5	928.02
490.05	928.01	490.7	928.01	491.25	928	493.62	928.3	510.08	930
516.31	931	518.01	930.99	522.1	932	523.47	932	527.88	933.02
531.88	934	532.08	934	534.58	934.59	540.76	936	542.41	936
554.21	936.98	557.73	937.17	562.44	937.36	572.35	938	586.11	938.71
597.72	938.97	600.91	938.94	608.51	939.18	612.38	939.43	614.73	939.43
615.77	939.46	624.09	940	638.78	940.69	640.88	940.79	644.35	940.93
649.05	941.09	659.4	941.52	666.33	942	692.47	943.99	692.53	943.99
692.59	943.99	692.88	944.01	725.52	946	737.66	946.97	739.81	947.16
746.09	947.63	746.61	947.66	752.55	948	754.92	948.16	758.84	948.44
773.85	949.46	776.43	949.67	781.45	950				

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

 0 .035 396.74 .035 434.69 .035

Bank Sta: Left Right Coeff Contr. Expan.
 396.74 434.69 .1 .3
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 376.9 929.84 T
 431.25 781.45 929.84 T

Downstream Deck/Roadway Coordinates num= 13
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord

 68.53 944 161 944 227 944
 332.3 936 354.6 934 376.5 932
 423.9 929.84 427.9 929.84 928 459.9 929.84 928
 463.9 929.84 492.4 932 529.6 934
 572.5 936

Downstream Bridge Cross Section Data Station Elevation Data num= 103
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

 0 950 .62 949.94 1.97 949.77 2.65 949.68 12.72 948.44
 16.26 948 24.3 947.03 31.67 946.22 33.25 946.14 36.05 946
 46.56 945.46 48.89 945.34 50.99 945.18 55.91 944.9 57.95 944.68
 60.1 944.52 63.02 944.39 65.19 944.24 68.53 944 77.67 943.2
 87.53 942 88.02 941.94 88.59 941.86 92.27 941.19 98.96 940
 100.01 939.81 102.09 939.46 109.74 938 113.2 937.35 117.77 936.75
 122.15 936.19 123.91 936 135.87 934.87 139.96 934.13 140.13 934.11
 140.69 934 142.26 933.7 147.64 932.68 151.24 932 153.9 931.83
 158.53 931.45 177.34 930 179.69 930 189.56 929.72 208.57 929.28
 210.24 929.31 275.59 928 362.44 928 413.03 928 430.29 928.49

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430.85	928.5	434.04	928.55	434.11	928.43	434.38	928	435.37	926.06
435.42	926	435.96	925.22	436.02	925.17	436.53	925.03	440.72	924
441.16	924	443.57	924.61	447.27	924.94	448.43	925.87	450.36	926
454.8	926.27	459.96	926.65	528.73	928.39	528.77	928.41	528.82	928.43
533.83	930	538.24	931.38	540.23	932	541.75	932.49	546.66	934
548.26	934.51	553.19	936	554.61	936.46	559.48	938	577.6	939.07
590.07	939.69	591.24	939.73	595.65	940	597.48	940	613.88	940.57
624.97	940.82	637.69	941.46	647.48	942	656.53	942.42	661.12	942.55
670.37	942.89	676.39	943.05	679.98	943.21	684.39	943.31	688.66	943.57
694.37	944	723.14	945.97	723.56	946	723.64	946.01	723.7	946.01
723.86	946.02	753.12	948	771.15	950				

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

 0 .035 434.04 .035 459.96 .06

Bank Sta: Left Right Coeff Contr. Expan.
 434.04 459.96 .1 .3
 Ineffective Flow num= 1
 Sta L Sta R Elev Permanent
 0 409.82 930.1 T

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 Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
 Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Pressure and weir flow
 Submerged Inlet Cd =
 Submerged Inlet + Outlet Cd = .8
 Max Low Cord =

Additional Bridge Parameters

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

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Middle RS: 9831.906

INPUT
 Description:

Station Elevation Data num= 103

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	950	.62	949.94	1.97	949.77	2.65	949.68	12.72	948.44
16.26	948	24.3	947.03	31.67	946.22	33.25	946.14	36.05	946
46.56	945.46	48.89	945.34	50.99	945.18	55.91	944.9	57.95	944.68
60.1	944.52	63.02	944.39	65.19	944.24	68.53	944	77.67	943.2
87.53	942	88.02	941.94	88.59	941.86	92.27	941.19	98.96	940
100.01	939.81	102.09	939.46	109.74	938	113.2	937.35	117.77	936.75
122.15	936.19	123.91	936	135.87	934.87	139.96	934.13	140.13	934.11
140.69	934	142.26	933.7	147.64	932.68	151.24	932	153.9	931.83
158.53	931.45	177.34	930	179.69	930	189.56	929.72	208.57	929.28
210.24	929.31	275.59	928	362.44	928	413.03	928	430.29	928.49
430.85	928.5	434.04	928.55	434.11	928.43	434.38	928	435.37	926.06
435.42	926	435.96	925.22	436.02	925.17	436.53	925.03	440.72	924
441.16	924	443.57	924.61	447.27	924.94	448.43	925.87	450.36	926
454.8	926.27	459.96	926.65	528.73	928.39	528.77	928.41	528.82	928.43
533.83	930	538.24	931.38	540.23	932	541.75	932.49	546.66	934
548.26	934.51	553.19	936	554.61	936.46	559.48	938	577.6	939.07
590.07	939.69	591.24	939.73	595.65	940	597.48	940	613.88	940.57
624.97	940.82	637.69	941.46	647.48	942	656.53	942.42	661.12	942.55
670.37	942.89	676.39	943.05	679.98	943.21	684.39	943.31	688.66	943.57
694.37	944	723.14	945.97	723.56	946	723.64	946.01	723.7	946.01
723.86	946.02	753.12	948	771.15	950				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	434.04	.035	459.96	.06

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

434.04	459.96	9.93	158.21	292.75	.1	.3
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Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	409.82	930.1	T

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 929.25	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.70	* wt. n-Val.	* 0.035	* 0.035	* 0.060
* W.S. Elev (ft)	* 928.55	* Reach Len. (ft)	* 9.93	* 158.21	* 292.75
* Crit W.S. (ft)	* 928.55	* Flow Area (sq ft)	* 7.13	* 78.57	* 70.82
* E.G. Slope (ft/ft)	* 0.008112	* Area (sq ft)	* 88.40	* 78.57	* 70.82
* Q Total (cfs)	* 763.60	* Flow (cfs)	* 12.06	* 591.24	* 160.30
* Top Width (ft)	* 280.98	* Top width (ft)	* 185.82	* 25.92	* 69.24
* Vel Total (ft/s)	* 4.88	* Avg. vel. (ft/s)	* 1.69	* 7.53	* 2.26

OXF157-159Bridges.rep

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* Max Chl Dpth (ft) * 4.55 * Hydr. Depth (ft) * 0.29 * 3.03 * 1.02 *
* Conv. Total (cfs) * 8478.2 * Conv. (cfs) * 133.9 * 6564.5 * 1779.8 *
* Length Wtd. (ft) * 158.98 * Wetted Per. (ft) * 24.19 * 28.46 * 69.29 *
* Min Ch El (ft) * 924.00 * Shear (lb/sq ft) * 0.15 * 1.40 * 0.52 *
* Alpha * 1.89 * Stream Power (lb/ft s) * 771.15 * 0.00 * 0.00 *
* Frctn Loss (ft) * 0.97 * Cum Volume (acre-ft) * 8.01 * 6.60 * 5.36 *
* C & E Loss (ft) * 0.08 * Cum SA (acres) * 5.96 * 1.83 * 5.48 *
```

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

Warning: 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: Middle RS: 9559.249

INPUT

Description:

Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	924	57.9	924	101.99	944	228.9	944	264.2	928
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	518.5	942	564.97	957

Manning's n Values num= 3

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
 Left Levee Station= 228.9 Elevation= 944

CROSS SECTION OUTPUT Profile #PF 1

```

*****
* E.G. Elev (ft) * 928.16 * Element * Left OB * Channel * Right OB *
* Vel Head (ft) * 0.44 * 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) * 99.58 * 60.22 * 56.90 *
* E.G. Slope (ft/ft) * 0.004763 * Area (sq ft) * 99.58 * 60.22 * 56.90 *
* Q Total (cfs) * 763.60 * Flow (cfs) * 230.98 * 416.30 * 116.32 *
* Top Width (ft) * 199.46 * Top width (ft) * 141.31 * 14.75 * 43.39 *
* Vel Total (ft/s) * 3.52 * Avg. vel. (ft/s) * 2.32 * 6.91 * 2.04 *
* Max Chl Dpth (ft) * 4.69 * Hydr. Depth (ft) * 0.70 * 4.08 * 1.31 *
* Conv. Total (cfs) * 11063.9 * Conv. (cfs) * 3346.6 * 6031.8 * 1685.4 *
* Length Wtd. (ft) * 75.03 * Wetted Per. (ft) * 141.37 * 16.61 * 43.50 *
* Min Ch El (ft) * 923.03 * Shear (lb/sq ft) * 0.21 * 1.08 * 0.39 *
* Alpha * 2.28 * Stream Power (lb/ft s) * 564.97 * 228.90 * 0.00 *
* Frctn Loss (ft) * 0.36 * Cum Volume (acre-ft) * 7.99 * 6.34 * 4.93 *
* C & E Loss (ft) * 0.03 * Cum SA (acres) * 5.92 * 1.76 * 5.10 *
*****
    
```

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

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

defaulted to critical depth.

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

CROSS SECTION

RIVER: Bluestone Creek

REACH: Middle

RS: 9443.656

INPUT

Description:

```

Station Elevation Data num= 55
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
*****
0 924 60.05 924 101.1 944 219.6 944 256.44 926
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

 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
 Left Levee Station= 219.6 Elevation= 944

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 927.23	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.35	* Wt. n-Val.	* 0.035	* 0.035	* 0.100
* W.S. Elev (ft)	* 926.88	* Reach Len. (ft)	* 30.34	* 114.86	* 56.64
* Crit W.S. (ft)	* 926.74	* Flow Area (sq ft)	* 110.78	* 66.38	* 45.60
* E.G. Slope (ft/ft)	* 0.004727	* Area (sq ft)	* 110.78	* 66.38	* 45.60
* Q Total (cfs)	* 763.60	* Flow (cfs)	* 327.34	* 398.61	* 37.65
* Top Width (ft)	* 191.67	* Top Width (ft)	* 108.54	* 20.75	* 62.38
* Vel Total (ft/s)	* 3.43	* Avg. vel. (ft/s)	* 2.95	* 6.00	* 0.83
* Max Chl Dpth (ft)	* 4.02	* Hydr. Depth (ft)	* 1.02	* 3.20	* 0.73
* Conv. Total (cfs)	* 11106.0	* Conv. (cfs)	* 4760.9	* 5797.5	* 547.6
* Length Wtd. (ft)	* 80.93	* Wetted Per. (ft)	* 108.77	* 22.50	* 62.78
* Min Ch El (ft)	* 922.86	* Shear (lb/sq ft)	* 0.30	* 0.87	* 0.21
* Alpha	* 1.92	* Stream Power (lb/ft s)	* 495.25	* 219.60	* 0.00
* Frctn Loss (ft)	* 0.17	* Cum Volume (acre-ft)	* 7.94	* 6.19	* 4.80
* C & E Loss (ft)	* 0.06	* Cum SA (acres)	* 5.86	* 1.71	* 4.96

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

This may indicate the need for additional cross sections.

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

CROSS SECTION

RIVER: Bluestone Creek
REACH: Middle RS: 9322.807

INPUT

Description:

Station	Elevation	Data	num=	63					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	924	102.02	944	191.63	944	226.4	928	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

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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	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
 Left Levee Station= 191.63 Elevation= 944

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)	* 925.06	* Flow Area (sq ft)	* 93.49	* 118.36	* 173.89
* E.G. Slope (ft/ft)	* 0.001147	* Area (sq ft)	* 93.49	* 118.36	* 173.89
* Q Total (cfs)	* 763.60	* Flow (cfs)	* 149.67	* 454.09	* 159.84
* Top Width (ft)	* 174.57	* Top width (ft)	* 79.51	* 24.87	* 70.19
* Vel Total (ft/s)	* 1.98	* Avg. Vel. (ft/s)	* 1.60	* 3.84	* 0.92
* Max Chl Dpth (ft)	* 5.57	* Hydr. Depth (ft)	* 1.18	* 4.76	* 2.48
* Conv. Total (cfs)	* 22549.9	* Conv. (cfs)	* 4420.0	* 13409.7	* 4720.3
* Length wtd. (ft)	* 57.28	* wetted Per. (ft)	* 79.56	* 27.15	* 70.42
* Min Ch El (ft)	* 921.28	* Shear (lb/sq ft)	* 0.08	* 0.31	* 0.18
* Alpha	* 2.41	* Stream Power (lb/ft s)	* 452.79	* 191.63	* 0.00
* Frctn Loss (ft)	* 0.15	* Cum Volume (acre-ft)	* 7.87	* 5.95	* 4.66
* C & E Loss (ft)	* 0.09	* Cum SA (acres)	* 5.79	* 1.65	* 4.88

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

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

This may indicate the need for additional cross sections.

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

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Middle

RS: 9266.019

INPUT
Description:

Station Elevation Data num= 72									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	952	56.9	946	64.95	944	75.5	944	158.53	944
201.45	930	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)	* 7.74	* 5.83	* 4.55
* C & E Loss (ft)	* 0.18	* Cum SA (acres)	* 5.67	* 1.62	* 4.82

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

for the water surface and continued on with the calculations.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
 Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
 Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Middle RS: 9003.470

INPUT
 Description:

Station Elevation Data		num= 73		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	64.3	950
123.3	930	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	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	71.3	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

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

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* 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)	* 7.71	* 5.45	* 4.46
* C & E Loss (ft)	* 0.04	* Cum SA (acres)	* 5.63	* 1.48	* 4.66

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Middle RS: 8906.253

INPUT

Description:

Station Elevation Data num= 63

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	976	46.1	976	144.2	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
0	.035	311.14	.035	321.29	.1

Bank Sta: Left	Right	Lengths: Left	Channel	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

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* 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)	* 7.53	* 5.34	* 4.43
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 5.45	* 1.44	* 4.65

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Middle RS: 8843.186

INPUT
 Description:

Station Elevation Data		num= 65									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	976	103.93	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)	* 7.20	* 5.29	* 4.37
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 5.15	* 1.43	* 4.61

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= 57		Sta		Elev		Sta		Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	975	99.94	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	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
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
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OXF157-159Bridges.rep

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* 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) * 7.01 * 5.03 * 4.32 *
* C & E Loss (ft) * 0.04 * Cum SA (acres) * 4.98 * 1.36 * 4.58 *
*****

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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
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

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*****
* 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 *

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* 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)	*	* 6.40	*	* 4.64	*	* 4.27	*
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	*	* 4.58	*	* 1.26	*	* 4.55	*

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
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
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

OXF157-159Bridges.rep

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*****
* 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) * 5.47  * 4.43  * 4.20  *
* C & E Loss (ft)   * 0.02  * Cum SA (acres)   * 3.85  * 1.21  * 4.49  *
*****

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Warning: The energy loss was 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
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

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*****
* 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) * 5.38  * 4.21  * 3.58  *
* C & E Loss (ft)   * 0.02  * Cum SA (acres)    * 3.75  * 1.15  * 3.71  *
*****
    
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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		

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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
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

	*	920.16	*	Element	*	Left OB	*	Channel	*	Right OB	*
* 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	*
* 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)	*	5.30	*	4.03	*	3.13	*
* C & E Loss (ft)	*	0.06	*	Cum SA (acres)	*	3.65	*	1.09	*	3.14	*

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

This may indicate the need for additional cross sections.

CROSS SECTION

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	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	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	.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

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* Frctn Loss (ft) * 0.67 * Cum Volume (acre-ft) * 5.14 * 3.80 * 2.33 *
 * C & E Loss (ft) * 0.03 * Cum SA (acres) * 3.55 * 1.02 * 2.10 *

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

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	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
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

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* 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)	* 3.62	* 3.62	* 2.29
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 2.61	* 0.97	* 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: Middle RS: 6893.619

INPUT
 Description:

Station Elevation Data		num= 82		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
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) * 3.43 * 3.27 * 2.02 *
 * C & E Loss (ft) * 0.01 * Cum SA (acres) * 2.46 * 0.86 * 1.61 *

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: 6579.154

INPUT

Description:

Station Elevation Data num= 86
 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

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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
* 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)	* 95.65	* 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)	* 0.54	* Cum Volume (acre-ft)	* 3.33	* 2.88	* 1.69
* C & E Loss (ft)	* 0.05	* Cum SA (acres)	* 2.34	* 0.73	* 1.18

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)	* 914.28	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.34	* wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 913.94	* Reach Len. (ft)	* 241.25	* 133.84	* 29.29
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 115.46	* 48.01	* 49.01
* E.G. Slope (ft/ft)	* 0.005382	* Area (sq ft)	* 115.46	* 48.01	* 49.01
* Q Total (cfs)	* 855.60	* Flow (cfs)	* 411.59	* 305.76	* 138.25
* Top Width (ft)	* 165.31	* Top width (ft)	* 94.25	* 14.23	* 56.82
* Vel Total (ft/s)	* 4.03	* Avg. vel. (ft/s)	* 3.56	* 6.37	* 2.82
* Max Chl Dpth (ft)	* 3.99	* Hydr. Depth (ft)	* 1.22	* 3.37	* 0.86
* Conv. Total (cfs)	* 11663.2	* Conv. (cfs)	* 5610.6	* 4168.0	* 1884.5
* Length wtd. (ft)	* 136.64	* wetted Per. (ft)	* 94.29	* 16.42	* 56.85
* Min Ch El (ft)	* 909.95	* Shear (lb/sq ft)	* 0.41	* 0.98	* 0.29
* Alpha	* 1.35	* Stream Power (lb/ft s)	* 344.66	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.59	* Cum Volume (acre-ft)	* 3.11	* 2.76	* 1.61
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 2.12	* 0.70	* 1.08

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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
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

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 101.4 149.05 912.44 T
 181.06 264.42 912.44 T

Blocked Obstructions num= 1

Sta L Sta R Elev
 0 83.33 914.5

CROSS SECTION OUTPUT Profile #PF 1

```

*****
* E.G. Elev (ft)      * 913.70 * Element          * Left OB * Channel * Right OB *
* Vel Head (ft)      * 0.33  * Wt. n-Val.      * 0.035  * 0.035  * 0.035  *
* W.S. Elev (ft)     * 913.37 * Reach Len. (ft) * 13.44  * 13.44  * 13.44  *
* Crit W.S. (ft)     * 913.16 * Flow Area (sq ft) * 50.57  * 54.14  * 153.85  *
* E.G. Slope (ft/ft) * 0.003504 * Area (sq ft)    * 103.67 * 54.14  * 230.69  *
* Q Total (cfs)      * 855.60 * Flow (cfs)      * 130.33 * 352.68 * 372.59  *
* Top width (ft)     * 223.20 * Top width (ft)  * 48.51  * 12.26  * 162.43  *
* Vel Total (ft/s)   * 3.31  * Avg. vel. (ft/s) * 2.58  * 6.51  * 2.42  *
* Max Chl Dpth (ft) * 4.96  * Hydr. Depth (ft) * 1.04  * 4.42  * 0.95  *
* Conv. Total (cfs) * 14454.3 * Conv. (cfs)     * 2201.8 * 5958.0 * 6294.5  *
* Length wtd. (ft)  * 13.44 * wetted Per. (ft) * 48.70  * 12.97  * 162.63  *
* Min Ch El (ft)    * 908.41 * Shear (lb/sq ft) * 0.23  * 0.91  * 0.21  *
* Alpha             * 1.92  * Stream Power (lb/ft s) * 380.19 * 0.00  * 0.00  *
* Frctn Loss (ft)   *        * Cum Volume (acre-ft) * 2.51  * 2.60  * 1.52  *
* C & E Loss (ft)   *        * Cum SA (acres)   * 1.73  * 0.66  * 1.01  *
*****
    
```

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

BRIDGE

RIVER: Bluestone Creek
 REACH: Middle RS: 6303.783

INPUT

Description:
 Distance from Upstream XS = 13.44
 Deck/Roadway width = 13
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates

```

num= 7
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
*****
94.9 914 127.1 912.75 145.06 912.44
149.06 912.44 910.6 181.06 912.44 910.6 185.06 912.44
272.5 912.52
    
```

Upstream Bridge Cross Section Data

```

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
    
```

OXF157-159Bridges.rep

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
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 Coeff Contr. Expan.
 153.07 165.33 .1 .3

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 101.4 149.05 912.44 T
 181.06 264.42 912.44 T

Blocked Obstructions num= 1
 Sta L Sta R Elev

 0 83.33 914.5

Downstream Deck/Roadway Coordinates num= 7
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord

 12.2 912.75 143.2 912.44 147.2 912.44 910.6
 179.2 912.44 910.6 183.2 912.44 270.6 912.52
 275.8 912.54

Downstream Bridge Cross Section Data 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
 65.01 915.6 67.94 915.63 69.32 915.44 85.09 914.42 89.83 914.14

OXF157-159Bridges.rep

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 Coeff Contr. Expan.
 151.88 165.38 .1 .3

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 135.75 912.44 T
 189.55 361.44 912.44 T

Blocked Obstructions num= 1
 Sta L Sta R Elev

 251.31 361.44 912.3

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 Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
 Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Pressure and weir flow
 Submerged Inlet Cd =
 Submerged Inlet + Outlet Cd = .8
 Max Low Cord =

Additional Bridge Parameters

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

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	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		
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	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

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 0 135.75 912.44 T
 189.55 361.44 912.44 T

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)      * 912.94 * Element          * Left OB * Channel * Right OB *
* Vel Head (ft)      * 0.97  * Wt. n-Val.      * 0.035  * 0.035  * 0.035  *
* W.S. Elev (ft)     * 911.97 * Reach Len. (ft) * 17.53  * 109.18 * 143.43 *
* Crit W.S. (ft)     * 911.97 * Flow Area (sq ft) * 29.37  * 40.08  * 42.10  *
* E.G. Slope (ft/ft) * 0.012094 * Area (sq ft)    * 46.17  * 40.08  * 70.06  *
* Q Total (cfs)      * 855.60 * Flow (cfs)      * 204.35 * 366.70 * 284.55 *
* Top Width (ft)     * 112.70 * Top width (ft)  * 40.51  * 13.50  * 58.69  *
* Vel Total (ft/s)   * 7.67  * Avg. Vel. (ft/s) * 6.96  * 9.15  * 6.76  *
* Max Chl Dpth (ft) * 3.90  * Hydr. Depth (ft) * 1.82  * 2.97  * 1.74  *
* Conv. Total (cfs)  * 7780.0 * Conv. (cfs)     * 1858.2 * 3334.4 * 2587.4 *
* Length wtd. (ft)  * 80.01 * Wetted Per. (ft) * 16.15  * 14.61  * 24.18  *
* Min Ch El (ft)    * 908.07 * Shear (lb/sq ft) * 1.37  * 2.07  * 1.31  *
* Alpha              * 1.06  * Stream Power (lb/ft s) * 361.44 * 0.00  * 0.00  *
* Frctn Loss (ft)   * 0.44  * Cum Volume (acre-ft) * 2.47  * 2.57  * 1.42  *
* C & E Loss (ft)   * 0.20  * Cum SA (acres)   * 1.69  * 0.65  * 0.90  *
*****
    
```

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: Middle

RS: 6179.412

INPUT

Description:

```

Station Elevation Data      num=      54
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
    
```

OXF157-159Bridges.rep

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)	* 2.43	* 2.45	* 1.24
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 1.66	* 0.61	* 0.75

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

OXF157-159Bridges.rep

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)	* 2.20	* 2.30	* 1.06
* C & E Loss (ft)	* 0.12	* Cum SA (acres)	* 1.49	* 0.58	* 0.64

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

for the water surface and continued on with the calculations.

Warning: 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

OXF157-159Bridges.rep

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
* 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)	* 1.80	* 2.09	* 0.97
* C & E Loss (ft)	* 0.05	* Cum SA (acres)	* 1.21	* 0.52	* 0.58

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

* 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)	* 1.40	* 1.85	* 0.82
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 0.93	* 0.46	* 0.51

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	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		
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
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

OXF157-159Bridges.rep

```

*****
* 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)  * 70.15 * 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)   * 0.35  * Cum Volume (acre-ft) * 1.22   * 1.67   * 0.74   *
* C & E Loss (ft)   * 0.14  * Cum SA (acres)   * 0.77   * 0.41   * 0.47   *
*****

```

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: 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

INPUT

Description:

Station Elevation Data		num=		84							
Sta	Elev	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		

OXF157-159Bridges.rep

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

Blocked Obstructions num= 1
 Sta L Sta R Elev

 0 124.18 907.83

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 907.87	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.52	* Wt. n-Val.	* 0.035	* 0.035	* 0.100
* W.S. Elev (ft)	* 907.35	* Reach Len. (ft)	* 6.86	* 80.28	* 173.13
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 7.31	* 146.55	* 0.94
* E.G. Slope (ft/ft)	* 0.003156	* Area (sq ft)	* 7.31	* 146.55	* 0.94
* Q Total (cfs)	* 865.00	* Flow (cfs)	* 13.03	* 851.48	* 0.49
* Top Width (ft)	* 48.73	* Top width (ft)	* 11.23	* 36.13	* 1.37
* Vel Total (ft/s)	* 5.59	* Avg. Vel. (ft/s)	* 1.78	* 5.81	* 0.52
* Max Chl Dpth (ft)	* 4.51	* Hydr. Depth (ft)	* 0.65	* 4.06	* 0.69
* Conv. Total (cfs)	* 15396.9	* Conv. (cfs)	* 231.9	* 15156.2	* 8.7
* Length Wtd. (ft)	* 68.13	* Wetted Per. (ft)	* 11.31	* 38.55	* 1.93
* Min Ch El (ft)	* 902.84	* Shear (lb/sq ft)	* 0.13	* 0.75	* 0.10
* Alpha	* 1.07	* Stream Power (lb/ft s)	* 285.23	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.14	* Cum Volume (acre-ft)	* 1.21	* 1.47	* 0.74
* C & E Loss (ft)	* 0.11	* Cum SA (acres)	* 0.77	* 0.36	* 0.47

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

OXF157-159Bridges.rep

```

*****
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  30.52          .1          .3
Ineffective Flow      num=      2
Sta L  Sta R  Elev  Permanent
107.2  159.36  905.51  T
199.76  219  906.09  T

```

CROSS SECTION OUTPUT Profile #PF 1

```

*****
* E.G. Elev (ft)      * 907.63 * Element      * Left OB * Channel * Right OB *
* Vel Head (ft)      * 0.17  * wt. n-Val.   * 0.035  * 0.035  * 0.060  *
* W.S. Elev (ft)     * 907.46 * Reach Len. (ft) * 7.50  * 7.50  * 7.50  *
* Crit W.S. (ft)     * 906.44 * Flow Area (sq ft) * 171.03 * 77.76 * 77.87 *
* E.G. Slope (ft/ft) * 0.001404 * Area (sq ft) * 261.67 * 77.76 * 82.95 *
* Q Total (cfs)      * 865.00 * Flow (cfs) * 413.04 * 341.94 * 110.02 *
* Top width (ft)     * 148.83 * Top width (ft) * 91.14 * 16.44 * 41.25 *
* Vel Total (ft/s)   * 2.65  * Avg. Vel. (ft/s) * 2.42  * 4.40  * 1.41  *
* Max Chl Dpth (ft) * 5.04  * Hydr. Depth (ft) * 1.88  * 4.73  * 1.89  *
* Conv. Total (cfs) * 23085.7 * Conv. (cfs) * 11023.4 * 9125.9 * 2936.4 *
* Length wtd. (ft)  * 7.50  * wetted Per. (ft) * 91.43 * 16.92 * 41.44 *
* Min Ch El (ft)    * 902.42 * Shear (lb/sq ft) * 0.16  * 0.40  * 0.16  *
* Alpha              * 1.52  * Stream Power (lb/ft s) * 390.15 * 0.00  * 0.00  *
* Frctn Loss (ft)   *      * Cum Volume (acre-ft) * 1.19  * 1.26  * 0.57  *
* C & E Loss (ft)   *      * Cum SA (acres) * 0.76  * 0.31  * 0.38  *
*****

```

RIVER: Bluestone Creek
 REACH: Middle RS: 5395.595

INPUT

Description:
 Distance from Upstream XS = 7.5
 Deck/Roadway Width = 13
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates

num= 8

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
88.7	905.51				122.2	906				158.6	906.09			
162.6	906.09	904.25			194.6	906.09	904.25			198.6	906.09			
210	906.42				225.4	906.91								

Upstream Bridge Cross Section Data

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 Coeff Contr. Expan.
 165.5 181.94 .1 .3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
107.2	159.36	905.51	T
199.76	219	906.09	T

Downstream Deck/Roadway Coordinates

num= 9											
Sta Hi Cord Lo Cord				Sta Hi Cord Lo Cord				Sta Hi Cord Lo Cord			
76.7	905.51			102.8	906			139.1	906.09		
143.1	906.09	904.25		175.1	906.09	904.25		179.1	906.09		
191.4	906.42			206.6	906.91			248.7	910		

Downstream Bridge Cross Section Data

Station Elevation Data num= 87											
Sta	Elev	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 Coeff Contr. Expan.
 146.19 158.14 .1 .3

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 110 130.6 905.51 T
 182.97 222.2 906.09 T

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 Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy

Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Pressure and Weir flow

Submerged Inlet Cd =

Submerged Inlet + Outlet Cd = .8

Max Low Cord =

Additional Bridge Parameters

Add Friction component to Momentum

Do not add weight component to Momentum

Class B flow critical depth computations use critical depth
inside the bridge at the upstream end

Criteria to check for pressure flow = Upstream energy grade line

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	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
Ineffective Flow	num=		2				
Sta L	Sta R	Elev	Permanent				
110	130.6	905.51	T				
182.97	222.2	906.09	T				

CROSS SECTION OUTPUT Profile #PF 1

```

*****
* E.G. Elev (ft)          * 907.14 * Element          * Left OB * Channel * Right OB *
* Vel Head (ft)          * 0.15 * Wt. n-Val.      * 0.035 * 0.035 * 0.035 *
* W.S. Elev (ft)         * 906.98 * Reach Len. (ft) * 110.49 * 88.75 * 69.17 *
* Crit W.S. (ft)         *          * Flow Area (sq ft) * 137.26 * 54.95 * 121.64 *
* E.G. Slope (ft/ft)     * 0.001477 * Area (sq ft)    * 160.58 * 54.95 * 156.13 *
* Q Total (cfs)          * 865.00 * Flow (cfs)      * 317.66 * 244.96 * 302.39 *
* Top width (ft)         * 157.64 * Top width (ft)  * 81.16 * 11.95 * 64.52 *
* Vel Total (ft/s)       * 2.76 * Avg. Vel. (ft/s) * 2.31 * 4.46 * 2.49 *
* Max Chl Dpth (ft)      * 4.70 * Hydr. Depth (ft) * 1.69 * 4.60 * 1.89 *
* Conv. Total (cfs)      * 22503.9 * Conv. (cfs)     * 8264.2 * 6372.9 * 7866.9 *
* Length wtd. (ft)       * 85.74 * wetted Per. (ft) * 81.28 * 12.17 * 64.70 *
* Min Ch El (ft)         * 902.28 * Shear (lb/sq ft) * 0.16 * 0.42 * 0.17 *
* Alpha                  * 1.28 * Stream Power (lb/ft s) * 380.55 * 0.00 * 0.00 *
* Frctn Loss (ft)        * 0.26 * Cum Volume (acre-ft) * 1.10 * 1.23 * 0.52 *
* C & E Loss (ft)        * 0.08 * Cum SA (acres)  * 0.70 * 0.30 * 0.35 *
*****
    
```

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

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

This may indicate the need for additional cross sections.

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	

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

CROSS SECTION OUTPUT Profile #PF 1

* 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)	* 0.89	* 1.12	* 0.31
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 0.59	* 0.27	* 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: Middle RS: 5071.499

INPUT
 Description:

Station Elevation Data		num= 84		Sta Elev		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	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		
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	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)	* 0.56	* 0.83	* 0.22
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 0.36	* 0.19	* 0.15

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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	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	.1	.3

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)   * 139.38 * 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)    * 0.30  * Cum Volume (acre-ft) * 0.25  * 0.51  * 0.18  *
* C & E Loss (ft)    * 0.31  * 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: 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

OXF157-159Bridges.rep

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)	* 901.53	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.15	* Wt. n-Val.	* 0.100	* 0.035	* 0.060
* W.S. Elev (ft)	* 901.38	* Reach Len. (ft)	* 20.21	* 20.21	* 20.21
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 220.71	* 158.69	* 145.20
* E.G. Slope (ft/ft)	* 0.000948	* Area (sq ft)	* 220.71	* 158.69	* 145.20
* Q Total (cfs)	* 865.00	* Flow (cfs)	* 152.63	* 589.80	* 122.57
* Top Width (ft)	* 273.22	* Top width (ft)	* 118.70	* 30.93	* 123.59
* Vel Total (ft/s)	* 1.65	* Avg. vel. (ft/s)	* 0.69	* 3.72	* 0.84
* Max Chl Dpth (ft)	* 5.56	* Hydr. Depth (ft)	* 1.86	* 5.13	* 1.17
* Conv. Total (cfs)	* 28095.8	* Conv. (cfs)	* 4957.7	* 19157.0	* 3981.1
* Length wtd. (ft)	* 20.21	* Wetted Per. (ft)	* 118.75	* 33.10	* 124.64
* Min Ch El (ft)	* 895.82	* Shear (lb/sq ft)	* 0.11	* 0.28	* 0.07
* Alpha	* 3.53	* Stream Power (lb/ft s)	* 443.09	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.04	* Cum Volume (acre-ft)	* 0.05	* 0.06	* 0.06
* C & E Loss (ft)	* 0.05	* 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
0	920	9.22	919.66	22.51	919.17	53.59	918.21	59.01	918.14

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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

Ineffective Flow num= 1
 Sta L Sta R Elev Permanent
 334.44 381.3 901.44 T

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)	* 901.45	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.70	* wt. n-Val.	* 0.100	* 0.035	* 0.060
* W.S. Elev (ft)	* 900.74	* Reach Len. (ft)	* 19.00	* 19.00	* 19.00
* Crit W.S. (ft)	* 900.31	* Flow Area (sq ft)	* 0.52	* 112.01	* 62.93
* E.G. slope (ft/ft)	* 0.005239	* Area (sq ft)	* 0.52	* 112.01	* 107.97
* Q Total (cfs)	* 914.40	* Flow (cfs)	* 0.25	* 799.27	* 114.88
* Top width (ft)	* 130.72	* Top width (ft)	* 1.53	* 29.70	* 99.50
* Vel Total (ft/s)	* 5.21	* Avg. Vel. (ft/s)	* 0.48	* 7.14	* 1.83
* Max Chl Dpth (ft)	* 4.99	* Hydr. Depth (ft)	* 0.34	* 3.77	* 1.00
* Conv. Total (cfs)	* 12632.6	* Conv. (cfs)	* 3.5	* 11042.1	* 1587.0
* Length wtd. (ft)	* 19.00	* Wetted Per. (ft)	* 1.70	* 31.66	* 62.77
* Min Ch El (ft)	* 895.75	* Shear (lb/sq ft)	* 0.10	* 1.16	* 0.33
* Alpha	* 1.65	* Stream Power (lb/ft s)	* 522.73	* 0.00	* 0.00
* Frctn Loss (ft)	*	* Cum volume (acre-ft)	* 3.83	* 7.84	* 4.48
* C & E Loss (ft)	*	* Cum SA (acres)	* 2.18	* 1.73	* 2.54

RIVER: Bluestone Creek
 REACH: Lower RS: 4657.419

INPUT
 Description:
 Distance from Upstream XS = 19
 Deck/Roadway Width = 13
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates

num= 10														
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
292.6		902			294.4	901.44				298.4	901.44			899.6
330.4	901.44		899.6		334.4	901.44				382.9	900			
400.2	899.4				419.4	900				442.4	902			
522.73	914													

Upstream Bridge Cross Section Data

Station Elevation Data num= 82									
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 Coeff Contr. Expan.
 297.85 327.55 .1 .3

Ineffective Flow num= 1
 Sta L Sta R Elev Permanent
 334.44 381.3 901.44 T

Blocked Obstructions num= 1

Sta L Sta R Elev

 343.69 522.73 899.45

Downstream Deck/Roadway Coordinates

num= 10
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord

 294.9 902 324.1 901.44 328.1 901.44 899.6
 360.1 901.44 899.6 364.1 901.44 390.3 900
 410.04 899.4 431.35 900 455.8 902
 521 914

Downstream Bridge Cross Section Data

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
 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 Coeff Contr. Expan.
 335.96 356.51 .1 .3

Ineffective Flow num= 1
 Sta L Sta R Elev Permanent
 0 324.1 901.44 T

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 Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy

Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Pressure and Weir flow

Submerged Inlet Cd =
 Submerged Inlet + Outlet Cd = .8
 Max Low Cord =

Additional Bridge Parameters

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

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
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
 Ineffective Flow num= 1
 Sta L Sta R Elev Permanent
 0 324.1 901.44 T

CROSS SECTION OUTPUT Profile #PF 1

```
*****
* E.G. Elev (ft)      * 900.46 * 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) * 19.54  * 72.36  * 114.92 *
* E.G. Slope (ft/ft) * 0.008219 * Area (sq ft)    * 19.91  * 72.36  * 114.92 *
* Q Total (cfs)      * 914.40 * Flow (cfs)      * 36.29  * 602.66 * 275.45 *
* Top width (ft)     * 138.01 * Top width (ft)  * 13.34  * 20.55  * 104.12 *
* Vel Total (ft/s)   * 4.42  * Avg. vel. (ft/s) * 1.86   * 8.33   * 2.40   *
* Max Chl Dpth (ft) * 4.13  * Hydr. Depth (ft) * 1.65   * 3.52   * 1.10   *
* Conv. Total (cfs) * 10086.0 * Conv. (cfs)     * 400.3  * 6647.4 * 3038.3 *
* Length wtd. (ft)  * 41.64 * Wetted Per. (ft) * 12.07  * 22.74  * 104.19 *
* Min Ch El (ft)    * 895.59 * Shear (lb/sq ft) * 0.83   * 1.63   * 0.57   *
* Alpha             * 2.43  * Stream Power (lb/ft s) * 521.70 * 0.00   * 0.00   *
* Frctn Loss (ft)  * 0.24  * Cum Volume (acre-ft) * 3.82   * 7.73   * 4.38   *
* C & E Loss (ft)   * 0.13  * Cum SA (acres)   * 2.18   * 1.71   * 2.44   *
*****
```

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

for the water surface and continued on with the calculations.

Warning: The energy loss was 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= 76

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	924	72.03	930.3	104.95	926.46	241.39	907.97	272.23	903.38
282.37	902.24	285.46	900.75	287.95	902	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

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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)	* 20.93	* 55.67	* 144.85
* E.G. Slope (ft/ft)	* 0.004331	* Area (sq ft)	* 20.93	* 55.67	* 144.85
* Q Total (cfs)	* 914.40	* Flow (cfs)	* 45.27	* 303.53	* 565.60
* Top Width (ft)	* 137.45	* Top width (ft)	* 30.69	* 19.38	* 87.38
* Vel Total (ft/s)	* 4.13	* Avg. vel. (ft/s)	* 2.16	* 5.45	* 3.90
* Max chl Dpth (ft)	* 3.58	* Hydr. Depth (ft)	* 0.68	* 2.87	* 1.66
* Conv. Total (cfs)	* 13894.5	* Conv. (cfs)	* 687.8	* 4612.2	* 8594.5
* Length Wtd. (ft)	* 163.17	* Wetted Per. (ft)	* 30.72	* 20.42	* 87.67
* Min ch El (ft)	* 895.41	* Shear (lb/sq ft)	* 0.18	* 0.74	* 0.45
* Alpha	* 1.15	* Stream Power (lb/ft s)	* 538.72	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.60	* Cum Volume (acre-ft)	* 3.82	* 7.63	* 4.33
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 2.18	* 1.68	* 2.40

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Lower RS: 4258.834

INPUT
 Description:
 Station Elevation Data num= 84

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Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	934	20.62	938.5	35.4	937.2	50.14	935.47	91	918
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	198.6	902	209.6	897.34	212.8	898.89	228.3	899.52
240.6	899.28	243.8	898.16	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
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Blocked Obstructions num= 1

Sta L	Sta R	Elev
0	215.4	898.9

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)	* 898.28	* Reach Len. (ft)	* 15.43	* 180.39	* 150.97
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 89.06	* 123.71	* 0.46
* E.G. Slope (ft/ft)	* 0.003174	* Area (sq ft)	* 89.06	* 123.71	* 0.46
* Q Total (cfs)	* 914.40	* Flow (cfs)	* 218.71	* 695.51	* 0.19
* Top Width (ft)	* 118.21	* Top width (ft)	* 85.57	* 31.56	* 1.08
* Vel Total (ft/s)	* 4.29	* Avg. vel. (ft/s)	* 2.46	* 5.62	* 0.40
* Max Chl Dpth (ft)	* 5.11	* Hydr. Depth (ft)	* 1.04	* 3.92	* 0.43
* Conv. Total (cfs)	* 16229.5	* Conv. (cfs)	* 3881.8	* 12344.4	* 3.3
* Length Wtd. (ft)	* 156.43	* Wetted Per. (ft)	* 85.62	* 34.33	* 1.38
* Min Ch El (ft)	* 893.17	* Shear (lb/sq ft)	* 0.21	* 0.71	* 0.07
* Alpha	* 1.39	* Stream Power (lb/ft s)	* 415.64	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.77	* Cum Volume (acre-ft)	* 3.79	* 7.34	* 3.89
* C & E Loss (ft)	* 0.05	* Cum SA (acres)	* 2.15	* 1.60	* 2.13

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

1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Lower RS: 4054.239

INPUT
 Description:

Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	941.3	10.99	941.26	21.99	940.09	66.66	918	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	134.88	908
158.33	896.61	161.4	898.11	171.8	898.4	182.2	897.89	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	* 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	* 151.47
* E.G. Slope (ft/ft)	* 0.008511	* Area (sq ft)	* 73.60	* 151.47	* 151.47
* Q Total (cfs)	* 914.40	* Flow (cfs)	* 651.39	* 263.01	* 263.01
* Top width (ft)	* 124.53	* Top width (ft)	* 18.55	* 105.97	* 105.97
* Vel Total (ft/s)	* 4.06	* Avg. vel. (ft/s)	* 8.85	* 1.74	* 1.74
* Max Chl Dpth (ft)	* 4.99	* Hydr. Depth (ft)	* 3.97	* 1.43	* 1.43
* Conv. Total (cfs)	* 9911.8	* Conv. (cfs)	* 7060.9	* 2850.9	* 2850.9

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* 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)  * 3.78  * 6.93 * 3.63 *
* C & E Loss (ft)      * 0.01  * Cum SA (acres)        * 2.13  * 1.49 * 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: Lower

RS: 3934.570

INPUT

Description:

Station Elevation Data		num= 64									
Sta	Elev	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	34.88	910		
65.74	896.02	69.4	897.35	81.65	897.24	93.89	896.45	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.   *         *         *         *
* 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 * 149.37 *
* E.G. Slope (ft/ft) * 0.009531 * Area (sq ft) *         * 74.90 * 149.37 *
* Q Total (cfs)      * 914.40 * Flow (cfs)    *         * 650.54 * 263.86 *
* 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) * 9366.2 * Conv. (cfs)   *         * 6663.5 * 2702.7 *
* Length Wtd. (ft)  * 93.49 * Wetted Per. (ft) *         * 24.69 * 111.15 *
* Min Ch El (ft)    * 891.76 * Shear (lb/sq ft) *         * 1.80 * 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) * 3.78 * 6.73 * 3.27 *
* C & E Loss (ft)   * 0.19  * Cum SA (acres) * 2.13 * 1.44 * 1.69 *
*****
    
```

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

for the water surface and continued on with the calculations.

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

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

This may indicate the need for additional cross sections.

Warning: 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= 80		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	920	7.71	918	12.86	916.64	13.48	916	29.86	907.75
32.98	909.13	43.2	909.32	53.45	908.81	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

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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
* 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)	* 3.71	* 6.49	* 3.15
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 2.10	* 1.38	* 1.62

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Lower RS: 3679.344

INPUT

Description:

Station Elevation Data num= 74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	917	17.8	908.03	20.8	909.5	30.95	909.83	41.1	909.35
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

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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)	* 3.47	* 6.21	* 2.90
* C & E Loss (ft)	* 0.05	* Cum SA (acres)	* 1.99	* 1.32	* 1.49

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=	56	Sta	Elev	Sta	Elev	Sta	Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

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*****
0      904      1.5  902.83      4.8  904.23      15.9  904.25      26.9  903.5
30.2   901.9   35.15   904      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

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Manning's n Values      num=      3
Sta      n Val      Sta      n Val      Sta      n Val
*****
0      .06   62.87      .035   79.66      .1

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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) * 3.31 * 5.95 * 2.69 *
* C & E Loss (ft) * 0.05 * Cum SA (acres) * 1.91 * 1.26 * 1.38 *
*****

```

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Lower RS: 3438.299

INPUT

Description:

```

Station Elevation Data      num=      74
Sta      Elev      Sta      Elev      Sta      Elev      Sta      Elev
*****

```

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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
72.61	896	75.5	897.44	85.5	897.3	95.5	897.4	98.2	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)	* 3.17	* 5.70	* 2.53
* C & E Loss (ft)	* 0.07	* Cum SA (acres)	* 1.82	* 1.20	* 1.30

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

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

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Lower

RS: 3282.877

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	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	41.7	897.73		
51.7	898.13	61.7	897.74	65.2	896	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	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)	* 1.20	* Cum Volume (acre-ft)	* 3.00	* 5.38	* 2.50
* C & E Loss (ft)	* 0.08	* Cum SA (acres)	* 1.69	* 1.12	* 1.26

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

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

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Lower RS: 3129.654

INPUT
 Description:

Station Elevation Data num= 69

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	55.1	898	64.6	893.2
67.7	894.7	77.7	895.06	87.6	894.63	92.9	892	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)	* 891.75	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 1.03	* Wt. n-Val.	* 0.060	* 0.035	*
* w.s. Elev (ft)	* 890.72	* Reach Len. (ft)	* 41.42	* 177.15	* 191.92
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 0.03	* 112.10	*
* E.G. Slope (ft/ft)	* 0.007870	* Area (sq ft)	* 0.03	* 112.10	*
* Q Total (cfs)	* 914.40	* Flow (cfs)	* 0.01	* 914.39	*

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* Top width (ft)      * 32.06 * Top width (ft)      * 0.62 * 31.44 *
* Vel Total (ft/s)   * 8.15 * Avg. Vel. (ft/s)   * 0.26 * 8.16 *
* Max Chl Dpth (ft)  * 4.11 * Hydr. Depth (ft)   * 0.04 * 3.57 *
* Conv. Total (cfs)  * 10307.4 * Conv. (cfs)        * 0.1 * 10307.3 *
* Length Wtd. (ft)   * 149.21 * Wetted Per. (ft)   * 0.66 * 35.17 *
* Min Ch El (ft)     * 886.61 * Shear (lb/sq ft)   * 0.02 * 1.57 *
* Alpha              * 1.00 * Stream Power (lb/ft s) * 251.32 * 0.00 * 0.00 *
* Frctn Loss (ft)    * 0.73 * Cum Volume (acre-ft) * 2.99 * 5.05 * 2.46 *
* C & E Loss (ft)    * 0.20 * Cum SA (acres)     * 1.66 * 1.03 * 1.22 *
*****

```

Warning: Divided flow computed for this cross-section.

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

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

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Lower

RS: 2951.927

INPUT
 Description:

Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	908.12	1.19	908	3.23	908	6.78	906.8	9.26	906
46	887.85	49.3	889.23	60.36	888.93	71.4	888.11	72.05	888
81.63	886.67	81.99	886.58	83.4	886.54	90.81	886.38	98.79	886.12
101.06	886.12	101.09	886.12	101.1	886.12	105.46	886.83	116.85	888
122.73	888.47	129.85	889.05	133.31	889.2	135.43	889	135.45	888.99
136.26	888	137.32	886.78	137.9	886	138.17	885.73	138.81	885.19
153.57	885.52	154.19	886	155.46	887.19	156.45	888	157.77	888.97
158.24	889.41	159.55	889.91	162.78	891.13	165.23	892	169.05	893.47
170.53	894	173.86	895.16	175.09	895.58	176.25	896	177.64	896.43
183.13	898	188.56	899.58	190.02	900	191.17	900.32	195.17	901.45
197.15	902	201.59	903.22	202.74	903.5	204.78	904	207.94	904.56
214.36	906	255.68	916						

Manning's n Values num= 3

Sta	n Val	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 5.71 75.59 135.21 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

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* E.G. Elev (ft)	* 890.83	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.38	* Wt. n-Val.	* 0.100	* 0.035	* 0.100
* W.S. Elev (ft)	* 890.44	* Reach Len. (ft)	* 5.71	* 75.59	* 135.21
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 244.85	* 99.95	* 2.00
* E.G. Slope (ft/ft)	*0.003438	* Area (sq ft)	* 244.85	* 99.95	* 2.00
* Q Total (cfs)	* 1021.20	* Flow (cfs)	* 398.51	* 621.51	* 1.18
* Top width (ft)	* 120.22	* Top width (ft)	* 94.68	* 22.34	* 3.20
* Vel Total (ft/s)	* 2.94	* Avg. vel. (ft/s)	* 1.63	* 6.22	* 0.59
* Max Chl Dpth (ft)	* 5.25	* Hydr. Depth (ft)	* 2.59	* 4.47	* 0.62
* Conv. Total (cfs)	* 17417.5	* Conv. (cfs)	* 6796.9	* 10600.4	* 20.2
* Length Wtd. (ft)	* 52.70	* Wetted Per. (ft)	* 95.89	* 25.31	* 3.56
* Min Ch El (ft)	* 885.19	* Shear (lb/sq ft)	* 0.55	* 0.85	* 0.12
* Alpha	* 2.83	* Stream Power (lb/ft s)	* 255.68	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.19	* Cum volume (acre-ft)	* 2.87	* 4.62	* 2.46
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 1.62	* 0.92	* 1.22

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Lower RS: 2875.345

INPUT
 Description:

Station Elevation Data		num= 63		Sta Elev		Sta Elev		Sta Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	908	7.92	906	11.54	905.11	15.9	904	18.25	903.39
23.72	902	23.78	901.98	23.84	901.97	29.02	900.38	30.28	900
35.56	898.45	37.08	898	38.58	897.57	43.81	896	46.71	895.29
51.08	894	55.6	892.88	59.25	892	63.64	890.93	67.52	890
71.69	888.98	75.83	888	118.56	886.06	138.34	885.52	140.27	884.64
152.36	884.64	154.47	886	154.8	886.19	156.01	887.08	157.94	887.16
168.75	887.95	168.94	888	175.31	889.65	176.66	890	180.14	890.92
183.87	891.85	184.49	892	191.42	893.77	192.43	894	195.55	894.73
200.18	895.7	201.94	896	214.35	897.62	224.9	899.03	227.92	899.42
233.12	900	254.5	901.9	255.52	902	268.07	903.27	271.36	903.54
276.96	904	292.96	905.2	306.22	906	322.22	906.92	330.2	907.24
355.28	908	359.55	908.13	360.14	908.16	361.76	908.26	364.83	908.43
368	908.69	375.23	909.27	383.06	910				

Manning's n Values		num= 3		Sta n Val	
Sta	n Val	Sta	n Val	Sta	n Val
0	.1	138.34	.035	156.01	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
138.34	156.01	20.87	29.24	34.41	.1	.3
Ineffective Flow	num= 2	Permanent	T			
Sta L	Sta R	Elev				
78.63	134.4	887.26				

166.4 175 889.05 T

CROSS SECTION OUTPUT Profile #PF 1

```

*****
* E.G. Elev (ft)      * 890.63 * Element          * Left OB * Channel * Right OB *
* Vel Head (ft)      * 0.55  * Wt. n-Val.      * 0.100  * 0.035  * 0.100  *
* W.S. Elev (ft)     * 890.07 * Reach Len. (ft) * 2.60   * 2.60   * 2.60   *
* Crit W.S. (ft)     * 889.17 * Flow Area (sq ft) * 185.20 * 90.76  * 36.42  *
* E.G. Slope (ft/ft) * 0.003585 * Area (sq ft)    * 223.49 * 90.76  * 41.54  *
* Q Total (cfs)      * 1021.20 * Flow (cfs)      * 311.06 * 663.68 * 46.46  *
* Top Width (ft)     * 109.69 * Top Width (ft)  * 71.11  * 17.67  * 20.91  *
* Vel Total (ft/s)   * 3.27   * Avg. Vel. (ft/s) * 1.68   * 7.31   * 1.28   *
* Max Chl Dpth (ft) * 5.43   * Hydr. Depth (ft) * 2.60   * 5.14   * 1.74   *
* Conv. Total (cfs) * 17054.5 * Conv. (cfs)     * 5194.9 * 11083.7 * 775.9  *
* Length Wtd. (ft)  * 2.60   * Wetted Per. (ft) * 71.41  * 18.60  * 21.21  *
* Min Ch El (ft)    * 884.64 * Shear (lb/sq ft) * 0.58   * 1.09   * 0.38   *
* Alpha             * 3.34   * Stream Power (lb/ft s) * 383.06 * 0.00   * 0.00   *
* Frctn Loss (ft)   *         * Cum Volume (acre-ft) * 2.84   * 4.45   * 2.39   *
* C & E Loss (ft)   *         * Cum SA (acres)    * 1.61   * 0.88   * 1.18   *
*****
    
```

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

BRIDGE

RIVER: Bluestone Creek
 REACH: Lower RS: 2862.727

INPUT

Description:
 Distance from Upstream XS = 2.6
 Deck/Roadway width = 13
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates

```

num= 8
Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
*****
60.83 888 69.75 887.26 83.18 888
130.4 889.05 134.4 889.05 887.21 166.4 889.05 887.21
170.4 889.05 182.8 889
    
```

Upstream Bridge Cross Section Data

```

Station Elevation Data num= 63
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
*****
0 908 7.92 906 11.54 905.11 15.9 904 18.25 903.39
23.72 902 23.78 901.98 23.84 901.97 29.02 900.38 30.28 900
35.56 898.45 37.08 898 38.58 897.57 43.81 896 46.71 895.29
51.08 894 55.6 892.88 59.25 892 63.64 890.93 67.52 890
71.69 888.98 75.83 888 118.56 886.06 138.34 885.52 140.27 884.64
    
```

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152.36	884.64	154.47	886	154.8	886.19	156.01	887.08	157.94	887.16
168.75	887.95	168.94	888	175.31	889.65	176.66	890	180.14	890.92
183.87	891.85	184.49	892	191.42	893.77	192.43	894	195.55	894.73
200.18	895.7	201.94	896	214.35	897.62	224.9	899.03	227.92	899.42
233.12	900	254.5	901.9	255.52	902	268.07	903.27	271.36	903.54
276.96	904	292.96	905.2	306.22	906	322.22	906.92	330.2	907.24
355.28	908	359.55	908.13	360.14	908.16	361.76	908.26	364.83	908.43
368	908.69	375.23	909.27	383.06	910				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	138.34	.035	156.01	.1

Bank Sta: Left Right Coeff Contr. Expan.

138.34	156.01	.1	.3
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
78.63	134.4	887.26	T
166.4	175	889.05	T

Downstream Deck/Roadway Coordinates

num= 8

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
35.75	888				53.6	887.26				72.26	888			
116.8	889.05				120.8	889.05	887.21			152.8	889.05	887.21		
156.8	889.05				195.6	889								

Downstream Bridge Cross Section Data

Station Elevation Data num= 75

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	910	6.22	908.17	6.82	908	13.37	906.07	13.62	906
16.31	905.2	20.55	904	20.86	903.91	27.43	901.99	34.42	900
34.85	899.88	41.47	898	48.23	896.15	48.76	896	56.9	894.11
57.4	894.01	57.45	894	66.03	892.22	67.09	892	70.75	891.25
76.81	890	82.15	888.91	85.39	888	91.5	886.3	116.35	886.05
119.95	886	124.93	885.92	125	885.91	127.77	884.44	141.02	884.44
144.39	886.93	148.49	887.01	148.96	886.91	151.56	886.9	155.53	886.61
160.15	886	163.43	885.54	164.73	886	165.23	886	165.68	886.22
166.67	887	172.27	887.34	176.91	887.62	179.55	888	184.89	888.81
190.72	890	197.52	891.37	200.59	892	204.67	892.81	207.71	893.41
211.26	894	213.32	894.31	217.45	894.79	229.11	896	239.25	897.09
242.76	897.4	250.7	898.01	267.78	899.11	279.26	900	285.83	900.52
293.51	901.1	299.82	901.53	306.61	902	306.93	902.02	313.94	902.57
322.97	903.16	327.48	903.48	333.23	903.78	333.62	903.79	334.09	903.82
338.43	904	348.61	904.37	349.75	904.41	355.81	904.66	374.49	906

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

0 .1 124.93 .035 144.39 .035

Bank Sta: Left Right Coeff Contr. Expan.
 124.93 144.39 .1 .3
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 78.6 100.6 887.26 T
 152.8 188 889.05 T

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 Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy
 Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Pressure and weir flow
 Submerged Inlet Cd =
 Submerged Inlet + Outlet Cd = .8
 Max Low Cord =

Additional Bridge Parameters

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

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Lower RS: 2846.103

INPUT
 Description:

Station Elevation Data		num= 75									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	910	6.22	908.17	6.82	908	13.37	906.07	13.62	906		
16.31	905.2	20.55	904	20.86	903.91	27.43	901.99	34.42	900		
34.85	899.88	41.47	898	48.23	896.15	48.76	896	56.9	894.11		
57.4	894.01	57.45	894	66.03	892.22	67.09	892	70.75	891.25		
76.81	890	82.15	888.91	85.39	888	91.5	886.3	116.35	886.05		

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119.95	886	124.93	885.92	125	885.91	127.77	884.44	141.02	884.44
144.39	886.93	148.49	887.01	148.96	886.91	151.56	886.9	155.53	886.61
160.15	886	163.43	885.54	164.73	886	165.23	886	165.68	886.22
166.67	887	172.27	887.34	176.91	887.62	179.55	888	184.89	888.81
190.72	890	197.52	891.37	200.59	892	204.67	892.81	207.71	893.41
211.26	894	213.32	894.31	217.45	894.79	229.11	896	239.25	897.09
242.76	897.4	250.7	898.01	267.78	899.11	279.26	900	285.83	900.52
293.51	901.1	299.82	901.53	306.61	902	306.93	902.02	313.94	902.57
322.97	903.16	327.48	903.48	333.23	903.78	333.62	903.79	334.09	903.82
338.43	904	348.61	904.37	349.75	904.41	355.81	904.66	374.49	906

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	124.93	.035	144.39	.035

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

124.93	144.39	174.03	63.81	6.65	.1	.3
--------	--------	--------	-------	------	----	----

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
78.6	100.6	887.26	T
152.8	188	889.05	T

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 890.26	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.51	* Wt. n-Val.	* 0.100	* 0.035	* 0.035
* W.S. Elev (ft)	* 889.75	* Reach Len. (ft)	* 174.03	* 63.81	* 6.65
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 131.92	* 96.91	* 47.99
* E.G. Slope (ft/ft)	* 0.003398	* Area (sq ft)	* 142.73	* 96.91	* 112.02
* Q Total (cfs)	* 1021.20	* Flow (cfs)	* 226.33	* 672.33	* 122.54
* Top width (ft)	* 111.42	* Top width (ft)	* 46.87	* 19.46	* 45.08
* Vel Total (ft/s)	* 3.69	* Avg. vel. (ft/s)	* 1.72	* 6.94	* 2.55
* Max Chl Dpth (ft)	* 5.31	* Hydr. Depth (ft)	* 2.81	* 4.98	* 1.06
* Conv. Total (cfs)	* 17519.9	* Conv. (cfs)	* 3883.0	* 11534.5	* 2102.3
* Length Wtd. (ft)	* 66.18	* Wetted Per. (ft)	* 47.32	* 20.65	* 45.78
* Min Ch El (ft)	* 884.44	* Shear (lb/sq ft)	* 0.59	* 1.00	* 0.22
* Alpha	* 2.43	* Stream Power (lb/ft s)	* 374.49	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.22	* Cum volume (acre-ft)	* 2.77	* 4.40	* 2.35
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 1.57	* 0.87	* 1.15

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Lower RS: 2773.556

INPUT
 Description:

Station	Elevation	Data	num=	61	Sta	Elev	Sta	Elev	Sta	Elev	
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

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```
*****
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
113.71 888     115.9  889     127.1  889.42  138.2  889.04  150.02 890
163.82 892     175.78 894     188.14 896     195.99 897.38  201.3  898
215.1  899.67  228.13 898.26  234.72 900     254.56 906     280.39 906
322.01 898
```

```
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
Ineffective Flow      num=      1
Sta L  Sta R  Elev  Permanent
  95.4  322.01  889.05      T
Blocked Obstructions  num=      1
Sta L  Sta R  Elev
*****
127.1  322.01  889.42
```

CROSS SECTION OUTPUT Profile #PF 1

```
*****
* E.G. Elev (ft)      * 890.03 * Element      * Left OB * Channel * Right OB *
* Vel Head (ft)      * 0.56  * wt. n-Val.   * 0.100 * 0.035 * 0.035 *
* W.S. Elev (ft)     * 889.47 * Reach Len. (ft) * 88.56 * 82.82 * 18.59 *
* Crit W.S. (ft)     *      * Flow Area (sq ft) * 5.57 * 115.10 * 91.28 *
* E.G. Slope (ft/ft) * 0.003205 * Area (sq ft) * 5.57 * 115.10 * 119.83 *
* Q Total (cfs)      * 1021.20 * Flow (cfs) * 5.20 * 776.92 * 239.08 *
* Top width (ft)     * 106.57 * Top width (ft) * 3.82 * 22.78 * 79.98 *
* Vel Total (ft/s)   * 4.82 * Avg. vel. (ft/s) * 0.93 * 6.75 * 2.62 *
* Max Chl Dpth (ft) * 5.55 * Hydr. Depth (ft) * 1.46 * 5.05 * 1.14 *
* Conv. Total (cfs)  * 18039.6 * Conv. (cfs) * 91.9 * 13724.3 * 4223.4 *
* Length wtd. (ft)   * 71.89 * Wetted Per. (ft) * 4.76 * 24.45 * 80.23 *
* Min Ch El (ft)    * 883.92 * Shear (lb/sq ft) * 0.23 * 0.94 * 0.23 *
* Alpha             * 1.56 * Stream Power (lb/ft s) * 322.01 * 0.00 * 0.00 *
* Frctn Loss (ft)   * 0.37 * Cum Volume (acre-ft) * 2.48 * 4.25 * 2.33 *
* C & E Loss (ft)   * 0.09 * 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= 72

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	114.8	890	120.4	887.63	125.1	889.12	136.4	889.4
147.4	888.96	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	197.36	894	225.94	906
243.74	906	308.6	892						

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
 Right Levee Station= 105.18 Elevation= 890

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)	* 2.68	* 89.63	* 25.12
* E.G. Slope (ft/ft)	* 0.009447	* Area (sq ft)	* 2.68	* 89.63	* 25.12
* Q Total (cfs)	* 1021.20	* Flow (cfs)	* 3.37	* 908.50	* 109.33
* Top Width (ft)	* 46.02	* Top width (ft)	* 2.53	* 20.41	* 23.08
* Vel Total (ft/s)	* 8.70	* Avg. vel. (ft/s)	* 1.26	* 10.14	* 4.35
* Max Chl Dpth (ft)	* 4.79	* Hydr. Depth (ft)	* 1.06	* 4.39	* 1.09
* Conv. Total (cfs)	* 10506.7	* Conv. (cfs)	* 34.7	* 9347.2	* 1124.8
* Length Wtd. (ft)	* 168.31	* Wetted Per. (ft)	* 3.30	* 23.28	* 23.19

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```
* 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 * 105.18 *
* 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.

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

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
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
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

 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
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	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	51.8	.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
* 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	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	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	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		
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

OXF157-159Bridges.rep

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*****
* 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
0	900	3.28	898.86	5.79	898	7.47	897.42
15.35	894.44	16.75	894	17.93	893.63	22.92	892
29.17	890	35.05	888.36	36.29	888	38.23	887.43
47.53	884.74	49.95	884	50.68	883.76	50.98	883.66
56.79	882	66.45	882	87.72	881.89	89.13	881.88
93.19	881.92	96.73	881.7	102.39	881.33	103.96	881.22
117.45	880.15	119.05	880	121.35	879.74	122.15	879.66
126.41	878	127.09	877.64	128.26	877.31	148.11	877.31
148.84	878	150.38	879.83	150.57	880	150.62	880.03
153.89	880.71	161.76	880.36	169.9	880	194.12	880
196.59	882	197.12	882.39	199.36	884	199.94	884.42
202.95	886.61	204.89	888	206.62	889.18	207.73	890
210.61	892	210.69	892.05	213.29	894	214.63	894.92
218.26	897.56	218.82	898	219	898.12	219.13	898.23

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

Description:

```

Station Elevation Data      num=      67
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

 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

OXF157-159Bridges.rep

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
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
* 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

CROSS SECTION

RIVER: Bluestone Creek
 REACH: Lower

RS: 1387.656

INPUT
 Description:

OXF157-159Bridges.rep

Station Elevation Data		num= 70		Sta		Elev		Sta		Elev	
Sta	Elev	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	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

* 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
* 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

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.

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

* 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	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		
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

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* 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	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		
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

 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 .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
 Description:

Station Elevation Data num= 52

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
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 61.92 .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
*****
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
```

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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
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
* 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)	* 0.01	* 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	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	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

OXF157-159Bridges.rep

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* 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

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

OXF157-159Bridges.rep

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

OXF157-159Bridges.rep

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
* Vel Head (ft)	* 0.50	* Wt. n-Val.	* 0.035	* 0.035	* 0.035
* W.S. Elev (ft)	* 931.22	* Reach Len. (ft)	* 0.00	* 0.00	* 0.00
* Crit w.s. (ft)	* 931.22	* Flow Area (sq ft)	* 26.63	* 9.79	* 21.85
* E.G. Slope (ft/ft)	* 0.013317	* Area (sq ft)	* 26.63	* 9.79	* 21.85
* Q Total (cfs)	* 303.00	* Flow (cfs)	* 127.58	* 77.37	* 98.04
* Top width (ft)	* 56.69	* Top width (ft)	* 27.48	* 4.34	* 24.88
* Vel Total (ft/s)	* 5.20	* Avg. Vel. (ft/s)	* 4.79	* 7.90	* 4.49
* Max Chl Dpth (ft)	* 2.49	* Hydr. Depth (ft)	* 0.97	* 2.26	* 0.88
* Conv. Total (cfs)	* 2625.7	* Conv. (cfs)	* 1105.6	* 670.5	* 849.6
* Length wtd. (ft)	* 0.00	* Wetted Per. (ft)	* 27.53	* 4.78	* 24.94
* Min Ch El (ft)	* 928.73	* Shear (lb/sq ft)	* 0.80	* 1.70	* 0.73
* Alpha	* 1.19	* Stream Power (lb/ft s)	* 403.10	* 0.00	* 0.00
* Frctn Loss (ft)	* 0.00	* Cum volume (acre-ft)	*	*	*
* C & E Loss (ft)	* 0.10	* 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		Sta Elev		Sta Elev		Sta Elev	
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	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

OXF157-159Bridges.rep

```

* 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	Sta	Elev	Sta	Elev	Sta	Elev
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	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 82.26 .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

OXF157-159Bridges.rep

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

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	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
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
 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

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 *
 * Culv Nml 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

 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

OXF157-159Bridges.rep

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
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		.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
* 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

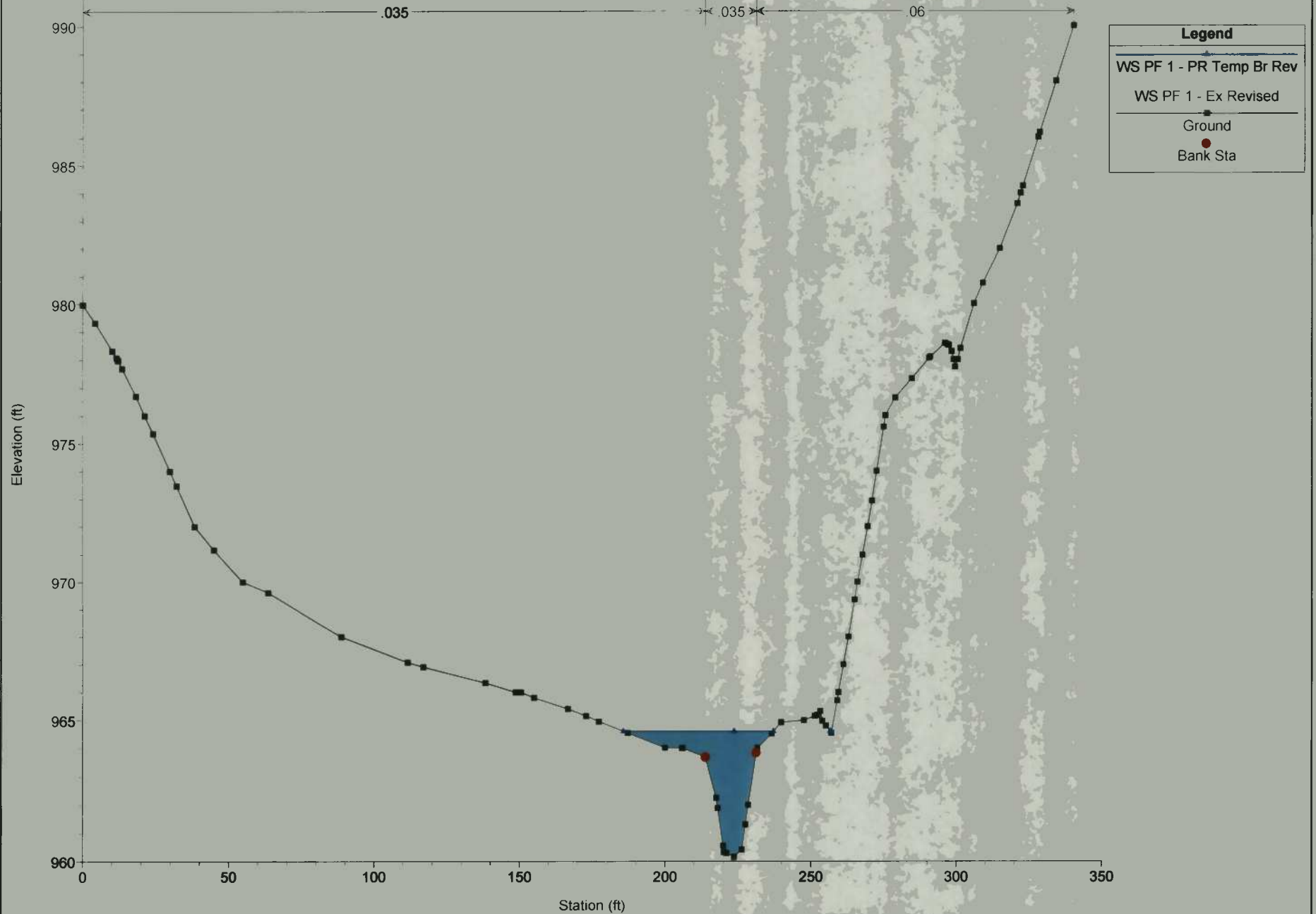
surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program

defaulted to critical depth.

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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Bluestone Creek RS = 14659.36

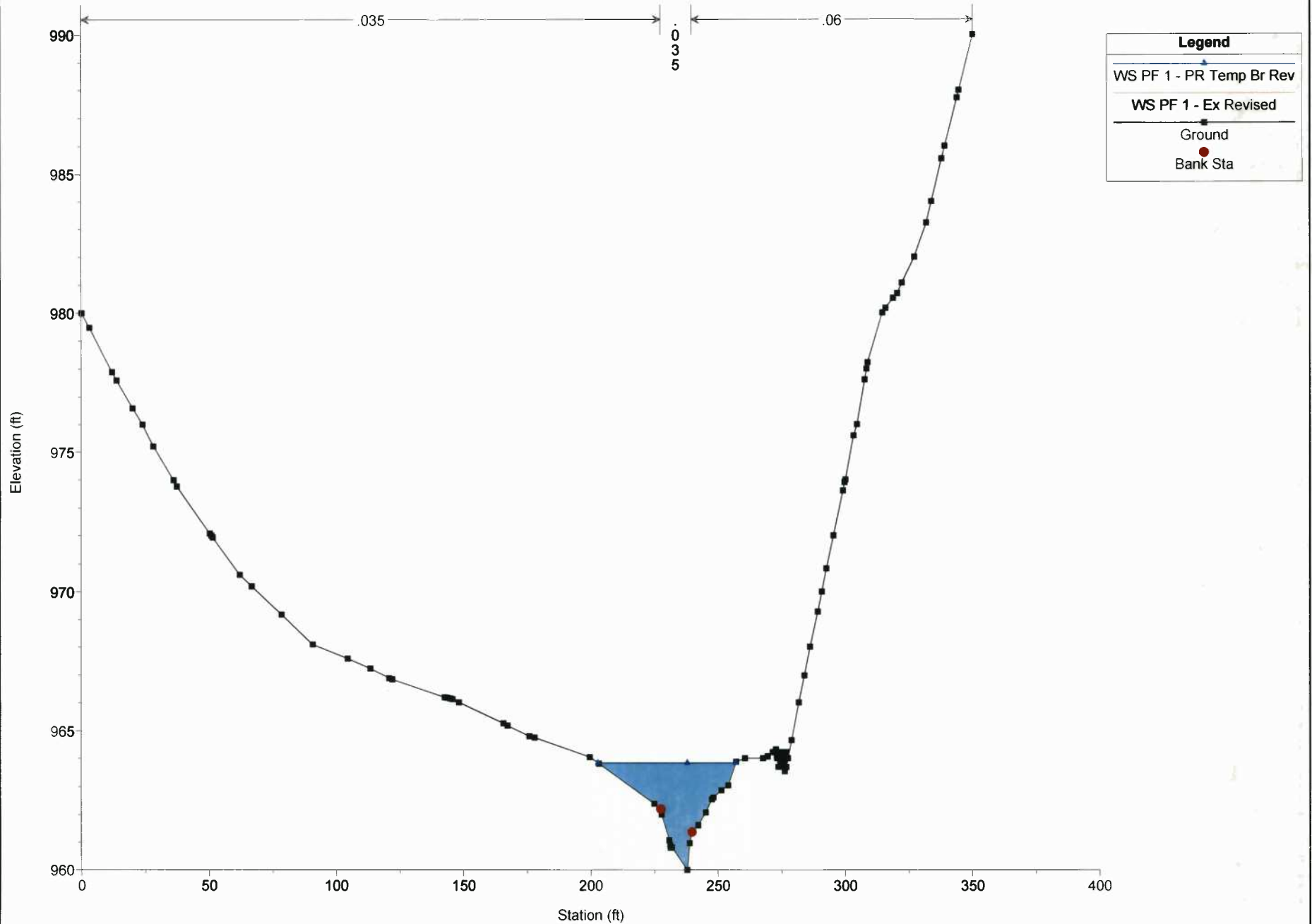


Legend

- 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

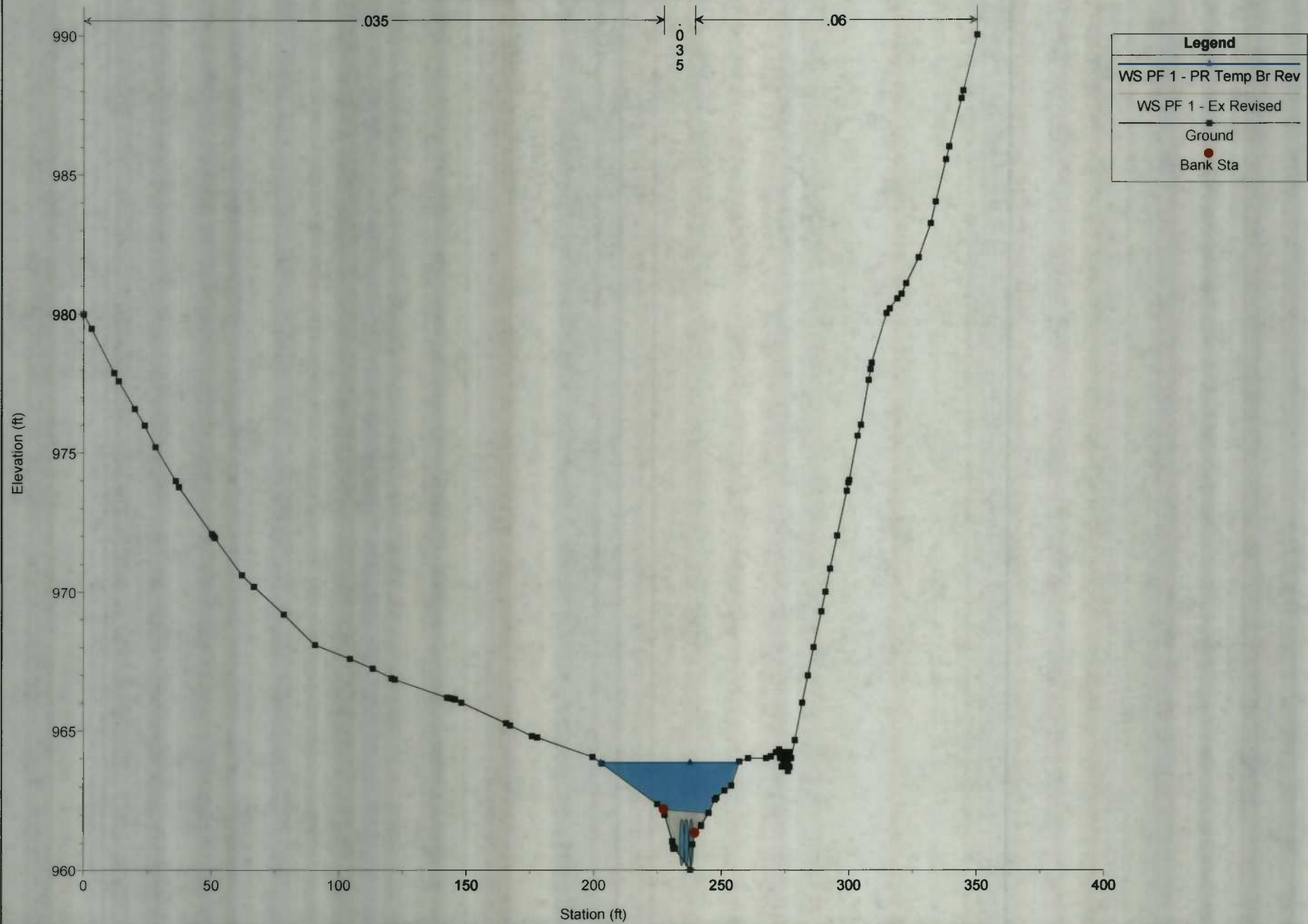
Geom: Proposed Temp Bridge Revised Flow: Structures Revised
River = Bluestone Creek Reach = Bluestone Creek RS = 14572.23



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

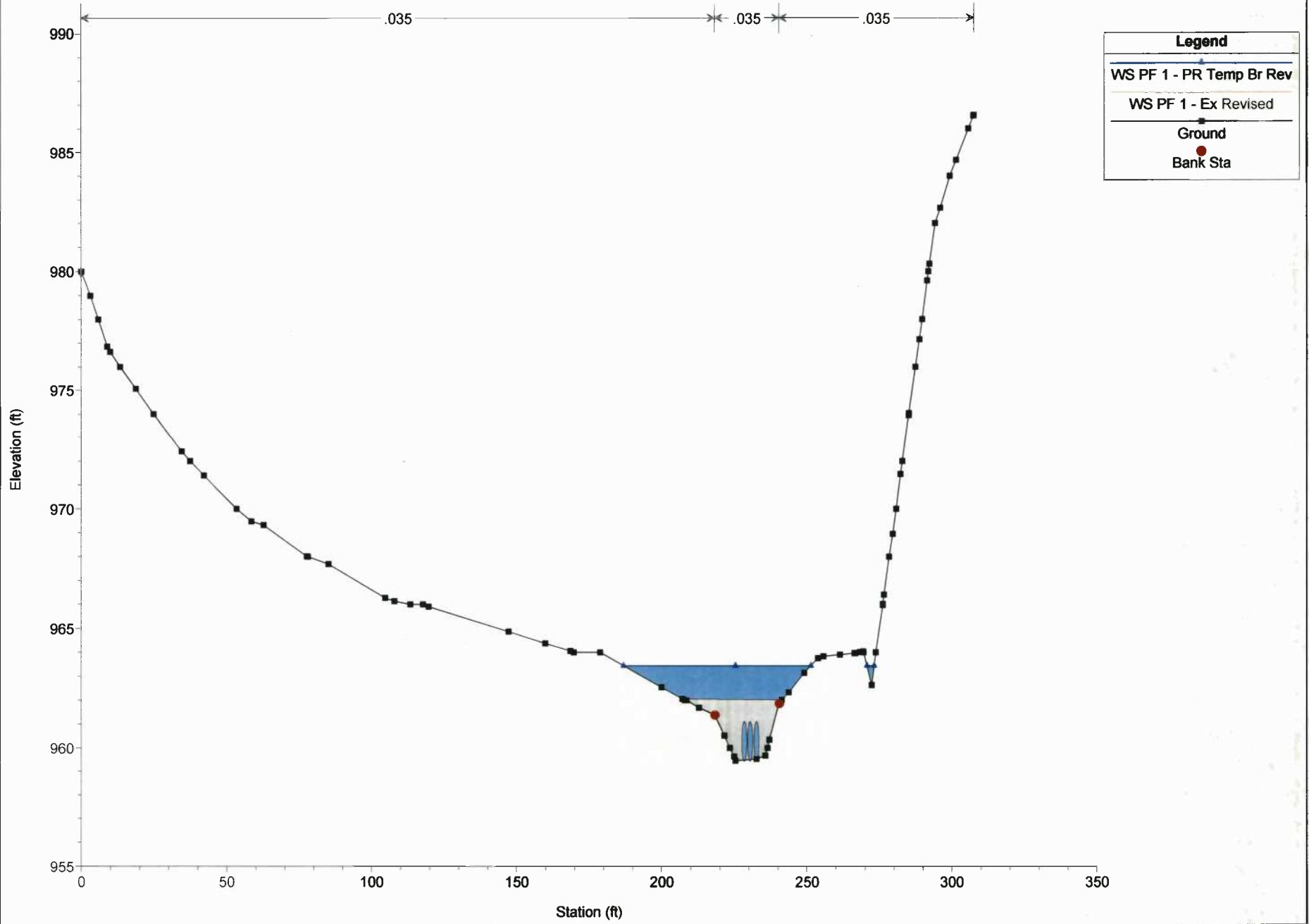
River = Bluestone Creek Reach = Bluestone Creek RS = 14557.54 Culv



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

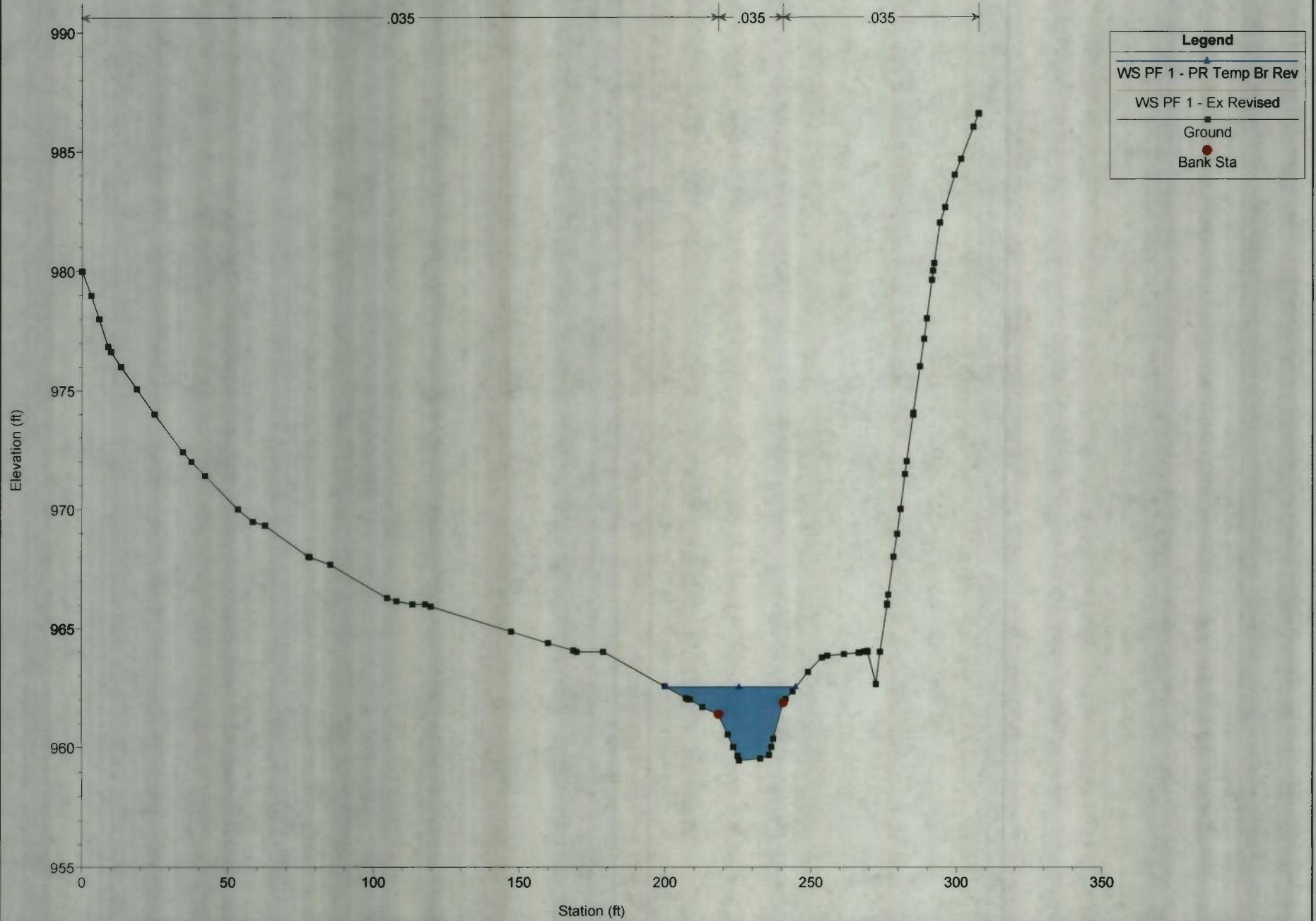
River = Bluestone Creek Reach = Bluestone Creek RS = 14557.54 Culv



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

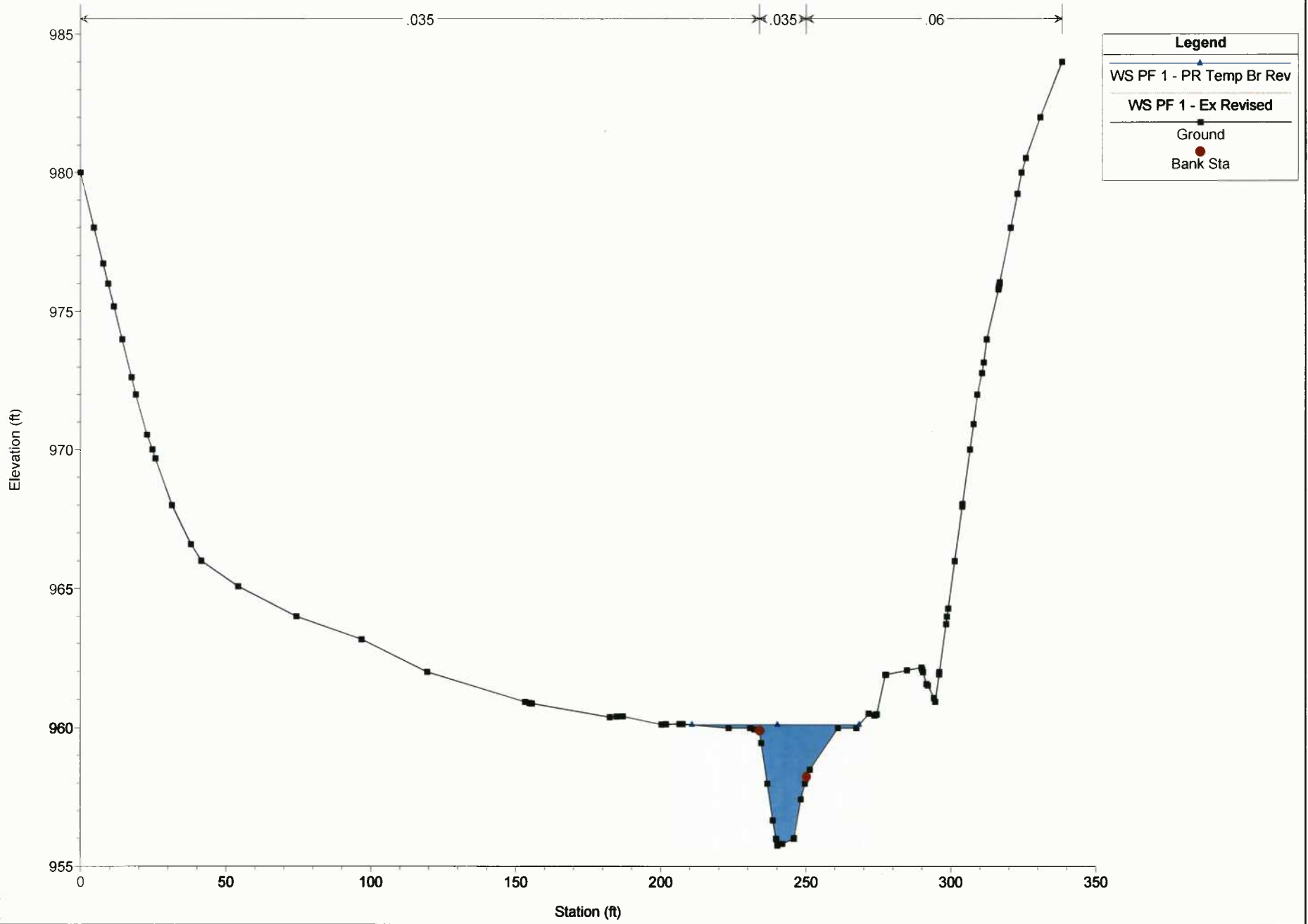
River = Bluestone Creek Reach = Bluestone Creek RS = 14543.33



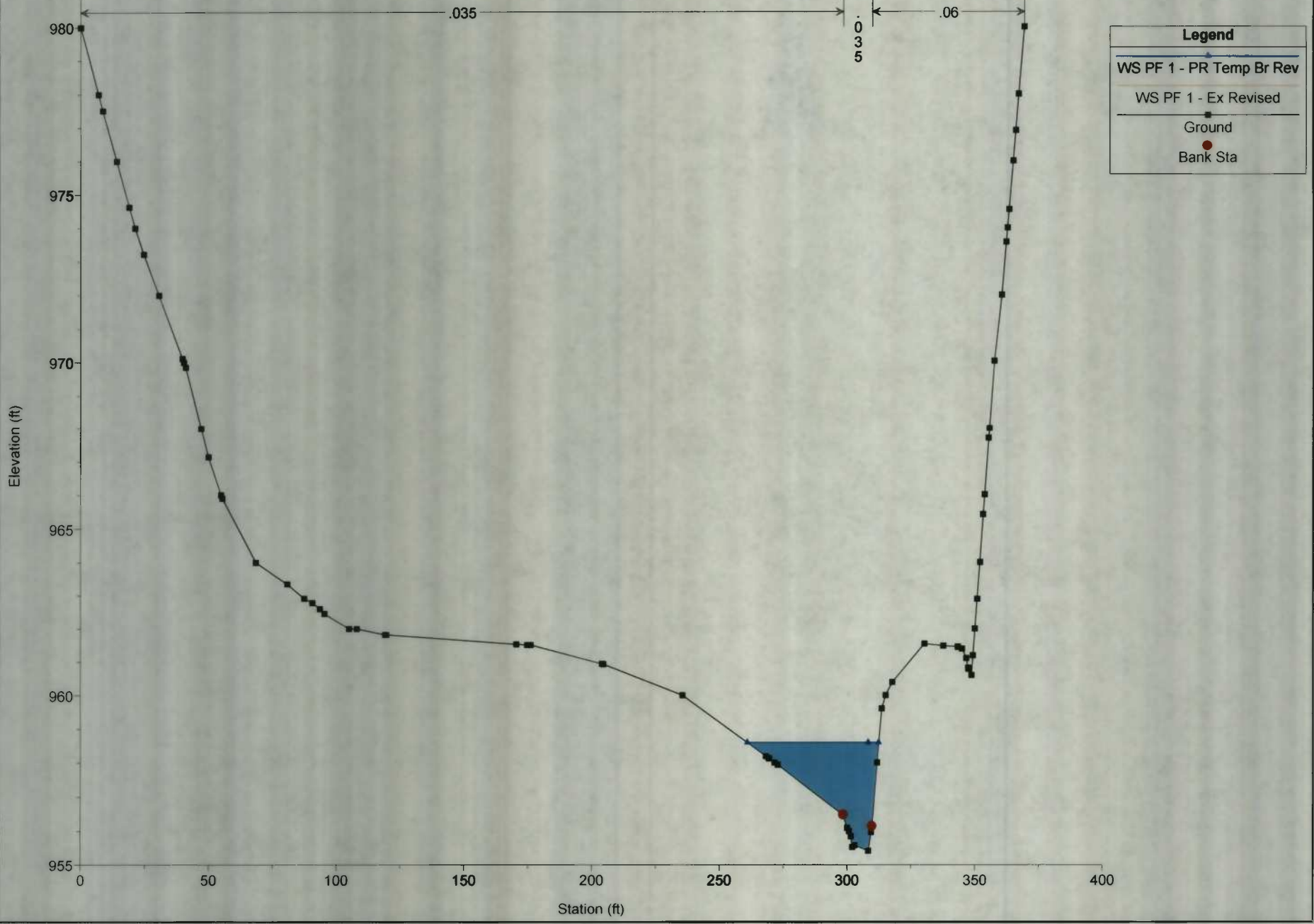
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Bluestone Creek RS = 14371.96



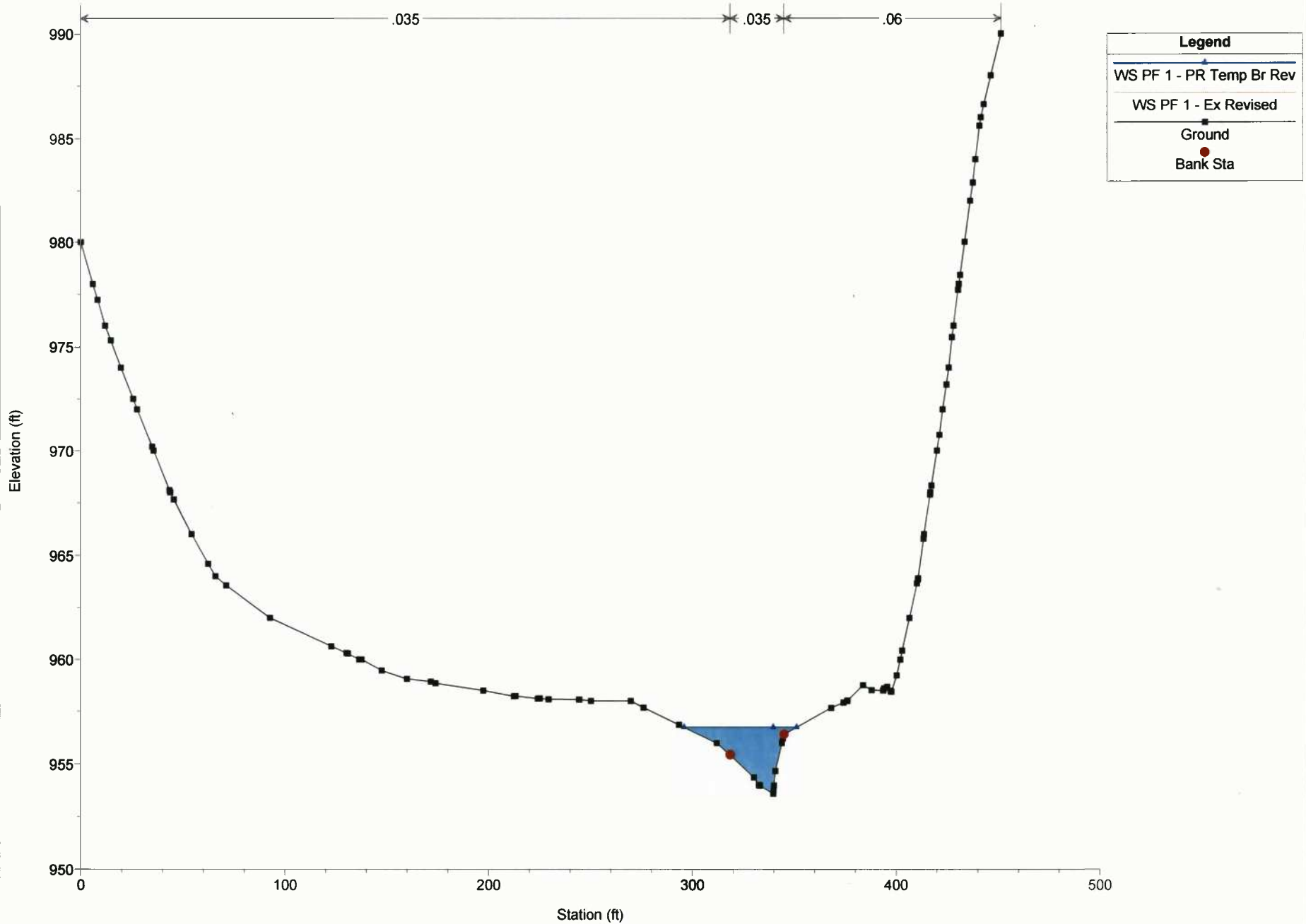
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised
 River = Bluestone Creek Reach = Bluestone Creek RS = 14193.22



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

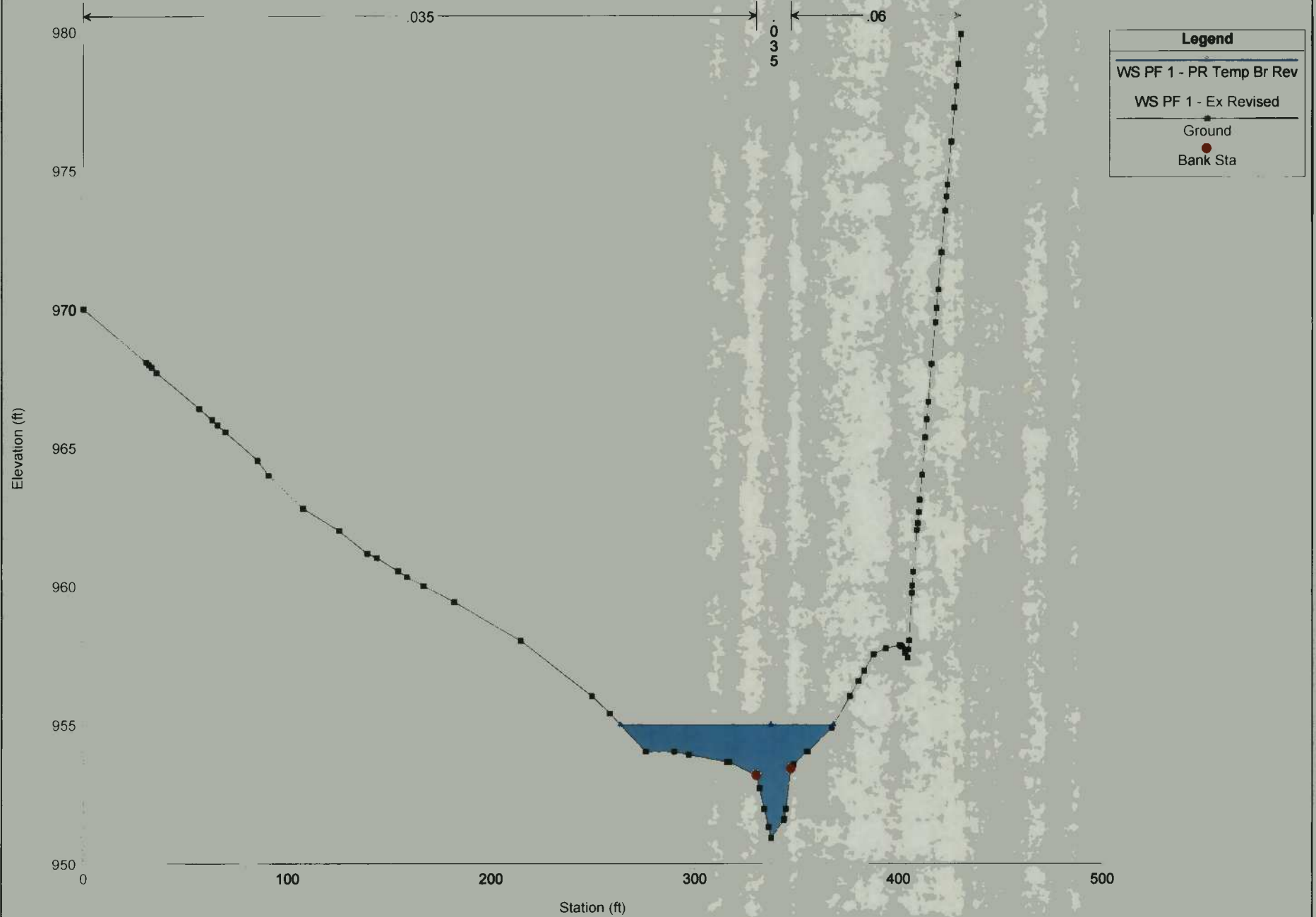
River = Bluestone Creek Reach = Bluestone Creek RS = 14044.56



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

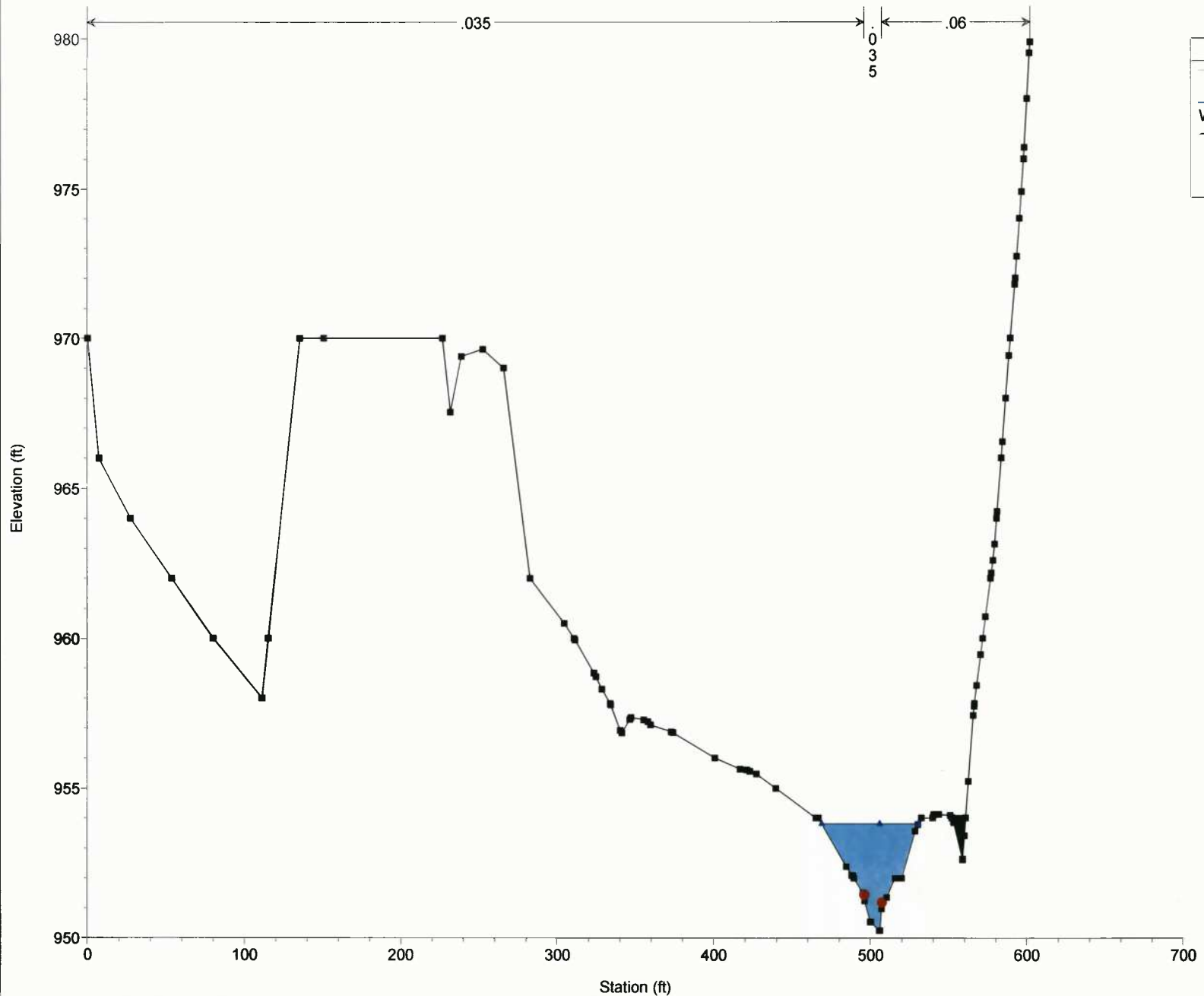
River = Bluestone Creek Reach = Bluestone Creek RS = 13852.52



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 = Bluestone Creek RS = 13658.52

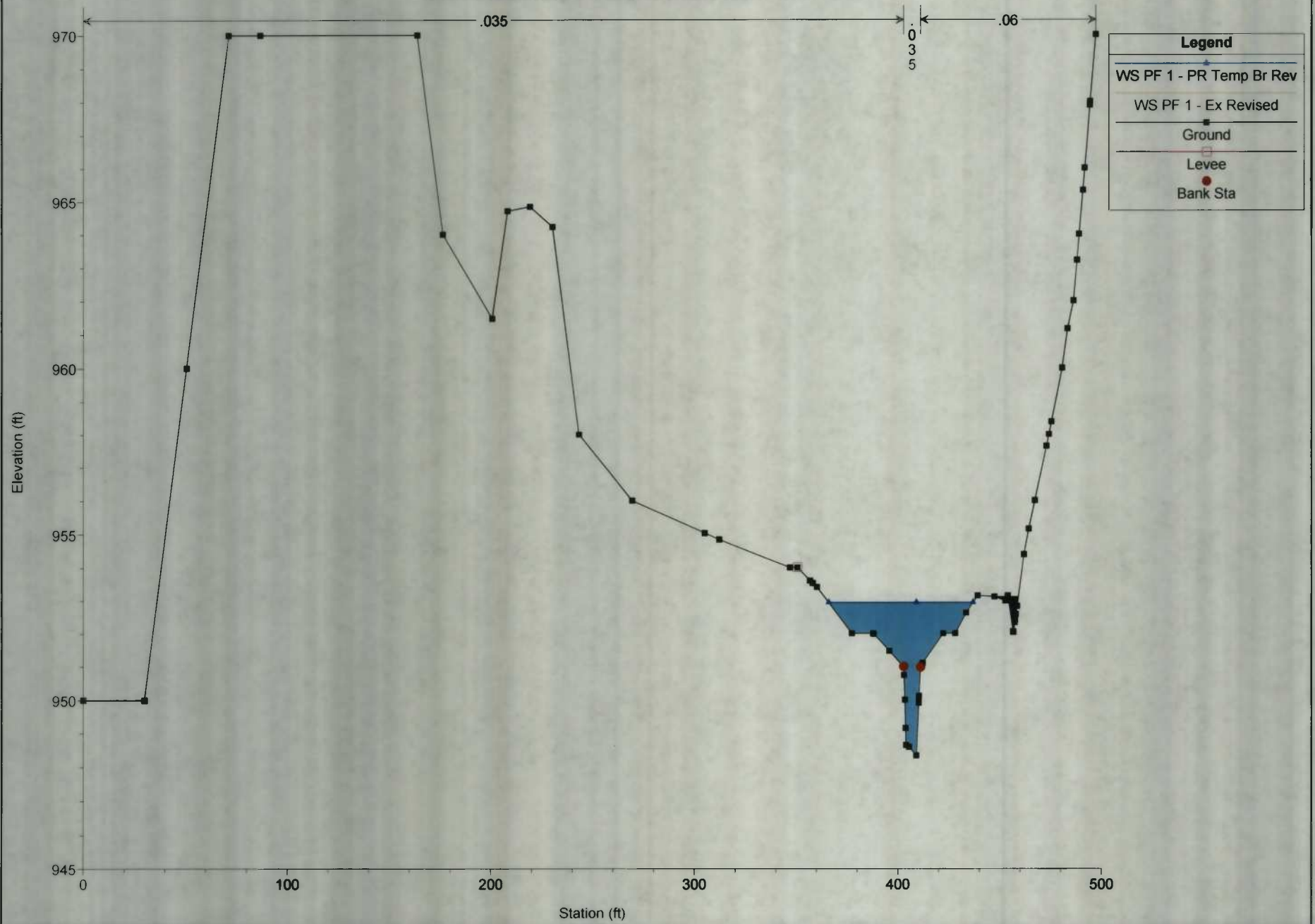


Legend	
WS PF 1 - Ex Revised	(Blue line)
WS PF 1 - PR Temp Br Rev	(Black line)
Ground	(Black line with square markers)
Bank Sta	(Red dot)

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

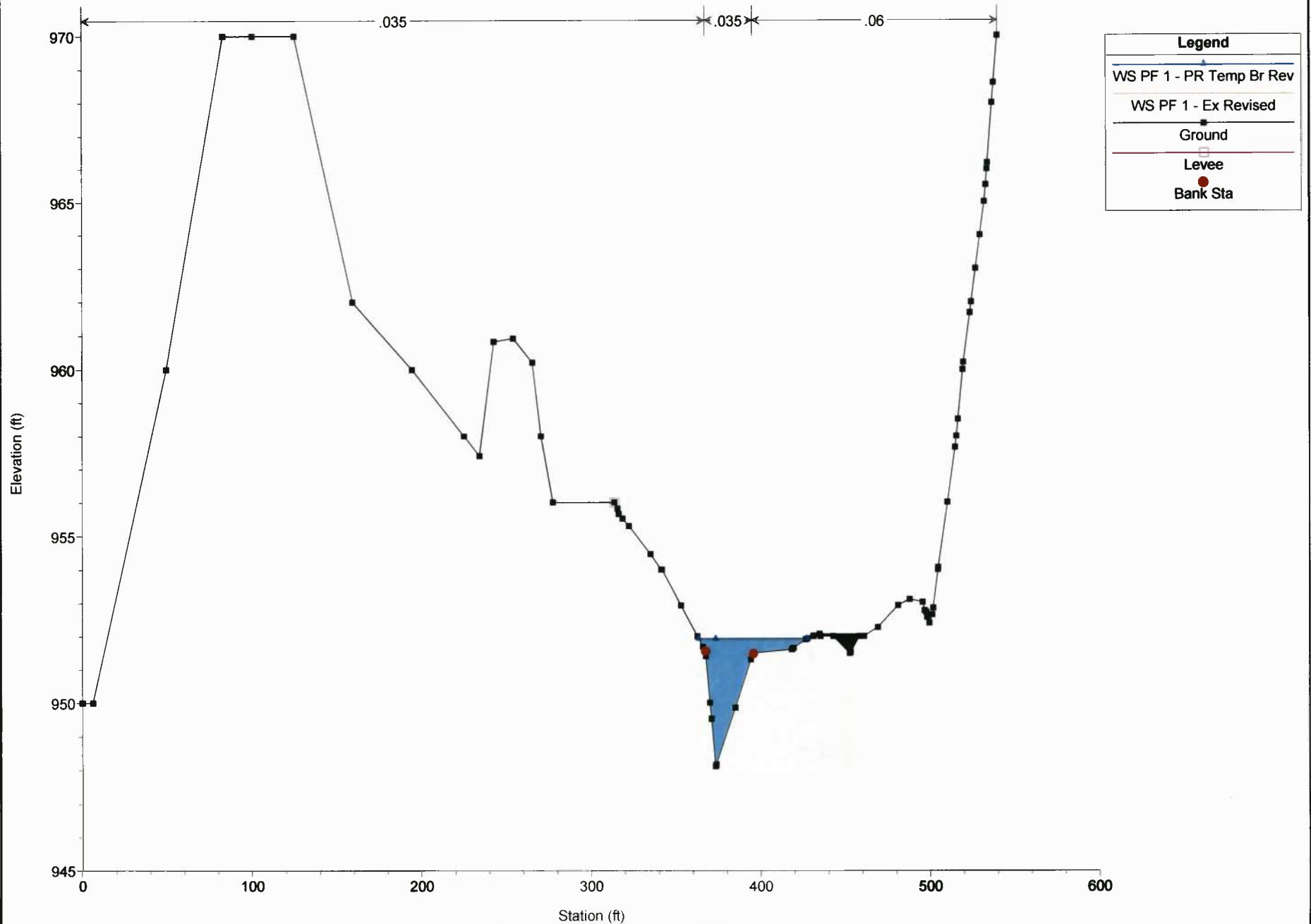
Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Bluestone Creek RS = 13552.07



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 = Bluestone Creek RS = 13440.10



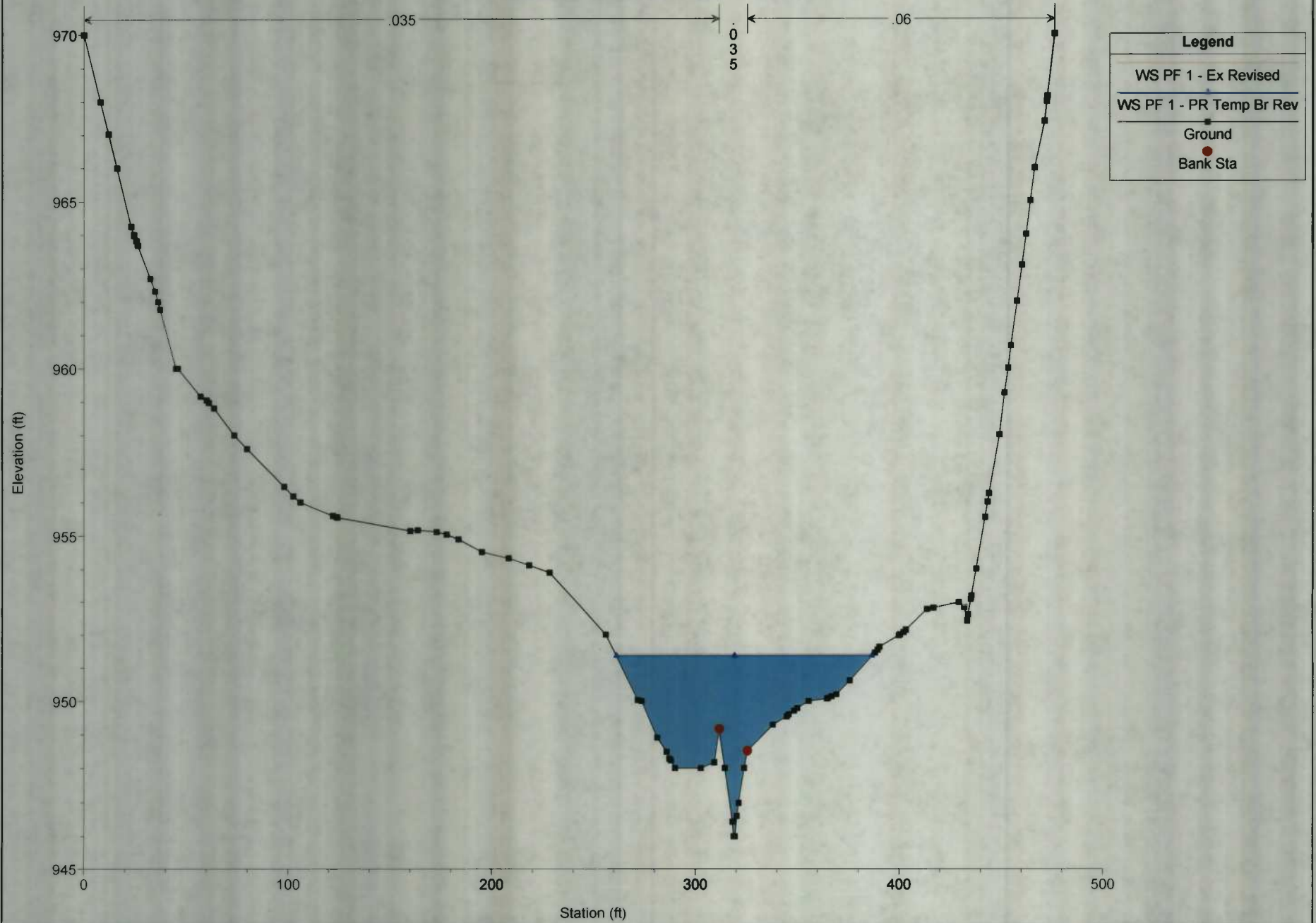
Legend

- 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

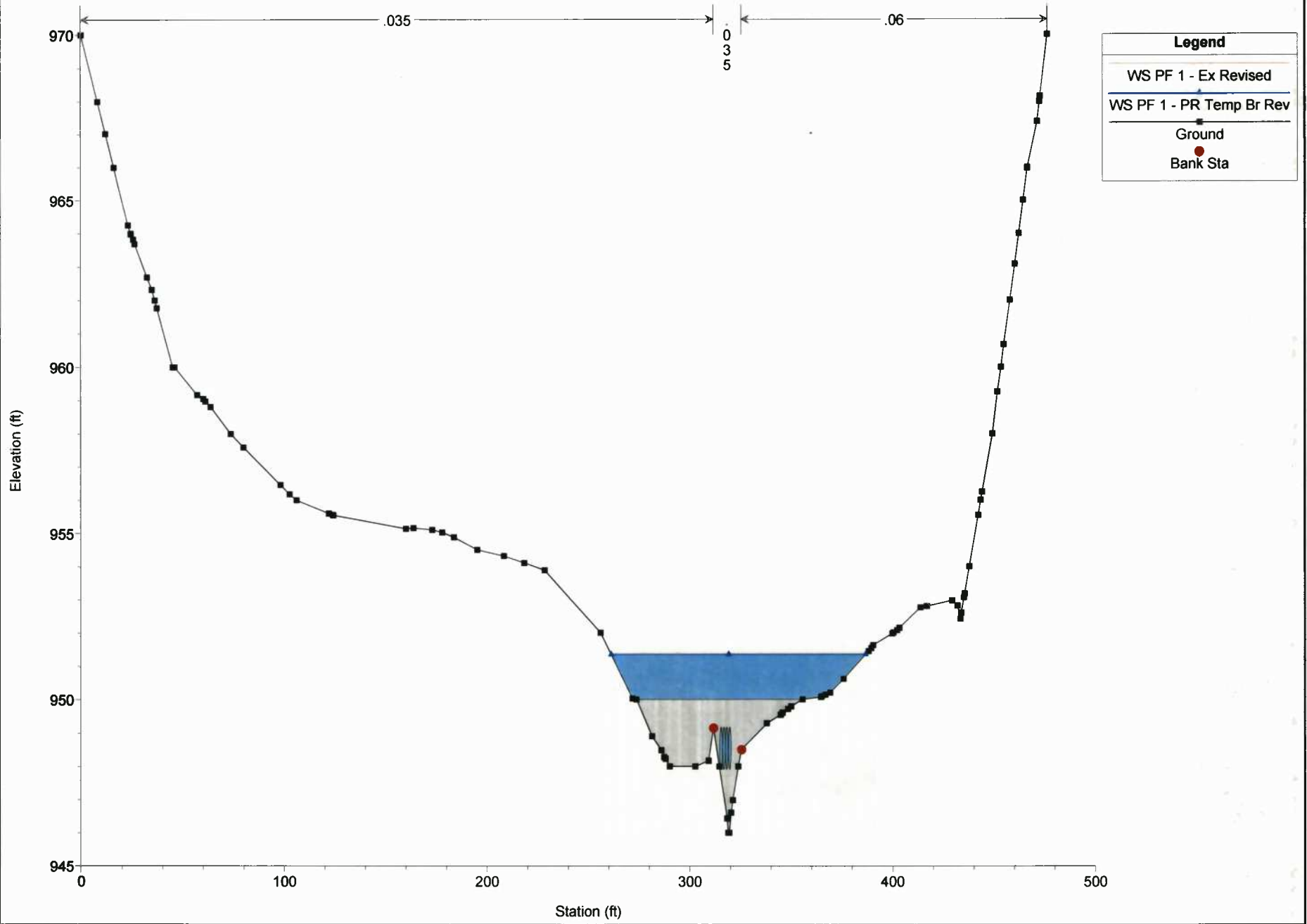
River = Bluestone Creek Reach = Upper RS = 13395.79



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

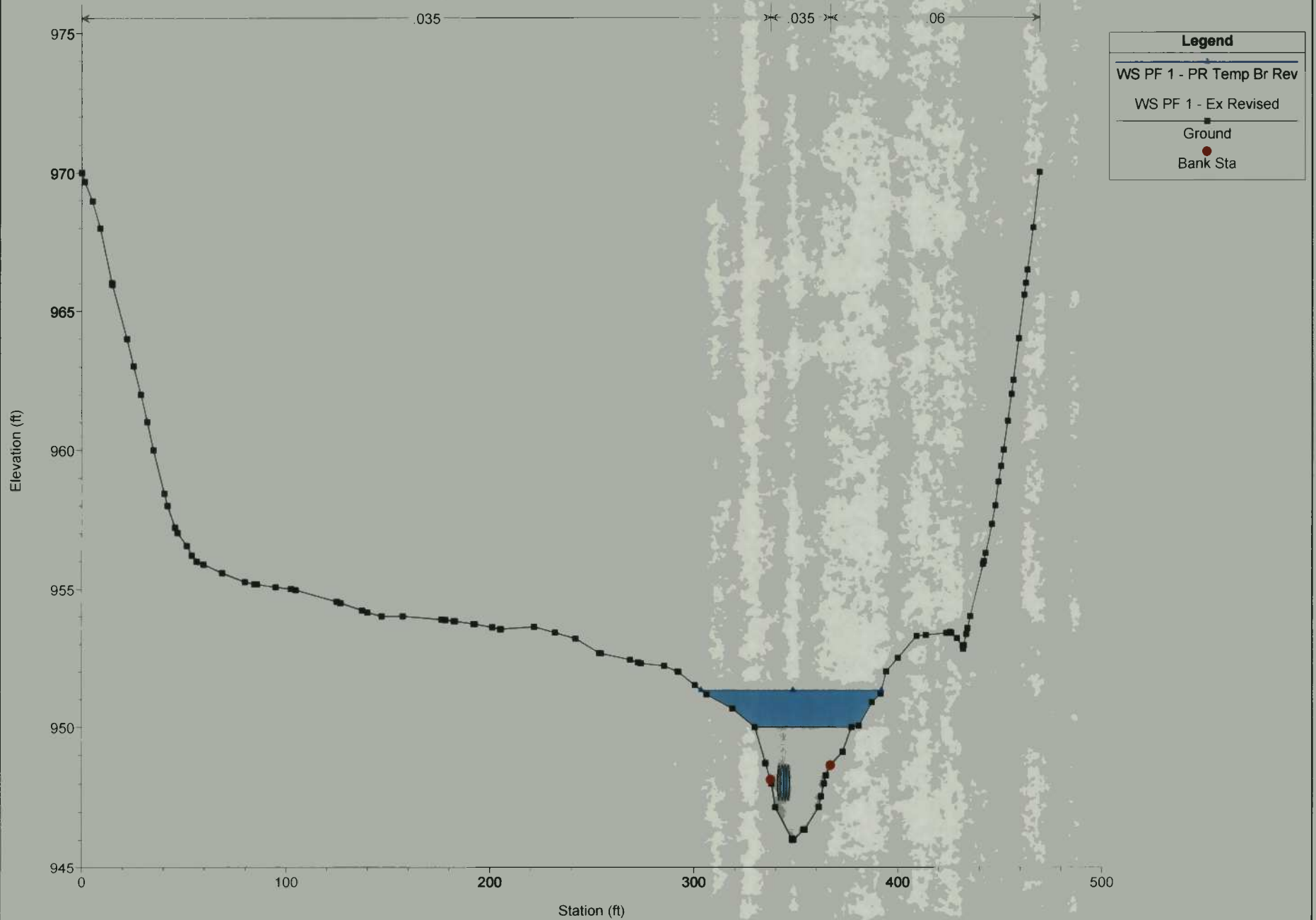
River = Bluestone Creek Reach = Upper RS = 13372.57 Culv



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

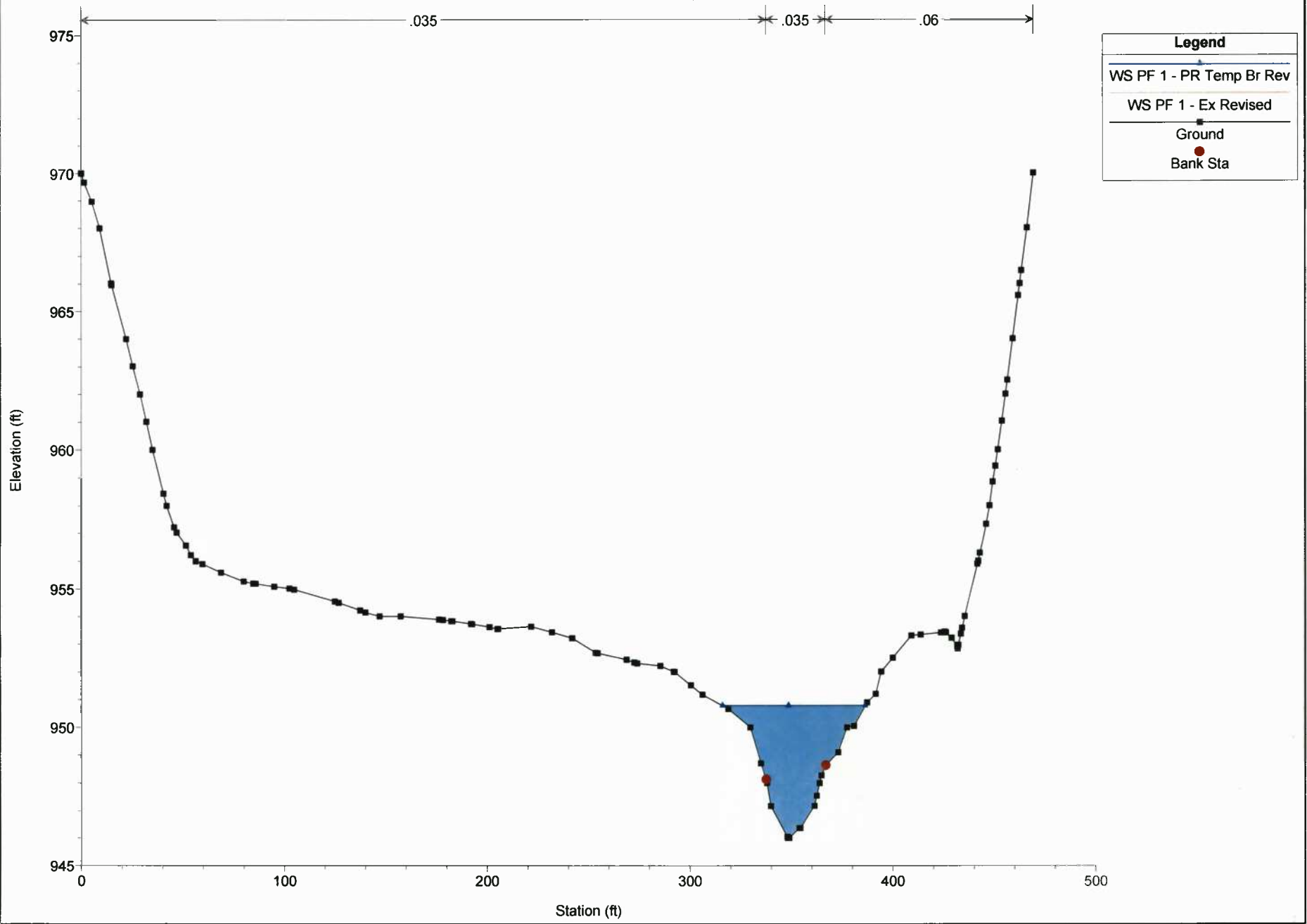
River = Bluestone Creek Reach = Upper RS = 13372.57 Culv



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

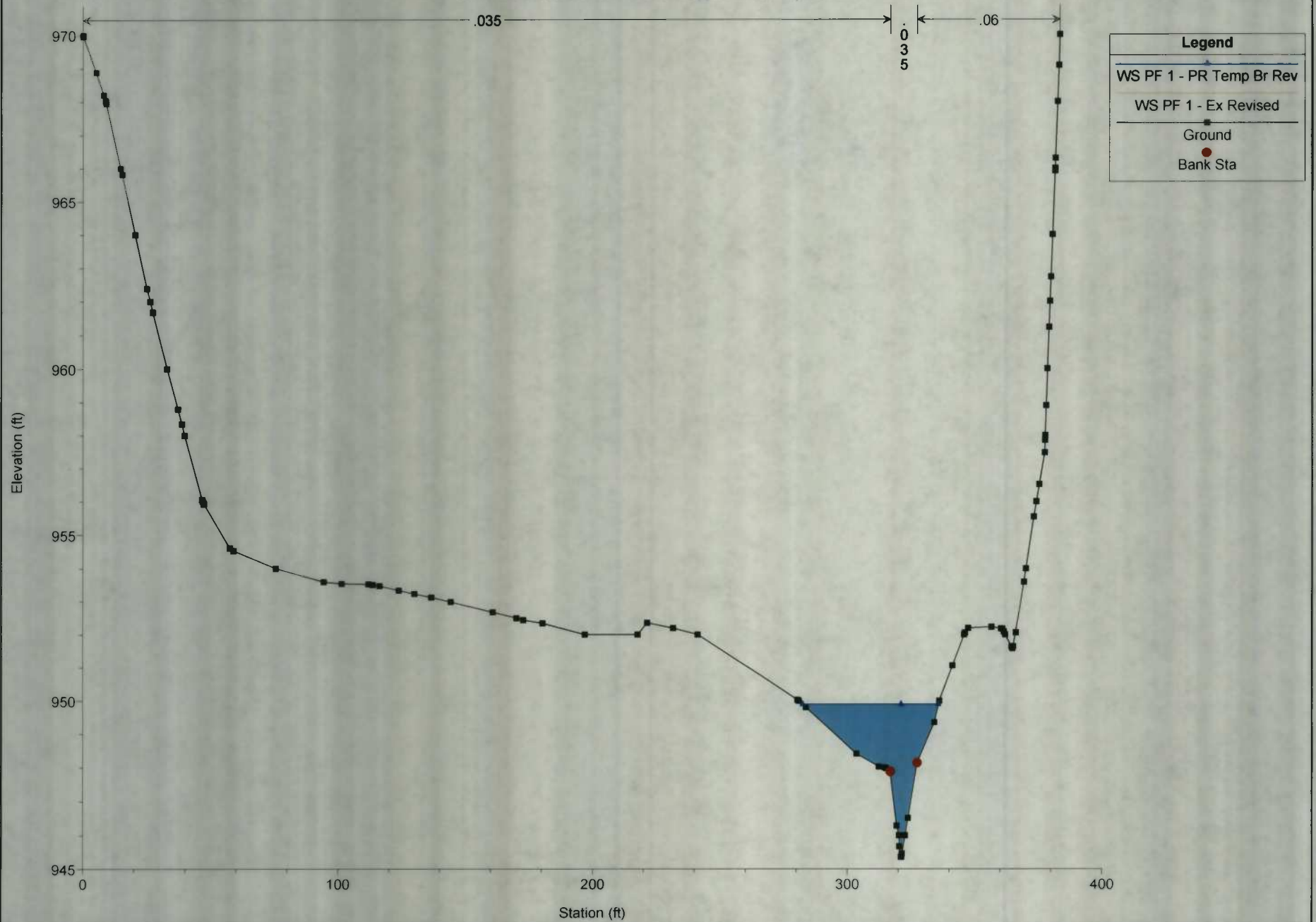
River = Bluestone Creek Reach = Upper RS = 13353.46



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

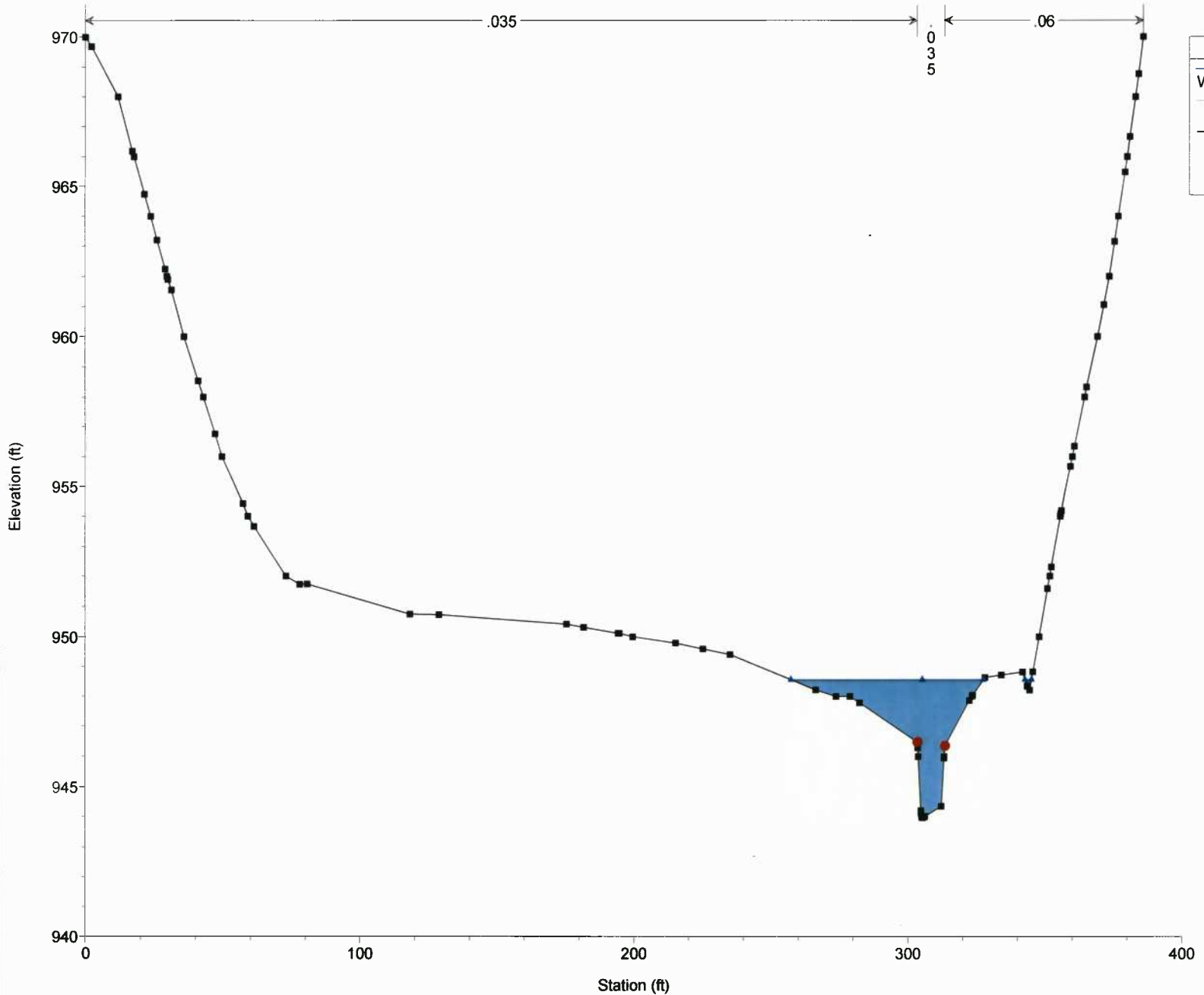
River = Bluestone Creek Reach = Upper RS = 13212.39



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 = 13020.26



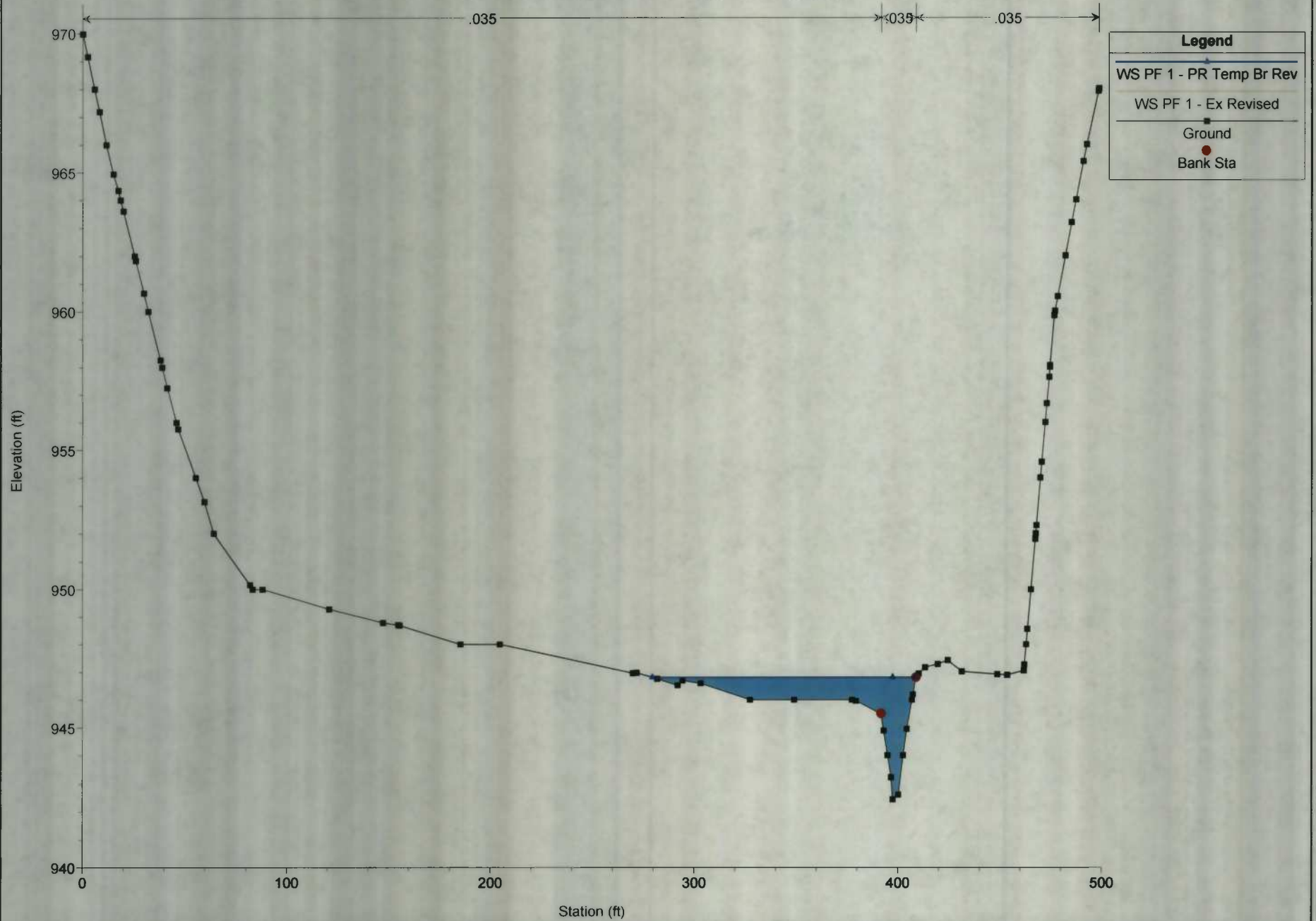
Legend

- 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

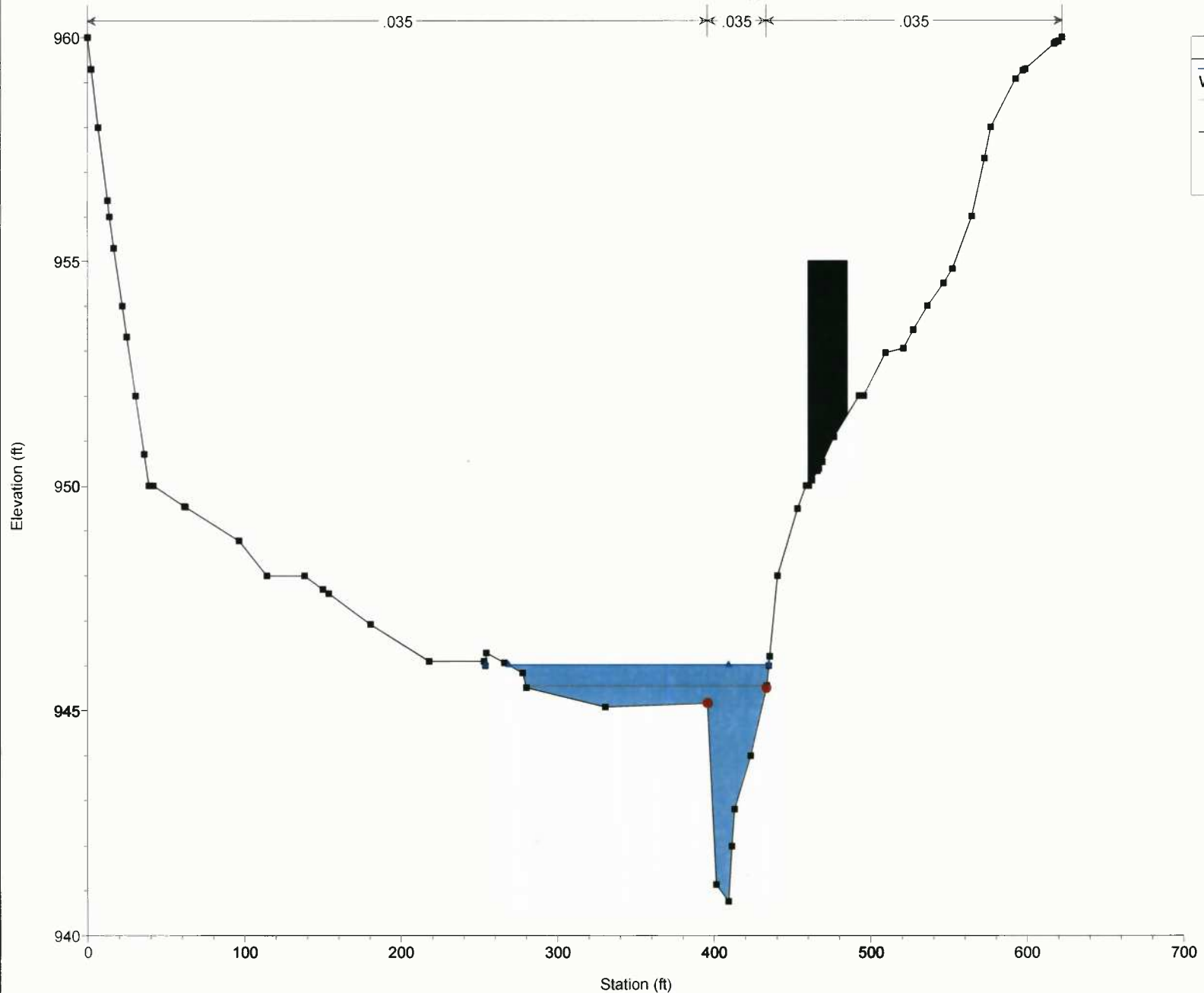
River = Bluestone Creek Reach = Upper RS = 12827.43



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 = 12694.78



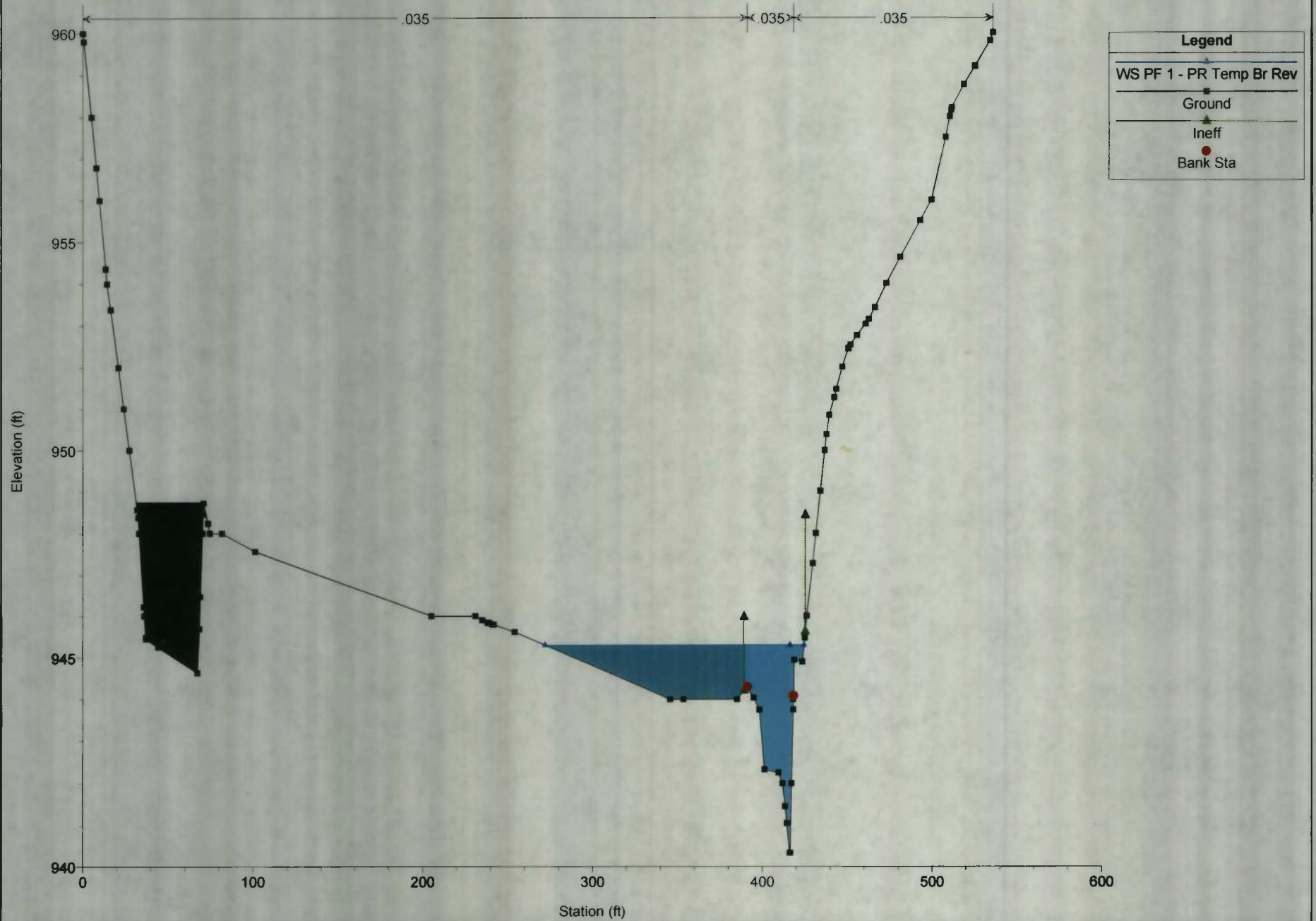
Legend

- 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

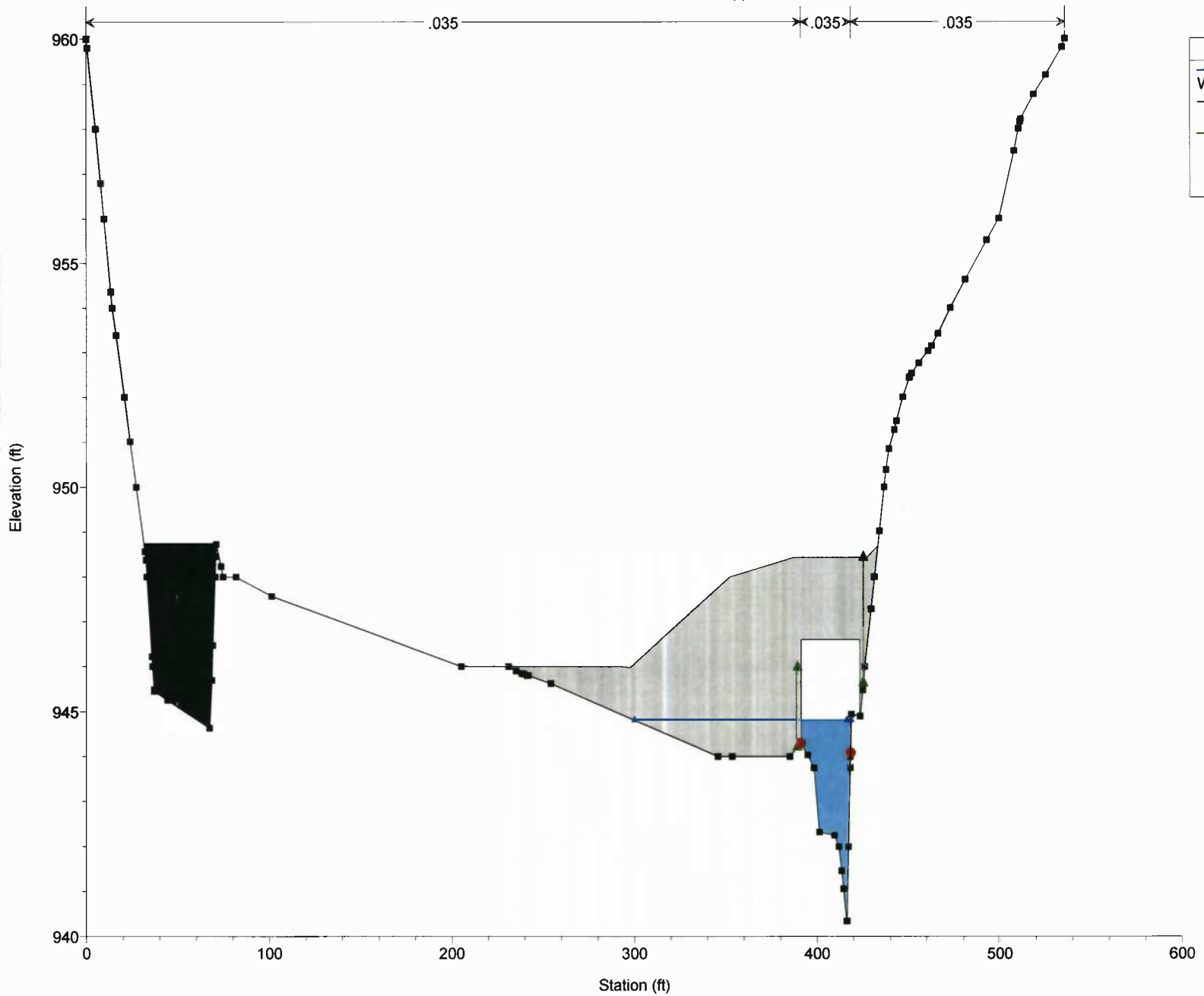
River = Bluestone Creek Reach = Upper RS = 12646.06



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

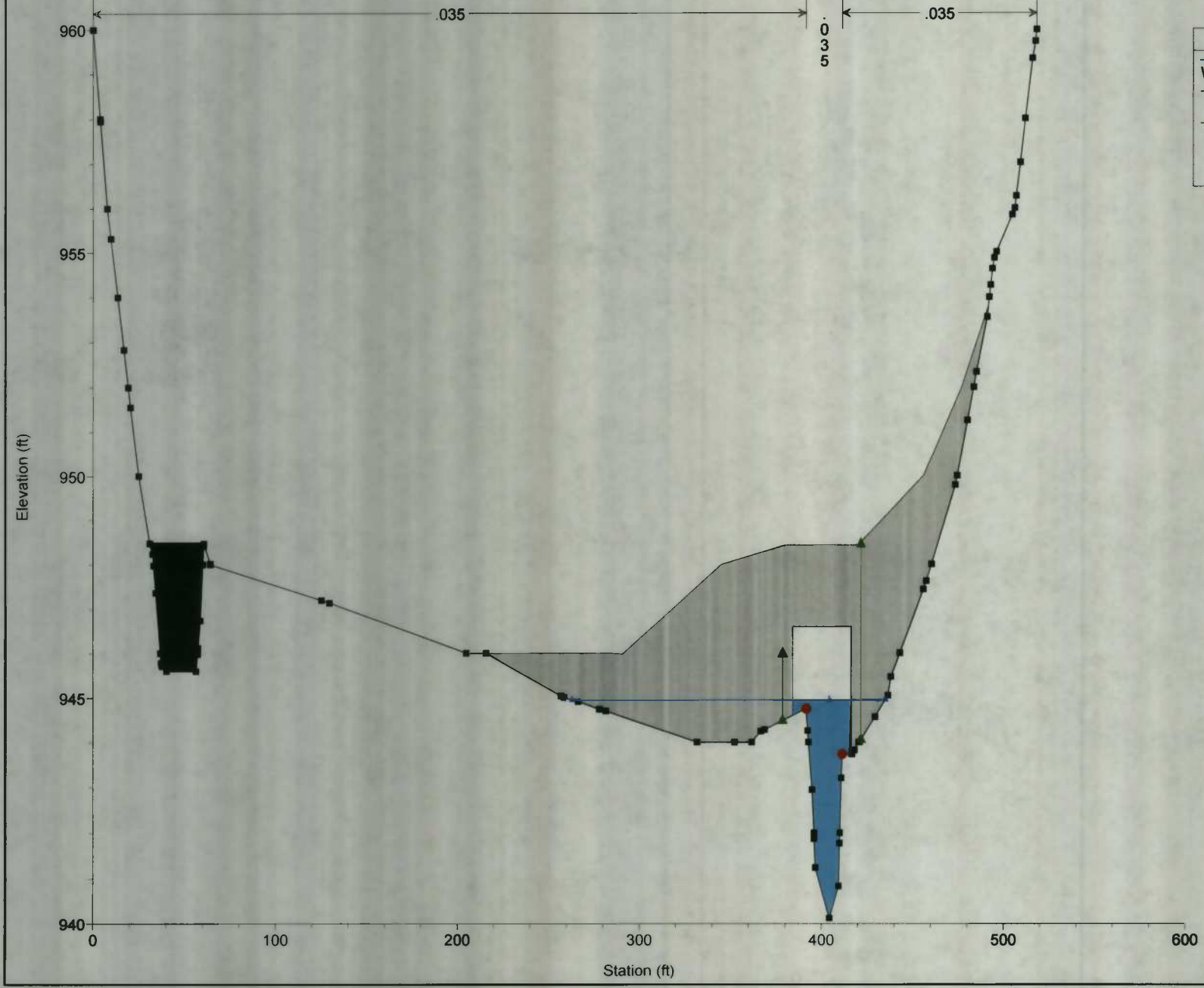
Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 12633.65 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 = Upper RS = 12633.65 BR

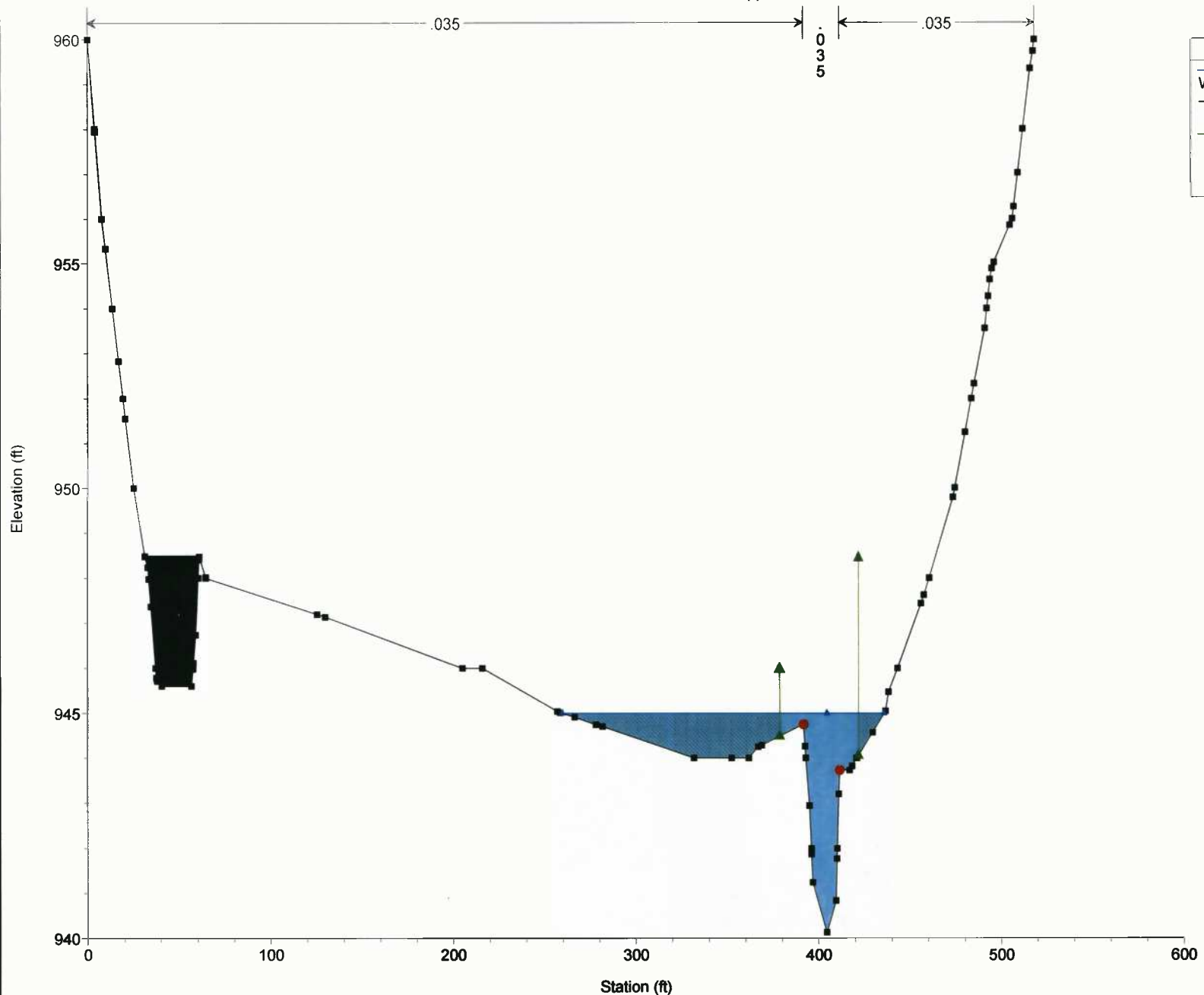
Legend	
	WS PF 1 - PR Temp Br Rev
	Ground
	Ineff
	Bank Sta



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 = Upper RS = 12620.64

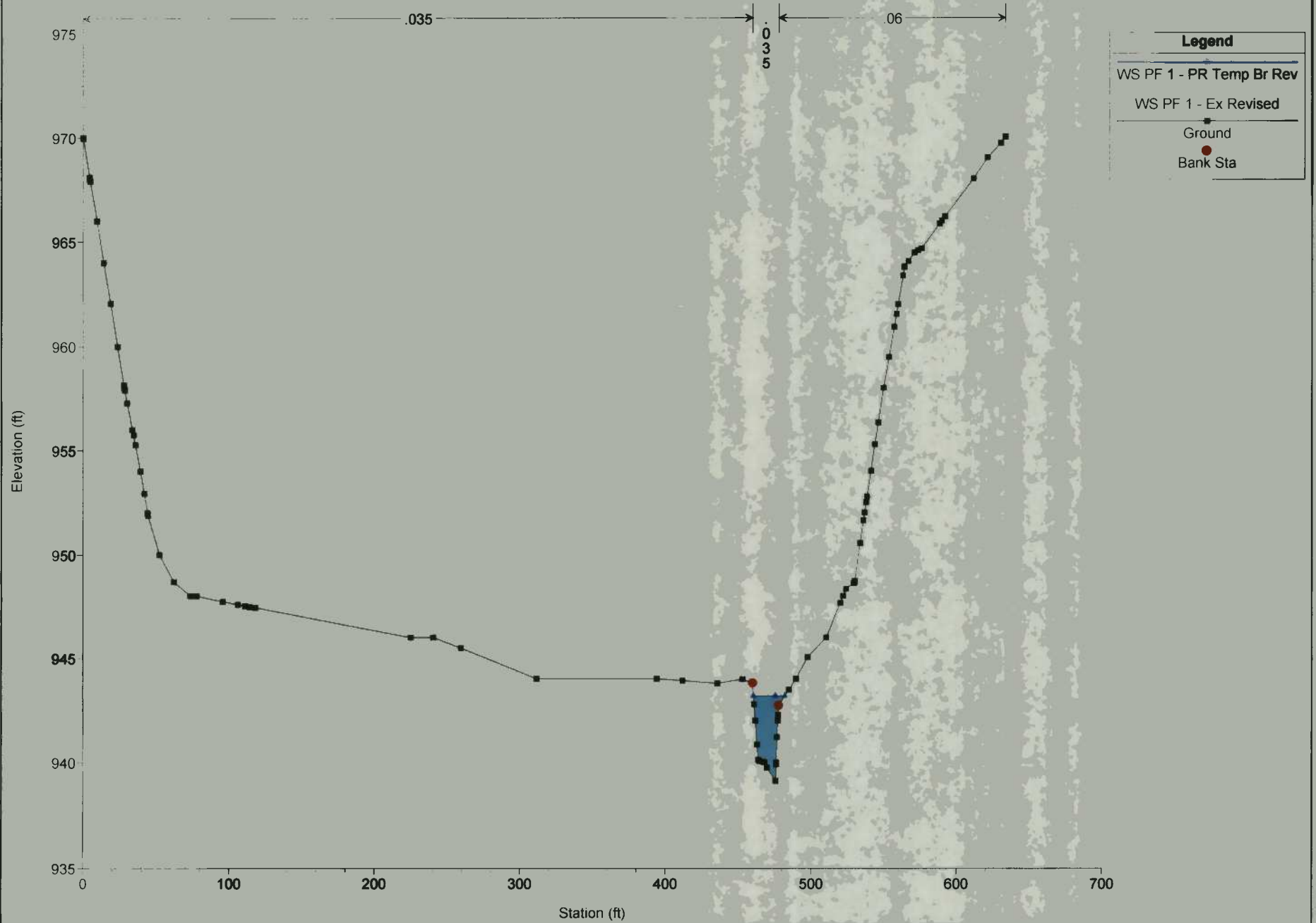


Legend	
WS PF 1 - PR Temp Br Rev	▲
Ground	■
Ineff	▲
Bank Sta	●

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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

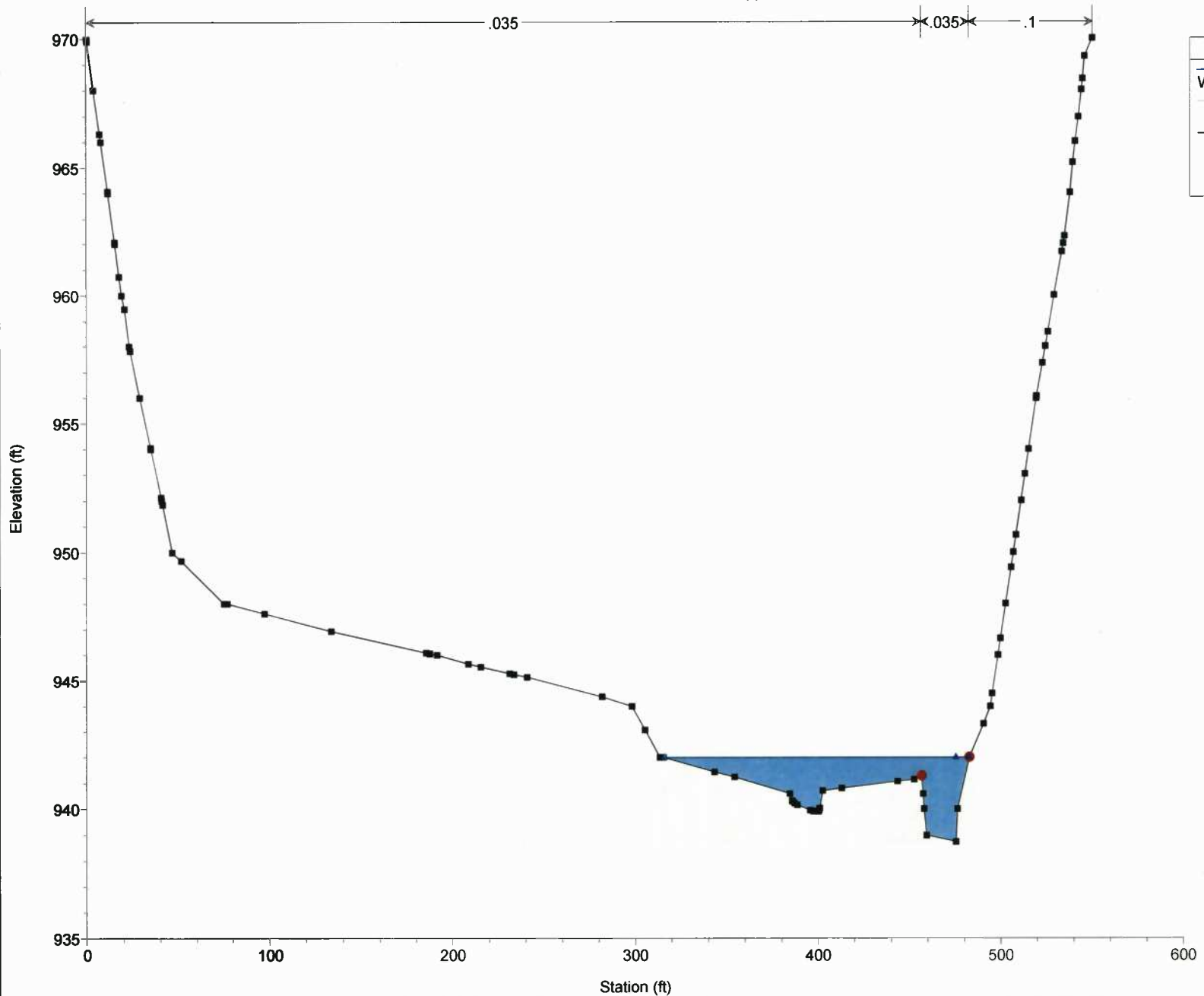
River = Bluestone Creek Reach = Upper RS = 12504.92



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 = 12207.32

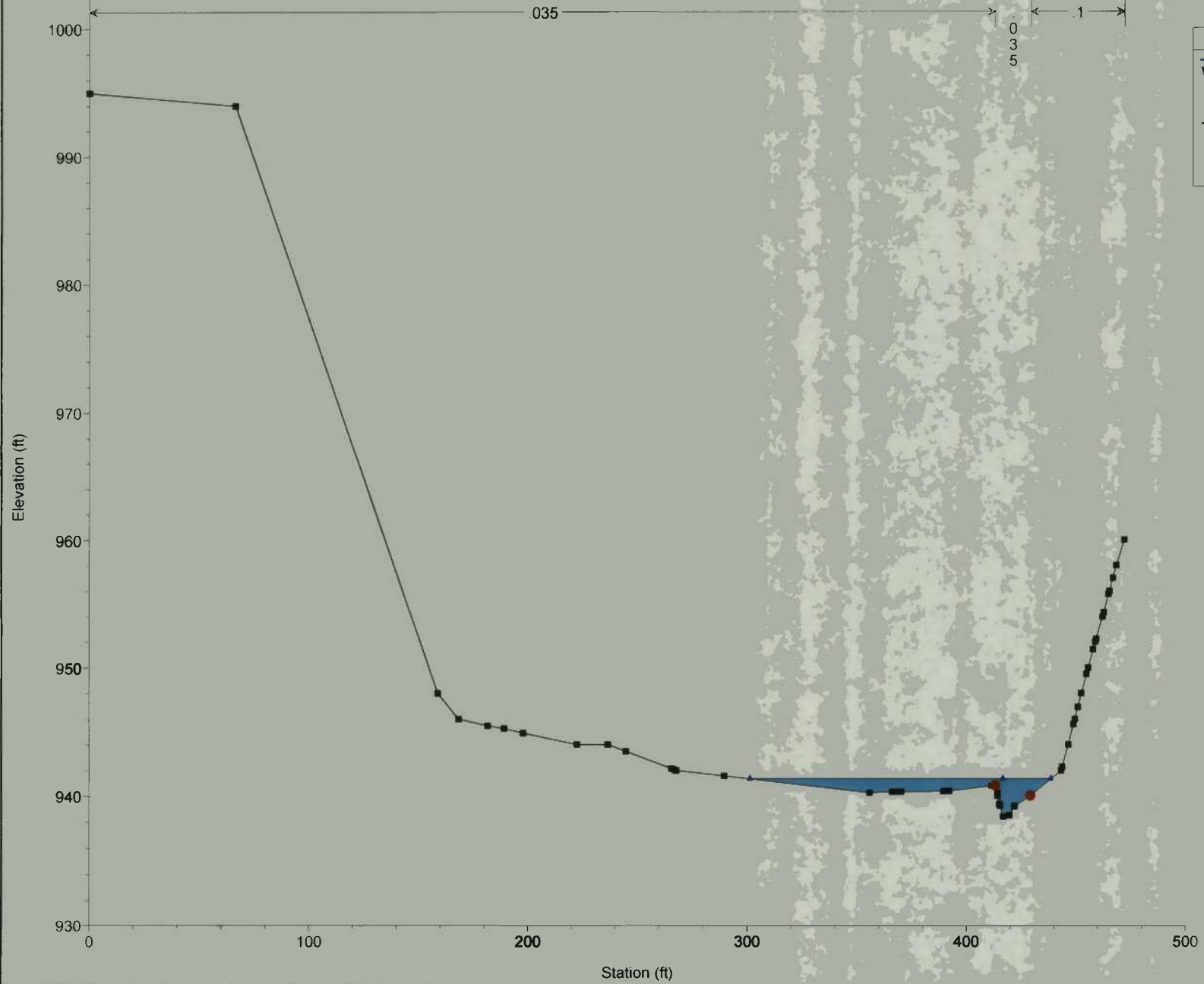


Legend	
	WS PF 1 - PR Temp Br Rev
	WS PF 1 - Ex Revised
	Ground
	Bank Sta

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 = 12162.04



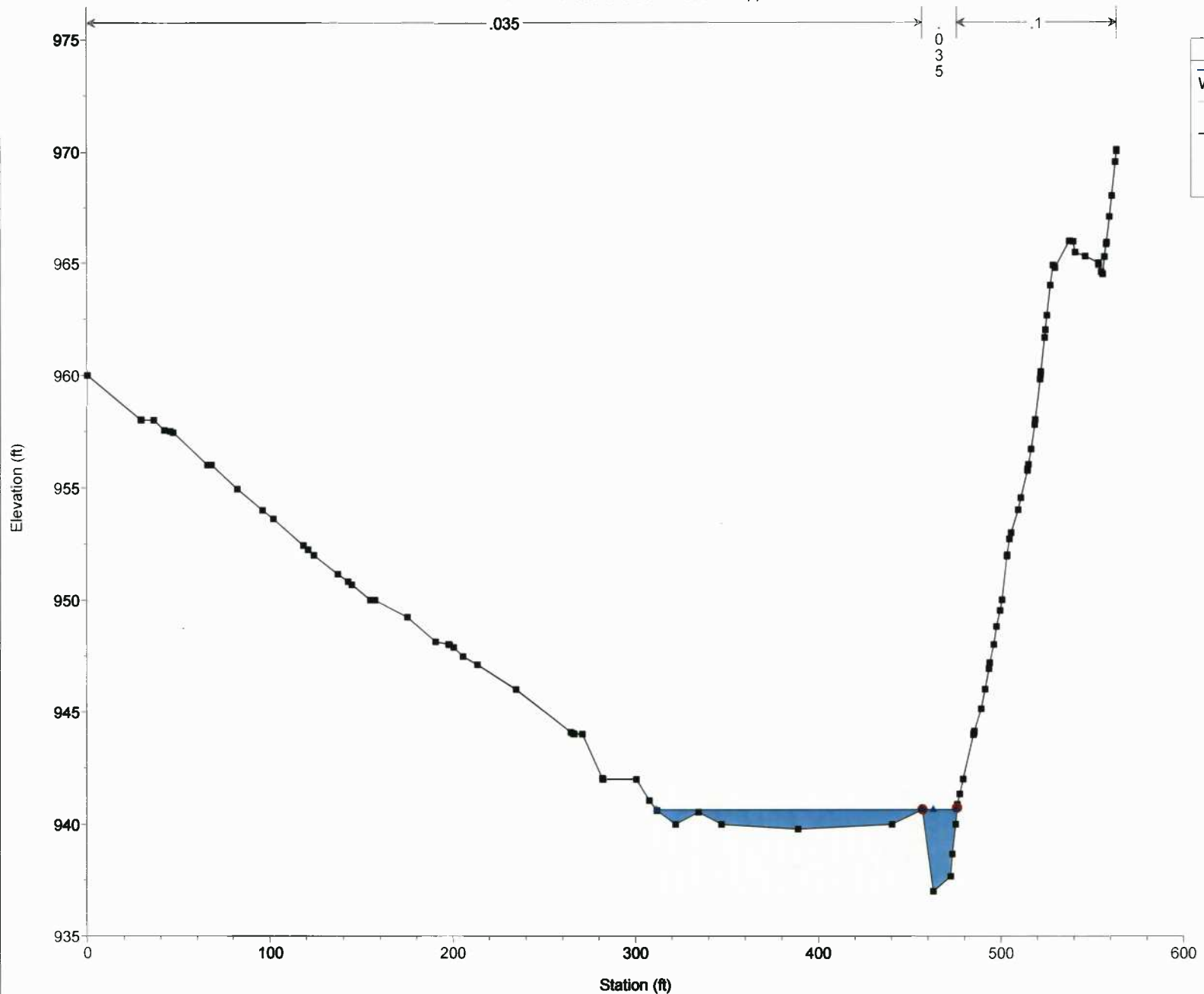
Legend

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

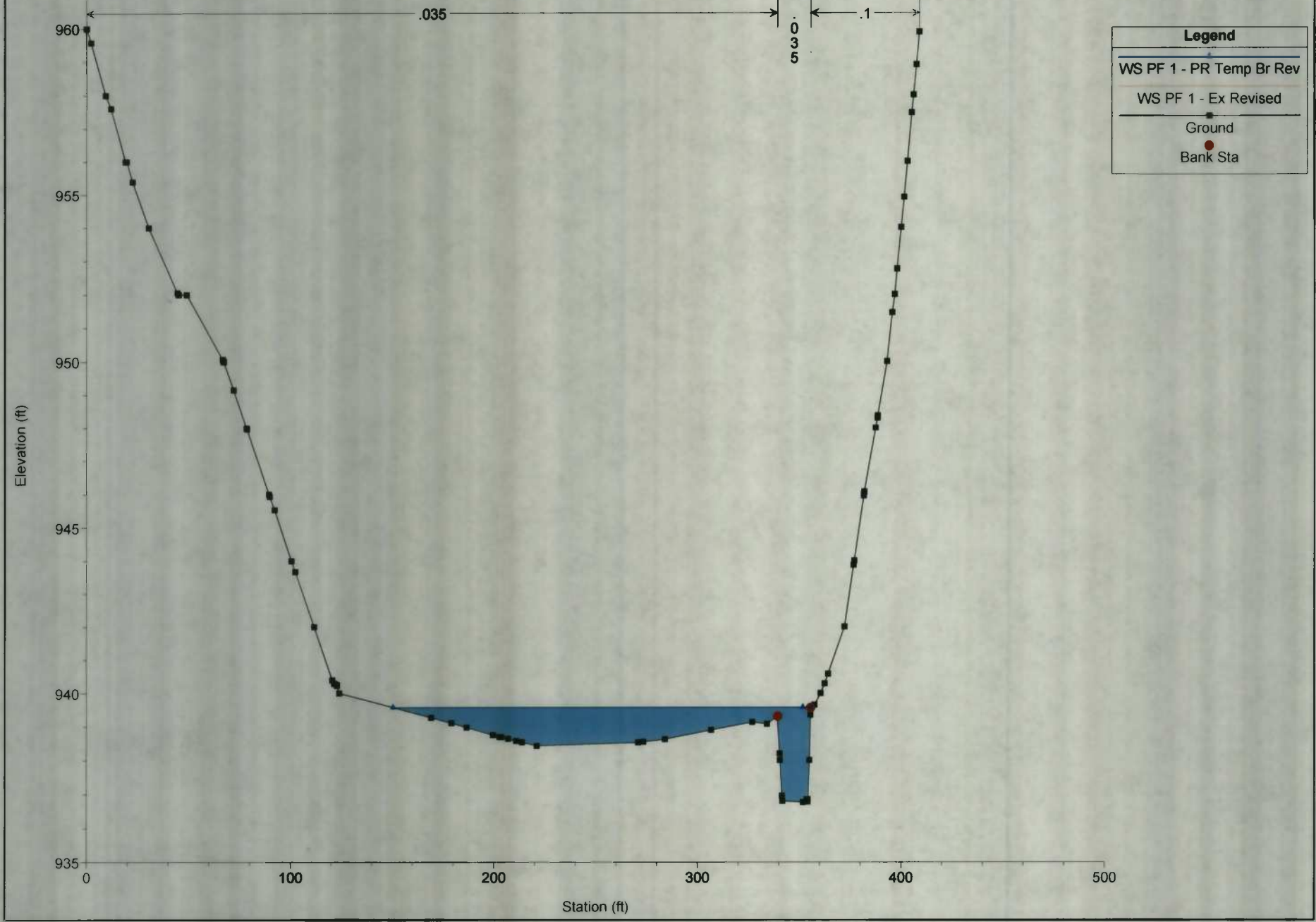
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 12075.53



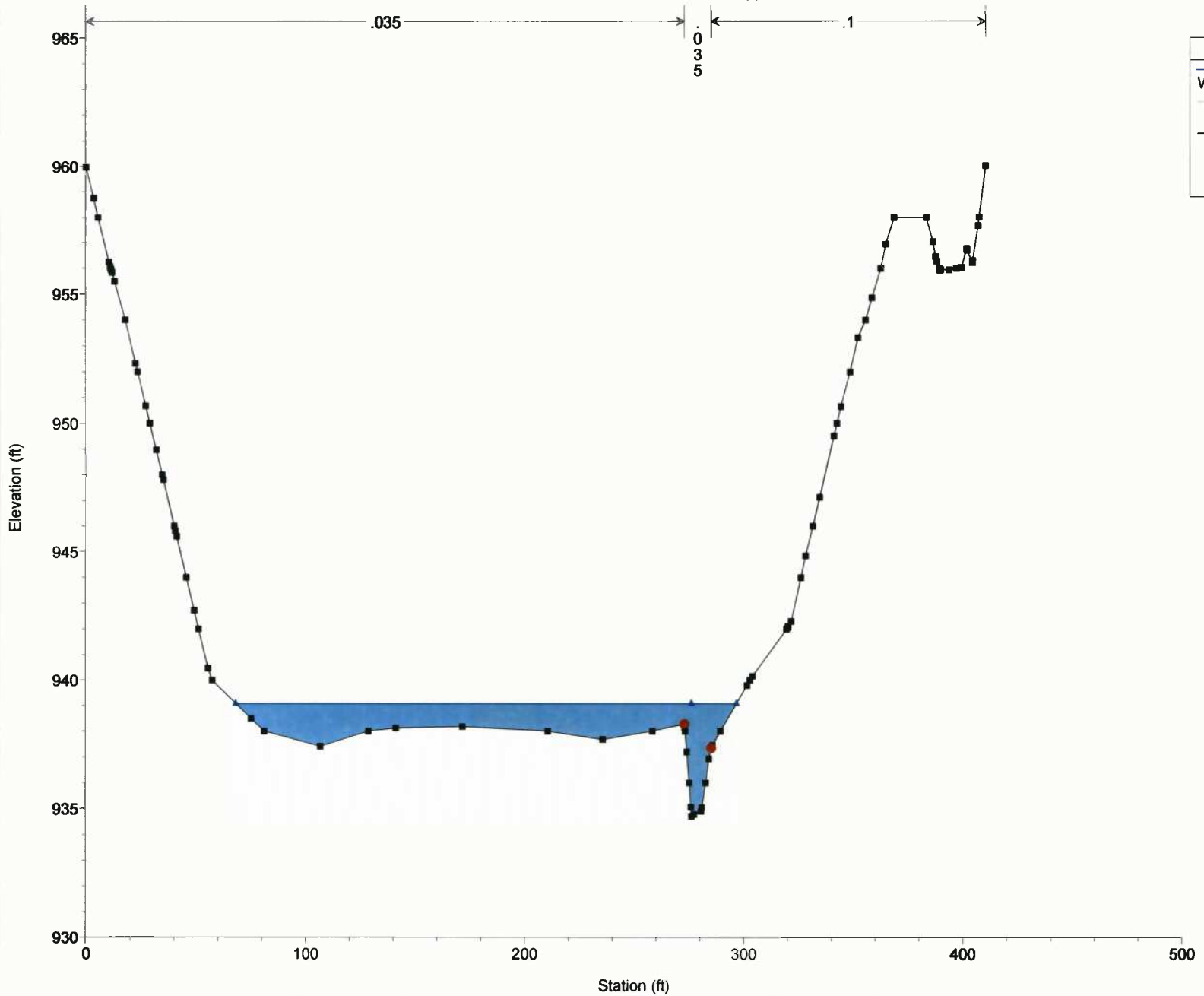
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised
 River = Bluestone Creek Reach = Upper RS = 11904.55



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 = 11770.60



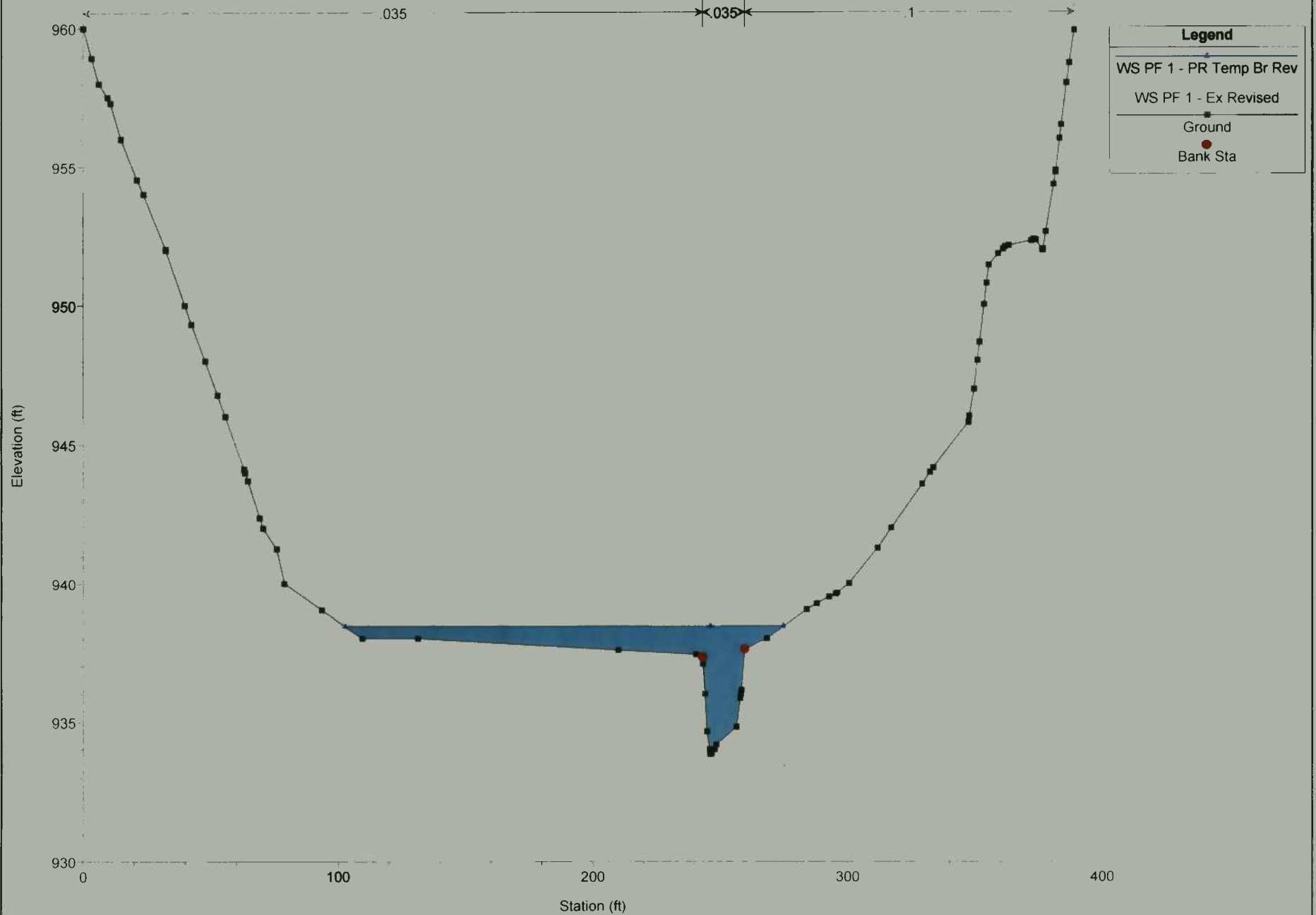
Legend

- 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

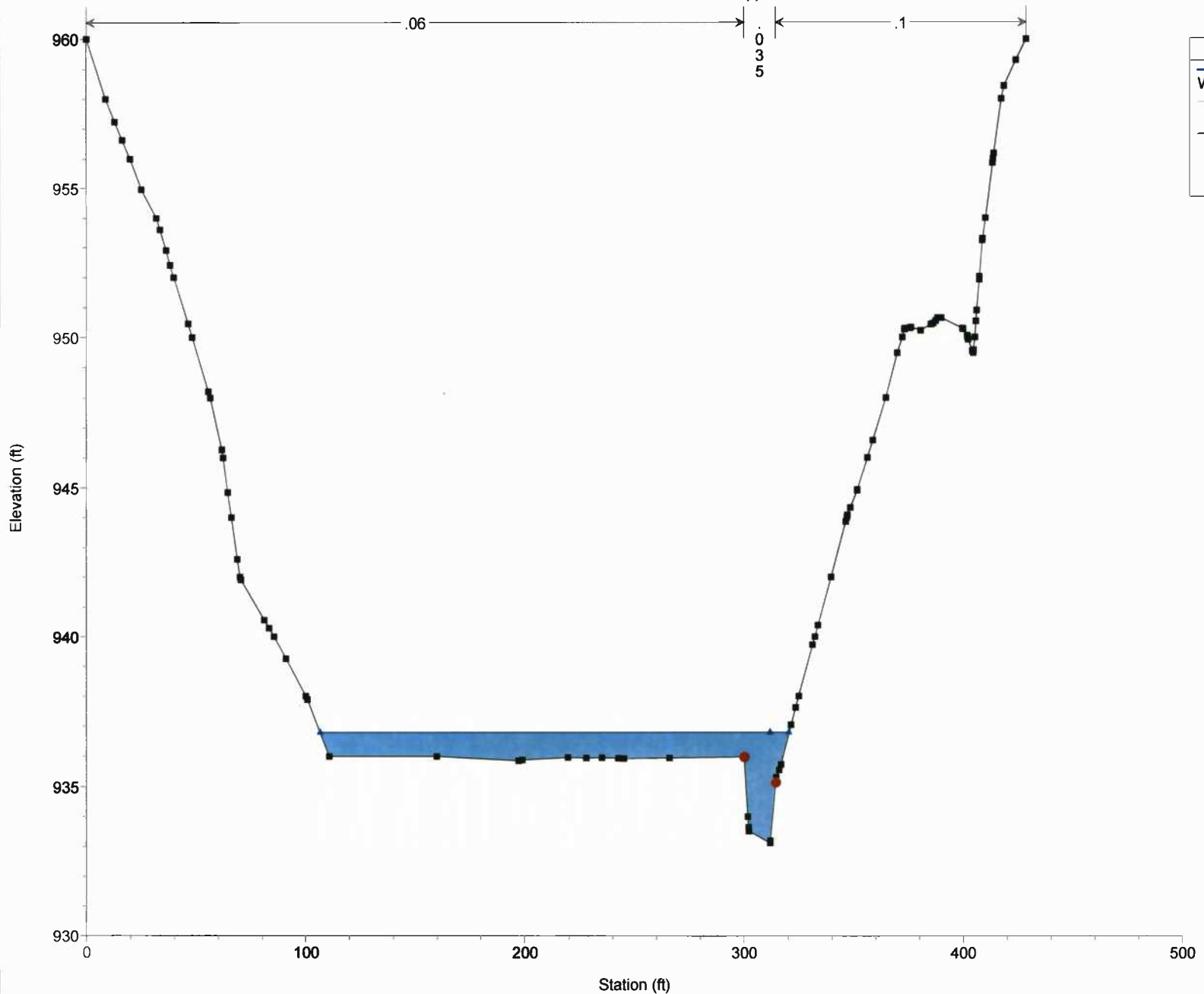
River = Bluestone Creek Reach = Upper RS = 11632.87



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

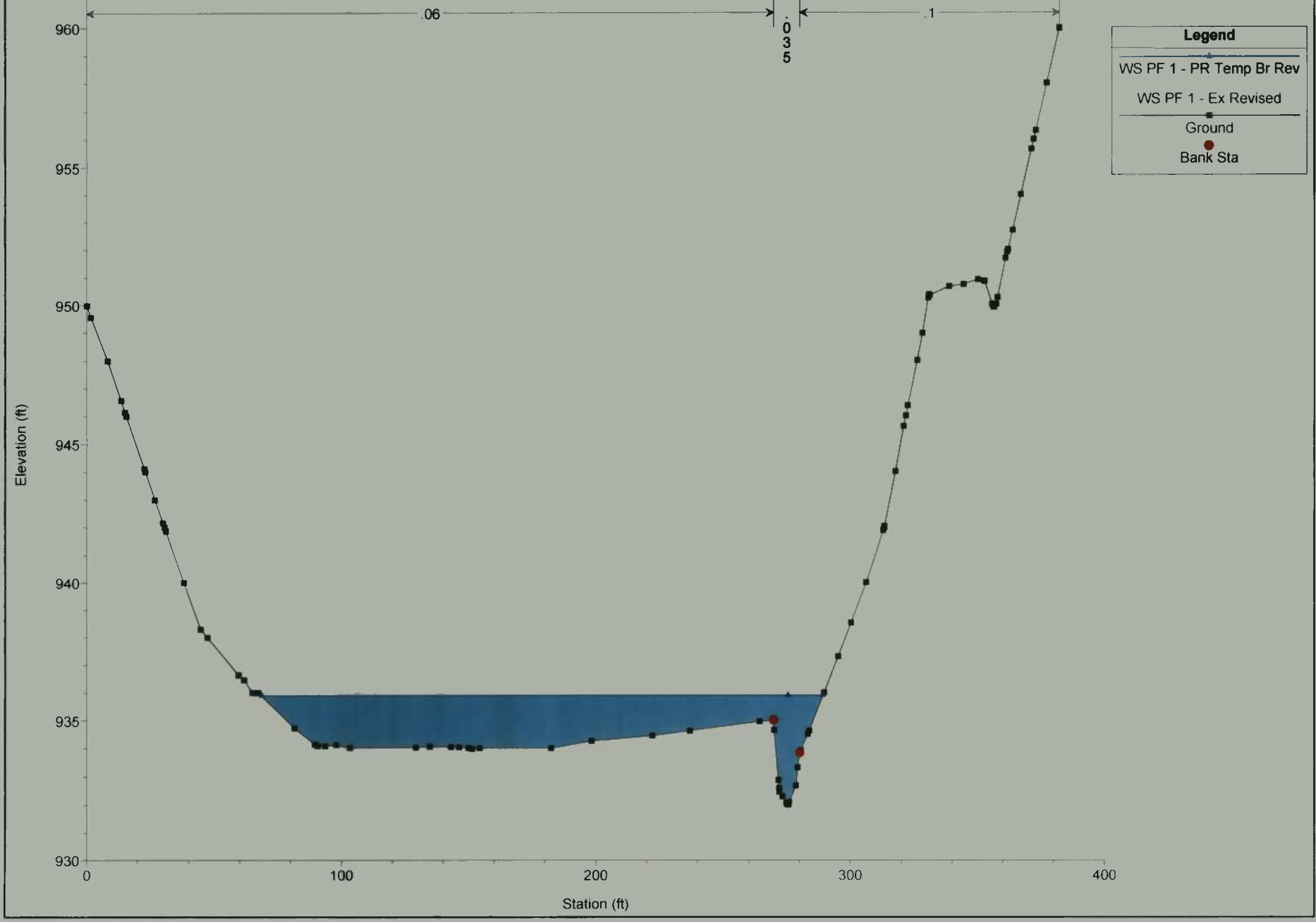
River = Bluestone Creek Reach = Upper RS = 11351.13



Legend

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

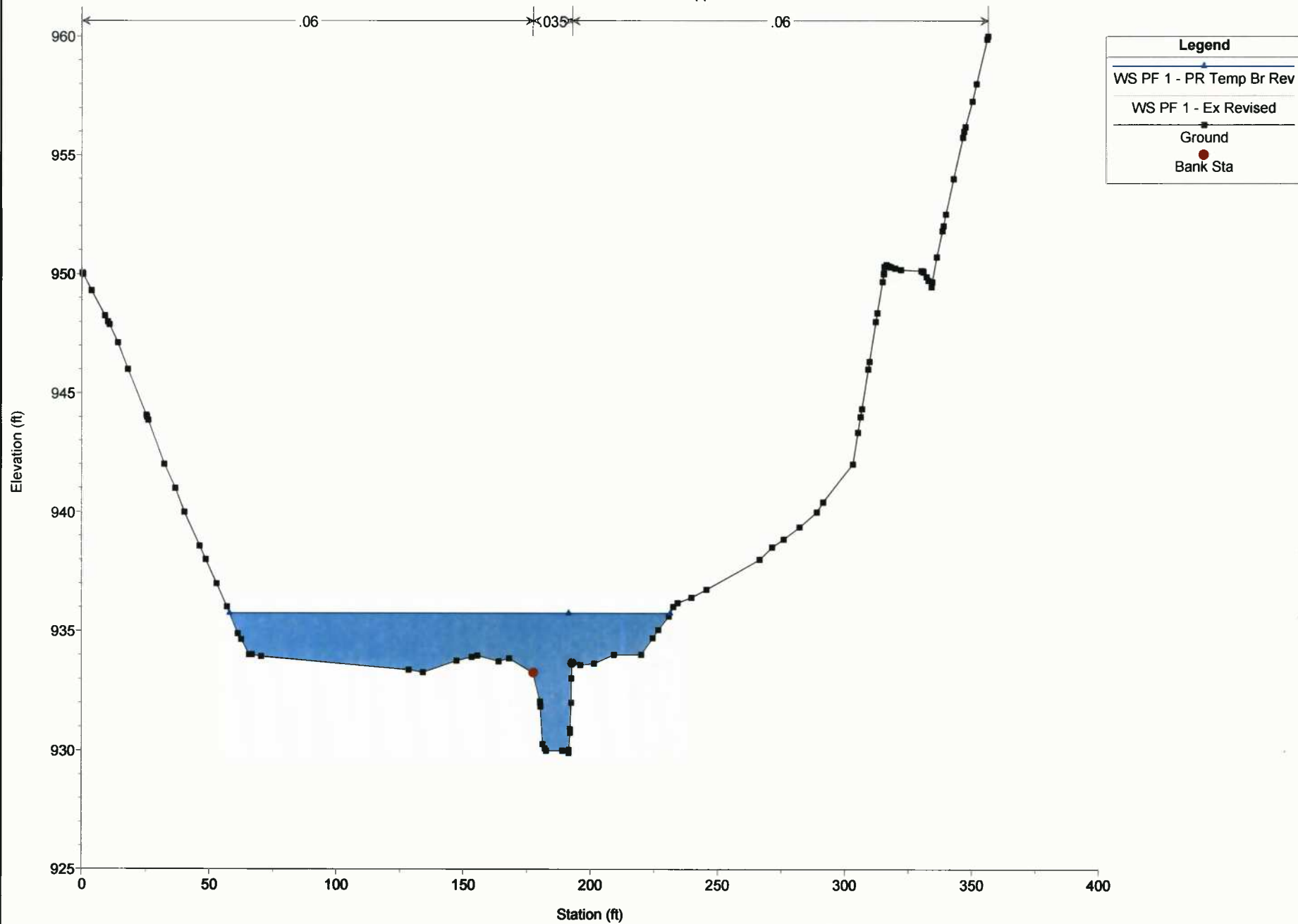
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised
Geom: Proposed Temp Bridge Revised Flow: Structures Revised
River = Bluestone Creek Reach = Upper RS = 11189.95



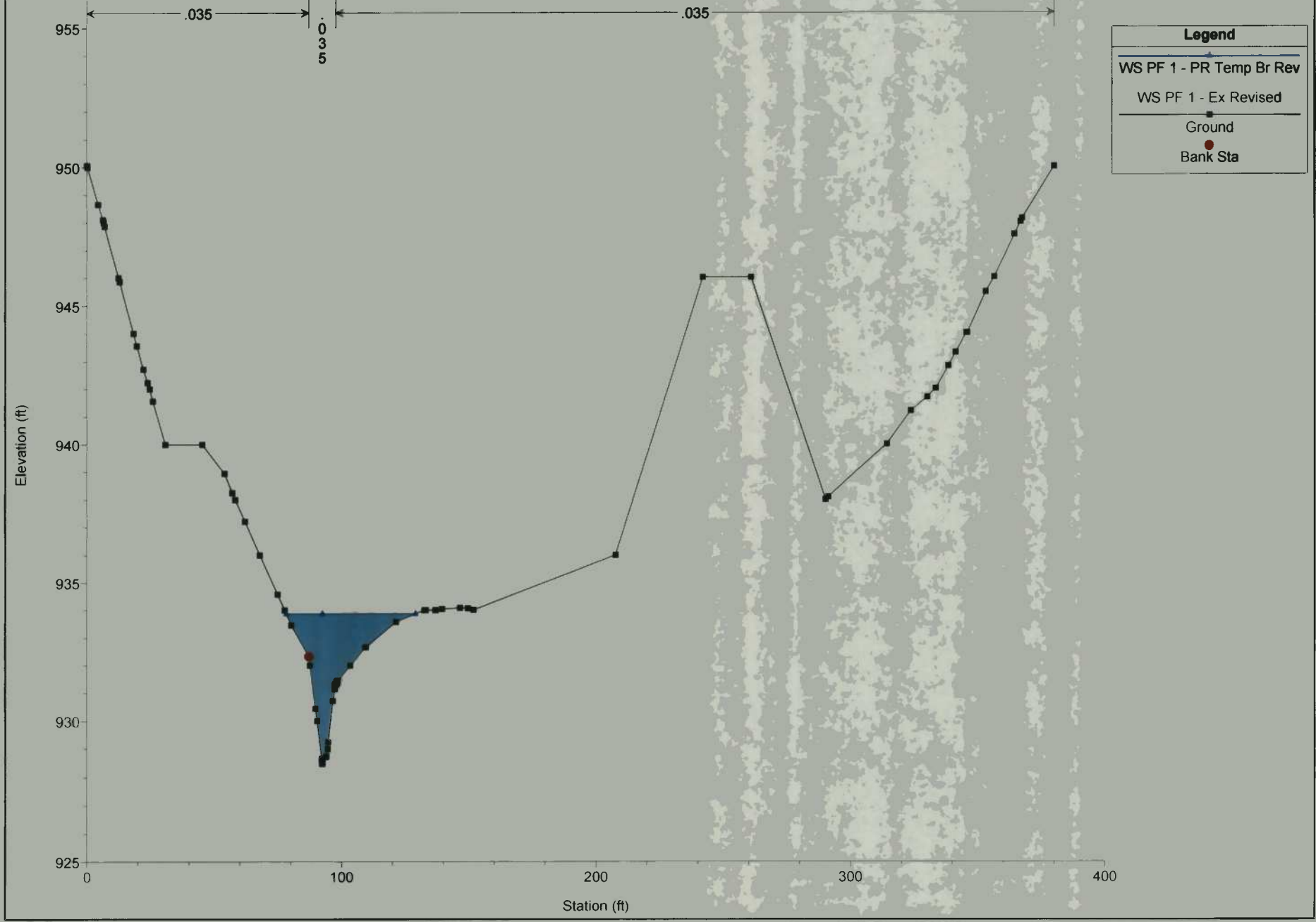
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 10974.14



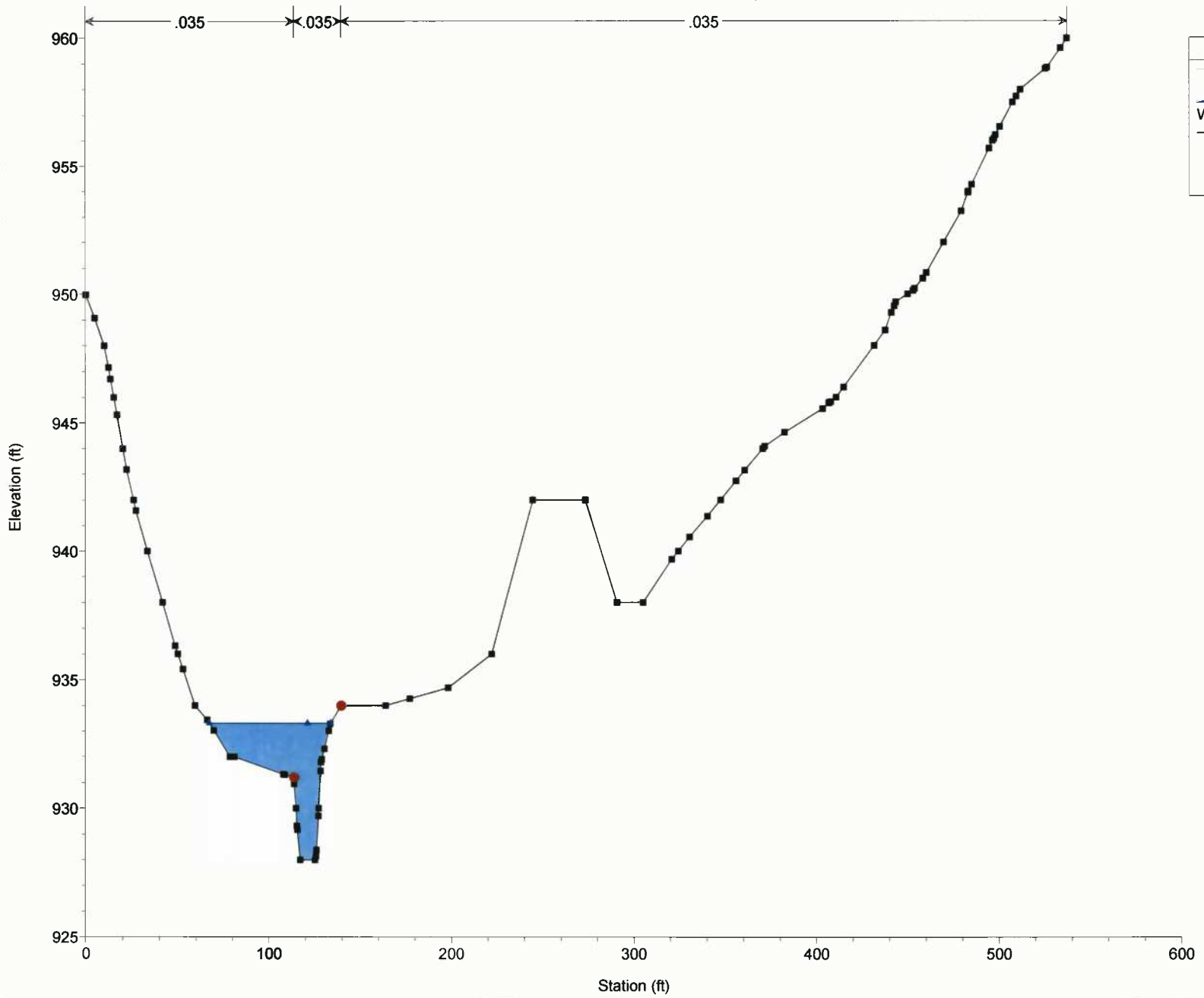
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised
 River = Bluestone Creek Reach = Upper RS = 10615.35



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

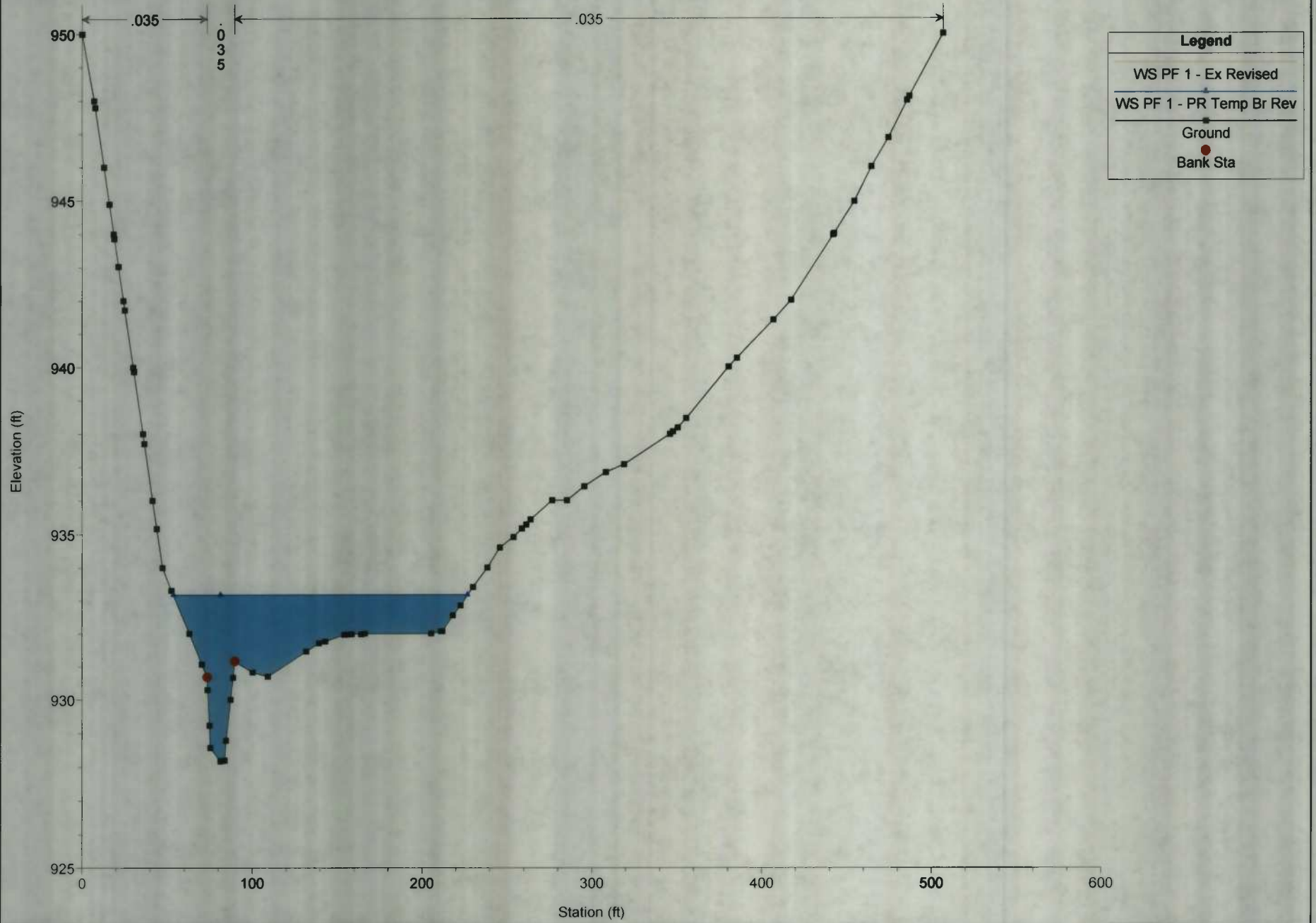


Legend	
WS PF 1 - Ex Revised	■
WS PF 1 - PR Temp Br Rev	■
Ground	■
Bank Sta	●

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 = 10179.69

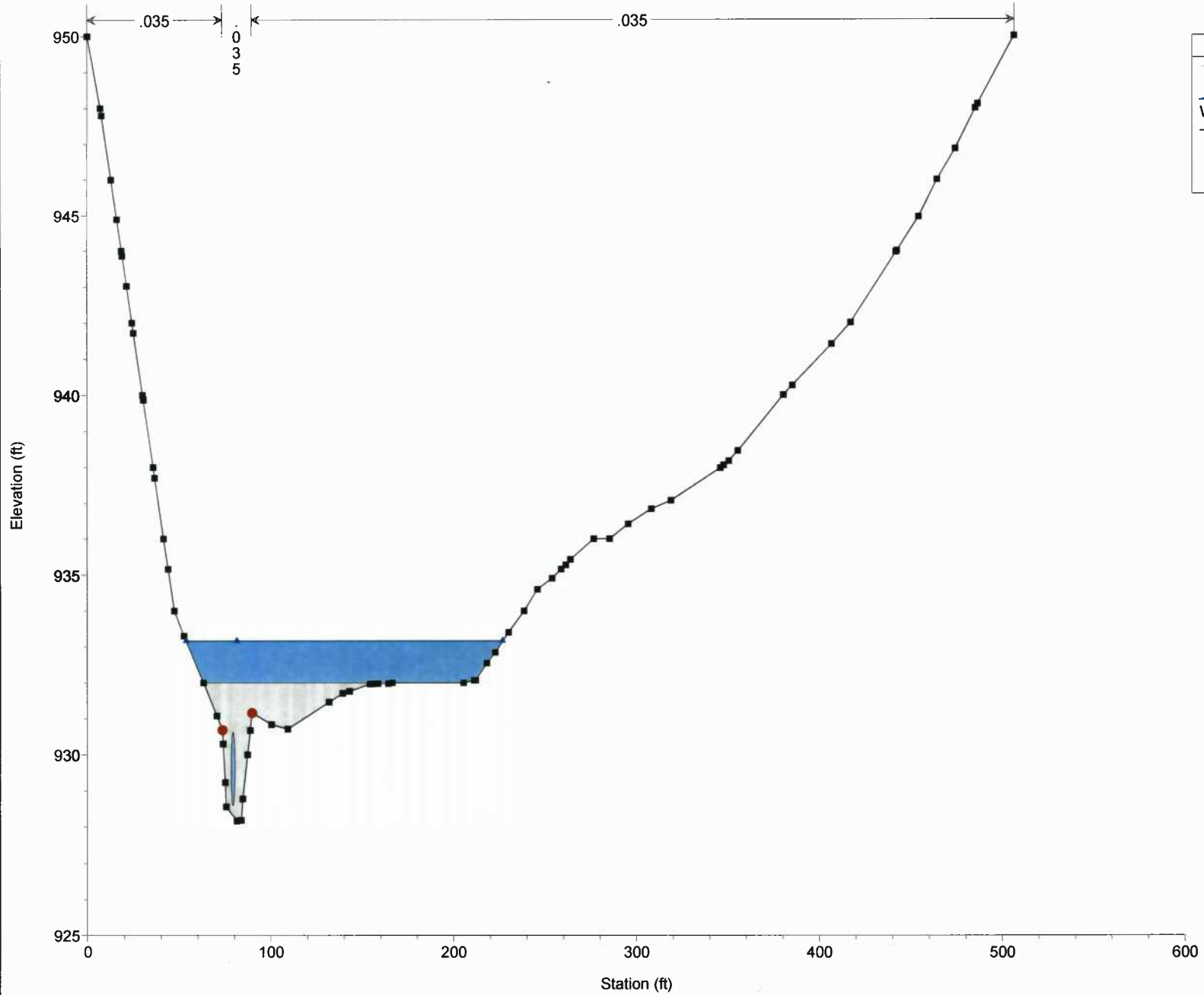


Legend	
WS PF 1 - Ex Revised	Blue line with square markers
WS PF 1 - PR Temp Br Rev	Black line with square markers
Ground	Black line with square markers
Bank Sta	Red dot

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 = Upper RS = 10155.71 Culv

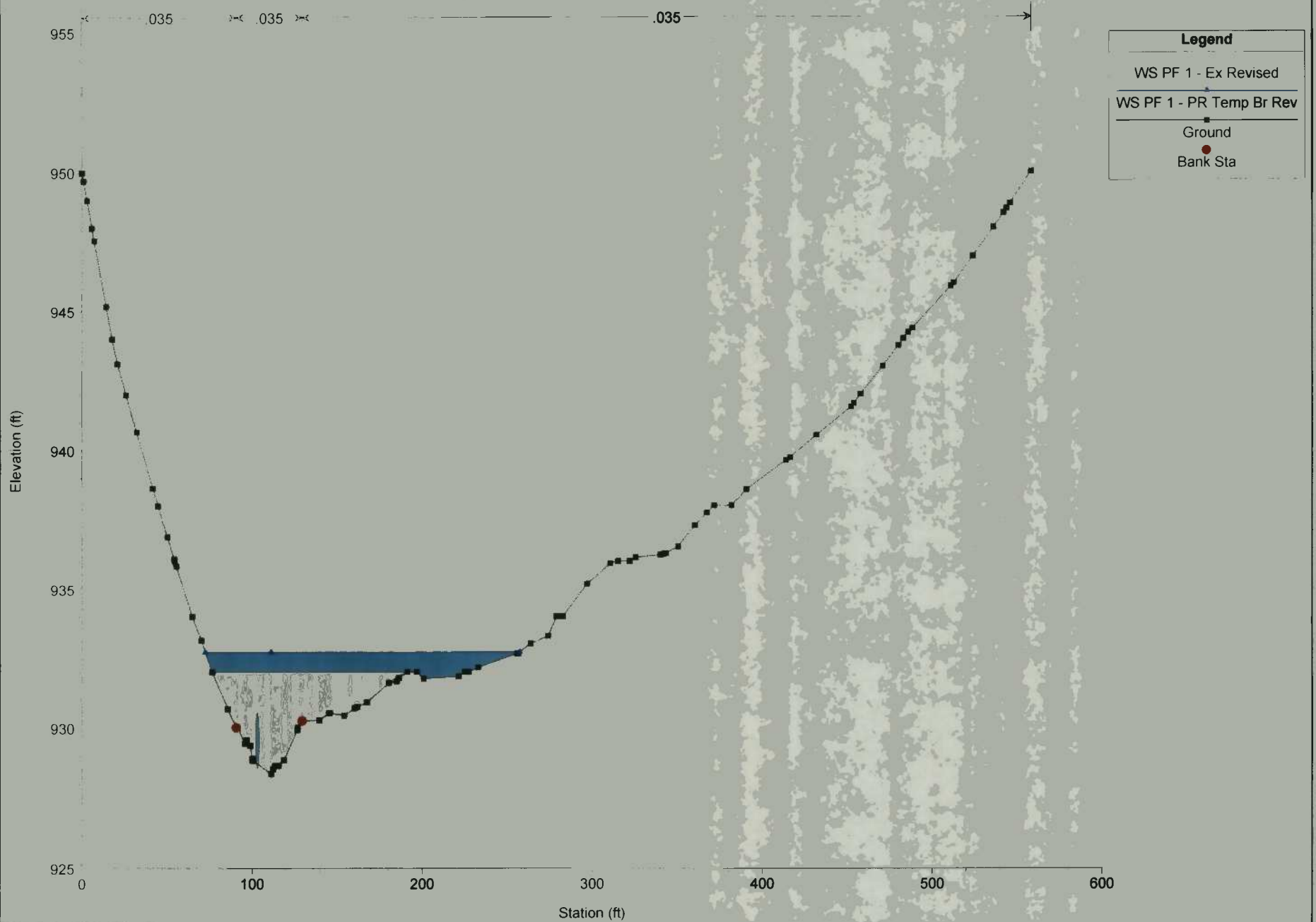


Legend	
WS PF 1 - Ex Revised	(Blue line)
WS PF 1 - PR Temp Br Rev	(Black line)
Ground	(Grey area)
Bank Sta	(Red dot)

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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

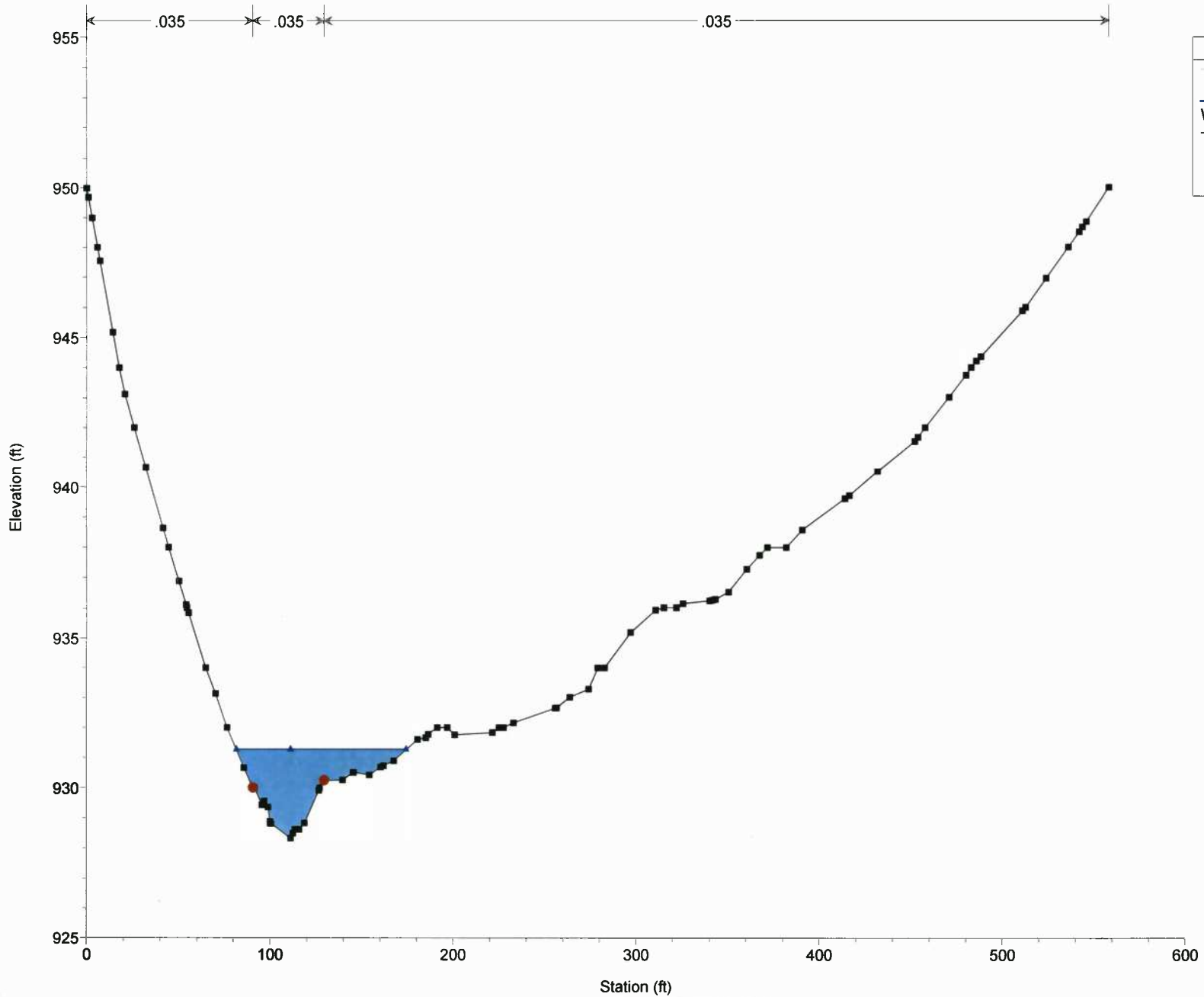
River = Bluestone Creek Reach = Upper RS = 10155.71 Culv



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

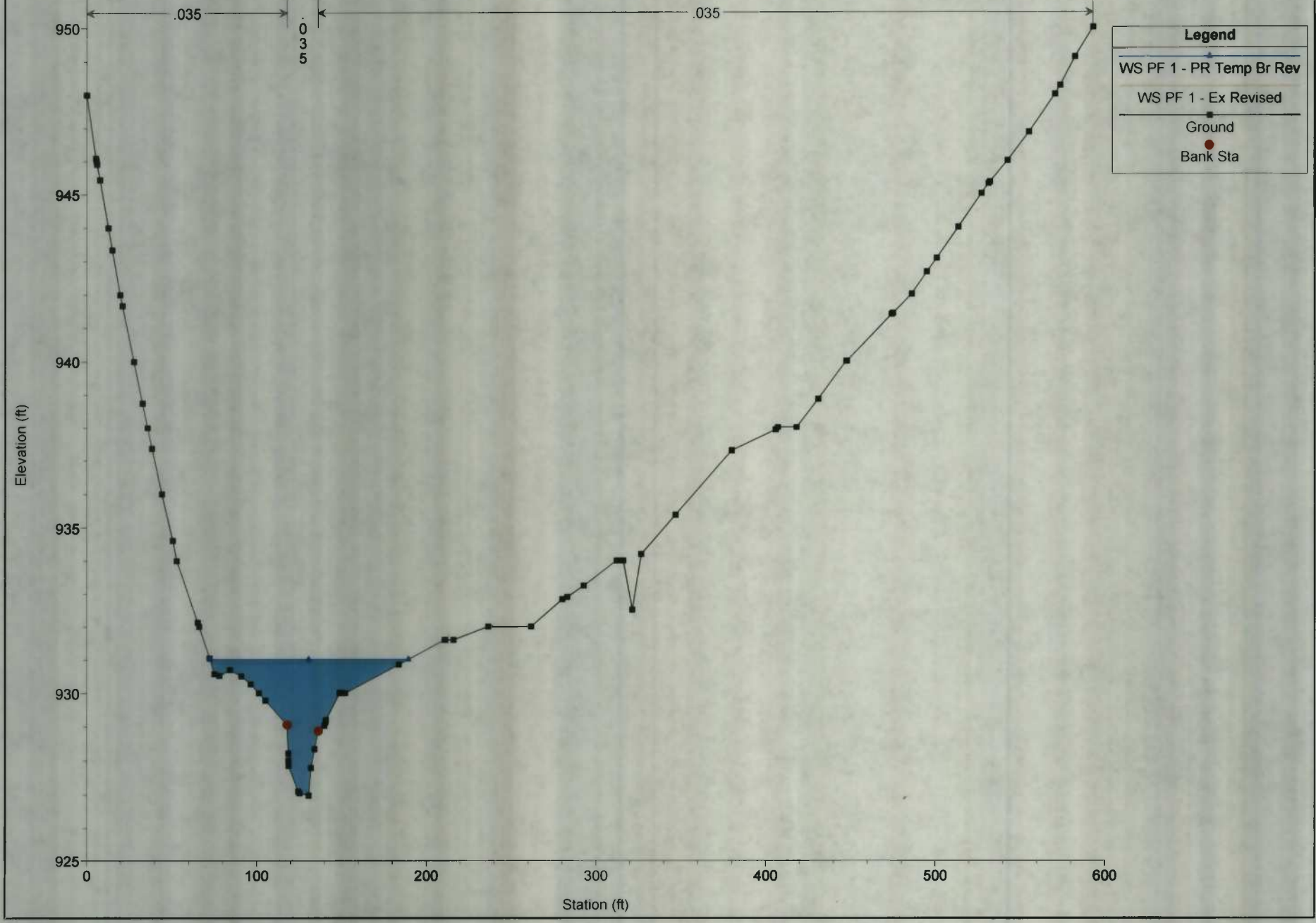
Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Upper RS = 10120.86



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

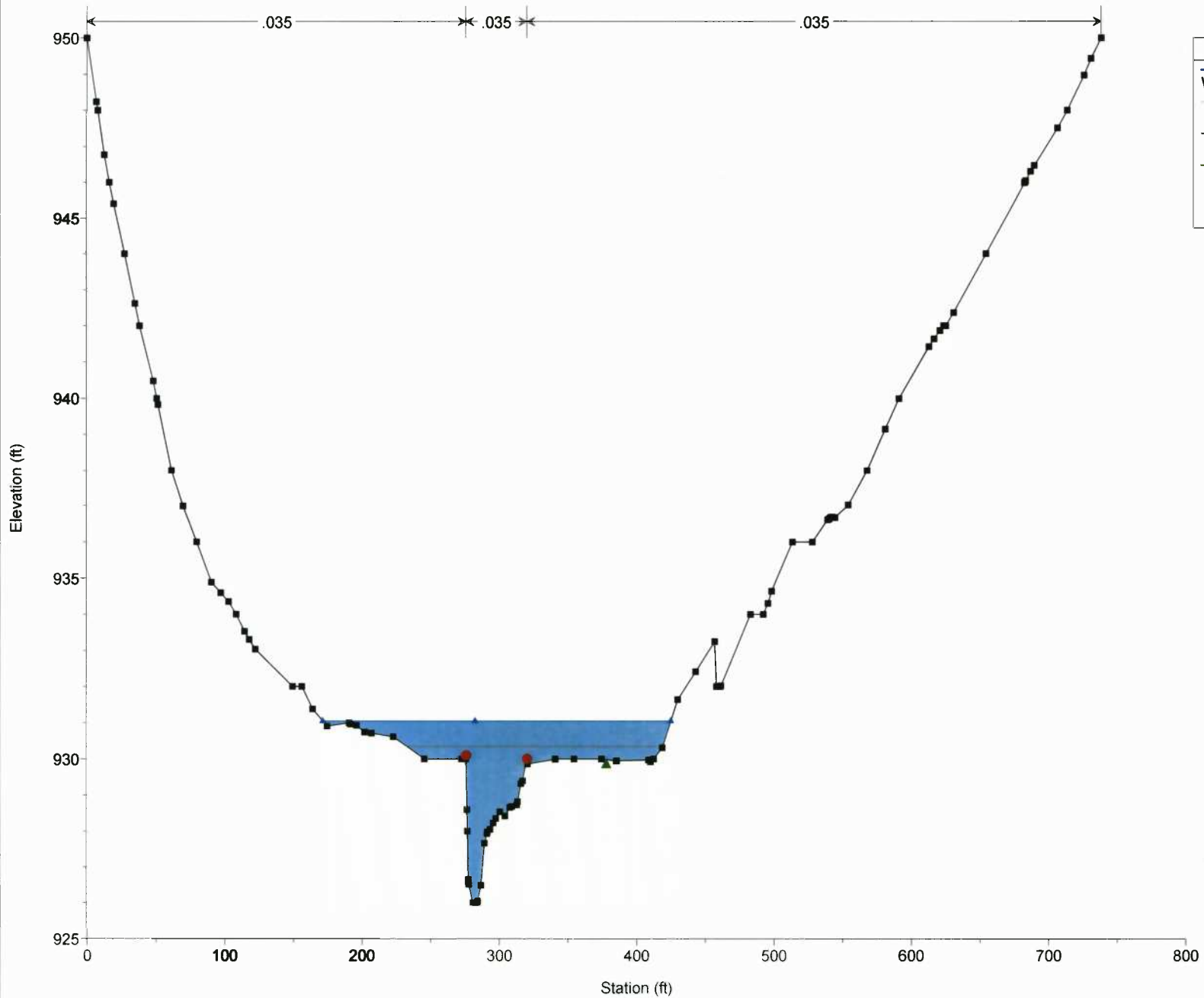
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised
Geom: Proposed Temp Bridge Revised Flow: Structures Revised
River = Bluestone Creek Reach = Upper RS = 10055.03



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

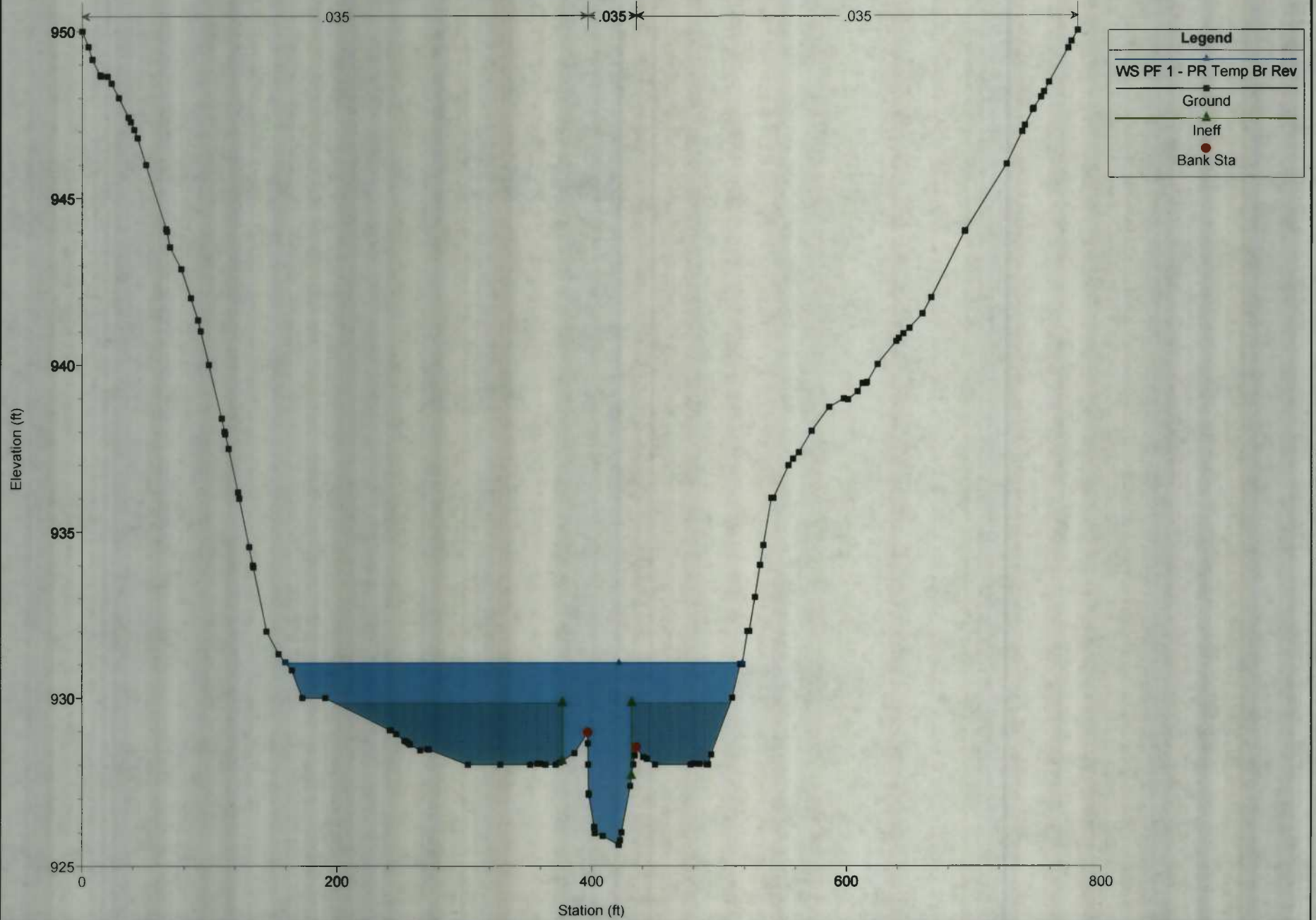


Legend	
WS PF 1 - PR Temp Br Rev	Blue line with square markers
WS PF 1 - Ex Revised	Black line with square markers
Ground	Black line with square markers
Ineff	Black triangle
Bank Sta	Red circle

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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

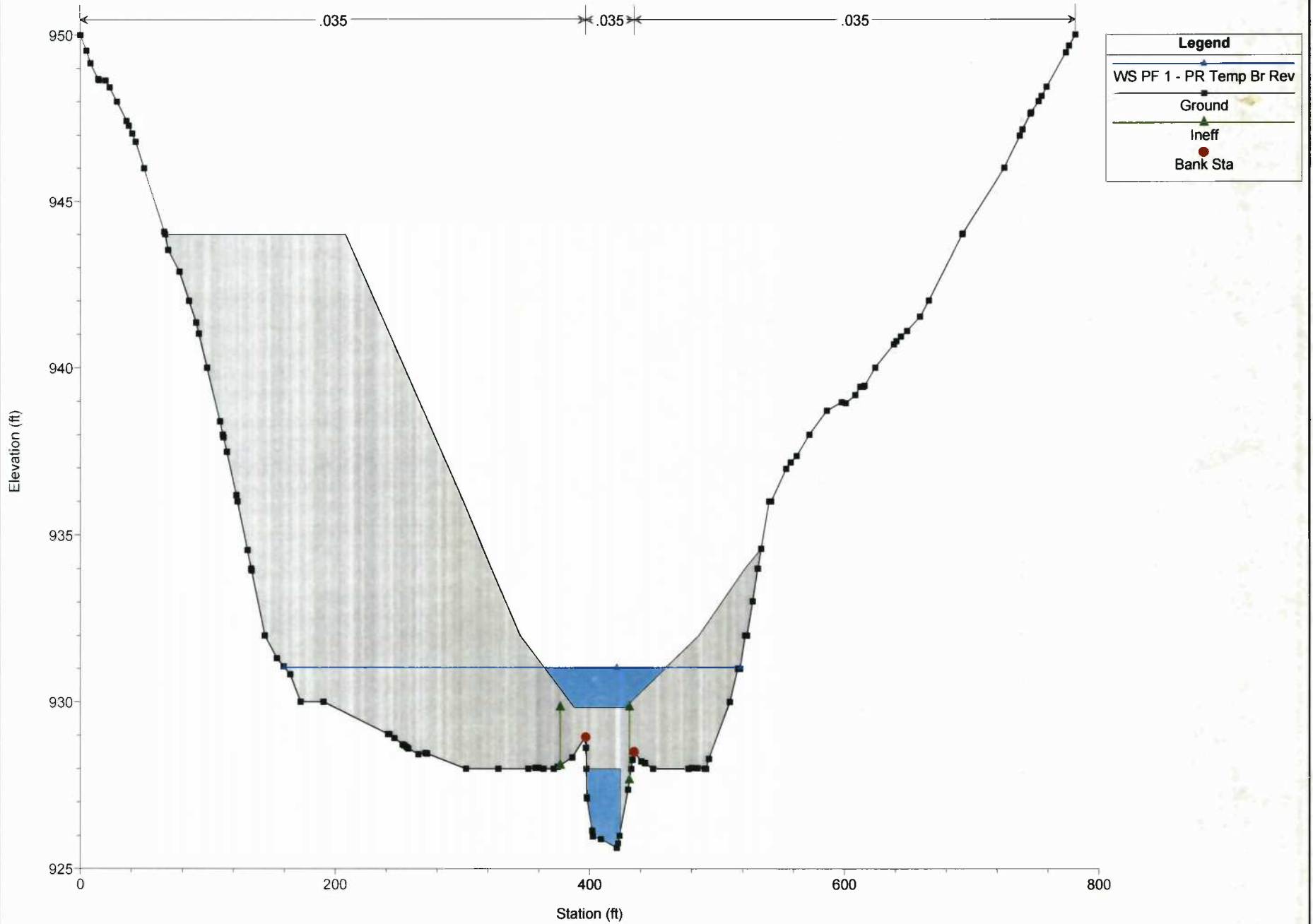
River = Bluestone Creek Reach = Middle RS = 9878.981



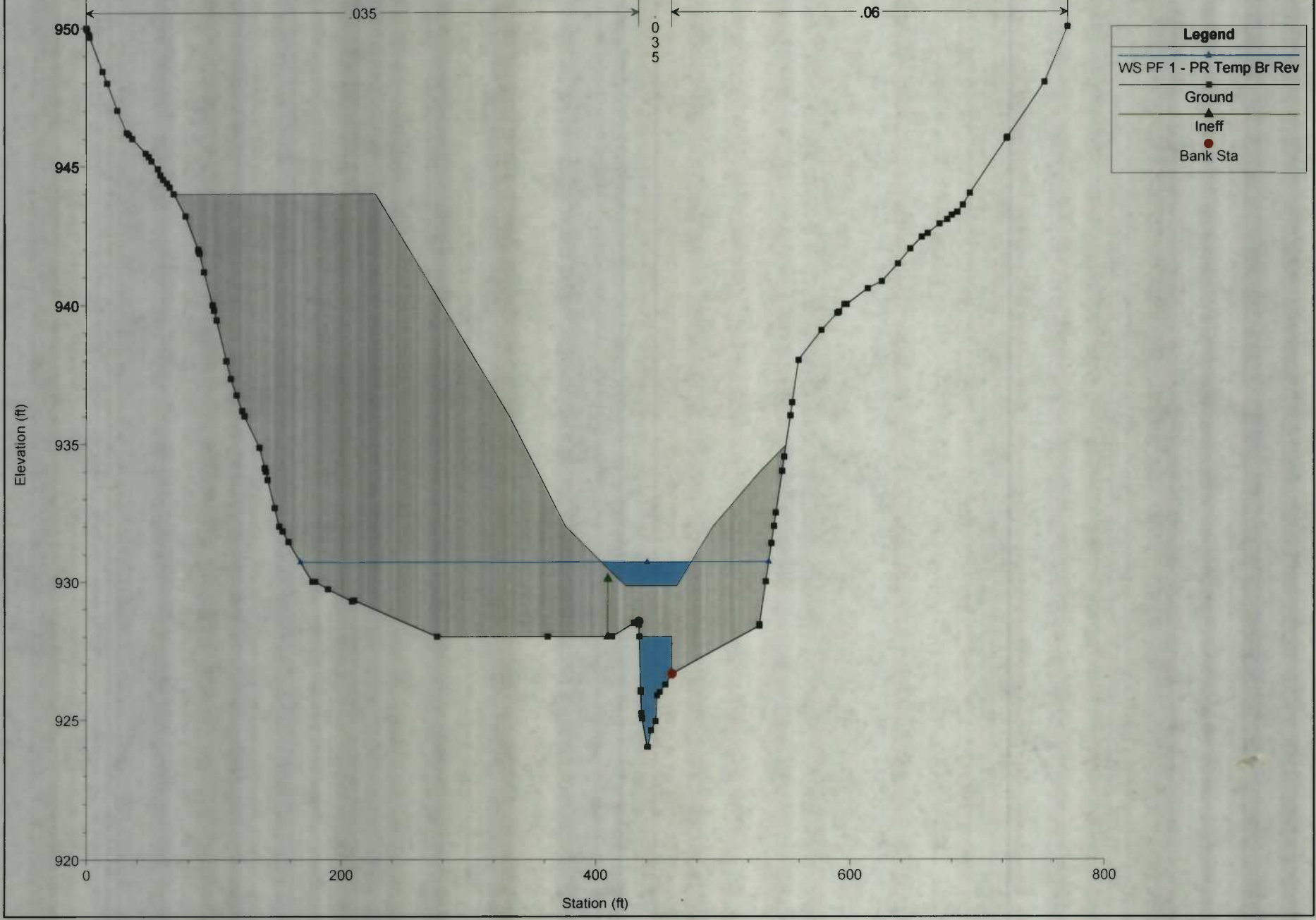
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

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

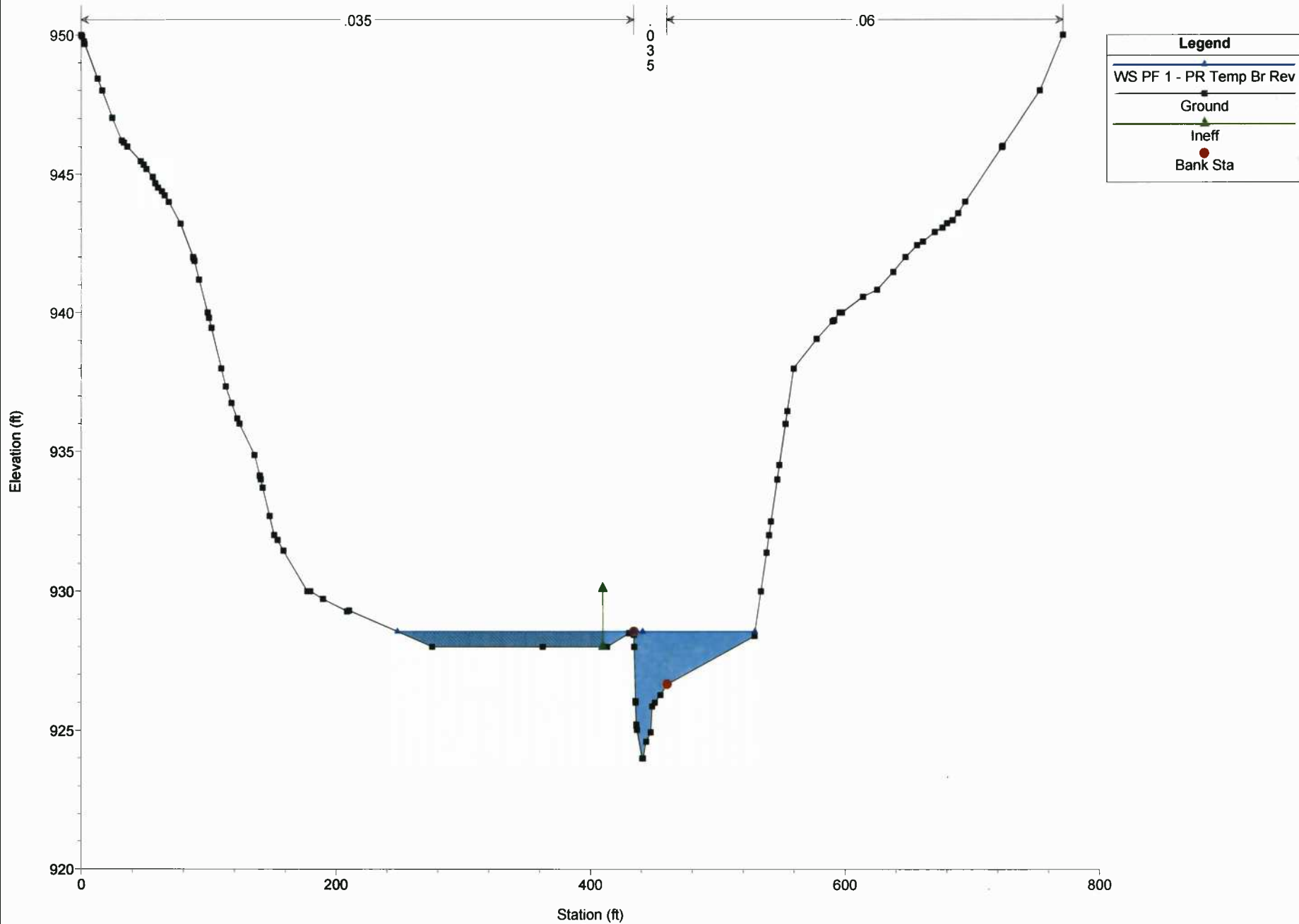


Legend	
WS PF 1 - PR Temp Br Rev	(Blue line)
Ground	(Square marker)
Ineff	(Triangle marker)
Bank Sta	(Red circle marker)

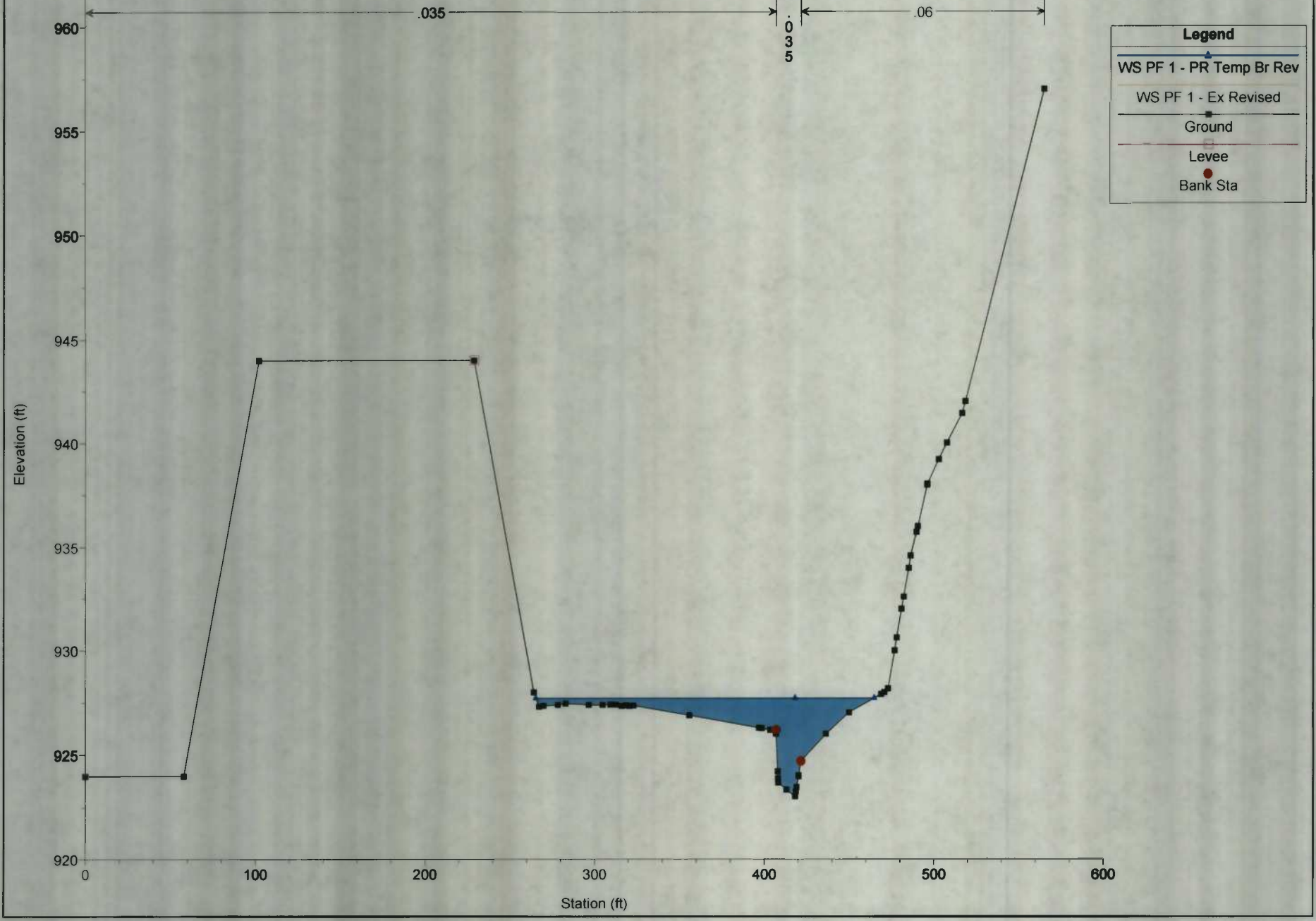
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 9831.906



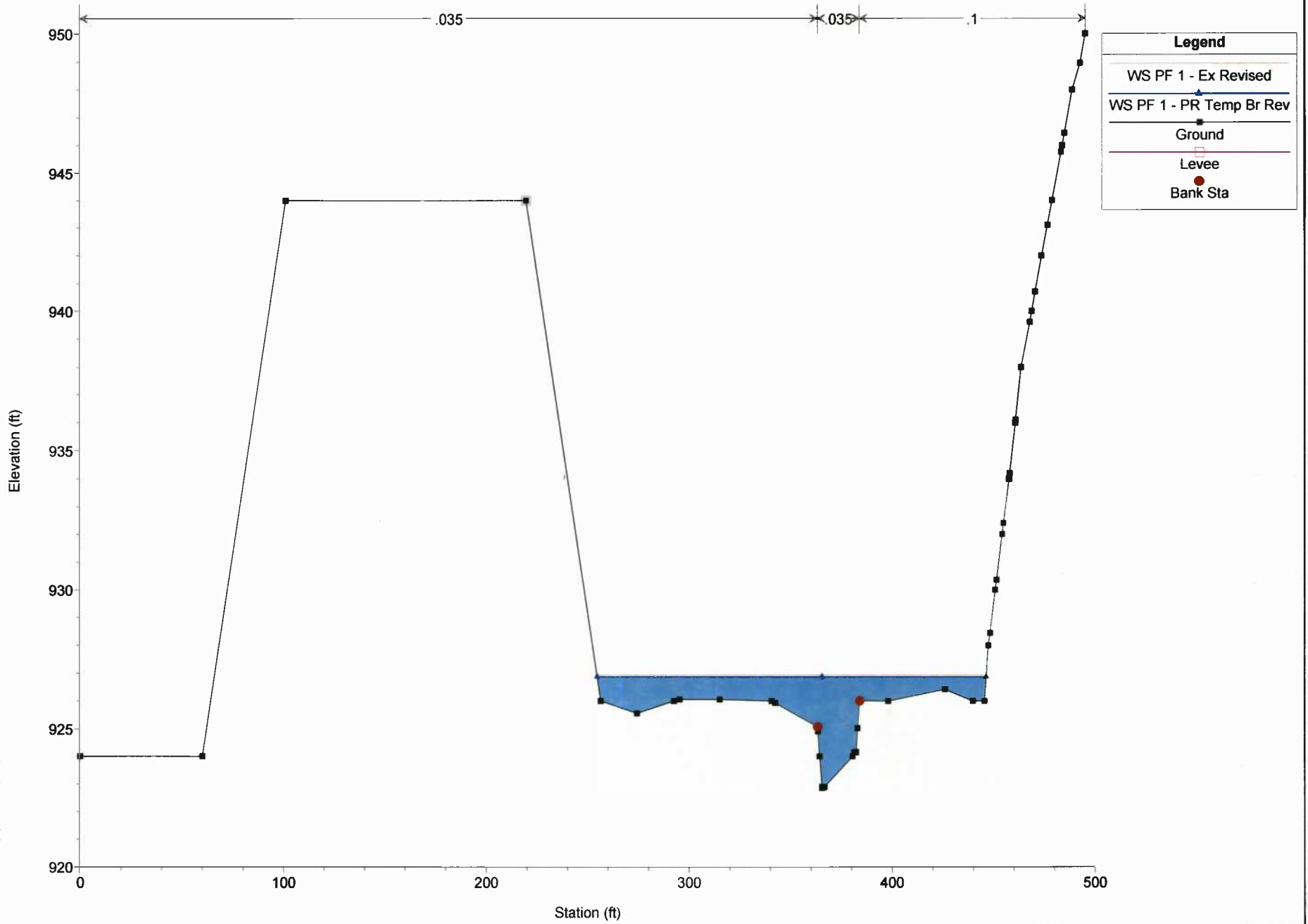
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised
 Geom: Proposed Temp Bridge Revised Flow: Structures Revised
 River = Bluestone Creek Reach = Middle RS = 9559.249



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

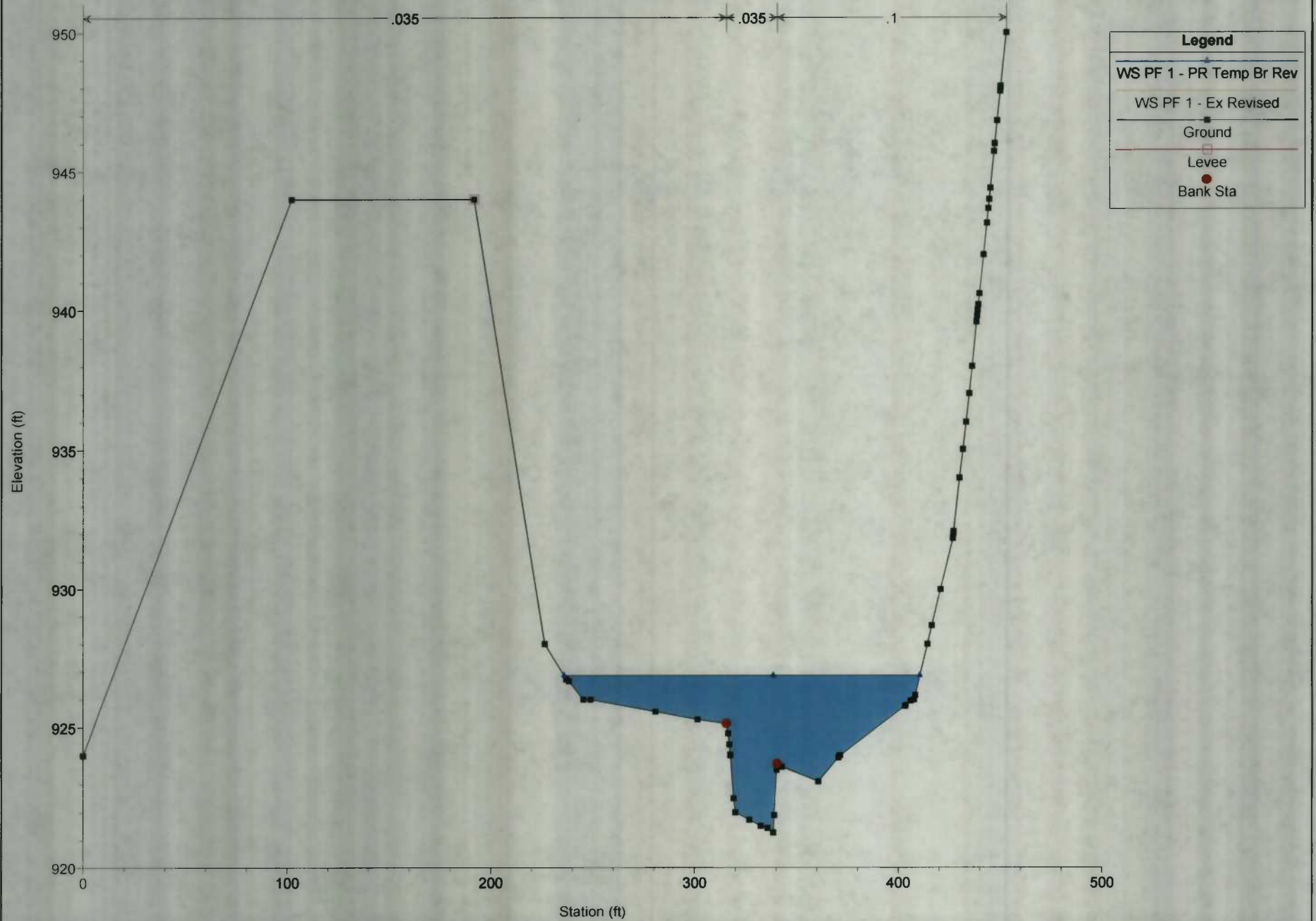
River = Bluestone Creek Reach = Middle RS = 9443.656



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

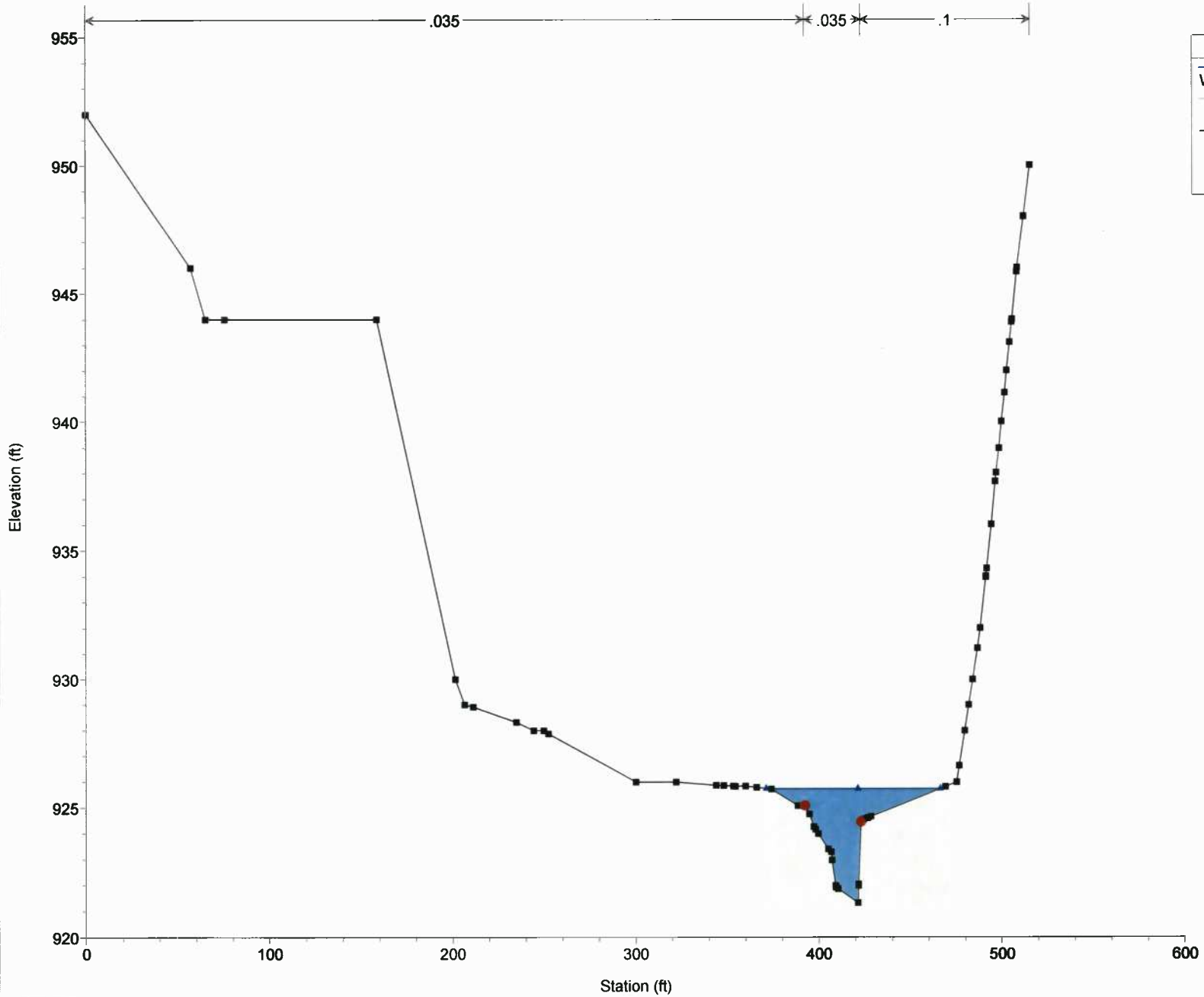
River = Bluestone Creek Reach = Middle RS = 9322.807



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



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 = 9003.470

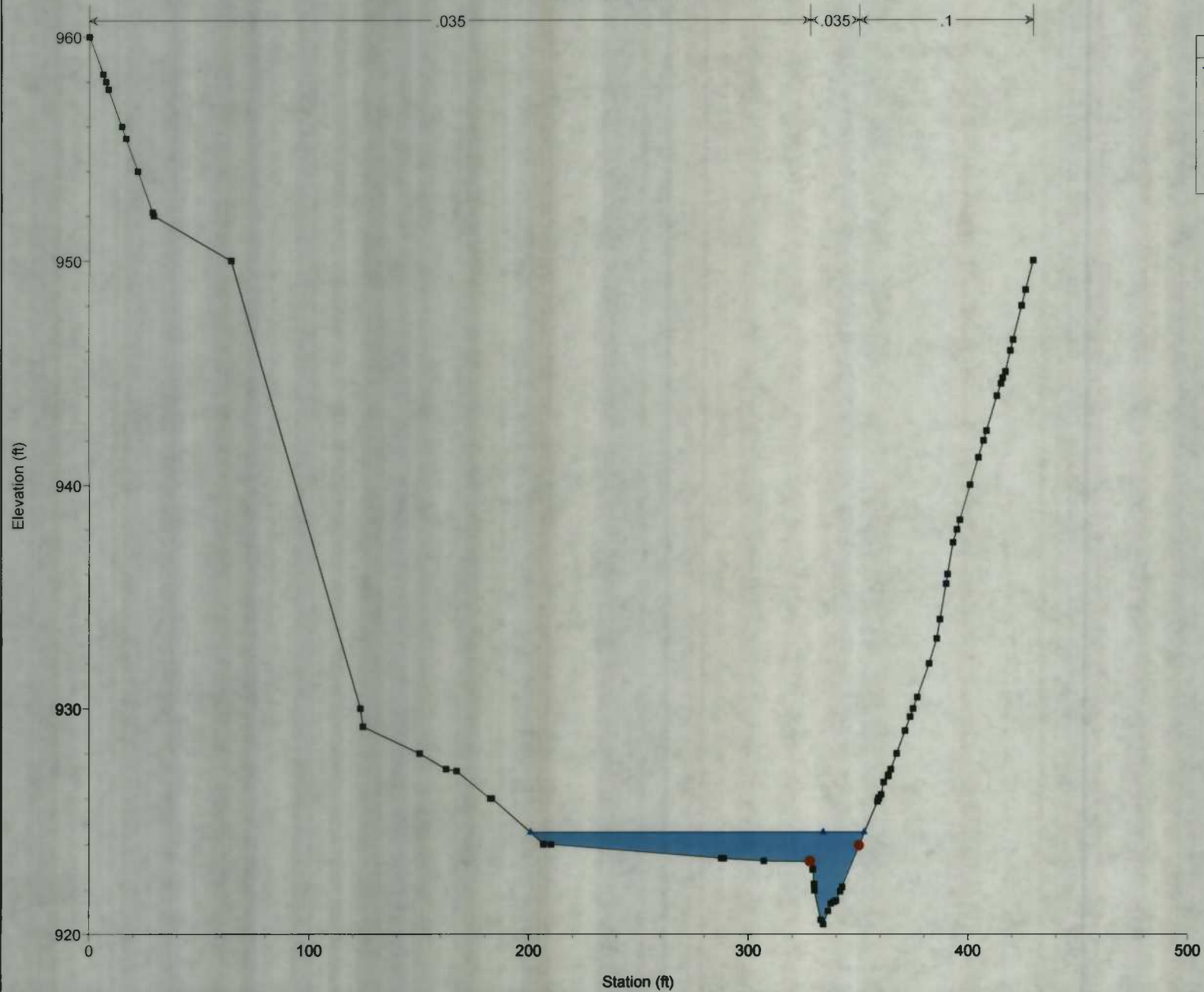
Legend

WS PF 1 - PR Temp Br Rev

WS PF 1 - Ex Revised

Ground

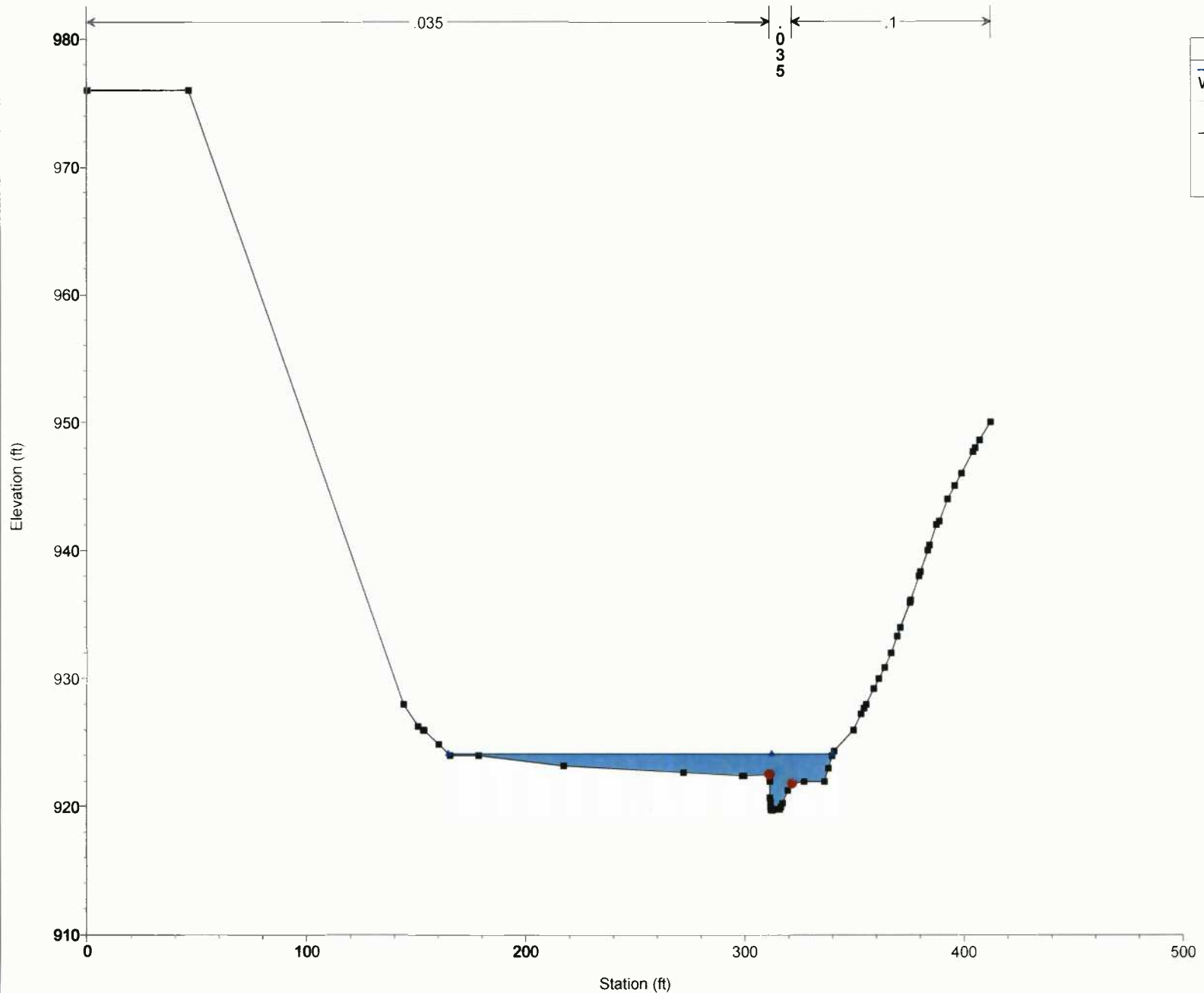
Bank Sta



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

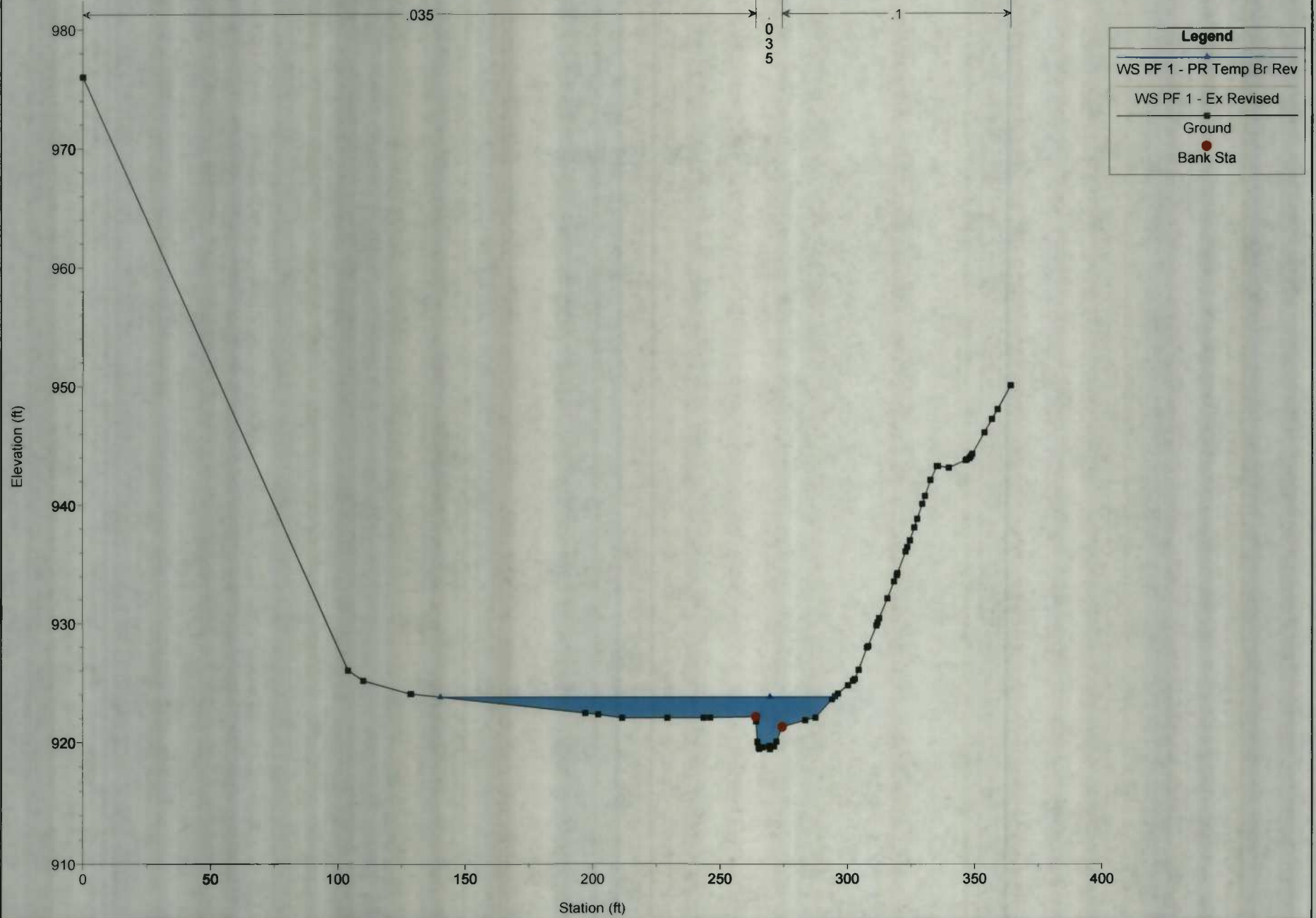


Legend	
	WS PF 1 - PR Temp Br Rev
	WS PF 1 - Ex Revised
	Ground
	Bank Sta

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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

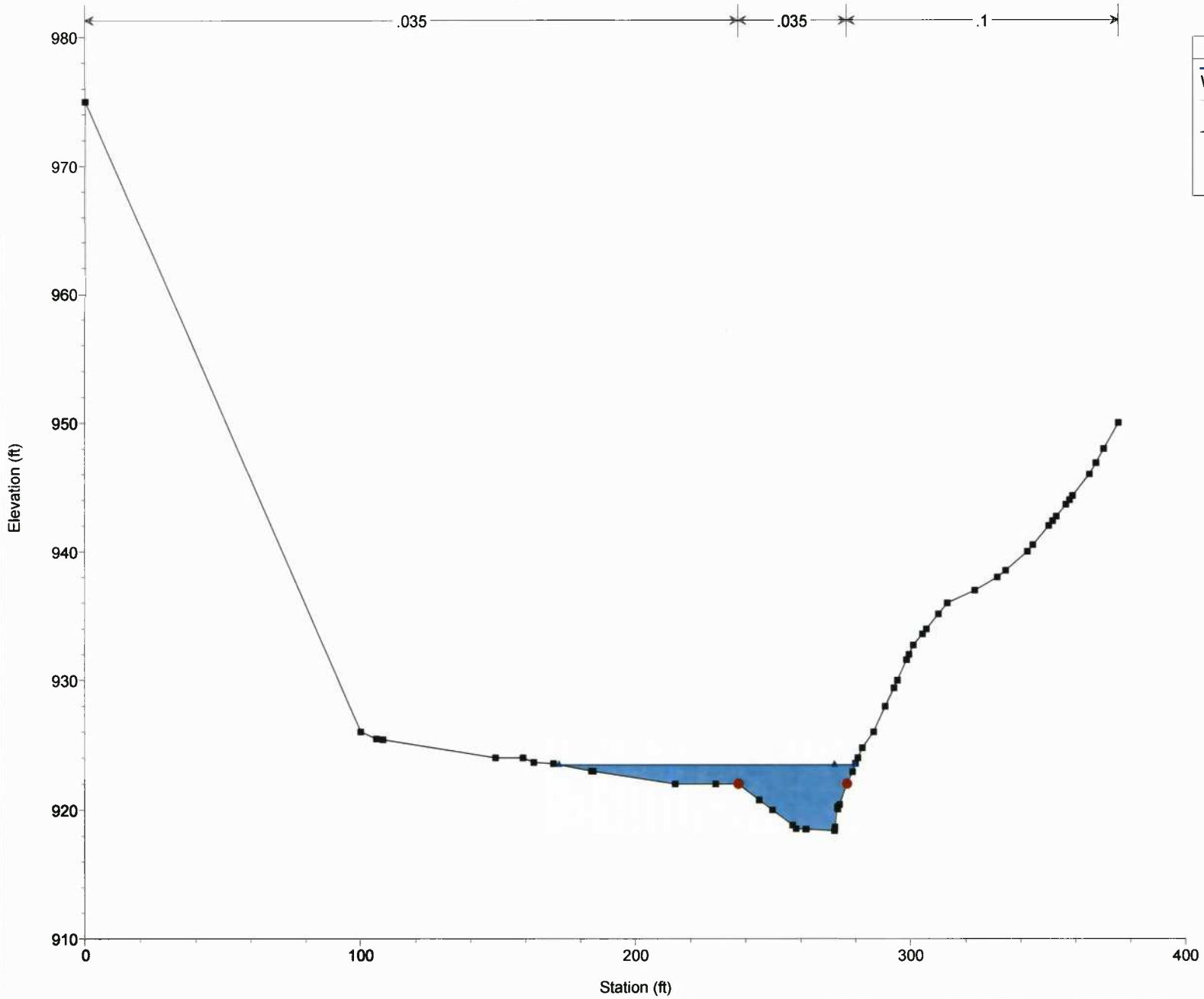
River = Bluestone Creek Reach = Middle RS = 8843.186



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

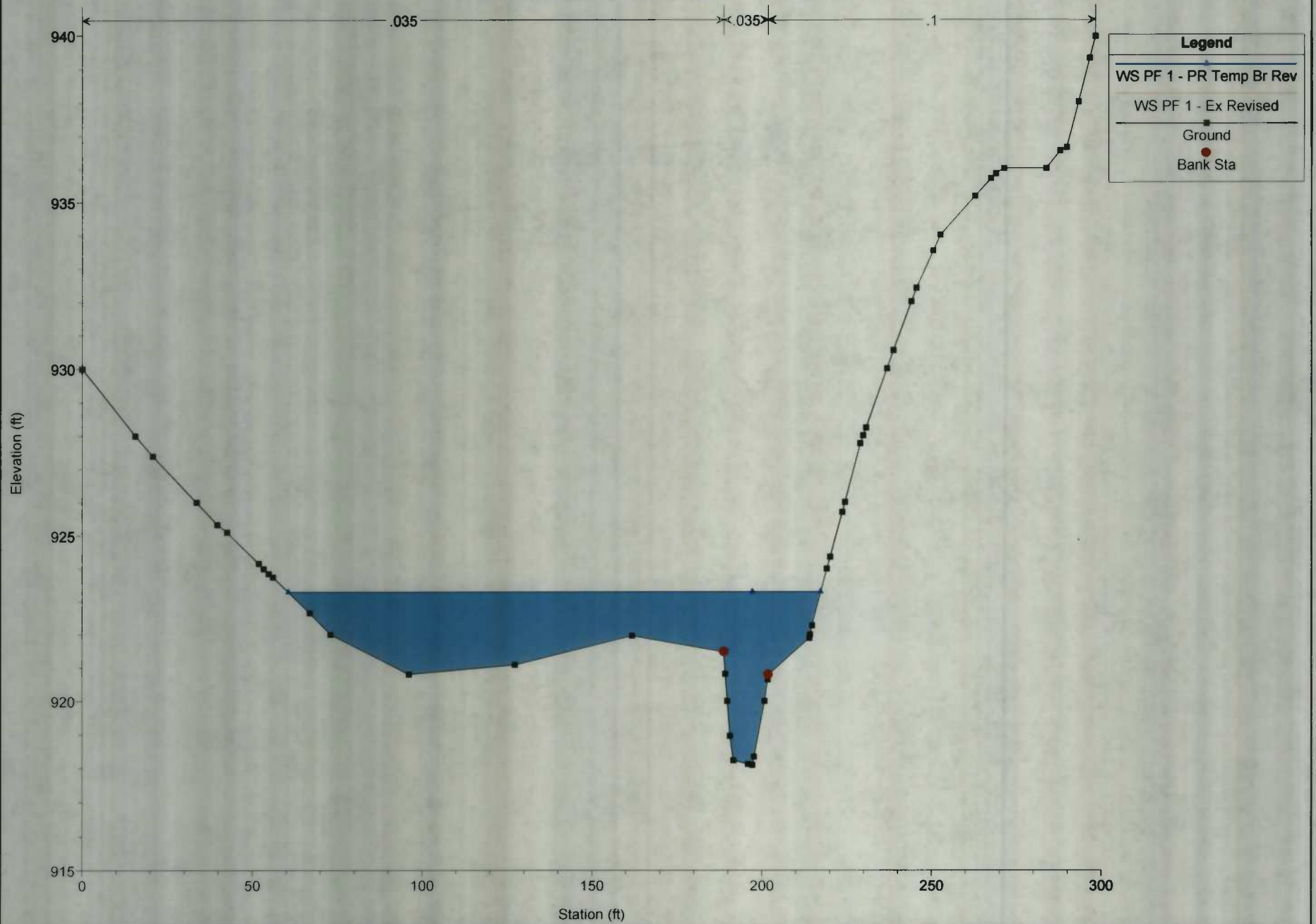


Legend	
—▲—	WS PF 1 - PR Temp Br Rev
—■—	WS PF 1 - Ex Revised
—■—	Ground
●	Bank Sta

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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

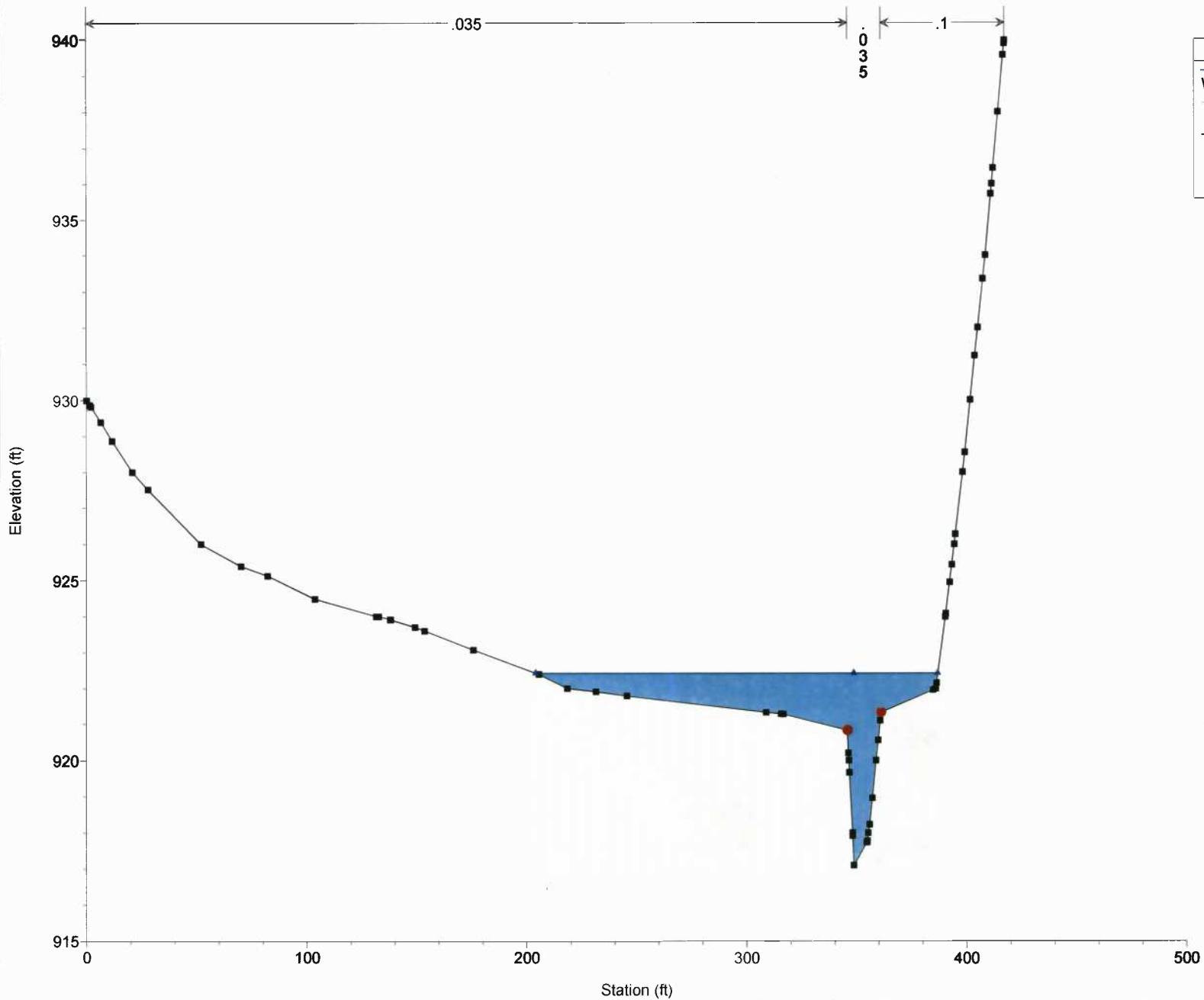
River = Bluestone Creek Reach = Middle RS = 8542.514



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

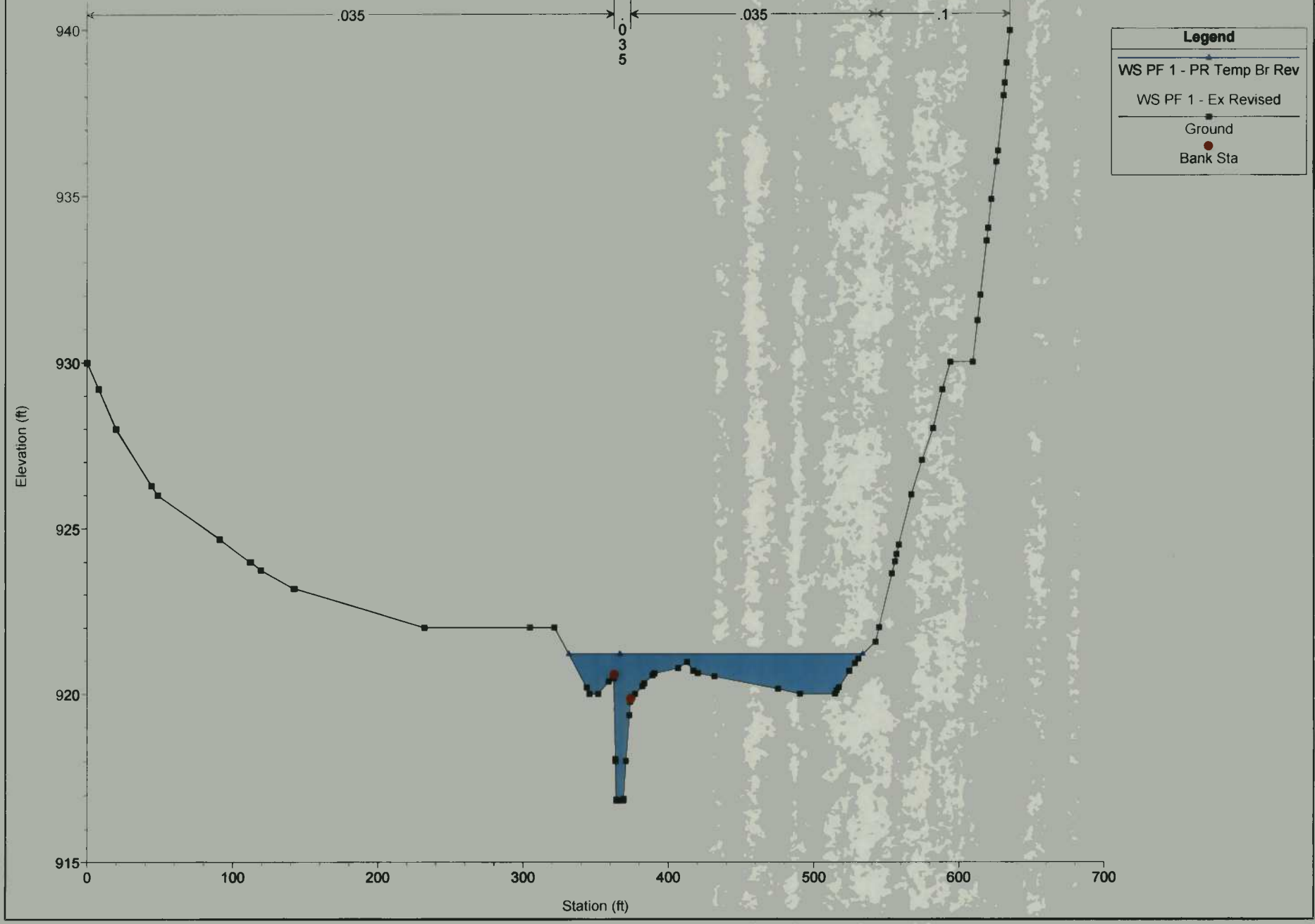
Geom: Proposed Temp Bridge Revised Flow: Structures Revised

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



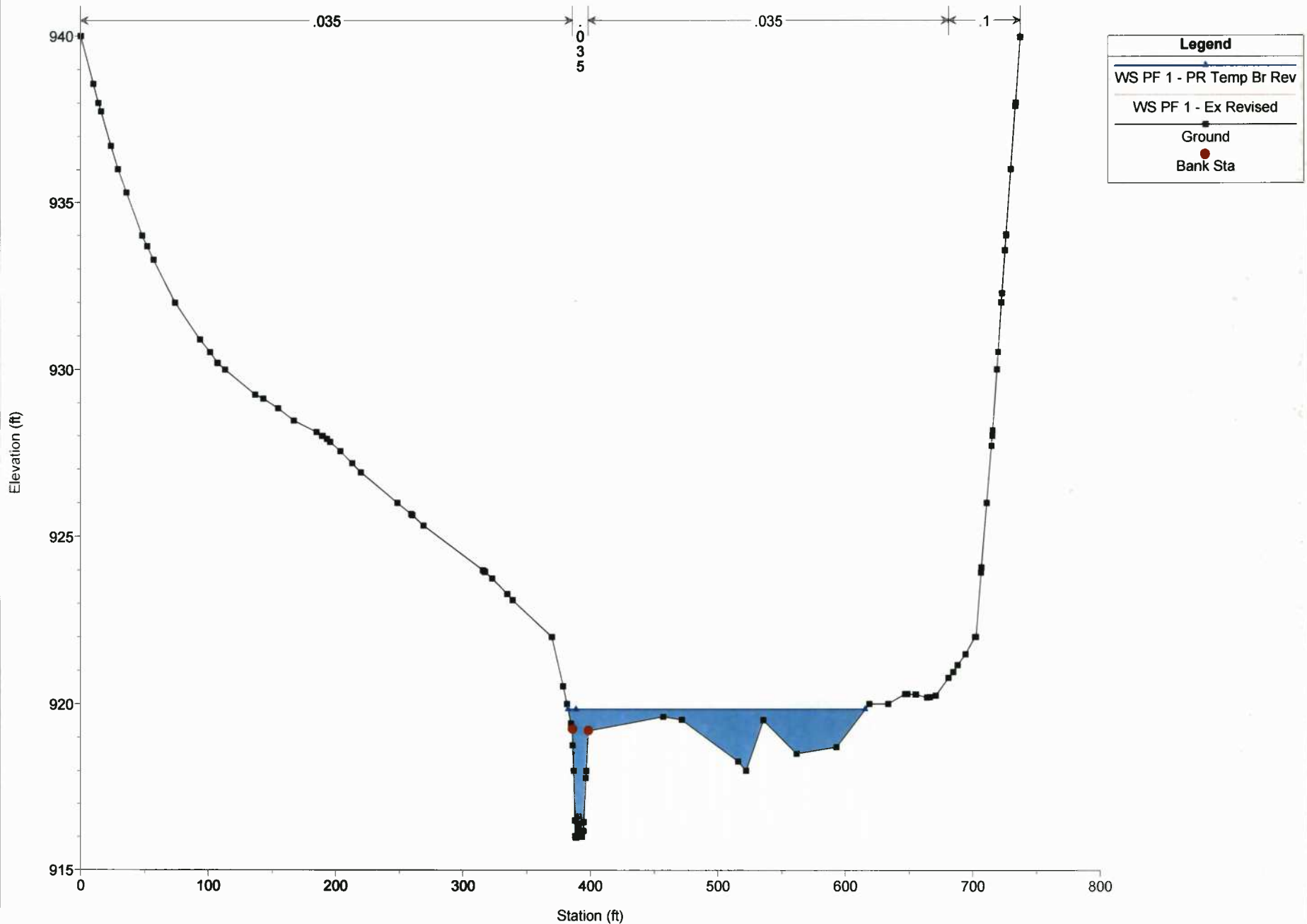
Legend

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

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

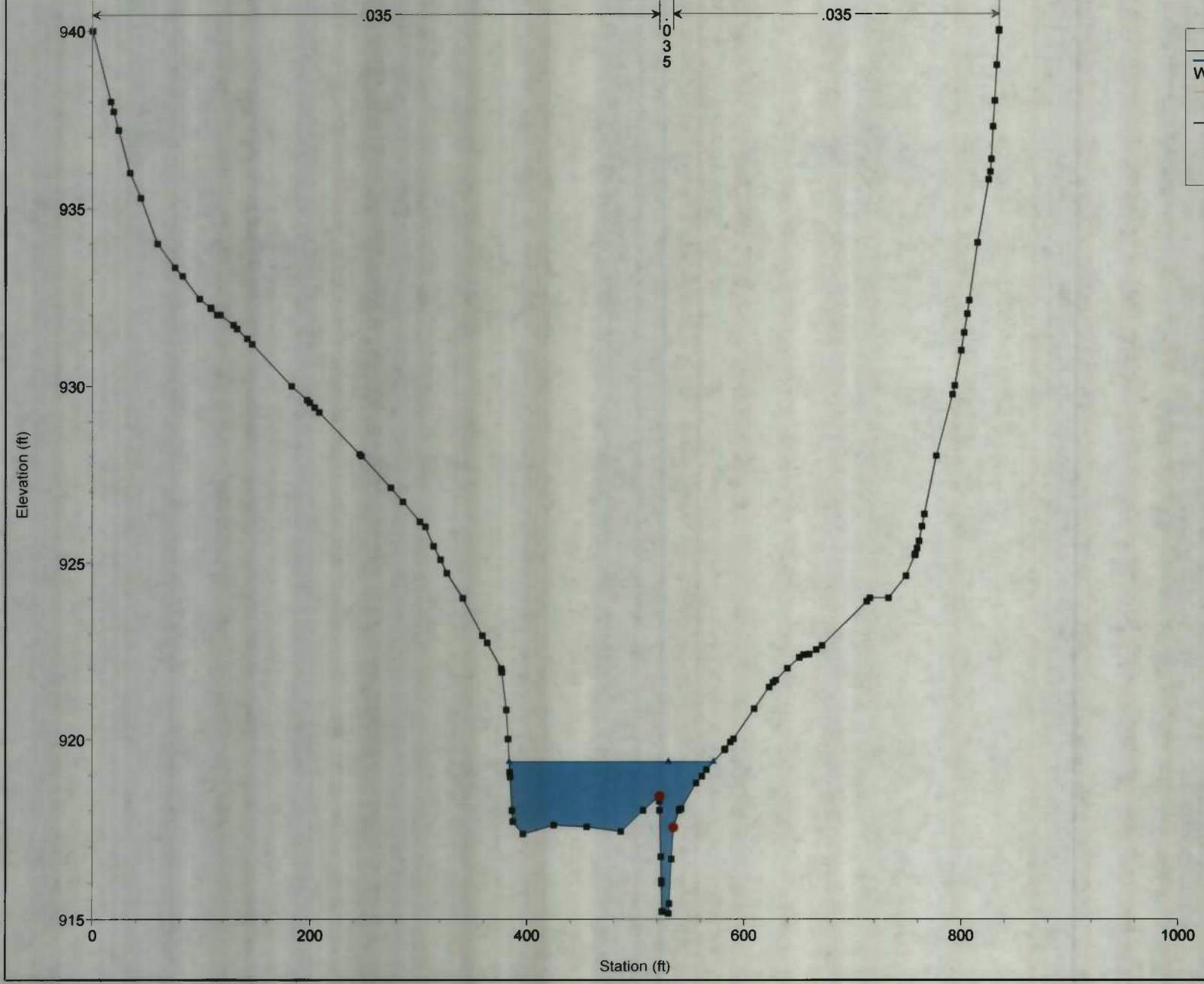
Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Middle RS = 7770.441



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

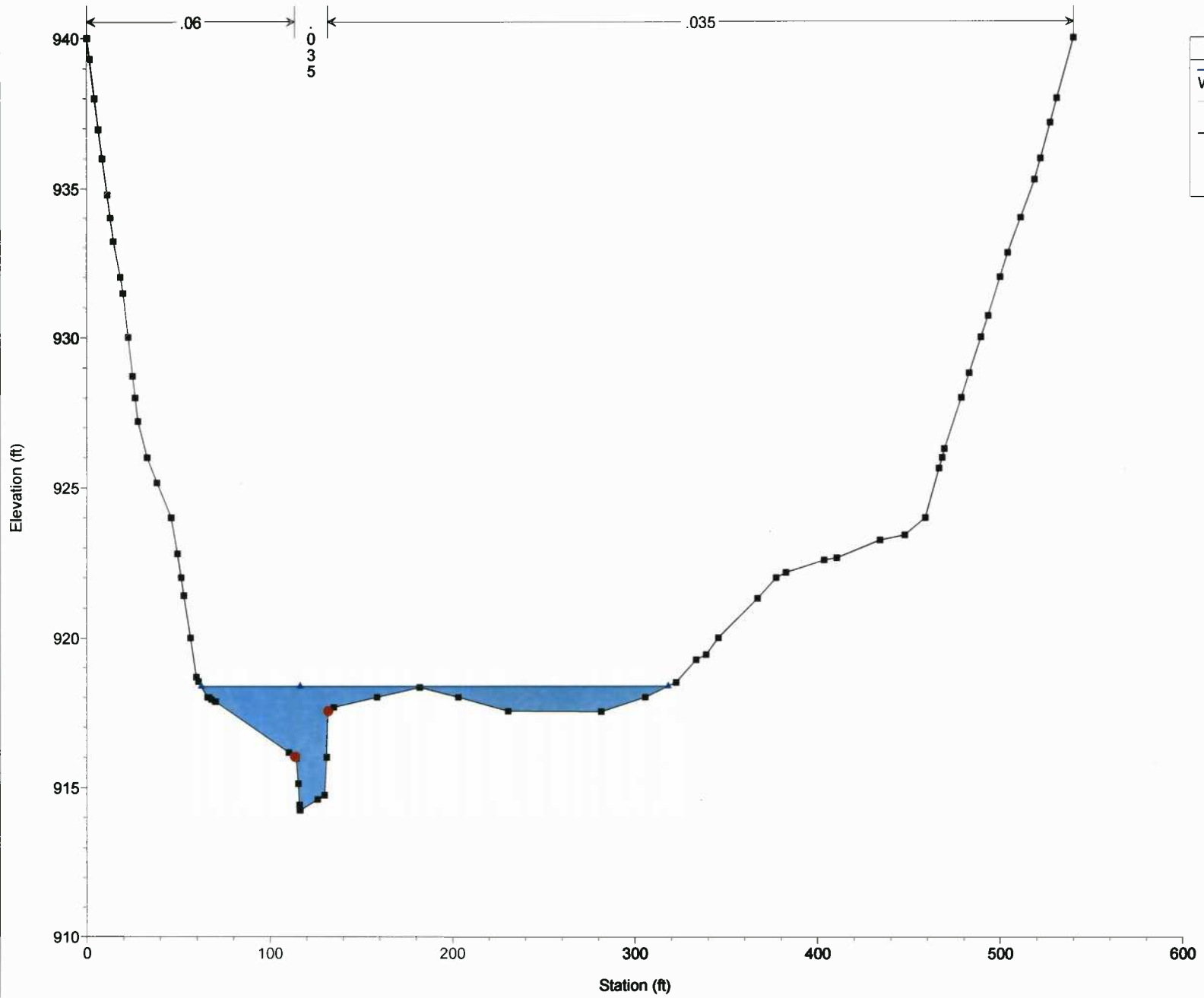
Legend	
	WS PF 1 - PR Temp Br Rev
	WS PF 1 - Ex Revised
	Ground
	Bank Sta







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 = 7150.429

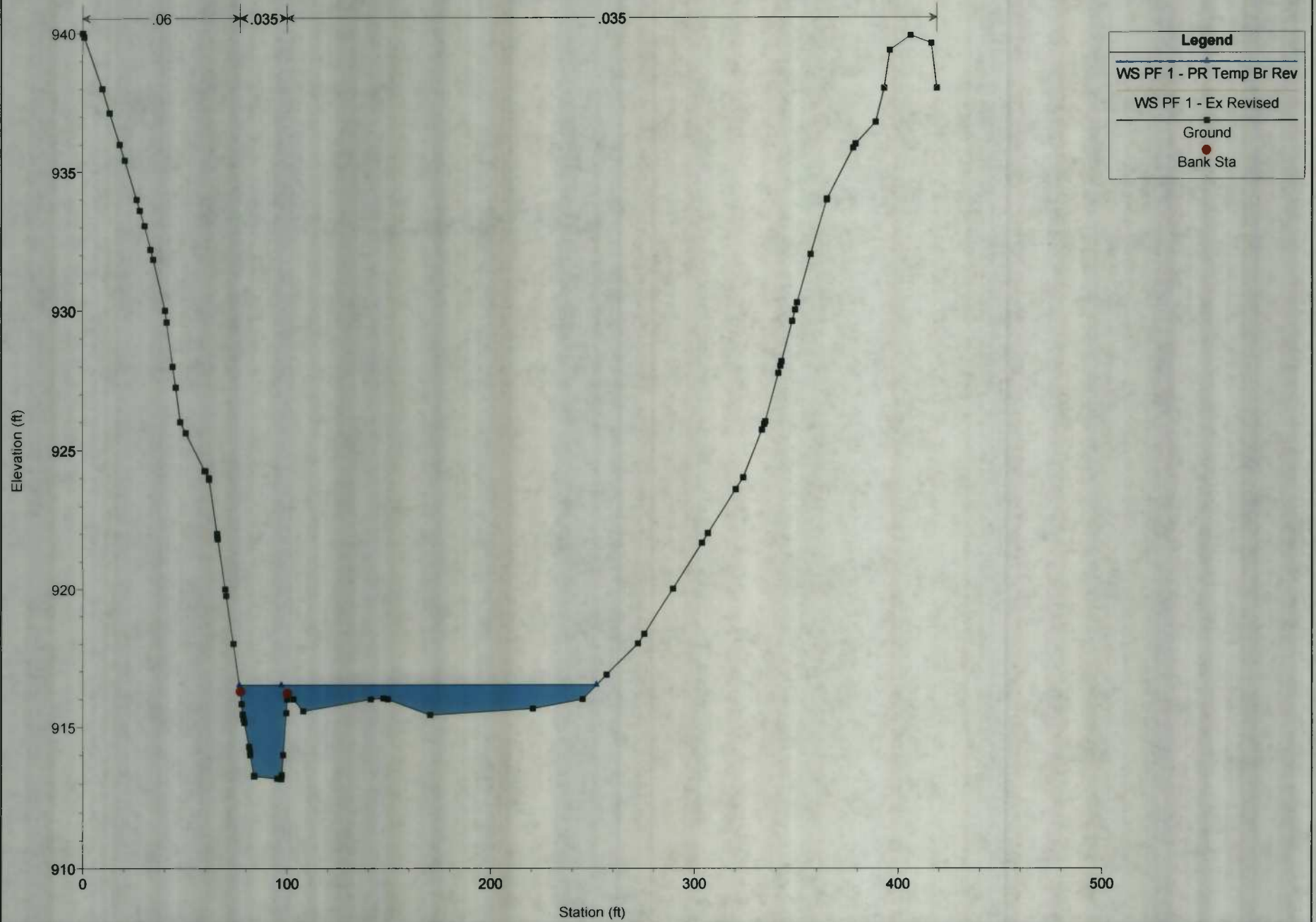


Legend	
	WS PF 1 - PR Temp Br Rev
	WS PF 1 - Ex Revised
	Ground
	Bank Sta

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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

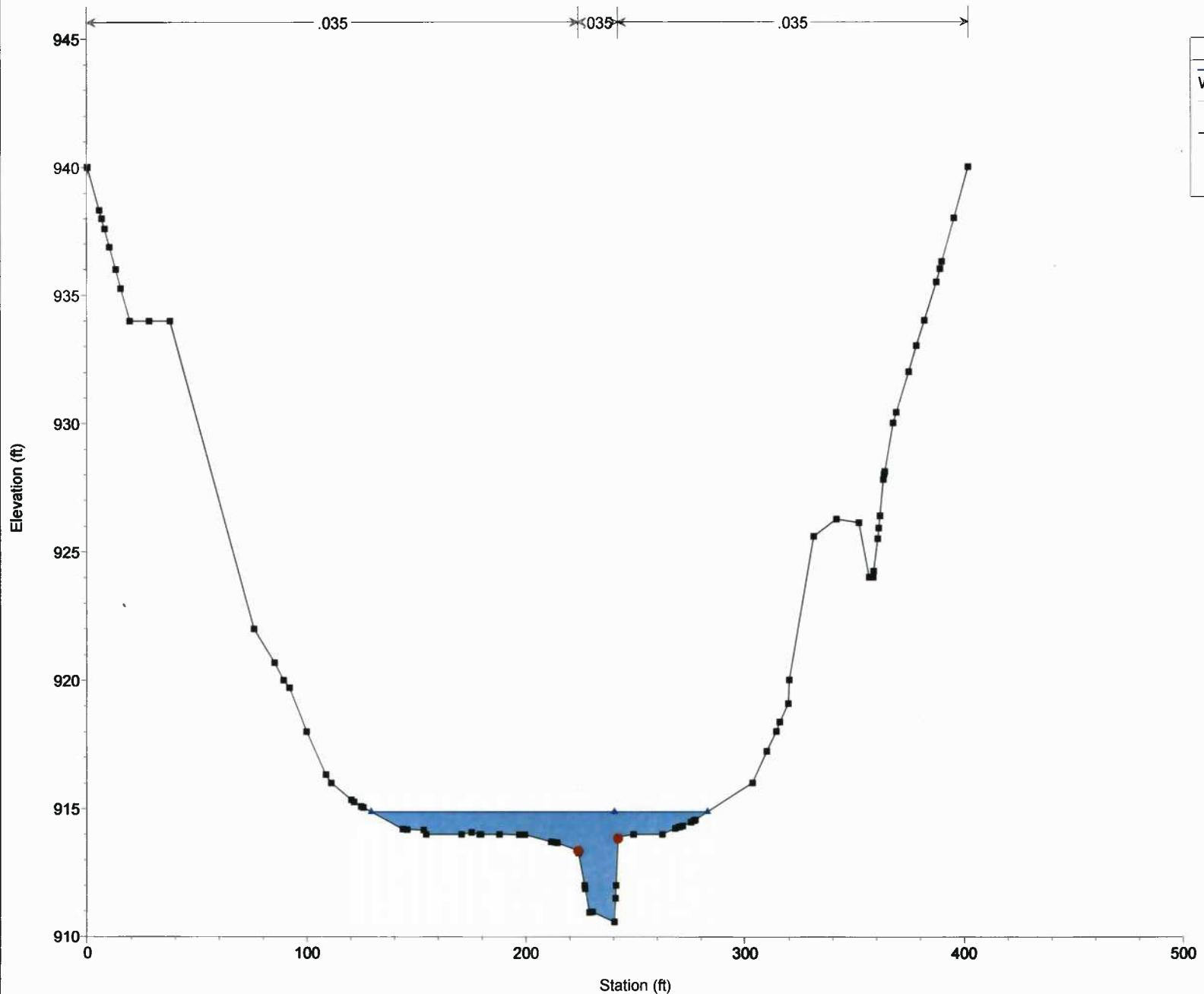
River = Bluestone Creek Reach = Middle RS = 6893.619



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



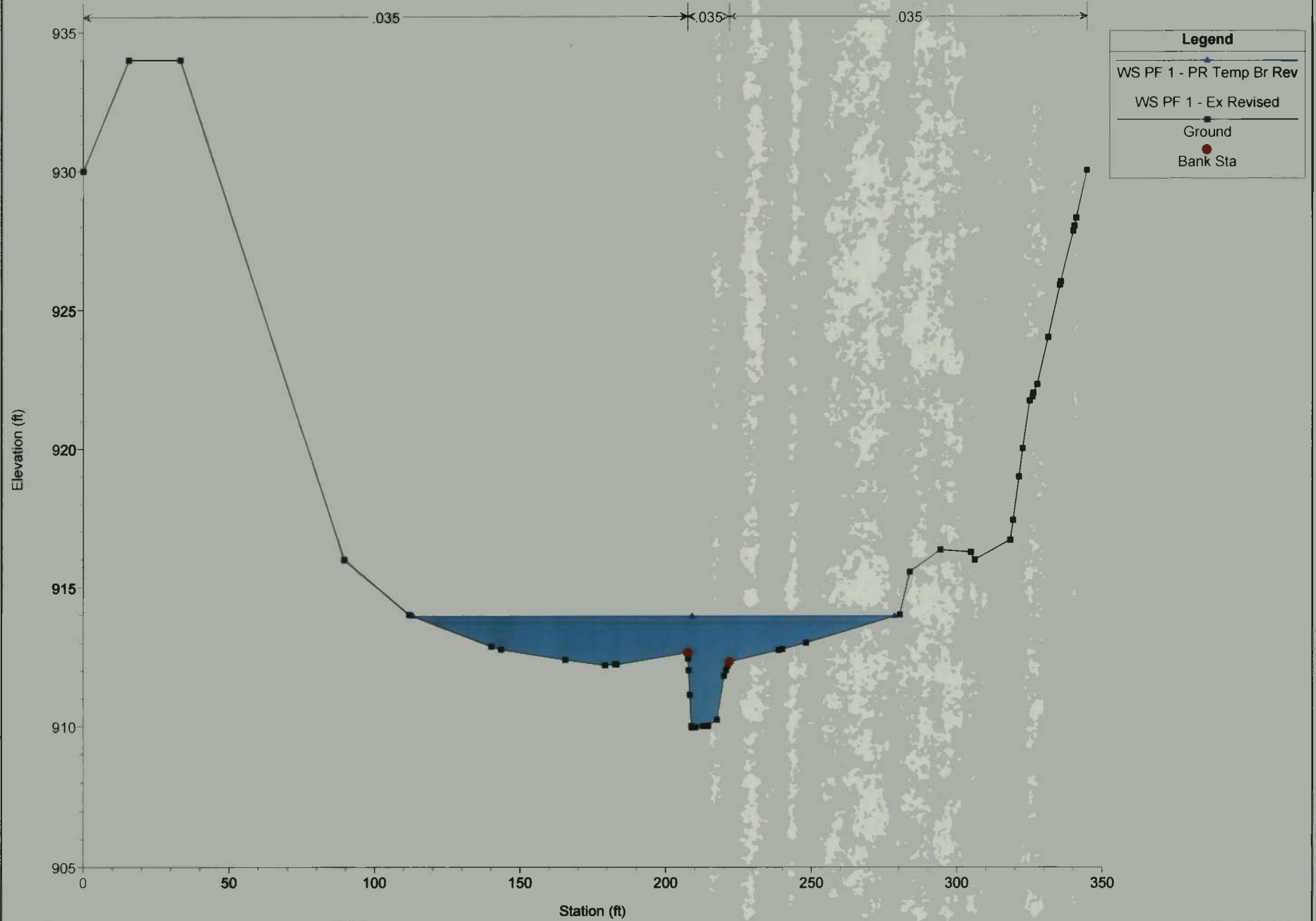
Legend

- 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

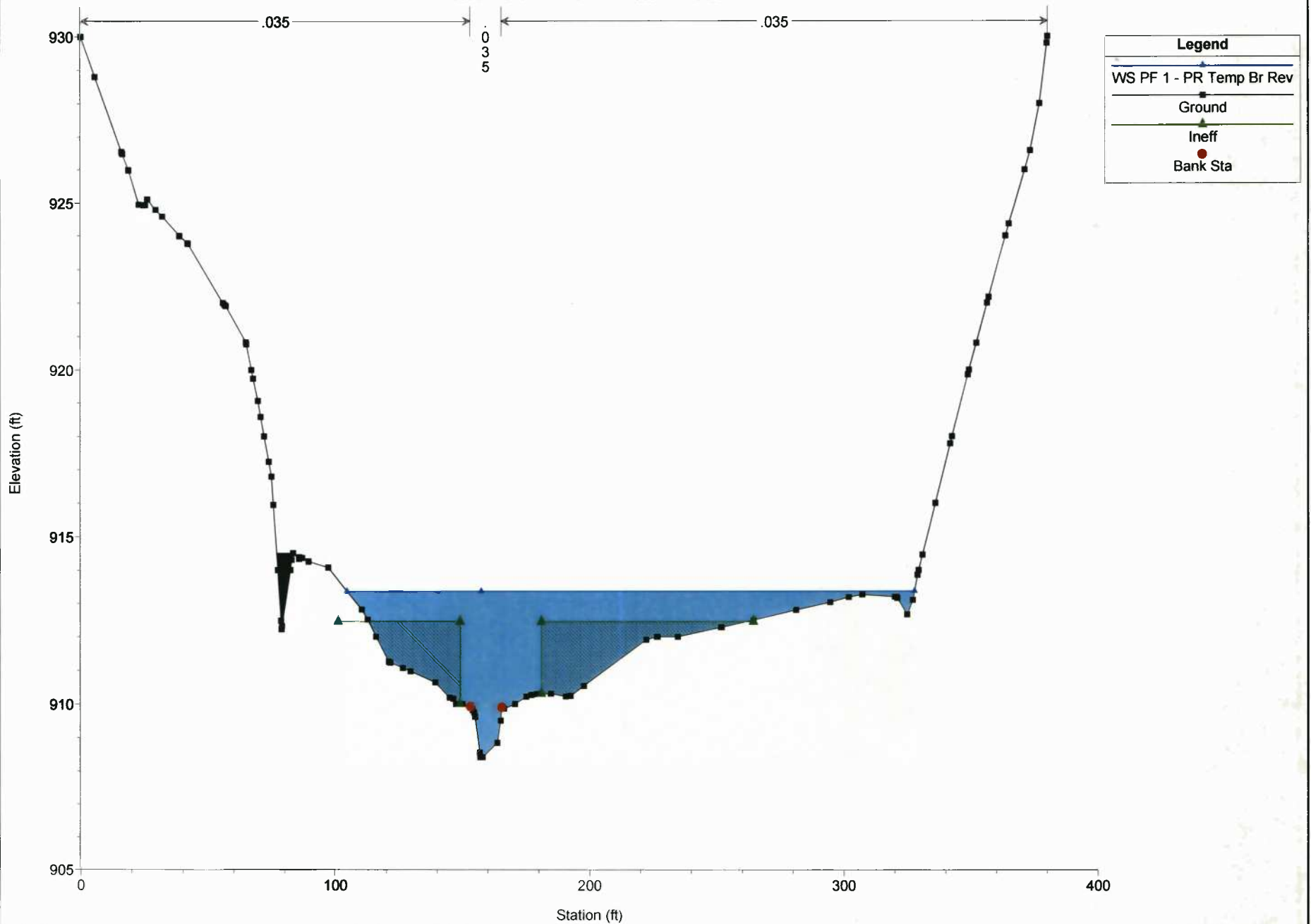
River = Bluestone Creek Reach = Middle RS = 6481.438



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

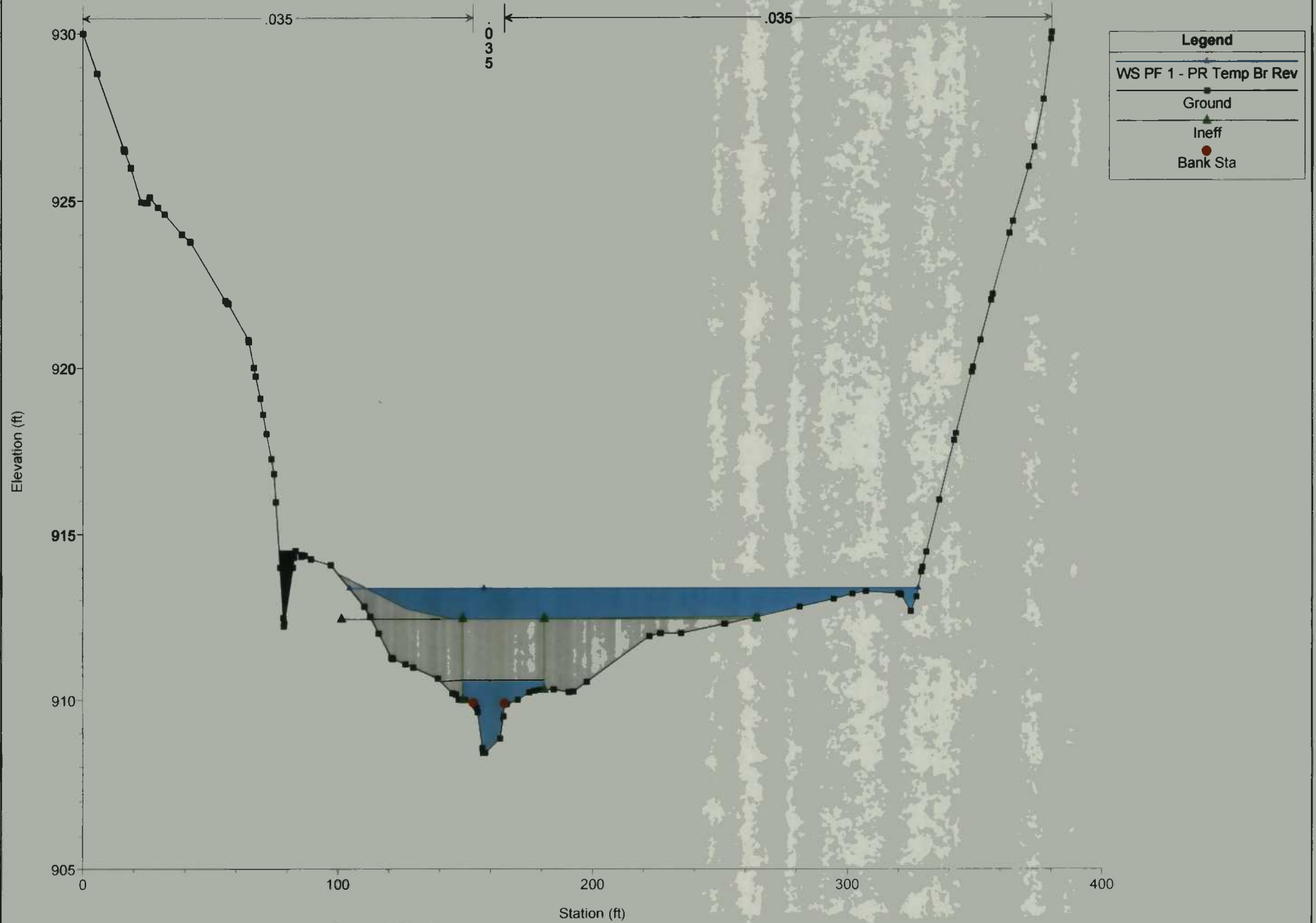
River = Bluestone Creek Reach = Middle RS = 6323.723



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

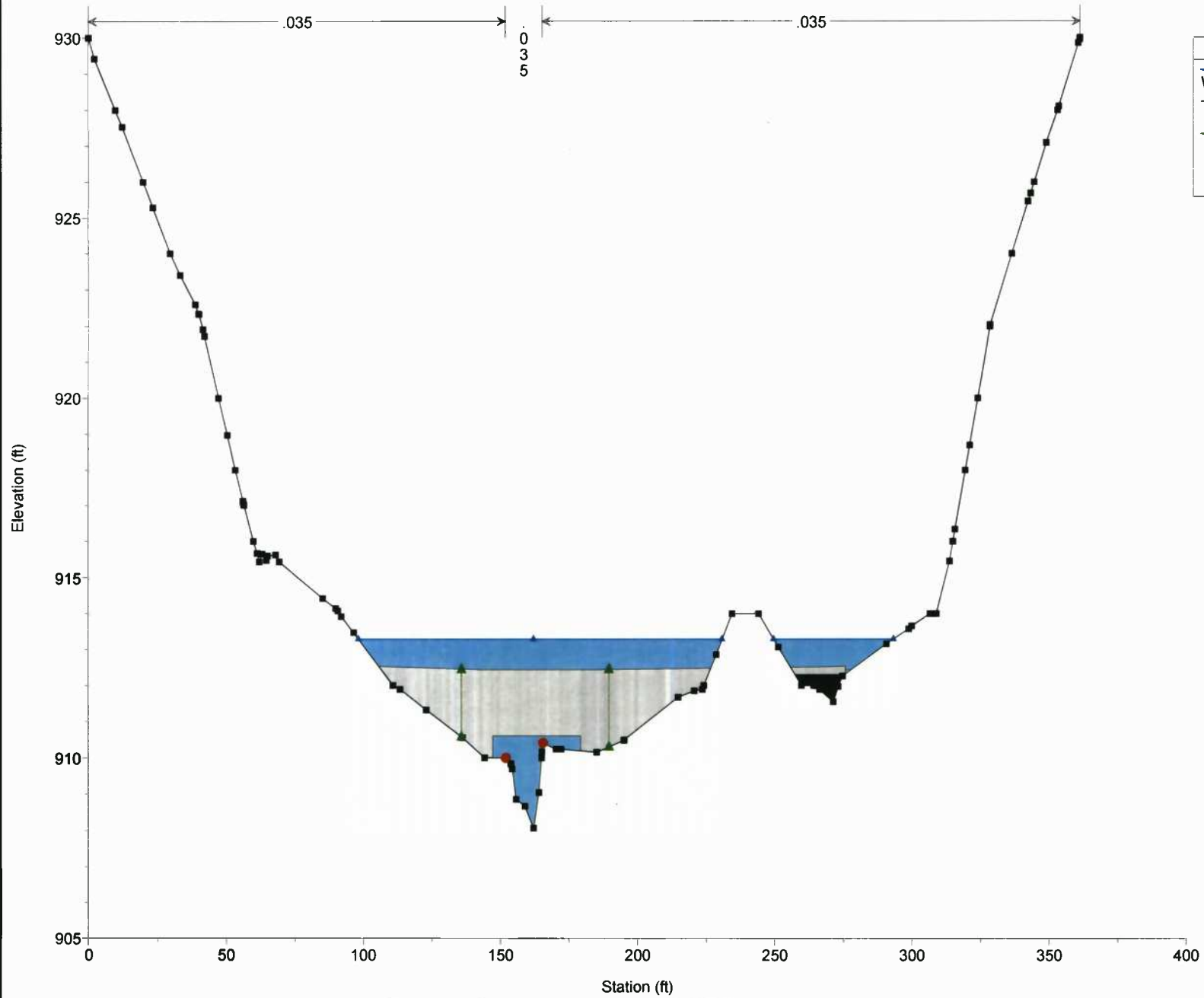
River = Bluestone Creek Reach = Middle RS = 6303.783 BR



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

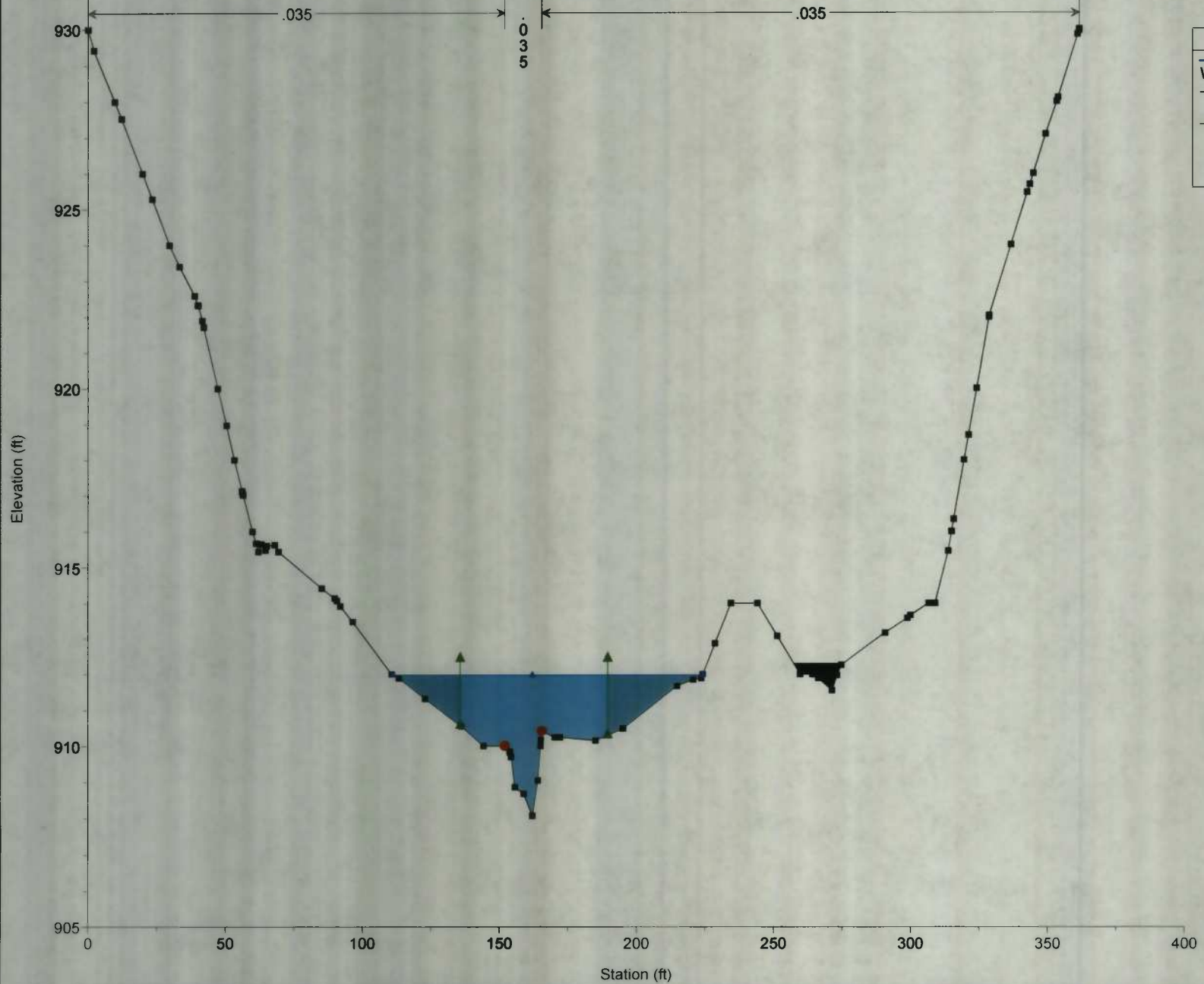


Legend	
WS PF 1 - PR Temp Br Rev	(Blue line with triangles)
Ground	(Black line with squares)
Ineff	(Green line with triangles)
Bank Sta	(Red line with circles)

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

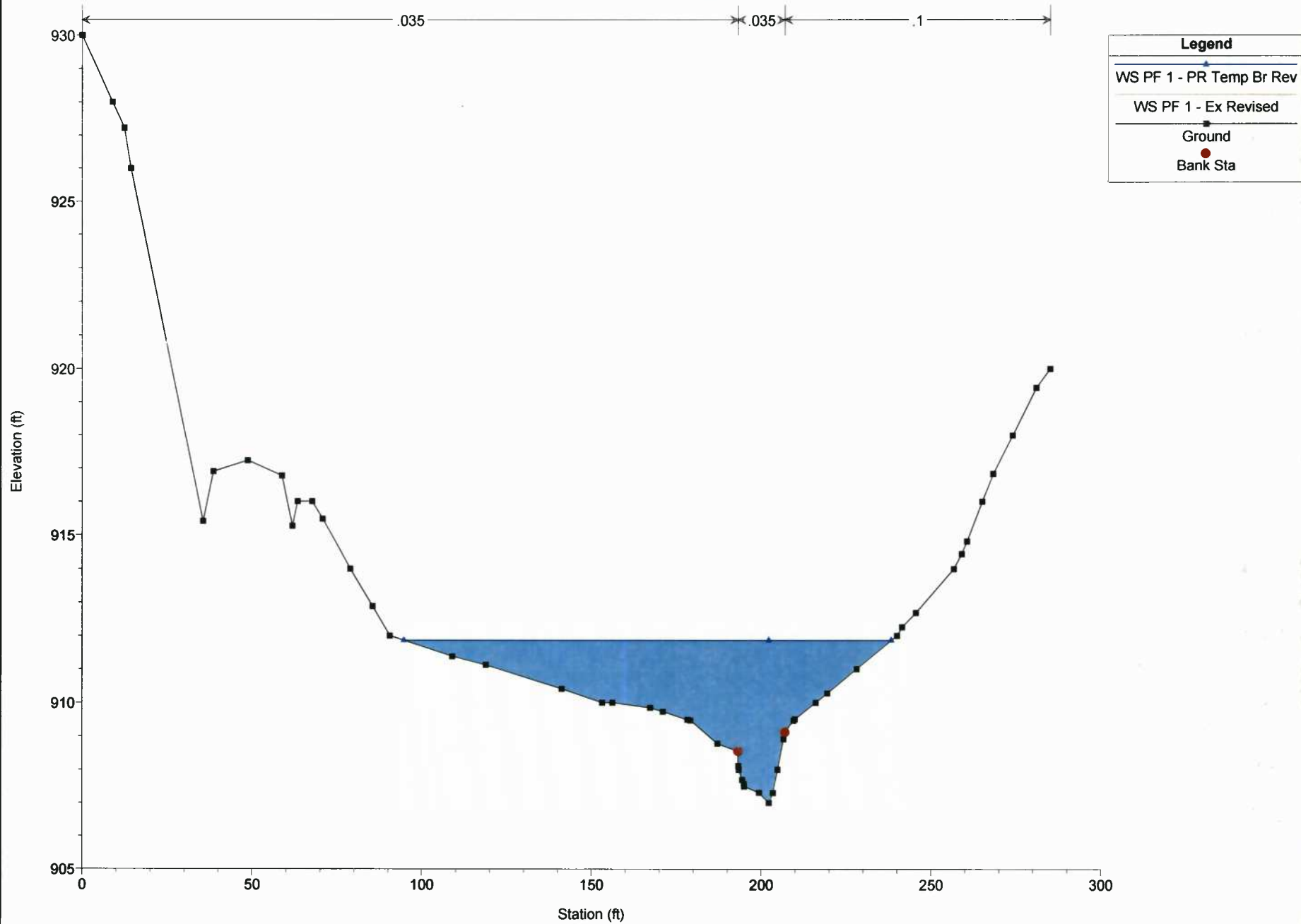


Legend	
WS PF 1 - PR Temp Br Rev	(Blue line with square markers)
Ground	(Black line with square markers)
Ineff	(Black triangle)
Bank Sta	(Red circle)

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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

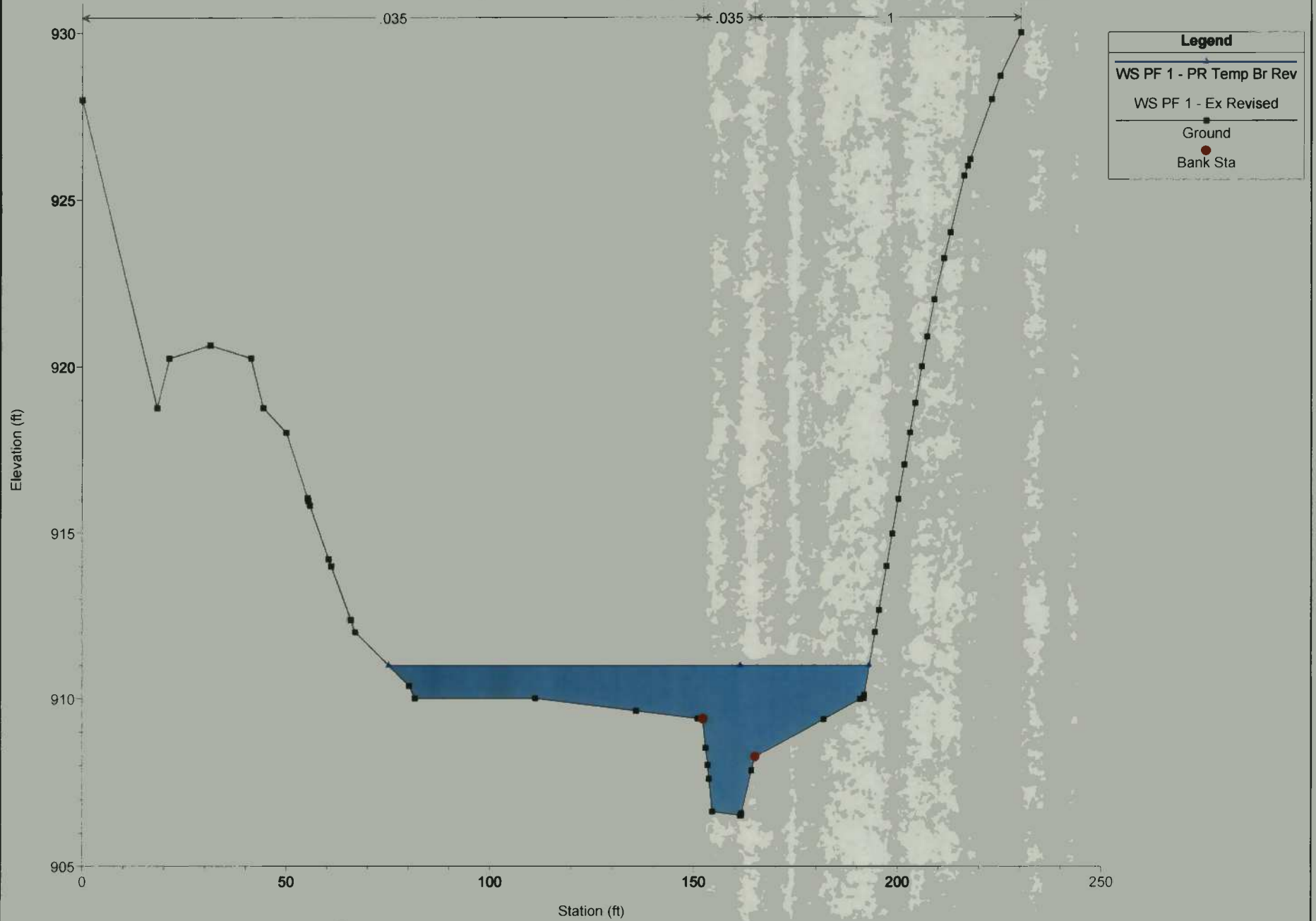
River = Bluestone Creek Reach = Middle RS = 6179.412



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

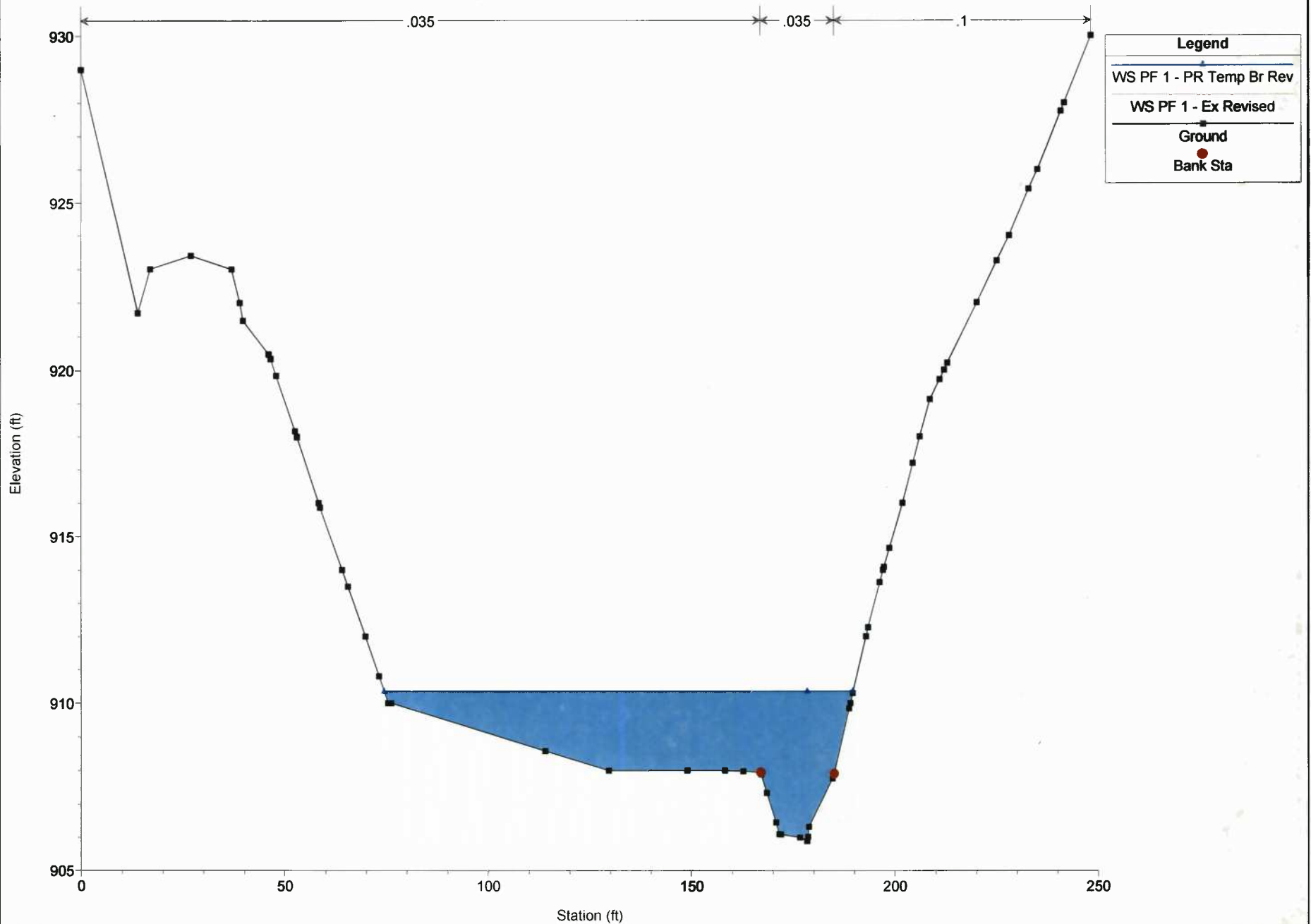
River = Bluestone Creek Reach = Middle RS = 6057.761



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

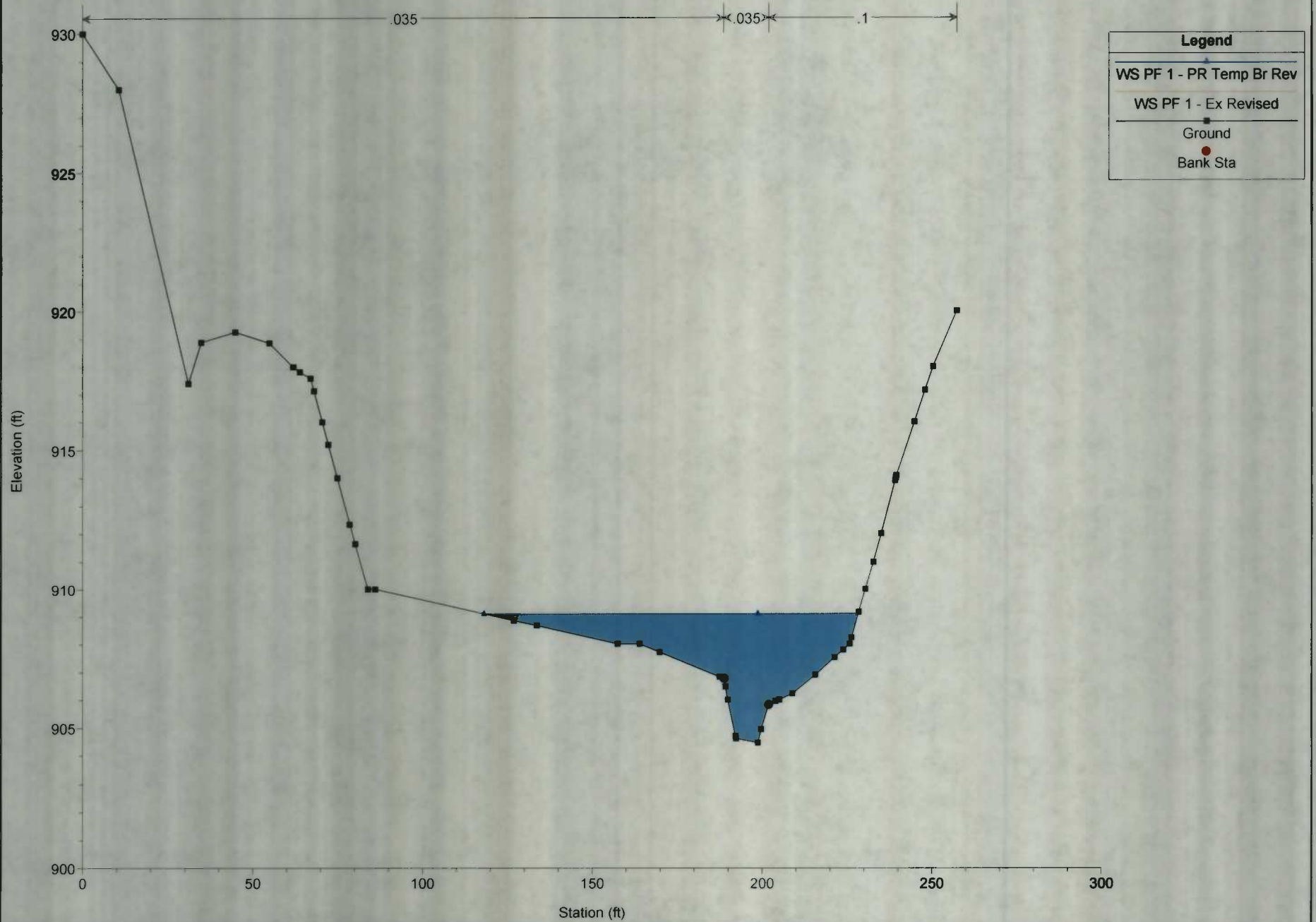
River = Bluestone Creek Reach = Middle RS = 5898.334



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

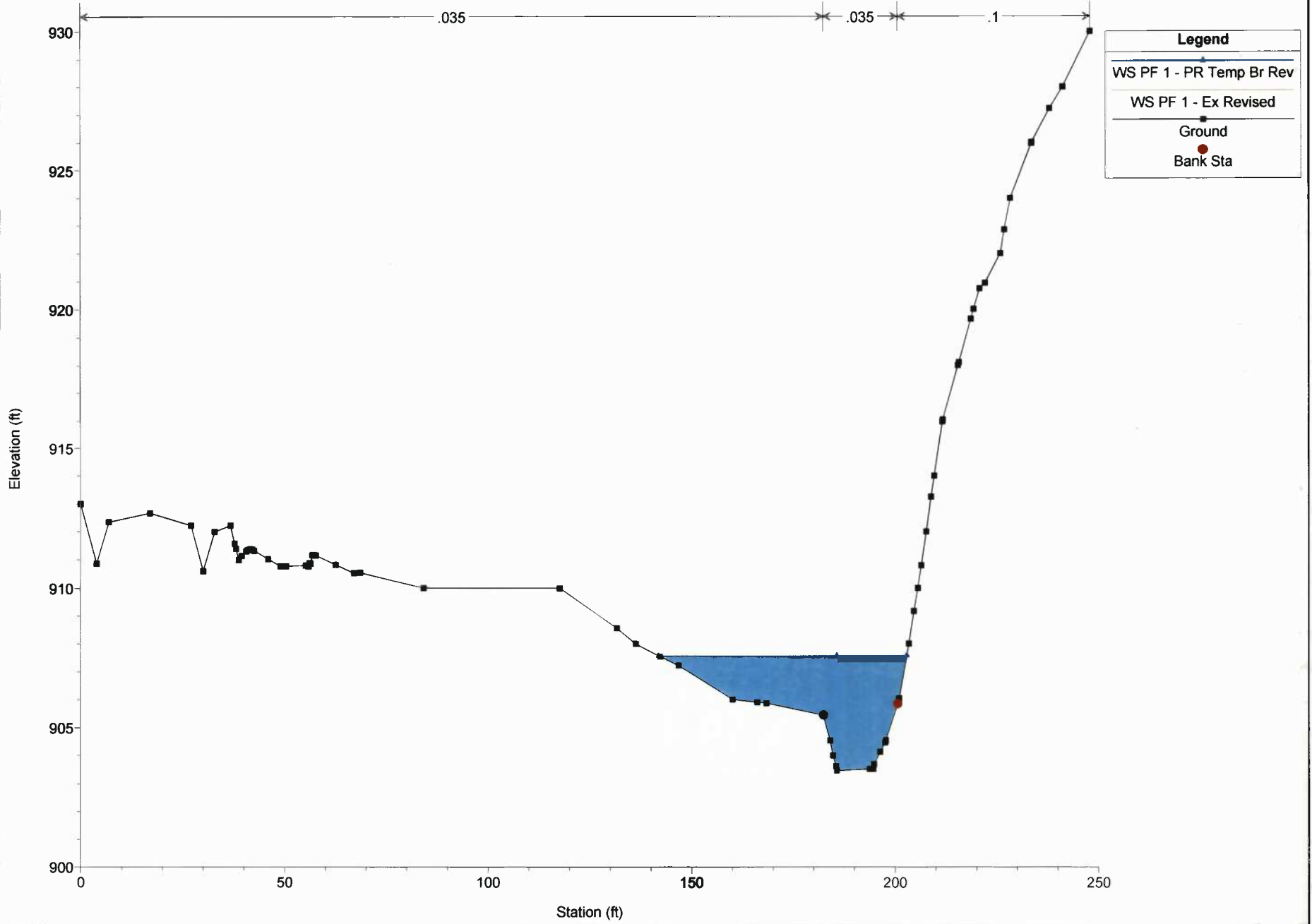
River = Bluestone Creek Reach = Middle RS = 5722.175



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

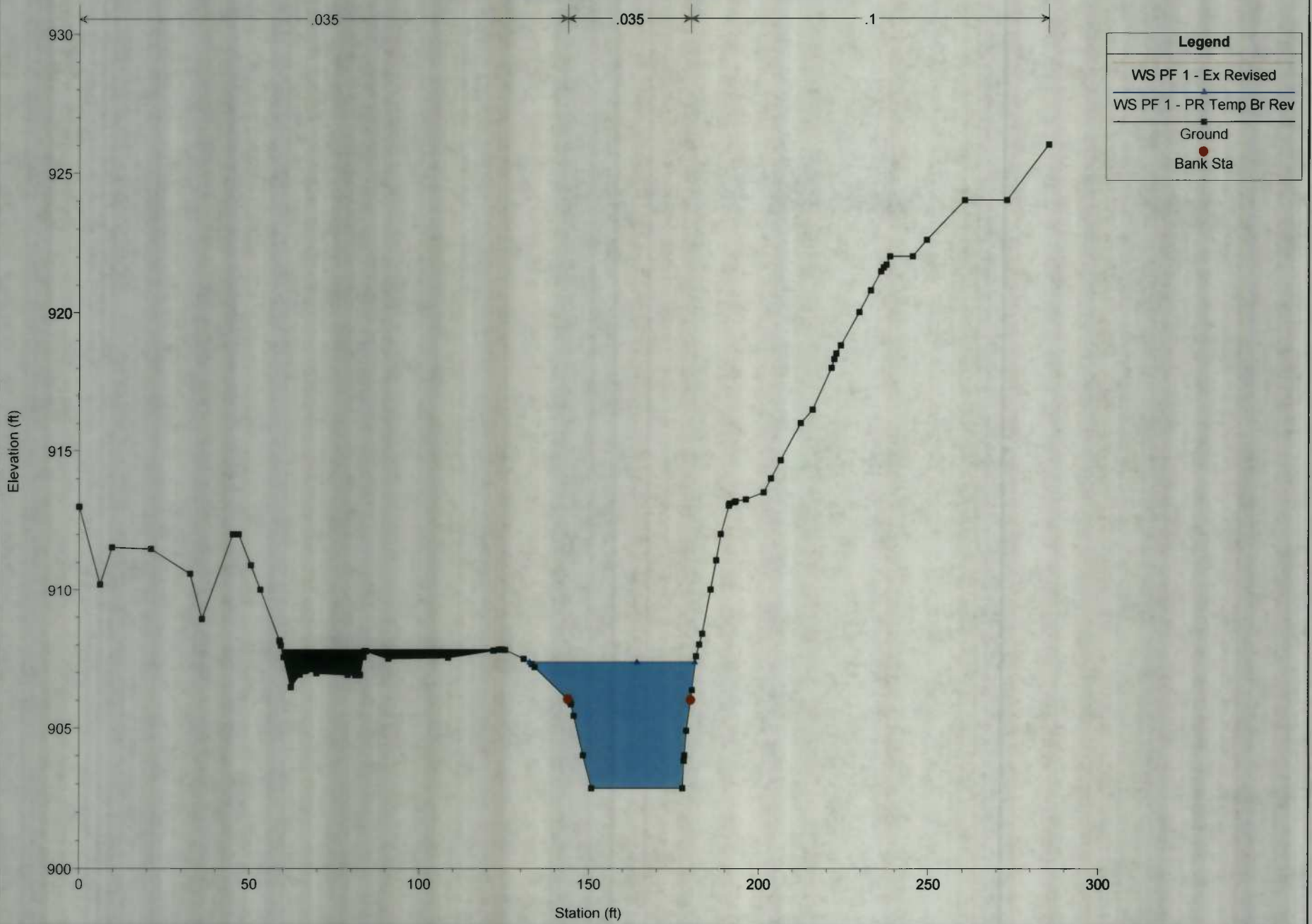
River = Bluestone Creek Reach = Middle RS = 5588.448



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

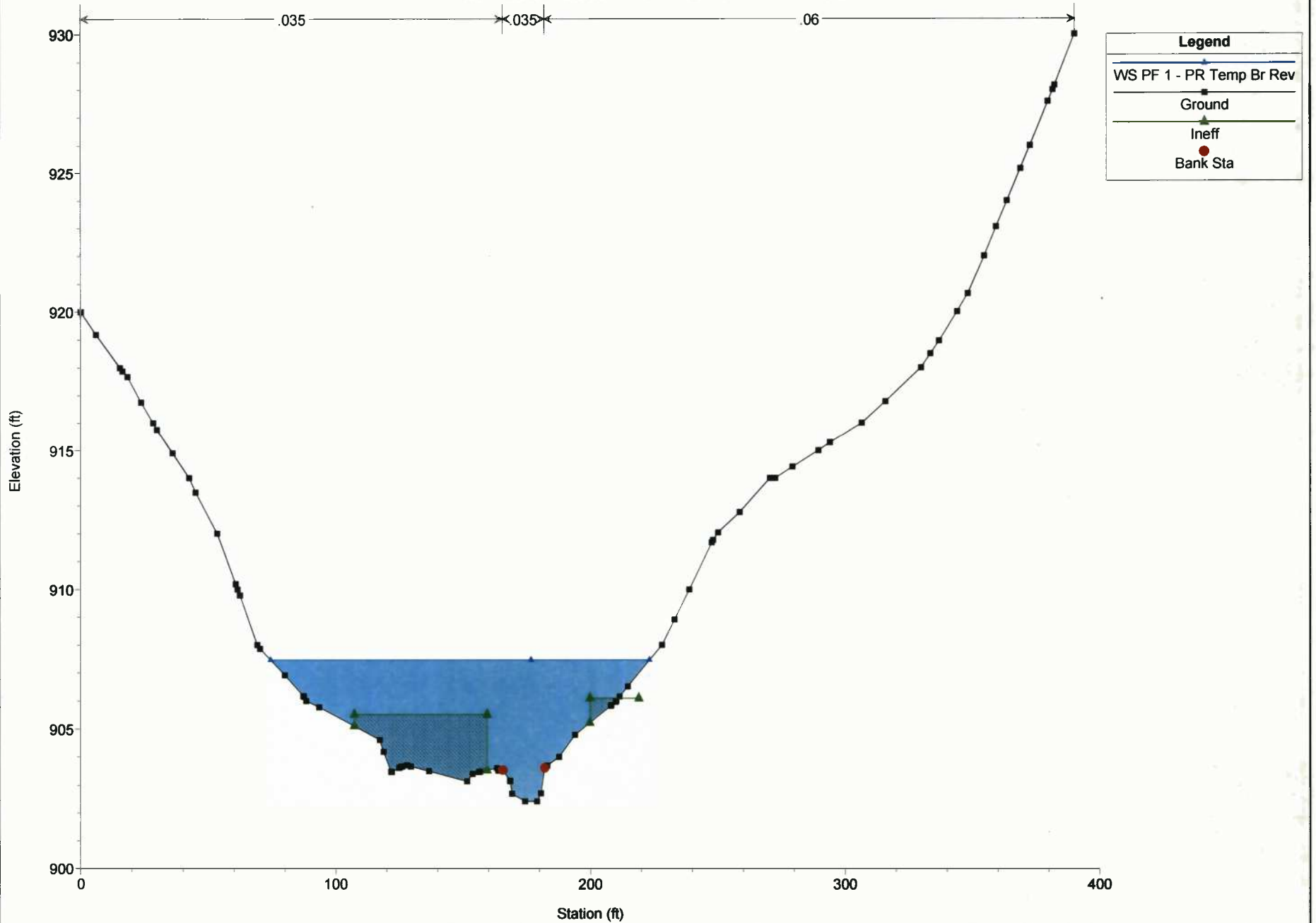
River = Bluestone Creek Reach = Middle RS = 5493.950



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

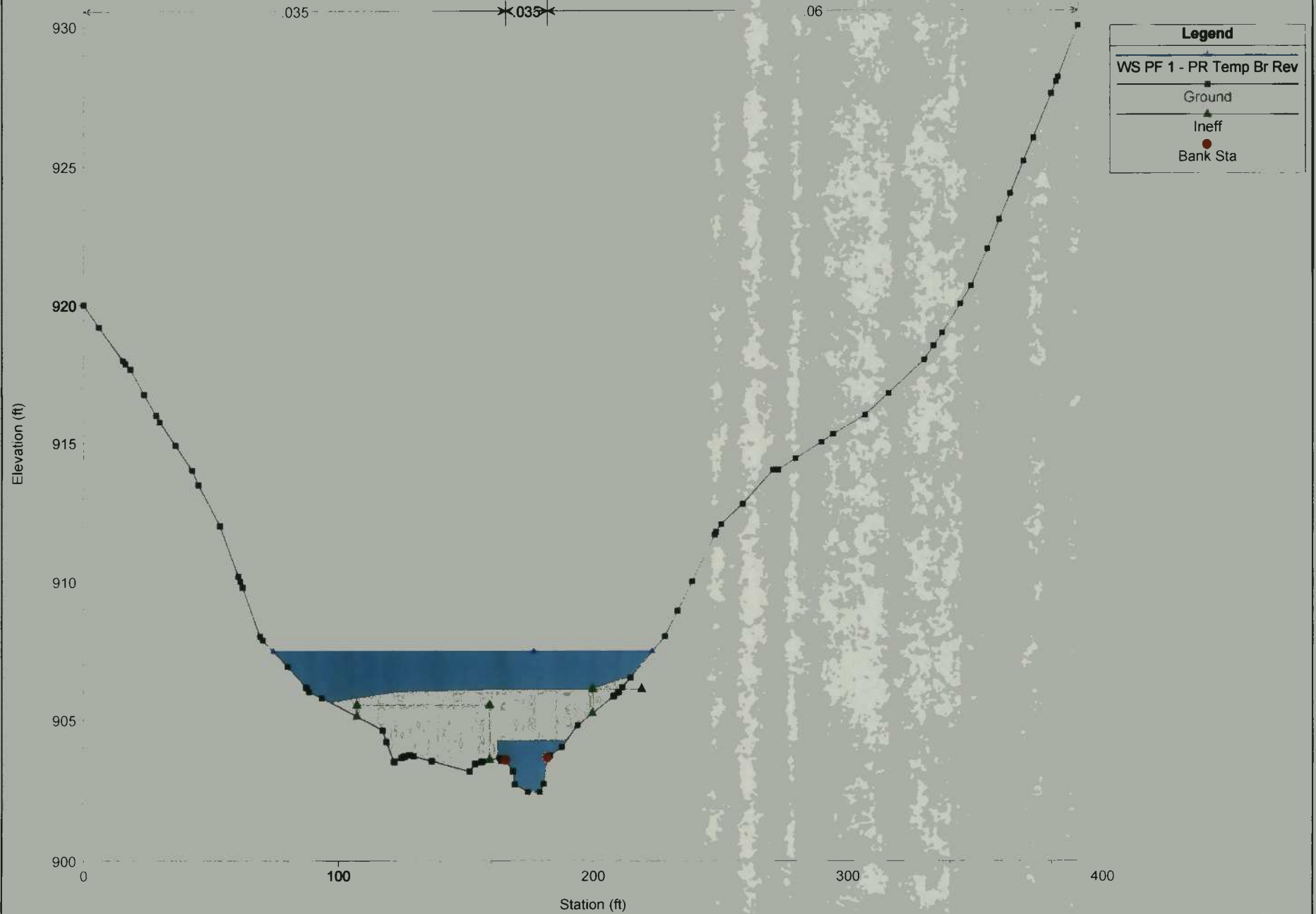
River = Bluestone Creek Reach = Middle RS = 5409.687



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

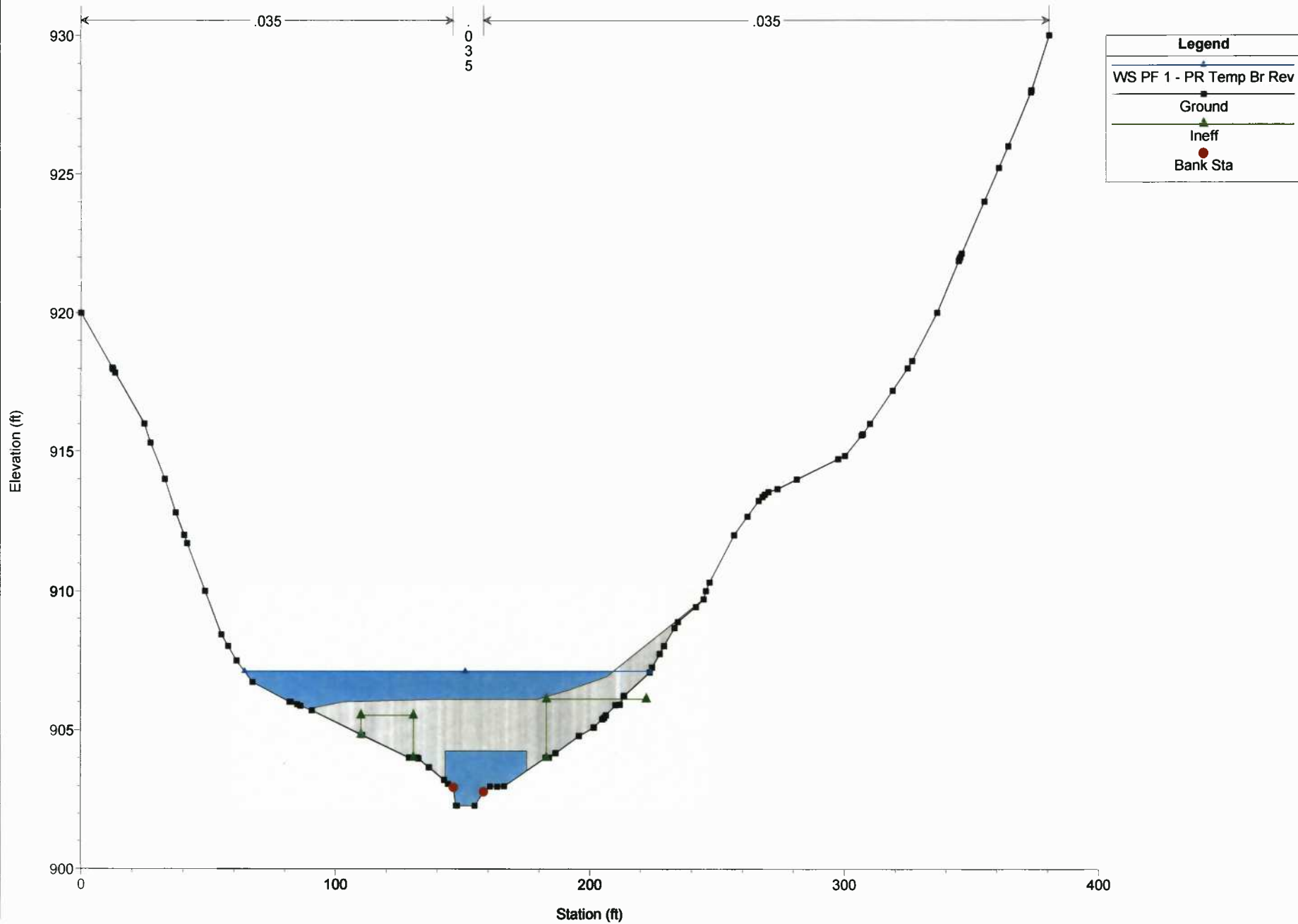
River = Bluestone Creek Reach = Middle RS = 5395.595 BR



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

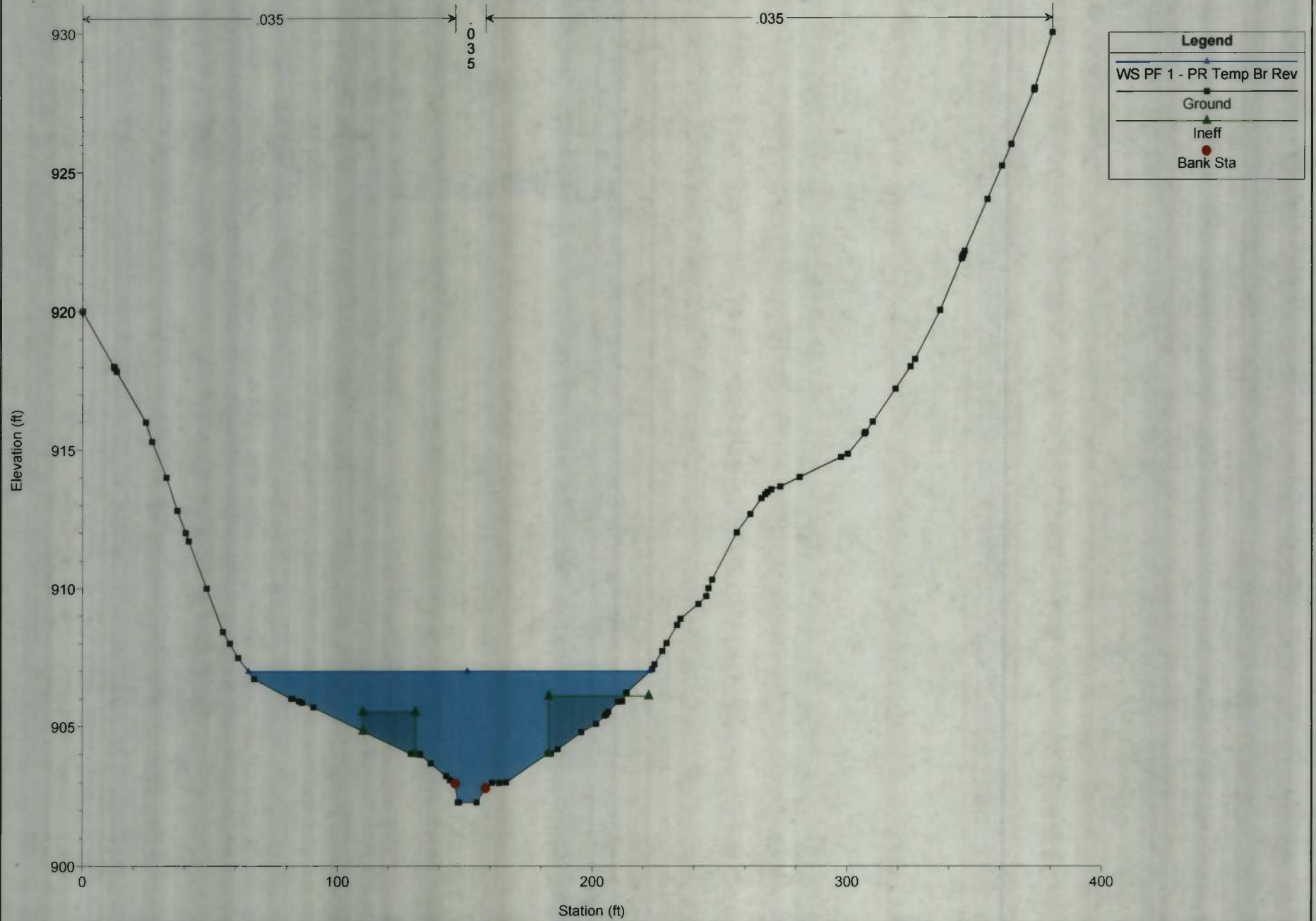
River = Bluestone Creek Reach = Middle RS = 5395.595 BR



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

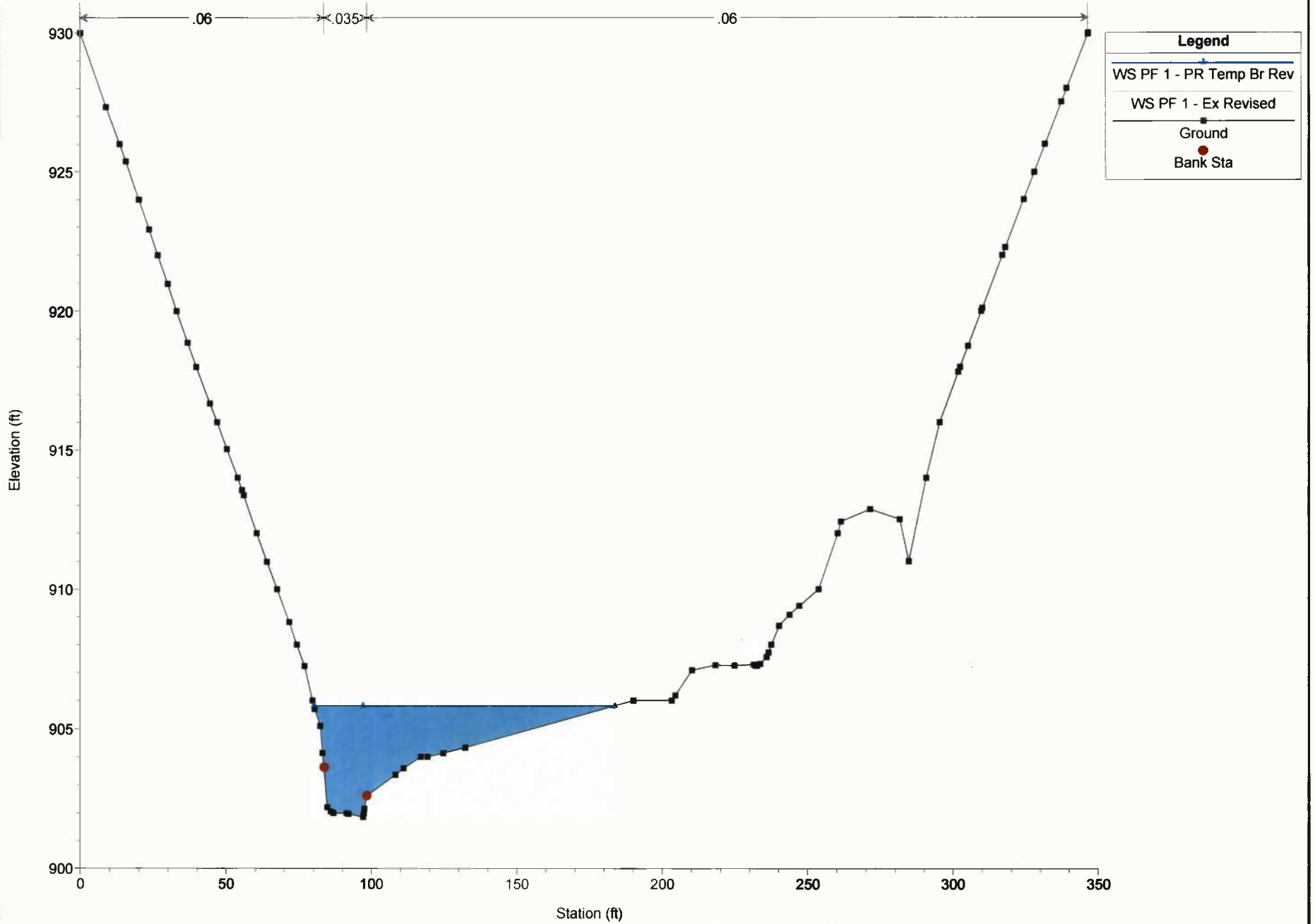
River = Bluestone Creek Reach = Middle RS = 5379.960



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

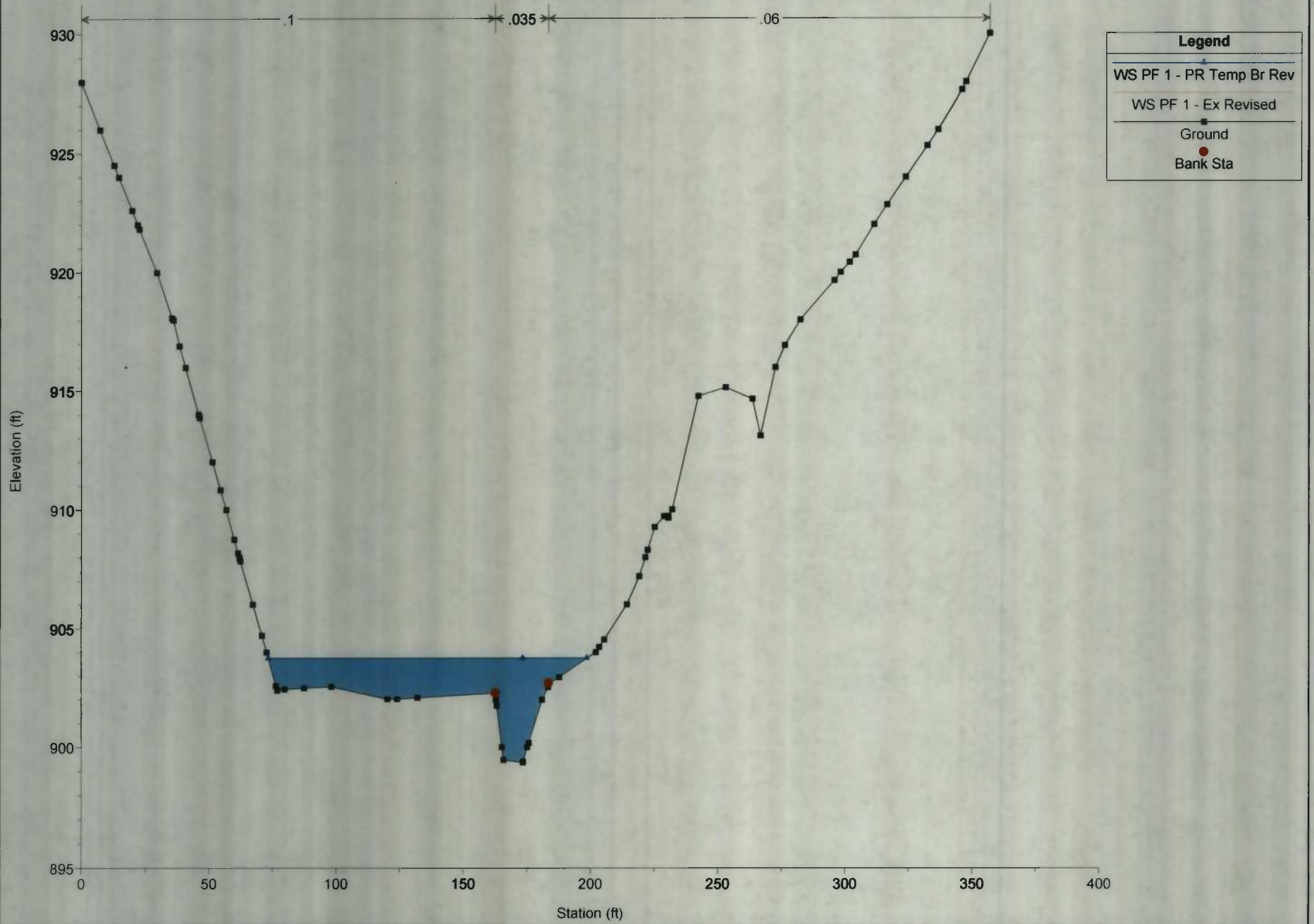
River = Bluestone Creek Reach = Middle RS = 5291.039



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

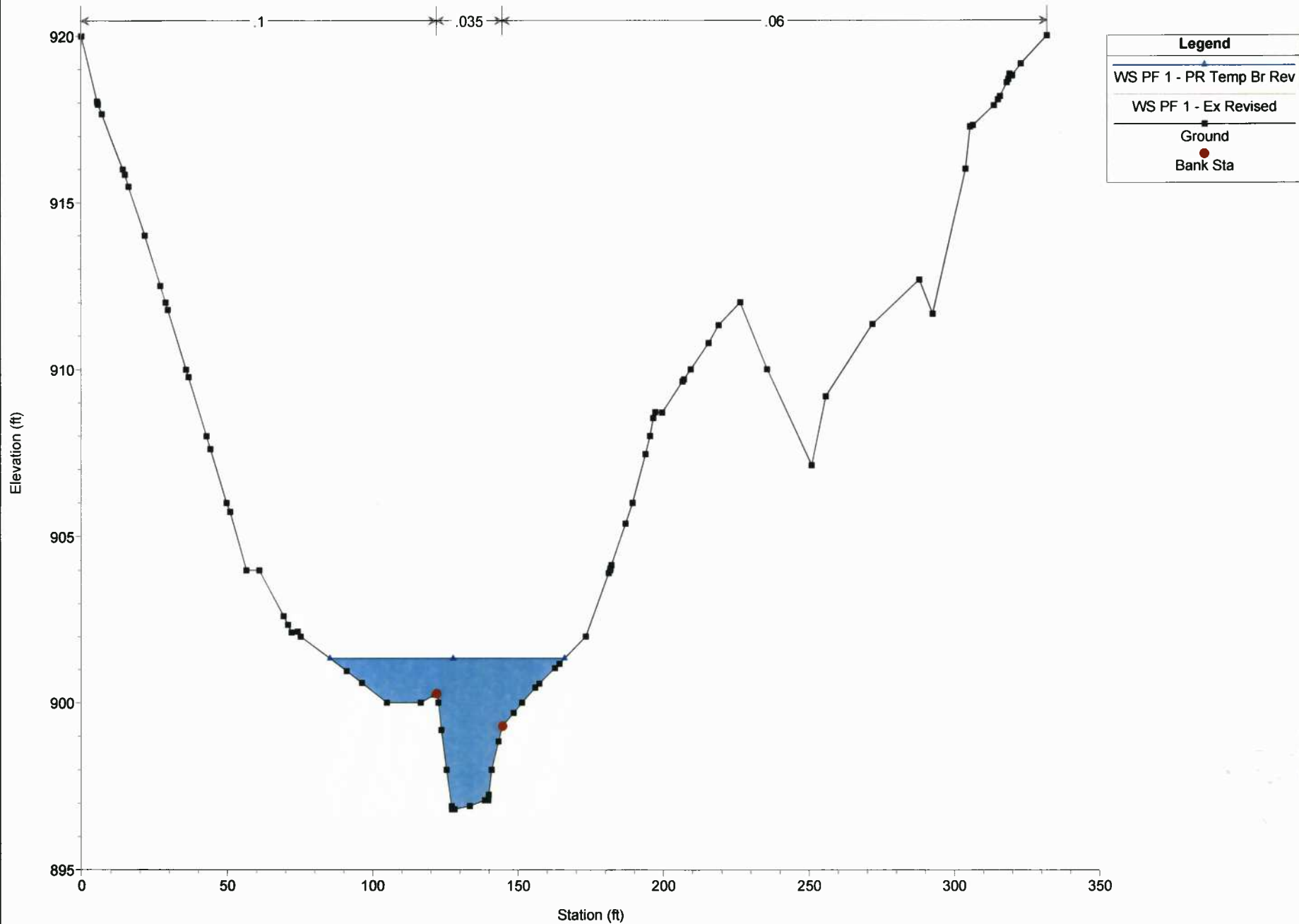
River = Bluestone Creek Reach = Middle RS = 5071.499



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

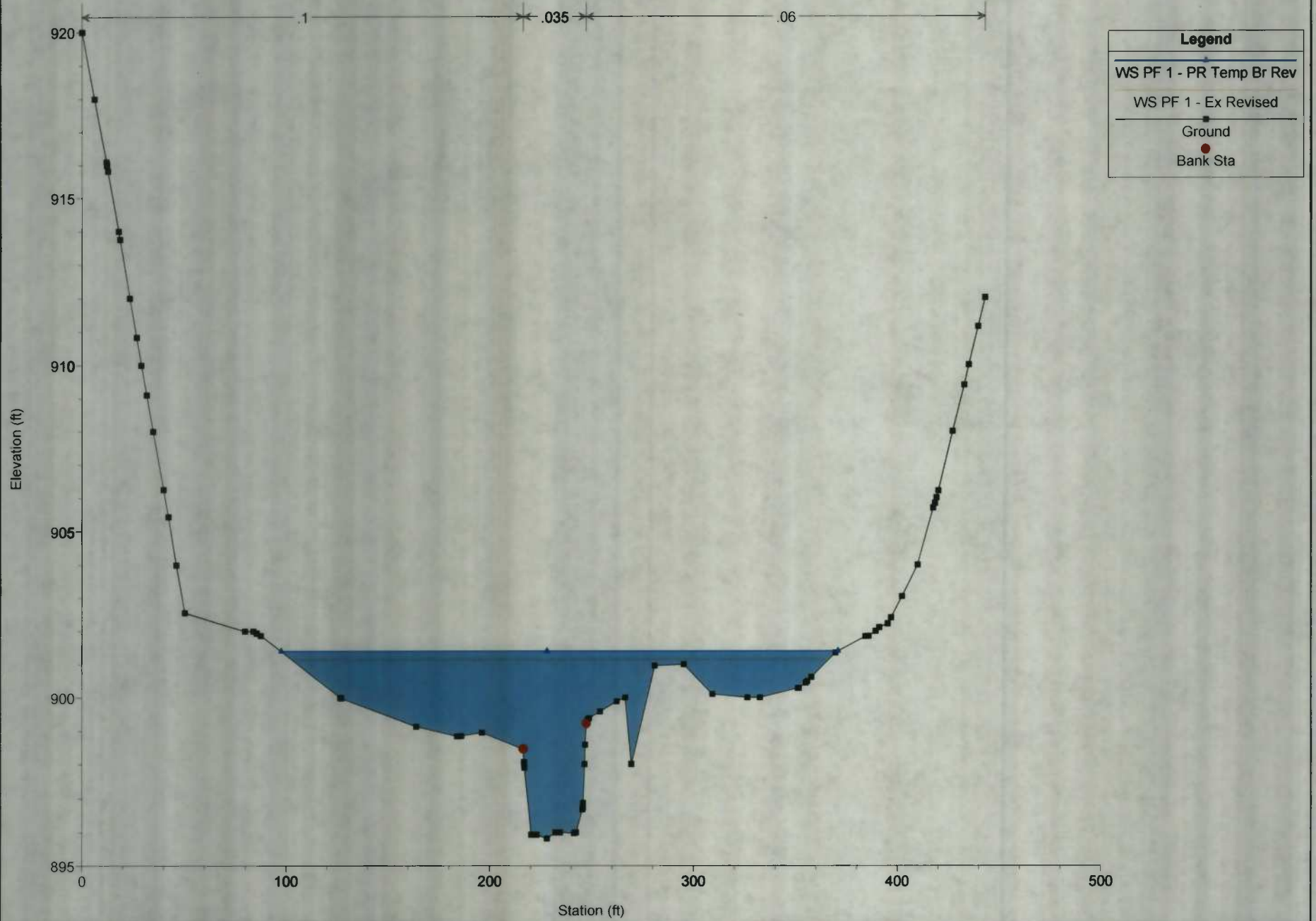
River = Bluestone Creek Reach = Middle RS = 4871.481



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

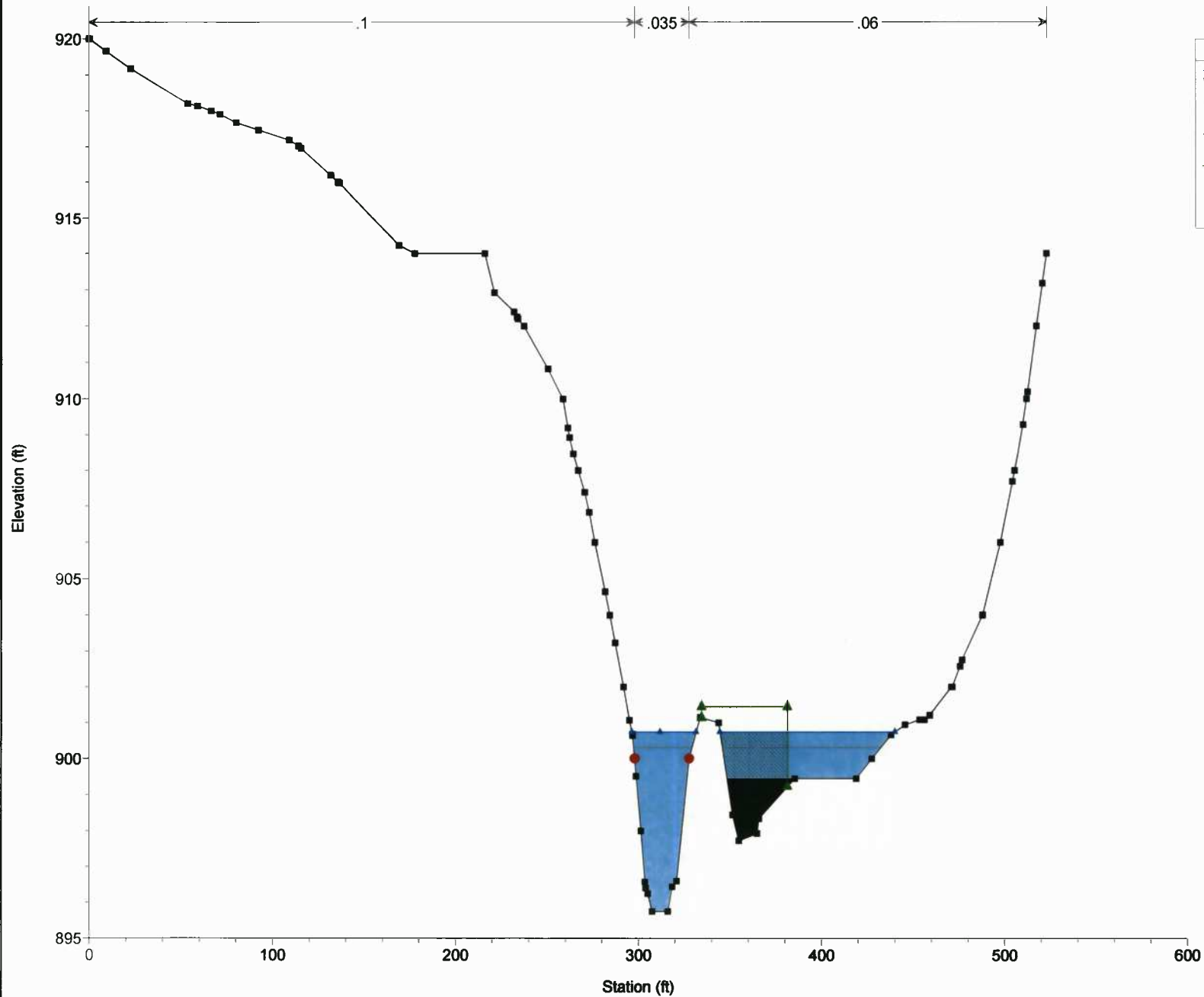
River = Bluestone Creek Reach = Middle RS = 4704.612



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



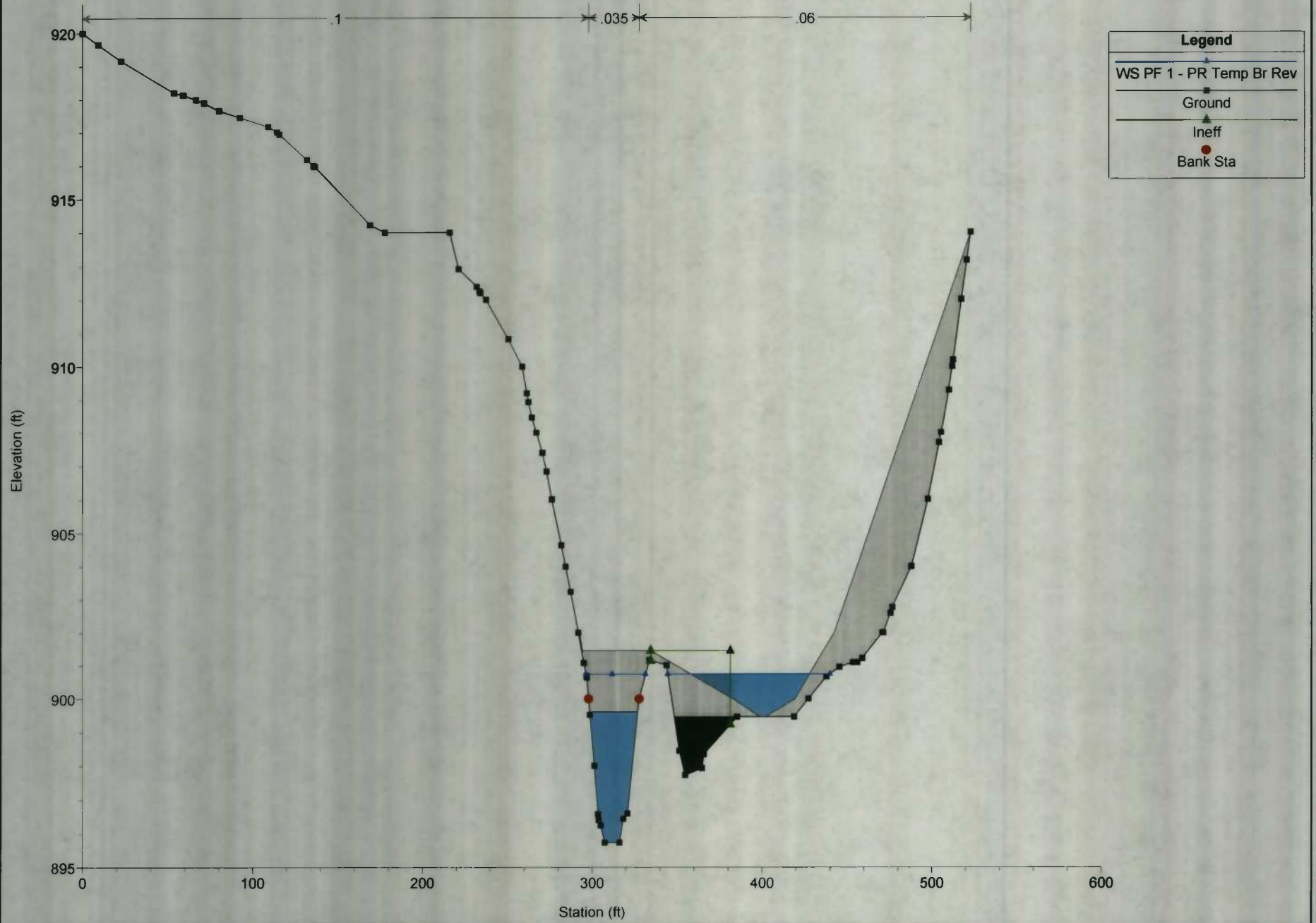
Legend

- 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

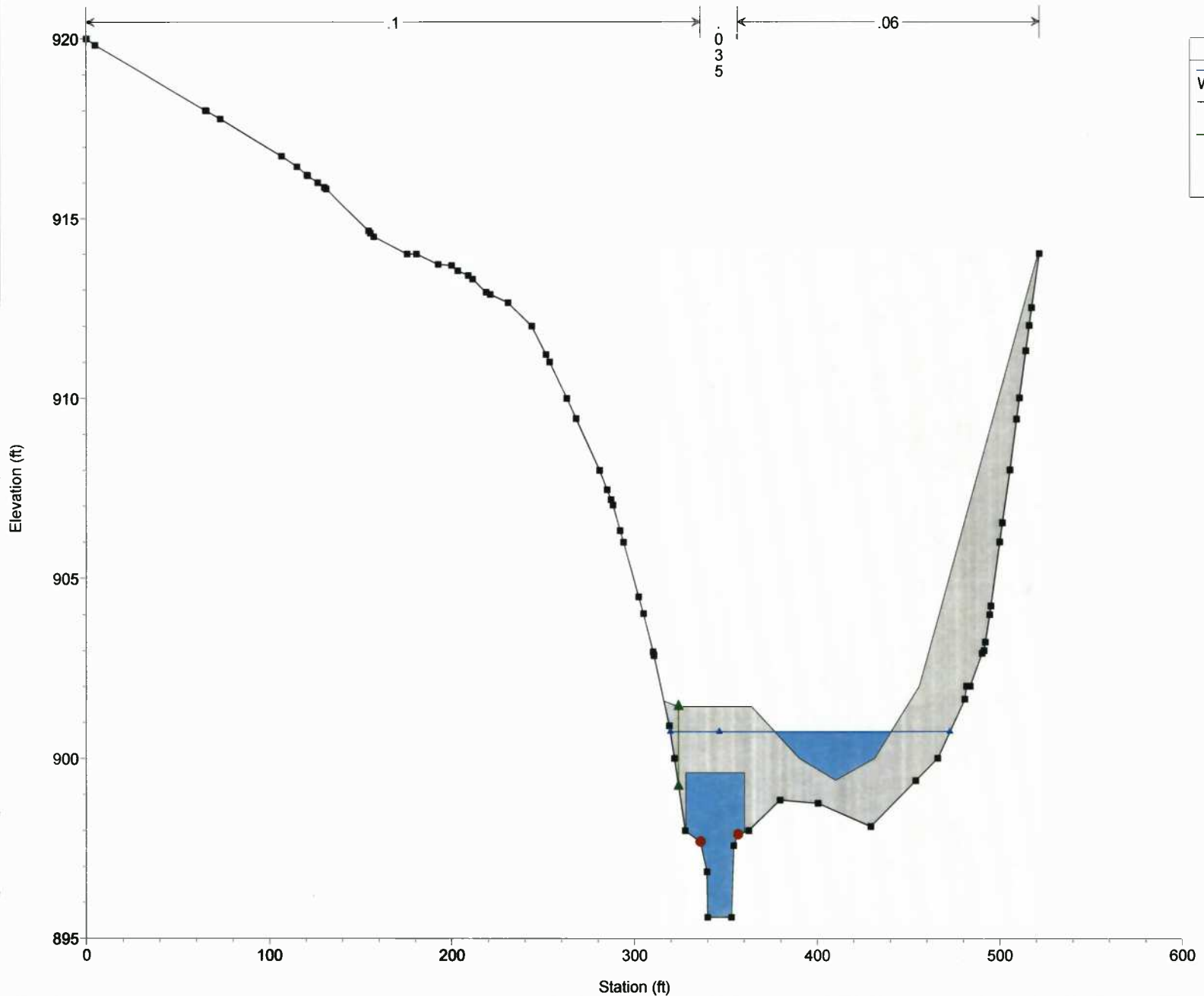
River = Bluestone Creek Reach = Lower RS = 4657.419 BR



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 = 4657.419 BR



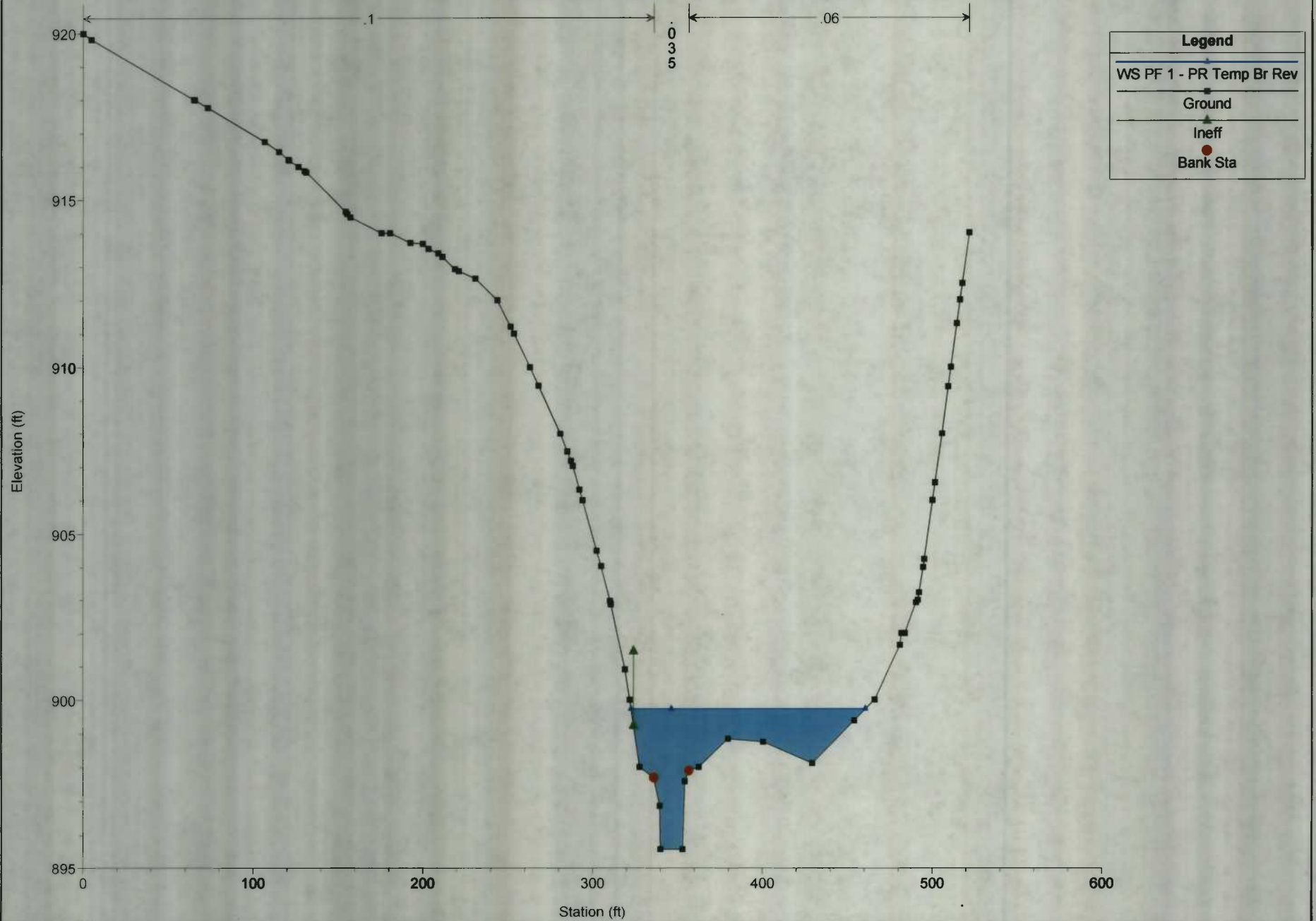
Legend

- 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

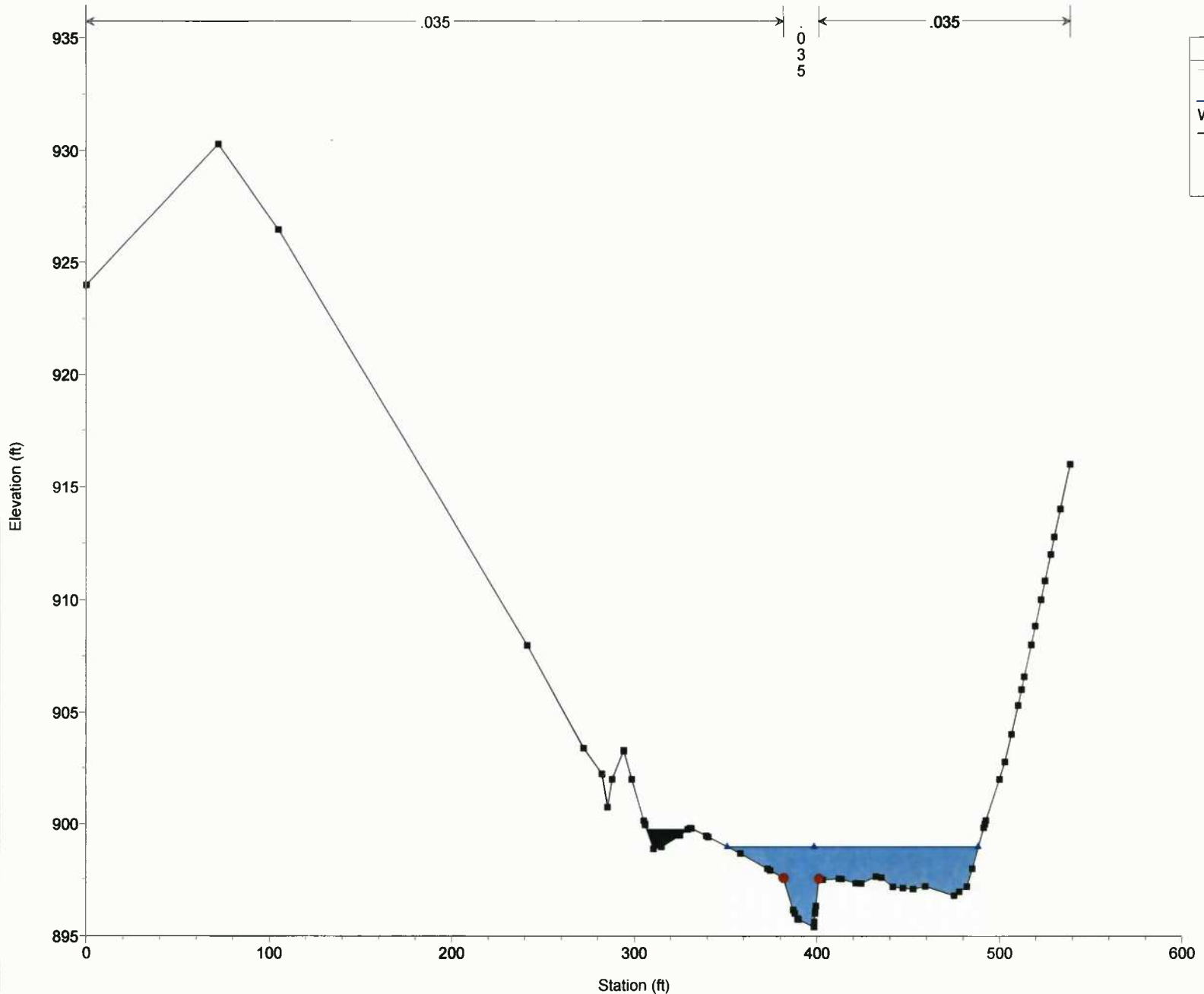
River = Bluestone Creek Reach = Lower RS = 4626.456



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

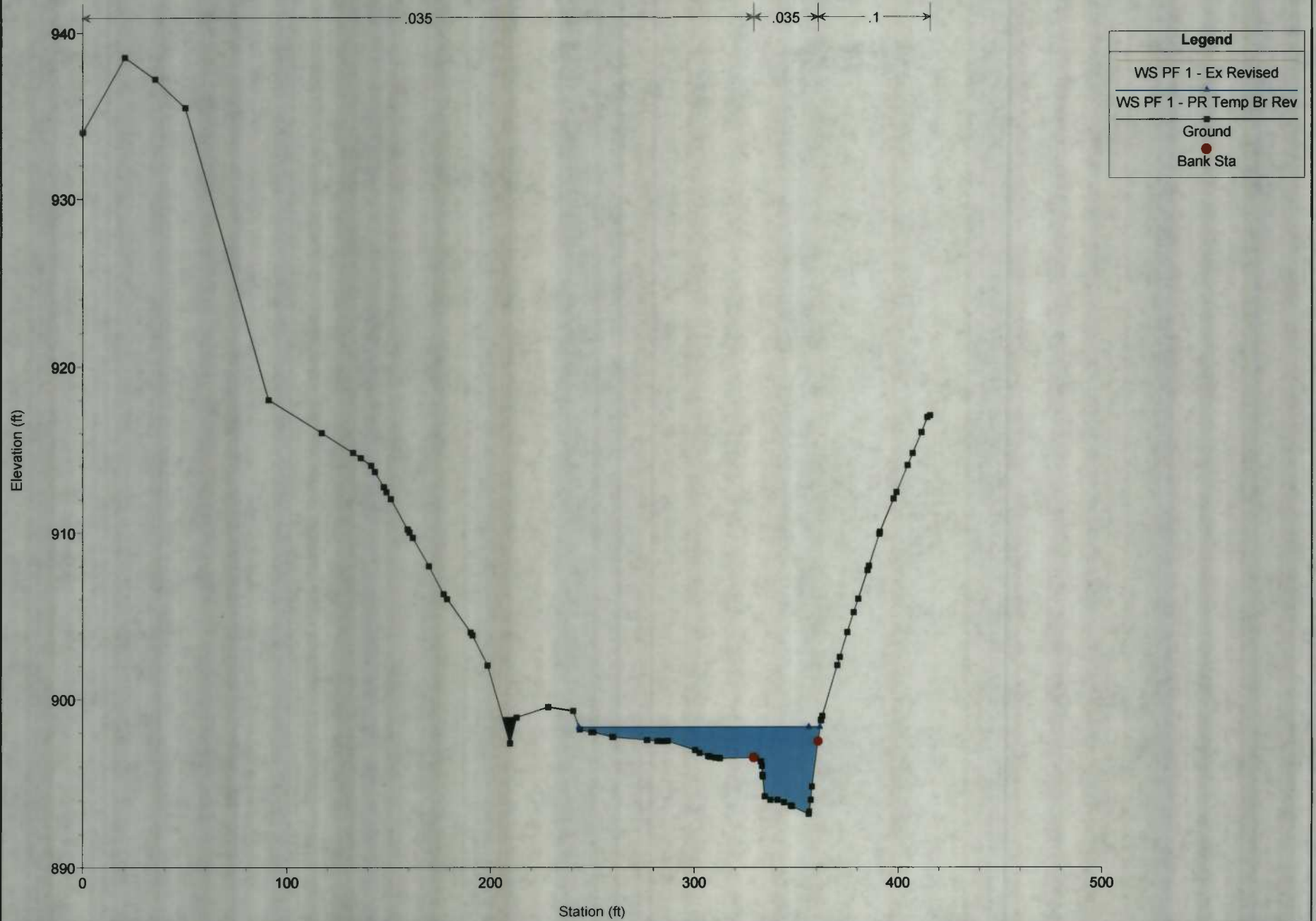


Legend	
WS PF 1 - Ex Revised	(Blue line with triangles)
WS PF 1 - PR Temp Br Rev	(Black line with squares)
Ground	(Black line with squares)
Bank Sta	(Red dot)

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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

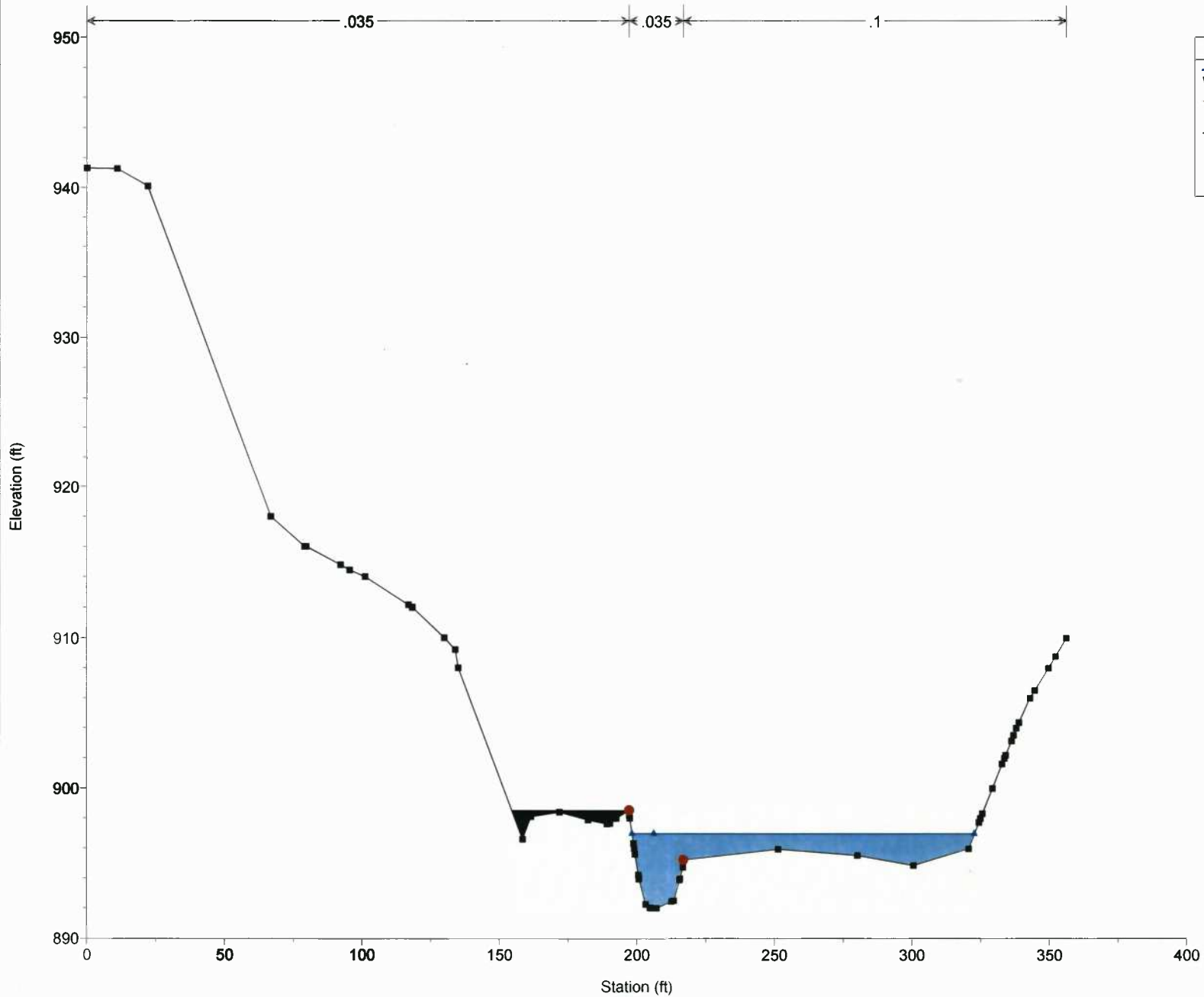
River = Bluestone Creek Reach = Lower RS = 4258.834







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

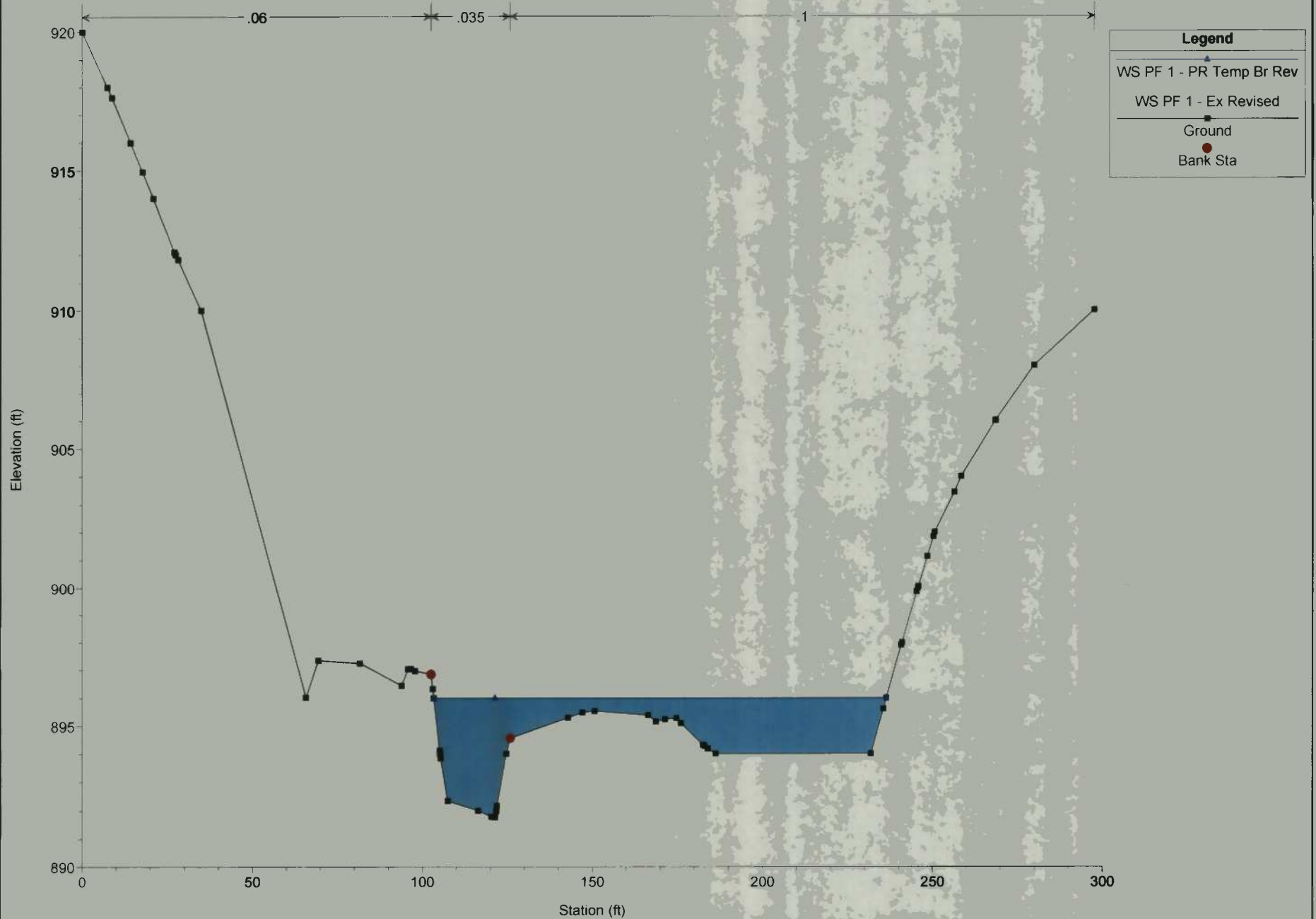


Legend	
	WS PF 1 - PR Temp Br Rev
	WS PF 1 - Ex Revised
	Ground
	Bank Sta

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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

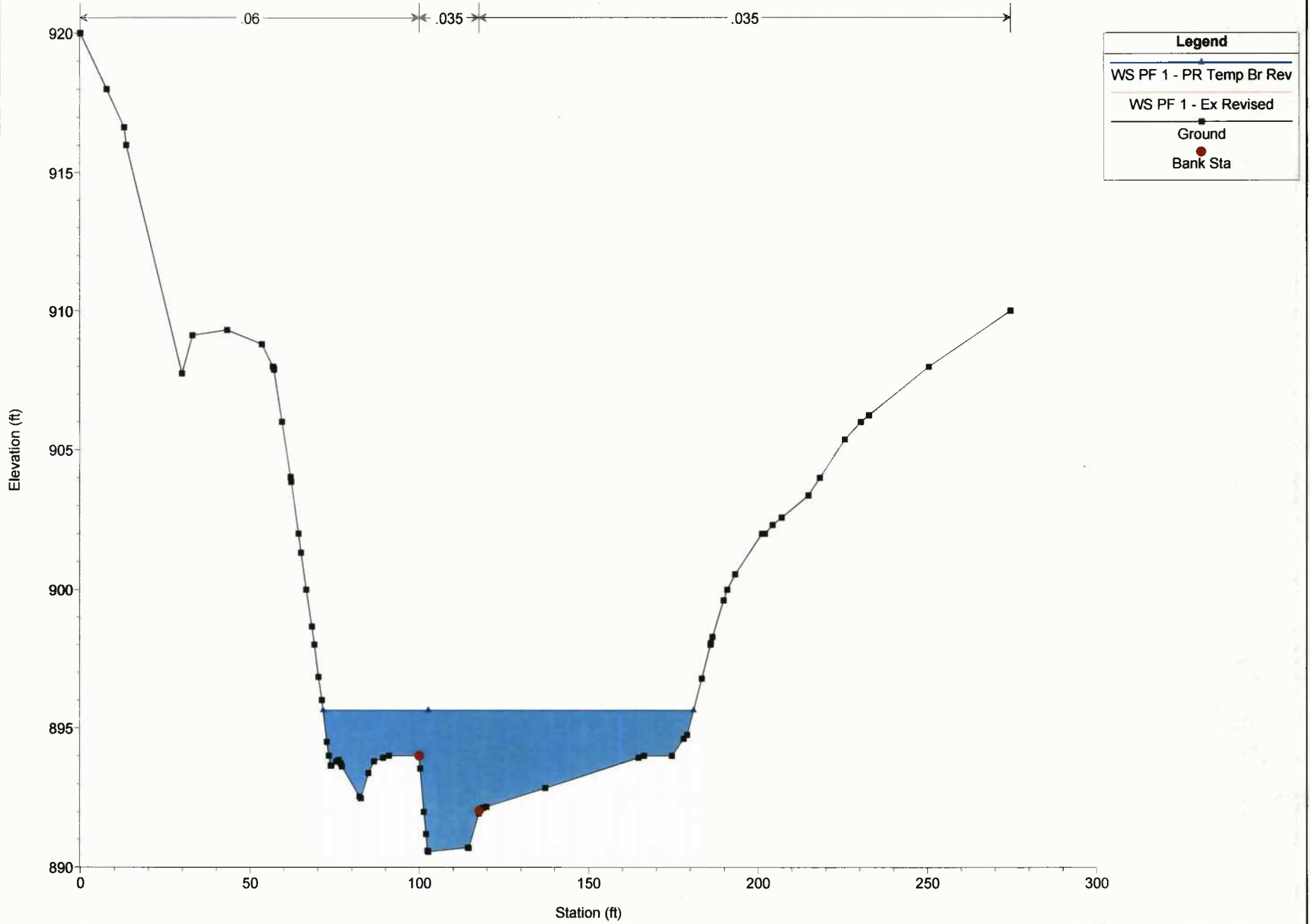
River = Bluestone Creek Reach = Lower RS = 3934.570



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

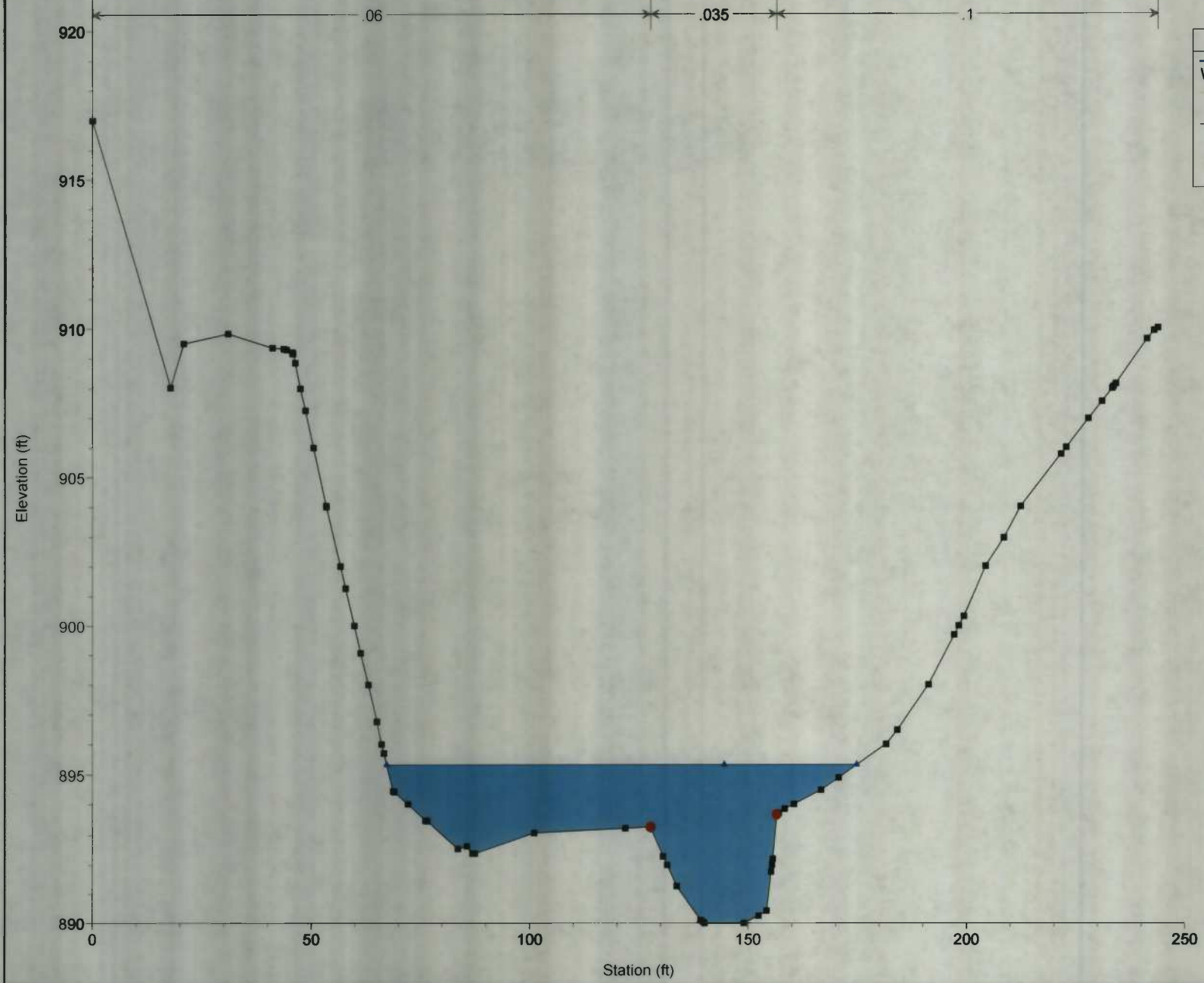
Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 3797.323



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

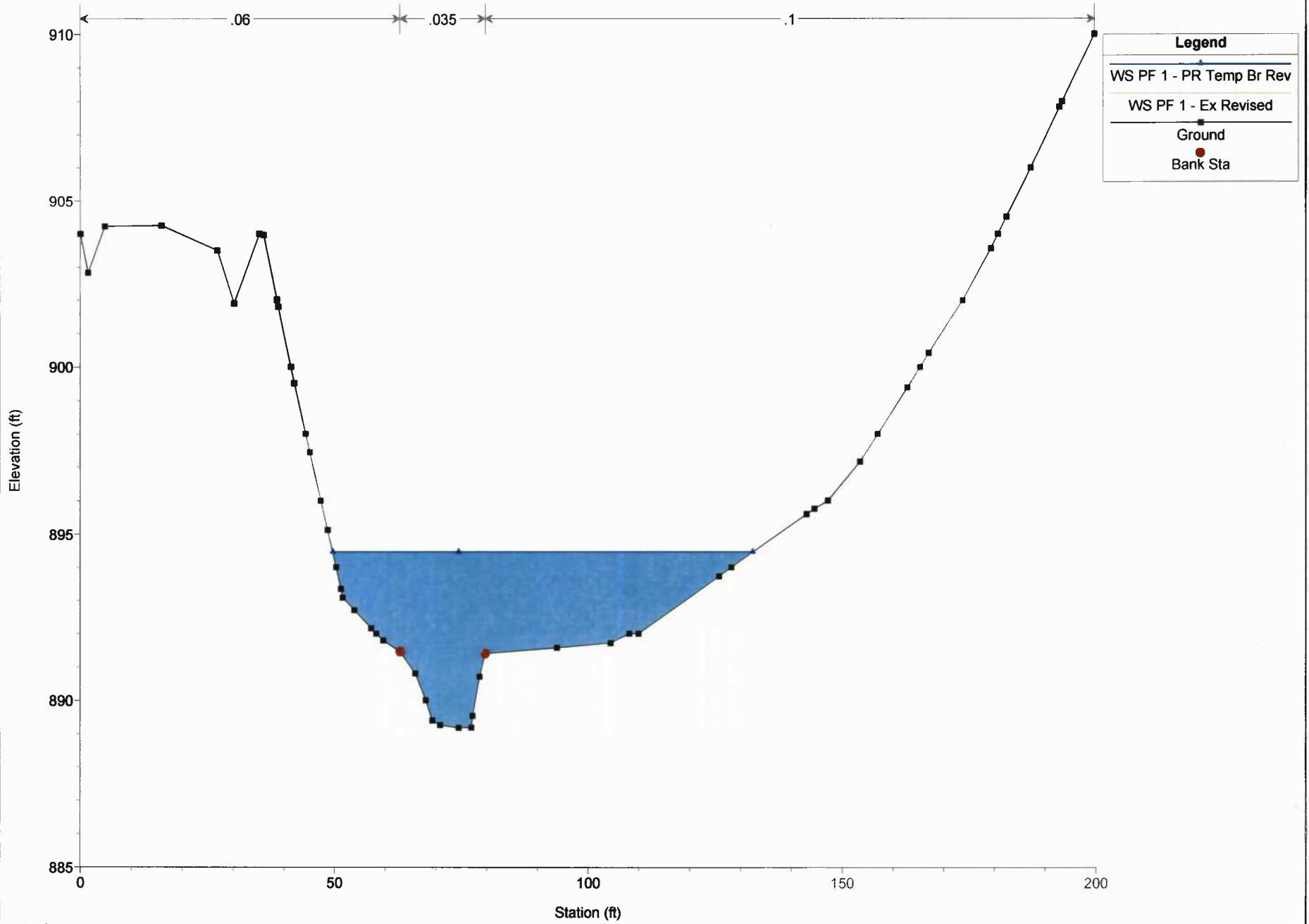
Legend	
	WS PF 1 - PR Temp Br Rev
	WS PF 1 - Ex Revised
	Ground
	Bank Sta



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 = 3568.220

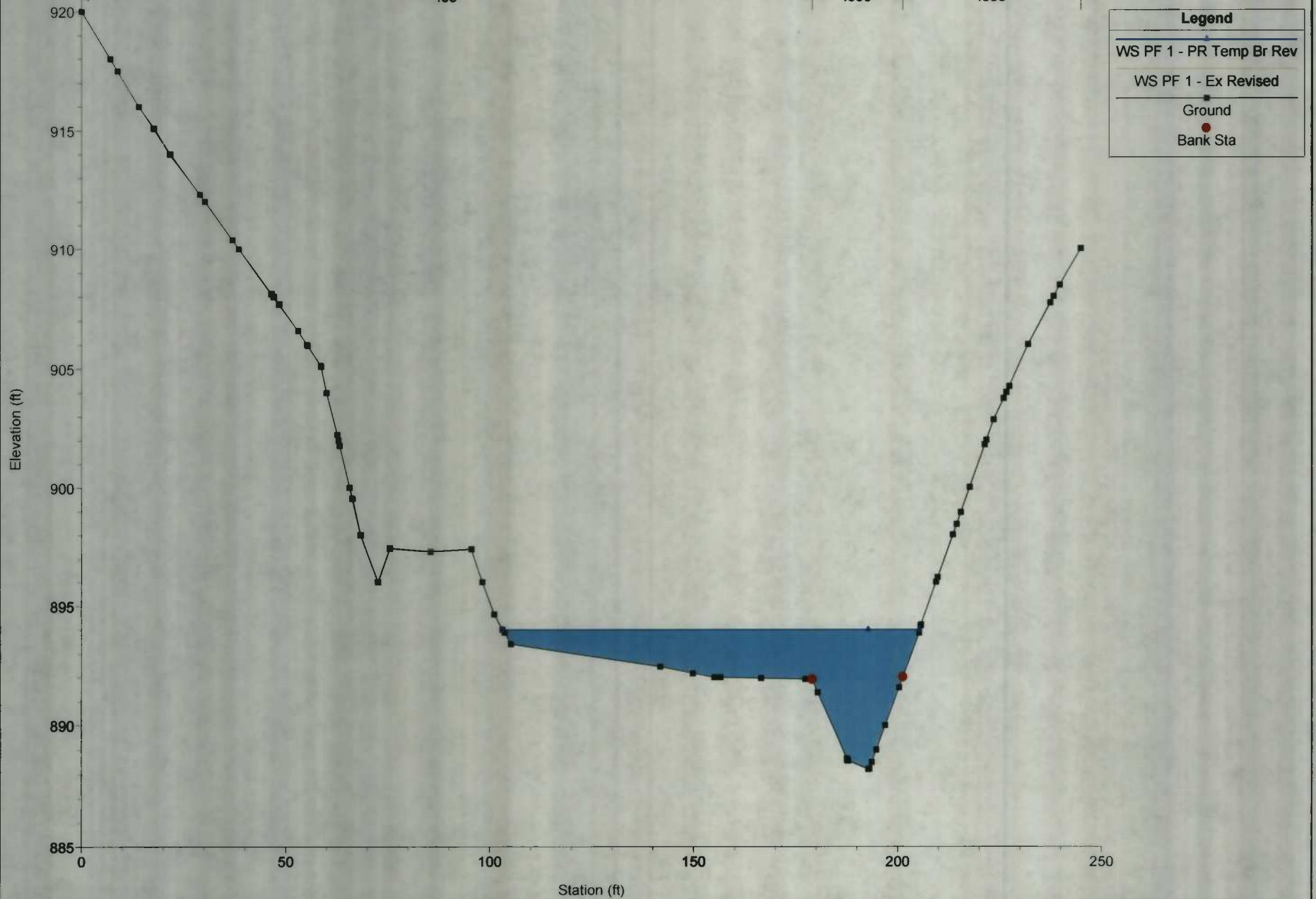


OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 3438.299

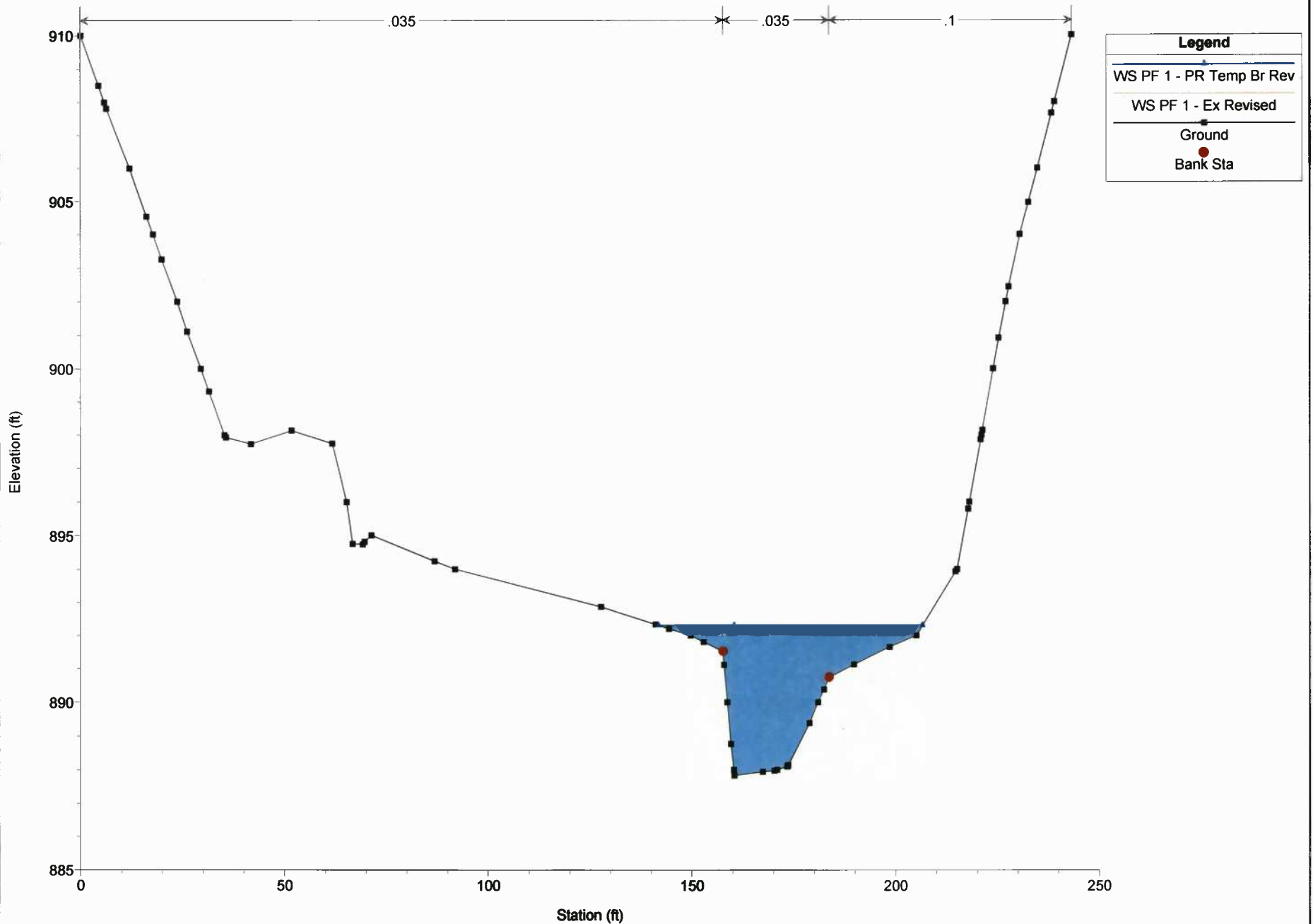
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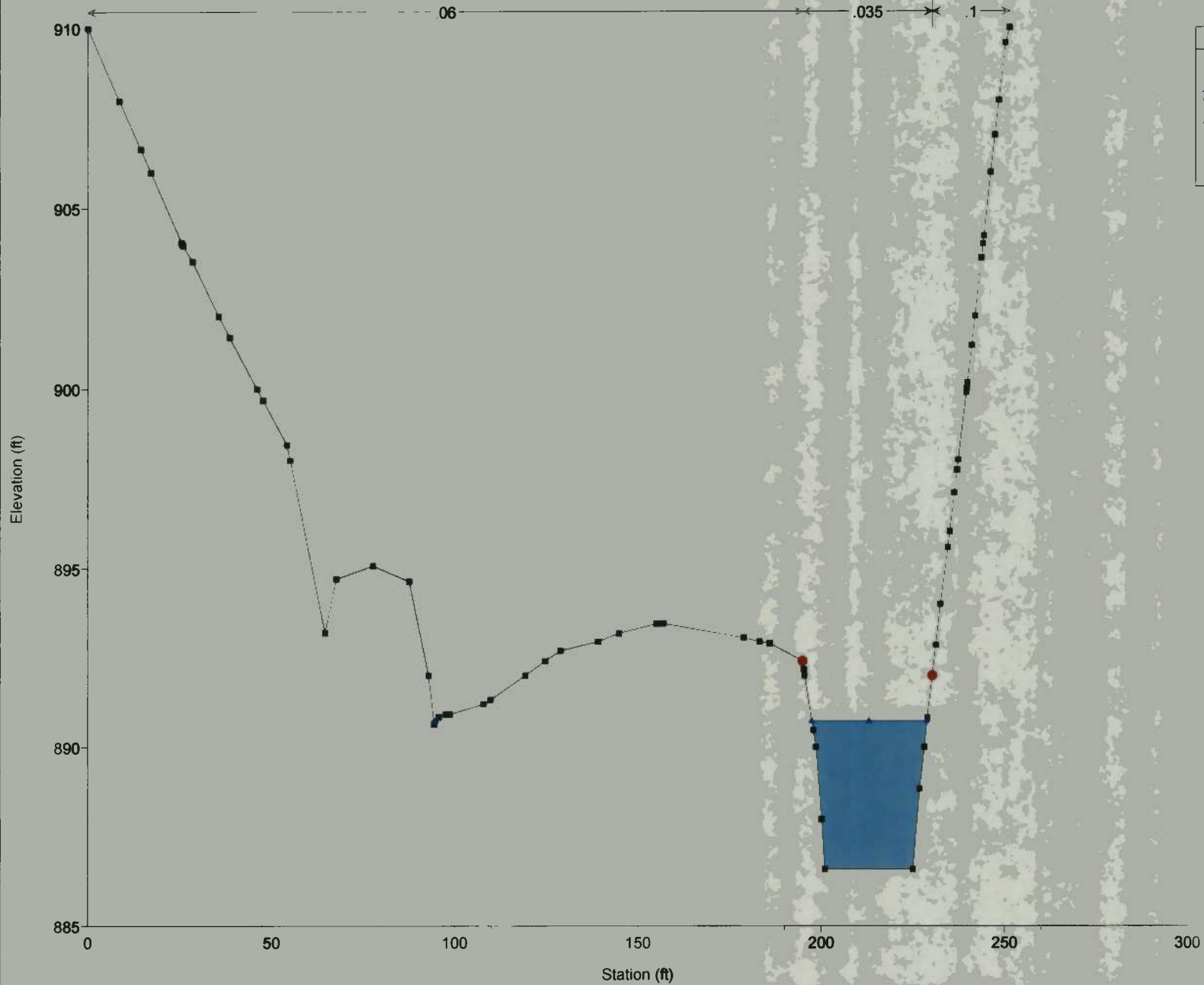
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

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

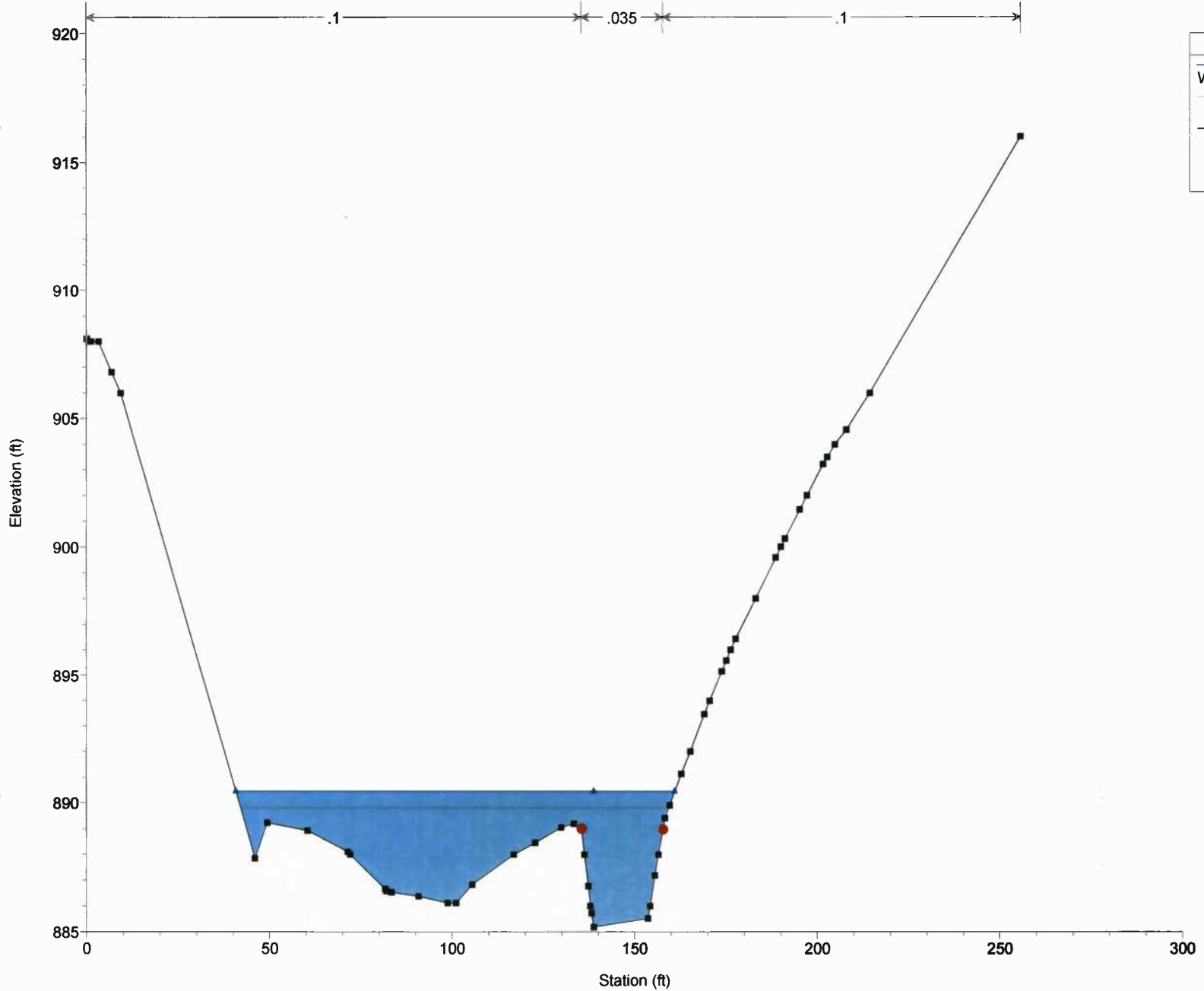


Legend	
WS PF 1 - Ex Revised	◆
WS PF 1 - PR Temp Br Rev	■
Ground	■
Bank Sta	●

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



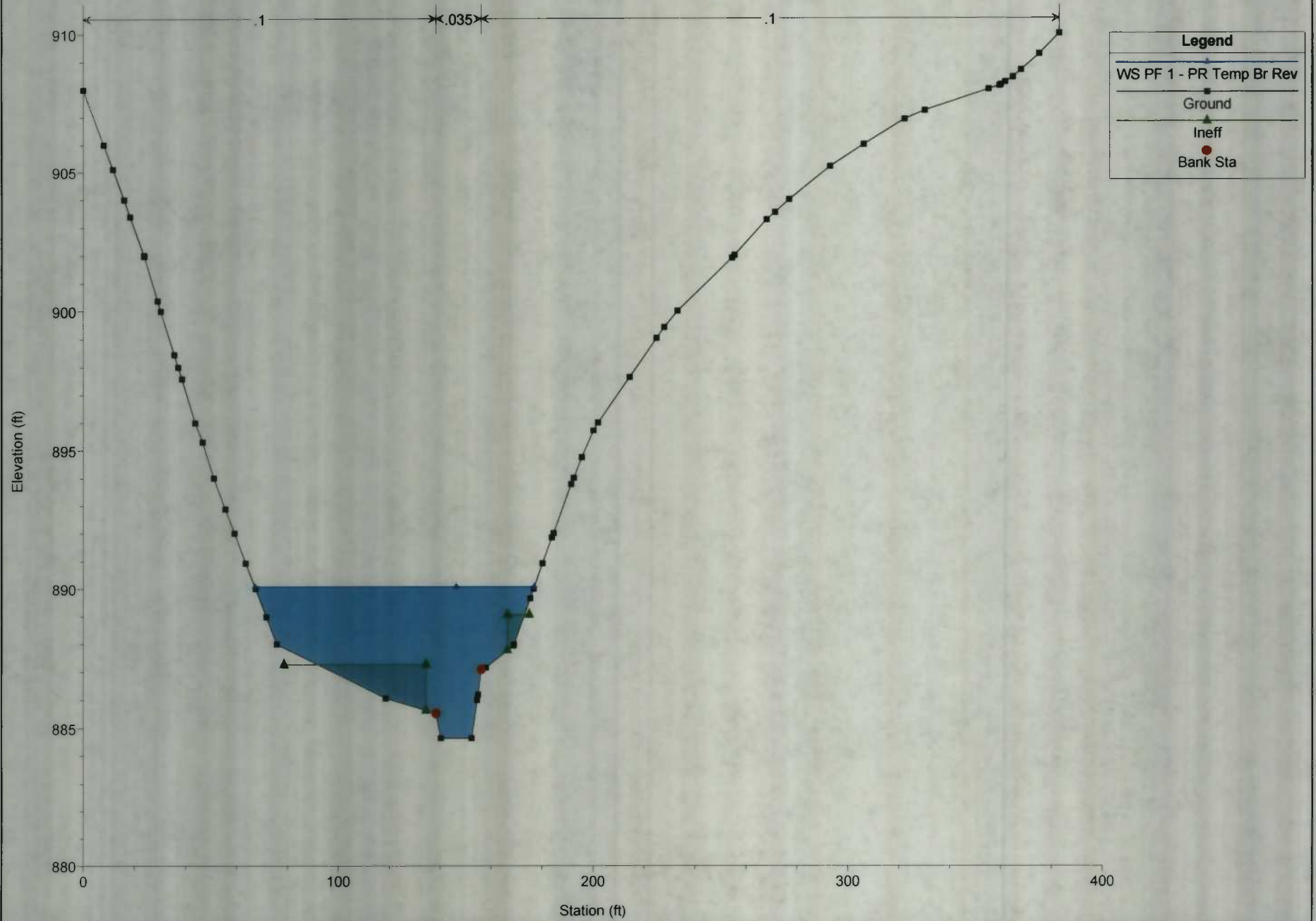
Legend

- 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

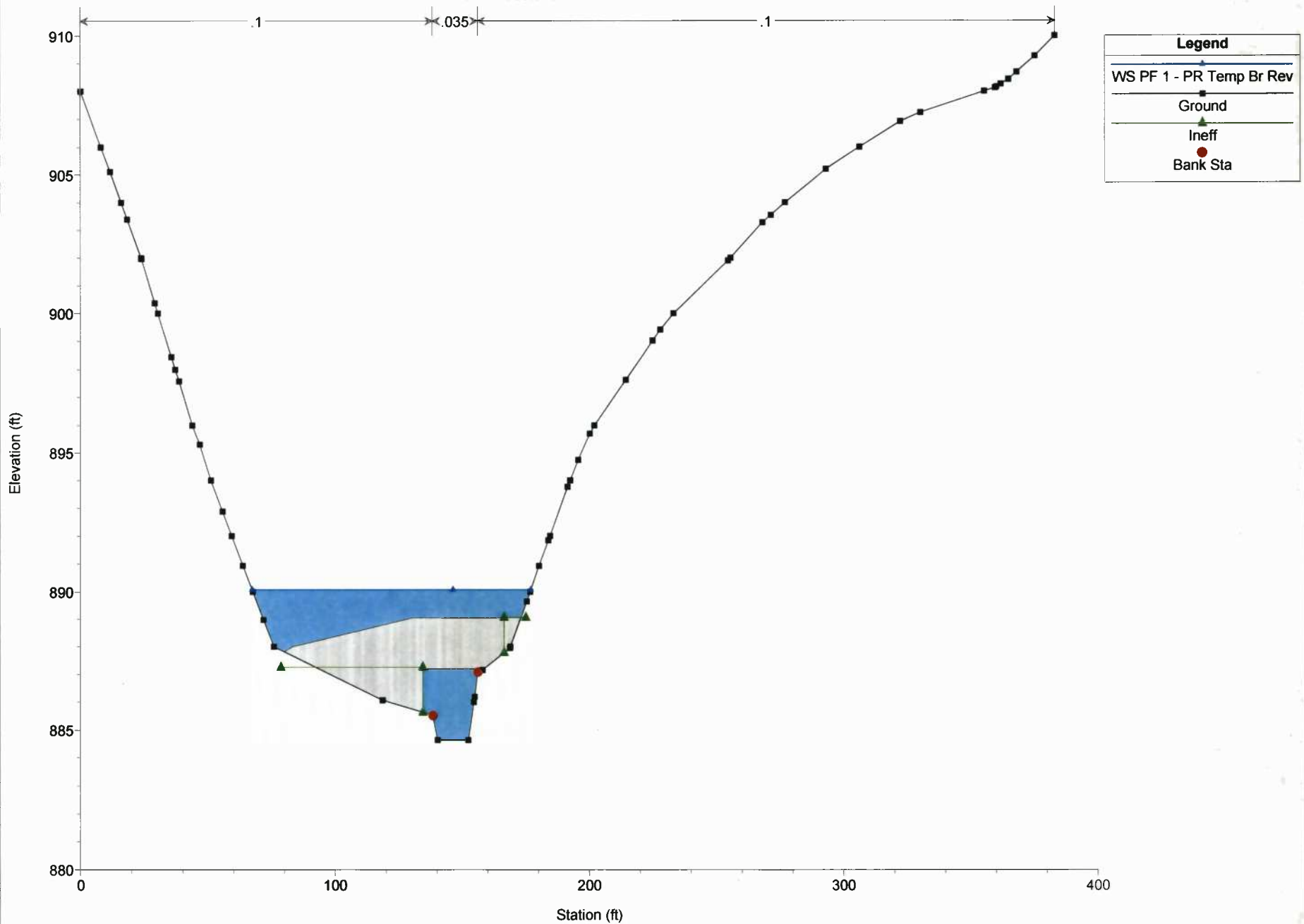
River = Bluestone Creek Reach = Lower RS = 2875.345



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

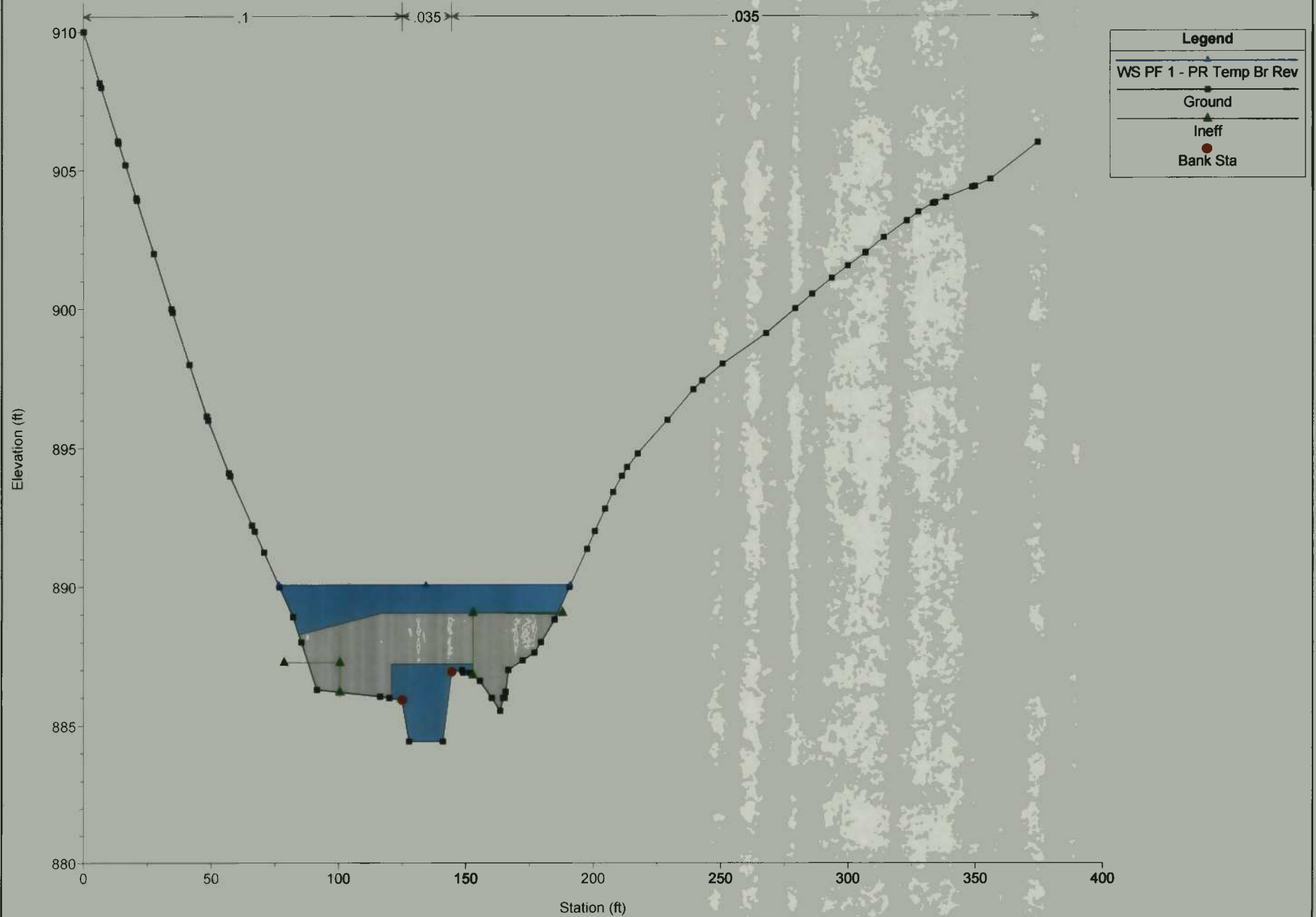
River = Bluestone Creek Reach = Lower RS = 2862.727 BR



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

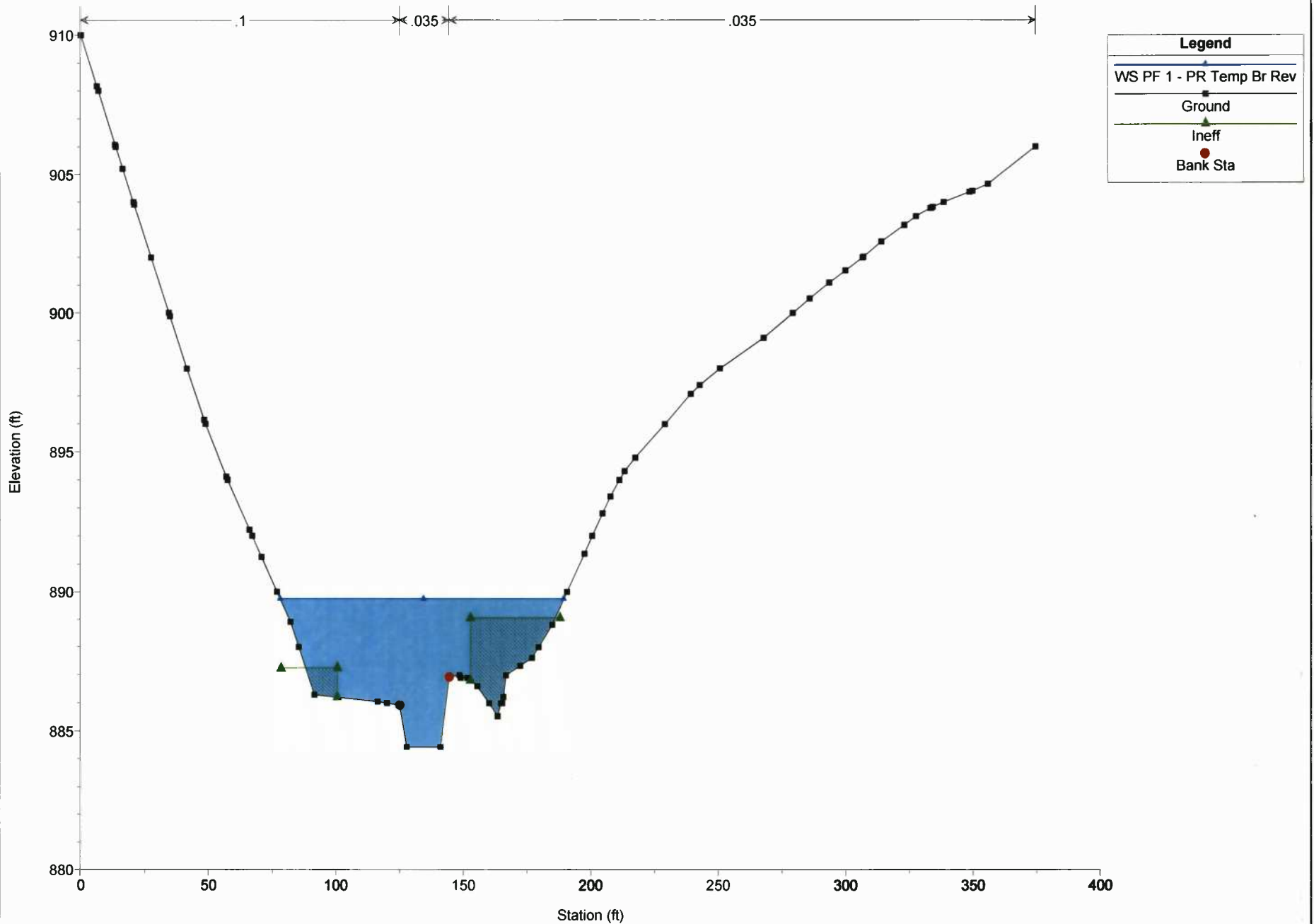
River = Bluestone Creek Reach = Lower RS = 2862.727 BR



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

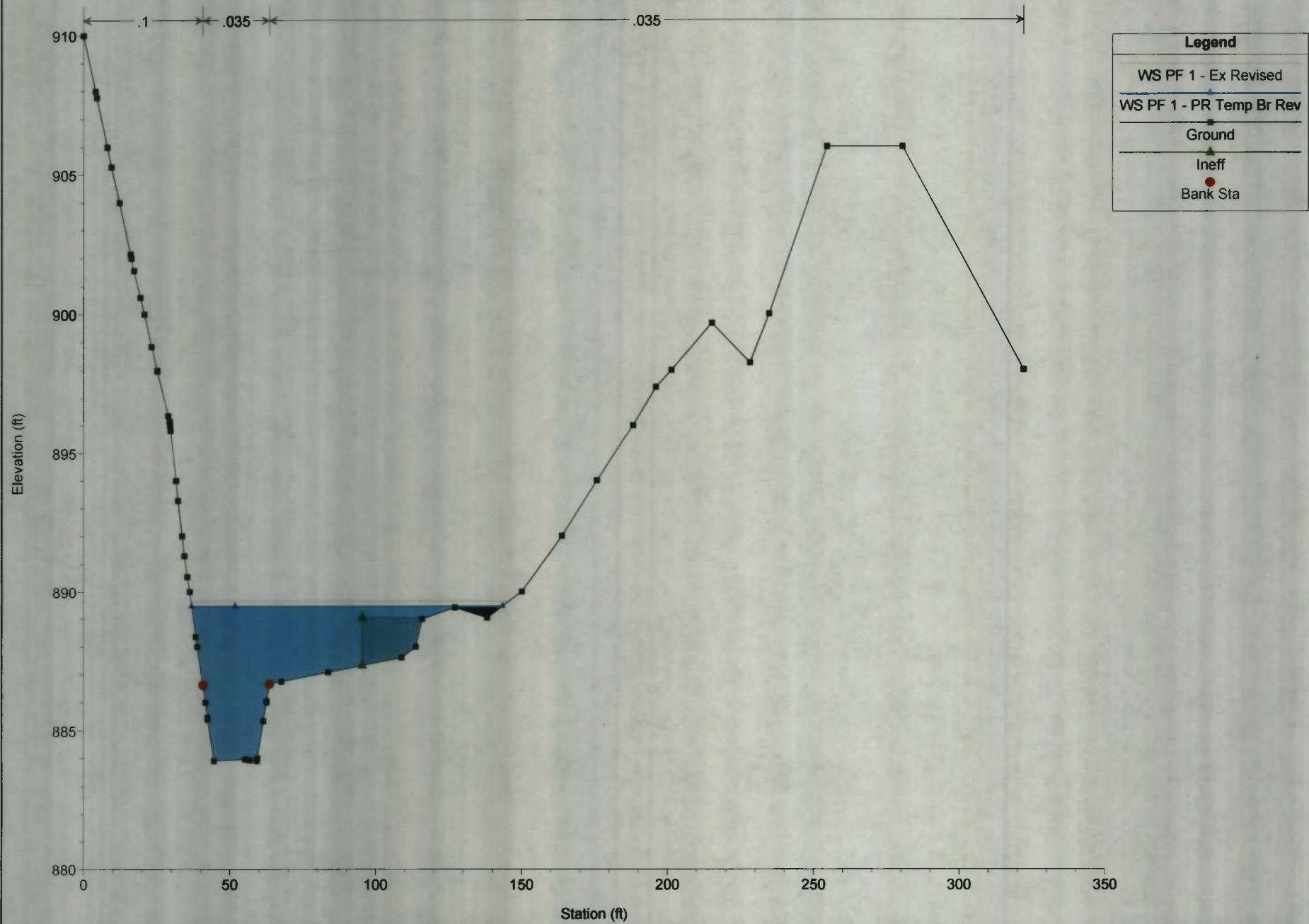
River = Bluestone Creek Reach = Lower RS = 2846.103



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

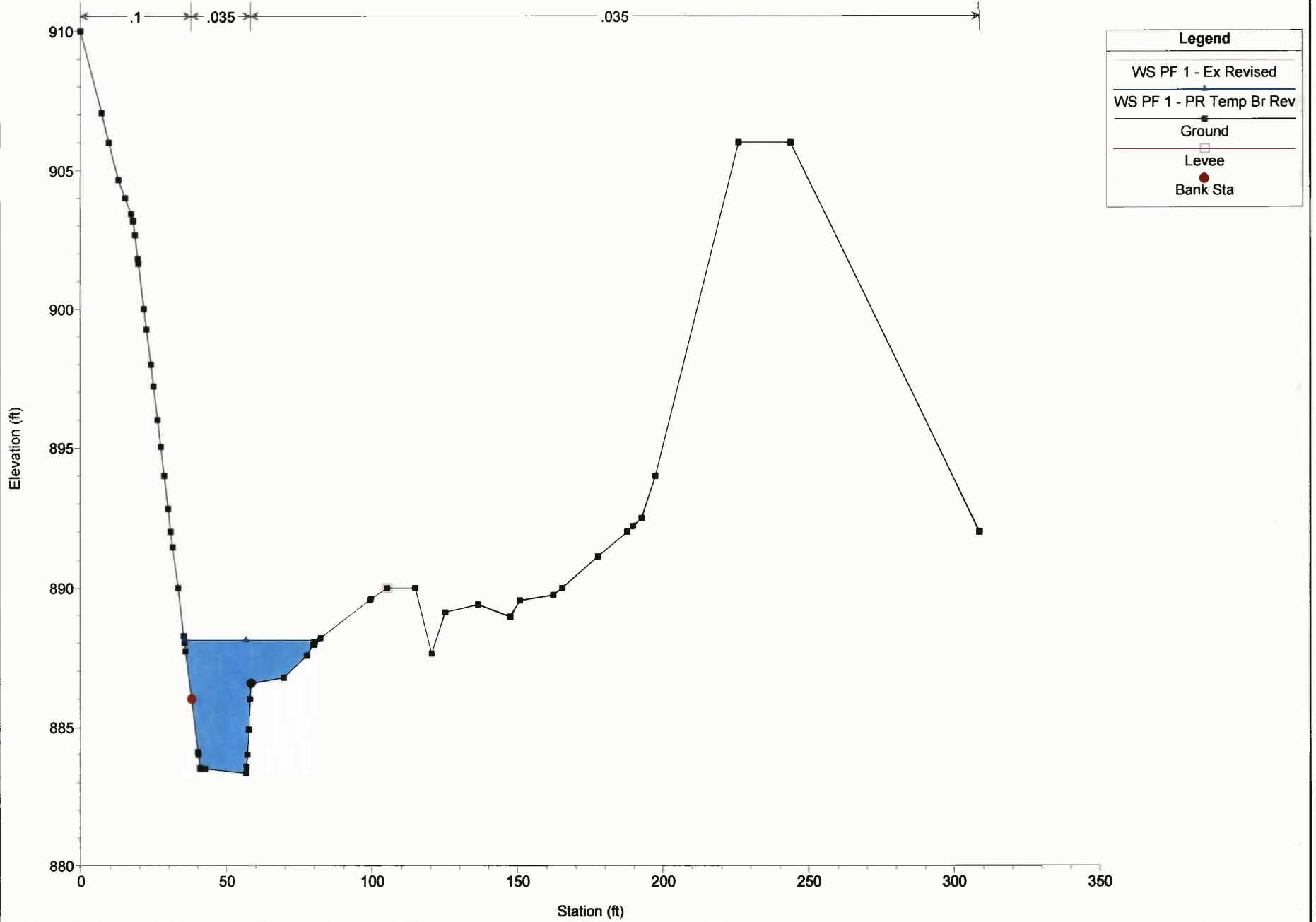
River = Bluestone Creek Reach = Lower RS = 2773.556



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

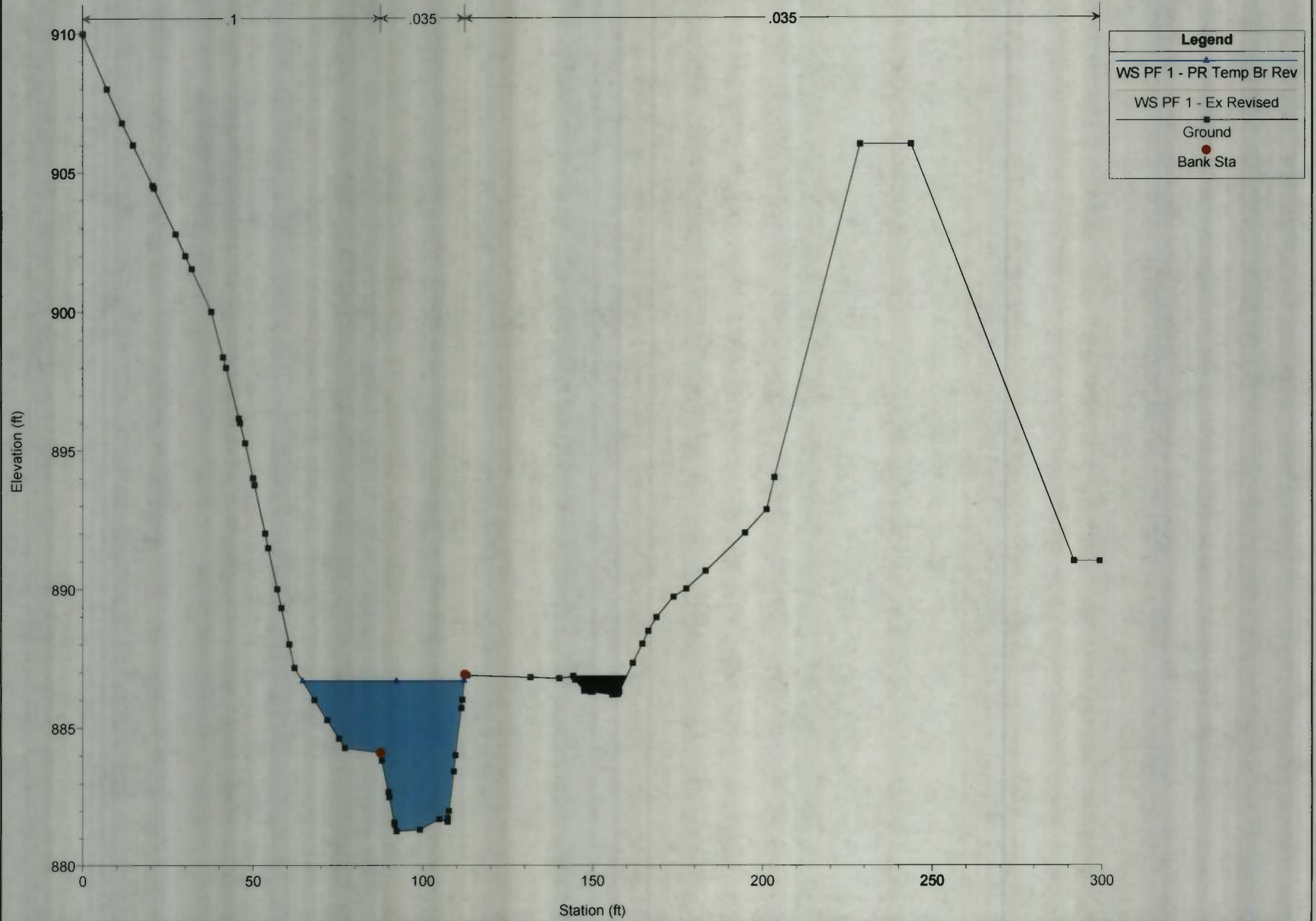
River = Bluestone Creek Reach = Lower RS = 2690.443



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

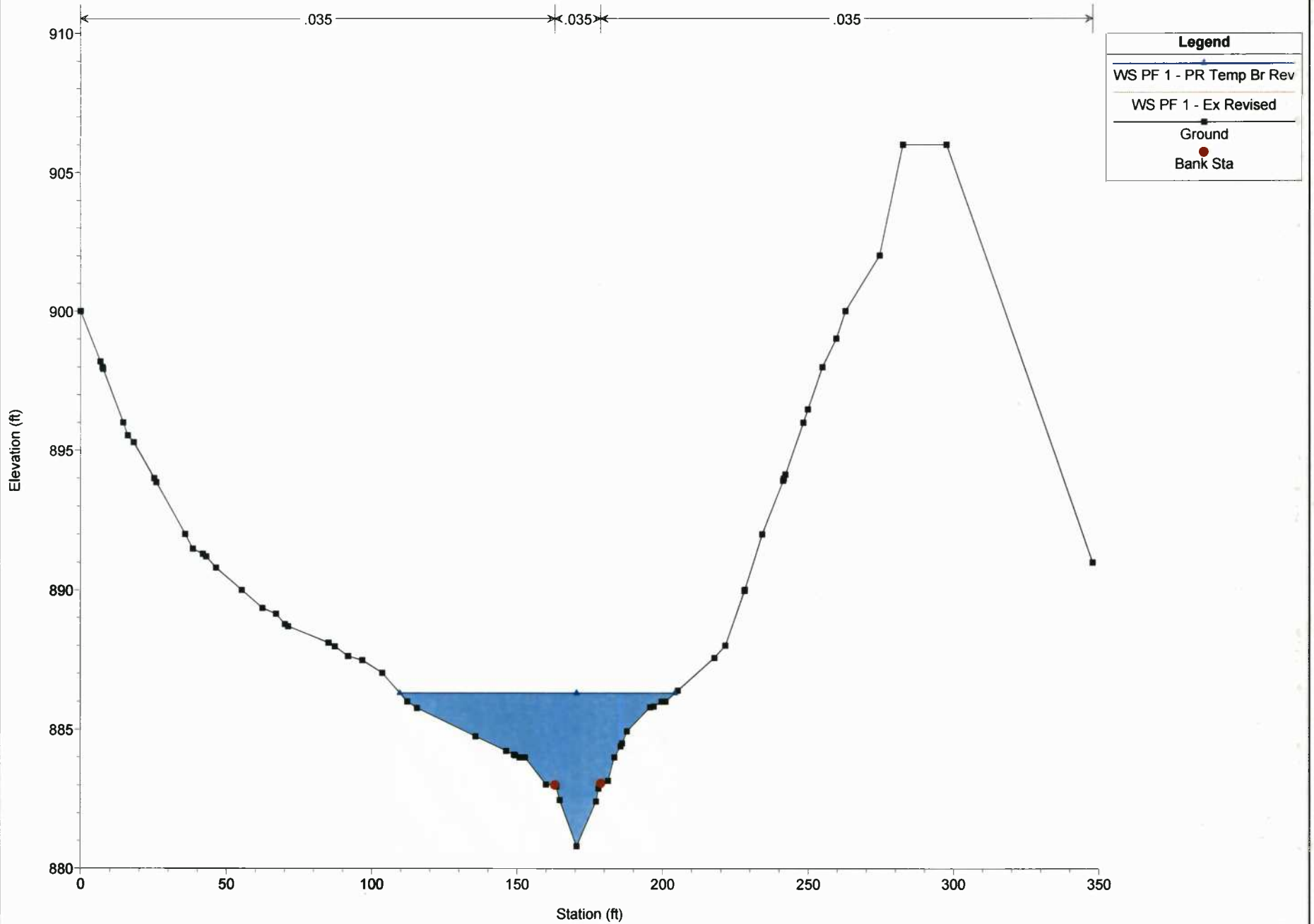
River = Bluestone Creek Reach = Lower RS = 2515.269



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

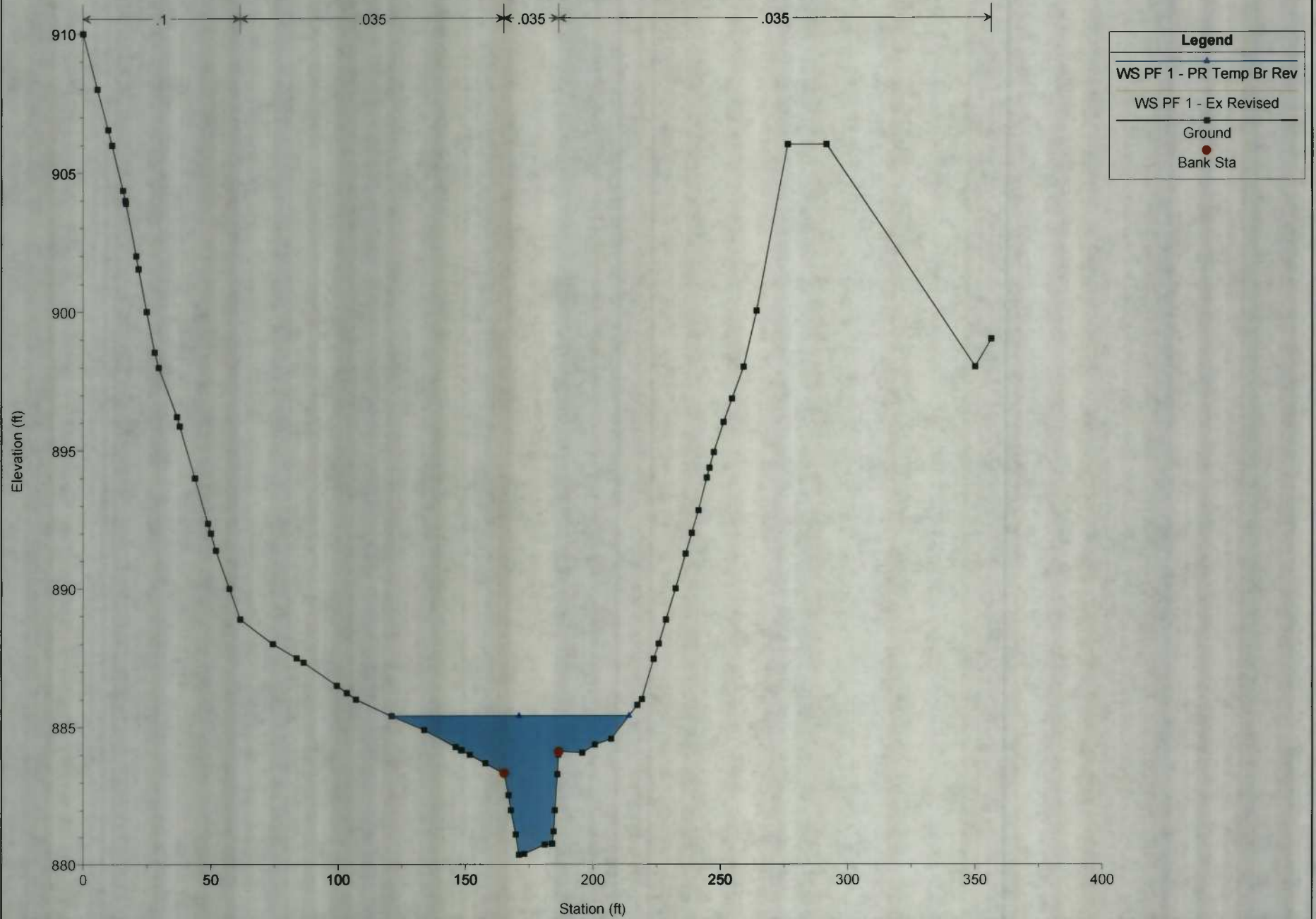
River = Bluestone Creek Reach = Lower RS = 2420.230



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

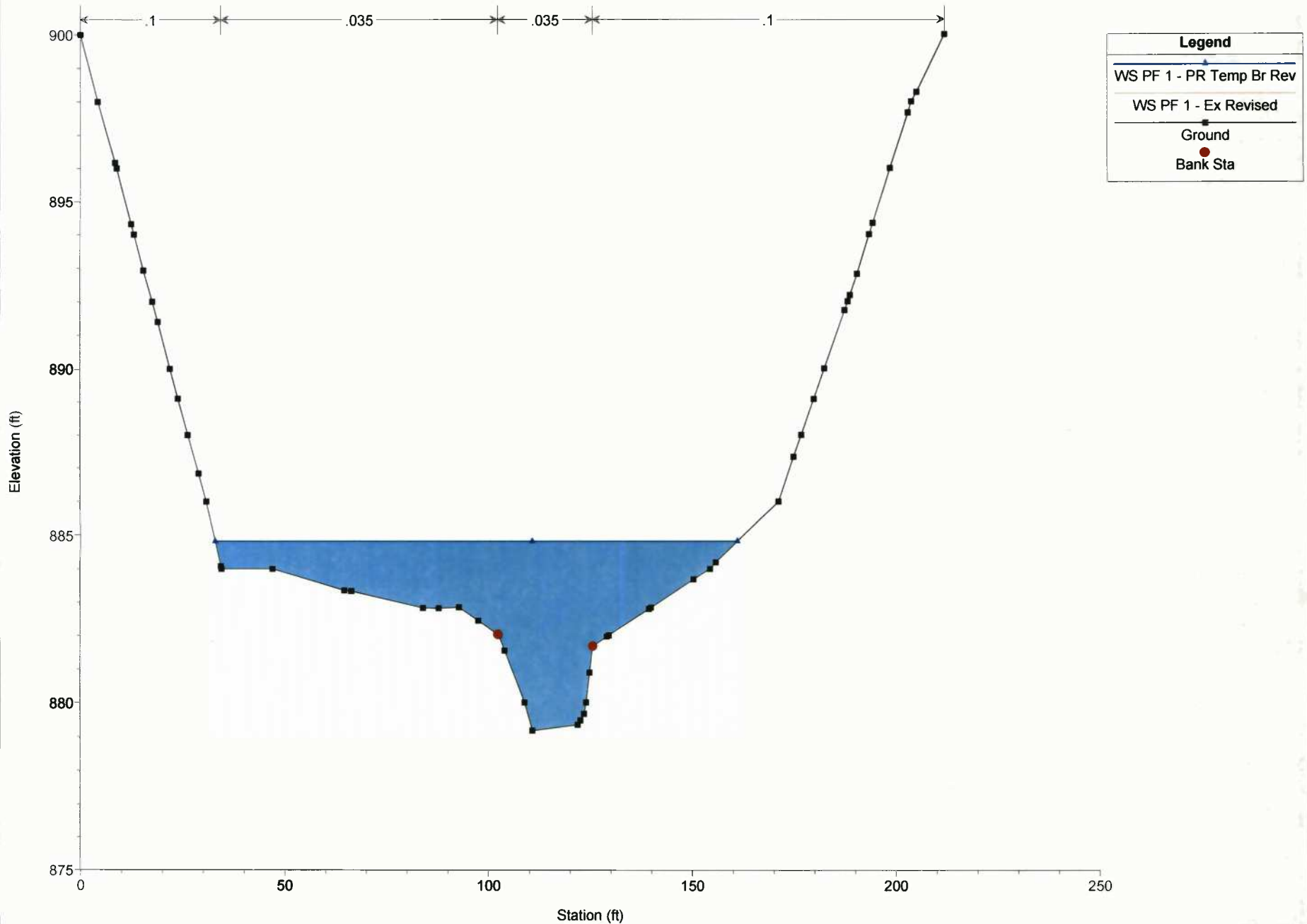
River = Bluestone Creek Reach = Lower RS = 2319.762



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

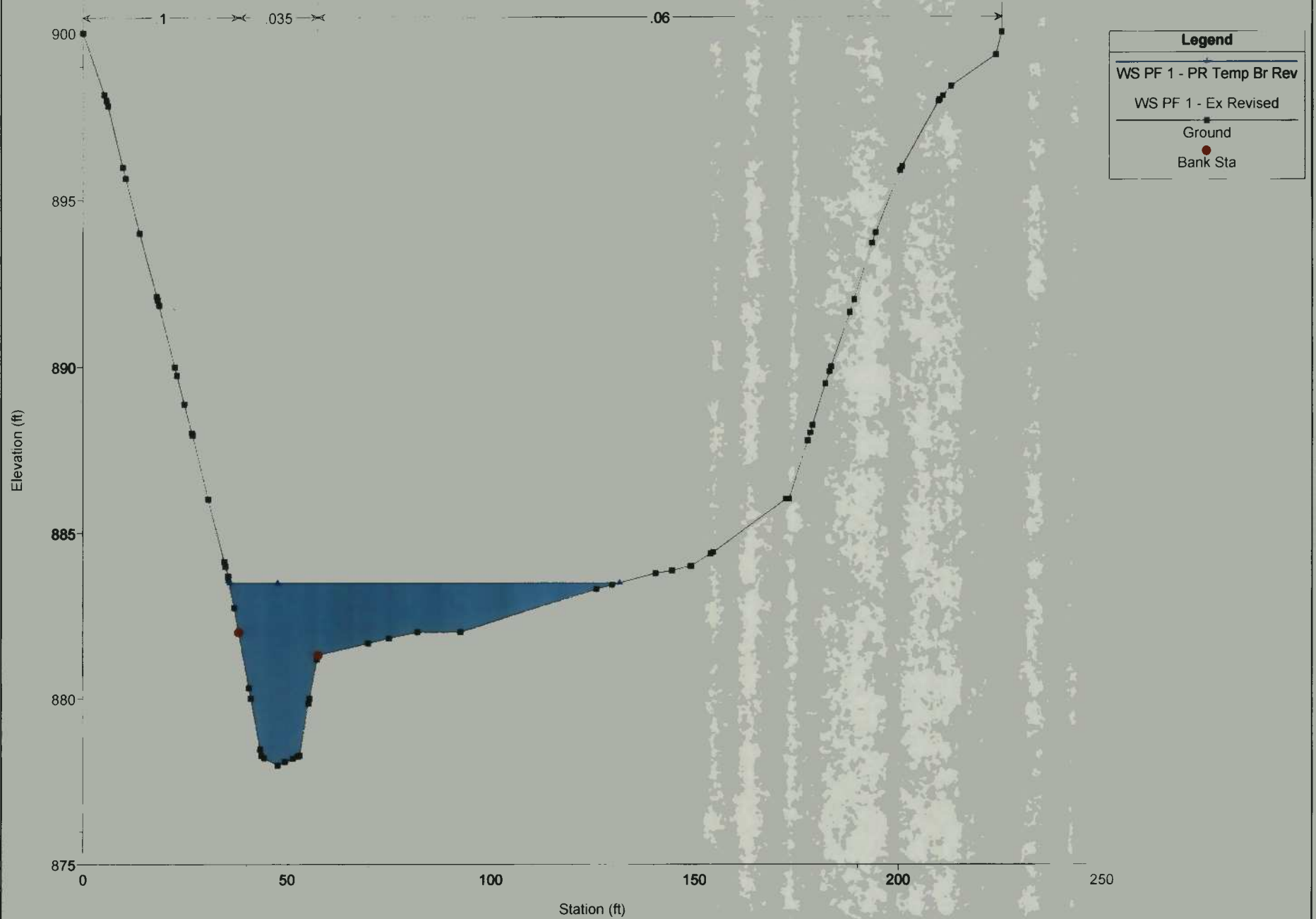
River = Bluestone Creek Reach = Lower RS = 2130.340



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

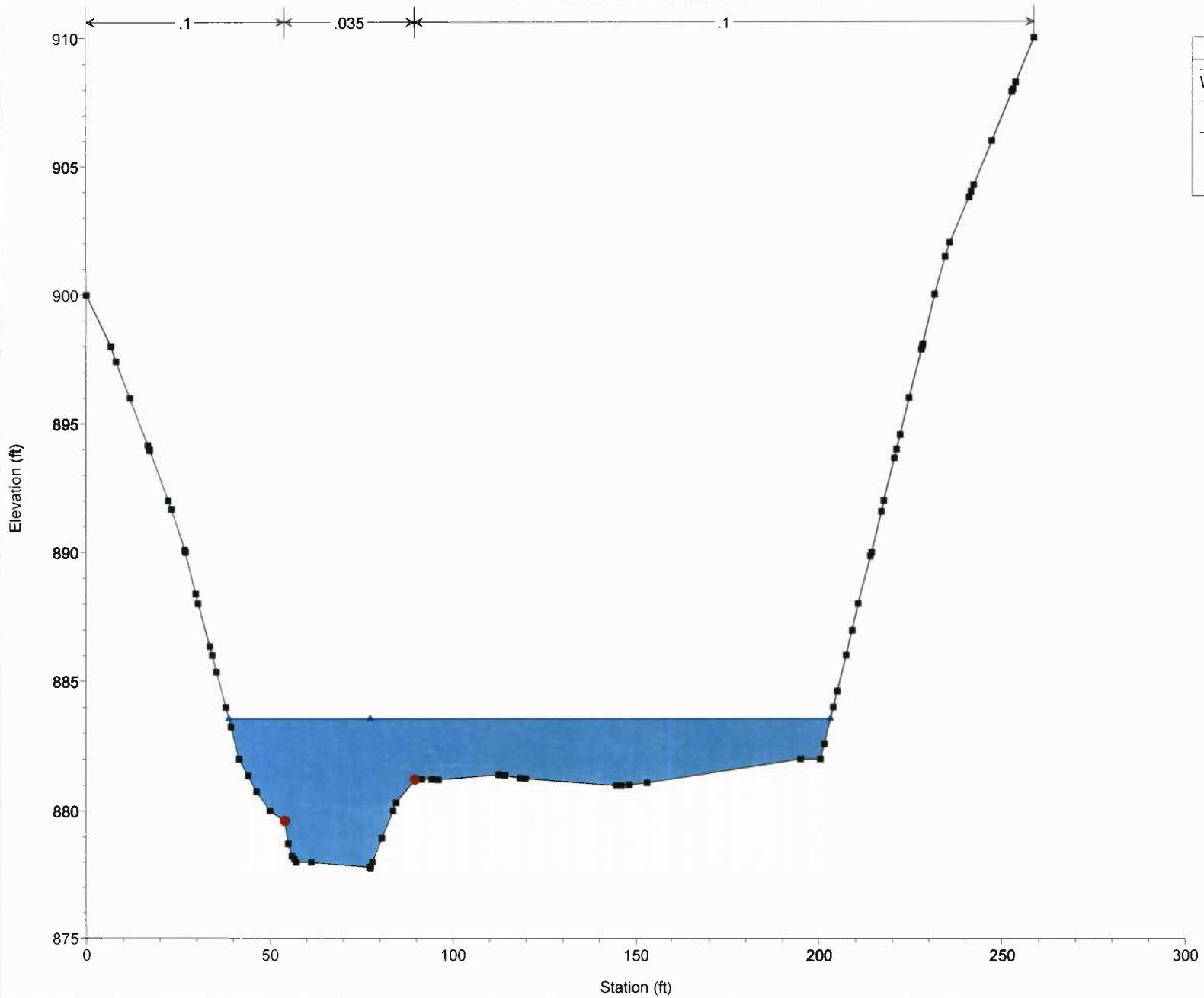
River = Bluestone Creek Reach = Lower RS = 1966.255



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

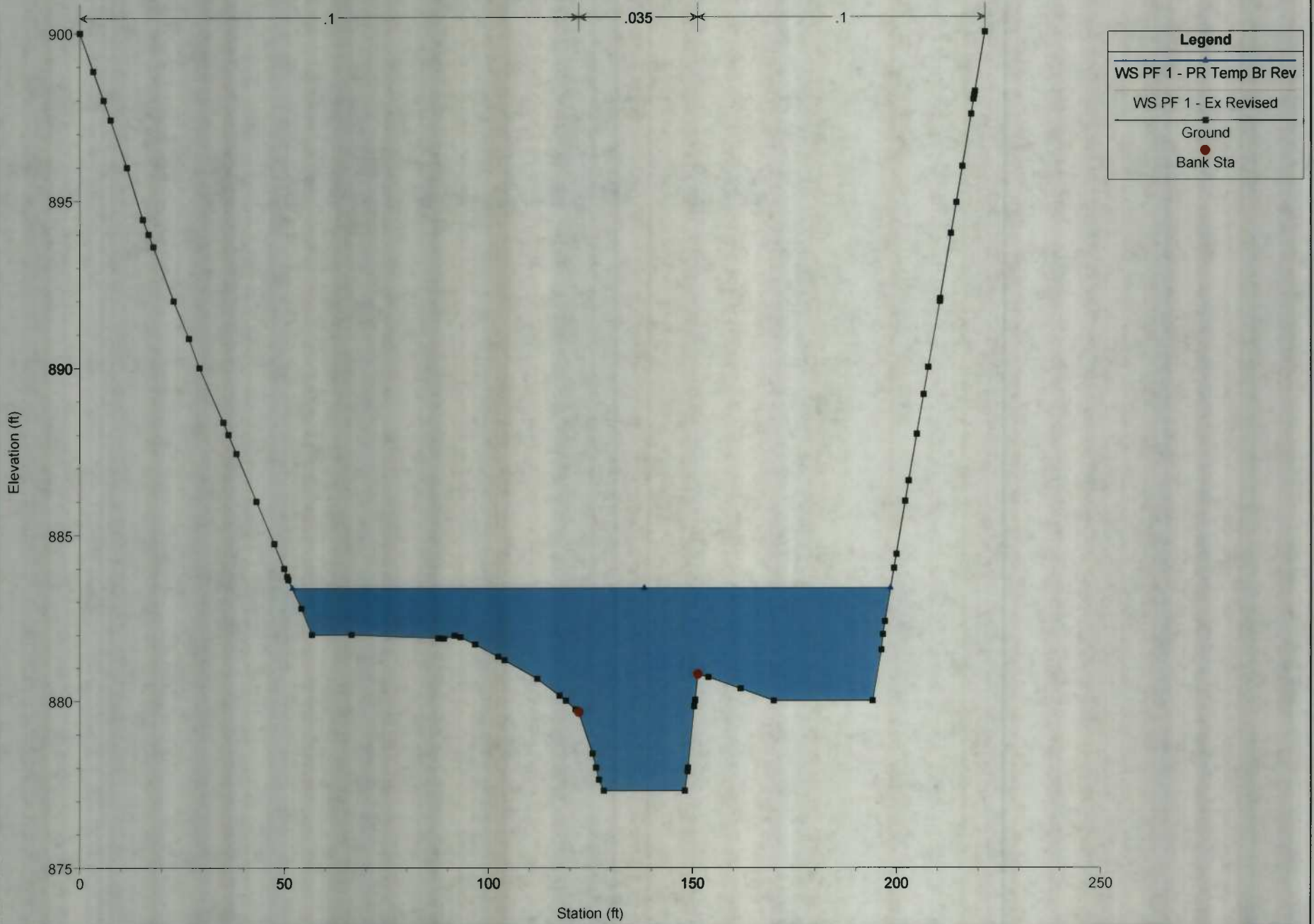


Legend	
—▲—	WS PF 1 - PR Temp Br Rev
- - -▲- - -	WS PF 1 - Ex Revised
—■—	Ground
●	Bank Sta

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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

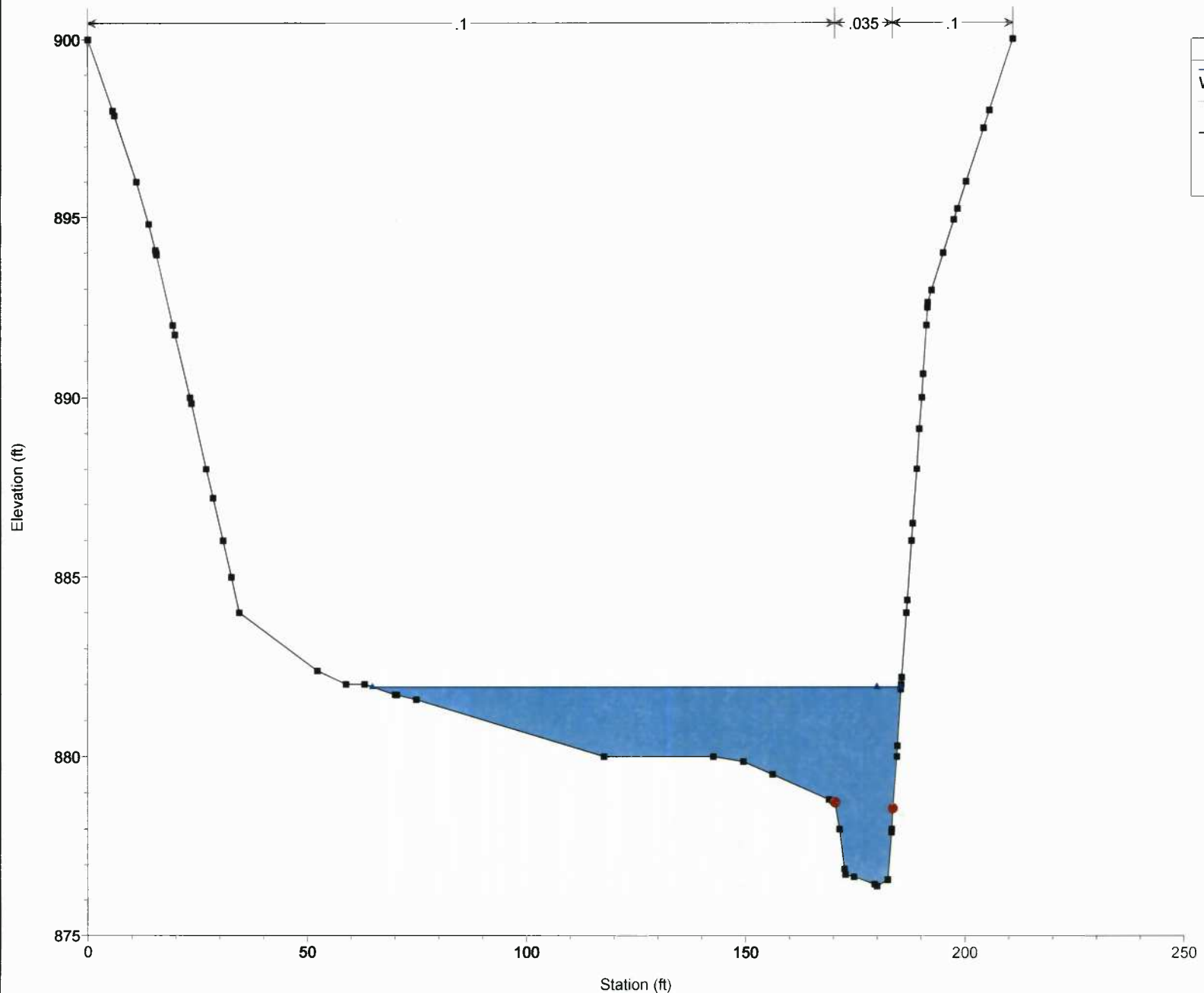
River = Bluestone Creek Reach = Lower RS = 1819.717



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



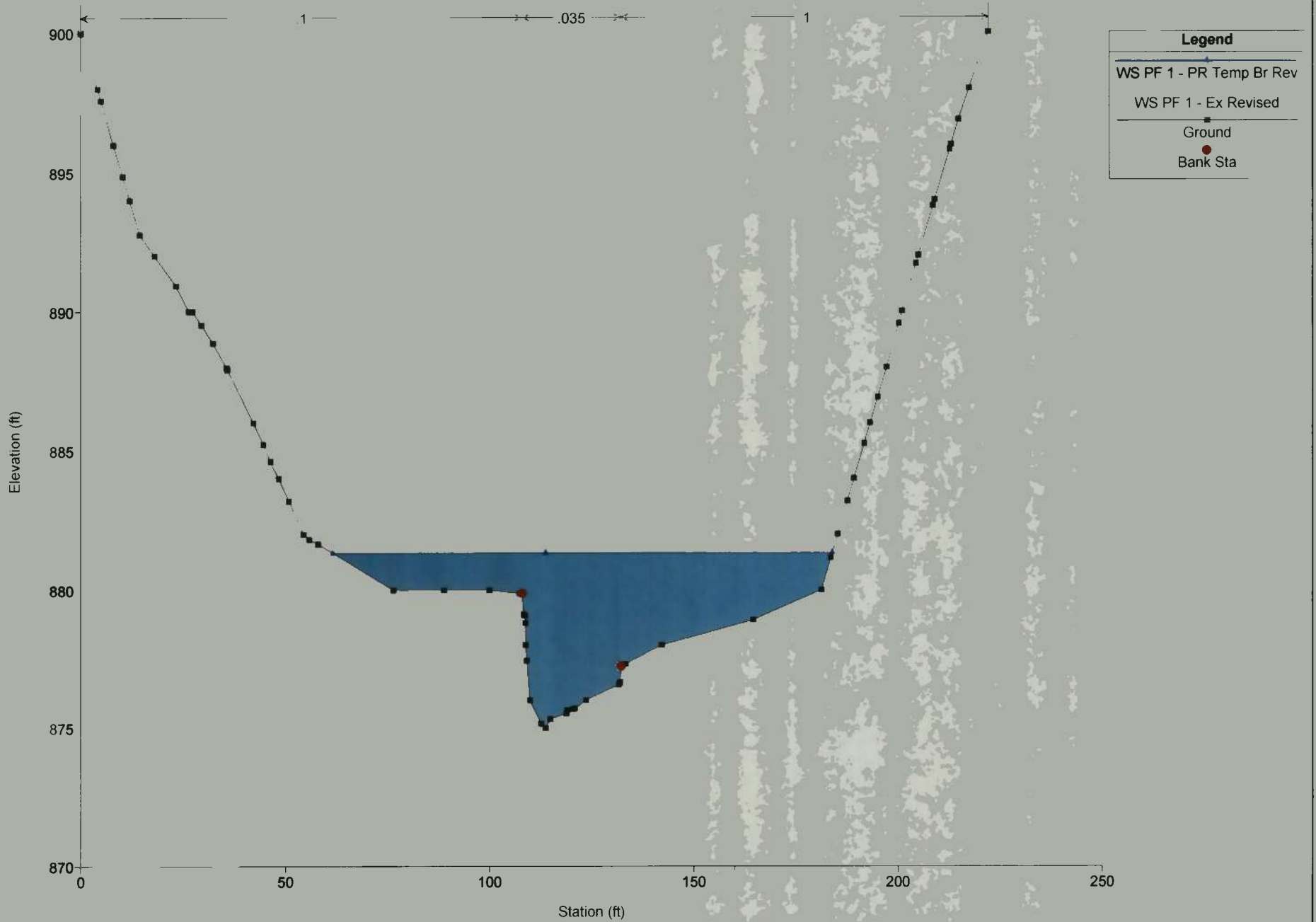
Legend

- 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

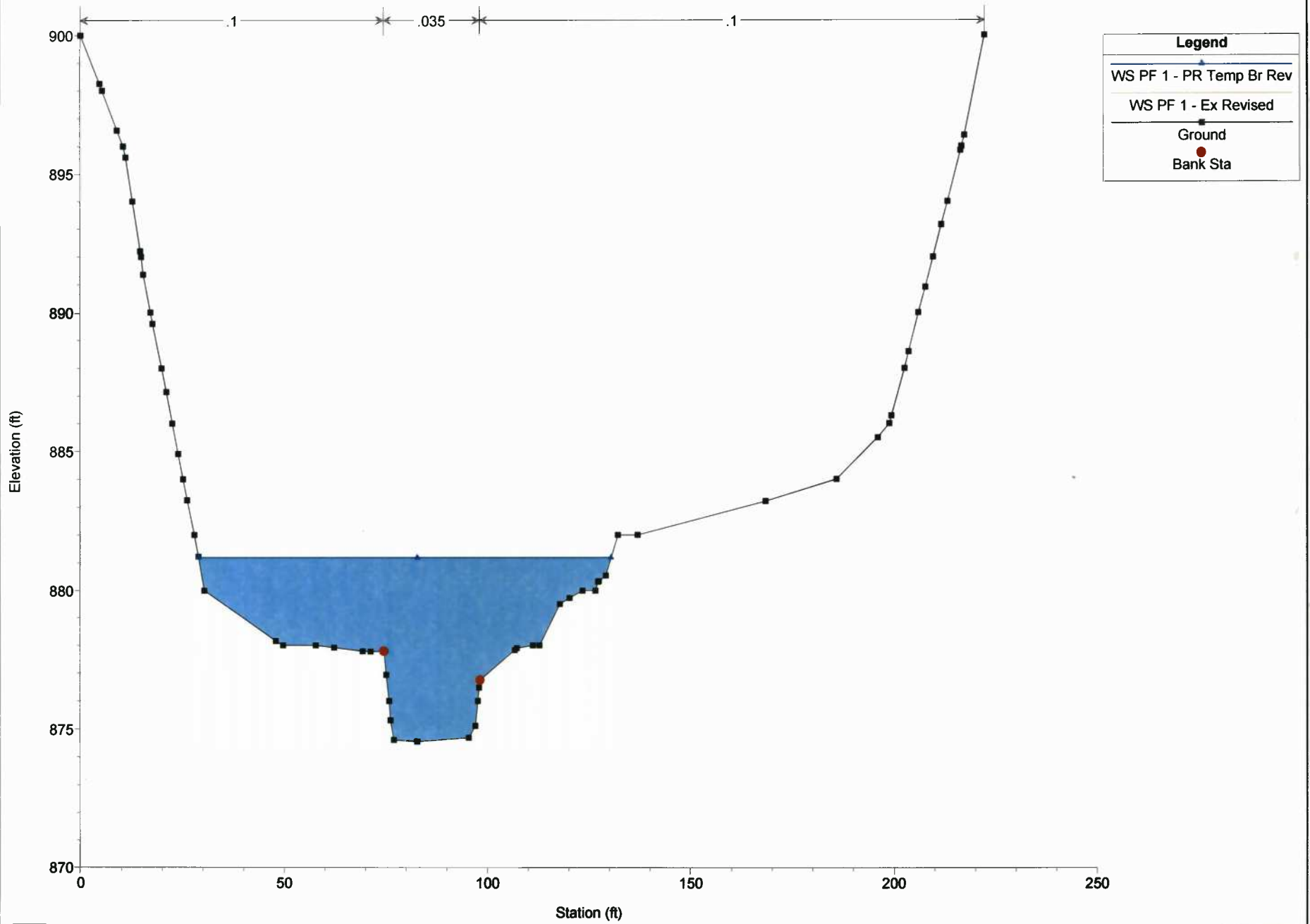
River = Bluestone Creek Reach = Lower RS = 1512.215



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

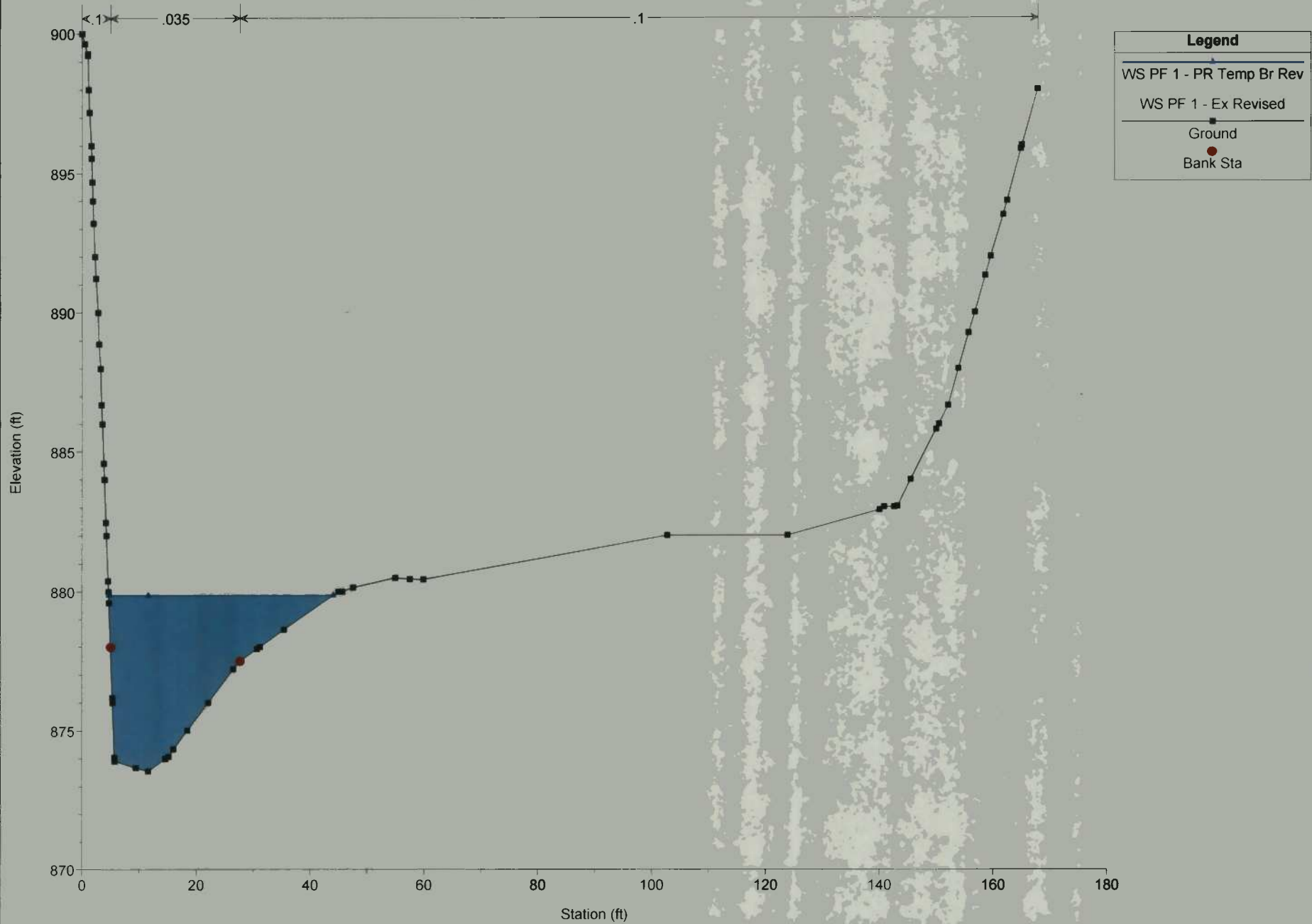
River = Bluestone Creek Reach = Lower RS = 1387.656



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

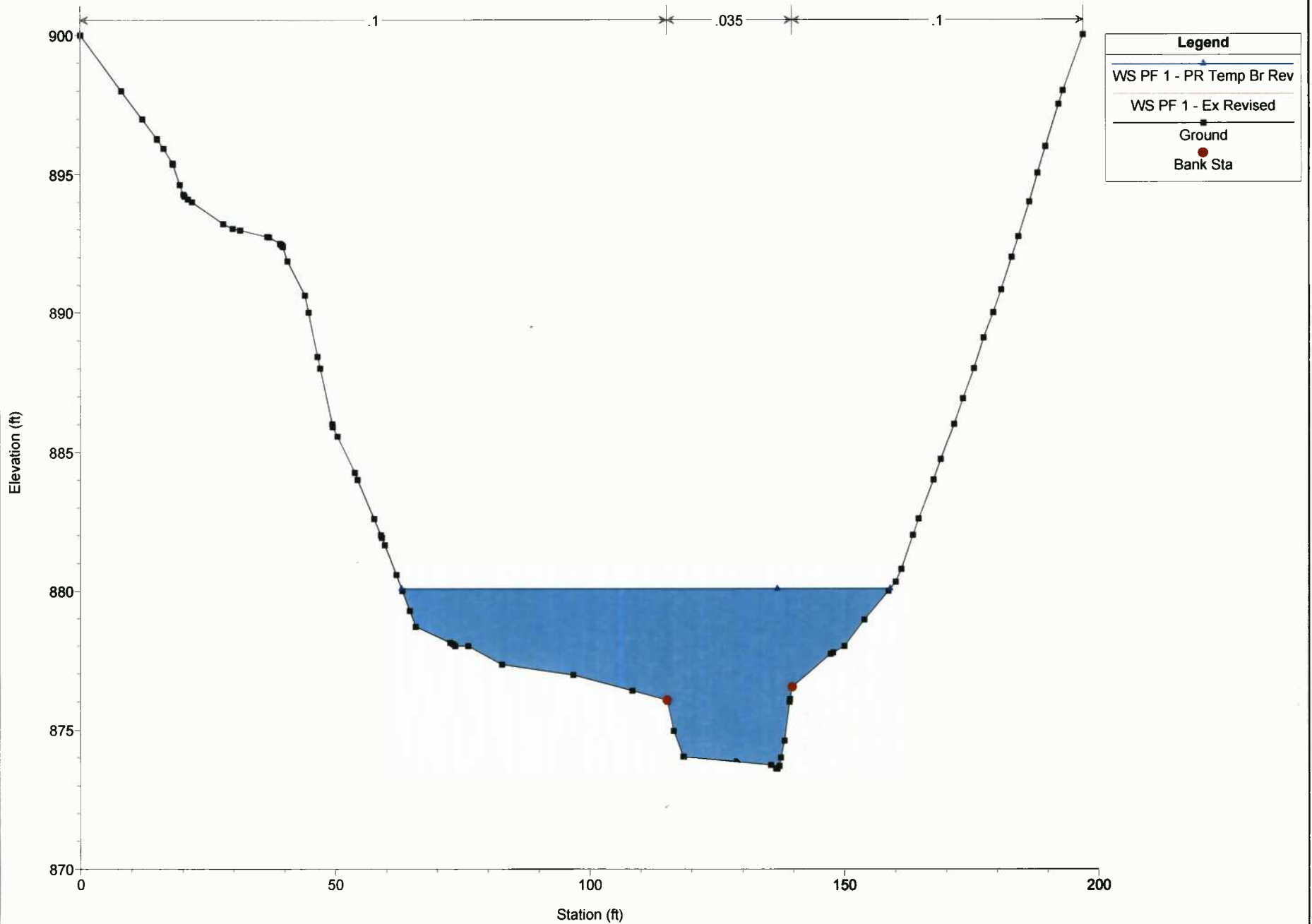
River = Bluestone Creek Reach = Lower RS = 1246.924



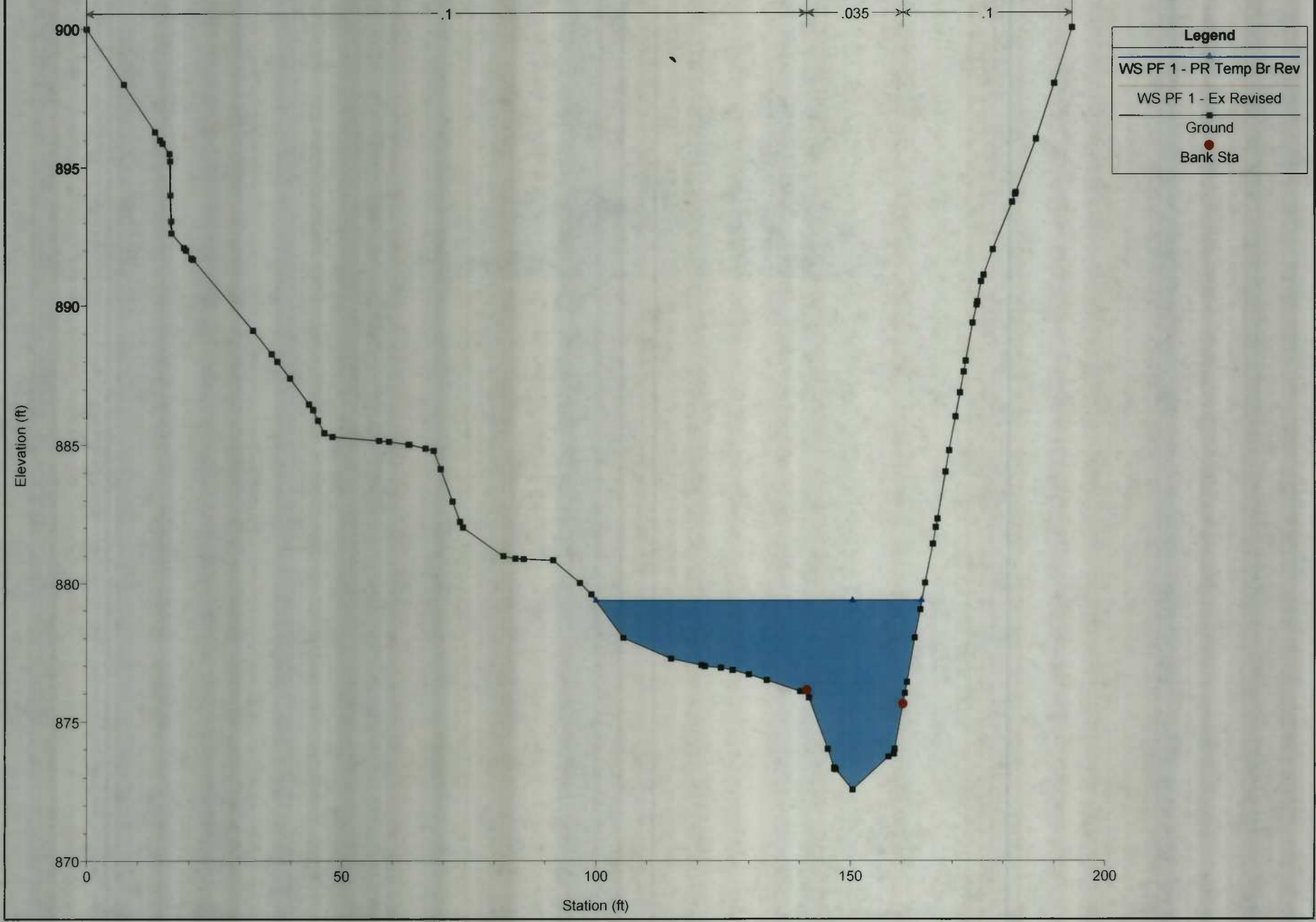
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Bluestone Creek Reach = Lower RS = 1109.636



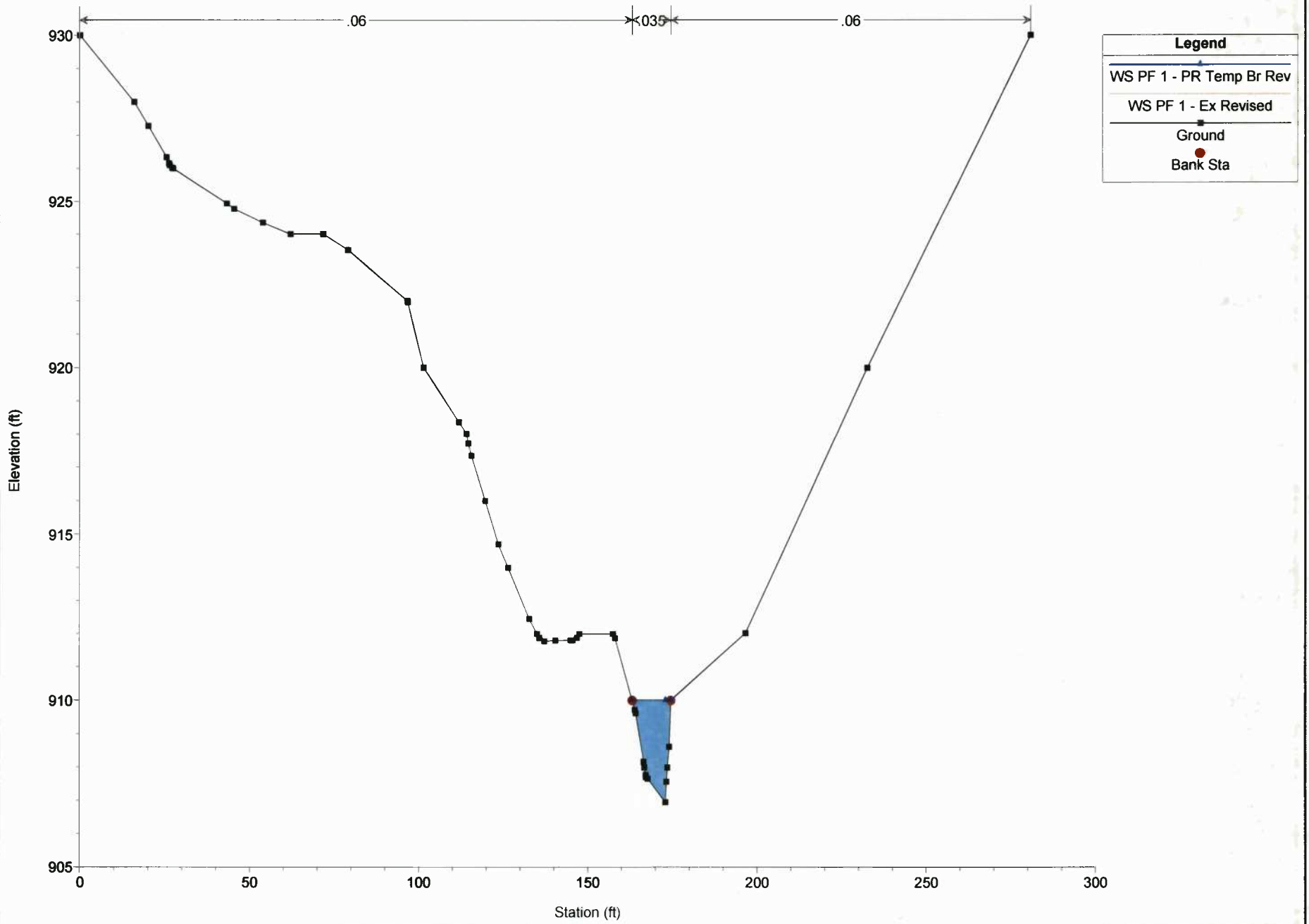
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised
Geom: Proposed Temp Bridge Revised Flow: Structures Revised
River = Bluestone Creek Reach = Lower RS = 1029.896



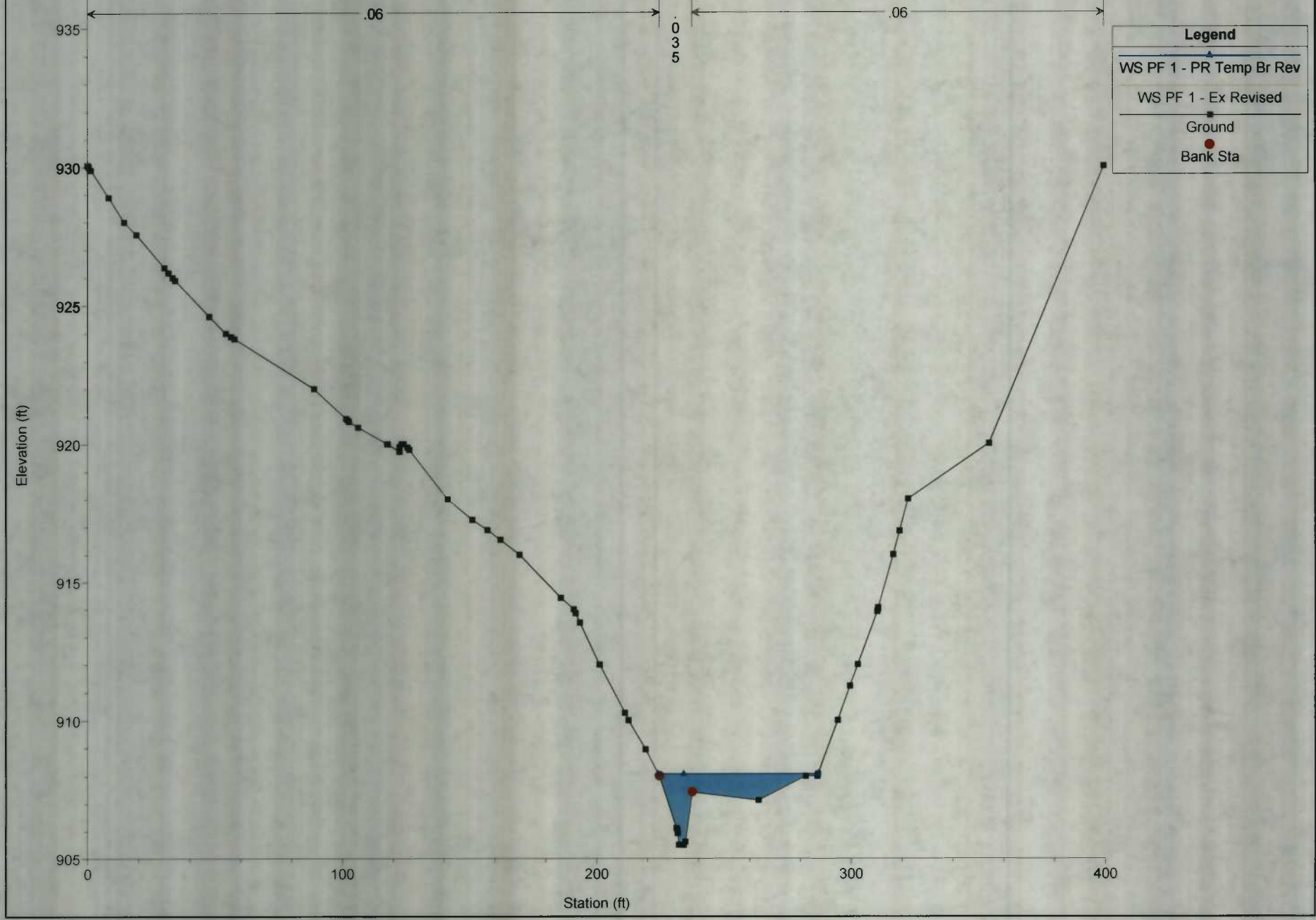
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Trib 1 Reach = Trib 1 RS = 1494.636



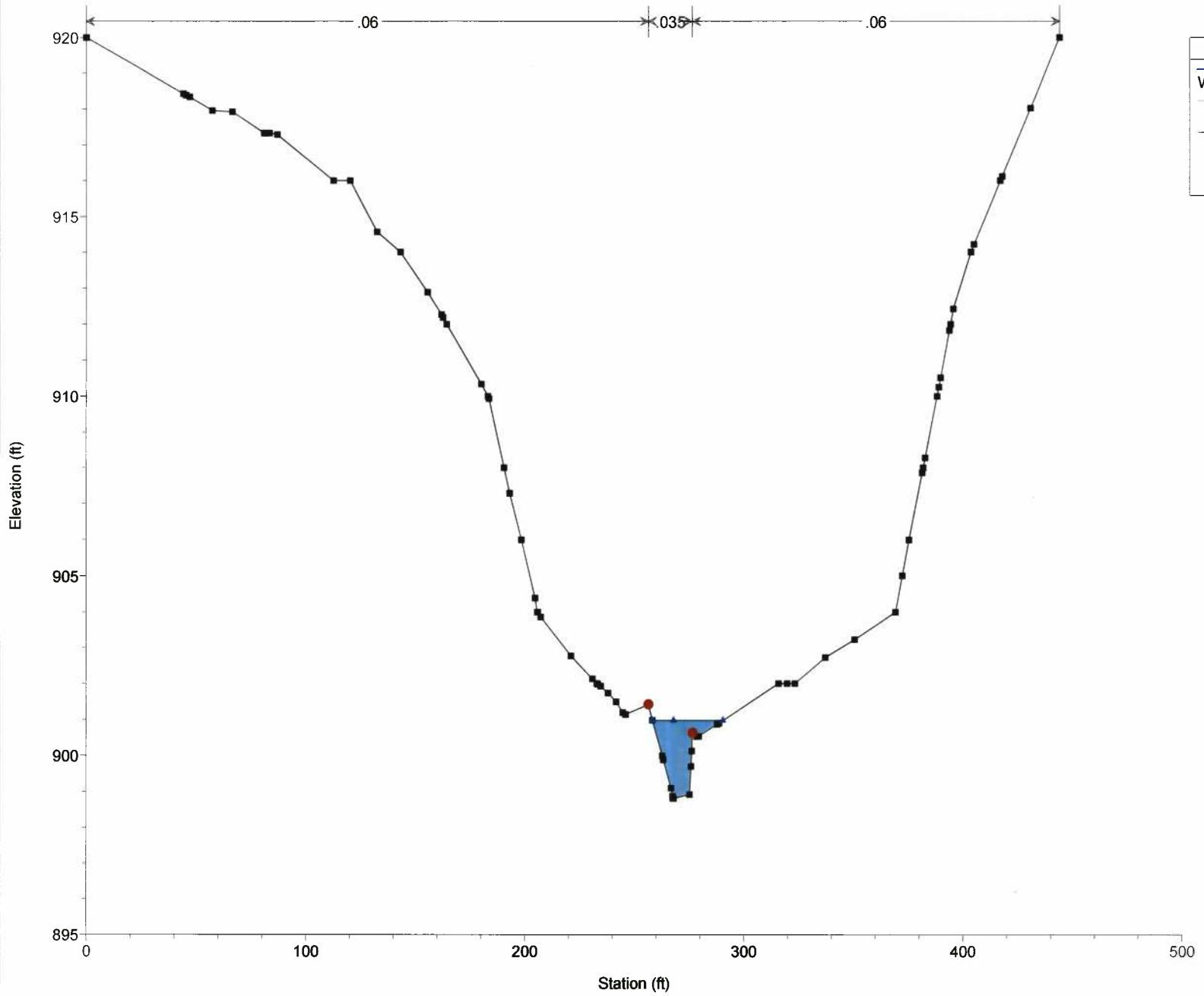
OXF 157-159 Bridges Plan: 1) PR Temp Br Rev 2) Ex Revised
Geom: Proposed Temp Bridge Revised Flow: Structures Revised
River = Trib 1 Reach = Trib 1 RS = 1352.345



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

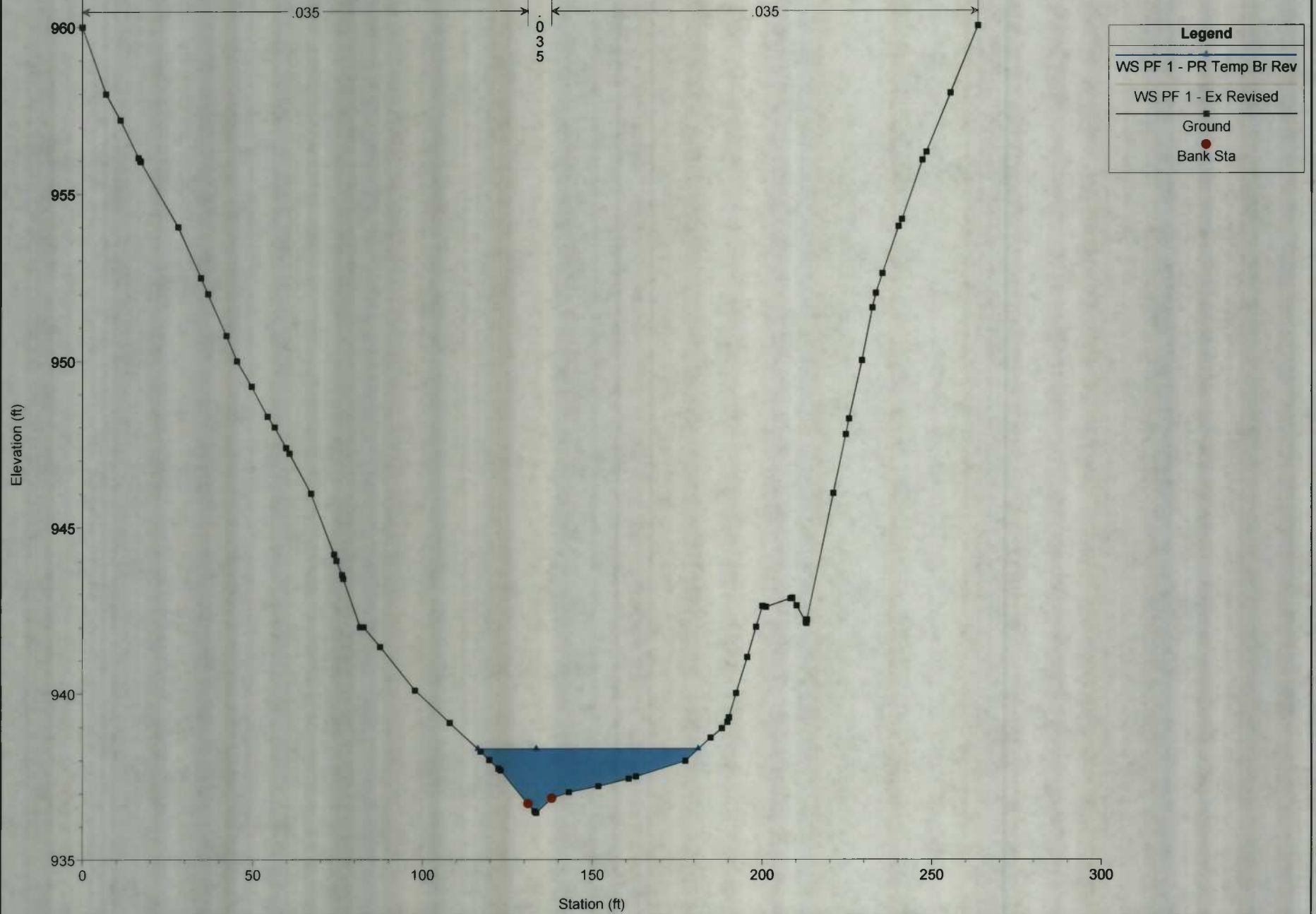


Legend	
	WS PF 1 - PR Temp Br Rev
	WS PF 1 - Ex Revised
	Ground
	Bank Sta

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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

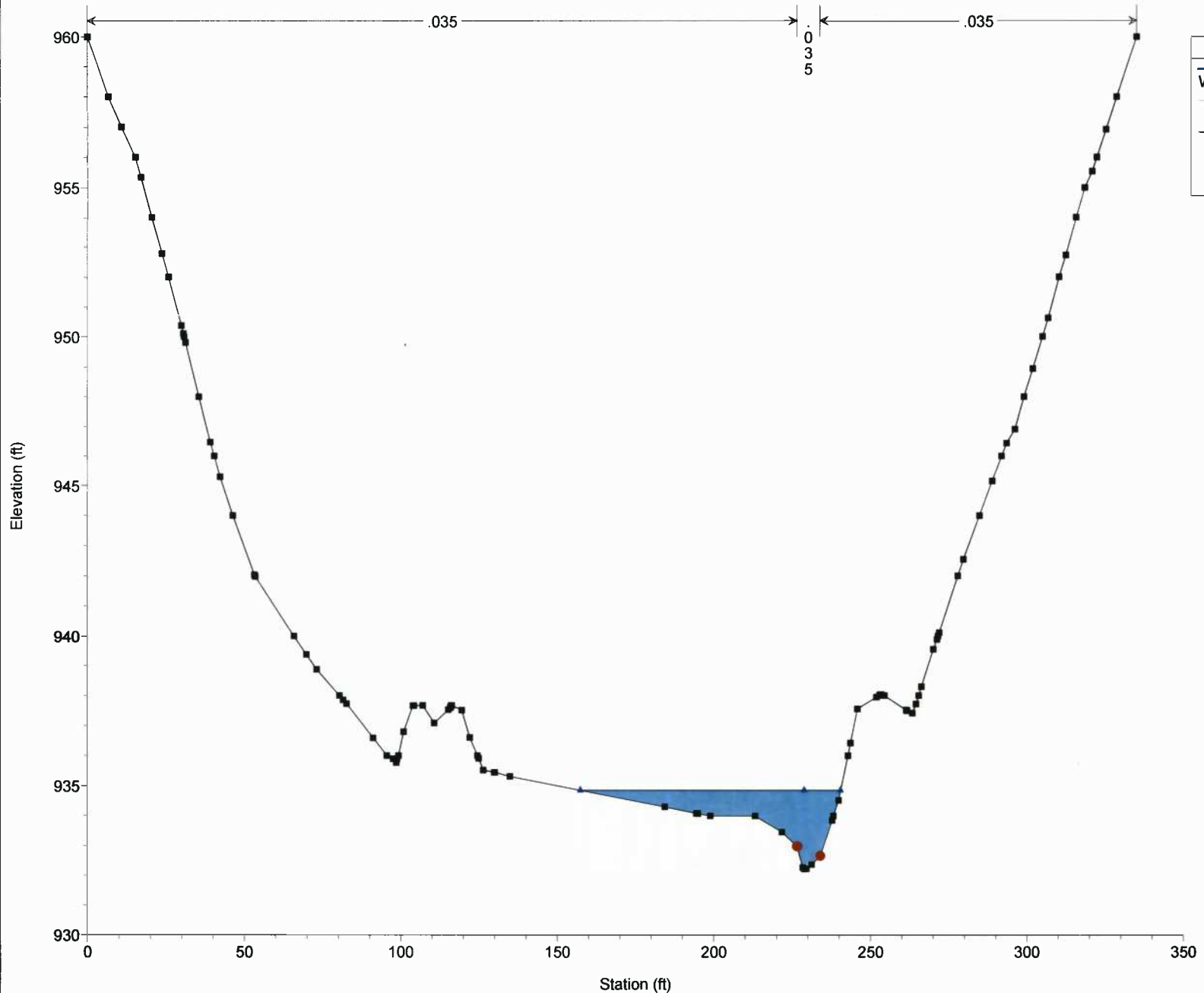
River = Trib 2 Reach = Trib 2 RS = 1293.508



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



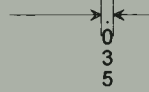
Legend	
WS PF 1 - PR Temp Br Rev	Blue shaded area
WS PF 1 - Ex Revised	Black line with square markers
Ground	Black line with square markers
Bank Sta	Red dot

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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Trib 2 Reach = Trib 2 RS = 1030.844

.035



.035

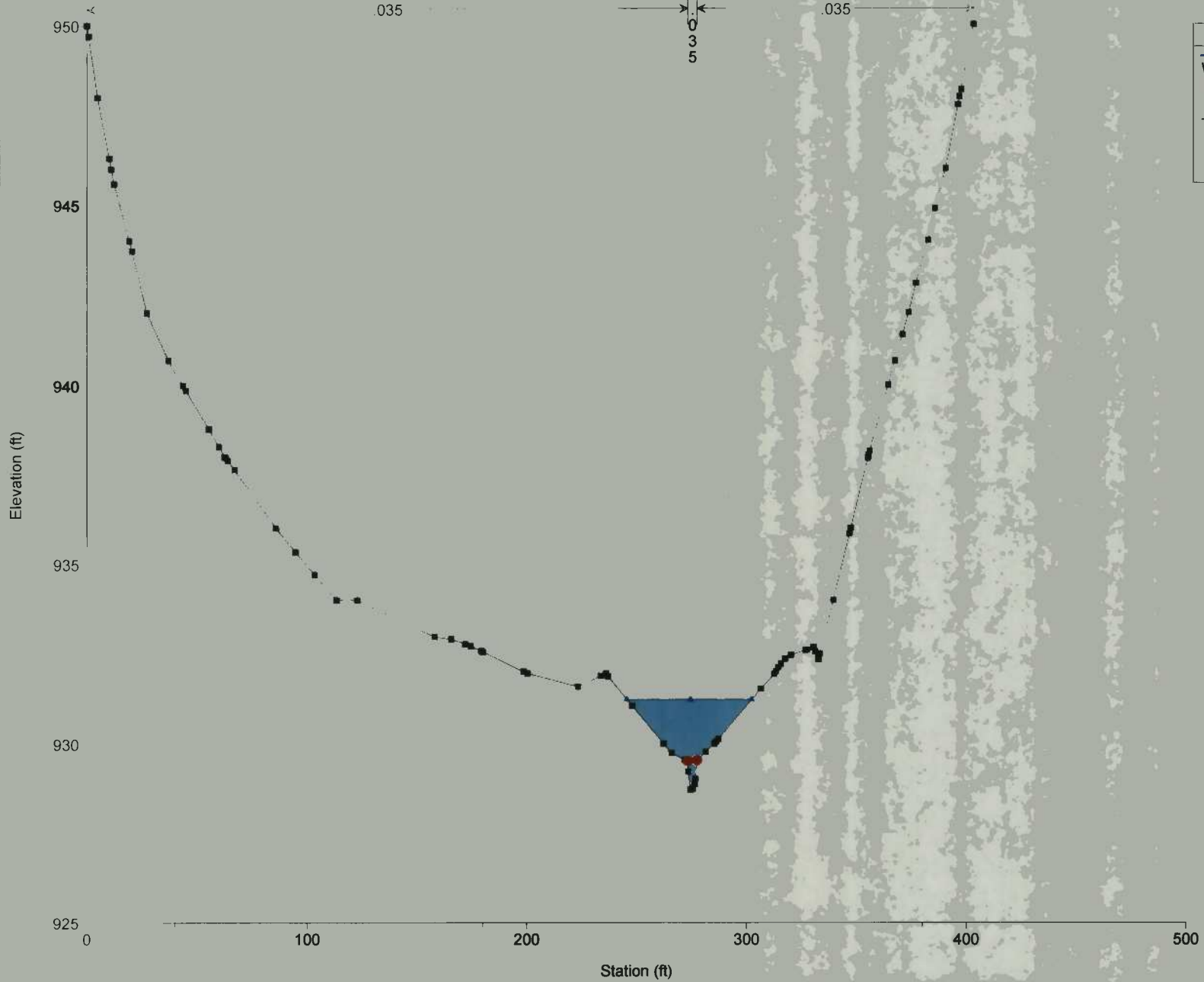
Legend

WS PF 1 - PR Temp Br Rev

WS PF 1 - Ex Revised

Ground

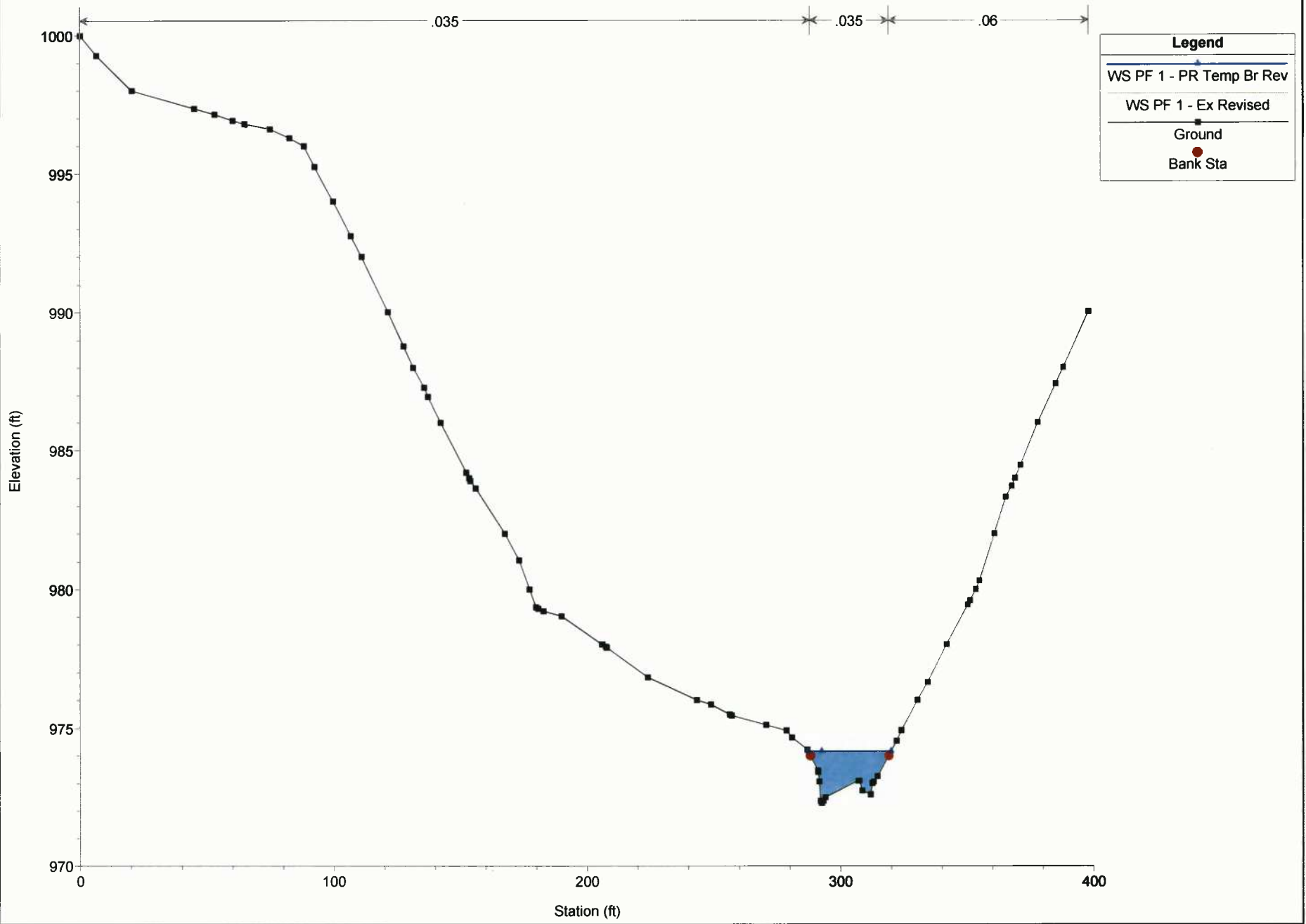
Bank Sta



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

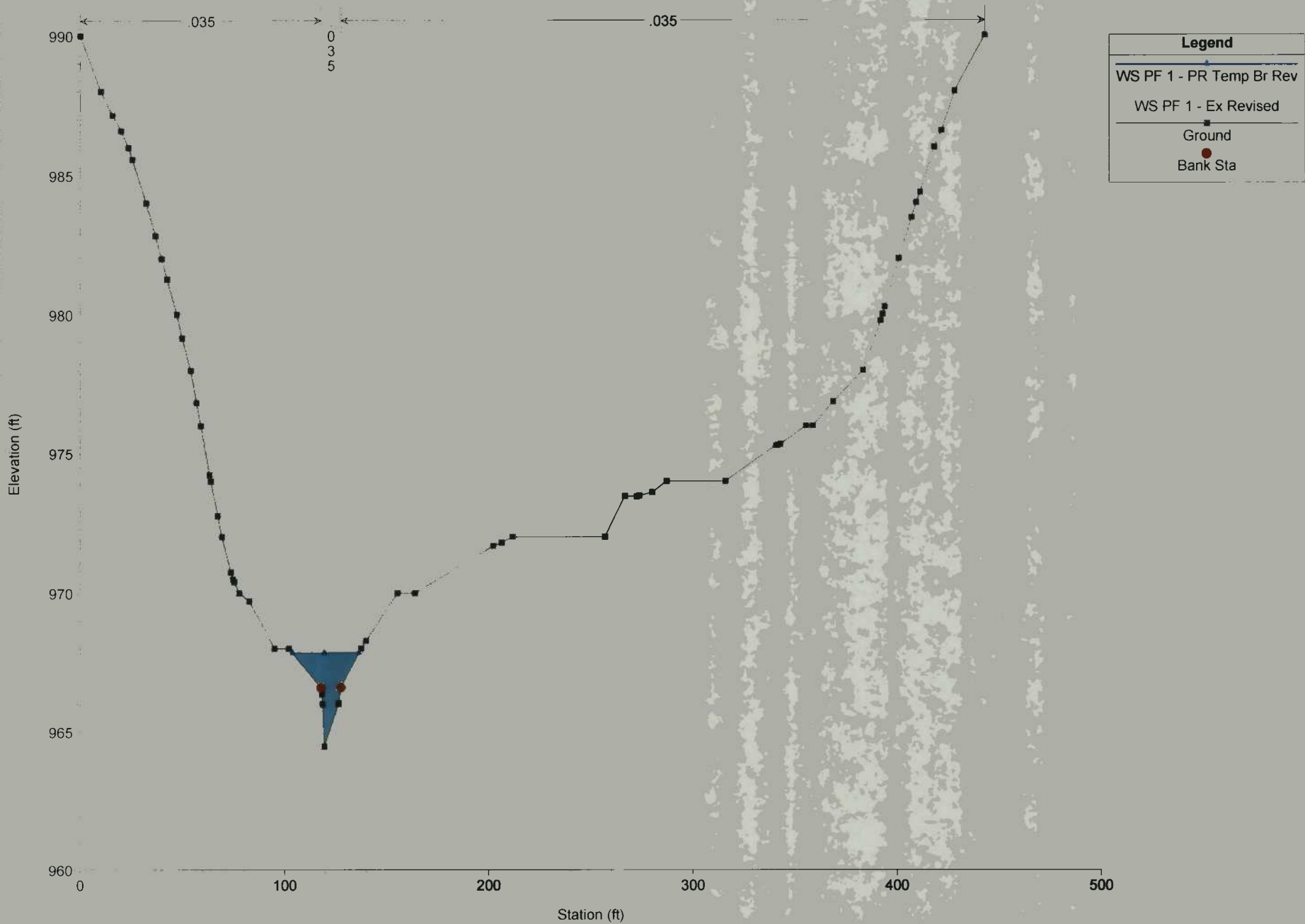
River = Trib 3 Reach = Trib 3 RS = 1842.591



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

Geom: Proposed Temp Bridge Revised Flow: Structures Revised

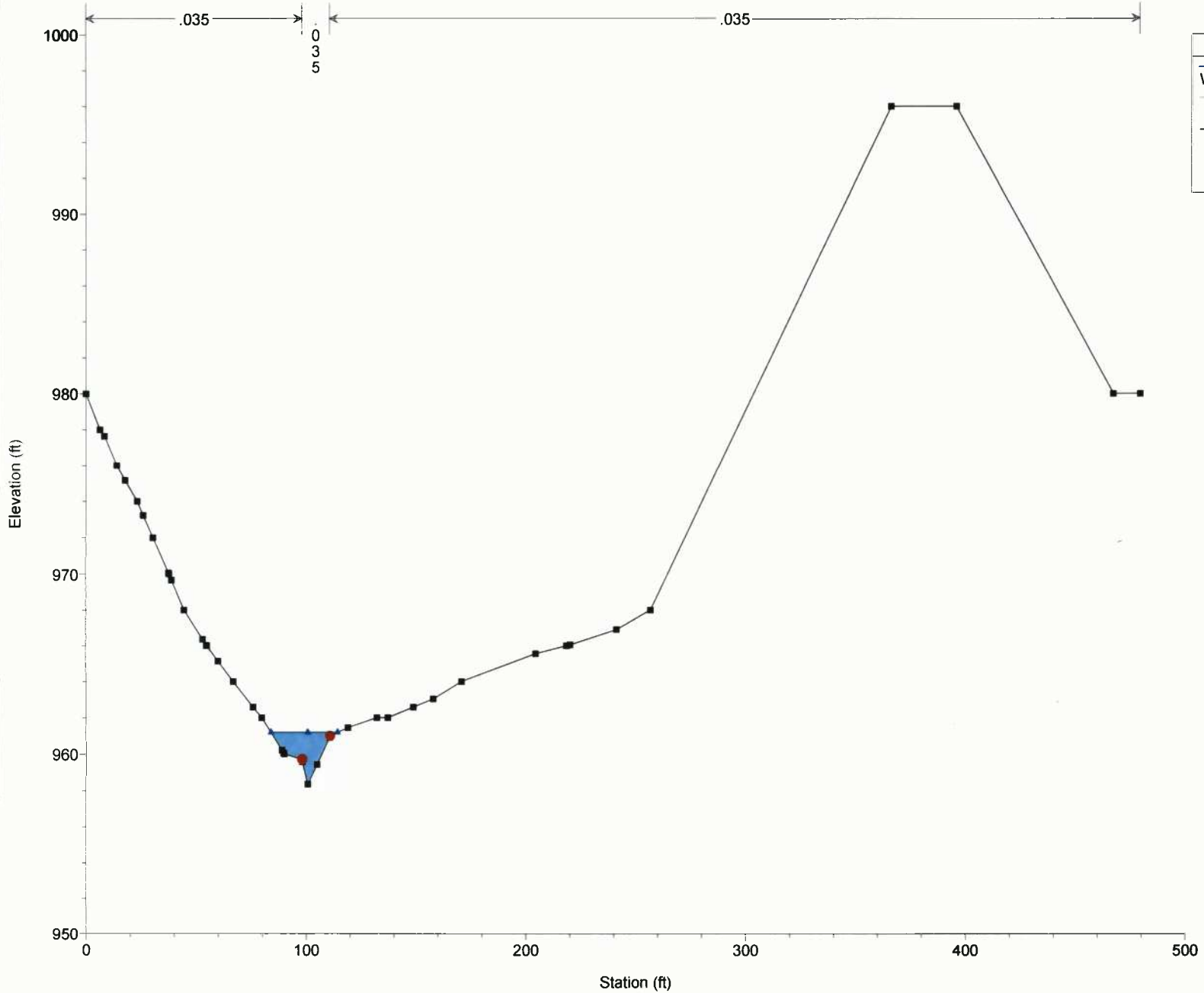
River = Trib 3 Reach = Trib 3 RS = 1574.434



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



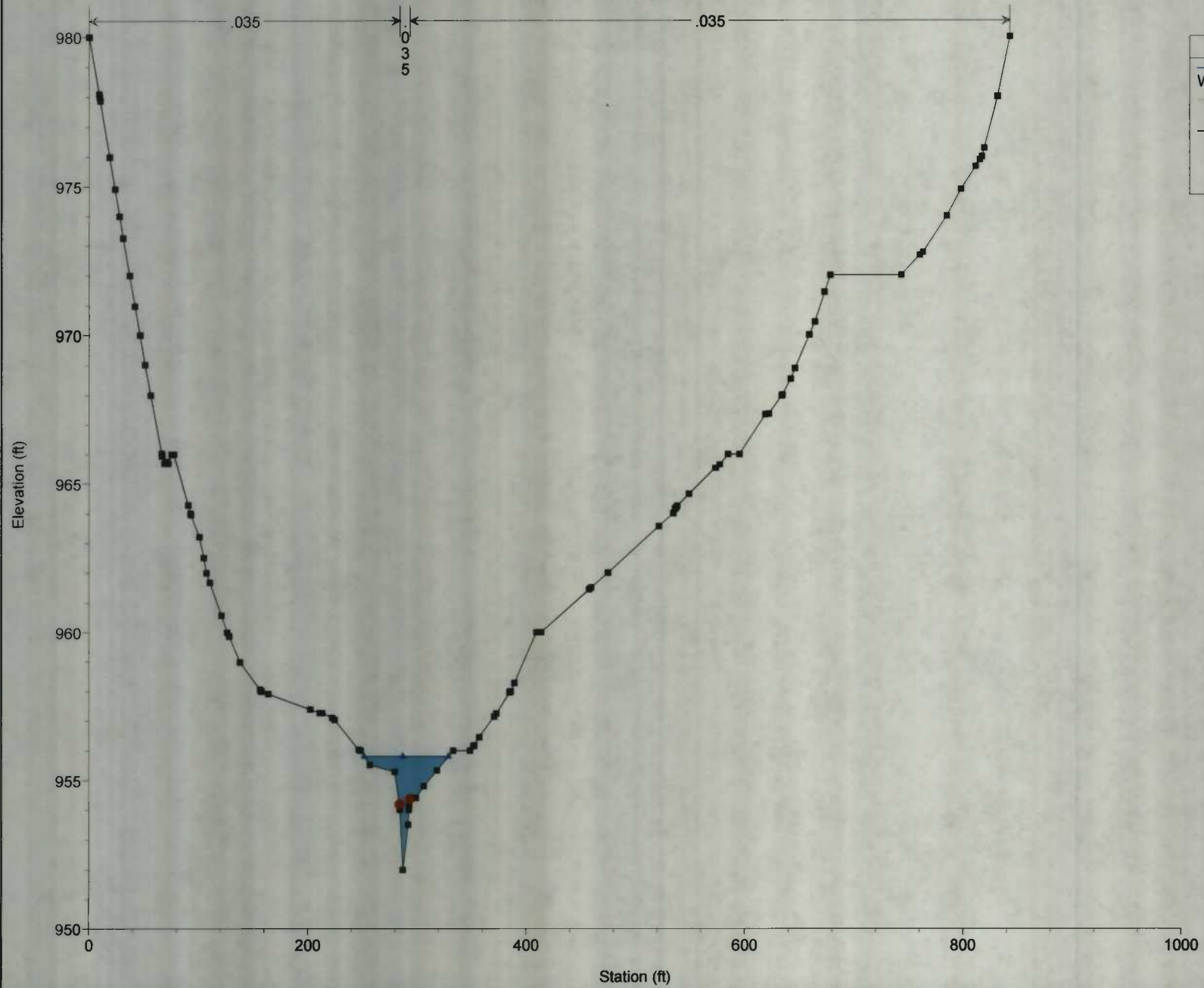
Legend

- 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 = 1126.884

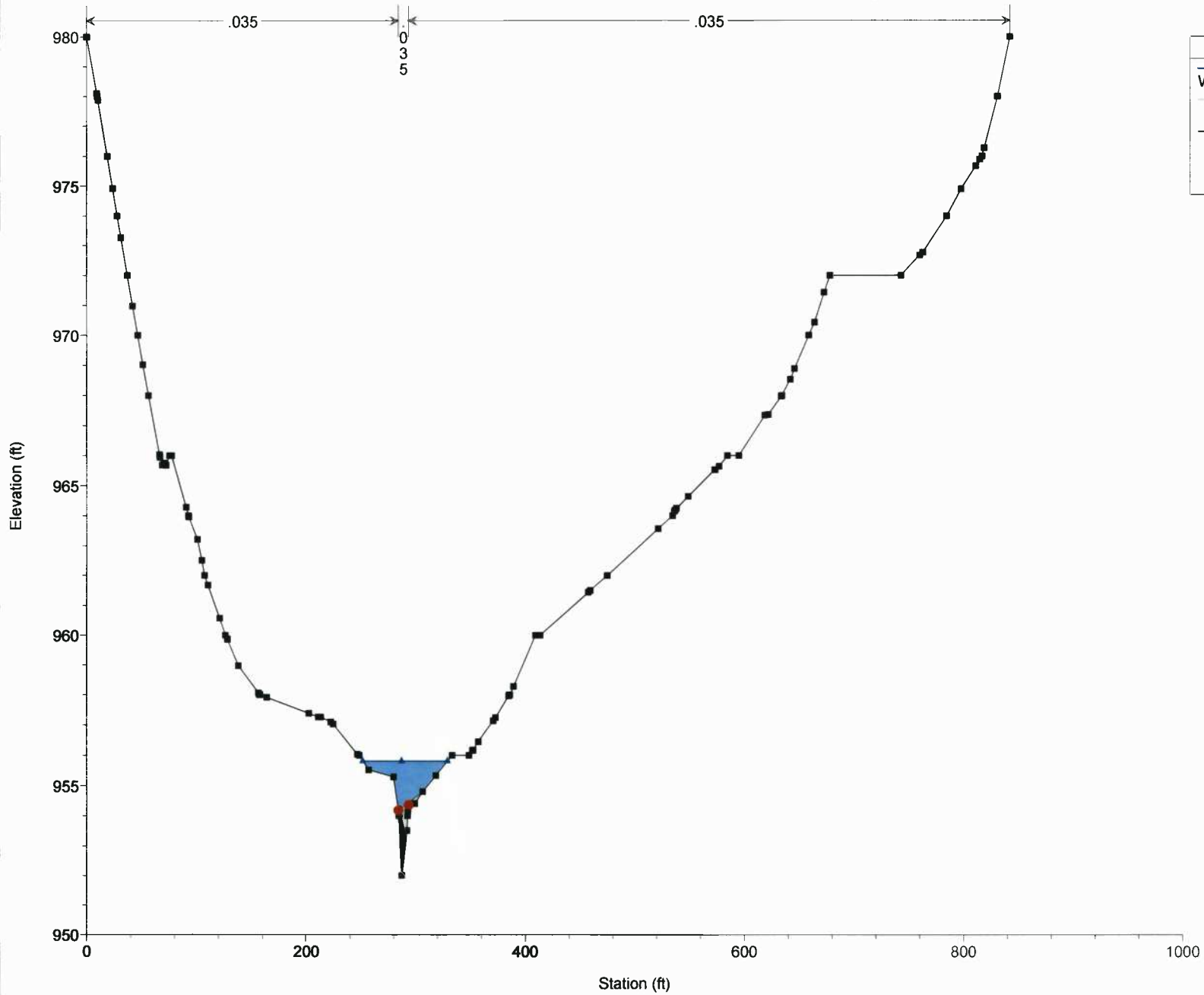


Legend	
WS PF 1 - PR Temp Br Rev	▲
WS PF 1 - Ex Revised	■
Ground	—
Bank Sta	●

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

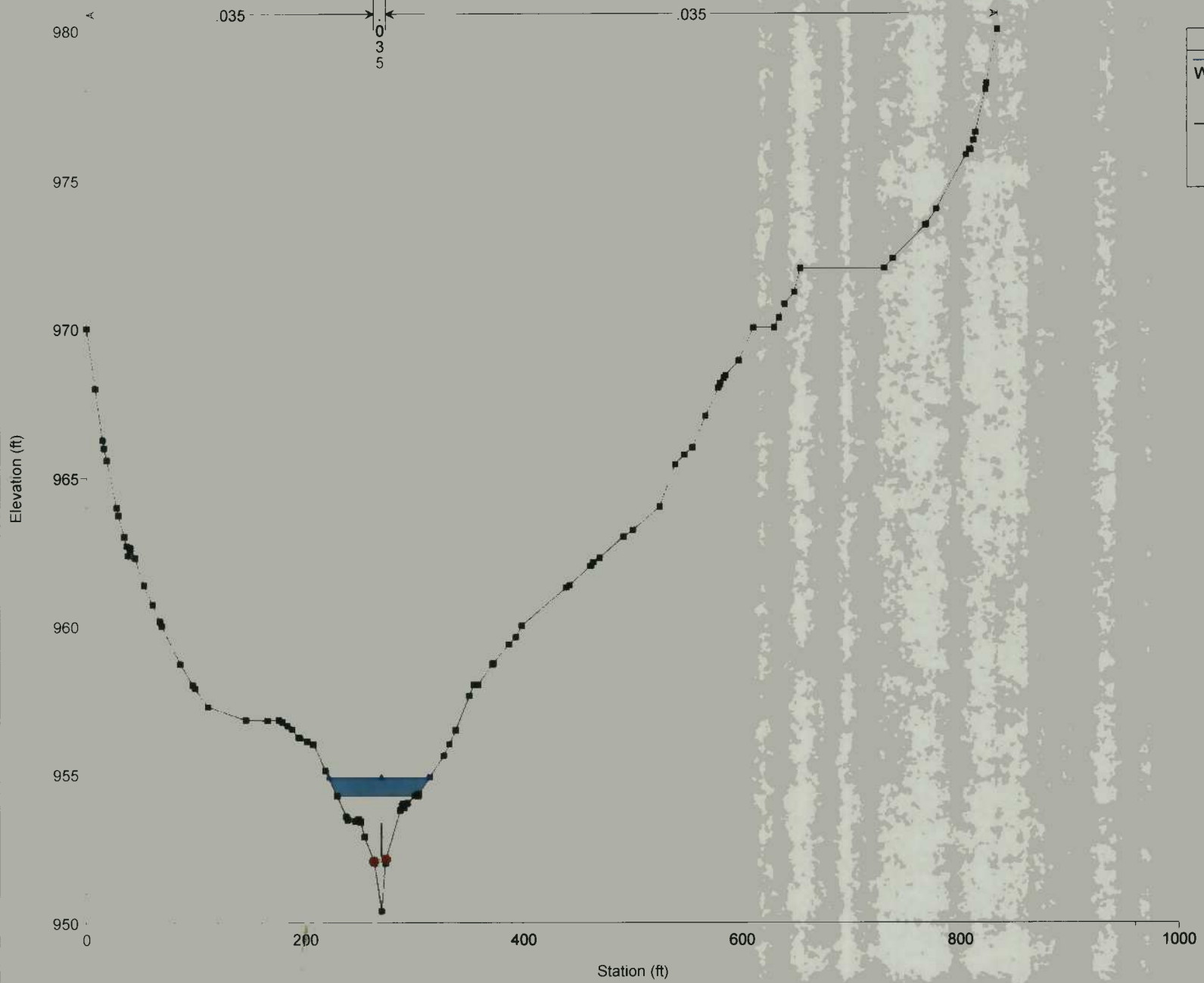
Geom: Proposed Temp Bridge Revised Flow: Structures Revised

River = Trib 3 Reach = Trib 3 RS = 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 = 1109.439 Culv

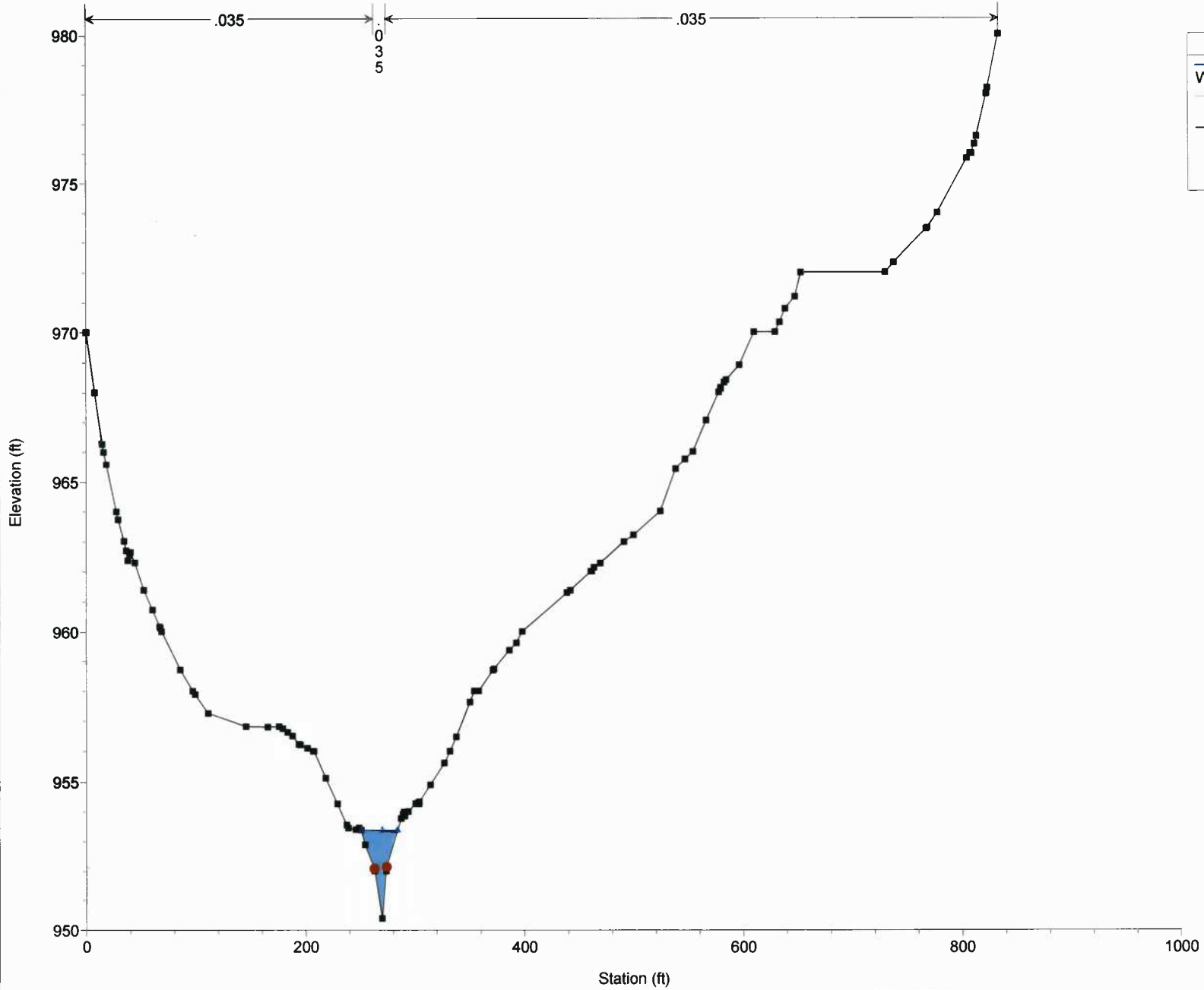






Legend	
WS PF 1 - PR Temp Br Rev	→
WS PF 1 - Ex Revised	→
Ground	■
Bank Sta	●

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