

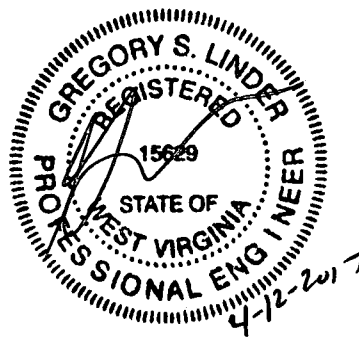
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# ***HYDRAULIC STUDY***

***WEU 51 Well Pad Bridge  
Doddridge County, West Virginia***

*Prepared For:*

***EQT Production Company  
Bridgeport, West Virginia***



***April 2017***



**Civil & Environmental  
Consultants, Inc.**

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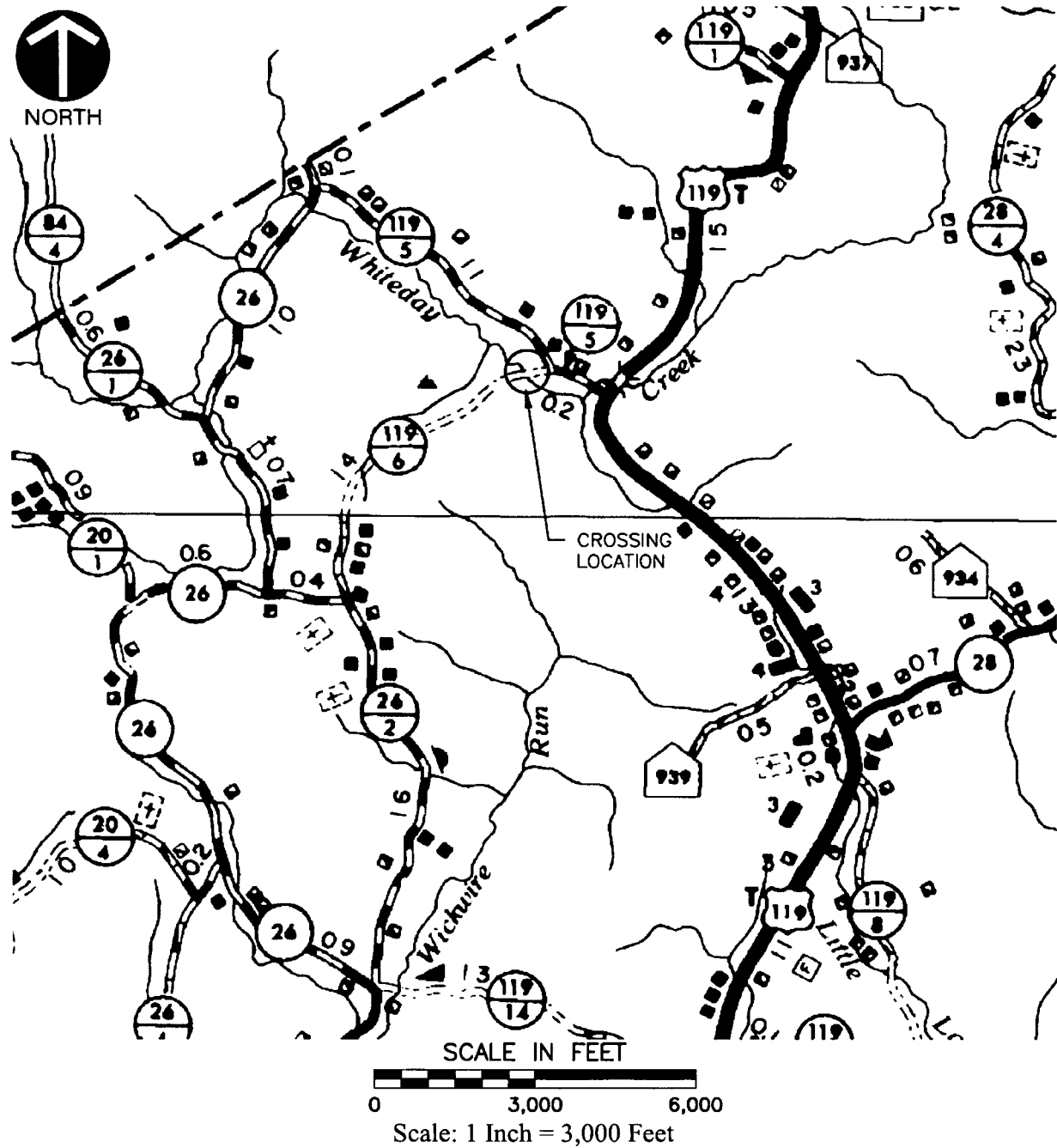
**I. PROJECT DESCRIPTION**

**A. Narrative**

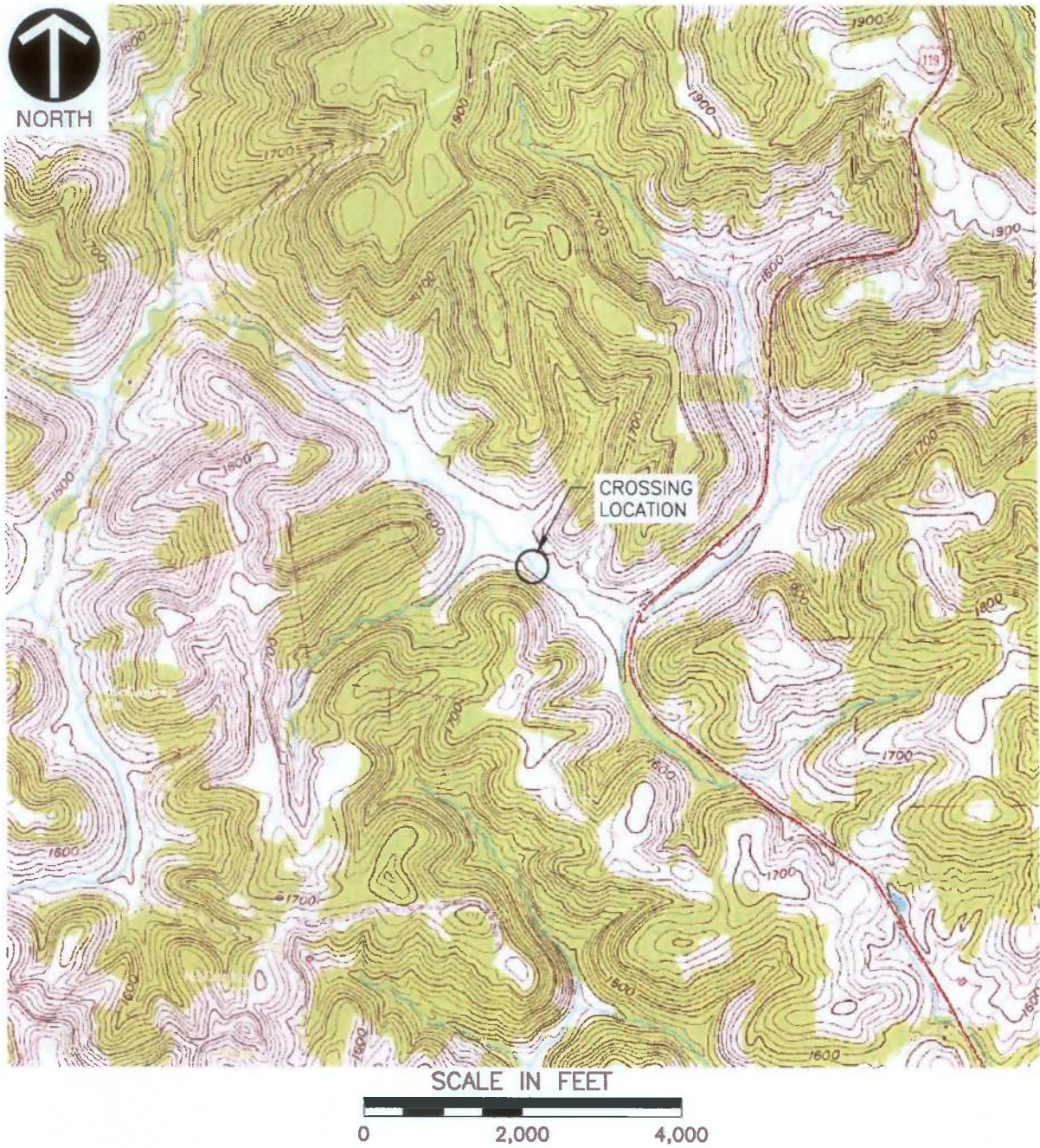
The project site is located off of County Route 13, approximately 3 miles south of West Union, WV. This hydraulic study is for the construction of a proposed bridge allowing access to the WEU-51 Well Pad for EQT, LLC. The proposed project involves the construction of the well pad, pit, and associated access road and bridge. The site is located near Bluestone Creek, which is a tributary of the Middle Island Creek in Doddridge County, WV. There is an existing concrete ford running across Bluestone Creek in the project area; however, the existing ford becomes unsafe to cross during storm events and requires the construction of a raised bridge structure to accommodate well traffic. According to the Federal Emergency Management Agency (FEMA), the site is located within a Zone A Floodplain as designated on the Doddridge County Flood Insurance Rate Map (FIRM) Panel 54017C0120C. The purpose of this hydraulic study is not to investigate the existence or severity of flood hazards in the study area. The purpose of this hydraulic study is to determine the potential for adverse effects caused by the construction of the bridge and the potential impacts to the water levels and floodplain of Bluestone Creek.

## B. Location Maps

### 1. County Map



## 2. USGS Topographic Map



USGS 7<sup>1</sup>/<sub>2</sub> Minute Topographic Map – Gladesville Quadrangle  
Scale: 1 Inch = 2000 Feet

## C. Field Observations

### 1. High Water Marks

There are no established landmarks in the project vicinity to determine a historic high water mark for Bluestone Creek.

### 2. Features Relevant to the Hydraulic Analysis

There is an existing concrete ford through Bluestone Creek in the project area. The hydraulic opening is a concrete arch with a span of 100 feet and a thickness of 3.5 feet. See Section I.D. for pictures of the bridge.

### 3. Verification of Manning's "n" Values

Manning's roughness coefficients were determined based on photographs of the project site:

From Table 3.1 of the HEC-RAS Hydraulic Reference Manual:

#### Main Channel:

Clean, straight, full, no rifts or deep pools, but more stones and weeds: 'n' value 0.035

#### Floodplain:

Heavy Stand of Timber, few down trees, little undergrowth, flow below branches: 'n' value 0.100

The Manning's "n" values assigned to the left overbank (LOB), channel, and right overbank (ROB) for each cross-section are shown in the following table.

Cross-Section	Friction (n/K)	LOB	Channel	ROB
4197.97	n	0.100	0.035	0.100
3984.50	n	0.100	0.035	0.100
3769.43	n	0.100	0.035	0.100
3555.05	n	0.100	0.035	0.100
3354.63	n	0.100	0.035	0.100
3210.37	n	0.100	0.035	0.100
3106.56	n	0.100	0.035	0.100
3021.02	n	0.100	0.035	0.100
2906.64	n	0.100	0.035	0.100
2807.26	n	0.100	0.035	0.100
2757.33	n	0.100	0.035	0.100
2707.29	n	0.100	0.035	0.100
2630.55	n	0.100	0.035	0.100
2624.76	Bridge 1			
2597.10	n	0.100	0.035	0.100
2517.50	n	0.100	0.035	0.100
2475.27	n	0.100	0.035	0.100
2395.33	n	0.100	0.035	0.100
2296.43	n	0.100	0.035	0.100
2049.28	n	0.100	0.035	0.100
1901.96	n	0.100	0.035	0.100
1819.38	n	0.100	0.035	0.100
1776.91	n	0.100	0.035	0.100

**D. Pictures**



Existing Ford Facing East



Existing Ford Facing West



Bluestone Creek (Facing Downstream)



Bluestone Creek (Facing Upstream)



## II. SUMMARY OF RESULTS

### A. Analyses Performed:

Two analyses were performed in this study: an existing conditions analysis and a proposed conditions analysis. Cross-sections of Bluestone Creek were field surveyed at specified locations within the study area to provide an accurate representation of the stream channel, existing bridge, and floodplains. The proposed bridge is a concrete span on steel beams, with a span of 100 feet and a thickness of 3.5 feet. Concrete abutments and gravel ramps will be constructed on both ends to allow access to the bridge. By comparing the results from the two analyses, the effects of the proposed access road and bridge on the 100-year water levels of Bluestone Creek were determined, as shown in the following table.

### B. Water Surface Elevation Table, Including Existing and Proposed Analyses

100-Year Rainfall Event (2,250 cfs)			
Cross-Section	Existing (ft)	Proposed (ft)	Difference (ft)
4197.97	859.90	859.90	0.00
3984.50	858.84	858.84	0.00
3769.43	858.31	858.31	0.00
3555.05	856.61	856.61	0.00
3354.63	856.15	856.15	0.00
3210.37	855.49	855.49	0.00
3106.56	855.31	855.30	-0.01
3021.02	854.98	854.97	-0.01
2906.64	855.02	855.01	-0.01
2807.26	854.47	854.46	-0.01
2757.33	852.66	852.80	0.14
2707.29	852.36	853.09	0.73
2630.55	853.33	853.74	0.41
2624.76	N/A	N/A	
2597.10	853.33	853.63	0.30
2517.50	851.50	851.50	0.00
2475.27	851.85	851.85	0.00
2395.33	851.57	851.57	0.00
2296.43	851.39	851.39	0.00
2049.28	850.63	850.63	0.00
1901.96	847.44	847.44	0.00
1819.38	847.43	847.43	0.00
1776.91	847.44	847.44	0.00

See Appendix D – HEC-RAS Profile Summary Tables.

**C. Compliance with FEMA Criteria**

Based on the HEC-RAS results, the proposed conditions at the site will increase the 100-year flood elevation by 0.73 feet, which is less than the FEMA-allowable rise of 1 foot. Thus, the project satisfies the FEMA criteria set forth in Section 18 as well as that of the Doddridge County Ordinance.

**D. Recommendation**

The proposed bridge for EQT involves construction within the floodplain established by FEMA. The results of the hydraulic study indicate that the construction will increase the 100-year water surface elevation of Bluestone Creek by 0.73 feet, which is less than the FEMA-allowable rise of 1 foot. Therefore, it is recommended that the site be constructed as designed.

**E. Signature Block, Consultant, or In-House Designers**

1. Preparer

Jason M. Pauley (West Virginia Registered Professional Engineer No. 22205)

2. Reviewer

Gregory S. Linder, P.E. (West Virginia Registered Professional Engineer No. 15629)

3. Date

April 6, 2017

4. Engineer's Seal on Final Report

Gregory S. Linder, P.E. (West Virginia Registered Professional Engineer No. 15629)

**III. AVAILABLE DATA**

**A. Flood Insurance Study**

The initial countywide Flood Insurance Study (FIS) for Doddridge County had an effective date of September 25, 2009. The final Consultation Coordination Officer's meeting for the countywide revision to the FIS was held on May 26, 2010. The revised countywide FIS has an effective date of August 2, 2011. Bluestone Creek was included among the areas studied by approximate methods, with no Base Flood Elevations (BFEs) or flood depths listed.

See Appendix B – FEMA FIRMette.

**B. Existing Hydrologic Data**

No detailed hydrologic evaluation has been performed within the boundaries of this project site.

**C. Existing Hydraulic Model from FEMA, USACE, NRCS, others**

There is no existing hydraulic model for this project site.

**IV. HYDROLOGY**

**A. Design Discharge Based on HydroCAD TR-20 Method**

Since no detailed hydrology has been performed within the boundaries of this project, the design discharge of the 100-year storm were calculated using HydroCAD TR-20 modeling for the Western Plateaus Region of West Virginia. The hydraulic analysis was performed for the 100-year discharge. The 100-year flood has been adopted by FEMA as the base flood for floodplain management purposes.

See Appendix C – Design Discharge Calculations.

Frequency	Discharge
100-year	2,250 cfs

**B. Boundary Conditions**

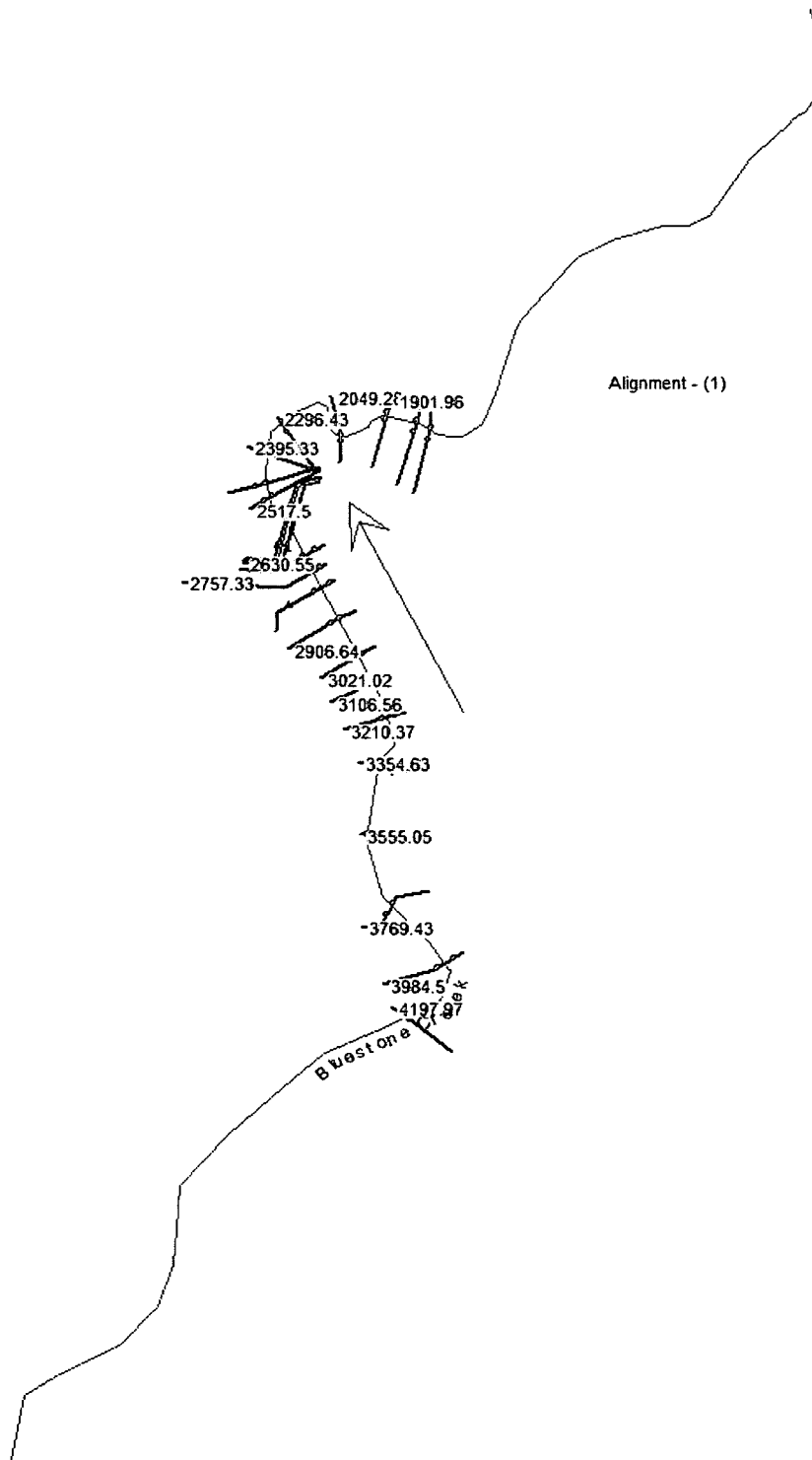
The boundary condition applicable to this hydraulic analysis is the Normal Depth slope at Cross-Section 1776.91, which is approximately 0.0054 ft/ft.

**V. HYDRAULIC MODELING**

**A. Source of Model**

HEC-RAS Version 5.0.3 was used to perform a hydraulic analysis to determine if adverse effects will be caused by the EQT WEU 51 Well Pad access road and bridge relative to existing conditions, as well as the potential impacts to the water levels and floodplain of Bluestone Creek. HEC-RAS 5.0.3 is the most current version of the river analysis software available from the Hydraulic Engineering Center of the U.S. Army Corps of Engineers.

## B. Site Map with Cross-Sections



### C. Explanation of Data and Methods

1. Manning's Values

Manning's roughness coefficients were determined based on photographs of the project site. See Section I.C.3. for a detailed description of the Manning's values used.

2. Bridge Modeling Approach

The Bridge Modeling Approach used was Energy (Standard Step).

3. Ineffective Flow Areas

Ineffective flow areas were incorporated to account for areas in the cross-sectional geometry where ponded water will not be actively conveyed downstream.

4. Any Unusual Circumstances

There are no unusual circumstances specified in correlation with the hydraulic analysis of this project.

5. Table of HEC-RAS Plan Files

Filename	Description
171149 Existing Analysis	Existing Conditions Analysis
171149 Proposed Analysis	Proposed Conditions Analysis

See Appendix F - HEC-RAS Output Files

### D. HEC-RAS Generated Tables

1. Profile Summary with Existing and Proposed Conditions

See Appendix D – HEC-RAS Profile Summary Tables

2. Detailed Output Tables

See Appendix F – HEC-RAS Output Files

**APPENDIX A**

**Site Plan**



EXISTING WEU 51 WELL PAD

EXISTING WEU 51 ACCESS ROAD

COUNTY ROUTE 13

EXISTING CONCRETE FORD CROSSING  
PROPOSED 100' WEU 51 BRIDGE  
LATITUDE: 39.253300  
LONGITUDE: -80.755366 (NAD 83)



NO.	DATE	DESCRIPTION

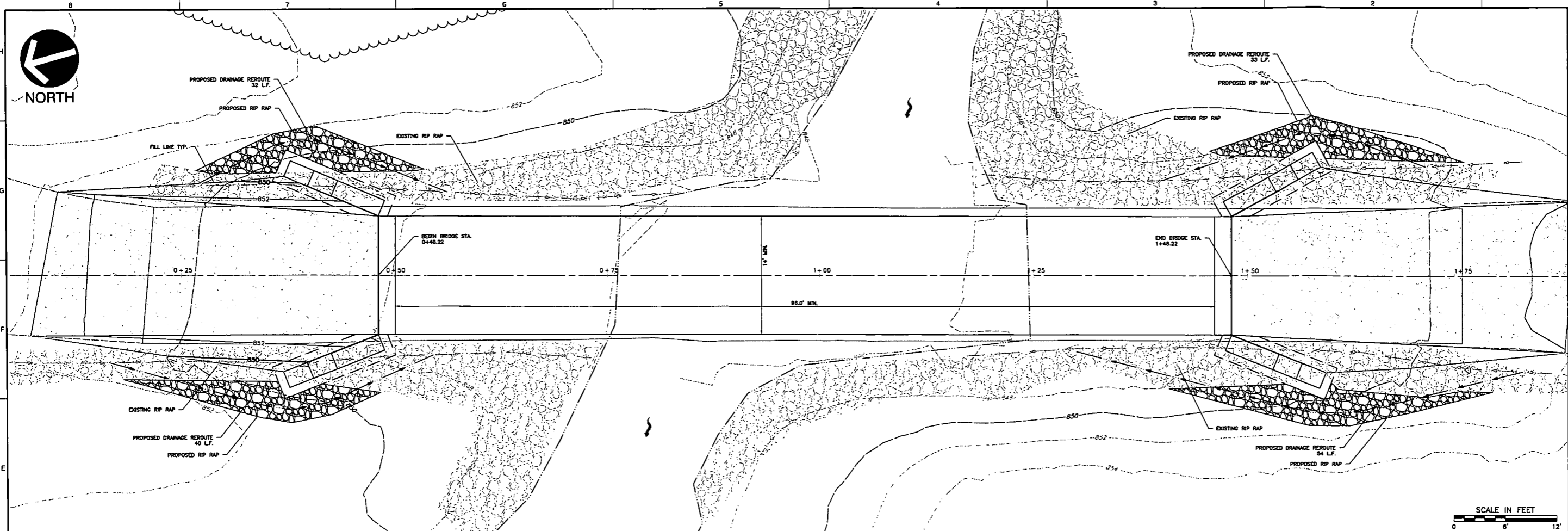
**Civil & Environmental Consultants, Inc.**  
600 Marketplace Ave · Suite 200 · Bridgeport, WV 26330  
Ph: 304.933.3119 · 855.488.9539 · Fax: 304.933.3327  
www.cecinc.com

**EQT PRODUCTION COMPANY**  
**WEU 51 BRIDGE CROSSING**  
**WEST UNION DISTRICT**  
**DODDRIDGE COUNTY, WV**

**WEU 51 OVERVIEW PLAN**  
REVISION TO DNR OLS PERMIT # LS-16-VI-09-1340

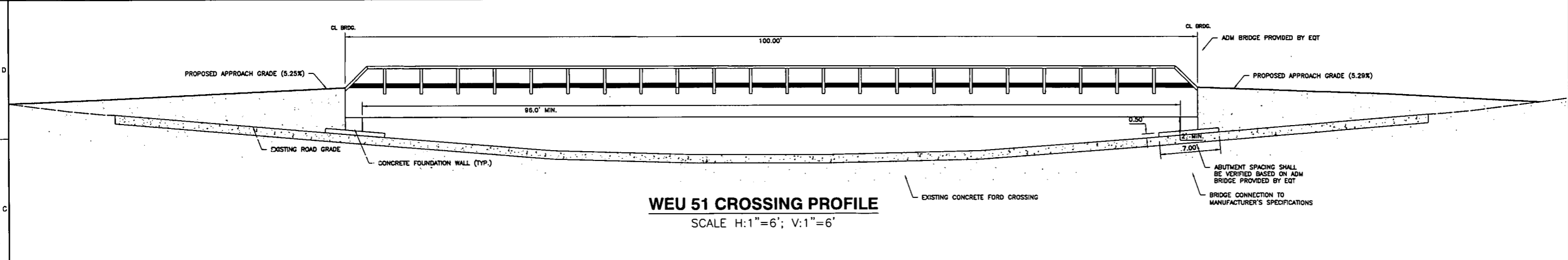
DATE	MARCH 2017	DRAWN BY	DBS
DWG SCALE	AS SHOWN	CHECKED BY	QSL
PROJECT NO.	171-149	APPROVED BY:	JDR

DRAWING NO. **CV01**  
SHEET 1 OF 3



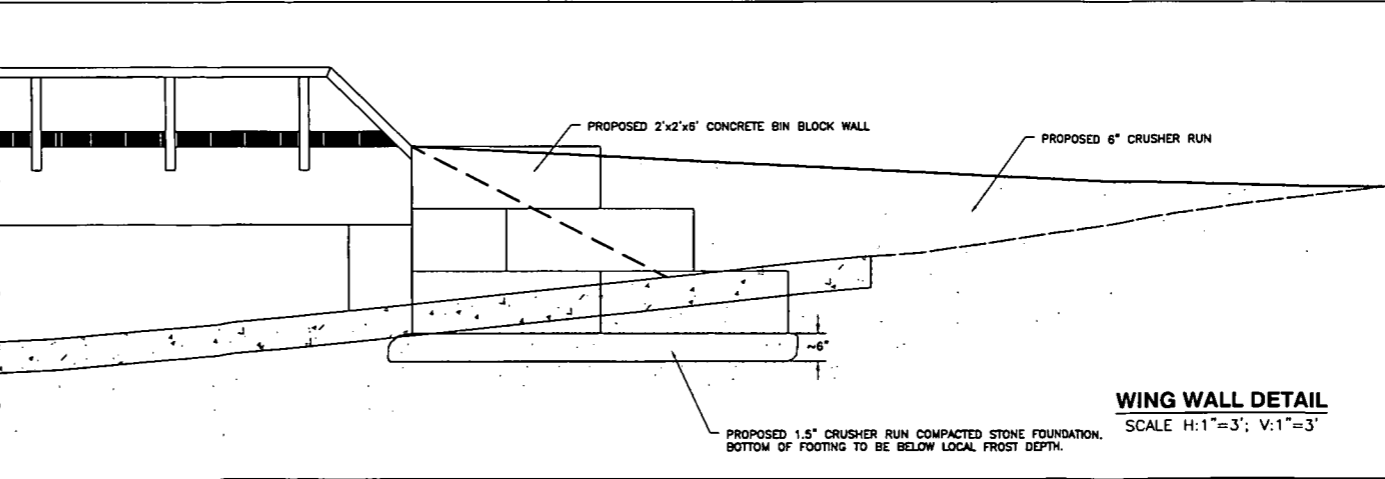
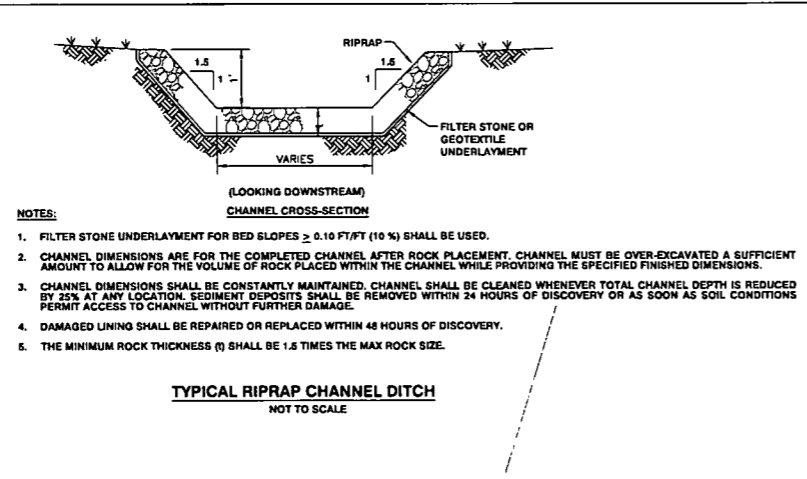
NO.	DATE	DESCRIPTION

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**EQT PRODUCTION COMPANY**  
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**WEST UNION DISTRICT**  
**DODDRIDGE COUNTY, WV**  
 REVISION TO DNR OLS PERMIT # LS-16-VI/09-1340

WORK ITEM	QUANTITY
ROCK CONSTRUCTION (6" CRUSHER RUN)	320 TN
ROCK CONSTRUCTION (1.5" CRUSHER RUN)	8 TN
RIP RAP	25 TN
100.0' ADM. BRIDGE	1 LS
2'x2'x6" CONCRETE BIN BLOCK WALL	16 EA
2'x2'x3" CONCRETE BIN BLOCK HALF WALL	4 EA



**CROSSING PLAN AND PROFILE**  
 REVISION TO DNR OLS PERMIT # LS-16-VI/09-1340

DATE: MARCH 2017 DRAWN BY: DBS  
 DWG SCALE: AS SHOWN CHECKED BY: GSL  
 PROJECT NO: 171-149  
 APPROVED BY: JDR

**JOSEPH D. ROBINSON**  
 REGISTERED PROFESSIONAL ENGINEER  
 STATE OF WEST VIRGINIA  
 18756  
 3-14-2017

DRAWING NO: **CV01**  
 SHEET 2 OF 3



**GENERAL NOTES**

- THESE GENERAL NOTES REPRESENT AND/OR SUMMARIZE KEY PROJECT INFORMATION FOR THE DRAWING USER'S CONVENIENCE. HOWEVER, ADDITIONAL DRAWING NOTES AND PROJECT SPECIFICATIONS SHOULD BE REVIEWED FOR FURTHER DETAILS AND REQUIREMENTS.
- ALL REFERENCES TO STANDARDS HEREIN ARE TO THE MOST RECENT ISSUE IN EFFECT AS OF THE DATE OF THESE DOCUMENTS, UNLESS NOTED OTHERWISE IN PROJECT SPECIFICATIONS OR ON THE DRAWINGS.
- THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE CONSTRUCTION IS FULLY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURES AND SECURE AND INSURE THE SAFETY OF THE BUILDING AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, ETC. THAT MAY BE NECESSARY. SUCH MATERIAL SHALL REMAIN THE CONTRACTOR'S PROPERTY AFTER COMPLETION OF THE PROJECT.
- THE FOLLOWING ABBREVIATIONS MAY BE USED ON THE DESIGN DRAWINGS:

A.B. - ANCHOR BOLT	MAX. - MAXIMUM
APPROX. - APPROXIMATE	MECH. - MECHANICAL
ARCH. - ARCHITECT (URAL)	MFR. - MANUFACTURER
@ - AT	MID. - MIDDLE / MIDPOINT
BLDG. - BUILDING	MIN. - MINIMUM
BM. - BEAM	MISC. - MISCELLANEOUS
B.O. - BOTTOM OF	MTL. - METAL
B.O.F. - BOTTOM OF FOOTING	NOM. - NOMINAL
B.O.S. - BOTTOM OF STEEL	N.T.S. - NOT TO SCALE
C/C - CENTER-TO-CENTER	O/C - ON CENTER
C.J. - CONTROL JOINT	OPP. - OPPOSITE
CL. - CENTERLINE	PL. - PLATE
CLR. - CLEAR	PLF. - POUNDS PER LINEAR FOOT
CMU. - CONCRETE MASONRY UNIT	PSF. - POUNDS PER SQUARE FOOT
COL. - COLUMN	PSI. - POUNDS PER SQUARE INCH
CONC. - CONCRETE	REIN. - REINFORCEMENT
CONT. - CONTINUOUS	REV. - REVISED/REVISION
CTR. - CENTER	SEC. - SECTION
DIA. - DIAMETER	S.J.I. - STRUCTURAL JOIST INSTITUTE
DIM. - DIMENSION	SIM. - SIMILAR
DWG. - DRAWING	SPEC. - SPECIFICATION
EA. - EACH	SQ. - SQUARE
E.F. - EACH FACE	STD. - STANDARD
E.J. - EXPANSION JOINT	T/ - TOP OF
EL. - ELEVATION	T.O.C. - TOP OF CONCRETE
E.W. - EACH WAY	T.O.F. - TOP OF FOOTING
F.F.E. - FINISHED FLOOR ELEVATION	T.O.S. - TOP OF STEEL
FLR. - FLOOR	T.O.W. - TOP OF WALL
FND. - FOUNDATION	TRAN. - TRANSVERSE
FT / - FOOT, FEET	TYP. - TYPICAL
FTG. - FOOTING	U.N.O. - UNLESS NOTED OTHERWISE
HORIZ. - HORIZONTAL	VERT. - VERTICAL
IN / - INCH	W/ - WITH
L. - ANGLE	W/O - WITHOUT
LLH. - LONG LEG HORIZ.	W.C.J. - WALL CONTROL JOINT
LLV. - LONG LEG VERT.	W.W.F. - WELDED WIRE FABRIC
LONG. - LONGITUDINAL	

**DESIGN CODES**

- REINF. PLACEMENT CRSI PLACING REINFORCING BARS  
 REINF. DETAILING CRSI REINFORCING BAR DETAILING  
 REINFORCING CRSI MSP-2-01 MANUAL OF STANDARD PRACTICE  
 REINF. DETAILING ACI SP-66 ACI DETAILING MANUAL  
 CONCRETE. STRUCTURAL ACI 318 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE  
 LOADING AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES  
 BUILDING CODE ICC INTERNATIONAL BUILDING CODE, 2012 EDITION

**DESIGN CRITERIA**

**DEAD LOAD REACTIONS (PER ABUTMENT)**

100' BRIDGE	80 KIPS
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**LIVE LOAD REACTIONS (PER ABUTMENT)**

100' BRIDGE	150 KIPS
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**NOTE:**  
 THE ABOVE REACTIONS ARE UNFACTORED.  
 THE LIVE LOAD REACTIONS INCLUDE 10% IMPACT.

**FOUNDATION NOTES**

- FOUNDATION DESIGN WAS COMPLETED PRIOR TO COMPLETION OF GEOTECHNICAL INVESTIGATIONS. ASSUMPTIONS WERE MADE FOR SOIL PROPERTIES AS NOTED BELOW: BEARING CAPACITY - 1,500 PSF
- THERE WILL BE NO BACKFILLING OPERATIONS UNTIL THE CONCRETE WALLS HAVE REACHED THEIR 28-DAY DESIGN STRENGTH, UNLESS NOTED OTHERWISE OR APPROVED BY THE ENGINEER.
- THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE SHORING OR SLOPING OF EXCAVATIONS TO MEET OSHA REQUIREMENTS. DESIGN OF SHORING IS THE CONTRACTOR'S RESPONSIBILITY. EXCAVATIONS SHALL BE IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS.
- FOR STRUCTURES WITH CONCRETE TOP SLABS, THERE WILL BE NO BACKFILLING OPERATIONS UNTIL THE TOP SLAB IS IN PLACE, HAS BEEN CURED A MINIMUM OF 7 DAYS, AND HAS REACHED 70% OF ITS 28 DAY DESIGN STRENGTH, UNLESS NOTED OTHERWISE OR APPROVED BY THE ENGINEER.

**REINFORCING STEEL NOTES**

- REINFORCING BARS: ASTM A615, GRADE 60
- BAR SUPPORTS CLASS 1, MAXIMUM PROTECTION (CRSI MANUAL OF STANDARD PRACTICE) FOR ALL SLABS AND BEAMS WITH SOFFITS EXPOSED TO VIEW.
- ALL REINFORCING STEEL DETAILS SHALL BE IN ACCORDANCE WITH THE ACI CODE REQUIREMENTS (ACI 318 CURRENT EDITION).
- REINFORCING STEEL PLACING DRAWINGS AND BAR LISTS SHALL CONFORM TO THE ACI OR CRSI DETAILING MANUALS. ALL BAR SUPPORTS MUST BE CLEARLY DETAILED.
- HOOKS AND BENDS SHALL BE ACI STANDARD UNLESS OTHERWISE INDICATED.
- CONTINUOUS REINFORCING BARS SHALL BE PROVIDED WITH TENSION LAPS AT ALL SPLICES, UNLESS NOTED OTHERWISE. ALL STEEL REINFORCING LAPS SHALL BE TENSION B LAPS TYPICAL, UNLESS NOTED OTHERWISE.
- MECHANICAL SPLICES SHALL NOT BE PERMITTED UNLESS APPROVED BY THE ENGINEER.
- REINFORCING STEEL FABRICATION AND PLACEMENT SHALL BE IN ACCORDANCE WITH CRSI MANUAL OF STANDARD PRACTICE AND CRSI PLACING REINFORCING BARS (LATEST EDITIONS).
- REINFORCING STEEL IN FOOTINGS SHALL BE ASSEMBLED IN MAT GRILLES EQUALLY SPACED AND SECURELY WIRED TOGETHER BEFORE THE CONCRETE IS POURED.
- WALL FOOTING DOWELS ARE TO HAVE A FULL TENSION LAP SPLICE WITH THE WALL STEEL UNLESS NOTED OTHERWISE.
- ALL REINFORCING SHALL BE HELD SECURELY IN POSITION WITH STANDARD ACCESSORIES IN CONCRETE.
- NO REINFORCING STEEL SHALL BE FIELD BENT WITHOUT THE APPROVAL OF THE STRUCTURAL ENGINEER. FIELD BENDING OF PLAIN REINFORCEMENT, IF PERMITTED, SHALL BE PERFORMED USING AN APPROVED AND APPROPRIATE SIZED PORTABLE HYDRAULIC DEVICE THAT MAKES ACI STANDARD RADIUS BENDS. NO OTHER FIELD BENDING METHOD SHALL BE PERMITTED.
- WELDING, INCLUDING TACK WELDING, FOR REINFORCING STEEL IS PROHIBITED. WELDING OF REINFORCING STEEL AND HIGH STRENGTH BOLTS (A325, A490) WILL BE PERMITTED ONLY BY WRITTEN APPROVAL OF THE ENGINEER.

**CONCRETE DEVELOPMENT/LAP SPLICE SCHEDULE (f<sub>c</sub> = 4 KSI)**

BAR SIZE	DEVELOPMENT LENGTH, L <sub>d</sub> (IN)		LAP SPLICE LENGTH (IN)	
	BAR TYPE 1*	BAR TYPE 2*	BAR TYPE 1*	BAR TYPE 2*
4	19	29	25	37
5	24	36	31	47
6	29	43	37	56
7	42	63	54	81
8	47	72	62	93
9	54	81	70	105

\*BAR TYPE 1 - CLEAR SPACING OF BARS BEING DEVELOPED OR LAP SPLICED NOT LESS THAN BAR DIAMETER D  
 CONCRETE COVER NOT LESS THAN D<sub>b</sub> AND STIRRUPS OR TIES THROUGHOUT L<sub>d</sub> NOT LESS THAN THE CODE MINIMUM.  
 \*BAR TYPE 2 - OTHER CASES

**REINFORCING CLEAR COVER TABLE**

TYPE	MINIMUM CLEAR COVER (IN)
PERMANENTLY EXPOSED TO OR CAST AGAINST EARTH	3
EXPOSED TO EARTH OR WEATHER (#5 OR SMALLER)	1 1/2
EXPOSED TO EARTH OR WEATHER (#6 OR LARGER)	2
NOT EXPOSED TO EARTH OR WEATHER (#11 OR SMALLER)	1
NOT EXPOSED TO EARTH OR WEATHER (#12 OR LARGER)	1 1/2

**STRUCTURAL CONCRETE NOTES**

- ALL CONCRETE AGGREGATE SHALL COMPLY WITH ASTM C33 (NORMAL WEIGHT).
- USE ADMIXTURES AS PROVIDED IN THE SPECIFICATION, OR AS APPROVED BY THE STRUCTURAL ENGINEER.
- DESIGN FORMWORK FOR THE LOADS, LATERAL PRESSURE AND ALLOWABLE STRESSES OUTLINED IN ACI 347.
- FORMWORK SHALL BE SHORED ADEQUATELY TO ENSURE THAT IT WILL NOT MOVE DURING POURING OR CURING OF THE CONCRETE.
- CURE CONCRETE IN ACCORDANCE WITH THE SPECIFICATION, MEETING THE REQUIREMENTS OF ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS".
- SEE THE MECHANICAL, ELECTRICAL AND SUPPLIERS DRAWINGS FOR THE LOCATION OF SPECIAL ANCHORS, CHAMFERS, SLEEVES, PIPES, CONDUITS AND OTHER DETAILS NOT SHOWN ON THE STRUCTURAL DRAWINGS.
- THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE CONSTRUCTION IS FULLY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND INSURE THE SAFETY OF THE BUILDING AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, ETC. THAT MAY BE NECESSARY. SUCH MATERIAL SHALL REMAIN THE CONTRACTOR'S PROPERTY AFTER COMPLETION OF THE PROJECT.
- ALL CONCRETE SHALL CURE A MINIMUM OF 7 DAYS AFTER POURING, AND SHALL REMAIN UNLOADED UNTIL CONCRETE HAS REACHED 80% OF THE 28 DAY DESIGN STRENGTH, UNLESS APPROVED BY ENGINEER.

**CONCRETE MIX REQUIREMENTS**

CONCRETE TYPE	28 DAY COMPRESSIVE STRENGTH (f <sub>c</sub> )	AIR CONTENT (+/- 1%) (AE - AIR ENTRAINMENT)	MAX. W/C RATIO	MAX. SLUMP AT PLACEMENT	MAX. NOM. AGGREGATE SIZE*	CEMENT TYPE	FLYASH % OF TOTAL CEMENT
SLAB ON GRADE (EXTERIOR)	4,000 PSI	5% (AE)	0.50	5"	1"	TYPE III	10-20
FOOTINGS	4,000 PSI	5% (AE)	0.50	5"	1"	TYPE III	10-20

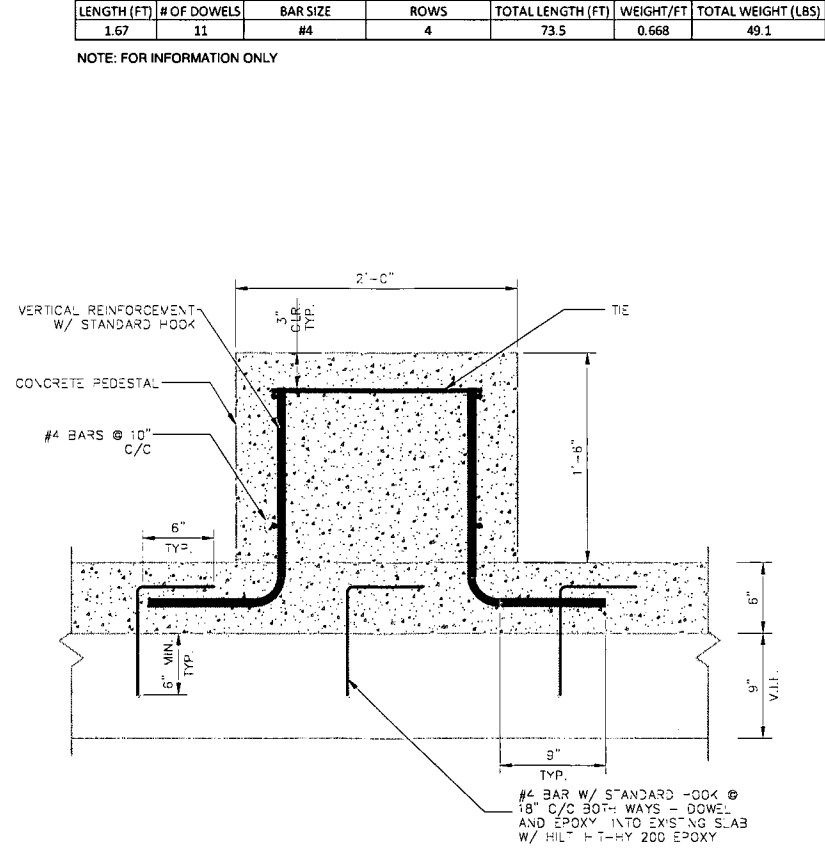
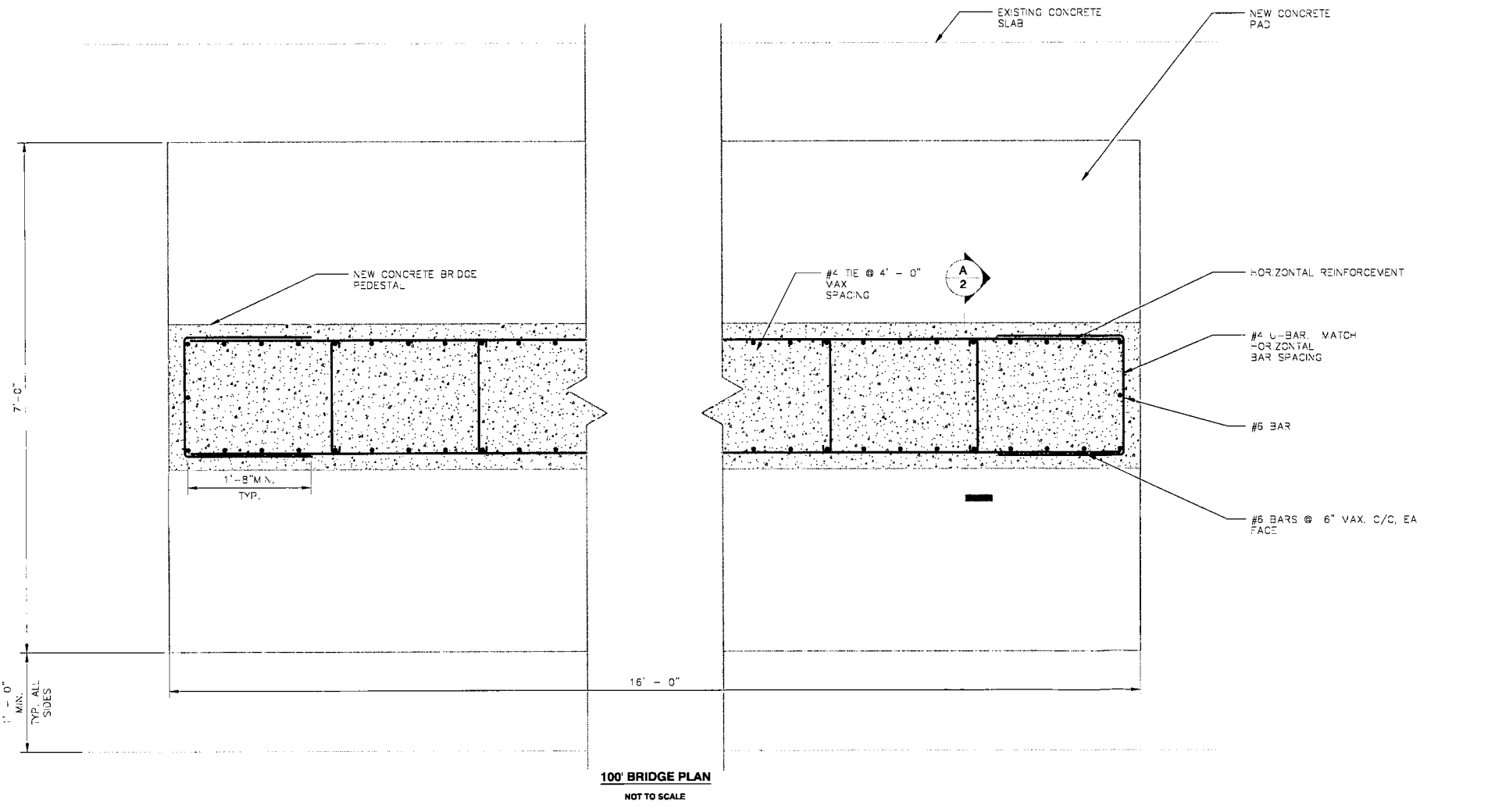
\*AGGREGATES SHALL CONFORM TO REQUIREMENTS IN ACI 302.1.

**REINFORCING STEEL QUANTITIES**

**100' BRIDGE, PER ABUTMENT**

CONCRETE PEDESTAL						
LENGTH (FT)	WIDTH (FT)	HEIGHT (FT)	VOLUME (CY)			
16	2	2	2.4			
CONCRETE SLAB						
LENGTH (FT)	WIDTH (FT)	HEIGHT (FT)	VOLUME (CY)			
16	7	0.5	2.1			
VERTICAL REINFORCEMENT						
LENGTH (FT)	# OF BARS	BAR SIZE	TOTAL LENGTH (FT)	WEIGHT/FT	TOTAL WEIGHT (LBS)	
2.25	64	#6	144	1.502	216.3	
HORIZONTAL REINFORCEMENT						
LENGTH (FT)	SIDES	BAR SIZE	# OF ROWS	TOTAL LENGTH (FT)	WEIGHT/FT	TOTAL WEIGHT (LBS)
15.5	2	#4	2	62	0.668	41.4
HORIZONTAL TIES						
LENGTH (FT)	# OF TIES	BAR SIZE	# OF ROWS	TOTAL LENGTH (FT)	WEIGHT/FT	TOTAL WEIGHT (LBS)
1.5	4	#3	2	12	0.375	4.5
#4 DOWELS						
LENGTH (FT)	# OF DOWELS	BAR SIZE	ROWS	TOTAL LENGTH (FT)	WEIGHT/FT	TOTAL WEIGHT (LBS)
1.67	11	#4	4	73.5	0.668	49.1

NOTE: FOR INFORMATION ONLY



**REVISION RECORD**

NO.	DATE	DESCRIPTION

**Civil & Environmental Consultants, Inc.**  
 600 Marketplace Ave. Suite 200 - Bridgeport, WV 26330  
 Ph: 304.833.3119 - 855.488.9539 - Fax: 304.833.3327  
 www.cesinc.com

**EQT PRODUCTION COMPANY**  
 WEU 51 BRIDGE CROSSING  
 WEST UNION DISTRICT  
 DODDRIDGE COUNTY, WV  
 REVISION TO DNR OLS PERMIT # LS-16-VI/09-1340

**STRUCTURAL NOTES AND DETAILS**  
 REVISION TO DNR OLS PERMIT # LS-16-VI/09-1340

DATE: MARCH 2017 DRAWN BY: DBS  
 DWG SCALE: AS SHOWN CHECKED BY: CSL  
 PROJECT NO: 171-149  
 APPROVED BY: JDR

DRAWING NO. **CV01**  
 SHEET 3 OF 3



**APPENDIX B**

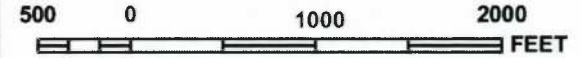
**FEMA FIRMette**



39° 15' 00"  
80° 45' 00"



MAP SCALE 1" = 1000'



**NFIP**  
**NATIONAL FLOOD INSURANCE PROGRAM**

PANEL 0120C

## FIRM

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

PANEL 120 OF 325  
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
DODDRIDGE COUNTY	540024	0120	C
WEST UNION TOWN OF	540025	0120	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.



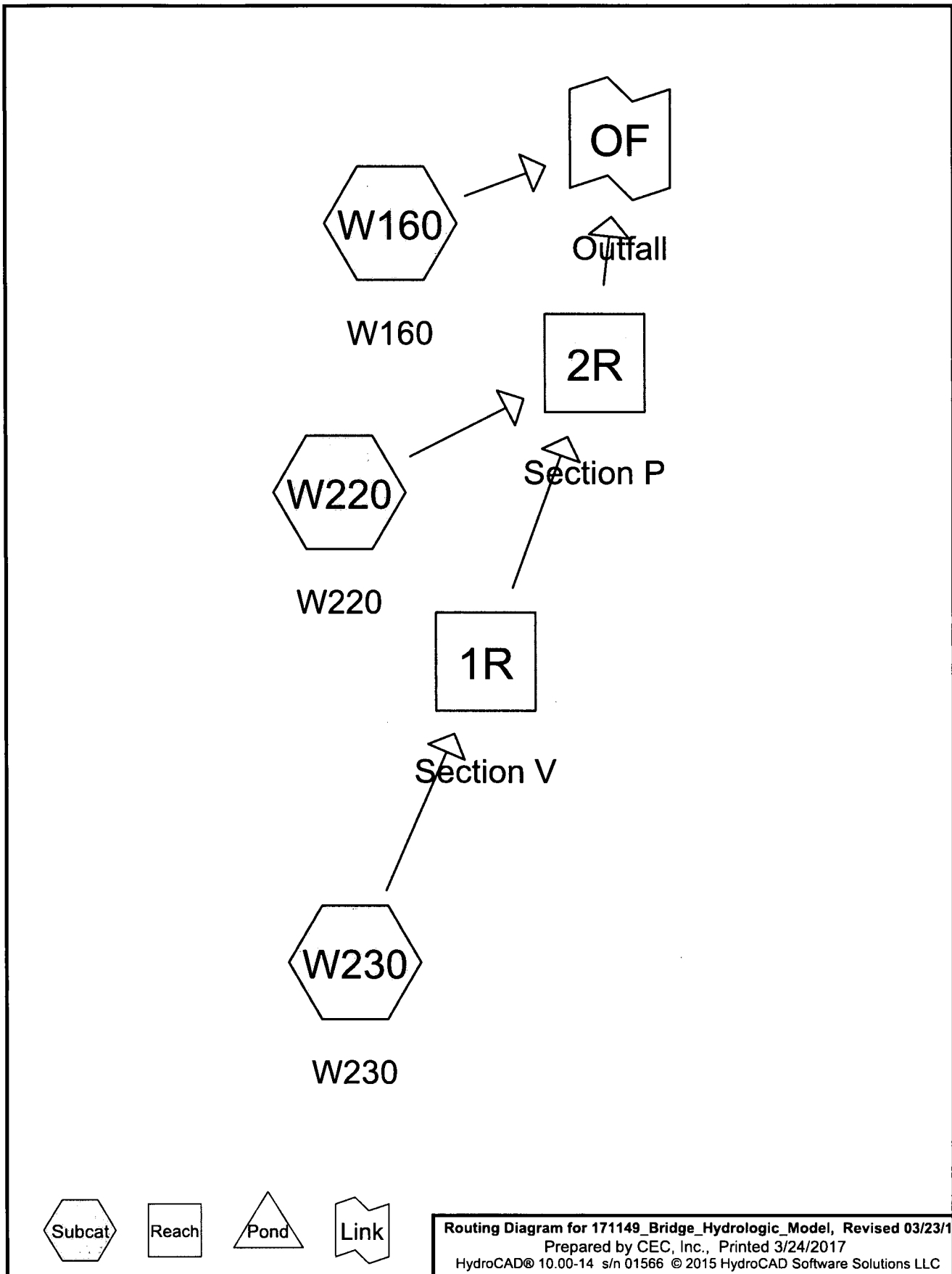
**MAP NUMBER**  
 54017C0120C  
**MAP REVISED**  
 OCTOBER 4, 2011

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](http://www.msc.fema.gov)

**APPENDIX C**

**Design Discharge Calculations**



**Summary for Subcatchment W160: W160**

Runoff = 1,195.90 cfs @ 12.29 hrs, Volume= 124.874 af, Depth> 2.48"

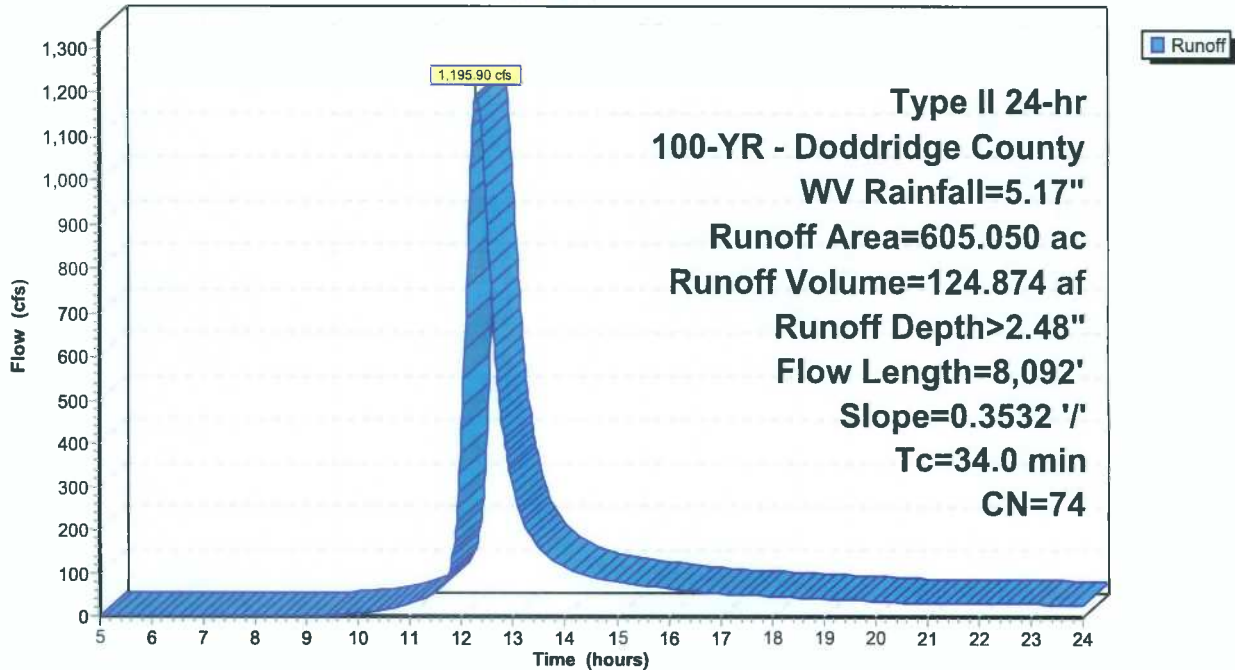
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.02 hrs  
 Type II 24-hr 100-YR - Doddridge County, WV Rainfall=5.17"

Area (ac)	CN	Description
* 605.050	74	
605.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.0	8,092	0.3532	3.96		Lag/CN Method,

**Subcatchment W160: W160**

Hydrograph



**Summary for Subcatchment W220: W220**

Runoff = 2,047.79 cfs @ 12.46 hrs, Volume= 263.533 af, Depth> 2.55"

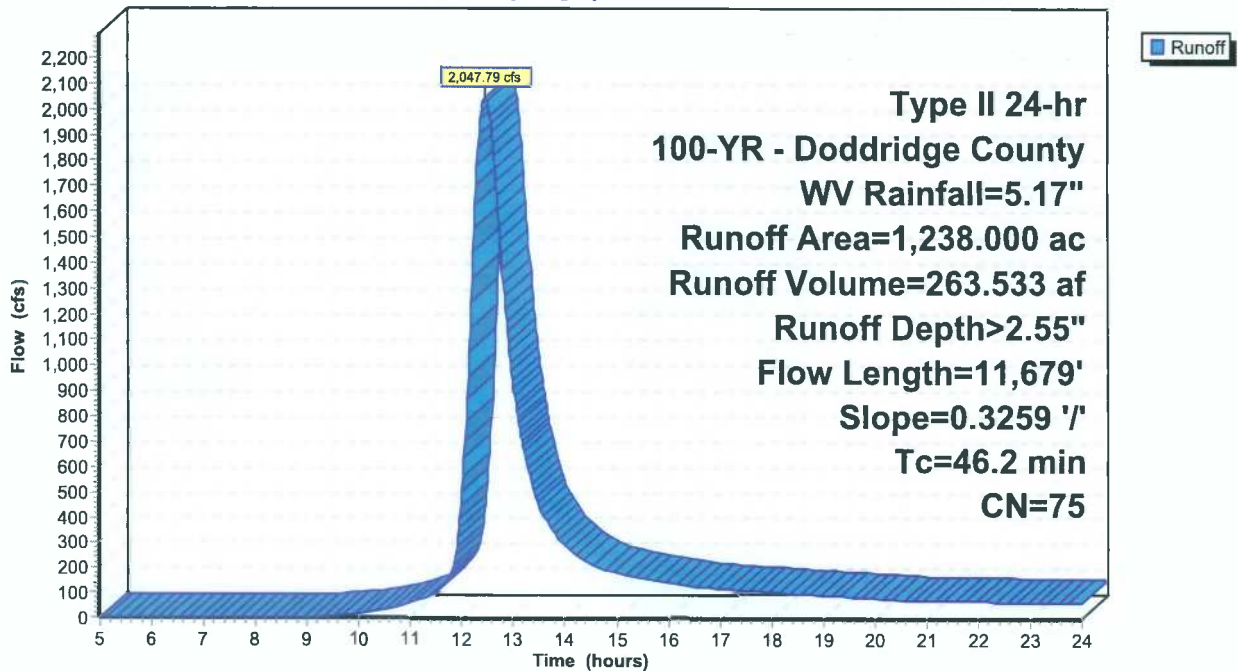
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.02 hrs  
 Type II 24-hr 100-YR - Doddridge County, WV Rainfall=5.17"

Area (ac)	CN	Description
* 1,238.000	75	
1,238.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
46.2	11,679	0.3259	4.22		Lag/CN Method,

**Subcatchment W220: W220**

Hydrograph



**Summary for Subcatchment W230: W230**

Runoff = 1,748.01 cfs @ 12.44 hrs, Volume= 222.396 af, Depth> 2.55"

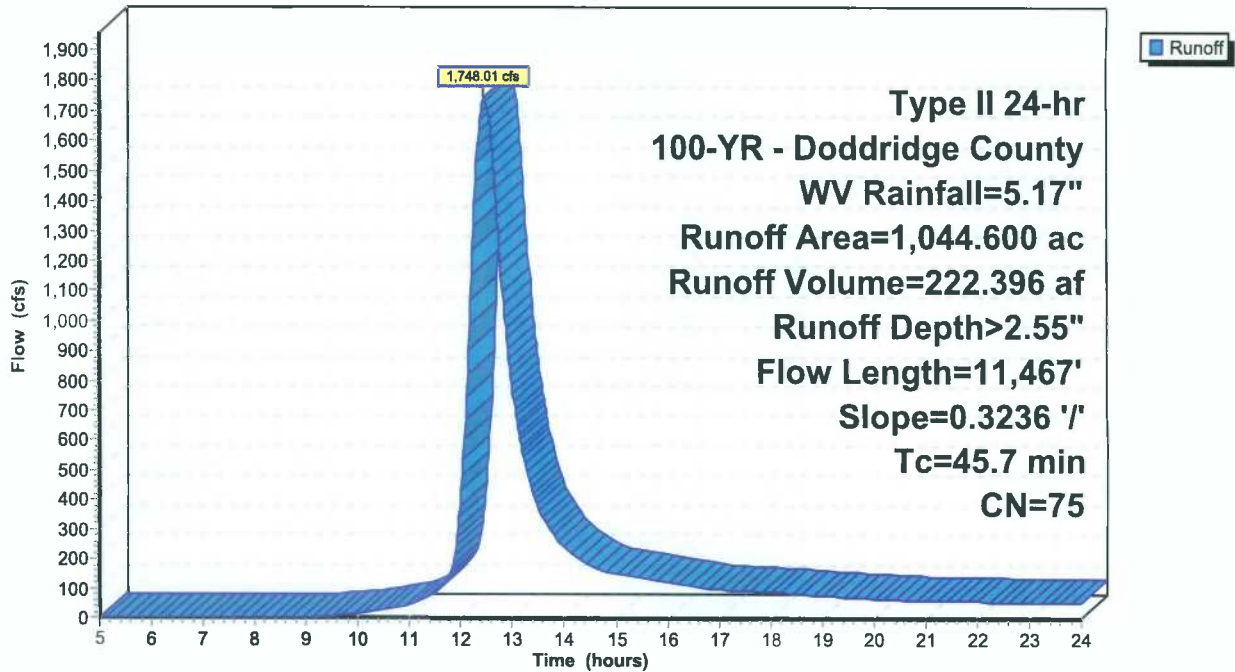
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.02 hrs  
 Type II 24-hr 100-YR - Doddridge County, WV Rainfall=5.17"

Area (ac)	CN	Description
* 1,044.600	75	
1,044.600		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
45.7	11,467	0.3236	4.19		Lag/CN Method,

**Subcatchment W230: W230**

Hydrograph





**Summary for Reach 1R: Section V**

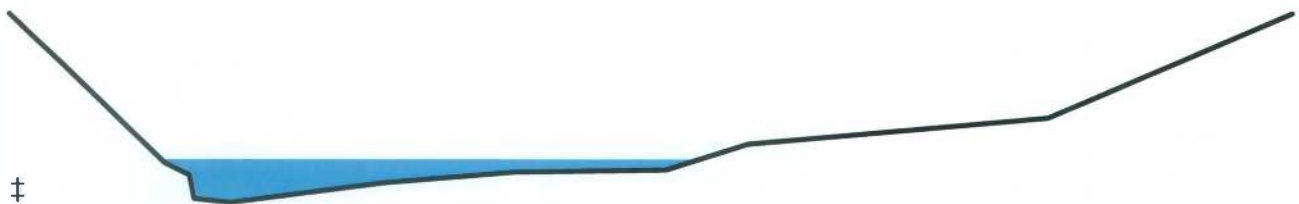
Obtained from surveyed Section V 3d polyline of CAD file.

Inflow Area = 1,044.600 ac, 0.00% Impervious, Inflow Depth > 2.55" for 100-YR - Doddridge County, WV even  
 Inflow = 1,748.01 cfs @ 12.44 hrs, Volume= 222.396 af  
 Outflow = 1,211.86 cfs @ 13.25 hrs, Volume= 215.871 af, Atten= 31%, Lag= 48.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-24.00 hrs, dt= 0.02 hrs  
 Max. Velocity= 5.73 fps, Min. Travel Time= 30.0 min  
 Avg. Velocity = 3.12 fps, Avg. Travel Time= 55.0 min

Peak Storage= 2,177,802 cf @ 12.75 hrs  
 Average Depth at Peak Storage= 4.94'  
 Bank-Full Depth= 21.63' Flow Area= 2,906.9 sf, Capacity= 53,100.14 cfs

Custom cross-section, Length= 10,302.0' Slope= 0.0077 ' / ' (108 Elevation Intervals)  
 Constant n= 0.040 Winding stream, pools & shoals  
 Inlet Invert= 947.70', Outlet Invert= 868.30'

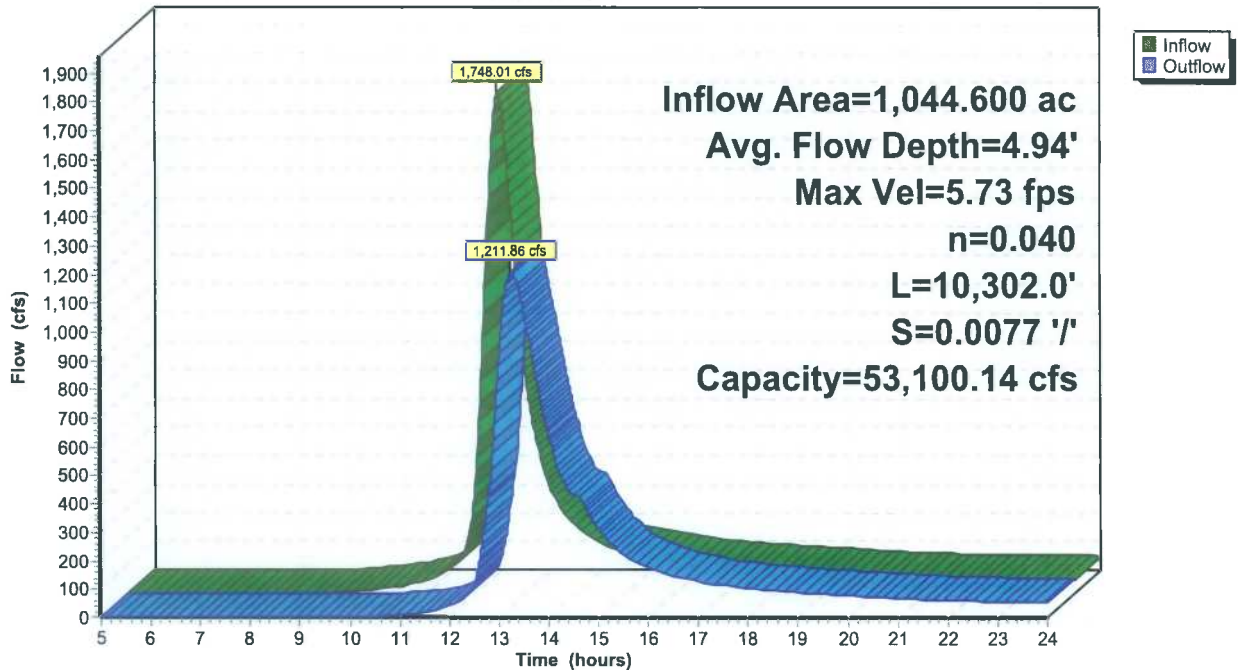


Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	875.70	0.00
25.00	858.64	17.06
29.10	857.20	18.50
29.80	854.54	21.16
35.75	854.07	21.63
60.91	856.31	19.39
82.41	857.56	18.14
107.14	857.81	17.89
120.54	860.79	14.91
169.57	863.79	11.91
209.42	875.70	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
0.47	2.6	11.3	27,185	3.27
2.24	40.5	33.1	417,449	151.36
3.13	75.5	49.3	778,212	327.39
3.49	93.8	56.6	966,343	428.42
3.74	110.6	82.1	1,139,045	439.80
4.57	179.3	88.4	1,847,249	936.98
6.72	377.7	102.1	3,891,218	2,946.03
9.72	753.9	156.6	7,766,947	7,011.38
21.63	2,906.9	219.3	29,946,661	53,100.14

**Reach 1R: Section V**

Hydrograph



**Summary for Reach 2R: Section P**

Obtained from surveyed Section P 3d polyline of CAD file.

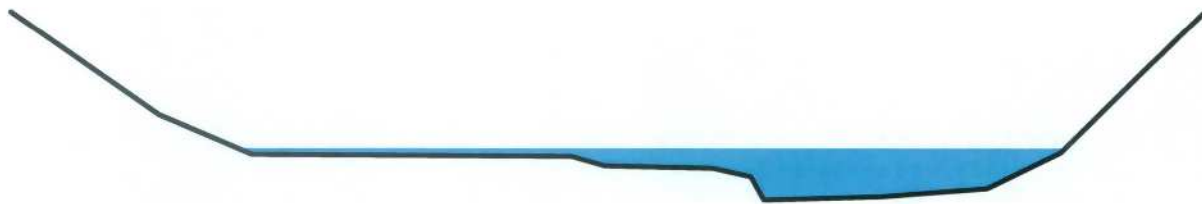
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=3)  
 [62] Hint: Exceeded Reach 1R OUTLET depth by 2.76' @ 13.50 hrs

Inflow Area = 2,282.600 ac, 0.00% Impervious, Inflow Depth > 2.52" for 100-YR - Doddridge County, WV even  
 Inflow = 2,156.22 cfs @ 12.48 hrs, Volume= 479.405 af  
 Outflow = 1,905.22 cfs @ 12.94 hrs, Volume= 472.988 af, Atten= 12%, Lag= 27.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-24.00 hrs, dt= 0.02 hrs  
 Max. Velocity= 5.62 fps, Min. Travel Time= 13.6 min  
 Avg. Velocity = 3.29 fps, Avg. Travel Time= 23.3 min

Peak Storage= 1,658,862 cf @ 12.71 hrs  
 Average Depth at Peak Storage= 7.10'  
 Bank-Full Depth= 25.92' Flow Area= 3,090.9 sf, Capacity= 51,407.06 cfs

Custom cross-section, Length= 4,598.0' Slope= 0.0047 '/' (108 Elevation Intervals)  
 Constant n= 0.040  
 Inlet Invert= 868.30', Outlet Invert= 846.60'

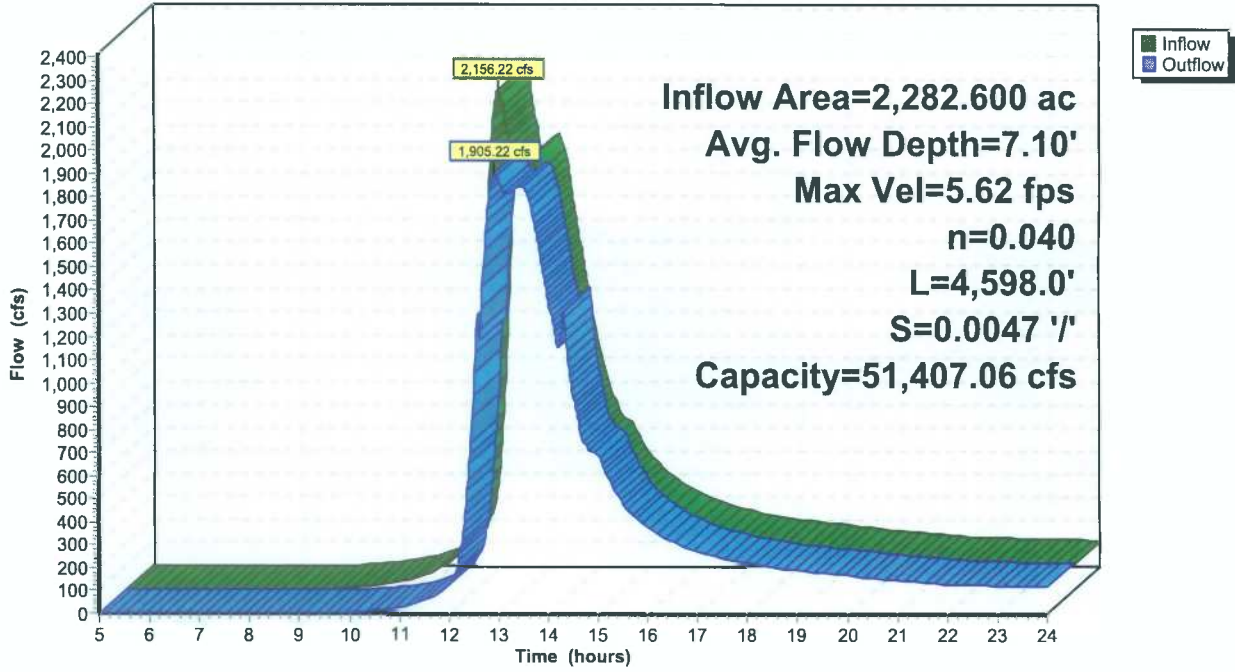


Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	873.44	0.00
20.94	859.19	14.25
33.98	853.76	19.68
79.41	853.48	19.96
84.15	852.18	21.26
99.39	851.91	21.53
104.83	850.71	22.73
106.68	847.52	25.92
123.26	847.96	25.48
138.37	849.06	24.38
148.87	853.99	19.45
169.23	873.44	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
0.44	3.7	17.1	17,030	3.41
1.54	30.9	33.5	142,004	74.64
3.19	88.3	39.3	406,162	386.80
4.39	137.6	47.7	632,671	711.61
4.66	151.9	63.6	698,416	692.80
5.96	235.9	71.6	1,084,678	1,330.55
6.24	261.5	117.6	1,202,327	1,136.63
6.47	287.9	118.8	1,323,861	1,325.96
11.67	934.8	139.8	4,298,402	8,466.86
25.92	3,090.9	185.8	14,211,913	51,407.06

**Reach 2R: Section P**

Hydrograph



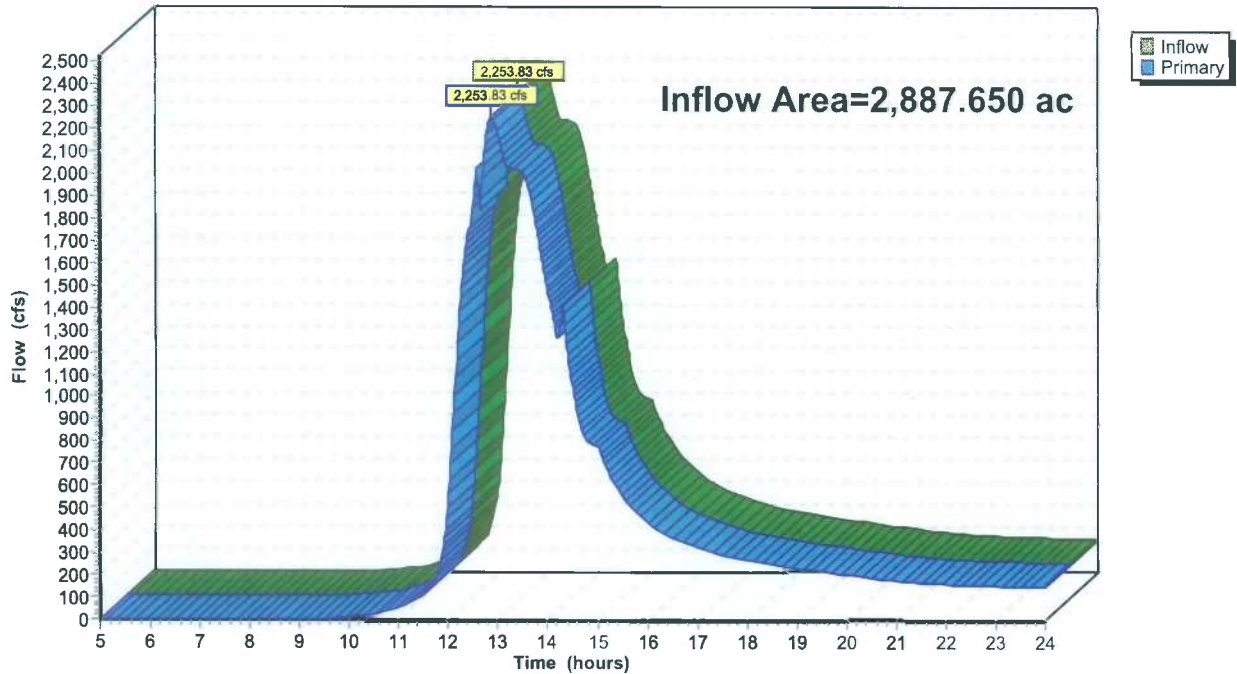
### Summary for Link OF: Outfall

Inflow Area = 2,887.650 ac, 0.00% Impervious, Inflow Depth > 2.48" for 100-YR - Doddridge County, WV even  
Inflow = 2,253.83 cfs @ 12.87 hrs, Volume= 597.862 af  
Primary = 2,253.83 cfs @ 12.87 hrs, Volume= 597.862 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-24.00 hrs, dt= 0.02 hrs

### Link OF: Outfall

Hydrograph



**APPENDIX D**  
**HEC-RAS Profile Summary Tables**

HEC-RAS Plan: Exist River: Bluestone Creek Reach: Alignment - (1) Profile: 100-YR

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Alignment - (1)	4197.97	100-YR	2250.00	854.07	859.90	859.90	861.73	0.009852	11.77	301.07	92.94	0.92
Alignment - (1)	3984.5	100-YR	2250.00	851.62	858.84		859.87	0.004667	8.23	318.70	101.14	0.84
Alignment - (1)	3769.43	100-YR	2250.00	850.58	858.31		859.05	0.002825	7.62	527.85	144.70	0.51
Alignment - (1)	3555.05	100-YR	2250.00	850.43	856.61	855.78	858.15	0.006100	10.18	293.92	110.59	0.76
Alignment - (1)	3354.63	100-YR	2250.00	849.01	856.15		857.03	0.003596	8.31	459.69	124.63	0.60
Alignment - (1)	3210.37	100-YR	2250.00	848.94	855.49		856.49	0.003725	8.49	405.28	117.40	0.61
Alignment - (1)	3106.56	100-YR	2250.00	847.52	855.31		856.08	0.002948	7.41	433.26	120.57	0.53
Alignment - (1)	3021.02	100-YR	2250.00	847.55	854.98		855.76	0.003317	8.13	504.29	123.90	0.57
Alignment - (1)	2906.64	100-YR	2250.00	846.44	855.02		855.41	0.001402	6.16	746.70	133.37	0.39
Alignment - (1)	2807.26	100-YR	2250.00	846.59	854.47	852.12	855.20	0.002285	7.06	432.01	142.21	0.48
Alignment - (1)	2757.33	100-YR	2250.00	846.53	852.66	852.66	854.85	0.008653	12.43	257.02	72.98	0.91
Alignment - (1)	2707.29	100-YR	2250.00	846.00	852.36	851.70	854.03	0.006569	10.63	267.33	77.24	0.77
Alignment - (1)	2630.55	100-YR	2250.00	845.30	853.33		853.45	0.000357	3.10	1179.94	235.10	0.20
Alignment - (1)	2597.1	100-YR	2250.00	844.04	853.33		853.43	0.000275	2.83	1184.89	216.75	0.18
Alignment - (1)	2517.5	100-YR	2250.00	844.82	851.50	851.27	853.21	0.006627	11.28	327.18	100.04	0.80
Alignment - (1)	2475.27	100-YR	2250.00	844.50	851.85		852.76	0.003885	8.95	534.26	157.12	0.62
Alignment - (1)	2395.33	100-YR	2250.00	844.57	851.57		852.43	0.004369	8.96	532.60	155.77	0.65
Alignment - (1)	2296.43	100-YR	2250.00	843.56	851.39		852.02	0.002832	7.73	635.67	163.75	0.53
Alignment - (1)	2049.28	100-YR	2250.00	842.83	850.63		851.19	0.003794	8.55	614.32	135.70	0.59
Alignment - (1)	1901.96	100-YR	2250.00	838.85	847.44	847.44	850.12	0.009476	13.52	220.79	68.09	0.95
Alignment - (1)	1819.38	100-YR	2250.00	840.58	847.43	846.91	849.13	0.006635	11.09	320.52	105.00	0.80
Alignment - (1)	1776.91	100-YR	2250.00	840.96	847.44	846.80	848.76	0.005407	9.79	353.59	109.90	0.72

HEC-RAS Plan: prop River: Bluestone Creek Reach: Alignment - (1) Profile: 100-YR

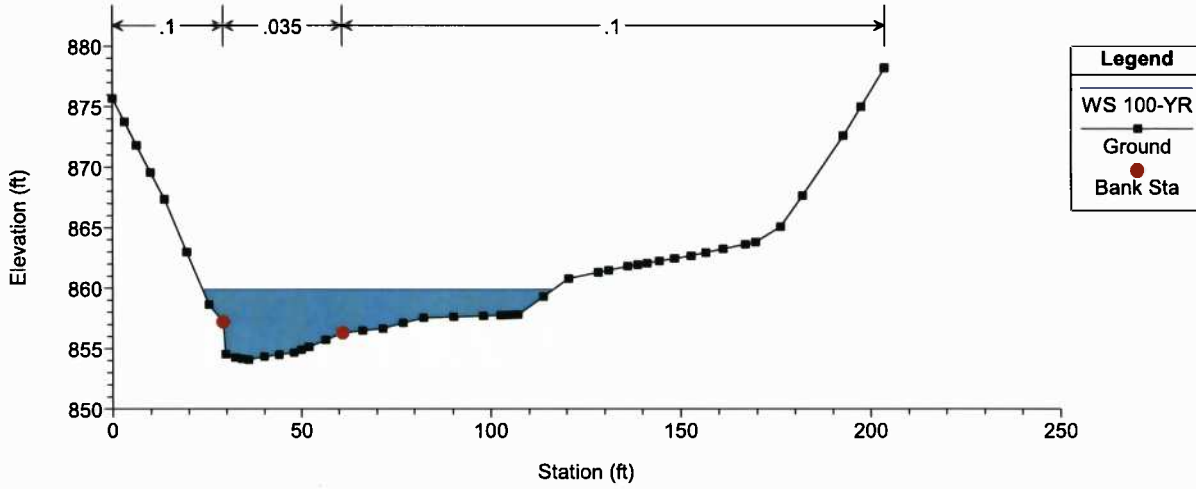
Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Alignment - (1)	4197.97	100-YR	2250.00	854.07	859.90	859.90	861.73	0.009652	11.77	301.07	92.94	0.92
Alignment - (1)	3984.5	100-YR	2250.00	851.82	858.84		859.87	0.004667	8.23	318.70	101.14	0.64
Alignment - (1)	3769.43	100-YR	2250.00	850.58	858.31		859.05	0.002825	7.62	527.85	144.70	0.51
Alignment - (1)	3555.05	100-YR	2250.00	850.43	856.61	855.78	858.15	0.006106	10.19	293.75	110.53	0.76
Alignment - (1)	3354.63	100-YR	2250.00	849.01	856.15		857.03	0.003604	8.31	459.26	124.62	0.60
Alignment - (1)	3210.37	100-YR	2250.00	848.94	855.49		856.49	0.003746	8.51	404.30	117.38	0.61
Alignment - (1)	3106.56	100-YR	2250.00	847.52	855.30		856.08	0.002967	7.43	432.06	120.53	0.53
Alignment - (1)	3021.02	100-YR	2250.00	847.55	854.97		855.75	0.003346	8.15	502.57	123.83	0.57
Alignment - (1)	2906.64	100-YR	2250.00	846.44	855.01		855.39	0.001411	6.18	744.91	133.30	0.39
Alignment - (1)	2807.26	100-YR	2250.00	846.59	854.46	852.12	855.18	0.002305	7.08	430.15	141.47	0.48
Alignment - (1)	2757.33	100-YR	2250.00	846.53	852.80	852.68	854.86	0.007900	12.06	267.40	73.83	0.87
Alignment - (1)	2707.29	100-YR	2250.00	846.00	853.09		854.33	0.004224	9.22	325.17	79.80	0.63
Alignment - (1)	2630.55	100-YR	2250.00	845.30	853.74	848.65	853.89	0.000365	3.24	833.26	238.68	0.20
Alignment - (1)	2624.76		Bridge									
Alignment - (1)	2597.1	100-YR	2250.00	844.04	853.63	848.03	853.75	0.000281	2.94	881.91	221.02	0.18
Alignment - (1)	2517.5	100-YR	2250.00	844.82	851.50	851.27	853.21	0.006627	11.28	327.18	100.04	0.80
Alignment - (1)	2475.27	100-YR	2250.00	844.50	851.85		852.76	0.003885	8.95	534.26	157.12	0.62
Alignment - (1)	2395.33	100-YR	2250.00	844.57	851.57		852.43	0.004369	8.96	532.60	155.77	0.65
Alignment - (1)	2296.43	100-YR	2250.00	843.58	851.39		852.02	0.002832	7.73	635.67	163.75	0.53
Alignment - (1)	2049.28	100-YR	2250.00	842.83	850.63		851.19	0.003794	8.55	614.32	135.70	0.59
Alignment - (1)	1901.96	100-YR	2250.00	838.85	847.44	847.44	850.12	0.009476	13.52	220.79	68.09	0.95
Alignment - (1)	1819.38	100-YR	2250.00	840.58	847.43	846.91	849.13	0.006635	11.09	320.52	105.00	0.80
Alignment - (1)	1776.91	100-YR	2250.00	840.96	847.44	846.80	848.76	0.005407	9.79	353.59	109.90	0.72



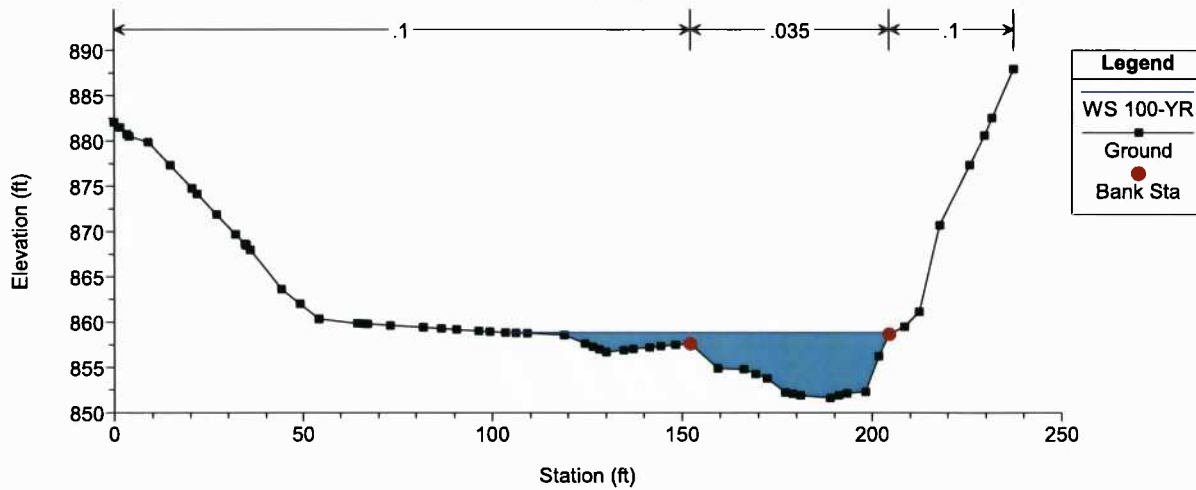
**APPENDIX E**

**HEC-RAS Cross-Section Reports**

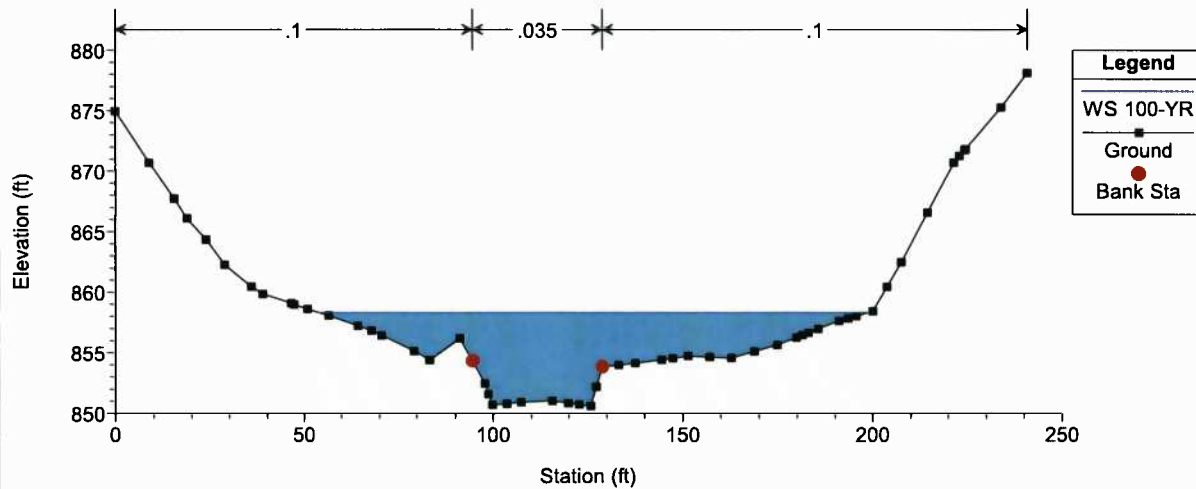
171149-he-cras analysis Plan: 171149-existing-analysis-revised 4/5/2017  
RS = 4197.97



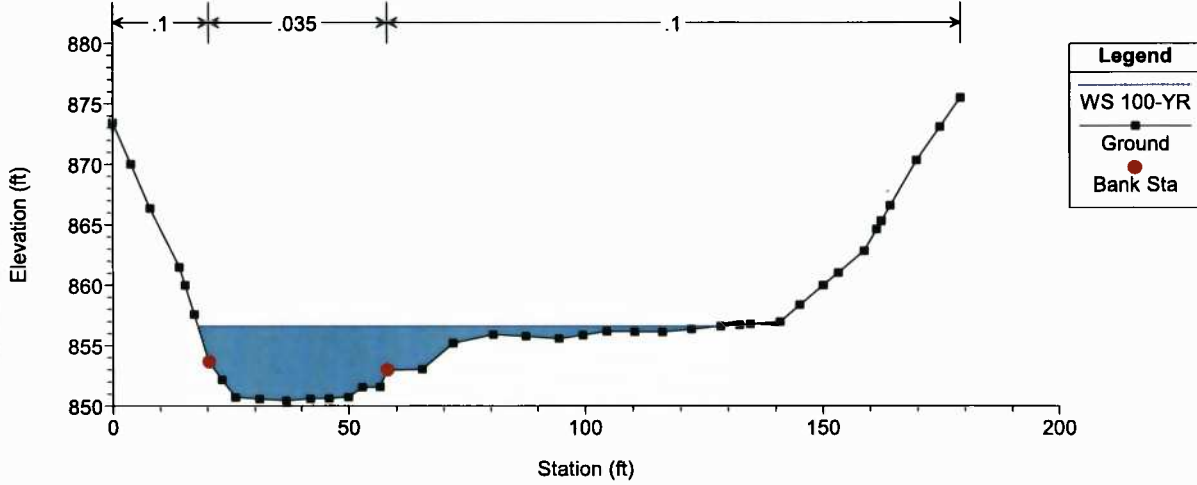
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RS = 3984.5



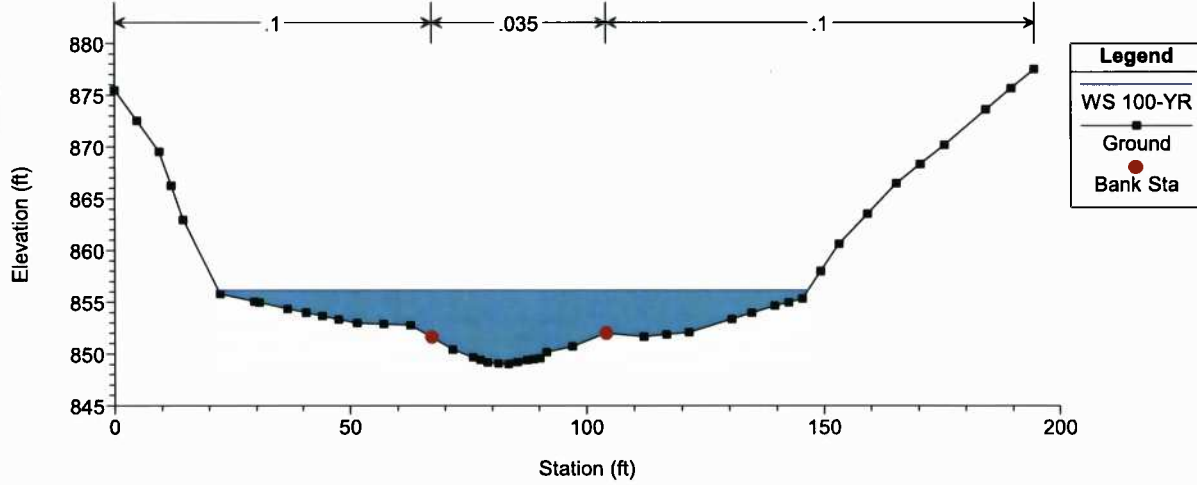
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RS = 3769.43



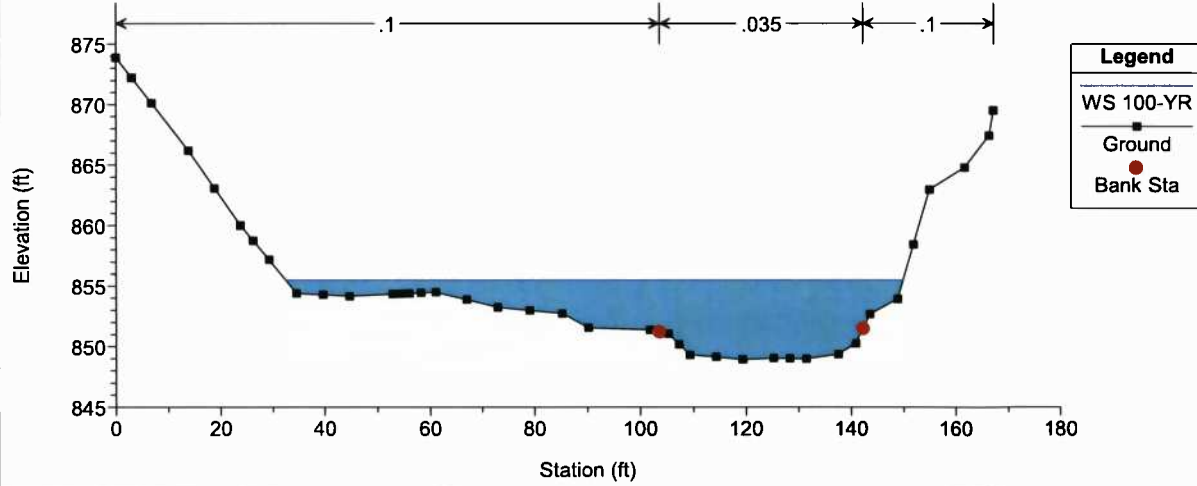
171149-he-cras analysis Plan: 171149-existing-analysis-revised 4/5/2017  
RS = 3555.05



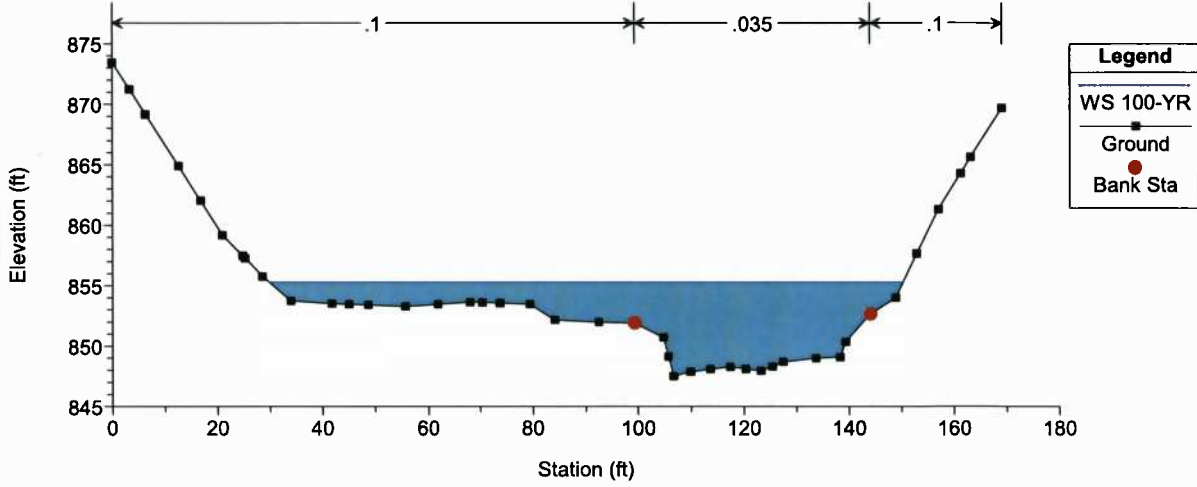
171149-he-cras analysis Plan: 171149-existing-analysis-revised 4/5/2017  
RS = 3354.63



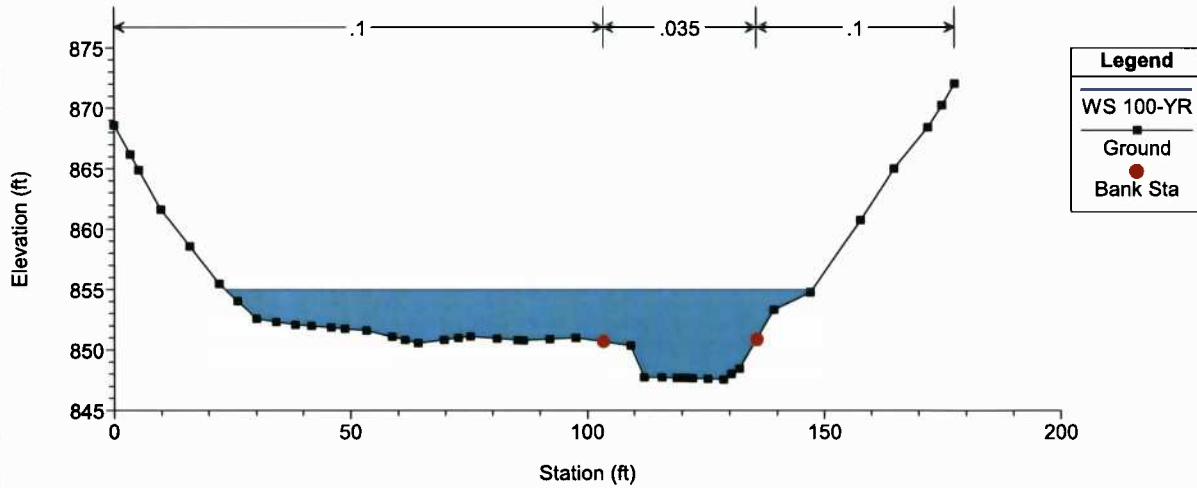
171149-he-cras analysis Plan: 171149-existing-analysis-revised 4/5/2017  
RS = 3210.37



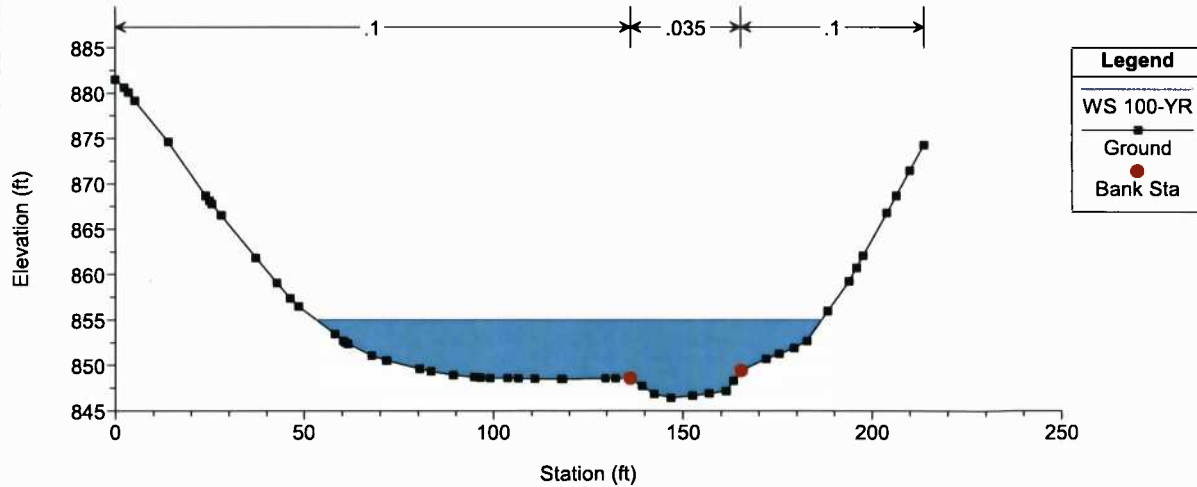
171149-he-cras analysis Plan: 171149-existing-analysis-revised 4/5/2017  
RS = 3106.56

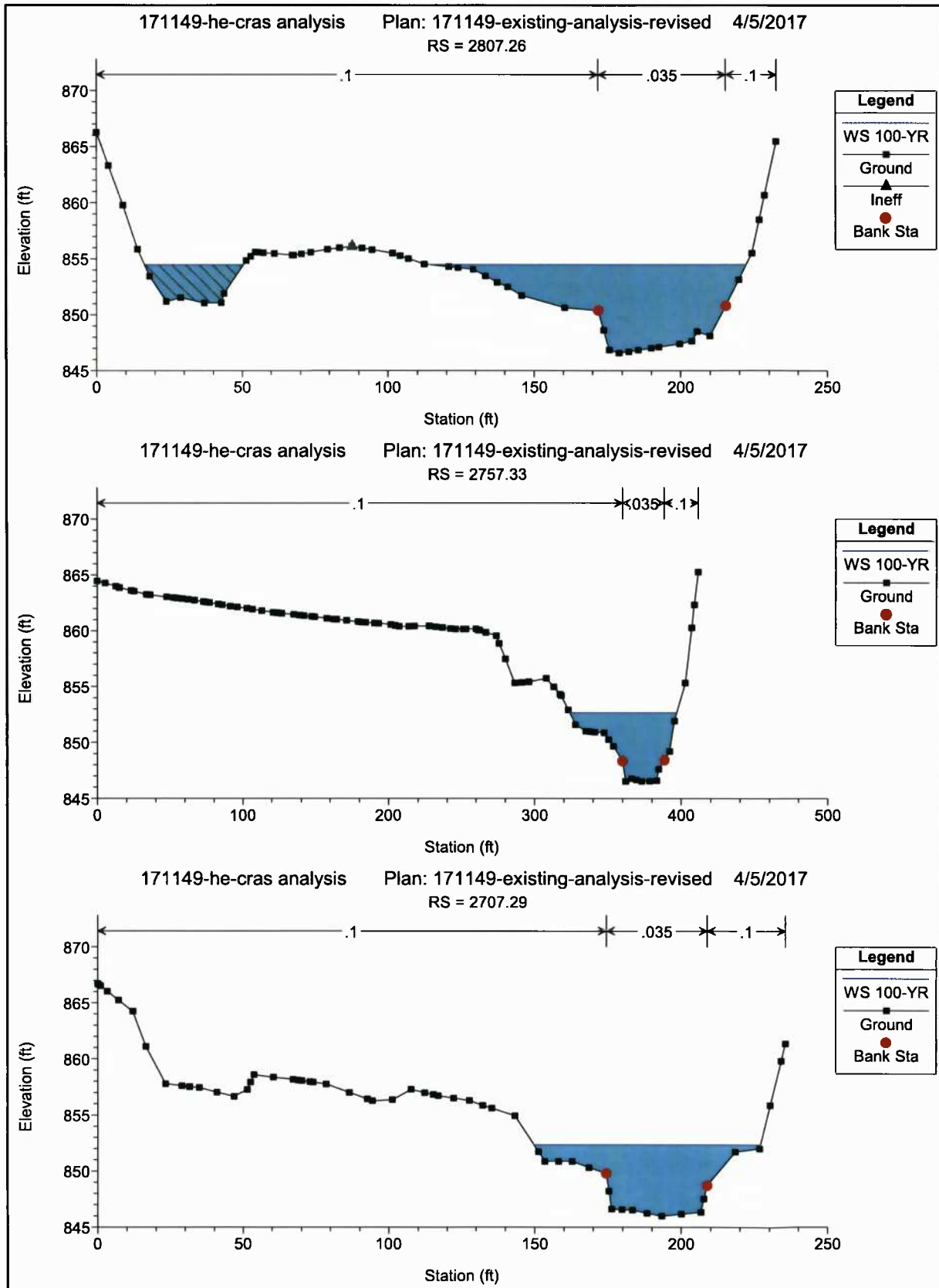


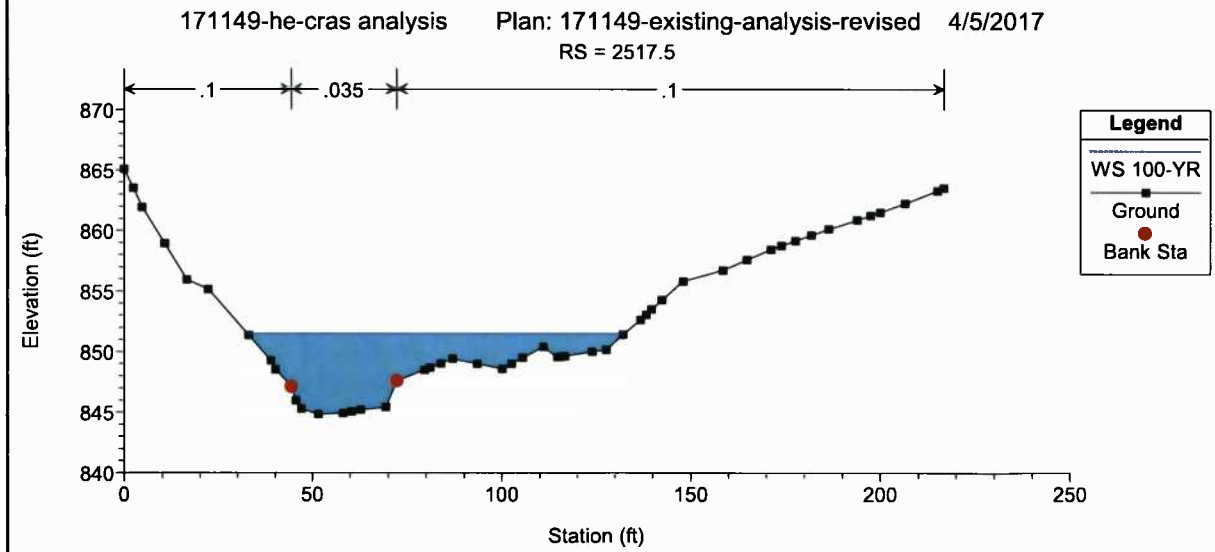
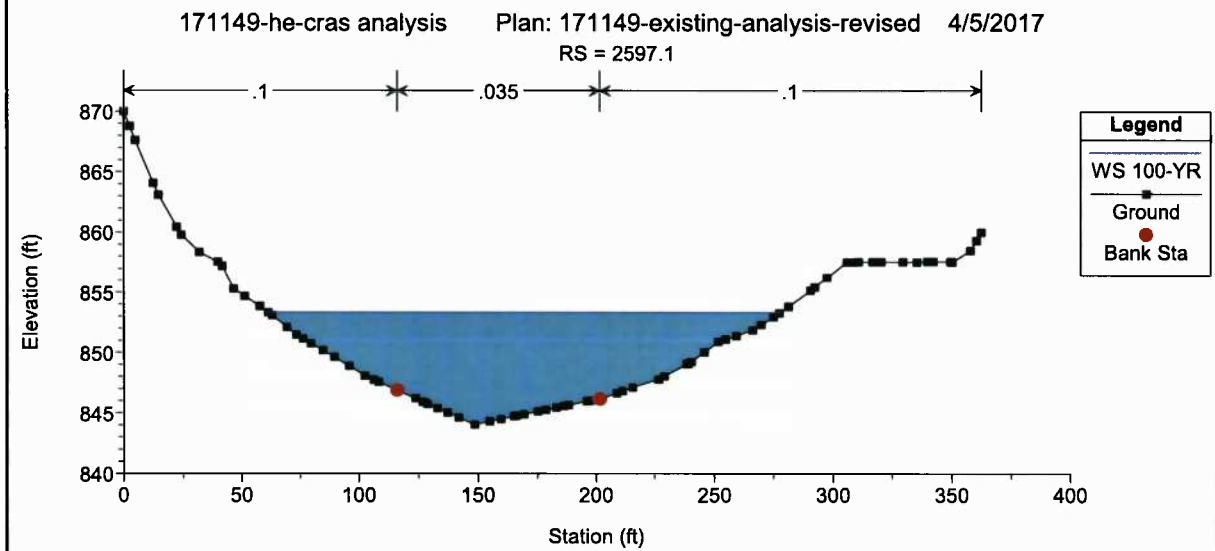
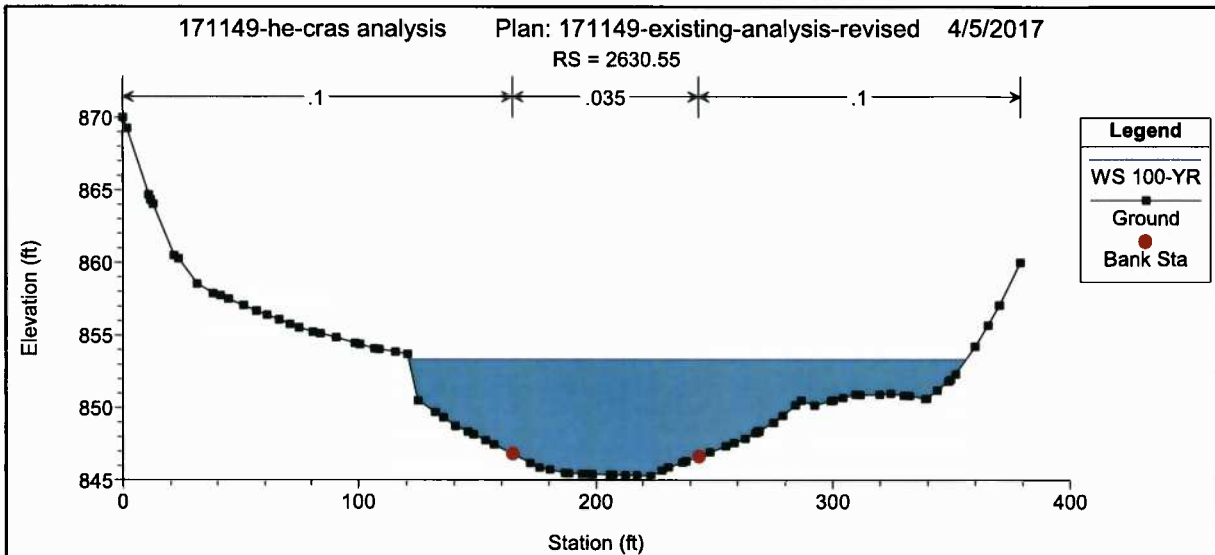
171149-he-cras analysis Plan: 171149-existing-analysis-revised 4/5/2017  
RS = 3021.02



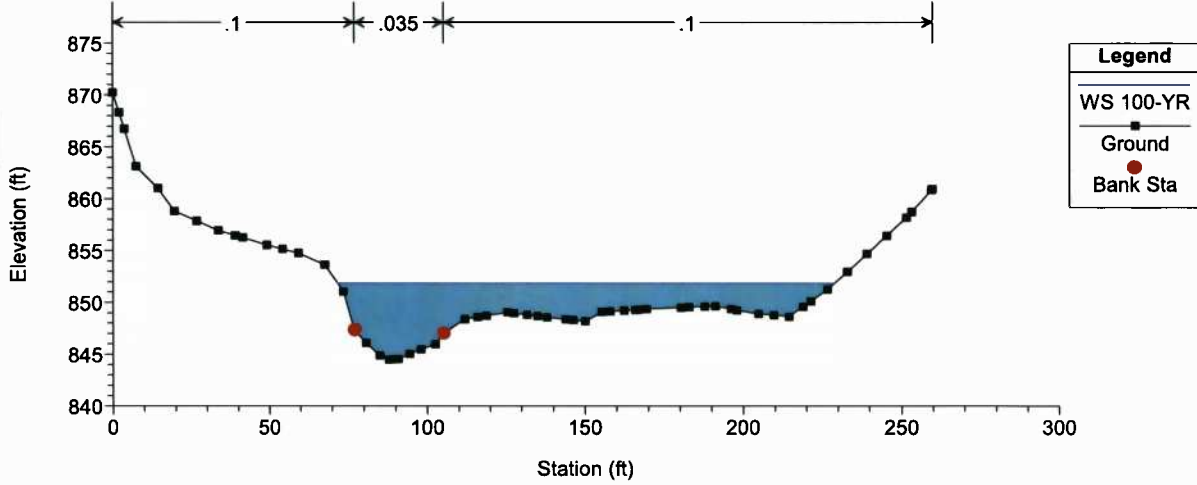
171149-he-cras analysis Plan: 171149-existing-analysis-revised 4/5/2017  
RS = 2906.64



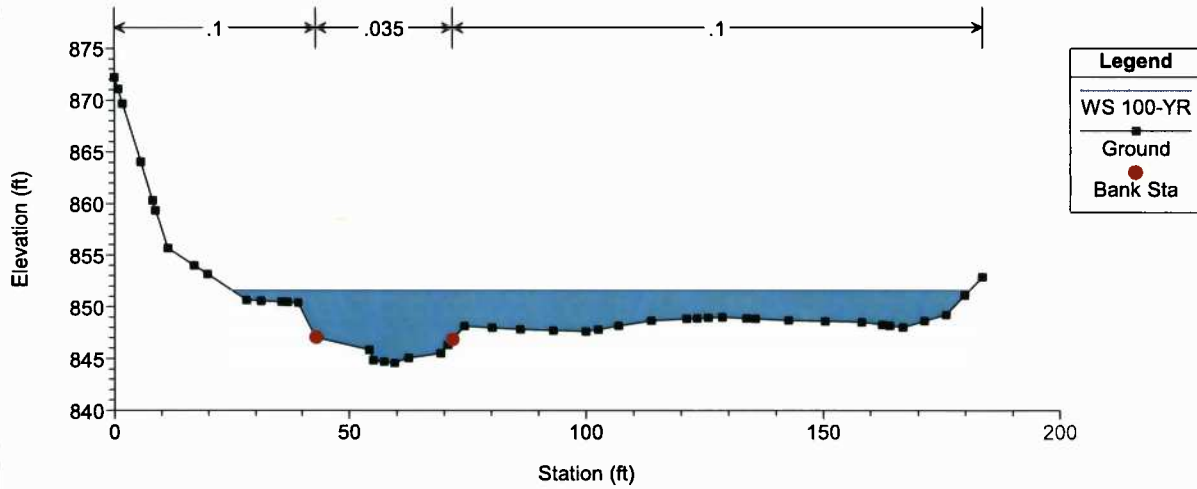




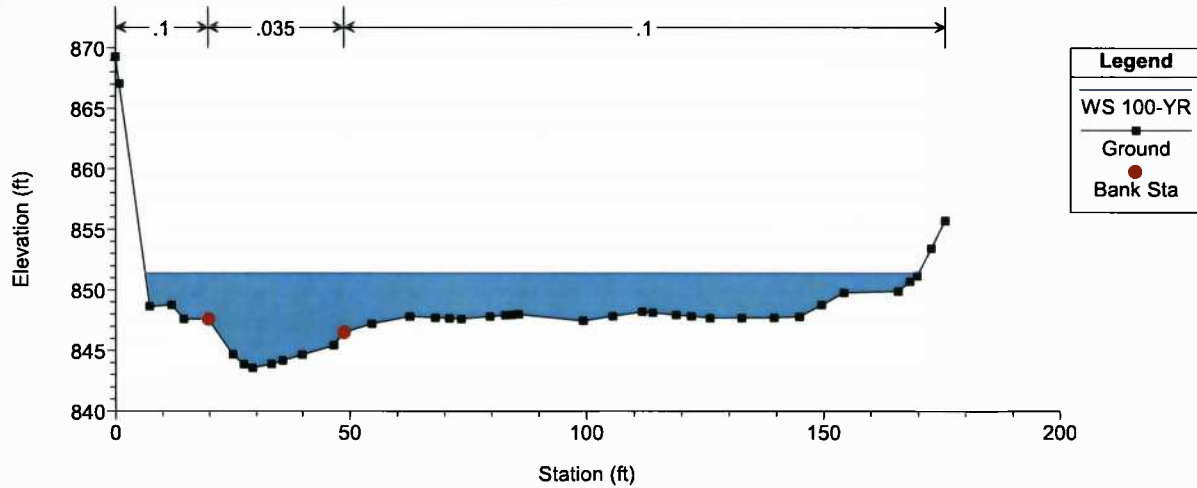
171149-he-cras analysis Plan: 171149-existing-analysis-revised 4/5/2017  
RS = 2475.27

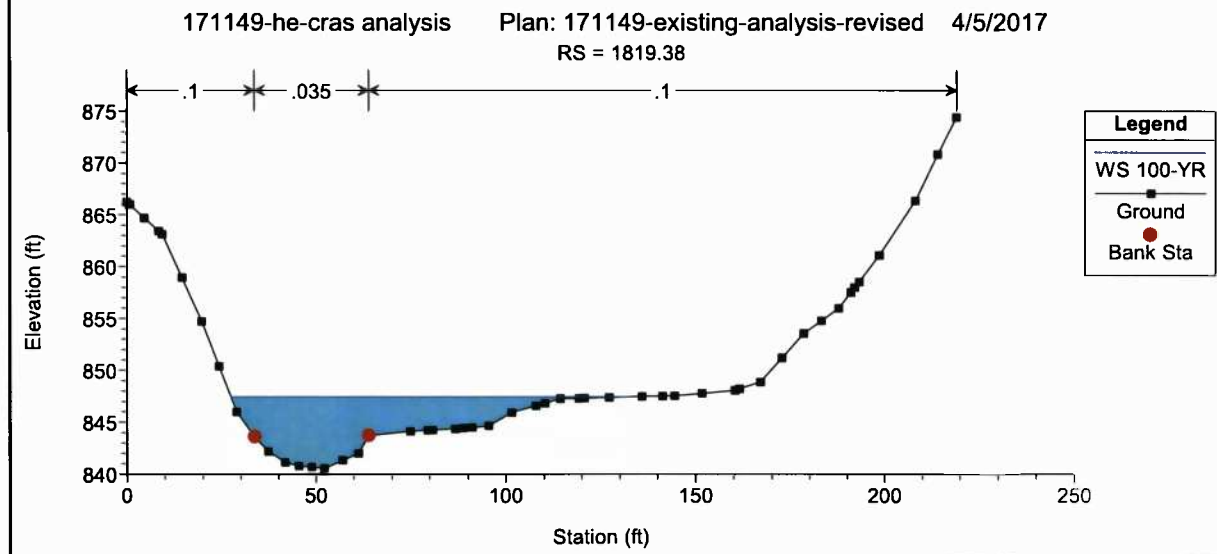
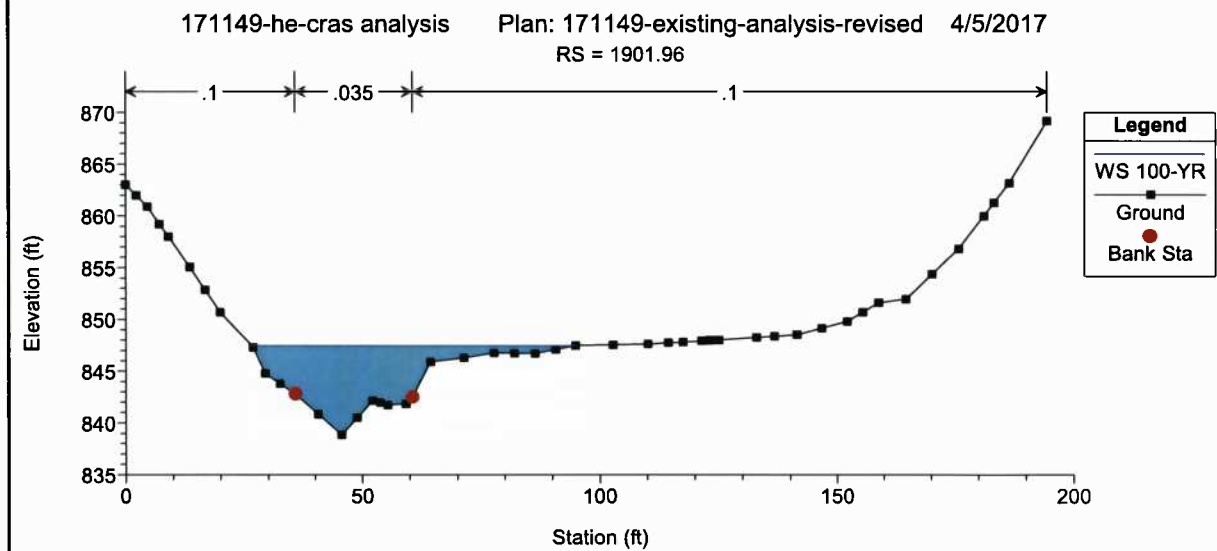
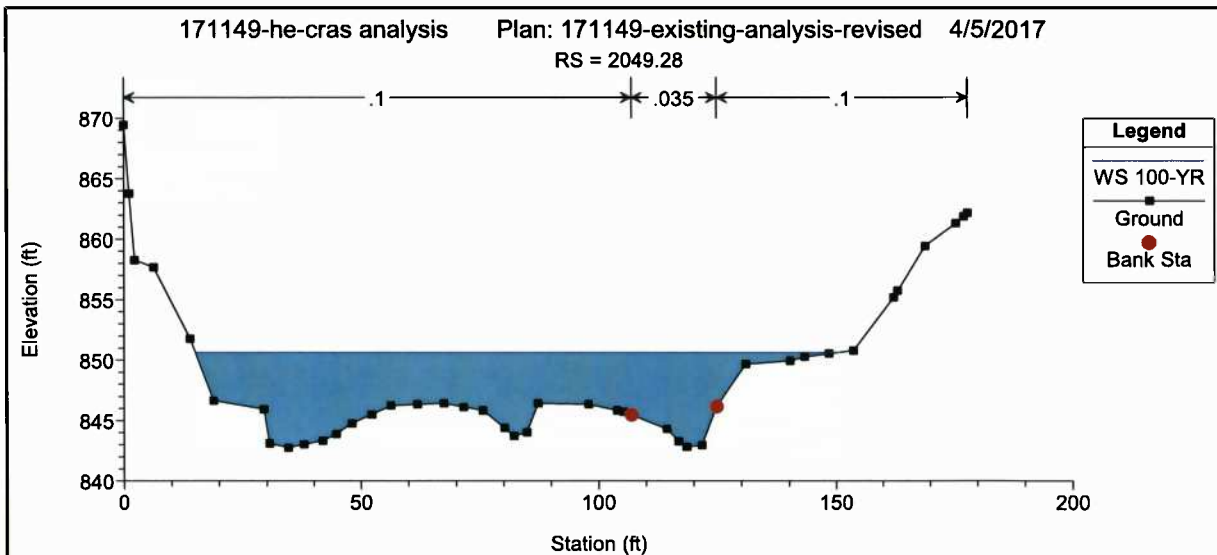


171149-he-cras analysis Plan: 171149-existing-analysis-revised 4/5/2017  
RS = 2395.33



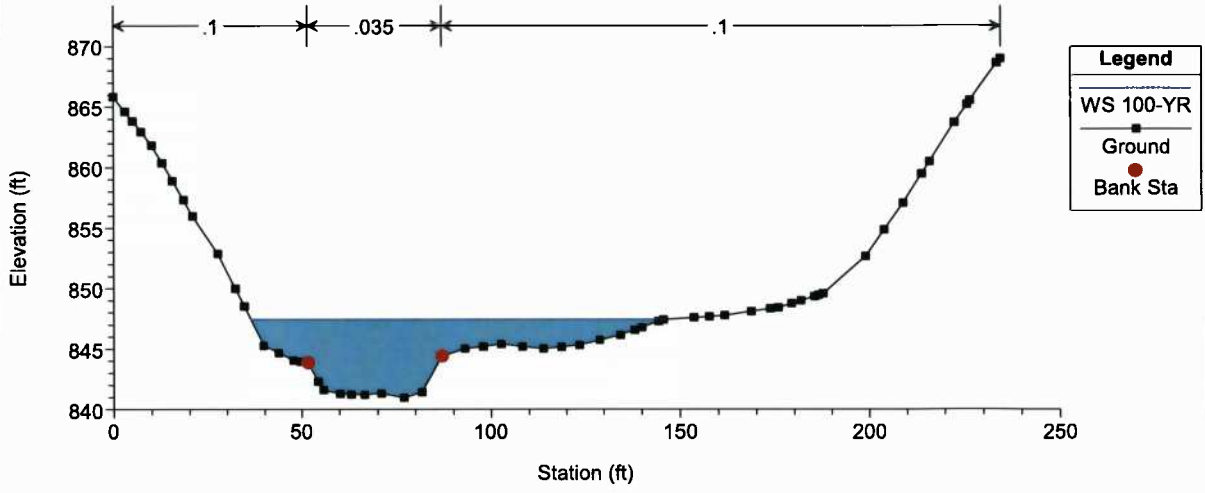
171149-he-cras analysis Plan: 171149-existing-analysis-revised 4/5/2017  
RS = 2296.43

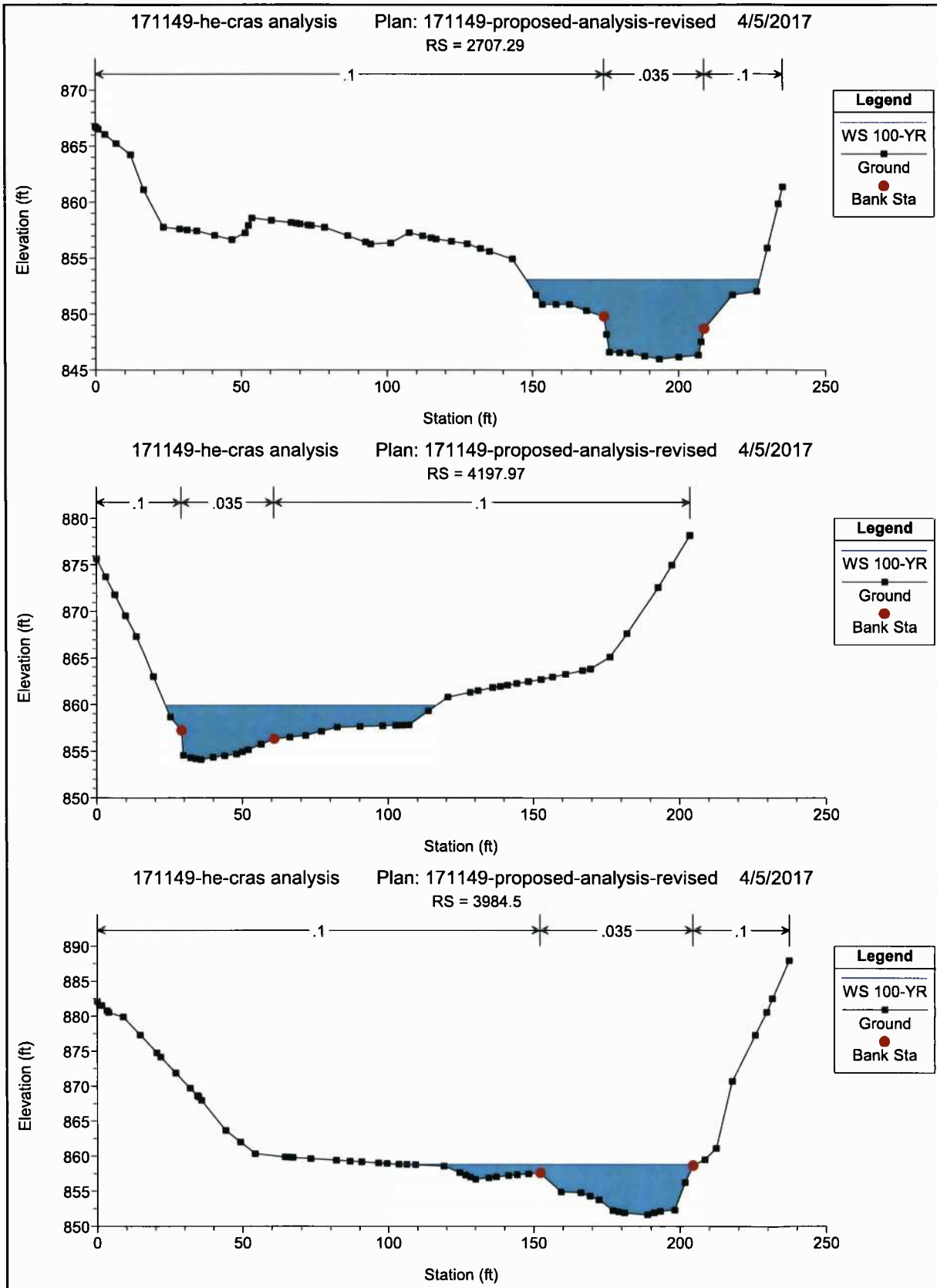


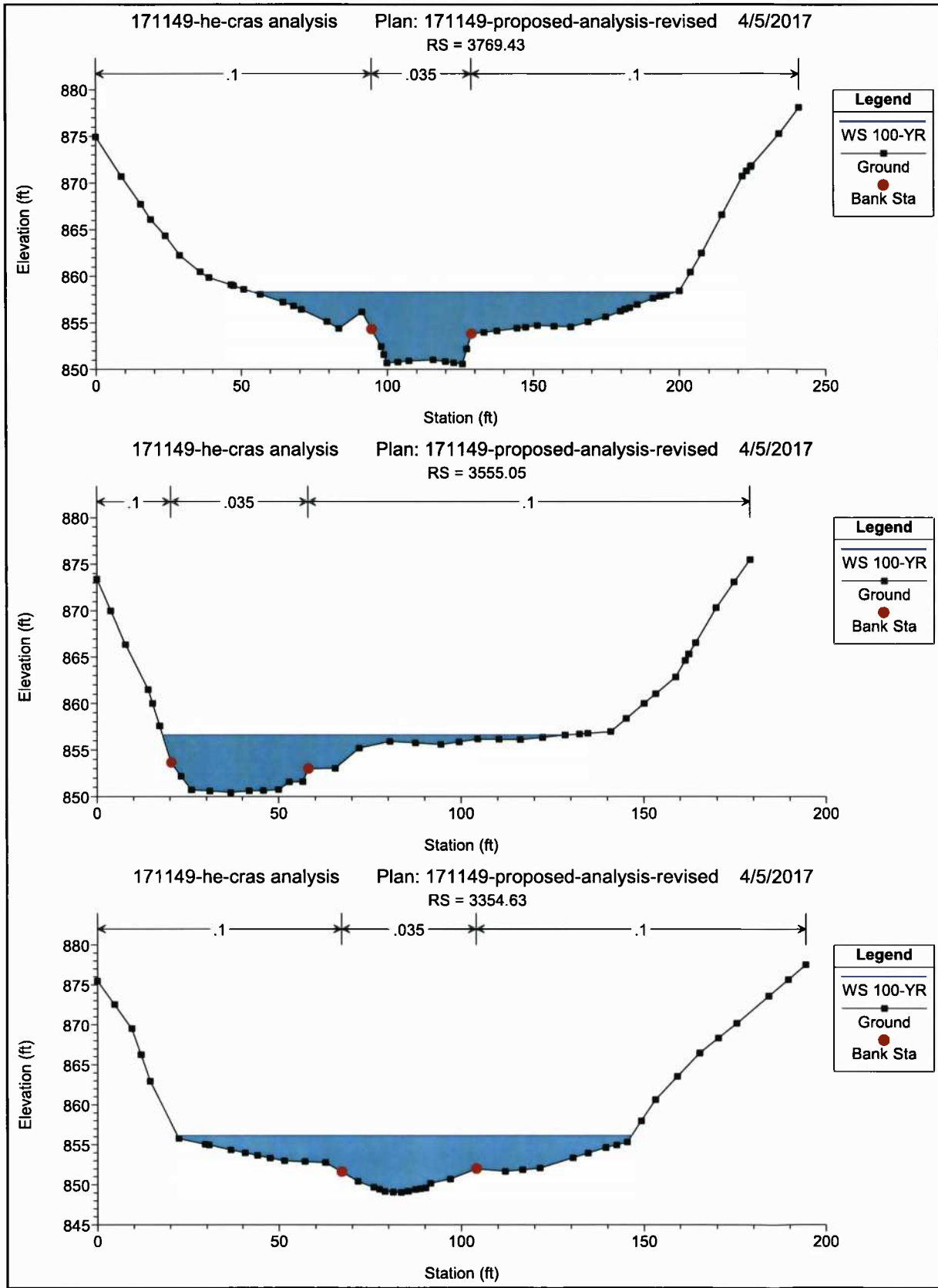




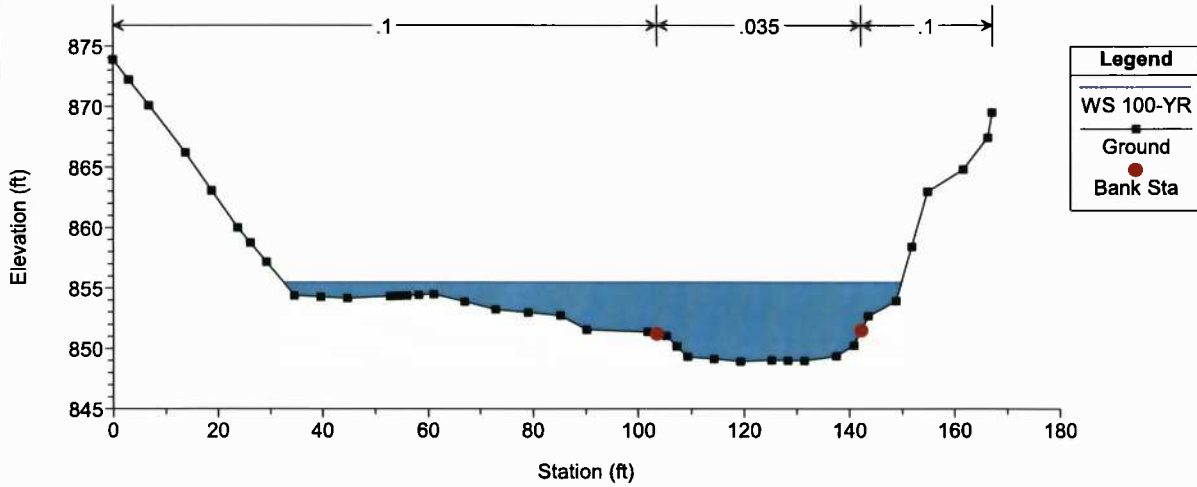
171149-he-cras analysis      Plan: 171149-existing-analysis-revised      4/5/2017  
RS = 1776.91



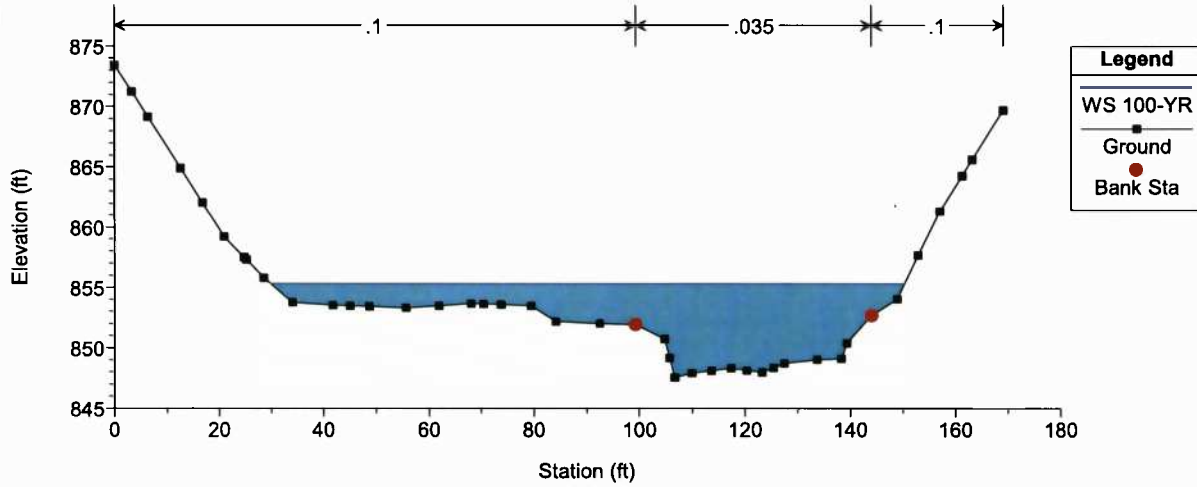




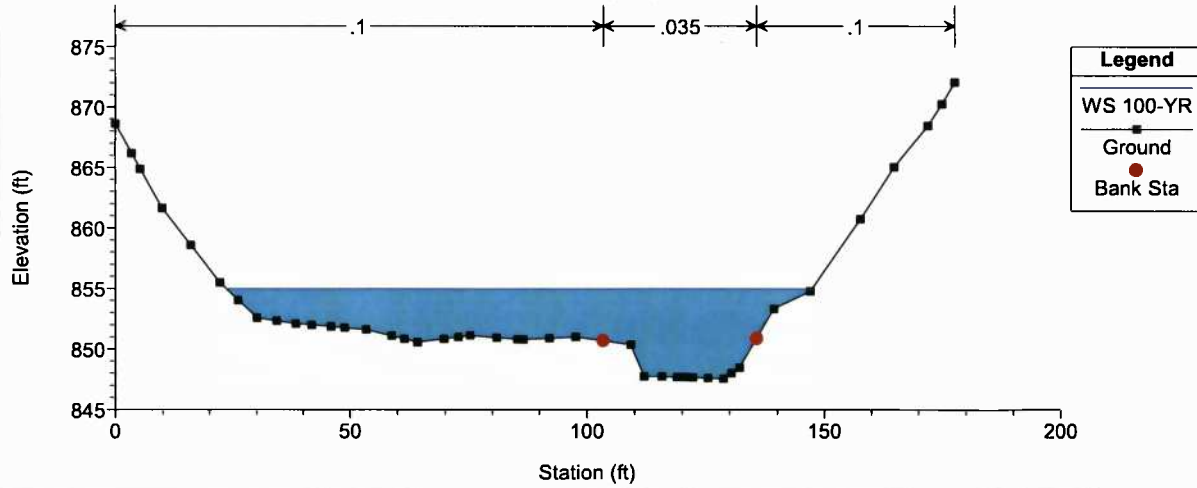
171149-he-cras analysis Plan: 171149-proposed-analysis-revised 4/5/2017  
 RS = 3210.37



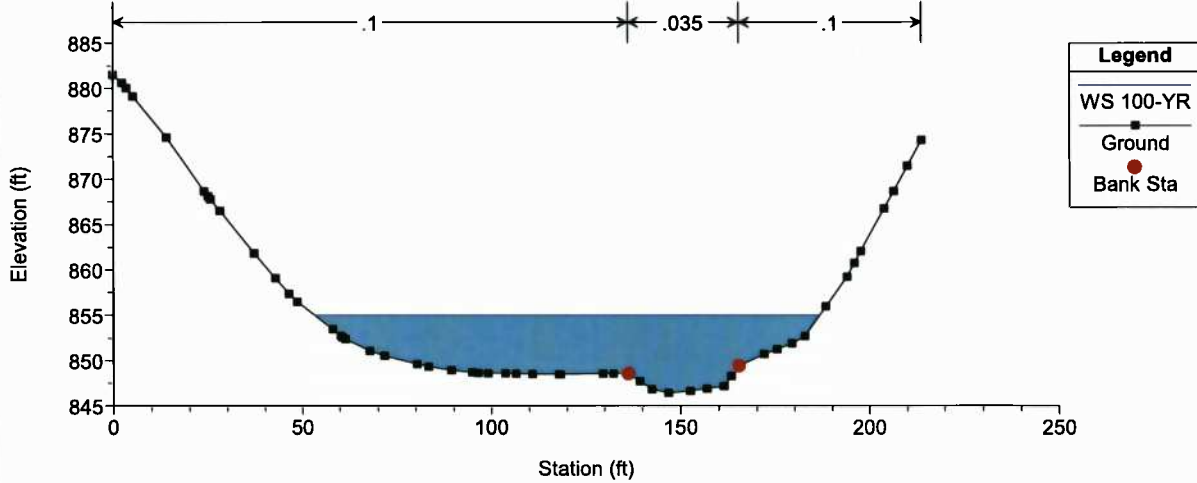
171149-he-cras analysis Plan: 171149-proposed-analysis-revised 4/5/2017  
 RS = 3106.56



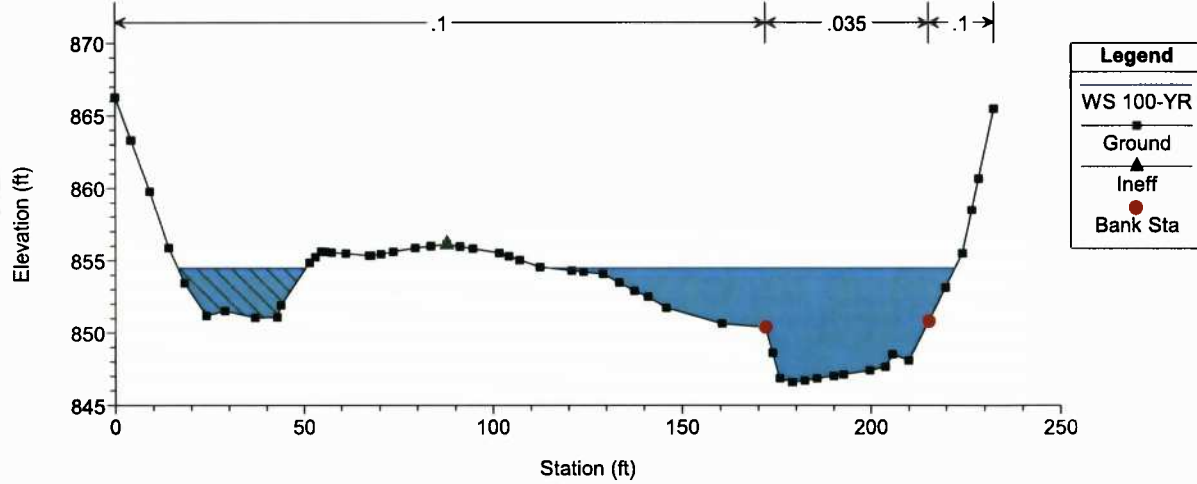
171149-he-cras analysis Plan: 171149-proposed-analysis-revised 4/5/2017  
 RS = 3021.02



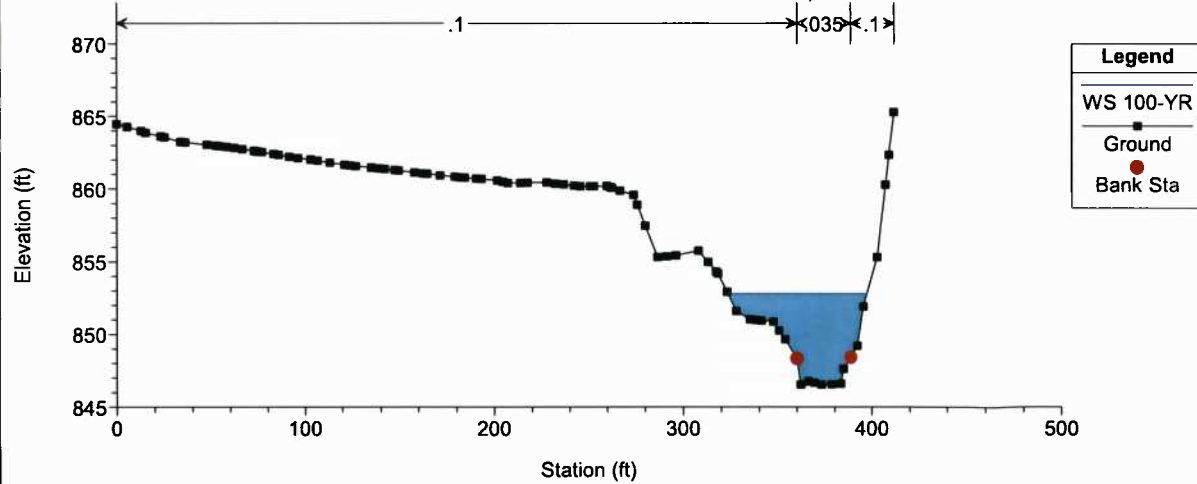
171149-he-cras analysis Plan: 171149-proposed-analysis-revised 4/5/2017  
 RS = 2906.64

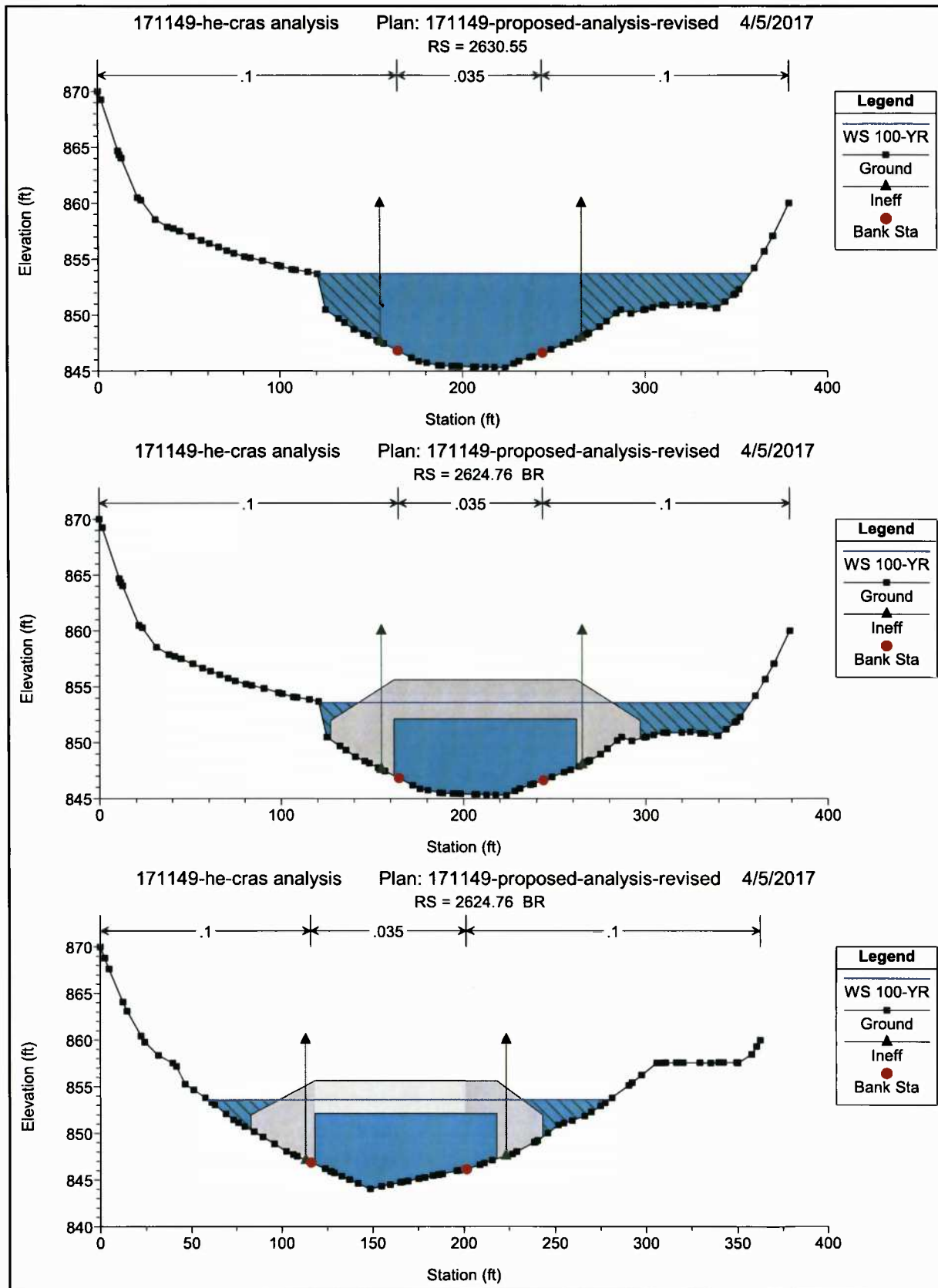


171149-he-cras analysis Plan: 171149-proposed-analysis-revised 4/5/2017  
 RS = 2807.26

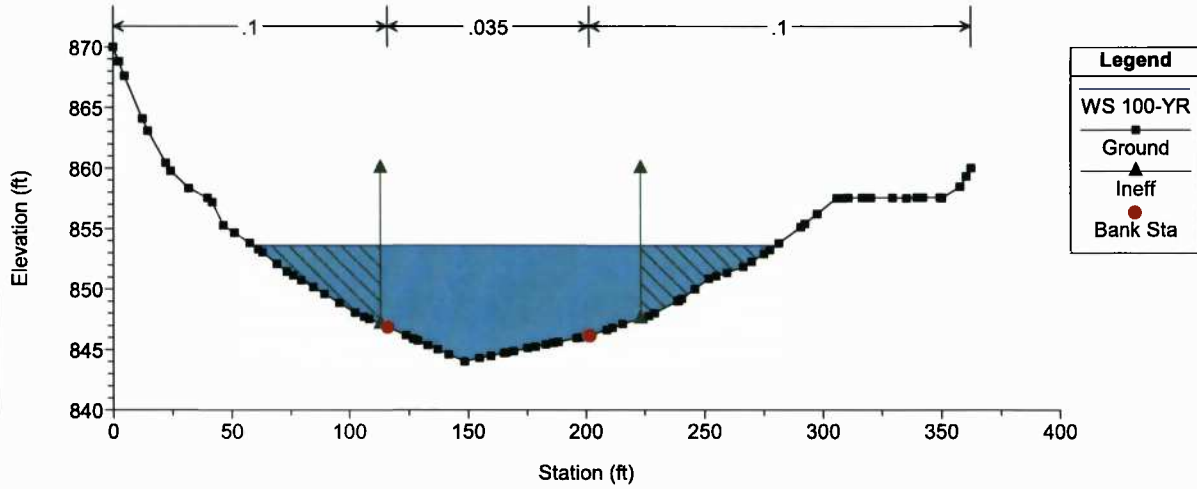


171149-he-cras analysis Plan: 171149-proposed-analysis-revised 4/5/2017  
 RS = 2757.33

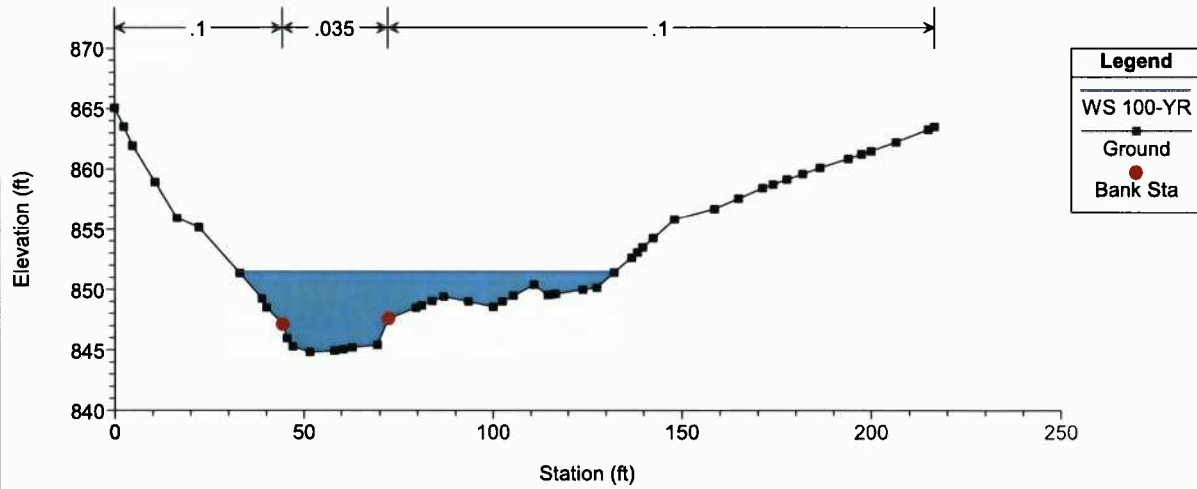




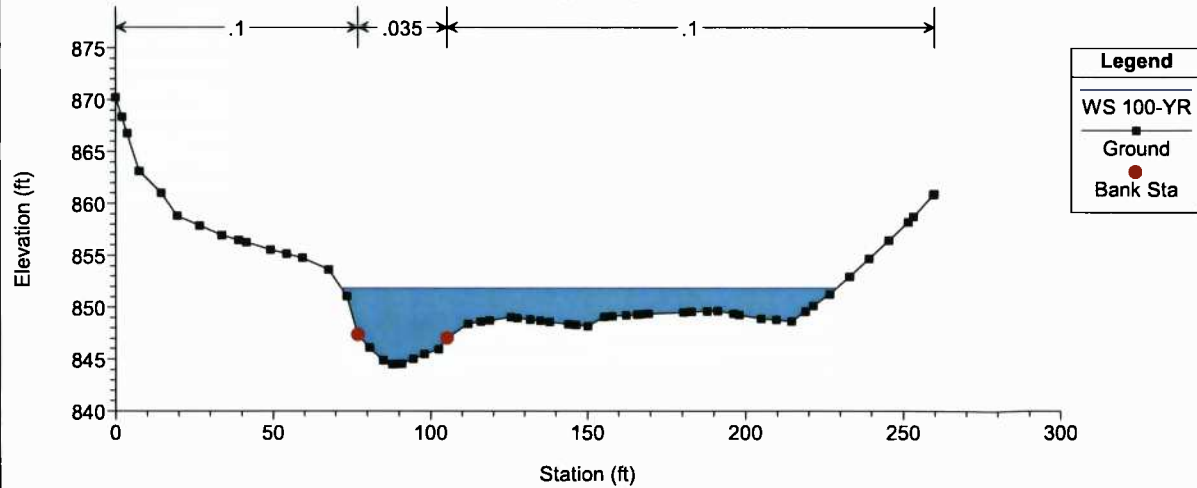
171149-he-cras analysis Plan: 171149-proposed-analysis-revised 4/5/2017  
RS = 2597.1



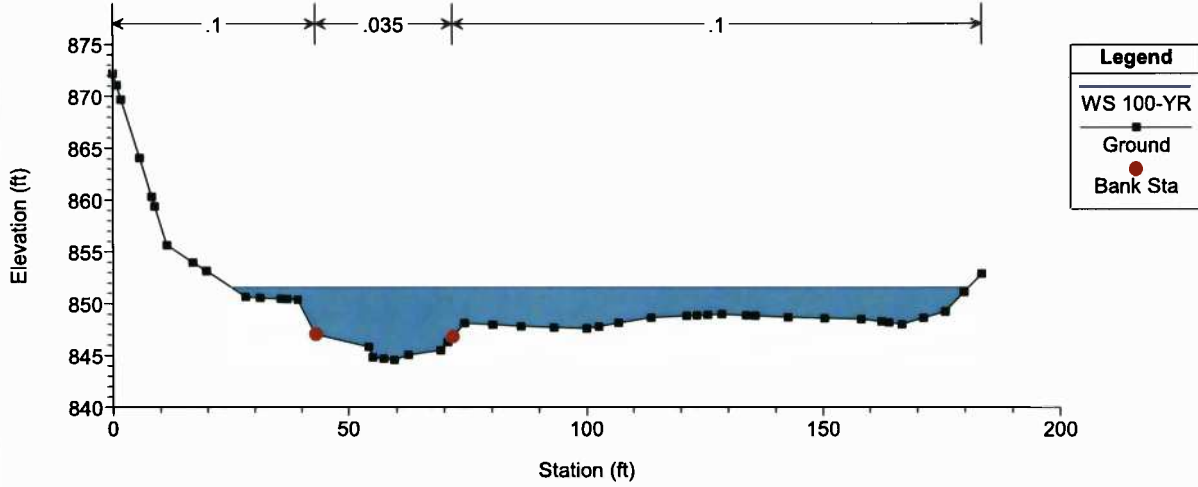
171149-he-cras analysis Plan: 171149-proposed-analysis-revised 4/5/2017  
RS = 2517.5



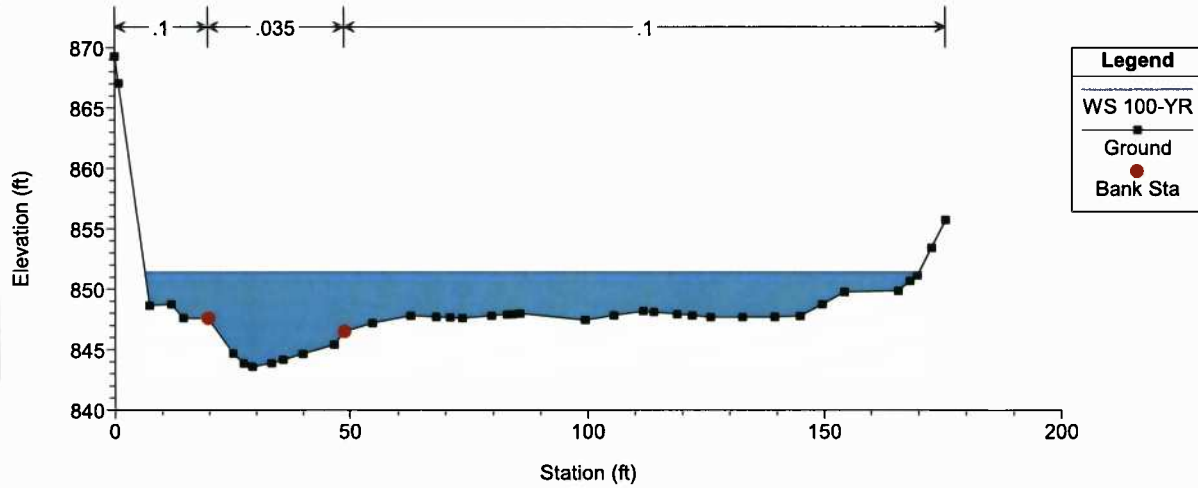
171149-he-cras analysis Plan: 171149-proposed-analysis-revised 4/5/2017  
RS = 2475.27



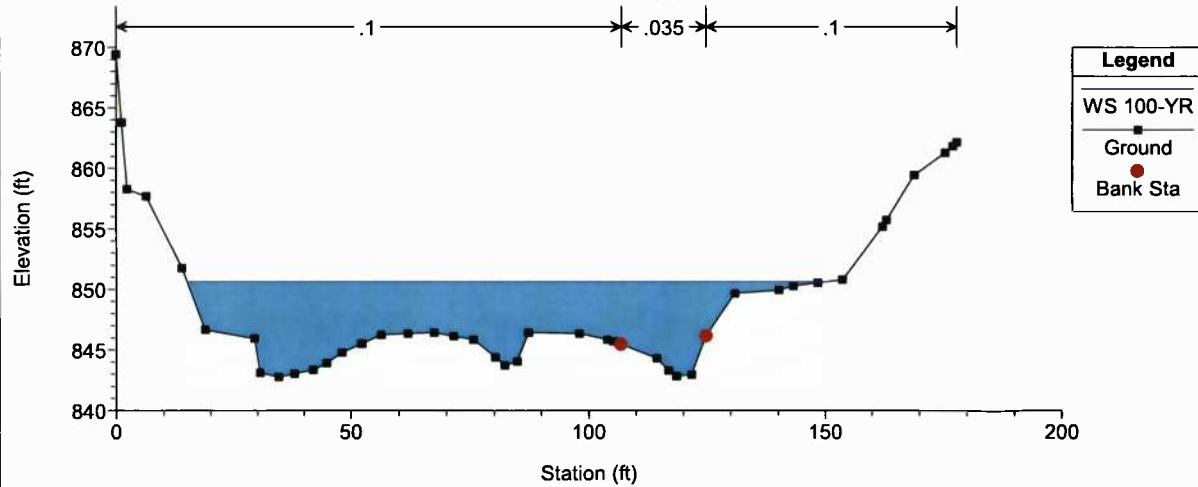
171149-he-cras analysis Plan: 171149-proposed-analysis-revised 4/5/2017  
RS = 2395.33



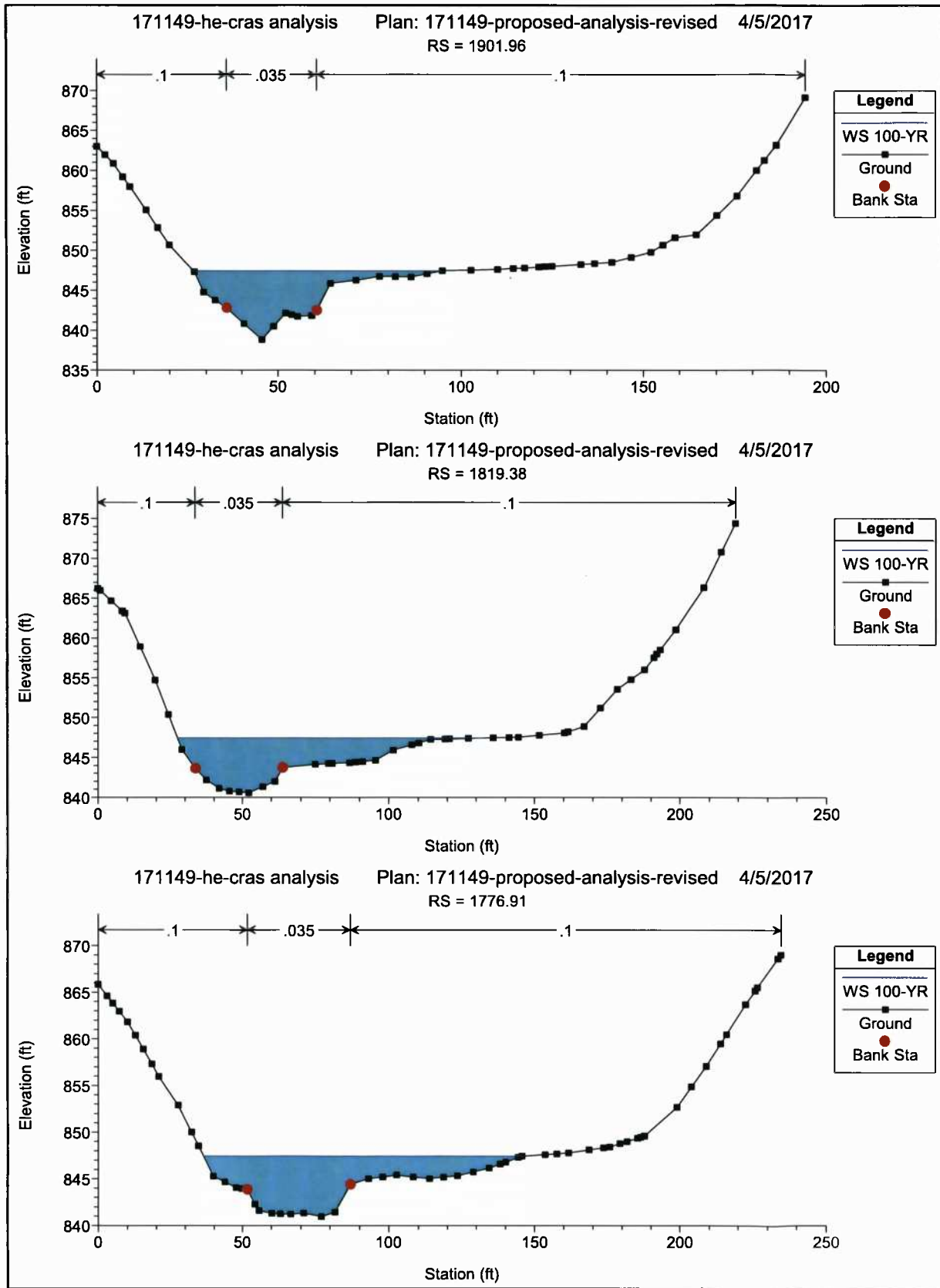
171149-he-cras analysis Plan: 171149-proposed-analysis-revised 4/5/2017  
RS = 2296.43



171149-he-cras analysis Plan: 171149-proposed-analysis-revised 4/5/2017  
RS = 2049.28







**APPENDIX F**  
**HEC-RAS Output Files**

171149-hrcrasanaly.rep

HEC-RAS HEC-RAS 5.0.3 September 2016  
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: 171149-he-cras analysis  
Project File : 171149-hrcrasanaly.prj  
Run Date and Time: 4/11/2017 1:56:02 PM

Project in English units

PLAN DATA

Plan Title: 171149-existing-analysis-revised  
Plan File : p:\2017\171-149\Calculations\HEC-RAS\171149-hrcrasanaly.p03

Geometry Title: 171149-existing geo  
Geometry File :  
p:\2017\171-149\Calculations\HEC-RAS\171149-hrcrasanaly.g01

Flow Title : 171149-steady-flow-data  
Flow File :  
p:\2017\171-149\Calculations\HEC-RAS\171149-hrcrasanaly.f01

Plan Summary Information:

Number of: Cross Sections	=	22	Multiple Openings	=	0
Culverts	=	0	Inline Structures	=	0
Bridges	=	0	Lateral Structures	=	0

Computational Information

Water surface calculation tolerance = 0.01

171149-hrcrasanaly.rep

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: 171149-steady-flow-data  
Flow File : p:\2017\171-149\Calculations\HEC-RAS\171149-hrcrasanaly.f01

Flow Data (cfs)

River	Reach	RS	100-YR
Bluestone Creek	Alignment - (1)	4197.97	2250

Boundary Conditions

River	Reach	Profile	Upstream
Bluestone Creek	Alignment - (1)	100-YR	

Bluestone Creek Alignment - (1) 100-YR  
Normal S = 0.0054

GEOMETRY DATA

Geometry Title: 171149-existing geo  
Geometry File : p:\2017\171-149\Calculations\HEC-RAS\171149-hrcrasanaly.g01

CROSS SECTION

RIVER: Bluestone Creek

REACH: Alignment - (1) RS: 4197.97

INPUT

Description:

Station Elevation Data										num=	48
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev		
0	875.73	130005	873.75	6.26001	871.89	910004	869.57	13.55	867.34		
19.44	862.99	25.32001	858.64	29.10001	857.2	29.8	854.54	32.36	854.26		
34.06	854.17	35.76001	854.07	40.03	854.34	44.02	854.5	48.02	854.66		
50.03	854.95	45.04001	855.13	56.48	855.72	60.91	856.31	66.26001	856.49		
71.61	856.67	77.01	857.11	82.41	857.56	90.26	857.63	98.12	857.71		
102.63	857.76	104.93	857.79	107.14	857.81	113.85	859.3	120.55	860.79		
128.32	861.3	131.05	861.47	136.08	861.8	138.75	861.94	141.23	862.07		
144.41	862.24	148.38	862.45	152.73	862.69	156.61	862.94	161.15	863.24		
167	863.62	169.57	863.79	176.18	865.07	181.99	867.66	192.71	872.61		
197.41	875	203.6	878.17	203.69	878.21						

Manning's n Values						num=	3
Sta	n Val	Sta	n Val	Sta	n Val		
0	.129	10001	.035	60.91	.1		

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	29.10001	60.91		213.45	213.45	213.45		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 3984.5

INPUT

Description:

Station Elevation Data										num=	59
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev		
0	882.07	1.490005	881.48	3.290009	880.75	3.869995	880.52	8.850006	879.85		
14.61	877.32	20.43001	874.77	21.82001	874.16	27.00999	871.88	31.95	869.71		
34.36	868.65	34.78	868.47	35.79001	867.95	44.19	863.63	49.2	861.99		
54.21	860.35	64.45	859.87	65.99001	859.83	67.10001	859.87	73.18001	859.64		
81.92	859.41	86.57001	859.28	90.62	859.17	96.45	859.02	99.32001	858.94		
103.43	858.86	106.17	858.81	109.17	858.76	119.01	858.58	124.51	857.64		
126.59	857.29	128.24	857.01	130.01	856.71	134.6	856.92	137.19	857.03		
141.42	857.22	144.38	857.35	148.29	857.47	152.2	857.59	159.5	854.9		
166.23	854.8	169.27	854.3	172.3	853.79	177.09	852.24	179.07	852.07		
181.05	851.89	188.83	851.62	191.04	851.89	193.24	852.15	198.12	852.3		
201.69	856.22	204.5	858.65	208.49	859.49	212.39	861.12	217.86	870.67		
225.71	877.31	229.67	880.58	231.69	882.5	237.33	887.91				

Manning's n Values						num=	3
--------------------	--	--	--	--	--	------	---

171149-hrcrasanaly.rep

Sta n Val Sta n Val Sta n Val  
 0 .1 152.2 .035 204.5 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 152.2 204.5 215.05 215.05 215.05 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 3769.43

INPUT

Description:

Station Elevation Data num= 56

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	874.948	809998	870.7	15.38	867.73	18.8	866.1	23.89	864.34
28.78999	862.2535	75999	860.4538	78999	859.85	46.53	859.08	47.33	858.99
50.95999	858.656	59999	858.0764	34999	857.21	67.98	856.81	70.61	856.42
79.34999	855.1483	34999	854.3891	28999	856.17	94.58	854.32	97.86	852.46
98.81999	851.57	99.78	850.69	103.6	850.8	107.42	850.91	115.68	851.01
119.88	850.85	122.79	850.72	125.7	850.58	127.23	852.2	128.76	853.82
133.17	853.97	137.58	854.12	144.51	854.41	147.42	854.54	151.45	854.71
157.12	854.64	162.8	854.56	168.8	855.11	174.8	855.65	179.81	856.26
181.36	856.45	182.91	856.64	185.58	856.97	191.01	857.64	193.36	857.84
195.49	858.02	199.97	858.41	203.75	860.44	207.54	862.48	214.48	866.59
221.42	870.71	222.96	871.27	224.26	871.74	224.5	871.83	233.95	875.28
240.81	878.12								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1 94.58 .035 128.76 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 94.58 128.76 228.5 214.4 198.8 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 3555.05

INPUT

Description:

Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	873.433	819992	869.997	849991	866.3514	03999	861.49	15.23	860
17.17999	857.57	20.33	853.64	23.14	852.1825	95999	850.72	30.95	850.58

171149-hrcrasanaly.rep

36.81	850.43	41.94	850.645.78999	850.64	49.92	850.73	52.89	851.56
56.57999	851.58	58.09	852.99	65.46	853.04	72	855.2180.50999	855.92
87.48	855.76	94.46	855.5999.50999	855.88	104.55	856.17	110.39	856.14
116.22	856.11	122.33	856.36	128.43	856.61	132.37	856.72	134.7
140.97	856.97	145.19	858.36	150.13	860	153.26	861.03	158.71
161.36	864.63	162.37	865.31	164.25	866.58	169.78	870.32	174.75
179.09	875.49							

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	20.33	.035	58.09	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	20.33	58.09		200.4	200.4		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 3354.63

INPUT  
 Description:

Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	875.484.649994	872.549.419998	869.5311.89999	866.24	14.39	862.96			
22.34	855.79	29.55	855.07	30.61	854.9736.75999	854.3540.70999	853.98		
44.08	853.67	47.52	853.34	51.39	852.9857.03999	852.88	62.69	852.78	
67.16	851.61	71.63	850.43	75.89	849.67	77.46	849.42	79.03	849.17
81.22	849.09	83.42	849.01	85.41	849.2187.39999	849.4188.75999	849.5		
90.11	849.59	91.53	850.19	97	850.7	104.05	851.98	112.06	851.66
116.74	851.88	121.43	852.09	130.46	853.36	134.7	853.96	139.49	854.63
142.43	854.98	145.37	855.33	149.24	857.97	153.11	860.62	159.19	863.54
165.27	866.47	170.34	868.32	175.4	870.17	184.15	873.6	189.47	875.66
194.31	877.51								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	67.16	.035	104.05	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	67.16	104.05		141.9	144.27		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 3210.37

171149-hrcrasanaly.rep

INPUT

Description:

Station Elevation Data		num= 41									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	873.872	970001	872.21	6.75	870.0913	74001	866.19	18.77	863.07		
23.77	860	26.11	858.7629	20001	857.1734	62001	854.439	64001	854.28		
44.66	854.1652	83001	854.3354	36001	854.3655	97001	854.458	23001	854.44		
61.01001	854.566	93001	853.8872	85001	853.2579	04001	852.9985	23001	852.74		
90.2	851.56	101.81	851.37	103.58	851.21	105.36	851.04	107.33	850.18		
109.3	849.31	114.32	849.12	119.34	848.94	125.18	849.04	128.3	849		
131.41	848.97	137.52	849.35	140.83	850.26	142.19	851.47	143.55	852.69		
148.83	853.92	151.85	858.43	154.88	862.95	161.56	864.79	166.24	867.42		
167.07	869.51										

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.1	103.58	.035	142.19	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	103.58	142.19		103.8	103.8	.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 3106.56

INPUT

Description:

Station Elevation Data		num= 42									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	873.44	3.25	871.246	299988	869.17	12.59	864.9116	76999	862.05		
20.93999	859.19	24.73	857.4825	15999	857.2828	51999	855.76	33.98	853.76		
41.73	853.5144	95999	853.4648	67999	853.4155	63999	853.3	61.84	853.48		
68.03999	853.6570	32999	853.62	73.73	853.57	79.41	853.48	84.16	852.18		
92.49	851.9999	38999	851.91	104.83	850.71	105.75	849.12	106.68	847.52		
109.92	847.89	113.63	848.09	117.35	848.28	120.31	848.12	123.26	847.96		
125.36	848.32	127.46	848.69	133.71	849	138.37	849.07	139.33	850.35		
143.99	852.66	148.87	854	152.95	857.65	157.03	861.3	161.21	864.25		
163.13	865.61	169.01	869.7								

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.199	38999	.035	143.99	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	99.38999	143.99		99.63	103.8	.1	.3



CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 3021.02

INPUT

Description:

Station Elevation Data		num= 44									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	868.593	410004	866.175	230011	864.889	809998	861.641	5.99001	858.56		
22.17	855.482	6.12001	854.03	30.08	852.583	4.32001	852.333	8.46001	852.08		
41.83	851.98	45.88	851.85	48.77	851.76	53.3	851.61	58.72	851.09		
61.41	850.83	64.15	850.57	69.73	850.84	72.72	850.997	5.32001	851.11		
80.91	850.958	5.32001	850.818	6.50001	850.78	92.02	850.89	97.54	851		
103.42	850.68	109.31	850.35	112.12	847.73	115.8	847.74	118.99	847.69		
120.64	847.67	122.19	847.65	125.44	847.6	128.69	847.55	130.38	848		
132.07	848.45	135.69	850.88	139.31	853.31	147.04	854.76	157.68	860.75		
164.75	865.03	171.95	868.45	174.93	870.25	177.52	872.05				

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.1	103.42	.035	135.69	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	103.42	135.69		114.39	114.39	.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 2906.64

INPUT

Description:

Station Elevation Data		num= 54									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	881.492	410004	880.613	4.70001	880.065	5.190002	879.16	13.97	874.63		
23.97	868.69	24.94	868.14	25.53	867.8	28.03	866.52	37.09	861.82		
42.75999	859.08	46.41	857.38	48.66	856.515	8.09999	853.46	60.22	852.71		
60.72	852.566	1.53999	852.396	7.87999	851.1	71.78	850.538	0.31999	849.63		
83.34	849.35	89.35	848.949	4.89999	848.72	96.5	848.64	99.1	848.59		
103.66	848.59	106.46	848.56	110.82	848.53	117.89	848.5	118.03	848.5		
118.25	848.5	129.59	848.57	132.29	848.56	136.2	848.56	139.34	847.71		
142.49	846.85	146.9	846.44	152.55	846.66	156.95	846.91	161.34	847.17		
163.27	848.29	165.2	849.42	171.92	850.7	175.35	851.25	179.29	851.89		
182.65	852.69	188.25	855.97	193.85	859.26	195.84	860.76	197.57	862.06		

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203.84 866.78 206.38 868.69 210.04 871.45 213.7 874.3

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1 136.2 .035 165.2 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 136.2 165.2 99.38 99.38 99.38 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 2807.26

INPUT

Description:

Station Elevation Data num= 55  

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	866.294	150009	863.339	040009	859.8	14.03	855.861	18.15001	853.44
23.91	851.18	28.86	851.533	36.90001	851.05	42.83	851.07	43.77	851.91
51.41	854.84	52.97	855.22	54.53	855.655	55.65001	855.58	57.36	855.54
61.14	855.47	67.25	855.346	7.76001	855.33	70.34	855.44	73.59	855.59
79.42	855.84	83.56	855.96	87.7	856.09	91.17	855.949	94.65001	855.79
101.61	855.5	104.21	855.27	107.03	855.01	112.45	854.52	120.83	854.29
123.96	854.21	129.2	854.06	133.49	853.46	137.5	852.89	141.08	852.49
145.8	851.71	160.44	850.64	171.9	850.37	173.79	848.61	175.68	846.84
178.98	846.59	182.27	846.71	185.57	846.84	189.99	847.01	192.59	847.12
199.62	847.4	203.78	847.66	205.64	848.51	209.91	848.11	215.28	850.78
219.71	853.13	224.14	855.47	226.62	858.48	228.44	860.67	232.41	865.48

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1 171.9 .035 215.28 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 171.9 215.28 49.93 49.93 49.93 .1 .3

Ineffective Flow num= 1  
 Sta L Sta R Elev Permanent  
 0 87.7 856.09 F

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 2757.33

INPUT

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Description:

Station Elevation Data		num= 91							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	864.485	360016	864.2812	76999	864	15.22	863.8823	20001	863.62
25.08002	863.55	33.62	863.26	34.94	863.2336	14001	863.2147	67001	863.05
52.42001	862.9854	70001	862.94	58.28	862.89	62.28	862.83	66.47	862.75
72.64001	862.6274	45001	862.5876	89999	862.5383	08002	862.4185	79001	862.35
91.51001	862.2396	20999	862.14	102.8	862.02	106.64	861.94	113.29	861.82
120.91	861.67	123.74	861.63	126.83	861.59	135.16	861.47	139.11	861.41
142.03	861.37	147.25	861.3	149.41	861.27	157.78	861.14	162.42	861.07
164.36	861.05	171.26	860.94	179.31	860.83	181.49	860.8	184.38	860.77
190.48	860.71	193.27	860.68	201.65	860.59	204.47	860.5	207.29	860.41
213.89	860.42	217.54	860.43	227.8	860.45	232.22	860.38	236.76	860.31
242.34	860.22	245.73	860.17	250.93	860.18	252.75	860.18	259.77	860.19
261.48	860.12	262.48	860.08	266.85	859.89	273.92	859.59	275.9	858.91
280.2	857.45	286.48	855.31	291.31	855.36	296.13	855.41	307.98	855.73
313.04	854.96	317.27	854.32	318.1	854.19	323.04	852.9	327.98	851.6
335.1	851.01	338.39	850.97	341.24	850.94	347.38	850.87	350.64	850.26
353.9	849.65	359.88	848.31	362.13	846.54	366.03	846.77	369.32	846.66
373.12	846.53	378.38	846.56	383.22	846.6	384.7	847.62	388.38	848.41
392.06	849.2	395.28	851.91	402.72	855.31	407.19	860.29	409.03	862.35
411.69	865.27								

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.1	359.88	.035	388.38	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	359.88	388.38		50.04	50.04	.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 2707.29

INPUT

Description:

Station Elevation Data		num= 57							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	866.72	3599854	866.65	9599915	866.523	289993	866.047	119995	865.24
11.98999	864.2316	42999	861.1223	26999	857.7828	92999	857.6131	50999	857.53
34.81	857.43	40.87	857.0446	89999	856.6551	42999	857.27	52.56	857.92
53.7	858.5860	40999	858.38	67.17	858.1868	95999	858.1170	15999	858.06
72.87999	857.96	73.95	857.92	78.59	857.7586	50999	857.0192	65999	856.43
94.42	856.27	101.21	856.35	107.6	857.28	112.21	857	115.11	856.82
116.82	856.72	122.18	856.5	127.54	856.29	132.28	855.87	135.38	855.6
143.23	854.92	151.36	851.71	153.5	850.87	158.14	850.87	162.81	850.86

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168.63	850.32	174.48	849.78	175.38	848.2	176.29	846.61	179.83	846.57
183.38	846.52	188.39	846.26	193.41	846	200.05	846.17	206.68	846.34
207.73	847.52	208.78	848.69	218.39	851.71	226.64	852.01	230.28	855.89
234	859.84	235.43	861.37						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	174.48	.035	208.78	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	174.48	208.78		120.9	122.82	125.49	.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 2630.55

INPUT

Description:

Station Elevation Data num= 85

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	8701.73	0011	869.25	10.75	864.69	11.61	002	864.33	12.62	864.04
21.48	860.52	35001	860.29	31.37	858.55	38.20	001	857.89	41.23	857.73
44.82	857.51	51.12	857.06	56.48	856.67	61	856.46	66.29	001	856.08
70.88	855.76	74.79	855.52	80.75	855.23	83.92	999	855.11	90.63	854.84
98.48	854.46	100.51	854.38	106.66	854.07	108.57	854.03	115.47	853.87	
120.52	853.7	124.9	850.5	132.17	849.69	135.48	849.33	140.67	848.75	
145.77	848.35	148.19	848.16	153.07	847.77	156.87	847.46	164.53	846.83	
172.11	846.2	176	845.88	180.39	845.74	186.88	845.52	188.52	845.48	
194.04	845.45	196.84	845.44	198.43	845.43	205.86	845.39	207.43	845.38	
212.59	845.35	217.65	845.33	223.52	845.3	228.12	845.67	231	845.89	
236.73	846.23	238.32	846.32	243.55	846.64	248.51	846.94	255.21	847.36	
258.67	847.57	263.34	847.86	267.68	848.27	268.59	848.36	268.84	848.38	
269.3	848.43	275.14	848.98	278.99	849.47	284.44	850.18	286.9	850.5	
292.49	850.17	299.41	850.48	300.49	850.52	304.35	850.69	309.63	850.9	
311.67	850.88	319.85	850.91	324.48	850.97	330.07	850.84	332.47	850.83	
339.01	850.64	339.59	850.63	344.01	851.21	348.59	851.83	349.75	851.93	
351.71	852.31	359.91	854.2	365.34	855.67	370.07	857.05	378.97	860	

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	164.53	.035	243.55	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	164.53	243.55		33.45	33.45	33.45	.1	.3

CROSS SECTION

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RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 2597.1

INPUT

Description:

Station Elevation Data num= 85									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	8702.369995	868.794.700012	867.62	12.22	864.0914.46002	863.08			
22.06	860.44	24.22	859.76	31.91	858.3539.74002	857.2			
46.48001	855.28	51.03	854.6857.57001	853.82	61.12	853.3262.89999	853.05		
69.07001	852.1	73.37	851.4576.07001	851.1479.58002	850.7484.64001	850.17			
89.39999	849.63	95.66	848.87	102.36	848.06	106.07	847.73	108.29	847.54
115.92	846.86	123.61	846.19	126.65	845.93	127.04	845.89	128.66	845.75
132.88	845.39	137.04	845.03	141.72	844.62	148.38	844.04	154.65	844.3
159.51	844.49	165.16	844.72	166.07	844.76	169.16	844.88	175.1	845.12
178.52	845.26	182.82	845.43	186.18	845.57	188.13	845.65	196.07	845.96
197.51	846.01	201.34	846.16	208.7	846.64	211.24	846.82	215.59	847.12
226.56	847.78	228.97	848.03	238.47	849.04	238.9	849.09	238.92	849.09
240.31	849.24	245.81	850.03	251.75	850.89	254.82	851.09	259.38	851.39
266.28	851.85	269.74	852.29	274.87	852.94	277.44	853.27	281.21	853.8
290.58	855.14	292.34	855.42	297.59	856.23	305.91	857.53	308.78	857.52
310.64	857.56	316.57	857.56	318.5	857.56	319.1	857.56	320.26	857.56
329.42	857.56	335.32	857.53	339.74	857.58	342.05	857.58	349.4	857.58
349.91	857.58	350.06	857.53	357.76	858.48	360.39	859.3	362.29	860

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.1	115.92	.035	201.34	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	115.92	201.34		79.6	79.6		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 2517.5

INPUT

Description:

Station Elevation Data num= 51									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	865.08	2.37001	863.514.730011	861.94	10.61	858.9416.48001	855.94		
22.18001	855.16	32.97	851.34	38.83	849.2640.10001	848.51	44.36	847.12	
45.63	845.96	47.08	845.2851.62001	844.82	58.13	844.92	60.44	845.06	
62.76001	845.2	69.36	845.42	72.22	847.5879.57001	848.49	81.06	848.68	

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83.89	849.03	86.91	849.41	93.44	849	99.98	848.58	102.52	849.01
105.44	849.5	110.9	850.42	114.66	849.55	115.67	849.6	116.66	849.65
123.86	849.99	127.54	850.16	132.19	851.4	136.84	852.64	138.39	853.07
139.85	853.49	142.56	854.25	148.06	855.81	158.57	856.7	164.92	857.57
171.27	858.44	173.98	858.74	177.69	859.15	181.86	859.61	186.49	860.12
193.84	860.87	197.44	861.24	200	861.5	206.51	862.24	215.04	863.28
216.66	863.51								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	44.36	.035	72.22	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	44.36	72.22		43.11	42.23		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 2475.27

INPUT

Description:

Station Elevation Data num= 61

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	870.24	2	868.333.650024	866.767.450012	863.1314.39001				861
19.59001	858.8226.64001	857.87	33.69	856.9238.96001	856.4541.40001				856.24
49.10001	855.5554.20001	855.1659.31001	854.7667.74001	853.6373.57001					851.03
77.00002	847.36	80.66	846.11	85.05	844.8887.85001	844.589.34001			844.52
90.84001	844.5494.47002	845.0298.09001	845.49	102.58	845.94	105.16			847.03
111.91	848.39	115.97	848.59	118.76	848.72	125.63	849.05	127.56	848.97
131.77	848.8	135.01	848.68	137.94	848.56	144.02	848.37	146.31	848.3
150.1	848.19	155.36	849.08	157.97	849.13	162.47	849.23	165.86	849.29
166.9	849.32	169.44	849.37	180.29	849.5	182.89	849.54	187.78	849.6
191.13	849.64	196.19	849.37	198	849.27	204.88	848.91	209.7	848.78
214.52	848.64	218.9	849.59	221.37	850.12	226.66	851.26	232.9	852.96
239.14	854.66	245.37	856.42	251.59	858.19	253.17	858.71	259.54	860.83
259.76	860.91								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.177.00002	.035	105.16	.1	

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	77.00002	105.16		84.08	79.94		.1	.3

CROSS SECTION

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RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 2395.33

INPUT

Description:

Station Elevation Data		num= 47									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	872.27700043	871.071.729996	869.665.580002	864.06	8.12001	860.34					
8.779999	859.38	11.34	855.64	16.88	853.99	19.73	853.14	28.13	850.64		
31.18001	850.5735.62001	850.48	36.97	850.4539.24001	850.4	43.02	847.06				
54.26001	845.8355.04001	844.81	57.29	844.69	59.54	844.57	62.48	845.05			
69.24001	845.5270.78001	846.3271.74001	846.82	74.25	848.1280.21001	847.98					
86.17001	847.84	93.08	847.7299.99001	847.61	102.56	847.81	106.87	848.14			
113.75	848.67	121.18	848.83	123.34	848.88	125.65	848.93	128.61	849		
133.76	848.88	135.65	848.84	142.69	848.68	150.42	848.59	158.15	848.5		
162.47	848.26	164.01	848.17	166.78	848.02	171.29	848.62	175.81	849.22		
179.81	851.11	183.55	852.87								

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.1	43.02	.03571.74001		.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	43.0271.74001		108.8	98.9	92.64	.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 2296.43

INPUT

Description:

Station Elevation Data		num= 40									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	869.27.7799988	867.037.229996	848.64	11.87	848.7514.50999	847.59					
19.66	847.57	25.11	844.68	27.3	843.85	29.19	843.56	33.31	843.87		
35.75	844.16	39.95	844.65	46.64	845.4	48.7	846.49	54.65	847.2		
62.67	847.8	68.1	847.71	70.97	847.66	73.52	847.61	79.6	847.8		
82.88	847.9	84.18	847.94	85.69	847.99	99.37	847.45	105.56	847.82		
111.76	848.19	113.93	848.11	118.88	847.93	122.05	847.82	126.01	847.68		
132.75	847.69	139.5	847.7	144.89	847.77	149.59	848.76	154.28	849.76		
165.72	849.88	168.22	850.68	169.69	851.15	172.66	853.43	175.64	855.71		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.1	19.66	.035	48.7	.1

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Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
19.66	48.7	249.3 247.15	248.95	.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 2049.28

INPUT

Description:

Station Elevation Data	num=	43
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
0 869.431.150009	863.782.270004	858.276.279999
18.81001 846.6729.45001	845.9530.59001	843.1234.54001
41.94 843.35 44.78	843.9148.07001	844.7752.18001
61.86001 846.3467.43001	846.4271.53001	846.1275.64001
82.2 843.73 84.87	844.0387.22001	846.4297.99001
105.26 845.72 106.94	845.47 114.4	844.31 116.92
121.75 842.95 124.82	846.16 130.89	849.66 140.22
148.53 850.53 153.7	850.78 162.2	855.18 163.07
175.46 861.31 177.06	861.87 177.85	862.17

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
0 .1 106.94	.035	124.82 .1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
106.94	124.82	157.5 147.33	152.1	.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 1901.96

INPUT

Description:

Station Elevation Data	num=	48
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
0 8632.259995	861.954.540009	860.897.100006
13.43001 855.05 16.64	852.8619.85001	850.67 26.8
32.54001 843.7935.74001	842.81 40.67	840.83 45.61
52.10001 842.15 53.69	841.9555.29001	841.74 59.2
64.3 845.8871.31001	846.27 77.67	846.76 82.03
90.63 847.09 94.88	847.47 102.69	847.54 110.11
117.54 847.81 121.4	847.92 123.11	847.97 125.03
		848.02 132.93
		848.25



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136.66	848.36	141.42	848.5	146.77	849.14	152.12	849.78	155.45	850.69
158.79	851.6	164.58	851.95	170.18	854.38	175.78	856.81	181.11	859.98
183.22	861.25	186.43	863.16	194.33	869.17				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.135	74001	.035	60.56	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	35.74001	60.56		82.58	82.58		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 1819.38

INPUT

Description:

Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	866.23	7899933	865.974	639999	864.688	429993	863.419	309998	863.12
14.48999	858.92	19.66	854.71	24.31	850.35	28.97	845.99	33.59	843.61
37.31999	842.16	41.8	841.14	45.39	840.77	48.84	840.68	52.28	840.58
57.13	841.34	61.25	842	63.86	843.7174	92999	844.1579	45999	844.23
80.78999	844.2586	64999	844.35	88.7	844.42	91.06	844.49	95.47	844.64
101.55	845.91	107.92	846.58	110.28	846.83	114.3	847.25	119.23	847.3
120.28	847.32	120.76	847.32	127.23	847.39	135.86	847.46	141.27	847.49
144.49	847.52	151.67	847.76	160.28	848.06	161.5	848.21	167	848.87
172.66	851.19	178.37	853.54	183.06	854.76	187.76	855.99	191	857.5
192	857.97	193.18	858.52	198.59	861.06	208.1	866.35	214.13	870.79
219.06	874.41								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	33.59	.035	63.86	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	33.59	63.86		43	42.47		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 1776.91

INPUT

Description:

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Station Elevation Data num= 60									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	865.843	050003	864.635	030014	863.837	220001	862.961	060001	861.83
12.76001	860.3715	46001	858.9118	42001	857.31	20.86	855.9827	59001	852.87
32.19	85034.56001		848.53	39.75	845.29	43.83	844.6747	90001	844.06
49.84001	843.9651	78001	843.8654	42001	842.3	55.77	841.660	18001	841.29
63.03001	841.2566	56001	841.2270	98001	841.33	77	840.9681	71001	841.44
86.95001	844.41	93.08	845.02	97.91	845.21	102.74	845.4	108.31	845.21
113.87	845.03	118.66	845.18	123.44	845.34	128.93	845.74	134.41	846.15
138.18	846.58	140.02	846.79	144.42	847.29	145.63	847.43	153.66	847.6
157.67	847.69	161.7	847.78	168.73	848.11	173.67	848.34	175.76	848.43
179.33	848.78	181.75	849.01	185.41	849.36	186.44	849.46	187.73	849.59
198.95	852.67	203.93	854.86	208.92	857.06	213.88	859.48	215.95	860.49
222.55	863.7	225.77	865.17	226.58	865.53	233.56	868.66	234.57	869.04

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.151	78001	.035	86.95001	.1

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	51.7800	186.95001		.1	.3

SUMMARY OF MANNING'S N VALUES

River: Bluestone Creek

Reach	River Sta.	n1	n2	n3
Alignment - (1)	4197.97	.1	.035	.1
Alignment - (1)	3984.5	.1	.035	.1
Alignment - (1)	3769.43	.1	.035	.1
Alignment - (1)	3555.05	.1	.035	.1
Alignment - (1)	3354.63	.1	.035	.1
Alignment - (1)	3210.37	.1	.035	.1
Alignment - (1)	3106.56	.1	.035	.1
Alignment - (1)	3021.02	.1	.035	.1
Alignment - (1)	2906.64	.1	.035	.1
Alignment - (1)	2807.26	.1	.035	.1
Alignment - (1)	2757.33	.1	.035	.1
Alignment - (1)	2707.29	.1	.035	.1
Alignment - (1)	2630.55	.1	.035	.1
Alignment - (1)	2597.1	.1	.035	.1
Alignment - (1)	2517.5	.1	.035	.1
Alignment - (1)	2475.27	.1	.035	.1
Alignment - (1)	2395.33	.1	.035	.1
Alignment - (1)	2296.43	.1	.035	.1

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Alignment - (1)	2049.28	.1	.035	.1
Alignment - (1)	1901.96	.1	.035	.1
Alignment - (1)	1819.38	.1	.035	.1
Alignment - (1)	1776.91	.1	.035	.1

SUMMARY OF REACH LENGTHS

River: Bluestone Creek

Reach	River Sta.	Left	Channel	Right
Alignment - (1)	4197.97	213.45	213.45	213.45
Alignment - (1)	3984.5	215.05	215.05	215.05
Alignment - (1)	3769.43	228.5	214.4	198.8
Alignment - (1)	3555.05	200.4	200.4	200.4
Alignment - (1)	3354.63	141.9	144.27	145.89
Alignment - (1)	3210.37	103.8	103.8	103.8
Alignment - (1)	3106.56	99.63	103.8	104.07
Alignment - (1)	3021.02	114.39	114.39	114.39
Alignment - (1)	2906.64	99.38	99.38	99.38
Alignment - (1)	2807.26	49.93	49.93	49.93
Alignment - (1)	2757.33	50.04	50.04	50.04
Alignment - (1)	2707.29	120.9	122.82	125.49
Alignment - (1)	2630.55	33.45	33.45	33.45
Alignment - (1)	2597.1	79.6	79.6	79.6
Alignment - (1)	2517.5	43.11	42.23	40.43
Alignment - (1)	2475.27	84.08	79.94	71.14
Alignment - (1)	2395.33	108.8	98.9	92.64
Alignment - (1)	2296.43	249.3	247.15	248.95
Alignment - (1)	2049.28	157.5	147.33	152.1
Alignment - (1)	1901.96	82.58	82.58	82.58
Alignment - (1)	1819.38	43	42.47	41.93
Alignment - (1)	1776.91			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Bluestone Creek

Reach	River Sta.	Contr.	Expan.
Alignment - (1)	4197.97	.1	.3
Alignment - (1)	3984.5	.1	.3

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Alignment - (1)	3769.43	.1	.3
Alignment - (1)	3555.05	.1	.3
Alignment - (1)	3354.63	.1	.3
Alignment - (1)	3210.37	.1	.3
Alignment - (1)	3106.56	.1	.3
Alignment - (1)	3021.02	.1	.3
Alignment - (1)	2906.64	.1	.3
Alignment - (1)	2807.26	.1	.3
Alignment - (1)	2757.33	.1	.3
Alignment - (1)	2707.29	.1	.3
Alignment - (1)	2630.55	.1	.3
Alignment - (1)	2597.1	.1	.3
Alignment - (1)	2517.5	.1	.3
Alignment - (1)	2475.27	.1	.3
Alignment - (1)	2395.33	.1	.3
Alignment - (1)	2296.43	.1	.3
Alignment - (1)	2049.28	.1	.3
Alignment - (1)	1901.96	.1	.3
Alignment - (1)	1819.38	.1	.3
Alignment - (1)	1776.91	.1	.3

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HEC-RAS HEC-RAS 5.0.3 September 2016  
U.S. Army Corps of Engineers  
Hydrologic Engineering Center  
609 Second Street  
Davis, California

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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: 171149-he-cras analysis  
Project File : 171149-hrcrasanaly.prj  
Run Date and Time: 4/5/2017 3:45:49 PM

Project in English units

PLAN DATA

Plan Title: 171149-proposed-analysis-revised  
Plan File : p:\2017\171-149\Calculations\HEC-RAS\171149-hrcrasanaly.p04

Geometry Title: 171149-proposed geo  
Geometry File :  
p:\2017\171-149\Calculations\HEC-RAS\171149-hrcrasanaly.g02

Flow Title : 171149-steady-flow-data  
Flow File :  
p:\2017\171-149\Calculations\HEC-RAS\171149-hrcrasanaly.f01

Plan Summary Information:

Number of:	Cross Sections =	22	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	1	Lateral Structures =	0

Computational Information

Water surface calculation tolerance = 0.01

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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: 171149-steady-flow-data  
Flow File : p:\2017\171-149-Calculations\HEC-RAS\171149-hrcrasanaly.f01

Flow Data (cfs)

River	Reach	RS	100-YR
Bluestone Creek	Alignment - (1)	4197.97	2250

Boundary Conditions

River	Reach	Profile	Upstream
	Downstream		

Bluestone Creek Alignment - (1) 100-YR  
Normal S = 0.0054

GEOMETRY DATA

Geometry Title: 171149-proposed geo  
Geometry File : p:\2017\171-149-Calculations\HEC-RAS\171149-hrcrasanaly.g02

CROSS SECTION

RIVER: Bluestone Creek

REACH: Alignment - (1) RS: 4197.97

INPUT

Description:

Station Elevation Data num= 48									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	875.73	130005	873.75	6.26001	871.89	910004	869.57	13.55	867.34
19.44	862.99	25.32001	858.64	29.10001	857.2	29.8	854.54	32.36	854.26
34.06	854.17	35.76001	854.07	40.03	854.34	44.02	854.5	48.02	854.66
50.03	854.95	2.04001	855.13	56.48	855.72	60.91	856.31	66.26001	856.49
71.61	856.67	77.01	857.11	82.41	857.56	90.26	857.63	98.12	857.71
102.63	857.76	104.93	857.79	107.14	857.81	113.85	859.3	120.55	860.79
128.32	861.3	131.05	861.47	136.08	861.8	138.75	861.94	141.23	862.07
144.41	862.24	148.38	862.45	152.73	862.69	156.61	862.94	161.15	863.24
167	863.62	169.57	863.79	176.18	865.07	181.99	867.66	192.71	872.61
197.41	875	203.6	878.17	203.69	878.21				

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.129	10001	.035	60.91	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	29.10001	60.91		213.45	213.45	213.45	.1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 3984.5

INPUT

Description:

Station Elevation Data num= 59									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	882.07	1.490005	881.48	3.290009	880.75	3.869995	880.52	8.850006	879.85
14.61	877.32	20.43001	874.77	21.82001	874.16	27.00999	871.88	31.95	869.71
34.36	868.65	34.78	868.47	35.79001	867.95	44.19	863.63	49.2	861.99
54.21	860.35	64.45	859.87	65.99001	859.83	67.10001	859.87	73.18001	859.64
81.92	859.41	86.57001	859.28	90.62	859.17	96.45	859.02	99.32001	858.94
103.43	858.86	106.17	858.81	109.17	858.76	119.01	858.58	124.51	857.64
126.59	857.29	128.24	857.01	130.01	856.71	134.6	856.92	137.19	857.03
141.42	857.22	144.38	857.35	148.29	857.47	152.2	857.59	159.5	854.9
166.23	854.8	169.27	854.3	172.3	853.79	177.09	852.24	179.07	852.07
181.05	851.89	188.83	851.62	191.04	851.89	193.24	852.15	198.12	852.3
201.69	856.22	204.5	858.65	208.49	859.49	212.39	861.12	217.86	870.67
225.71	877.31	229.67	880.58	231.69	882.5	237.33	887.91		

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

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Sta	n Val	Sta	n Val	Sta	n Val
0	.1	152.2	.035	204.5	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	152.2	204.5		215.05	215.05		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 3769.43

INPUT

Description:

Station Elevation Data	num=	56
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
0 874.948 809998 870.7 15.38 867.73 18.8 866.1 23.89 864.34		
28.78999 862.2535 75999 860.4538 78999 859.85 46.53 859.08 47.33 858.99		
50.95999 858.656 59999 858.0764 34999 857.21 67.98 856.81 70.61 856.42		
79.34999 855.1483 34999 854.3891 28999 856.17 94.58 854.32 97.86 852.46		
98.81999 851.57 99.78 850.69 103.6 850.8 107.42 850.91 115.68 851.01		
119.88 850.85 122.79 850.72 125.7 850.58 127.23 852.2 128.76 853.82		
133.17 853.97 137.58 854.12 144.51 854.41 147.42 854.54 151.45 854.71		
157.12 854.64 162.8 854.56 168.8 855.11 174.8 855.65 179.81 856.26		
181.36 856.45 182.91 856.64 185.58 856.97 191.01 857.64 193.36 857.84		
195.49 858.02 199.97 858.41 203.75 860.44 207.54 862.48 214.48 866.59		
221.42 870.71 222.96 871.27 224.26 871.74 224.5 871.83 233.95 875.28		
240.81 878.12		

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
0 .1 94.58 .035 128.76 .1		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	94.58	128.76		228.5	214.4		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 3555.05

INPUT

Description:

Station Elevation Data	num=	41
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
0 873.433 819992 869.997 849991 866.3514 03999 861.49 15.23 860		
17.17999 857.57 20.33 853.64 23.14 852.1825 95999 850.72 30.95 850.58		



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36.81	850.43	41.94	850.645.78999	850.64	49.92	850.73	52.89	851.56
56.57999	851.58	58.09	852.99	65.46	853.04	72	855.2180.50999	855.92
87.48	855.76	94.46	855.5999.50999	855.88	104.55	856.17	110.39	856.14
116.22	856.11	122.33	856.36	128.43	856.61	132.37	856.72	134.7
140.97	856.97	145.19	858.36	150.13	860	153.26	861.03	158.71
161.36	864.63	162.37	865.31	164.25	866.58	169.78	870.32	174.75
179.09	875.49							

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	20.33	.035	58.09	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	20.33	58.09		200.4	200.4		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 3354.63

INPUT

Description:

Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	875.484.649994	872.549.419998	869.5311.89999	866.24	14.39	862.96			
22.34	855.79	29.55	855.07	30.61	854.9736.75999	854.3540.70999	853.98		
44.08	853.67	47.52	853.34	51.39	852.9857.03999	852.88	62.69	852.78	
67.16	851.61	71.63	850.43	75.89	849.67	77.46	849.42	79.03	849.17
81.22	849.09	83.42	849.01	85.41	849.2187.39999	849.4188.75999	849.5		
90.11	849.59	91.53	850.19	97	850.7	104.05	851.98	112.06	851.66
116.74	851.88	121.43	852.09	130.46	853.36	134.7	853.96	139.49	854.63
142.43	854.98	145.37	855.33	149.24	857.97	153.11	860.62	159.19	863.54
165.27	866.47	170.34	868.32	175.4	870.17	184.15	873.6	189.47	875.66
194.31	877.51								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	67.16	.035	104.05	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	67.16	104.05		141.9	144.27	145.89	.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 3210.37

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INPUT

Description:

Station Elevation Data		num= 41							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	873.872	970001	872.21	6.75	870.0913	74001	866.19	18.77	863.07
23.77	860	26.11	858.7629	20001	857.1734	62001	854.439	64001	854.28
44.66	854.1652	83001	854.3354	36001	854.3655	97001	854.458	23001	854.44
61.01001	854.566	93001	853.8872	85001	853.2579	04001	852.9985	23001	852.74
90.2	851.56	101.81	851.37	103.58	851.21	105.36	851.04	107.33	850.18
109.3	849.31	114.32	849.12	119.34	848.94	125.18	849.04	128.3	849
131.41	848.97	137.52	849.35	140.83	850.26	142.19	851.47	143.55	852.69
148.83	853.92	151.85	858.43	154.88	862.95	161.56	864.79	166.24	867.42
167.07	869.51								

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.1	103.58	.035
		142.19	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	103.58	142.19		103.8	103.8	.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 3106.56

INPUT

Description:

Station Elevation Data		num= 42							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	873.44	3.25	871.246	299988	869.17	12.59	864.9116	76999	862.05
20.93999	859.19	24.73	857.4825	15999	857.2828	51999	855.76	33.98	853.76
41.73	853.5144	95999	853.4648	67999	853.4155	63999	853.3	61.84	853.48
68.03999	853.6570	32999	853.62	73.73	853.57	79.41	853.48	84.16	852.18
92.49	851.9999	38999	851.91	104.83	850.71	105.75	849.12	106.68	847.52
109.92	847.89	113.63	848.09	117.35	848.28	120.31	848.12	123.26	847.96
125.36	848.32	127.46	848.69	133.71	849	138.37	849.07	139.33	850.35
143.99	852.66	148.87	854	152.95	857.65	157.03	861.3	161.21	864.25
163.13	865.61	169.01	869.7						

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.199	38999	.035
		143.99	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	99.38999	143.99		99.63	103.8	104.07	.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 3021.02

INPUT

Description:

Station Elevation Data				num=	44				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	868.593	410004	866.175	230011	864.889	809998	861.641	599001	858.56
22.17	855.482	612001	854.03	30.08	852.583	432001	852.333	846001	852.08
41.83	851.98	45.88	851.85	48.77	851.76	53.3	851.61	58.72	851.09
61.41	850.83	64.15	850.57	69.73	850.84	72.72	850.997	532001	851.11
80.91	850.958	532001	850.818	650001	850.78	92.02	850.89	97.54	851
103.42	850.68	109.31	850.35	112.12	847.73	115.8	847.74	118.99	847.69
120.64	847.67	122.19	847.65	125.44	847.6	128.69	847.55	130.38	848
132.07	848.45	135.69	850.88	139.31	853.31	147.04	854.76	157.68	860.75
164.75	865.03	171.95	868.45	174.93	870.25	177.52	872.05		

Manning's n Values				num=	3		
Sta	n Val	Sta	n Val	Sta	n Val		
0	.1	103.42	.035	135.69	.1		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	103.42	135.69		114.39	114.39	.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 2906.64

INPUT

Description:

Station Elevation Data				num=	54				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	881.492	410004	880.613	470001	880.065	190002	879.16	13.97	874.63
23.97	868.69	24.94	868.14	25.53	867.8	28.03	866.52	37.09	861.82
42.75999	859.08	46.41	857.38	48.66	856.515	809999	853.46	60.22	852.71
60.72	852.566	153999	852.396	787999	851.1	71.78	850.538	8031999	849.63
83.34	849.35	89.35	848.949	489999	848.72	96.5	848.64	99.1	848.59
103.66	848.59	106.46	848.56	110.82	848.53	117.89	848.5	118.03	848.5
118.25	848.5	129.59	848.57	132.29	848.56	136.2	848.56	139.34	847.71
142.49	846.85	146.9	846.44	152.55	846.66	156.95	846.91	161.34	847.17
163.27	848.29	165.2	849.42	171.92	850.7	175.35	851.25	179.29	851.89
182.65	852.69	188.25	855.97	193.85	859.26	195.84	860.76	197.57	862.06

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203.84 866.78 206.38 868.69 210.04 871.45 213.7 874.3

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1 136.2 .035 165.2 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 136.2 165.2 99.38 99.38 99.38 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 2807.26

INPUT

Description:

Station Elevation Data num= 55  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 0 866.294.150009 863.339.040009 859.8 14.03 855.8618.15001 853.44  
 23.91 851.18 28.86 851.5336.90001 851.05 42.83 851.07 43.77 851.91  
 51.41 854.84 52.97 855.22 54.53 855.655.65001 855.58 57.36 855.54  
 61.14 855.47 67.25 855.3467.76001 855.33 70.34 855.44 73.59 855.59  
 79.42 855.84 83.56 855.96 87.7 856.09 91.17 855.9494.65001 855.79  
 101.61 855.5 104.21 855.27 107.03 855.01 112.45 854.52 120.83 854.29  
 123.96 854.21 129.2 854.06 133.49 853.46 137.5 852.89 141.08 852.49  
 145.8 851.71 160.44 850.64 171.9 850.37 173.79 848.61 175.68 846.84  
 178.98 846.59 182.27 846.71 185.57 846.84 189.99 847.01 192.59 847.12  
 199.62 847.4 203.78 847.66 205.64 848.51 209.91 848.11 215.28 850.78  
 219.71 853.13 224.14 855.47 226.62 858.48 228.44 860.67 232.41 865.48

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1 171.9 .035 215.28 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 171.9 215.28 49.93 49.93 49.93 .1 .3

Ineffective Flow num= 1  
 Sta L Sta R Elev Permanent  
 0 87.7 856.09 F

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 2757.33

INPUT

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Description:

Station Elevation Data										num=	91
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	864.485	360016	864.2812	76999	864	15.22	863.8823	20001	863.62		
25.08002	863.55	33.62	863.26	34.94	863.2336	14001	863.2147	67001	863.05		
52.42001	862.9854	70001	862.94	58.28	862.89	62.28	862.83	66.47	862.75		
72.64001	862.6274	45001	862.5876	89999	862.5383	08002	862.4185	79001	862.35		
91.51001	862.2396	20999	862.14	102.8	862.02	106.64	861.94	113.29	861.82		
120.91	861.67	123.74	861.63	126.83	861.59	135.16	861.47	139.11	861.41		
142.03	861.37	147.25	861.3	149.41	861.27	157.78	861.14	162.42	861.07		
164.36	861.05	171.26	860.94	179.31	860.83	181.49	860.8	184.38	860.77		
190.48	860.71	193.27	860.68	201.65	860.59	204.47	860.5	207.29	860.41		
213.89	860.42	217.54	860.43	227.8	860.45	232.22	860.38	236.76	860.31		
242.34	860.22	245.73	860.17	250.93	860.18	252.75	860.18	259.77	860.19		
261.48	860.12	262.48	860.08	266.85	859.89	273.92	859.59	275.9	858.91		
280.2	857.45	286.48	855.31	291.31	855.36	296.13	855.41	307.98	855.73		
313.04	854.96	317.27	854.32	318.1	854.19	323.04	852.9	327.98	851.6		
335.1	851.01	338.39	850.97	341.24	850.94	347.38	850.87	350.64	850.26		
353.9	849.65	359.88	848.31	362.13	846.54	366.03	846.77	369.32	846.66		
373.12	846.53	378.38	846.56	383.22	846.6	384.7	847.62	388.38	848.41		
392.06	849.2	395.28	851.91	402.72	855.31	407.19	860.29	409.03	862.35		
411.69	865.27										

Manning's n Values						num=	3
Sta	n Val	Sta	n Val	Sta	n Val		
0	.1	359.88	.035	388.38	.1		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	359.88	388.38		50.04	50.04		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 2707.29

INPUT

Description:

Station Elevation Data										num=	57
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	866.72	3599854	866.65	9599915	866.523	289993	866.047	119995	865.24		
11.98999	864.2316	42999	861.1223	26999	857.7828	92999	857.6131	50999	857.53		
34.81	857.43	40.87	857.0446	89999	856.6551	42999	857.27	52.56	857.92		
53.7	858.5860	40999	858.38	67.17	858.1868	95999	858.1170	15999	858.06		
72.87999	857.96	73.95	857.92	78.59	857.7586	50999	857.0192	65999	856.43		
94.42	856.27	101.21	856.35	107.6	857.28	112.21	857	115.11	856.82		
116.82	856.72	122.18	856.5	127.54	856.29	132.28	855.87	135.38	855.6		
143.23	854.92	151.36	851.71	153.5	850.87	158.14	850.87	162.81	850.86		

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168.63	850.32	174.48	849.78	175.38	848.2	176.29	846.61	179.83	846.57
183.38	846.52	188.39	846.26	193.41	846	200.05	846.17	206.68	846.34
207.73	847.52	208.78	848.69	218.39	851.71	226.64	852.01	230.28	855.89
234	859.84	235.43	861.37						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	174.48	.035	208.78	.1

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

174.48	208.78	120.9	122.82	125.49	.1	.3
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CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 2630.55

INPUT

Description:

Station Elevation Data num= 85

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	870.17	300.11	869.25	10.75	864.69	11.61	864.33	12.62	864.04
21.48	860.52	350.01	860.29	31.37	858.55	38.20	857.89	41.23	857.73
44.82	857.51	51.12	857.06	56.48	856.67	61	856.46	66.29	856.08
70.88	855.76	74.79	855.52	80.75	855.23	83.92	855.11	90.63	854.84
98.48	854.46	100.51	854.38	106.66	854.07	108.57	854.03	115.47	853.87
120.52	853.7	124.9	850.5	132.17	849.69	135.48	849.33	140.67	848.75
145.77	848.35	148.19	848.16	153.07	847.77	156.87	847.46	164.53	846.83
172.11	846.2	176	845.88	180.39	845.74	186.88	845.52	188.52	845.48
194.04	845.45	196.84	845.44	198.43	845.43	205.86	845.39	207.43	845.38
212.59	845.35	217.65	845.33	223.52	845.3	228.12	845.67	231	845.89
236.73	846.23	238.32	846.32	243.55	846.64	248.51	846.94	255.21	847.36
258.67	847.57	263.34	847.86	267.68	848.27	268.59	848.36	268.84	848.38
269.3	848.43	275.14	848.98	278.99	849.47	284.44	850.18	286.9	850.5
292.49	850.17	299.41	850.48	300.49	850.52	304.35	850.69	309.63	850.9
311.67	850.88	319.85	850.91	324.48	850.97	330.07	850.84	332.47	850.83
339.01	850.64	339.59	850.63	344.01	851.21	348.59	851.83	349.75	851.93
351.71	852.31	359.91	854.2	365.34	855.67	370.07	857.05	378.97	860

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	164.53	.035	243.55	.1

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

164.53	243.55	33.45	33.45	33.45	.3	.5
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
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0 155 860 F  
 265 378.97 860 F

BRIDGE

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 2624.76

INPUT

Description:

Distance from Upstream XS = 5  
 Deck/Roadway Width = 16  
 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	Sta	Hi Cord	Lo Cord
127	852	840	162	855.63	840	162	855.63	852.13			
212	855.63	852.13	262	855.63	852.13	262	855.63	840			
297	852	840									

Upstream Bridge Cross Section Data

Station	Elevation	Data	num=	85							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	8701.73	0011	869.25	10.75	864.69	11.61	002	864.33	12.62	864.04	
21.48	860.52	35001	860.29	31.37	858.55	38.20	001	857.89	41.23	857.73	
44.82	857.51	51.12	857.06	56.48	856.67	61	856.46	66.29	001	856.08	
70.88	855.76	74.79	855.52	80.75	855.23	83.92	92999	855.11	90.63	854.84	
98.48	854.46	100.51	854.38	106.66	854.07	108.57	854.03	115.47	853.87		
120.52	853.7	124.9	850.5	132.17	849.69	135.48	849.33	140.67	848.75		
145.77	848.35	148.19	848.16	153.07	847.77	156.87	847.46	164.53	846.83		
172.11	846.2	176	845.88	180.39	845.74	186.88	845.52	188.52	845.48		
194.04	845.45	196.84	845.44	198.43	845.43	205.86	845.39	207.43	845.38		
212.59	845.35	217.65	845.33	223.52	845.3	228.12	845.67	231	845.89		
236.73	846.23	238.32	846.32	243.55	846.64	248.51	846.94	255.21	847.36		
258.67	847.57	263.34	847.86	267.68	848.27	268.59	848.36	268.84	848.38		
269.3	848.43	275.14	848.98	278.99	849.47	284.44	850.18	286.9	850.5		
292.49	850.17	299.41	850.48	300.49	850.52	304.35	850.69	309.63	850.9		
311.67	850.88	319.85	850.91	324.48	850.97	330.07	850.84	332.47	850.83		
339.01	850.64	339.59	850.63	344.01	851.21	348.59	851.83	349.75	851.93		
351.71	852.31	359.91	854.2	365.34	855.67	370.07	857.05	378.97	860		

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.1	164.53	.035	243.55	.1

Bank Sta: Left Right Coeff Contr. Expan.  
 164.53 243.55 .3 .5

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Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 0 155 860 F  
 265 378.97 860 F

Downstream Deck/Roadway Coordinates

num= 7  
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord  
 83 852 840 118 855.63 840 118 855.63 852.13  
 168 855.63 852.13 218 855.63 852.13 218 855.63 840  
 243 852 840

Downstream Bridge Cross Section Data

Station Elevation Data num= 85  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 0 870.236995 868.794700012 867.62 12.22 864.0914.46002 863.08  
 22.06 860.44 24.22 859.76 31.91 858.3539.74002 857.5541.76001 857.2  
 46.48001 855.28 51.03 854.6857.57001 853.82 61.12 853.3262.89999 853.05  
 69.07001 852.1 73.37 851.4576.07001 851.1479.58002 850.7484.64001 850.17  
 89.39999 849.63 95.66 848.87 102.36 848.06 106.07 847.73 108.29 847.54  
 115.92 846.86 123.61 846.19 126.65 845.93 127.04 845.89 128.66 845.75  
 132.88 845.39 137.04 845.03 141.72 844.62 148.38 844.04 154.65 844.3  
 159.51 844.49 165.16 844.72 166.07 844.76 169.16 844.88 175.1 845.12  
 178.52 845.26 182.82 845.43 186.18 845.57 188.13 845.65 196.07 845.96  
 197.51 846.01 201.34 846.16 208.7 846.64 211.24 846.82 215.59 847.12  
 226.56 847.78 228.97 848.03 238.47 849.04 238.9 849.09 238.92 849.09  
 240.31 849.24 245.81 850.03 251.75 850.89 254.82 851.09 259.38 851.39  
 266.28 851.85 269.74 852.29 274.87 852.94 277.44 853.27 281.21 853.8  
 290.58 855.14 292.34 855.42 297.59 856.23 305.91 857.53 308.78 857.52  
 310.64 857.56 316.57 857.56 318.5 857.56 319.1 857.56 320.26 857.56  
 329.42 857.56 335.32 857.53 339.74 857.58 342.05 857.58 349.4 857.58  
 349.91 857.58 350.06 857.53 357.76 858.48 360.39 859.3 362.29 860

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1 115.92 .035 201.34 .1

Bank Sta: Left Right Coeff Contr. Expan.  
 115.92 201.34 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 0 113 860 F  
 223 362.29 860 F

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 =



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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: Alignment - (1) RS: 2597.1

INPUT

Description:

Station Elevation Data		num= 85									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	8702.369995	868.794.700012	867.62	12.22	864.0914.46002	863.08					
22.06	860.44	24.22	859.76	31.91	858.3539.74002	857.2					
46.48001	855.28	51.03	854.6857.57001	853.82	61.12	853.3262.89999	853.05				
69.07001	852.1	73.37	851.4576.07001	851.1479.58002		850.7484.64001	850.17				
89.39999	849.63	95.66	848.87	102.36	848.06	106.07	847.73	108.29	847.54		
115.92	846.86	123.61	846.19	126.65	845.93	127.04	845.89	128.66	845.75		
132.88	845.39	137.04	845.03	141.72	844.62	148.38	844.04	154.65	844.3		
159.51	844.49	165.16	844.72	166.07	844.76	169.16	844.88	175.1	845.12		
178.52	845.26	182.82	845.43	186.18	845.57	188.13	845.65	196.07	845.96		
197.51	846.01	201.34	846.16	208.7	846.64	211.24	846.82	215.59	847.12		
226.56	847.78	228.97	848.03	238.47	849.04	238.9	849.09	238.92	849.09		
240.31	849.24	245.81	850.03	251.75	850.89	254.82	851.09	259.38	851.39		
266.28	851.85	269.74	852.29	274.87	852.94	277.44	853.27	281.21	853.8		
290.58	855.14	292.34	855.42	297.59	856.23	305.91	857.53	308.78	857.52		
310.64	857.56	316.57	857.56	318.5	857.56	319.1	857.56	320.26	857.56		
329.42	857.56	335.32	857.53	339.74	857.58	342.05	857.58	349.4	857.58		
349.91	857.58	350.06	857.53	357.76	858.48	360.39	859.3	362.29	860		

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Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1 115.92 .035 201.34 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 115.92 201.34 79.6 79.6 79.6 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 0 113 860 F  
 223 362.29 860 F

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 2517.5

INPUT

Description:

Station Elevation Data num= 51  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 0 865.08 2.37001 863.514.730011 861.94 10.61 858.9416.48001 855.94  
 22.18001 855.16 32.97 851.34 38.83 849.2640.10001 848.51 44.36 847.12  
 45.63 845.96 47.08 845.2851.62001 844.82 58.13 844.92 60.44 845.06  
 62.76001 845.2 69.36 845.42 72.22 847.5879.57001 848.49 81.06 848.68  
 83.89 849.03 86.91 849.41 93.44 849 99.98 848.58 102.52 849.01  
 105.44 849.5 110.9 850.42 114.66 849.55 115.67 849.6 116.66 849.65  
 123.86 849.99 127.54 850.16 132.19 851.4 136.84 852.64 138.39 853.07  
 139.85 853.49 142.56 854.25 148.06 855.81 158.57 856.7 164.92 857.57  
 171.27 858.44 173.98 858.74 177.69 859.15 181.86 859.61 186.49 860.12  
 193.84 860.87 197.44 861.24 200 861.5 206.51 862.24 215.04 863.28  
 216.66 863.51

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1 44.36 .035 72.22 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 44.36 72.22 43.11 42.23 40.43 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 2475.27

INPUT

Description:

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Station Elevation Data		num= 61							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	870.24	2	868.333	650024	866.767	450012	863.1314	39001	861
19.59001	858.8226	64001	857.87	33.69	856.9238	96001	856.4541	40001	856.24
49.10001	855.5554	20001	855.1659	31001	854.7667	74001	853.6373	57001	851.03
77.00002	847.36	80.66	846.11	85.05	844.8887	85001	844.589	34001	844.52
90.84001	844.5494	47002	845.0298	09001	845.49	102.58	845.94	105.16	847.03
111.91	848.39	115.97	848.59	118.76	848.72	125.63	849.05	127.56	848.97
131.77	848.8	135.01	848.68	137.94	848.56	144.02	848.37	146.31	848.3
150.1	848.19	155.36	849.08	157.97	849.13	162.47	849.23	165.86	849.29
166.9	849.32	169.44	849.37	180.29	849.5	182.89	849.54	187.78	849.6
191.13	849.64	196.19	849.37	198	849.27	204.88	848.91	209.7	848.78
214.52	848.64	218.9	849.59	221.37	850.12	226.66	851.26	232.9	852.96
239.14	854.66	245.37	856.42	251.59	858.19	253.17	858.71	259.54	860.83
259.76	860.91								

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.177	00002	.035	105.16	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
77.00002	105.16		84.08	79.94	71.14	.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 2395.33

INPUT

Description:

Station Elevation Data		num= 47							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	872.2	7700043	871.071	729996	869.665	580002	864.06	8.12001	860.34
8.779999	859.38	11.34	855.64	16.88	853.99	19.73	853.14	28.13	850.64
31.18001	850.5735	62001	850.48	36.97	850.4539	24001	850.4	43.02	847.06
54.26001	845.8355	04001	844.81	57.29	844.69	59.54	844.57	62.48	845.05
69.24001	845.5270	78001	846.3271	74001	846.82	74.25	848.1280	21001	847.98
86.17001	847.84	93.08	847.7299	99001	847.61	102.56	847.81	106.87	848.14
113.75	848.67	121.18	848.83	123.34	848.88	125.65	848.93	128.61	849
133.76	848.88	135.65	848.84	142.69	848.68	150.42	848.59	158.15	848.5
162.47	848.26	164.01	848.17	166.78	848.02	171.29	848.62	175.81	849.22
179.81	851.11	183.55	852.87						

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.1	43.02	.035	71.74001	.1

171149-hrcrasanaly.rep

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 43.0271.74001 108.8 98.9 92.64 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 2296.43

INPUT

Description:

Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	869.27	7799988	867.03	7.22	9996	848.64	11.87	848.75	14.50
19.66	847.57	25.11	844.68	27.3	843.85	29.19	843.56	33.31	843.87
35.75	844.16	39.95	844.65	46.64	845.4	48.7	846.49	54.65	847.2
62.67	847.8	68.1	847.71	70.97	847.66	73.52	847.61	79.6	847.8
82.88	847.9	84.18	847.94	85.69	847.99	99.37	847.45	105.56	847.82
111.76	848.19	113.93	848.11	118.88	847.93	122.05	847.82	126.01	847.68
132.75	847.69	139.5	847.7	144.89	847.77	149.59	848.76	154.28	849.76
165.72	849.88	168.22	850.68	169.69	851.15	172.66	853.43	175.64	855.71

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	19.66	.035	48.7	.1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 19.66 48.7 249.3 247.15 248.95 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 2049.28

INPUT

Description:

Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	869.43	1.150009	863.78	2.270004	858.27	6.279999	857.68	13.89	851.77
18.81001	846.67	29.45001	845.95	30.59001	843.12	34.54001	842.75	37.94	843.04
41.94	843.35	44.78	843.91	48.07001	844.77	52.18001	845.52	56.29001	846.26
61.86001	846.34	67.43001	846.42	71.53001	846.12	75.64001	845.83	80.23	844.39
82.2	843.73	84.87	844.03	87.22001	846.42	97.99001	846.35	103.87	845.84
105.26	845.72	106.94	845.47	114.4	844.31	116.92	843.29	118.58	842.83
121.75	842.95	124.82	846.16	130.89	849.66	140.22	849.96	143.35	850.27
148.53	850.53	153.7	850.78	162.2	855.18	163.07	855.73	168.94	859.44
175.46	861.31	177.06	861.87	177.85	862.17				

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Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1 106.94 .035 124.82 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 106.94 124.82 157.5 147.33 152.1 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 1901.96

INPUT

Description:

Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	8632.259995	861.954.540009	860.897.100006	859.28.990005	857.97				
13.43001	855.05 16.64	852.8619.85001	850.67 26.8	847.2829.35001	844.77				
32.54001	843.7935.74001	842.81 40.67	840.83 45.61	838.8548.85001	840.5				
52.10001	842.15 53.69	841.9555.29001	841.74 59.2	841.85 60.56	842.51				
64.3	845.8871.31001	846.27 77.67	846.76 82.03	846.73 86.29	846.71				
90.63	847.09 94.88	847.47 102.69	847.54 110.11	847.61 114.42	847.73				
117.54	847.81 121.4	847.92 123.11	847.97 125.03	848.02 132.93	848.25				
136.66	848.36 141.42	848.5 146.77	849.14 152.12	849.78 155.45	850.69				
158.79	851.6 164.58	851.95 170.18	854.38 175.78	856.81 181.11	859.98				
183.22	861.25 186.43	863.16 194.33	869.17						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .135.74001 .035 60.56 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 35.74001 60.56 82.58 82.58 82.58 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 1819.38

INPUT

Description:

Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	866.23.7899933	865.974.639999	864.688.429993	863.419.309998	863.12				
14.48999	858.92 19.66	854.71 24.31	850.35 28.97	845.99 33.59	843.61				

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37.31999	842.16	41.8	841.14	45.39	840.77	48.84	840.68	52.28	840.58
57.13	841.34	61.25	842	63.86	843.7174	.92999	844.1579	.45999	844.23
80.78999	844.2586	.64999	844.35	88.7	844.42	91.06	844.49	95.47	844.64
101.55	845.91	107.92	846.58	110.28	846.83	114.3	847.25	119.23	847.3
120.28	847.32	120.76	847.32	127.23	847.39	135.86	847.46	141.27	847.49
144.49	847.52	151.67	847.76	160.28	848.06	161.5	848.21	167	848.87
172.66	851.19	178.37	853.54	183.06	854.76	187.76	855.99	191	857.5
192	857.97	193.18	858.52	198.59	861.06	208.1	866.35	214.13	870.79
219.06	874.41								

Manning's n Values		num=		3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.1	33.59	.035	63.86	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	33.59	63.86		43	42.47		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Alignment - (1) RS: 1776.91

INPUT

Description:

Station Elevation Data		num=		60					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	865.843	.050003	864.635	.030014	863.837	.220001	862.961	.06001	861.83
12.76001	860.3715	.46001	858.9118	.42001	857.31	20.86	855.9827	.59001	852.87
32.19	85034	.56001	848.53	39.75	845.29	43.83	844.6747	.90001	844.06
49.84001	843.9651	.78001	843.8654	.42001	842.3	55.77	841.660	.18001	841.29
63.03001	841.2566	.56001	841.2270	.98001	841.33	77	840.9681	.71001	841.44
86.95001	844.41	93.08	845.02	97.91	845.21	102.74	845.4	108.31	845.21
113.87	845.03	118.66	845.18	123.44	845.34	128.93	845.74	134.41	846.15
138.18	846.58	140.02	846.79	144.42	847.29	145.63	847.43	153.66	847.6
157.67	847.69	161.7	847.78	168.73	848.11	173.67	848.34	175.76	848.43
179.33	848.78	181.75	849.01	185.41	849.36	186.44	849.46	187.73	849.59
198.95	852.67	203.93	854.86	208.92	857.06	213.88	859.48	215.95	860.49
222.55	863.7	225.77	865.17	226.58	865.53	233.56	868.66	234.57	869.04

Manning's n Values		num=		3		
Sta	n Val	Sta	n Val	Sta	n Val	
0	.151	.78001	.035	.86	.95001	.1

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	51.7800	186.95001		.1	.3

## SUMMARY OF MANNING'S N VALUES

River: Bluestone Creek

Reach	River Sta.	n1	n2	n3
Alignment - (1)	4197.97	.1	.035	.1
Alignment - (1)	3984.5	.1	.035	.1
Alignment - (1)	3769.43	.1	.035	.1
Alignment - (1)	3555.05	.1	.035	.1
Alignment - (1)	3354.63	.1	.035	.1
Alignment - (1)	3210.37	.1	.035	.1
Alignment - (1)	3106.56	.1	.035	.1
Alignment - (1)	3021.02	.1	.035	.1
Alignment - (1)	2906.64	.1	.035	.1
Alignment - (1)	2807.26	.1	.035	.1
Alignment - (1)	2757.33	.1	.035	.1
Alignment - (1)	2707.29	.1	.035	.1
Alignment - (1)	2630.55	.1	.035	.1
Alignment - (1)	2624.76	Bridge		
Alignment - (1)	2597.1	.1	.035	.1
Alignment - (1)	2517.5	.1	.035	.1
Alignment - (1)	2475.27	.1	.035	.1
Alignment - (1)	2395.33	.1	.035	.1
Alignment - (1)	2296.43	.1	.035	.1
Alignment - (1)	2049.28	.1	.035	.1
Alignment - (1)	1901.96	.1	.035	.1
Alignment - (1)	1819.38	.1	.035	.1
Alignment - (1)	1776.91	.1	.035	.1

## SUMMARY OF REACH LENGTHS

River: Bluestone Creek

Reach	River Sta.	Left	Channel	Right
Alignment - (1)	4197.97	213.45	213.45	213.45
Alignment - (1)	3984.5	215.05	215.05	215.05
Alignment - (1)	3769.43	228.5	214.4	198.8
Alignment - (1)	3555.05	200.4	200.4	200.4
Alignment - (1)	3354.63	141.9	144.27	145.89
Alignment - (1)	3210.37	103.8	103.8	103.8
Alignment - (1)	3106.56	99.63	103.8	104.07
Alignment - (1)	3021.02	114.39	114.39	114.39

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Alignment - (1)	2906.64	99.38	99.38	99.38
Alignment - (1)	2807.26	49.93	49.93	49.93
Alignment - (1)	2757.33	50.04	50.04	50.04
Alignment - (1)	2707.29	120.9	122.82	125.49
Alignment - (1)	2630.55	33.45	33.45	33.45
Alignment - (1)	2624.76	Bridge		
Alignment - (1)	2597.1	79.6	79.6	79.6
Alignment - (1)	2517.5	43.11	42.23	40.43
Alignment - (1)	2475.27	84.08	79.94	71.14
Alignment - (1)	2395.33	108.8	98.9	92.64
Alignment - (1)	2296.43	249.3	247.15	248.95
Alignment - (1)	2049.28	157.5	147.33	152.1
Alignment - (1)	1901.96	82.58	82.58	82.58
Alignment - (1)	1819.38	43	42.47	41.93
Alignment - (1)	1776.91			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

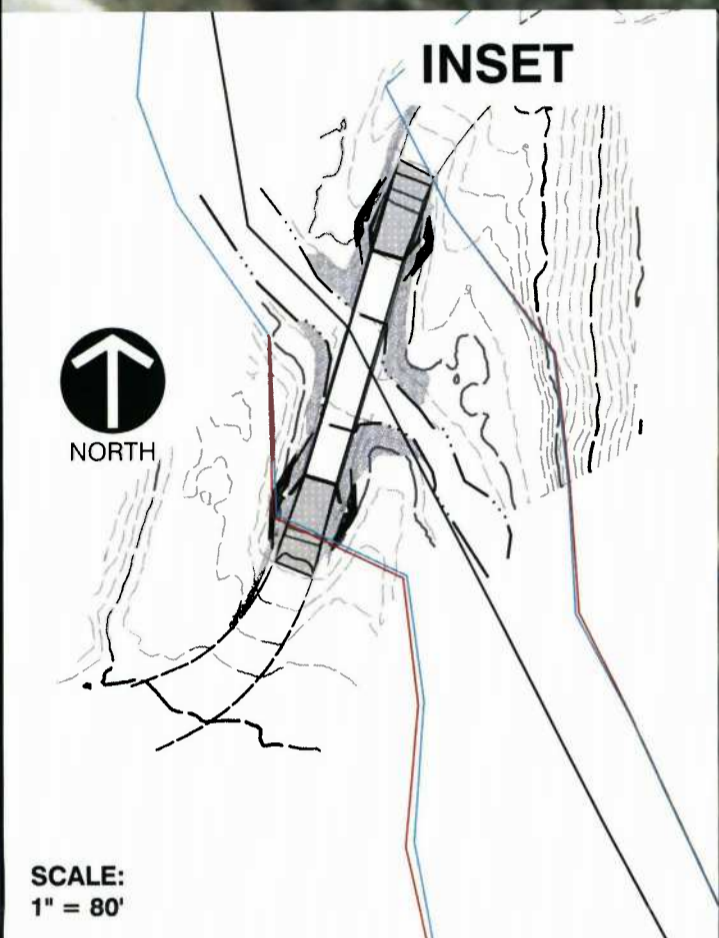
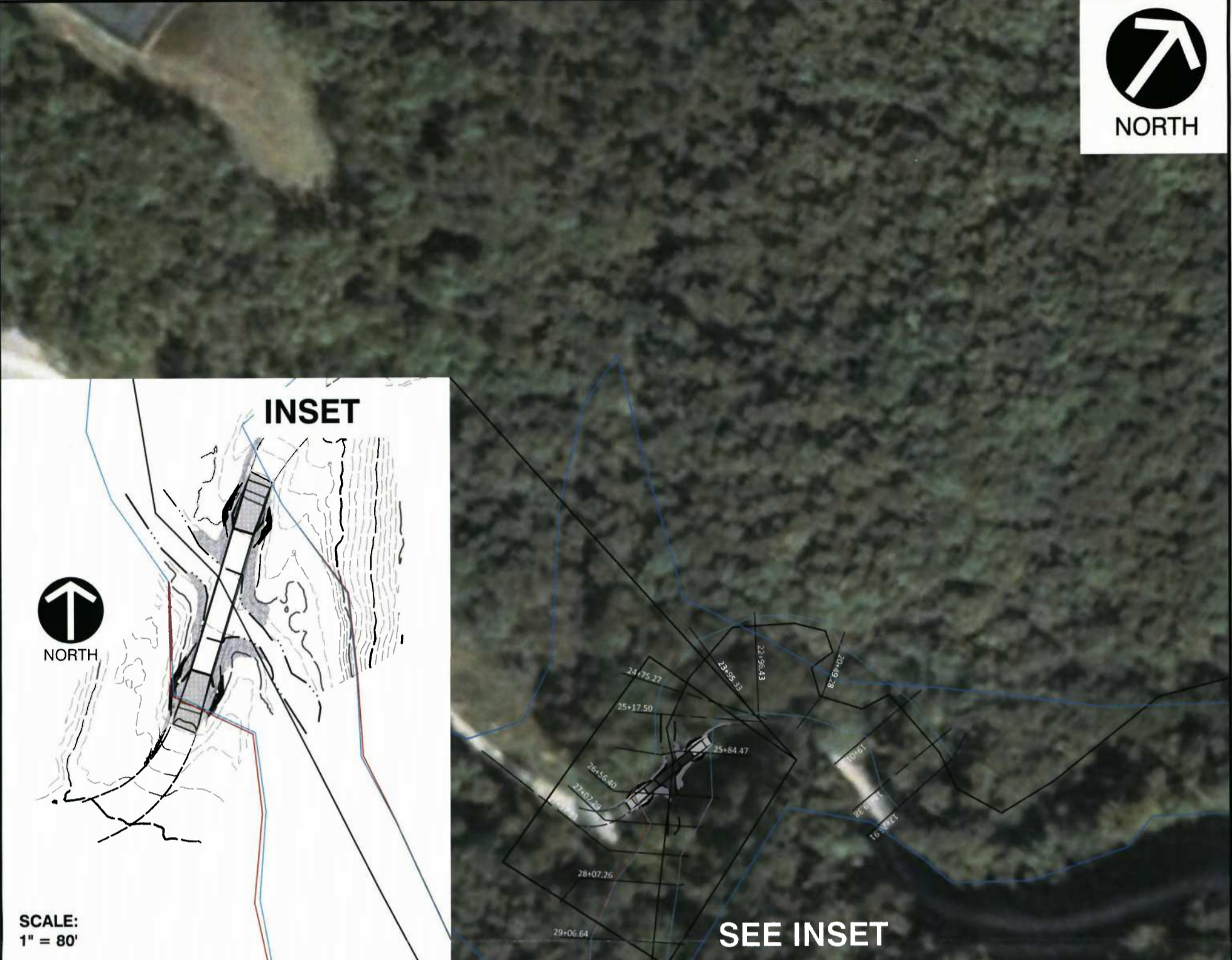
River: Bluestone Creek

Reach	River Sta.	Contr.	Expan.
Alignment - (1)	4197.97	.1	.3
Alignment - (1)	3984.5	.1	.3
Alignment - (1)	3769.43	.1	.3
Alignment - (1)	3555.05	.1	.3
Alignment - (1)	3354.63	.1	.3
Alignment - (1)	3210.37	.1	.3
Alignment - (1)	3106.56	.1	.3
Alignment - (1)	3021.02	.1	.3
Alignment - (1)	2906.64	.1	.3
Alignment - (1)	2807.26	.1	.3
Alignment - (1)	2757.33	.1	.3
Alignment - (1)	2707.29	.1	.3
Alignment - (1)	2630.55	.3	.5
Alignment - (1)	2624.76	Bridge	
Alignment - (1)	2597.1	.3	.5
Alignment - (1)	2517.5	.1	.3
Alignment - (1)	2475.27	.1	.3
Alignment - (1)	2395.33	.1	.3
Alignment - (1)	2296.43	.1	.3
Alignment - (1)	2049.28	.1	.3
Alignment - (1)	1901.96	.1	.3
Alignment - (1)	1819.38	.1	.3
Alignment - (1)	1776.91	.1	.3



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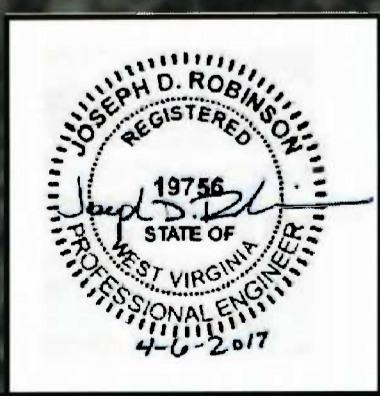
**APPENDIX G**  
**FEMA Floodplain Exhibit**



SEE INSET

SCALE:  
1" = 80'

CURRENT FEMA FLOODPLAIN  
MAP 54017C0120C



**LEGEND**

- EXISTING FEMA FLOOD ELEVATION
- EXISTING FLOOD ELEVATION LINE
- PROPOSED FLOOD ELEVATION LINE



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EQT PRODUCTION COMPANY  
WEU 51 BRIDGE CROSSING  
WEST UNION DISTRICT  
DODDRIDGE COUNTY, WV

FLOODPLAIN  
EXHIBIT

DRAWN BY:	KES	CHECKED BY:	JDR	APPROVED BY:	SAC	FIGURE NO.:	1
DATE:	MARCH 2017	DWG SCALE:	1"=200'	PROJECT NO:	171-149		

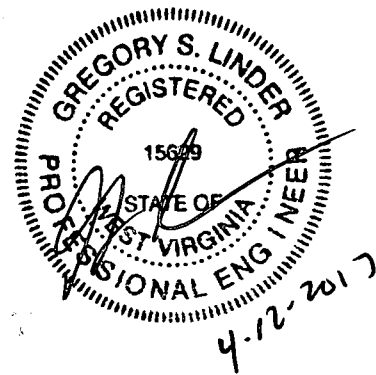
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# ***HYDRAULIC STUDY***

***Oxford 157 Well Pad Access Road Bridges  
Doddridge County, West Virginia***

*Prepared For:*

***EQT Production Company  
Bridgeport, West Virginia***



***April 2017***



**Civil & Environmental  
Consultants, Inc.**

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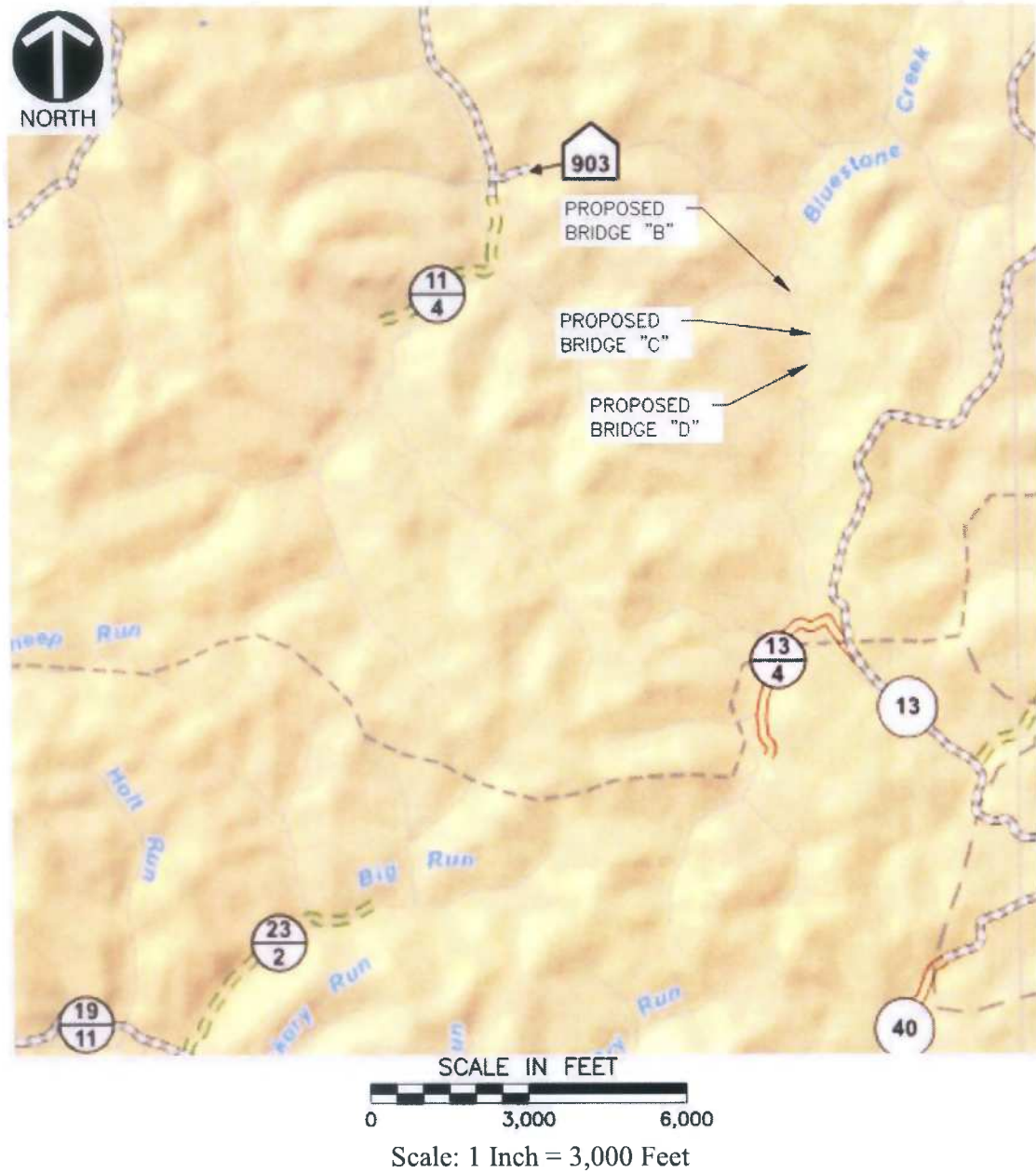
## **I. PROJECT DESCRIPTION**

### **A. Narrative**

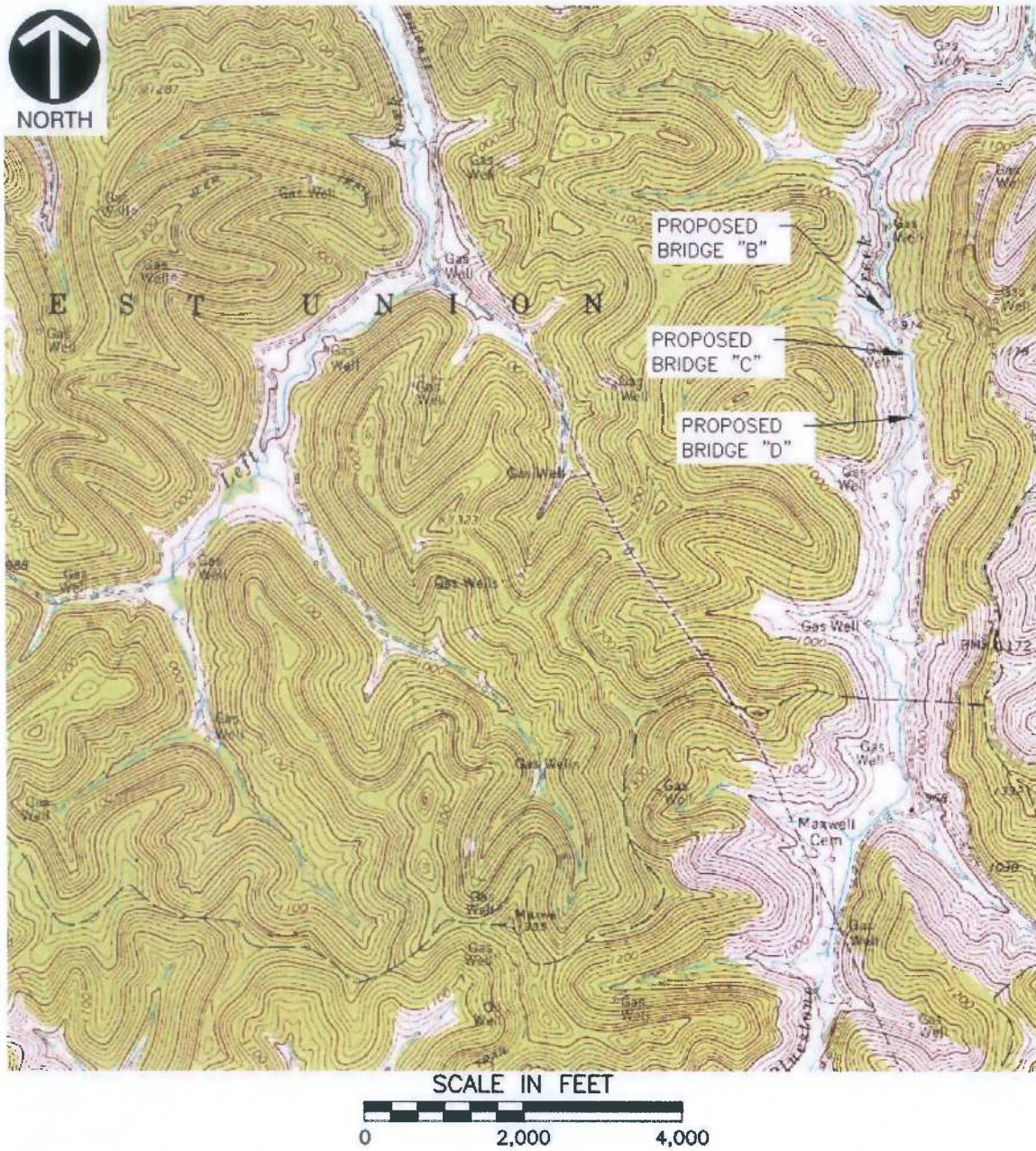
The project site is located off of County Route 13, approximately 4.5 miles south of West Union, WV. This hydraulic study is for the construction of three (3) proposed bridges allowing access to the Oxford 157 Well Pad for EQT Production Company. The site is located near Bluestone Creek, which is a tributary of the Middle Island Creek in Doddridge County, WV. There are existing concrete fords running across Bluestone Creek in the project area; however, the existing fords become unsafe to cross during storm events and requires the construction of raised bridge structures to accommodate well traffic. According to the Federal Emergency Management Agency (FEMA), the site is located within a Zone A Floodplain as designated on the Doddridge County Flood Insurance Rate Map (FIRM) Panel 54017C0225C. The purpose of this hydraulic study is not to investigate the existence or severity of flood hazards in the study area. The purpose of this hydraulic study is to determine the potential for adverse effects caused by the construction of the bridges and the potential impacts to the water levels and floodplain of Bluestone Creek. A FEMA Floodplain Exhibit can be found in Appendix G at the end of this report.

## B. Location Maps

### 1. County Map



2. USGS Topographic Map



USGS 7 $\frac{1}{2}$  Minute Topographic Map – Oxford and West Union Quadrangles  
Scale: 1 Inch = 2000 Feet



### C. Field Observations

#### 1. High Water Marks

There are no established landmarks in the project vicinity to determine a historic high water mark for Bluestone Creek.

#### 2. Features Relevant to the Hydraulic Analysis

There are no existing features in the project area relevant to this hydraulic analysis.

#### 3. Verification of Manning's "n" Values

Manning's roughness coefficients were determined based on photographs of the project site:

From Table 3.1 of the HEC-RAS Hydraulic Reference Manual:

Main Channel:

Clean, straight, full, no rifts or deep pools, but more stones and weeds: 'n' value 0.035

Floodplain:

Brush, scattered brush, heavy weeds: 'n' value 0.050

Floodplain:

Heavy Stand of Timber, few down trees, little undergrowth, flow below branches: 'n' value 0.100

The Manning's "n" values assigned to the left overbank (LOB), channel, and right overbank (ROB) for each cross-section are shown in the following table.

Cross-Section	Friction (n/K)	LOB	Channel	ROB
9505.57	n	0.050	0.035	0.100
9327.36	n	0.050	0.035	0.050
9112.88	n	0.050	0.035	0.100
8893.47	n	0.050	0.035	0.100
8694.47	n	0.050	0.035	0.100
9502.63	n	0.050	0.035	0.100
8312.06	n	0.050	0.035	0.100
8092.65	n	0.050	0.035	0.100
7909.32	n	0.050	0.035	0.100
7703.66	n	0.050	0.035	0.100
7500.63	n	0.100	0.035	0.050
7359.70	n	0.050	0.035	0.050
7155.83	n	0.050	0.035	0.050

6967.63	n	0.050	0.035	0.050
6671.12	n	0.050	0.035	0.050
6456.57	n	0.050	0.035	0.100
6296.61	n	0.050	0.035	0.100
6151.32	n	0.050	0.035	0.100
5993.50	n	0.050	0.035	0.100
5874.57	n	0.050	0.035	0.100
5766.87	n	0.050	0.035	0.100
5631.82	n	0.050	0.035	0.100
5483.31	n	0.050	0.035	0.100
5339.61	n	0.050	0.035	0.100
5216.26	n	0.050	0.035	0.100
4942.13	n	0.050	0.035	0.050
4652.11	n	0.050	0.035	0.050
4394.46	n	0.050	0.035	0.050
4118.13	n	0.100	0.035	0.050
4004.96	n	0.100	0.035	0.050
3887.33	n	0.100	0.035	0.050
3774.24	n	0.100	0.035	0.050
3655.76	n	0.050	0.035	0.050
3522.15	n	0.050	0.035	0.050
3474.34	n	0.050	0.035	0.050
3419.48	n	0.050	0.035	0.050
3327.31	n	0.050	0.035	0.050
3320.00	Bridge "D"			
3262.70	n	0.050	0.035	0.050
3220.40	n	0.050	0.035	0.100
3147.68	n	0.050	0.035	0.100
3097.20	n	0.050	0.035	0.100
2991.10	n	0.050	0.035	0.100
2894.59	n	0.050	0.035	0.100
2793.00	n	0.050	0.035	0.100
2692.71	n	0.050	0.035	0.100
2591.27	n	0.050	0.035	0.100
2540.29	n	0.050	0.035	0.100
2480.61	n	0.050	0.035	0.100
2415.92	n	0.050	0.035	0.050
2379.00	Bridge "C"			
2313.19	n	0.100	0.035	0.100
2258.53	n	0.100	0.035	0.100
2199.16	n	0.100	0.035	0.100
2147.20	n	0.100	0.035	0.100

2038.82	n	0.100	0.035	0.100
1891.98	n	0.100	0.035	0.100
1836.41	n	0.100	0.035	0.100
1784.51	n	0.100	0.035	0.100
1708.16	n	0.100	0.035	0.100
1672.59	Bridge "B"			
1632.74	n	0.100	0.035	0.050
1582.56	n	0.100	0.035	0.050
1513.38	n	0.050	0.035	0.100
1472.03	n	0.050	0.035	0.100
1423.70	n	0.050	0.035	0.100
1368.31	n	0.050	0.035	0.100
1246.88	n	0.050	0.035	0.100
1127.31	n	0.050	0.035	0.100
1023.96	n	0.050	0.035	0.100

**D. Pictures**

**D.1 Bridge "D" Photos**



Existing Concrete Ford



Bluestone Creek (Facing Upstream)



Bluestone Creek (Facing Downstream)

## D.2 Bridge "C" Photos



Existing Concrete Ford



Bluestone Creek (Facing Downstream)



Bluestone Creek (Facing Upstream)

**D.3 Bridge "B" Photos**



Existing Concrete Ford



Bluestone Creek (Facing Downstream)



Bluestone Creek (Facing Upstream)

## II. SUMMARY OF RESULTS

### A. Analyses Performed:

Two analyses were performed in this study: an existing conditions analysis and a proposed conditions analysis. Cross-sections of Bluestone Creek were field surveyed at specified locations within the study area to provide an accurate representation of the stream channel, existing bridge, and floodplains. The proposed bridges will all be of the steel span with concrete decking type, with a span of 50 feet and a thickness of 3.5 feet. By comparing the results from the two analyses, the effects of the proposed access road and bridge on the 100-year water levels of Bluestone Creek were determined, as shown in the following table.

### B. Water Surface Elevation Table, Including Existing and Proposed Analyses

100-Year Rainfall Event (1,271 cfs)			
Cross-Section	Existing (ft)	Proposed (ft)	Difference (ft)
9505.57	949.17	949.17	0.00
9327.36	946.57	946.57	0.00
9112.88	944.32	944.32	0.00
8893.47	943.61	943.61	0.00
8694.47	942.04	942.04	0.00
9502.63	940.43	940.43	0.00
8312.06	939.54	939.54	0.00
8092.65	939.02	939.02	0.00
7909.32	938.08	938.08	0.00
7703.66	936.24	936.24	0.00
7500.63	935.05	935.05	0.00
7359.70	934.38	934.38	0.00
7155.83	932.75	932.75	0.00
6967.63	930.57	930.57	0.00
6671.12	928.80	928.80	0.00
6456.57	927.82	927.82	0.00
6296.61	927.85	927.85	0.00
6151.32	927.68	927.68	0.00
5993.50	924.89	924.89	0.00
5874.57	924.53	924.53	0.00
5766.87	924.26	924.26	0.00
5631.82	923.78	923.78	0.00
5483.31	923.26	923.26	0.00
5339.61	922.97	922.97	0.00
5216.26	922.03	922.03	0.00
4942.13	921.60	921.60	0.00
4652.11	920.58	920.58	0.00

4394.46	919.97	919.97	0.00
4118.13	918.60	918.60	0.00
4004.96	918.03	918.03	0.00
3887.33	917.11	917.11	0.00
3774.24	916.02	916.02	0.00
3655.76	915.51	915.51	0.00
3522.15	914.35	914.35	0.00
3474.34	914.16	914.16	0.00
3419.48	913.32	913.32	0.00
3327.31	912.82	912.93	0.11
3320.00	Bridge "D"		
3273.98	912.70	912.64	0.00
3220.40	912.29	912.29	0.00
3147.68	912.28	912.28	0.00
3097.20	911.97	911.97	0.00
2991.10	910.86	910.86	0.00
2894.59	910.69	910.69	0.00
2793.00	909.56	909.56	0.00
2692.71	908.79	908.79	0.00
2591.27	908.45	908.45	0.00
2540.29	907.49	907.49	0.00
2480.61	906.12	906.96	0.84
2384.96	906.41	907.10	0.69
2379.00	Bridge "C"		
2358.81	906.40	906.39	0.00
2258.53	905.73	905.73	0.00
2199.16	905.25	905.25	0.00
2147.20	904.78	904.78	0.00
2038.82	903.88	903.88	0.00
1891.98	902.93	902.93	0.00
1836.41	902.49	902.49	0.00
1784.51	901.12	901.12	0.00
1679.48	901.09	901.54	0.45
1672.59	Bridge "B"		
1651.65	900.97	900.96	0.00
1582.56	901.06	901.06	0.00
1513.38	898.58	898.58	0.00
1472.03	898.36	898.36	0.00
1423.70	898.23	898.23	0.00
1368.31	898.09	898.09	0.00
1246.88	898.36	898.36	0.00



1127.31	896.90	896.90	0.00
1023.96	895.48	895.48	0.00

See Appendix D – HEC-RAS Profile Summary Tables.

**C. Compliance with FEMA Criteria**

Based on the HEC-RAS results, the proposed conditions at the site will increase the 100-year flood elevation by 0.11 feet at Bridge “D”, 0.84 feet at Bridge “C” and 0.45 feet at Bridge “C”, which is less than the FEMA-allowable rise of 1 foot at each location. The 100-year flood level will return to normal levels approximately 150 feet upstream from Bridge “C” and less than 50 feet for both Bridge “B” and Bridge “D”. Thus, the project satisfies the FEMA criteria section 18 as well as that of Doddridge County Ordinance.

An outline in Exhibit “G” shows what a hypothetical rise of the floodplain by 3’ would look like as it pertains to the residence south of the proposed bridges. This information was shown at the request of George Eidel and is in no way a reflection of the resulting floodplain from the construction of the proposed bridges. The installation of the bridges would result in no rise in the 100-year floodplain levels at the house shown as shown in the HEC-RAS modeling report.

**D. Recommendation**

The existing Oxford 157 Well Pad for EQT Corporation involves construction within the floodplain established by FEMA. The results of the hydraulic study indicate that the construction will increase the 100-year water surface elevation of Bluestone Creek by 0.84 feet at Bridge “D”, which is less than the FEMA-allowable rise of 1 foot. Therefore, it is recommended that the site be constructed as designed.

**E. Signature Block, Consultant, or In-House Designers**

1. Preparer

Jason M. Pauley, P.E. (West Virginia Registered Professional Engineer No. 22205)

2. Reviewer

Gregory S. Linder, P.E. (West Virginia Registered Professional Engineer No. 15629)

3. Date

March 24, 2017

4. Engineer’s Seal on Final Report

Gregory S. Linder, P.E. (West Virginia Registered Professional Engineer No. 15629)

### **III. AVAILABLE DATA**

#### **A. Flood Insurance Study**

The initial countywide Flood Insurance Study (FIS) for Doddridge County had an effective date of September 25, 2009. The final Consultation Coordination Officer's meeting for the countywide revision to the FIS was held on May 26, 2010. The revised countywide FIS has an effective date of August 2, 2011. Bluestone Creek was included among the areas studied by approximate methods, with no Base Flood Elevations (BFEs) or flood depths listed.

See Appendix B – FEMA FIRMette.

#### **B. Existing Hydrologic Data**

No detailed hydrologic evaluation has been performed within the boundaries of this project site.

#### **C. Existing Hydraulic Model from FEMA, USACE, NRCS, others**

There is no existing hydraulic model for this project site.

### **IV. HYDROLOGY**

#### **A. Design Discharge Based on HydroCAD TR-20 Modeling Methods**

Since no detailed hydrology has been performed within the boundaries of this project, the design discharge of the 100-year storm was calculated using the HydroCAD TR-20 modeling methods for the Western Plateaus Region of West Virginia. The hydraulic analysis was performed for the 100-year discharge. The 100-year flood has been adopted by FEMA as the base flood for floodplain management purposes.

See Appendix C – Design Discharge Calculations.

Frequency	Discharge
100-year	1,271 cfs

#### **B. Boundary Conditions**

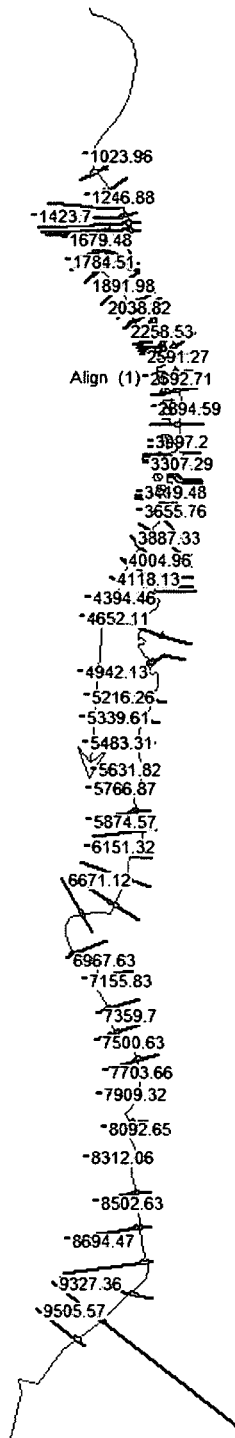
The boundary condition applicable to this hydraulic analysis is the Normal Depth slope at Cross-Section 1023.96, which is approximately 0.0066 ft/ft.

## V. HYDRAULIC MODELING

### A. Source of Model

HEC-RAS Version 5.0.3 was used to perform a hydraulic analysis to determine if adverse effects will be caused by the Oxford 157 Well Pad access road and bridge relative to existing conditions, as well as the potential impacts to the water levels and floodplain of Bluestone Creek. HEC-RAS 5.0.3 is the most current version of the river analysis software available from the Hydraulic Engineering Center of the U.S. Army Corps of Engineers.

**B. Site Map with Cross-Sections**



### C. Explanation of Data and Methods

1. Manning's Values

Manning's roughness coefficients were determined based on photographs of the project site. See Section I.C.3. for a detailed description of the Manning's values used.

2. Bridge Modeling Approach

The Bridge Modeling Approach used was Energy (Standard Step).

3. Ineffective Flow Areas

Ineffective flow areas were incorporated to account for areas in the cross-sectional geometry where ponded water will not be actively conveyed downstream.

4. Any Unusual Circumstances

There are no unusual circumstances specified in correlation with the hydraulic analysis of this project.

5. Table of HEC-RAS Plan Files

Filename	Description
171149 Revised Existing Steady Flow	Existing Conditions Analysis
171149 Revised Proposed Steady Flow	Proposed Conditions Analysis

See Appendix F - HEC-RAS Output Files

**D. HEC-RAS Generated Tables**

1. Profile Summary with Existing and Proposed Conditions

See Appendix D – HEC-RAS Profile Summary Tables

2. Detailed Output Tables

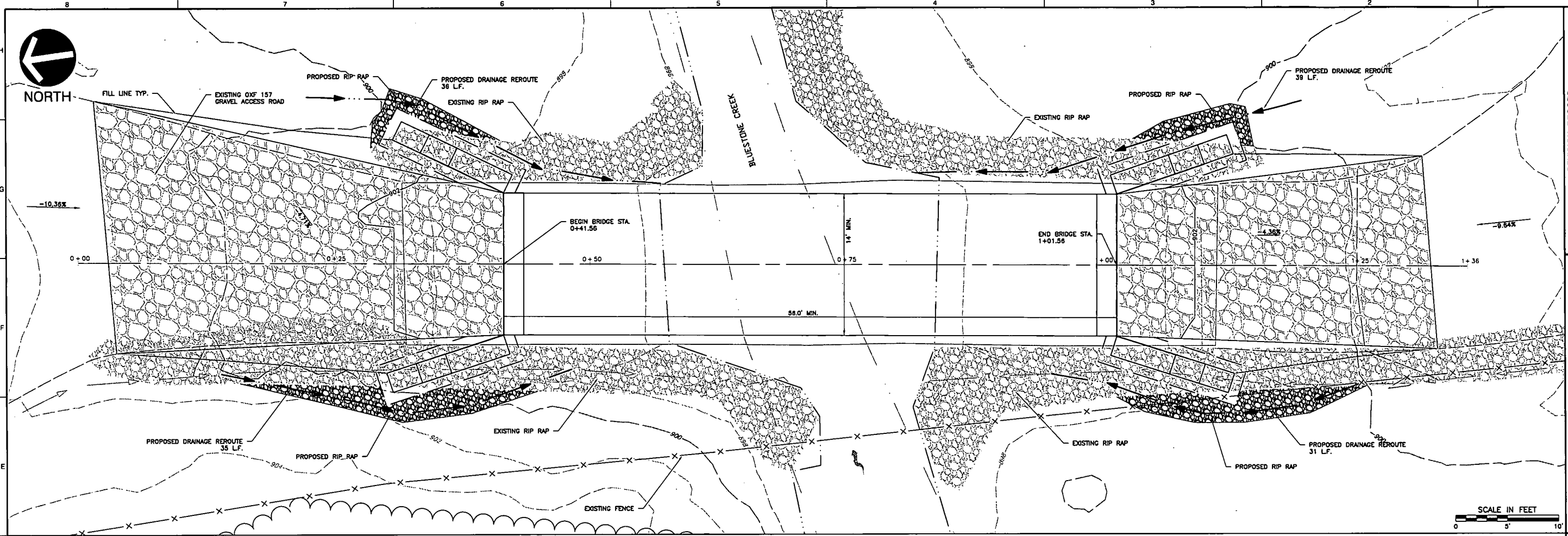
See Appendix F – HEC-RAS Output Files

**APPENDIX A**

**Site Plan**

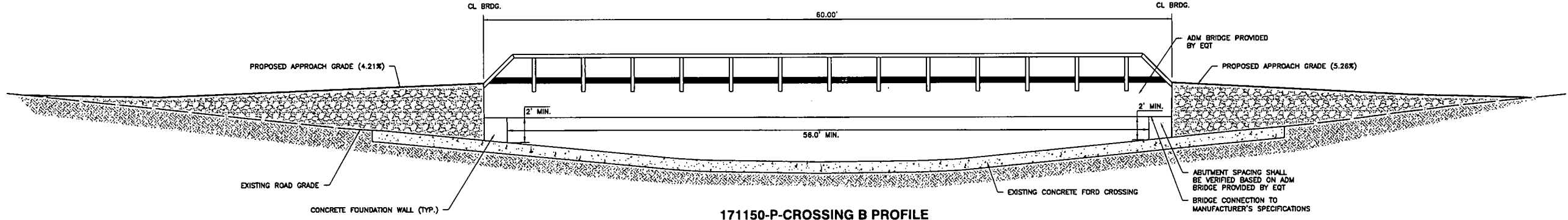






NO.	DATE	DESCRIPTION

**Civil & Environmental Consultants, Inc.**  
 600 Marketplace Ave - Suite 200 - Bridgeport, WV 26330  
 Ph: 304.933.3119 - 855.488.9539 - Fax: 304.933.3327  
 www.ceinc.com

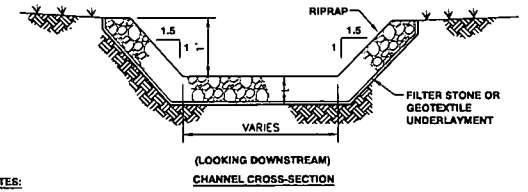


**171150-P-CROSSING B PROFILE**  
 SCALE H:1"=5'; V:1"=5'

**EQT PRODUCTION COMPANY**  
**OXF 157 BRIDGE CROSSINGS**  
**WEST UNION DISTRICT**  
**DODDRIDGE COUNTY, WV**

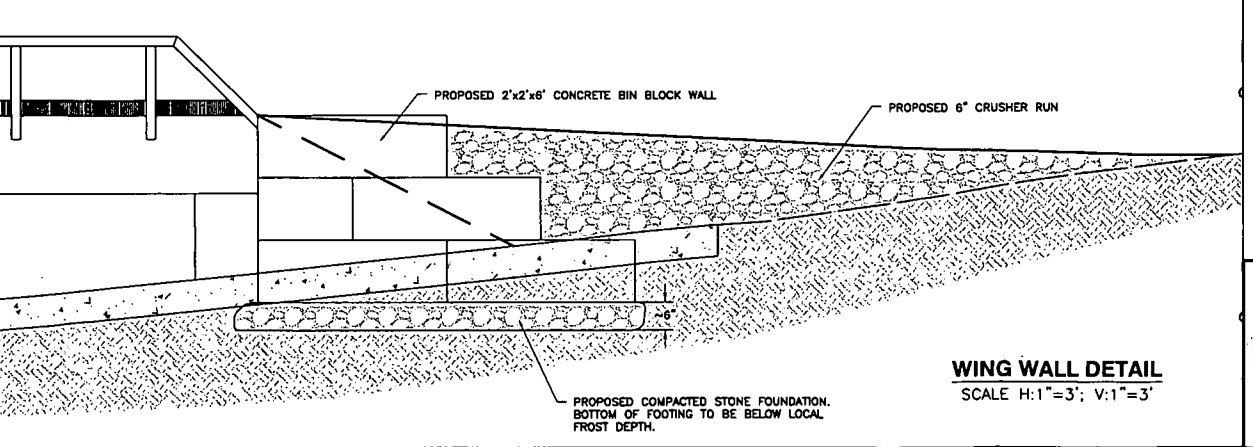
WORK ITEM	QUANTITY
ROCK CONSTRUCTION (6" CRUSHER RUN)	225 TN
ROCK CONSTRUCTION (1.5" CRUSHER RUN)	5 TN
RIP RAP	25 TN
60.0' ADM BRIDGE	1 LS
2'x2'x6' CONCRETE BIN BLOCK WALL	16 EA
2'x2'x3' CONCRETE BIN BLOCK HALF WALL	4 EA

NOTE:  
 1. ESTIMATED QUANTITIES MAY VARY BASED ON FINAL BRIDGE SIZE.  
 2. ESTIMATED QUANTITIES MAY VARY BASED ON HYDRAULIC STUDY AND FINAL FLOODPLAIN PERMIT APPROVAL.



- NOTES:**
1. FILTER STONE UNDERLAYMENT FOR BED SLOPES  $\geq 0.10$  FT/FT (10%) SHALL BE USED.
  2. CHANNEL DIMENSIONS ARE FOR THE COMPLETED CHANNEL AFTER ROCK PLACEMENT. CHANNEL MUST BE OVER-EXCAVATED A SUFFICIENT AMOUNT TO ALLOW FOR THE VOLUME OF ROCK PLACED WITHIN THE CHANNEL WHILE PROVIDING THE SPECIFIED FINISHED DIMENSIONS.
  3. CHANNEL DIMENSIONS SHALL BE CONSTANTLY MAINTAINED. CHANNEL SHALL BE CLEANED WHENEVER TOTAL CHANNEL DEPTH IS REDUCED BY 25% AT ANY LOCATION. SEDIMENT DEPOSITS SHALL BE REMOVED WITHIN 24 HOURS OF DISCOVERY OR AS SOON AS SOIL CONDITIONS PERMIT ACCESS TO CHANNEL WITHOUT FURTHER DAMAGE.
  4. DAMAGED LINING SHALL BE REPAIRED OR REPLACED WITHIN 48 HOURS OF DISCOVERY.
  5. THE MINIMUM ROCK THICKNESS (T) SHALL BE 1.5 TIMES THE MAX ROCK SIZE.

**TYPICAL RIPRAP CHANNEL DITCH**  
 NOT TO SCALE



**WING WALL DETAIL**  
 SCALE H:1"=3'; V:1"=3'

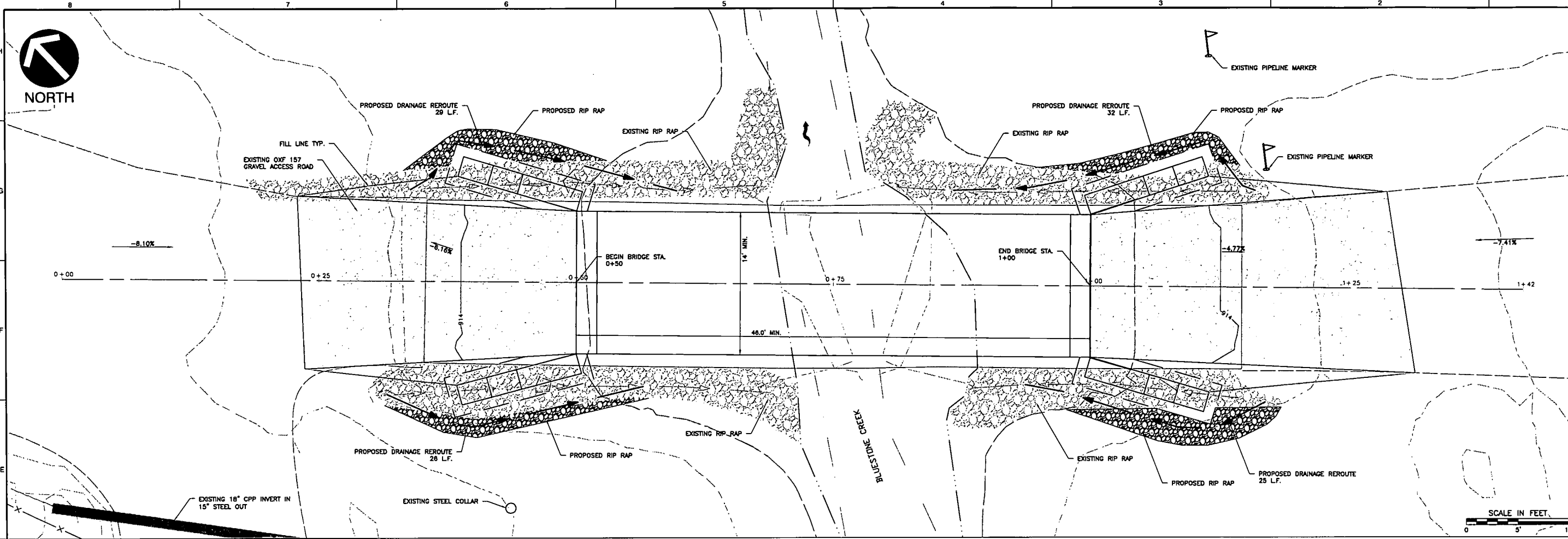


**CROSSING B PLAN AND PROFILE**  
**REVISION TO DNR OLS PERMIT # LS-14-VI/09-53**

DATE: MARCH 2017 DRAWN BY: DBS  
 DWG SCALE: AS SHOWN CHECKED BY: GSL  
 PROJECT NO: 171-150  
 APPROVED BY: JDR

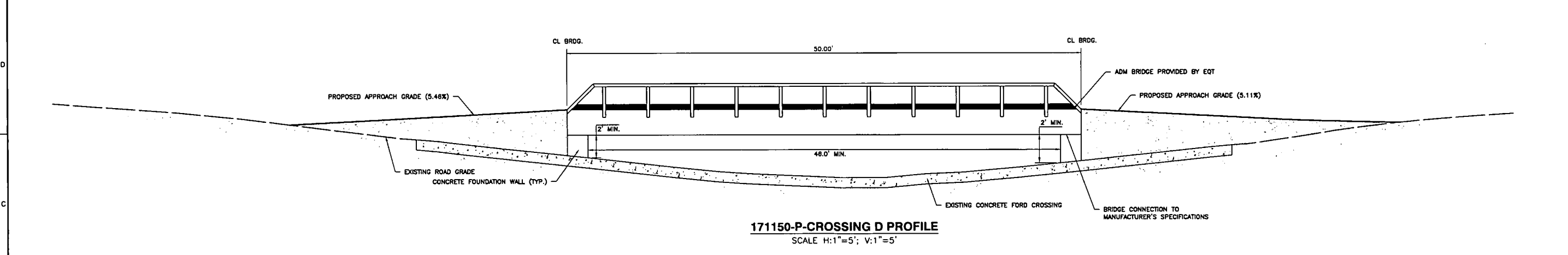
DRAWING NO: **CV01**  
 SHEET 2 OF 5





NO.	DATE	DESCRIPTION

**CEC**  
**Civil & Environmental Consultants, Inc.**  
 600 Marketplace Ave. - Suite 200 - Bridgeport, WV 26330  
 PH: 304.933.3119 - 855.488.9539 - Fax: 304.933.3327  
 www.cecinc.com

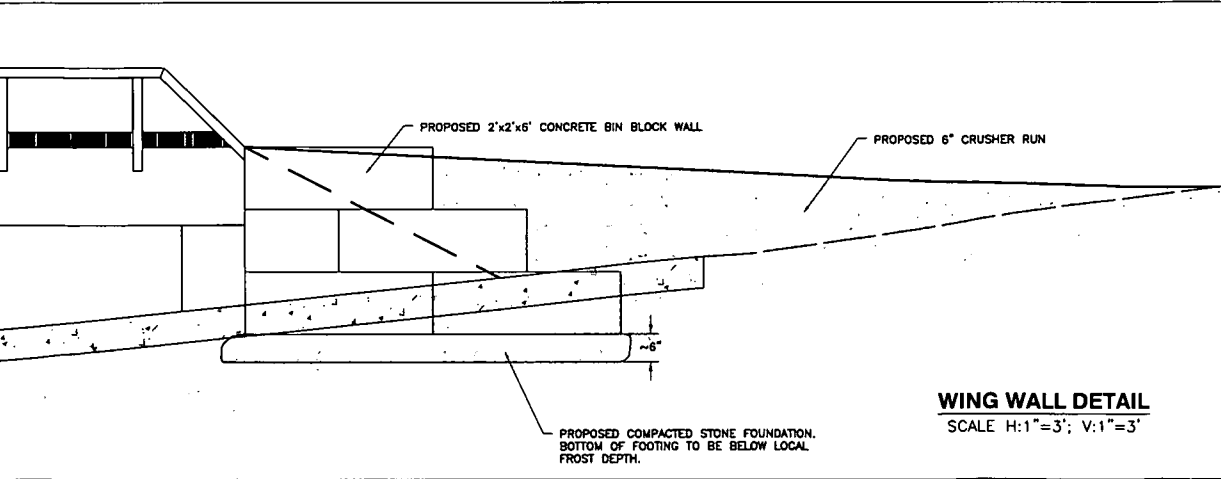
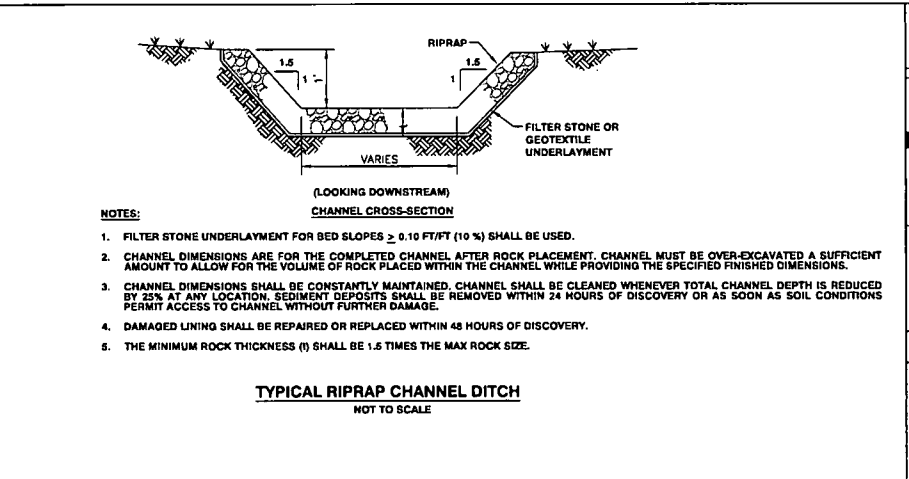


**171150-P-CROSSING D PROFILE**  
 SCALE H:1"=5'; V:1"=5'

**EQT PRODUCTION COMPANY**  
**OXF 157 BRIDGE CROSSINGS**  
**WEST UNION DISTRICT**  
**DODDRIDGE COUNTY, WV**

WORK ITEM	QUANTITY
ROCK CONSTRUCTION (6" CRUSHER RUN)	180 TN
ROCK CONSTRUCTION (1.5" CRUSHER RUN)	8 TN
RIP RAP	23.5 TN
50.0' ADM BRIDGE	1 LS
2'x2'x6" CONCRETE BIN BLOCK WALL	16 EA
2'x2'x3" CONCRETE BIN BLOCK HALF WALL	4 EA

NOTE:  
 1. ESTIMATED QUANTITIES MAY VARY BASED ON FINAL BRIDGE SIZE.  
 2. ESTIMATED QUANTITIES MAY VARY BASED ON HYDRAULIC STUDY AND FINAL FLOODPLAIN PERMIT APPROVAL.



**CROSSING D PLAN AND PROFILE**  
**REVISION TO DNR OLS PERMIT # LS-14-V/09-53**

DATE: MARCH 2017  
 DRAWN BY: DBS  
 CHECKED BY: AS SHOWN  
 PROJECT NO: 171-150  
 APPROVED BY: JDR

DRAWING NO: **CV01**  
 SHEET 4 OF 5

**GENERAL NOTES**

- THESE GENERAL NOTES REPRESENT AND/OR SUMMARIZE KEY PROJECT INFORMATION FOR THE DRAWING USER'S CONVENIENCE. HOWEVER, ADDITIONAL DRAWING NOTES AND PROJECT SPECIFICATIONS SHOULD BE REVIEWED FOR FURTHER DETAILS AND REQUIREMENTS.
- ALL REFERENCES TO STANDARDS HEREIN ARE TO THE MOST RECENT ISSUE IN EFFECT AS OF THE DATE OF THESE DOCUMENTS, UNLESS NOTED OTHERWISE IN PROJECT SPECIFICATIONS OR ON THE DRAWINGS.
- THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE CONSTRUCTION IS FULLY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND INSURE THE SAFETY OF THE BUILDING AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, ETC. THAT MAY BE NECESSARY. SUCH MATERIAL SHALL REMAIN THE CONTRACTOR'S PROPERTY AFTER COMPLETION OF THE PROJECT.
- THE FOLLOWING ABBREVIATIONS MAY BE USED ON THE DESIGN DRAWINGS:

A.B. - ANCHOR BOLT	MAX. - MAXIMUM
APPROX. - APPROXIMATE	MECH. - MECHANICAL
ARCH. - ARCHITECT (URAL)	MFR. - MANUFACTURER
@ - AT	MID. - MIDDLE / MIDPOINT
BLDG. - BUILDING	MIN. - MINIMUM
BM - BEAM	MISC. - MISCELLANEOUS
B.O. - BOTTOM OF	MTL. - METAL
B.O.F. - BOTTOM OF FOOTING	NOM. - NOMINAL
B.O.S. - BOTTOM OF STEEL	N.T.S. - NOT TO SCALE
C/C - CENTER-TO-CENTER	O/C - ON CENTER
C.J. - CONTROL JOINT	OPP. - OPPOSITE
CL - CENTERLINE	PL - PLATE
CLR. - CLEAR	PLF. - POUNDS PER LINEAR FOOT
CMU - CONCRETE MASONRY UNIT	PSF. - POUNDS PER SQUARE FOOT
COL. - COLUMN	PSI. - POUNDS PER SQUARE INCH
CONC. - CONCRETE	REIN. - REINFORCEMENT
CONT. - CONTINUOUS	REV. - REVISED/REVISION
CTR. - CENTER	SEC. - SECTION
DIA. - DIAMETER	S.J.I. - STRUCTURAL JOIST INSTITUTE
DIM. - DIMENSION	SIM. - SIMILAR
DWG. - DRAWING	SPEC. - SPECIFICATION
EA. - EACH	SQ. - SQUARE
E.F. - EACH FACE	STD. - STANDARD
E.J. - EXPANSION JOINT	T/ - TOP OF
EL. - ELEVATION	T.O.C. - TOP OF CONCRETE
E.W. - EACH WAY	T.O.F. - TOP OF FOOTING
F.F.E. - FINISHED FLOOR ELEVATION	T.O.S. - TOP OF STEEL
FLR. - FLOOR	T.O.W. - TOP OF WALL
FND. - FOUNDATION	TRAN. - TRANSVERSE
FT / - FOOT, FEET	TYP. - TYPICAL
FTG. - FOOTING	UNQ. - UNLESS NOTED OTHERWISE
HORIZ. - HORIZONTAL	VERT. - VERTICAL
I.N. / - INCH	W/ - WITH
L - ANGLE	W/O - WITHOUT
LLH. - LONG LEG HORIZ.	W.C.J. - WALL CONTROL JOINT
LLV. - LONG LEG VERT.	W.W.F. - WELDED WIRE FABRIC
LONG - LONGITUDINAL	

**DESIGN CODES**

REIN. PLACEMENT	CRSI PLACING REINFORCING BARS
REIN. DETAILING	CRSI REINFORCING BAR DETAILING
REINFORCING	CRSI MSP-2-01 MANUAL OF STANDARD PRACTICE
REIN. DETAILING	ACI SP-66 ACI DETAILING MANUAL
CONCRETE: STRUCTURAL	ACI 318 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
LOADING	AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES
BUILDING CODE	ICC INTERNATIONAL BUILDING CODE, 2012 EDITION

**DESIGN CRITERIA**

**DEAD LOAD REACTIONS (PER ABUTMENT)**

50' BRIDGE	23 KIPS
60' BRIDGE	38 KIPS

**LIVE LOAD REACTIONS (PER ABUTMENT)**

50' BRIDGE	84 KIPS
60' BRIDGE	107 KIPS

**NOTE:**

THE ABOVE REACTIONS ARE UNFACTORED.  
THE LIVE LOAD REACTIONS INCLUDE 10% IMPACT.

**FOUNDATION NOTES**

- FOUNDATION DESIGN WAS COMPLETED PRIOR TO COMPLETION OF GEOTECHNICAL INVESTIGATIONS. ASSUMPTIONS WERE MADE FOR SOIL PROPERTIES AS NOTED BELOW:  
BEARING CAPACITY - 1,500 PSF
- THERE WILL BE NO BACKFILLING OPERATIONS UNTIL THE CONCRETE WALLS HAVE REACHED THEIR 28-DAY DESIGN STRENGTH, UNLESS NOTED OTHERWISE OR APPROVED BY THE ENGINEER.
- THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE SHORING OR SLOPING OF EXCAVATIONS TO MEET OSHA REQUIREMENTS. DESIGN OF SHORING IS THE CONTRACTOR'S RESPONSIBILITY. EXCAVATIONS SHALL BE IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS.
- FOR STRUCTURES WITH CONCRETE TOP SLABS, THERE WILL BE NO BACKFILLING OPERATIONS UNTIL THE TOP SLAB IS IN PLACE, HAS BEEN CURED A MINIMUM OF 7 DAYS, AND HAS REACHED 70% OF ITS 28 DAY DESIGN STRENGTH, UNLESS NOTED OTHERWISE OR APPROVED BY THE ENGINEER.

**REINFORCING STEEL NOTES**

- REINFORCING BARS: ASTM A615, GRADE 60
- BAR SUPPORTS CLASS 1, MAXIMUM PROTECTION (CRSI MANUAL OF STANDARD PRACTICE) FOR ALL SLABS AND BEAMS WITH SOFFITS EXPOSED TO VIEW.
- ALL REINFORCING STEEL DETAILS SHALL BE IN ACCORDANCE WITH THE ACI CODE REQUIREMENTS (ACI 318 CURRENT EDITION).
- REINFORCING STEEL PLACING DRAWINGS AND BAR LISTS SHALL CONFORM TO THE ACI OR CRSI DETAILING MANUALS. ALL BAR SUPPORTS MUST BE CLEARLY DETAILED.
- HOOKS AND BENDS SHALL BE ACI STANDARD UNLESS OTHERWISE INDICATED.
- CONTINUOUS REINFORCING BARS SHALL BE PROVIDED WITH TENSION LAPS AT ALL SPLICES, UNLESS NOTED OTHERWISE. ALL STEEL REINFORCING LAPS SHALL BE TENSION B LAPS TYPICAL, UNLESS NOTED OTHERWISE.
- MECHANICAL SPLICES SHALL NOT BE PERMITTED UNLESS APPROVED BY THE ENGINEER.
- REINFORCING STEEL FABRICATION AND PLACEMENT SHALL BE IN ACCORDANCE WITH CRSI MANUAL OF STANDARD PRACTICE AND CRSI PLACING REINFORCING BARS (LATEST EDITIONS).
- REINFORCING STEEL IN FOOTINGS SHALL BE ASSEMBLED IN MAT GRILLES EQUALLY SPACED AND SECURELY WIRED TOGETHER BEFORE THE CONCRETE IS POURED.
- WALL FOOTING DOWELS ARE TO HAVE A FULL TENSION LAP SPLICE WITH THE WALL STEEL UNLESS NOTED OTHERWISE.
- ALL REINFORCING SHALL BE HELD SECURELY IN POSITION WITH STANDARD ACCESSORIES IN CONCRETE.
- NO REINFORCING STEEL SHALL BE FIELD BENT WITHOUT THE APPROVAL OF THE STRUCTURAL ENGINEER. FIELD BENDING OF PLAIN REINFORCEMENT, IF PERMITTED, SHALL BE PERFORMED USING AN APPROVED AND APPROPRIATE SIZED PORTABLE HYDRAULIC DEVICE THAT MAKES ACI STANDARD RADIUS BENDS. NO OTHER FIELD BENDING METHOD SHALL BE PERMITTED.
- WELDING, INCLUDING TACK WELDING, FOR REINFORCING STEEL IS PROHIBITED. WELDING OF REINFORCING STEEL AND HIGH STRENGTH BOLTS (A325, A490) WILL BE PERMITTED ONLY BY WRITTEN APPROVAL OF THE ENGINEER.

**CONCRETE DEVELOPMENT/LAP SPLICE SCHEDULE (f<sub>c</sub> = 4 KSI)**

BAR SIZE	DEVELOPMENT LENGTH, L <sub>d</sub> (IN)		LAP SPLICE LENGTH (IN)	
	BAR TYPE 1*	BAR TYPE 2*	BAR TYPE 1*	BAR TYPE 2*
4	19	29	25	37
5	24	36	31	47
6	29	43	37	56
7	42	63	54	81
8	47	72	62	93
9	54	81	70	105

\*BAR TYPE 1 - CLEAR SPACING OF BARS BEING DEVELOPED OR LAP SPICED NOT LESS THAN BAR DIAMETER OR CONCRETE COVER NOT LESS THAN D<sub>b</sub>, AND STIRRUPS OR TIES THROUGHOUT L<sub>d</sub> NOT LESS THAN THE CODE MINIMUM.

\*BAR TYPE 2 - OTHER CASES

REINFORCING CLEAR COVER TABLE	
TYPE	MINIMUM CLEAR COVER (IN)
PERMANENTLY EXPOSED TO OR CAST AGAINST EARTH	3
EXPOSED TO EARTH OR WEATHER (#5 OR SMALLER)	1 1/2
EXPOSED TO EARTH OR WEATHER (#6 OR LARGER)	2
NOT EXPOSED TO EARTH OR WEATHER (#11 OR SMALLER)	1
NOT EXPOSED TO EARTH OR WEATHER (#12 OR LARGER)	1 1/2

**STRUCTURAL CONCRETE NOTES**

- ALL CONCRETE AGGREGATE SHALL COMPLY WITH ASTM C33 (NORMAL WEIGHT).
- USE ADMIXTURES AS PROVIDED IN THE SPECIFICATION, OR AS APPROVED BY THE STRUCTURAL ENGINEER.
- DESIGN FORMWORK FOR THE LOADS, LATERAL PRESSURE AND ALLOWABLE STRESSES OUTLINED IN ACI 347.
- FORMWORK SHALL BE SHORED ADEQUATELY TO ENSURE THAT IT WILL NOT MOVE DURING POURING OR CURING OF THE CONCRETE.
- CURE CONCRETE IN ACCORDANCE WITH THE SPECIFICATION, MEETING THE REQUIREMENTS OF ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS".
- SEE THE MECHANICAL, ELECTRICAL AND SUPPLIERS DRAWINGS FOR THE LOCATION OF SPECIAL ANCHORS, CHAMBERS, SLEEVES, PIPES, CONDUITS AND OTHER DETAILS NOT SHOWN ON THE STRUCTURAL DRAWINGS.
- THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE CONSTRUCTION IS FULLY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND INSURE THE SAFETY OF THE BUILDING AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, ETC. THAT MAY BE NECESSARY. SUCH MATERIAL SHALL REMAIN THE CONTRACTOR'S PROPERTY AFTER COMPLETION OF THE PROJECT.
- ALL CONCRETE SHALL CURE A MINIMUM OF 7 DAYS AFTER POURING, AND SHALL REMAIN UNLOADED UNTIL CONCRETE HAS REACHED 80% OF THE 28 DAY DESIGN STRENGTH, UNLESS APPROVED BY ENGINEER.

**CONCRETE MIX REQUIREMENTS**

CONCRETE TYPE	28 DAY COMPRESSIVE STRENGTH (PSI)	AIR CONTENT (+/- 1%) (AE-AIR ENTRAINED)	MAX. W/C RATIO	MAX. SLUMP AT PLACEMENT	MAX. NOM. AGGREGATE SIZE*	CEMENT TYPE	FLYASH % OF TOTAL CEMENT
SLAB ON GRADE (EXTERIOR)	4,000 PSI	5% (AE)	0.50	5"	1"	TYPE III	10-20
FOOTINGS		5% (AE)	0.50	5"	1"	TYPE III	10-20

\*AGGREGATES SHALL CONFORM TO REQUIREMENTS IN ACI 302.1.

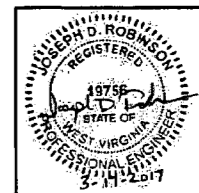
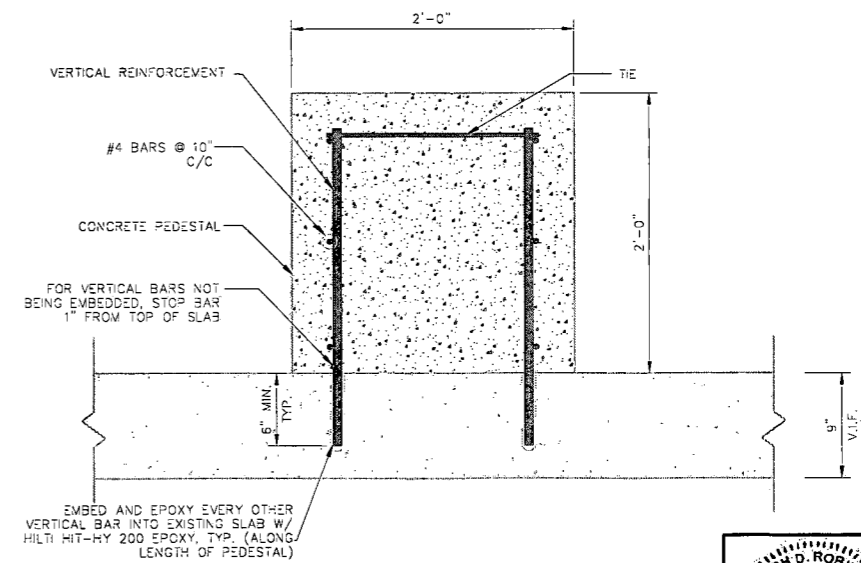
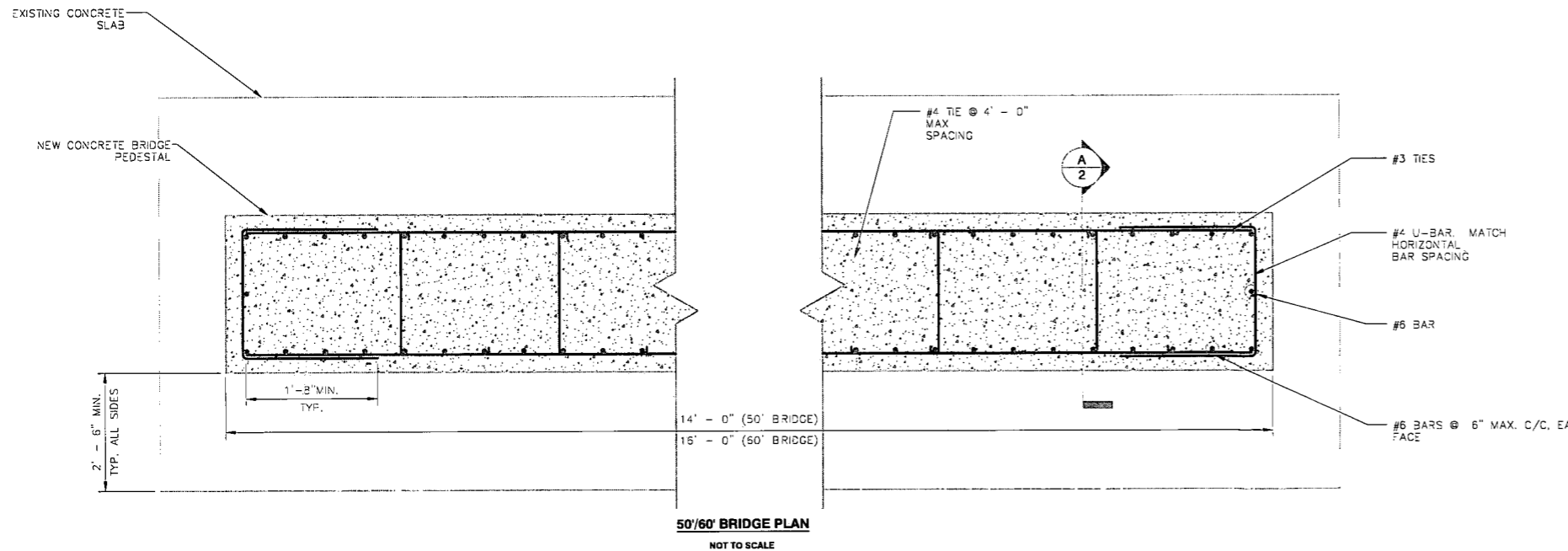
**REINFORCING STEEL QUANTITIES**

50' BRIDGE PER ABUTMENT						
CONCRETE PEDESTAL				VOLUME (CY)		
LENGTH (FT)	WIDTH (FT)	HEIGHT (FT)				
14	2	2	2.1			
VERTICAL REINFORCEMENT						
LENGTH (FT)	# OF BARS	BAR SIZE	TOTAL LENGTH (FT)	WEIGHT/FT	TOTAL WEIGHT (LBS)	
2.25	56	#6	126	1.502	189.3	
HORIZONTAL REINFORCEMENT						
LENGTH (FT)	SIDES	BAR SIZE	# OF ROWS	TOTAL LENGTH (FT)	WEIGHT/FT	TOTAL WEIGHT (LBS)
13.5	2	#4	3	81	0.668	54.1
HORIZONTAL TIES						
LENGTH (FT)	# OF TIES	BAR SIZE	# OF ROWS	TOTAL LENGTH (FT)	WEIGHT/FT	TOTAL WEIGHT (LBS)
1.5	4	#3	3	18	0.376	6.8

NOTE: FOR INFORMATION ONLY

60' BRIDGE PER ABUTMENT						
CONCRETE PEDESTAL				VOLUME (CY)		
LENGTH (FT)	WIDTH (FT)	HEIGHT (FT)				
16	2	2	2.4			
VERTICAL REINFORCEMENT						
LENGTH (FT)	# OF BARS	BAR SIZE	TOTAL LENGTH (FT)	WEIGHT/FT	TOTAL WEIGHT (LBS)	
2.25	64	#6	144	1.502	216.3	
HORIZONTAL REINFORCEMENT						
LENGTH (FT)	SIDES	BAR SIZE	# OF ROWS	TOTAL LENGTH (FT)	WEIGHT/FT	TOTAL WEIGHT (LBS)
15.5	2	#4	3	93	0.668	62.1
HORIZONTAL TIES						
LENGTH (FT)	# OF TIES	BAR SIZE	# OF ROWS	TOTAL LENGTH (FT)	WEIGHT/FT	TOTAL WEIGHT (LBS)
1.5	4	#3	3	18	0.376	6.8

NOTE: FOR INFORMATION ONLY



NO.	DATE	DESCRIPTION

**Civil & Environmental Consultants, Inc.**  
600 Marketplace Ave - Suite 200 - Bridgeport, WV 26330  
Ph: 304.933.3119 - 855.488.9539 - Fax: 304.933.3327  
www.ccecinc.com

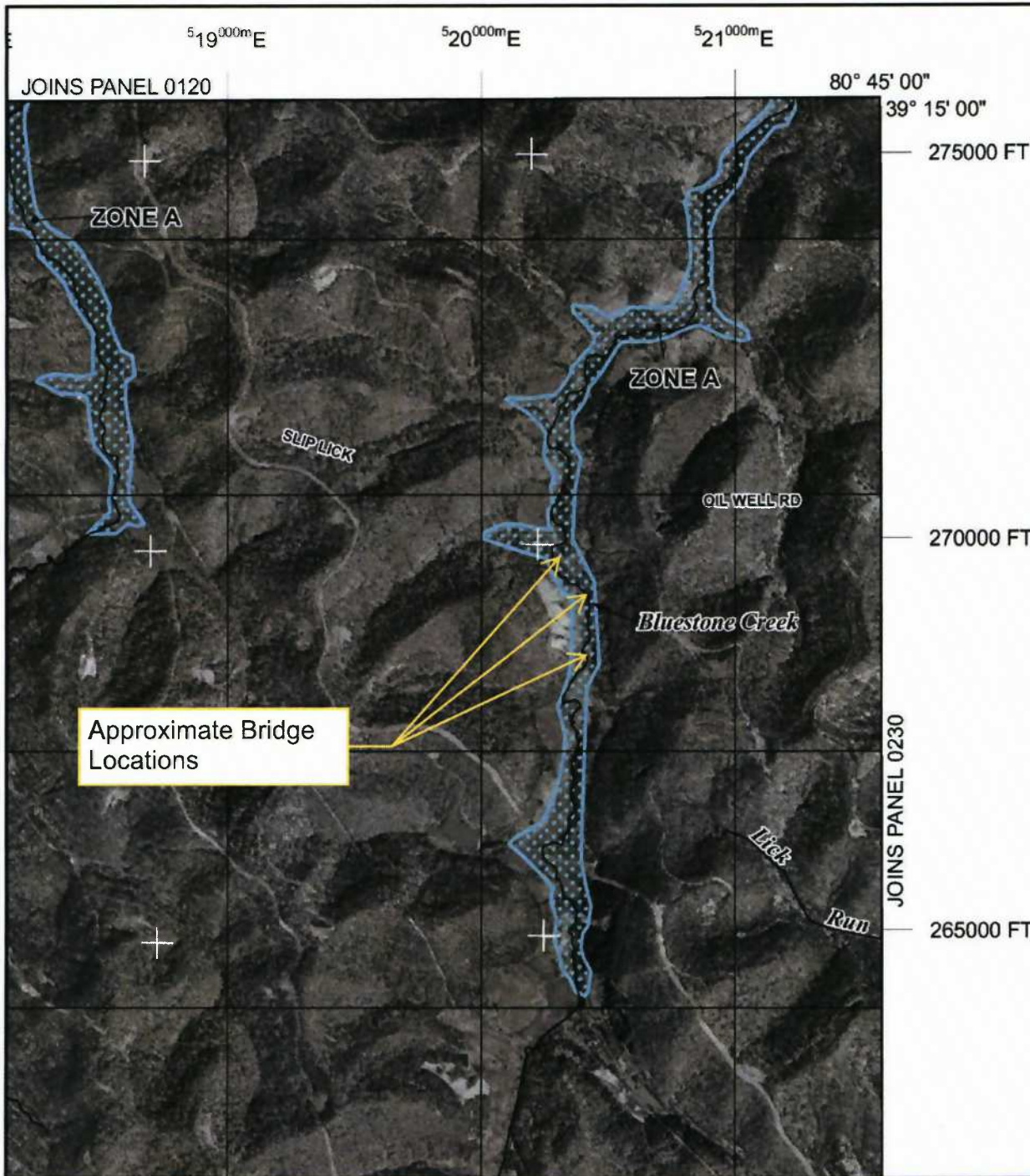
**EQT PRODUCTION COMPANY**  
OXF 157 BRIDGE CROSSINGS  
WEST UNION DISTRICT  
DODDRIDGE COUNTY, WV

STRUCTURAL NOTES AND DETAILS  
REVISION TO DNR OLS PERMIT # LS-14-VI/09-53

DATE: MARCH 2017 DRAWN BY: DBS  
DWG SCALE: AS SHOWN CHECKED BY: GSL  
PROJECT NO: 171-150  
APPROVED BY: JDR

DRAWING NO: **CV01**  
SHEET 5 OF 5

**APPENDIX B**  
**FEMA FIRMette**



MAP SCALE 1" = 2000'



NATIONAL FLOOD INSURANCE PROGRAM

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.



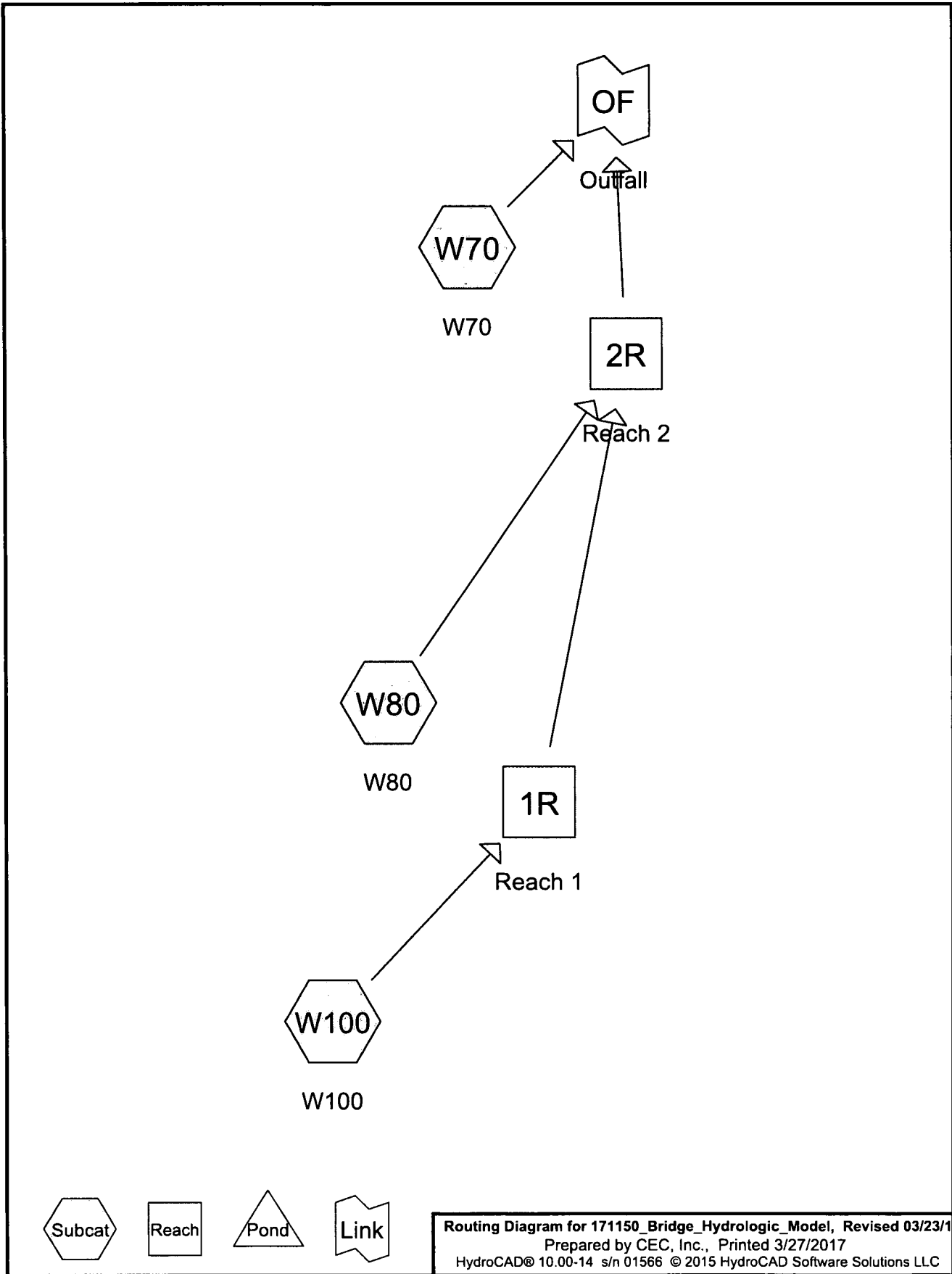
MAP NUMBER  
 54017C0225C  
 MAP REVISED  
 OCTOBER 4, 2011

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](http://www.msc.fema.gov)

**APPENDIX C**

**Design Discharge Calculations**





**Summary for Subcatchment W100: W100**

Runoff = 825.38 cfs @ 12.16 hrs, Volume= 67.169 af, Depth> 2.48"

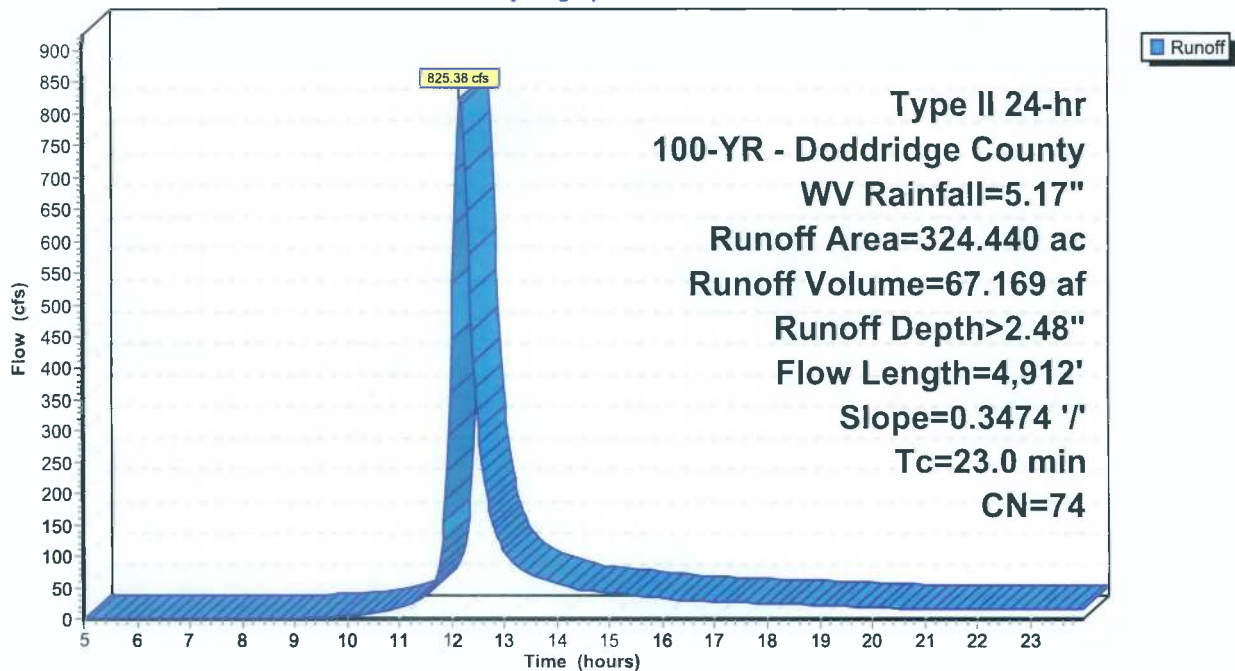
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-23.99 hrs, dt= 0.03 hrs  
 Type II 24-hr 100-YR - Doddridge County, WV Rainfall=5.17"

Area (ac)	CN	Description
* 324.440	74	HEC-GeoHMS
324.440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.0	4,912	0.3474	3.56		Lag/CN Method,

**Subcatchment W100: W100**

Hydrograph



**Summary for Subcatchment W70: W70**

Runoff = 959.19 cfs @ 12.37 hrs, Volume= 111.973 af, Depth> 2.56"

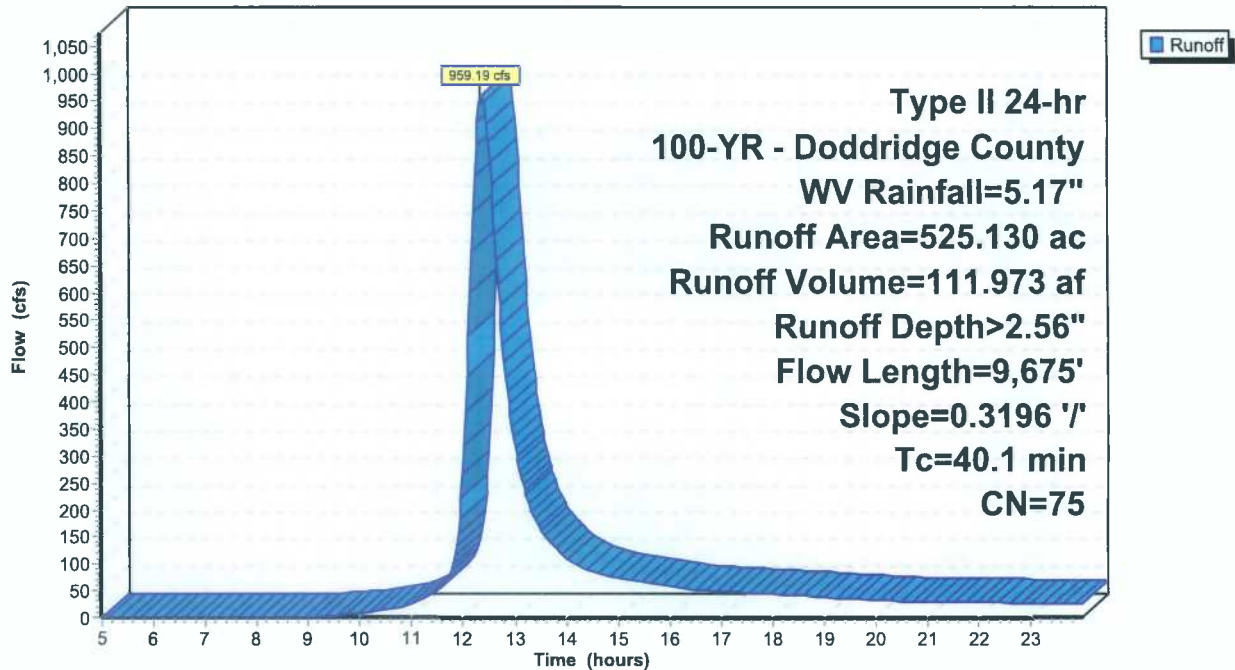
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-23.99 hrs, dt= 0.03 hrs  
 Type II 24-hr 100-YR - Doddridge County, WV Rainfall=5.17"

Area (ac)	CN	Description
* 525.130	75	HEC-GeoHMS
525.130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.1	9,675	0.3196	4.02		Lag/CN Method,

**Subcatchment W70: W70**

Hydrograph



**Summary for Subcatchment W80: W80**

Runoff = 1,044.17 cfs @ 12.37 hrs, Volume= 121.159 af, Depth> 2.56"

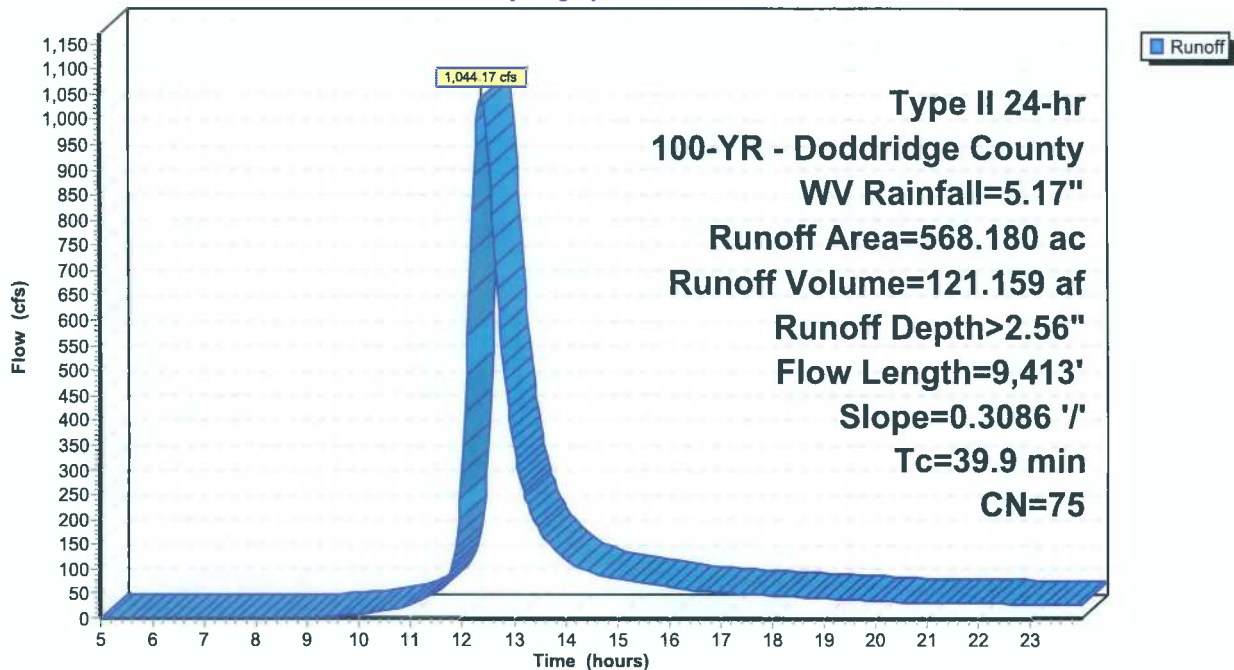
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-23.99 hrs, dt= 0.03 hrs  
 Type II 24-hr 100-YR - Doddridge County, WV Rainfall=5.17"

Area (ac)	CN	Description
* 568.180	75	HEC-GeoHMS
568.180		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.9	9,413	0.3086	3.93		Lag/CN Method,

**Subcatchment W80: W80**

Hydrograph



### Summary for Reach 1R: Reach 1

From EG-GIS-LIDAR-COMPOSITE surface near Bridge Crossing D

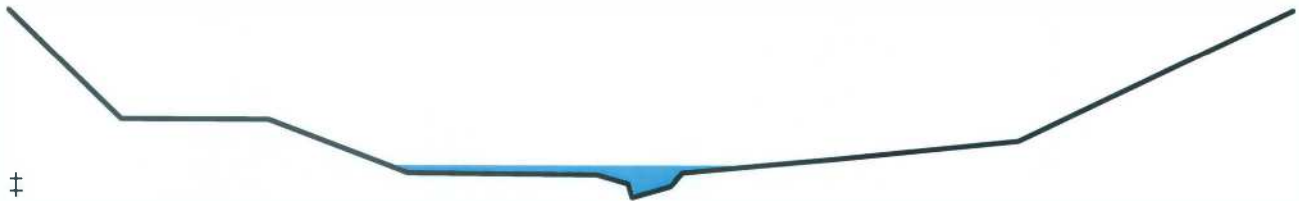
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=2)

Inflow Area = 324.440 ac, 0.00% Impervious, Inflow Depth > 2.48" for 100-YR - Doddridge County, WV even  
 Inflow = 825.38 cfs @ 12.16 hrs, Volume= 67.169 af  
 Outflow = 436.95 cfs @ 12.86 hrs, Volume= 65.584 af, Atten= 47%, Lag= 41.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-23.99 hrs, dt= 0.03 hrs  
 Max. Velocity= 4.04 fps, Min. Travel Time= 27.6 min  
 Avg. Velocity= 2.63 fps, Avg. Travel Time= 42.3 min

Peak Storage= 764,706 cf @ 12.39 hrs  
 Average Depth at Peak Storage= 3.91'  
 Bank-Full Depth= 23.01' Flow Area= 4,908.2 sf, Capacity= 100,893.63 cfs

Custom cross-section, Length= 6,694.0' Slope= 0.0087 '/' (109 Elevation Intervals)  
 Constant n= 0.040  
 Inlet Invert= 982.57', Outlet Invert= 924.50'

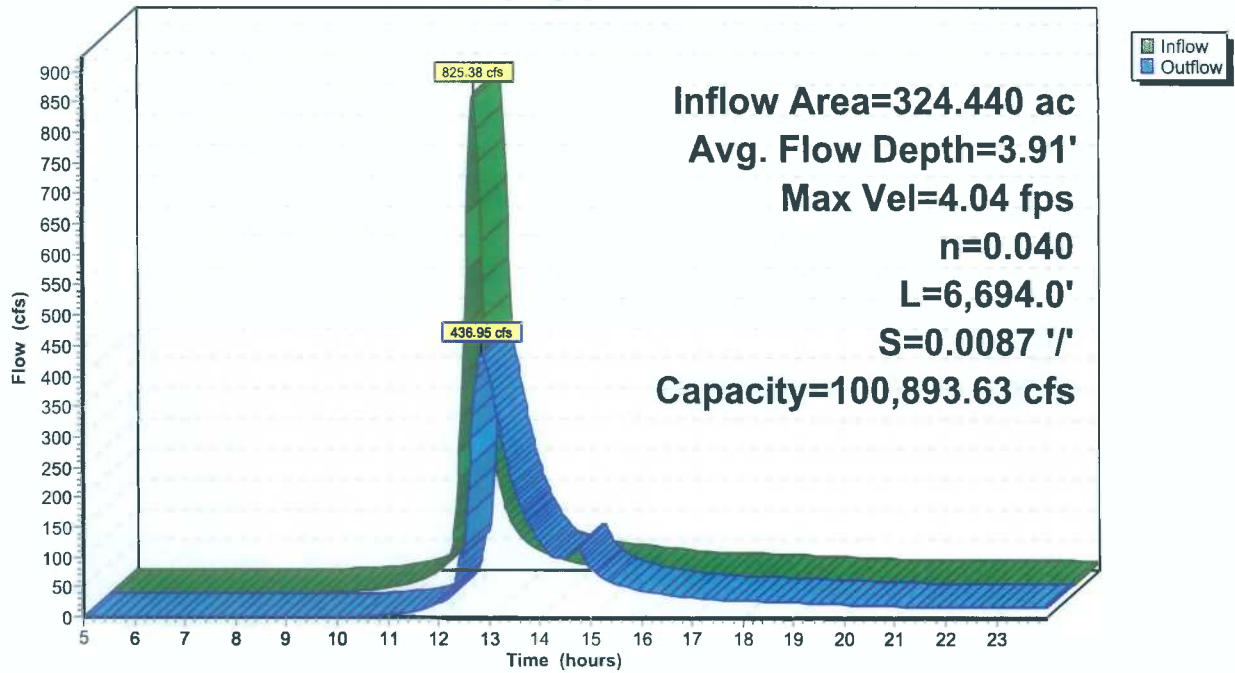


Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	930.43	0.00
29.00	917.01	13.42
67.00	916.95	13.48
103.00	910.47	19.96
152.00	910.20	20.23
160.00	909.08	21.35
161.00	907.42	23.01
171.00	908.75	21.68
174.00	910.44	19.99
214.00	912.16	18.27
261.00	914.38	16.05
332.00	930.43	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
1.33	7.2	11.6	48,082	18.01
1.66	10.9	12.7	72,808	33.94
2.78	29.4	23.1	197,112	119.93
3.02	39.9	67.1	267,102	97.63
3.05	42.0	73.2	280,883	100.15
4.74	204.3	122.1	1,367,408	995.96
6.96	537.4	181.7	3,597,335	3,831.19
9.53	1,032.2	207.9	6,909,808	10,395.90
9.59	1,045.7	246.1	6,999,976	9,491.12
23.01	4,908.2	339.0	32,855,591	100,893.63

Reach 1R: Reach 1

Hydrograph



**Summary for Reach 2R: Reach 2**

From EG-GIS-LIDAR-COMPOSITE surface near Bridge Crossing B

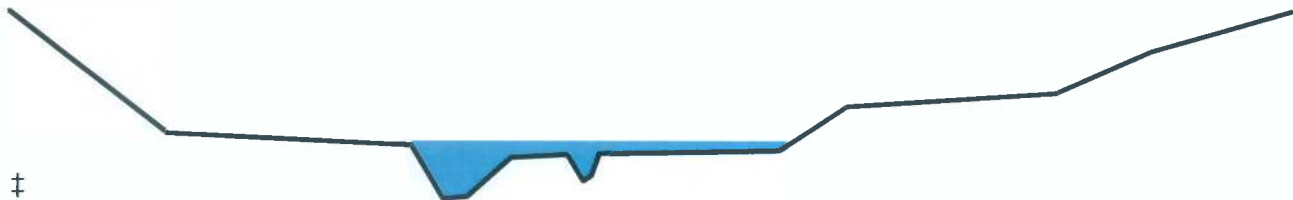
[62] Hint: Exceeded Reach 1R OUTLET depth by 2.74' @ 13.01 hrs

Inflow Area = 892.620 ac, 0.00% Impervious, Inflow Depth > 2.51" for 100-YR - Doddridge County, WV even  
 Inflow = 1,127.42 cfs @ 12.41 hrs, Volume= 186.744 af  
 Outflow = 920.72 cfs @ 13.12 hrs, Volume= 184.012 af, Atten= 18%, Lag= 42.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-23.99 hrs, dt= 0.03 hrs  
 Max. Velocity= 4.82 fps, Min. Travel Time= 17.7 min  
 Avg. Velocity = 3.17 fps, Avg. Travel Time= 26.9 min

Peak Storage= 1,104,414 cf @ 12.82 hrs  
 Average Depth at Peak Storage= 6.26'  
 Bank-Full Depth= 20.24' Flow Area= 3,537.2 sf, Capacity= 50,284.24 cfs

Custom cross-section, Length= 5,109.0' Slope= 0.0062 '/' (110 Elevation Intervals)  
 Constant n= 0.040  
 Inlet Invert= 924.50', Outlet Invert= 893.06'

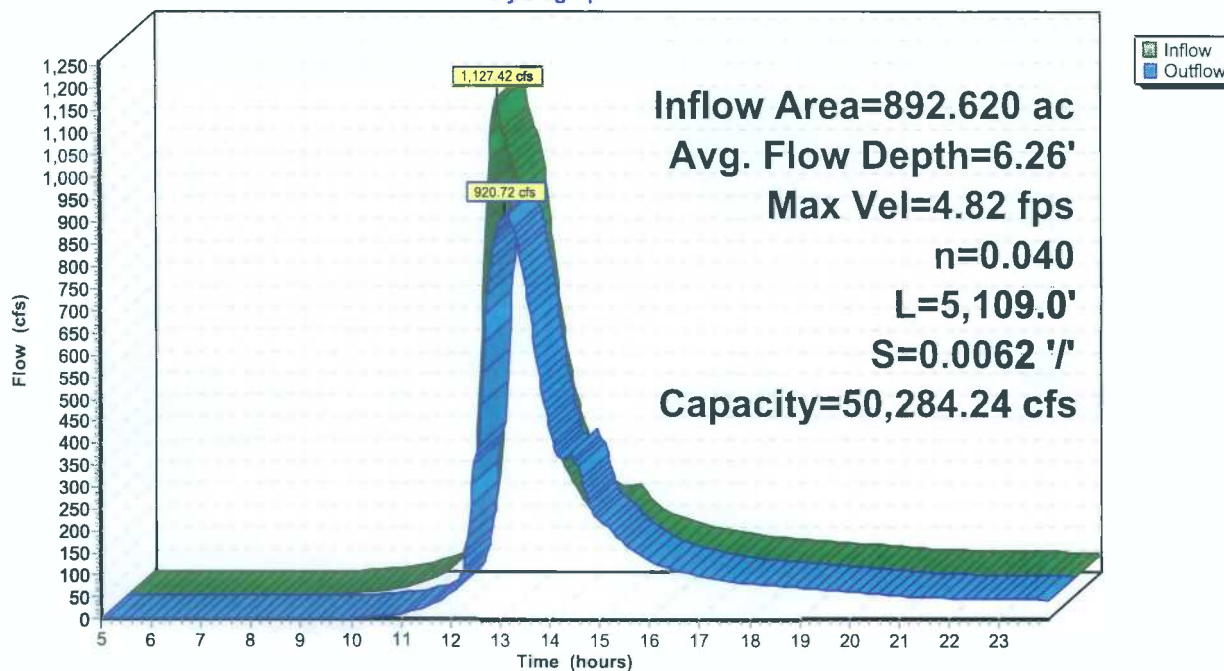


Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	920.00	0.00
39.00	906.84	13.16
100.00	905.56	14.44
108.00	899.76	20.24
114.00	900.00	20.00
125.00	904.22	15.78
139.00	904.53	15.47
143.00	901.68	18.32
145.00	902.22	17.78
147.00	904.62	15.38
192.00	904.98	15.02
209.00	909.75	10.25
261.00	911.19	8.81
285.00	915.70	4.30
320.00	920.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
0.24	0.8	6.4	3,881	0.53
1.92	17.0	14.0	86,959	56.60
2.46	25.4	19.4	129,674	88.49
4.46	73.7	34.4	376,546	356.71
4.77	85.5	49.9	436,641	356.51
4.86	89.6	50.2	457,763	383.08
5.22	114.2	95.8	583,509	374.25
5.80	167.9	98.9	858,003	696.48
7.08	330.3	164.7	1,687,630	1,532.23
9.99	822.5	184.6	4,201,962	6,491.04
11.43	1,120.2	241.1	5,723,069	9,090.45
15.94	2,263.8	279.6	11,565,820	26,601.55
20.24	3,537.2	328.3	18,071,376	50,284.24

Reach 2R: Reach 2

Hydrograph



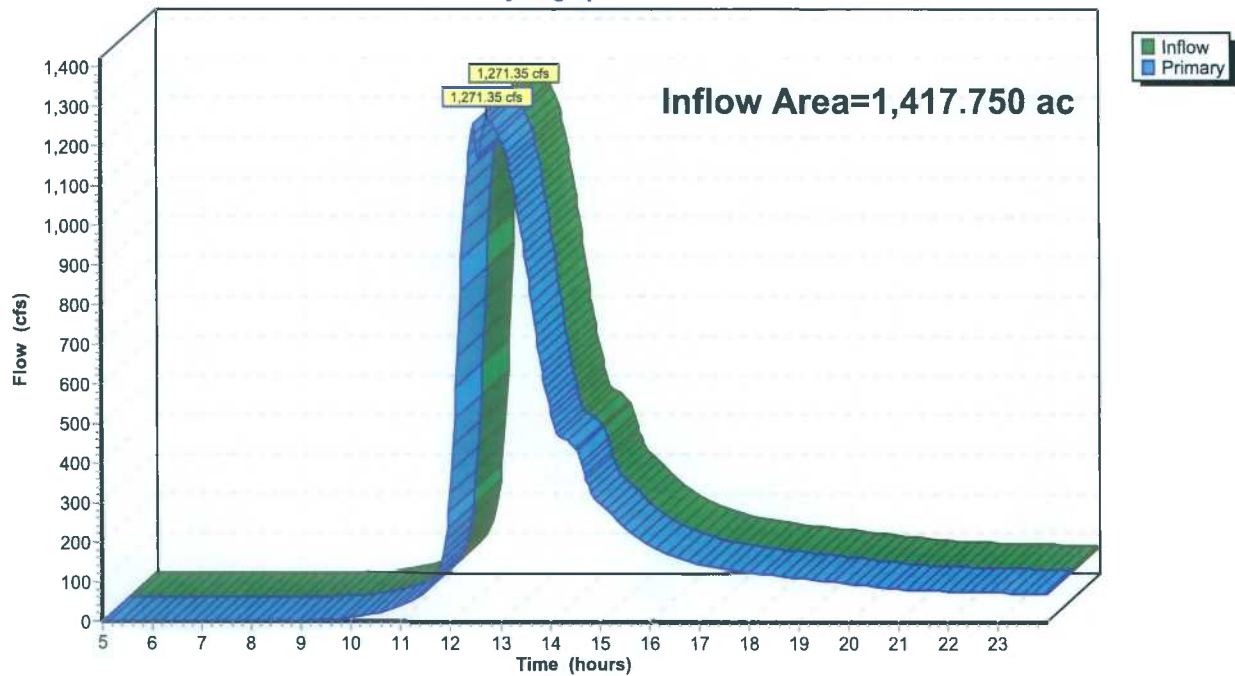
### Summary for Link OF: Outfall

Inflow Area = 1,417.750 ac, 0.00% Impervious, Inflow Depth > 2.51" for 100-YR - Doddridge County, WV even  
Inflow = 1,271.35 cfs @ 12.76 hrs, Volume= 295.984 af  
Primary = 1,271.35 cfs @ 12.76 hrs, Volume= 295.984 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-23.99 hrs, dt= 0.03 hrs

### Link OF: Outfall

Hydrograph





**APPENDIX D**

**HEC-RAS Profile Summary Tables**

HEC-RAS Plan: Existing River: Bluestone Creek Reach: Align (1) Profile: 100 YR

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Align (1)	9505.57	100 YR	950.02	949.17	0.85	1.77	0.11	502.04	702.74	66.23	148.10
Align (1)	9327.36	100 YR	947.07	946.57	0.50	0.99	0.09	666.16	440.12	164.72	291.40
Align (1)	9112.88	100 YR	944.51	944.32	0.18	0.66	0.01	765.11	452.96	52.93	282.05
Align (1)	8893.47	100 YR	943.85	943.61	0.24	0.92	0.06	779.25	471.26	20.48	235.48
Align (1)	8694.47	100 YR	942.87	942.04	0.83	1.52	0.01	328.17	926.08	16.75	111.76
Align (1)	8502.63	100 YR	941.34	940.43	0.91	0.69	0.23	541.59	699.58	29.83	133.54
Align (1)	8312.06	100 YR	939.69	939.54	0.15	0.38	0.01	820.17	430.08	20.75	239.48
Align (1)	8092.65	100 YR	939.30	939.02	0.28	0.50	0.04	562.70	647.53	60.77	124.16
Align (1)	7909.32	100 YR	938.76	938.08	0.68	1.44	0.02	525.33	719.34	26.33	200.88
Align (1)	7703.66	100 YR	936.86	936.24	0.62	0.64	0.10	730.70	502.33	37.98	190.49
Align (1)	7500.63	100 YR	935.33	935.05	0.28	0.32	0.03	47.47	1008.70	214.83	126.36
Align (1)	7359.7	100 YR	934.97	934.38	0.59	1.13	0.05	127.45	785.74	357.81	90.31
Align (1)	7155.83	100 YR	933.80	932.75	1.05	1.05	0.11	275.63	775.66	219.71	100.58
Align (1)	6967.63	100 YR	931.24	930.57	0.67	1.64	0.01	26.40	1173.43	71.18	82.43
Align (1)	6671.12	100 YR	929.58	928.80	0.79	0.88	0.13	316.48	628.80	325.72	157.05
Align (1)	6456.57	100 YR	928.17	927.82	0.35	0.15	0.08	354.30	867.11	49.59	173.32
Align (1)	6296.61	100 YR	927.94	927.85	0.08	0.11	0.01	680.43	532.75	57.82	235.93
Align (1)	6151.32	100 YR	927.82	927.68	0.14	0.50	0.21	509.77	387.36	373.87	198.73
Align (1)	5993.5	100 YR	927.11	924.89	2.22	1.41	0.48	321.04	945.82	4.14	58.53
Align (1)	5874.57	100 YR	925.15	924.53	0.62	0.54	0.11	717.67	535.90	17.43	152.22
Align (1)	5766.87	100 YR	924.50	924.26	0.24	0.43	0.00	806.24	411.13	53.63	179.64
Align (1)	5631.82	100 YR	924.07	923.78	0.29	0.53	0.00	759.85	452.49	58.66	171.05
Align (1)	5483.31	100 YR	923.53	923.26	0.28	0.37	0.04	884.88	307.91	78.21	174.21
Align (1)	5339.61	100 YR	923.12	922.97	0.15	0.42	0.05	941.39	311.07	18.54	190.58
Align (1)	5216.26	100 YR	922.65	922.04	0.62	0.81	0.16	625.02	593.83	52.15	189.92
Align (1)	4942.13	100 YR	921.69	921.60	0.09	0.73	0.03	316.42	287.31	667.27	339.21
Align (1)	4652.11	100 YR	920.93	920.58	0.35	0.77	0.07	11.80	422.79	836.41	311.72
Align (1)	4394.46	100 YR	920.10	919.97	0.13	0.90	0.04	900.16	285.49	85.35	316.22
Align (1)	4118.13	100 YR	919.15	918.60	0.56	0.64	0.03	142.51	610.26	518.23	247.13
Align (1)	4004.96	100 YR	918.49	918.03	0.46	0.70	0.02	3.32	591.88	675.80	200.32
Align (1)	3887.33	100 YR	917.77	917.11	0.66	0.82	0.00	31.92	644.31	594.77	182.40
Align (1)	3774.24	100 YR	916.67	916.02	0.65	0.76	0.10	42.47	667.00	561.53	163.27
Align (1)	3655.76	100 YR	915.81	915.51	0.30	0.94	0.02	294.11	297.92	678.97	185.77
Align (1)	3522.15	100 YR	914.85	914.35	0.50	0.31	0.05	635.75	420.52	214.72	164.57
Align (1)	3474.34	100 YR	914.48	914.16	0.32	0.38	0.04	699.85	380.61	190.54	163.41
Align (1)	3419.48	100 YR	914.06	913.32	0.74	0.36	0.14	493.51	499.99	277.50	155.97
Align (1)	3307.29	100 YR	913.08	912.82	0.27	0.06	0.01	32.42	1233.13	5.45	122.20
Align (1)	3273.98	100 YR	913.02	912.70	0.32	0.16	0.02	49.29	1168.91	52.79	134.10
Align (1)	3220.4	100 YR	912.84	912.29	0.55	0.23	0.09	617.69	492.64	160.67	159.76
Align (1)	3147.68	100 YR	912.51	912.28	0.24	0.13	0.02	719.35	485.56	66.09	157.97
Align (1)	3097.2	100 YR	912.37	911.97	0.40	0.47	0.06	657.16	587.42	26.41	123.11
Align (1)	2991.1	100 YR	911.84	910.86	0.98	0.43	0.19	304.42	816.70	149.88	122.23
Align (1)	2894.59	100 YR	911.02	910.69	0.33	0.48	0.06	763.67	416.27	91.06	123.36
Align (1)	2793	100 YR	910.48	909.56	0.92	0.84	0.04	436.74	741.06	93.20	121.38
Align (1)	2692.71	100 YR	909.60	908.79	0.81	0.51	0.07	514.17	557.18	199.64	136.76
Align (1)	2591.27	100 YR	909.01	908.45	0.56	0.26	0.06	340.92	919.07	11.01	77.19
Align (1)	2540.29	100 YR	908.68	907.49	1.20	0.37	0.03	489.23	780.69	1.08	86.55
Align (1)	2480.61	100 YR	907.22	906.12	1.10	0.25	0.23	45.59	1221.38	4.03	40.01
Align (1)	2384.96	100 YR	906.74	906.41	0.33	0.04	0.01	84.02	975.64	211.34	112.19
Align (1)	2358.81	100 YR	906.68	906.40	0.28	0.24	0.04	77.92	1032.48	160.60	143.58
Align (1)	2258.53	100 YR	906.40	905.73	0.67	0.33	0.01	10.68	825.40	434.92	130.98
Align (1)	2199.16	100 YR	906.06	905.25	0.81	0.31	0.02	19.65	867.12	384.23	119.78
Align (1)	2147.2	100 YR	905.74	904.78	0.96	0.73	0.02	125.16	978.26	167.59	117.61
Align (1)	2038.82	100 YR	905.00	903.88	1.12	1.00	0.05	318.45	946.04	6.51	129.77
Align (1)	1891.98	100 YR	903.88	902.94	0.95	0.41	0.00	384.06	738.30	148.63	103.08
Align (1)	1836.41	100 YR	903.46	902.47	0.99	0.50	0.05	620.19	586.52	64.29	153.05
Align (1)	1784.51	100 YR	902.60	901.12	1.48	0.25	0.38	332.91	887.08	51.02	201.38
Align (1)	1679.48	100 YR	901.32	901.09	0.23	0.03	0.01	42.77	1129.04	99.19	185.63
Align (1)	1651.65	100 YR	901.28	900.96	0.32	0.07	0.07	220.19	920.09	130.71	204.14
Align (1)	1582.56	100 YR	901.14	901.06	0.09	0.13	0.21	123.25	316.81	830.94	226.86
Align (1)	1513.38	100 YR	900.80	898.58	2.22	0.51	0.24	186.27	1084.12	0.60	57.02
Align (1)	1472.03	100 YR	899.78	898.36	1.42	0.34	0.09	279.72	985.74	5.54	63.72
Align (1)	1423.7	100 YR	899.35	898.23	1.12	0.29	0.06	99.00	1163.11	8.89	48.48
Align (1)	1368.31	100 YR	899.00	898.09	0.91	0.24	0.22	291.66	968.06	11.29	87.75
Align (1)	1246.88	100 YR	898.55	898.36	0.19	0.27	0.11	11.78	871.31	387.91	163.43
Align (1)	1127.31	100 YR	898.17	896.88	1.29	0.90	0.02	61.12	937.99	271.89	149.29
Align (1)	1023.96	100 YR	896.42	895.18	1.24			9.74	932.10	329.16	105.58

HEC-RAS Plan: Proposed River: Bluestone Creek Reach: Align (1) Profile: 100 YR

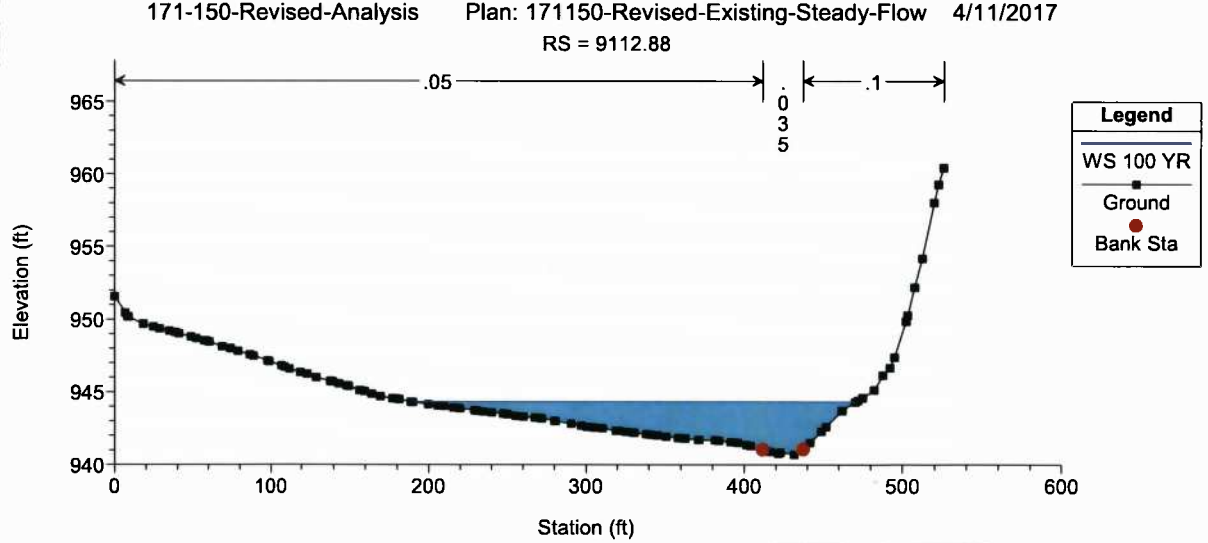
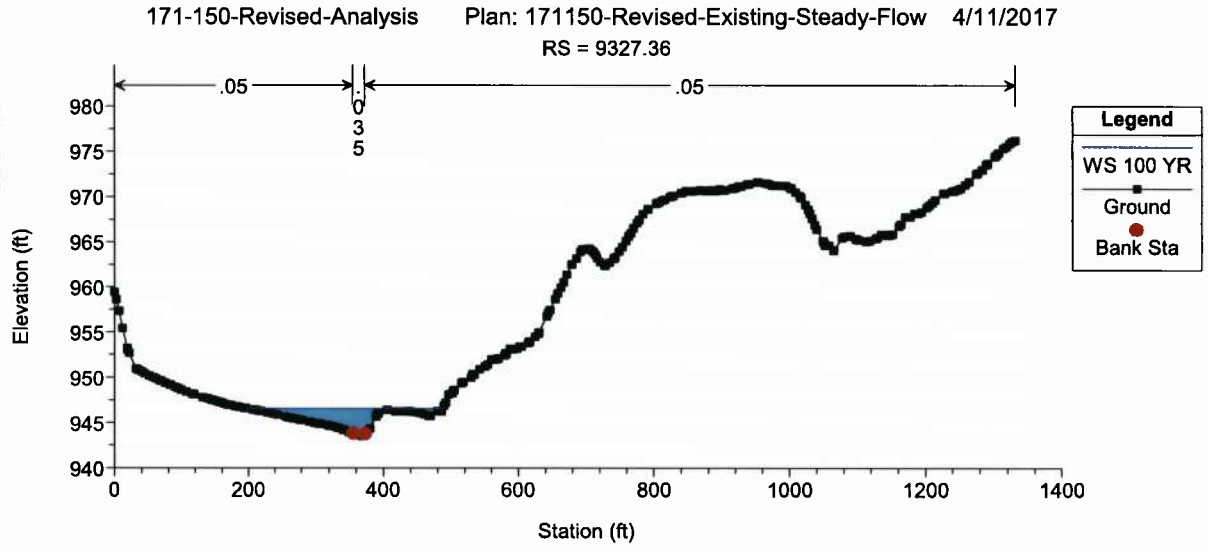
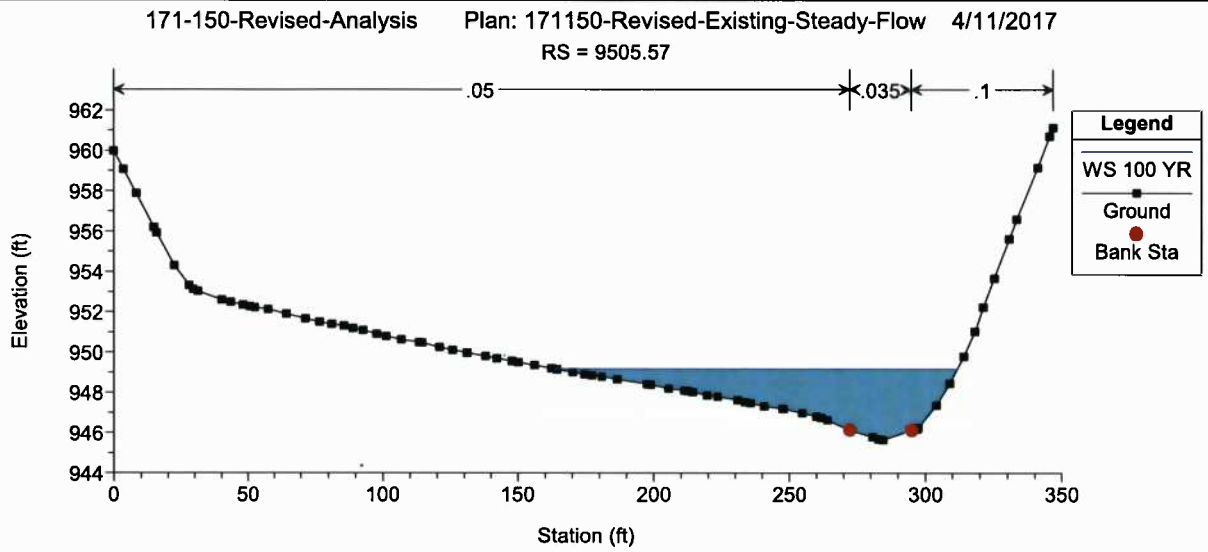
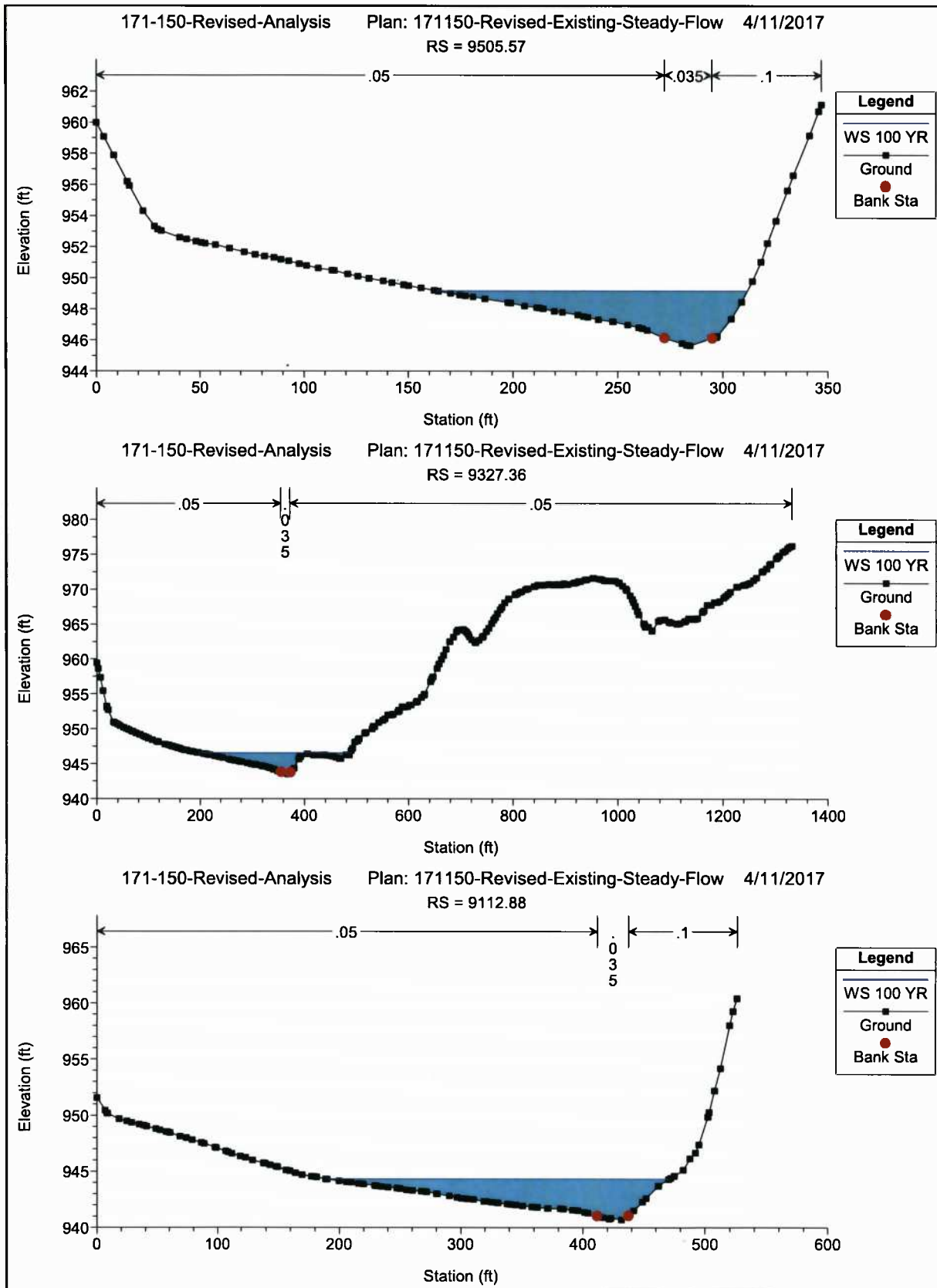
Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Align (1)	9505.57	100 YR	950.02	949.17	0.85	1.77	0.11	502.04	702.74	66.23	148.10
Align (1)	9327.36	100 YR	947.07	946.57	0.50	0.99	0.09	666.16	440.12	164.72	291.40
Align (1)	9112.88	100 YR	944.51	944.32	0.18	0.66	0.01	765.11	452.96	52.93	282.05
Align (1)	8893.47	100 YR	943.85	943.61	0.24	0.92	0.06	779.25	471.26	20.48	235.48
Align (1)	8694.47	100 YR	942.87	942.04	0.83	1.52	0.01	328.17	926.08	16.75	111.76
Align (1)	8502.63	100 YR	941.34	940.43	0.91	0.69	0.23	541.59	699.58	29.83	133.54
Align (1)	8312.06	100 YR	939.69	939.54	0.15	0.38	0.01	820.17	430.08	20.75	239.48
Align (1)	8092.65	100 YR	939.30	939.02	0.28	0.50	0.04	562.70	647.53	60.77	124.16
Align (1)	7909.32	100 YR	938.76	938.08	0.68	1.44	0.02	525.33	719.34	26.33	200.88
Align (1)	7703.66	100 YR	936.86	936.24	0.62	0.64	0.10	730.70	502.33	37.98	190.49
Align (1)	7500.63	100 YR	935.33	935.05	0.28	0.32	0.03	47.47	1008.70	214.83	126.36
Align (1)	7359.7	100 YR	934.97	934.38	0.59	1.13	0.05	127.45	785.74	357.81	90.31
Align (1)	7155.83	100 YR	933.80	932.75	1.05	1.05	0.11	275.63	775.66	219.71	100.58
Align (1)	6967.63	100 YR	931.24	930.57	0.67	1.64	0.01	26.40	1173.43	71.18	82.43
Align (1)	6671.12	100 YR	929.58	928.80	0.79	0.88	0.13	316.48	628.80	325.72	157.05
Align (1)	6456.57	100 YR	928.17	927.82	0.35	0.15	0.08	354.30	867.11	49.59	173.32
Align (1)	6296.61	100 YR	927.94	927.85	0.08	0.11	0.01	680.43	532.75	57.82	235.93
Align (1)	6151.32	100 YR	927.82	927.68	0.14	0.50	0.21	509.77	387.36	373.87	198.73
Align (1)	5993.5	100 YR	927.11	924.89	2.22	1.41	0.48	321.04	945.82	4.14	58.53
Align (1)	5874.57	100 YR	925.15	924.53	0.62	0.54	0.11	717.67	535.90	17.43	152.22
Align (1)	5766.87	100 YR	924.50	924.26	0.24	0.43	0.00	806.24	411.13	53.63	179.64
Align (1)	5631.82	100 YR	924.07	923.78	0.29	0.53	0.00	759.85	452.49	58.66	171.05
Align (1)	5483.31	100 YR	923.53	923.26	0.28	0.37	0.04	884.88	307.91	78.21	174.21
Align (1)	5339.61	100 YR	923.12	922.97	0.15	0.42	0.05	941.39	311.07	18.54	190.58
Align (1)	5216.26	100 YR	922.65	922.04	0.62	0.81	0.16	625.02	593.83	52.15	189.92
Align (1)	4942.13	100 YR	921.69	921.60	0.09	0.73	0.03	316.42	287.31	667.27	339.21
Align (1)	4652.11	100 YR	920.93	920.58	0.35	0.77	0.07	11.80	422.79	836.41	311.72
Align (1)	4394.46	100 YR	920.10	919.97	0.13	0.90	0.04	900.16	285.49	85.35	316.22
Align (1)	4118.13	100 YR	919.15	918.60	0.56	0.64	0.03	142.51	610.26	518.23	247.13
Align (1)	4004.96	100 YR	918.49	918.03	0.46	0.70	0.02	3.32	591.88	675.80	200.32
Align (1)	3887.33	100 YR	917.77	917.11	0.66	0.82	0.00	31.92	644.31	594.77	182.40
Align (1)	3774.24	100 YR	916.67	916.02	0.65	0.76	0.10	42.47	667.00	561.53	163.27
Align (1)	3655.76	100 YR	915.81	915.51	0.30	0.94	0.02	294.11	297.92	678.97	185.77
Align (1)	3522.15	100 YR	914.85	914.35	0.50	0.31	0.05	635.75	420.52	214.72	164.57
Align (1)	3474.34	100 YR	914.48	914.16	0.32	0.38	0.04	699.85	380.61	190.54	163.41
Align (1)	3419.48	100 YR	914.06	913.32	0.74	0.39	0.12	493.51	499.99	277.50	155.97
Align (1)	3307.29	100 YR	913.27	912.92	0.35	0.01	0.05		1271.00		124.17
Align (1)	3301.29		Bridge								
Align (1)	3273.98	100 YR	913.06	912.64	0.42	0.18	0.04		1262.39	8.61	131.73
Align (1)	3220.4	100 YR	912.84	912.29	0.55	0.23	0.09	617.69	492.64	160.67	159.76
Align (1)	3147.68	100 YR	912.51	912.28	0.24	0.13	0.02	719.35	485.56	66.09	157.97
Align (1)	3097.2	100 YR	912.37	911.97	0.40	0.47	0.06	657.16	587.42	26.41	123.11
Align (1)	2991.1	100 YR	911.84	910.86	0.98	0.43	0.19	304.42	816.70	149.88	122.23
Align (1)	2894.59	100 YR	911.02	910.69	0.33	0.48	0.06	763.67	416.27	91.06	123.36
Align (1)	2793	100 YR	910.48	909.56	0.92	0.84	0.04	436.74	741.06	93.20	121.38
Align (1)	2692.71	100 YR	909.60	908.79	0.81	0.51	0.07	514.17	557.18	199.64	136.76
Align (1)	2591.27	100 YR	909.01	908.45	0.56	0.26	0.06	340.92	919.07	11.01	77.19
Align (1)	2540.29	100 YR	908.68	907.49	1.20	0.28	0.12	489.23	780.69	1.08	86.55
Align (1)	2480.61	100 YR	907.70	906.89	0.81	0.18	0.14	63.62	1202.14	5.24	62.89
Align (1)	2384.96	100 YR	907.38	907.04	0.34	0.02	0.17	71.54	1073.61	125.86	145.34
Align (1)	2378.96		Bridge								
Align (1)	2358.81	100 YR	906.71	906.33	0.38	0.28	0.03	42.90	1132.30	95.79	138.70
Align (1)	2258.53	100 YR	906.40	905.73	0.67	0.33	0.01	10.68	825.40	434.92	130.98
Align (1)	2199.16	100 YR	906.06	905.25	0.81	0.31	0.02	19.65	867.12	384.23	119.78
Align (1)	2147.2	100 YR	905.74	904.78	0.96	0.73	0.02	125.16	978.26	167.59	117.61
Align (1)	2038.82	100 YR	905.00	903.88	1.12	1.00	0.05	318.45	946.04	6.51	129.77
Align (1)	1891.98	100 YR	903.88	902.94	0.95	0.41	0.00	384.06	738.30	148.63	103.08
Align (1)	1836.41	100 YR	903.46	902.47	0.99	0.50	0.05	620.19	586.52	64.29	153.05
Align (1)	1784.51	100 YR	902.60	901.12	1.48	0.21	0.38	332.91	887.08	51.02	201.38
Align (1)	1679.48	100 YR	901.76	901.54	0.22	0.01	0.05	51.36	1170.57	49.07	215.35
Align (1)	1673.48		Bridge								
Align (1)	1651.65	100 YR	901.39	900.96	0.44	0.07	0.18	121.15	1024.87	124.98	203.80
Align (1)	1582.56	100 YR	901.14	901.06	0.09	0.13	0.21	123.25	316.81	830.94	226.86
Align (1)	1513.38	100 YR	900.80	898.58	2.22	0.51	0.24	186.27	1084.12	0.60	57.02
Align (1)	1472.03	100 YR	899.78	898.36	1.42	0.34	0.09	279.72	985.74	5.54	63.72
Align (1)	1423.7	100 YR	899.35	898.23	1.12	0.29	0.06	99.00	1163.11	8.89	48.48
Align (1)	1368.31	100 YR	899.00	898.09	0.91	0.24	0.22	291.66	968.06	11.29	87.75
Align (1)	1246.88	100 YR	898.55	898.36	0.19	0.27	0.11	11.78	871.31	387.91	163.43

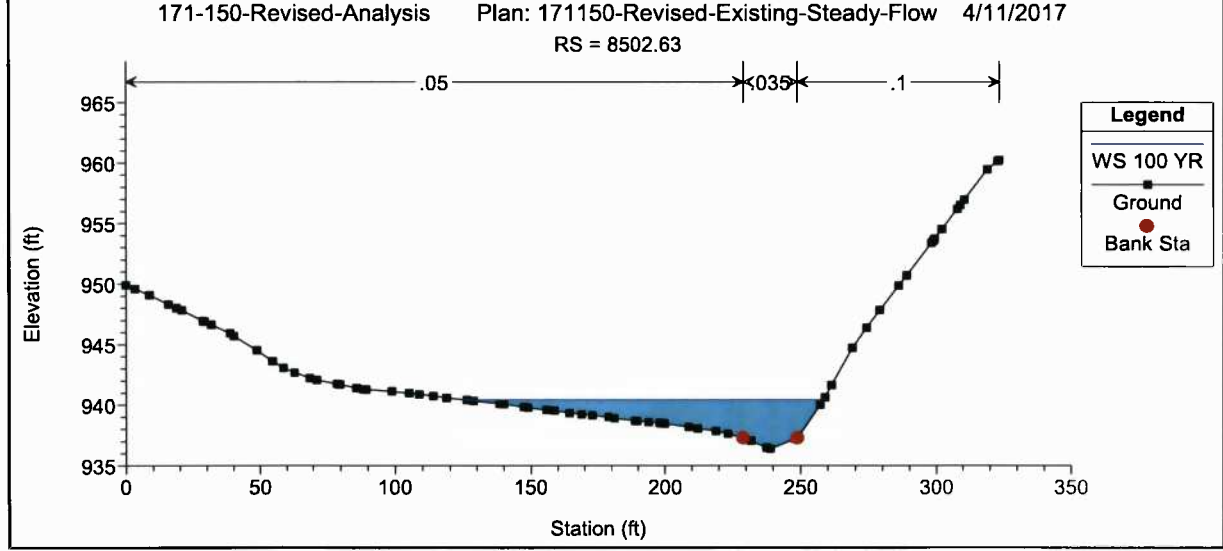
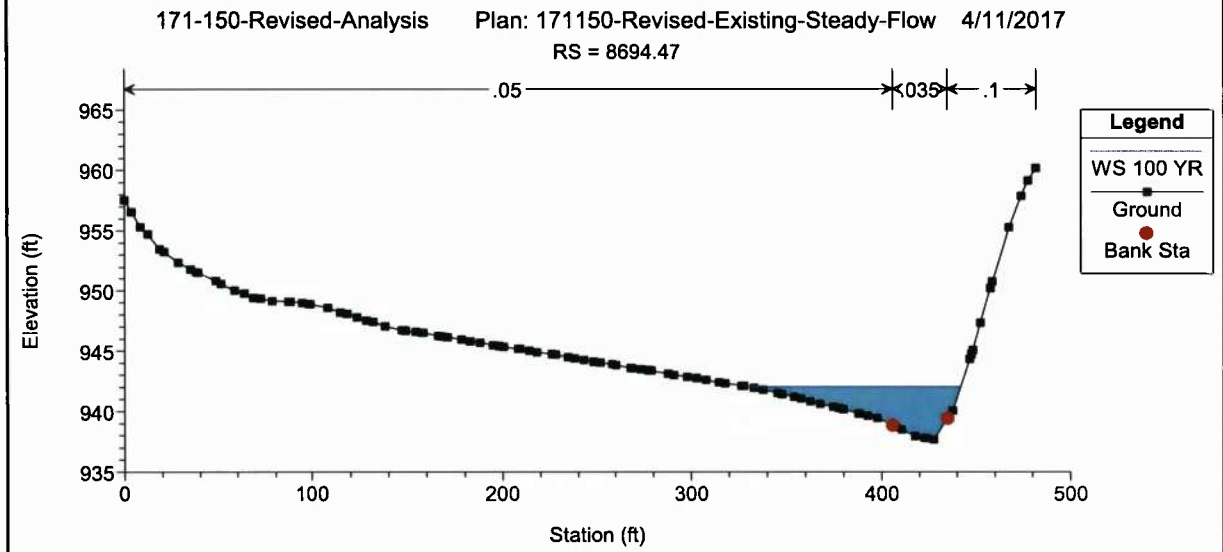
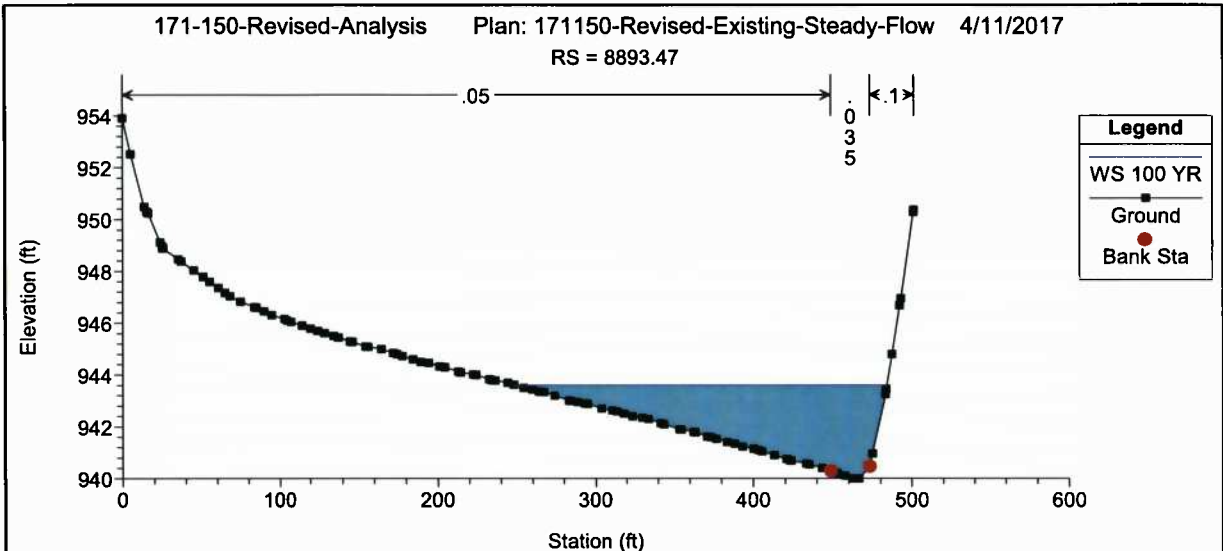
HEC-RAS Plan: Proposed River: Bluestone Creek Reach: Align (1) Profile: 100 YR (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Align (1)	1127.31	100 YR	898.17	896.88	1.29	0.90	0.02	61.12	937.99	271.89	149.29
Align (1)	1023.96	100 YR	896.42	895.18	1.24			9.74	932.10	329.16	105.58

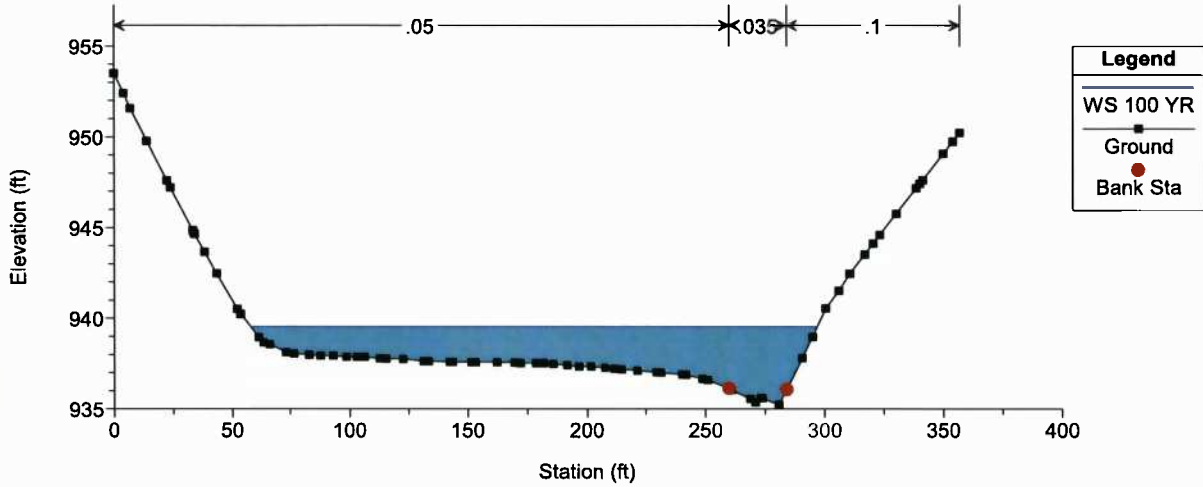
**APPENDIX E**

**HEC-RAS Cross-Section Reports**

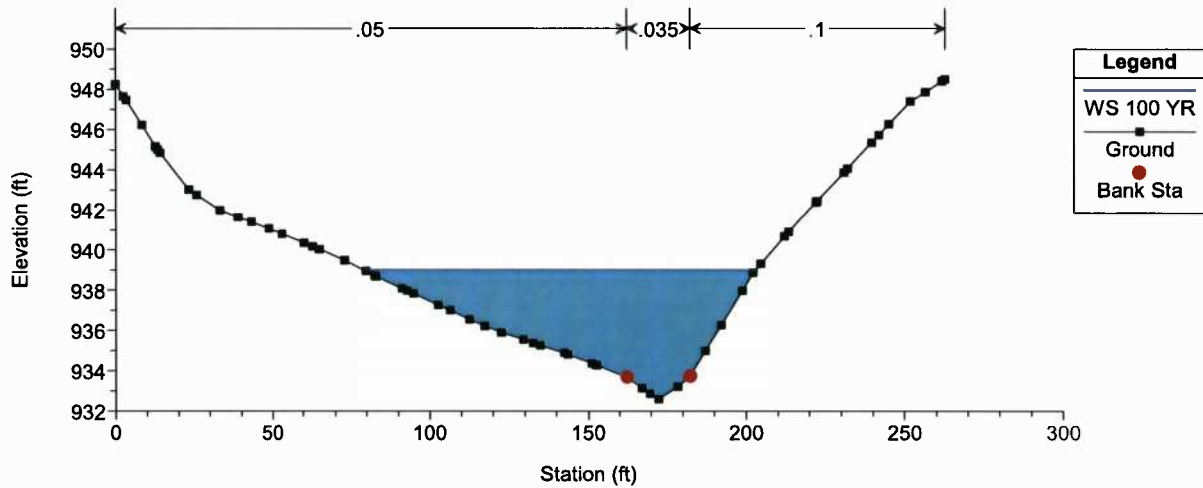




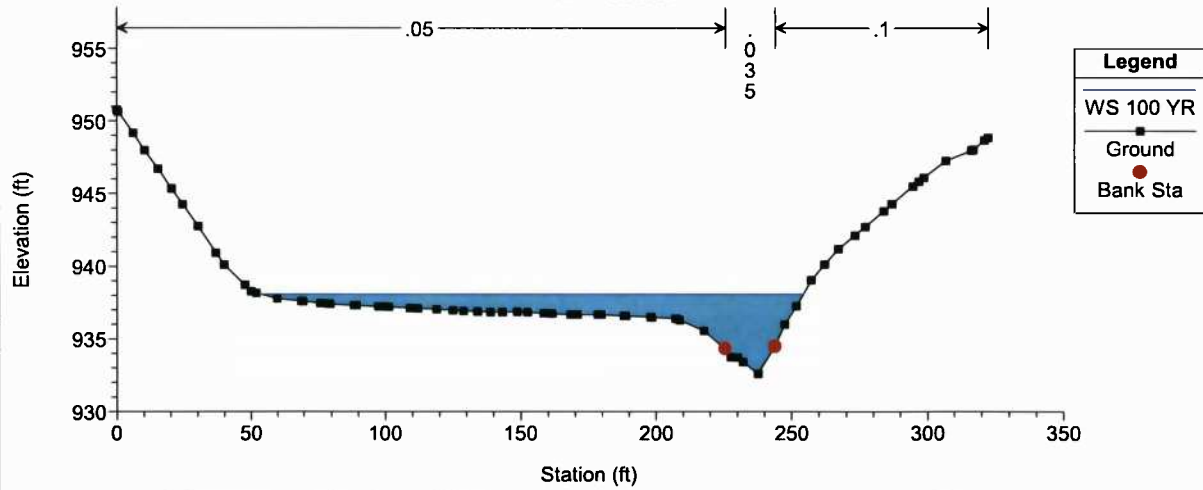
171-150-Revised-Analysis Plan: 171150-Revised-Existing-Steady-Flow 4/11/2017  
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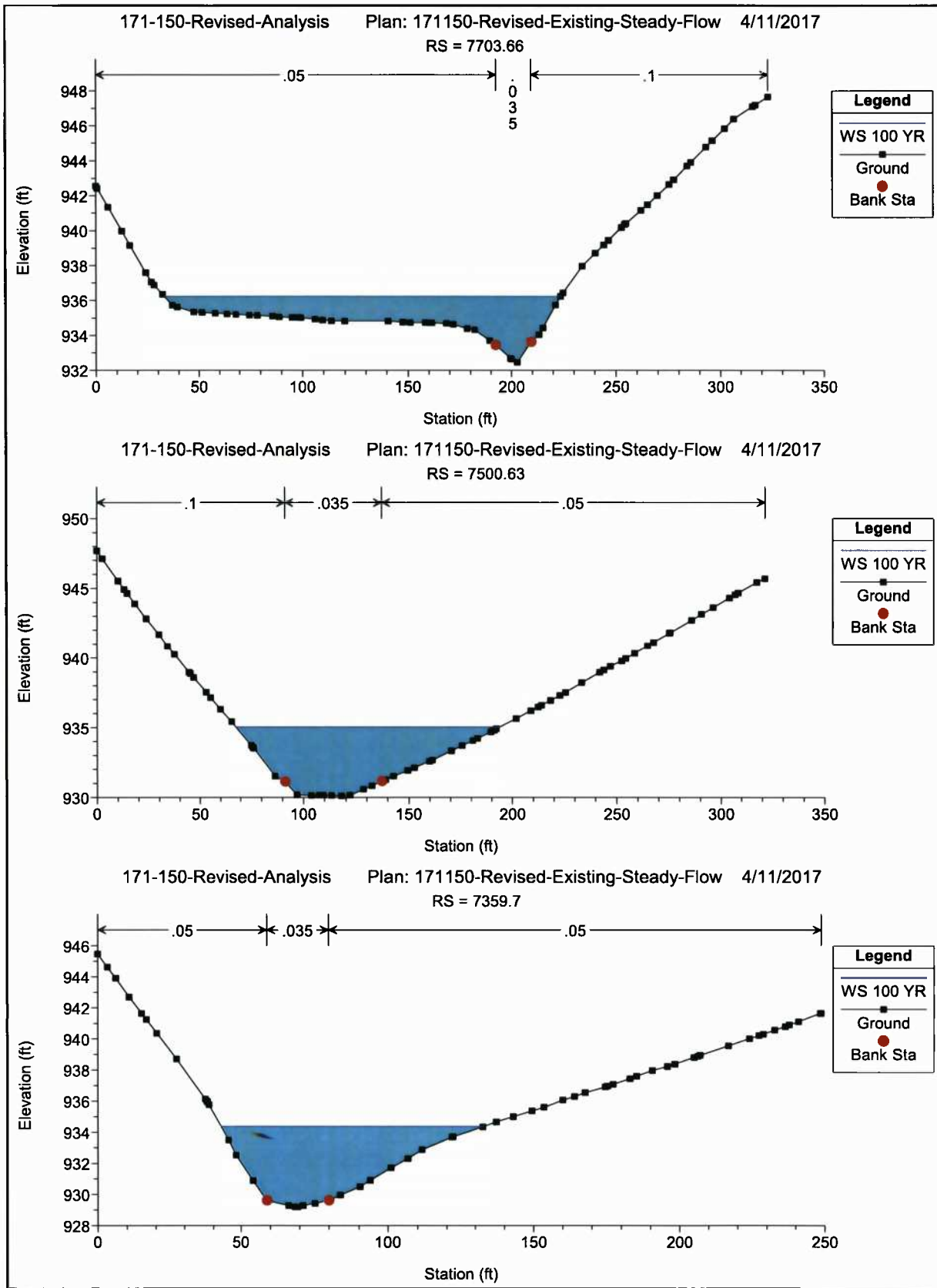
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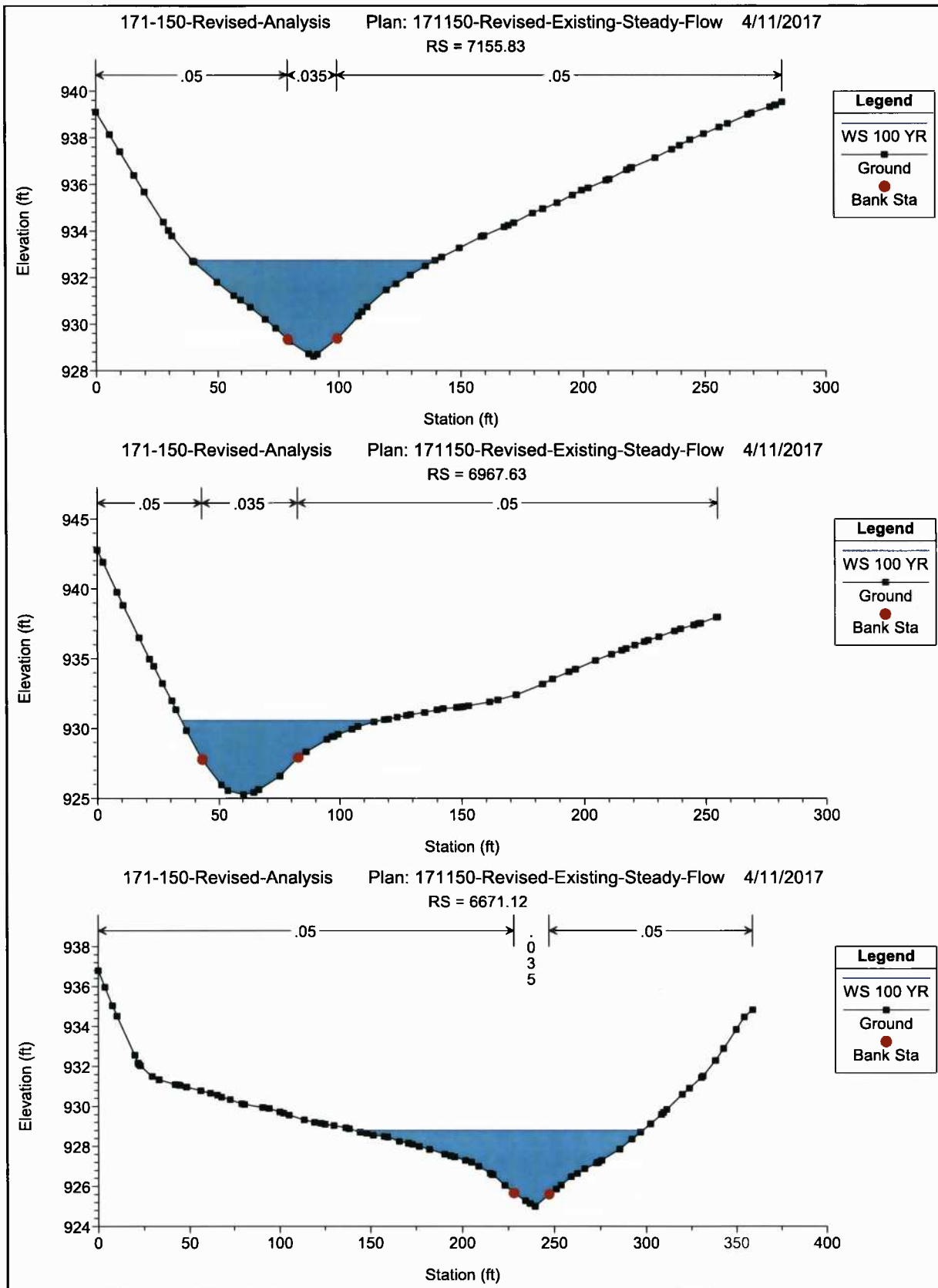


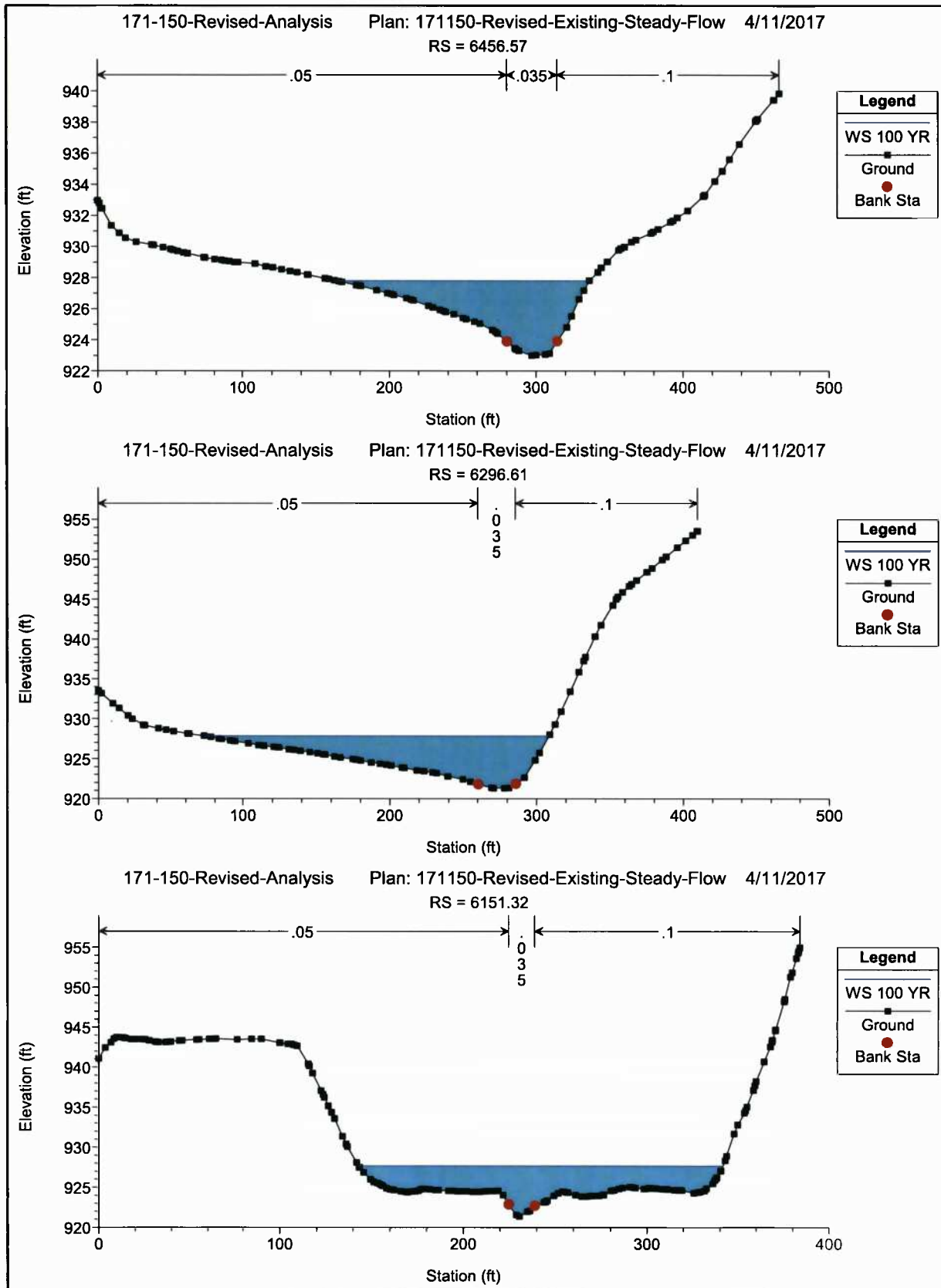
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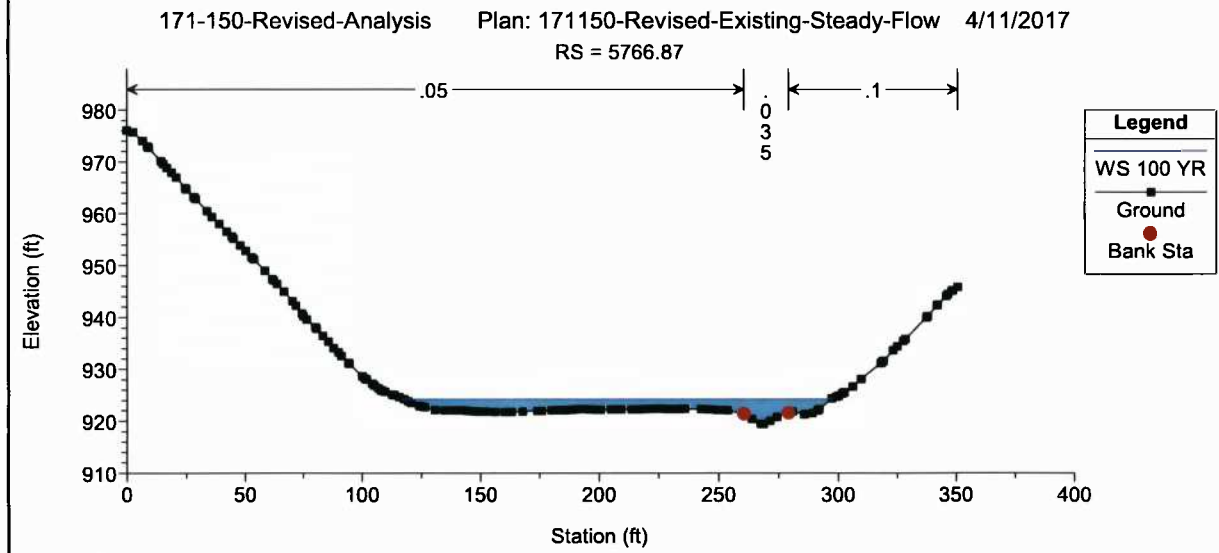
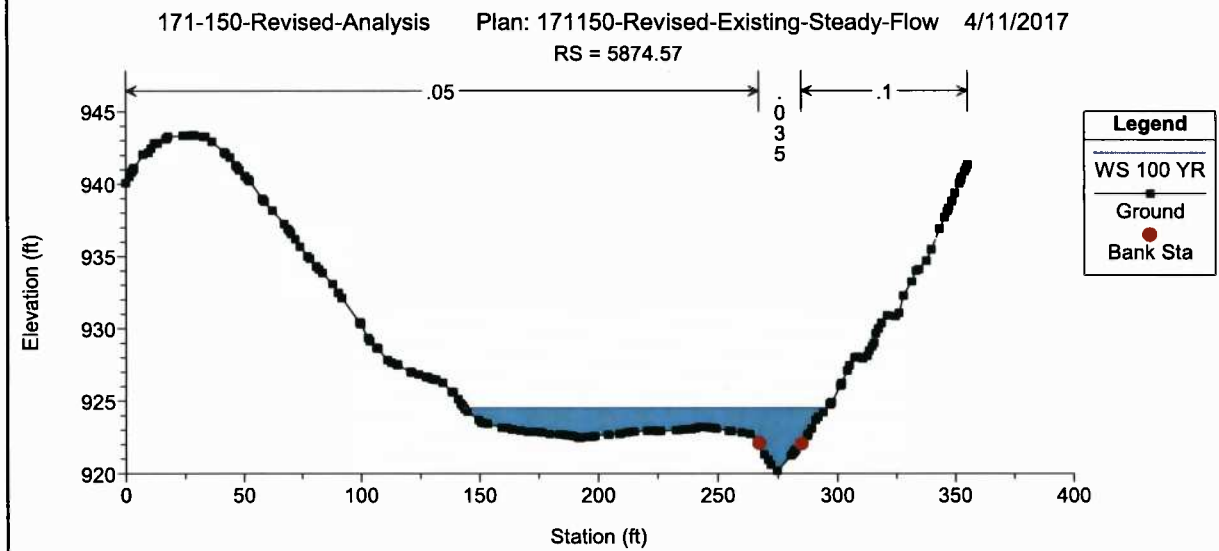
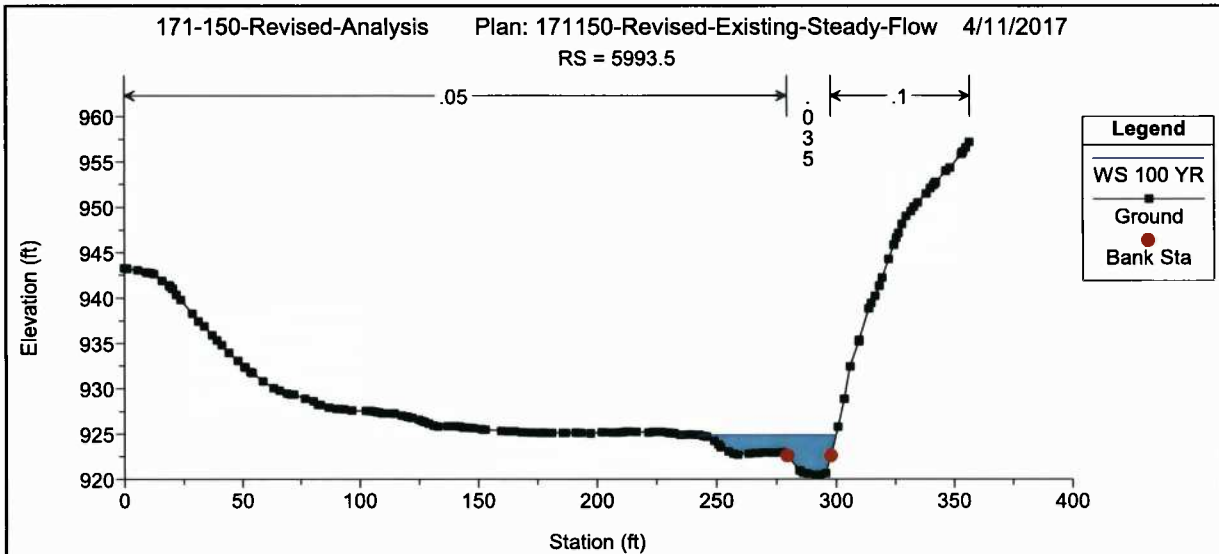


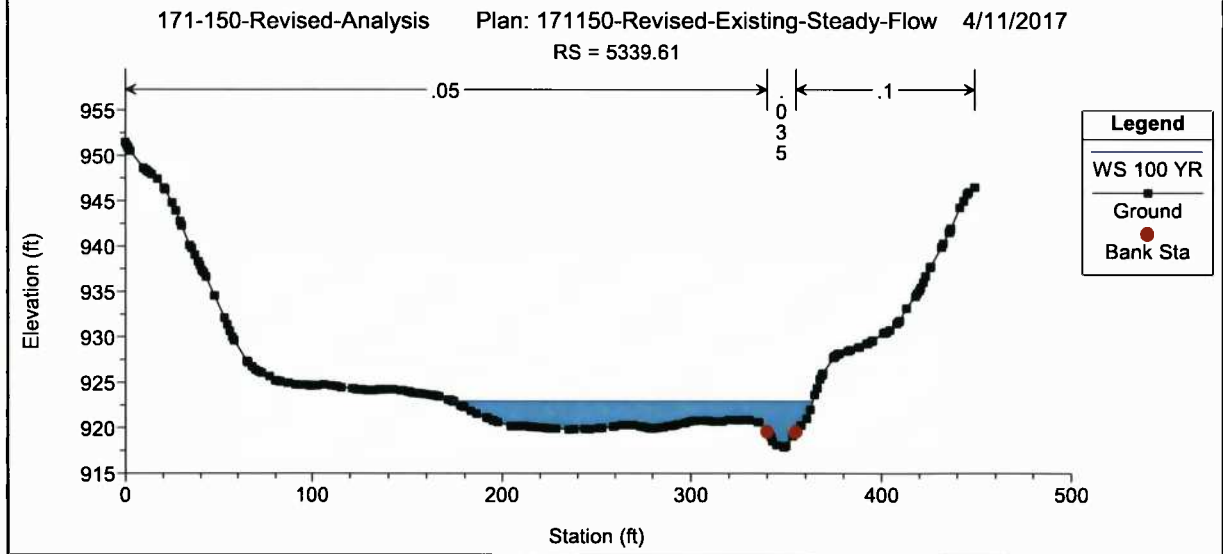
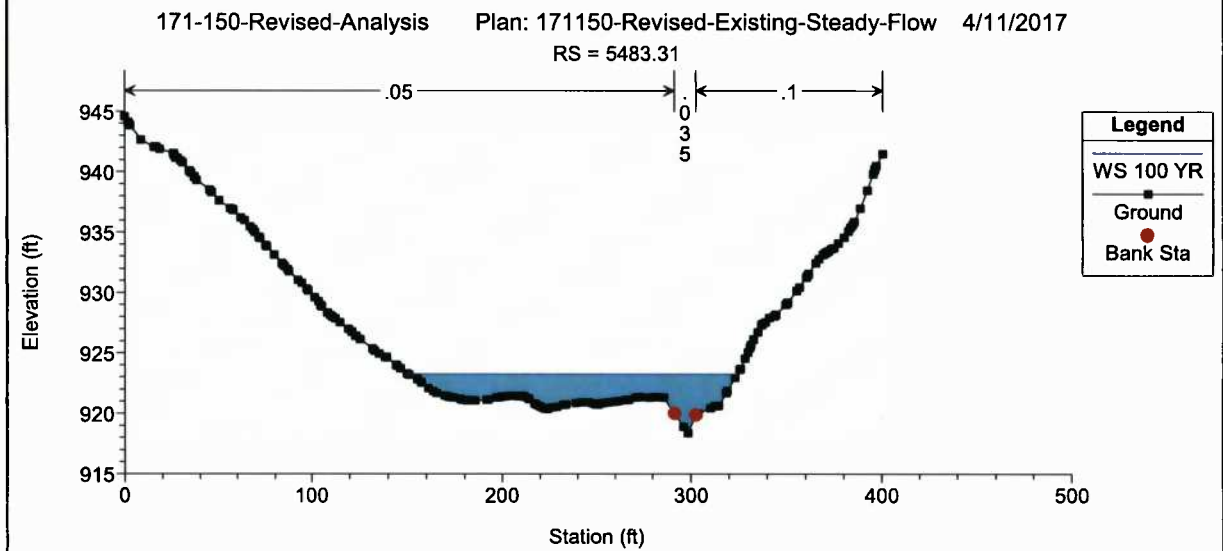
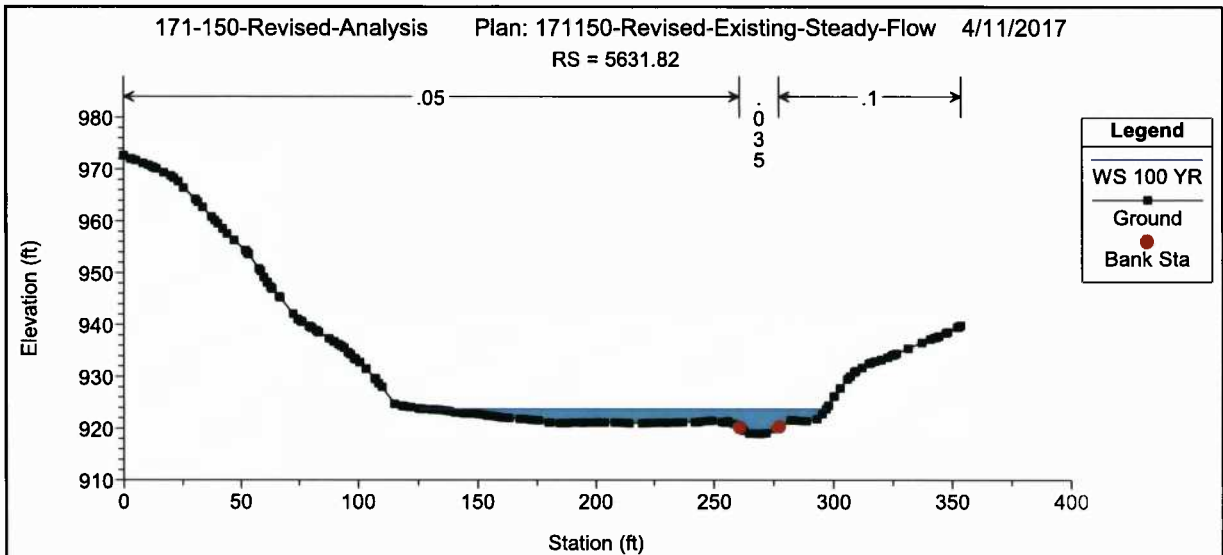


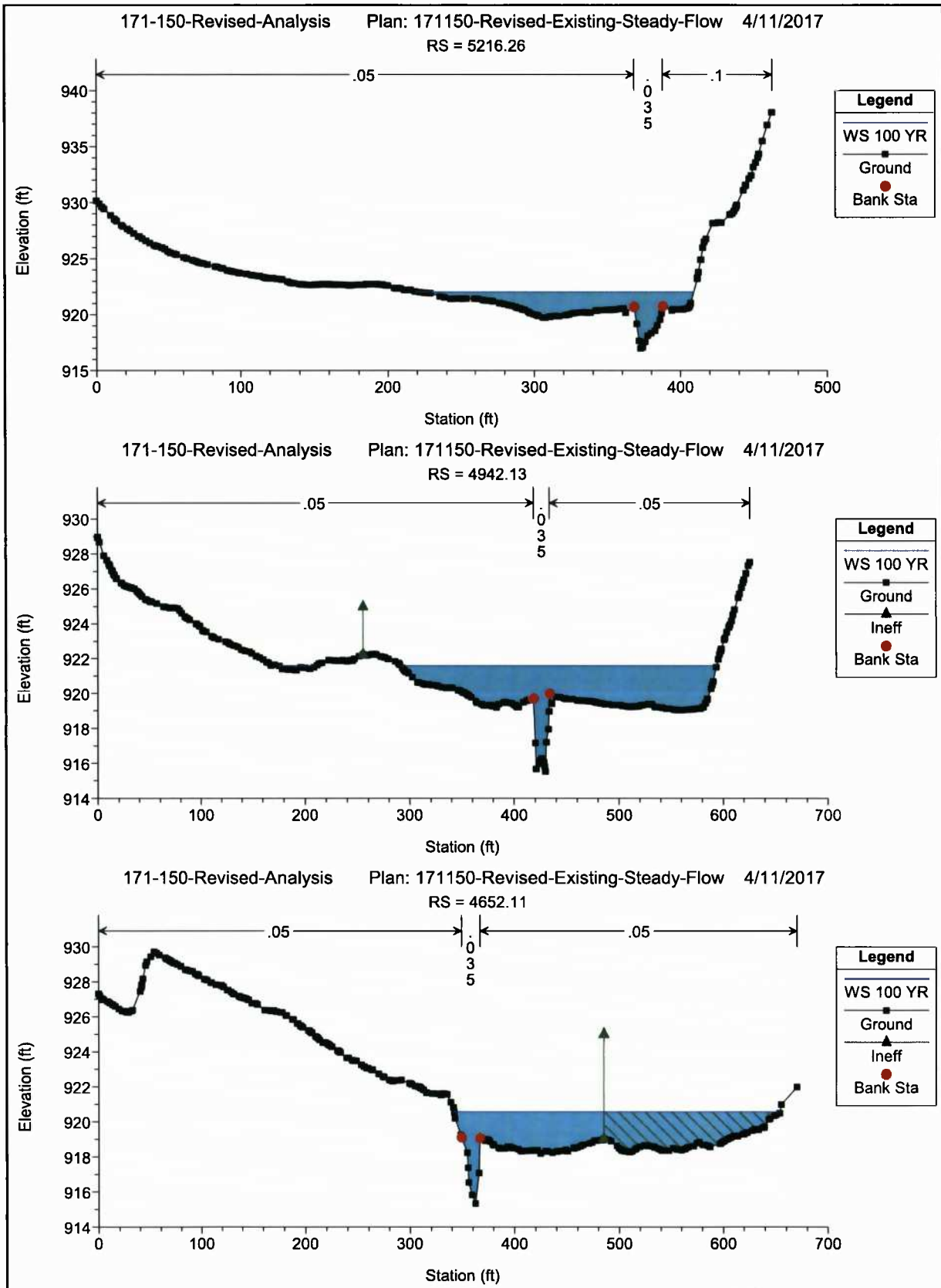


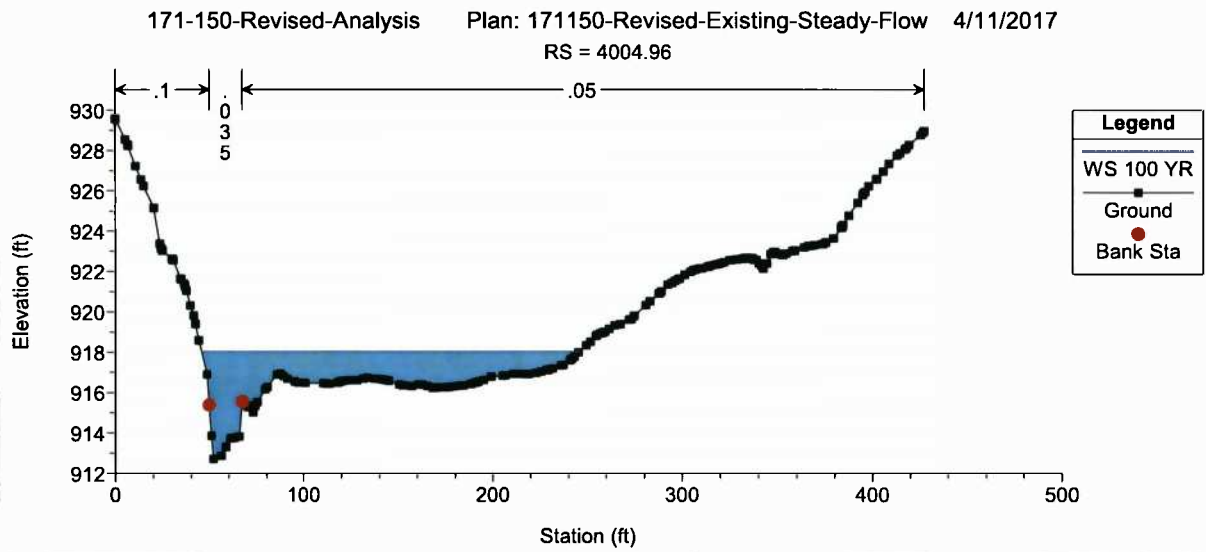
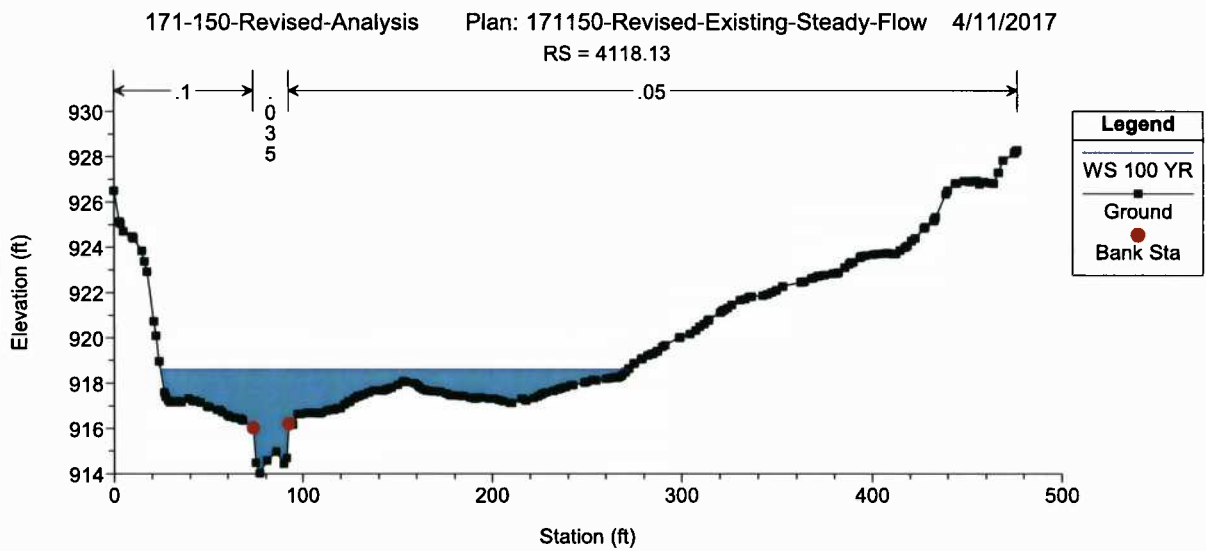
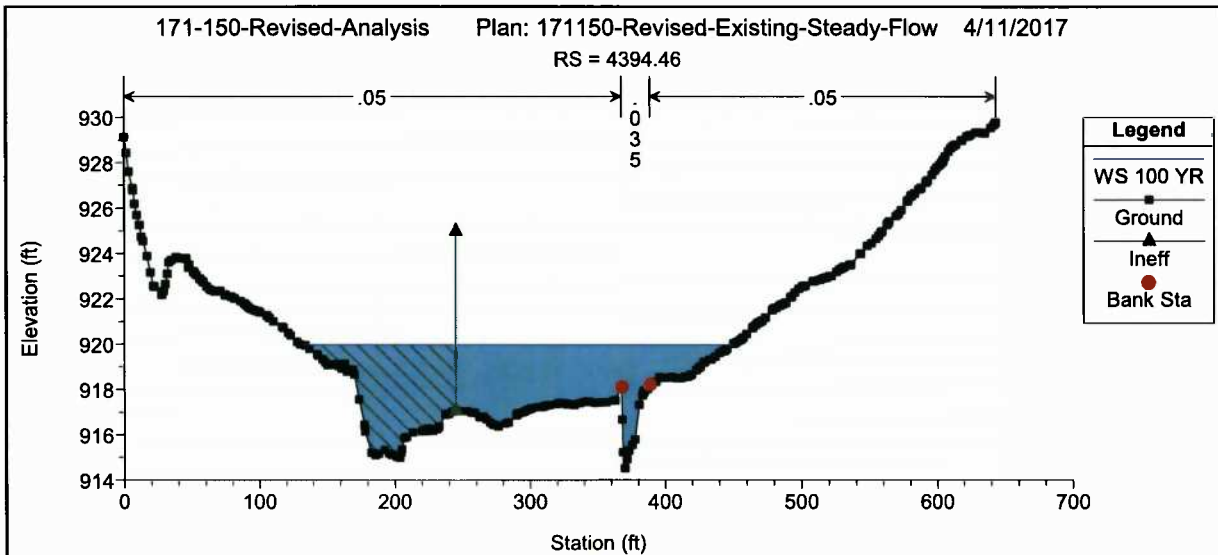


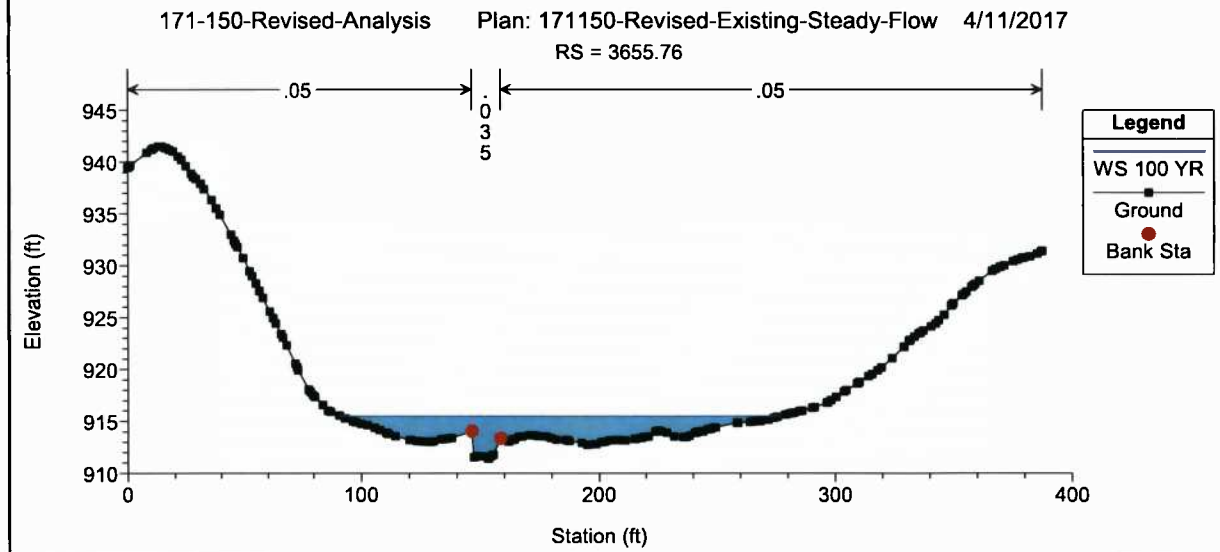
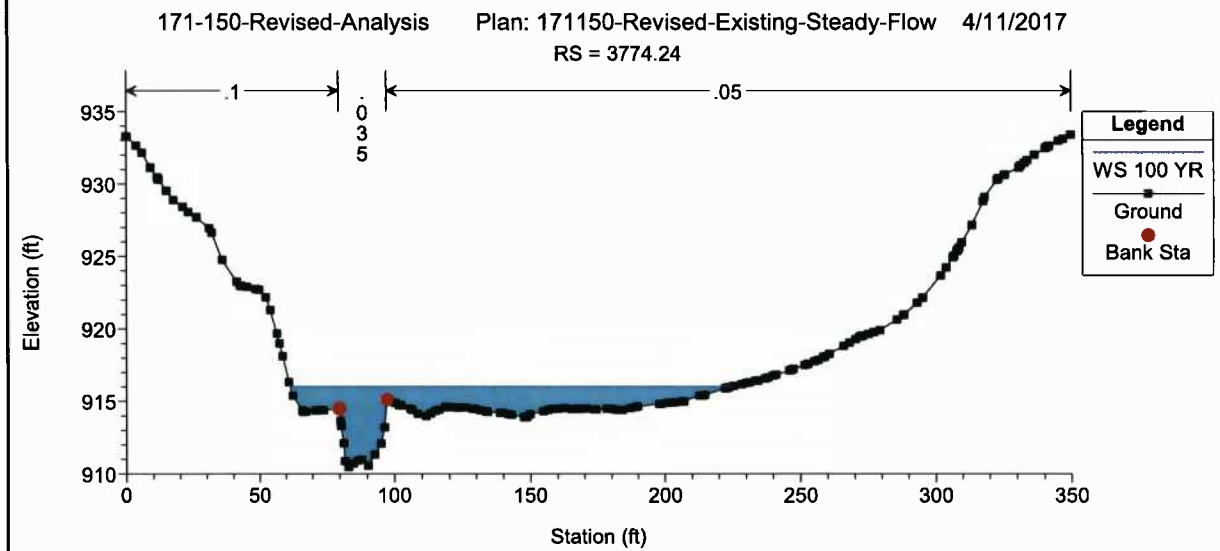
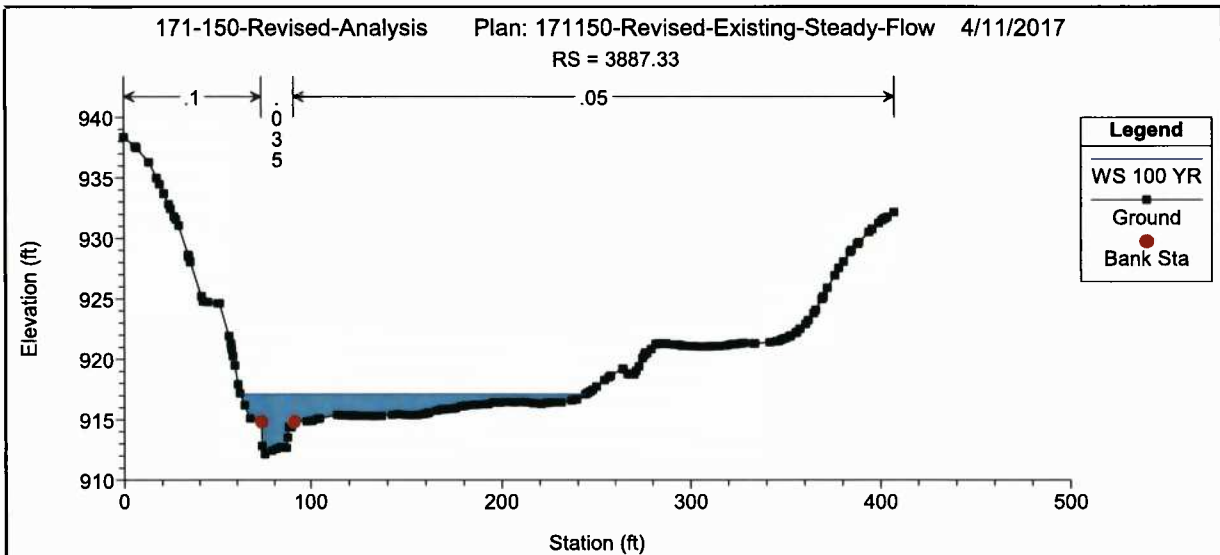




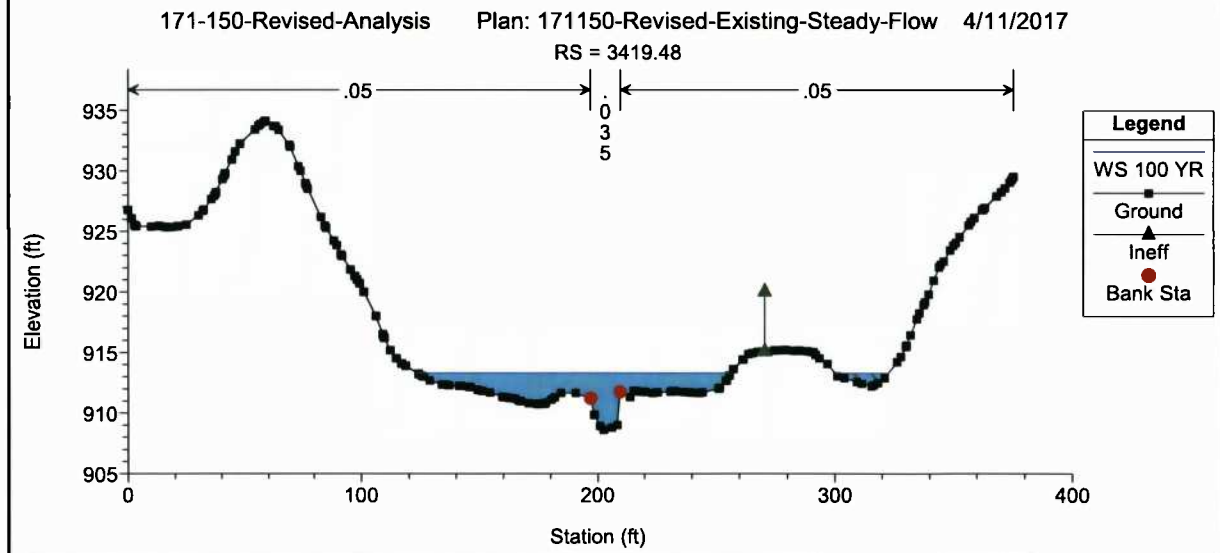
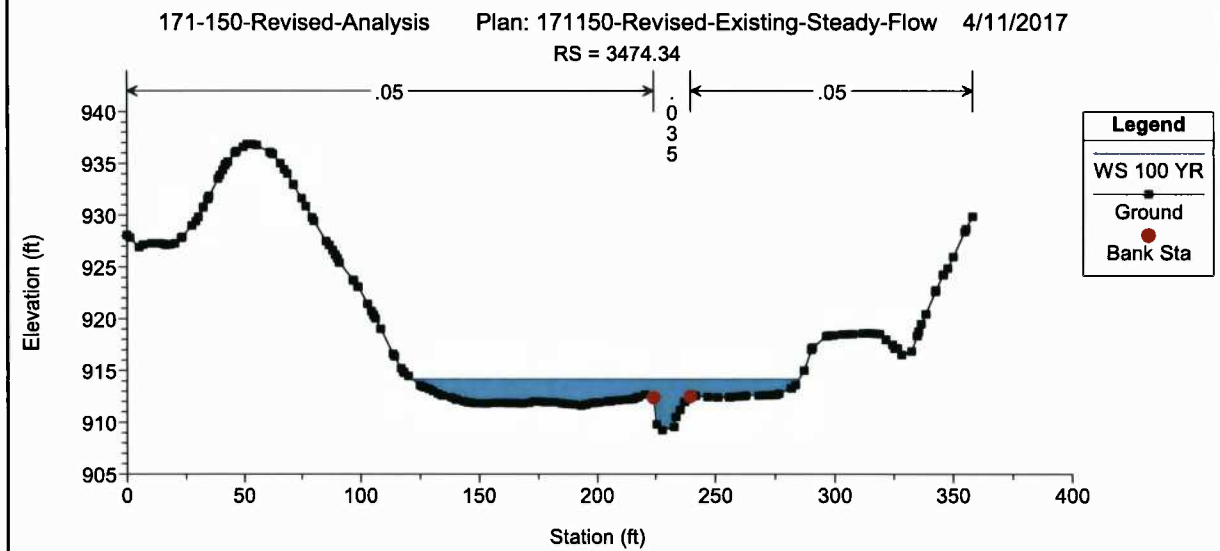
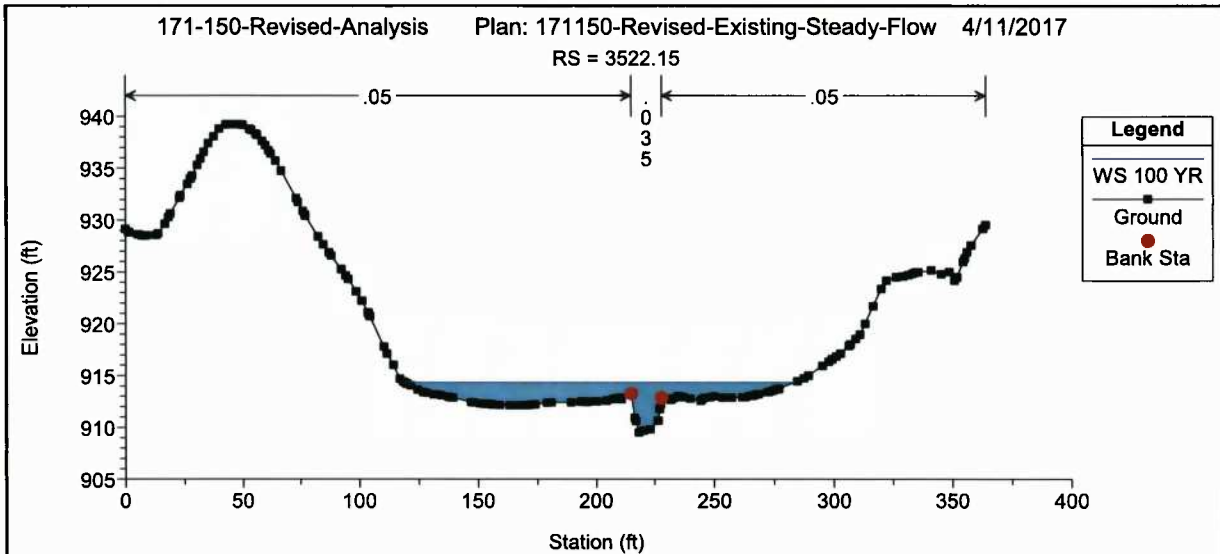


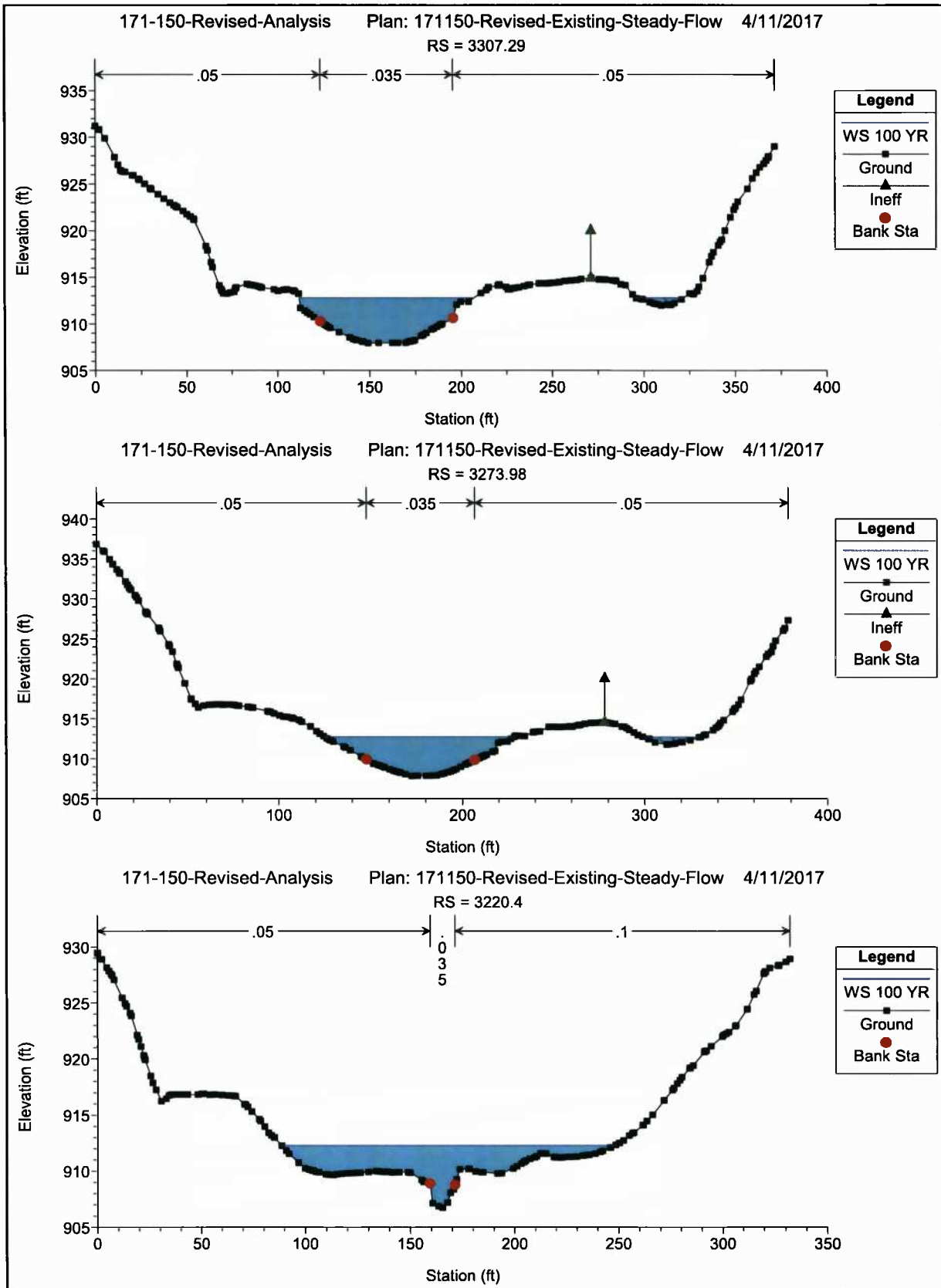


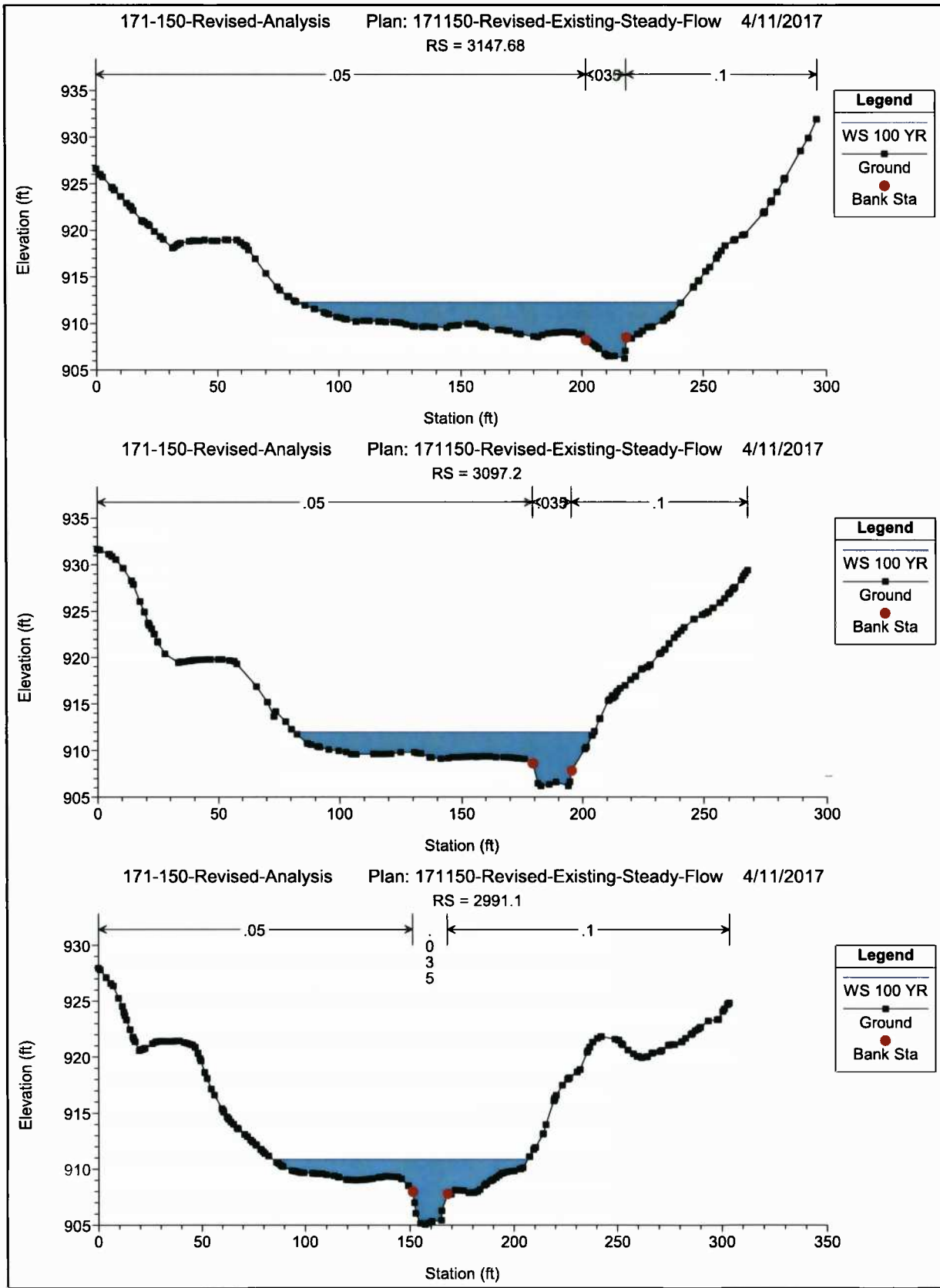


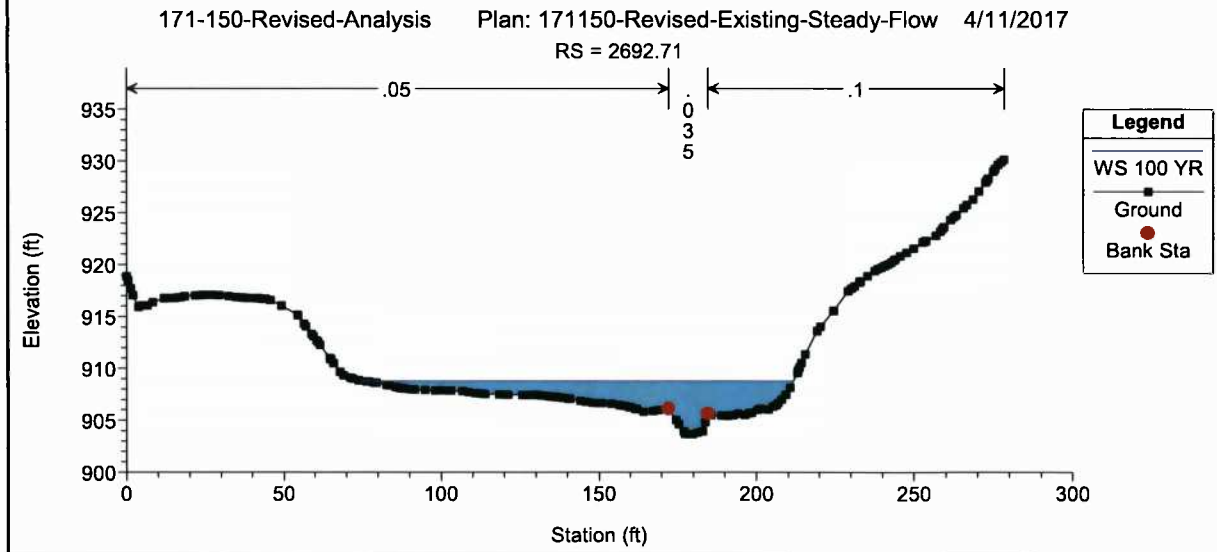
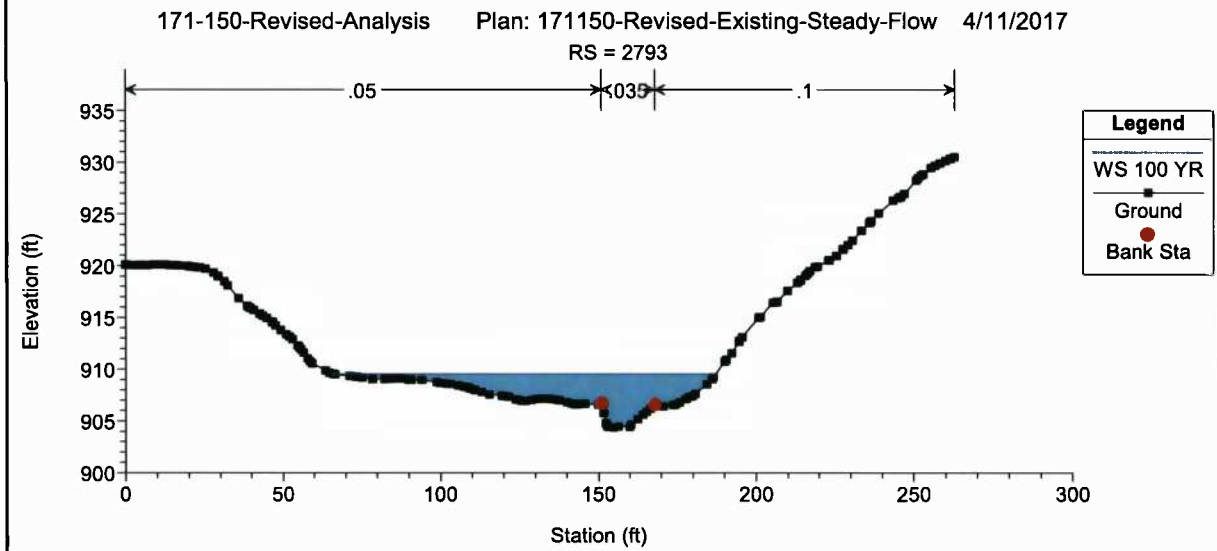
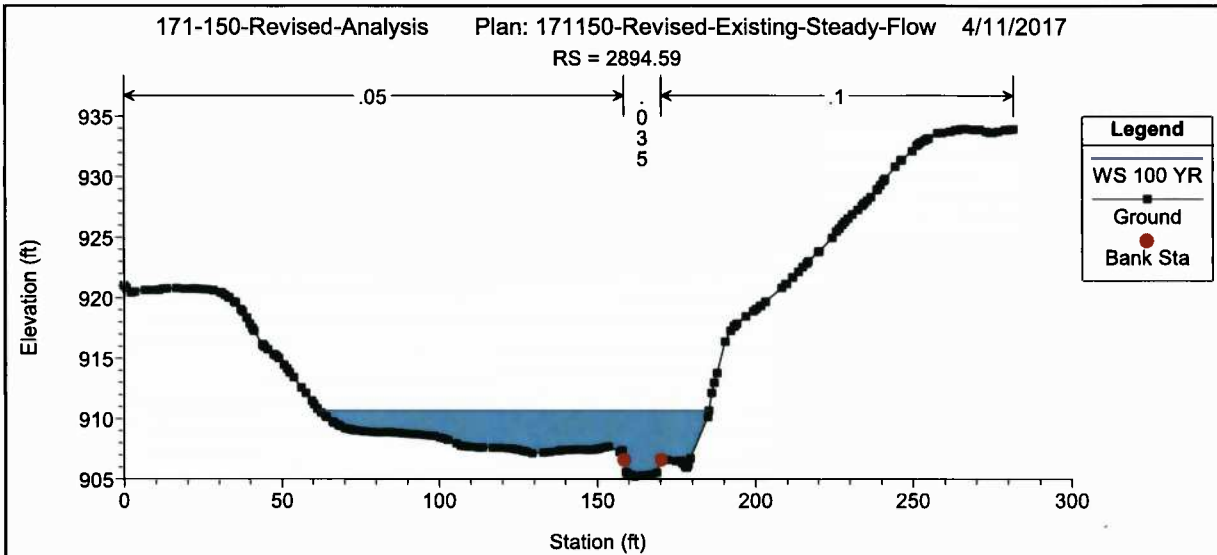


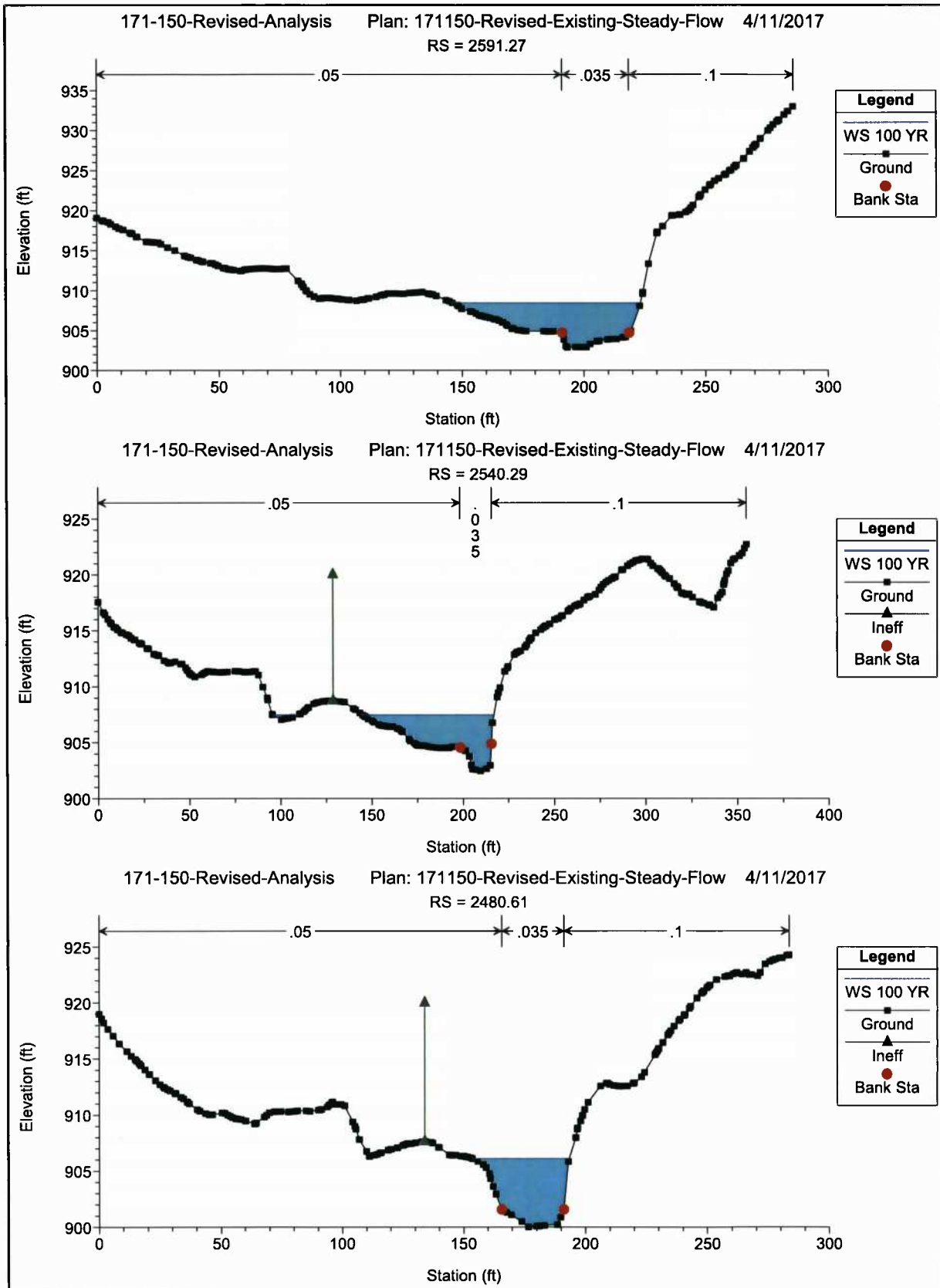


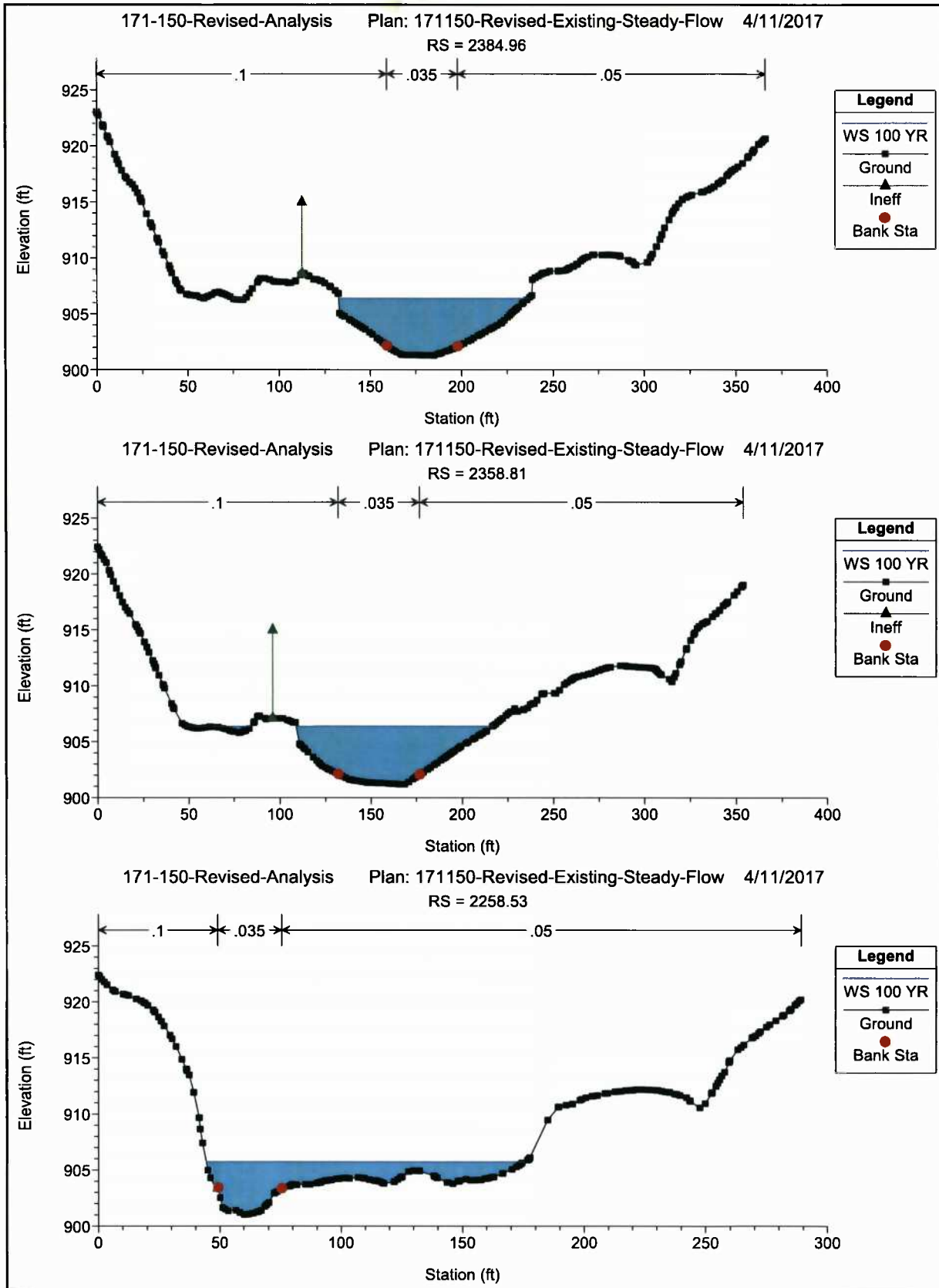


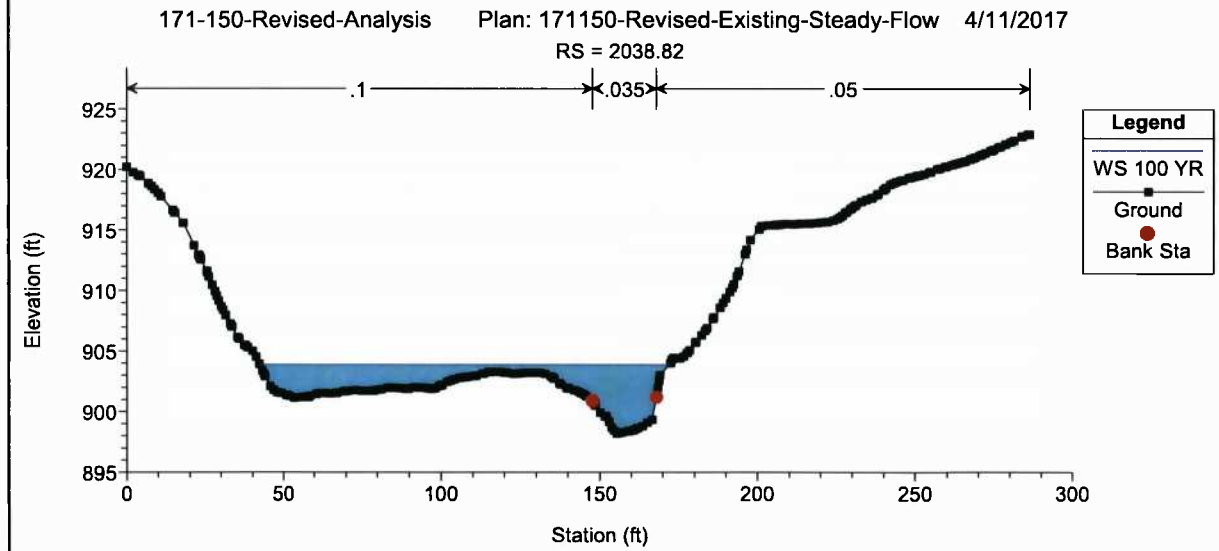
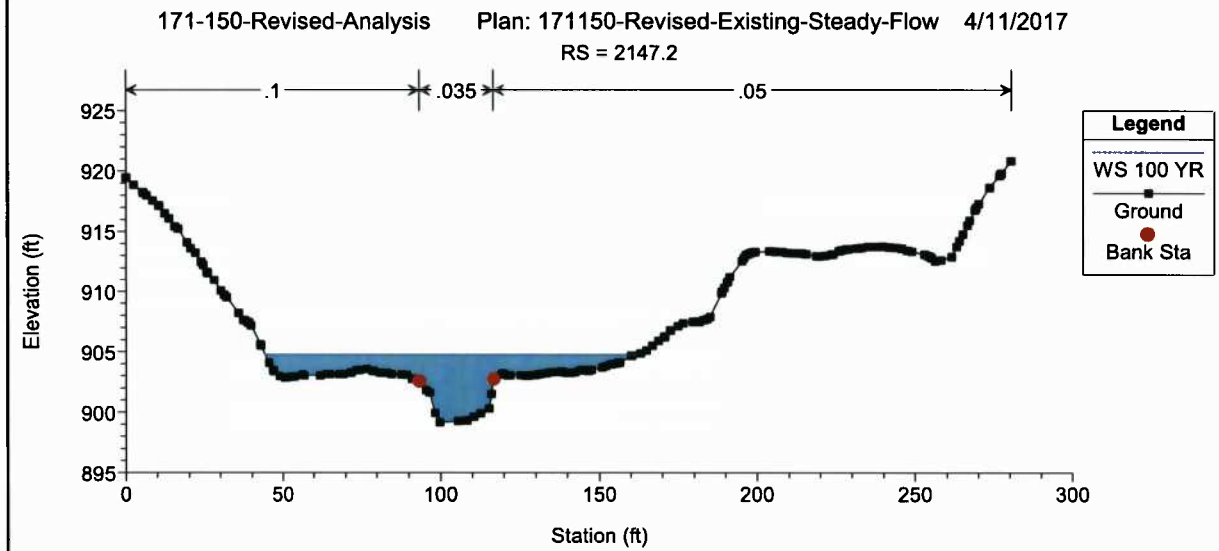
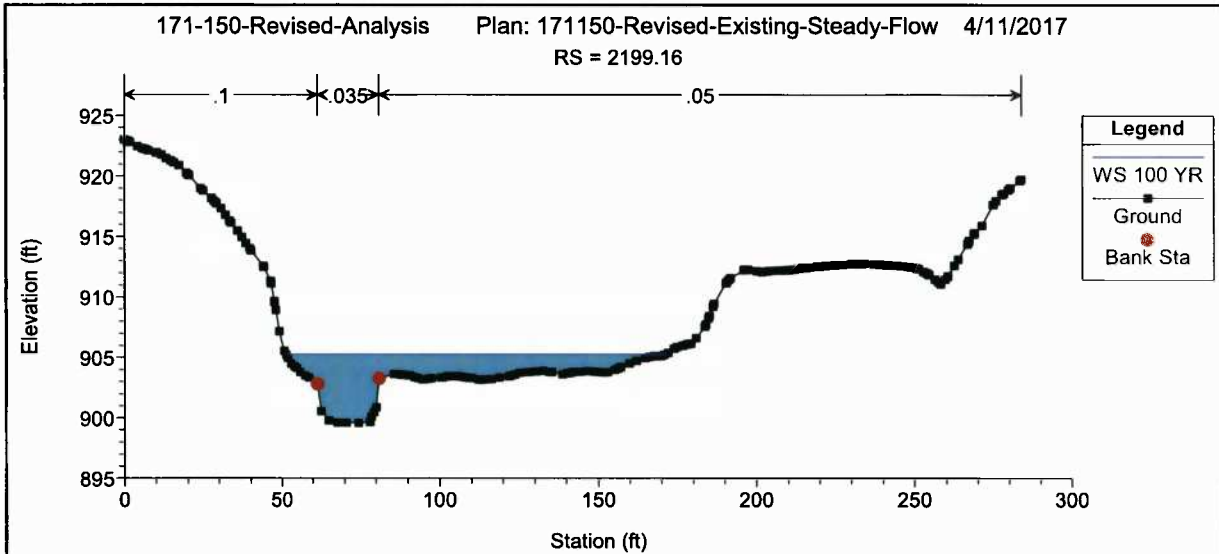


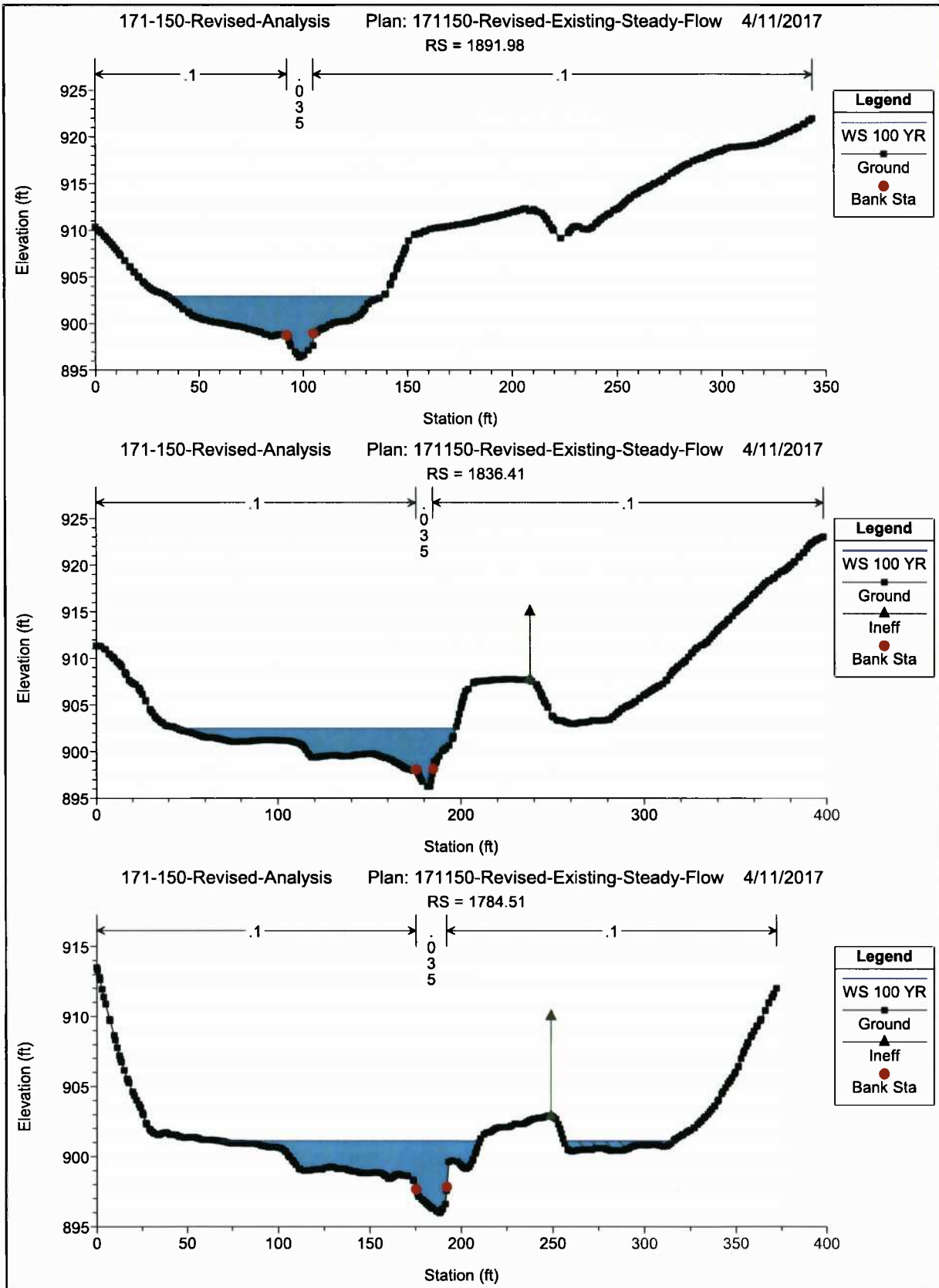




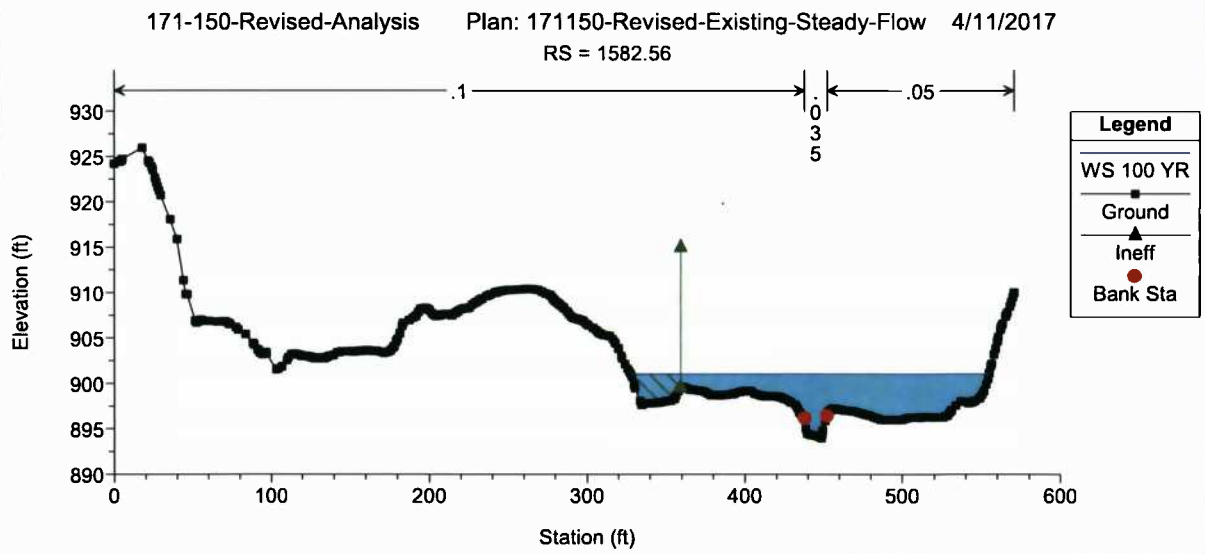
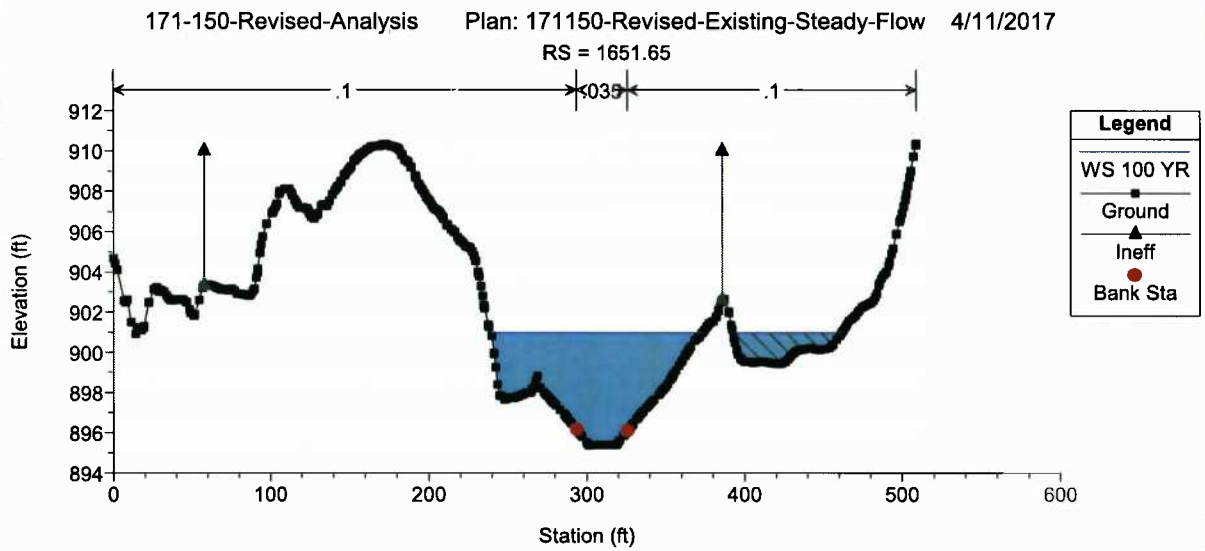
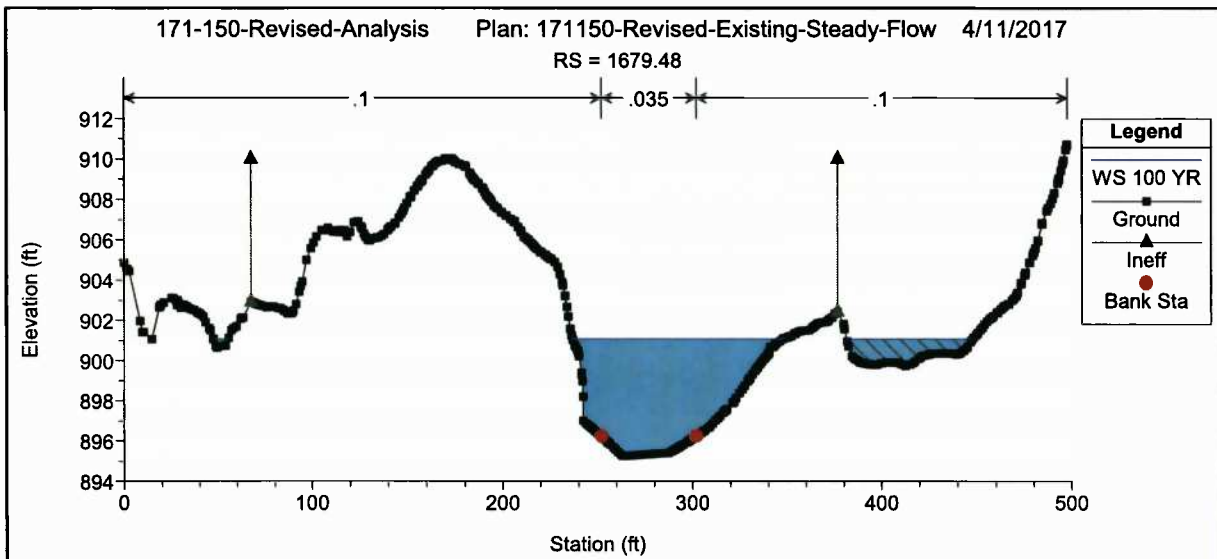


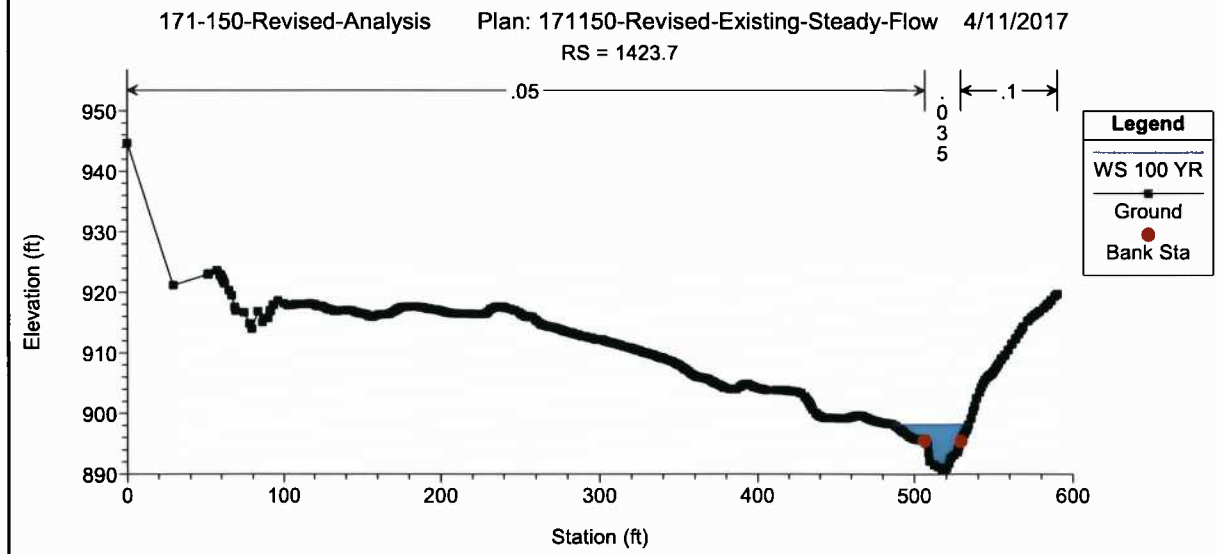
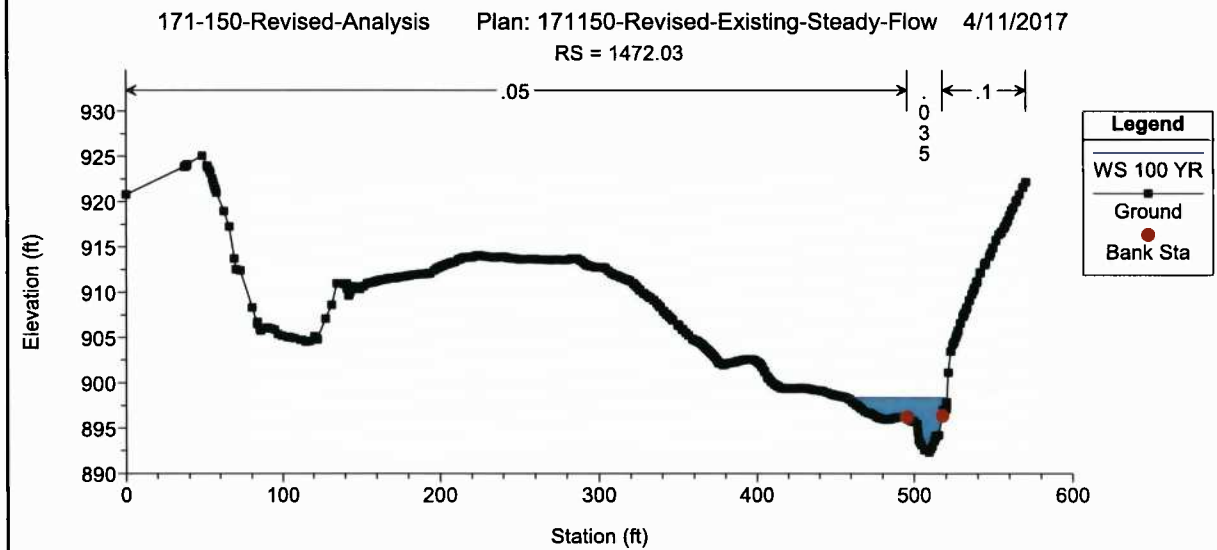
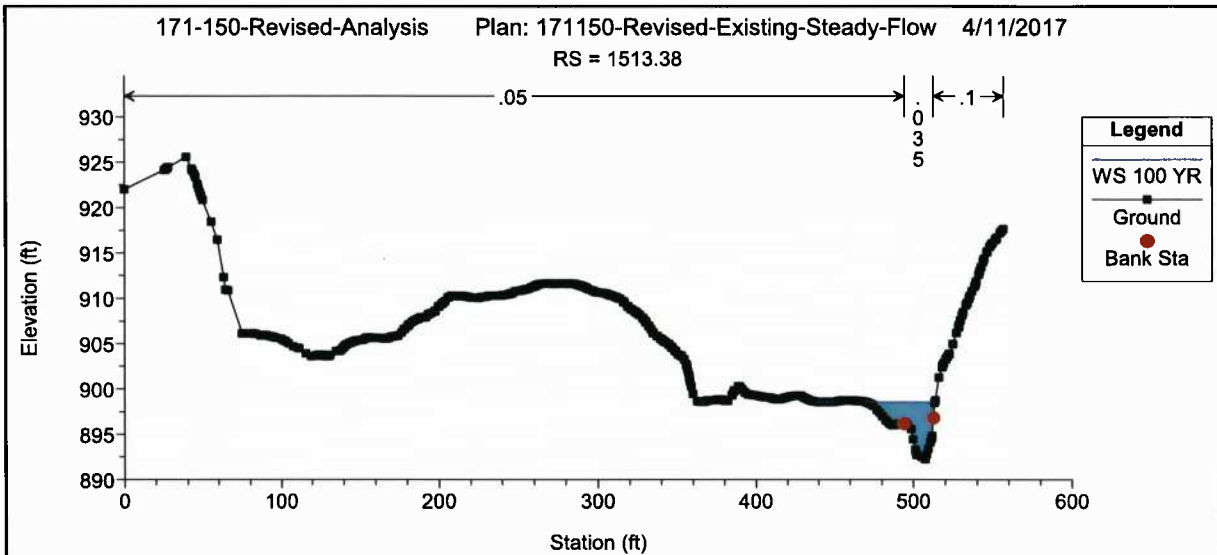


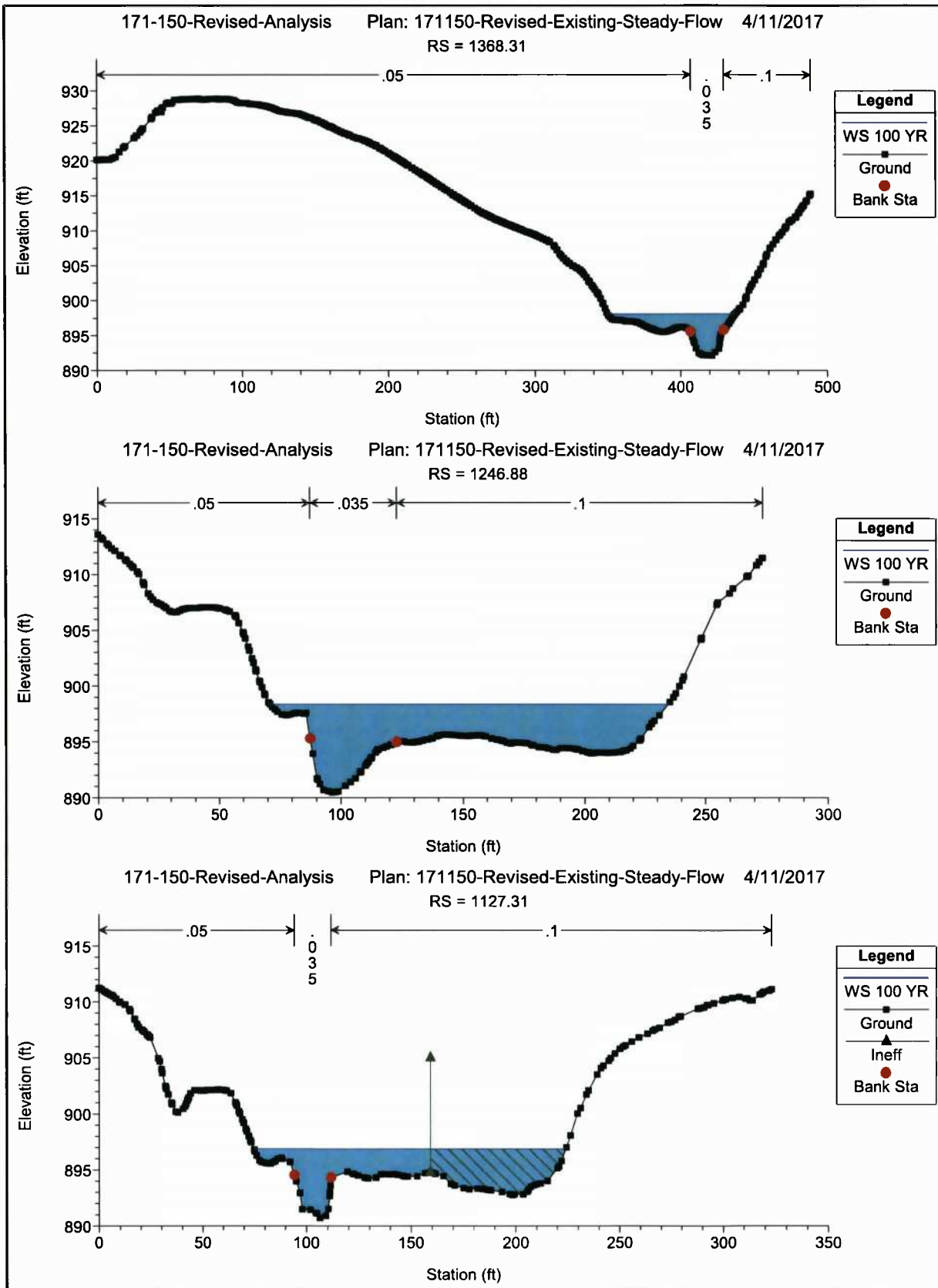




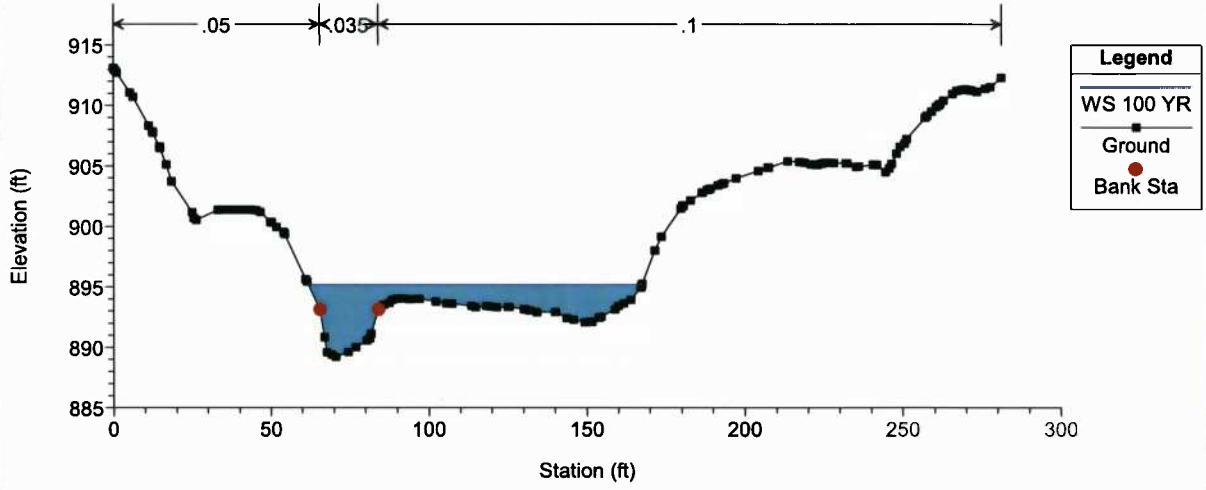




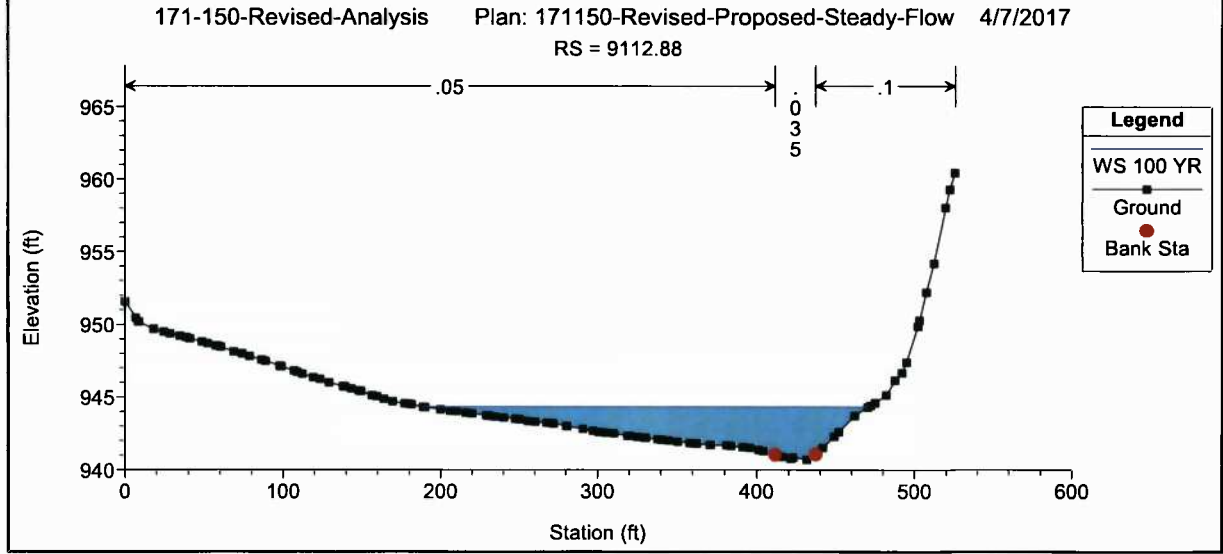
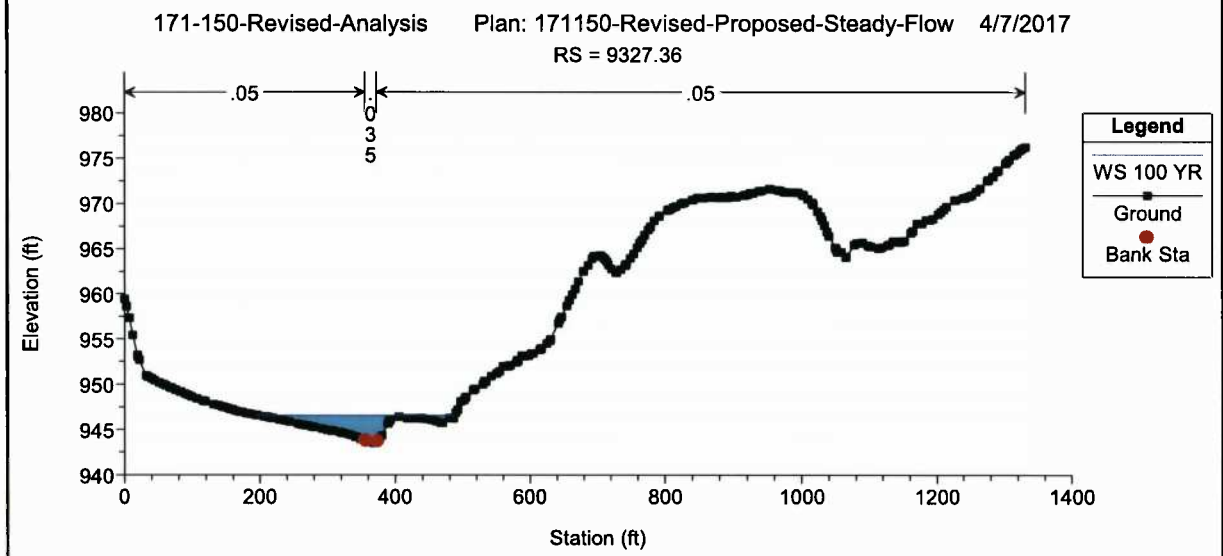
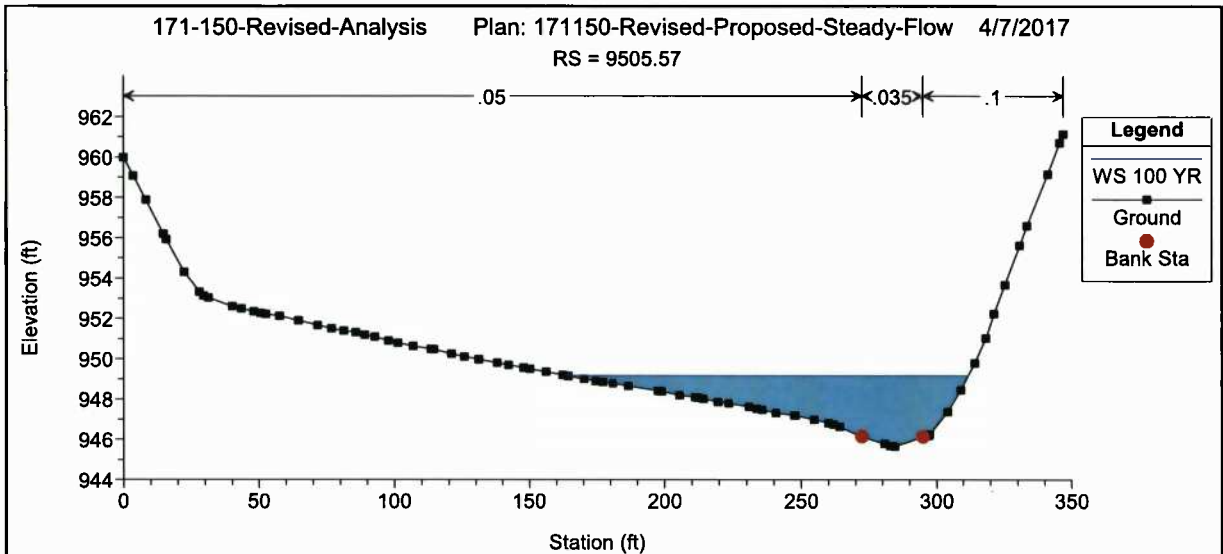




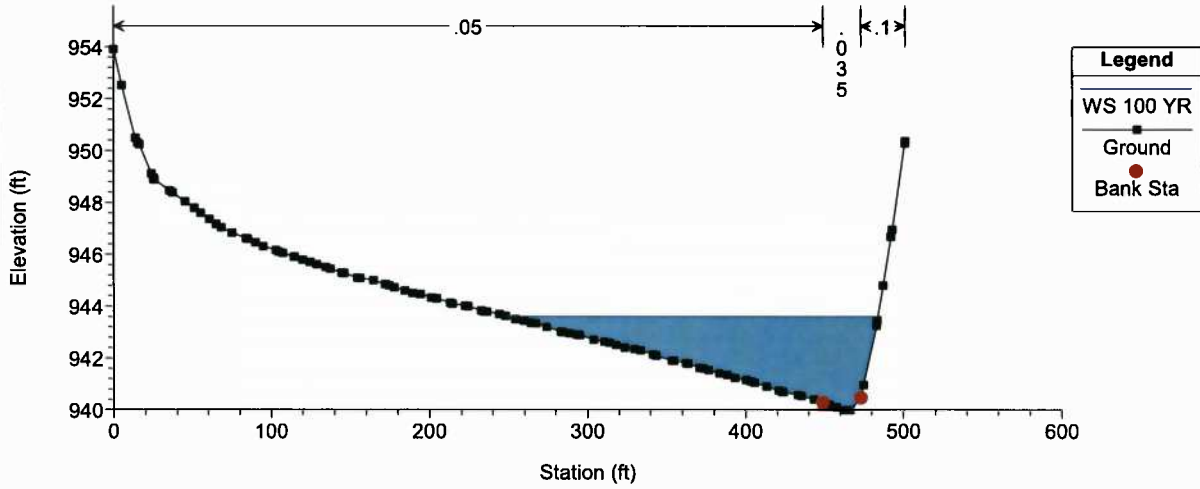
171-150-Revised-Analysis Plan: 171150-Revised-Existing-Steady-Flow 4/11/2017  
RS = 1023.96



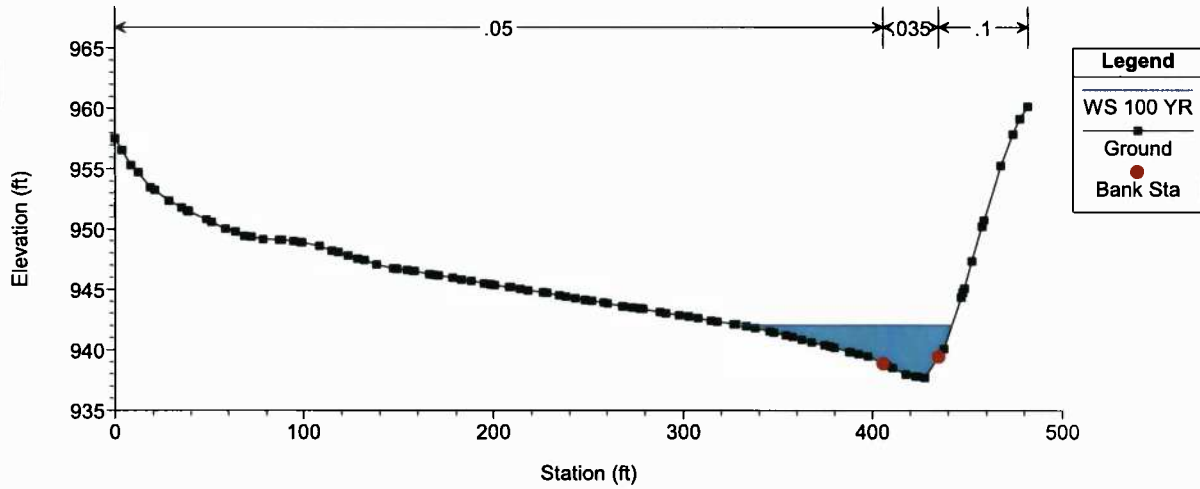
**Legend**  
WS 100 YR  
Ground  
Bank Sta



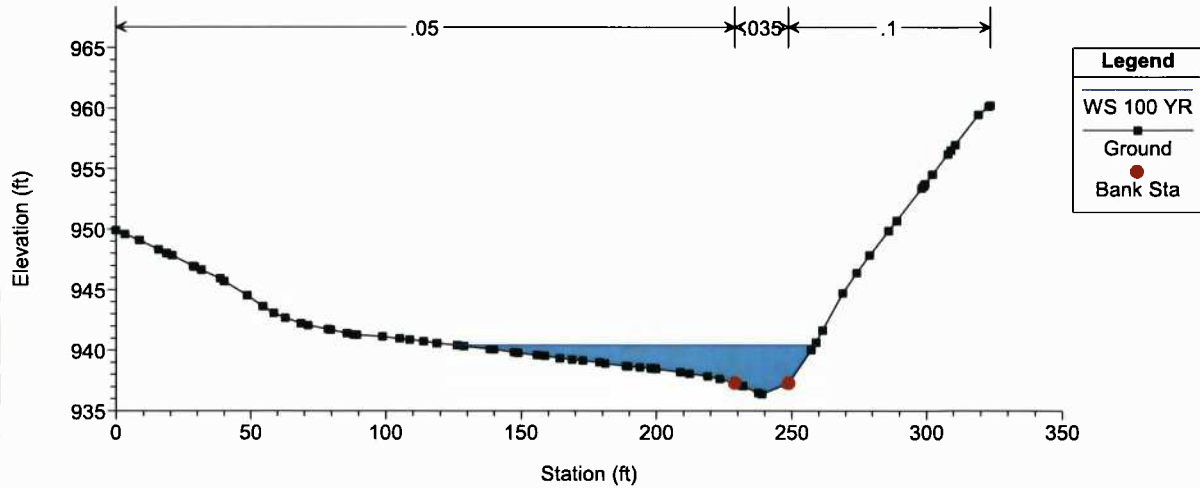
171-150-Revised-Analysis Plan: 171150-Revised-Proposed-Steady-Flow 4/7/2017  
 RS = 8893.47

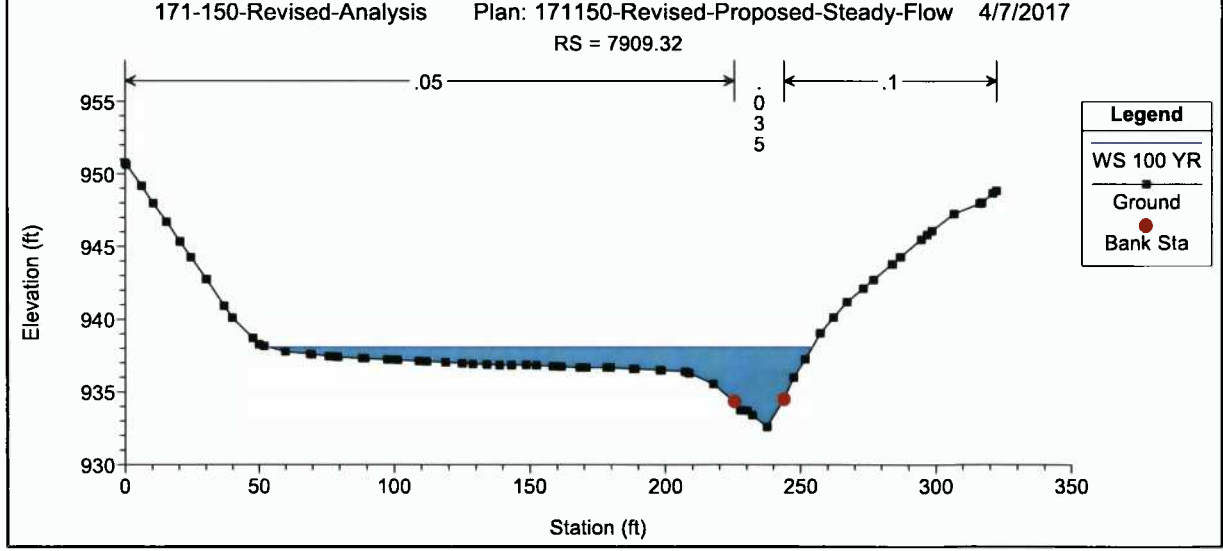
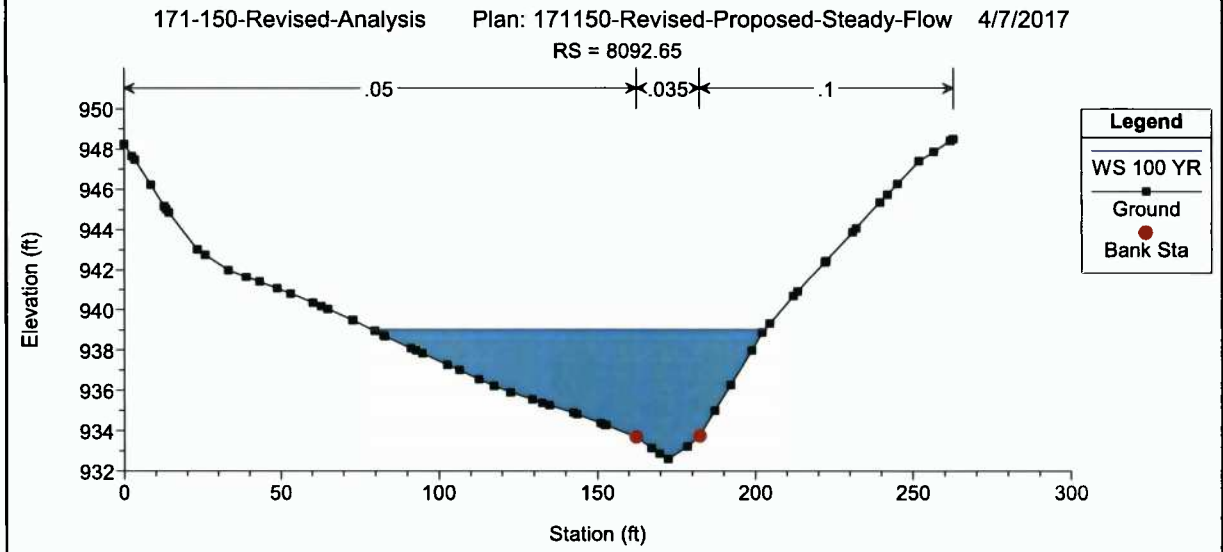
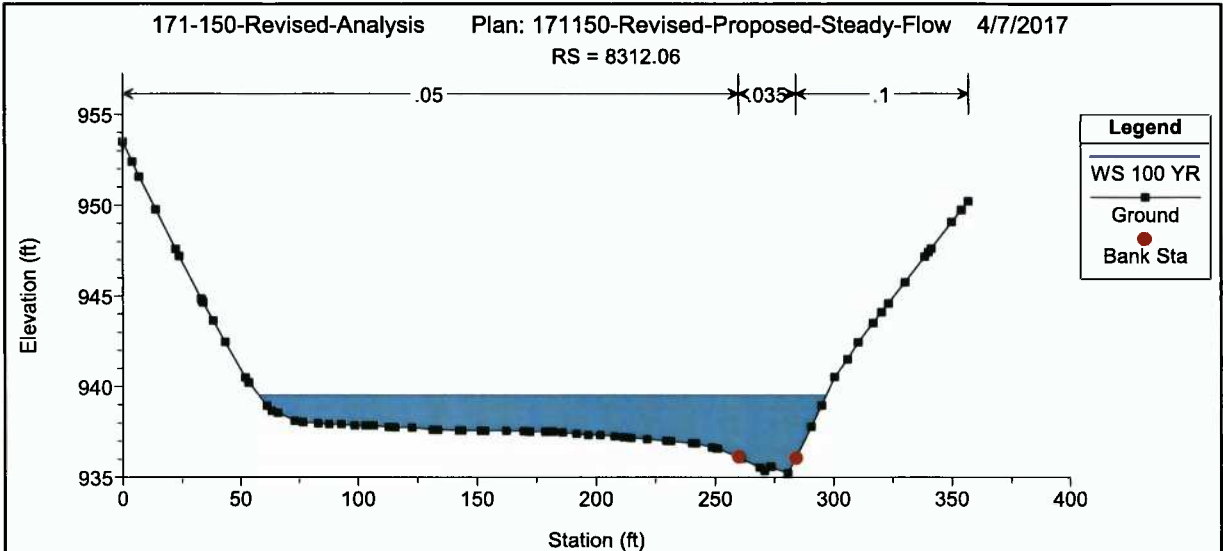


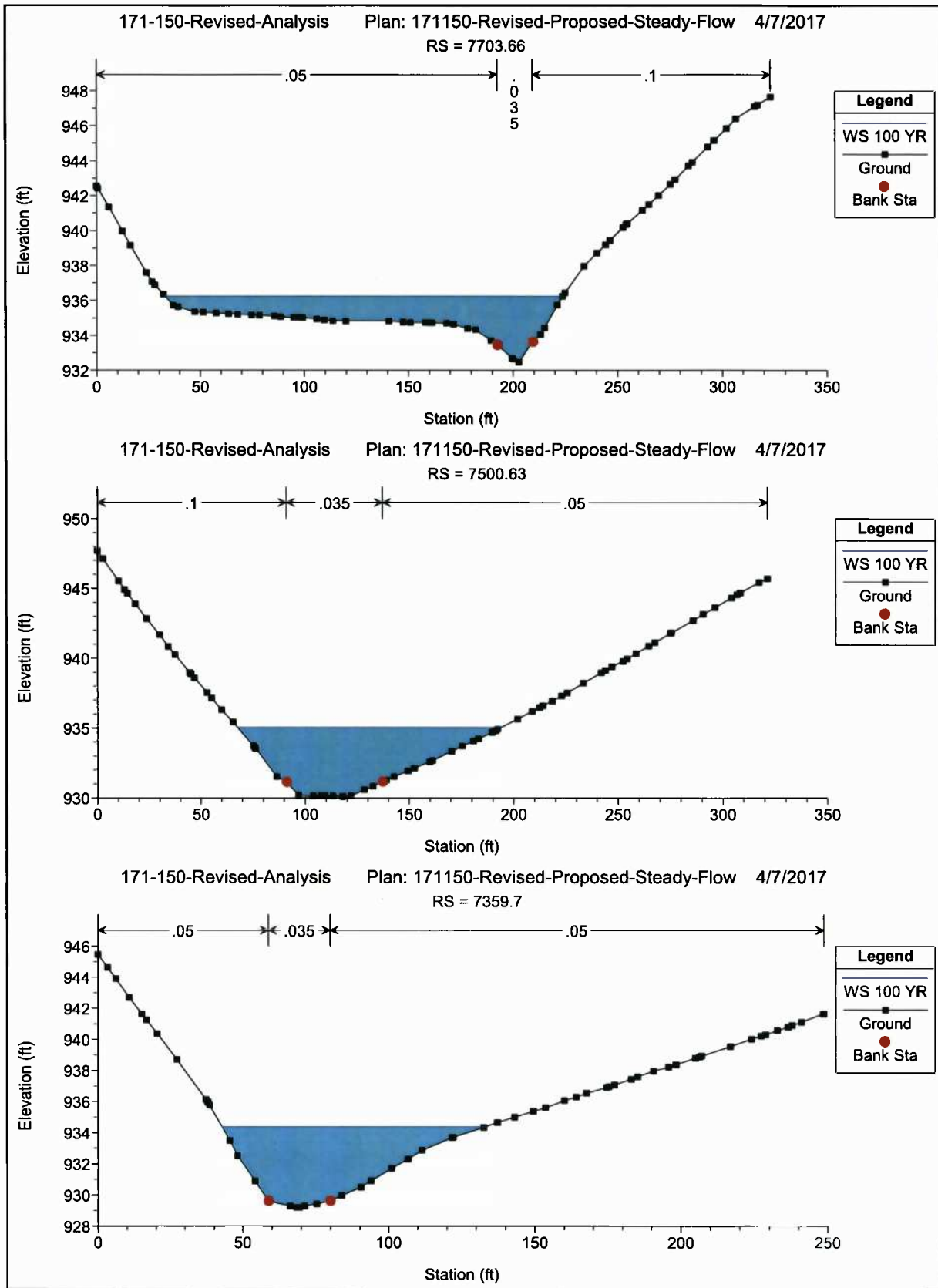
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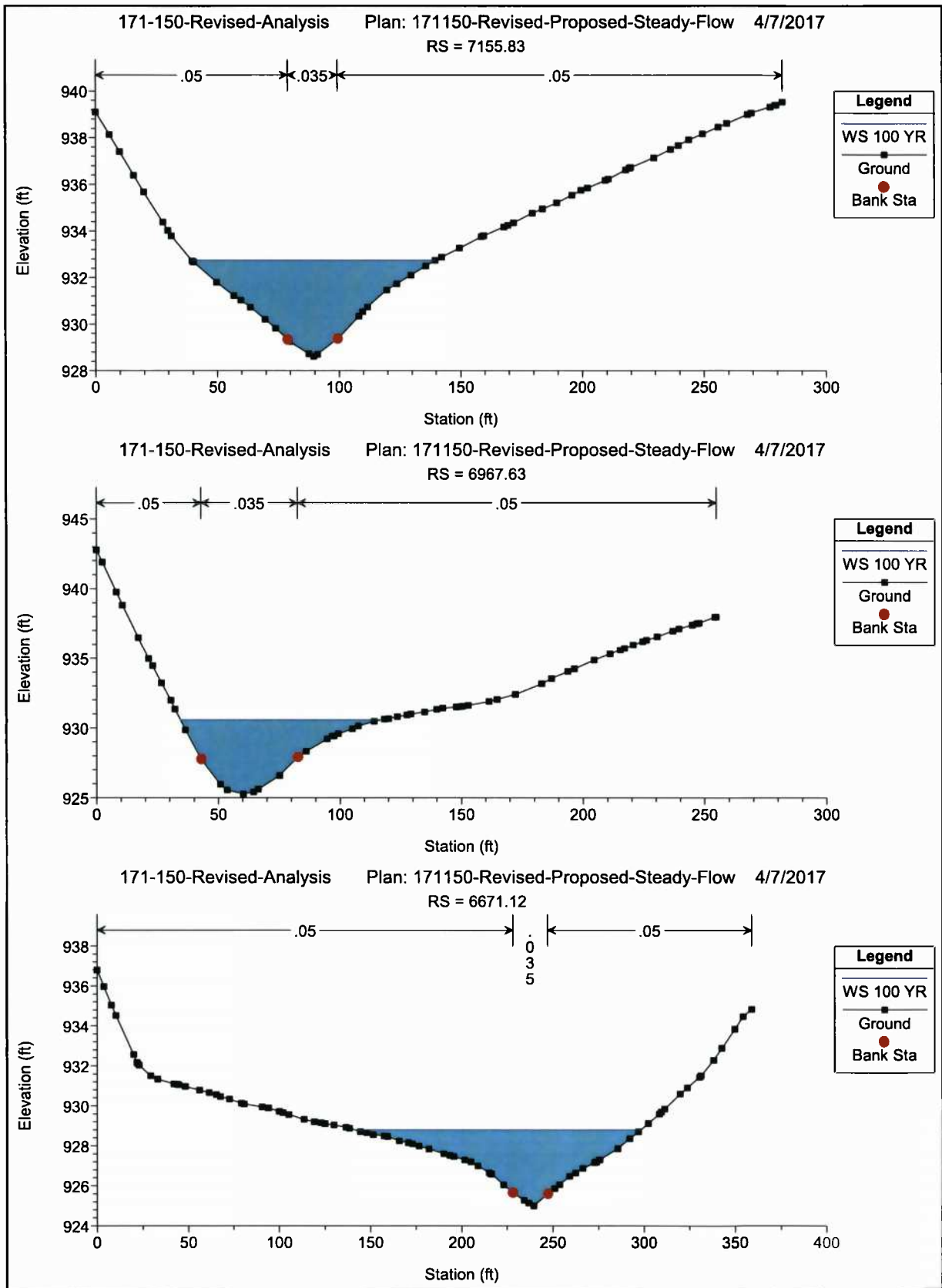
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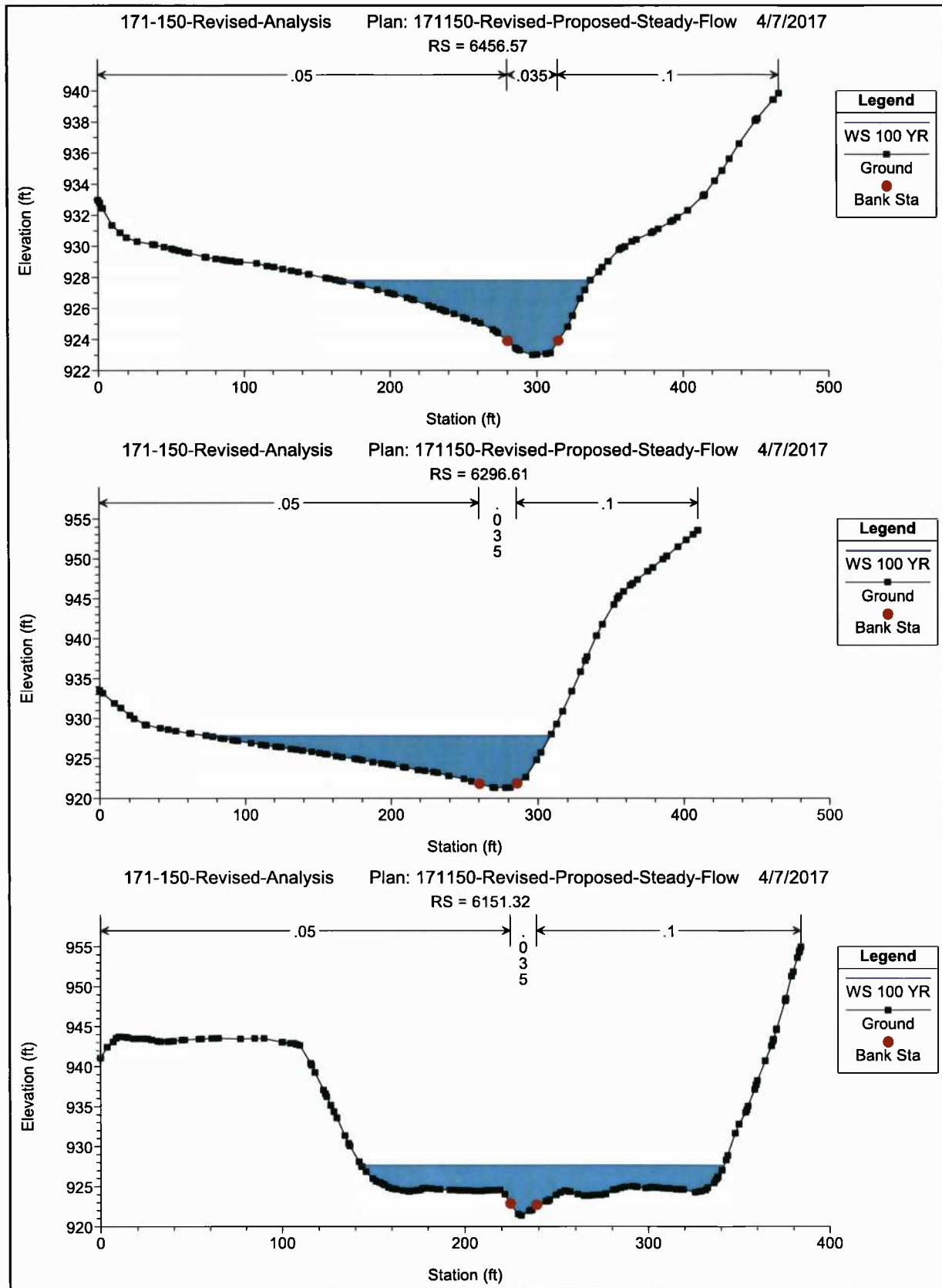




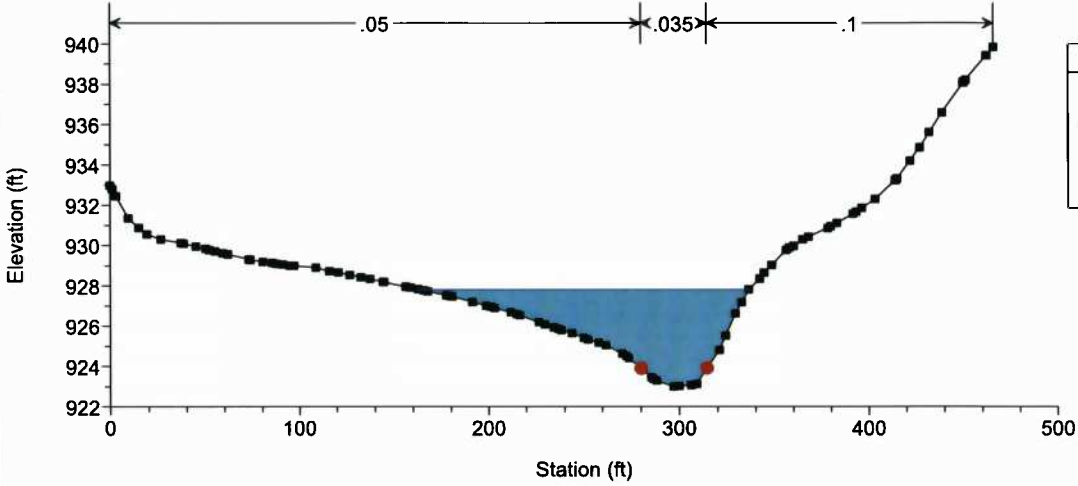




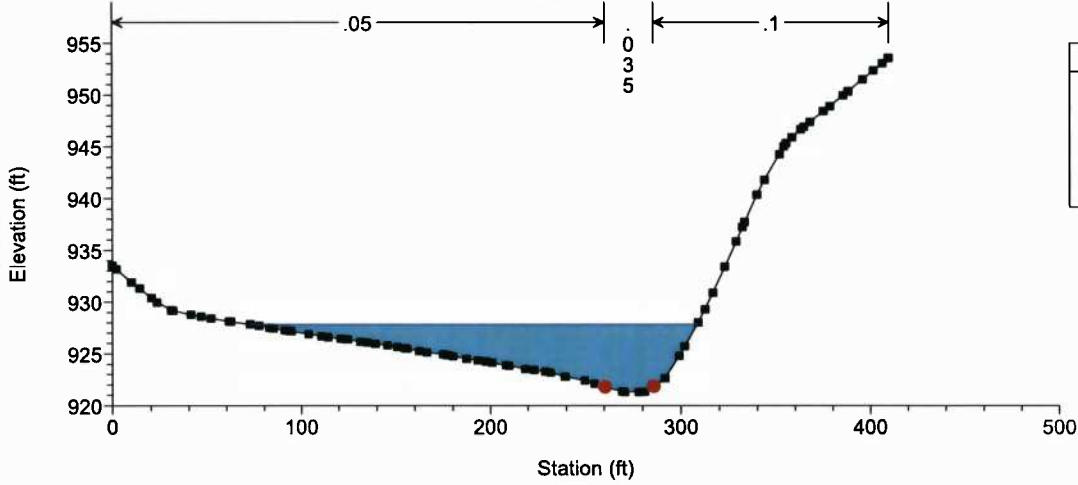




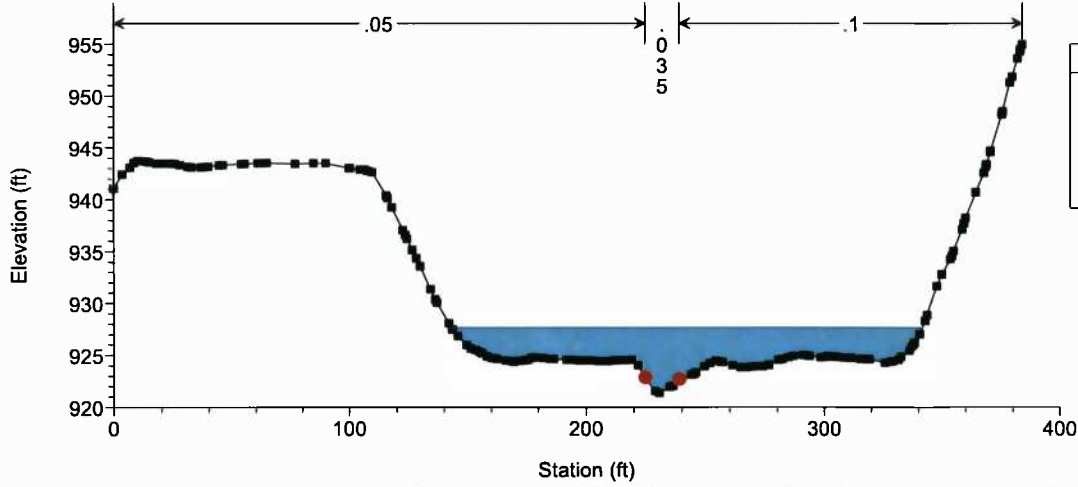
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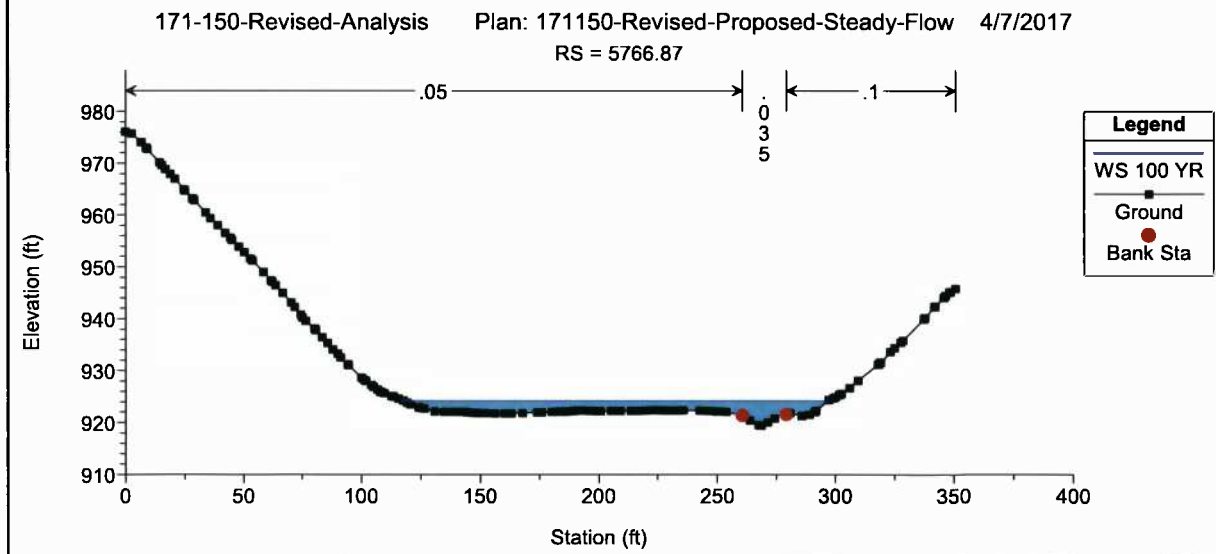
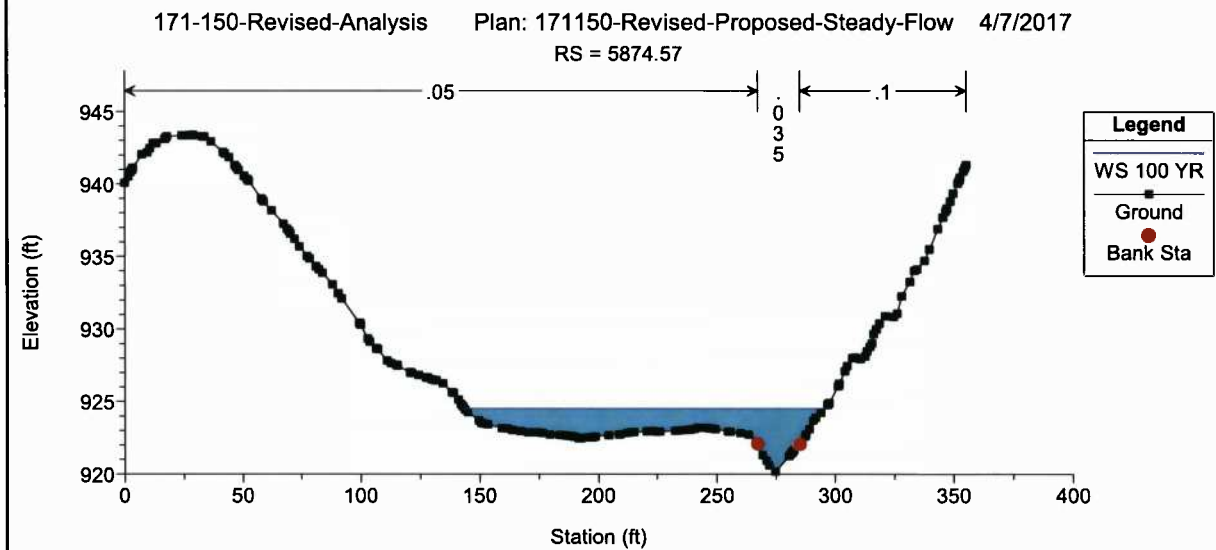
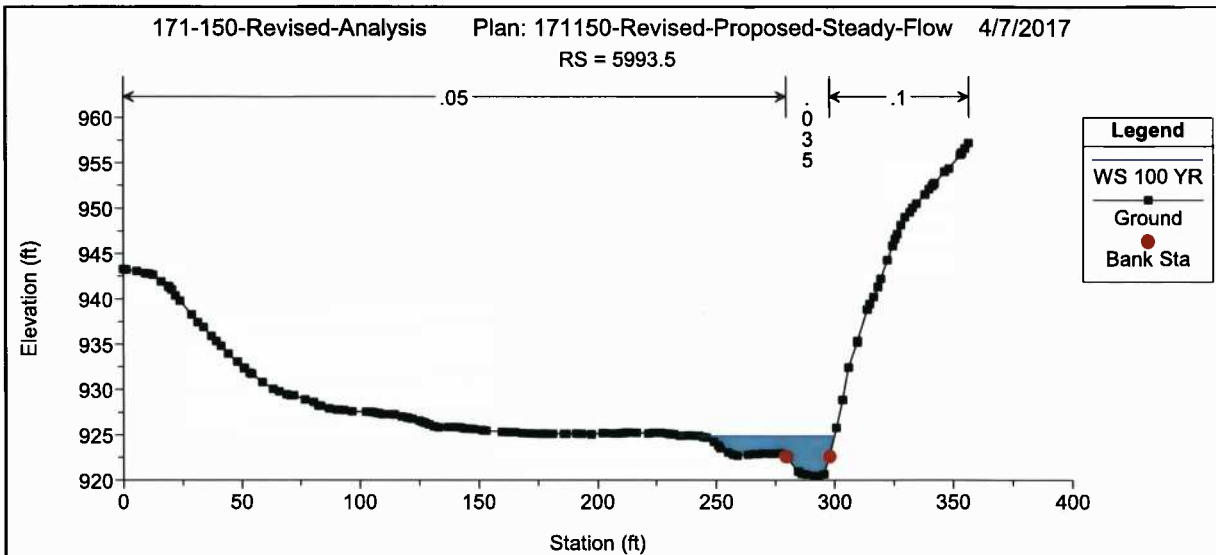


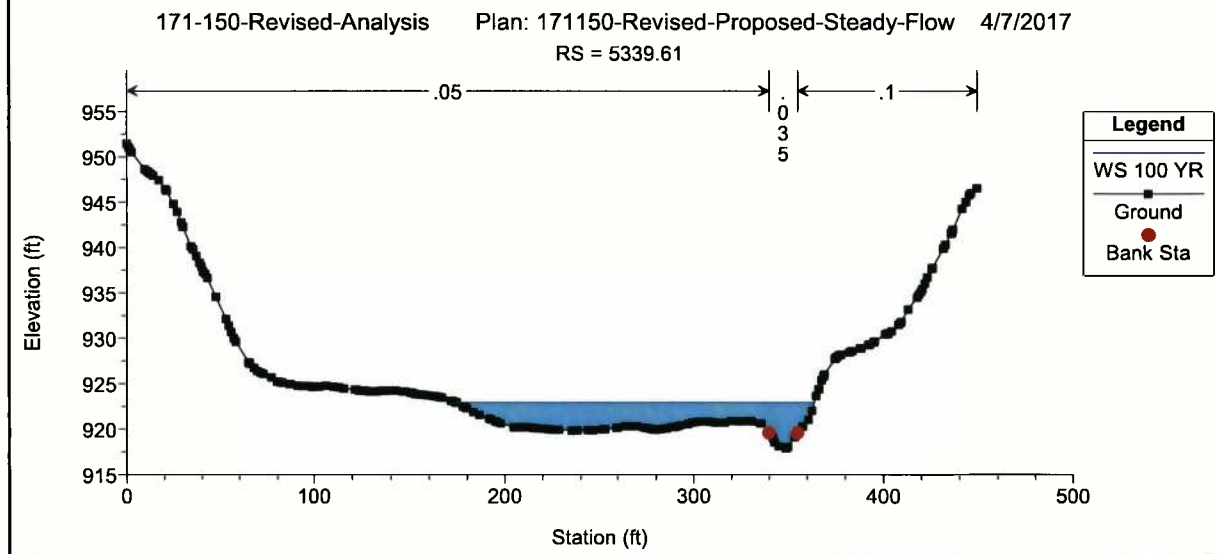
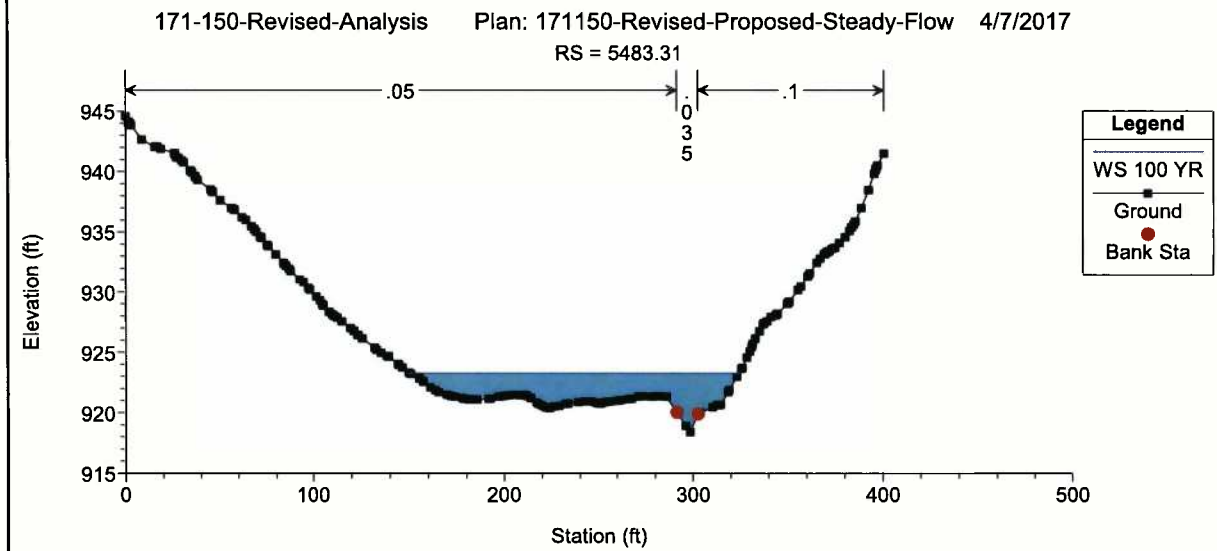
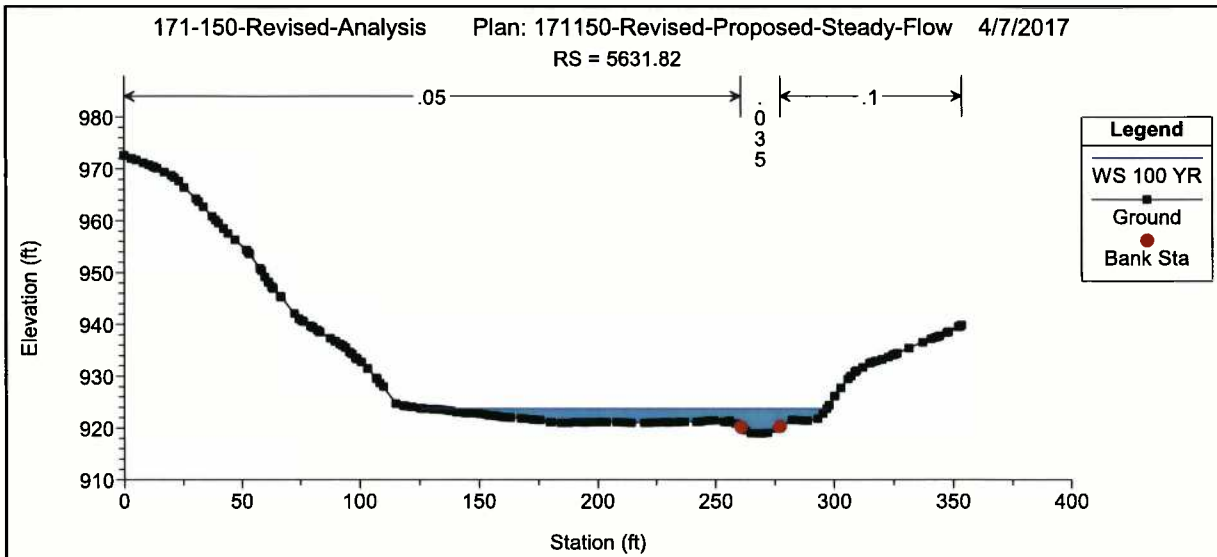
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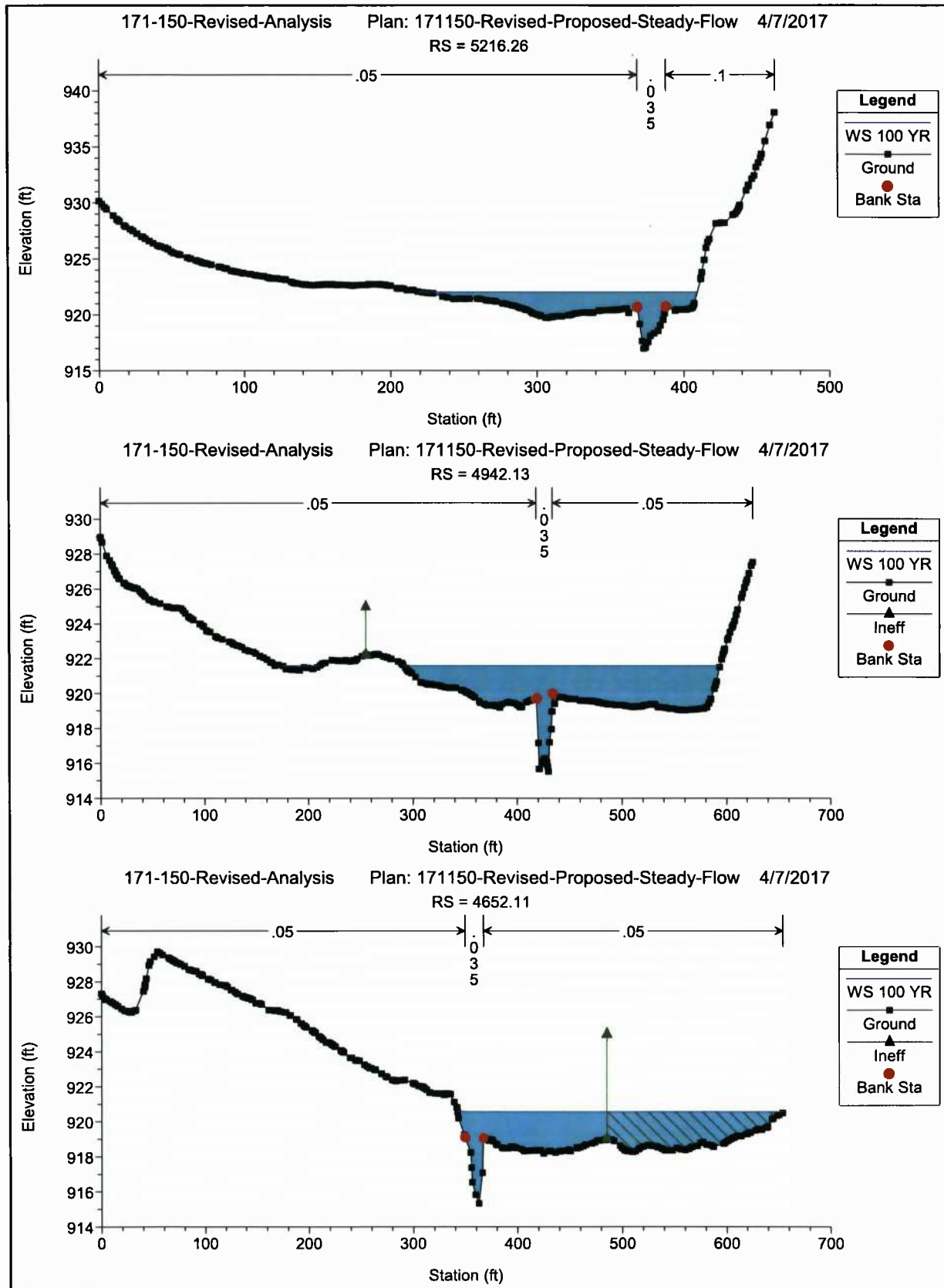


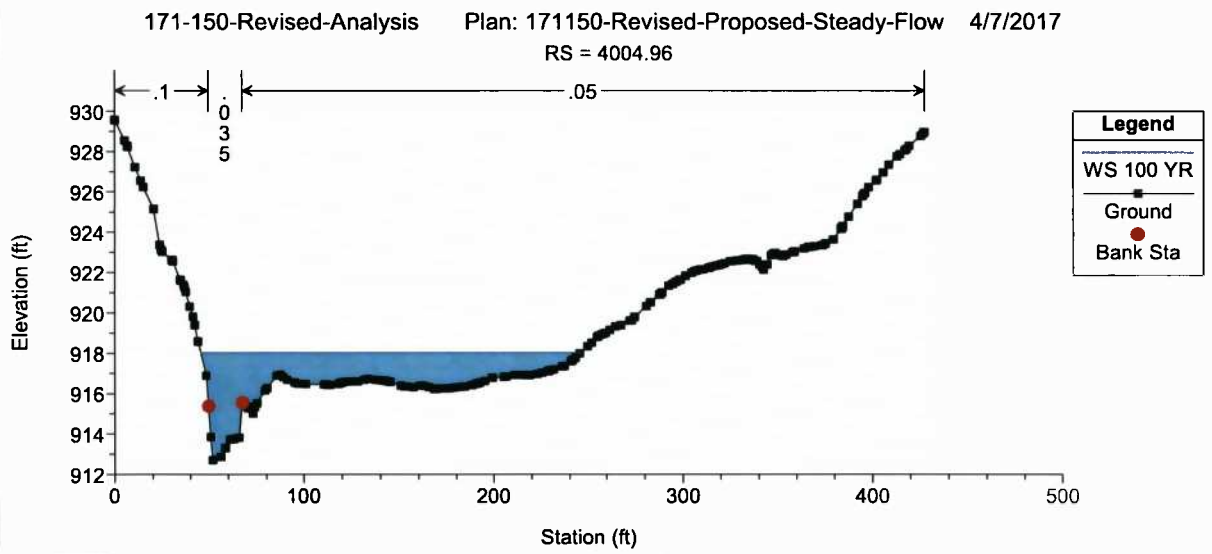
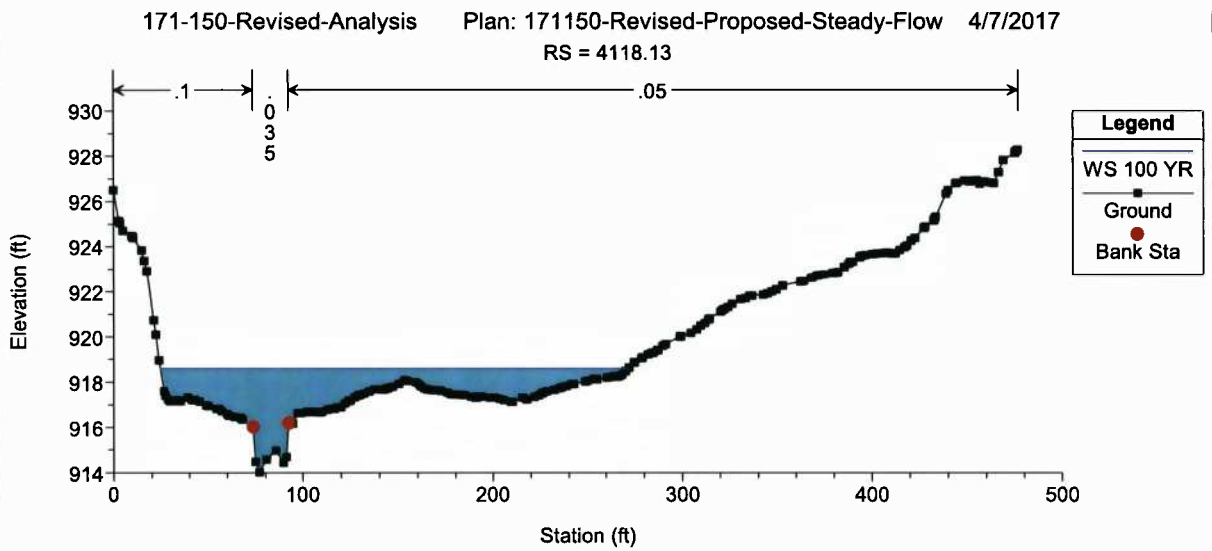
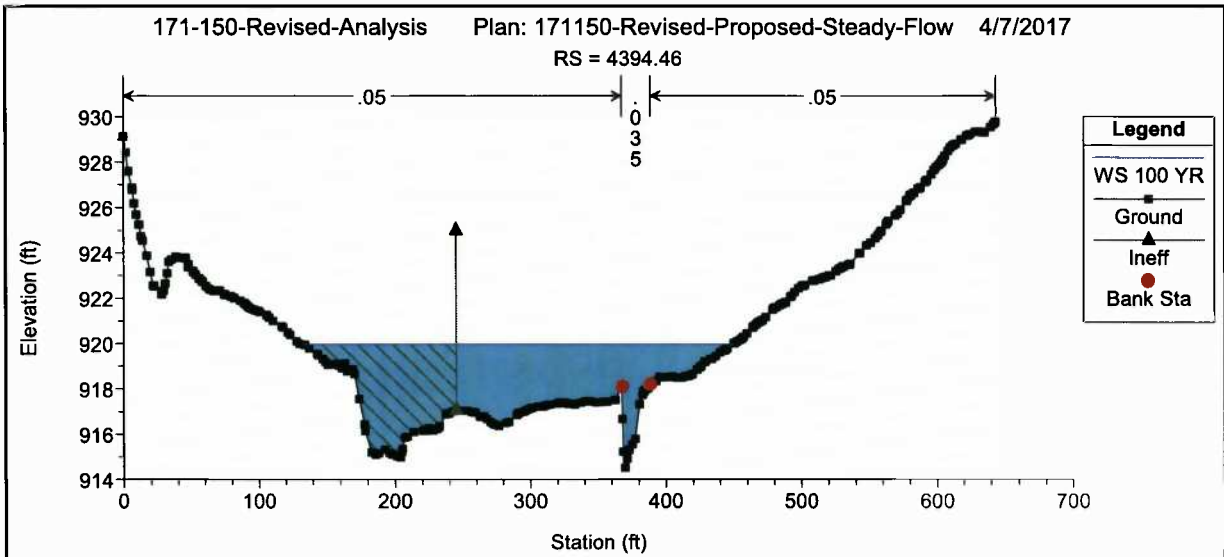
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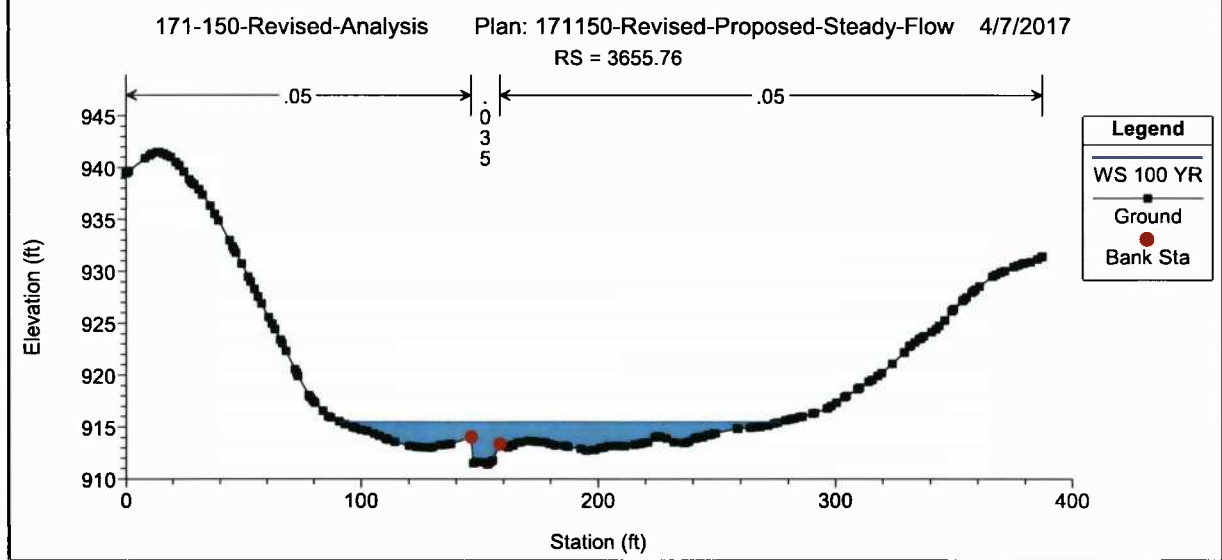
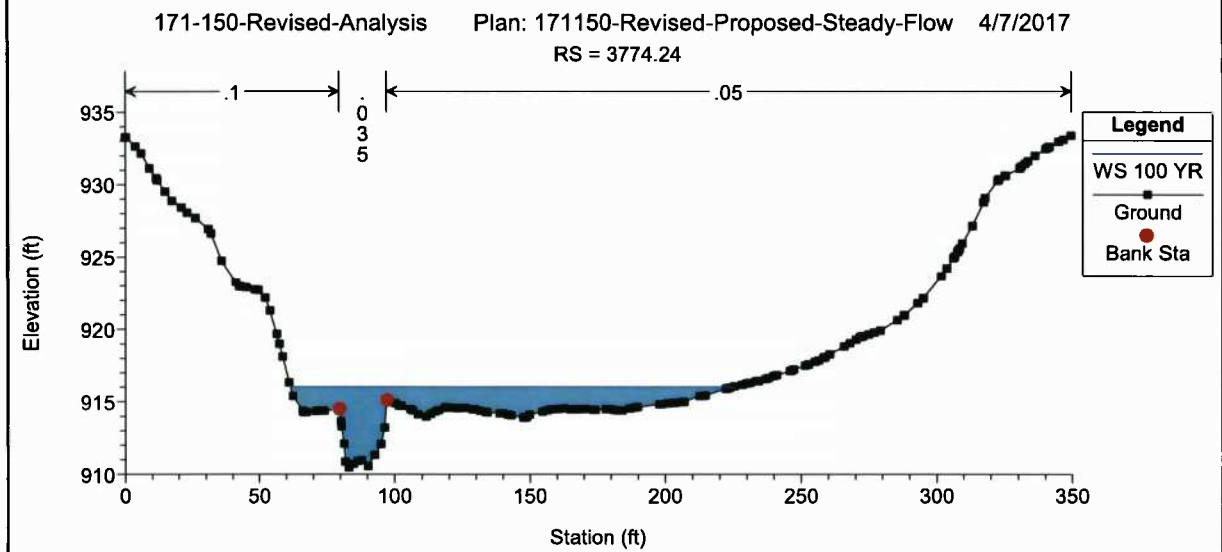
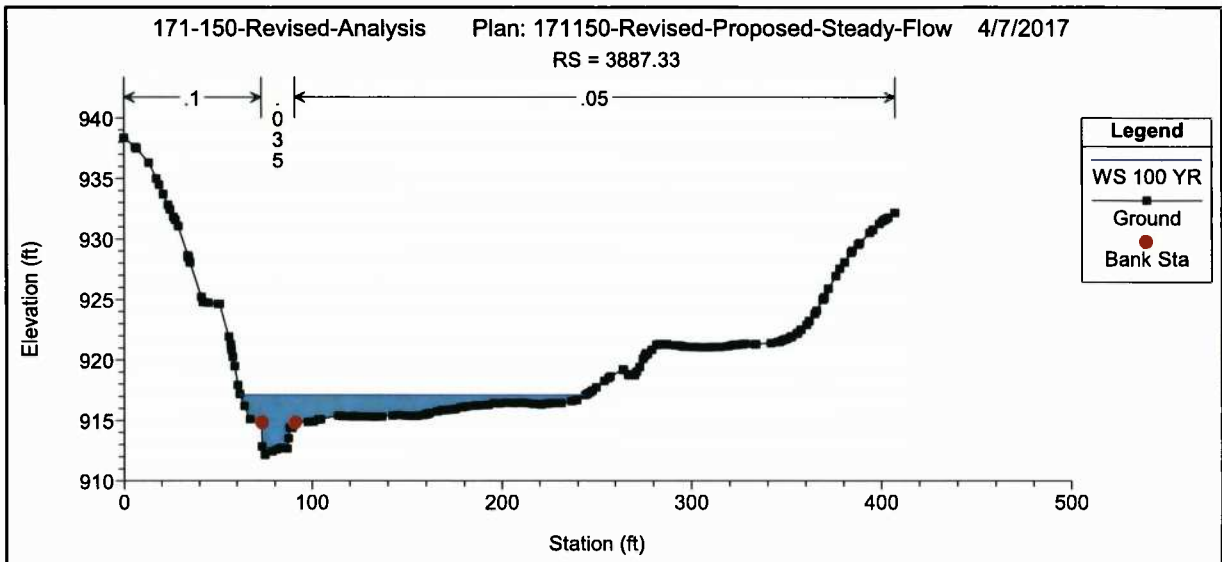


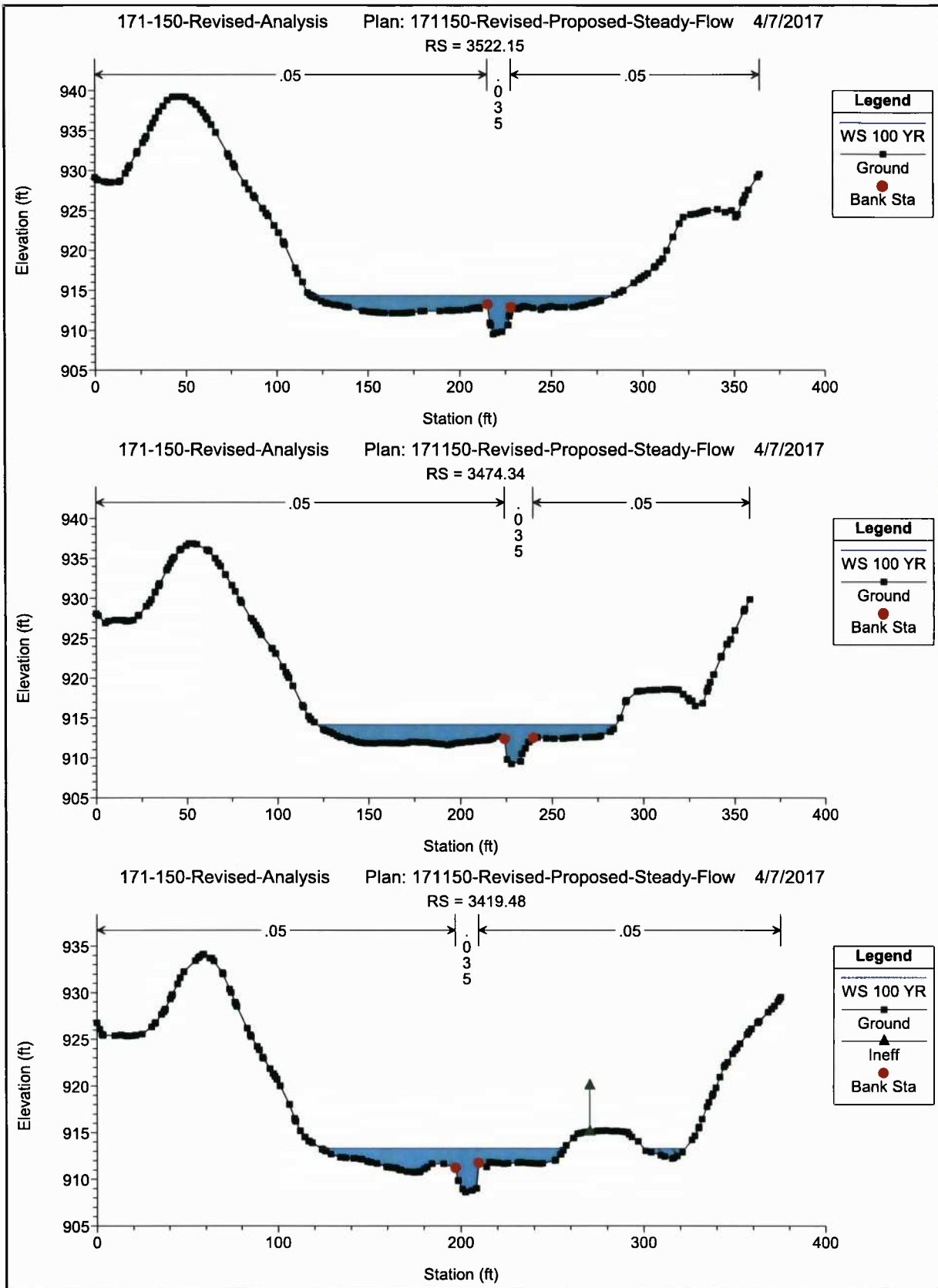






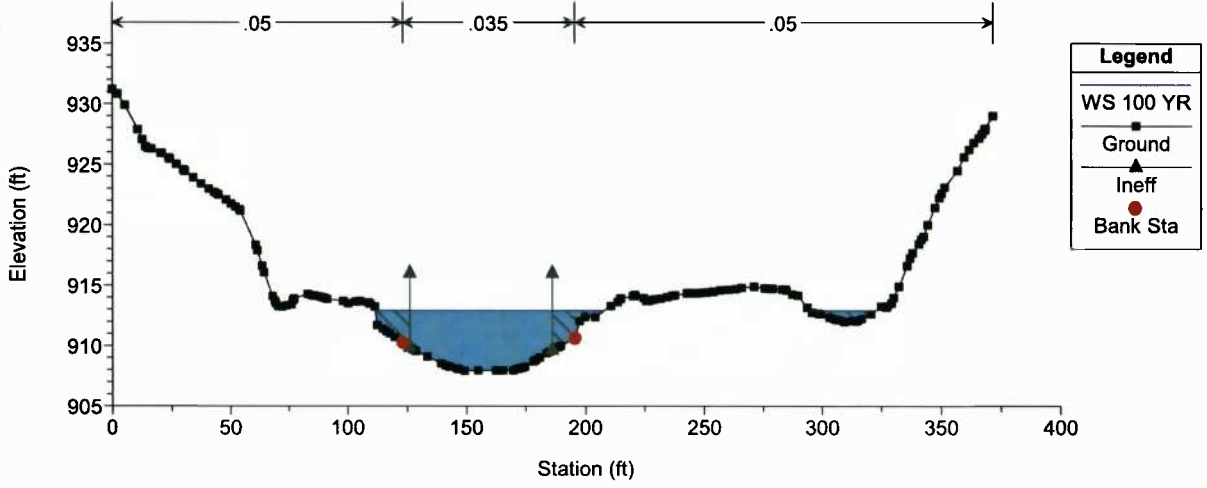




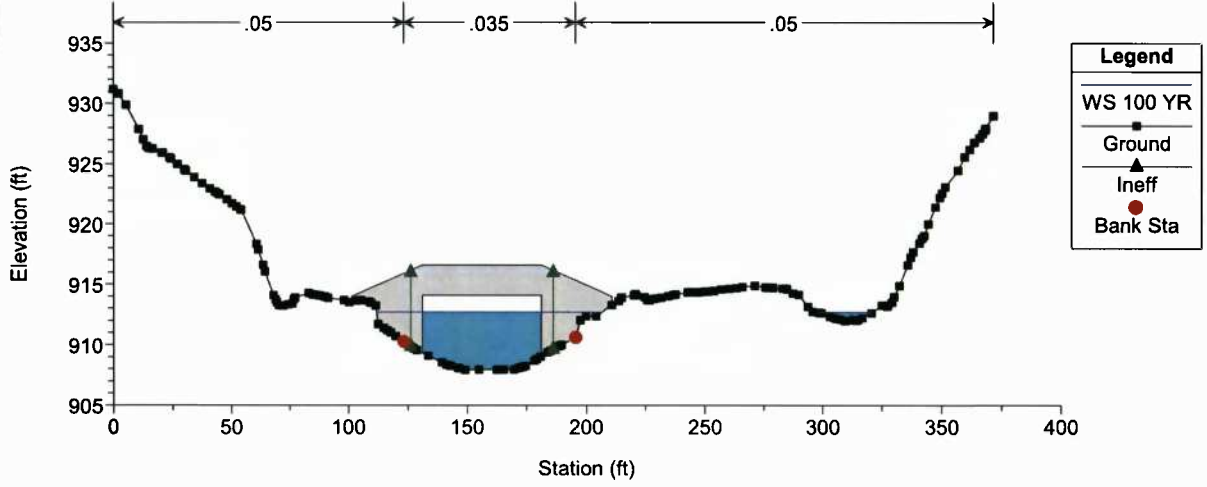




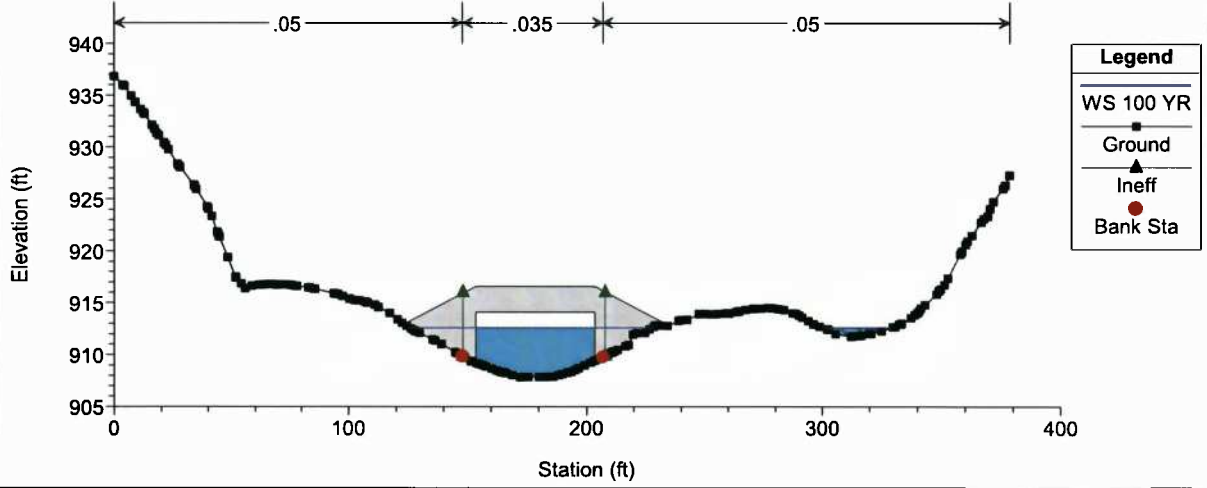
171-150-Revised-Analysis Plan: 171150-Revised-Proposed-Steady-Flow 4/7/2017  
RS = 3307.29

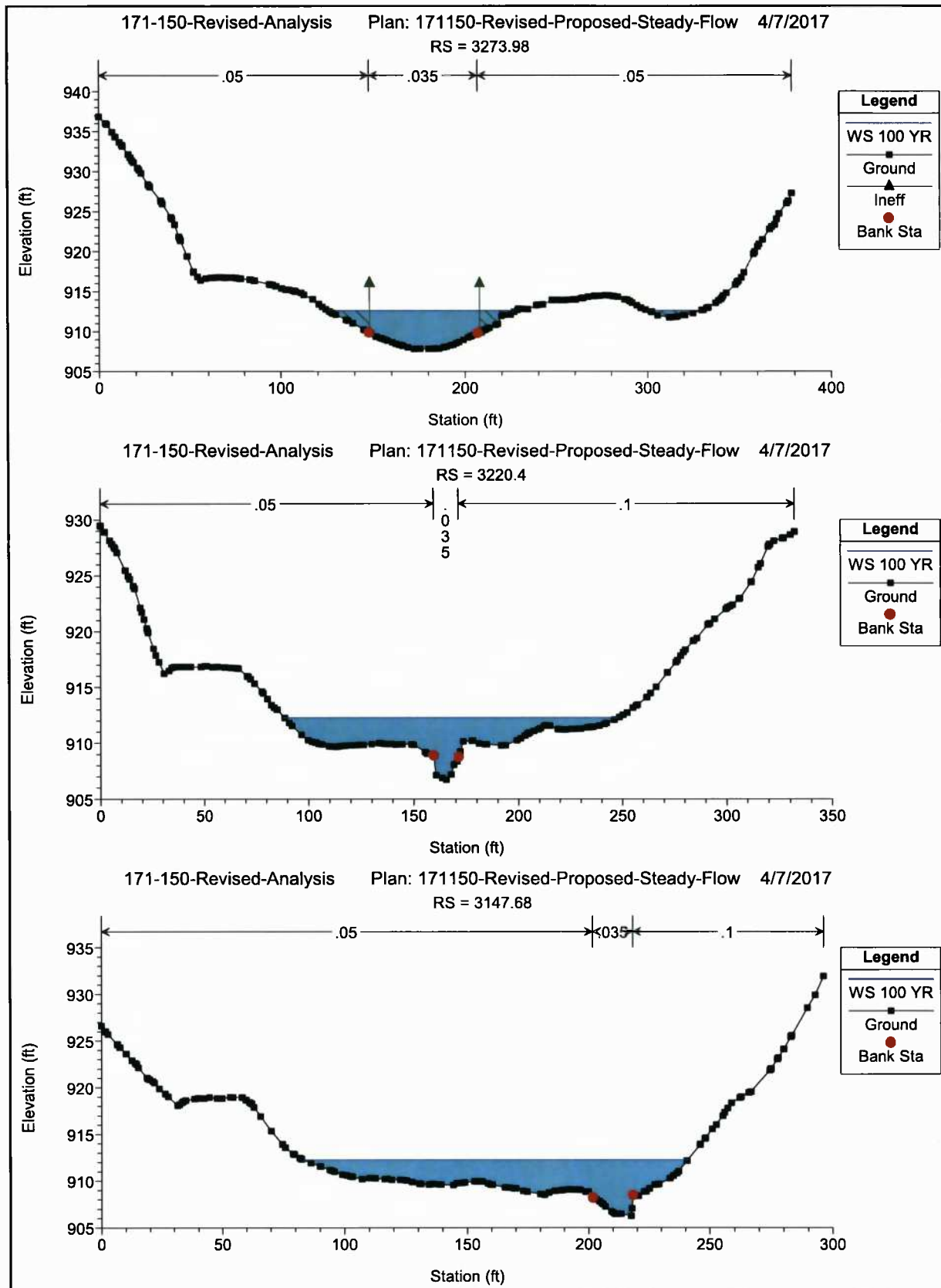


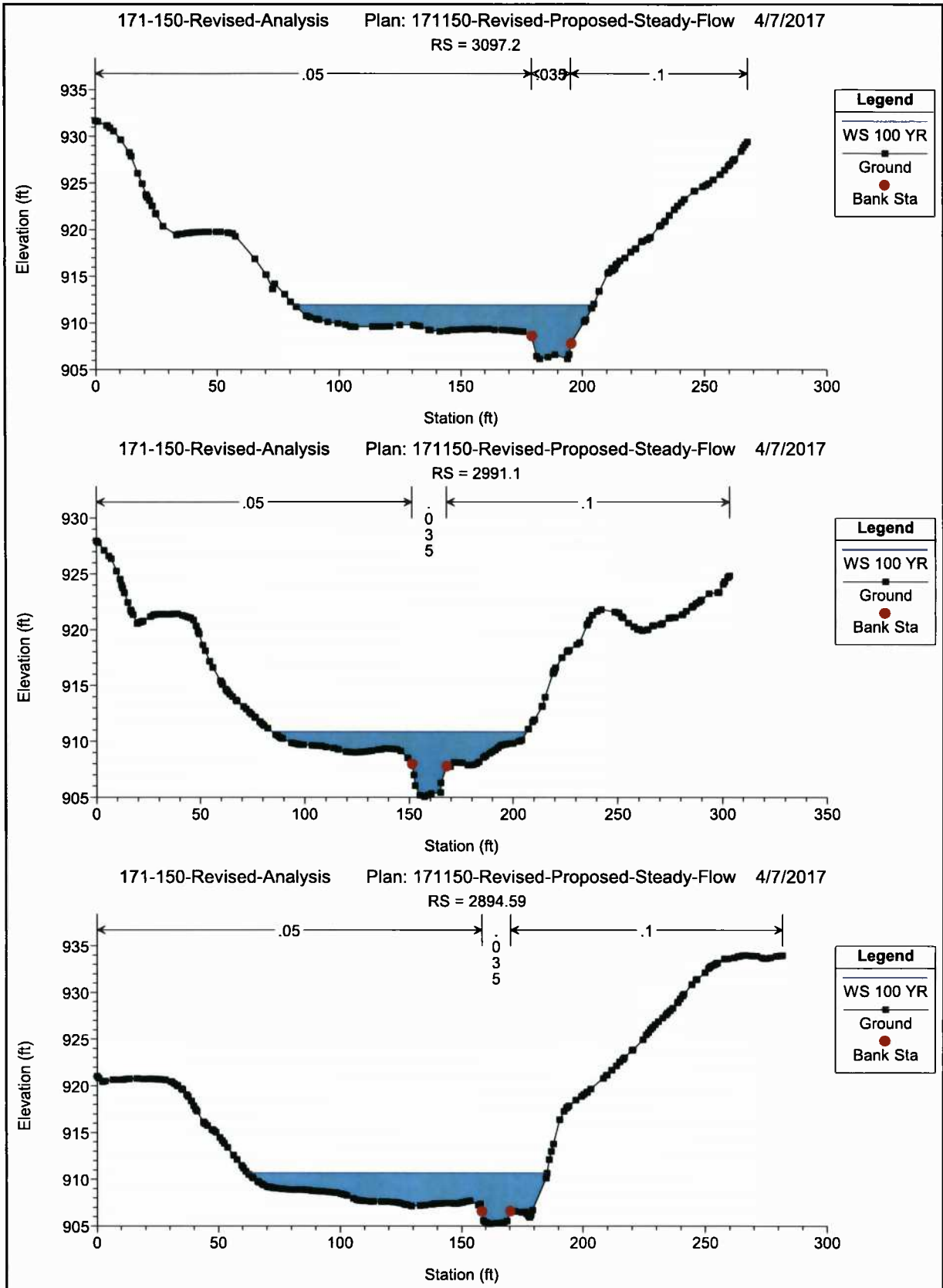
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RS = 3301.29 BR Bridge D

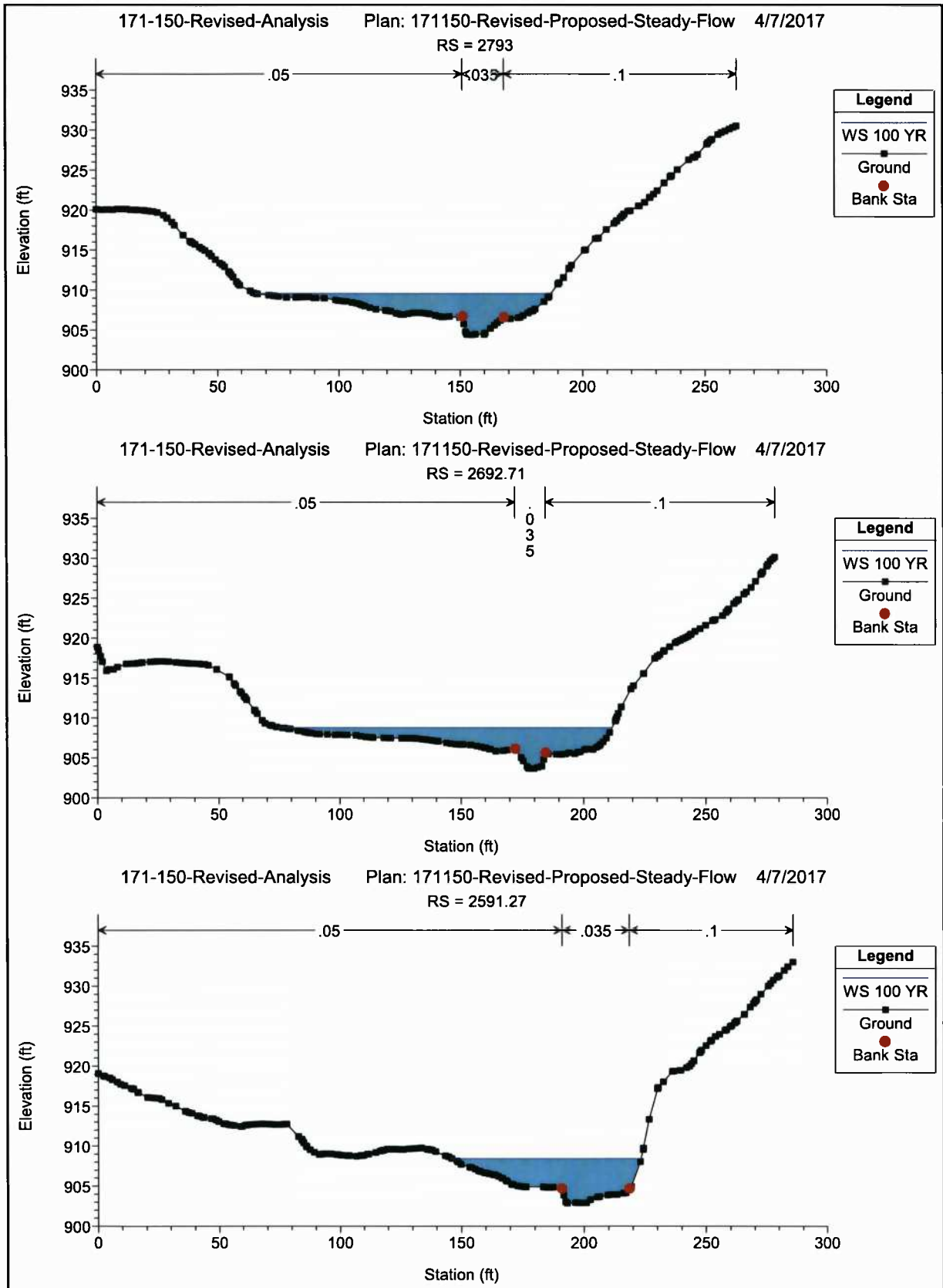


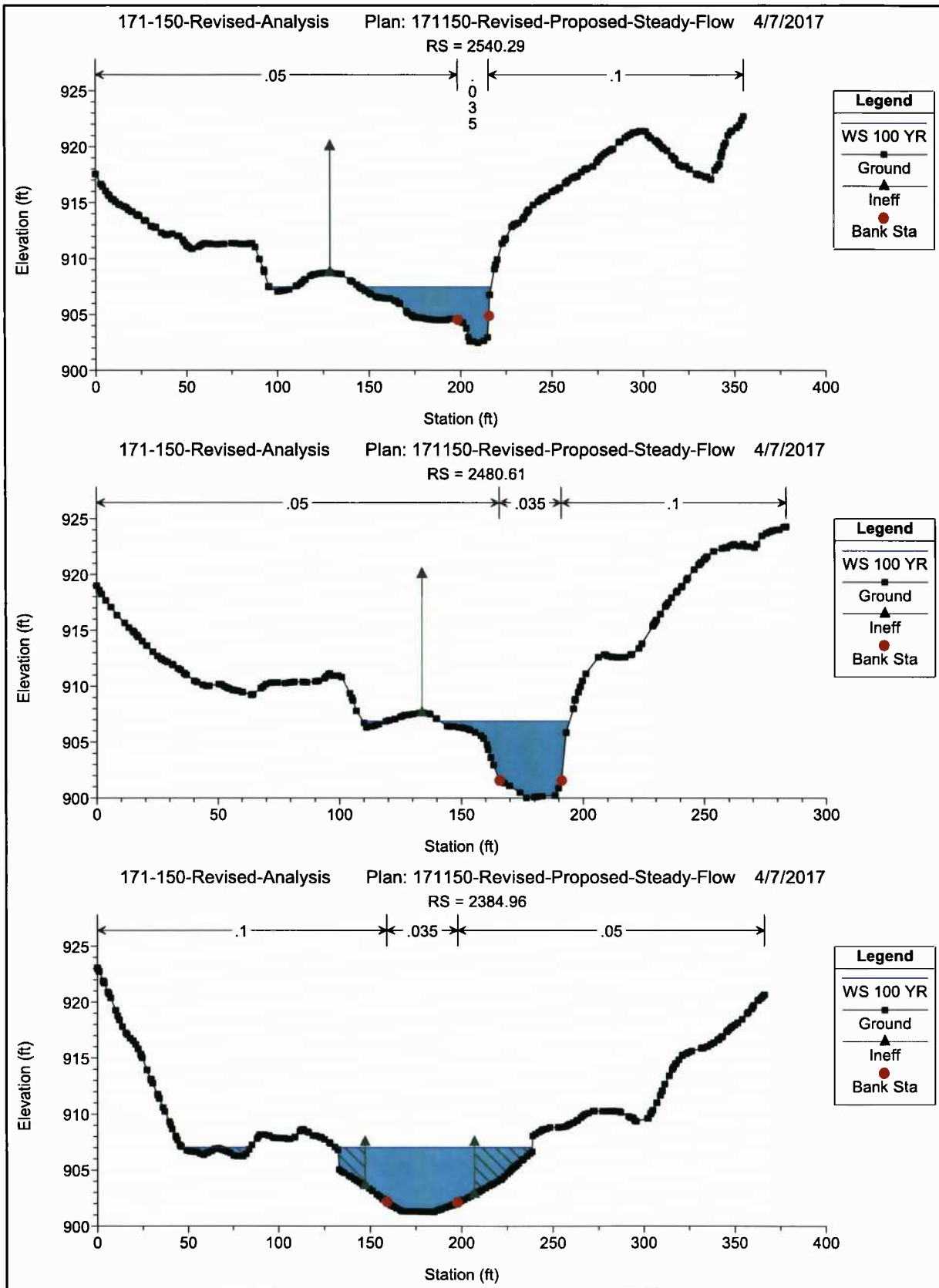
171-150-Revised-Analysis Plan: 171150-Revised-Proposed-Steady-Flow 4/7/2017  
RS = 3301.29 BR Bridge D

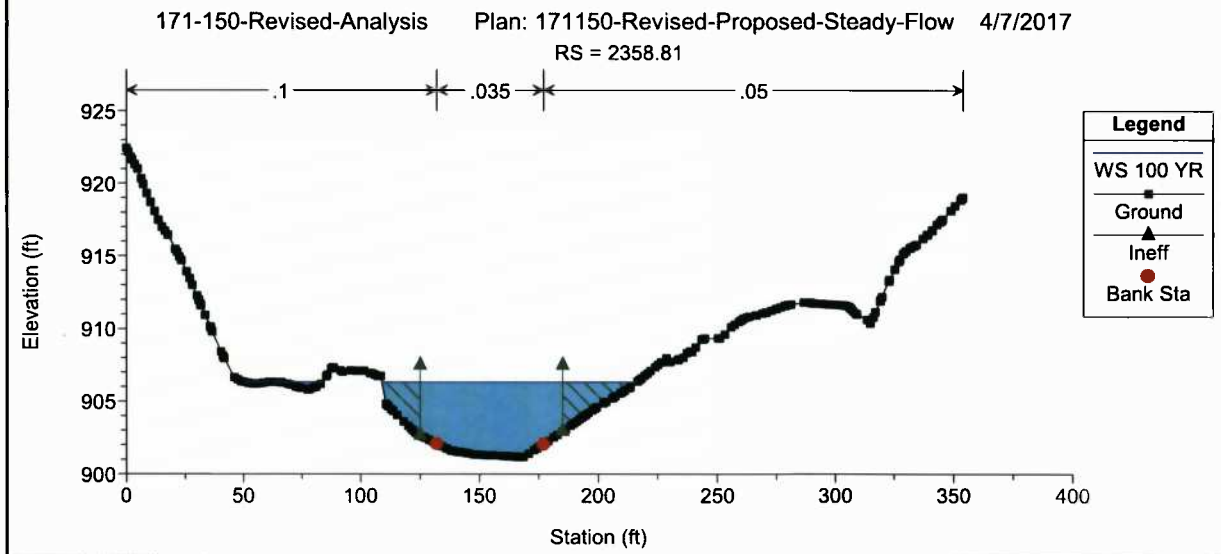
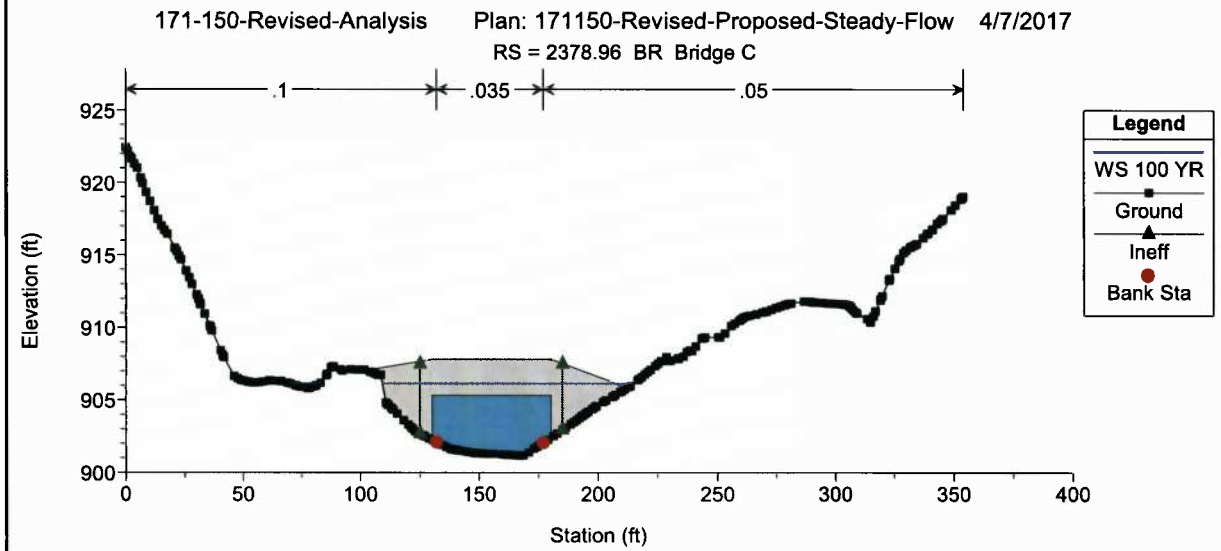
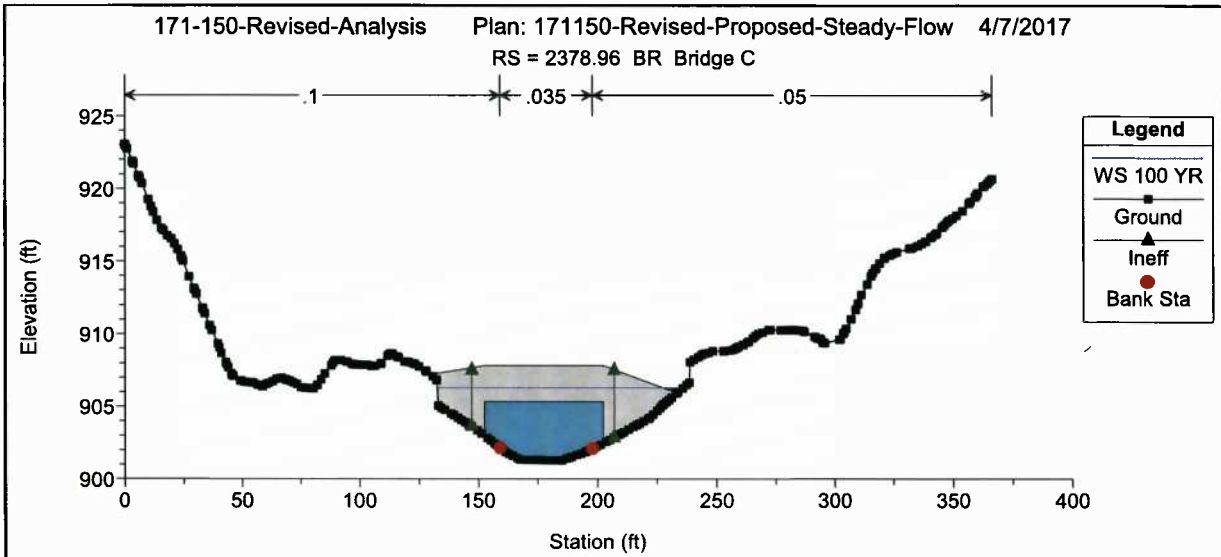


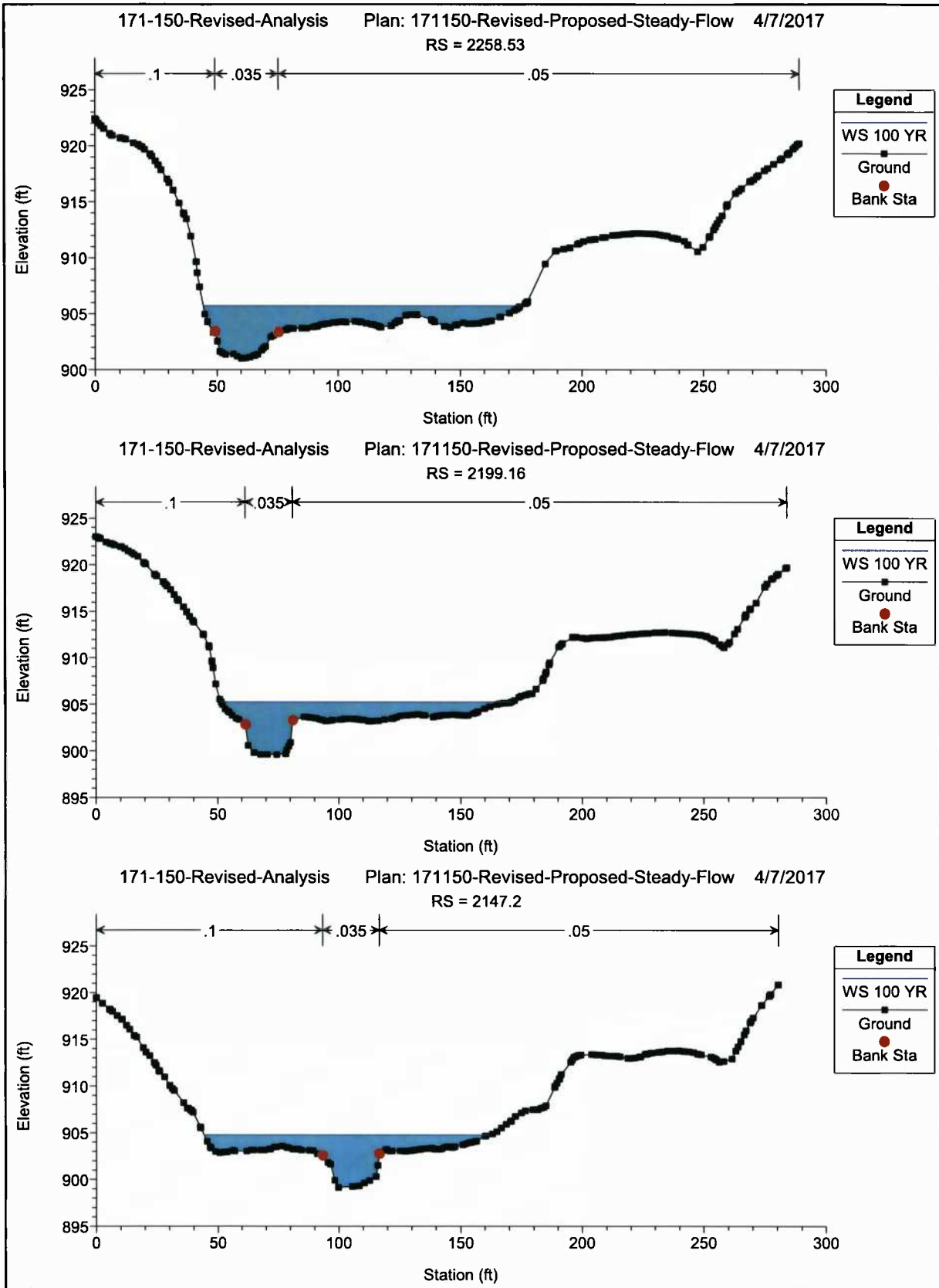


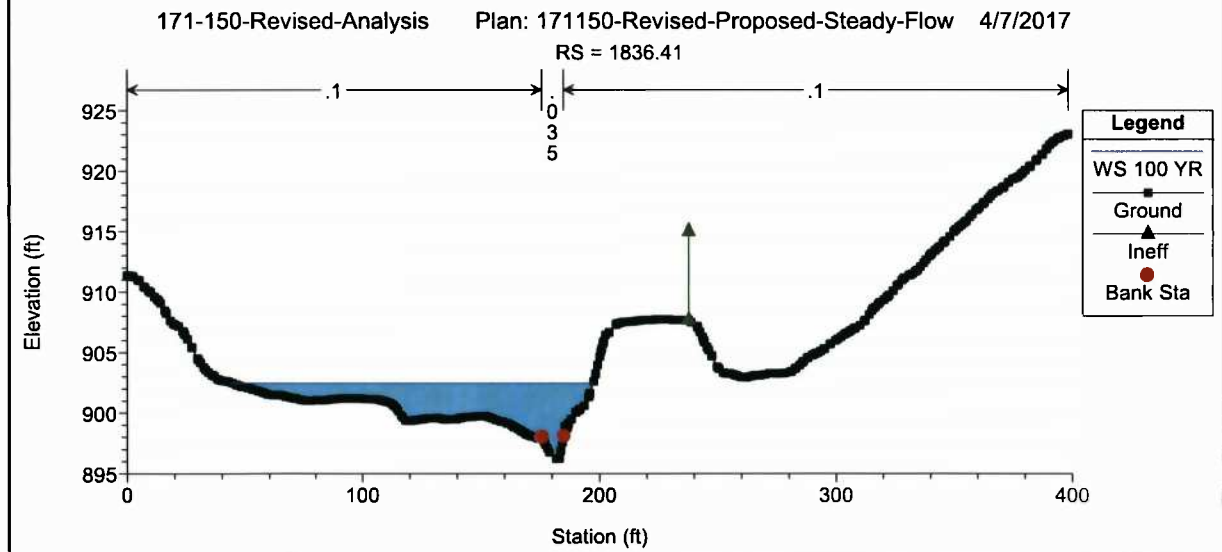
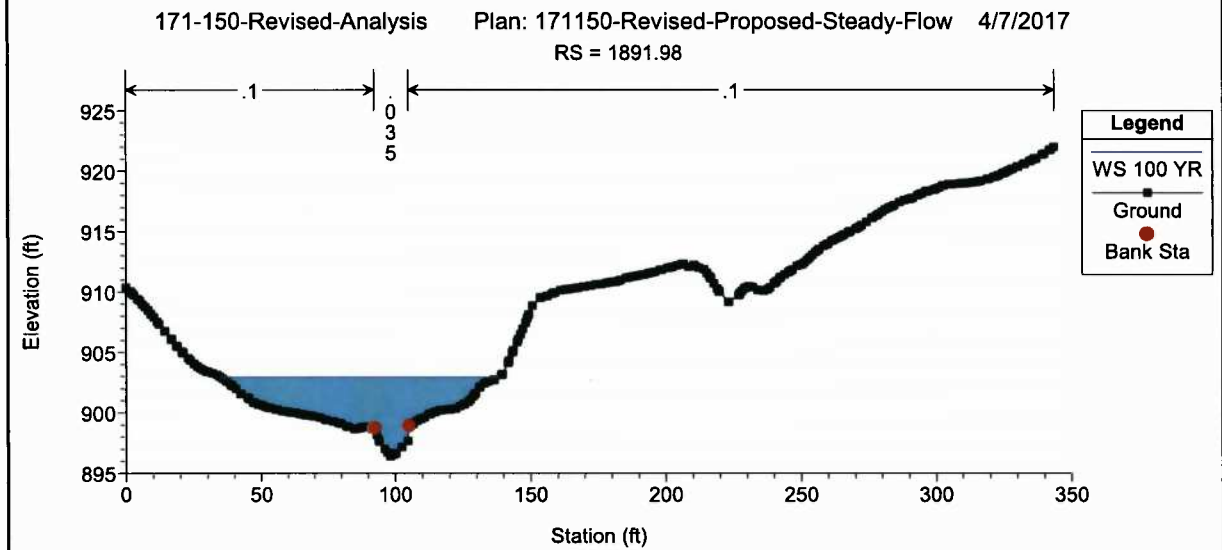
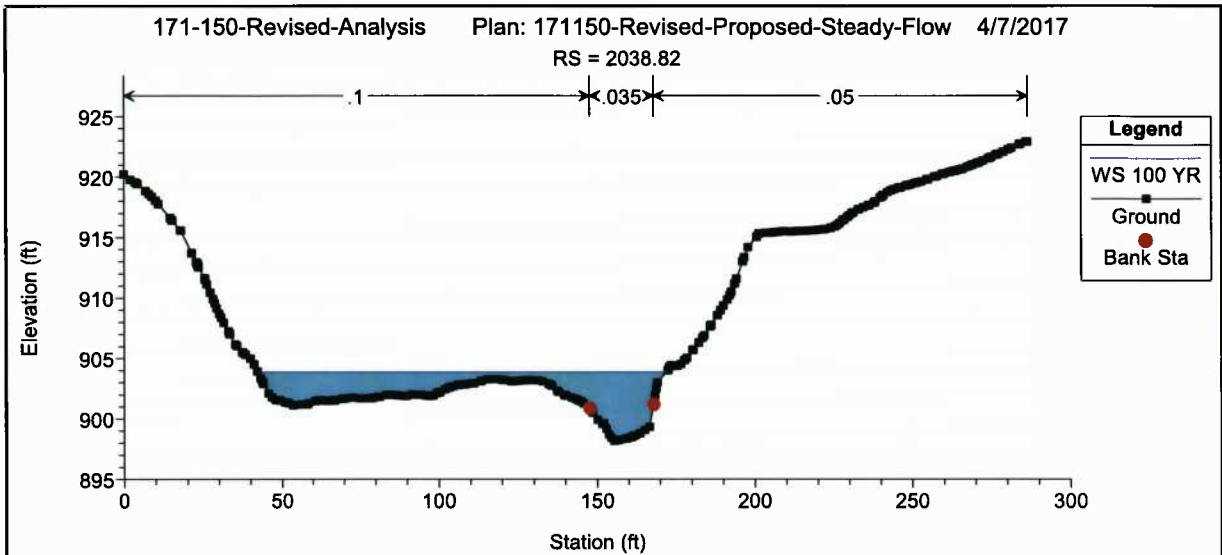




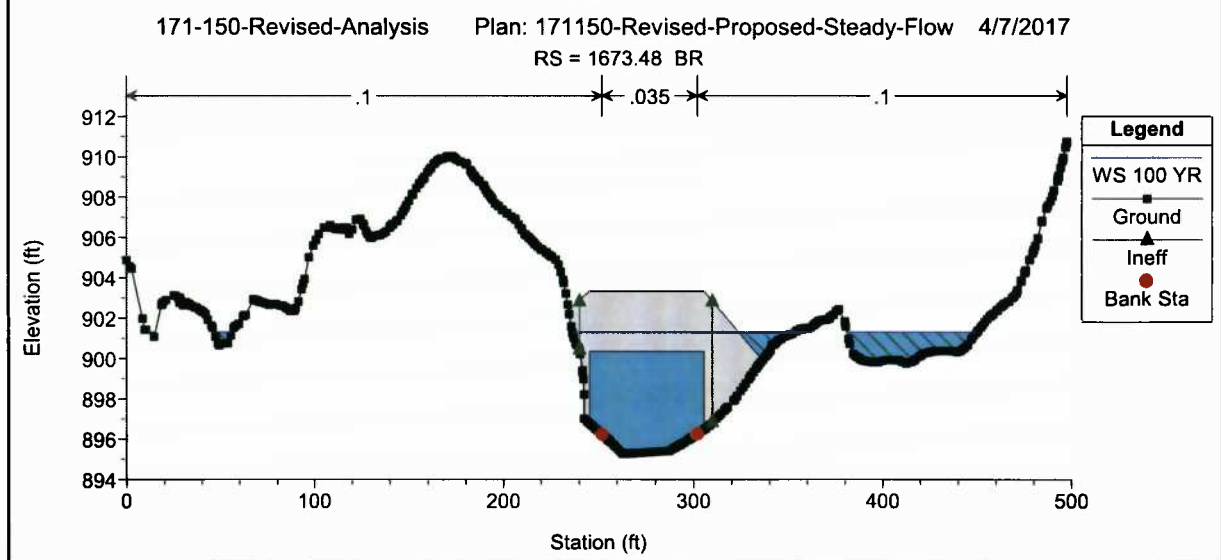
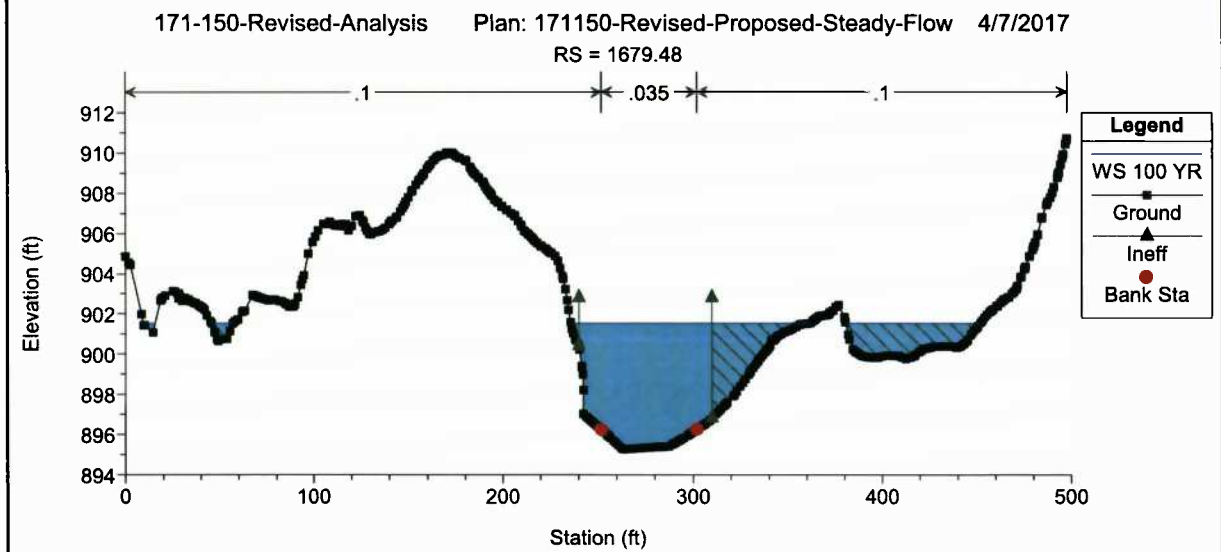
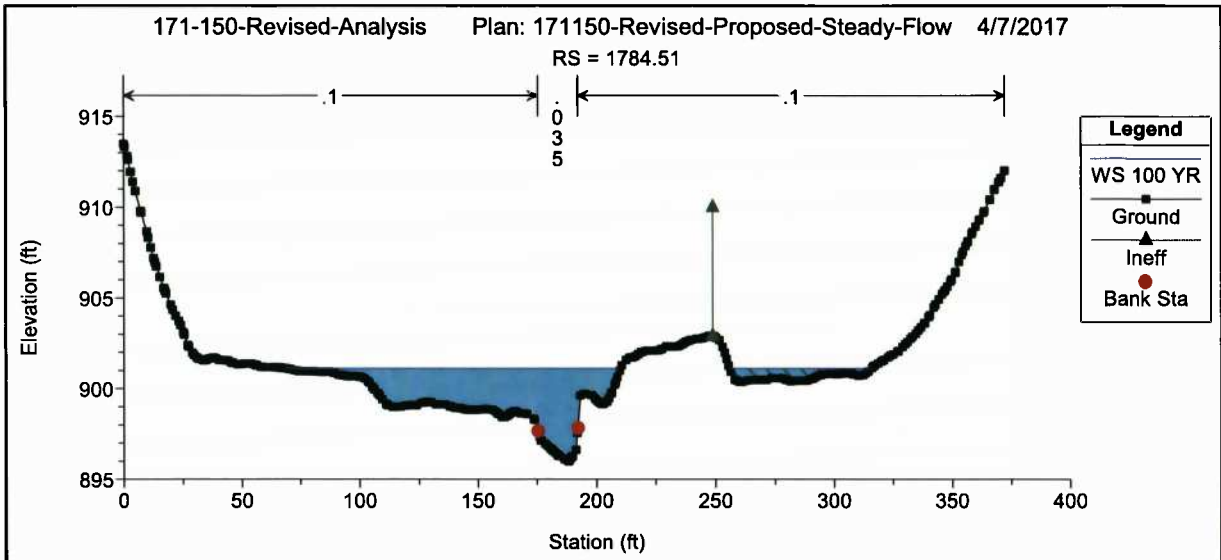


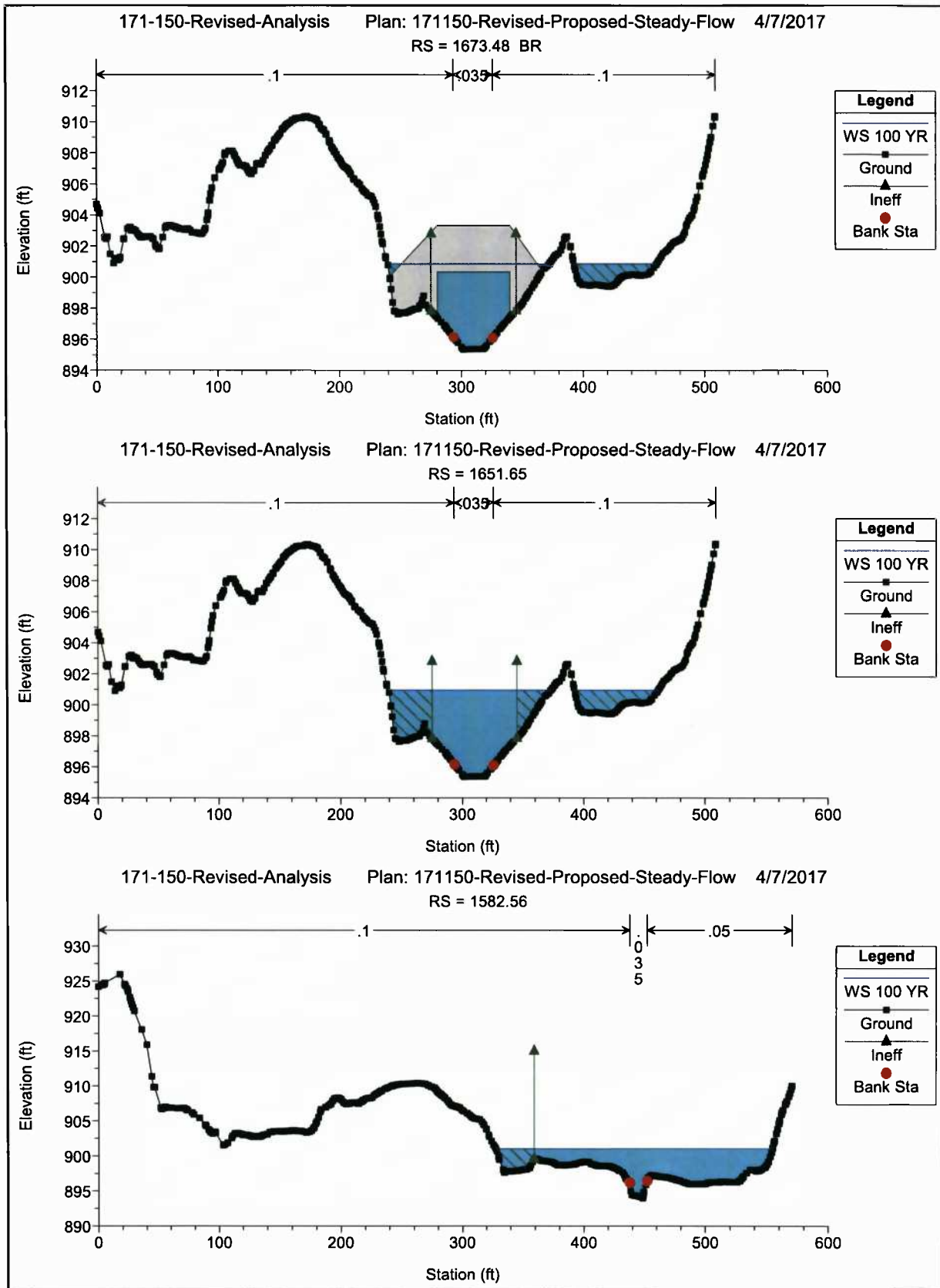


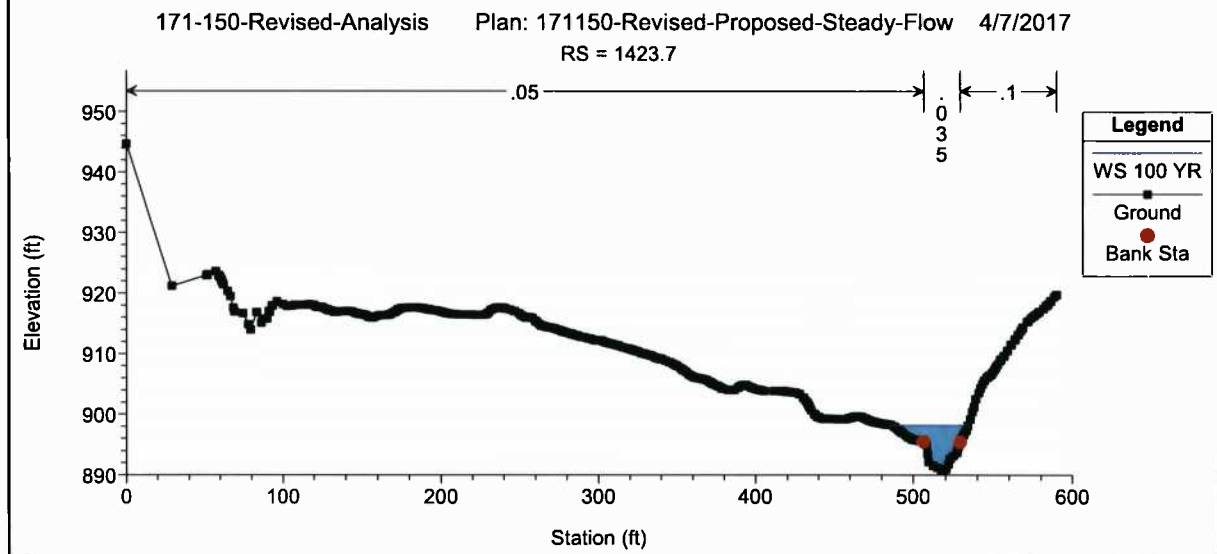
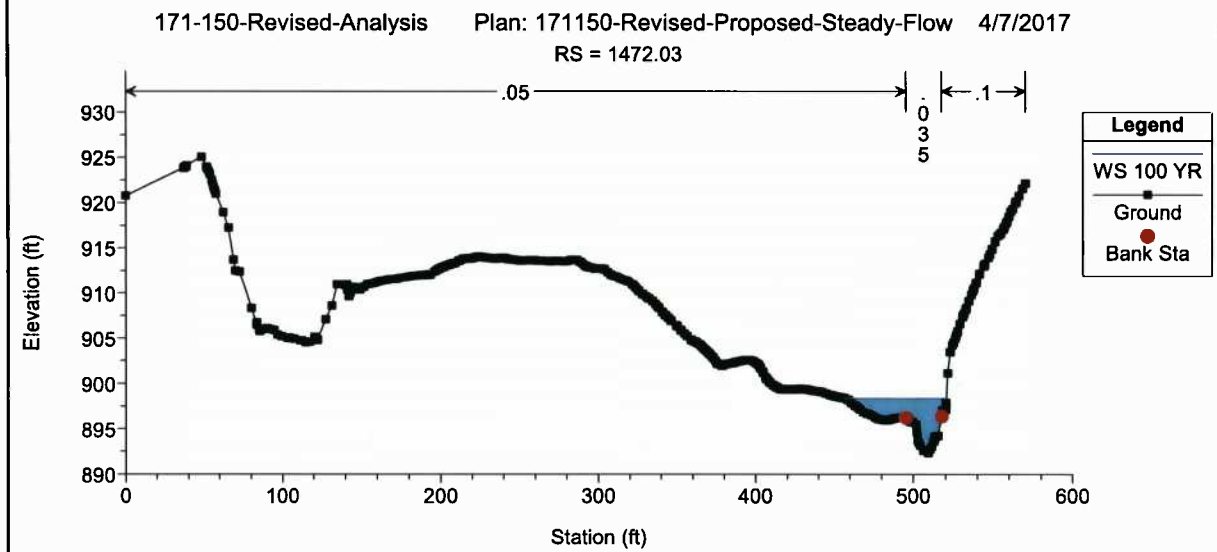
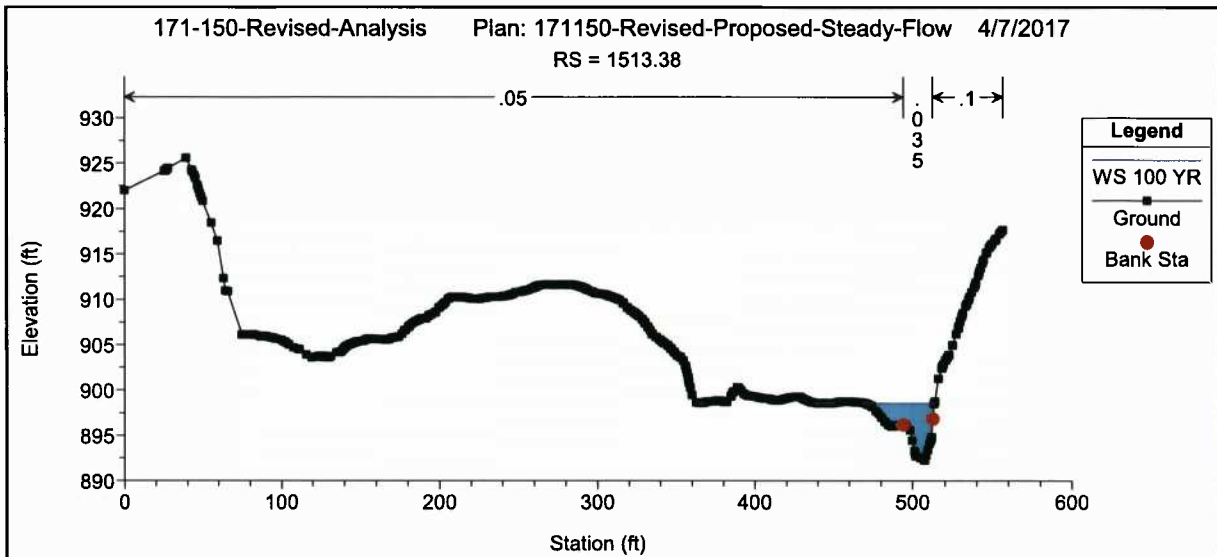


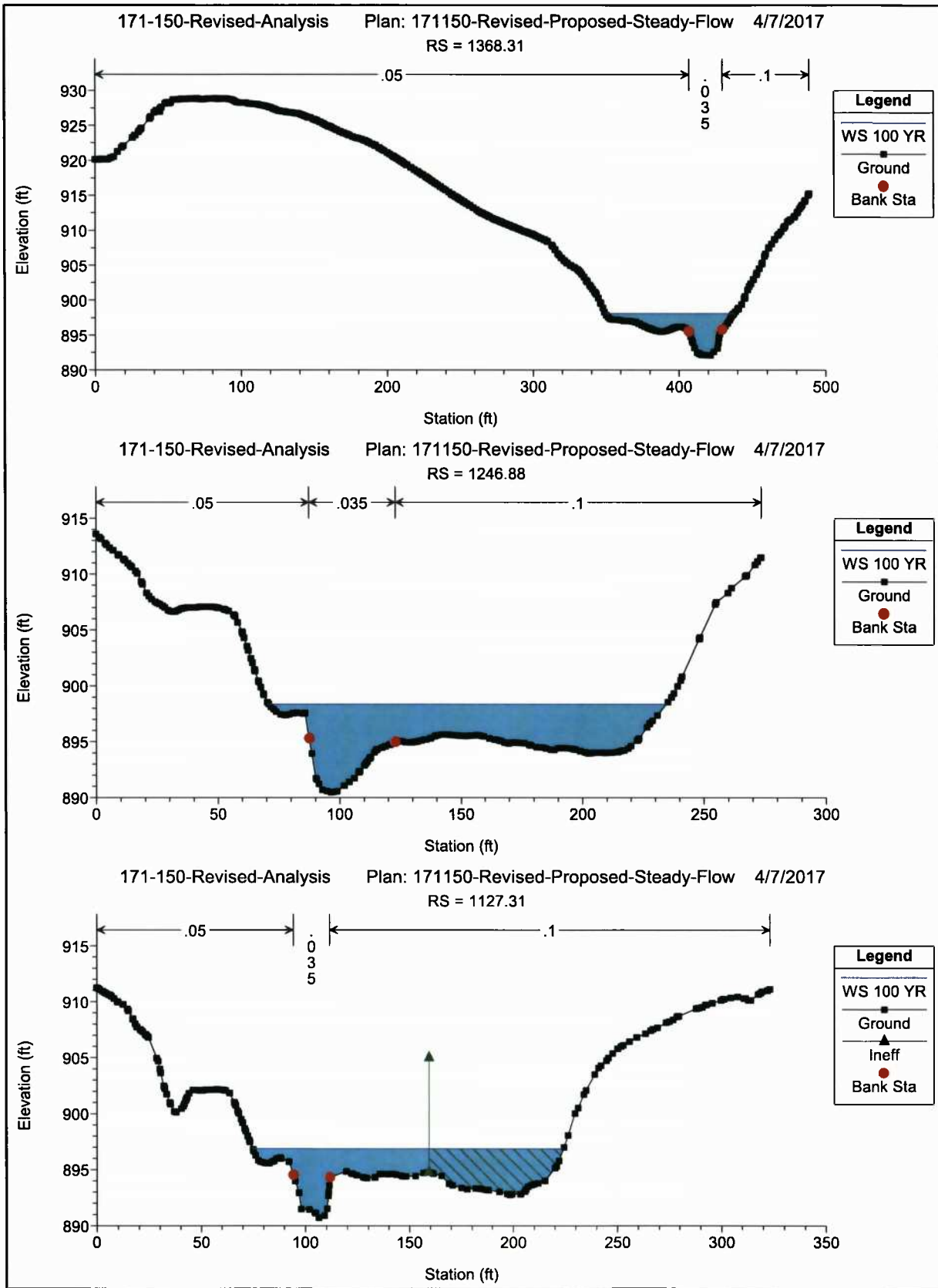




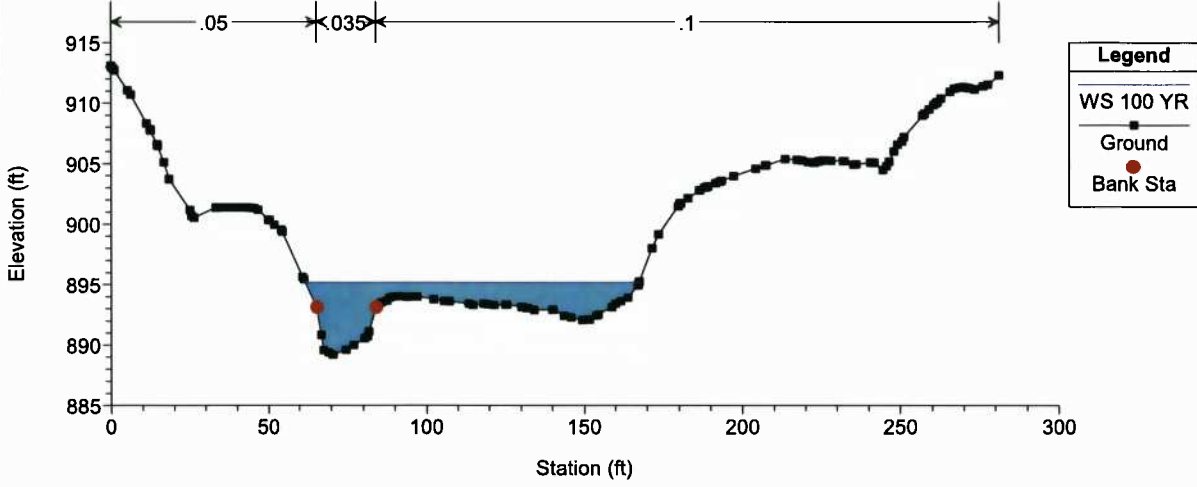








171-150-Revised-Analysis Plan: 171150-Revised-Proposed-Steady-Flow 4/7/2017  
RS = 1023.96



Legend	
WS 100 YR	—
Ground	■
Bank Sta	●

**APPENDIX F**  
**HEC-RAS Output Files**

171-150-Revised-An.rep

HEC-RAS HEC-RAS 5.0.3 September 2016  
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: 171-150-Revised-Analysis  
Project File : 171-150-Revised-An.prj  
Run Date and Time: 4/10/2017 11:48:01 AM

Project in English units

PLAN DATA

Plan Title: 171150-Revised-Existing-Steady-Flow  
Plan File : p:\2017\171-150\Calculations\HEC-RAS\171-150-Revised-An.p03

Geometry Title: 171150-Existing-Revised  
Geometry File :  
p:\2017\171-150\Calculations\HEC-RAS\171-150-Revised-An.g01

Flow Title : Flow 01  
Flow File :  
p:\2017\171-150\Calculations\HEC-RAS\171-150-Revised-An.f01

Plan Summary Information:

Number of:	Cross Sections =	67	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information

Water surface calculation tolerance = 0.01

171-150-Revised-An.rep

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: Flow 01  
Flow File : p:\2017\171-150\Calculations\HEC-RAS\171-150-Revised-An.f01

Flow Data (cfs)

River	Reach	RS	100 YR
Bluestone Creek	Align (1)	9505.57	1271

Boundary Conditions

River	Reach	Profile	Upstream
Downstream			
Bluestone Creek	Align (1)	100 YR	

Normal S = 0.6656

GEOMETRY DATA

Geometry Title: 171150-Existing-Revised  
Geometry File : p:\2017\171-150\Calculations\HEC-RAS\171-150-Revised-An.g01

CROSS SECTION

RIVER: Bluestone Creek



171-150-Revised-An.rep

REACH: Align (1)

RS: 9505.57

INPUT

Description:

Station Elevation Data		num= 82							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	959.983.560028	959.078.290009	957.8914.73001	956.2	15.78	955.93			
22.38	954.327.99002	953.3229.42001	953.1331.36002	953.0340.21002		952.6			
43.5	952.4947.99002	952.3450.55002	952.2652.43002	952.2257.59003		952.13			
64.62003	951.964.65002	951.971.68002	951.6776.87003	951.5	81.25	951.39			
85.76001	951.3189.08002	951.292.81001	951.0897.87001	950.91	101.3	950.8			
106.89	950.62	113.52	950.49	114.5	950.47	120.98	950.25	125.74	950.1
131.13	949.97	137.96	949.8	142.11	949.7	147.76	949.56	150.17	949.5
156.2	949.35	162.39	949.2	164.39	949.15	170.28	949	174.61	948.9
177.32	948.85	181.02	948.79	186.83	948.66	197.65	948.42	198.45	948.41
199.05	948.39	205.5	948.19	211.26	948.1	212.54	948.07	214.28	948.02
219.58	947.86	223.48	947.8	230.91	947.62	233.67	947.53	235.7	947.47
240.71	947.32	247.54	947.2	247.92	947.2	254.8	946.99	260.14	946.82
261.84	946.76	264.17	946.63	272.35	946.15	280.8	945.79	282.92	945.69
282.97	945.69	284.57	945.65	295.03	946.13	296.79	946.17	297.06	946.19
297.42	946.25	304.1	947.36	309.01	948.45	314.05	949.78	318.19	951.02
321.22	952.23	325.23	953.67	330.68	955.62	333.44	956.6	341.09	959.16
345.66	960.71	346.92	961.14						

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.05	272.35	.035	295.03	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	272.35	295.03		178.21	178.21	178.21	.1 .3

CROSS SECTION

RIVER: Bluestone Creek

REACH: Align (1)

RS: 9327.36

INPUT

Description:

Station Elevation Data		num= 291							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	959.432.579956	958.626.889893	957.3112.02991	955.4118.67993	953.23				
19.04993	953.1119.32996	953.0521.55994	952.731.77991	950.9534.77991	950.8				
40.09998	950.6344.21997	950.44	50.88	950.1856.66992	95061.15991	949.85			
66.96997	949.6769.10999	949.675.19995	949.481.55994	949.282.21997	949.18				
83.06995	949.1589.23999	948.95	94	948.899.16992	948.63	106.45	948.4		
115.2699	948.19117.3099	948.14118.8899	948.1	131.23	947.8	131.37	947.8		
138.37	947.69143.7799	947.52	147.47	947.44152.4099	947.36	156.23	947.24		

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159.4299	947.2163.5699	947.08168.6699	946.97	173.47	946.94179.6599	946.81			
180.48	946.8	181.12	946.79186.0699	946.72193.5599	946.61194.5199	946.61			
195.7599	946.58206.0099	946.43208.5599	946.42	211.86	946.35	215.58	946.3		
218.45	946.26	227.96	946.12230.8999	946.08236.6399	946	243.34	945.9		
244.0599	945.89255.7899	945.65260.1599	945.56	264.71	945.5	268.23	945.45		
271.73	945.43276.2599	945.33	278.75	945.3280.6799	945.27	292.35	945.1		
293.12	945.09299.8099	944.95305.5699	944.92	306.83	944.88	308.45	944.87		
318.0099	944.74320.8599	944.63324.5499	944.59	330.46	944.5	334.9	944.39		
340.65	944.25341.9199	944.2	342.9	944.18348.9399	943.95	355.35	943.8		
356.59	943.76356.7499	943.75367.7899	943.54369.9999	943.51	372.85	943.76			
380.2399	944.37	388.95	945.64391.0499	945.91392.6799	946.04405.0399	946.4			
405.1299	946.4405.4199	946.39	417.58	946.22	421.14	946.23	430.02	946.24	
437.2399	946.26	442.47	946.2	447.21	946.15	453.34	946.09	454.91	946.06
460.2599	945.93467.3599	945.75468.2599	945.73469.4399	945.71479.7999	946.25				
485.5399	946.22489.3199	946.86492.2499	947.19	496.34	948.11	501.64	948.24		
503.3599	948.53504.6899	948.62	515.1	949.34	517.14	949.5517.7299	949.5		
529.58	949.95531.4299	950.38	533.83	950.29	542.03	950.88549.9299	951.19		
554.47	951.43559.5099	951.98	566.03	951.94	566.53	951.98566.9199	951.99		
569.9399	952.07579.3599	952.4580.5699	952.65582.1299	952.56	587.59	953.16			
591.8099	953.08598.2299	953.17601.6199	953.4604.2499	953.4	614.33	953.78			
615.66	953.92	616.7	953.96	624.77	954.5	629.14	954.84	629.7	954.96
630.4199	954.95	641.59	956.75643.7399	957.11	646.52	957.42	654.03	958.64	
657.78	959.24662.6199	959.89666.4799	960.5671.8099	961.38	678.72	962.53			
678.9199	962.55	685.85	963.19691.3699	963.93694.8199	964.23703.8099	964.29			
706.91	964.11710.9199	963.87713.9299	963.58716.2599	963.23	720.95	962.78			
727.02	962.45	728.7	962.38734.9899	962.73	741.15	963.16741.9999	963.24		
743.1099	963.34	749.02	963.97	753.59	964.45	759.21	965.14763.0599	965.63	
766.0399	965.97	770.08	966.53775.3099	967.1778.4799	967.45784.1199	968.11			
790.9299	968.62	791.41	968.66803.3699	969.26805.1799	969.35807.5099	969.4			
812.2	969.59815.8199	969.68	823.61	969.95	826.23	970.07828.2599	970.11		
839.71	970.4	840.71	970.43847.2899	970.65853.1499	970.6854.3099	970.63			
855.7999	970.62	865.6	970.69	868.35	970.76871.8999	970.69878.0399	970.65		
882.39	970.76887.9999	970.66	890.49	970.65896.4199	970.85902.9299	970.71			
904.1	970.74915.3799	970.9	917.48	970.94	920.2	971924.4999	971.18		
927.8199	971.17936.2999	971.36	940.27	971.44952.3999	971.61	952.71	971.62		
953.7999	971.61965.1599	971.51	968.49	971.43973.6299	971.3	977.6	971.26		
984.59	971.25987.6699	971.26990.0499	971.27994.6899	971.22	1000.69	970.97			
1001.71	970.94	1002.49	970.9	1008.64	970.5	1014.94	970.11	1015.75	970
1016.79	969.87	1022.77	969.11	1027.39	968.59	1029.78	968.18	1032.89	967.62
1036.8	966.92	1039.83	966.39	1048.99	965.13	1050.84	964.9	1052.28	964.64
1057.86	964.61	1064.72	964.09	1064.88	964.12	1065.09	964.14	1077.17	965.45
1081.18	965.62	1089.61	965.68	1097.28	965.36	1099.97	965.28	1102.06	965.25
1113.38	965.08	1114.5	965.11	1118.32	965.16	1126.95	965.39	1129.48	965.46
1135.07	965.86	1139.39	965.79	1142.09	965.86	1145.58	965.75	1149.11	965.81
1151.84	965.9	1161.68	966.77	1164.28	966.97	1170.16	967.79	1176.73	967.78
1177.78	967.79	1184.2	968.16	1189.17	968.16	1193.87	968.31	1201.62	968.81
1205.26	969.04	1209.97	969.34	1214.06	969.65	1226.07	970.37	1226.51	970.38
1227.99	970.41	1238.95	970.6	1240.35	970.62	1242.17	970.68	1247.37	970.78

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1251.4	970.91	1258.27	971.31	1263.84	971.66	1274.37	972.5	1276.29	972.63
1282.47	972.99	1288.73	973.54	1290.47	973.67	1301.18	974.43	1303.53	974.58
1306.56	974.86	1313.62	975.33	1317.56	975.5	1322.66	975.87	1326.07	976.09
1330.57	976.21								

Manning's n Values num= 3

Sta	n	Val	Sta	n	Val	Sta	n	Val
0	.05	355.35	.035	372.85	.05			

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	355.35	372.85		214.48	214.48	214.48		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 9112.88

INPUT

Description:

Station Elevation Data num= 116

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.576	609985	950.438	169983	950.198	609985	950.17	18.25	949.67
24.39999	949.48	28.34	949.3534	51999	949.2138	41998	949.1	40.91	949.02
48.50998	948.852	16998	948.6957	42999	948.53	58.59	948.560	41998	948.44
68.67999	948.13	73.94	947.9978	75998	947.886	31998	947.5788	84998	947.48
97.72998	947.1598	92999	947.1	106.97	946.8	109.01	946.72	112.22	946.6
119.1	946.35	123.48	946.22	129.18	946	138.13	945.73	139.27	945.69
143.28	945.58	148.25	945.44	149.35	945.4	156.51	945.11	159.44	945.03
164.03	944.86	169.52	944.7	176.98	944.55	179.6	944.52	181.28	944.48
188.84	944.32	189.69	944.3	189.93	944.29	199.77	944.15	206.05	944.06
209.86	944.01	215.83	943.92	219.94	943.86	228.79	943.74	230.03	943.72
230.82	943.7	234.39	943.65	240.11	943.59	247.33	943.5	250.2	943.46
255.59	943.34	260.28	943.3	267.64	943.23	270.36	943.2	272.1	943.16
279.95	943.01	280.36	943	280.59	943	290.53	942.8	296.87	942.67
300.62	942.6	305.13	942.55	310.7	942.5	319.44	942.32	320.79	942.31
325.51	942.25	329.9	942.21	330.87	942.19	338.16	942.1	340.96	942.06
345.35	942.01	351.04	941.94	358.3	941.85	361.12	941.82	362.93	941.8
371.06	941.7	371.25	941.7	381.29	941.68	384.2	941.64	391.38	941.55
395.95	941.5	396.05	941.5	401.46	941.36	404.21	941.3	411.55	941.03
416.62	940.9	421.63	940.77	423.06	940.84	431.71	940.7	437.24	941.04
441.8	941.5	448.96	942.28	451.88	942.59	461.91	943.69	461.97	943.69
462.01	943.7	462.17	943.71	470.26	944.3	472.05	944.41	474.86	944.6
482.14	945.12	487.81	946.14	492.22	946.66	495.03	947.38	502.31	949.86
503.29	950.29	507.73	952.2	512.39	954.19	519.8	958.03	522.47	959.28
525.74	960.43								

Manning's n Values num= 3

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Sta n Val Sta n Val Sta n Val  
 0 .05 411.55 .035 437.24 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 411.55 437.24 217.06 219.41 222.31 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 8893.47

INPUT

Description:

Station Elevation Data num= 111

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	953.915	180023	952.5113	64001	950.4915	14001	950.3	16.25	950.24
23.64001	949.12	24.91	948.9525	10001	948.925	36002	948.8835	05002	948.46
37.07001	948.3845	01001	948.0350	87003	947.78	54.97	947.660	51001	947.36
64.92001	947.1768	18002	947.03	74.88	946.8283	95001	946.6284	84003	946.6
89.87003	946.4594	79001	946.31	102.81	946.16	104.75	946.1	107.38	946.05
114.71	945.9	120.12	945.79	124.66	945.7	128.77	945.62	134.62	945.5
137.43	945.44	144.58	945.3	146.08	945.27	154.53	945.1	156.1	945.08
164.49	945	172.05	944.85	174.45	944.8	177.69	944.73	184.4	944.6
189.36	944.5	194.36	944.46	201.13	944.33	204.32	944.3	212.85	944.13
214.27	944.1	222.34	944.02	223.98	944	224.23	944	232.64	943.83
234.19	943.8	236.29	943.78	244.15	943.7	248	943.62	254.1	943.5
259.72	943.44	264.06	943.36	267.26	943.33	274.02	943.2	283.16	943.01
283.97	943	284.57	942.99	288.57	942.95	293.23	942.91	293.93	942.9
294.88	942.88	303.89	942.7	310.54	942.63	313.84	942.6	318.31	942.51
323.8	942.4	330.03	942.34	333.76	942.3	341.75	942.14	343.71	942.1
353.47	941.9	353.82	941.9	354.8	941.89	362.47	941.81	363.63	941.78
371.13	941.62	373.58	941.6	376.91	941.53	383.54	941.4	388.44	941.35
393.5	941.24	400.34	941.16	403.45	941.1	405.75	941.05	413.41	940.9
421.03	940.75	423.06	940.7	423.37	940.7	423.78	940.69	433.32	940.58
435.5	940.55	443.28	940.4	449.03	940.28	453.24	940.2	457.68	940.11
463.19	940	466.43	940	473.15	940.47	474.99	940.97	483.11	943.25
483.65	943.46	487.26	944.8	492.3	946.68	493.06	946.95	500.96	950.27
501.17	950.37								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 449.03 .035 473.15 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 449.03 473.15 199 199 199 .1 .3

CROSS SECTION

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RIVER: Bluestone Creek  
 REACH: Align (1) RS: 8694.47

INPUT

Description:

Station Elevation Data		num= 107							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	957.523	630005	956.568	369995	955.312	179999	954.7118	359999	953.46
20.73001	953.26	28.34	952.38	34.94	951.8	37.84	951.5838	32001	951.54
39	951.5	48.31	950.850	98999	950.5758	29001	950.0163	48999	949.77
68.26999	949.3872	04001	949.3378	26001	949.1286	95999	949.0788	23999	949.08
94.57001	948.97	98.22	948.9198	95001	948.89	108.2	948.57	114.8	948.2
118.19	948.06	123.35	947.78	128.17	947.52	131.9	947.4	138.15	947.04
146.92	946.72	148.14	946.7	149.01	946.67	154.21	946.58	157.56	946.51
158.12	946.5	166.11	946.26	168.1	946.2	170.9	946.14	178.09	945.94
182.89	945.8	188.07	945.7	194.88	945.49	198.05	945.4	200.32	945.33
208.03	945.19	208.87	945.17	213.85	945.02	218.02	944.9	225.97	944.74
228	944.7	234.52	944.5	237.98	944.4	242.84	944.25	247.97	944.1
251.63	944.02	257.95	943.9	260.18	943.83	267.93	943.6	268.73	943.58
273.48	943.49	277.28	943.41	277.92	943.39	278.81	943.37	287.9	943.1
290.8	943.01	297.88	942.86	302.79	942.75	307.87	942.6	314.78	942.39
317.85	942.32	326.77	942.13	327.83	942.11	333.12	941.94	337.81	941.78
345.69	941.52	347.8	941.42	354.24	941.2	357.78	941.07	362.74	940.85
367.76	940.62	374.73	940.38	377.75	940.27	379.9	940.18	387.73	939.82
388.45	939.8	392.76	939.65	397.71	939.46	405.55	938.86	407.7	938.7
410.7	938.5	417.68	937.97	422.66	937.8	424.05	937.77	427.66	937.68
434.68	939.41	437.64	940.07	446.67	944.34	447.63	944.74	448.31	945.08
452.39	947.33	457.61	950.21	458.66	950.73	467.59	955.28	473.97	957.89
477.58	959.15	481.81	960.17						

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.05	405.55	.035	434.68	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	405.55	434.68		191.84	191.84		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 8502.63

INPUT

Description:

Station Elevation Data	num=	78
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Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	949.93	329987	949.588	579987	949.07	15.62	948.31	18.59	948.02
20.63	947.8228	60001	946.9329	07999	946.8931	66998	946.62	38.62	945.91
40.19998	945.7	48.63	944.5154	42999	943.6358	63998	943.05	62.88	942.67
68.65999	942.22	71.33	942.07	78.67	941.74	79.78	941.6885	75999	941.41
88.23	941.388	67999	941.2989	34999	941.27	98.7	941.13	105.13	940.96
108.71	940.87	113.92	940.74	118.72	940.58	126.21	940.4	128.74	940.34
138.5	940.11	138.75	940.1	138.92	940.09	139.85	940.07	147.37	939.81
148.76	939.77	155.82	939.6	158.78	939.53	164.27	939.34	168.79	939.24
172.72	939.12	178.8	939	181.17	938.9	188.82	938.69	189.62	938.67
193.94	938.6	198.07	938.51	198.83	938.5	199.94	938.46	208.84	938.2
212.23	938.06	218.86	937.85	223.41	937.62	228.87	937.27	231.86	937.05
237.56	936.49	238.88	936.37	248.03	937.21	248.76	937.28	248.9	937.3
257.21	940.02	258.91	940.64	261.38	941.63	268.92	944.73	274.11	946.39
278.94	947.83	285.96	949.84	288.95	950.7	298.25	953.37	298.96	953.58
299.46	953.73	302.13	954.51	307.91	956.21	308.98	956.51	310.53	956.96
318.99	959.43	322.82	960.13	323.37	960.23				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	228.87	.035	248.76	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	228.87	248.76		191.57	190.57		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 8312.06

INPUT

Description:

Station Elevation Data num= 77

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	953.53	910004	952.396	869995	951.5913	79999	949.7822	17999	947.6
23.69	947.21	33.09	944.8633	58002	944.7333	98999	944.64	38.31	943.65
43.47	942.4752	07001	940.5153	36002	940.2461	11002	938.96	63.25	938.67
65.84	938.5773	14001	938.13	76.75	938.06	83.03	93887	67001	937.95
92.92001	937.9598	58002	937.88	102.81	937.88	106.31	937.87	112.7	937.79
115.35	937.78	122.59	937.76	131.33	937.64	133.43	937.64	142.37	937.6
143.55	937.6	151.51	937.59	153.16	937.59	162.15	937.58	169.59	937.57
172.03	937.54	178.63	937.53	181.92	937.53	185.9	937.48	191.81	937.41
196.71	937.35	201.7	937.34	207.73	937.28	211.59	937.23	214.79	937.2
221.48	937.12	229.56	937.03	231.37	937.01	240.48	936.91	241.26	936.9
241.91	936.89	248.8	936.67	250.95	936.6	251.15	936.6	259.99	936.14
261.04	936.06	269.03	935.56	270.93	935.37	273.22	935.61	273.8	935.59
280.82	935.23	284.14	936.07	290.71	937.8	295.05	938.98	300.6	940.54

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305.97	941.51	310.49	942.45	316.89	943.52	320.38	944.11	323.27	944.59
330.27	945.76	338.72	947.18	340.16	947.42	341.35	947.62	350.04	949.08
354.04	949.74	356.94	950.23						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	259.99	.035	284.14	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	259.99	284.14		219.41	219.41		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 8092.65

INPUT

Description:

Station Elevation Data num= 63

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	948.252	509979	947.663	329987	947.478	369995	946.23	12.67	945.16
13.26999	945.01	14.06	944.852	320999	943.022	25.60999	942.763	33.14999	942
38.84	941.65	43.09	941.448	70999	941.06	53.03	940.860	25999	940.36
62.96999	940.176	5.01999	940.037	2.90999	939.49	79.7	938.958	2.46999	938.73
82.85999	938.69	91.2	938.099	2.79999	937.98	94.92	937.83	102.74	937.27
106.47	937	112.68	936.55	117.37	936.22	122.62	935.9	129.57	935.55
132.56	935.37	134.82	935.26	142.5	934.89	143.55	934.82	151.03	934.38
152.27	934.3	152.44	934.29	152.67	934.28	162.39	933.68	167.25	933.14
169.72	932.86	172.33	932.6	178.45	933.21	182.27	933.73	187.17	934.98
192.21	936.27	198.88	937.98	202.15	938.87	204.62	939.32	212.09	940.68
213.35	940.91	222.03	942.4	222.07	942.41	222.36	942.45	230.8	943.87
231.97	944.08	239.52	945.36	241.92	945.74	245.08	946.28	251.86	947.42
256.63	947.88	261.8	948.43	262.71	948.51				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	162.39	.035	182.27	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	162.39	182.27		188.66	183.33		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 7909.32

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INPUT

Description:

Station Elevation Data		num= 73							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	950.77	4599915	950.656	109985	949.18	10.34	947.99	15.25	946.71
20.22	945.3524	39001	944.2630	10001	942.76	36.81	940.9339	98001	940.1
47.54999	938.7249	85001	938.28	51.81	938.1659	73001	937.7769	03999	937.6
69.61	937.5976	10001	937.4779	24001	937.4179	49001	937.4	88.38	937.32
89.37	937.31	97.52	937.2399	24001	937.22	101.28	937.2	109.12	937.13
112.02	937.1	119	937.03	124.94	936.98	128.88	936.94	134.08	936.89
138.76	936.85	143.22	936.85	148.64	936.86	152.36	936.82	158.51	936.77
161.5	936.74	168.39	936.67	170.64	936.68	178.27	936.68	179.78	936.67
188.15	936.59	188.92	936.58	198.03	936.5	198.06	936.5	198.53	936.49
207.2	936.4	207.9	936.38	208.73	936.3	217.78	935.54	225.48	934.34
227.66	933.74	230.22	933.71	232.17	933.41	237.54	932.6	243.77	934.49
247.42	936	251.71	937.25	257.29	939.03	262.05	940.12	267.17	941.18
273.2	942.12	277.05	942.72	283.94	943.79	286.93	944.29	294.69	945.49
296.81	945.82	298.61	946.1	306.68	947.26	316.18	947.96	316.56	947.99
316.89	948.03	320.96	948.67	322.25	948.86				

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.05	225.48	.035	243.77	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.	
	225.48	243.77		200.4	205.66	210.75	.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 7703.66

INPUT

Description:

Station Elevation Data		num= 69							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.55	6000061	942.425	900024	941.3512	39001	939.9716	27002	939.15
23.95001	937.59	26.63	937.0627	99002	936.89	32.09	936.36	37	935.73
39.40002	935.6347	36002	935.35	51.38	935.3257	73001	935.28	63.59	935.24
68.10001	935.2174	78001	935.1778	46001	935.1585	75002	935.188	83002	935.06
95.09001	935.0498	18001	935.03	99.19	935.02	105.98	934.94	109.56	934.89
113.77	934.84	119.92	934.83	140.65	934.83	147.55	934.76	151.02	934.73
158.09	934.73	160.57	934.72	161.38	934.72	168.37	934.7	171.75	934.64
178.45	934.4	182.11	934.32	189.59	933.72	192.48	933.46	199.56	932.69
200.13	932.65	202.85	932.46	209.35	933.63	213.21	934.05	215.16	934.43
221.09	935.74	223.58	936.25	224.8	936.43	233.94	937.96	240.24	938.71
244.31	939.19	246.36	939.44	252.59	940.18	254.16	940.35	254.67	940.41



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261.96	941.16	265.04	941.48	269.76	942.01	275.4	942.64	277.55	942.91
284.09	943.7	285.77	943.9	293.15	944.78	296.13	945.14	302.04	945.84
306.5	946.4	315.59	947.1	316.87	947.19	323.01	947.65		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	192.48	.035	209.35	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
192.48	209.35	202.31	203.03	204.11	.1	.3	

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 7500.63

INPUT

Description:

Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	947.692	579987	947.131	0.12997	945.53	13.06	944.91	14.41998	944.65
18.12997	943.89	23.54999	942.83	29.76999	941.68	34.03998	940.83	37.44	940.25
44.51999	938.96	45.12	938.87	46.72998	938.58	52.78998	937.53	55.00998	937.14
59.81	936.31	65.49998	935.43	75.31999	933.72	75.98999	933.6	76.37	933.52
86.46999	931.52	91.15999	931.13	96.95999	930.19	103.92	930.13	107.45	930.15
109.49	930.16	113.31	930.13	117.94	930.1	121.85	930.15	128.42	930.57
132.52	930.83	137.19	931.15	138.91	931.27	142.61	931.52	149.4	931.93
152.54	932.13	159.88	932.58	161.11	932.67	170.37	933.33	175.56	933.7
180.86	934.07	183.23	934.22	189.71	934.7	190.91	934.79	191.35	934.83
192.29	934.91	201.83	935.65	208.86	936.2	212.32	936.47	213.93	936.6
218.31	936.94	222.81	937.29	225.42	937.52	233.3	938.21	241.98	938.97
243.78	939.12	246.9	939.38	252.29	939.78	254.27	939.95	258.54	940.33
264.76	940.87	267.64	941.13	275.24	941.79	275.31	941.8	275.5	941.82
285.73	942.71	290.66	943.15	296.22	943.63	304.1	944.32	306.71	944.54
308.22	944.67	317.19	945.43	321.27	945.69				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.191	15999	.035	137.19	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
91.15999	137.19	140.93	140.93	140.93	.1	.3	

CROSS SECTION

RIVER: Bluestone Creek

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REACH: Align (1)

RS: 7359.7

INPUT

Description:

Station Elevation Data		num= 61							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	945.473	319992	944.636	149994	943.911	0.75999	942.7	15.05	941.64
16.67999	941.26	20.3	940.372	7.20999	938.723	7.26999	936.133	7.73999	936.01
37.95	935.94	38.5	935.76	45.58	933.494	8.26999	932.52	54.25	930.88
58.8	929.61	66.25	929.296	8.48999	929.2	69.33	929.2	71.22	929.29
75.26999	929.43	79.87	929.6	83.75	929.969	0.39999	930.499	3.98999	930.91
100.93	931.7	106.65	932.3	111.46	932.86	121.74	933.68	121.92	933.69
121.99	933.7	122.15	933.71	132.52	934.34	137.19	934.66	143.05	935
149.49	935.36	153.59	935.61	160.09	936.07	164.12	936.3	167.73	936.54
174.65	936.91	175.36	936.95	177.23	937.07	182.99	937.45	185.18	937.6
190.63	937.96	195.71	938.23	198.26	938.37	204.98	938.81	206.24	938.89
207.02	938.94	216.77	939.56	223.99	940.01	227.31	940.22	228.8	940.31
232.72	940.56	236.43	940.8	237.84	940.9	240.97	941.11	248.37	941.64
248.59	941.66								

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	58.8	.035	79.87	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	58.8	79.87		206.43	203.87	200.3	.1 .3

CROSS SECTION

RIVER: Bluestone Creek

REACH: Align (1)

RS: 7155.83

INPUT

Description:

Station Elevation Data		num= 65							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	939.15	580017	938.13	9.73999	937.41	15.59	936.391	9.73001	935.67
27.60001	934.382	9.71001	934.02	31.22	933.79	39.7	932.7	40.13	932.66
49.68001	931.856	8.5001	931.22	59.67	931.03	63.63	930.726	9.65001	930.2
73.94	929.837	8.90001	929.34	79.64	929.268	7.65001	928.728	9.62001	928.61
91.03	928.799	3.5001	929.389	9.57001	929.39	99.61	929.4	108.12	930.35
109.59	930.53	111.67	930.73	119.58	931.47	123.68	931.73	129.56	932.1
135.69	932.49	139.55	932.73	142.29	932.88	149.53	933.27	158.57	933.75
159.38	933.79	159.52	933.8	167.93	934.17	169.5	934.24	171.72	934.35
179.49	934.77	183.73	934.95	189.47	935.2	195.74	935.54	199.46	935.74
202.1	935.85	209.44	936.17	210.65	936.22	217.79	936.62	219.19	936.69
219.43	936.7	219.76	936.72	229.41	937.14	236.28	937.5	239.4	937.67

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243.78	937.91	249.38	938.16	255.79	938.45	259.37	938.61	267.8	938.99
269.35	939.06	277.01	939.33	279	939.4	279.34	939.41	281.91	939.53

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .0578.90001 .03599.35001 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 78.9000199.35001 185.26 188.2 190.24 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 6967.63

INPUT

Description:

Station Elevation Data num= 63

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.782	410004	941.98	060013	939.771	10.57001	938.831	7.10001	936.49
21.35001	934.972	2.98001	934.462	6.65001	933.22	30.44	931.993	2.12001	931.35
36.49001	929.85	42.89	927.765	0.90001	925.965	3.67001	925.546	0.28001	925.28
64.44	925.4	66.41	925.62	75.14	926.59	75.22	926.682	6.65001	927.9
85.99001	928.319	4.67001	929.2	96.77	929.419	7.57001	929.43	99.39	929.57
105.03	929.94	107.54	930.13	114.06	930.46	118.32	930.63	119.95	930.67
123.63	930.8	127.41	930.91	129.09	930.99	134.87	931.14	139.86	931.33
142.33	931.41	147.88	931.5	149.79	931.53	150.64	931.56	152.85	931.62
161.41	931.88	164.71	932.04	172.13	932.4	172.24	932.4	182.96	933.17
187.09	933.54	193.74	934.04	196.37	934.24	204.51	934.87	211.02	935.3
215.29	935.59	216.93	935.71	220.62	935.95	224.39	936.2	226.06	936.31
230.42	936.56	236.83	936.97	239.3	937.12	244.86	937.4	246.76	937.5
247.61	937.54	254.22	937.96	254.71	937.98				

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 42.89 .03582.65001 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 42.8982.65001 309.39 296.51 279.44 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 6671.12

INPUT

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Description:

Station Elevation Data			num= 83								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	936.83	699982	935.977	789978	935.0410	22998	934.5219	87997	932.56		
21.68997	932.1722	14999	932.1122	91998	932.0429	32999	931.533	15997	931.33		
42.13998	931.143	69998	931.08	44.62	931.0648	28998	930.97	56.09	930.78		
61.35999	930.6565	23999	930.5667	54999	930.4772	41998	930.3379	01999	930.13		
80.59	930.190	47998	929.9493	95999	929.89	99.81	929.72	101.94	929.65		
105.1	929.56	113.41	929.32	119.03	929.2	122.69	929.16	124.87	929.11		
129.87	929.03	136.34	928.93	138.25	928.88	144.23	928.7	147.8	928.65		
151.41	928.56	157.47	928.5	159.27	928.47	165.78	928.25	170.73	928.16		
172.96	928.1	176.69	927.99	182.19	927.84	190.32	927.61	193.66	927.52		
195.92	927.46	201.68	927.3	205.12	927.2	208.86	927	215.14	926.66		
216.05	926.61	216.59	926.58	223.23	926.05	228.05	925.66	234.36	925.27		
236.87	925.14	239.52	925	247.14	925.6	250.98	925.86	253.58	926.06		
259.13	926.48	262.44	926.64	266.31	926.87	272.8	927.15	273.49	927.18		
273.91	927.2	275.54	927.3	285.37	927.86	292.02	928.36	296.84	928.7		
302.22	929.12	308.3	929.6	309.4	929.69	311.25	929.85	319.77	930.6		
323.76	930.91	330.47	931.44	331.23	931.51	338.13	932.3	342.69	932.89		
349.69	933.85	354.16	934.47	358.86	934.83						

Manning's n Values

num= 3		
Sta	n Val	Sta
0	.05	228.05
		.035
		247.14
		.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	228.05	247.14	206.34	214.55	217.5	.1	.3

CROSS SECTION

RIVER: Bluestone Creek

REACH: Align (1) RS: 6456.57

INPUT

Description:

Station Elevation Data			num= 103								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	932.981	099976	932.792	949982	932.469	319977	931.35	14.72	930.87		
19.04999	930.55	26.5	930.3	37	930.1238	26999	930.0944	87997	929.94		
50.03998	929.8351	98999	929.7854	95999	929.7159	09998	929.6261	81998	929.56		
72.91	929.31	73.59	929.2980	42999	929.2	85.37	929.1387	53998	929.08		
90.85999	929.05	94.66	92997	13998	929	108.81	928.9	108.92	928.9		
115.99	928.72	120.69	928.66	126.77	928.54	132.47	928.43	137.32	928.33		
144.24	928.2	144.72	928.19	156.02	927.96	158.65	927.91	162.67	927.83		
165.77	927.77	167.79	927.73	177.56	927.53	179.57	927.49	179.99	927.48		
180.62	927.47	191.34	927.2	198.58	927.01	201.32	926.96	203.12	926.9		
211.77	926.68	214.89	926.59	216.53	926.54	226.67	926.2	229.76	926.09		

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234.48	925.93	236.87	925.85	238.44	925.8	243.99	925.66	250.22	925.41
252.44	925.34	258.21	925.19	261.99	925.04	270.39	924.64	272.43	924.53
273.77	924.42	280.21	923.9	285.54	923.46	286.65	923.38	288.34	923.3
297.32	923	299.99	923.02	306.29	923.07	309.09	923.13	314.43	923.91
320.87	924.82	324.25	925.53	329.32	926.62	332.64	927.19	336.43	927.81
342.2	928.35	344.42	928.64	348.64	929.03	356.19	929.78	357.76	929.89
360.15	929.97	364.87	930.3	367.97	930.43	378.11	930.86	379.74	930.95
382.86	931.11	391.52	931.57	393.32	931.68	396.06	931.85	403.29	932.3
414.01	933.24	414.65	933.29	415.07	933.33	421.76	934.2	426.84	934.86
431.96	935.61	438.62	936.58	449.92	938.05	450.2	938.09	450.39	938.11
451.3	938.21	462.17	939.44	465.77	939.85				

Manning's n Values	num=	3
Sta n Val Sta n Val	Sta n Val	
0 .05 280.21 .035 314.43 .1		

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
280.21 314.43	159.96 159.96 159.96	.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 6296.61

INPUT

Description:

Station Elevation Data	num=	92
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
0 933.5 .08 933.491.980011 933.189.839996 931.91 14.09 931.3		
20.28 930.3823.23999 929.9730.70999 929.22 30.97 929.2 31.69 929.16		
41.14999 928.77 46.41 928.651.58002 928.43 61.41 928.1261.86002 928.1		
62.01999 928.162.35001 928.0972.45001 927.86 77.31 927.7182.89001 927.53		
85.03 927.46 91.12 927.2693.33002 927.1994.51999 927.16 103.76 926.9		
110.61 926.7 114.2 926.62 120.83 926.47 123.64 926.41 124.63 926.39		
131.37 926.17 135.07 926.1 139.09 925.98 145.51 925.8 150.54 925.65		
154.54 925.54 155.94 925.5 162.26 925.26 166.38 925.15 174.95 924.93		
176.81 924.89 177.71 924.86 180.25 924.77 187.25 924.52 193.15 924.37		
197.68 924.26 200.87 924.15 208.12 923.89 209.96 923.83 218.56 923.53		
223.21 923.41 228.99 923.26 231.77 923.17 239.43 922.8 239.49 922.8		
239.67 922.79 249.86 922.4 254.94 922.11 260.3 921.8 269.38 921.36		
270.73 921.3 278.11 921.3 281.17 921.34 285.83 921.84 291.61 922.62		
299.09 924.78 302.04 925.7 309 928 312.48 929.28 316.72 930.89		
322.91 933.4 328.8 935.84 332.17 937.23 333.35 937.7 339.89 940.37		
343.78 941.8 351.9 944.25 354.22 945.04 355.34 945.33 358.51 945.88		
363.06 946.68 364.66 946.89 367.98 947.38 375.09 948.42 378.51 948.89		
385.53 949.93 388.22 950.34 395.96 951.49 401.67 952.35 406.4 953.05		
409.4 953.53 409.66 953.57		

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Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 260.3 .035 285.83 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 260.3 285.83 145.29 145.29 145.29 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 6151.32

INPUT

Description:

Station Elevation Data num= 183

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	941.063	610016	942.446	709991	943.09	8.23999	943.549	720001	943.71
10.42001	943.7313	10001	943.6813	70001	943.6614	73001	943.6117	70001	943.48
18.19	943.4820	01999	943.49	23.94	943.4825	57999	943.4427	70999	943.33
31.06	943.1932	20001	943.13	32.62	943.1236	57999	943.1238	04001	943.15
39.64999	943.19	44.19	943.345	23999	943.3245	64999	943.3445	95001	943.34
53.76001	943.4255	07999	943.44	60.72	943.52	61.81	943.51	63.16	943.51
64.53	943.5376	82999	943.4584	67001	943.5289	79999	943.5299	86002	943.03
99.92999	943.02	100.08	943.02	104.44	942.9	106.33	942.89	107.54	942.78
109.4	942.64	115.5	940.38	115.99	940.15	117.79	939.27	122.43	937.06
123.45	936.57	124.17	936.21	126.44	935.14	128.1	934.35	129.8	933.56
134.22	931.36	136.24	930.38	136.94	930.07	141.91	928.1	143.39	927.51
143.58	927.46	145.76	926.85	149.56	925.99	151.28	925.66	153.19	925.5
154.63	925.36	155.66	925.25	156.07	925.19	158.17	924.88	159.99	924.72
161.39	924.69	162.18	924.65	165.96	924.5	168.58	924.42	169.17	924.39
169.69	924.38	171.84	924.45	173.81	924.5	175.23	924.55	175.64	924.58
176.99	924.74	177.52	924.76	178.45	924.78	178.69	924.78	181.78	924.72
184.93	924.65	185.22	924.65	185.76	924.64	186.36	924.63	191.89	924.54
192.53	924.54	193.92	924.55	196.96	924.49	199.59	924.48	202	924.48
205.48	924.43	206.43	924.44	208.99	924.44	212.02	924.49	213.35	924.51
216.68	924.52	219.18	924.55	221.78	924.02	224.8	922.86	228.95	921.55
230.65	921.36	234.99	921.96	236.37	922.06	239.04	922.68	244.16	923.12
244.77	923.15	245.17	923.21	245.78	923.37	249.43	923.92	251.78	924.26
254.01	924.45	254.48	924.46	256.09	924.38	257	924.36	261.16	924.03
264.56	923.85	265.92	923.85	267.04	923.85	269.3	923.89	270.87	923.94
272	923.94	273.8	923.94	276.3	924.03	276.51	924.07	280.49	924.54
282	924.61	284.64	924.8	286.78	924.94	290.66	925.04	291.39	925.04
293.06	924.96	293.7	924.95	298.36	924.78	299.74	924.83	301.25	924.91
302.14	924.88	305.11	924.86	308.28	924.77	309.42	924.75	310.5	924.75
310.94	924.74	311.34	924.73	315.14	924.65	317.04	924.64	317.73	924.62
318.28	924.64	319.26	924.6	325.81	924.3	327.99	924.37	329.27	924.42

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331.43	924.56	332.67	924.85	336.23	925.46	337.15	925.85	337.98	926.06
338.32	926.22	340.47	927.01	340.54	927.04	342.87	928.34	343.73	928.91
347.73	931.67	349.88	932.81	353.54	934.25	354.17	934.58	354.94	935.03
358.6	937.11	359.4	937.7	359.99	938.21	364.38	940.67	367.71	942.57
368.5	943.14	368.84	943.39	370.48	944.55	370.68	944.71	375.3	948.17
375.45	948.26	375.68	948.47	378.74	951.27	379.6	951.85	381.97	953.6
382.87	954.29	383.12	954.49	383.97	954.93				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	224.8	.035	239.04	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	224.8	239.04		156.75	157.82		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 5993.5

INPUT

Description:

Station Elevation Data num= 179

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.31	.230011	943.3	9100037	943.261	.230011	943.245	.470001	943.05
9.070007	942.829	.669983	942.8	11.06	942.7612	.35999	942.65	15.81	941.91
18.79001	941.41	19.22	941.2720	.19998	941.0321	.85001	940.3423	.67999	939.8
28.72	938.2731	.29999	937.4233	.67999	936.91	37.09	935.939	.13998	935.35
41.14999	934.844	.23999	933.9447	.98999	933.0750	.73999	932.4	51.09	932.35
53.29999	931.8454	.01001	931.7258	.57001	930.8263	.17999	930.07	65.66	929.78
68.75	929.4670	.48001	929.3771	.98001	929.37	76.87	928.9280	.45999	928.6
82.34	928.23	83.34	928.287	.07999	927.94	90.38	927.7691	.20999	927.74
93.17999	927.7196	.60999	927.58	102.42	927.56	103.93	927.56	104.07	927.55
104.55	927.53	105.81	927.47	107.03	927.42	107.92	927.37	109.36	927.29
110.14	927.28	113.95	927.27	114.2	927.27	114.49	927.25	117.57	927.04
119.97	926.89	121.81	926.78	124.8	926.57	126.32	926.42	127.39	926.32
129.09	926.14	130.95	925.92	132.97	925.81	136.89	925.84	138.89	925.86
139.01	925.86	140.04	925.84	142.08	925.8	143.57	925.71	144.24	925.69
145.35	925.67	146.03	925.67	147.65	925.63	151.18	925.53	152.24	925.48
152.63	925.47	152.78	925.46	159.58	925.34	162.35	925.32	164.16	925.3
165.11	925.29	168.23	925.21	168.26	925.21	171.94	925.17	172.87	925.16
176.13	925.15	177.16	925.17	179.11	925.15	180.11	925.13	181.05	925.14
185.72	925.13	186.5	925.13	186.76	925.14	190.97	925.17	191.1	925.16
192.21	925.14	193.33	925.12	197.32	925.06	202.22	925.19	202.36	925.19
202.92	925.2	206.72	925.18	208.58	925.18	210.26	925.22	211.16	925.22
212.17	925.27	213.27	925.27	216.66	925.24	221.59	925.18	223.77	925.23
224.67	925.24	226.87	925.23	229.6	925.16	230.7	925.11	232.28	925.06

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234.92	924.89	235.86	924.89	238.92	924.93	241.44	924.91	242.76	924.9
244.7	924.76	245.95	924.71	249.19	924.24	250.92	923.84	251.94	923.53
255.23	923.06	257.2	922.81	258.96	922.72	263.45	922.82	266.21	922.89
267.51	922.88	270.29	922.95	271.28	922.97	273.25	922.93	274.58	922.93
277.38	922.98	279.48	922.6	284.62	920.98	284.81	920.95	286.25	920.71
288.17	920.65	291.64	920.49	293.11	920.48	295.52	920.67	297.85	922.62
300.82	925.77	303.48	928.87	306.01	932.46	309.59	935.19	309.69	935.27
309.72	935.3	309.78	935.36	313.9	938.84	314.9	939.43	316.44	940.22
318.26	941.33	319.44	942.21	322.32	944.3	324.51	945.86	325.5	946.61
326.41	947.15	328.02	948.12	329.76	949	331.82	949.55	333.01	950.02
334.63	950.52	338.25	951.49	340.07	952.07	341.27	952.44	342.05	952.65
342.36	952.76	346.64	954.02	348.3	954.34	353.13	955.87	353.63	956.03
353.74	956.08	353.81	956.11	355.01	956.57	356.59	957.16		

Manning's n Values	num=	3
Sta n Val Sta n Val	Sta n Val	
0 .05 279.48	.035 297.85	.1

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
279.48 297.85	118.34 118.93 119.21	.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 5874.57

INPUT

Description:

Station Elevation Data	num=	197	
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev			
0 940.091.440002	940.532.430023	940.83 3 940.983.460022	941.1
7.180023 942.059.440002	942.17 10.63	942.4811.95001	942.83
16.78 943.117.24002	943.1817.74002	943.2724.02002	943.36
28.36002 943.3728.54001	943.3728.79001	943.3832.68002	943.28
33.12003 943.2733.54001	943.2536.39001	942.94 41.75	942.09
44.08002 941.8646.51001	941.347.24002	941.1547.95001	940.55
51.75 940.34 52.31	940.2257.55002	93958.01001	938.79
61.96002 938.1767.02002	937.2668.49002	936.9369.46002	936.59
71.85001 936.23 73.91	935.6977.21002	935.0478.26001	934.33
82.26001 934.11 83.75	933.8887.96002	933.08 90.31	932.12
99.23001 930.4199.40001	930.3799.69002	930.28 102.79	929.11
106.29 928.67 106.9	928.61 110.88	927.83 112.66	927.52
115.1 927.5 115.35	927.47 120.58	927.01 121.16	926.82
127.23 926.67 127.46	926.66 128.03	926.63 129.74	926.48
131.34 926.47 134.34	926.25 138.11	925.64 138.74	925.13
141.92 924.83 142.67	924.65 143.64	924.45 144.8	923.7
150.64 923.51 151.75	923.47 152.18	923.47 153.31	923.16



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161.68	923.15	163.57	923.05	163.66	923.05	167.17	922.96	170.26	922.87
170.81	922.87	174.23	922.86	176.31	922.83	176.35	922.83	179.52	922.73
183.48	922.7	184.59	922.69	185.76	922.67	186.45	922.65	187.25	922.64
188.83	922.61	189.52	922.59	190.1	922.58	191.7	922.49	192.05	922.47
192.2	922.46	192.55	922.47	195.51	922.52	197.21	922.54	198.05	922.57
198.67	922.59	204.17	922.67	204.49	922.68	208.79	922.73	209.47	922.74
212.05	922.82	213.63	922.88	215.17	922.9	220.6	922.94	221.63	922.96
223.13	922.96	224.99	922.92	225.36	922.93	226.11	922.93	232.51	922.97
233.25	922.98	235.56	923.01	238.87	923.06	240.78	923.13	242.28	923.2
245.66	923.18	246.7	923.16	247.34	923.14	248.21	923.15	248.43	923.14
249.39	923.11	254.67	922.93	255.74	922.91	259.87	922.83	263.42	922.72
266.4	922.28	267.2	922.08	269.37	921.3	270.97	920.93	272.14	920.59
274.69	920.17	280.37	921.24	281.24	921.38	281.68	921.5	281.84	921.54
282.38	921.63	284.89	922.05	287.31	922.59	287.63	922.75	288.92	923.11
290.66	923.7	291.76	923.88	293.92	924.24	296.73	924.77	297.17	924.83
297.48	924.92	301.28	926.06	301.58	926.12	301.8	926.22	304.17	927.1
305.08	927.43	307.21	927.99	308.5	928.04	310.56	927.92	312.55	928.11
313.35	928.46	314.57	928.78	315.41	929.01	316.09	929.65	317.26	930
318.52	930.38	321.08	930.88	324.65	930.85	326.03	931.07	327.86	932.26
331.52	933.26	333.27	934.04	334.43	934.11	337.71	934.71	339.77	935.49
343.26	936.89	345.38	937.69	346.62	938.12	347.13	938.3	348.38	938.79
349.76	939.35	351.55	940.05	352.24	940.26	352.71	940.45	353.96	940.88
354.62	941.12	355.2	941.33						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 267.2 .035 284.89 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 267.2 284.89 110.24 107.7 103.67 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 5766.87

INPUT

Description:

Station Elevation Data num= 174

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	976.082	559998	975.726	589996	974.048	580017	972.998	950012	972.81
9.070007	972.75	14.37	970.09	15.22	969.6	16.75	968.89	18.86002	967.89
20.83002	966.99	24.58002	964.92	24.84	964.78	24.95999	964.73	28.20999	963.23
28.42999	963.13	28.95001	962.86	33.75	960.45	35.95999	959.41	39.03	958.01
42.22	956.57	44.26999	955.64	45.17001	955.24	47.89999	953.89	50.20999	952.78
52.69	951.61	53.61002	951.18	58.23999	948.98	61.48001	947.37	62	947.13
63.47	946.46	65.57001	944.93	70.23999	943.12	71.66	942.29	74.31	940.76

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75.04001	940.2576.36002	939.61	80.22	938.0880.61002	937.9280.79001	937.82
83.5	936.485.70999	935.27	87.94	934.1389.95001	933.2691.33002	932.53
94.29999	931.2494.61002	931.08	99.98	928.64	101.21	928.19
104.12	927.19	105.14	926.82	106.61	926.36	107.86
108.25	925.86	109.58	925.64	112.54	925.13	112.95
115.63	924.63	117.64	924.21	119.35	923.82	120.65
124.95	922.8	126.44	922.66	130.69	922.15	134.68
138.69	922.09	140.7	922.11	140.95	922.11	142.88
144.88	921.99	147	921.92	147.36	921.89	147.92
150.98	921.85	151.5	921.85	152.38	921.83	156.18
160.62	921.77	163	921.76	163.09	921.76	167.89
174.59	921.95	175.1	921.95	175.82	921.97	180.13
183.24	922.12	185.39	922.09	186.71	922.13	189.05
191.12	922.32	192.81	922.33	193.9	922.34	195.84
197.38	922.27	197.73	922.25	199.01	922.22	200.75
205.64	922.24	209.13	922.28	209.36	922.28	213.73
219.55	922.31	219.58	922.31	222.7	922.39	224.92
228.15	922.35	231.51	922.32	233.02	922.33	233.88
235.78	922.39	242.69	922.3	245.74	922.28	246.54
251.5	922.12	253.81	922.08	253.82	922.08	260.6
267.49	919.47	268.55	919.4	271.4	920.04	274.21
280.76	921.83	280.78	921.84	280.8	921.84	285.68
291.29	922.05	291.34	922.08	291.82	922.27	297.26
300.11	924.9	301.66	925.3	302.27	925.46	302.59
309.57	928.08	318.09	931.2	318.62	931.41	319.12
325.06	934.38	327.53	935.4	328.56	935.84	337.42
337.85	940.15	341.97	942.32	342.02	942.35	342.27
346.58	944.44	348.23	945.12	348.57	945.25	350.69

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 260.6 .035 279.15 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 260.6 279.15 134.05 135.05 135.79 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 5631.82

INPUT

Description:

Station Elevation Data num= 204

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	972.59.1799927	972.563.029999	972.023.099976	9723.159973	971.99		
3.309998	971.975.179993	971.738.109985	971.210.57999	970.75	12.06	970.47	

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12.69998	970.2913.92999	970.1117.15997	969.37	19.97	968.75	21.31	968.31		
23.12	967.61	25.44	966.4430.35999	964.2131.56998	963.6733.48999		962.67		
37.39999	960.8538.84998	960.1540.09998	959.53	42.28	958.4944.09998		957.58		
47.06	956.2951.95999	954.3252.78998	953.93	53.25	953.5857.59998		950.83		
58.32999	950.3859.73999	949.17	61.03	948.24	61.31	948.162.65997	947.26		
63.00998	947.0463.26999	946.9166.29999		945.466.51999		945.366.67999	945.21		
72.39999	942.0774.32999	941.0675.53998		940.7275.57999		940.7175.60999	940.7		
76.23999	940.53	79.19	939.7579.87997	939.5680.48999	939.43	82.25	938.9		
82.91998	938.6783.42999	938.5287.82999		937.3289.70999		936.8189.92999	936.75		
91.84998	936.1792.85999	935.9194.14999		935.5295.78998		934.6496.64999	934.3		
98.27998	933.5998.83998	933.35	100.52	932.72	103.1	931.49	106.85	929.63	
107.05	929.52	107.12	929.48	108.36	928.72	109.79	927.95	115.11	924.71
118.21	924.34	119.2	924.25	121.7	924.08	125.25	923.84	125.82	923.79
126.3	923.76	126.82	923.74	130.55	923.65	130.82	923.62	131.27	923.61
132.58	923.57	134.03	923.51	136.55	923.41	137.98	923.25	140.36	923.03
140.55	923.01	140.78	923.01	143.94	922.89	144.59	922.88	146.42	922.87
148.39	922.83	150.33	922.72	152.67	922.59	154.09	922.46	154.14	922.45
155.76	922.46	156.68	922.4	157.74	922.32	159.16	922.2	160.77	922.1
163.05	922	167.56	921.86	168.67	921.81	169.14	921.8	172.3	921.64
173.08	921.62	173.4	921.6	175.31	921.56	175.79	921.54	179.79	921.14
180.54	921.15	184.72	920.99	186.74	921.01	186.92	921.01	187.09	921
187.6	921.04	190.24	921.15	191.14	921.16	192.79	921.12	194.6	921.08
195.48	921.13	196.81	921.16	199.3	921.16	201.11	921.17	202.87	921.12
203.81	921.13	208.01	921.11	208.98	921.11	212	921.07	212.65	921.05
214.37	921.04	219.99	921.04	221.76	921.03	222.62	921.05	225.14	921.07
228.43	921.11	229.37	921.12	229.69	921.11	230.22	921.1	234.19	921.16
235.03	921.18	235.08	921.18	236.91	921.22	241.97	921.19	242.9	921.2
244.2	921.29	247.31	921.41	248.62	921.47	249.39	921.47	253.29	921.26
254.78	921.13	255.92	921.4	258.63	920.87	259.93	920.56	260.89	920.1
262.7	919.6	264.98	919.04	267.31	919.06	268.58	918.97	269.61	918.98
271.1	919.1	271.93	919.11	275.84	919.89	276.1	919.94	277.13	920.27
282.22	921.53	282.62	921.61	286.23	921.46	287.9	921.42	288.5	921.4
288.7	921.43	293.07	921.78	295.29	922.77	296.98	923.74	297.95	924.41
300.28	926.13	300.37	926.21	302.82	927.73	305.76	929.44	306.96	930.04
308.65	930.85	309.4	931.1	312.03	931.72	314.84	932.51	315.78	932.66
317.55	932.9	319.98	933.22	322.85	933.68	324.59	934.02	325.22	934.14
325.62	934.22	326.53	934.42	331.41	935.44	337.2	936.55	340.8	937.19
342.51	937.47	343.54	937.55	344.38	937.74	347.41	938.4	348.07	938.56
352.21	939.53	352.68	939.61	353.02	939.73	353.55	939.91		

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 0 .05 260.89 .035 277.13 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 260.89 277.13 148.97 148.51 148.05 .1 .3

CROSS SECTION

171-150-Revised-An.rep

RIVER: Bluestone Creek

REACH: Align (1)

RS: 5483.31

INPUT

Description:

Station Elevation Data		num= 208									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	944.591.619995	944.122.089996		944.012.309998		943.95 2.76001		943.86			
8.470001	942.6515.45999	942.03 15.87		942.116.07001		942.1 16.84		942.03			
18.54001	941.9 25.81	941.5326.07001		941.48 26.28		941.3826.95999		941.18			
28.03	941.1529.54001	940.9130.73001		940.76 34.16		940.11 34.5		940.04			
35.14999	939.92 36.63	939.62 36.94		939.5637.07001		939.5537.92999		939.3			
45	938.5145.91998	938.3746.14999		938.3250.07999		937.63 56.25		937			
57.47	936.8857.95001	936.861.85001		936.2163.73001		935.9966.67999		935.45			
68.23999	935.25 68.31	935.2469.41998		935.0271.39999		934.6371.54999		934.6			
71.97	934.5274.95001	933.92 75.66		933.82 79.53		933.1583.63998		932.46			
84.22	932.3485.13998	932.286.76999		931.95 87.66		931.7792.60001		931.04			
94.56	930.7997.10999	930.3297.95001		930.18 101.39		929.63 103.39		929.29			
104.75	928.97 104.8	928.96 105.33		928.86 108.4		928.34 109.97		928.1			
111	927.98 112.44	927.85 114.98		927.55 119.37		926.99 120.94		926.77			
122.97	926.44 123.26	926.4 125.28		926.14 131.83		925.35 132.93		925.18			
135.26	924.96 138.33	924.67 138.87		924.66 139.22		924.62 144.18		924			
144.76	923.93 146.41	923.72 149.75		923.29 150.72		923.18 155.17		922.85			
155.52	922.81 157.4	922.57 157.69		922.53 161.16		922.09 163.64		921.84			
165.34	921.68 169.61	921.48 169.62		921.48 171.64		921.37 173.98		921.3			
177.72	921.19 178.74	921.13 181.24		921.07 183.12		921.1 183.18		921.1			
183.47	921.09 185.06	921.06 185.68		921.06 191.65		921.13 192.6		921.15			
192.68	921.15 196.78	921.3 197.67		921.3 199.53		921.38 202.38		921.44			
205.29	921.47 207.94	921.42 210.69		921.47 211.76		921.39 213.78		921.22			
214.17	921.18 216.92	920.85 217.81		920.73 219.29		920.61 220.64		920.51			
222.12	920.4 223.73	920.36 225.91		920.48 228.85		920.54 232.33		920.71			
233.16	920.74 233.83	920.76 238.98		920.88 242.48		920.93 246.37		920.91			
248.08	920.84 249.38	920.76 250.98		920.74 252.5		920.84 254.29		920.9			
256.25	920.91 260	920.98 261.68		921.02 261.96		921.03 265.38		921.09			
267.04	921.12 267.15	921.13 267.53		921.14 270.89		921.3 272.02		921.32			
273.34	921.36 278.03	921.3 278.36		921.3 281.2		921.35 283.66		921.33			
286.02	921.3 291.5	919.99 291.53		919.98 291.55		919.96 291.65		919.95			
296.27	918.91 298.65	918.38 302.54		919.86 303.7		919.98 303.83		919.99			
310.35	920.44 312.55	920.61 313.31		920.58 313.51		920.58 314.78		920.64			
318.65	921.69 319.12	921.85 323.27		922.97 325.52		923.61 325.98		923.7			
328.57	924.53 330.01	925.04 331.01		925.43 331.7		925.69 333		926.11			
335.1	926.71 337.09	927.3 337.54		927.39 339.03		927.54 341.22		927.9			
343.62	928.04 344.41	928.16 349.76		929.01 350.22		929.08 350.32		929.1			
350.76	929.19 355.32	930.15 356.77		930.44 360.4		931.25 360.92		931.37			
361.59	931.55 365.42	932.45 367.11		932.78 369.14		933.14 369.72		933.2			
370.66	933.31 371.38	933.38 372.06		933.41 373.42		933.61 374.84		933.7			

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377.22	934.08	380.24	934.57	382.42	935.07	383.55	935.39	384.76	935.63
385.62	935.87	388.77	937	392.47	938.48	395.35	939.83	396.09	940.14
396.41	940.25	397.16	940.52	400.56	941.48				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	291.5	.035	302.54	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	291.5	302.54		145.04	143.7	141.88	.1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 5339.61

INPUT

Description:

Station Elevation Data num= 231

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.45	8800049	951.09	1.399994	950.85	1.519989	950.8	2.47998	950.52
9.48999	948.62	10.78	948.39	11.45999	948.28	12.66998	948.12	14.03998	947.92
17.17999	947.41	20.38998	946.43	21.03	946.27	24.67999	944.79	26.81	943.91
28.98999	942.74	29.67999	942.29	34.03	940.09	35.14999	939.79	36.88	939.06
38.63	938.3	39.56	937.88	40.47998	937.34	41.53	937.12	42.78998	936.62
47.37	934.57	52.76999	932.11	54.19	931.37	55.60999	930.68	57	930.01
58.00998	929.61	64.75998	927.36	65.50998	927.2	67.62	926.75	69.42999	926.41
71.03	926.24	72.59	926.09	76.78998	925.67	79.84	925.24	80.69	925.19
81.41	925.18	82.72998	925.18	86.57999	924.93	88.95999	924.92	87.14999	924.92
90.78998	924.75	92.82999	924.74	96.41998	924.74	98.87	924.63	100.53	924.68
102.67	924.66	106.03	924.76	106.15	924.76	106.39	924.75	110.25	924.65
113.18	924.58	115.37	924.46	121.16	924.36	121.42	924.36	121.74	924.35
123.34	924.25	124.75	924.24	125.11	924.23	125.9	924.22	128.74	924.16
129.59	924.15	131.04	924.14	131.78	924.15	132.21	924.15	135.36	924.21
136.49	924.22	140.11	924.25	141.13	924.26	142.46	924.25	146.26	924.13
147.32	924.11	149.97	924.01	150.77	923.99	151.32	923.95	152.79	923.86
155.02	923.8	155.91	923.79	156.61	923.77	159.17	923.7	162.05	923.64
163.38	923.61	164.97	923.54	166.55	923.46	171.29	923.11	171.65	923.1
172.27	923.05	173.52	922.95	173.92	922.92	174.1	922.9	177.61	922.52
178.64	922.43	179.73	922.31	179.86	922.29	183.31	921.88	186.34	921.58
191.49	921.17	192.52	921.07	194.78	920.84	195.52	920.79	197.62	920.66
204.57	920.2	204.73	920.18	204.94	920.18	205.39	920.17	208.04	920.19
208.74	920.17	211.61	920.21	212.33	920.19	214.2	920.15	215.42	920.1
216.04	920.09	217.36	920.08	217.55	920.07	221.02	920.03	221.39	920.02
223.36	919.95	225.12	919.93	228.39	919.94	235.33	919.84	235.44	919.84
235.56	919.83	238.31	919.86	243.58	919.9	243.72	919.9	245.54	919.87
246.49	919.88	251.27	919.97	251.61	919.97	251.64	919.98	251.7	919.98

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253.11	920	258.72	920.13	259.81	920.16	263.96	920.3	266.46	920.32
268.18	920.32	269.9	920.29	273.55	920.18	275.54	920.09	277.24	920.05
278.37	919.98	280.17	919.94	282.73	919.99	284.77	920.06	285.75	920.08
287.87	920.19	288.81	920.2	289.69	920.21	291.23	920.27	292.79	920.36
297.04	920.53	299.18	920.73	301.78	920.77	302.88	920.8	307.44	920.8
307.78	920.81	309.8	920.78	311.95	920.73	316.5	920.73	319.83	920.87
320.17	920.87	324.76	920.86	325	920.86	327.5	920.87	330.33	920.88
330.88	920.86	335.2	920.65	335.87	920.63	339.93	919.55	341.97	919.05
342.74	918.54	345.08	918.12	348.86	917.9	349.96	918.02	353.32	919.13
354.76	919.56	357.57	920.26	360.49	921.02	362.55	922.02	364.68	923.64
366.14	924.4	367.7	925.37	368.61	925.79	369.1	925.99	374.68	927.71
375.26	927.87	375.64	927.96	376.8	928.13	377.66	928.19	382.15	928.45
383.47	928.58	387.81	928.87	388.19	928.9	391.98	929.25	392.52	929.3
392.74	929.33	394.77	929.54	395.34	929.64	400.82	930.4	401.86	930.49
402.65	930.53	404.34	930.78	407.97	931.49	408.86	931.69	409.4	931.8
413.07	933.15	417.83	934.49	418.84	934.79	419.85	935.13	420.55	935.45
421.94	936.07	423.26	936.69	425.49	937.64	425.66	937.71	425.78	937.75
431.53	939.9	431.66	939.94	432.57	940.3	435.6	941.54	436.01	941.69
436.57	941.96	441.29	944.27	443.2	944.99	445.03	945.76	445.94	945.99
448.99	946.48								

Manning's n Values	num=	3
Sta n Val	Sta n Val	Sta n Val
0 .05 339.93	.035 354.76	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
339.93	354.76	123.35	123.35	123.35	.1	.3	

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 5216.26

INPUT

Description:

Station Elevation Data	num=	243		
Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev
0 930.171.730011	929.93.540009	929.625.070007	929.449.660004	928.87
11.95001 928.5712.64001	928.48 13.75	928.3517.05002	927.98 18.03	927.88
21.23001 927.64 22.97	927.49 25.66	927.2628.79001	92729.17001	926.97
29.64001 926.96 31.34	926.833.98001	926.5936.61002	926.39 39.56	926.2
40.82001 926.1341.85001	926.09 44.87	925.99 45.09	925.98 46.78	925.86
46.98001 925.84 49.16	925.66 50.84	925.5353.61002	925.4454.82001	925.38
55.22 925.36 60.28	925.12 62.25	925.0362.48001	925.0266.27002	924.87
67.59 924.81 69.37	924.73 70.66	924.6572.11002	924.61 74	924.57
76.58002 924.4881.86002	924.2983.55002	924.2585.98001	924.1787.57001	924.11
90.37 923.96 91.19	923.9293.10001	923.8893.79001	923.8695.67999	923.8

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98.39999	923.7398	98.61002	923.7199	98.32001	923.7	104.04	923.63	107.28	923.55
108.98	923.5	111.97	923.46	113.21	923.45	115.55	923.35	116.86	923.29
117.6	923.27	119.07	923.23	120.47	923.23	122.1	923.24	124.81	923.19
127.35	923.16	128.09	923.12	131.83	922.95	133.33	922.86	134.26	922.83
136.2	922.81	139.76	922.74	141.32	922.7	142.12	922.69	144.44	922.65
147.37	922.63	150.35	922.67	151.65	922.66	153.23	922.7	153.67	922.7
155.6	922.71	155.85	922.71	158.38	922.69	158.9	922.69	160.04	922.71
163.02	922.67	164.83	922.67	169.57	922.66	171.42	922.63	172.39	922.63
173.91	922.58	176.65	922.63	179.72	922.65	183.28	922.66	184.91	922.71
185.74	922.71	187.09	922.72	192.01	922.72	192.15	922.71	192.31	922.71
193.25	922.7	195.98	922.67	197.92	922.6	199.75	922.59	204.23	922.38
205.65	922.34	206.82	922.38	208.6	922.34	211.19	922.21	211.72	922.21
214.87	922.22	215.06	922.21	215.33	922.2	218.49	922.05	221.69	921.99
224.58	921.95	226.4	921.92	228.87	921.9	228.91	921.9	235.52	921.63
238.52	921.54	242.87	921.4	243.55	921.39	244.16	921.39	246.56	921.43
249.13	921.44	250.94	921.4	252.16	921.43	253.92	921.41	259.14	921.43
259.94	921.42	261.21	921.4	261.91	921.39	265.14	921.32	266.43	921.28
268.46	921.25	269.9	921.26	271.75	921.2	272.08	921.19	276.49	921.04
277.25	921.01	279.97	920.93	282.62	920.85	284.87	920.78	287.33	920.69
288.56	920.62	290.17	920.56	292.2	920.47	293.76	920.39	295.89	920.25
297.34	920.13	299.62	920.03	301.41	919.98	301.68	919.97	302.63	919.9
305.95	919.75	307.46	919.73	310.55	919.79	310.92	919.82	313.04	919.85
313.4	919.85	314.7	919.86	316.68	919.85	321.35	919.96	321.8	919.97
323.57	920.02	325.63	920.11	327.58	920.14	327.7	920.14	331.41	920.19
334.2	920.2	334.63	920.19	336.21	920.17	336.98	920.17	338.25	920.18
341.97	920.34	342.4	920.36	342.97	920.38	343.95	920.37	348.45	920.4
349.07	920.41	351.08	920.43	352.07	920.43	353.4	920.44	354.61	920.45
356.06	920.48	359.15	920.53	360.85	920.56	362.44	920.16	368.18	920.67
369.9	919.17	371.62	917.66	372.6	916.97	373.94	917.08	375.68	917.56
377.27	918.1	379.83	918.33	382.39	918.55	384.11	919.04	385.83	919.54
386.81	920.13	387.78	920.73	394.06	920.36	394.94	920.48	395.97	920.46
399.26	920.46	401.38	920.47	401.69	920.47	402.28	920.5	404.45	920.55
405.87	920.64	406.69	920.81	407.09	921.02	411.6	923.19	411.75	923.3
412.43	923.79	413.99	924.89	415.39	925.98	416.3	926.49	417.41	926.76
422.14	928.16	423.7	928.16	425.63	928.22	426.64	928.21	428.05	928.21
433.8	928.93	435.4	929.02	436.64	929.25	437.64	929.5	438.14	929.67
438.47	929.79	442.89	931.1	444.25	931.49	444.51	931.58	446.97	932.13
448.41	932.44	449.9	933.18	451.3	933.57	452.76	934.03	453.55	934.35
455.97	935.49	459.17	936.94	462.35	938.07				

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 368.18 .035 387.78 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 368.18 387.78 257 274.13 291 .1 .3

CROSS SECTION

171-150-Revised-An.rep

RIVER: Bluestone Creek

REACH: Align (1)

RS: 4942.13

INPUT

Description:

Station Elevation Data

num= 343

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	928.96	1499634	928.931	639954	928.686	089966	927.98	820007	927.64
10.57996	927.4211	60999	927.3213	39996	927.0814	02997	927	15.12	926.85
15.95996	926.7817	77997	926.6117	89996	926.618	09998	926.5922	26001	926.35
23.25	926.31	25.56	926.2126	20001	926.1927	60999	926.1528	84998	926.13
30.72998	926.131	82001	926.0932	76996	926.0635	22998	926.0137	77997	925.88
39.07996	925.8239	72998	925.7541	26001	925.6642	76996	925.56	46	925.41
47.07996	925.38	50.19	925.2950	76001	925.28	51	925.2751	67999	925.25
56.75	925.17	63.63	92563	83997	924.9964	01001	924.9965	82001	924.96
69.62	924.9171	48999	924.9272	01996	924.92	72.5	924.9373	21997	924.93
74.02997	924.92	77.44	924.9	79.19	924.7781	26996	924.6284	21997	924.43
84.73999	924.4	86.31	924.3487	02997	924.3288	84998	924.2595	01996	924.03
95.26996	924.02	95.44	924.0195	71997	924	98	923.998	67999	923.87
101.22	923.65	102.12	923.59	102.39	923.59	104.96	923.55	110.08	923.31
111.5	923.26	112.56	923.21	116.86	923.13	123.76	922.99	126.08	922.95
127.52	922.88	128.55	922.85	131.41	922.77	132.07	922.75	132.51	922.75
133.52	922.74	135.67	922.69	136.61	922.66	139.19	922.52	139.61	922.51
141.67	922.49	143.23	922.44	147.42	922.39	149.52	922.3	153.69	922.15
153.79	922.14	153.88	922.14	157.11	922.05	160.46	921.95	163.75	921.79
165.2	921.77	167.83	921.61	168.36	921.61	171.11	921.64	175.7	921.58
178.51	921.4	179.56	921.41	183.36	921.37	184.87	921.4	185.44	921.38
185.64	921.38	190.02	921.34	191.45	921.33	191.82	921.34	195.7	921.49
198.58	921.47	199.83	921.47	203.66	921.43	204.63	921.41	208.28	921.5
211.26	921.62	213.06	921.72	215.62	921.76	216.05	921.76	222.55	921.9
222.9	921.9	227.49	921.89	228.4	921.89	228.68	921.88	230.26	921.87
232.02	921.86	233.74	921.86	235.69	921.9	237.02	921.87	240.19	921.84
243.03	921.9	244.61	921.87	245.37	921.91	246.81	921.99	251.36	922.13
254.96	922.24	257.04	922.19	258.9	922.18	260.36	922.21	263.03	922.24
265.8	922.26	265.93	922.26	267.34	922.23	267.48	922.23	267.6	922.22
271.74	922.12	272.72	922.11	275.19	922.07	275.35	922.07	276.09	922.05
278.55	921.98	279.46	921.97	285.79	921.83	289.02	921.74	289.48	921.72
289.86	921.69	290.51	921.63	292.74	921.47	294.09	921.36	295.41	921.29
296.11	921.24	297.31	921.22	298.72	921.15	302.53	920.94	307.27	920.64
308.67	920.61	312.14	920.57	313.41	920.54	313.63	920.53	315.16	920.5
317.33	920.53	317.4	920.53	321.08	920.47	325.11	920.46	325.92	920.44
327.13	920.41	330.49	920.35	334.41	920.33	334.91	920.33	338.57	920.34
339.52	920.33	340.81	920.33	346.12	920.2	346.59	920.19	346.75	920.19
348.75	920.15	350.52	920.05	351.38	920.07	351.42	920.08	352.36	920.03
354.45	919.97	355.57	919.91	356.02	919.89	357	919.85	359.06	919.77
363.46	919.55	364.45	919.46	369.08	919.39	369.18	919.38	371.38	919.31



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372.02	919.3	373.13	919.3	375	919.32	377.46	919.34	378.21	919.34
379.25	919.27	379.43	919.27	379.56	919.26	383.21	919.19	385.33	919.37
390.01	919.45	391.87	919.49	392.9	919.45	394.62	919.45	398.09	919.43
400.1	919.35	400.73	919.35	401.37	919.32	402.68	919.24	403.48	919.21
404.46	919.23	408.92	919.48	412.13	919.58	412.27	919.58	414.67	919.64
418.57	919.7	420.26	917.15	421.08	915.67	423.56	915.97	424.65	916.1
425.4	916.19	426.04	916.27	427.27	916.16	428.49	916.05	429.11	915.79
429.73	915.52	430.64	917.2	432.63	917.94	433.17	918.96	433.7	919.97
435.78	919.4	440	919.79	441.01	919.78	443.43	919.78	444.02	919.77
447.49	919.72	448.45	919.72	449.54	919.67	451.02	919.68	455.41	919.68
460.21	919.6	460.79	919.59	463.84	919.58	464.12	919.58	465.94	919.59
466.88	919.59	469.95	919.56	471.93	919.55	472.23	919.55	475.57	919.52
477.19	919.5	478.21	919.47	479.69	919.45	482.14	919.43	483.43	919.42
484.46	919.41	486.35	919.38	490.37	919.38	493.6	919.34	495.44	919.34
496.04	919.33	497.2	919.33	500	919.34	502.8	919.3	503.81	919.28
507.64	919.25	510.35	919.23	510.77	919.23	511.05	919.22	511.07	919.22
511.73	919.24	513.35	919.26	515.33	919.24	517.88	919.26	518.64	919.25
520.7	919.3	521.77	919.32	523.95	919.35	527.67	919.39	528.47	919.38
531.01	919.39	531.97	919.35	534.58	919.23	535.42	919.21	540.78	919.18
542.26	919.15	545.69	919.12	548.87	919.11	552.4	919.07	554.4	919.05
556.01	919.06	556.35	919.06	557.31	919.04	560.62	919.03	564.5	919.06
566.42	919.06	566.87	919.07	570.39	919.08	571.53	919.09	572.42	919.1
575.56	919.11	576.49	919.13	578.04	919.11	580.63	919.2	581.2	919.23
583.14	919.43	583.28	919.44	584.76	919.65	584.82	919.67	584.98	919.69
588.33	920.26	589.55	920.48	590.41	920.68	593.53	921.49	595.29	921.95
596.43	922.23	597.35	922.4	597.57	922.43	597.71	922.47	598.29	922.57
601	923.09	601.61	923.2	603.28	923.52	605.37	923.79	605.75	923.84
606.61	923.96	607.93	924.16	609.38	924.52	610.86	924.81	614.4	925.5
615.55	925.73	617.55	926.08	618.87	926.35	619.79	926.53	621.84	926.89
621.85	926.9	624.02	927.34	625.42	927.52				

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 418.57 .035 433.7 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 418.57 433.7 310 290.02 279.8 .1 .3

Ineffective Flow num= 1  
 Sta L Sta R Elev Permanent  
 0 254.96 925 F

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 4652.11

INPUT

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Description:

Station Elevation Data		num= 320							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	927.31	.210022	927.3	1.25	927.182.960022	927.04	3.77002	926.99	
4	926.974	.490051	926.968	.610046	926.878	.650024	926.8710	.48004	926.79
13.33002	926.69	15.69	926.619	.23004	926.4522	.42004	926.3325	.05005	926.31
26.16003	926.2826	.96002	926.2628	.56006	926.2431	.56006	926.3332	.71002	926.38
40.09003	927.4541	.09003	927.6741	.55005	927.8442	.73004	928.1845	.40002	928.94
46.53003	929.1450	.47003	929.4353	.34003	929.7255	.74005	929.6555	.91003	929.65
58.55005	929.5264	.52002	929.3765	.61005	929.3166	.78003	929.2968	.58002	929.22
69.68005	929.1769	.81006	929.1770	.53003	929.1572	.02002	929.0872	.77002	929.07
74	929.06	76.25	92979	.79004	928.8983	.91003	928.6983	.95001	928.69
85.78003	928.6785	.91003	928.6788	.47003	928.6391	.02002	928.693	.87006	928.44
95.73004	928.4296	.73004	928.3797	.09003	928.3597	.23004	928.34	102.61	928.15
105.15	928.09	108.98	927.96	109.33	927.95	109.66	927.94	113.65	927.84
118.98	927.79119	.1801	927.79	119.25	927.78119	.4301	927.78	121.32	927.7
124.88	927.53	125.36	927.52	125.8	927.52	129.07	927.4131	.0601	927.31
131.6	927.29	136.5	927.18137	.1801	927.15	138.59	927.12139	.6801	927.1
141.67	927.06	143.67	927.03	145.15	926.96	146.02	926.96	149.17	926.78
152.5	926.78	154.39	926.71	161.59	926.38	161.6	926.38	167.29	926.36
167.65	926.34	169.46	926.36	169.9	926.35	172.73	926.29	176.74	926.25
177.53	926.24	177.68	926.24	181.36	926.08	181.63	926.07	181.79	926.07
187.68	925.85	187.99	925.84	188.19	925.83	192.31	925.61	192.6	925.6
195.09	925.49	195.72	925.45	197.3	925.4	202.9	925.21	203.75	925.18
204.8	925.12	205.52	925.09	205.97	925.07	209.39	924.87	210.64	924.83
211.66	924.78	213.34	924.68	216.46	924.53	217.56	924.53	219.41	924.51
221.35	924.43	222.06	924.4	223.34	924.35	225.08	924.29	230.5	924.07
231.47	924.03	232.2	924	233.07	923.96	239.3	923.65	239.97	923.64
240.68	923.65	244.53	923.52	245.63	923.49	246.72	923.48	248.12	923.48
252.93	923.25	255.42	923.15	258.08	923.06	259.09	923.05	262.7	922.98
262.77	922.98	263.64	922.95	269.59	922.74	273.51	922.59	274.91	922.54
279.7	922.39	281.18	922.37	281.31	922.37	283.11	922.31	283.38	922.33
284.67	922.35	288.51	922.36	291.35	922.38	299.42	922.2	300.28	922.18
300.39	922.18	301.48	922.14	305.1	922.04	307.96	922	308.69	921.98
309.93	921.93	310.38	921.91	312.67	921.82	315.45	921.66	320.92	921.61
321.31	921.6	321.48	921.6	325.9	921.59	329.38	921.52	329.57	921.52
330.99	921.6	331.7	921.59	332.98	921.59	335.17	921.56	338.85	921.12
341.46	920.82	342.18	920.53	342.95	920.2	348.55	919.25	349.41	919.1
349.71	919.04	354.71	918.25	355.42	917.39	356.12	916.54	359.32	915.82
362.89	915.33	366.31	917.09	367.14	919.08	372.16	918.93	372.76	919.01
372.83	919.01	373.33	919	375.38	918.98	376.62	918.89	379.43	918.73
379.9	918.69	380.3	918.67	384.82	918.53	385.97	918.49	390.11	918.49
391.48	918.51	393.54	918.58	393.92	918.59	394.97	918.59	397.1	918.54
398.26	918.51	399.07	918.51	403.52	918.45	405.79	918.35	406.76	918.33
407.97	918.35	411.04	918.36	411.91	918.36	416.6	918.38	417.66	918.35
418.38	918.38	422.03	918.38	424.59	918.22	424.82	918.21	429.52	918.34
430.94	918.34	431.57	918.31	436.03	918.24	439.52	918.31	440.68	918.31
440.9901	918.34	445.41	918.36	447.22	918.35	448.93	918.42449	.9901	918.34

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450.47	918.33	456.12	918.54	456.85	918.49	459.77	918.54	462.74	01	918.61	
464.91	918.69	465.05	918.7	471.06	918.78	473.67	918.83	476.06	918.94		
478.29	918.94	481.9	918.96	483.36	918.98	483.8	918.97	484.05	918.98		
484.9	919.05	489.09	918.99	491.8	918.91	497.67	918.64	499.4	918.51		
501.28	918.45	502.12	918.38	502.66	918.37	504.9	918.32	506.68	918.33		
509.46	918.28	510.23	918.29	512.47	918.33	515.21	918.44	515.93	01	918.47	
516.47	918.5	519.8	918.58	523.92	918.66	524.05	918.65	524.92	918.64		
527	918.66	528.69	01	918.63	531.55	918.61	533.53	918.57	534.35	918.54	
537.48	918.47	539.37	918.44	540.72	918.38	541.77	918.37	547.74	01	918.37	
551.84	918.55	551.94	01	918.5	555.2	918.44	557	918.44	560.25	918.39	
563.51	918.46	563.62	918.46	565.39	918.54	566.79	918.57	571.89	918.63		
574.47	918.8	576.98	918.84	580.36	918.69	581.84	918.69	585.14	918.65		
585.28	918.65	587.18	01	918.59	587.19	01	918.59	596.56	01	918.76	
598.23	918.81	599.83	918.88	601.18	01	918.93	604.08	919	605.39	919.07	
607.16	919.12	609.62	01	919.2	612.2	919.26	613.12	01	919.19	613.95	919.21
618.61	919.3	618.9	919.3	619.33	919.31	620.05	919.33	622.3	919.4		
622.8	919.39	627.45	919.51	629.59	919.58	630.34	919.59	633.56	01	919.55	
637.26	919.67	637.88	919.67	638.8	919.69	639.15	919.73	643.48	920.15		
644.44	920.19	648.37	01	920.36	650.37	01	920.41	653.59	920.51	653.78	920.51

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	349.41	.035	367.14	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	349.41	367.14		244	257.65	271.8	.1	.3
Ineffective Flow	num= 1							
Sta L	Sta R	Elev	Permanent					
484.9	653.78	925	F					

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 4394.46

INPUT

Description:

Station Elevation Data			num= 346							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
0	929.131	690002	928.433	279968	927.616	109985	926.876	419983	926.77	
7.659973	926.199	219971	925.69	11.37	925.251	272998	924.731	389996	924.54	
16.81	923.88	19.37	923.15	21.46	002	922.57	22.08	002	922.54	
27.65997	922.18	27.94	922.23	29	922.34	30.42	922.65	31.72	923.1	
32.98999	923.61	34.82	923.71	38.09	923.83	40.78	923.79	41.17	923.78	
45.04999	923.79	45.20	923.78	45.56	923.75	47.27	923.38	47.71	923.5	
50.77997	923.21	51.33	923.15	51.47	923.14	52.89	923.05	55.56	922.88	
56.02002	922.86	57.44	922.77	58.34	922.72	60.88	922.54	62.85	922.43	

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64.08002	922.3866.58002	922.3268.73999	922.3570.46997	922.3470.95001	922.35
74.20001	922.2 74.62	922.1774.84998	922.1675.01001	922.1678.84998	922.11
79.01001	922.181.27997	922.0481.64001	922.0285.78998	921.988.59998	921.81
89.31	921.7790.51001	921.7191.71002	921.6392.90997	921.5894.97998	921.52
96.35999	921.4997.29999	921.4799.14996	921.45 100.36	921.4 105.3	921.28
105.34	921.27 105.38	921.27 107.1	921.15 107.31	921.15 110.13	921.01
116.51	920.77 117.57	920.72 120.97	920.51 122.85	920.39 127.81	920.11
130.1	920 133.72	919.96 133.84	919.95 134.17	919.94 137.25	919.79
142.84	919.56 143.7	919.5 147.16	919.33 147.3	919.33 149.1	919.2
150.66	919.07 155.87	919.12 156.28	919.09 156.81	919.11 157.98	919.1
159.01	919.04 160.04	919.04 161.08	918.92 163.52	919.14 165.07	918.79
166.93	918.83 169.22	918.88 170.25	918.66 173.87	917.56 177.64	916.45
178.27	916.15 182.83	915.21 185.72	915.1 188.05	915.17 192.45	915.33
195.77	915.18 197.66	915.12 201.38	915.04 203.73	914.99 204.61	915.23
205.04	915.36 206.92	915.86 208.83	915.91 213.47	916.11 220.03	916.17
220.26	916.18 220.51	916.16 222.77	916.17 223.87	916.26 224.66	916.28
225.86	916.22 228.21	916.18 231.07	916.25 232.21	916.32 232.35	916.32
232.79	916.37 237.28	916.88 238.14	916.92 239.9	916.92 242.43	917.02
245.21	917.07 246.68	917.05 253.02	917.05 256.24	916.99 257.38	917
258.95	916.96 262.23	916.81 263.2	916.78 265.46	916.8 267.71	916.68
270.26	916.55 272.07	916.47 273.29	916.43 274.07	916.43 276.49	916.37
281.41	916.51 284.06	916.54 289.77	916.86 290.07	916.89 290.5	916.92
290.87	916.95 291.76	916.96 294.27	916.99 295.85	917.04 297.44	917.09
299.84	917.14 301.04	917.19 305.54	917.22 308.5	917.22 309.45	917.25
310.43	917.26 312.4	917.3 314.16	917.32 319.54	917.36 320.43	917.39
321.72	917.41 322.67	917.42 324.67	917.4 325.37	917.4 326.76	917.35
328.62	917.37 329.41	917.36 329.93	917.35 332.68	917.32 336.6	917.4
339.72	917.46 341.17	917.45 341.7	917.46 342.87	917.47 344.03	917.46
347.78	917.42 350.72	917.41 351.64	917.42 354.38	917.43 356.36	917.43
362.42	917.51 362.73	917.52 363.12	917.52 367.7	918.09 368.24	916.66
368.78	915.22 370.13	914.52 371.61	914.91 373.09	915.3 375.34	915.55
377.58	915.8 380.84	917.32 383.05	917.73 383.85	917.86 384.39	917.94
386.16	918 387.14	918.04 388.84	918.22 393.1	918.34 395.76	918.53
398.55	918.51 399.38	918.51 401.01	918.52 404.01	918.52 405.29	918.54
408.07	918.49 411.04	918.49 412.36	918.51 414.52	918.54 415.67	918.56
417.17	918.58 418.78	918.63 419.59	918.66 422.99	918.84 424.92	918.95
424.99	918.95 426.01	919.02 428.69	919.19 428.9	919.2 429.34	919.21
432.93	919.32 434.24	919.34 436.94	919.44 440.18	919.61 442.85	919.69
443.32	919.7 443.85	919.72 444.54	919.75 445.37	919.79 445.49	919.79
450.19	920.01 450.99	920.04 452.88	920.1 454.8	920.17 456.28	920.22
457.28	920.28 459.82	920.45 464.2	920.7 464.85	920.76 466.63	920.84
468	920.92 468.93	920.95 470.56	920.99 471.43	921.03 473.62	921.17
478.77	921.49 479.68	921.58 481.56	921.61 484.17	921.69 485.43	921.74
486.1	921.75 487.78	921.79 488.64	921.82 491.84	922.05 492.76	922.1
495.09	922.27 498.01	922.43 500.45	922.52 501.01	922.54 501.19	922.54
501.34	922.55 501.58	922.56 502.71	922.58 508.28	922.76 509.14	922.78
509.7	922.79 512.92	922.83 513.5	922.83 515.45	922.89 517.28	922.92
517.96	922.94 518.41	922.95 520.79	923 521.94	923.01 525.67	923.19

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527.92	923.29	529.26	923.34	530.92	923.39	531.39	923.41	534.97	923.47
535.41	923.48	535.61	923.48	536.17	923.51	543.07	923.98	543.17	923.98
548.08	924.33	551.35	924.45	554.63	924.64	556.66	924.78	558.25	924.91
559.09	924.97	562.89	925.25	563.53	925.33	563.71	925.34	564.47	925.4
569.44	925.65	571.4	925.73	573.18	925.9	577.53	926.28	578.16	926.34
580.28	926.5	580.86	926.55	581.25	926.57	582.95	926.64	583.33	926.65
586.4	926.81	587.02	926.83	588.04	926.89	591.38	927.11	592.04	927.15
592.99	927.21	595.97	927.45	598.05	927.66	599.62	927.78	601.43	927.88
602.77	927.97	603.74	928.04	604.51	928.12	605.79	928.27	608.16	928.49
609.72	928.64	611.57	928.72	612.41	928.76	613.84	928.8	617.73	928.97
618.1	928.98	618.34	928.98	618.51	928.99	621.76	929.16	623.39	929.19
624.41	929.22	628.28	929.32	629.83	929.34	630.62	929.33	634.61	929.29
634.81	929.29	635.35	929.32	639.37	929.54	641.79	929.66	642.89	929.75
643.18	929.77								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 367.7 .035 388.84 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 367.7 388.84 287.76 276.33 261.85 .1 .3  
 Ineffective Flow num= 1  
 Sta L Sta R Elev Permanent  
 0 245.21 925 F

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 4118.13

INPUT

Description:

Station Elevation Data num= 242

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	926.512	829987	925.143	299988	925.054	909973	924.719	529999	924.47
9.919983	924.451	0.06998	924.44	10.25	924.414	59998	923.83	15.87	923.37
17.38998	922.932	0.89999	920.74	21.97	920.123	73999	918.972	6.48999	917.59
27.07999	917.428	4.5999	917.242	9.47998	917.163	3.54999	917.213	4.34998	917.15
35.34	917.153	9.17999	917.32	39.34	917.324	1.04999	917.234	1.97998	917.2
42.89999	917.23	45.56	917.144	9.00998	916.975	0.12997	916.945	4.41998	916.82
55.76999	916.825	7.16998	916.725	9.78998	916.59	61.03	916.526	3.85999	916.46
66.87	916.436	7.56998	916.376	7.90997	916.36	73.5	916.017	4.82999	914.48
76.79999	914.028	0.51999	914.59	85.59	914.988	9.63998	914.439	1.19998	914.7
92.34	916.19	94.47	916.179	7.37997	916.62	98.81	916.63	102.14	916.68
104.29	916.71	104.33	916.71	105.82	916.68	107.18	916.68	108.97	916.67
110.04	916.7	112.68	916.77	114.38	916.81	115.88	916.81	116.57	916.83
118.01	916.88	119.68	916.89	119.81	916.89	122.08	917.06	123.89	917.15

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124.46	917.18	124.58	917.19	124.72	917.2	127.16	917.32	128.66	917.4
129.94	917.44	132.02	917.5	134.49	917.58	137.3	917.67	138.03	917.67
142.07	917.66	143.34	917.7	144.55	917.74	146.69	917.8	149.98	917.92
152.82	918.06	153.31	918.08	154.42	918.04	158.92	917.99	160.57	917.91
161.79	917.81	163.36	917.72	165.18	917.68	166.03	917.66	167.72	917.64
168.45	917.63	171.47	917.63	172.69	917.6	175.72	917.54	177.61	917.47
179.23	917.45	183.15	917.44	184.41	917.43	184.73	917.43	188.39	917.35
190.56	917.3	191.06	917.31	192.89	917.36	194.11	917.35	198.23	917.31
200.04	917.3	201.03	917.3	203.53	917.25	205.81	917.2	209.53	917.13
210.32	917.13	215.33	917.3	216.1	917.3	217.73	917.23	221.57	917.33
223.87	917.42	225.6	917.5	226.06	917.53	228.1	917.58	232.18	917.65
234.61	917.72	236.2	917.77	238.81	917.82	241.57	917.9	242.2	917.91
242.31	917.92	242.76	917.92	248.76	918.02	249.87	918.06	253	918.13
254.11	918.14	254.87	918.12	260.02	918.19	261.16	918.2	262.03	918.22
263.98	918.26	265.96	918.23	267.12	918.27	268.31	918.33	270.17	918.48
271.99	918.63	272.18	918.64	274.73	918.86	274.87	918.87	275.06	918.88
278.63	919.05	279.18	919.09	282.03	919.23	283.99	919.28	284.88	919.3
286.75	919.39	287.2	919.41	289.78	919.6	291.13	919.68	298.68	920
299.13	920.03	299.31	920.03	304.27	920.17	307.41	920.32	309.64	920.49
311.87	920.6	313.94	920.76	314.3	920.8	314.45	920.8	320.3	921.12
321.24	921.19	322.17	921.22	324	921.31	326.23	921.45	330.65	921.66
333.24	921.7	335.45	921.81	336.79	921.82	342.44	921.86	344.96	921.92
347.03	922	349.51	922.1	352.63	922.26	352.66	922.26	352.78	922.27
362.36	922.45	362.85	922.46	363.26	922.46	364.24	922.49	367.98	922.61
368.81	922.64	371.12	922.71	371.55	922.72	372.1	922.73	374.76	922.76
379.43	922.83	381.01	922.85	381.3	922.86	382.08	922.89	385.43	923.09
385.59	923.1	387.67	923.25	388.69	923.33	389.8	923.34	393.43	923.54
394.06	923.59	394.23	923.6	396.19	923.63	400.12	923.67	402.43	923.7
405.75	923.72	407.32	923.73	407.91	923.74	410.54	923.7	411.89	923.7
412.44	923.72	414.71	923.85	417.14	923.99	418.33	924.06	420.6	924.27
422.59	924.4	427.29	924.83	427.93	924.89	432.5	925.16	432.64	925.18
432.86	925.22	433.39	925.32	438.76	926.34	439.8	926.5	443.69	926.82
443.87	926.82	444.52	926.83	448.59	926.93	451.25	926.89	451.52	926.89
453.34	926.92	454.88	926.94	456.63	926.79	459.13	926.89	461.91	926.84
463.93	926.81	466.49	927.29	468.96	927.82	474.84	928.14	474.98	928.18
475.78	928.24	476.55	928.28						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1 73.5 .035 92.34 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 73.5 92.34 116.57 113.17 111.58 .1 .3

CROSS SECTION

RIVER: Bluestone Creek

REACH: Align (1)

RS: 4004.96

INPUT

Description:

Station Elevation Data		num=		216							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	929.59.1399841	929.565.199982		928.556.549988		928.286.589996		928.27			
6.769989	928.2310.73999	927.23	13.62	926.5615.01999		926.24	20.38	925.16			
20.39999	925.15	20.41	925.1523.57999	923.37	24.16	923.15	24.78	923.03			
29.95999	922.6330.32999	922.6330.60001		922.5534.32999		921.6534.82001		921.6			
36.37	921.3836.82999	921.2437.45999		921.0539.66998		920.3141.19998		919.82			
42.23999	919.3944.04999	918.5848.51999		916.89	49.66	915.37	50.81	913.85			
51.97998	912.71	56.12	912.8658.57999	913.361.03998		913.7362.10001		913.75			
63.32999	913.78	65.62	913.8267.23999	915.5469.64999		915.3670.32001		915.26			
72.87	915.0174.07001	915.34	75.19	915.52	79.28	916.16	80.41	916.27			
85.53	916.88	87.63	916.9389.03998	916.8191.28998		916.68	95.06	916.54			
97.03	916.48	100.95	916.47	100.96	916.47	110.5	916.45	110.94	916.45		
111.83	916.44	112.27	916.42	113.67	916.43	118.01	916.47	119.02	916.53		
119.51	916.54	120.34	916.57	121.95	916.59	124.56	916.6	128.11	916.61		
131.55	916.68	133.38	916.73	137.21	916.69	139.57	916.67	140.85	916.66		
142.06	916.64	142.64	916.63	144.14	916.61	144.96	916.57	150.46	916.4		
152.4	916.34	153.25	916.34	157.21	916.32	160.68	916.39	160.91	916.4		
162.72	916.38	165.6	916.31	168.15	916.22	168.58	916.22	169.08	916.23		
170.46	916.25	171.68	916.26	175.49	916.25	176.7	916.27	179	916.3		
182.37	916.33	184.37	916.35	188.09	916.41	188.44	916.42	190.16	916.47		
191.17	916.5	192.3	916.54	195.03	916.63	198.89	916.77	199.26	916.79		
205.22	916.82	205.97	916.83	206.47	916.84	210.88	916.92	214.64	916.92		
218.05	916.9	218.47	916.9	218.93	916.91	222.75	916.98	225.25	917.04		
228.02	917.09	228.54	917.1	229.04	917.12	229.38	917.14	231.43	917.19		
235.9	917.33	236.17	917.33	237.3	917.38	240.65	917.59	241.19	917.63		
241.65	917.66	242.95	917.77	245.37	917.99	249.37	918.34	251.58	918.51		
254.49	918.79	255.24	918.86	256.94	918.92	258.13	918.97	259.22	919.01		
261.54	919.15	264.43	919.32	267.37	919.37	271.93	919.6	273.06	919.62		
274.58	919.79	280.89	920.32	283.04	920.51	287.66	920.89	288.28	920.93		
289.04	921	292.56	921.33	294.56	921.43	296.26	921.53	297.92	921.61		
298.7	921.65	301.3	921.82	304.41	921.98	306.04	922.05	307.16	922.08		
308.78	922.13	310.65	922.15	313.49	922.23	315.04	922.28	317.22	922.33		
319.14	922.36	320.4	922.41	321.95	922.46	324.95	922.54	325.43	922.55		
328.14	922.57	329.46	922.59	331.94	922.63	332.52	922.64	333.18	922.65		
334.29	922.69	336.62	922.67	337.03	922.62	337.94	922.56	338.86	922.56		
340.3	922.39	341.7	922.28	342.49	922.13	344.34	922.39	346.36	922.85		
347.53	922.93	348.57	922.96	350.66	922.87	351.88	922.83	352.66	922.81		
354.57	922.89	357.71	922.99	358.37	923.01	358.92	923.03	363.8	923.19		
366.19	923.25	366.39	923.26	367.07	923.26	369.23	923.29	373.28	923.34		
373.89	923.35	375.33	923.43	379.38	923.64	383.4	924.15	383.82	924.21		
384.28	924.27	384.44	924.3	387.31	924.77	391.9	925.4	394.56	925.78		
395.13	925.86	395.93	925.95	397.86	926.22	401.88	926.55	402.15	926.58		
402.26	926.59	405.62	926.96	408.54	927.34	412.85	927.75	414.53	927.85		

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416.93 928.05 417.81 928.12 419.33 928.27 425.38 928.78 426.56 928.89  
 427.18 928.96

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1 49.66 .03567.23999 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 49.6667.23999 117.63 117.63 117.63 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 3887.33

INPUT

Description:

Station Elevation Data num= 208

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	938.385	880005	937.596	410004	937.516	490021	937.56	630005	937.47
13.23001	936.317	20001	935.0118	74002	934.482	0.86002	933.732	0.92001	933.71
23.45001	932.82	24.56	932.46	26.47	931.82	27.38	931.5828	87003	931.07
34.03	928.6134	26001	928.5	34.31	928.4735	21002	928.0541	11002	925.21
41.97	924.844	80002	924.7549	74002	924.6350	87003	924.6155	68002	921.91
56.81	921.2757	21002	920.83	57.94	920.26	58.91	919.560	71002	917.94
61.66	917.17	64.13	916.2167	04001	915.173	10001	914.8173	46002	912.84
75	912.1578	76001	912.43	81.03	912.59	83.31	912.7485	01001	912.71
86.72	912.6887	39001	913.53	88.06	914.38	89.38	914.3690	87003	914.81
91.69	914.8697	85001	914.88	100.44	914.9	100.63	914.89	100.94	914.92
103.25	915.06	103.54	915.08	103.88	915.08	104.72	915.11	113.9	915.42
114.56	915.42	115.56	915.38	116.6	915.36	119.59	915.36	121.59	915.34
122.53	915.38	126.2	915.34	127.98	915.33	128.58	915.32	129.86	915.34
133.05	915.31	135.68	915.32	135.98	915.33	137.04	915.32	142.42	915.41
145.51	915.46	149.15	915.41	152.12	915.38	153	915.37	154.54	915.37
155.84	915.42	158.84	915.45	160.31	915.52	160.93	915.57	161.85	915.61
165.9	915.73	168.18	915.85	169.28	915.87	171.42	915.89	174.07	915.91
175.55	915.96	178.33	916.1	179.69	916.11	181.3	916.18	185.62	916.23
185.84	916.23	186.05	916.24	187.63	916.26	192.12	916.28	192.89	916.31
195.74	916.43	196.47	916.42	198.63	916.41	201.79	916.45	202.57	916.45
202.93	916.46	206.5	916.44	208.91	916.46	210.49	916.46	210.76	916.45
212.71	916.44	212.79	916.44	216.27	916.38	217.1	916.36	217.59	916.38
220.68	916.31	222.79	916.37	223.72	916.37	224.46	916.4	225.61	916.42
226.41	916.43	228.56	916.44	231.33	916.43	236.68	916.6	237.03	916.6
239.38	916.69	244.13	917.1	245.31	917.21	246.6	917.34	247.77	917.47
249.98	917.74	254.25	918.27	256.25	918.49	257.47	918.64	264	919.2
264.1	919.21	264.19	919.21	264.42	919.16	266.88	918.8	267.54	918.75
268.84	918.83	270.1	918.74	271.27	919.02	272.72	919.42	274.72	920.09



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275.76	920.36	276.25	920.54	277.03	920.49	279.4	920.83	281.73	921.24
282.21	921.26	283.42	921.29	285.57	921.31	287	921.29	287.06	921.28
291.54	921.2	293.36	921.19	294.75	921.14	295.88	921.1	300.46	921.08
301.62	921.07	302.05	921.07	304.66	921.04	305.55	921.04	308.86	921.05
309.88	921.05	310.79	921.06	315.24	921.06	319.18	921.13	320.89	921.2
322.81	921.25	323.25	921.24	323.83	921.26	326.72	921.3	328.35	921.35
333.36	921.29	333.89	921.29	341.75	921.41	345.47	921.48	346.39	921.51
347.72	921.61	348.97	921.68	350.23	921.74	352.09	921.87	352.41	921.9
352.63	921.93	355.44	922.18	356	922.24	357.65	922.49	360.52	922.91
362.07	923.22	364.84	923.8	365.83	924.07	369.19	924.97	369.58	925.08
369.92	925.18	372.02	925.89	376.04	926.94	378.04	927.55	380.68	928.09
384.05	928.89	384.7	929.02	387.84	929.54	388.75	929.66	393.92	930.5
395.62	930.77	399.02	931.25	400.75	931.5	401.82	931.6	402.51	931.66
403.63	931.77	407.04	932.16	407.2	932.18				

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 0 .173.10001 .03590.87003 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 73.1000190.87003 113.09 113.09 113.09 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 3774.24

INPUT

Description:

Station Elevation Data num= 187

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	933.27.2399902	933.253.720001	932.645.829987	932.169.019989	931.13				
11.34	930.45	11.72	930.3711.97998	930.31	14.81	929.5317.35999	928.89		
20.97	928.4323.01999	928.0626.07999	927.71	31	926.95	31.88	926.64		
35.76999	924.7641.22998	923.2742.42999	922.9842.94998	922.9445.01999	922.9				
48.38	922.7649.54999	922.7152.17999	922.1853.88998	921.29	56.37	919.67			
57.29999	919	58.63	918.0960.98999	916.3262.45999	915.3966.07999	914.37			
66.45999	914.2766.82999	914.2967.54999	914.371.06998	914.3672.56998	914.41				
73.59	914.39	74.09	914.3879.69998	914.49	80.34	913.66	80.62	913.3	
81.53998	912.181.95999	910.87	83.25	910.4784.81998	910.786.38998	910.92			
87.91	910.9890.25998	910.5592.67999	911.3295.09999	912.0896.34999	913.2				
97.14999	915.1	100.33	914.88	101.58	914.74	101.68	914.74	102.4	914.72
105.75	914.49	106.69	914.41	108.59	914.13	111.57	913.98	113.25	914.16
114.85	914.33	116.22	914.42	118.39	914.57	118.85	914.61	120.34	914.59
122.43	914.57	123.15	914.54	123.37	914.54	125.2	914.58	125.99	914.56
128.64	914.49	128.94	914.49	129.7	914.47	131.69	914.37	133.5	914.32
134.12	914.28	138.66	914.2	139.84	914.2	141.78	914.1	142.95	914.05

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147.48	913.92	148.09	913.9	148.71	913.95	149.9	914.11	154.59	914.31
156.31	914.41	157.74	914.46	160.04	914.49	162.79	914.52	165.01	914.47
166.95	914.48	167.37	914.47	168.25	914.48	169.88	914.49	170.56	914.51
173.33	914.44	174.23	914.45	178.09	914.48	179.65	914.48	180.88	914.45
182.28	914.4	184.12	914.39	187.03	914.52	188.75	914.59	189.87	914.63
197.87	914.82	198.52	914.83	200.75	914.88	202.83	914.92	203.68	914.94
206.37	914.97	206.67	914.97	206.9	914.99	212.66	915.39	213.84	915.41
214.82	915.44	222.21	915.89	223.06	915.94	223.61	915.97	225.24	916.05
228.18	916.17	229.88	916.25	231.14	916.3	233.27	916.39	234.24	916.43
236.92	916.56	237.89	916.63	239.74	916.76	240.87	916.83	245.87	917.13
246.57	917.17	247.27	917.22	251.53	917.49	252.67	917.57	255.04	917.75
256.56	917.84	258.32	918.02	258.74	918.06	258.88	918.08	260.61	918.26
265.91	918.82	267.89	919.03	270.25	919.3	271.72	919.45	272.42	919.51
272.89	919.53	274.94	919.62	276.88	919.75	279.16	919.9	285.54	920.63
287.95	920.93	288.19	920.96	292.99	921.8	294.93	922.13	295.07	922.15
301.64	923.67	301.65	923.67	303.7	924.22	306.16	924.94	306.62	925.06
307.51	925.34	307.84	925.45	308.41	925.61	309.36	925.95	313.12	927.16
317.33	928.8	317.89	929.08	322.54	930.29	322.8	930.36	323.01	930.39
325.17	930.63	325.24	930.64	325.4	930.65	330.56	931.13	331.17	931.28
332.38	931.46	333.59	931.62	336.18	932.01	340.06	932.47	340.65	932.54
340.95	932.58	341.12	932.59	341.43	932.62	344.95	932.97	346.65	933.11
349.42	933.4	349.49	933.41						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .179.69998 .03597.14999 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 79.6999897.14999 118.48 118.48 118.48 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 3655.76

INPUT

Description:

Station Elevation Data num= 203

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	939.45.3399963	939.52.6499939	939.61.070007	939.678.059998	940.89				
10.14999	941.210.95999	941.3312.85001	941.49 14.31	941.4815.80002	941.38				
16.14001	941.3317.54001	941.1919.11002	941.0421.32001	940.5522.76999	940.22				
24.67001	939.61 26.94	938.8827.95001	938.58 29.13	938.37 31.03	937.91				
32.51999	937.39 35.72	936.34 37.72	935.54 39.34	934.92 44.03	932.97				
45.36002	932.42 46.09	932.0946.82001	931.79 49.31	930.73 52.13	929.47				
53.12	92954.73999	928.2756.32001	927.56 57.78	926.9160.82001	925.57				
62.28	924.9363.42999	924.4365.83002	923.3866.55002	923.0868.17001	922.33				

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71.97	920.58	72.69	920.21	73.30	002	919.91	77.87	918.04	78.51	999	917.82			
79.57	001	917.52	80.54	001	917.36	83.92	001	916.57	86.08	002	916.02	87.17	999	915.92
90.91	915.53	93.07	001	915.28	96.44	915.01	97.75	914.92	99.79	001	914.74			
102.52	914.61	105.45	914.38	107.66	914.16	110.23	913.89	110.77	913.84					
111.39	913.79	114.22	913.58	120.26	913.19	120.7	913.17	120.76	913.17					
123.12	913.09	124.61	913.07	126.69	913.03	129.04	913.01	130.13	913.06					
133.49	913.25	133.81	913.26	135.63	913.33	137.77	913.4	146.26	914.03					
147.36	911.51	148.34	911.64	150.46	911.6	153.29	911.4	154.31	911.6					
155.33	911.8	158.32	913.32	161.77	913.04	163.36	913.19	163.9	913.24					
164.16	913.26	165.86	913.51	167.2	913.53	170.64	913.67	172.53	913.62					
174.18	913.57	177.54	913.54	179.5	913.39	181.89	913.21	185.91	913.17					
186.14	913.17	186.45	913.16	187.33	913.11	192.65	912.92	195.03	912.73					
198.6	912.81	201.01	912.97	202.52	913.05	204.31	913.15	204.67	913.16					
207.41	913.18	208.88	913.17	209.83	913.15	211.42	913.15	215.31	913.29					
215.6	913.3	217.93	913.4	218.98	913.47	221.16	913.54	224.16	913.98					
224.44	914	225.13	914.09	226.42	914.06	228.92	913.91	232.08	913.54					
236.04	913.48	236.9	913.48	238.31	913.61	240.85	913.88	241.5	913.94					
242.32	913.99	243.4	913.98	244.31	914.05	246.38	914.22	247.59	914.3					
248.98	914.39	249.32	914.4	249.48	914.41	258.66	914.85	258.71	914.85					
258.74	914.86	258.95	914.86	263.95	914.95	265.13	914.97	266.28	914.99					
267.35	914.99	268.32	915.03	271.61	915.15	274.11	915.32	275.58	915.43					
278.99	915.63	280.74	915.73	281.86	915.79	282.65	915.82	284.78	915.94					
286.02	916.02	290.29	916.28	291.24	916.34	296.45	916.78	296.84	916.82					
298.22	917.02	300.49	917.35	303.77	917.86	304.68	917.99	309.19	918.62					
309.52	918.67	309.68	918.7	310.14	918.77	314.14	919.34	315.49	919.51					
317.91	919.91	319.45	920.17	324.02	921.07	329.12	922.18	329.16	922.18					
329.24	922.2	331.34	922.76	331.81	922.85	333.61	923.15	335.45	923.44					
336.06	923.54	337.3	923.74	340.51	924.15	342.49	924.44	343.72	924.72					
346.04	925.26	349.09	926.17	349.3	926.23	349.9	926.36	353.57	927.13					
354.2	927.26	355.34	927.47	357.52	927.94	358.16	928.08	358.92	928.21					
360.85	928.55	366.36	929.48	367.73	929.67	369.62	929.87	371.26	930.02					
375.14	930.41	376.92	930.56	378.65	930.73	379.47	930.79	382.11	930.9					
385.12	931.17	386.91	931.38	387.16	931.42									

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 146.26 .035 158.32 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 146.26 158.32 127 133.61 140.51 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 3522.15

INPUT

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Description:

Station Elevation Data		num= 189							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	929.131	200012	928.87	1.26001	928.841	390015	928.815	080017	928.63
5.540009	928.626	860016	928.557	940002	928.528	880005	928.5412	93002	928.56
13.75	928.72	16.59	929.6518	14001	930.29	18.94	930.6222	71002	932.15
23.19	932.3726	11002	933.4727	43002	933.9828	29001	934.330	45001	935.31
31.78	935.9233	24002	936.5835	30002	937.4237	54001	938.0739	92001	938.81
42.70001	939.243	10001	939.24	43.97	939.24	45.5	939.23	47.69	939.24
48.24002	939.2249	73001	939.1949	90002	939.1852	80002	938.853	55002	938.7
55.55002	938.33	55.97	938.2258	15002	937.61	59.56	937.22	60.91	936.73
61.78	936.4363	89001	935.73	66.44	934.77	72.94	932.1	73.84	931.77
75.85001	930.8976	76001	930.5377	11002	930.42	82.47	928.42	84.75	927.69
87.24002	926.9188	18002	926.5992	32001	925.27	94.13	924.6895	21002	924.33
98.53	923.12	100.89	922.22	103.38	921.11	103.68	920.99	104.24	920.73
110.15	917.8	111.47	917.11	114	916.05	116.81	914.69	118.27	914.43
119.21	914.32	119.88	914.24	121.43	914.04	124.3	913.66	126.7	913.43
128.08	913.33	131.19	913.19	132.7	913.17	134.43	913.1	137.27	912.97
138.09	912.93	138.28	912.92	138.41	912.91	139.13	912.88	146.91	912.44
147.98	912.42	150.69	912.33	152.59	912.28	152.78	912.27	152.99	912.29
153.77	912.29	154.22	912.28	154.94	912.26	155.89	912.2	159	912.16
159.03	912.16	163.12	912.15	163.87	912.13	167.62	912.14	170.09	912.13
171.47	912.18	172.14	912.19	173.9	912.23	178.86	912.38	180.74	912.41
189.32	912.41	193.27	912.48	194.29	912.5	194.58	912.5	195.07	912.47
195.99	912.45	199.23	912.49	200.31	912.49	204.3	912.59	207.19	912.75
207.68	912.76	207.86	912.78	208.68	912.82	210.3	912.9	211.01	912.74
215.13	913.25	216.6	910.93	217.15	910.62	218.38	909.52	220.35	909.69
223.26	909.82	226.45	910.65	227.19	911.75	227.54	912.27	227.93	912.86
231.75	912.69	232.99	912.84	234.73	913.04	235.86	912.99	236.69	912.94
237.34	912.92	240	912.81	244.37	912.58	244.73	912.7	245.68	912.85
248.15	912.93	249.86	913.01	253.43	912.89	253.55	912.88	257.28	912.88
261.73	912.91	262.93	912.93	265.05	913.03	266.12	913.07	267.2	913.14
268.3	913.21	272.28	913.43	272.63	913.45	272.74	913.45	274.28	913.53
275.76	913.66	276.55	913.7	277	913.74	284.66	914.45	287.37	914.74
289.3	915	295.17	915.96	297.84	916.34	299.07	916.58	300.95	916.86
302.68	917.12	306.22	917.87	306.92	918.02	309.05	918.53	310.93	918.96
313.07	920.01	316.47	921.7	319.93	923.37	322.11	924.18	326.23	924.49
329.13	924.58	331.3	924.7	332.88	924.82	333.93	924.9	334.94	924.96
335.61	924.98	340.97	925.15	345.15	924.79	348.57	924.99	350.87	924.17
351.86	924.49	354.54	925.98	355.21	926.33	356.26	926.94	357.84	927.55
357.87	927.56	357.9	927.57	362.8	929.16	363.98	929.54		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.05	215.13	.035	227.93	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	215.13	227.93		47.81	47.81	.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 3474.34

INPUT

Description:

Station Elevation Data		num=		197							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	928.071	149994	927.835	029999	926.89	6.73999	927.14	10.34	927.26		
11.22	927.2514	10999	927.2515	20999	927.2315	94998	927.1816	57001	927.12		
18.41998	927.1820	14999	927.25	22.87	927.8	23.34	927.9	27.5	929		
29.16998	929.41	30.19	929.8332	41998	930.7532	54001	930.834	29999	931.55		
34.67999	931.7235	00998	931.8638	82001	933.5139	64999	933.8640	72998	934.34		
41.82001	934.8142	07001	934.91	42.97	935.16	46.03	936.02	46.66	936.16		
49.63998	936.5751	19998	936.85	53.44	936.85	55.28	936.76	60.94	936.06		
61.69	935.97	62.28	935.89	65.44	935.0167	25998	934.4168	54999	934.01		
71.10001	932.99	71.22	932.9571	32001	932.91	74.78	931.63	76.69	930.85		
79.29999	929.75	80.22	929.42	85.38	927.51	86.66	927.1288	10001	926.61		
89.17999	926.1890	04001	925.8291	04999	925.4296	72998	923.7496	91998	923.69		
98.63	923.11	98.75	923.07	102.72	921.44	104.39	920.72	105.2	920.37		
106.07	920.04	108.27	919.03	113.36	916.62	114	916.34	116.83	915.21		
117.75	914.88	118.02	914.8	119.95	914.45	124.88	913.57	125.86	913.45		
126.89	913.37	128.76	913.22	130.47	913.01	132.58	912.77	134.17	912.6		
134.54	912.58	138.21	912.37	139.94	912.22	140.4	912.18	143.38	912.01		
144.77	911.93	145.02	911.92	146.09	911.89	147.86	911.85	150.69	911.85		
151.55	911.86	152.74	911.83	156.11	911.88	157.48	911.87	160.28	911.88		
161.01	911.88	162.23	911.86	164.6	911.85	165.61	911.88	167.93	911.83		
170.87	911.87	173	911.98	175.09	911.98	177.41	911.95	177.76	911.94		
180.53	911.94	182.07	911.93	184.67	911.86	186.2	911.8	188.74	911.77		
190.25	911.73	193.16	911.59	194.84	911.69	195.45	911.75	197.69	911.85		
198.66	911.88	199.55	911.9	200.7	911.91	204.4	912	205.4	912.05		
205.88	912.02	208.85	912.1	209.03	912.11	209.11	912.11	212.86	912.17		
214.7	912.21	215.87	912.25	217.2	912.41	217.4	912.44	217.63	912.45		
220.53	912.68	224.12	912.34	225.5	909.78	227.87	909.24	232.66	909.55		
233.43	910.51	235.26	911.18	237.21	911.97	238.46	912.24	239.72	912.51		
241.05	912.58	241.85	912.56	246.75	912.45	250.8	912.39	251.04	912.38		
251.13	912.38	251.25	912.39	255.81	912.42	256.43	912.44	259.64	912.51		
262.09	912.54	262.87	912.58	268.12	912.59	270.41	912.61	271.63	912.61		
273.45	912.62	275.4	912.66	276.59	912.78	281.57	913.27	281.72	913.28		
281.86	913.3	283.53	913.6	287.16	914.99	290.14	916.98	290.3	917.07		
290.68	917.2	296.48	918.31	297.41	918.37	298.11	918.4	299.39	918.39		
303.31	918.47	303.56	918.47	304.2	918.48	306.8	918.5	307.65	918.51		
311.58	918.58	314.15	918.59	315.47	918.58	315.77	918.57	315.87	918.57		
317.36	918.55	319.03	918.51	321.62	917.98	324.4	917.51	325.23	917.11		
326.46	917.15	328.29	916.53	332.35	916.84	334.71	918.34	335.37	918.75		

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336.47	919.45	338.47	920.45	342.42	922.6	342.65	922.74	345.74	924.2
345.87	924.26	345.88	924.27	347.65	924.84	349.99	925.99	354.9	928.4
355.47	928.66	358.15	929.89						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	224.12	.035	239.72	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	224.12	239.72		49.33	54.86		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 3419.48

INPUT

Description:

Station Elevation Data num= 190

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	926.75	1.51001	926.072	589996	925.573	170013	925.443	440002	925.46
9.670013	925.399	709991	925.39	13	925.4715	32001	925.3816	45999	925.33
16.80002	925.3318	52002	925.35	18.81	925.3621	17999	925.4424	67001	925.57
29.92999	926.33	31.84	926.6932	20001	926.7835	54001	927.6736	64999	927.93
37.17001	928.1	37.5	928.2340	24002	929.3240	98001	929.61	41.44	929.79
44.38	930.9545	80002	931.6	47.72	932.2554	20999	933.4155	80002	933.74
56.61002	933.8958	02002	934.0558	73001	934.12	62.06	933.7263	26001	933.69
64.42999	933.4	69.09	932.1469	39001	932	73.12	930.3874	01001	930
76.20001	928.9776	67001	928.7677	23001	928.5282	89999	926.19	84.59	925.48
85.13	925.2988	45001	924.23	89.59	923.86	91.38	923.0991	83002	922.95
95.38	921.8497	24002	921.29	98.16	921.01	99.16	920.71	100.98	919.99
106.06	918	108.89	916.51	109.19	916.35	109.62	916.19	112.13	915.19
114.55	914.51	116.66	914.1	116.87	914.07	118.68	913.91	123.98	913.23
124.08	913.22	125.64	913.07	126.29	913.01	128.86	912.71	134.03	912.35
135.33	912.34	136.88	912.3	137.08	912.3	141.24	912.25	141.94	912.24
145.39	912.18	146	912.15	149.08	911.92	151.05	911.82	154.24	911.68
159.36	911.36	160.17	911.31	161.22	911.29	162.55	911.26	163.48	911.26
164.87	911.17	166.33	911.03	167.51	910.97	170.69	910.82	174.11	910.77
174.84	910.74	175.75	910.8	177.16	910.76	177.8	910.84	180.06	911.09
181.65	911.3	184.3	911.66	190.62	911.66	197	911.21	198.59	909.85
201.03	908.92	202.57	908.61	206.13	908.81	208.44	909.01	209.66	911.74
214.03	911.33	215.59	911.84	217.24	911.79	217.81	911.78	218.29	911.77
219.72	911.76	220.46	911.73	223.65	911.67	225.62	911.72	231.11	911.76
232.32	911.8	233.09	911.79	236.88	911.74	238.8	911.71	240.25	911.68
243.05	911.66	243.18	911.67	244.52	911.72	251.37	912.01	251.73	912.1
254.54	912.67	255.8	913.08	257.36	913.61	261.49	914.41	263.76	914.86
265.46	914.95	267.36	915.03	268.34	915.04	270.38	915.07	274.43	915.15

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275.51	915.17	276.62	915.18	277.63	915.17	279.12	915.2	282.31	915.15
282.88	915.15	284.91	915.17	285.06	915.17	285.53	915.16	287.87	915.12
288.79	915.09	290.24	915.06	290.92	915.04	291.87	914.83	293.41	914.53
296.82	914.07	301.14	913.05	304.03	912.91	309.3	912.59	311.32	912.44
315.49	912.25	316.52	912.33	318.17	912.5	321.02	912.91	326.36	914.24
327.88	914.67	330.01	915.49	330.11	915.54	330.27	915.6	331.98	916.45
334.63	917.78	335.74	918.26	337.51	918.96	338.06	919.18	339.59	919.83
341.75	920.97	343.96	922.06	344.62	922.26	345.92	922.56	348.66	923.47
350.01	923.85	351.04	924.07	352.66	924.53	356.64	925.53	357.54	925.81
358.79	926.13	362.24	926.79	362.49	926.82	363.24	926.96	368.14	927.9
370.16	928.27	371.62	928.57	373.65	929.06	374.44	929.28	375.1	929.51

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	197	.035	209.66	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	197	209.66		139 112.19	71.7		.1	.3
Ineffective Flow			num=	1				
Sta L	Sta R	Elev	Permanent					
270.38	375.1	920	F					

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 3307.29

INPUT

Description:

Station Elevation Data num= 190

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	931.211	929993	930.852	029999	930.842	160004	930.825	309998	929.9
10.60001	927.871	2.54001	927.05	13.94	926.481	4.85999	926.331	6.26999	926.27
20.44998	925.95	20.75	925.932	3.51001	925.542	4.26001	925.432	6.88998	925.01
26.98999		92529.88998	924.56	30.31	924.493	0.57001	924.44	34.16	923.91
37.51001	923.41	40.81	922.994	2.94998	922.734	4.07999	922.644	8.85001	922.49
48.06	922.085	0.10001	921.755	1.94998	921.515	3.60999	921.285	3.98999	921.18
60.44998	918.336	1.35999	917.886	3.35999	916.61	64.22	916.06	67.87	914.1
68.79999	913.75	69.31	913.53	70.22	913.26	72.13	913.247	4.04999	913.35
76.01001	913.427	6.70999	913.777	7.26999	913.982	9.94998	914.298	4.57999	914.19
84.91998	914.168	6.07001	914.138	7.73999	914.078	9.35001	914.019	0.07999	913.95
91.13	913.879	8.01001	913.71	100.16	913.53	103.09	913.66	104.68	913.71
105.15	913.68	108.5	913.56	109.37	913.48	111.24	913.25	112.36	911.72
114.65	911.41	116.11	911.21	117.56	911.02	119.73	910.72	123.14	910.26
124.22	910.11	125.54	909.93	126.41	909.82	127.37	909.69	128.58	909.57
133.51	909.1	139.29	908.54	141.15	908.36	142.46	908.29	143	908.26
145.88	908.11	146.71	908.06	149.03	907.94	154.83	907.95	162.37	907.96

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162.99	907.96	165.34	907.97	169.53	907.97	171.03	908.06	171.91	908.11
172.74	908.16	173.55	908.2	174.61	908.27	178.04	908.69	179.13	908.83
180.72	909.03	183.64	909.39	184.91	909.52	186.59	909.69	188.2	909.86
188.92	909.93	189.57	910	195.5	910.6	197.46	912.04	199.75	912.37
204	912.38	210.84	913.3	213.71	913.62	214.74	913.88	215.03	913.93
220.13	914.1	220.86	914.2	221.1	914.1	224.68	913.96	225.7	913.69
226.79	913.71	228.4	913.79	229.57	913.84	231.57	913.91	234.5	914.02
236.63	914.13	237.72	914.18	242.7	914.34	243	914.35	243.63	914.36
243.8	914.35	245.63	914.36	246.66	914.33	247.6	914.36	248.8	914.39
250.22	914.41	251.26	914.41	253.7	914.47	253.77	914.47	253.92	914.48
256.88	914.6	260.16	914.65	263.47	914.69	265.85	914.79	271.15	914.91
271.22	914.91	275.52	914.78	276.28	914.75	276.63	914.75	277.93	914.74
278.56	914.75	278.95	914.73	282.95	914.68	284.37	914.67	284.94	914.59
287.42	914.25	289.86	914.17	293.85	913.16	295.76	912.76	298.31	912.67
298.67	912.68	299.52	912.62	303.24	912.34	304.86	912.24	305.92	912.18
307.58	912.12	309.19	912	309.44	912	312.42	912.06	313.93	912.04
314.23	912.04	315.03	912.09	316.72	912.24	320.7	912.62	325.01	913.27
327.14	913.19	327.51	913.28	329.18	913.51	330.14	913.97	332.43	914.91
335.76	916.61	336.98	917.25	338.04	917.67	340.64	918.43	341.79	918.8
342.61	919.02	344.34	919.99	347.38	921.42	349.18	922.25	350.09	922.59
351.42	923.1	356.85	924.48	359.56	925.6	361.69	926.22	363.7	926.79
365.74	927.17	367.1	927.49	368.14	927.83	368.42	927.95	371.62	929

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 123.14 .035 195.5 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 123.14 195.5 33.31 33.31 33.31 .1 .3

Ineffective Flow num= 1  
 Sta L Sta R Elev Permanent  
 271.15 371.62 920 F

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 3273.98

INPUT

Description:

Station Elevation Data num= 215

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	936.863	639984	936.014	339996	935.887	179993	934.938	869995	934.35
8.98999	934.31	11.16	933.67	12.34	933.32	12.76999	933.18	15.91	932.13
17.00998	931.76	17.94998	931.38	18.78998	931.12	21.03	930.45	21.81998	930.2
22.91	929.8	26.75	928.38	27.31	928.21	27.84	928.06	33.75998	926.38
34.19	926.21	34.81998	925.96	39.44998	924.28	39.89999	924.12	39.97	924.09



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41.62	923.3743.85001	921.8544.17999	921.65	44.66	921.36	48.25	919.39
51.56	917.551.72998	917.4153.95999	916.8455.69998	916.4	58.38	916.63	
61.44	916.73 62.56	916.7463.81998	916.7565.85001	916.78	67	916.79	
67.59	916.78 69.12	916.7370.94998	916.75 71.53	916.7673.28998	916.75		
75.25	916.7275.45999	916.7177.20999	916.6477.97998	916.61	82.87	916.48	
83.41	916.4585.25998	916.36 85.41	916.36 85.66	916.3593.72998	915.92		
94.44	915.8795.50998	915.8497.32999	915.66 100.31	915.39	102.6	915.23	
104.34	915.2 106.7	915.13 107.17	915.08 107.81	915.01	110.9	914.81	
112.48	914.58 117.18	914.02 117.24	914.02 120.51	913.42	122.37	913.09	
124.29	912.79 126.11	912.54 127.38	912.37 127.92	912.29	128.29	912.25	
129.8	912.11 135.37	911.49 136.45	911.36 139.02	911.03	144.79	910.27	
145.76	910.14 147.71	909.89 149.03	909.71 151.38	909.4	151.85	909.36	
153.91	909.19 154.98	909.1 156.41	908.98 157.74	908.87	160.3	908.65	
162.33	908.48 163.86	908.37 164.66	908.32 165.61	908.26	166.29	908.22	
168.95	908.05 172.29	907.84 173.79	907.85 175.66	907.85	180.03	907.87	
182.42	907.87 183.3	907.88 184.53	907.88 186.01	907.89	188.42	908.03	
189.84	908.12 192.05	908.26 193.67	908.36 195.17	908.53	196.65	908.69	
199.19	908.97 201.7	909.25 202.9	909.39 203.66	909.47	204.74	909.58	
206.89	909.81 209.41	910.07 210.77	910.22 211.44	910.29	212.05	910.35	
213.39	910.49 216.61	910.83 217.89	910.96 219.86	911.95	221.05	912.07	
224.84	912.12 226.82	912.47 228.6	912.72 229.2	912.85	231.26	912.84	
234.27	912.79 238.9	913.26 239.36	913.32 240.12	913.36	242.57	913.38	
247.5	913.94 247.56	913.95 250.56	913.95 251.7	913.92	254.41	913.92	
255.52	913.95 258.71	913.99 259.23	914.01 259.55	914.02	260.43	913.99	
263.17	914.14 263.82	914.17 264.03	914.16 264.38	914.19	264.75	914.23	
267.33	914.35 270.57	914.43 270.7	914.44 270.9	914.45	273.78	914.45	
276.62	914.51 278.02	914.52 279.04	914.49 280.87	914.43	281.61	914.41	
283.58	914.36 283.68	914.36 287.36	914.03 288.87	913.98	290.21	913.8	
291.53	913.6 294.1	913.28 296.18	912.97 296.32	912.96	298.89	912.75	
301.88	912.49 302.29	912.46 302.5	912.44 305.59	912.02	311.97	911.79	
312.16	911.78 312.32	911.77 313.94	911.81 315.84	911.86	316.56	911.9	
319.69	912.04 319.98	912.04 320.69	912.05 325.08	912.28	329.7	912.68	
330.63	912.72 332.44	912.94 332.89	912.97 333.39	913.05	337.35	913.56	
339.02	913.87 340.12	914.06 340.78	914.25 341.49	914.49	343.2	914.83	
348.06	915.86 348.93	916.16 349.09	916.21 349.8	916.35	351.37	916.77	
352.72	917.37 357.87	919.7 358.39	919.87 358.74	920	360.2	920.62	
360.99	920.95 362.75	921.5 366.7	922.76 367.79	923.09	369.29	923.33	
370.47	924.05 371.73	924.72 375.81	926.01 376.57	926.3	378.46	927.28	

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 147.71 .035 206.89 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 147.71 206.89 56.05 53.58 50.5 .1 .3  
 Ineffective Flow num= 1  
 Sta L Sta R Elev Permanent  
 278.02 378.46 920 F

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CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 3220.4

INPUT

Description:

Station Elevation Data		num= 183									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	929.5	.230011	929.432	.110016	928.914	.540009	928.145	.480011	927.85		
6.589996	927.587	.059998	927.447	.990021	927.0611	.860002	925.4713	.270002	924.96		
13.91	924.7	15.66	924.0816	.260001	923.8518	.960002	922.1419	.710002	921.76		
20.74002	921.1222	.120003	920.322	.480001	920.09	22.75	919.9325	.460002	918.47		
26.49002	917.87	28.06	917.2430	.640001	916.22	32.91	916.46	34.31	916.73		
35.25	916.8	36.25	916.83	39.34	916.8340	.550002	916.8242	.210002	916.81		
43.23001	916.8148	.150002	916.83	48.34	916.8350	.020002	916.8850	.950001	916.88		
53.92001	916.854	.350001	916.8	55.88	916.8156	.450001	916.8259	.740002	916.77		
62.93002	916.7365	.260001	916.71	65.88	916.766	.460002	916.68	70.84	915.97		
71.28	915.92	72.28	915.7274	.200001	915.3277	.860002	914.61	78.41	914.45		
80.46001	913.9682	.350001	913.3983	.730001	913.1885	.030001	912.9988	.680001	912.25		
90.83002	911.81	92.16	911.5496	.690002	910.7399	.810001	910.26	101.65	910.13		
102.96	910.07	103.64	910.03	104.86	909.94	106.34	909.88	109.82	909.72		
111.43	909.68	113.33	909.66	114.85	909.73	117.13	909.76	120.43	909.8		
123.19	909.83	124.68	909.84	125.11	909.84	125.59	909.85	126.16	909.85		
129.92	909.92	133.42	909.99	134.41	909.98	135.98	909.94	136.5	909.93		
137.76	909.92	139.23	909.93	141.2	909.86	143.75	909.89	144.52	909.88		
148.81	909.88	149.97	909.85	155.43	909.21	156.35	909.03	159.4	908.9		
160.6	907.12	163.46	906.87	165.35	906.73	167.69	907.2	169.04	908.06		
170.57	908.35	171.24	908.76	172.05	909.25	173.54	910.14	177.74	910.18		
178.11	910.2	181.16	909.96	184.01	909.89	184.25	909.88	184.69	909.88		
191.6	909.78	193.7	909.8	199.25	910.24	201.01	910.42	202.97	910.65		
204.25	910.81	204.66	910.87	205.28	910.93	207.28	911.07	209.45	911.21		
210.52	911.32	212.31	911.55	212.99	911.6	213.79	911.59	214.49	911.55		
215.06	911.55	218.79	911.26	219.32	911.22	219.58	911.2	221.89	911.18		
222.78	911.21	225.79	911.24	226.31	911.25	226.72	911.25	229.85	911.27		
232.89	911.38	234.06	911.41	235.68	911.45	238.67	911.54	241.11	911.69		
242.22	911.78	245.86	912.07	246.1	912.09	248.52	912.32	250.17	912.51		
252.15	912.72	254.98	913.16	256.51	913.36	257.21	913.41	261.53	914.07		
261.64	914.08	261.71	914.1	263.5	914.45	266.26	915.01	271.57	916.28		
271.6	916.3	275.81	917.23	276.51	917.39	278.04	917.8	279.32	918.12		
280.31	918.37	284.01	919.15	284.4	919.2	285.81	919.41	291.11	920.62		
291.31	920.68	291.95	920.73	294.26	921.14	299.66	922.01	300.41	922.16		
301.58	922.26	302.76	922.4	305.95	922.92	306.27	922.98	306.32	922.99		
311.7	924.44	311.79	924.46	315.05	925.74	316	926.06	319.63	927.59		
320.07	927.77	320.47	927.82	322.38	928.1	326.33	928.35	326.56	928.33		
326.89	928.39	330.05	928.67	331.98	928.93						

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Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 159.4 .035 171.24 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 159.4 171.24 69.73 72.72 75.32 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 3147.68

INPUT  
 Description:

Station Elevation Data num= 170

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	926.61	610016	926.01	11.72	0001	925.97	2.61	9995	925.71
6.64	924.56	7.52	924.3	10.03	923.62	12.44	922.9	13.84	922.61
14.34	922.51	14.98	922.15	18.64	921.05	19.08	920.95	19.69	920.87
21.14	920.66	21.79	920.52	23.89	919.88	26.36	919.33	27.5	919.02
31.44	918.08	32.19	918.2	33.13	918.4	33.81	918.52	34.72	918.62
38.28	918.81	39.82	918.89	40.17	918.85	42.31	918.84	44.56	918.96
47.76	918.86	48.94	918.85	49.96	918.86	53.24	918.97	54.31	918.96
58.06	918.96	58.35	918.94	59.82	918.68	61.16	918.42	61.61	918.35
62.18	918.26	63.07	917.89	65.77	916.92	70.18	915.35	74.81	913.93
75.94	913.58	79.10	912.91	79.34	912.87	79.64	912.82	81.78	912.46
82.36	912.36	82.5	912.33	86.32	911.95	89.99	911.57	90.04	911.56
90.29	911.55	94.02	911.17	94.8	911.19	94.82	911.09	95.85	910.99
99.29	910.69	100.92	910.6	102.37	910.49	103.3	910.43	107.11	910.2
107.22	910.2	110.17	910.31	110.74	910.31	112.57	910.28	116.3	910.21
117.33	910.22	119.2	910.14	122.56	910.13	124.04	910.09	125.37	910.05
127.6	909.9	130.39	909.72	130.76	909.7	131.22	909.67	134.4	909.63
135.51	909.7	136.26	909.67	138.91	909.63	139.3	909.62	144.3	909.57
145.73	909.74	147.81	909.76	149.01	909.82	152.95	909.98	153.8	909.96
155.8	909.97	155.93	909.97	156.23	909.94	158.57	909.71	159.66	909.63
160.06	909.61	160.42	909.59	165.54	909.31	167.41	909.28	169.21	909.2
169.93	909.21	173.06	908.92	174.58	908.84	180.08	908.6	181.82	908.53
183.61	908.74	186.1	908.93	188.69	908.97	189.69	909.04	192.18	909.07
193.54	909.05	195.7	909.05	196.6	909.03	198.74	908.85	198.88	908.85
199.1	908.83	200.01	908.84	201.66	908.19	203.08	908	204.51	907.81
205.41	907.61	205.99	907.49	206.99	907.27	209.48	906.73	210.19	906.6
210.9	906.48	212.2	906.49	213.5	906.5	217.66	906.25	217.94	907.03
218.24	908.46	220.56	908.4	222.91	908.84	223.76	908.88	225.08	909.19
227.17	909.58	228.42	909.63	229.08	909.66	233.61	910.29	233.69	910.31
234.96	910.55	236.48	910.82	237.14	911.01	240.65	912.16	245.95	913.86
246.16	913.92	247.95	914.51	248.24	914.6	250.99	915.56	252.66	916.03

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255.31	916.97	256.04	917.35	257.28	917.79	258.76	918.33	262.29	918.9
262.84	919.01	265.86	919.46	266.71	919.55	274.36	921.84	274.79	921.93
274.94	922.01	277.36	923.03	277.83	923.2	279.98	924.11	282.82	925.43
282.97	925.49	283.19	925.59	289.57	928.53	292.67	929.91	296.16	931.92

Manning's n Values	num=	3
Sta n Val	Sta n Val	Sta n Val
0 .05 201.66	.035 218.24	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
201.66	218.24	50.48	50.48	50.48	.1	.3	

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 3097.2

INPUT

Description:

Station Elevation Data	num=	151		
Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev
0 931.671.029999	931.594.659973	931.14 4.98999	931.116.019989	930.89
7.589996 930.5610.53998	929.6114.00998	928.2614.73999	927.8717.39998	926.05
19.19998 924.9220.82999	923.7621.14998	923.5621.33998	923.4622.17999	923.14
23.30998 922.5424.67999	921.7524.79999	921.6927.71999	920.3733.30998	919.43
33.32999 919.4333.34999	919.4233.35999	919.4334.41998	919.5135.70999	919.55
37.65999 919.6138.47998	919.6539.36998	919.6940.46999	919.7142.60999	919.75
45.24998 919.7745.57999	919.7846.53998	919.7849.77998	919.7751.29999	919.78
51.44998 919.7854.64998	919.6656.55998	919.5957.74998	919.2965.75998	916.86
70.32999 915.1773.02998	913.6673.74998	914.1877.84999	913.0980.20999	912.27
82.59999 911.7486.68999	910.7787.01999	910.7588.14998	910.6290.82999	910.43
91.22998 910.4191.85999	910.3695.44998	910.1199.65999	909.96 102.73	909.83
104.81 909.63 105.55	909.59 106.67	909.6 113.82	909.62 114.22	909.64
116.13 909.62 118	909.62 120.6	909.64 120.9	909.64 124.87	909.8
130.63 909.8 131.67	909.73 133.18	909.66 136.81	909.25 137.14	909.24
137.48 909.23 141.43	909.11 144.39	909.15 146.16	909.25 147.26	909.27
148.08 909.26 148.35	909.26 151.17	909.31 152.84	909.34 155.28	909.35
156.07 909.31 158.82	909.37 161.62	909.35 164.2	909.26 167.32	909.26
169.66 909.24 170.85	909.22 171.93	909.19 173.16	909.14 173.47	909.13
175.87 909.08 179.3	908.59 181.42	906.46 182.57	906.17 186.02	906.36
188.93 906.6 194.05	906.18 194.68	906.62 195.31	907.8 200.87	910.15
201.54 910.35 203.9	911.61 204.83	912.05 207.02	913.39 207.04	913.4
207.06 913.41 210.51	915.32 210.99	915.47 212.19	915.9 212.27	915.61
212.7 915.73 213.36	915.82 213.88	916.22 214.28	916.35 215.44	916.66
217.53 917 219.89	917.61 221.66	917.93 221.91	917.99 224.19	918.71
224.64 918.78 226.63	918.96 227.66	919.12 227.75	919.15 227.9	919.2
231.61 920.37 232.21	920.48 233.75	920.85 234	920.93 235.69	921.54

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237.68	922.15	238.99	922.56	240.5	922.9	241.8	923.26	245.83	924.14
245.98	924.16	249.25	924.63	250.62	924.78	251.72	924.95	253.61	925.35
256.46	925.92	258.23	926.39	259.89	926.84	260.46	927.02	261.62	927.36
262	927.48	262.38	927.58	265.1	928.4	265.89	928.79	266.7	929.1
267.61	929.41								

Manning's n Values	num=	3
Sta n Val	Sta n Val	Sta n Val
0 .05	179.3 .035	195.31 .1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
179.3	195.31	107.52	106.1	104.95	.1	.3	

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 2991.1

INPUT

Description:

Station Elevation Data	num=	222		
Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev
0 927.96	.769989 927.813	7.09991 927.116	.019989 926.597	.130005 926.37
9.720001 925.2611	.39999 924.5412	12.23001 924	12.66 923.7313	13.51001 923.32
15.23999 922.4516	.45999 921.7916	16.76999 921.6317	17.45001 921.3619	18.51001 920.58
20.54001 920.6621	.26999 920.721	18.86002 920.7522	33.002 920.8	25.84 921.2
27.35001 921.3327	.79999 921.3628	17.3999 921.38	30.13 921.4130	18.5001 921.4
32.26001 921.41	33.41 921.433	.79999 921.3935	35.001 921.436	.20999 921.41
37.39001 921.4339	.01999 921.4341	29.001 921.31	42.72 921.24	43.94 921.15
45.26999 921.146	.67001 920.8847	.93001 920.34	48.87 919.88	49.36 919.65
51.15001 918.6352	.40001 918.0954	.32001 917.17	55.92 916.6	59.61 915.39
60.15001 915.22	60.56 915.08	62.17 914.6562	.65001 914.53	63.05 914.44
64.13 914.21	65.38 914	67.11 913.68	67.45 913.62	67.67 913.59
70.75 913.1	72.09 912.89	73.7 912.59	74.53 912.42	76.16 912.18
76.21001 912.1776	.49001 912.12	78.48 911.76	78.72 911.7279	.71001 911.54
80.58 911.39	82.37 911.16	86.22 910.59	87.09 910.588	.15001 910.36
88.87 910.28	89.44 910.2393	.60001 909.87	94.88 909.82	95.89 909.78
97.02 909.72	97.53 909.7198	.24001 909.6899	.29001 909.68	103.43 909.64
104.51 909.61	105.62 909.59	107.73 909.59	108.06 909.57	110.09 909.49
113.61 909.41	113.75 909.4	113.89 909.4	115.83 909.29	115.9 909.29
116.17 909.27	119.71 909.05	120.94 909.03	122.22 909.02	122.78 909.02
124.06 909	126.15 909.02	126.49 909.02	126.89 909.04	128.56 909.05
130.26 909.1	132.07 909.14	134.95 909.25	135.78 909.28	136.1 909.29
136.46 909.3	138.25 909.35	138.73 909.36	140.44 909.34	142.05 909.32
143.82 909.3	144.23 909.29	145.81 909.13	149.31 908.51	151.38 907.95
152.13 907	152.88 906.04	155.08 905.16	157.24 905.04	158.86 905.19
160.47 905.34	165.06 905.43	165.21 906.27	167.94 907.77	169.62 907.75

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171.65	908.13	173.35	908.1	173.43	908.11	174.15	908.11	175.53	908.09
178.2	907.88	179.3	907.87	180.62	907.9	180.92	907.92	182.45	907.99
183.69	908.16	185.8	908.56	186.63	908.67	186.96	908.71	188.76	908.93
189.9	909.07	191.35	909.24	192.81	909.43	194.07	909.62	194.97	909.68
196.45	909.74	198.57	909.81	199.99	909.82	202.82	909.99	203.19	909.99
204.16	910.1	207.44	911.11	209.37	911.74	210.03	911.92	210.31	911.93
213.98	913.13	214.05	913.15	214.09	913.17	215.32	913.94	219.13	916.07
219.43	916.2	219.74	916.34	220.45	916.59	223.45	917.47	225.94	918.02
226.24	918.07	226.55	918.14	226.83	918.16	230.56	918.66	231.97	918.88
235.35	920.43	235.68	920.56	236.53	920.88	238.06	921.32	240.2	921.66
241.87	921.81	242.16	921.83	248.77	921.6	250.46	921.54	250.63	921.5
251.87	921.19	252.24	921.12	252.49	921.09	255.05	920.62	257.65	920.29
259.49	920.06	260.17	920.07	261.58	919.95	263.91	920	263.99	920.02
264.03	920.02	264.4	920.06	266.61	920.35	267.07	920.4	270.43	920.5
270.56	920.51	271.33	920.61	274.42	921.04	274.97	921.09	276.31	921.13
277.05	921.12	277.3	921.11	280.55	921.34	281.01	921.4	282.71	921.68
285.29	922.03	285.46	922.05	285.5	922.06	285.96	922.14	287.38	922.37
288.82	922.49	289.53	922.65	289.75	922.69	293.6	923.23	297.69	923.34
297.94	923.34	298.35	923.39	300.44	924.08	301.03	924.32	302.59	924.69
302.85	924.74	303.44	924.84						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 151.38 .035 167.94 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 151.38 167.94 96.51 96.51 96.51 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 2894.59

INPUT

Description:

Station Elevation Data num= 231

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	921.02	6600037	920.822	2999988	920.443	0899996	920.53	3899984	920.52
6.549988	920.636	7599979	920.647	6499994	920.641	0549999	920.651	0989999	920.67
12.269999	920.751	2579999	920.741	3429999	920.761	6509998	920.781	9079999	920.75
20.81	920.742	1429999	920.752	2139998	920.762	2799999	920.752	4350001	920.72
25.909999	920.682	6039999	920.68	27.98	920.63	28.06	920.62	30.34	920.46
30.879999	920.431	9099999	920.233	2989999	920.06	33.25	92034	7999999	919.69
35.17	919.62	35.28	919.593	7019999	919.06	37.61	918.853	8499999	918.38
39.879999	917.85	40.62	917.541	1499999	917.284	3789999	916.154	3959999	916.06
44.45	915.944	5439999	915.73	47.36	915.344	7539999	915.348	0999999	915.2
48.959999	915.03	50.64	914.46	51.64	914.125	2519999	913.825	3759999	913.42

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56.23	912.5857.73999	912.1259.54999	911.4760.32999	911.19	61.36	910.85
62.62	910.564.03999	910.2264.43999	910.1466.32999	909.77	66.78	909.68
66.89999	909.6668.12999	909.48 68.73	909.3968.79999	909.38	70.25	909.22
71.12999	909.1771.79999	909.1272.43999	909.0872.93999	909.0673.70999		909.04
75.89999	908.9776.68999	908.9579.14999	908.9180.89999	908.8881.89999		908.89
83.09	908.9 84.53	908.984.67999	908.89 84.75	908.8986.25999		908.86
87.22	908.8488.25999	908.78 89.97	908.7590.20999	908.74 91.28		908.73
92.2	908.72 92.48	908.7292.59999	908.71 92.92	908.71 95.25		908.64
97.36	908.698.43999	908.56 100.24	908.45 101.39	908.36 102.72		908.26
105.44	907.97 106.79	907.79 107.78	907.74 108.89	907.7 109.77		907.68
112.46	907.62 112.92	907.61 113.79	907.63 116.89	907.6 118.77		907.61
119.01	907.6 119.21	907.6 121.9	907.55 122.61	907.54 123.83		907.51
124.84	907.45 126.24	907.35 127.19	907.29 127.54	907.27 129.33		907.15
132.89	907.2 134.84	907.24 137.71	907.32 138.56	907.37 138.78		907.39
139.26	907.4 140.15	907.39 141.2	907.4 141.89	907.43 143.83		907.44
145.99	907.45 146.98	907.39 147.77	907.41 148.89	907.45 150.08		907.51
150.64	907.55 152.21	907.64 153.52	907.7 157.17	907.24 158.01		907.36
158.53	906.56 159.16	905.59 159.71	905.45 160.85	905.35 161.99		905.26
164.21	905.3 165.88	905.34 167.56	905.37 168.89	905.53 170.25		906.58
172.25	906.58 175.11	906.48 176.52	906.53 177.02	906.31 177.85		906.09
178.14	905.99 178.31	905.94 178.58	906.12 178.65	906.18 178.83		906.31
179.42	906.72 184.95	910.12 185.28	910.66 186.28	912.12 187.03		912.98
187.95	913.77 190.51	916.38 192.31	917.27 193.22	917.62 193.51		917.7
194.24	917.86 197.08	918.48 199.47	918.88 200.36	919.07 201.69		919.32
201.8	919.34 203.18	919.68 208.33	920.81 209.63	921.14 209.91		921.16
211.81	921.68 213.69	922.14 215.07	922.55 216.3	922.84 216.84		923.01
220.1	923.79 220.28	923.83 220.41	923.85 224.4	924.96 225.85		925.48
226.67	925.72 227.7	926.05 228.46	926.28 229.51	926.56 230.83		926.89
232.53	927.27 233.92	927.59 234.53	927.8 235.55	928.03 236.68		928.32
238.62	928.91 238.85	928.99 239.77	929.31 240.73	929.65 241.19		929.81
244.45	930.84 246.26	931.34 246.43	931.38 246.47	931.39 246.54		931.41
249.84	932.12 251.41	932.57 251.86	932.7 252.41	932.83 253.5		932.97
254.36	933.07 254.76	933.13 255.01	933.17 257.86	933.6 259.4		933.61
261.89	933.73 263.4	933.84 264.14	933.88 265.3	933.96 266.43		933.97
268.8	933.93 269.63	933.91 271.09	933.9 273.27	933.72 274.28		933.66
275.28	933.66 276.75	933.73 279.12	933.89 280.2	933.91 280.98		933.92
281.65	933.95					

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 158.53 .035 170.25 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 158.53 170.25 99.96 101.59 105 .1 .3

CROSS SECTION

171-150-Revised-An.rep

RIVER: Bluestone Creek  
 REACH: Align (1)

RS: 2793

INPUT

Description:

Station Elevation Data		num= 185							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	920.08.2099915	920.082.5099979	920.024.289978	920.055.189972	920.05				
6.709991	920.048.689987	920.1110.88998	920.1112.02998	920.1312.22998	920.12				
12.42999	920.1214.10999	920.0314.15999	920.0315.85999	920.0416.69998	920.01				
19.55998	919.9620.43999	919.921.45999	919.8822.73999	919.8123.47998	919.81				
25.11998	919.7127.67999	919.3529.13998	919.0229.17999	919.0129.31999	918.97				
31.23999	918.4832.26999	918.135.82999	916.8638.60999	916.1139.16998	915.99				
39.65999	915.940.65999	915.742.53999	915.3543.47998	915.1544.74998	914.93				
46.36998	914.5746.60999	914.5147.57999	914.2349.11998	913.7850.88998	913.37				
52.00998	913.1452.95999	912.8854.63998	912.355.12999	912.1455.70999	911.9				
56.49998	911.657.94998	911.0558.60999	910.7759.25998	910.5863.59999	909.87				
64.79999	909.6565.94998	909.5566.61998	909.4971.25998	909.3571.42999	909.35				
73.27998	909.2973.54999	909.2773.69998	909.2675.14999	909.1978.43999	909.06				
78.58998	909.0582.28999	909.0583.06999	909.0883.70999	909.0884.37999	909.09				
85.71999	909.1287.13998	909.1187.55998	909.189.83998	908.9890.79999	908.99				
93.96999	908.9794.16998	908.9798.71999	908.7599.79999	908.67	101.9	908.61			
103.15	908.57	105.56	908.44	105.64	908.44	105.86	908.42	107.4	908.34
107.81	908.31	108.84	908.2	109.67	908.11	110.77	908.01	111	907.99
113.1	907.8	115.56	907.57	119.32	907.43	119.47	907.43	120.37	907.39
121.48	907.34	121.6	907.33	123.82	907.09	124.77	907.03	125.78	906.93
126.81	906.94	128.68	907.03	130.27	907.12	131.76	907.14	133.17	907.14
133.99	907.13	134.88	907.12	136.65	907.06	137.69	906.99	140.01	906.81
141.5	906.7	142.63	906.62	143.66	906.65	145.74	906.68	149.91	906.55
151.03	906.71	151.66	905.75	152.29	904.78	152.59	904.6	152.89	904.42
154.86	904.38	156.39	904.47	159.98	904.42	160.39	904.65	162.54	905.19
164.2	905.61	165.36	905.9	166.51	906.19	168.01	906.57	170.65	906.4
173.72	906.52	174.49	906.58	175.84	906.79	177.74	907.11	178.86	907.31
179.76	907.38	180.74	907.62	184.37	908.55	186.07	909.05	186.42	909.22
190.04	910.73	190.5	910.92	192.27	911.55	194.52	912.65	194.62	912.73
195.5	913.11	200.75	914.98	201.28	915.03	205.25	916.44	206.27	916.47
206.51	916.53	209.83	917.57	213.03	918.33	213.9	918.58	214.12	918.65
215.57	919.02	216.29	919.23	216.38	919.24	217.05	919.48	218.63	919.84
219.47	919.9	222.98	920.5	223.26	920.53	225.43	920.94	225.46	920.94
225.5	920.95	227.53	921.56	227.66	921.6	229.07	921.99	230.55	922.42
233.38	923.38	235.88	924.14	236.14	924.22	236.46	924.31	238.83	925.06
243.49	926.28	245.15	926.55	245.66	926.63	246.01	926.66	246.98	926.94
250.74	928.25	251.35	928.45	252.27	928.69	252.9	928.85	255.38	929.44
256.75	929.66	258.27	929.89	260	930.12	261.53	930.34	262.83	930.52

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.05	151.03	.035	168.01	.1



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Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 151.03 168.01 100.29 100.29 100.29 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 2692.71

INPUT

Description:

Station Elevation Data num= 204

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	918.87	5200195	918.471	309998	917.721	990021	917.053	790009	915.9
4.920013	916.07	6.5	916.088	300018	916.3711	80002	916.77	14.44	916.79
15.22	916.8	16.38	916.8516	92999	916.8618	24002	916.9418	48001	916.95
21.75	917.0123	64001	917.0524	39001	917.0725	46001	917.0827	14001	917.07
29	917.0429	40001	917.0432	34001	916.95	34.69	916.8736	40001	916.84
36.59001	916.84	37.25	916.8338	35001	916.838	98001	916.7941	85001	916.76
43.33	916.743	89001	916.744	06001	916.69	45.72	916.5849	09001	916.06
49.11	916.0549	14001	916.0554	34001	915.1554	39001	915.1454	49001	915.1
56.45001	914.28	57.05	914.0558	87001	913.3159	45001	913.0960	59001	912.68
61.04001	912.5261	68001	912.2564	79001	910.99	65.11	910.8565	99001	910.52
68.07001	909.6769	12001	909.33	71.19	909.1	72.05	909.02	73.88	908.84
76.47	908.7277	03001	908.7178	70001	908.63	79.13	908.679	48001	908.6
82.64001	908.43	83.08	908.3983	70001	908.3685	54001	908.2286	68001	908.14
87.02	908.1287	18001	908.11	88.36	908.06	90.27	907.9991	06001	907.97
91.62001	907.96	94.88	907.9198	03001	907.87	98.05	907.8799	71001	907.89
102.08	907.86	102.76	907.87	103.14	907.86	106.64	907.81	106.78	907.8
106.95	907.8	108.71	907.71	110.77	907.63	111.95	907.58	113.25	907.55
113.33	907.55	113.88	907.54	118.35	907.5	120.51	907.47	121.18	907.47
125.66	907.44	125.89	907.44	127.33	907.45	129.58	907.46	130.02	907.44
131.26	907.4	132.43	907.38	134.06	907.32	134.82	907.29	135.95	907.25
136.67	907.22	138.17	907.17	138.8	907.15	140.23	907.07	140.68	907.04
140.79	907.04	144.17	906.88	145.81	906.78	147.97	906.71	149.9	906.68
150.4	906.67	150.82	906.66	153.81	906.61	154.17	906.61	156.69	906.47
158.38	906.36	159.67	906.28	159.93	906.26	160.41	906.23	161.67	906.09
162.06	906.06	164.29	905.83	167.3	905.9	168.99	905.99	172.18	906.13
174.58	905.03	175.47	904.62	176.97	903.93	177.46	903.69	178.61	903.67
179.76	903.66	181.33	903.8	182.9	903.93	183.76	904.79	184.61	905.65
185.52	905.47	188.87	905.45	190.04	905.46	190.78	905.42	192.62	905.48
194.1	905.63	196.43	905.5	197.61	905.69	198.44	905.74	200.35	906
201.06	906.11	201.66	906.11	203.76	906.04	205.22	906.3	206.15	906.47
206.85	906.68	207.91	906.99	209.26	907.47	210.59	908.15	212.96	909.58
213.19	909.78	213.6	910.1	214.13	910.53	215.5	911.37	219.34	913.6
220.42	914.01	224.48	915.53	224.5	915.55	224.56	915.57	229.06	917.43
230.15	917.7	231.12	917.92	232.59	918.31	232.72	918.34	233.04	918.42

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235.14	918.89	237.46	919.41	238.42	919.57	239.53	919.71	240.6	919.88
241.66	920.04	242.71	920.21	243.63	920.42	244.04	920.51	245.58	920.82
247.65	921.17	249.93	921.58	252.74	922.15	253.06	922.21	253.69	922.3
256.85	922.81	258.29	923.22	258.91	923.46	259.48	923.63	261.52	924.31
262.54	924.58	263.35	924.8	265.55	925.48	266.53	925.77	268.55	926.3
270.44	927.08	272.59	927.96	273.01	928.12	273.38	928.29	275.06	928.98
275.54	929.24	276.39	929.63	277.36	929.88	278.32	930.12		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	172.18	.035	184.61	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	172.18	184.61		103.1	101.44	100.42	.1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 2591.27

INPUT

Description:

Station Elevation Data num= 226

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	919.082	190002	918.77	2.72998	918.694	709991	918.555	779999	918.3
7.859985	918.029	130005	917.75	10.81	917.5913	63998	917.2214	20999	917.16
14.47	917.1216	25998	916.7216	29001	916.7216	47998	916.6920	23999	916.1
20.85001	916.08	22.47	916.0523	51999	916.0125	04001	915.9726	26999	915.81
29.00998	915.36	32	915.01	35.92	914.3436	04999	914.3237	25999	914.21
38.34	914.11	38.47	914.1	40.87	913.82	41.61	913.7542	95999	913.63
43.54999	913.5646	56999	913.43	47.42	913.38	48.62	913.2349	68999	913.08
51.7	912.8352	03999	912.852	89999	912.7353	82999	912.66	54.09	912.64
54.82999	912.61	56.17	912.5759	03999	912.4559	50999	912.47	60.78	912.58
61.47	912.6361	65999	912.64	63.09	912.69	64.59	912.71	66.06	912.73
67.23	912.7567	98999	912.7669	95999	912.75	70.03	912.7571	56999	912.7
72.95999	912.6875	20999	912.69	76.56	912.7177	34999	912.7477	78999	912.75
82.67999	911.1984	01999	910.8584	25999	910.7184	87999	910.4385	81999	910.02
86.26999	909.8787	51999	909.51	89.28	909.2291	39999	908.9592	12999	908.99
92.61	909.03	93.39	909.0594	67999	909.0695	62999	909.0596	32999	909.02
98.45999	908.9599	23999	908.92	100.51	908.87	103.12	908.81	103.53	908.8
103.73	908.79	106.68	908.73	108.49	908.81	109.38	908.85	109.79	908.87
111.23	908.98	111.52	909	111.79	909.02	114.76	909.2	116.6	909.38
117.45	909.44	118.21	909.49	119.6	909.6	120.63	909.62	122.65	909.61
125.26	909.58	125.61	909.57	126.11	909.58	128.56	909.66	130.14	909.69
131.53	909.74	133.38	909.77	133.63	909.78	136.16	909.6	136.9	909.56
137.46	909.52	138	909.5	139.51	909.32	143.43	908.79	144.79	908.67
145.96	908.46	148.13	908.14	148.63	908.05	149.85	907.73	149.98	907.72

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153.43	907.39	154.31	907.32	155.8	907.1	157.11	906.89	158.05	906.83
159.47	906.71	160.34	906.63	161.49	906.54	163.16	906.43	163.51	906.4
163.94	906.36	165.35	906.22	166.64	906.02	166.93	905.97	168.28	905.7
168.79	905.61	170.57	905.26	170.91	905.2	171.29	905.18	173.13	905.04
174.62	904.97	175.88	904.91	176.39	904.9	183.46	904.9	184.24	904.87
185.04	904.86	185.45	904.85	186.38	904.84	187.42	904.87	191.07	904.71
191.8	903.87	192.54	903.03	193.12	902.89	196.54	902.94	197.51	902.93
200.01	902.91	200.49	902.92	200.98	902.93	202.49	903.31	205.41	903.64
205.52	903.66	206.32	903.7	209.59	903.88	209.64	903.88	211.04	903.92
211.29	903.94	211.69	903.93	212.83	903.94	213.34	903.92	216.01	904.11
217.02	904.18	218.64	904.71	218.85	904.75	218.93	904.76	219.12	904.79
219.29	904.91	222.91	908.06	224.11	909.59	224.15	909.64	224.17	909.67
224.22	909.75	226.65	913.33	230.09	917.17	230.27	917.33	232.41	918.05
236.13	919.34	236.17	919.35	236.57	919.37	239.28	919.46	239.49	919.47
241.91	919.8	243.07	919.99	243.97	920.31	244.83	920.64	247.25	921.66
247.59	921.81	248	921.98	249.92	922.55	251.7	923.1	252	923.2
252.16	923.24	253.77	923.69	255.44	924	257.7	924.42	258.17	924.52
258.35	924.54	259.89	924.94	260.4	925.07	261.68	925.41	262.46	925.61
262.5	925.63	262.54	925.64	262.59	925.65	265.59	926.45	265.7	926.48
267.99	927.38	269.4	927.85	270.11	928.09	270.24	928.15	270.66	928.3
272.52	928.99	275.52	930	276.45	930.33	277.65	930.74	279.1	931.09
279.59	931.21	279.93	931.3	282.01	931.95	283.54	932.4	283.58	932.41
285.65	933								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 191.07 .035 218.64 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 191.07 218.64 47.53 50.98 55.1 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 2540.29

INPUT

Description:

Station Elevation Data num= 269

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	917.552	829987	916.653	799988	916.435	359985	916.036	799988	915.74
7.339996	915.638	720001	915.339	640015	915.291	0.82001	915.09	12.5	914.85
13.22	914.815	42999	914.671	6.73001	914.591	8.07001	914.361	9.60001	914.21
19.95999	914.18	22.47	913.932	2.95999	913.88	23.41	913.842	3.64999	913.81
26.59	913.43	27.37	913.4	30.19	912.923	0.32999	912.91	31.97	912.83
32.79999	912.79	32.84	912.793	2.89001	912.783	5.89999	912.333	7.82999	912.2
38.54001	912.123	9.07999	912.14	39.63	912.154	1.98999	912.24	45	912.06

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45.95001	912.04	47.81	911.71	48.56	911.51	48.78	911.4849.73999	911.25	
50.14001	911.1750.29999		911.1551.20001		911.0552.60999		910.9153.07001	910.89	
56.53	911.08	57.66	911.21	58.47	911.28	59.81	911.3962.29001	911.35	
62.78	911.3463.60999		911.32	66.72	911.28	66.91	911.29	68.16	911.31
69.34	911.3270.57001		911.3374.73001		911.3976.17001		911.3977.04001	911.38	
79.81	911.3380.17001		911.3280.45001		911.32	82.63	911.383.42999	911.33	
85.03	911.3885.57999		911.3786.20999		911.3887.79001		911.05	90.16	909.97
92.45001	909.01	92.72	908.8395.14001		907.54	95.19	907.51	95.31	907.48
100.08	907.05	101.85	907.12	103.14	907.17	103.95	907.19	105.32	907.24
106.42	907.27	110.1	907.54	110.39	907.56	110.51	907.56	110.79	907.59
112.45	907.76	113.36	907.9	114.55	908.09	115.24	908.17	117.83	908.47
119.21	908.55	120.33	908.58	122.76	908.65	123.85	908.68	124.65	908.7
126.41	908.72	127.59	908.7	128.46	908.73	128.55	908.73	128.97	908.71
132.47	908.65	134.77	908.6	139.88	908.03	140.93	907.94	143.33	907.65
144.88	907.44	145.75	907.35	146.46	907.29	147.85	907.1	150.04	906.94
151.04	906.8	153.77	906.61	154.72	906.54	155.71	906.5	156.49	906.49
158.55	906.44	159.74	906.43	161.52	906.41	163.89	906.26	164.88	906.19
166.14	906.04	166.59	905.99	166.78	905.96	170.34	905.3	171.19	905.13
173.21	904.96	174.21	904.84	174.51	904.8	175.05	904.74	176.67	904.72
177.37	904.71	177.92	904.71	178.69	904.69	179.54	904.68	181.22	904.62
182.97	904.56	185.41	904.52	187.49	904.51	189.48	904.51	191.02	904.52
192.11	904.51	192.46	904.53	194.27	904.61	195.81	904.61	196.77	904.6
198.44	904.53	201.17	904.28	201.44	904.26	203.31	903.77	204.39	902.97
205.1	902.62	207.19	902.58	209.66	902.46	212.9	902.65	214.97	902.96
215.57	904.87	216.17	906.77	218.75	909.05	219.46	909.45	220.29	909.9
222.94	911.35	224.4	911.68	224.76	911.79	228.19	912.86	229.3	913
230.1	913.1	231.62	913.19	234.13	913.52	234.91	913.71	236.3	914.09
237.03	914.27	237.57	914.38	239.73	914.79	242.52	915.09	243.81	915.26
244.79	915.36	245.33	915.42	245.46	915.43	247.45	915.61	250.01	915.97
251.82	916.08	252.25	916.11	253.78	916.28	254.45	916.35	257.4	916.74
258.11	916.83	259.12	916.99	261.07	917.19	261.82	917.23	262.56	917.31
263.09	917.31	263.65	917.34	264.11	917.41	266.23	917.72	268.11	917.96
268.55	918	268.9	918.03	269.37	918.06	272.48	918.22	272.55	918.23
274.51	918.62	275.61	918.85	275.72	918.87	276.84	919.13	278.3	919.33
279.82	919.49	281.5	919.65	282.72	919.75	283.18	919.79	283.41	919.81
286.83	920.41	287.53	920.45	290.13	920.79	291.61	920.96	293.24	921.09
294.69	921.25	295.26	921.28	296.66	921.32	298.18	921.41	300.33	921.41
300.4	921.4	301.41	921.37	302.81	921.03	304.15	920.8	306.62	920.55
307.01	920.51	307.75	920.43	308.44	920.31	309.06	920.18	310.45	919.94
311.13	919.83	313.02	919.66	313.08	919.65	313.1	919.65	315.6	919.19
316.9	918.96	317.24	918.88	317.49	918.82	319.44	918.39	320.41	918.31
322.1	918.19	323.6	918.26	325.52	917.99	329.36	917.58	329.57	917.56
329.97	917.52	331.5	917.45	334.25	917.33	334.61	917.31	334.78	917.3
335.09	917.27	337.14	917.07	339.37	917.92	340.51	918.2	341.69	918.44
342.57	919.12	342.79	919.2	343.17	919.5	344.13	920.06	345.04	920.34
346.5	921.03	347.78	921.35	348.6	921.42	351.04	921.69	351.11	921.69
351.15	921.7	352.79	921.92	353.99	922.37	355	922.71		

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Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 198.44 .035 215.57 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 198.44 215.57 59.68 59.68 59.68 .1 .3

Ineffective Flow num= 1  
 Sta L Sta R Elev Permanent  
 0 128.46 920 F

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 2480.61

INPUT

Description:

Station Elevation Data num= 205

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	919.9700012	918.61.880005	918.243.679993	917.675.789978	917.07				
8.289978	916.358.319977	916.3511.48999	915.6613.22998	915.2514.76999	914.96				
15.41998	914.8216.42999	914.5817.10999	914.4218.75998	914.0420.50998	913.63				
23.00998	913.0724.82999	912.7226.35001	912.47 26.88	912.3928.01999	912.27				
29.12	912.15 31.06	911.94 31.2	911.9231.43999	911.88 33.59	911.59				
34.60999	911.4535.95999	911.1836.15999	911.1536.95999	911.0240.25999	910.48				
41.2	910.36 43.62	910.12 45.23	910.01 45.67	910.0246.35999	910.04				
50.28	910.19 50.7	910.1851.49998	910.1452.65999	910 53.73	909.89				
54.60999	909.7756.00999	909.6856.34999	909.6556.92999	909.6458.38998	909.58				
60.09999	909.49 60.31	909.4763.84999	909.2464.06999	909.2164.50999	909.28				
67.84999	909.8368.75999	909.96 69.81	910.1871.79999	910.28 73.03	910.3				
73.51999	910.374.63998	910.3177.68999	910.2779.57999	910.3280.53999	910.34				
81.60999	910.3785.06999	910.3885.10999	910.3886.62999	910.3490.07999	910.43				
90.50999	910.4490.68999	910.4591.48999	910.593.84999	910.7194.50999	910.91				
95.49998	911.195.95999	911.1697.37999	910.9599.56999	910.94 100.92	910.83				
104.31	909.38 105.13	908.97 105.53	908.73 106.94	907.81 110.04	906.73				
111	906.36 111.2	906.32 113.15	906.43 114.27	906.49 115.45	906.6				
115.94	906.64 115.99	906.64 118.85	906.87 120.07	906.95 120.08	906.95				
120.28	906.96 122.53	907.06 122.69	907.07 124.87	907.28 125.67	907.34				
126.62	907.42 126.9	907.43 128.14	907.43 128.58	907.47 130.1	907.52				
132.55	907.6 133.79	907.64 134.39	907.63 136.49	907.57 137.2	907.5				
139.64	907.12 139.87	907.09 144.12	906.44 145.21	906.4 146.79	906.42				
148.85	906.34 150.01	906.31 151.02	906.25 151.73	906.22 152.95	906.16				
153.65	906.09 155.82	905.87 158.15	905.58 159.24	905.31 160.66	904.76				
161.08	904.32 162.28	903.61 163.4	902.94 165.72	901.55 167.77	901.31				
169.81	901.08 174	900.48 176.67	900.01 179.87	900.07 180.41	900.08				
180.65	900.09 181.05	900.1 183.06	900.14 188.57	900.21 189.85	900.88				
191.13	901.56 192.99	905.84 195.99	907.97 196.66	908.73 196.84	908.84				

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197.95	909.45	198.82	909.95	199.7	910.48	201.07	911.12	206.18	912.59
208.53	912.81	208.85	912.85	209.03	912.83	209.96	912.71	211.72	912.63
213.44	912.59	214.18	912.57	216.39	912.58	217.11	912.58	219.5	912.79
219.81	912.83	220.06	912.87	223.06	913.39	224.21	913.8	228.59	915.37
228.95	915.53	229.52	915.71	230.1	915.93	231.73	916.45	233.77	917.13
234.34	917.3	234.96	917.49	236.39	917.92	238.32	918.4	238.88	918.53
240.38	918.88	240.63	918.94	240.71	918.96	242.56	919.51	243.05	919.68
245.79	920.42	247.64	920.85	248.07	920.97	248.65	921.08	249.87	921.35
250.41	921.44	251.04	921.59	253.75	922.07	257.22	922.35	258.46	922.43
259.15	922.38	260.55	922.58	261.51	922.65	262.07	922.7	264.11	922.55
265.85	922.72	267.18	922.52	267.99	922.52	270.57	922.4	271.62	922.7
273.7	923.48	275.52	923.69	276.73	923.82	277.91	923.91	279.44	924
280.64	924.03	282.44	924.23	283.09	924.24	283.35	924.27	283.46	924.28

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	165.72	.035	191.13	.1

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

165.72	191.13	74.5	95.65	117.1	.1	.3
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Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	133.79	920	F

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 2384.96

INPUT

Description:

Station Elevation Data num= 284

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	923.06	.25	922.96	.960022	922.753	1.50024	921.93	4.30023	921.83
3.680023	921.715	7.20001	920.896	0.29999	920.776	1.20026	920.747	2.40021	920.36
9.900024	919.271	11.01001	918.77	11.91	918.421	13.73001	917.81	15.53	917.26
16.29001	917.111	18.01001	916.771	19.55002	916.572	21.10001	916.222	23.30002	915.81
23.62003	915.362	24.08002	915.242	24.61002	915.03	27.13	913.942	29.21002	913.13
29.49002	913.033	30.27002	912.753	32.89001	911.773	33.09003	911.673	33.80002	911.39
35.96002	910.583	36.83002	910.243	39.46002	909.344	40.15002	909.064	40.96002	908.67
42.82001	908.05	43.19	907.93	43.91	907.7	45.28	907.27	45.66	907.17
46.23001	907.11	49.03	906.78	49.41	906.765	49.74002	906.751	51.001	906.68
53.48001	906.665	54.04001	906.655	54.54001	906.645	56.48001	906.495	58.17001	906.41
58.56	906.386	60.12003	906.556	60.98001	906.62	62.69	906.716	63.30002	906.88
65.13	906.93	66.78	906.976	68.37003	906.866	68.52002	906.856	68.59003	906.85
68.65002	906.846	68.73001	906.836	69.82001	906.78	70.56	906.747	71.67001	906.65
73.26001	906.547	75.05002	906.32	76.97	906.28	79.75	906.25	80.38	906.26

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81.90002	906.4682.11002	906.49	83.72	906.8685.21002	907.26	88.03	907.82
88.70001	90889.51001	908.1892.07001	908.1894.32001	908.0994.73001	908.08		
96.74002	907.9297.42001	907.8898.80002	907.88	100.82	907.86	101.94	907.86
103.09	907.87	104.8	907.79	106.22	907.8	108.76	907.95
108.79	907.96	108.8	907.96	108.85	907.97	111.52	908.48
113.35	908.66	113.69	908.6	115.47	908.43	116.32	908.38
120.01	908.07	120.27	908.05	120.49	908.05	122.33	907.98
123.06	907.94	123.16	907.92	124.84	907.75	127.48	907.48
130.58	907.08	132.17	906.84	132.36	906.81	132.96	905.05
135.81	904.76	138.43	904.5	139.5	904.39	141.23	904.21
144.24	903.91	145.65	903.77	147.15	903.62	149.45	903.36
153.64	902.83	155.11	902.65	156.7	902.45	157.45	902.35
160.3	901.99	161.41	901.85	162.88	901.73	164.44	901.59
167.46	901.33	169.94	901.32	172.95	901.32	174.93	901.31
177.95	901.3	179.77	901.3	182.03	901.29	182.96	901.29
185.09	901.3	186.85	901.4	188.21	901.47	189.19	901.53
193.09	901.75	194.62	901.84	195.23	901.89	195.72	901.93
198.02	902.11	199.73	902.25	201.25	902.37	203.45	902.55
206.79	902.84	209.09	903.04	210.06	903.13	211.24	903.24
215.13	903.59	216.61	903.72	217.86	903.83	219.51	903.98
221.49	904.16	221.58	904.17	222.1	904.22	223.54	904.45
226.39	904.9	227.32	905.05	228.12	905.18	229.08	905.32
231.2	905.62	233.1	905.88	233.92	906	235.8	906.26
238.61	906.65	238.89	908.06	240.49	908.22	242.25	908.39
244.33	908.64	245.19	908.65	246.46	908.69	248.34	908.82
252.98	908.83	253.03	908.84	253.09	908.83	255.48	908.87
257.96	908.99	258.55	909.06	259.08	909.11	260.97	909.22
261.15	909.24	261.27	909.25	262.88	909.41	263.63	909.49
266.36	909.87	267.57	910.01	269.3	910.1	271.88	910.27
272.21	910.29	272.62	910.29	276.95	910.26	278.04	910.26
280.96	910.27	281.9	910.27	282.76	910.26	283.9	910.25
286.51	910.22	287.12	910.13	291.45	909.81	292.48	909.7
294.17	909.62	294.9	909.41	295.66	909.36	301.86	909.61
302.33	909.61	303.57	910.01	303.94	910.12	304.78	910.36
308.79	911.68	309.79	912.05	309.9	912.09	311.29	912.7
315.43	913.99	316.13	914.2	317.16	914.48	317.6	914.55
321.03	915.21	321.27	915.26	323.26	915.42	324.48	915.51
331.55	915.87	332.13	915.91	332.39	915.91	332.66	915.93
336.66	916.21	338.26	916.37	340.44	916.62	340.89	916.68
343.09	916.94	345.28	917.34	346.15	917.49	347.44	917.69
349.77	917.96	351.29	918.16	353.85	918.48	356.53	918.98
359.03	919.4	359.69	919.55	360.32	919.7	362.64	920.15
362.91	920.2	364.31	920.35	365.11	920.52	366.2	920.66

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 0 .1 159.07 .035 198.02 .05

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Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 159.07 198.02 26.15 26.15 26.15 .1 .3

Ineffective Flow num= 1  
 Sta L Sta R Elev Permanent  
 0 112.39 915 F

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 2358.81

INPUT

Description:

Station Elevation Data		num= 265									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	922.43	.730011	922.171	720001	921.822	.339996	921.643	.589996	921.3		
4.76001	921.016	.149994	920.337	.070007	919.95	8.5	919.321	.26001	918.7		
11.91	918.07	13.56	917.481	.08002	917.011	.32001	916.72	17.66	916.45		
20.77002	915.48	21.53	915.262	.45999	914.952	.23001	914.692	.57001	913.92		
26.77002	913.462	.08002	912.982	.98001	912.263	.77002	911.973	.49002	911.69		
31.75	911.58	33.41	910.93	35.59	910.14	35.87	910.04	36.47	909.8		
40.23001	908.414	.02002	908.14	41.22	908.08	41.34	908.04	41.72	907.95		
46	906.66	47.59	906.548	.92001	906.375	.29001	906.345	.79001	906.27		
52.37	906.26	53.94	906.2	55	906.215	.77002	906.225	.42001	906.27		
60.82001	906.336	.98001	906.336	.08002	906.346	.17999	906.34	62.34	906.33		
65.89001	906.31	66.22	906.296	.60001	906.270	.14999	906.157	.20001	906.02		
73.08002	905.977	.432001	905.947	.51001	905.947	.83002	905.927	.45999	905.81		
78.35001	905.857	.67999	905.938	.80002	905.98	81.16	906.02	83.03	906.19		
85.42999	906.728	.45999	906.728	.92001	906.83	87.53	907.24	87.62	907.26		
88.16	907.34	88.25	907.338	.70999	907.299	.54001	907.139	.39999	907.04		
95.70001	907.12	98.33	907.1	101.32	907.09	103.78	906.95	104.36	906.92		
105.64	906.85	106.87	906.75	107.28	906.74	107.66	906.74	108.21	906.73		
110.44	904.82	110.91	904.74	111.53	904.65	112.71	904.46	113.55	904.33		
115.18	904.07	118.01	903.62	120.01	903.31	121.16	903.12	121.94	903		
123.03	902.83	124.74	902.69	126.18	902.57	126.98	902.51	128.61	902.37		
130.16	902.25	131.17	902.16	131.92	902.1	132.87	902.02	134.21	901.91		
135.98	901.77	137.66	901.63	138.51	901.61	139.02	901.6	140.37	901.56		
141.04	901.54	141.97	901.51	144	901.46	145.35	901.42	147.49	901.36		
148.76	901.34	149.75	901.33	151.57	901.32	153.58	901.3	155.69	901.29		
159.46	901.25	161.41	901.24	162.39	901.23	164.84	901.21	165.62	901.2		
166.61	901.2	167.37	901.19	168.49	901.18	170.67	901.41	173.01	901.66		
174.22	901.79	175.32	901.91	176.85	902.07	178.85	902.28	181.08	902.52		
182.74	902.7	184.79	902.93	186.23	903.1	188.37	903.34	189.68	903.49		
190.84	903.62	192.06	903.76	193.05	903.88	193.85	903.97	194.85	904.08		
195.92	904.21	197.43	904.38	198.37	904.49	199.05	904.57	199.3	904.59		
202.1	904.86	203.28	904.97	205.8	905.21	206.52	905.28	207.31	905.36		
209.24	905.54	210.06	905.62	211.23	905.73	212.99	905.9	213.55	905.97		



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216.59	906.37	217.42	906.48	218.33	906.6	219.65	906.78	220.87	906.94
222	907.09	224	907.35	225.25	907.52	226.57	907.69	228.74	907.98
229.9	907.72	230.27	907.72	230.31	907.73	233.49	907.84	233.66	907.86
233.91	907.91	235.83	908.01	237.35	908.33	238.62	908.44	239.39	908.39
240.91	908.71	243.47	909.27	243.96	909.26	244.17	909.28	244.49	909.32
244.75	909.34	250.28	909.35	251.15	909.33	253.24	909.6	255.82	910.11
257.23	910.29	259.08	910.49	259.98	910.56	260.32	910.6	261.14	910.72
262.25	910.78	263.59	910.84	266.31	910.93	266.52	910.93	269.01	911.05
270.53	911.11	270.63	911.12	270.71	911.12	272.87	911.25	274.76	911.37
275.04	911.38	276.64	911.49	278.51	911.57	278.63	911.58	278.74	911.58
279.97	911.65	281.2	911.68	286.81	911.79	288.96	911.79	289.14	911.8
290.23	911.76	291.01	911.74	291.21	911.74	294.54	911.71	297.01	911.67
297.66	911.67	300.34	911.65	302.69	911.63	303.69	911.6	304.49	911.58
305.63	911.52	306.16	911.43	306.57	911.35	307.47	911.21	308.59	911.05
309.14	910.99	313.43	910.6	314.84	910.37	315.09	910.41	316.17	910.77
317.06	911.15	319.04	911.88	319.25	911.94	319.89	912.19	322.75	913.27
323.03	913.38	325.26	914.07	326.93	914.6	327.34	914.75	328.89	915.15
329.83	915.32	331.55	915.55	332.08	915.61	333.35	915.69	334.28	915.78
337.01	916.19	338.74	916.45	339.07	916.49	340.83	916.76	341	916.79
342.89	917.17	344.23	917.35	344.83	917.44	345.26	917.51	348.86	918.11
350.48	918.45	352.86	918.86	353.35	918.94	353.64	919.01	353.85	919.05

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	131.92	.035	176.85	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	131.92	176.85		127.91	100.28		.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	95.7	915	F

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 2258.53

INPUT

Description:

Station Elevation Data num= 210

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	922.4	4799805	922.291	329987	922.032	429993	921.783	570007	921.54
5.910004	921.086	679993	920.936	880005	920.921	0.23999	920.7	10.31	920.69
11.35001	920.651	2.44998	920.58	15.72	920.261	7.57001	920.118	67999	919.96
19.20999	919.920	2.5998	919.682	2.51999	919.28	23.19	919.09	24.62	918.64
25.87	918.28	27.03	917.86	29.47	917.023	0.32999	916.713	1.98999	916.02
34.40999	914.88	36.25	914.013	6.54999	913.87	37.39	913.48	39.23	911.93

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41.40999	909.66	41.84	908.6542.76999	907.445.00999	904.9746.10999	904.29
48.43999	903.3449.17999		903.4250.18999	902.5351.20999	901.63	52.39
53.56999	901.37	56.84	901.458.48999	901.2260.31999	901.03	61.31
62.01999	901.07	63.73	901.1265.25999	901.2565.90999	901.3	67.03
68.56999	901.7469.29999		901.9170.10999	902.0972.39999	902.9373.46999	903.07
73.5	903.07	75.56	903.35	78.67	903.54	79.17
80.06	903.7381.71999		903.68	85.17	903.7187.10999	903.7389.98999
91.03	903.8791.43999		903.9	91.7	903.9393.18999	904.03
95.06999	904.11	96	904.1298.10999	904.2	98.34	904.2
99.09	904.23	100.73	904.27	102.08	904.29	103.41
107.07	904.34	108.92	904.29	109.69	904.25	111.65
114.15	904.07	114.68	904.03	115.86	903.97	116.78
117.74	903.81	121.82	903.94	122.02	903.98	123.37
124.9	904.36	125.25	904.41	127.96	904.87	129.72
131.59	904.94	132.26	904.95	132.46	904.91	138.43
139.66	904.3	143.71	903.89	144.12	903.89	145.97
148.33	903.99	148.54	904.01	148.79	904.03	151.37
155.2	904.1	156.41	904.13	157.73	904.13	159.56
160.86	904.3	162.12	904.36	163.02	904.38	166.41
166.59	904.71	166.64	904.71	170.35	905.06	172.11
173.91	905.53	174.39	905.63	176.64	905.89	177.13
177.41	906	177.64	906.1	185.01	909.46	185.02
189.5	910.62	192.43	910.78	194.99	910.89	195.14
199.03	911.31	200.67	911.45	203.19	911.58	203.8
208.56	911.81	209.64	911.84	209.71	911.84	212.68
215.12	912.04	217.17	912.09	218.9	912.12	219.83
221.56	912.19	222.98	912.19	223.51	912.18	223.98
229.33	912.14	230.44	912.12	231.98	912.06	233.49
237.17	911.79	238.11	911.76	239.41	911.67	242.2
243.64	911.18	243.79	911.14	247.62	910.57	249.81
252.61	911.93	254.18	912.51	254.89	912.77	255.63
257.69	913.75	259.48	914.6	259.7	914.72	259.86
264.45	915.96	265.55	916.18	268.94	916.79	269.19
270.51	916.99	271.67	917.23	272.44	917.37	274.96
278.69	918.35	281.4	918.76	281.97	918.86	284.12
284.95	919.38	286.51	919.73	287.24	919.9	288.29
					920.12	288.93
						920.21

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .149.17999 .035 75.56 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 49.17999 75.56 61.13 59.37 57.75 .1 .3

CROSS SECTION

RIVER: Bluestone Creek

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REACH: Align (1)

RS: 2199.16

INPUT

Description:

Station Elevation Data

num= 214

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	923.02	1300049	923.01	8399963	922.931	279999	922.891	779999	922.8
4.130005	922.455	699982	922.295	850006	922.276	669983	922.217	639984	922.12
10.09	921.96	10.37	921.93	11.72	921.7613	17999	921.4914	60999	921.29
15.60001	921.1117	16998	920.8919	50998	920.2620	04999	920.1420	32001	920.08
24.10001	918.99	24.84	918.827	53998	918.18	27.59	918.1728	40999	917.94
29.09999	917.7529	15999	917.7430	59999	917.34	32.03	916.7933	20999	916.31
33.87999	916.1635	79999	915.4837	20999	914.9438	37999	914.4639	62999	914.02
40.09999	913.84	43.87	912.5844	03999	912.52	44.12	912.4946	23999	911.33
46.31999	911.2546	42999	911.1147	53999	909.64	47.62	909.5748	04999	908.9
49.14999	907.1650	75999	905.54	51.37	905.2252	01999	904.9853	06999	904.48
54.17	904.2754	98999	904.13	56.03	903.8	57.73	903.558	85999	903.33
61.53999	902.862	78999	900.57	65.12	899.7967	82999	899.62	70.67	899.62
74.50999	899.5878	09999	899.6778	64999	900.0979	37999	900.4980	10999	900.89
80.98999	903.27	85.75	903.6686	93999	903.66	87.78	903.6	88.42	903.58
90.31	903.5290	75999	903.4992	12999	903.37	93.23	903.2894	71999	903.2
94.98999	903.296	71999	903.2597	59999	903.28	100.49	903.35	100.75	903.34
100.91	903.35	102.3	903.42	102.77	903.45	104.32	903.45	105.92	903.44
106.42	903.43	107.74	903.38	108.79	903.33	109.08	903.32	110.42	903.28
112.31	903.19	113.08	903.16	114.02	903.19	116.28	903.22	118.86	903.34
121.84	903.45	122.44	903.5	123.69	903.6	125.18	903.75	128.07	903.79
130.43	903.86	132.7	903.9	134.45	903.83	135.19	903.8	135.4	903.79
138.76	903.63	140.13	903.7	140.69	903.73	141.17	903.76	142.08	903.8
143.06	903.83	144.47	903.82	146.91	903.89	148.45	903.85	149.1	903.83
150.22	903.79	152.06	903.78	153.03	903.79	155.27	903.99	156.29	904.09
157.02	904.18	157.18	904.2	159.9	904.52	162.06	904.71	164.95	904.98
166.06	905.05	167.7	905.12	168.24	905.11	169.91	905.12	170.91	905.23
172.07	905.37	173.96	905.73	174.83	905.86	176.63	905.98	176.67	905.98
177.84	906.07	178.63	906.11	179.28	906.14	180.93	906.6	183.7	907.56
184.02	907.75	184.77	908.23	185.1	908.45	186.23	909.22	186.59	909.45
190.3	911.14	190.58	911.25	191.29	911.43	191.82	911.56	195.95	912.21
196.36	912.27	196.77	912.27	197.41	912.24	200.13	912.15	201.76	912.07
203.14	912.11	204.24	912.16	206.9	912.19	208.64	912.2	208.92	912.21
210.47	912.24	211.75	912.28	213.2	912.34	214.55	912.39	215.37	912.41
216.61	912.45	216.9	912.46	219.14	912.53	219.81	912.53	220.92	912.55
221.97	912.57	224.46	912.62	226.44	912.65	227.05	912.66	229.86	912.72
231.55	912.74	233.15	912.74	234.04	912.75	236.93	912.7	238.97	912.67
239.96	912.66	241.62	912.62	243.95	912.59	244.2	912.59	246.05	912.55
248.07	912.49	249.08	912.44	250.71	912.36	251.23	912.3	252.79	912.08
253.68	911.98	254.24	911.92	254.52	911.83	256.35	911.45	257.36	911.24
258.13	911.08	259.61	911.46	260.47	911.7	262.56	912.61	263.71	913.12
266.68	914.4	267.03	914.55	267.26	914.67	268.72	915.21	268.94	915.3
271.33	915.93	274.87	917.64	275.76	917.95	277.61	918.48	278.15	918.58

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279.57 918.85 280.29 919 283.3 919.63 283.68 919.71

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .161.53999 .03580.98999 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 61.5399980.98999 51.96 51.96 51.96 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 2147.2

INPUT

Description:

Station Elevation Data num= 212

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	919.46	.0499	919.44	2.47998	918.865	.329987	918.255	.669983	918.17
6.469971	917.99	8.48999	917.55	10.35999	917.17	10.5	917.15	10.59998	917.11
12.23999	916.51	13.64999	916.06	15.44998	915.41	16.43997	915.23	19.23999	914.09
20.35999	913.62	21.90997	913.24	23.78998	912.51	23.81998	912.51	23.88998	912.48
24.41998	912.22	25.59999	911.66	25.90999	911.55	27.92999	910.97	30.06999	910.06
31.16998	909.72	31.92999	909.52	35.75998	908.21	37.30998	907.63	37.63998	907.59
38.55998	907.45	39.07999	907.37	39.67999	907.17	42.64998	905.61	42.71999	905.57
42.83998	905.51	45.49998	904.07	46.73999	903.54	47.09999	903.37	48.97998	902.99
50.67999	902.85	52.13998	902.92	52.79999	902.94	53.29999	902.93	53.41998	902.94
53.86998	902.97	56.31999	903.15	56.93999	903.03	56.94998	903.03	56.02998	903.14
64.86998	903.15	67.93999	903.15	69.16998	903.13	71.49998	903.25	71.82999	903.28
73.49998	903.47	74.27998	903.57	76.72998	903.58	76.77998	903.58	78.53998	903.44
79.14998	903.48	80.94998	903.26	81.74998	903.25	82.21999	903.25	83.28998	903.23
84.63998	903.15	87.74998	903.12	89.42999	903.08	91.04999	902.75	92.69998	902.66
93.28998	902.55	95.48999	901.81	96.53998	901.64	98.33998	899.93	99.81999	899.16
105.58	899.25	108.29	899.32	110.48	899.61	112.68	899.9	115.31	900.3
115.97	901.51	116.64	902.73	119.16	903.11	119.66	903.21	121.15	903.04
121.53	903.04	121.97	903.05	125.05	903.07	126.9	903.02	127.48	903.02
128.4	903.06	129.66	903.07	130.67	903.12	131.57	903.16	133.32	903.22
134.58	903.29	136.4	903.31	138.2	903.36	138.95	903.29	139.79	903.25
140.97	903.24	142.21	903.29	143.43	903.44	144.63	903.52	145.04	903.53
145.62	903.5	146.46	903.43	146.63	903.45	146.92	903.47	147.6	903.53
150.86	903.71	151.98	903.81	153.43	903.92	154.53	903.99	155.72	904.06
156.42	904.11	160.11	904.64	160.18	904.65	160.24	904.66	160.34	904.67
163.04	904.88	164.94	905.11	166.71	905.5	168.73	905.89	170.47	906.2
170.63	906.23	170.78	906.28	172.44	906.75	174.81	907.11	176.5	907.35
179.59	907.47	180.96	907.5	181.64	907.48	183.02	907.63	184.13	907.7
184.98	907.87	188.66	909.84	188.8	909.94	188.86	909.97	189.55	910.31
190.42	910.74	190.57	910.81	191.31	911.22	195.09	912.55	195.72	912.81

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196.46	913.07	197.06	913.14	197.7	913.21	198.26	913.26	198.8	913.3
199.41	913.31	203.69	913.36	203.88	913.36	205.39	913.34	205.84	913.32
207.84	913.32	209.25	913.25	211.15	913.22	213.35	913.22	213.56	913.21
213.78	913.21	214.12	913.19	215.45	913.14	218.65	912.99	219.54	912.95
221.51	913	223.36	913.09	223.7	913.11	223.97	913.14	225.81	913.37
226.16	913.41	226.95	913.46	228.27	913.54	228.53	913.55	231.31	913.61
231.71	913.62	232.93	913.67	234.91	913.75	236.42	913.75	237.93	913.76
238.39	913.76	239.57	913.77	241.37	913.72	241.91	913.71	242.13	913.7
243.89	913.68	245.6	913.59	247.4	913.42	247.51	913.41	248.87	913.33
252.84	913.12	253.94	913	254.63	912.92	255.14	912.81	256.21	912.55
258.06	912.64	261.46	912.92	262.99	913.75	263.89	914.22	265.03	914.78
266.47	915.51	267.28	915.93	268.83	916.75	269.26	916.97	270.07	917.29
273.43	918.62	273.54	918.66	276.59	919.62	276.96	919.75	277.21	919.83
280.27	920.83	280.36	920.85						

Manning's n Values	num=	3
Sta n Val Sta n Val	Sta n Val	Sta n Val
0 .193.28998	.035 116.64	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
93.28998	116.64	106.46	108.38	111.4	.1	.3	

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 2038.82

INPUT

Description:

Station Elevation Data	num=	284		
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev				
0 920.23 1.97998	919.783.569977	919.573.949982	919.484.199982	919.44
6.849976 918.867.910004	918.618.809998	918.369.940002	918.06 10.88	917.77
14.56 916.63 15.22	916.4417.89999	915.5821.29999	913.72 22.69	912.95
22.87 912.8723.03998	912.83 23.31	912.67 23.5	912.56 25.31	911.64
25.5 911.53 26.06	911.16 27.16	910.4628.03998	909.93 28.62	909.57
29.23999 909.1730.01999	908.6930.60999	908.3931.49998	907.96 32.95	907.24
33.27998 907.0733.39999	907.0235.25999	906.1635.66998	906.0237.39999	905.51
37.65999 905.4538.35999	905.339.95999	905.01 41.06	904.5242.16998	903.93
43.15999 903.3843.62999	903.1144.00999	902.9245.63998	902.0846.74998	901.78
47.88998 901.5848.99998	901.5449.35999	901.5350.81999	901.3951.07999	901.37
51.31999 901.3552.06999	901.353.41998	901.1353.88998	901.1656.29999	901.21
57.89999 901.2158.20999	901.2358.57999	901.360.68999	901.4661.48999	901.52
63.41998 901.5264.51999	901.5165.00999	901.51 66.2	901.5366.87999	901.54
67.06 901.5569.26999	901.66 69.81	901.6969.88998	901.6970.40999	901.7
72.66998 901.76 72.87	901.7675.02998	901.777.35999	901.7 78.7	901.72
79.21999 901.7580.73999	901.8181.26999	901.8383.41998	901.96 83.95	901.98

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84.50999	901.99	86.62	901.9787	24998	901.9389	12999	901.989	46999	901.9
89.89999	901.9291	59999	902.0192	96999	901.9994	49998	901.99	95.81	901.94
96.62999	901.9197	17999	901.8998	25999	901.9599	41998	902.1199	98999	902.17
100.38	902.23	102.02	902.46	103.23	902.58	104.3	902.68	105.87	902.79
106.18	902.8	107.09	902.83	108.23	902.86	108.53	902.87	110.59	902.94
110.83	902.95	111.08	902.96	113.12	903.12	113.49	903.15	115.08	903.26
115.58	903.29	117.99	903.29	119.91	903.23	120.35	903.22	120.86	903.21
122.74	903.14	123.27	903.12	124.27	903.14	125.28	903.16	127.09	903.21
127.18	903.2	127.76	903.21	129.33	903.21	131.02	903.2	131.4	903.19
132.82	903.11	134.63	902.92	135.28	902.82	135.72	902.72	137.34	902.35
137.84	902.25	139.55	901.98	139.92	901.94	140.25	901.91	142.08	901.77
142.17	901.76	143.37	901.65	144.16	901.54	145.09	901.42	145.81	901.27
147.79	900.87	148.3	900.64	148.65	900.51	150.28	899.92	151.7	899.58
152.2	899.65	152.98	899.18	153.76	898.71	154.6	898.45	155.43	898.19
156.4	898.24	157.38	898.28	159.02	898.38	159.47	898.4	160.66	898.47
161.4	898.56	162.11	898.64	163.56	898.8	165.11	899.07	166.67	899.33
167.89	901.18	168.41	901.96	168.8	902.55	169.11	903.02	172.46	904
172.81	904.28	173.45	904.44	174.14	904.41	174.93	904.38	175.5	904.42
176.58	904.53	177.7	904.84	178.46	905.04	180.3	905.68	180.38	905.71
180.5	905.75	182.19	906.29	183.37	906.68	184.01	906.9	185.88	907.66
186.08	907.74	186.15	907.77	188.09	908.58	189.08	908.98	190.04	909.35
191.25	909.87	192.04	910.24	192.45	910.52	193.53	911.2	194.13	911.59
196.09	913.02	196.6	913.38	197.82	914.19	200.56	915.06	201.22	915.3
201.37	915.32	203.4	915.39	203.81	915.38	204.71	915.39	205.7	915.42
206.11	915.44	207.4	915.47	208.81	915.51	209.37	915.51	211.11	915.49
211.44	915.49	212.87	915.51	213.66	915.53	213.82	915.53	216.13	915.54
216.27	915.54	216.5	915.55	218.8	915.58	220.16	915.63	220.38	915.63
221.87	915.67	222.22	915.68	224.02	915.78	225.41	915.92	226.19	916.05
226.9	916.19	227.92	916.42	228.33	916.51	229.36	916.72	229.82	916.82
230.77	916.98	231.21	917.06	232.82	917.32	233	917.35	234.36	917.5
235.97	917.64	236.11	917.66	236.37	917.69	237.8	917.89	238.29	917.98
239.73	918.28	240.2	918.38	240.74	918.5	242.13	918.76	243.08	918.89
244.1	918.99	245.36	919.08	246.26	919.14	247.88	919.28	248.52	919.33
249.46	919.39	250.6	919.49	251.54	919.54	252.72	919.62	254.49	919.78
254.93	919.82	257.02	920.02	257.12	920.03	257.78	920.08	259.4	920.23
259.59	920.24	260.02	920.27	261.58	920.39	262.63	920.46	263.41	920.51
264.39	920.58	265.38	920.65	265.95	920.7	267.47	920.85	268.43	920.95
268.99	921.01	270.38	921.15	271.07	921.23	272.31	921.35	273.9	921.54
274.33	921.59	274.93	921.65	276.35	921.83	277	921.89	278.58	922.07
278.66	922.08	278.73	922.09	280.29	922.27	281.24	922.41	283.68	922.71
284.03	922.75	285.78	922.9	286.07	922.92	286.24	922.94		

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1 147.79 .035 167.89 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 147.79 167.89 146.84 146.84 146.84 .1 .3

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CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 1891.98

INPUT

Description:

Station Elevation Data		num= 361									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	910.381.559998	910.052.119995	909.912.869995	909.744.199982	909.42						
4.919983	909.286.039978	908.997.009979	908.768.069977	908.498.139984	908.47						
9.23999	908.1610.26999	907.9211.44998	907.5512.21997	907.3214.10999	906.77						
14.25	906.7316.53998	906.11	16.59	906.1	16.78	906.05	18.53	905.56			
18.84998	905.48	20.5	905.07	20.87	904.9820.96997	904.9522.82999	904.52				
23.62	904.3424.97998	904.06	26.12	903.8426.17999	903.68						
28.28998	903.5529.43997	903.4330.13998	903.3731.79999	903.2731.81998	903.26						
33.5	903.1334.51999	902.9835.53998	902.8336.79999	902.6537.22998	902.58						
38.38998	902.3638.91998	902.2639.19998	902.2140.63998	901.9642.40997	901.58						
42.51999	901.55	42.56	901.5544.82999	901.2544.94998	901.22	901.23	45.06	901.22			
45.51999	901.1346.90997	900.8847.37997	900.8148.75998	900.68	49.87	900.68	49.87	900.63			
50.64999	900.5751.64999	900.4752.84998	900.4153.43997	900.3755.31998	900.27						
55.51999	900.2655.76999	900.25	57.5	900.1658.38998	900.1	900.13	59.56	900.1			
60.28	900.06	61.28	900.0262.26999	899.9962.89999	899.9	899.9764.17999	899.9				
64.84	899.8765.57999	899.8466.03998	899.8366.85999	899.7867.90997	899.76						
68.73999	899.7469.71997	899.771.91998	899.61	72.03	899.6	899.672.07999	899.6				
73.90997	899.45	74.53	899.474.54999	899.4	76.87	899.2877.29999	899.25				
78.78	899.1679.79999	899.180.06998	899.0781.95999	898.8982.57999	898.83						
82.69998	898.8284.85999	898.6386.12997	898.6986.72998	898.7287.45999	898.77						
88.22998	898.8288.65999	898.8489.74998	898.8591.39998	898.6891.60999	898.66						
92.14998	898.7393.07999	898.1793.75998	897.7694.00998	897.6196.10999	896.99						
97.04999	896.7298.20999	896.3899.22998	896.5	100.24	897.14	896.62	102.46	897.14			
104.68	897.66	104.85	898.94	106.41	899.33	899.05	106.86	899.17	108.04	899.33	
109.08	899.47	109.56	899.52	110.83	899.87	899.61	112.33	899.84	112.58	899.87	
113.19	899.93	114.47	900.06	114.88	900.21	900.1	116.45	900.19	116.97	900.21	
117.53	900.22	119.75	900.28	119.92	900.32	900.27	120.28	900.25	121.94	900.32	
122.21	900.33	122.31	900.34	123.83	900.7	900.53	125.39	900.69	125.47	900.7	
125.62	900.72	126.96	900.9	127.64	901.52	901.08	128.65	901.33	129.26	901.52	
129.57	901.61	130.96	902.09	131.35	902.56	902.16	132.82	902.42	133.87	902.56	
134.38	902.61	136.01	902.67	136.55	903.16	902.72	139.04	903.12	139.29	903.16	
139.34	903.16	139.44	903.2	141.59	904.31	904.14	141.64	904.17	141.9	904.31	
143.22	905	143.49	905.16	144.88	906.48	905.85	145.29	906.07	146.09	906.48	
146.98	906.93	147.98	907.46	148.64	908.87	907.82	149.2	908.12	150.55	908.87	
153.39	909.51	153.6	909.55	153.69	909.66	909.56	155.81	909.65	155.83	909.66	
156.02	909.68	157.67	909.84	158.52	910.13	909.92	159	909.96	160.88	910.13	
160.94	910.13	161	910.14	162.87	910.27	910.2	163.85	910.24	164.78	910.27	
166.25	910.31	167	910.33	167.43	910.44	910.35	169.33	910.43	169.76	910.44	

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171.71	910.5	172.12	910.51	173.98	910.6	174.18	910.6	175.8	910.65
176	910.65	177.68	910.72	178.79	910.76	179.66	910.8	180.39	910.82
181.4	910.84	182.41	910.93	183.19	910.99	185.13	911.15	185.69	911.18
186.8	911.22	187.9	911.27	188.66	911.3	189.78	911.34	191.12	911.4
191.57	911.42	191.94	911.44	193.46	911.52	194.64	911.61	195.84	911.66
197.77	911.8	198.14	911.83	198.41	911.84	200.54	911.96	200.87	911.98
202.07	912.04	202.35	912.06	203.92	912.16	205.54	912.26	206.2	912.31
206.45	912.32	208.35	912.07	210.32	912.24	210.98	912.09	212.17	911.99
214.11	911.87	215.15	911.55	216.07	911.27	216.52	911.11	217.68	910.69
218.8	910.28	219.41	910.08	219.65	910.01	223.07	909.16	223.08	909.15
223.09	909.15	223.19	909.17	226.77	909.71	227.05	909.79	227.24	909.89
227.92	910.06	228.8	910.27	229.37	910.35	230.4	910.47	231.03	910.43
232.05	910.39	233.74	910.15	233.87	910.14	233.98	910.14	236.04	910.08
237.46	910.21	238.35	910.35	239.85	910.68	240.23	910.75	240.77	910.87
241.98	911.13	242.39	911.22	243.82	911.43	245.28	911.64	245.89	911.73
246.12	911.76	246.6	911.83	248.36	912.14	249.65	912.24	250.24	912.3
251.09	912.46	252.18	912.66	252.93	912.83	254	913.07	255.21	913.3
255.93	913.43	256.45	913.51	258.14	913.79	259.24	913.91	259.83	913.99
261.2	914.2	261.99	914.3	263.25	914.44	264.2	914.55	265.08	914.65
265.9	914.74	267.35	914.92	267.83	914.99	268.11	915.03	270.15	915.2
270.56	915.27	271.48	915.39	272.26	915.5	274.03	915.78	274.05	915.78
276.03	916.09	276.51	916.15	277.82	916.32	278.69	916.45	279.83	916.62
281.11	916.81	282.27	916.96	283.45	917.07	284.45	917.18	286.24	917.42
286.27	917.42	286.3	917.43	288.1	917.57	289.68	917.68	290.47	917.73
291.21	917.79	292.98	917.99	293.99	918.08	294.65	918.15	296.04	918.28
296.6	918.33	297.09	918.36	298.96	918.45	299.24	918.48	299.98	918.55
300.94	918.62	302.27	918.77	302.5	918.8	302.67	918.81	304.45	918.9
304.99	918.88	305.58	918.89	307.49	918.94	307.78	918.94	309.12	918.97
310.05	918.99	310.55	919	311.01	919.01	312.05	919.04	313.08	919.05
313.77	919.07	315	919.11	315.91	919.15	316.26	919.18	318.69	919.32
318.9	919.34	319.36	919.37	321.09	919.49	321.94	919.54	322.83	919.64
324.29	919.79	324.84	919.85	325.48	919.91	326.51	920.02	327.53	920.12
328.09	920.19	329.88	920.35	330.02	920.36	330.07	920.37	332.03	920.55
332.56	920.6	334.29	920.8	334.9	920.87	336.11	920.99	336.57	921.03
336.83	921.06	339.02	921.36	339.78	921.44	341.62	921.74	342.23	921.78
343.36	922								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .192.14998 .035 104.85 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 92.14998 104.85 55.57 55.57 55.57 .1 .3

CROSS SECTION

RIVER: Bluestone Creek



REACH: Align (1)

RS: 1836.41

INPUT

Description:

Station Elevation Data

num= 410

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	911.39	1	911.362.049988	911.322.449982	911.264.519989	911.03			
5.019989	910.985.130005	910.957.029999	910.467.470001	910.378.899994	910.13				
9.589996	9109.850006	909.9511.44998	909.6212.44998	909.4313.32999	909.28				
14.12	909.0715.75998	908.4716.25998	908.316.41998	908.2418.19998	907.63				
19.31	907.420.07999	907.2821.50998	907.1623.29999	906.78	23.72	906.65			
24.22998	906.49	25.31	906.12	26.97	905.46	27.12	905.4129.50998	904.52	
29.91	904.39	30.75	904.1532.14999	903.78	32.94	903.5834.10999	903.36		
35.45999	903.1536.01999	903.136.57999	903.0337.95999	902.8	39	902.73			
39.92999	902.6741.03998	902.6641.82999	902.6542.69998	902.6144.17999	902.48				
44.26999	902.47	45.94	902.34	46.62	902.2947.91998	902.2248.50998	902.18		
49.75	902.16	50.81	902.0951.23999	902.06	52.88	901.9653.28998	901.94		
55.01999	901.8355.60001	901.7956.97998	901.757.64999	901.6658.85999	901.57				
59.56	901.53	60.84	901.51	61.66	901.4962.29999	901.5	63.59	901.51	
65.03	901.4965.32999	901.4865.82999	901.45	66.88	901.3867.20999	901.34			
68.98999	901.2969.22998	901.28	70.63	901.2271.13998	901.271.20999	901.19			
71.66998	901.17	73.25	901.173.50998	901.09	74.12	901.07	75.69	901.02	
77.75	901.02	77.97	901.03	80.19	901.08	80.37	901.0882.25998	901.04	
82.53998	901.0584.20999	901.06	84.78	901.06	86.63	901.1386.94998	901.14		
88.56	901.14	89.81	901.17	90.81	901.2	91.44	901.293.76999	901.21	
94.04999	901.2194.28998	901.296.57999	901.296.73999	901.2198.92999	901.19				
99.16998	901.1999.66998	901.18	101.1	901.15	102.99	901.14	103.03	901.14	
105.05	901.13	106.06	901.11	107.31	901.08	108.24	901.01	109.46	900.97
110.32	900.92	111.75	900.83	112.86	900.7	113.55	900.58	114.5	900.37
115.17	900.15	116.42	899.8	117.05	899.64	118.3	899.38	119.68	899.35
120.45	899.36	121.3	899.38	122.14	899.41	123.12	899.44	123.96	899.47
125.12	899.49	125.67	899.5	126.16	899.51	127.66	899.56	130.47	899.56
131.68	899.58	132.41	899.56	133.61	899.51	134.27	899.49	135.17	899.47
136.27	899.5	137.54	899.5	138.76	899.49	139.75	899.5	141.07	899.56
141.55	899.58	142.97	899.65	143.88	899.66	145.63	899.68	145.89	899.67
146.36	899.68	147.76	899.72	148.53	899.71	150.01	899.72	151.22	899.75
152	899.74	153.04	899.68	153.62	899.66	154.08	899.62	155.06	899.55
156.2	899.44	156.98	899.41	158.43	899.31	159.28	899.29	160.95	899.17
161.77	899.1	162.94	898.98	163.92	898.85	164.71	898.79	165.76	898.67
166.77	898.54	167.21	898.49	168.34	898.37	169.04	898.25	169.86	898.18
170.9	898.11	171.9	898.07	173.3	898.01	173.52	898	174.08	897.92
175.61	898.03	176.1	897.84	176.34	897.75	176.72	897.6	177.23	897.4
178.08	897.06	178.84	896.76	181.78	896.22	182.41	896.23	183.04	896.25
183.64	896.9	184.27	897.58	184.76	898.11	185.51	898.91	186.37	898.77
186.61	899	186.86	899.15	188.1	899.48	189.94	900.06	190.33	900.09
191.28	900.23	191.65	900.27	191.95	900.32	193.58	900.62	195.42	901.32
195.67	901.41	196.04	901.64	197.53	902.62	198.37	903.25	199.29	903.99
200.2	904.68	200.63	905.04	201	905.32	201.57	905.75	201.83	905.92

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202.75	906.45	204.11	906.67	207	907.3	207.35	907.4	207.5	907.41
208.67	907.46	209.7	907.5	210.19	907.52	210.9	907.53	211.93	907.55
212.56	907.55	213.7	907.56	214.18	907.57	214.43	907.57	215.55	907.59
216.49	907.62	217.41	907.65	218.55	907.68	219.17	907.69	221.67	907.69
223.71	907.71	223.99	907.72	225.83	907.72	226.74	907.74	227.24	907.73
228.94	907.73	229.19	907.72	231.18	907.68	231.65	907.68	232.25	907.69
233.77	907.68	234.72	907.69	235.5	907.69	236.35	907.67	237.67	907.68
238.74	907.51	241.41	907.16	241.65	907.05	242.43	906.71	243.41	906.3
244.05	906.02	244.45	905.85	245.38	905.46	245.5	905.41	246.08	905.19
247.23	904.76	247.44	904.69	249.69	903.81	249.83	903.77	250.5	903.65
252.23	903.33	253.34	903.26	254.59	903.28	255.07	903.28	256.41	903.18
257.3	903.12	258.03	903.06	259.49	902.99	260.07	902.96	260.32	902.96
262.19	902.94	262.2	902.94	263.6	903.01	264.96	903.07	265.54	903.08
266.13	903.1	267.82	903.09	269.84	903.16	269.9	903.16	271.89	903.29
273.31	903.28	273.7	903.28	274.61	903.27	275.48	903.26	275.74	903.27
277.67	903.28	278.32	903.31	280.51	903.39	280.62	903.4	281.05	903.45
282.66	903.65	283.13	903.72	284.45	903.96	285.51	904.16	286.05	904.27
287.68	904.52	288.11	904.6	289.84	904.78	290.22	904.83	291.1	904.89
291.77	904.94	292.14	904.97	293.41	905.09	294.78	905.27	295.18	905.32
297.42	905.67	297.52	905.68	297.69	905.71	299.6	905.99	300.86	906.11
302.12	906.31	303.4	906.47	304.36	906.58	305.48	906.71	306.09	906.8
307.39	906.94	307.93	906.99	308.23	907.03	309.98	907.22	311.9	907.58
312.15	907.62	312.34	907.67	314.1	908.14	315.12	908.45	315.75	908.62
316.55	908.76	317.88	908.97	318.58	909.12	320.3	909.37	321.54	909.56
322.12	909.64	322.59	909.74	324.17	910.1	325.8	910.5	326.45	910.62
327.9	910.96	328.69	911.13	329.05	911.17	330.96	911.38	331.3	911.41
332.35	911.51	333.56	911.68	333.98	911.73	334.46	911.81	335.81	912.08
337.09	912.39	338.2	912.66	339.58	912.97	340.14	913.08	340.5	913.18
342.05	913.42	343.18	913.63	344.01	913.75	345.42	914.05	346.01	914.16
346.37	914.23	348.22	914.56	349.89	914.97	350.55	915.11	350.91	915.18
352.02	915.36	352.98	915.51	353.93	915.66	354.75	915.78	355.22	915.88
356.77	916.2	357.84	916.44	359.31	916.75	360.04	916.86	360.66	916.98
362.13	917.25	362.59	917.34	362.8	917.39	364.37	917.69	365.21	917.92
366.39	918.11	367.86	918.31	368.56	918.4	370.41	918.58	370.66	918.6
370.73	918.62	371.16	918.71	372.77	919.02	373.08	919.07	374.78	919.31
375.42	919.36	376.41	919.44	377.2	919.54	378.35	919.72	379	919.84
380.14	920.04	381.91	920.34	382.2	920.4	382.43	920.44	384.55	920.84
385.15	920.97	387.16	921.33	387.41	921.39	388.94	921.79	389.24	921.87
390.29	922.14	391.47	922.34	392.28	922.48	393.7	922.66	394.37	922.73
394.79	922.77	396.31	922.9	397.84	923.02	398.17	923.05	398.18	923.06

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1 175.61 .035 184.76 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 175.61 184.76 51.9 51.9 51.9 .1 .3  
 Ineffective Flow num= 1

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Sta L Sta R Elev Permanent  
 237.67 398.18 915 F

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 1784.51

INPUT

Description:

Station Elevation Data		num= 379	
Sta	Elev	Sta	Elev
0	913.49	3300171	913.321
3.860016	911.394	830017	910.897
9.540009	908.661	0.24002	908.311
13.64999	906.73	15.12	906.151
19.67001	904.62	20.59	904.362
25.16	903.11	25.53	902.97
29.63	901.86	30.59	901.733
33.89001	901.55	35.03	901.635
38.21002	901.723	9.07001	901.67
43.66	901.54	44	901.534
48.08002	901.34	48.62	901.345
53.75	901.385	5.30002	901.335
59.24002	901.19	62.81	901.19
66.62	901.14	68.06	901.12
70.71002	901.057	2.30002	901
77.54001	900.957	8.20001	900.95
83.38	900.938	4.05002	900.92
86.94	900.948	8.86002	900.898
91.94	900.76	92.87	900.739
96.66	900.798	1.14001	900.689
101.94	900.56	103.42	900.41
106.2	899.95	107.65	899.74
111.53	899.12	111.89	899.09
115.82	899.02	117.07	899.01
121.4	899.1	123.01	899.08
126.34	899.22	127.99	899.29
132	899.15	132.16	899.15
137.91	899.04	138.09	899.03
141.87	898.95	142.46	898.93
145.89	898.83	146.06	898.83
150.85	898.84	153.04	898.87
156.14	898.82	157.41	898.74
160.66	898.41	161.28	898.46
164.96	898.72	165.9	898.75
170.88	898.6	173.69	898.33
			173.75
			898.32
			173.78
			898.31
			173.84
			898.29

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175.38	897.66	176.02	897.38	176.48	897.14	176.88	897.15	178.45	896.96
179.55	896.84	180.59	896.72	181.27	896.64	182.08	896.54	182.83	896.46
183.68	896.36	183.93	896.33	184.31	896.29	186.36	896.15	186.92	896.09
188.41	895.98	188.93	896.09	189.63	896.24	189.92	896.3	191.44	896.61
192.01	897.56	192.18	897.83	193.28	899.62	195.06	899.71	197.77	899.65
198.1	899.65	198.17	899.64	199.47	899.47	200.17	899.36	201.08	899.25
201.49	899.21	202.49	899.15	202.93	899.17	204.24	899.27	204.45	899.29
205.21	899.47	206.3	899.73	206.55	899.82	207.7	900.22	208.09	900.36
208.78	900.64	209.82	901	210.56	901.3	212.39	901.6	213.89	901.72
214.8	901.73	215.31	901.73	216.37	901.8	217.5	901.91	217.6	901.92
218.91	902.02	218.95	902.02	219.03	902.03	220.7	902.09	221.43	902.11
224.33	902.11	225.97	902.13	227.09	902.17	227.55	902.21	229.29	902.33
229.53	902.35	229.83	902.35	231.64	902.33	232.62	902.33	234.1	902.35
234.79	902.39	235.89	902.45	236.42	902.5	237.29	902.59	237.54	902.61
238.6	902.65	239.72	902.7	239.98	902.7	241.97	902.75	242.28	902.76
242.75	902.77	243.93	902.78	244.77	902.8	245.85	902.85	246.72	902.88
247.46	902.92	248.81	902.9	249.4	902.9	249.57	902.88	250.19	902.81
251.6	902.69	252.93	902.31	253.9	901.99	254.66	901.65	255.41	901.27
256.36	900.95	258.04	900.51	258.67	900.48	259.48	900.42	260.03	900.4
260.54	900.39	260.81	900.39	262.11	900.42	263.45	900.48	263.63	900.48
265.26	900.5	267.3	900.5	268.78	900.51	269.03	900.51	270.81	900.49
271.5	900.51	273.4	900.59	273.93	900.6	276.42	900.6	277.53	900.59
277.97	900.59	278.97	900.54	279.9	900.49	281.47	900.43	281.76	900.42
281.86	900.42	283.98	900.46	284.6	900.45	285.67	900.46	286.65	900.45
287.37	900.45	288.59	900.46	289.59	900.52	290.77	900.56	291.29	900.6
292.42	900.68	293.81	900.75	294.16	900.77	294.46	900.78	296.07	900.82
297.62	900.84	299.68	900.84	300.45	900.82	301.59	900.81	302.48	900.84
303.53	900.85	304.53	900.87	305.77	900.88	306.19	900.86	307.27	900.83
308.15	900.8	310.12	900.74	310.25	900.73	310.39	900.74	312.2	900.77
313.37	900.86	314.54	900.97	315.92	901.16	316.53	901.24	317.14	901.29
318.58	901.42	320.05	901.52	320.59	901.56	321.05	901.6	322.79	901.74
323.89	901.84	325.05	901.91	326.82	902.06	327.08	902.08	327.28	902.1
328.96	902.31	330.16	902.46	331.05	902.59	332.44	902.77	333.16	902.87
334.64	903.05	335.7	903.23	336.71	903.4	338.11	903.61	338.38	903.64
339.92	903.96	340.42	904.06	342.1	904.49	342.75	904.66	344.21	904.94
345.6	905.22	346.4	905.37	346.8	905.44	347.82	905.64	349.14	905.92
349.6	906.03	351.16	906.41	351.23	906.42	351.32	906.46	352.83	907.01
353.94	907.4	354.51	907.57	355.54	907.88	356.29	908.07	356.61	908.15
358.19	908.54	358.61	908.65	359.93	908.95	361.35	909.28	361.59	909.33
363.33	909.69	363.74	909.8	365.87	910.41	365.92	910.42	367.87	910.96
367.95	910.98	369.7	911.37	370.71	911.62	372.07	912		

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1 175.38 .035 192.18 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 175.38 192.18 145.4 105.03 62.75 .1 .3

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Ineffective Flow num= 1  
 Sta L Sta R Elev Permanent  
 248.81 372.07 910 F

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 1679.48

INPUT

Description:

Station Elevation Data				num=	481				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	904.861.690002	904.562.549988	904.468.429993	901.989.589996	901.43				
10.20999	901.4314.47998	901.0718.48999	902.65 18.81	902.7118.98999	902.7				
19.17999	902.78 20.84	902.924.95999	903.13 26.13	903.0927.44998	902.97				
27.91	902.7628.03998	903.01 28.25	902.94 28.66	902.9 29.12	902.76				
29.53	902.7829.89999	902.6330.28998	902.7130.56998	902.6331.28998	902.76				
31.34998	902.7731.42999	902.78 32.87	902.7133.28998	902.68 33.62	902.66				
34.79999	902.5836.34998	902.5436.47998	902.53 37.12	902.5138.69998	902.42				
38.94	902.41 39.5	902.3840.32999	902.3140.70999	902.29 41.91	902.19				
43.09998	901.9245.07999	901.6245.67999	901.5247.20999	901.09 47.25	901.08				
47.31	901.07 48.53	900.74 49.22	900.6450.98999	900.73 53.72	900.75				
55.34	901.1456.81998	901.5157.92999	901.63 59.44	901.759.59998	901.72				
61.78	902.08 62.41	902.1563.16998	902.1567.26999	902.9267.42999	902.92				
68.04999	902.9 68.84	902.8869.19998	902.8670.07999	902.8270.75998	902.8				
71.73999	902.7772.45999	902.7673.66998	902.71 75.56	902.66 75.62	902.66				
75.66998	902.6577.28998	902.6979.01999	902.69 79.31	902.68 81.06	902.63				
82.13	902.62 82.97	902.684.56998	902.5285.16998	902.4786.67999	902.35				
87.60999	902.3489.03998	902.36 89.53	902.4390.00998	902.591.48999	902.82				
93.03	903.4393.89999	903.7294.67999	903.9497.07999	90599.25998	905.59				
100.84	905.86 102.23	906.17 104.99	906.49 106.5	906.47 108.33	906.6				
109.3	906.47 110.46	906.47 110.98	906.44 111.45	906.4 112.79	906.41				
113.69	906.39 114.97	906.49 115.35	906.42 115.52	906.47 115.85	906.37				
117.1	906.48 118.34	906.17 119.98	906.39 122.04	906.87 123.66	906.91				
124.37	906.92 125.59	906.68 126	906.6 126.2	906.56 127.32	906.3				
128.1	906.16 129.25	906 130.3	905.97 131.25	906.06 132.55	906.07				
133.76	906.11 134.33	906.12 134.9	906.12 136.4	906.2 137.85	906.29				
139.7	906.48 139.99	906.52 140.41	906.57 141	906.64 141.49	906.66				
143.42	906.8 143.71	906.83 143.79	906.84 145.71	907.1 146.87	907.28				
147.75	907.44 148.55	907.59 149.78	907.8 151.49	908.09 151.76	908.12				
151.95	908.16 153.81	908.43 155.15	908.64 155.68	908.69 156.85	908.84				
157.64	908.92 157.98	909 159.68	909.23 160.63	909.37 161.41	909.45				
162.81	909.63 163.52	909.69 164.82	909.81 165.74	909.86 166.51	909.9				
167.71	909.91 169.83	910.01 170.2	910.01 170.46	910.03 171.84	909.95				
172.88	910.03 173.21	910.01 174.27	909.93 175.1	909.84 177	909.76				
177.15	909.75 179.84	909.67 180.12	909.65 180.48	909.61 182.45	909.32				

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183.1	909.21	183.92	909.09	184.67	909.01	185.31	908.94	186.75	908.81
187.29	908.76	189.19	908.58	189.7	908.51	190.51	908.34	191.58	908.19
192.53	908.08	193.32	907.99	194.05	907.88	195.38	907.69	196.91	907.58
197.29	907.55	199.18	907.37	199.36	907.35	201.72	907.19	201.78	907.19
201.87	907.18	204.08	907.02	205.78	906.93	206.04	906.9	206.28	906.87
208.04	906.62	209.39	906.44	209.82	906.36	211.16	906.16	211.81	906.1
213.07	906.01	213.72	905.95	214.93	905.85	215.9	905.75	216.68	905.65
217.97	905.54	219.6	905.42	220.11	905.38	220.42	905.38	222.45	905.26
222.72	905.24	223.92	905.12	225.07	905.06	225.65	905.04	227.57	904.9
229.08	904.65	230.12	904.29	231.47	903.89	231.88	903.74	233.02	903.21
233.9	902.67	234.66	902.19	235.83	901.57	236.5	901.26	237.12	901.02
238.12	900.76	238.54	900.68	239.56	900.52	240.03	900.41	240.38	900.22
241.63	899.41	241.75	899.33	242.26	898.97	242.44	898.21	242.6	897.01
244.13	896.88	245.17	896.8	246.27	896.71	247.23	896.63	248.45	896.53
249.81	896.42	250.64	896.36	252.06	896.24	253.74	896.09	254.83	896
255.17	895.97	255.24	895.96	255.38	895.95	255.89	895.91	256.66	895.84
258.3	895.7	259.52	895.59	260.83	895.47	262.19	895.35	263.21	895.27
264.55	895.27	265.5	895.28	266.48	895.29	267.58	895.29	268.18	895.3
269	895.3	271.16	895.32	272.42	895.32	273.93	895.33	274.84	895.34
276.46	895.35	277.02	895.35	278.31	895.36	279.83	895.37	280.37	895.37
281.09	895.38	282.44	895.39	283.9	895.39	284.1	895.4	284.44	895.4
285.72	895.41	287.27	895.41	288.95	895.5	290	895.56	290.87	895.61
292.1	895.67	292.94	895.72	293.88	895.77	295.13	895.83	297.18	895.95
297.92	896	298.46	896.03	299.48	896.1	300.07	896.14	300.47	896.16
300.84	896.19	302.01	896.26	303.01	896.33	304.5	896.42	305.77	896.5
306.58	896.55	308.3	896.66	309.11	896.74	310.53	896.88	312.11	897.03
313.45	897.16	314.5	897.26	316.2	897.42	316.89	897.49	317.33	897.53
317.92	897.59	321.18	897.9	321.72	897.97	322.87	898.13	324.74	898.39
326.13	898.58	327.49	898.76	329.09	898.98	329.85	899.08	330.38	899.16
331.6	899.32	332.91	899.5	333.73	899.61	334.28	899.68	335.39	899.81
336.55	899.95	337.76	900.09	338.38	900.16	339.14	900.25	339.99	900.35
340.56	900.42	340.98	900.67	342.47	900.67	343.24	900.77	344.15	900.87
344.68	900.91	346.08	900.97	347.64	901.07	348.35	901.11	348.92	901.12
350.32	901.17	351.16	901.21	352.22	901.24	353.79	901.33	354.16	901.35
354.46	901.37	356.13	901.45	356.76	901.47	357.98	901.5	360.1	901.5
360.23	901.51	361.92	901.53	363.18	901.64	363.78	901.68	364.03	901.7
364.64	901.75	365.41	901.81	366.31	901.86	367.21	901.89	368.25	901.91
369.64	901.92	370.12	901.93	370.7	901.94	371.72	901.98	372.11	902.06
373.61	902.14	373.81	902.16	375.23	902.34	376.73	902.43	379.83	901.83
380.05	901.74	380.38	901.58	381.74	900.96	382.42	900.72	384.21	900.23
385.48	900.12	386.23	900.07	387.35	900.01	388.43	899.94	389.12	899.91
390.34	899.88	391.04	899.87	392.1	899.85	393.18	899.84	393.55	899.83
394.48	899.81	395.43	899.81	397.21	899.82	397.32	899.82	397.67	899.83
399.55	899.88	400.03	899.89	402.43	899.92	404.76	899.92	405.53	899.91
406.77	899.92	408.66	899.92	409.15	899.9	410.45	899.83	412.49	899.75
412.55	899.75	414.84	899.81	415.09	899.83	416.78	899.9	417.48	899.97
419.35	900.09	420.38	900.16	421.48	900.25	423.01	900.27	423.13	900.28
424.74	900.31	425.72	900.33	427.22	900.36	428.11	900.37	430.45	900.37

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431.95	900.38	432.44	900.39	434.48	900.38	434.69	900.38	436.02	900.37
436.74	900.36	436.86	900.36	438.93	900.32	439.53	900.32	441.15	900.37
442.01	900.44	442.97	900.51	443.43	900.54	444.82	900.65	445.23	900.7
446.73	900.94	447.35	901.02	448.38	901.15	449.64	901.27	450.27	901.34
450.7	901.39	452.04	901.55	452.97	901.66	454.19	901.8	455.46	901.94
456.71	902.06	457.67	902.13	458.76	902.21	460.49	902.36	460.79	902.38
461.01	902.4	462.61	902.54	463.88	902.63	464.56	902.71	466.43	902.8
466.66	902.82	466.74	902.82	468.61	902.98	469.51	903.08	470.7	903.21
471.35	903.36	473.23	903.8	473.28	903.82	473.43	903.85	475.13	904.24
475.69	904.36	477.69	904.86	477.87	904.89	479.33	905.21	479.99	905.36
480.06	905.37	480.78	905.57	482.02	905.92	482.14	905.96	484.28	906.77
484.34	906.8	484.42	906.82	486.61	907.43	487.38	907.57	488.89	907.79
489.76	908.03	490.68	908.31	492.43	908.79	492.97	908.96	493.18	909.04
494.23	909.43	495.08	909.76	495.51	909.93	496.73	910.45	497.3	910.67
497.49	910.73								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	252.06	.035	302.01	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	252.06	302.01		27.83	27.83	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	67.27	910	F
376.73	497.49	910	F

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 1651.65

INPUT

Description:

Station Elevation Data num= 476

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	904.69	1.01001	904.442	429993	904.116	429993	902.557	600006	902.46
8.76001	902.610	.98001	901.48	13.87	900.9	15.59	901.2317	.51001	901.08
18.73999	901.219	.10001	901.28	22.06	902.4522	.23999	902.4825	.45999	903.13
25.54999	903.1327	.07999	903.2227	.51001	903.1927	.60999	903.1427	.64001	903.2
27.89001	903.1128	.39999	903.0628	.57999	90329	.10001	903.0429	.17999	903
29.62	903.0829	.95001	903.08	31.47	903.01	32.12	902.97	33.47	902.82
34.63	902.735	.45001	902.6436	.32999	902.5737	.42001	902.5538	.17999	902.58
39.39999	902.6140	.35999	902.58	41.69	902.642	.45999	902.6243	.76001	902.61
44.38	902.5845	.98001	902.4946	.51001	902.47	48.37	902.09	48.87	901.95
50.95001	901.851	.23001	901.851	.51999	901.87	54.5	902.57	56.62	903.19
57.57001	903.358	.39001	903.3159	.82001	903.34	60.97	903.3261	.85999	903.29

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63.16	903.2763.42001	903.26	63.72	903.2665.23999	903.2166.17001	903.17
67.34	903.16	68.5	903.1	68.62	903.0970.29001	903.11
72.98001	903.05	75.19	903.12	75.38	903.1276.92999	903.0378.89001
78.98001	902.8979.07999	902.88	81.09	902.87	82.25	902.86
83.98001	902.8385.04999	902.8186.20001	902.7887.39999	902.84	89.03	903.01
89.72	903.1490.98999	903.6991.67001	903.9691.95001	904.1593.26001	904.94	
94.04999	905.38	95.03	905.7697.39999	906.3997.48001	906.4	101.11
101.65	906.97	102.2	907.05	103.1	907.22	104.19
106.01	907.94	106.12	907.97	106.44	908	109.34
112.11	908.11	112.2	908.11	113.43	907.93	114.14
115.63	907.59	116.37	907.49	117.02	907.38	117.42
120.37	907.21	121.2	907.21	122.45	907.14	123.5
125.34	906.89	126.37	906.72	128.04	906.64	129.63
130.07	906.87	130.3	906.91	132.38	907.28	133.53
135.81	907.27	136.39	907.32	137.8	907.52	139.4
139.53	907.85	141.24	908.05	142.16	908.18	143.03
144.66	908.46	144.98	908.51	146.91	908.78	147.28
149.4	909.03	150.29	909.14	151.48	909.24	153.13
154.04	909.58	155.26	909.68	156.37	909.79	157.45
159.6	909.96	161.33	910.07	161.53	910.08	161.88
164.23	910.23	165.21	910.22	166.14	910.24	167.07
169.4	910.24	170.22	910.28	171.07	910.31	172.62
173.45	910.34	175.05	910.28	176.23	910.25	177.38
179.79	910.18	180.99	910.15	181.74	910.05	183.29
183.69	909.79	185.16	909.57	186.53	909.51	187.23
189.3	909.18	191.57	908.78	191.66	908.76	191.74
193.85	908.38	194.58	908.28	195.46	908.14	196.18
198.63	907.72	199.88	907.6	200.88	907.5	201.83
204.24	907.12	205.24	907.07	206.23	907.03	206.99
208.89	906.72	209.36	906.63	211.32	906.37	211.77
214.28	906.12	214.59	906.1	215.86	906.02	216.6
219.44	905.6	219.91	905.54	220.3	905.53	221.72
223.95	905.26	224.79	905.25	225.52	905.23	226.4
228.64	904.8	229.69	904.54	231.3	904.01	231.53
233.1	903.26	233.99	902.78	234.88	902.31	235.31
237.66	901.31	237.94	901.24	239.73	900.8	241.27
242.3	899.23	243.56	898.37	244.64	897.84	245.85
248.41	897.64	249.01	897.68	249.75	897.71	250.55
251.99	897.71	253.51	897.7	253.78	897.71	254.09
256.85	897.79	258.37	897.85	258.81	897.87	259.93
262.9	897.97	263.21	897.97	263.44	897.98	264.74
267.2	898.29	268.02	898.54	268.85	898.81	270.2
272.8	898.01	273.91	897.92	274.86	897.84	276.46
278.39	897.54	279.39	897.46	280.85	897.34	283.41
286.1	896.89	286.71	896.83	287.45	896.75	288.15
290.54	896.44	292.63	896.24	293.62	896.14	294.42
295.77	895.92	297.1	895.79	299.88	895.51	300.63
301.89	895.36	306.91	895.36	307.43	895.37	312.25
						895.37
						313.6
						895.38



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317.78	895.38	318.84	895.39	319.86	895.49	321.03	895.6	323.43	895.84
324.18	895.91	325	895.99	325.99	896.09	326.88	896.18	327.85	896.28
328.83	896.37	329.61	896.45	331.74	896.66	332.6	896.74	333.64	896.85
334.91	896.96	335.97	897.06	338	897.23	339.19	897.34	340.43	897.45
341.41	897.53	342.43	897.62	345.47	897.88	346.39	897.96	347.74	898.08
348.68	898.16	349.93	898.27	351.11	898.42	352.87	898.64	353.49	898.72
354.15	898.8	355.04	898.92	356.37	899.08	358.35	899.33	359.59	899.49
360.47	899.6	362.02	899.8	362.49	899.86	363.4	899.97	364.32	900.09
364.85	900.15	365.75	900.27	368.12	900.57	369.25	900.62	370.63	900.72
370.86	900.75	371.45	900.8	372.72	900.93	373.22	900.96	374.24	901.08
374.39	901.09	375.61	901.23	376.18	901.3	377.16	901.41	377.8	901.44
379.45	901.51	379.97	901.53	381.73	901.74	381.86	901.75	381.97	901.76
383.08	902.04	383.33	902.09	384.68	902.46	385.46	902.6	386.89	902.63
389.62	902.01	389.8	902	389.91	901.95	391.35	901.34	391.89	901.11
392.92	900.71	393.53	900.48	394.77	900.1	395.45	899.9	396.96	899.73
397.59	899.64	397.91	899.62	399.59	899.53	400.18	899.53	401.18	899.52
401.91	899.51	403.31	899.51	405.35	899.46	406.72	899.49	407	899.5
408.53	899.53	410.53	899.53	411.91	899.52	412.54	899.51	414.24	899.49
414.61	899.49	414.75	899.48	416.79	899.45	417.59	899.46	419.35	899.43
419.52	899.43	421.16	899.41	422.77	899.43	423.25	899.43	423.56	899.45
425.44	899.51	425.72	899.52	425.82	899.53	427.5	899.65	428.72	899.77
429.27	899.82	430.89	899.94	432.01	900.01	433.37	900.08	434.43	900.1
435.47	900.11	435.97	900.12	436.62	900.13	437.75	900.14	438.38	900.15
440.02	900.18	440.48	900.19	441.94	900.18	442.91	900.18	444.75	900.14
444.83	900.14	447.18	900.11	447.3	900.11	449.32	900.14	451.32	900.15
453.54	900.2	455	900.31	455.71	900.36	456.08	900.39	458.35	900.63
458.43	900.64	460.19	900.79	460.75	900.86	461.77	900.99	462.75	901.1
463.87	901.25	464.84	901.37	466.06	901.54	468.09	901.66	469.48	901.75
470.36	901.82	471.8	901.97	472.74	902.07	474.35	902.2	474.67	902.23
475.99	902.28	476.67	902.31	476.84	902.32	478.45	902.37	479.16	902.4
479.91	902.43	480.38	902.46	481.73	902.55	483.02	902.74	483.89	902.89
485.23	903.31	485.78	903.43	486.87	903.66	487.91	903.81	488.66	903.88
489.71	903.98	490.06	904.01	491.47	904.33	492.03	904.51	493.32	904.92
494.18	905.17	496.28	905.88	496.34	905.9	496.39	905.91	498.34	906.5
498.96	906.64	500.01	906.91	501	907.25	501.98	907.59	502.69	907.87
503.68	908.28	504.71	908.69	505.5	909.02	507.05	909.73	508.55	910.29
508.75	910.36								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1 293.62 .035 325.99 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 293.62 325.99 69.09 69.09 69.09 .1 .3

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 0 57.57 910 F  
 385.46 508.75 910 F

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CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 1582.56

INPUT

Description:

Station Elevation Data		num= 482									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	924.172.780029	924.42.960022	924.393.280029	924.413.630005	924.47						
4.059998	924.554.530029	924.565.090027	924.7317.60999	925.9521.53003	924.53						
22.20001	924.2923.59998	923.8824.28003	923.525.77002	922.6426.57001	922.17						
27.42999	921.6828.35999	921.2129.33002	920.7135.46997	918.0739.78003	915.89						
43.92999	911.3745.33002	909.8346.28998	909.7851.57001	906.9252.32001	906.71						
53.06	906.853.17999	906.8154.78003	906.9955.59998	906.9457.57001	906.87						
60.03	906.87 65.44	906.867.04999	906.867.70999	906.8169.14001	906.82						
70.69	906.82 72.34	906.69 73.22	906.5873.85999	906.5377.39001	906.2						
79.01999	905.9383.60999	905.4 88.38	904.4389.14001	904.2491.17999	903.77						
91.72	903.64 92.44	903.36 94.47	903.1996.45999	903.4396.57999	903.37						
96.92001	903.3 103.22	901.54 104.72	901.63 106.96	901.86 110.28	902.56						
111.11	902.89 112.9	903.19 113.13	903.22 113.54	903.22 115.7	903.26						
115.82	903.22 116.37	903.17 116.45	903.17 117.78	903.16 118.94	903.08						
119.76	903.03 120.62	903 121.5	902.99 122.46	903.02 124.22	902.96						
125.02	902.93 126.09	902.86 127.16	902.81 128.04	902.75 128.76	902.73						
129.97	902.84 130.79	902.8 131.75	902.75 132.67	902.73 133.76	902.73						
134.97	902.87 135.78	902.92 137.02	903.04 139.23	903.08 139.47	903.1						
139.75	903.14 141.98	903.39 143.34	903.4 144.56	903.49 145.55	903.52						
146.41	903.49 147.88	903.5 149.76	903.52 149.97	903.53 150.12	903.52						
151.99	903.48 152.48	903.48 153.44	903.52 154	903.53 154.9	903.54						
156.33	903.56 156.99	903.53 157.78	903.53 159.18	903.6 160.6	903.64						
161.18	903.65 161.57	903.65 163.64	903.56 163.76	903.56 164.3	903.55						
165.5	903.53 166.13	903.54 167.14	903.58 169.25	903.48 171.45	903.32						
171.68	903.33 173.87	903.42 174	903.45 175.32	903.58 175.77	903.63						
175.85	903.65 177.36	903.94 178.21	904.12 179.37	904.62 180.07	904.9						
181.44	905.52 183	906.3 183.65	906.66 187.19	906.93 187.49	906.98						
189.88	907.22 191.42	907.39 191.75	907.47 193.2	907.85 194.56	908.15						
195.19	908.22 197.34	908.32 198.39	908.22 199.52	908.12 199.77	908.09						
200.22	907.99 201.59	907.72 202.54	907.58 202.98	907.54 204.32	907.4						
205.06	907.44 206.76	907.47 207.24	907.52 208.84	907.61 209.11	907.63						
210.58	907.67 211.37	907.66 213.92	907.47 214.23	907.47 214.5	907.49						
216.35	907.73 216.68	907.78 217.79	907.9 218.26	907.98 220.11	908.16						
220.49	908.18 222.13	908.29 222.28	908.29 223.66	908.26 223.99	908.29						
225.5	908.37 227.15	908.69 228.75	908.84 229.96	908.96 231.45	909.16						
232.75	909.28 233	909.31 233.35	909.35 236.27	909.6 237.53	909.69						
238.67	909.8 241.34	909.94 241.68	909.95 242.5	910.02 243.47	910.11						
243.84	910.13 245.37	910.18 246.11	910.21 247.31	910.23 249.44	910.28						

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249.65	910.28	249.76	910.29	250.23	910.29	253.63	910.31	255.74	910.33
257.9	910.33	258.07	910.34	259.56	910.36	261.1	910.39	261.51	910.39
262.23	910.4	263.44	910.4	264	910.39	265.52	910.36	266.11	910.36
268.33	910.32	269.14	910.3	271.31	910.12	271.43	910.1	271.56	910.09
273.73	909.91	274.3	909.88	276.33	909.76	276.42	909.75	276.73	909.69
278.21	909.44	278.94	909.26	279.86	909.07	280.91	908.91	281.88	908.8
282.48	908.72	283.55	908.58	284.83	908.41	285.5	908.28	287.54	907.92
288.58	907.65	290.1	907.38	291.21	907.22	292.24	907.15	293.69	907.1
294.18	907.09	295.01	907.01	295.87	906.97	297.08	906.89	297.62	906.86
297.9	906.82	299.47	906.55	300.93	906.4	303.73	906.14	303.91	906.12
303.99	906.11	305.89	905.86	307.04	905.66	307.81	905.56	308.77	905.48
309.89	905.39	310.47	905.34	311.89	905.29	312.32	905.29	314.16	905.25
314.22	905.25	314.31	905.23	316.27	904.9	317.53	904.56	318.14	904.42
319.71	903.91	319.9	903.86	319.97	903.83	321.76	903.04	322.23	902.78
324.09	902.13	325.84	901.62	326.97	901.32	327.77	901.08	328.46	900.75
329.87	899.96	329.99	899.88	330.44	899.48	333.63	898.1	334.43	897.7
335.07	897.67	336.6	897.81	337.18	897.84	337.97	897.87	339.09	897.86
339.78	897.85	340.48	897.85	341.97	897.86	343.65	897.89	344.39	897.89
345.46	897.91	346.28	897.93	347.83	898	349.11	898.04	349.67	898.07
350.47	898.08	351.28	898.1	352.4	898.12	352.83	898.13	352.97	898.13
355.13	898.31	355.45	898.36	356.38	898.74	357.65	899.19	359.15	899.58
359.53	899.61	361.22	899.64	361.29	899.64	362.86	899.49	363.17	899.45
364.37	899.39	364.73	899.36	365.99	899.33	366.33	899.32	367.48	899.31
369.6	899.26	370.76	899.24	371.84	899.21	372.72	899.17	374.26	899.11
375.64	898.99	376.34	898.91	377.6	898.79	378.2	898.73	378.62	898.72
381.24	898.74	381.76	898.75	383.38	898.72	384.46	898.72	385.91	898.73
388.1	898.78	388.38	898.78	390.44	898.8	391.54	898.84	392.15	898.86
392.68	898.89	393.7	898.95	395.9	899.05	396.94	899.07	398.24	899.14
398.9	899.16	400.31	899.22	400.71	899.22	402.09	899.2	403.59	899.17
403.96	899.15	405.72	898.92	406.23	898.89	407.25	898.85	408.41	898.78
409.46	898.72	410.34	898.68	410.99	898.66	412.05	898.62	412.68	898.62
413.3	898.63	414.37	898.6	415.16	898.59	417.24	898.6	419.34	898.6
420.44	898.56	420.97	898.55	422.41	898.5	423.29	898.45	424.73	898.35
425.34	898.31	427.27	898.13	428.85	897.96	429.17	897.93	429.42	897.89
432.11	897.65	433.25	897.27	434.38	896.9	434.84	896.8	435.38	896.68
436.08	896.54	437.78	896.17	438.68	894.99	439.64	894.47	441.41	894.35
441.79	894.34	442.36	894.32	444.52	894.24	446.55	894.16	448.38	893.98
448.83	894.42	449.28	894.85	451.09	895.88	452.05	896.42	452.9	896.9
454.48	897.05	455.04	897.12	455.48	897.19	455.76	897.24	456.02	897.25
457.37	897.22	457.93	897.21	458.11	897.2	459.69	897.15	461.27	897.09
461.69	897.07	463.66	897.02	463.91	897.01	465.66	896.99	465.93	896.99
467.39	896.96	467.96	896.94	469.07	896.92	469.71	896.91	471.99	896.8
472.16	896.8	473.67	896.73	474.45	896.7	474.53	896.69	476.35	896.6
477.18	896.55	479.07	896.46	479.33	896.44	479.48	896.43	481.8	896.3
482.38	896.27	484.03	896.16	484.69	896.14	486.33	896.03	486.72	896.01
488.71	895.98	488.92	895.98	490.56	896	491.16	896	492.76	896.01
493.48	896.01	495.26	896	495.75	896.01	497.65	895.98	498.02	895.98
499.96	896.03	500.4	896.05	502.13	896.15	502.85	896.18	504.22	896.24

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505.33	896.25	509.55	896.25	511.16	896.24	511.22	896.24	511.29	896.25
512.99	896.31	516.04	896.31	516.36	896.3	517.23	896.29	518.61	896.28
519.32	896.27	520.73	896.27	522.8	896.26	523.42	896.26	525.85	896.27
527.43	896.39	528.38	896.46	529.76	896.78	530.73	896.96	531.2	897.06
533.62	897.58	533.68	897.58	536.65	898	536.9	898.04	539.32	897.98
539.56	897.99	540.95	897.93	541.76	897.84	543.68	897.89	543.86	897.91
543.94	897.92	544.98	898.02	545.75	898.09	545.86	898.09	548.2	898.34
548.83	898.43	550.29	898.76	551.42	899.18	552.91	899.91	553.94	900.52
554.8	901.15	555.85	901.89	556.31	902.19	557.76	903.2	558.82	903.83
559.87	904.65	560.56	905.09	561.92	905.91	562.35	906.21	563.13	906.57
564.87	907.37	565.47	907.52	566.26	907.81	567.86	908.52	568.65	908.96
569.62	909.54	570.5	910						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	437.78	.035	452.05	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	437.78	452.05		61.68	69.18	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	359.15	915	F

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 1513.38

INPUT

Description:

Station Elevation Data num= 488

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	922.0225	52997	924.16	25.69	924.1525	97998	924.1726	29999	924.22
26.69	924.29	27.12	924.31	27.62	924.4638	98999	925.5742	57001	924.29
43.17999	924.0744	45001	923.6945	06998	923.3646	42999	922.5847	15997	922.15
47.94998	921.7148	79999	921.2849	67999	920.8455	29999	918.44	59.25	916.47
63.06	912.3664	34998	910.9665	97998	910.88	74.84	906.1274	88998	906.11
74.92999	906.1175	39999	906.14	75.78	906.12	80.59	906.13	81.59	906.15
83.12	906.186	38998	905.9188	10999	905.9589	45999	905.87	90.28	905.93
92.41998	905.82	93.84	905.79	94.84	905.7196	45999	905.6599	81998	905.56
101.31	905.39	102.51	905.29	102.85	905.23	104.69	905.04	107.63	904.68
110.65	904.56	111.62	904.48	116.11	903.9	119.38	903.62	122.28	903.71
124.24	903.76	124.63	903.76	125.45	903.64	125.98	903.65	126.9	903.77
128.96	903.61	129.73	903.64	129.87	903.63	130.11	903.62	130.57	903.65
131.62	903.73	135.06	904.19	136.89	904.2	137.87	904.25	138.17	904.3
139.33	904.48	140.17	904.65	140.99	904.78	142.1	904.9	143.67	905.06
143.94	905.08	145.54	905.21	146.11	905.24	147.33	905.32	148.36	905.39

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149.21	905.38	150.54	905.4	151.44	905.41	152.66	905.46	153.63	905.57
154.1	905.62	155	905.68	155.61	905.67	156.95	905.65	157.66	905.63
159.42	905.62	160.17	905.63	161.69	905.61	161.77	905.61	163.3	905.6
163.53	905.6	165.44	905.55	165.69	905.55	167.75	905.59	167.89	905.59
168.51	905.63	169.96	905.75	170.23	905.76	171.08	905.78	171.96	905.8
173.74	905.86	174.11	905.87	174.18	905.88	174.32	905.9	176.41	906.21
178	906.58	178.7	906.64	180.34	906.95	180.95	907.07	181.31	907.15
183.16	907.39	184.63	907.54	185.02	907.59	186.63	907.73	187.26	907.8
188.68	907.91	189.45	907.9	190.3	907.9	191.51	907.94	191.78	907.96
193.34	908.2	193.76	908.26	195.39	908.38	197.34	908.54	197.4	908.55
197.61	908.6	199.58	909.09	199.82	909.09	200.27	909.15	201.85	909.34
202.66	909.54	204	909.71	205.5	910.07	206.29	910.14	207.73	910.26
207.95	910.28	209.93	910.27	210.09	910.27	212.34	910.22	213.69	910.26
214.37	910.25	216.05	910.25	217.53	910.18	218.07	910.18	218.85	910.13
220.33	910.08	222.78	910.08	223	910.06	225.29	910.05	225.31	910.05
225.47	910.06	226.67	910.12	227.96	910.15	228.28	910.15	228.88	910.16
230.42	910.2	231.82	910.26	232.23	910.27	232.42	910.28	234.24	910.26
234.86	910.26	236.48	910.27	236.85	910.27	238.19	910.28	239.58	910.29
240.33	910.34	242.15	910.38	242.44	910.38	244.34	910.46	244.62	910.47
246	910.57	246.53	910.61	246.66	910.62	248.3	910.77	249.6	910.83
250.73	910.82	252.07	910.87	252.75	910.89	253.65	910.95	254.62	911
255.36	911.02	256.56	911.05	258.32	911.18	258.45	911.19	258.72	911.22
260.22	911.33	261.02	911.38	261.86	911.48	263.15	911.58	264.01	911.59
265.45	911.62	266.26	911.64	267.76	911.65	268.53	911.66	270.58	911.66
271.97	911.6	272.14	911.6	273.61	911.61	274.12	911.62	276.11	911.66
276.52	911.67	276.63	911.67	277.43	911.66	278.97	911.64	279.2	911.63
280.94	911.61	281.43	911.63	282.69	911.65	284.11	911.62	284.79	911.62
285.6	911.59	286.85	911.53	287.91	911.5	288.72	911.45	289.41	911.41
290.53	911.33	292	911.24	292.1	911.23	292.87	911.15	294.08	911.03
294.15	911.02	294.21	911.02	296.35	910.88	297.04	910.84	298.34	910.76
299.46	910.67	300.54	910.65	301.75	910.66	302.9	910.61	304.63	910.57
304.79	910.57	305.04	910.55	306.59	910.44	307.8	910.34	308.56	910.3
309.11	910.26	310.73	910.18	311.15	910.16	312.38	910.06	313.7	909.98
314.04	909.95	316.04	909.68	316.35	909.63	316.67	909.57	318.89	909.15
319.3	909.09	320.86	908.85	321.37	908.78	322.98	908.59	323.94	908.47
324.91	908.32	326.08	908.19	326.43	908.15	328.09	907.89	328.52	907.8
329.81	907.51	330.18	907.43	330.57	907.34	331.85	907.02	332.21	906.94
333.46	906.6	334.66	906.26	335.04	906.17	337.28	905.84	337.52	905.8
339.51	905.58	339.69	905.56	340.96	905.39	341.57	905.32	342.36	905.22
342.46	905.2	342.8	905.16	344.42	904.96	344.83	904.89	346.21	904.67
346.63	904.6	347.07	904.52	348.44	904.24	349.02	904.14	350.61	903.8
352.24	903.7	352.5	903.66	352.77	903.62	354.42	903.27	355.74	902.72
356.39	902.37	356.96	901.92	357.43	901.48	357.72	901.2	358.06	900.83
358.97	900.26	359.96	899.45	362.65	898.65	363.15	898.64	364.1	898.61
365.02	898.56	365.42	898.56	366.67	898.57	367.43	898.62	368.7	898.72
369.61	898.75	370.91	898.77	371.83	898.78	373.09	898.79	374.46	898.82
374.78	898.83	375.08	898.84	376.44	898.89	377.53	898.88	378.47	898.83
379.87	898.74	380.29	898.72	381.35	898.72	381.85	898.71	382.06	898.73

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384.58	899.29	384.85	899.4	385.66	899.74	386.11	899.88	388.62	900.29
389.77	900.26	390.75	900.05	391.46	899.9	393.1	899.59	393.2	899.59
394.89	899.41	395.49	899.39	396.43	899.37	397.02	899.36	398.31	899.32
400.13	899.28	400.18	899.28	401.97	899.22	403.15	899.17	404.07	899.14
405.25	899.1	406.09	899.09	407.86	899.07	408.69	899.07	409.91	899
410.65	898.96	411.43	898.93	412.57	898.88	414.47	898.88	415.46	898.9
416.49	898.94	417.81	899	418.66	899.05	419.4	899.09	420.97	899.15
421.56	899.18	422.69	899.22	424.43	899.25	425.05	899.25	426.76	899.27
427.38	899.29	428.71	899.24	428.99	899.22	430.43	899.08	431.16	899.02
432.69	898.92	433.06	898.88	434.37	898.76	436.09	898.68	436.29	898.67
436.58	898.65	438.24	898.59	439.69	898.57	440.4	898.55	440.98	898.57
442.6	898.57	444.2	898.59	444.57	898.57	445.31	898.56	446.07	898.53
447.82	898.53	449.98	898.57	450.51	898.59	452.6	898.66	452.82	898.66
453.17	898.68	453.89	898.7	454.82	898.74	456.8	898.75	456.95	898.75
458.97	898.74	460.92	898.74	461.51	898.73	462.75	898.71	463.46	898.7
464.31	898.68	466.25	898.66	466.57	898.67	467.22	898.66	468.85	898.61
469.66	898.58	470.49	898.53	471.54	898.45	471.95	898.42	472.71	898.36
474.07	898.25	474.55	898.15	476.85	897.72	476.94	897.7	477.04	897.68
478.61	897.4	480.14	897.05	480.24	897.03	480.34	897.01	482.39	896.59
482.94	896.48	484.65	896.23	485.5	896.14	486.73	896.03	488.18	896.04
488.71	896.05	490	896.13	490.37	896.16	490.83	896.17	492.16	896.21
492.5	896.22	492.98	896.2	494.16	896.17	495.25	896.09	495.89	896.05
496.01	896.04	496.06	896.04	496.19	896	498.62	895.57	499.85	894.44
501.09	893.3	501.64	893.01	502.2	892.72	505.1	892.53	507.5	892.23
508.52	892.83	509.53	893.44	510.69	894.14	511.32	894.52	511.84	894.84
512.68	896.8	513.4	898.48	513.93	898.77	516.09	901.26	518.29	902.41
518.55	902.55	518.74	902.63	519.3	902.86	520.49	903.29	520.66	903.35
521.7	903.62	522.52	903.85	522.64	903.89	524.96	904.93	524.98	904.94
525.01	904.95	527.21	906.19	528.49	906.83	528.94	907.08	529.81	907.6
530.7	908.13	531.35	908.47	533.21	909.24	533.86	909.48	535.16	909.96
535.77	910.26	536.89	910.81	538.42	911.3	539.14	911.58	539.72	911.86
541.12	912.65	541.83	913.04	542.61	913.47	543.82	914.04	544.64	914.38
546.21	915.1	546.45	915.19	547.93	915.69	548.78	915.92	549.75	916.12
551.54	916.45	551.87	916.52	552	916.57	552.45	916.69	554.44	917.21
555.43	917.41	556.52	917.63	556.55	917.64				

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 494.16 .035 512.68 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 494.16 512.68 41.35 41.35 41.35 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 1472.03

171-150-Revised-An.rep

INPUT

Description:

Station Elevation Data		num= 484							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	920.7736.87006	923.8737.01001	923.86	37.25	923.8737.53003	923.92			
37.86005	923.9838.23004	923.9938.67004	924.1248.42004	925.0851.48004	923.97				
52	923.7853.09003	923.4653.62006	923.1754.78003	922.555.41003	922.13				
56.08002	921.7556.80005	921.3857.56006	92162.35004	918.9365.71002	917.24				
68.95004	913.7270.04004	912.5272.55002	912.480.11002	908.383.39001	906.45				
83.71002	906.7285.02002	905.9485.40002	905.7985.70004	905.8588.83002	906.03				
90.17004	906.0892.33002	90694.76004	905.8996.74002	905.3999.52002	905.19				
102.84	905.08	103.32	905.05	103.6	905.06	104.12	905.04	105.2	904.99
107.57	904.92	111.44	904.73	112.08	904.72	112.33	904.73	114.95	904.54
117.65	904.6	120.47	905.12	122.35	904.78	122.53	904.87	127.61	907.07
131.68	908.61	134.68	910.95	135.51	910.95	139.64	910.84	140.81	910.94
141.32	910.38	142.32	909.62	142.46	909.8	142.96	910.01	143.21	910.3
143.46	910.35	143.58	910.48	143.87	910.49	143.99	910.57	144.31	910.55
144.59	910.57	144.78	910.63	144.94	910.58	145.08	910.66	145.16	910.66
145.47	910.63	147.42	910.42	148.75	910.38	149.19	910.37	151.54	910.66
151.65	910.68	151.76	910.69	153.99	910.96	154.39	910.99	155.52	911.03
156.7	911.04	157.58	911.08	159.07	911.19	159.45	911.21	160.27	911.26
161.32	911.32	161.79	911.34	163.07	911.38	163.87	911.39	165.24	911.43
166.39	911.47	167.53	911.52	168.71	911.58	169.51	911.56	170.29	911.53
171.24	911.54	172.69	911.59	173.37	911.63	174.05	911.65	175.51	911.7
177.53	911.73	177.89	911.73	179.61	911.79	180.63	911.84	180.91	911.85
182.7	911.89	182.76	911.89	185.27	911.93	185.42	911.94	185.79	911.94
187.76	911.99	188.62	912.01	190.15	912	191.01	912.03	191.76	912.04
192.81	912.06	193.42	912.09	194.03	912.15	196.28	912.42	197.68	912.57
198.89	912.68	199.81	912.75	200.87	912.86	201.89	912.94	203.23	913.05
204.53	913.13	205.76	913.21	206.82	913.26	207.66	913.29	208.54	913.34
209.41	913.38	211.25	913.56	211.7	913.6	212.5	913.68	214.05	913.79
215.01	913.84	216.04	913.86	217.51	913.87	217.89	913.87	218.27	913.86
220.04	913.88	221.07	913.95	222.15	914.01	223.19	914.05	224.31	914.07
224.48	914.07	225.64	914.03	227.06	914	227.82	913.99	228.94	913.96
230.29	913.94	231.46	913.92	232.37	913.9	233.08	913.88	234.72	913.84
234.87	913.84	235.59	913.86	237.12	913.9	237.38	913.91	238.32	913.93
239.67	913.94	240.19	913.92	241.82	913.83	243.15	913.77	243.91	913.75
246.03	913.73	246.09	913.73	246.14	913.72	248.23	913.69	248.46	913.68
249.92	913.65	250.82	913.62	251.64	913.62	252.48	913.63	254.53	913.63
255.48	913.65	257.06	913.68	257.83	913.67	259.01	913.69	259.41	913.68
261.19	913.62	261.45	913.62	261.85	913.61	263.55	913.59	265.12	913.6
267.16	913.57	267.39	913.57	267.88	913.56	269.67	913.55	271.1	913.59
273.56	913.59	274.52	913.58	275.96	913.57	277.02	913.56	278.09	913.53
279.74	913.57	279.94	913.57	281.75	913.63	283.17	913.7	283.85	913.72
285.98	913.72	286.48	913.67	288.21	913.52	288.48	913.5	288.77	913.46
290.19	913.26	291.59	913.1	291.89	913.07	292.65	913.01	293.94	912.89
294.42	912.87	295.99	912.83	297.84	912.74	297.96	912.73	298.18	912.73

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299.79	912.72	301.53	912.76	301.81	912.75	303.02	912.71	303.98	912.67
304.24	912.63	305.99	912.33	307.8	912.11	307.93	912.1	308.07	912.08
309.83	911.92	311.15	911.84	311.81	911.79	313.26	911.67	313.82	911.63
314.07	911.61	315.92	911.48	317.13	911.42	317.78	911.38	318.52	911.33
319.4901	911.26	321.4	910.99	321.89	910.92	322.73	910.75	323.81	910.54
325.31	910.27	325.71	910.19	327.76	909.9	327.97	909.87	328.29	909.83
330.2401	909.62	331.56	909.46	332.3	909.38	334.25	909.1	334.37	909.08
336.36	908.76	337.63	908.5	338.61	908.32	340.56	907.94	341.03	907.85
342.41	907.6	342.94	907.51	344.33	907.26	344.46	907.24	345.87	907
346.42	906.9	349.4	906.42	349.91	906.34	350.23	906.28	352.16	905.94
352.59	905.86	352.69	905.84	354.51	905.52	356.36	905.25356.4901	362.12	905.23
358.6	904.88	359.16	904.81	360.26	904.67	361.43	904.62	362.12	904.56
362.86	904.46364.2401	904.32	365.18	904.18	366.35	903.99	903.99	367.46	903.78
368.38	903.63	369.3	903.46	370.15	903.32	370.9	903.19	372.29	902.96
373.03	902.8374.2401	902.53	375.11	902.28	375.5	902.18	902.18	376.54	902.13
378.31	901.93	379.01	901.97	381.05	902.14	381.15	902.15	382.95	902.2
384.52	902.24	385.18	902.26	386.16	902.3	387.42	902.38	387.77	902.4
389.39	902.46	390.62	902.5	391.47	902.52	393.29	902.57	393.87	902.58
395.01	902.59	395.9	902.59	396.33	902.58	397.94	902.52	398.81	902.45
400.02	902.31	400.56	902.25	401.55	902.12	402	902.03	402.77	901.8
403.38	901.65	404.39	901.33	404.91	901.16	406.17	900.73	406.66	900.56
407.16	900.47	408.52	900.19	409.13	900.08	410.73	899.87	411.3	899.8
412.57	899.67	413.3	899.62	413.81	899.57	415.26	899.42	415.55	899.4
417.95	899.33	418.35	899.34	418.85	899.36	420.62	899.38	422.29	899.38
422.89	899.37	424.91	899.37	425.83	899.38	426.54	899.4	428.19	899.42
429.56	899.38	430.28	899.39	431.39	899.38	431.96	899.37	432.31	899.37
434.22	899.27	434.93	899.25	436.55	899.19	436.9	899.17	438.79	899.16
439.07	899.16	440.71	899.12	441.36	899.09	442.34	899.05	444.74	898.92
447.15	898.77	447.67	898.73	449	898.66	449.61	898.64	450.6	898.61
451.99	898.56	452.24	898.55	452.47	898.54	454.21	898.46	455.42	898.41
456.12	898.4	456.64	898.38	458.34	898.24	459.11	898.16	460.72	897.93
461.38	897.83	463.08	897.6	463.69	897.54	464.89	897.38	466.08	897.2
466.59	897.13	468.44	896.87	470.46	896.72	471.57	896.66	471.98	896.63
472.09	896.62	473.62	896.5	473.69	896.5	475.73	896.28	475.86	896.27
477.41	896.16	478.14	896.11	478.2	896.11	478.39	896.1	480.49	896.02
481.48	895.99	482.48	895.95	483.86	895.98	484.11	895.98	484.54	896
485.98	896.08	486.39	896.09	487.69	896.15	488.49	896.18	488.83	896.19
490.11	896.24	491.81	896.24	493.41	896.26	493.79	896.26	495.35	896.2
495.85	896.13	497.32	895.93	497.84	895.85	498.29	895.8	499.46	895.74
499.71	895.74	501.7	895.47	502.3	894.58	502.89	893.69	503.75	893.43
504.6	893.16	506.29	892.59	507.85	892.57	509.46	892.35	510.45	892.71
511.43	893.06	512.7	893.62512.8701	893.7	513.47	893.97	893.97	513.72	894.08
513.98	894.19	514.5	894.21	514.73	894.22	515.61	894.24	517.65	896.35
518.3	897.04	520.21	897.11520.4301	897.55520.4901	897.89	521.4	897.89	521.4	901.11
523.0601	903.46	524.47	904.25	525.21	904.54	526.14	904.99526.8701	905.33	905.33
527.58	905.74	529.11	906.58	530.77	907.31	531.11	907.48531.6801	907.71	907.71
532.69	908.14	533.1	908.34534.7401	909.08	534.83	909.12	536.19	909.8	909.8
537.27	910.24	537.91	910.52539.2401	911.06	539.65	911.24541.4301	912.15	912.15	912.15



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541.5601	912.21	544.11	913.03	544.27	913.09	545	913.31	547.15	913.98
547.95	914.33	549.29	914.91	549.34	914.93	551.21	915.72	551.35	915.77
553.08	916.35554.4301		916.57	555.05	916.7	556.46	917.06556.6801		917.13
557.27	917.36	558.26	917.76	558.77	917.97	559.89	918.51	561.2	919.06
562.33	919.37	563.98	919.96	564.3	920.08564.5601		920.18566.1801		920.79
568.23	921.55	568.3	921.57	568.4	921.61	570.28	922.19		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	495.35	.035	517.65	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	495.35	517.65		46.62	48.33	49.76	.1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 1423.7

INPUT

Description:

Station Elevation Data num= 483

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	944.7	29	921.1550.85004	922.96	51.06	922.9651.20001		922.99	
51.38	923.0251.58002	923.03	51.81	923.0957.04999		923.658.72003		923.03	
59	922.9359.60004	922.7659.89001	922.6160.52002	922.26	60.87	922.06			
61.23004	921.8662.04999	921.4764.70001	920.3866.57001	919.48	68.38	917.6			
69	916.9674.33002	916.6877.85004	914.8479.39001	91483.08002		916.86			
86.07001	915.187.90002	915.73	89.72	915.7690.82001	916.9991.06003	916.94			
91.42001	916.8992.80002	917.9293.32001	917.9696.08002	918.61	100.07	918.17			
102.48	917.86	103.49	917.89	105.64	917.93	107.1	918	107.54	918.04
109.12	918.04	111.22	918.07	112	918.04	114.29	918.06	116.98	918.17
119.68	918.06	120.84	917.85	121.68	917.76	122.25	917.72	124.05	917.73
124.4	917.73	125	917.66	126.68	917.51	128.07	917.28	128.55	917.22
129.01	917.17	130.23	917.08	131.09	917.08	132.5	916.88	134.29	916.91
134.41	916.92	134.49	916.92	136.25	916.97	137.78	916.99	138.47	917.01
139.54	917.01	140.59	917.03	141.21	917.02	142.77	916.99	144.08	916.92
145.92	916.73	146.94	916.66	147.92	916.57	149.02	916.55	149.79	916.53
150.82	916.48	152.55	916.37	152.68	916.36	152.83	916.33	154.22	916.09
156.59	915.95	156.97	915.96	158.61	916.16	158.83	916.17	160.66	916.34
161.04	916.35	162.36	916.37	163.12	916.38	163.45	916.38	165.12	916.4
166.78	916.45	167.35	916.46	167.85	916.54	169.57	916.73	170.7	916.88
171.41	916.99	172.43	917.18	173.11	917.31	173.94	917.41	175	917.55
175.46	917.55	176.69	917.58	176.91	917.58	178.1	917.59	178.76	917.6
180.02	917.63	181	917.66	182.41	917.67	182.99	917.67	184.22	917.65
186.32	917.58	186.53	917.58	187.36	917.56	188.81	917.53	189.24	917.5
190.76	917.42	192.17	917.33	192.35	917.32	194.23	917.18	194.37	917.17

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196.82	917.12	197.11	917.1	197.45	917.09	199.41	916.99	200.07	916.95
201.42	916.83	202.85	916.73	203.13	916.71	203.41	916.7	204.91	916.64
206.48	916.57	206.73	916.56	206.9	916.55	208.77	916.52	209.51	916.51
211	916.5	211.32	916.49	214.12	916.47	214.89	916.5	215.62	916.48
217.22	916.48	218.68	916.49	218.83	916.49	220.73	916.43	221.12	916.42
224.02	916.42	225.69	916.41	226.35	916.41	228.21	916.46	229.15	916.63
230.06	916.79	231.52	917.17	231.78	917.22	233.7	917.47	234.39	917.54
234.97	917.6	236.51	917.66	237.91	917.61	238.25	917.65	239.31	917.62
240.36	917.46	240.93	917.5	243.7	917.26	246.27	917.02	246.57	916.97
246.89	916.99	249.31	916.68	249.45	916.66	250.85	916.39	251.17	916.33
251.22	916.32	252.66	916.12	253.08	916.09	254.21	915.97	255.52	916.01
257.12	915.93	257.94	915.88	259.73	915.48	260.44	915.28	260.67	915.24
262.46	914.89	263.33	914.71	263.46	914.69	264.03	914.64	265.53	914.5
267.14	914.38	268.19	914.33	268.84	914.31	269.55	914.27	271.38	914.17
272.9	914.06	274.31	913.94	274.92	913.91	276.31	913.77	277.05	913.69
278.04	913.61	279.26	913.53	280.94	913.43	281.04	913.43	281.72	913.37
283.05	913.25	283.24	913.23	285.17	913.08	286.01	912.99	287.15	912.91
288.92	912.77	289.05	912.76	289.16	912.76	290.97	912.68	293	912.57
294.79	912.5	295.14	912.47	296.77	912.32	297.03	912.3	298.51	912.21
299.67	912.25	300.85	912.23	301.87	912.18	302.83	912.06	303.47	911.99
304.99	911.83	305.17	911.81	305.24	911.8	307.18	911.67	307.78	911.62
309.57	911.51	311.1	911.44	312.7	911.32	312.94	911.3	315.22	911.07
315.44	911.05	317.81	910.92	318.03	910.9	319.67	910.81	320.74	910.73
321.79	910.61	323.21	910.44	324.26	910.4	325.37	910.31	327.09	910.12
327.35	910.09	327.78	910.07	329.23	909.99	330.33	909.91	332.02	909.78
333.23	909.67	333.95	909.63	335.82	909.45	336.28	909.41	337.59	909.29
337.96	909.26	338.85	909.19	339.67	909.12	340.51	909.05	342.71	908.84
342.81	908.84	345.18	908.63	345.54	908.6	347.3	908.35	348.72	908.17
349.54	908.06	350.02	908	352.02	907.64	353.18	907.42	353.86	907.3
354.07	907.25	355.85	906.98	357.25	906.65	357.33	906.63	358.79	906.37
360.07	906.16	360.55	906.11	361.94	906	362.55	905.98	363.56	905.95
364.8	905.89	365.61	905.86	367.02	905.79	368.15	905.72	369.1	905.57
370.48	905.38	370.95	905.29	371.88	905.16	372.74	905.02	373.19	904.96
374.79	904.76	375.02	904.74	375.17	904.72	376.38	904.57	377.92	904.37
378.29	904.31	378.44	904.29	378.93	904.23	382.47	904.01	383.4	904.07
386.15	904.05	386.34	904.07	388.6	904.39	389.09	904.49	390.23	904.69
391.81	904.8	392.63	904.87	393.75	904.86	395.44	904.65	396.93	904.46
397.47	904.39	397.67	904.37	398.02	904.34	399.96	904.18	401.84	904.07
402.69	904.03	403.42	903.98	405.21	903.87	405.43	903.86	411.47	903.86
411.97	903.87	413.23	903.89	414.57	903.88	415.17	903.87	415.97	903.85
417.28	903.83	417.91	903.81	419.56	903.75	420.26	903.73	421.63	903.67
422.69	903.64	424.67	903.58	425.25	903.55	427.42	903.37	427.67	903.35
427.85	903.31	430.17	902.83	430.54	902.7	431.71	902.23	432.68	901.88
433.02	901.72	433.61	901.47	434.28	901.15	435.32	900.64	437.16	900.09
437.32	900.03	437.75	899.94	439.14	899.61	439.59	899.55	440.37	899.47
441.63	899.36	443.21	899.26	443.71	899.24	445.57	899.27	446.35	899.27
447.42	899.26	449.11	899.23	449.23	899.23	451.12	899.21	452.15	899.19
453.22	899.18	454.12	899.18	455.6	899.17	456.62	899.2	457.78	899.26

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459.32	899.35	459.46	899.35	459.61	899.37	461.03	899.46	462.07	899.53
462.82	899.6	463.61	899.64	464.98	899.66	466.59	899.6	467.45	899.53
469.08	899.33	469.56	899.27	469.95	899.23	471.38	899.07	472.35	899
473.55	898.88	473.98	898.85	475.07	898.76	475.9	898.68	476.84	898.65
478	898.58	479.27	898.53	479.58	898.52	481.3	898.44	481.82	898.42
482.66	898.39	483.75	898.33	485.4	898.27	485.64	898.25	487.74	897.99
488.52	897.84	489.82	897.61	490.83	897.4	491.15	897.33	491.97	897.17
492.59	897.04	493.53	896.87	495.19	896.53	496.64	896.23	497.02	896.16
497.13	896.15	498.98	895.95	499.5	895.89	500.81	895.81	501.28	895.78
502.8	895.71	502.98	895.7	503.05	895.7	504.67	895.63	505.45	895.56
506.49	895.48	507.22	895.38	508.42	894.95	509.02	893.54	509.61	892.13
512.58	891.51	515.23	891.17	517.58	890.77	519.01	890.86	520.43	890.96
521.77	891.8	523.1	892.65	525.11	893.14	527.13	893.64	527.65	894.27
528.12	894.73	529.15	895.41	530.31	896.18	531.25	896.56	531.37	896.61
531.61	896.73	532.61	897.21	533.17	897.5	534.1	898.13	535.65	899.17
536.82	900.43	537.77	901.24	539.08	902.57	540.95	903.53	542.05	904.33
543.25	904.96	544.42	905.56	545.85	906	546.64	906.19	547.56	906.38
548.73	906.6	549.61	906.92	550.81	907.38	551.8	907.79	552.84	908.29
554.17	908.82	554.88	909.07	556.52	909.59	556.92	909.71	558.85	910.47
558.97	910.51	561.15	911.45	561.44	911.55	563.41	912.28	563.87	912.44
565.61	913.1	565.83	913.18	567.18	913.76	568.24	914.23	568.36	914.29
568.48	914.34	571.22	915.26	571.97	915.43	573.61	915.89	575.23	916.25
576.41	916.45	577.92	916.72	578.83	916.93	581.58	917.46	581.66	917.48
583.17	917.91	583.7	918.01	584.46	918.18	585.96	918.67	586.22	918.75
588.42	919.39	589.63	919.7	589.89	919.76				

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 506.49 .035 529.15 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 506.49 529.15 55.39 55.39 55.39 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 1368.31

INPUT

Description:

Station Elevation Data num= 481

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	920.12	.0899	920.121.359985	920.111.769989	920.113.920013	920.21			
5.799988	920.176.290009	920.157.940002	920.149.019989	920.22	10.69	920.38			
12.72	920.5515.04999	921.2617.88998	921.85	19.12	922.0825.29001	923.28			
26.75	923.59	27.25	923.59	29.22	924.0830.17999	924.51			
31.41	924.6336.95001	925.9837.48001	926.1737.85999	926.2740.13998	926.86				

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41.35999	927.0641.82001	927.1942.14999	927.1744.23001	927.0144.26999	927.04
44.28	926.97 44.37	927.4344.38998	927.4244.39999	927.4344.42999	927.42
44.47	927.4645.17999	927.6147.76001	928.1448.48999	928.24 48.81	928.24
48.95001	928.2549.23001	928.29 50.78	928.15 51.56	928.3153.35001	928.7
55.23001	928.756.01001	928.72 56.72	928.73 57.44	928.7559.01999	928.8
59.23001	928.81 59.41	928.861.10999	928.7961.70999	928.7962.63998	928.81
63.54001	928.8165.13998	928.84 65.75	928.8266.42001	928.82 67.47	928.83
68.54001	928.8769.26001	928.8770.67001	928.871.23001	928.7973.01001	928.75
73.35001	928.7575.20001	928.78 75.72	928.877.48001	928.8378.17001	928.83
80.20999	928.84 80.41	928.8582.04999	928.8782.17001	928.8783.32999	928.82
84.32999	928.7685.07999	928.7786.63998	928.83 87.5	928.8388.70999	928.82
89.26999	928.8390.17999	928.8291.26001	928.7892.29999	928.75 93.84	928.68
94.34	928.63 95.66	928.4697.04001	928.31 97.19	928.399.13998	928.23
99.22	928.2299.32001	928.22 101.55	928.24 103.25	928.24 105.13	928.14
105.5	928.12 106.6	928.08 107.61	928.06 108.05	928.05 109.48	928.06
111.04	928.02 111.35	928.02 111.59	928 113.18	927.92 114.1	927.88
114.99	927.87 116.04	927.83 117.35	927.75 117.84	927.72 119.42	927.63
120.44	927.55 121.97	927.41 122.95	927.33 123.94	927.23 125.51	927.14
125.79	927.12 126.03	927.12 127.7	927.05 128.91	927.01 129.09	927
129.5	926.99 131.01	926.94 131.26	926.92 132.9	926.88 133.18	926.87
134.4	926.85 135.14	926.83 136.73	926.76 137.47	926.74 138.31	926.72
139.52	926.65 140.88	926.55 141.89	926.48 143.4	926.37 143.86	926.34
145.13	926.22 145.39	926.19 145.87	926.17 147.07	926.13 147.28	926.11
149.36	925.92 149.69	925.88 150.83	925.78 151.69	925.71 151.94	925.69
153.67	925.52 154.39	925.46 155.92	925.29 156.29	925.26 157.67	925.11
159.12	924.97 159.57	924.93 160.22	924.88 161.38	924.78 162.08	924.7
163.51	924.56 165.19	924.38 165.56	924.35 167.36	924.18 168.04	924.11
169.91	923.94 170.34	923.9 170.56	923.88 172.11	923.76 173.35	923.66
173.95	923.62 176.21	923.41 176.24	923.41 178.01	923.27 179.55	923.19
179.82	923.18 180.17	923.16 182.09	923.02 183.74	922.89 184.11	922.86
184.65	922.82 185.91	922.72 186.86	922.63 187.48	922.56 189.02	922.38
189.33	922.35 191.04	922.2 191.53	922.16 191.61	922.15 192.12	922.09
194.07	921.84 194.33	921.81 194.91	921.74 196.31	921.58 197.81	921.41
200.01	921.11 200.07	921.1 200.17	921.09 201.81	920.88 203.38	920.69
204.05	920.6 204.68	920.52 205.93	920.35 206.8	920.23 208.06	920.08
208.96	919.97 209.96	919.84 210.69	919.75 211.66	919.6 213.13	919.4
213.38	919.36 213.45	919.35 213.75	919.32 215.97	919.03 216.44	918.97
218.46	918.7 218.53	918.69 218.55	918.69 220.56	918.42 221.01	918.37
222.5	918.17 223.83	918 224.17	917.96 224.39	917.93 226.06	917.7
227.08	917.56 227.94	917.44 228.94	917.28 230.23	917.11 230.97	917
232.54	916.78 232.84	916.74 234.28	916.54 236.08	916.3 236.33	916.27
236.52	916.24 238.24	915.98 240.08	915.75 240.1	915.75 242.26	915.46
243.81	915.22 244.43	915.13 244.82	915.08 246.3	914.88 246.81	914.81
247.91	914.68 248.73	914.57 249.81	914.42 250.39	914.35 251.65	914.19
252.54	914.06 254.12	913.85 254.37	913.82 256.06	913.62 256.69	913.53
258.77	913.26 259.08	913.22 261.02	912.96 261.14	912.94 262.86	912.73
263.1	912.7 264.44	912.55 265.12	912.48 265.83	912.41 267.36	912.24
267.98	912.18 268.91	912.08 269.91	911.98 270.64	911.91 272.22	911.73

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273.32	911.63	274.25	911.56	274.88	911.51	276.03	911.42	277.28	911.3
277.9	911.23	278.63	911.16	279.83	911.05	281.06	910.96	281.95	910.89
283.39	910.77	284.19	910.7	284.47	910.68	285.76	910.57	286.75	910.48
287.11	910.45	288.74	910.31	290.1	910.2	290.66	910.15	292.3	910.01
292.37	910.01	293.96	909.88	294.91	909.81	295.72	909.75	296.95	909.66
297.82	909.59	299	909.48	299.73	909.41	300.66	909.33	301.99	909.2
303.6	909.06	303.73	909.05	305.32	908.89	305.69	908.86	307.51	908.69
308	908.64	309.65	908.46	309.83	908.44	309.94	908.4	310.15	908.36
312.78	907.92	313.45	907.69	315.03	907.29	315.26	907.2	316.84	906.67
317.81	906.44	319.31	906.08	319.56	906.04	321.12	905.72	321.67	905.62
323.08	905.37	323.61	905.29	325.54	905	325.76	904.97	325.99	904.94
328.01	904.73	328.91	904.62	330.54	904.41	331.23	904.26	332.51	904
333.45	903.72	334.86	903.35	336.42	902.87	336.76	902.77	337.25	902.62
338.75	902.17	339.6	901.93	340.8	901.6	342.2	901.19	342.74	901.03
343.26	900.85	344.72	900.3	346.05	899.69	346.26	899.6	346.44	899.51
347.69	898.9	348.94	898.31	350.03	897.88	351.29	897.6	352.45	897.35
354.37	897.23	356.49	897.23	356.79	897.22	357.22	897.22	358.61	897.23
360.29	897.14	360.45	897.14	362.35	897.04	363.47	897.06	364.36	897.05
365.43	897.06	366.44	897.04	367.81	897.01	368.72	896.98	369.97	896.9
370.48	896.88	372.43	896.69	372.61	896.67	372.92	896.63	374.74	896.44
376.47	896.28	376.61	896.27	376.92	896.24	378.44	896.09	379.45	896.01
380.21	895.96	380.31	895.96	381.26	895.86	382.06	895.78	382.38	895.76
384.12	895.65	384.77	895.61	386.86	895.51	387.01	895.51	387.81	895.52
389.02	895.55	389.21	895.56	391.02	895.62	391.39	895.64	393.07	895.75
393.88	895.81	394.9	895.91	395.8	896.01	397.02	896.09	397.75	896.14
399.11	896.2	399.48	896.21	400.8	896.24	402.05	896.18	402.5	896.18
403.96	896.07	404.41	896.05	406.99	895.55	407.19	895.34	408.06	894.8
408.95	894.25	409.45	893.94	410.71	893.15	412.6	892.51	414.01	892.35
414.34	892.31	415.42	892.18	416.76	892.16	418.1	892.15	419.74	892.14
420.07	892.13	421.38	892.12	423.68	892.62	426.1	893.1	426.61	893.86
427.12	894.61	427.73	895.16	427.75	895.18	427.79	895.2	429.54	895.82
430.68	896.08	431.47	896.28	432.92	896.67	433.05	896.69	433.44	896.83
434.57	897.19	435.42	897.51	436.34	897.85	436.67	897.95	437.28	898.1
438.55	898.38	440	898.7	440.43	898.8	440.84	898.92	442.79	899.4
444.6	900.23	444.87	900.35	445.23	900.56	446.87	901.5	447.94	901.97
449.07	902.39	450.72	902.92	450.86	902.98	452.6	903.65	453.22	903.9
454.73	904.54	454.74	904.54	456.39	905.17	456.75	905.34	458.37	906.28
459.04	906.64	461.03	907.46	461.12	907.5	461.27	907.54	463.15	908.07
465.04	908.66	465.2	908.7	465.32	908.74	467.22	909.25	468.07	909.46
469.37	909.8	471.17	910.28	471.76	910.48	472.16	910.61	473.93	911.2
474.53	911.33	475.83	911.49	476.24	911.56	478.18	911.88	478.38	911.92
478.82	912.05	480.36	912.5	480.97	912.7	482.09	913.1	483.14	913.39
483.93	913.65	485.53	914.14	486.1	914.32	487.82	915.05	488.38	915.21
488.53	915.26								

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 0 .05 406.99 .035 429.54 .1

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Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 406.99 429.54 121.43 121.43 121.43 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 1246.88

INPUT

Description:

Station Elevation Data num= 250

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	913.61	289978	913.31	959991	913.153	669983	912.764	289978	912.62
5.549988	912.376	839996	912.136	899994	912.128	849976	911.769	069977	911.71
9.269989	911.68	11	911.37	11.59	911.2611	68997	911.2412	90997	910.96
13.78998	910.7714	38998	910.6516	01999	910.2816	66998	910.0618	32999	909.33
18.70999	909.1718	87999	909.120	55998	908.3321	51999	908.0322	49998	907.78
24.03999	907.5224	82999	907.4225	89999	907.3327	13998	907.1527	99998	907
29.37999	906.7730	25998	906.6931	57999	906.6532	44998	906.6733	52998	906.77
34.64999	906.8735	24998	906.9336	16998	906.9637	32999	90738	01999	907.01
39.27998	90740	16998	90740	64999	907.0142	15999	907.0542	66998	907.06
44.53999	907.0847	12999	907.0848	03999	907.0548	46999	907.0449	45999	907
50.15999	906.9750	32999	906.9752	33998	906.8752	63998	906.8553	21999	906.8
54.32999	906.7156	37999	906.3756	68999	906.3256	98999	906.2358	14999	905.66
59.87999	904.8360	15999	904.6760	77998	904.2861	90999	903.5562	47998	903.16
63.52998	902.4564	08998	902.0864	99998	901.4665	23999	901.366	56999	900.45
66.76999	900.3467	57999	899.8968	64999	899.3168	89999	899.1870	34999	898.53
70.88998	898.3871	81999	898.0973	03999	897.973	95999	897.775	83998	897.44
76.12999	897.4377	38998	897.3977	77998	897.3877	90999	897.3979	22998	897.45
80.80998	897.5480	87999	897.5580	93999	897.5582	36998	897.5984	79999	897.53
84.97998	897.585	70999	897.5687	44998	895.2988	48999	893.9490	17999	891.73
90.49998	891.6191	48999	891.2192	79999	890.6994	81999	890.5796	40999	890.47
96.93999	890.4997	20999	890.597	45999	890.5197	78999	890.5298	88998	890.56
101.79	891.07	103.88	891.4	105.98	891.73	107.79	892.25	107.99	892.3
108.24	892.37	110.05	892.88	110.72	893.07	111.29	893.23	112.2	893.49
112.64	893.62	114.12	894.03	114.96	894.26	115.16	894.3	115.38	894.33
117.26	894.46	118.59	894.57	118.81	894.59	120.49	894.72	120.6	894.73
121.22	894.81	122.88	895	123.12	895.02	123.89	895.03	125.36	895.04
125.94	895.01	127.07	894.96	127.93	894.95	128.93	894.93	129.63	894.93
130.85	894.97	131.58	895	132.1	895.03	133.54	895.1	134.99	895.18
135.5	895.18	137.14	895.28	137.52	895.34	139.16	895.49	139.61	895.54
139.71	895.54	140.2	895.56	142	895.64	144.23	895.64	145.26	895.62
146.49	895.59	147.95	895.56	148.88	895.54	149.72	895.53	150.73	895.53
152.02	895.51	153.04	895.53	153.71	895.54	155.06	895.55	156.25	895.6
157.41	895.56	158.47	895.52	159.43	895.48	161.79	895.3	161.8	895.3
163.94	895.19	164.79	895.17	165.92	895.11	166.69	895.07	168.14	894.94

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168.42	894.92	169.64	894.85	171.14	894.91	171.43	894.93	171.72	894.93
173.51	894.92	175.25	894.9	175.95	894.89	176.34	894.86	178.18	894.71
178.72	894.67	178.84	894.66	181.14	894.52	181.28	894.51	181.43	894.51
183.7	894.48	184.98	894.41	186.97	894.29	188.27	894.27	189.89	894.42
190.1	894.43	191.39	894.45	193.24	894.43	193.43	894.43	195.61	894.38
196.46	894.33	197.22	894.3	199.12	894.17	199.19	894.17	200.98	894.05
201.55	894.02	202.54	893.96	203.54	893.97	204.75	894.02	205.33	894.01
207.26	894.02	207.94	894.01	209.24	894	211.32	894.01	211.92	894.02
214.25	894.06	214.63	894.08	215.67	894.17	216.74	894.23	217.14	894.24
218.8	894.4	220.04	894.61	222.54	895.1	222.65	895.12	222.82	895.16
223.21	895.27	226.55	896.3	227.39	896.59	227.73	896.67	228.72	896.86
230.79	897.36	235.1	898.55	236.55	898.98	236.65	899	237.6	899.33
239.14	899.98	240.37	900.51	241.01	900.83	248.04	904.18	248.16	904.24
248.17	904.25	248.19	904.26	248.33	904.32	254.59	907.3	255.06	907.49
259.82	908.32	261.27	908.75	266.97	909.79	267.12	909.82	267.29	909.85
267.56	909.9	270.9	910.84	271.87	911.14	273.18	911.47	273.33	911.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.0587	44998	.035	122.88	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	87.44998	122.88		119.57	119.57		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 1127.31

INPUT

Description:

Station Elevation Data num= 219

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	911.26	.519989	911.21	.230011	911.112	.600006	910.933	.549988	910.83
4.410004	910.755	.540009	910.656	.290009	910.596	.880005	910.49	8.01001	910.29
9.630005	910.039	.929993	909.991	.07001	909.97	12.28	909.77	12.41	909.74
14.42001	909.36	14.97	909.17	16.91	908.49	17.09	908.43	18.17999	908.03
18.87	907.78	19.01001	907.74	20.5	907.52	21.10001	907.43	21.81	907.33
22.89001	907.12	23.20999	907.05	23.38	907.02	24.01001	906.9	24.5	906.81
28.42999	904.96	29.13	904.69	29.95001	903.99	30.35001	903.64	31.92999	902.48
32.10999	902.36	32.34	902.25	33.29999	901.73	34.76999	901.01	34.94	900.92
34.95999	900.92	35.10999	900.86	36.98999	900.19	37.91	900.11	38.42001	900.46
41.28	900.67	41.81	900.91	42.42999	901.18	43.79001	901.34	43.16	901.49
43.94	901.82	45.89001	902.11	46.98001	902.12	47.67001	902.11	49.12	902.07
49.29999	902.07	50.17001	902.08	51.73999	902.09	50.91	902.15	51.98999	902.13
53.16	902.14	53.98999	902.13	55.42999	902.13	57.07001	902.16	57.54001	902.18
58.14001	902.17	59.35001	902.14	60.29999	902.13	61.09	902.09	61.64001	902.08

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63.64999	901.85	65.88	901.0366.14001	900.966.51001	900.73	67.58	900.22		
68.06	900.03	69.19	899.51	69.87	899.21	70.89	898.6871.35001	898.43	
72.25	898.01	73.12	897.6573.46001	897.48	74.88	896.81	75.2	896.65	
76.19	896.29	77.47	895.84	78.52	895.6980.14999	895.6380.89999	895.59		
82.08	895.57	82.48	895.56	82.72	895.58	84.03	895.7	84.97	895.79
84.98	895.8	86.36	895.9987.85001	896.08	88	896.0988.28999	895.99		
92.2	895.7294.21001	894.5295.14999	893.97	96.88	892.9498.07001	891.48			
101.88	891.45	104.48	891.16	104.92	891.12	106.39	890.73	109.07	890.92
110.41	891.53	110.94	892.67	111.1	893.02	111.37	893.61	111.71	894.34
119.56	894.84	119.61	894.84	121.97	894.67	122.76	894.64	124.48	894.51
127.62	894.34	128.5	894.29	129.39	894.25	133.03	894.31	133.13	894.32
133.27	894.33	135.52	894.62	136.76	894.64	139.71	894.62	141.89	894.64
143.49	894.56	145.97	894.48	146.8	894.43	148.22	894.43	152.81	894.44
156.66	894.73	158.3	894.77	159.16	894.78	160.05	894.75	160.91	894.71
161.44	894.65	165.41	894.46	168.99	893.77	170.63	893.62	174.9	893.37
177.67	893.28	181.69	893.33	183.97	893.32	184.26	893.31	184.8	893.3
186.58	893.24	187.61	893.21	188.22	893.19	193.46	893.04	197.16	892.84
198.53	892.76	199.43	892.82	203.52	892.82	203.58	892.83	205.46	893.06
205.53	893.07	206.19	893.25	207.2	893.51	208.72	893.64	210.04	893.73
211.87	893.81	215.26	894.02	219.91	895.17	220.76	895.32	221.9	895.8
224.29	897.02	226.3	898.08	229.64	900.04	231.08	900.52	233.82	901.73
234.89	902.1	239.06	903.53	240.89	904.09	242.03	904.3	244.66	904.75
245.59	904.98	247.68	905.39	250.14	905.79	251.71	906	252.74	906.12
255.75	906.44	259.33	906.82	263.49	907.16	265.98	907.41	267.05	907.54
269.24	907.69	273.37	908.13	274.92	908.24	276.65	908.39	278.57	908.64
279	908.69	279.12	908.7	279.45	908.71	287.88	909.39	288.09	909.4
289.15	909.46	290.76	909.52	292.17	909.7	292.7	909.72	295.43	909.87
299.75	910.14	300.76	910.23	301.03	910.22	304.35	910.35	307.68	910.45
310.61	910.27	311.32	910.3	312.8	910.14	313.87	910.14	317.53	910.66
318.54	910.76	319.26	910.89	321.8	911.01	323	911.14		

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .0594.21001 .035 111.71 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 94.21001 111.71 103.35 103.35 103.35 .1 .3  
 Ineffective Flow num= 1  
 Sta L Sta R Elev Permanent  
 159.16 323 905 F

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 1023.96

INPUT



171-150-Revised-An.rep

Description:

Station Elevation Data		num= 157							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	913.08.2399902	912.99.6899719	912.851.079987	912.75.209991	911.04				
6.23999	910.7111.17999	908.3112.21997	907.8612.46997	907.7314.45999	906.61				
14.59	906.5514.67999	906.4916.67999	905.1218.31998	903.7224.92999	901.17				
25.46999	900.6926.30998	900.5433.10999	901.3533.44998	901.3933.58998	901.39				
36.00998	901.3838.24998	901.3738.50998	901.3740.58998	901.3841.66998	901.37				
43.28998	901.3744.32999	901.3645.36998	901.3346.54999	901.1949.88998	900.38				
50.31999	900.3251.78998	899.9554.06999	899.5354.36998	899.4154.42999	899.37				
61.05998	895.6561.50998	895.4365.64998	893.1467.09999	890.8467.88998	889.59				
69.35999	889.3970.65999	889.274.56999	889.6176.92999	89080.40999	890.57				
81.33998	890.7281.79999	891.1384.09999	893.1584.19998	893.1885.69998	893.52				
87.48999	893.6888.41998	893.9389.63998	894.0191.24998	894.0391.67999	894.03				
93.86998	893.9996.05998	894.0197.11998	894	102.2	893.79	102.39	893.77		
105.6	893.66	106.59	893.65	106.86	893.64	107.46	893.62	113.58	893.41
114.87	893.32	118.18	893.41	119.51	893.38	121.49	893.31	124.96	893.33
125.56	893.33	130.09	893.17	130.66	893.14	131.78	893.06	132.19	893.06
134.24	892.91	139.98	892.94	140.26	892.93	140.31	892.93	143.78	892.43
145.94	892.3	149.44	892.06	151.17	892.11	151.74	892.09	153.76	892.45
154.57	892.52	158.94	893.13	160.08	893.42	161.67	893.64	163.91	893.94
167.09	894.94	167.37	895.07	167.65	895.26	171.53	898.01	173.58	899.15
179.72	901.48	180.28	901.69	180.37	901.72	180.66	901.77	182.85	902.14
186.45	902.77	186.66	902.8	188.11	903	188.78	903.08	189.17	903.13
191.62	903.4	192.81	903.5	193.43	903.56	197.29	903.97	197.32	903.98
197.35	903.98	204.33	904.59	207.25	904.85	207.39	904.86	207.61	904.88
213.57	905.39	217.34	905.34	218.9	905.29	220.89	905.16	222.57	905.11
222.92	905.11	223.86	905.19	224.58	905.22	225.37	905.27	226.66	905.28
228.18	905.26	231.93	905.23	232.32	905.23	235.14	904.92	236.1	904.96
240.64	905.11	241.79	905.08	244.57	904.5	245.62	904.79	246.53	905.17
248	906.03	249.15	906.58	250.55	906.84	251.22	907.22	257.1	908.99
257.66	909.13	259.13	909.49	260.58	909.87	261.22	910	261.72	910.1
262.79	910.38	265.68	910.95	267.03	911.23	268.54	911.31	269.84	911.36
271.02	911.31	271.39	911.28	271.7	911.24	273.49	911.15	276.13	911.41
277.69	911.54	281.11	912.3						

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.0565.64998	.03584.09999	.1

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	65.6499884	.09999	.1	.3	

SUMMARY OF MANNING'S N VALUES

River:Bluestone Creek

171-150-Revised-An.rep

Reach	River Sta.	n1	n2	n3
Align (1)	9505.57	.05	.035	.1
Align (1)	9327.36	.05	.035	.05
Align (1)	9112.88	.05	.035	.1
Align (1)	8893.47	.05	.035	.1
Align (1)	8694.47	.05	.035	.1
Align (1)	8502.63	.05	.035	.1
Align (1)	8312.06	.05	.035	.1
Align (1)	8092.65	.05	.035	.1
Align (1)	7909.32	.05	.035	.1
Align (1)	7703.66	.05	.035	.1
Align (1)	7500.63	.1	.035	.05
Align (1)	7359.7	.05	.035	.05
Align (1)	7155.83	.05	.035	.05
Align (1)	6967.63	.05	.035	.05
Align (1)	6671.12	.05	.035	.05
Align (1)	6456.57	.05	.035	.1
Align (1)	6296.61	.05	.035	.1
Align (1)	6151.32	.05	.035	.1
Align (1)	5993.5	.05	.035	.1
Align (1)	5874.57	.05	.035	.1
Align (1)	5766.87	.05	.035	.1
Align (1)	5631.82	.05	.035	.1
Align (1)	5483.31	.05	.035	.1
Align (1)	5339.61	.05	.035	.1
Align (1)	5216.26	.05	.035	.1
Align (1)	4942.13	.05	.035	.05
Align (1)	4652.11	.05	.035	.05
Align (1)	4394.46	.05	.035	.05
Align (1)	4118.13	.1	.035	.05
Align (1)	4004.96	.1	.035	.05
Align (1)	3887.33	.1	.035	.05
Align (1)	3774.24	.1	.035	.05
Align (1)	3655.76	.05	.035	.05
Align (1)	3522.15	.05	.035	.05
Align (1)	3474.34	.05	.035	.05
Align (1)	3419.48	.05	.035	.05
Align (1)	3307.29	.05	.035	.05
Align (1)	3273.98	.05	.035	.05
Align (1)	3220.4	.05	.035	.1
Align (1)	3147.68	.05	.035	.1
Align (1)	3097.2	.05	.035	.1
Align (1)	2991.1	.05	.035	.1
Align (1)	2894.59	.05	.035	.1
Align (1)	2793	.05	.035	.1
Align (1)	2692.71	.05	.035	.1

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Align (1)	2591.27	.05	.035	.1
Align (1)	2540.29	.05	.035	.1
Align (1)	2480.61	.05	.035	.1
Align (1)	2384.96	.1	.035	.05
Align (1)	2358.81	.1	.035	.05
Align (1)	2258.53	.1	.035	.05
Align (1)	2199.16	.1	.035	.05
Align (1)	2147.2	.1	.035	.05
Align (1)	2038.82	.1	.035	.05
Align (1)	1891.98	.1	.035	.1
Align (1)	1836.41	.1	.035	.1
Align (1)	1784.51	.1	.035	.1
Align (1)	1679.48	.1	.035	.1
Align (1)	1651.65	.1	.035	.1
Align (1)	1582.56	.1	.035	.05
Align (1)	1513.38	.05	.035	.1
Align (1)	1472.03	.05	.035	.1
Align (1)	1423.7	.05	.035	.1
Align (1)	1368.31	.05	.035	.1
Align (1)	1246.88	.05	.035	.1
Align (1)	1127.31	.05	.035	.1
Align (1)	1023.96	.05	.035	.1

SUMMARY OF REACH LENGTHS

River: Bluestone Creek

Reach	River Sta.	Left	Channel	Right
Align (1)	9505.57	178.21	178.21	178.21
Align (1)	9327.36	214.48	214.48	214.48
Align (1)	9112.88	217.06	219.41	222.31
Align (1)	8893.47	199	199	199
Align (1)	8694.47	191.84	191.84	191.84
Align (1)	8502.63	191.57	190.57	189.78
Align (1)	8312.06	219.41	219.41	219.41
Align (1)	8092.65	188.66	183.33	182.95
Align (1)	7909.32	200.4	205.66	210.75
Align (1)	7703.66	202.31	203.03	204.11
Align (1)	7500.63	140.93	140.93	140.93
Align (1)	7359.7	206.43	203.87	200.3
Align (1)	7155.83	185.26	188.2	190.24
Align (1)	6967.63	309.39	296.51	279.44
Align (1)	6671.12	206.34	214.55	217.5
Align (1)	6456.57	159.96	159.96	159.96

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Align (1)	6296.61	145.29	145.29	145.29
Align (1)	6151.32	156.75	157.82	163.2
Align (1)	5993.5	118.34	118.93	119.21
Align (1)	5874.57	110.24	107.7	103.67
Align (1)	5766.87	134.05	135.05	135.79
Align (1)	5631.82	148.97	148.51	148.05
Align (1)	5483.31	145.04	143.7	141.88
Align (1)	5339.61	123.35	123.35	123.35
Align (1)	5216.26	257	274.13	291
Align (1)	4942.13	310	290.02	279.8
Align (1)	4652.11	244	257.65	271.8
Align (1)	4394.46	287.76	276.33	261.85
Align (1)	4118.13	116.57	113.17	111.58
Align (1)	4004.96	117.63	117.63	117.63
Align (1)	3887.33	113.09	113.09	113.09
Align (1)	3774.24	118.48	118.48	118.48
Align (1)	3655.76	127	133.61	140.51
Align (1)	3522.15	47.81	47.81	47.81
Align (1)	3474.34	49.33	54.86	58.55
Align (1)	3419.48	139	112.19	71.7
Align (1)	3307.29	33.31	33.31	33.31
Align (1)	3273.98	56.05	53.58	50.5
Align (1)	3220.4	69.73	72.72	75.32
Align (1)	3147.68	50.48	50.48	50.48
Align (1)	3097.2	107.52	106.1	104.95
Align (1)	2991.1	96.51	96.51	96.51
Align (1)	2894.59	99.96	101.59	105
Align (1)	2793	100.29	100.29	100.29
Align (1)	2692.71	103.1	101.44	100.42
Align (1)	2591.27	47.53	50.98	55.1
Align (1)	2540.29	59.68	59.68	59.68
Align (1)	2480.61	74.5	95.65	117.1
Align (1)	2384.96	26.15	26.15	26.15
Align (1)	2358.81	127.91	100.28	70.7
Align (1)	2258.53	61.13	59.37	57.75
Align (1)	2199.16	51.96	51.96	51.96
Align (1)	2147.2	106.46	108.38	111.4
Align (1)	2038.82	146.84	146.84	146.84
Align (1)	1891.98	55.57	55.57	55.57
Align (1)	1836.41	51.9	51.9	51.9
Align (1)	1784.51	145.4	105.03	62.75
Align (1)	1679.48	27.83	27.83	27.83
Align (1)	1651.65	69.09	69.09	69.09
Align (1)	1582.56	61.68	69.18	79.58
Align (1)	1513.38	41.35	41.35	41.35
Align (1)	1472.03	46.62	48.33	49.76
Align (1)	1423.7	55.39	55.39	55.39
Align (1)	1368.31	121.43	121.43	121.43

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Align (1)	1246.88	119.57	119.57	119.57
Align (1)	1127.31	103.35	103.35	103.35
Align (1)	1023.96			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS  
 River: Bluestone Creek

Reach	River Sta.	Contr.	Expan.
Align (1)	9505.57	.1	.3
Align (1)	9327.36	.1	.3
Align (1)	9112.88	.1	.3
Align (1)	8893.47	.1	.3
Align (1)	8694.47	.1	.3
Align (1)	8502.63	.1	.3
Align (1)	8312.06	.1	.3
Align (1)	8092.65	.1	.3
Align (1)	7909.32	.1	.3
Align (1)	7703.66	.1	.3
Align (1)	7500.63	.1	.3
Align (1)	7359.7	.1	.3
Align (1)	7155.83	.1	.3
Align (1)	6967.63	.1	.3
Align (1)	6671.12	.1	.3
Align (1)	6456.57	.1	.3
Align (1)	6296.61	.1	.3
Align (1)	6151.32	.1	.3
Align (1)	5993.5	.1	.3
Align (1)	5874.57	.1	.3
Align (1)	5766.87	.1	.3
Align (1)	5631.82	.1	.3
Align (1)	5483.31	.1	.3
Align (1)	5339.61	.1	.3
Align (1)	5216.26	.1	.3
Align (1)	4942.13	.1	.3
Align (1)	4652.11	.1	.3
Align (1)	4394.46	.1	.3
Align (1)	4118.13	.1	.3
Align (1)	4004.96	.1	.3
Align (1)	3887.33	.1	.3
Align (1)	3774.24	.1	.3
Align (1)	3655.76	.1	.3
Align (1)	3522.15	.1	.3
Align (1)	3474.34	.1	.3

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Align (1)	3419.48	.1	.3
Align (1)	3307.29	.1	.3
Align (1)	3273.98	.1	.3
Align (1)	3220.4	.1	.3
Align (1)	3147.68	.1	.3
Align (1)	3097.2	.1	.3
Align (1)	2991.1	.1	.3
Align (1)	2894.59	.1	.3
Align (1)	2793	.1	.3
Align (1)	2692.71	.1	.3
Align (1)	2591.27	.1	.3
Align (1)	2540.29	.1	.3
Align (1)	2480.61	.1	.3
Align (1)	2384.96	.1	.3
Align (1)	2358.81	.1	.3
Align (1)	2258.53	.1	.3
Align (1)	2199.16	.1	.3
Align (1)	2147.2	.1	.3
Align (1)	2038.82	.1	.3
Align (1)	1891.98	.1	.3
Align (1)	1836.41	.1	.3
Align (1)	1784.51	.1	.3
Align (1)	1679.48	.1	.3
Align (1)	1651.65	.1	.3
Align (1)	1582.56	.1	.3
Align (1)	1513.38	.1	.3
Align (1)	1472.03	.1	.3
Align (1)	1423.7	.1	.3
Align (1)	1368.31	.1	.3
Align (1)	1246.88	.1	.3
Align (1)	1127.31	.1	.3
Align (1)	1023.96	.1	.3

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HEC-RAS HEC-RAS 5.0.3 September 2016  
U.S. Army Corps of Engineers  
Hydrologic Engineering Center  
609 Second Street  
Davis, California

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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: 171-150-Revised-Analysis  
Project File : 171-150-Revised-An.prj  
Run Date and Time: 4/11/2017 12:58:56 PM

Project in English units

PLAN DATA

Plan Title: 171150-Revised-Proposed-Steady-Flow  
Plan File : p:\2017\171-150\Calculations\HEC-RAS\171-150-Revised-An.p01

Geometry Title: 171150-Proposed-Revised  
Geometry File :  
p:\2017\171-150\Calculations\HEC-RAS\171-150-Revised-An.g02

Flow Title : Flow 01  
Flow File :  
p:\2017\171-150\Calculations\HEC-RAS\171-150-Revised-An.f01

Plan Summary Information:

Number of: Cross Sections =	67	Multiple Openings =	0
Culverts =	0	Inline Structures =	0
Bridges =	3	Lateral Structures =	0

Computational Information

Water surface calculation tolerance = 0.01

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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: Flow 01  
Flow File : p:\2017\171-150\Calculations\HEC-RAS\171-150-Revised-An.f01

Flow Data (cfs)

River	Reach	RS	100 YR
Bluestone Creek	Align (1)	9505.57	1271

Boundary Conditions

River	Reach	Profile	Upstream
	Downstream		
Bluestone Creek	Align (1)	100 YR	

Normal S = 0.6656

GEOMETRY DATA

Geometry Title: 171150-Proposed-Revised  
Geometry File : p:\2017\171-150\Calculations\HEC-RAS\171-150-Revised-An.g02

CROSS SECTION

RIVER: Bluestone Creek



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REACH: Align (1)

RS: 9505.57

INPUT

Description:

Station Elevation Data		num= 82							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	959.983.560028	959.078.290009	957.8914.73001	956.2	15.78	955.93			
22.38	954.327.99002	953.3229.42001	953.1331.36002	953.0340.21002		952.6			
43.5	952.4947.99002	952.3450.55002	952.2652.43002	952.2257.59003		952.13			
64.62003	951.964.65002	951.971.68002	951.6776.87003	951.5	81.25	951.39			
85.76001	951.3189.08002	951.292.81001	951.0897.87001	950.91	101.3	950.8			
106.89	950.62	113.52	950.49	114.5	950.47	120.98	950.25	125.74	950.1
131.13	949.97	137.96	949.8	142.11	949.7	147.76	949.56	150.17	949.5
156.2	949.35	162.39	949.2	164.39	949.15	170.28	949	174.61	948.9
177.32	948.85	181.02	948.79	186.83	948.66	197.65	948.42	198.45	948.41
199.05	948.39	205.5	948.19	211.26	948.1	212.54	948.07	214.28	948.02
219.58	947.86	223.48	947.8	230.91	947.62	233.67	947.53	235.7	947.47
240.71	947.32	247.54	947.2	247.92	947.2	254.8	946.99	260.14	946.82
261.84	946.76	264.17	946.63	272.35	946.15	280.8	945.79	282.92	945.69
282.97	945.69	284.57	945.65	295.03	946.13	296.79	946.17	297.06	946.19
297.42	946.25	304.1	947.36	309.01	948.45	314.05	949.78	318.19	951.02
321.22	952.23	325.23	953.67	330.68	955.62	333.44	956.6	341.09	959.16
345.66	960.71	346.92	961.14						

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.05	272.35	.035	295.03	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	272.35	295.03		178.21	178.21	178.21	.1	.3

CROSS SECTION

RIVER: Bluestone Creek

REACH: Align (1)

RS: 9327.36

INPUT

Description:

Station Elevation Data		num= 291							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	959.432.579956	958.626.889893	957.3112.02991	955.4118.67993	953.23				
19.04993	953.1119.32996	953.0521.55994	952.731.77991	950.9534.77991	950.8				
40.09998	950.6344.21997	950.44	50.88	950.1856.66992	95061.15991	949.85			
66.96997	949.6769.10999	949.675.19995	949.481.55994	949.282.21997	949.18				
83.06995	949.1589.23999	948.95	94	948.899.16992	948.63	106.45	948.4		
115.2699	948.19117.3099	948.14118.8899	948.1	131.23	947.8	131.37	947.8		
138.37	947.69143.7799	947.52	147.47	947.44152.4099	947.36	156.23	947.24		

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159.4299	947.2163.5699	947.08168.6699	946.97	173.47	946.94179.6599	946.81			
180.48	946.8	181.12	946.79186.0699	946.72193.5599	946.61194.5199	946.61			
195.7599	946.58206.0099	946.43208.5599	946.42	211.86	946.35	215.58	946.3		
218.45	946.26	227.96	946.12230.8999	946.08236.6399	946	243.34	945.9		
244.0599	945.89255.7899	945.65260.1599	945.56	264.71	945.5	268.23	945.45		
271.73	945.43276.2599	945.33	278.75	945.3280.6799	945.27	292.35	945.1		
293.12	945.09299.8099	944.95305.5699	944.92	306.83	944.88	308.45	944.87		
318.0099	944.74320.8599	944.63324.5499	944.59	330.46	944.5	334.9	944.39		
340.65	944.25341.9199	944.2	342.9	944.18348.9399	943.95	355.35	943.8		
356.59	943.76356.7499	943.75367.7899	943.54369.9999	943.51	372.85	943.76			
380.2399	944.37	388.95	945.64391.0499	945.91392.6799	946.04405.0399	946.4			
405.1299	946.4405.4199	946.39	417.58	946.22	421.14	946.23	430.02	946.24	
437.2399	946.26	442.47	946.2	447.21	946.15	453.34	946.09	454.91	946.06
460.2599	945.93467.3599	945.75468.2599	945.73469.4399	945.71479.7999	946.25				
485.5399	946.22489.3199	946.86492.2499	947.19	496.34	948.11	501.64	948.24		
503.3599	948.53504.6899	948.62	515.1	949.34	517.14	949.5517.7299	949.5		
529.58	949.95531.4299	950.38	533.83	950.29	542.03	950.88549.9299	951.19		
554.47	951.43559.5099	951.98	566.03	951.94	566.53	951.98566.9199	951.99		
569.9399	952.07579.3599	952.4580.5699	952.65582.1299	952.56	587.59	953.16			
591.8099	953.08598.2299	953.17601.6199	953.4604.2499	953.4	614.33	953.78			
615.66	953.92	616.7	953.96	624.77	954.5	629.14	954.84	629.7	954.96
630.4199	954.95	641.59	956.75643.7399	957.11	646.52	957.42	654.03	958.64	
657.78	959.24662.6199	959.89666.4799	960.5671.8099	961.38	678.72	962.53			
678.9199	962.55	685.85	963.19691.3699	963.93694.8199	964.23703.8099	964.29			
706.91	964.11710.9199	963.87713.9299	963.58716.2599	963.23	720.95	962.78			
727.02	962.45	728.7	962.38734.9899	962.73	741.15	963.16741.9999	963.24		
743.1099	963.34	749.02	963.97	753.59	964.45	759.21	965.14763.0599	965.63	
766.0399	965.97	770.08	966.53775.3099	967.1778.4799	967.45784.1199	968.11			
790.9299	968.62	791.41	968.66803.3699	969.26805.1799	969.35807.5099	969.4			
812.2	969.59815.8199	969.68	823.61	969.95	826.23	970.07828.2599	970.11		
839.71	970.4	840.71	970.43847.2899	970.65853.1499	970.6854.3099	970.63			
855.7999	970.62	865.6	970.69	868.35	970.76871.8999	970.69878.0399	970.65		
882.39	970.76887.9999	970.66	890.49	970.65896.4199	970.85902.9299	970.71			
904.1	970.74915.3799	970.9	917.48	970.94	920.2	971924.4999	971.18		
927.8199	971.17936.2999	971.36	940.27	971.44952.3999	971.61	952.71	971.62		
953.7999	971.61965.1599	971.51	968.49	971.43973.6299	971.3	977.6	971.26		
984.59	971.25987.6699	971.26990.0499	971.27994.6899	971.22	1000.69	970.97			
1001.71	970.94	1002.49	970.9	1008.64	970.5	1014.94	970.11	1015.75	970
1016.79	969.87	1022.77	969.11	1027.39	968.59	1029.78	968.18	1032.89	967.62
1036.8	966.92	1039.83	966.39	1048.99	965.13	1050.84	964.9	1052.28	964.64
1057.86	964.61	1064.72	964.09	1064.88	964.12	1065.09	964.14	1077.17	965.45
1081.18	965.62	1089.61	965.68	1097.28	965.36	1099.97	965.28	1102.06	965.25
1113.38	965.08	1114.5	965.11	1118.32	965.16	1126.95	965.39	1129.48	965.46
1135.07	965.86	1139.39	965.79	1142.09	965.86	1145.58	965.75	1149.11	965.81
1151.84	965.9	1161.68	966.77	1164.28	966.97	1170.16	967.79	1176.73	967.78
1177.78	967.79	1184.2	968.16	1189.17	968.16	1193.87	968.31	1201.62	968.81
1205.26	969.04	1209.97	969.34	1214.06	969.65	1226.07	970.37	1226.51	970.38
1227.99	970.41	1238.95	970.6	1240.35	970.62	1242.17	970.68	1247.37	970.78

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1251.4	970.91	1258.27	971.31	1263.84	971.66	1274.37	972.5	1276.29	972.63
1282.47	972.99	1288.73	973.54	1290.47	973.67	1301.18	974.43	1303.53	974.58
1306.56	974.86	1313.62	975.33	1317.56	975.5	1322.66	975.87	1326.07	976.09
1330.57	976.21								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	355.35	.035	372.85	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	355.35	372.85		214.48	214.48	214.48	.1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 9112.88

INPUT

Description:

Station Elevation Data num= 116

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.576	609985	950.438	169983	950.198	609985	950.17	18.25	949.67
24.39999	949.48	28.34	949.3534	51999	949.2138	41998	949.1	40.91	949.02
48.50998	948.852	16998	948.6957	42999	948.53	58.59	948.560	41998	948.44
68.67999	948.13	73.94	947.9978	75998	947.886	31998	947.5788	84998	947.48
97.72998	947.1598	92999	947.1	106.97	946.8	109.01	946.72	112.22	946.6
119.1	946.35	123.48	946.22	129.18	946	138.13	945.73	139.27	945.69
143.28	945.58	148.25	945.44	149.35	945.4	156.51	945.11	159.44	945.03
164.03	944.86	169.52	944.7	176.98	944.55	179.6	944.52	181.28	944.48
188.84	944.32	189.69	944.3	189.93	944.29	199.77	944.15	206.05	944.06
209.86	944.01	215.83	943.92	219.94	943.86	228.79	943.74	230.03	943.72
230.82	943.7	234.39	943.65	240.11	943.59	247.33	943.5	250.2	943.46
255.59	943.34	260.28	943.3	267.64	943.23	270.36	943.2	272.1	943.16
279.95	943.01	280.36	943	280.59	943	290.53	942.8	296.87	942.67
300.62	942.6	305.13	942.55	310.7	942.5	319.44	942.32	320.79	942.31
325.51	942.25	329.9	942.21	330.87	942.19	338.16	942.1	340.96	942.06
345.35	942.01	351.04	941.94	358.3	941.85	361.12	941.82	362.93	941.8
371.06	941.7	371.25	941.7	381.29	941.68	384.2	941.64	391.38	941.55
395.95	941.5	396.05	941.5	401.46	941.36	404.21	941.3	411.55	941.03
416.62	940.9	421.63	940.77	423.06	940.84	431.71	940.7	437.24	941.04
441.8	941.5	448.96	942.28	451.88	942.59	461.91	943.69	461.97	943.69
462.01	943.7	462.17	943.71	470.26	944.3	472.05	944.41	474.86	944.6
482.14	945.12	487.81	946.14	492.22	946.66	495.03	947.38	502.31	949.86
503.29	950.29	507.73	952.2	512.39	954.19	519.8	958.03	522.47	959.28
525.74	960.43								

Manning's n Values num= 3

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Sta n Val Sta n Val Sta n Val  
 0 .05 411.55 .035 437.24 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 411.55 437.24 217.06 219.41 222.31 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 8893.47

INPUT

Description:

Station Elevation Data num= 111

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	953.915	180023	952.5113	64001	950.4915	14001	950.3	16.25	950.24
23.64001	949.12	24.91	948.9525	10001	948.925	36002	948.8835	05002	948.46
37.07001	948.3845	01001	948.0350	87003	947.78	54.97	947.660	51001	947.36
64.92001	947.1768	18002	947.03	74.88	946.8283	95001	946.6284	84003	946.6
89.87003	946.4594	79001	946.31	102.81	946.16	104.75	946.1	107.38	946.05
114.71	945.9	120.12	945.79	124.66	945.7	128.77	945.62	134.62	945.5
137.43	945.44	144.58	945.3	146.08	945.27	154.53	945.1	156.1	945.08
164.49	945	172.05	944.85	174.45	944.8	177.69	944.73	184.4	944.6
189.36	944.5	194.36	944.46	201.13	944.33	204.32	944.3	212.85	944.13
214.27	944.1	222.34	944.02	223.98	944	224.23	944	232.64	943.83
234.19	943.8	236.29	943.78	244.15	943.7	248	943.62	254.1	943.5
259.72	943.44	264.06	943.36	267.26	943.33	274.02	943.2	283.16	943.01
283.97	943	284.57	942.99	288.57	942.95	293.23	942.91	293.93	942.9
294.88	942.88	303.89	942.7	310.54	942.63	313.84	942.6	318.31	942.51
323.8	942.4	330.03	942.34	333.76	942.3	341.75	942.14	343.71	942.1
353.47	941.9	353.82	941.9	354.8	941.89	362.47	941.81	363.63	941.78
371.13	941.62	373.58	941.6	376.91	941.53	383.54	941.4	388.44	941.35
393.5	941.24	400.34	941.16	403.45	941.1	405.75	941.05	413.41	940.9
421.03	940.75	423.06	940.7	423.37	940.7	423.78	940.69	433.32	940.58
435.5	940.55	443.28	940.4	449.03	940.28	453.24	940.2	457.68	940.11
463.19	940	466.43	940	473.15	940.47	474.99	940.97	483.11	943.25
483.65	943.46	487.26	944.8	492.3	946.68	493.06	946.95	500.96	950.27
501.17	950.37								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 449.03 .035 473.15 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 449.03 473.15 199 199 199 .1 .3

CROSS SECTION

171-150-Revised-An.rep

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 8694.47

INPUT

Description:

Station Elevation Data		num= 107							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	957.523	630005	956.568	369995	955.312	179999	954.7118	359999	953.46
20.73001	953.26	28.34	952.38	34.94	951.8	37.84	951.5838	32001	951.54
39	951.5	48.31	950.850	98999	950.5758	29001	950.0163	48999	949.77
68.26999	949.3872	04001	949.3378	26001	949.1286	95999	949.0788	23999	949.08
94.57001	948.97	98.22	948.9198	95001	948.89	108.2	948.57	114.8	948.2
118.19	948.06	123.35	947.78	128.17	947.52	131.9	947.4	138.15	947.04
146.92	946.72	148.14	946.7	149.01	946.67	154.21	946.58	157.56	946.51
158.12	946.5	166.11	946.26	168.1	946.2	170.9	946.14	178.09	945.94
182.89	945.8	188.07	945.7	194.88	945.49	198.05	945.4	200.32	945.33
208.03	945.19	208.87	945.17	213.85	945.02	218.02	944.9	225.97	944.74
228	944.7	234.52	944.5	237.98	944.4	242.84	944.25	247.97	944.1
251.63	944.02	257.95	943.9	260.18	943.83	267.93	943.6	268.73	943.58
273.48	943.49	277.28	943.41	277.92	943.39	278.81	943.37	287.9	943.1
290.8	943.01	297.88	942.86	302.79	942.75	307.87	942.6	314.78	942.39
317.85	942.32	326.77	942.13	327.83	942.11	333.12	941.94	337.81	941.78
345.69	941.52	347.8	941.42	354.24	941.2	357.78	941.07	362.74	940.85
367.76	940.62	374.73	940.38	377.75	940.27	379.9	940.18	387.73	939.82
388.45	939.8	392.76	939.65	397.71	939.46	405.55	938.86	407.7	938.7
410.7	938.5	417.68	937.97	422.66	937.8	424.05	937.77	427.66	937.68
434.68	939.41	437.64	940.07	446.67	944.34	447.63	944.74	448.31	945.08
452.39	947.33	457.61	950.21	458.66	950.73	467.59	955.28	473.97	957.89
477.58	959.15	481.81	960.17						

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.05	405.55	.035	434.68	.1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 405.55 434.68 191.84 191.84 191.84 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 8502.63

INPUT

Description:

Station Elevation Data		num= 78	
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Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	949.93	329987	949.588	579987	949.07	15.62	948.31	18.59	948.02
20.63	947.8228	60001	946.9329	07999	946.8931	66998	946.62	38.62	945.91
40.19998	945.7	48.63	944.5154	42999	943.6358	63998	943.05	62.88	942.67
68.65999	942.22	71.33	942.07	78.67	941.74	79.78	941.6885	75999	941.41
88.23	941.388	67999	941.2989	34999	941.27	98.7	941.13	105.13	940.96
108.71	940.87	113.92	940.74	118.72	940.58	126.21	940.4	128.74	940.34
138.5	940.11	138.75	940.1	138.92	940.09	139.85	940.07	147.37	939.81
148.76	939.77	155.82	939.6	158.78	939.53	164.27	939.34	168.79	939.24
172.72	939.12	178.8	939	181.17	938.9	188.82	938.69	189.62	938.67
193.94	938.6	198.07	938.51	198.83	938.5	199.94	938.46	208.84	938.2
212.23	938.06	218.86	937.85	223.41	937.62	228.87	937.27	231.86	937.05
237.56	936.49	238.88	936.37	248.03	937.21	248.76	937.28	248.9	937.3
257.21	940.02	258.91	940.64	261.38	941.63	268.92	944.73	274.11	946.39
278.94	947.83	285.96	949.84	288.95	950.7	298.25	953.37	298.96	953.58
299.46	953.73	302.13	954.51	307.91	956.21	308.98	956.51	310.53	956.96
318.99	959.43	322.82	960.13	323.37	960.23				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	228.87	.035	248.76	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	228.87	248.76		191.57	190.57		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 8312.06

INPUT

Description:

Station Elevation Data num= 77

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	953.53	910004	952.396	869995	951.5913	79999	949.7822	17999	947.6
23.69	947.21	33.09	944.8633	58002	944.7333	98999	944.64	38.31	943.65
43.47	942.4752	07001	940.5153	36002	940.2461	11002	938.96	63.25	938.67
65.84	938.5773	14001	938.13	76.75	938.06	83.03	93887	67001	937.95
92.92001	937.9598	58002	937.88	102.81	937.88	106.31	937.87	112.7	937.79
115.35	937.78	122.59	937.76	131.33	937.64	133.43	937.64	142.37	937.6
143.55	937.6	151.51	937.59	153.16	937.59	162.15	937.58	169.59	937.57
172.03	937.54	178.63	937.53	181.92	937.53	185.9	937.48	191.81	937.41
196.71	937.35	201.7	937.34	207.73	937.28	211.59	937.23	214.79	937.2
221.48	937.12	229.56	937.03	231.37	937.01	240.48	936.91	241.26	936.9
241.91	936.89	248.8	936.67	250.95	936.6	251.15	936.6	259.99	936.14
261.04	936.06	269.03	935.56	270.93	935.37	273.22	935.61	273.8	935.59
280.82	935.23	284.14	936.07	290.71	937.8	295.05	938.98	300.6	940.54

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305.97	941.51	310.49	942.45	316.89	943.52	320.38	944.11	323.27	944.59
330.27	945.76	338.72	947.18	340.16	947.42	341.35	947.62	350.04	949.08
354.04	949.74	356.94	950.23						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 259.99 .035 284.14 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 259.99 284.14 219.41 219.41 219.41 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 8092.65

INPUT  
 Description:

Station Elevation Data num= 63

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	948.252	509979	947.663	329987	947.478	369995	946.23	12.67	945.16
13.26999	945.01	14.06	944.852	320999	943.022	560999	942.763	33.14999	942
38.84	941.65	43.09	941.448	70999	941.06	53.03	940.860	25999	940.36
62.96999	940.176	501999	940.037	290999	939.49	79.7	938.958	246999	938.73
82.85999	938.69	91.2	938.099	279999	937.98	94.92	937.83	102.74	937.27
106.47	937	112.68	936.55	117.37	936.22	122.62	935.9	129.57	935.55
132.56	935.37	134.82	935.26	142.5	934.89	143.55	934.82	151.03	934.38
152.27	934.3	152.44	934.29	152.67	934.28	162.39	933.68	167.25	933.14
169.72	932.86	172.33	932.6	178.45	933.21	182.27	933.73	187.17	934.98
192.21	936.27	198.88	937.98	202.15	938.87	204.62	939.32	212.09	940.68
213.35	940.91	222.03	942.4	222.07	942.41	222.36	942.45	230.8	943.87
231.97	944.08	239.52	945.36	241.92	945.74	245.08	946.28	251.86	947.42
256.63	947.88	261.8	948.43	262.71	948.51				

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 162.39 .035 182.27 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 162.39 182.27 188.66 183.33 182.95 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 7909.32

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INPUT

Description:

Station Elevation Data										num=	73
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	950.77	4599915	950.656	109985	949.18	10.34	947.99	15.25	946.71		
20.22	945.3524	39001	944.2630	10001	942.76	36.81	940.9339	98001	940.1		
47.54999	938.7249	85001	938.28	51.81	938.1659	73001	937.7769	03999	937.6		
69.61	937.5976	10001	937.4779	24001	937.4179	49001	937.4	88.38	937.32		
89.37	937.31	97.52	937.2399	24001	937.22	101.28	937.2	109.12	937.13		
112.02	937.1	119	937.03	124.94	936.98	128.88	936.94	134.08	936.89		
138.76	936.85	143.22	936.85	148.64	936.86	152.36	936.82	158.51	936.77		
161.5	936.74	168.39	936.67	170.64	936.68	178.27	936.68	179.78	936.67		
188.15	936.59	188.92	936.58	198.03	936.5	198.06	936.5	198.53	936.49		
207.2	936.4	207.9	936.38	208.73	936.3	217.78	935.54	225.48	934.34		
227.66	933.74	230.22	933.71	232.17	933.41	237.54	932.6	243.77	934.49		
247.42	936	251.71	937.25	257.29	939.03	262.05	940.12	267.17	941.18		
273.2	942.12	277.05	942.72	283.94	943.79	286.93	944.29	294.69	945.49		
296.81	945.82	298.61	946.1	306.68	947.26	316.18	947.96	316.56	947.99		
316.89	948.03	320.96	948.67	322.25	948.86						

Manning's n Values						num=	3
Sta	n Val	Sta	n Val	Sta	n Val		
0	.05	225.48	.035	243.77	.1		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	225.48	243.77		200.4	205.66	210.75	.1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 7703.66

INPUT

Description:

Station Elevation Data										num=	69
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.55	6000061	942.425	900024	941.3512	39001	939.9716	27002	939.15		
23.95001	937.59	26.63	937.0627	99002	936.89	32.09	936.36	37	935.73		
39.40002	935.6347	36002	935.35	51.38	935.3257	73001	935.28	63.59	935.24		
68.10001	935.2174	78001	935.1778	46001	935.1585	75002	935.188	83002	935.06		
95.09001	935.0498	18001	935.03	99.19	935.02	105.98	934.94	109.56	934.89		
113.77	934.84	119.92	934.83	140.65	934.83	147.55	934.76	151.02	934.73		
158.09	934.73	160.57	934.72	161.38	934.72	168.37	934.7	171.75	934.64		
178.45	934.4	182.11	934.32	189.59	933.72	192.48	933.46	199.56	932.69		
200.13	932.65	202.85	932.46	209.35	933.63	213.21	934.05	215.16	934.43		
221.09	935.74	223.58	936.25	224.8	936.43	233.94	937.96	240.24	938.71		
244.31	939.19	246.36	939.44	252.59	940.18	254.16	940.35	254.67	940.41		



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261.96	941.16	265.04	941.48	269.76	942.01	275.4	942.64	277.55	942.91
284.09	943.7	285.77	943.9	293.15	944.78	296.13	945.14	302.04	945.84
306.5	946.4	315.59	947.1	316.87	947.19	323.01	947.65		

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.05	192.48	.035	209.35	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
192.48	209.35	202.31	203.03	204.11	.1	.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 7500.63

INPUT

Description:

Station Elevation Data		num=	73		
Sta	Elev	Sta	Elev	Sta	Elev
0	947.692	579987	947.1310	12997	945.53
18.12997	943.8923	54999	942.8329	76999	941.6834
44.51999	938.96	45.12	938.8746	72998	938.5852
59.81	936.3165	49998	935.4375	31999	933.7275
86.46999	931.5291	15999	931.1396	95999	930.19
109.49	930.16	113.31	930.13	117.94	930.1
132.52	930.83	137.19	931.15	138.91	931.27
152.54	932.13	159.88	932.58	161.11	932.67
180.86	934.07	183.23	934.22	189.71	934.7
192.29	934.91	201.83	935.65	208.86	936.2
218.31	936.94	222.81	937.29	225.42	937.52
243.78	939.12	246.9	939.38	252.29	939.78
264.76	940.87	267.64	941.13	275.24	941.79
285.73	942.71	290.66	943.15	296.22	943.63
308.22	944.67	317.19	945.43	321.27	945.69

Manning's n Values		num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.191	15999	.035	137.19	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
91.15999	137.19	140.93	140.93	140.93	.1	.1	.3

CROSS SECTION

RIVER: Bluestone Creek

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REACH: Align (1)

RS: 7359.7

INPUT

Description:

Station Elevation Data		num= 61							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	945.473	319992	944.636	149994	943.911	0.75999	942.7	15.05	941.64
16.67999	941.26	20.3	940.372	720999	938.723	7.26999	936.133	7.73999	936.01
37.95	935.94	38.5	935.76	45.58	933.494	8.26999	932.52	54.25	930.88
58.8	929.61	66.25	929.296	8.48999	929.2	69.33	929.2	71.22	929.29
75.26999	929.43	79.87	929.6	83.75	929.969	0.39999	930.499	3.98999	930.91
100.93	931.7	106.65	932.3	111.46	932.86	121.74	933.68	121.92	933.69
121.99	933.7	122.15	933.71	132.52	934.34	137.19	934.66	143.05	935
149.49	935.36	153.59	935.61	160.09	936.07	164.12	936.3	167.73	936.54
174.65	936.91	175.36	936.95	177.23	937.07	182.99	937.45	185.18	937.6
190.63	937.96	195.71	938.23	198.26	938.37	204.98	938.81	206.24	938.89
207.02	938.94	216.77	939.56	223.99	940.01	227.31	940.22	228.8	940.31
232.72	940.56	236.43	940.8	237.84	940.9	240.97	941.11	248.37	941.64
248.59	941.66								

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	58.8	.035	79.87	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	58.8	79.87		206.43	203.87	200.3	.1 .3

CROSS SECTION

RIVER: Bluestone Creek

REACH: Align (1)

RS: 7155.83

INPUT

Description:

Station Elevation Data		num= 65							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	939.15	580017	938.13	9.73999	937.41	15.59	936.391	9.73001	935.67
27.60001	934.382	9.71001	934.02	31.22	933.79	39.7	932.7	40.13	932.66
49.68001	931.856	8.5001	931.22	59.67	931.03	63.63	930.726	9.65001	930.2
73.94	929.837	8.90001	929.34	79.64	929.268	7.65001	928.728	9.62001	928.61
91.03	928.799	3.5001	929.389	9.57001	929.39	99.61	929.4	108.12	930.35
109.59	930.53	111.67	930.73	119.58	931.47	123.68	931.73	129.56	932.1
135.69	932.49	139.55	932.73	142.29	932.88	149.53	933.27	158.57	933.75
159.38	933.79	159.52	933.8	167.93	934.17	169.5	934.24	171.72	934.35
179.49	934.77	183.73	934.95	189.47	935.2	195.74	935.54	199.46	935.74
202.1	935.85	209.44	936.17	210.65	936.22	217.79	936.62	219.19	936.69
219.43	936.7	219.76	936.72	229.41	937.14	236.28	937.5	239.4	937.67

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243.78	937.91	249.38	938.16	255.79	938.45	259.37	938.61	267.8	938.99
269.35	939.06	277.01	939.33	279	939.4	279.34	939.41	281.91	939.53

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .0578.90001 .03599.35001 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 78.9000199.35001 185.26 188.2 190.24 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 6967.63

INPUT

Description:

Station Elevation Data num= 63

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	942.782	410004	941.98	060013	939.771	10.57001	938.831	7.10001	936.49
21.35001	934.972	2.98001	934.462	6.65001	933.22	30.44	931.993	2.12001	931.35
36.49001	929.85	42.89	927.765	0.90001	925.965	3.67001	925.546	0.28001	925.28
64.44	925.4	66.41	925.62	75.14	926.59	75.22	926.682	6.65001	927.9
85.99001	928.319	4.67001	929.2	96.77	929.419	7.57001	929.43	99.39	929.57
105.03	929.94	107.54	930.13	114.06	930.46	118.32	930.63	119.95	930.67
123.63	930.8	127.41	930.91	129.09	930.99	134.87	931.14	139.86	931.33
142.33	931.41	147.88	931.5	149.79	931.53	150.64	931.56	152.85	931.62
161.41	931.88	164.71	932.04	172.13	932.4	172.24	932.4	182.96	933.17
187.09	933.54	193.74	934.04	196.37	934.24	204.51	934.87	211.02	935.3
215.29	935.59	216.93	935.71	220.62	935.95	224.39	936.2	226.06	936.31
230.42	936.56	236.83	936.97	239.3	937.12	244.86	937.4	246.76	937.5
247.61	937.54	254.22	937.96	254.71	937.98				

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 42.89 .03582.65001 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 42.8982.65001 309.39 296.51 279.44 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 6671.12

INPUT

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Description:

Station Elevation Data										num=	83
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	936.83	699982	935.977	789978	935.0410	22998	934.5219	87997	932.56		
21.68997	932.1722	14999	932.1122	91998	932.0429	32999	931.533	15997	931.33		
42.13998	931.143	69998	931.08	44.62	931.0648	28998	930.97	56.09	930.78		
61.35999	930.6565	23999	930.5667	54999	930.4772	41998	930.3379	01999	930.13		
80.59	930.190	47998	929.9493	95999	929.89	99.81	929.72	101.94	929.65		
105.1	929.56	113.41	929.32	119.03	929.2	122.69	929.16	124.87	929.11		
129.87	929.03	136.34	928.93	138.25	928.88	144.23	928.7	147.8	928.65		
151.41	928.56	157.47	928.5	159.27	928.47	165.78	928.25	170.73	928.16		
172.96	928.1	176.69	927.99	182.19	927.84	190.32	927.61	193.66	927.52		
195.92	927.46	201.68	927.3	205.12	927.2	208.86	927	215.14	926.66		
216.05	926.61	216.59	926.58	223.23	926.05	228.05	925.66	234.36	925.27		
236.87	925.14	239.52	925	247.14	925.6	250.98	925.86	253.58	926.06		
259.13	926.48	262.44	926.64	266.31	926.87	272.8	927.15	273.49	927.18		
273.91	927.2	275.54	927.3	285.37	927.86	292.02	928.36	296.84	928.7		
302.22	929.12	308.3	929.6	309.4	929.69	311.25	929.85	319.77	930.6		
323.76	930.91	330.47	931.44	331.23	931.51	338.13	932.3	342.69	932.89		
349.69	933.85	354.16	934.47	358.86	934.83						

Manning's n Values						num=	3
Sta	n Val	Sta	n Val	Sta	n Val		
0	.05	228.05	.035	247.14	.05		

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	228.05	247.14		206.34	214.55	217.5	.1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 6456.57

INPUT

Description:

Station Elevation Data										num=	103
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	932.981	099976	932.792	949982	932.469	319977	931.35	14.72	930.87		
19.04999	930.55	26.5	930.3	37	930.1238	26999	930.0944	87997	929.94		
50.03998	929.8351	98999	929.7854	95999	929.7159	09998	929.6261	81998	929.56		
72.91	929.31	73.59	929.2980	42999	929.2	85.37	929.1387	53998	929.08		
90.85999	929.05	94.66	92997	13998	929	108.81	928.9	108.92	928.9		
115.99	928.72	120.69	928.66	126.77	928.54	132.47	928.43	137.32	928.33		
144.24	928.2	144.72	928.19	156.02	927.96	158.65	927.91	162.67	927.83		
165.77	927.77	167.79	927.73	177.56	927.53	179.57	927.49	179.99	927.48		
180.62	927.47	191.34	927.2	198.58	927.01	201.32	926.96	203.12	926.9		
211.77	926.68	214.89	926.59	216.53	926.54	226.67	926.2	229.76	926.09		

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234.48	925.93	236.87	925.85	238.44	925.8	243.99	925.66	250.22	925.41
252.44	925.34	258.21	925.19	261.99	925.04	270.39	924.64	272.43	924.53
273.77	924.42	280.21	923.9	285.54	923.46	286.65	923.38	288.34	923.3
297.32	923	299.99	923.02	306.29	923.07	309.09	923.13	314.43	923.91
320.87	924.82	324.25	925.53	329.32	926.62	332.64	927.19	336.43	927.81
342.2	928.35	344.42	928.64	348.64	929.03	356.19	929.78	357.76	929.89
360.15	929.97	364.87	930.3	367.97	930.43	378.11	930.86	379.74	930.95
382.86	931.11	391.52	931.57	393.32	931.68	396.06	931.85	403.29	932.3
414.01	933.24	414.65	933.29	415.07	933.33	421.76	934.2	426.84	934.86
431.96	935.61	438.62	936.58	449.92	938.05	450.2	938.09	450.39	938.11
451.3	938.21	462.17	939.44	465.77	939.85				

Manning's n Values	num=	3
Sta n Val Sta n Val Sta n Val		
0 .05 280.21 .035 314.43 .1		

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
280.21 314.43	159.96 159.96 159.96	.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 6296.61

INPUT

Description:

Station Elevation Data	num=	92
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev		
0 933.5 .08 933.491.980011 933.189.839996 931.91 14.09 931.3		
20.28 930.3823.23999 929.9730.70999 929.22 30.97 929.2 31.69 929.16		
41.14999 928.77 46.41 928.651.58002 928.43 61.41 928.1261.86002 928.1		
62.01999 928.162.35001 928.0972.45001 927.86 77.31 927.7182.89001 927.53		
85.03 927.46 91.12 927.2693.33002 927.1994.51999 927.16 103.76 926.9		
110.61 926.7 114.2 926.62 120.83 926.47 123.64 926.41 124.63 926.39		
131.37 926.17 135.07 926.1 139.09 925.98 145.51 925.8 150.54 925.65		
154.54 925.54 155.94 925.5 162.26 925.26 166.38 925.15 174.95 924.93		
176.81 924.89 177.71 924.86 180.25 924.77 187.25 924.52 193.15 924.37		
197.68 924.26 200.87 924.15 208.12 923.89 209.96 923.83 218.56 923.53		
223.21 923.41 228.99 923.26 231.77 923.17 239.43 922.8 239.49 922.8		
239.67 922.79 249.86 922.4 254.94 922.11 260.3 921.8 269.38 921.36		
270.73 921.3 278.11 921.3 281.17 921.34 285.83 921.84 291.61 922.62		
299.09 924.78 302.04 925.7 309 928 312.48 929.28 316.72 930.89		
322.91 933.4 328.8 935.84 332.17 937.23 333.35 937.7 339.89 940.37		
343.78 941.8 351.9 944.25 354.22 945.04 355.34 945.33 358.51 945.88		
363.06 946.68 364.66 946.89 367.98 947.38 375.09 948.42 378.51 948.89		
385.53 949.93 388.22 950.34 395.96 951.49 401.67 952.35 406.4 953.05		
409.4 953.53 409.66 953.57		

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Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 260.3 .035 285.83 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 260.3 285.83 145.29 145.29 145.29 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 6151.32

INPUT

Description:

Station Elevation Data num= 183

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	941.063	610016	942.446	709991	943.09	8.23999	943.549	720001	943.71
10.42001	943.7313	10001	943.6813	70001	943.6614	73001	943.6117	70001	943.48
18.19	943.4820	01999	943.49	23.94	943.4825	57999	943.4427	70999	943.33
31.06	943.1932	20001	943.13	32.62	943.1236	57999	943.1238	04001	943.15
39.64999	943.19	44.19	943.345	23999	943.3245	64999	943.3445	95001	943.34
53.76001	943.4255	07999	943.44	60.72	943.52	61.81	943.51	63.16	943.51
64.53	943.5376	82999	943.4584	67001	943.5289	79999	943.5299	86002	943.03
99.92999	943.02	100.08	943.02	104.44	942.9	106.33	942.89	107.54	942.78
109.4	942.64	115.5	940.38	115.99	940.15	117.79	939.27	122.43	937.06
123.45	936.57	124.17	936.21	126.44	935.14	128.1	934.35	129.8	933.56
134.22	931.36	136.24	930.38	136.94	930.07	141.91	928.1	143.39	927.51
143.58	927.46	145.76	926.85	149.56	925.99	151.28	925.66	153.19	925.5
154.63	925.36	155.66	925.25	156.07	925.19	158.17	924.88	159.99	924.72
161.39	924.69	162.18	924.65	165.96	924.5	168.58	924.42	169.17	924.39
169.69	924.38	171.84	924.45	173.81	924.5	175.23	924.55	175.64	924.58
176.99	924.74	177.52	924.76	178.45	924.78	178.69	924.78	181.78	924.72
184.93	924.65	185.22	924.65	185.76	924.64	186.36	924.63	191.89	924.54
192.53	924.54	193.92	924.55	196.96	924.49	199.59	924.48	202	924.48
205.48	924.43	206.43	924.44	208.99	924.44	212.02	924.49	213.35	924.51
216.68	924.52	219.18	924.55	221.78	924.02	224.8	922.86	228.95	921.55
230.65	921.36	234.99	921.96	236.37	922.06	239.04	922.68	244.16	923.12
244.77	923.15	245.17	923.21	245.78	923.37	249.43	923.92	251.78	924.26
254.01	924.45	254.48	924.46	256.09	924.38	257	924.36	261.16	924.03
264.56	923.85	265.92	923.85	267.04	923.85	269.3	923.89	270.87	923.94
272	923.94	273.8	923.94	276.3	924.03	276.51	924.07	280.49	924.54
282	924.61	284.64	924.8	286.78	924.94	290.66	925.04	291.39	925.04
293.06	924.96	293.7	924.95	298.36	924.78	299.74	924.83	301.25	924.91
302.14	924.88	305.11	924.86	308.28	924.77	309.42	924.75	310.5	924.75
310.94	924.74	311.34	924.73	315.14	924.65	317.04	924.64	317.73	924.62
318.28	924.64	319.26	924.6	325.81	924.3	327.99	924.37	329.27	924.42

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331.43	924.56	332.67	924.85	336.23	925.46	337.15	925.85	337.98	926.06
338.32	926.22	340.47	927.01	340.54	927.04	342.87	928.34	343.73	928.91
347.73	931.67	349.88	932.81	353.54	934.25	354.17	934.58	354.94	935.03
358.6	937.11	359.4	937.7	359.99	938.21	364.38	940.67	367.71	942.57
368.5	943.14	368.84	943.39	370.48	944.55	370.68	944.71	375.3	948.17
375.45	948.26	375.68	948.47	378.74	951.27	379.6	951.85	381.97	953.6
382.87	954.29	383.12	954.49	383.97	954.93				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	224.8	.035	239.04	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	224.8	239.04		156.75	157.82		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 5993.5

INPUT

Description:

Station Elevation Data num= 179

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	943.31	.230011	943.3	9100037	943.261	.230011	943.245	.470001	943.05
9.070007	942.829	.669983	942.8	11.06	942.7612	.359999	942.65	15.81	941.91
18.79001	941.41	19.22	941.2720	.199998	941.0321	.85001	940.3423	.679999	939.8
28.72	938.2731	.299999	937.4233	.679999	936.91	37.09	935.939	.139998	935.35
41.14999	934.844	.239999	933.9447	.989999	933.0750	.739999	932.4	51.09	932.35
53.29999	931.8454	.01001	931.7258	.57001	930.8263	.179999	930.07	65.66	929.78
68.75	929.4670	.48001	929.3771	.98001	929.37	76.87	928.9280	.459999	928.6
82.34	928.23	83.34	928.287	.079999	927.94	90.38	927.7691	.209999	927.74
93.17999	927.7196	.609999	927.58	102.42	927.56	103.93	927.56	104.07	927.55
104.55	927.53	105.81	927.47	107.03	927.42	107.92	927.37	109.36	927.29
110.14	927.28	113.95	927.27	114.2	927.27	114.49	927.25	117.57	927.04
119.97	926.89	121.81	926.78	124.8	926.57	126.32	926.42	127.39	926.32
129.09	926.14	130.95	925.92	132.97	925.81	136.89	925.84	138.89	925.86
139.01	925.86	140.04	925.84	142.08	925.8	143.57	925.71	144.24	925.69
145.35	925.67	146.03	925.67	147.65	925.63	151.18	925.53	152.24	925.48
152.63	925.47	152.78	925.46	159.58	925.34	162.35	925.32	164.16	925.3
165.11	925.29	168.23	925.21	168.26	925.21	171.94	925.17	172.87	925.16
176.13	925.15	177.16	925.17	179.11	925.15	180.11	925.13	181.05	925.14
185.72	925.13	186.5	925.13	186.76	925.14	190.97	925.17	191.1	925.16
192.21	925.14	193.33	925.12	197.32	925.06	202.22	925.19	202.36	925.19
202.92	925.2	206.72	925.18	208.58	925.18	210.26	925.22	211.16	925.22
212.17	925.27	213.27	925.27	216.66	925.24	221.59	925.18	223.77	925.23
224.67	925.24	226.87	925.23	229.6	925.16	230.7	925.11	232.28	925.06

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234.92	924.89	235.86	924.89	238.92	924.93	241.44	924.91	242.76	924.9
244.7	924.76	245.95	924.71	249.19	924.24	250.92	923.84	251.94	923.53
255.23	923.06	257.2	922.81	258.96	922.72	263.45	922.82	266.21	922.89
267.51	922.88	270.29	922.95	271.28	922.97	273.25	922.93	274.58	922.93
277.38	922.98	279.48	922.6	284.62	920.98	284.81	920.95	286.25	920.71
288.17	920.65	291.64	920.49	293.11	920.48	295.52	920.67	297.85	922.62
300.82	925.77	303.48	928.87	306.01	932.46	309.59	935.19	309.69	935.27
309.72	935.3	309.78	935.36	313.9	938.84	314.9	939.43	316.44	940.22
318.26	941.33	319.44	942.21	322.32	944.3	324.51	945.86	325.5	946.61
326.41	947.15	328.02	948.12	329.76	949	331.82	949.55	333.01	950.02
334.63	950.52	338.25	951.49	340.07	952.07	341.27	952.44	342.05	952.65
342.36	952.76	346.64	954.02	348.3	954.34	353.13	955.87	353.63	956.03
353.74	956.08	353.81	956.11	355.01	956.57	356.59	957.16		

Manning's n Values	num=	3
Sta n Val Sta n Val	Sta n Val	
0 .05 279.48	.035 297.85	.1

Bank Sta: Left Right	Lengths: Left Channel Right	Coeff Contr.	Expan.
279.48 297.85	118.34 118.93 119.21	.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 5874.57

INPUT

Description:

Station Elevation Data	num=	197	
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev			
0 940.091.440002	940.532.430023	940.83 3 940.983.460022	941.1
7.180023 942.059.440002	942.17 10.63	942.4811.95001	942.83
16.78 943.117.24002	943.1817.74002	943.2724.02002	943.36
28.36002 943.3728.54001	943.3728.79001	943.3832.68002	943.28
33.12003 943.2733.54001	943.2536.39001	942.94 41.75	942.09
44.08002 941.8646.51001	941.347.24002	941.1547.95001	940.55
51.75 940.34 52.31	940.2257.55002	93958.01001	938.79
61.96002 938.1767.02002	937.2668.49002	936.9369.46002	936.59
71.85001 936.23 73.91	935.6977.21002	935.0478.26001	934.33
82.26001 934.11 83.75	933.8887.96002	933.08 90.31	932.12
99.23001 930.4199.40001	930.3799.69002	930.28 102.79	929.11
106.29 928.67 106.9	928.61 110.88	927.83 112.66	927.52
115.1 927.5 115.35	927.47 120.58	927.01 121.16	926.82
127.23 926.67 127.46	926.66 128.03	926.63 129.74	926.48
131.34 926.47 134.34	926.25 138.11	925.64 138.74	925.13
141.92 924.83 142.67	924.65 143.64	924.45 144.8	923.7
150.64 923.51 151.75	923.47 152.18	923.47 153.31	923.16



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161.68	923.15	163.57	923.05	163.66	923.05	167.17	922.96	170.26	922.87
170.81	922.87	174.23	922.86	176.31	922.83	176.35	922.83	179.52	922.73
183.48	922.7	184.59	922.69	185.76	922.67	186.45	922.65	187.25	922.64
188.83	922.61	189.52	922.59	190.1	922.58	191.7	922.49	192.05	922.47
192.2	922.46	192.55	922.47	195.51	922.52	197.21	922.54	198.05	922.57
198.67	922.59	204.17	922.67	204.49	922.68	208.79	922.73	209.47	922.74
212.05	922.82	213.63	922.88	215.17	922.9	220.6	922.94	221.63	922.96
223.13	922.96	224.99	922.92	225.36	922.93	226.11	922.93	232.51	922.97
233.25	922.98	235.56	923.01	238.87	923.06	240.78	923.13	242.28	923.2
245.66	923.18	246.7	923.16	247.34	923.14	248.21	923.15	248.43	923.14
249.39	923.11	254.67	922.93	255.74	922.91	259.87	922.83	263.42	922.72
266.4	922.28	267.2	922.08	269.37	921.3	270.97	920.93	272.14	920.59
274.69	920.17	280.37	921.24	281.24	921.38	281.68	921.5	281.84	921.54
282.38	921.63	284.89	922.05	287.31	922.59	287.63	922.75	288.92	923.11
290.66	923.7	291.76	923.88	293.92	924.24	296.73	924.77	297.17	924.83
297.48	924.92	301.28	926.06	301.58	926.12	301.8	926.22	304.17	927.1
305.08	927.43	307.21	927.99	308.5	928.04	310.56	927.92	312.55	928.11
313.35	928.46	314.57	928.78	315.41	929.01	316.09	929.65	317.26	930
318.52	930.38	321.08	930.88	324.65	930.85	326.03	931.07	327.86	932.26
331.52	933.26	333.27	934.04	334.43	934.11	337.71	934.71	339.77	935.49
343.26	936.89	345.38	937.69	346.62	938.12	347.13	938.3	348.38	938.79
349.76	939.35	351.55	940.05	352.24	940.26	352.71	940.45	353.96	940.88
354.62	941.12	355.2	941.33						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 267.2 .035 284.89 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 267.2 284.89 110.24 107.7 103.67 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 5766.87

INPUT

Description:

Station Elevation Data num= 174

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	976.082	.559998	975.726	.589996	974.048	.580017	972.998	.950012	972.81
9.070007	972.75	14.37	970.09	15.22	969.6	16.75	968.89	18.86002	967.89
20.83002	966.99	24.58002	964.92	24.84	964.78	24.95999	964.73	28.20999	963.23
28.42999	963.13	28.95001	962.86	33.75	960.45	35.95999	959.41	39.03	958.01
42.22	956.57	44.26999	955.64	51.7001	955.24	71.89999	953.89	75.20999	952.78
52.69	951.61	53.61002	951.18	58.23999	948.98	61.48001	947.37	62	947.13
63.47	946.46	66.57001	944.93	70.23999	943.12	71.66	942.29	74.31	940.76

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75.04001	940.2576.36002	939.61	80.22	938.0880.61002	937.9280.79001	937.82
83.5	936.485.70999	935.27	87.94	934.1389.95001	933.2691.33002	932.53
94.29999	931.2494.61002	931.08	99.98	928.64	101.21	928.19
104.12	927.19	105.14	926.82	106.61	926.36	107.86
108.25	925.86	109.58	925.64	112.54	925.13	112.95
115.63	924.63	117.64	924.21	119.35	923.82	120.65
124.95	922.8	126.44	922.66	130.69	922.15	134.68
138.69	922.09	140.7	922.11	140.95	922.11	142.88
144.88	921.99	147	921.92	147.36	921.89	147.92
150.98	921.85	151.5	921.85	152.38	921.83	156.18
160.62	921.77	163	921.76	163.09	921.76	167.89
174.59	921.95	175.1	921.95	175.82	921.97	180.13
183.24	922.12	185.39	922.09	186.71	922.13	189.05
191.12	922.32	192.81	922.33	193.9	922.34	195.84
197.38	922.27	197.73	922.25	199.01	922.22	200.75
205.64	922.24	209.13	922.28	209.36	922.28	213.73
219.55	922.31	219.58	922.31	222.7	922.39	224.92
228.15	922.35	231.51	922.32	233.02	922.33	233.88
235.78	922.39	242.69	922.3	245.74	922.28	246.54
251.5	922.12	253.81	922.08	253.82	922.08	260.6
267.49	919.47	268.55	919.4	271.4	920.04	274.21
280.76	921.83	280.78	921.84	280.8	921.84	285.68
291.29	922.05	291.34	922.08	291.82	922.27	297.26
300.11	924.9	301.66	925.3	302.27	925.46	302.59
309.57	928.08	318.09	931.2	318.62	931.41	319.12
325.06	934.38	327.53	935.4	328.56	935.84	337.42
337.85	940.15	341.97	942.32	342.02	942.35	342.27
346.58	944.44	348.23	945.12	348.57	945.25	350.69

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 260.6 .035 279.15 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 260.6 279.15 134.05 135.05 135.79 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 5631.82

INPUT

Description:

Station Elevation Data num= 204  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 0 972.59.1799927 972.563.029999 972.023.099976 9723.159973 971.99  
 3.309998 971.975.179993 971.738.109985 971.210.57999 970.75 12.06 970.47

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12.69998	970.2913.92999	970.1117.15997	969.37	19.97	968.75	21.31	968.31		
23.12	967.61	25.44	966.4430.35999	964.2131.56998	963.6733.48999		962.67		
37.39999	960.8538.84998	960.1540.09998	959.53	42.28	958.4944.09998		957.58		
47.06	956.2951.95999	954.3252.78998	953.93	53.25	953.5857.59998		950.83		
58.32999	950.3859.73999	949.17	61.03	948.24	61.31	948.162.65997	947.26		
63.00998	947.0463.26999	946.9166.29999		945.466.51999		945.366.67999	945.21		
72.39999	942.0774.32999	941.0675.53998		940.7275.57999		940.7175.60999	940.7		
76.23999	940.53	79.19	939.7579.87997	939.5680.48999	939.43	82.25	938.9		
82.91998	938.6783.42999	938.5287.82999		937.3289.70999		936.8189.92999	936.75		
91.84998	936.1792.85999	935.9194.14999		935.5295.78998		934.6496.64999	934.3		
98.27998	933.5998.83998	933.35	100.52	932.72	103.1	931.49	106.85	929.63	
107.05	929.52	107.12	929.48	108.36	928.72	109.79	927.95	115.11	924.71
118.21	924.34	119.2	924.25	121.7	924.08	125.25	923.84	125.82	923.79
126.3	923.76	126.82	923.74	130.55	923.65	130.82	923.62	131.27	923.61
132.58	923.57	134.03	923.51	136.55	923.41	137.98	923.25	140.36	923.03
140.55	923.01	140.78	923.01	143.94	922.89	144.59	922.88	146.42	922.87
148.39	922.83	150.33	922.72	152.67	922.59	154.09	922.46	154.14	922.45
155.76	922.46	156.68	922.4	157.74	922.32	159.16	922.2	160.77	922.1
163.05	922	167.56	921.86	168.67	921.81	169.14	921.8	172.3	921.64
173.08	921.62	173.4	921.6	175.31	921.56	175.79	921.54	179.79	921.14
180.54	921.15	184.72	920.99	186.74	921.01	186.92	921.01	187.09	921
187.6	921.04	190.24	921.15	191.14	921.16	192.79	921.12	194.6	921.08
195.48	921.13	196.81	921.16	199.3	921.16	201.11	921.17	202.87	921.12
203.81	921.13	208.01	921.11	208.98	921.11	212	921.07	212.65	921.05
214.37	921.04	219.99	921.04	221.76	921.03	222.62	921.05	225.14	921.07
228.43	921.11	229.37	921.12	229.69	921.11	230.22	921.1	234.19	921.16
235.03	921.18	235.08	921.18	236.91	921.22	241.97	921.19	242.9	921.2
244.2	921.29	247.31	921.41	248.62	921.47	249.39	921.47	253.29	921.26
254.78	921.13	255.92	921.4	258.63	920.87	259.93	920.56	260.89	920.1
262.7	919.6	264.98	919.04	267.31	919.06	268.58	918.97	269.61	918.98
271.1	919.1	271.93	919.11	275.84	919.89	276.1	919.94	277.13	920.27
282.22	921.53	282.62	921.61	286.23	921.46	287.9	921.42	288.5	921.4
288.7	921.43	293.07	921.78	295.29	922.77	296.98	923.74	297.95	924.41
300.28	926.13	300.37	926.21	302.82	927.73	305.76	929.44	306.96	930.04
308.65	930.85	309.4	931.1	312.03	931.72	314.84	932.51	315.78	932.66
317.55	932.9	319.98	933.22	322.85	933.68	324.59	934.02	325.22	934.14
325.62	934.22	326.53	934.42	331.41	935.44	337.2	936.55	340.8	937.19
342.51	937.47	343.54	937.55	344.38	937.74	347.41	938.4	348.07	938.56
352.21	939.53	352.68	939.61	353.02	939.73	353.55	939.91		

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 260.89 .035 277.13 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 260.89 277.13 148.97 148.51 148.05 .1 .3

CROSS SECTION

171-150-Revised-An.rep

RIVER: Bluestone Creek

REACH: Align (1)

RS: 5483.31

INPUT

Description:

Station Elevation Data		num= 208									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	944.591.619995	944.122.089996	944.012.309998	943.95	2.76001	943.86					
8.470001	942.6515.45999	942.03	15.87	942.116.07001	942.1	16.84	942.03				
18.54001	941.9	25.81	941.5326.07001	941.48	26.28	941.3826.95999	941.18				
28.03	941.1529.54001	940.9130.73001	940.76	34.16	940.11	34.5	940.04				
35.14999	939.92	36.63	939.62	36.94	939.5637.07001	939.5537.92999	939.3				
45	938.5145.91998	938.3746.14999	938.3250.07999	937.63	56.25	937					
57.47	936.8857.95001	936.861.85001	936.2163.73001	935.9966.67999	935.45						
68.23999	935.25	68.31	935.2469.41998	935.0271.39999	934.6371.54999	934.6					
71.97	934.5274.95001	933.92	75.66	933.82	79.53	933.1583.63998	932.46				
84.22	932.3485.13998	932.286.76999	931.95	87.66	931.7792.60001	931.04					
94.56	930.7997.10999	930.3297.95001	930.18	101.39	929.63	103.39	929.29				
104.75	928.97	104.8	928.96	105.33	928.86	108.4	928.34	109.97	928.1		
111	927.98	112.44	927.85	114.98	927.55	119.37	926.99	120.94	926.77		
122.97	926.44	123.26	926.4	125.28	926.14	131.83	925.35	132.93	925.18		
135.26	924.96	138.33	924.67	138.87	924.66	139.22	924.62	144.18	924		
144.76	923.93	146.41	923.72	149.75	923.29	150.72	923.18	155.17	922.85		
155.52	922.81	157.4	922.57	157.69	922.53	161.16	922.09	163.64	921.84		
165.34	921.68	169.61	921.48	169.62	921.48	171.64	921.37	173.98	921.3		
177.72	921.19	178.74	921.13	181.24	921.07	183.12	921.1	183.18	921.1		
183.47	921.09	185.06	921.06	185.68	921.06	191.65	921.13	192.6	921.15		
192.68	921.15	196.78	921.3	197.67	921.3	199.53	921.38	202.38	921.44		
205.29	921.47	207.94	921.42	210.69	921.47	211.76	921.39	213.78	921.22		
214.17	921.18	216.92	920.85	217.81	920.73	219.29	920.61	220.64	920.51		
222.12	920.4	223.73	920.36	225.91	920.48	228.85	920.54	232.33	920.71		
233.16	920.74	233.83	920.76	238.98	920.88	242.48	920.93	246.37	920.91		
248.08	920.84	249.38	920.76	250.98	920.74	252.5	920.84	254.29	920.9		
256.25	920.91	260	920.98	261.68	921.02	261.96	921.03	265.38	921.09		
267.04	921.12	267.15	921.13	267.53	921.14	270.89	921.3	272.02	921.32		
273.34	921.36	278.03	921.3	278.36	921.3	281.2	921.35	283.66	921.33		
286.02	921.3	291.5	919.99	291.53	919.98	291.55	919.96	291.65	919.95		
296.27	918.91	298.65	918.38	302.54	919.86	303.7	919.98	303.83	919.99		
310.35	920.44	312.55	920.61	313.31	920.58	313.51	920.58	314.78	920.64		
318.65	921.69	319.12	921.85	323.27	922.97	325.52	923.61	325.98	923.7		
328.57	924.53	330.01	925.04	331.01	925.43	331.7	925.69	333	926.11		
335.1	926.71	337.09	927.3	337.54	927.39	339.03	927.54	341.22	927.9		
343.62	928.04	344.41	928.16	349.76	929.01	350.22	929.08	350.32	929.1		
350.76	929.19	355.32	930.15	356.77	930.44	360.4	931.25	360.92	931.37		
361.59	931.55	365.42	932.45	367.11	932.78	369.14	933.14	369.72	933.2		
370.66	933.31	371.38	933.38	372.06	933.41	373.42	933.61	374.84	933.7		

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377.22	934.08	380.24	934.57	382.42	935.07	383.55	935.39	384.76	935.63
385.62	935.87	388.77	937	392.47	938.48	395.35	939.83	396.09	940.14
396.41	940.25	397.16	940.52	400.56	941.48				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	291.5	.035	302.54	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	291.5	302.54		145.04	143.7	141.88	.1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 5339.61

INPUT

Description:

Station Elevation Data num= 231

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	951.45	8800049	951.09	1.399994	950.85	1.519989	950.8	2.47998	950.52
9.48999	948.62	10.78	948.39	11.45999	948.28	12.66998	948.12	14.03998	947.92
17.17999	947.41	20.38998	946.43	21.03	946.27	24.67999	944.79	26.81	943.91
28.98999	942.74	29.67999	942.29	34.03	940.09	35.14999	939.79	36.88	939.06
38.63	938.3	39.56	937.88	40.47998	937.34	41.53	937.12	42.78998	936.62
47.37	934.57	52.76999	932.11	54.19	931.37	55.60999	930.68	57	930.01
58.00998	929.61	64.75998	927.36	65.50998	927.2	67.62	926.75	69.42999	926.41
71.03	926.24	72.59	926.09	76.78998	925.67	79.84	925.24	80.69	925.19
81.41	925.18	82.72998	925.18	86.57999	924.93	88.95999	924.92	87.14999	924.92
90.78998	924.75	92.82999	924.74	96.41998	924.74	98.87	924.63	100.53	924.68
102.67	924.66	106.03	924.76	106.15	924.76	106.39	924.75	110.25	924.65
113.18	924.58	115.37	924.46	121.16	924.36	121.42	924.36	121.74	924.35
123.34	924.25	124.75	924.24	125.11	924.23	125.9	924.22	128.74	924.16
129.59	924.15	131.04	924.14	131.78	924.15	132.21	924.15	135.36	924.21
136.49	924.22	140.11	924.25	141.13	924.26	142.46	924.25	146.26	924.13
147.32	924.11	149.97	924.01	150.77	923.99	151.32	923.95	152.79	923.86
155.02	923.8	155.91	923.79	156.61	923.77	159.17	923.7	162.05	923.64
163.38	923.61	164.97	923.54	166.55	923.46	171.29	923.11	171.65	923.1
172.27	923.05	173.52	922.95	173.92	922.92	174.1	922.9	177.61	922.52
178.64	922.43	179.73	922.31	179.86	922.29	183.31	921.88	186.34	921.58
191.49	921.17	192.52	921.07	194.78	920.84	195.52	920.79	197.62	920.66
204.57	920.2	204.73	920.18	204.94	920.18	205.39	920.17	208.04	920.19
208.74	920.17	211.61	920.21	212.33	920.19	214.2	920.15	215.42	920.1
216.04	920.09	217.36	920.08	217.55	920.07	221.02	920.03	221.39	920.02
223.36	919.95	225.12	919.93	228.39	919.94	235.33	919.84	235.44	919.84
235.56	919.83	238.31	919.86	243.58	919.9	243.72	919.9	245.54	919.87
246.49	919.88	251.27	919.97	251.61	919.97	251.64	919.98	251.7	919.98

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253.11	920	258.72	920.13	259.81	920.16	263.96	920.3	266.46	920.32
268.18	920.32	269.9	920.29	273.55	920.18	275.54	920.09	277.24	920.05
278.37	919.98	280.17	919.94	282.73	919.99	284.77	920.06	285.75	920.08
287.87	920.19	288.81	920.2	289.69	920.21	291.23	920.27	292.79	920.36
297.04	920.53	299.18	920.73	301.78	920.77	302.88	920.8	307.44	920.8
307.78	920.81	309.8	920.78	311.95	920.73	316.5	920.73	319.83	920.87
320.17	920.87	324.76	920.86	325	920.86	327.5	920.87	330.33	920.88
330.88	920.86	335.2	920.65	335.87	920.63	339.93	919.55	341.97	919.05
342.74	918.54	345.08	918.12	348.86	917.9	349.96	918.02	353.32	919.13
354.76	919.56	357.57	920.26	360.49	921.02	362.55	922.02	364.68	923.64
366.14	924.4	367.7	925.37	368.61	925.79	369.1	925.99	374.68	927.71
375.26	927.87	375.64	927.96	376.8	928.13	377.66	928.19	382.15	928.45
383.47	928.58	387.81	928.87	388.19	928.9	391.98	929.25	392.52	929.3
392.74	929.33	394.77	929.54	395.34	929.64	400.82	930.4	401.86	930.49
402.65	930.53	404.34	930.78	407.97	931.49	408.86	931.69	409.4	931.8
413.07	933.15	417.83	934.49	418.84	934.79	419.85	935.13	420.55	935.45
421.94	936.07	423.26	936.69	425.49	937.64	425.66	937.71	425.78	937.75
431.53	939.9	431.66	939.94	432.57	940.3	435.6	941.54	436.01	941.69
436.57	941.96	441.29	944.27	443.2	944.99	445.03	945.76	445.94	945.99
448.99	946.48								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	339.93	.035	354.76	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	339.93	354.76		123.35	123.35	123.35	.1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 5216.26

INPUT

Description:

Station Elevation Data num= 243

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	930.171.730011	929.93.540009	929.625.070007	929.449.660004	928.87				
11.95001	928.5712.64001	928.48	13.75	928.3517.05002	927.98	18.03	927.88		
21.23001	927.64	22.97	927.49	25.66	927.2628.79001	92729.17001	926.97		
29.64001	926.96	31.34	926.833.98001	926.5936.61002	926.39	39.56	926.2		
40.82001	926.1341.85001	926.09	44.87	925.99	45.09	925.98	46.78	925.86	
46.98001	925.84	49.16	925.66	50.84	925.5353.61002	925.4454.82001	925.38		
55.22	925.36	60.28	925.12	62.25	925.0362.48001	925.0266.27002	924.87		
67.59	924.81	69.37	924.73	70.66	924.6572.11002	924.61	74	924.57	
76.58002	924.4881.86002	924.2983.55002	924.2585.98001	924.1787.57001	924.11				
90.37	923.96	91.19	923.9293.10001	923.8893.79001	923.8695.67999		923.8		

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98.39999	923.7398	61002	923.7199	32001	923.7	104.04	923.63	107.28	923.55
108.98	923.5	111.97	923.46	113.21	923.45	115.55	923.35	116.86	923.29
117.6	923.27	119.07	923.23	120.47	923.23	122.1	923.24	124.81	923.19
127.35	923.16	128.09	923.12	131.83	922.95	133.33	922.86	134.26	922.83
136.2	922.81	139.76	922.74	141.32	922.7	142.12	922.69	144.44	922.65
147.37	922.63	150.35	922.67	151.65	922.66	153.23	922.7	153.67	922.7
155.6	922.71	155.85	922.71	158.38	922.69	158.9	922.69	160.04	922.71
163.02	922.67	164.83	922.67	169.57	922.66	171.42	922.63	172.39	922.63
173.91	922.58	176.65	922.63	179.72	922.65	183.28	922.66	184.91	922.71
185.74	922.71	187.09	922.72	192.01	922.72	192.15	922.71	192.31	922.71
193.25	922.7	195.98	922.67	197.92	922.6	199.75	922.59	204.23	922.38
205.65	922.34	206.82	922.38	208.6	922.34	211.19	922.21	211.72	922.21
214.87	922.22	215.06	922.21	215.33	922.2	218.49	922.05	221.69	921.99
224.58	921.95	226.4	921.92	228.87	921.9	228.91	921.9	235.52	921.63
238.52	921.54	242.87	921.4	243.55	921.39	244.16	921.39	246.56	921.43
249.13	921.44	250.94	921.4	252.16	921.43	253.92	921.41	259.14	921.43
259.94	921.42	261.21	921.4	261.91	921.39	265.14	921.32	266.43	921.28
268.46	921.25	269.9	921.26	271.75	921.2	272.08	921.19	276.49	921.04
277.25	921.01	279.97	920.93	282.62	920.85	284.87	920.78	287.33	920.69
288.56	920.62	290.17	920.56	292.2	920.47	293.76	920.39	295.89	920.25
297.34	920.13	299.62	920.03	301.41	919.98	301.68	919.97	302.63	919.9
305.95	919.75	307.46	919.73	310.55	919.79	310.92	919.82	313.04	919.85
313.4	919.85	314.7	919.86	316.68	919.85	321.35	919.96	321.8	919.97
323.57	920.02	325.63	920.11	327.58	920.14	327.7	920.14	331.41	920.19
334.2	920.2	334.63	920.19	336.21	920.17	336.98	920.17	338.25	920.18
341.97	920.34	342.4	920.36	342.97	920.38	343.95	920.37	348.45	920.4
349.07	920.41	351.08	920.43	352.07	920.43	353.4	920.44	354.61	920.45
356.06	920.48	359.15	920.53	360.85	920.56	362.44	920.16	368.18	920.67
369.9	919.17	371.62	917.66	372.6	916.97	373.94	917.08	375.68	917.56
377.27	918.1	379.83	918.33	382.39	918.55	384.11	919.04	385.83	919.54
386.81	920.13	387.78	920.73	394.06	920.36	394.94	920.48	395.97	920.46
399.26	920.46	401.38	920.47	401.69	920.47	402.28	920.5	404.45	920.55
405.87	920.64	406.69	920.81	407.09	921.02	411.6	923.19	411.75	923.3
412.43	923.79	413.99	924.89	415.39	925.98	416.3	926.49	417.41	926.76
422.14	928.16	423.7	928.16	425.63	928.22	426.64	928.21	428.05	928.21
433.8	928.93	435.4	929.02	436.64	929.25	437.64	929.5	438.14	929.67
438.47	929.79	442.89	931.1	444.25	931.49	444.51	931.58	446.97	932.13
448.41	932.44	449.9	933.18	451.3	933.57	452.76	934.03	453.55	934.35
455.97	935.49	459.17	936.94	462.35	938.07				

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 368.18 .035 387.78 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 368.18 387.78 257 274.13 291 .1 .3

CROSS SECTION

171-150-Revised-An.rep

RIVER: Bluestone Creek

REACH: Align (1)

RS: 4942.13

INPUT

Description:

Station Elevation Data

num= 343

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	928.96	1499634	928.931	639954	928.686	089966	927.98	820007	927.64
10.57996	927.4211	60999	927.3213	39996	927.0814	02997	927	15.12	926.85
15.95996	926.7817	77997	926.6117	89996	926.618	09998	926.5922	26001	926.35
23.25	926.31	25.56	926.2126	20001	926.1927	60999	926.1528	84998	926.13
30.72998	926.131	82001	926.0932	76996	926.0635	22998	926.0137	77997	925.88
39.07996	925.8239	72998	925.7541	26001	925.6642	76996	925.56	46	925.41
47.07996	925.38	50.19	925.2950	76001	925.28	51	925.2751	67999	925.25
56.75	925.17	63.63	92563	83997	924.9964	01001	924.9965	82001	924.96
69.62	924.9171	48999	924.9272	01996	924.92	72.5	924.9373	21997	924.93
74.02997	924.92	77.44	924.9	79.19	924.7781	26996	924.6284	21997	924.43
84.73999	924.4	86.31	924.3487	02997	924.3288	84998	924.2595	01996	924.03
95.26996	924.02	95.44	924.0195	71997	924	98	923.998	67999	923.87
101.22	923.65	102.12	923.59	102.39	923.59	104.96	923.55	110.08	923.31
111.5	923.26	112.56	923.21	116.86	923.13	123.76	922.99	126.08	922.95
127.52	922.88	128.55	922.85	131.41	922.77	132.07	922.75	132.51	922.75
133.52	922.74	135.67	922.69	136.61	922.66	139.19	922.52	139.61	922.51
141.67	922.49	143.23	922.44	147.42	922.39	149.52	922.3	153.69	922.15
153.79	922.14	153.88	922.14	157.11	922.05	160.46	921.95	163.75	921.79
165.2	921.77	167.83	921.61	168.36	921.61	171.11	921.64	175.7	921.58
178.51	921.4	179.56	921.41	183.36	921.37	184.87	921.4	185.44	921.38
185.64	921.38	190.02	921.34	191.45	921.33	191.82	921.34	195.7	921.49
198.58	921.47	199.83	921.47	203.66	921.43	204.63	921.41	208.28	921.5
211.26	921.62	213.06	921.72	215.62	921.76	216.05	921.76	222.55	921.9
222.9	921.9	227.49	921.89	228.4	921.89	228.68	921.88	230.26	921.87
232.02	921.86	233.74	921.86	235.69	921.9	237.02	921.87	240.19	921.84
243.03	921.9	244.61	921.87	245.37	921.91	246.81	921.99	251.36	922.13
254.96	922.24	257.04	922.19	258.9	922.18	260.36	922.21	263.03	922.24
265.8	922.26	265.93	922.26	267.34	922.23	267.48	922.23	267.6	922.22
271.74	922.12	272.72	922.11	275.19	922.07	275.35	922.07	276.09	922.05
278.55	921.98	279.46	921.97	285.79	921.83	289.02	921.74	289.48	921.72
289.86	921.69	290.51	921.63	292.74	921.47	294.09	921.36	295.41	921.29
296.11	921.24	297.31	921.22	298.72	921.15	302.53	920.94	307.27	920.64
308.67	920.61	312.14	920.57	313.41	920.54	313.63	920.53	315.16	920.5
317.33	920.53	317.4	920.53	321.08	920.47	325.11	920.46	325.92	920.44
327.13	920.41	330.49	920.35	334.41	920.33	334.91	920.33	338.57	920.34
339.52	920.33	340.81	920.33	346.12	920.2	346.59	920.19	346.75	920.19
348.75	920.15	350.52	920.05	351.38	920.07	351.42	920.08	352.36	920.03
354.45	919.97	355.57	919.91	356.02	919.89	357	919.85	359.06	919.77
363.46	919.55	364.45	919.46	369.08	919.39	369.18	919.38	371.38	919.31



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372.02	919.3	373.13	919.3	375	919.32	377.46	919.34	378.21	919.34
379.25	919.27	379.43	919.27	379.56	919.26	383.21	919.19	385.33	919.37
390.01	919.45	391.87	919.49	392.9	919.45	394.62	919.45	398.09	919.43
400.1	919.35	400.73	919.35	401.37	919.32	402.68	919.24	403.48	919.21
404.46	919.23	408.92	919.48	412.13	919.58	412.27	919.58	414.67	919.64
418.57	919.7	420.26	917.15	421.08	915.67	423.56	915.97	424.65	916.1
425.4	916.19	426.04	916.27	427.27	916.16	428.49	916.05	429.11	915.79
429.73	915.52	430.64	917.2	432.63	917.94	433.17	918.96	433.7	919.97
435.78	919.4	440	919.79	441.01	919.78	443.43	919.78	444.02	919.77
447.49	919.72	448.45	919.72	449.54	919.67	451.02	919.68	455.41	919.68
460.21	919.6	460.79	919.59	463.84	919.58	464.12	919.58	465.94	919.59
466.88	919.59	469.95	919.56	471.93	919.55	472.23	919.55	475.57	919.52
477.19	919.5	478.21	919.47	479.69	919.45	482.14	919.43	483.43	919.42
484.46	919.41	486.35	919.38	490.37	919.38	493.6	919.34	495.44	919.34
496.04	919.33	497.2	919.33	500	919.34	502.8	919.3	503.81	919.28
507.64	919.25	510.35	919.23	510.77	919.23	511.05	919.22	511.07	919.22
511.73	919.24	513.35	919.26	515.33	919.24	517.88	919.26	518.64	919.25
520.7	919.3	521.77	919.32	523.95	919.35	527.67	919.39	528.47	919.38
531.01	919.39	531.97	919.35	534.58	919.23	535.42	919.21	540.78	919.18
542.26	919.15	545.69	919.12	548.87	919.11	552.4	919.07	554.4	919.05
556.01	919.06	556.35	919.06	557.31	919.04	560.62	919.03	564.5	919.06
566.42	919.06	566.87	919.07	570.39	919.08	571.53	919.09	572.42	919.1
575.56	919.11	576.49	919.13	578.04	919.11	580.63	919.2	581.2	919.23
583.14	919.43	583.28	919.44	584.76	919.65	584.82	919.67	584.98	919.69
588.33	920.26	589.55	920.48	590.41	920.68	593.53	921.49	595.29	921.95
596.43	922.23	597.35	922.4	597.57	922.43	597.71	922.47	598.29	922.57
601	923.09	601.61	923.2	603.28	923.52	605.37	923.79	605.75	923.84
606.61	923.96	607.93	924.16	609.38	924.52	610.86	924.81	614.4	925.5
615.55	925.73	617.55	926.08	618.87	926.35	619.79	926.53	621.84	926.89
621.85	926.9	624.02	927.34	625.42	927.52				

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 418.57 .035 433.7 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 418.57 433.7 310 290.02 279.8 .1 .3

Ineffective Flow num= 1  
 Sta L Sta R Elev Permanent  
 0 254.96 925 F

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 4652.11

INPUT

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Description:

Station Elevation Data		num= 320							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	927.31	.210022	927.3	1.25	927.182.960022	927.04	3.77002	926.99	
4	926.974.490051		926.968.610046		926.878.650024	926.8710.48004		926.79	
13.33002	926.69	15.69	926.619.23004		926.4522.42004	926.3325.05005		926.31	
26.16003	926.2826.96002		926.2628.56006		926.2431.56006	926.3332.71002		926.38	
40.09003	927.4541.09003		927.6741.55005		927.8442.73004	928.1845.40002		928.94	
46.53003	929.1450.47003		929.4353.34003		929.7255.74005	929.6555.91003		929.65	
58.55005	929.5264.52002		929.3765.61005		929.3166.78003	929.2968.58002		929.22	
69.68005	929.1769.81006		929.1770.53003		929.1572.02002	929.0872.77002		929.07	
74	929.06	76.25	92979.79004		928.8983.91003	928.6983.95001		928.69	
85.78003	928.6785.91003		928.6788.47003		928.6391.02002	928.693.87006		928.44	
95.73004	928.4296.73004		928.3797.09003		928.3597.23004	928.34	102.61	928.15	
105.15	928.09	108.98	927.96	109.33	927.95	109.66	927.94	113.65	927.84
118.98	927.79119.1801		927.79	119.25	927.78119.4301	927.78	121.32	927.7	
124.88	927.53	125.36	927.52	125.8	927.52	129.07	927.4131.0601	927.31	
131.6	927.29	136.5	927.18137.1801		927.15	138.59	927.12139.6801	927.1	
141.67	927.06	143.67	927.03	145.15	926.96	146.02	926.96	149.17	926.78
152.5	926.78	154.39	926.71	161.59	926.38	161.6	926.38	167.29	926.36
167.65	926.34	169.46	926.36	169.9	926.35	172.73	926.29	176.74	926.25
177.53	926.24	177.68	926.24	181.36	926.08	181.63	926.07	181.79	926.07
187.68	925.85	187.99	925.84	188.19	925.83	192.31	925.61	192.6	925.6
195.09	925.49	195.72	925.45	197.3	925.4	202.9	925.21	203.75	925.18
204.8	925.12	205.52	925.09	205.97	925.07	209.39	924.87	210.64	924.83
211.66	924.78	213.34	924.68	216.46	924.53	217.56	924.53	219.41	924.51
221.35	924.43	222.06	924.4	223.34	924.35	225.08	924.29	230.5	924.07
231.47	924.03	232.2	924	233.07	923.96	239.3	923.65	239.97	923.64
240.68	923.65	244.53	923.52	245.63	923.49	246.72	923.48	248.12	923.48
252.93	923.25	255.42	923.15	258.08	923.06	259.09	923.05	262.7	922.98
262.77	922.98	263.64	922.95	269.59	922.74	273.51	922.59	274.91	922.54
279.7	922.39	281.18	922.37	281.31	922.37	283.11	922.31	283.38	922.33
284.67	922.35	288.51	922.36	291.35	922.38	299.42	922.2	300.28	922.18
300.39	922.18	301.48	922.14	305.1	922.04	307.96	922	308.69	921.98
309.93	921.93	310.38	921.91	312.67	921.82	315.45	921.66	320.92	921.61
321.31	921.6	321.48	921.6	325.9	921.59	329.38	921.52	329.57	921.52
330.99	921.6	331.7	921.59	332.98	921.59	335.17	921.56	338.85	921.12
341.46	920.82	342.18	920.53	342.95	920.2	348.55	919.25	349.41	919.1
349.71	919.04	354.71	918.25	355.42	917.39	356.12	916.54	359.32	915.82
362.89	915.33	366.31	917.09	367.14	919.08	372.16	918.93	372.76	919.01
372.83	919.01	373.33	919	375.38	918.98	376.62	918.89	379.43	918.73
379.9	918.69	380.3	918.67	384.82	918.53	385.97	918.49	390.11	918.49
391.48	918.51	393.54	918.58	393.92	918.59	394.97	918.59	397.1	918.54
398.26	918.51	399.07	918.51	403.52	918.45	405.79	918.35	406.76	918.33
407.97	918.35	411.04	918.36	411.91	918.36	416.6	918.38	417.66	918.35
418.38	918.38	422.03	918.38	424.59	918.22	424.82	918.21	429.52	918.34
430.94	918.34	431.57	918.31	436.03	918.24	439.52	918.31	440.68	918.31
440.9901	918.34	445.41	918.36	447.22	918.35	448.93	918.42449.9901		918.34

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450.47	918.33	456.12	918.54	456.85	918.49	459.77	918.54462.7401	918.61
464.91	918.69	465.05	918.7	471.06	918.78	473.67	918.83 476.06	918.94
478.29	918.94	481.9	918.96	483.36	918.98	483.8	918.97 484.05	918.98
484.9	919.05	489.09	918.99	491.8	918.91	497.67	918.64 499.4	918.51
501.28	918.45	502.12	918.38	502.66	918.37	504.9	918.32 506.68	918.33
509.46	918.28	510.23	918.29	512.47	918.33	515.21	918.44515.9301	918.47
516.47	918.5	519.8	918.58	523.92	918.66	524.05	918.65 524.92	918.64
527	918.66528.6901	918.63	531.55	918.61	533.53	918.57	534.35	918.54
537.48	918.47	539.37	918.44	540.72	918.38	541.77	918.37547.7401	918.37
551.84	918.5551.9401	918.5	555.2	918.44	557	918.44	560.25	918.39
563.51	918.46	563.62	918.46	565.39	918.54	566.79	918.57 571.89	918.63
574.47	918.8	576.98	918.84	580.36	918.69	581.84	918.69 585.14	918.65
585.28	918.65587.1801	918.59587.1901	918.59596.5601	918.76	597.21	918.76	597.21	918.76
598.23	918.81	599.83	918.88601.1801	918.93	604.08	919	605.39	919.07
607.16	919.12609.6201	919.2	612.2	919.2613.1201	919.19	613.95	919.21	919.21
618.61	919.3	618.9	919.3	619.33	919.31	620.05	919.33 622.3	919.4
622.8	919.39	627.45	919.51	629.59	919.58	630.34	919.59633.5601	919.55
637.26	919.67	637.88	919.67	638.8	919.69	639.15	919.73 643.48	920.15
644.44	920.19648.3701	920.36650.3701	920.41	653.59	920.51	653.78	920.51	920.51

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	349.41	.035	367.14	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	349.41	367.14		244 257.65	271.8		.1	.3
Ineffective Flow			num=	1				
Sta L	Sta R	Elev	Permanent					
484.9	653.78	925	F					

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 4394.46

INPUT

Description:

Station Elevation Data num= 346

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	929.131.690002	928.433.279968	927.616.109985	926.876.419983	926.77				
7.659973	926.199.219971	925.69 11.37	925.2512.72998	924.7313.89996	924.54				
16.81	923.88 19.37	923.1521.46002	922.5722.08002	922.5322.14996	922.54				
27.65997	922.18 27.94	922.23 29	922.3430.42999	922.6531.72998	923.1				
32.98999	923.6134.82001	923.7138.09998	923.8340.78998	923.7941.17999	923.78				
45.04999	923.7945.20001	923.78 45.56	923.7547.27002	923.3847.71997	923.5				
50.77997	923.2151.33002	923.1551.47998	923.1452.89001	923.05 55.56	922.88				
56.02002	922.86 57.44	922.7758.34998	922.72 60.88	922.5462.85999	922.43				

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64.08002	922.3866.58002	922.3268.73999	922.3570.46997	922.3470.95001	922.35
74.20001	922.2 74.62	922.1774.84998	922.1675.01001	922.1678.84998	922.11
79.01001	922.181.27997	922.0481.64001	922.0285.78998	921.988.59998	921.81
89.31	921.7790.51001	921.7191.71002	921.6392.90997	921.5894.97998	921.52
96.35999	921.4997.29999	921.4799.14996	921.45 100.36	921.4 105.3	921.28
105.34	921.27 105.38	921.27 107.1	921.15 107.31	921.15 110.13	921.01
116.51	920.77 117.57	920.72 120.97	920.51 122.85	920.39 127.81	920.11
130.1	920 133.72	919.96 133.84	919.95 134.17	919.94 137.25	919.79
142.84	919.56 143.7	919.5 147.16	919.33 147.3	919.33 149.1	919.2
150.66	919.07 155.87	919.12 156.28	919.09 156.81	919.11 157.98	919.1
159.01	919.04 160.04	919.04 161.08	918.92 163.52	919.14 165.07	918.79
166.93	918.83 169.22	918.88 170.25	918.66 173.87	917.56 177.64	916.45
178.27	916.15 182.83	915.21 185.72	915.1 188.05	915.17 192.45	915.33
195.77	915.18 197.66	915.12 201.38	915.04 203.73	914.99 204.61	915.23
205.04	915.36 206.92	915.86 208.83	915.91 213.47	916.11 220.03	916.17
220.26	916.18 220.51	916.16 222.77	916.17 223.87	916.26 224.66	916.28
225.86	916.22 228.21	916.18 231.07	916.25 232.21	916.32 232.35	916.32
232.79	916.37 237.28	916.88 238.14	916.92 239.9	916.92 242.43	917.02
245.21	917.07 246.68	917.05 253.02	917.05 256.24	916.99 257.38	917
258.95	916.96 262.23	916.81 263.2	916.78 265.46	916.8 267.71	916.68
270.26	916.55 272.07	916.47 273.29	916.43 274.07	916.43 276.49	916.37
281.41	916.51 284.06	916.54 289.77	916.86 290.07	916.89 290.5	916.92
290.87	916.95 291.76	916.96 294.27	916.99 295.85	917.04 297.44	917.09
299.84	917.14 301.04	917.19 305.54	917.22 308.5	917.22 309.45	917.25
310.43	917.26 312.4	917.3 314.16	917.32 319.54	917.36 320.43	917.39
321.72	917.41 322.67	917.42 324.67	917.4 325.37	917.4 326.76	917.35
328.62	917.37 329.41	917.36 329.93	917.35 332.68	917.32 336.6	917.4
339.72	917.46 341.17	917.45 341.7	917.46 342.87	917.47 344.03	917.46
347.78	917.42 350.72	917.41 351.64	917.42 354.38	917.43 356.36	917.43
362.42	917.51 362.73	917.52 363.12	917.52 367.7	918.09 368.24	916.66
368.78	915.22 370.13	914.52 371.61	914.91 373.09	915.3 375.34	915.55
377.58	915.8 380.84	917.32 383.05	917.73 383.85	917.86 384.39	917.94
386.16	918 387.14	918.04 388.84	918.22 393.1	918.34 395.76	918.53
398.55	918.51 399.38	918.51 401.01	918.52 404.01	918.52 405.29	918.54
408.07	918.49 411.04	918.49 412.36	918.51 414.52	918.54 415.67	918.56
417.17	918.58 418.78	918.63 419.59	918.66 422.99	918.84 424.92	918.95
424.99	918.95 426.01	919.02 428.69	919.19 428.9	919.2 429.34	919.21
432.93	919.32 434.24	919.34 436.94	919.44 440.18	919.61 442.85	919.69
443.32	919.7 443.85	919.72 444.54	919.75 445.37	919.79 445.49	919.79
450.19	920.01 450.99	920.04 452.88	920.1 454.8	920.17 456.28	920.22
457.28	920.28 459.82	920.45 464.2	920.7 464.85	920.76 466.63	920.84
468	920.92 468.93	920.95 470.56	920.99 471.43	921.03 473.62	921.17
478.77	921.49 479.68	921.58 481.56	921.61 484.17	921.69 485.43	921.74
486.1	921.75 487.78	921.79 488.64	921.82 491.84	922.05 492.76	922.1
495.09	922.27 498.01	922.43 500.45	922.52 501.01	922.54 501.19	922.54
501.34	922.55 501.58	922.56 502.71	922.58 508.28	922.76 509.14	922.78
509.7	922.79 512.92	922.83 513.5	922.83 515.45	922.89 517.28	922.92
517.96	922.94 518.41	922.95 520.79	923 521.94	923.01 525.67	923.19

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527.92	923.29	529.26	923.34	530.92	923.39	531.39	923.41	534.97	923.47
535.41	923.48	535.61	923.48	536.17	923.51	543.07	923.98	543.17	923.98
548.08	924.33	551.35	924.45	554.63	924.64	556.66	924.78	558.25	924.91
559.09	924.97	562.89	925.25	563.53	925.33	563.71	925.34	564.47	925.4
569.44	925.65	571.4	925.73	573.18	925.9	577.53	926.28	578.16	926.34
580.28	926.5	580.86	926.55	581.25	926.57	582.95	926.64	583.33	926.65
586.4	926.81	587.02	926.83	588.04	926.89	591.38	927.11	592.04	927.15
592.99	927.21	595.97	927.45	598.05	927.66	599.62	927.78	601.43	927.88
602.77	927.97	603.74	928.04	604.51	928.12	605.79	928.27	608.16	928.49
609.72	928.64	611.57	928.72	612.41	928.76	613.84	928.8	617.73	928.97
618.1	928.98	618.34	928.98	618.51	928.99	621.76	929.16	623.39	929.19
624.41	929.22	628.28	929.32	629.83	929.34	630.62	929.33	634.61	929.29
634.81	929.29	635.35	929.32	639.37	929.54	641.79	929.66	642.89	929.75
643.18	929.77								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	367.7	.035	388.84	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	367.7	388.84		287.76	276.33	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	245.21	925	F

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 4118.13

INPUT

Description:

Station Elevation Data num= 242

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	926.512	829987	925.143	299988	925.054	909973	924.719	529999	924.47
9.919983	924.451	0.06998	924.44	10.25	924.414	59998	923.83	15.87	923.37
17.38998	922.932	0.89999	920.74	21.97	920.123	73999	918.972	6.48999	917.59
27.07999	917.428	45999	917.242	9.47998	917.163	3.54999	917.213	4.34998	917.15
35.34	917.153	9.17999	917.32	39.34	917.324	1.04999	917.234	1.97998	917.2
42.89999	917.23	45.56	917.144	9.00998	916.975	0.12997	916.945	4.41998	916.82
55.76999	916.825	7.16998	916.725	9.78998	916.59	61.03	916.526	3.85999	916.46
66.87	916.436	7.56998	916.376	7.90997	916.36	73.5	916.017	4.82999	914.48
76.79999	914.028	0.51999	914.59	85.59	914.988	9.63998	914.439	1.19998	914.7
92.34	916.19	94.47	916.179	7.37997	916.62	98.81	916.63	102.14	916.68
104.29	916.71	104.33	916.71	105.82	916.68	107.18	916.68	108.97	916.67
110.04	916.7	112.68	916.77	114.38	916.81	115.88	916.81	116.57	916.83
118.01	916.88	119.68	916.89	119.81	916.89	122.08	917.06	123.89	917.15

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124.46	917.18	124.58	917.19	124.72	917.2	127.16	917.32	128.66	917.4
129.94	917.44	132.02	917.5	134.49	917.58	137.3	917.67	138.03	917.67
142.07	917.66	143.34	917.7	144.55	917.74	146.69	917.8	149.98	917.92
152.82	918.06	153.31	918.08	154.42	918.04	158.92	917.99	160.57	917.91
161.79	917.81	163.36	917.72	165.18	917.68	166.03	917.66	167.72	917.64
168.45	917.63	171.47	917.63	172.69	917.6	175.72	917.54	177.61	917.47
179.23	917.45	183.15	917.44	184.41	917.43	184.73	917.43	188.39	917.35
190.56	917.3	191.06	917.31	192.89	917.36	194.11	917.35	198.23	917.31
200.04	917.3	201.03	917.3	203.53	917.25	205.81	917.2	209.53	917.13
210.32	917.13	215.33	917.3	216.1	917.3	217.73	917.23	221.57	917.33
223.87	917.42	225.6	917.5	226.06	917.53	228.1	917.58	232.18	917.65
234.61	917.72	236.2	917.77	238.81	917.82	241.57	917.9	242.2	917.91
242.31	917.92	242.76	917.92	248.76	918.02	249.87	918.06	253	918.13
254.11	918.14	254.87	918.12	260.02	918.19	261.16	918.2	262.03	918.22
263.98	918.26	265.96	918.23	267.12	918.27	268.31	918.33	270.17	918.48
271.99	918.63	272.18	918.64	274.73	918.86	274.87	918.87	275.06	918.88
278.63	919.05	279.18	919.09	282.03	919.23	283.99	919.28	284.88	919.3
286.75	919.39	287.2	919.41	289.78	919.6	291.13	919.68	298.68	920
299.13	920.03	299.31	920.03	304.27	920.17	307.41	920.32	309.64	920.49
311.87	920.6	313.94	920.76	314.3	920.8	314.45	920.8	320.3	921.12
321.24	921.19	322.17	921.22	324	921.31	326.23	921.45	330.65	921.66
333.24	921.7	335.45	921.81	336.79	921.82	342.44	921.86	344.96	921.92
347.03	922	349.51	922.1	352.63	922.26	352.66	922.26	352.78	922.27
362.36	922.45	362.85	922.46	363.26	922.46	364.24	922.49	367.98	922.61
368.81	922.64	371.12	922.71	371.55	922.72	372.1	922.73	374.76	922.76
379.43	922.83	381.01	922.85	381.3	922.86	382.08	922.89	385.43	923.09
385.59	923.1	387.67	923.25	388.69	923.33	389.8	923.34	393.43	923.54
394.06	923.59	394.23	923.6	396.19	923.63	400.12	923.67	402.43	923.7
405.75	923.72	407.32	923.73	407.91	923.74	410.54	923.7	411.89	923.7
412.44	923.72	414.71	923.85	417.14	923.99	418.33	924.06	420.6	924.27
422.59	924.4	427.29	924.83	427.93	924.89	432.5	925.16	432.64	925.18
432.86	925.22	433.39	925.32	438.76	926.34	439.8	926.5	443.69	926.82
443.87	926.82	444.52	926.83	448.59	926.93	451.25	926.89	451.52	926.89
453.34	926.92	454.88	926.94	456.63	926.79	459.13	926.89	461.91	926.84
463.93	926.81	466.49	927.29	468.96	927.82	474.84	928.14	474.98	928.18
475.78	928.24	476.55	928.28						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1 73.5 .035 92.34 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 73.5 92.34 116.57 113.17 111.58 .1 .3

CROSS SECTION

RIVER: Bluestone Creek

REACH: Align (1)

RS: 4004.96

INPUT

Description:

Station Elevation Data		num= 216							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	929.59	1399841	929.565	1999982	928.556	549988	928.286	589996	928.27
6.769989	928.231	0.73999	927.23	13.62	926.5615	0.01999	926.24	20.38	925.16
20.39999	925.15	20.41	925.1523	5.7999	923.37	24.16	923.15	24.78	923.03
29.95999	922.6330	3.2999	922.6330	6.0001	922.5534	3.2999	921.6534	8.2001	921.6
36.37	921.3836	8.2999	921.2437	4.5999	921.0539	6.6998	920.3141	1.19998	919.82
42.23999	919.3944	0.04999	918.5848	5.1999	916.89	49.66	915.37	50.81	913.85
51.97998	912.71	56.12	912.8658	5.7999	913.361	0.03998	913.7362	1.0001	913.75
63.32999	913.78	65.62	913.8267	2.3999	915.5469	6.4999	915.3670	3.2001	915.26
72.87	915.0174	0.07001	915.34	75.19	915.52	79.28	916.16	80.41	916.27
85.53	916.88	87.63	916.9389	0.03998	916.8191	2.8998	916.68	95.06	916.54
97.03	916.48	100.95	916.47	100.96	916.47	110.5	916.45	110.94	916.45
111.83	916.44	112.27	916.42	113.67	916.43	118.01	916.47	119.02	916.53
119.51	916.54	120.34	916.57	121.95	916.59	124.56	916.6	128.11	916.61
131.55	916.68	133.38	916.73	137.21	916.69	139.57	916.67	140.85	916.66
142.06	916.64	142.64	916.63	144.14	916.61	144.96	916.57	150.46	916.4
152.4	916.34	153.25	916.34	157.21	916.32	160.68	916.39	160.91	916.4
162.72	916.38	165.6	916.31	168.15	916.22	168.58	916.22	169.08	916.23
170.46	916.25	171.68	916.26	175.49	916.25	176.7	916.27	179	916.3
182.37	916.33	184.37	916.35	188.09	916.41	188.44	916.42	190.16	916.47
191.17	916.5	192.3	916.54	195.03	916.63	198.89	916.77	199.26	916.79
205.22	916.82	205.97	916.83	206.47	916.84	210.88	916.92	214.64	916.92
218.05	916.9	218.47	916.9	218.93	916.91	222.75	916.98	225.25	917.04
228.02	917.09	228.54	917.1	229.04	917.12	229.38	917.14	231.43	917.19
235.9	917.33	236.17	917.33	237.3	917.38	240.65	917.59	241.19	917.63
241.65	917.66	242.95	917.77	245.37	917.99	249.37	918.34	251.58	918.51
254.49	918.79	255.24	918.86	256.94	918.92	258.13	918.97	259.22	919.01
261.54	919.15	264.43	919.32	267.37	919.37	271.93	919.6	273.06	919.62
274.58	919.79	280.89	920.32	283.04	920.51	287.66	920.89	288.28	920.93
289.04	921	292.56	921.33	294.56	921.43	296.26	921.53	297.92	921.61
298.7	921.65	301.3	921.82	304.41	921.98	306.04	922.05	307.16	922.08
308.78	922.13	310.65	922.15	313.49	922.23	315.04	922.28	317.22	922.33
319.14	922.36	320.4	922.41	321.95	922.46	324.95	922.54	325.43	922.55
328.14	922.57	329.46	922.59	331.94	922.63	332.52	922.64	333.18	922.65
334.29	922.69	336.62	922.67	337.03	922.62	337.94	922.56	338.86	922.56
340.3	922.39	341.7	922.28	342.49	922.13	344.34	922.39	346.36	922.85
347.53	922.93	348.57	922.96	350.66	922.87	351.88	922.83	352.66	922.81
354.57	922.89	357.71	922.99	358.37	923.01	358.92	923.03	363.8	923.19
366.19	923.25	366.39	923.26	367.07	923.26	369.23	923.29	373.28	923.34
373.89	923.35	375.33	923.43	379.38	923.64	383.4	924.15	383.82	924.21
384.28	924.27	384.44	924.3	387.31	924.77	391.9	925.4	394.56	925.78
395.13	925.86	395.93	925.95	397.86	926.22	401.88	926.55	402.15	926.58
402.26	926.59	405.62	926.96	408.54	927.34	412.85	927.75	414.53	927.85

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416.93 928.05 417.81 928.12 419.33 928.27 425.38 928.78 426.56 928.89  
 427.18 928.96

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1 49.66 .03567.23999 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 49.6667.23999 117.63 117.63 117.63 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 3887.33

INPUT

Description:

Station Elevation Data num= 208

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	938.385	880005	937.596	410004	937.516	490021	937.56	630005	937.47
13.23001	936.317	20001	935.0118	74002	934.4820	86002	933.7320	92001	933.71
23.45001	932.82	24.56	932.46	26.47	931.82	27.38	931.5828	87003	931.07
34.03	928.6134	26001	928.5	34.31	928.4735	21002	928.0541	11002	925.21
41.97	924.844	80002	924.7549	74002	924.6350	87003	924.6155	68002	921.91
56.81	921.2757	21002	920.83	57.94	920.26	58.91	919.560	71002	917.94
61.66	917.17	64.13	916.2167	04001	915.173	10001	914.8173	46002	912.84
75	912.1578	76001	912.43	81.03	912.59	83.31	912.7485	01001	912.71
86.72	912.6887	39001	913.53	88.06	914.38	89.38	914.3690	87003	914.81
91.69	914.8697	85001	914.88	100.44	914.9	100.63	914.89	100.94	914.92
103.25	915.06	103.54	915.08	103.88	915.08	104.72	915.11	113.9	915.42
114.56	915.42	115.56	915.38	116.6	915.36	119.59	915.36	121.59	915.34
122.53	915.38	126.2	915.34	127.98	915.33	128.58	915.32	129.86	915.34
133.05	915.31	135.68	915.32	135.98	915.33	137.04	915.32	142.42	915.41
145.51	915.46	149.15	915.41	152.12	915.38	153	915.37	154.54	915.37
155.84	915.42	158.84	915.45	160.31	915.52	160.93	915.57	161.85	915.61
165.9	915.73	168.18	915.85	169.28	915.87	171.42	915.89	174.07	915.91
175.55	915.96	178.33	916.1	179.69	916.11	181.3	916.18	185.62	916.23
185.84	916.23	186.05	916.24	187.63	916.26	192.12	916.28	192.89	916.31
195.74	916.43	196.47	916.42	198.63	916.41	201.79	916.45	202.57	916.45
202.93	916.46	206.5	916.44	208.91	916.46	210.49	916.46	210.76	916.45
212.71	916.44	212.79	916.44	216.27	916.38	217.1	916.36	217.59	916.38
220.68	916.31	222.79	916.37	223.72	916.37	224.46	916.4	225.61	916.42
226.41	916.43	228.56	916.44	231.33	916.43	236.68	916.6	237.03	916.6
239.38	916.69	244.13	917.1	245.31	917.21	246.6	917.34	247.77	917.47
249.98	917.74	254.25	918.27	256.25	918.49	257.47	918.64	264	919.2
264.1	919.21	264.19	919.21	264.42	919.16	266.88	918.8	267.54	918.75
268.84	918.83	270.1	918.74	271.27	919.02	272.72	919.42	274.72	920.09



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275.76	920.36	276.25	920.54	277.03	920.49	279.4	920.83	281.73	921.24
282.21	921.26	283.42	921.29	285.57	921.31	287	921.29	287.06	921.28
291.54	921.2	293.36	921.19	294.75	921.14	295.88	921.1	300.46	921.08
301.62	921.07	302.05	921.07	304.66	921.04	305.55	921.04	308.86	921.05
309.88	921.05	310.79	921.06	315.24	921.06	319.18	921.13	320.89	921.2
322.81	921.25	323.25	921.24	323.83	921.26	326.72	921.3	328.35	921.35
333.36	921.29	333.89	921.29	341.75	921.41	345.47	921.48	346.39	921.51
347.72	921.61	348.97	921.68	350.23	921.74	352.09	921.87	352.41	921.9
352.63	921.93	355.44	922.18	356	922.24	357.65	922.49	360.52	922.91
362.07	923.22	364.84	923.8	365.83	924.07	369.19	924.97	369.58	925.08
369.92	925.18	372.02	925.89	376.04	926.94	378.04	927.55	380.68	928.09
384.05	928.89	384.7	929.02	387.84	929.54	388.75	929.66	393.92	930.5
395.62	930.77	399.02	931.25	400.75	931.5	401.82	931.6	402.51	931.66
403.63	931.77	407.04	932.16	407.2	932.18				

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 0 .173.10001 .03590.87003 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 73.1000190.87003 113.09 113.09 113.09 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 3774.24

INPUT

Description:

Station Elevation Data num= 187

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	933.27	2399902	933.253	720001	932.645	829987	932.169	019989	931.13
11.34	930.45	11.72	930.3711	97998	930.31	14.81	929.5317	35999	928.89
20.97	928.4323	01999	928.0626	07999	927.71	31	926.95	31.88	926.64
35.76999	924.7641	22998	923.2742	42999	922.9842	94998	922.9445	01999	922.9
48.38	922.7649	54999	922.7152	17999	922.1853	88998	921.29	56.37	919.67
57.29999	919	58.63	918.0960	98999	916.3262	45999	915.3966	07999	914.37
66.45999	914.2766	82999	914.2967	54999	914.371	06998	914.3672	56998	914.41
73.59	914.39	74.09	914.3879	69998	914.49	80.34	913.66	80.62	913.3
81.53998	912.181	95999	910.87	83.25	910.4784	81998	910.786	38998	910.92
87.91	910.9890	25998	910.5592	67999	911.3295	09999	912.0896	34999	913.2
97.14999	915.1	100.33	914.88	101.58	914.74	101.68	914.74	102.4	914.72
105.75	914.49	106.69	914.41	108.59	914.13	111.57	913.98	113.25	914.16
114.85	914.33	116.22	914.42	118.39	914.57	118.85	914.61	120.34	914.59
122.43	914.57	123.15	914.54	123.37	914.54	125.2	914.58	125.99	914.56
128.64	914.49	128.94	914.49	129.7	914.47	131.69	914.37	133.5	914.32
134.12	914.28	138.66	914.2	139.84	914.2	141.78	914.1	142.95	914.05

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147.48	913.92	148.09	913.9	148.71	913.95	149.9	914.11	154.59	914.31
156.31	914.41	157.74	914.46	160.04	914.49	162.79	914.52	165.01	914.47
166.95	914.48	167.37	914.47	168.25	914.48	169.88	914.49	170.56	914.51
173.33	914.44	174.23	914.45	178.09	914.48	179.65	914.48	180.88	914.45
182.28	914.4	184.12	914.39	187.03	914.52	188.75	914.59	189.87	914.63
197.87	914.82	198.52	914.83	200.75	914.88	202.83	914.92	203.68	914.94
206.37	914.97	206.67	914.97	206.9	914.99	212.66	915.39	213.84	915.41
214.82	915.44	222.21	915.89	223.06	915.94	223.61	915.97	225.24	916.05
228.18	916.17	229.88	916.25	231.14	916.3	233.27	916.39	234.24	916.43
236.92	916.56	237.89	916.63	239.74	916.76	240.87	916.83	245.87	917.13
246.57	917.17	247.27	917.22	251.53	917.49	252.67	917.57	255.04	917.75
256.56	917.84	258.32	918.02	258.74	918.06	258.88	918.08	260.61	918.26
265.91	918.82	267.89	919.03	270.25	919.3	271.72	919.45	272.42	919.51
272.89	919.53	274.94	919.62	276.88	919.75	279.16	919.9	285.54	920.63
287.95	920.93	288.19	920.96	292.99	921.8	294.93	922.13	295.07	922.15
301.64	923.67	301.65	923.67	303.7	924.22	306.16	924.94	306.62	925.06
307.51	925.34	307.84	925.45	308.41	925.61	309.36	925.95	313.12	927.16
317.33	928.8	317.89	929.08	322.54	930.29	322.8	930.36	323.01	930.39
325.17	930.63	325.24	930.64	325.4	930.65	330.56	931.13	331.17	931.28
332.38	931.46	333.59	931.62	336.18	932.01	340.06	932.47	340.65	932.54
340.95	932.58	341.12	932.59	341.43	932.62	344.95	932.97	346.65	933.11
349.42	933.4	349.49	933.41						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .179.69998 .03597.14999 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 79.6999897.14999 118.48 118.48 118.48 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 3655.76

INPUT

Description:

Station Elevation Data num= 203

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	939.45.3399963	939.52.6499939	939.61.070007	939.678.059998	940.89				
10.14999	941.210.95999	941.3312.85001	941.49	14.31	941.4815.80002	941.38			
16.14001	941.3317.54001	941.1919.11002	941.0421.32001	940.5522.76999	940.22				
24.67001	939.61	26.94	938.8827.95001	938.58	29.13	938.37	31.03	937.91	
32.51999	937.39	35.72	936.34	37.72	935.54	39.34	934.92	44.03	932.97
45.36002	932.42	46.09	932.0946.82001	931.79	49.31	930.73	52.13	929.47	
53.12	92954.73999	928.2756.32001	927.56	57.78	926.9160.82001	925.57			
62.28	924.9363.42999	924.4365.83002	923.3866.55002	923.0868.17001	922.33				

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71.97	920.58	72.69	920.2173.30002	919.91	77.87	918.0478.51999	917.82		
79.57001	917.5280.54001	917.3683.92001	916.5786.08002	916.0287.17999	915.92				
90.91	915.5393.07001	915.28	96.44	915.01	97.75	914.9299.79001	914.74		
102.52	914.61	105.45	914.38	107.66	914.16	110.23	913.89	110.77	913.84
111.39	913.79	114.22	913.58	120.26	913.19	120.7	913.17	120.76	913.17
123.12	913.09	124.61	913.07	126.69	913.03	129.04	913.01	130.13	913.06
133.49	913.25	133.81	913.26	135.63	913.33	137.77	913.4	146.26	914.03
147.36	911.51	148.34	911.64	150.46	911.6	153.29	911.4	154.31	911.6
155.33	911.8	158.32	913.32	161.77	913.04	163.36	913.19	163.9	913.24
164.16	913.26	165.86	913.51	167.2	913.53	170.64	913.67	172.53	913.62
174.18	913.57	177.54	913.54	179.5	913.39	181.89	913.21	185.91	913.17
186.14	913.17	186.45	913.16	187.33	913.11	192.65	912.92	195.03	912.73
198.6	912.81	201.01	912.97	202.52	913.05	204.31	913.15	204.67	913.16
207.41	913.18	208.88	913.17	209.83	913.15	211.42	913.15	215.31	913.29
215.6	913.3	217.93	913.4	218.98	913.47	221.16	913.54	224.16	913.98
224.44	914	225.13	914.09	226.42	914.06	228.92	913.91	232.08	913.54
236.04	913.48	236.9	913.48	238.31	913.61	240.85	913.88	241.5	913.94
242.32	913.99	243.4	913.98	244.31	914.05	246.38	914.22	247.59	914.3
248.98	914.39	249.32	914.4	249.48	914.41	258.66	914.85	258.71	914.85
258.74	914.86	258.95	914.86	263.95	914.95	265.13	914.97	266.28	914.99
267.35	914.99	268.32	915.03	271.61	915.15	274.11	915.32	275.58	915.43
278.99	915.63	280.74	915.73	281.86	915.79	282.65	915.82	284.78	915.94
286.02	916.02	290.29	916.28	291.24	916.34	296.45	916.78	296.84	916.82
298.22	917.02	300.49	917.35	303.77	917.86	304.68	917.99	309.19	918.62
309.52	918.67	309.68	918.7	310.14	918.77	314.14	919.34	315.49	919.51
317.91	919.91	319.45	920.17	324.02	921.07	329.12	922.18	329.16	922.18
329.24	922.2	331.34	922.76	331.81	922.85	333.61	923.15	335.45	923.44
336.06	923.54	337.3	923.74	340.51	924.15	342.49	924.44	343.72	924.72
346.04	925.26	349.09	926.17	349.3	926.23	349.9	926.36	353.57	927.13
354.2	927.26	355.34	927.47	357.52	927.94	358.16	928.08	358.92	928.21
360.85	928.55	366.36	929.48	367.73	929.67	369.62	929.87	371.26	930.02
375.14	930.41	376.92	930.56	378.65	930.73	379.47	930.79	382.11	930.9
385.12	931.17	386.91	931.38	387.16	931.42				

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 146.26 .035 158.32 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 146.26 158.32 127 133.61 140.51 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 3522.15

INPUT

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Description:

Station Elevation Data		num= 189							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	929.131.200012	928.87	1.26001	928.841.390015	928.815.080017	928.63			
5.540009	928.626.860016	928.557.940002	928.528.880005	928.5412.93002	928.56				
13.75	928.72	16.59	929.6518.14001	930.29	18.94	930.6222.71002	932.15		
23.19	932.3726.11002	933.4727.43002	933.9828.29001	934.330.45001	935.31				
31.78	935.9233.24002	936.5835.30002	937.4237.54001	938.0739.92001	938.81				
42.70001	939.243.10001	939.24	43.97	939.24	45.5	939.23	47.69	939.24	
48.24002	939.2249.73001	939.1949.90002	939.1852.80002	938.853.55002	938.7				
55.55002	938.33	55.97	938.2258.15002	937.61	59.56	937.22	60.91	936.73	
61.78	936.4363.89001	935.73	66.44	934.77	72.94	932.1	73.84	931.77	
75.85001	930.8976.76001	930.5377.11002	930.42	82.47	928.42	84.75	927.69		
87.24002	926.9188.18002	926.5992.32001	925.27	94.13	924.6895.21002	924.33			
98.53	923.12	100.89	922.22	103.38	921.11	103.68	920.99	104.24	920.73
110.15	917.8	111.47	917.11	114	916.05	116.81	914.69	118.27	914.43
119.21	914.32	119.88	914.24	121.43	914.04	124.3	913.66	126.7	913.43
128.08	913.33	131.19	913.19	132.7	913.17	134.43	913.1	137.27	912.97
138.09	912.93	138.28	912.92	138.41	912.91	139.13	912.88	146.91	912.44
147.98	912.42	150.69	912.33	152.59	912.28	152.78	912.27	152.99	912.29
153.77	912.29	154.22	912.28	154.94	912.26	155.89	912.2	159	912.16
159.03	912.16	163.12	912.15	163.87	912.13	167.62	912.14	170.09	912.13
171.47	912.18	172.14	912.19	173.9	912.23	178.86	912.38	180.74	912.41
189.32	912.41	193.27	912.48	194.29	912.5	194.58	912.5	195.07	912.47
195.99	912.45	199.23	912.49	200.31	912.49	204.3	912.59	207.19	912.75
207.68	912.76	207.86	912.78	208.68	912.82	216.3	912.9	211.01	912.74
215.13	913.25	216.6	910.93	217.15	910.62	218.38	909.52	220.35	909.69
223.26	909.82	226.45	910.65	227.19	911.75	227.54	912.27	227.93	912.86
231.75	912.69	232.99	912.84	234.73	913.04	235.86	912.99	236.69	912.94
237.34	912.92	240	912.81	244.37	912.58	244.73	912.7	245.68	912.85
248.15	912.93	249.86	913.01	253.43	912.89	253.55	912.88	257.28	912.88
261.73	912.91	262.93	912.93	265.05	913.03	266.12	913.07	267.2	913.14
268.3	913.21	272.28	913.43	272.63	913.45	272.74	913.45	274.28	913.53
275.76	913.66	276.55	913.7	277	913.74	284.66	914.45	287.37	914.74
289.3	915	295.17	915.96	297.84	916.34	299.07	916.58	300.95	916.86
302.68	917.12	306.22	917.87	306.92	918.02	309.05	918.53	310.93	918.96
313.07	920.01	316.47	921.7	319.93	923.37	322.11	924.18	326.23	924.49
329.13	924.58	331.3	924.7	332.88	924.82	333.93	924.9	334.94	924.96
335.61	924.98	340.97	925.15	345.15	924.79	348.57	924.99	350.87	924.17
351.86	924.49	354.54	925.98	355.21	926.33	356.26	926.94	357.84	927.55
357.87	927.56	357.9	927.57	362.8	929.16	363.98	929.54		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.05	215.13	.035	227.93	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	215.13	227.93		47.81	47.81	47.81	.1 .3

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CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 3474.34

INPUT

Description:

Station Elevation Data		num=		197							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	928.071.149994	927.835.029999	926.89	6.73999	927.14	10.34	927.26				
11.22	927.2514.10999	927.2515.20999	927.2315.94998	927.1816.57001	927.12						
18.41998	927.1820.14999	927.25	22.87	927.8	23.34	927.9	27.5	929			
29.16998	929.41	30.19	929.8332.41998	930.7532.54001	930.834.29999	931.55					
34.67999	931.7235.00998	931.8638.82001	933.5139.64999	933.8640.72998	934.34						
41.82001	934.8142.07001	934.91	42.97	935.16	46.03	936.02	46.66	936.16			
49.63998	936.5751.19998	936.85	53.44	936.85	55.28	936.76	60.94	936.06			
61.69	935.97	62.28	935.89	65.44	935.0167.25998	934.4168.54999	934.01				
71.10001	932.99	71.22	932.9571.32001	932.91	74.78	931.63	76.69	930.85			
79.29999	929.75	80.22	929.42	85.38	927.51	86.66	927.1288.10001	926.61			
89.17999	926.1890.04001	925.8291.04999	925.4296.72998	923.7496.91998	923.69						
98.63	923.11	98.75	923.07	102.72	921.44	104.39	920.72	105.2	920.37		
106.07	920.04	108.27	919.03	113.36	916.62	114	916.34	116.83	915.21		
117.75	914.88	118.02	914.8	119.95	914.45	124.88	913.57	125.86	913.45		
126.89	913.37	128.76	913.22	130.47	913.01	132.58	912.77	134.17	912.6		
134.54	912.58	138.21	912.37	139.94	912.22	140.4	912.18	143.38	912.01		
144.77	911.93	145.02	911.92	146.09	911.89	147.86	911.85	150.69	911.85		
151.55	911.86	152.74	911.83	156.11	911.88	157.48	911.87	160.28	911.88		
161.01	911.88	162.23	911.86	164.6	911.85	165.61	911.88	167.93	911.83		
170.87	911.87	173	911.98	175.09	911.98	177.41	911.95	177.76	911.94		
180.53	911.94	182.07	911.93	184.67	911.86	186.2	911.8	188.74	911.77		
190.25	911.73	193.16	911.59	194.84	911.69	195.45	911.75	197.69	911.85		
198.66	911.88	199.55	911.9	200.7	911.91	204.4	912	205.4	912.05		
205.88	912.02	208.85	912.1	209.03	912.11	209.11	912.11	212.86	912.17		
214.7	912.21	215.87	912.25	217.2	912.41	217.4	912.44	217.63	912.45		
220.53	912.68	224.12	912.34	225.5	909.78	227.87	909.24	232.66	909.55		
233.43	910.51	235.26	911.18	237.21	911.97	238.46	912.24	239.72	912.51		
241.05	912.58	241.85	912.56	246.75	912.45	250.8	912.39	251.04	912.38		
251.13	912.38	251.25	912.39	255.81	912.42	256.43	912.44	259.64	912.51		
262.09	912.54	262.87	912.58	268.12	912.59	270.41	912.61	271.63	912.61		
273.45	912.62	275.4	912.66	276.59	912.78	281.57	913.27	281.72	913.28		
281.86	913.3	283.53	913.6	287.16	914.99	290.14	916.98	290.3	917.07		
290.68	917.2	296.48	918.31	297.41	918.37	298.11	918.4	299.39	918.39		
303.31	918.47	303.56	918.47	304.2	918.48	306.8	918.5	307.65	918.51		
311.58	918.58	314.15	918.59	315.47	918.58	315.77	918.57	315.87	918.57		
317.36	918.55	319.03	918.51	321.62	917.98	324.4	917.51	325.23	917.11		
326.46	917.15	328.29	916.53	332.35	916.84	334.71	918.34	335.37	918.75		

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336.47	919.45	338.47	920.45	342.42	922.6	342.65	922.74	345.74	924.2
345.87	924.26	345.88	924.27	347.65	924.84	349.99	925.99	354.9	928.4
355.47	928.66	358.15	929.89						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 224.12 .035 239.72 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 224.12 239.72 49.33 54.86 58.55 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 3419.48

INPUT

Description:

Station Elevation Data num= 190

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	926.75	1.51001	926.072	589996	925.573	170013	925.443	440002	925.46
9.670013	925.399	709991	925.39	13	925.4715	32001	925.3816	45999	925.33
16.80002	925.3318	52002	925.35	18.81	925.3621	17999	925.4424	67001	925.57
29.92999	926.33	31.84	926.6932	20001	926.7835	54001	927.6736	64999	927.93
37.17001	928.1	37.5	928.2340	24002	929.3240	98001	929.61	41.44	929.79
44.38	930.9545	80002	931.6	47.72	932.2554	20999	933.4155	80002	933.74
56.61002	933.8958	02002	934.0558	73001	934.12	62.06	933.7263	26001	933.69
64.42999	933.4	69.09	932.1469	39001	932	73.12	930.3874	01001	930
76.20001	928.9776	67001	928.7677	23001	928.5282	89999	926.19	84.59	925.48
85.13	925.2988	45001	924.23	89.59	923.86	91.38	923.0991	83002	922.95
95.38	921.8497	24002	921.29	98.16	921.01	99.16	920.71	100.98	919.99
106.06	918	108.89	916.51	109.19	916.35	109.62	916.19	112.13	915.19
114.55	914.51	116.66	914.1	116.87	914.07	118.68	913.91	123.98	913.23
124.08	913.22	125.64	913.07	126.29	913.01	128.86	912.71	134.03	912.35
135.33	912.34	136.88	912.3	137.08	912.3	141.24	912.25	141.94	912.24
145.39	912.18	146	912.15	149.08	911.92	151.05	911.82	154.24	911.68
159.36	911.36	160.17	911.31	161.22	911.29	162.55	911.26	163.48	911.26
164.87	911.17	166.33	911.03	167.51	910.97	170.69	910.82	174.11	910.77
174.84	910.74	175.75	910.8	177.16	910.76	177.8	910.84	180.06	911.09
181.65	911.3	184.3	911.66	190.62	911.66	197	911.21	198.59	909.85
201.03	908.92	202.57	908.61	206.13	908.81	208.44	909.01	209.66	911.74
214.03	911.33	215.59	911.84	217.24	911.79	217.81	911.78	218.29	911.77
219.72	911.76	220.46	911.73	223.65	911.67	225.62	911.72	231.11	911.76
232.32	911.8	233.09	911.79	236.88	911.74	238.8	911.71	240.25	911.68
243.05	911.66	243.18	911.67	244.52	911.72	251.37	912.01	251.73	912.1
254.54	912.67	255.8	913.08	257.36	913.61	261.49	914.41	263.76	914.86
265.46	914.95	267.36	915.03	268.34	915.04	270.38	915.07	274.43	915.15

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275.51	915.17	276.62	915.18	277.63	915.17	279.12	915.2	282.31	915.15
282.88	915.15	284.91	915.17	285.06	915.17	285.53	915.16	287.87	915.12
288.79	915.09	290.24	915.06	290.92	915.04	291.87	914.83	293.41	914.53
296.82	914.07	301.14	913.05	304.03	912.91	309.3	912.59	311.32	912.44
315.49	912.25	316.52	912.33	318.17	912.5	321.02	912.91	326.36	914.24
327.88	914.67	330.01	915.49	330.11	915.54	330.27	915.6	331.98	916.45
334.63	917.78	335.74	918.26	337.51	918.96	338.06	919.18	339.59	919.83
341.75	920.97	343.96	922.06	344.62	922.26	345.92	922.56	348.66	923.47
350.01	923.85	351.04	924.07	352.66	924.53	356.64	925.53	357.54	925.81
358.79	926.13	362.24	926.79	362.49	926.82	363.24	926.96	368.14	927.9
370.16	928.27	371.62	928.57	373.65	929.06	374.44	929.28	375.1	929.51

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	197	.035	209.66	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	197	209.66		139 112.19	71.7	.1	.3
Ineffective Flow			num=	1			
Sta L	Sta R	Elev	Permanent				
270.38	375.1	920	F				

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 3307.29

INPUT

Description:

Station Elevation Data num= 190

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	931.211.929993	930.852.029999	930.842.160004	930.825.309998	929.9				
10.60001	927.8712.54001	927.05 13.94	926.4814.85999	926.3316.26999	926.27				
20.44998	925.95 20.75	925.9323.51001	925.5424.26001	925.4326.88998	925.01				
26.98999	92529.88998	924.56 30.31	924.4930.57001	924.44 34.16	923.91				
37.51001	923.41 40.81	922.9942.94998	922.7344.07999	922.644.85001	922.49				
48.06	922.0850.10001	921.7551.94998	921.5153.60999	921.2853.98999	921.18				
60.44998	918.3361.35999	917.8863.35999	916.61 64.22	916.06 67.87	914.1				
68.79999	913.75 69.31	913.53 70.22	913.26 72.13	913.2474.04999	913.35				
76.01001	913.4276.70999	913.7777.26999	913.982.94998	914.2984.57999	914.19				
84.91998	914.1686.07001	914.1387.73999	914.0789.35001	914.0190.07999	913.95				
91.13	913.8798.01001	913.71 100.16	913.53 103.09	913.66 104.68	913.71				
105.15	913.68 108.5	913.56 109.37	913.48 111.24	913.25 112.36	911.72				
114.65	911.41 116.11	911.21 117.56	911.02 119.73	910.72 123.14	910.26				
124.22	910.11 125.54	909.93 126.41	909.82 127.37	909.69 128.58	909.57				
133.51	909.1 139.29	908.54 141.15	908.36 142.46	908.29 143	908.26				
145.88	908.11 146.71	908.06 149.03	907.94 154.83	907.95 162.37	907.96				

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162.99	907.96	165.34	907.97	169.53	907.97	171.03	908.06	171.91	908.11
172.74	908.16	173.55	908.2	174.61	908.27	178.04	908.69	179.13	908.83
180.72	909.03	183.64	909.39	184.91	909.52	186.59	909.69	188.2	909.86
188.92	909.93	189.57	910	195.5	910.6	197.46	912.04	199.75	912.37
204	912.38	210.84	913.3	213.71	913.62	214.74	913.88	215.03	913.93
220.13	914.1	220.86	914.2	221.1	914.1	224.68	913.96	225.7	913.69
226.79	913.71	228.4	913.79	229.57	913.84	231.57	913.91	234.5	914.02
236.63	914.13	237.72	914.18	242.7	914.34	243	914.35	243.63	914.36
243.8	914.35	245.63	914.36	246.66	914.33	247.6	914.36	248.8	914.39
250.22	914.41	251.26	914.41	253.7	914.47	253.77	914.47	253.92	914.48
256.88	914.6	260.16	914.65	263.47	914.69	265.85	914.79	271.15	914.91
271.22	914.91	275.52	914.78	276.28	914.75	276.63	914.75	277.93	914.74
278.56	914.75	278.95	914.73	282.95	914.68	284.37	914.67	284.94	914.59
287.42	914.25	289.86	914.17	293.85	913.16	295.76	912.76	298.31	912.67
298.67	912.68	299.52	912.62	303.24	912.34	304.86	912.24	305.92	912.18
307.58	912.12	309.19	912	309.44	912	312.42	912.06	313.93	912.04
314.23	912.04	315.03	912.09	316.72	912.24	320.7	912.62	325.01	913.27
327.14	913.19	327.51	913.28	329.18	913.51	330.14	913.97	332.43	914.91
335.76	916.61	336.98	917.25	338.04	917.67	340.64	918.43	341.79	918.8
342.61	919.02	344.34	919.99	347.38	921.42	349.18	922.25	350.09	922.59
351.42	923.1	356.85	924.48	359.56	925.6	361.69	926.22	363.7	926.79
365.74	927.17	367.1	927.49	368.14	927.83	368.42	927.95	371.62	929

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 123.14 .035 195.5 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 123.14 195.5 33.31 33.31 33.31 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 0 126 916 F  
 186 371.62 916 F

BRIDGE

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 3301.29

INPUT

Description: Bridge D  
 Distance from Upstream XS = 6  
 Deck/Roadway Width = 14  
 Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num= 6  
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord



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100.99	914	905	130.99	916.6	905	130.99	916.6	914.1
180.99	916.6	914.1	180.99	916.6	905	210.99	914	905

Upstream Bridge Cross Section Data

Station Elevation Data num= 190									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	931.211.929993	930.852.029999	930.842.160004	930.825.309998	929.9				
10.60001	927.8712.54001	927.05	13.94	926.4814.85999	926.3316.26999	926.27			
20.44998	925.95	20.75	925.9323.51001	925.5424.26001	925.4326.88998	925.01			
26.98999	92529.88998	924.56	30.31	924.4930.57001	924.44	34.16	923.91		
37.51001	923.41	40.81	922.9942.94998	922.7344.07999	922.644.85001	922.49			
48.06	922.0850.10001	921.7551.94998	921.5153.60999	921.2853.98999	921.18				
60.44998	918.3361.35999	917.8863.35999	916.61	64.22	916.06	67.87	914.1		
68.79999	913.75	69.31	913.53	70.22	913.26	72.13	913.35		
76.01001	913.4276.70999	913.7777.26999	913.982.94998	914.2984.57999	914.19				
84.91998	914.1686.07001	914.1387.73999	914.0789.35001	914.0190.07999	913.95				
91.13	913.8798.01001	913.71	100.16	913.53	103.09	913.66	104.68	913.71	
105.15	913.68	108.5	913.56	109.37	913.48	111.24	913.25	112.36	911.72
114.65	911.41	116.11	911.21	117.56	911.02	119.73	910.72	123.14	910.26
124.22	910.11	125.54	909.93	126.41	909.82	127.37	909.69	128.58	909.57
133.51	909.1	139.29	908.54	141.15	908.36	142.46	908.29	143	908.26
145.88	908.11	146.71	908.06	149.03	907.94	154.83	907.95	162.37	907.96
162.99	907.96	165.34	907.97	169.53	907.97	171.03	908.06	171.91	908.11
172.74	908.16	173.55	908.2	174.61	908.27	178.04	908.69	179.13	908.83
180.72	909.03	183.64	909.39	184.91	909.52	186.59	909.69	188.2	909.86
188.92	909.93	189.57	910	195.5	910.6	197.46	912.04	199.75	912.37
204	912.38	210.84	913.3	213.71	913.62	214.74	913.88	215.03	913.93
220.13	914.1	220.86	914.2	221.1	914.1	224.68	913.96	225.7	913.69
226.79	913.71	228.4	913.79	229.57	913.84	231.57	913.91	234.5	914.02
236.63	914.13	237.72	914.18	242.7	914.34	243	914.35	243.63	914.36
243.8	914.35	245.63	914.36	246.66	914.33	247.6	914.36	248.8	914.39
250.22	914.41	251.26	914.41	253.7	914.47	253.77	914.47	253.92	914.48
256.88	914.6	260.16	914.65	263.47	914.69	265.85	914.79	271.15	914.91
271.22	914.91	275.52	914.78	276.28	914.75	276.63	914.75	277.93	914.74
278.56	914.75	278.95	914.73	282.95	914.68	284.37	914.67	284.94	914.59
287.42	914.25	289.86	914.17	293.85	913.16	295.76	912.76	298.31	912.67
298.67	912.68	299.52	912.62	303.24	912.34	304.86	912.24	305.92	912.18
307.58	912.12	309.19	912	309.44	912	312.42	912.06	313.93	912.04
314.23	912.04	315.03	912.09	316.72	912.24	320.7	912.62	325.01	913.27
327.14	913.19	327.51	913.28	329.18	913.51	330.14	913.97	332.43	914.91
335.76	916.61	336.98	917.25	338.04	917.67	340.64	918.43	341.79	918.8
342.61	919.02	344.34	919.99	347.38	921.42	349.18	922.25	350.09	922.59
351.42	923.1	356.85	924.48	359.56	925.6	361.69	926.22	363.7	926.79
365.74	927.17	367.1	927.49	368.14	927.83	368.42	927.95	371.62	929

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val
0	.05	123.14	.035	195.5	.05

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Bank Sta: Left Right Coeff Contr. Expan.  
 123.14 195.5 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 0 126 916 F  
 186 371.62 916 F

Downstream Deck/Roadway Coordinates  
 num= 6

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
123.46		913		905	153.46		916.6		905	153.46		916.6		914.1
203.46		916.6		914.1	203.46		916.6		905	233.46		913		905

Downstream Bridge Cross Section Data

Station Elevation Data num= 215

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	936.863	639984	936.014	339996	935.887	179993	934.938	869995	934.35
8.98999	934.31	11.16	933.67	12.34	933.32	12.76999	933.18	15.91	932.13
17.00998	931.76	17.94998	931.38	18.78998	931.12	21.03	930.45	21.81998	930.2
22.91	929.8	26.75	928.38	27.31	928.21	27.84	928.06	33.75998	926.38
34.19	926.21	34.81998	925.96	39.44998	924.28	39.89999	924.12	39.97	924.09
41.62	923.37	43.85001	921.85	44.17999	921.65	44.66	921.36	48.25	919.39
51.56	917.55	51.72998	917.41	53.95999	916.84	55.69998	916.4	58.38	916.63
61.44	916.73	62.56	916.74	63.81998	916.75	65.85001	916.78	67	916.79
67.59	916.78	69.12	916.73	70.94998	916.75	71.53	916.76	73.28998	916.75
75.25	916.72	75.45999	916.71	77.20999	916.64	77.97998	916.61	82.87	916.48
83.41	916.45	85.25998	916.36	85.41	916.36	85.66	916.35	93.72998	915.92
94.44	915.87	95.50998	915.84	97.32999	915.66	100.31	915.39	102.6	915.23
104.34	915.2	106.7	915.13	107.17	915.08	107.81	915.01	110.9	914.81
112.48	914.58	117.18	914.02	117.24	914.02	120.51	913.42	122.37	913.09
124.29	912.79	126.11	912.54	127.38	912.37	127.92	912.29	128.29	912.25
129.8	912.11	135.37	911.49	136.45	911.36	139.02	911.03	144.79	910.27
145.76	910.14	147.71	909.89	149.03	909.71	151.38	909.4	151.85	909.36
153.91	909.19	154.98	909.1	156.41	908.98	157.74	908.87	160.3	908.65
162.33	908.48	163.86	908.37	164.66	908.32	165.61	908.26	166.29	908.22
168.95	908.05	172.29	907.84	173.79	907.85	175.66	907.85	180.03	907.87
182.42	907.87	183.3	907.88	184.53	907.88	186.01	907.89	188.42	908.03
189.84	908.12	192.05	908.26	193.67	908.36	195.17	908.53	196.65	908.69
199.19	908.97	201.7	909.25	202.9	909.39	203.66	909.47	204.74	909.58
206.89	909.81	209.41	910.07	210.77	910.22	211.44	910.29	212.05	910.35
213.39	910.49	216.61	910.83	217.89	910.96	219.86	911.95	221.05	912.07
224.84	912.12	226.82	912.47	228.6	912.72	229.2	912.85	231.26	912.84
234.27	912.79	238.9	913.26	239.36	913.32	240.12	913.36	242.57	913.38
247.5	913.94	247.56	913.95	250.56	913.95	251.7	913.92	254.41	913.92
255.52	913.95	258.71	913.99	259.23	914.01	259.55	914.02	260.43	913.99
263.17	914.14	263.82	914.17	264.03	914.16	264.38	914.19	264.75	914.23
267.33	914.35	270.57	914.43	270.7	914.44	270.9	914.45	273.78	914.45

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276.62	914.51	278.02	914.52	279.04	914.49	280.87	914.43	281.61	914.41
283.58	914.36	283.68	914.36	287.36	914.03	288.87	913.98	290.21	913.8
291.53	913.6	294.1	913.28	296.18	912.97	296.32	912.96	298.89	912.75
301.88	912.49	302.29	912.46	302.5	912.44	305.59	912.02	311.97	911.79
312.16	911.78	312.32	911.77	313.94	911.81	315.84	911.86	316.56	911.9
319.69	912.04	319.98	912.04	320.69	912.05	325.08	912.28	329.7	912.68
330.63	912.72	332.44	912.94	332.89	912.97	333.39	913.05	337.35	913.56
339.02	913.87	340.12	914.06	340.78	914.25	341.49	914.49	343.2	914.83
348.06	915.86	348.93	916.16	349.09	916.21	349.8	916.35	351.37	916.77
352.72	917.37	357.87	919.7	358.39	919.87	358.74	920	360.2	920.62
360.99	920.95	362.75	921.5	366.7	922.76	367.79	923.09	369.29	923.33
370.47	924.05	371.73	924.72	375.81	926.01	376.57	926.3	378.46	927.28

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 147.71 .035 206.89 .05

Bank Sta: Left Right Coeff Contr. Expan.  
 147.71 206.89 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 0 148 916 F  
 208 378.46 916 F

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: Align (1)

RS: 3273.98

INPUT

Description:

Station Elevation Data

num= 215

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	936.863.639984	936.014.339996	935.887.179993	934.938.869995	934.35				
8.98999	934.31 11.16	933.67 12.34	933.3212.76999	933.18 15.91	932.13				
17.00998	931.7617.94998	931.3818.78998	931.12 21.03	930.4521.81998	930.2				
22.91	929.8 26.75	928.38 27.31	928.21 27.84	928.0633.75998	926.38				
34.19	926.2134.81998	925.9639.44998	924.2839.89999	924.12 39.97	924.09				
41.62	923.3743.85001	921.8544.17999	921.65 44.66	921.36 48.25	919.39				
51.56	917.551.72998	917.4153.95999	916.8455.69998	916.4 58.38	916.63				
61.44	916.73 62.56	916.7463.81998	916.7565.85001	916.78 67	916.79				
67.59	916.78 69.12	916.7370.94998	916.75 71.53	916.7673.28998	916.75				
75.25	916.7275.45999	916.7177.20999	916.6477.97998	916.61 82.87	916.48				
83.41	916.4585.25998	916.36 85.41	916.36 85.66	916.3593.72998	915.92				
94.44	915.8795.50998	915.8497.32999	915.66 100.31	915.39 102.6	915.23				
104.34	915.2 106.7	915.13 107.17	915.08 107.81	915.01 110.9	914.81				
112.48	914.58 117.18	914.02 117.24	914.02 120.51	913.42 122.37	913.09				
124.29	912.79 126.11	912.54 127.38	912.37 127.92	912.29 128.29	912.25				
129.8	912.11 135.37	911.49 136.45	911.36 139.02	911.03 144.79	910.27				
145.76	910.14 147.71	909.89 149.03	909.71 151.38	909.4 151.85	909.36				
153.91	909.19 154.98	909.1 156.41	908.98 157.74	908.87 160.3	908.65				
162.33	908.48 163.86	908.37 164.66	908.32 165.61	908.26 166.29	908.22				
168.95	908.05 172.29	907.84 173.79	907.85 175.66	907.85 180.03	907.87				
182.42	907.87 183.3	907.88 184.53	907.88 186.01	907.89 188.42	908.03				
189.84	908.12 192.05	908.26 193.67	908.36 195.17	908.53 196.65	908.69				
199.19	908.97 201.7	909.25 202.9	909.39 203.66	909.47 204.74	909.58				
206.89	909.81 209.41	910.07 210.77	910.22 211.44	910.29 212.05	910.35				
213.39	910.49 216.61	910.83 217.89	910.96 219.86	911.95 221.05	912.07				
224.84	912.12 226.82	912.47 228.6	912.72 229.2	912.85 231.26	912.84				
234.27	912.79 238.9	913.26 239.36	913.32 240.12	913.36 242.57	913.38				
247.5	913.94 247.56	913.95 250.56	913.95 251.7	913.92 254.41	913.92				
255.52	913.95 258.71	913.99 259.23	914.01 259.55	914.02 260.43	913.99				
263.17	914.14 263.82	914.17 264.03	914.16 264.38	914.19 264.75	914.23				
267.33	914.35 270.57	914.43 270.7	914.44 270.9	914.45 273.78	914.45				
276.62	914.51 278.02	914.52 279.04	914.49 280.87	914.43 281.61	914.41				
283.58	914.36 283.68	914.36 287.36	914.03 288.87	913.98 290.21	913.8				
291.53	913.6 294.1	913.28 296.18	912.97 296.32	912.96 298.89	912.75				
301.88	912.49 302.29	912.46 302.5	912.44 305.59	912.02 311.97	911.79				
312.16	911.78 312.32	911.77 313.94	911.81 315.84	911.86 316.56	911.9				
319.69	912.04 319.98	912.04 320.69	912.05 325.08	912.28 329.7	912.68				
330.63	912.72 332.44	912.94 332.89	912.97 333.39	913.05 337.35	913.56				

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339.02	913.87	340.12	914.06	340.78	914.25	341.49	914.49	343.2	914.83
348.06	915.86	348.93	916.16	349.09	916.21	349.8	916.35	351.37	916.77
352.72	917.37	357.87	919.7	358.39	919.87	358.74	920	360.2	920.62
360.99	920.95	362.75	921.5	366.7	922.76	367.79	923.09	369.29	923.33
370.47	924.05	371.73	924.72	375.81	926.01	376.57	926.3	378.46	927.28

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	147.71	.035	206.89	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	147.71	206.89		56.05	53.58		.3	.5
Ineffective Flow			num=	2				
Sta L	Sta R	Elev	Permanent					
0	148	916	F					
208	378.46	916	F					

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 3220.4

INPUT

Description:

Station Elevation Data num= 183

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	929.5	.230011	929.432	.110016	928.914	.540009	928.145	.480011	927.85
6.589996	927.587	.059998	927.447	.990021	927.0611	.860002	925.4713	.270002	924.96
13.91	924.7	15.66	924.0816	.260001	923.8518	.960002	922.1419	.710002	921.76
20.74002	921.1222	.120003	920.322	.480001	920.09	22.75	919.9325	.460002	918.47
26.49002	917.87	28.06	917.2430	.640001	916.22	32.91	916.46	34.31	916.73
35.25	916.8	36.25	916.83	39.34	916.8340	.550002	916.8242	.210002	916.81
43.23001	916.8148	.150002	916.83	48.34	916.8350	.020002	916.8850	.950001	916.88
53.92001	916.854	.350001	916.8	55.88	916.8156	.450001	916.8259	.740002	916.77
62.93002	916.7365	.260001	916.71	65.88	916.766	.460002	916.68	70.84	915.97
71.28	915.92	72.28	915.7274	.200001	915.3277	.860002	914.61	78.41	914.45
80.46001	913.9682	.350001	913.3983	.730001	913.1885	.030001	912.9988	.680001	912.25
90.83002	911.81	92.16	911.5496	.690002	910.7399	.810001	910.26	101.65	910.13
102.96	910.07	103.64	910.03	104.86	909.94	106.34	909.88	109.82	909.72
111.43	909.68	113.33	909.66	114.85	909.73	117.13	909.76	120.43	909.8
123.19	909.83	124.68	909.84	125.11	909.84	125.59	909.85	126.16	909.85
129.92	909.92	133.42	909.99	134.41	909.98	135.98	909.94	136.5	909.93
137.76	909.92	139.23	909.93	141.2	909.86	143.75	909.89	144.52	909.88
148.81	909.88	149.97	909.85	155.43	909.21	156.35	909.03	159.4	908.9
160.6	907.12	163.46	906.87	165.35	906.73	167.69	907.2	169.04	908.06
170.57	908.35	171.24	908.76	172.05	909.25	173.54	910.14	177.74	910.18
178.11	910.2	181.16	909.96	184.01	909.89	184.25	909.88	184.69	909.88

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191.6	909.78	193.7	909.8	199.25	910.24	201.01	910.42	202.97	910.65
204.25	910.81	204.66	910.87	205.28	910.93	207.28	911.07	209.45	911.21
210.52	911.32	212.31	911.55	212.99	911.6	213.79	911.59	214.49	911.55
215.06	911.55	218.79	911.26	219.32	911.22	219.58	911.2	221.89	911.18
222.78	911.21	225.79	911.24	226.31	911.25	226.72	911.25	229.85	911.27
232.89	911.38	234.06	911.41	235.68	911.45	238.67	911.54	241.11	911.69
242.22	911.78	245.86	912.07	246.1	912.09	248.52	912.32	250.17	912.51
252.15	912.72	254.98	913.16	256.51	913.36	257.21	913.41	261.53	914.07
261.64	914.08	261.71	914.1	263.5	914.45	266.26	915.01	271.57	916.28
271.6	916.3	275.81	917.23	276.51	917.39	278.04	917.8	279.32	918.12
280.31	918.37	284.01	919.15	284.4	919.2	285.81	919.41	291.11	920.62
291.31	920.68	291.95	920.73	294.26	921.14	299.66	922.01	300.41	922.16
301.58	922.26	302.76	922.4	305.95	922.92	306.27	922.98	306.32	922.99
311.7	924.44	311.79	924.46	315.05	925.74	316	926.06	319.63	927.59
320.07	927.77	320.47	927.82	322.38	928.1	326.33	928.35	326.56	928.33
326.89	928.39	330.05	928.67	331.98	928.93				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	159.4	.035	171.24	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	159.4	171.24		69.73	72.72		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 3147.68

INPUT

Description:

Station Elevation Data num= 170

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	926.61	610016	926.01	11.720001	925.97	2.619995	925.71	6.429993	924.64
6.640015	924.56	7.529999	924.3	10.03	923.62	12.44	922.9	13.84	922.61
14.34	922.51	14.98999	922.15	18.64001	921.05	19.08002	920.95	19.69	920.87
21.14999	920.66	21.79001	920.52	23.89001	919.88	26.36002	919.33	27.5	919.02
31.44	918.08	32.19	918.2	33.13	918.4	33.81	918.52	34.72	918.62
38.28	918.81	39.82001	918.89	40.17	918.85	42.31	918.84	44.56	918.96
47.76001	918.86	48.94	918.85	49.96001	918.86	53.24001	918.97	54.31	918.96
58.06	918.96	58.35001	918.94	59.82001	918.68	61.16	918.42	61.61	918.35
62.18001	918.26	63.07001	917.89	65.77	916.92	70.18001	915.35	74.81	913.93
75.94	913.58	76.10001	912.91	79.34	912.87	79.64	912.82	81.78	912.46
82.36	912.36	82.5	912.33	86.32001	911.95	89.99001	911.57	90.04001	911.56
90.29001	911.55	94.02	911.17	94.8	911.19	94.82001	911.09	95.85001	910.99
99.29001	910.69	100.92	910.6	102.37	910.49	103.3	910.43	107.11	910.2
107.22	910.2	110.17	910.31	110.74	910.31	112.57	910.28	116.3	910.21

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117.33	910.22	119.2	910.14	122.56	910.13	124.04	910.09	125.37	910.05
127.6	909.9	130.39	909.72	130.76	909.7	131.22	909.67	134.4	909.63
135.51	909.7	136.26	909.67	138.91	909.63	139.3	909.62	144.3	909.57
145.73	909.74	147.81	909.76	149.01	909.82	152.95	909.98	153.8	909.96
155.8	909.97	155.93	909.97	156.23	909.94	158.57	909.71	159.66	909.63
160.06	909.61	160.42	909.59	165.54	909.31	167.41	909.28	169.21	909.2
169.93	909.21	173.06	908.92	174.58	908.84	180.08	908.6	181.82	908.53
183.61	908.74	186.1	908.93	188.69	908.97	189.69	909.04	192.18	909.07
193.54	909.05	195.7	909.05	196.6	909.03	198.74	908.85	198.88	908.85
199.1	908.83	200.01	908.84	201.66	908.19	203.08	908	204.51	907.81
205.41	907.61	205.99	907.49	206.99	907.27	209.48	906.73	210.19	906.6
210.9	906.48	212.2	906.49	213.5	906.5	217.66	906.25	217.94	907.03
218.24	908.46	220.56	908.4	222.91	908.84	223.76	908.88	225.08	909.19
227.17	909.58	228.42	909.63	229.08	909.66	233.61	910.29	233.69	910.31
234.96	910.55	236.48	910.82	237.14	911.01	240.65	912.16	245.95	913.86
246.16	913.92	247.95	914.51	248.24	914.6	250.99	915.56	252.66	916.03
255.31	916.97	256.04	917.35	257.28	917.79	258.76	918.33	262.29	918.9
262.84	919.01	265.86	919.46	266.71	919.55	274.36	921.84	274.79	921.93
274.94	922.01	277.36	923.03	277.83	923.2	279.98	924.11	282.82	925.43
282.97	925.49	283.19	925.59	289.57	928.53	292.67	929.91	296.16	931.92

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 201.66 .035 218.24 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 201.66 218.24 50.48 50.48 50.48 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 3097.2

INPUT

Description:

Station Elevation Data num= 151

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	931.671	029999	931.594	659973	931.14	4.98999	931.116	019989	930.89
7.589996	930.561	053998	929.611	400998	928.261	4.73999	927.871	739998	926.05
19.19998	924.922	082999	923.762	149998	923.562	1.33998	923.462	217999	923.14
23.30998	922.542	467999	921.752	479999	921.692	7.71999	920.373	330998	919.43
33.32999	919.433	334999	919.423	335999	919.433	4.41998	919.513	570999	919.55
37.65999	919.613	847998	919.653	936998	919.694	0.46999	919.714	260999	919.75
45.24998	919.774	557999	919.784	653998	919.784	9.77998	919.775	129999	919.78
51.44998	919.785	464998	919.665	655998	919.595	7.74998	919.296	575998	916.86
70.32999	915.177	302998	913.667	374998	914.187	7.84999	913.098	020999	912.27
82.59999	911.748	68999	910.778	701999	910.758	8.14998	910.629	082999	910.43

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91.22998	910.4191	1.85999	910.3695	5.44998	910.1199	6.65999	909.96	102.73	909.83
104.81	909.63	105.55	909.59	106.67	909.6	113.82	909.62	114.22	909.64
116.13	909.62	118	909.62	120.6	909.64	120.9	909.64	124.87	909.8
130.63	909.8	131.67	909.73	133.18	909.66	136.81	909.25	137.14	909.24
137.48	909.23	141.43	909.11	144.39	909.15	146.16	909.25	147.26	909.27
148.08	909.26	148.35	909.26	151.17	909.31	152.84	909.34	155.28	909.35
156.07	909.31	158.82	909.37	161.62	909.35	164.2	909.26	167.32	909.26
169.66	909.24	170.85	909.22	171.93	909.19	173.16	909.14	173.47	909.13
175.87	909.08	179.3	908.59	181.42	906.46	182.57	906.17	186.02	906.36
188.93	906.6	194.05	906.18	194.68	906.62	195.31	907.8	200.87	910.15
201.54	910.35	203.9	911.61	204.83	912.05	207.02	913.39	207.04	913.4
207.06	913.41	210.51	915.32	210.99	915.47	212.19	915.9	212.27	915.61
212.7	915.73	213.36	915.82	213.88	916.22	214.28	916.35	215.44	916.66
217.53	917	219.89	917.61	221.66	917.93	221.91	917.99	224.19	918.71
224.64	918.78	226.63	918.96	227.66	919.12	227.75	919.15	227.9	919.2
231.61	920.37	232.21	920.48	233.75	920.85	234	920.93	235.69	921.54
237.68	922.15	238.99	922.56	240.5	922.9	241.8	923.26	245.83	924.14
245.98	924.16	249.25	924.63	250.62	924.78	251.72	924.95	253.61	925.35
256.46	925.92	258.23	926.39	259.89	926.84	260.46	927.02	261.62	927.36
262	927.48	262.38	927.58	265.1	928.4	265.89	928.79	266.7	929.1
267.61	929.41								

Manning's n Values num= 3

Sta	n	Val	Sta	n	Val	Sta	n	Val
0	.05	179.3	.035	195.31	.1			

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	179.3	195.31		107.52	106.1	104.95		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 2991.1

INPUT

Description:

Station Elevation Data num= 222

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	927.96	.769989	927.813	7.09991	927.116	0.19989	926.597	13.0005	926.37
9.720001	925.2611	11.39999	924.5412	23.0001	924	12.66	923.7313	13.51001	923.32
15.23999	922.4516	16.45999	921.7916	16.76999	921.6317	17.45001	921.3619	19.51001	920.58
20.54001	920.6621	21.26999	920.721	21.86002	920.7522	22.33002	920.8	25.84	921.2
27.35001	921.3327	27.79999	921.3628	27.73999	921.38	30.13	921.4130	28.85001	921.4
32.26001	921.41	33.41	921.433	33.79999	921.3935	33.5001	921.436	32.20999	921.41
37.39001	921.4339	37.01999	921.4341	37.29001	921.31	42.72	921.24	43.94	921.15
45.26999	921.146	46.67001	920.8847	47.93001	920.34	48.87	919.88	49.36	919.65
51.15001	918.6352	52.40001	918.0954	53.32001	917.17	55.92	916.6	59.61	915.39



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60.15001	915.22	60.56	915.08	62.17	914.6562.65001	914.53	63.05	914.44	
64.13	914.21	65.38	914	67.11	913.68	67.45	913.62	67.67	913.59
70.75	913.1	72.09	912.89	73.7	912.59	74.53	912.42	76.16	912.18
76.21001	912.1776.49001	912.12	78.48	911.76	78.72	911.7279.71001	911.54		
80.58	911.39	82.37	911.16	86.22	910.59	87.09	910.588.15001	910.36	
88.87	910.28	89.44	910.2393.60001	909.87	94.88	909.82	95.89	909.78	
97.02	909.72	97.53	909.7198.24001	909.6899.29001	909.68	103.43	909.64		
104.51	909.61	105.62	909.59	107.73	909.59	108.06	909.57	110.09	909.49
113.61	909.41	113.75	909.4	113.89	909.4	115.83	909.29	115.9	909.29
116.17	909.27	119.71	909.05	120.94	909.03	122.22	909.02	122.78	909.02
124.06	909	126.15	909.02	126.49	909.02	126.89	909.04	128.56	909.05
130.26	909.1	132.07	909.14	134.95	909.25	135.78	909.28	136.1	909.29
136.46	909.3	138.25	909.35	138.73	909.36	140.44	909.34	142.05	909.32
143.82	909.3	144.23	909.29	145.81	909.13	149.31	908.51	151.38	907.95
152.13	907	152.88	906.04	155.08	905.16	157.24	905.04	158.86	905.19
160.47	905.34	165.06	905.43	165.21	906.27	167.94	907.77	169.62	907.75
171.65	908.13	173.35	908.1	173.43	908.11	174.15	908.11	175.53	908.09
178.2	907.88	179.3	907.87	180.62	907.9	180.92	907.92	182.45	907.99
183.69	908.16	185.8	908.56	186.63	908.67	186.96	908.71	188.76	908.93
189.9	909.07	191.35	909.24	192.81	909.43	194.07	909.62	194.97	909.68
196.45	909.74	198.57	909.81	199.99	909.82	202.82	909.99	203.19	909.99
204.16	910.1	207.44	911.11	209.37	911.74	210.03	911.92	210.31	911.93
213.98	913.13	214.05	913.15	214.09	913.17	215.32	913.94	219.13	916.07
219.43	916.2	219.74	916.34	220.45	916.59	223.45	917.47	225.94	918.02
226.24	918.07	226.55	918.14	226.83	918.16	230.56	918.66	231.97	918.88
235.35	920.43	235.68	920.56	236.53	920.88	238.06	921.32	240.2	921.66
241.87	921.81	242.16	921.83	248.77	921.6	250.46	921.54	250.63	921.5
251.87	921.19	252.24	921.12	252.49	921.09	255.05	920.62	257.65	920.29
259.49	920.06	260.17	920.07	261.58	919.95	263.91	920	263.99	920.02
264.03	920.02	264.4	920.06	266.61	920.35	267.07	920.4	270.43	920.5
270.56	920.51	271.33	920.61	274.42	921.04	274.97	921.09	276.31	921.13
277.05	921.12	277.3	921.11	280.55	921.34	281.01	921.4	282.71	921.68
285.29	922.03	285.46	922.05	285.5	922.06	285.96	922.14	287.38	922.37
288.82	922.49	289.53	922.65	289.75	922.69	293.6	923.23	297.69	923.34
297.94	923.34	298.35	923.39	300.44	924.08	301.03	924.32	302.59	924.69
302.85	924.74	303.44	924.84						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 151.38 .035 167.94 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 151.38 167.94 96.51 96.51 96.51 .1 .3

CROSS SECTION

RIVER: Bluestone Creek

REACH: Align (1)

RS: 2894.59

INPUT

Description:

Station Elevation Data

num= 231

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	921.02.6600037	920.822.299988	920.443.089996	920.53.389984	920.52				
6.549988	920.636.759979	920.647.649994	920.6410.54999	920.6510.98999	920.67				
12.26999	920.7512.57999	920.7413.42999	920.7616.50998	920.7819.07999	920.75				
20.81	920.7421.42999	920.7522.13998	920.7622.79999	920.7524.35001	920.72				
25.90999	920.6826.03999	920.68 27.98	920.63 28.06	920.62 30.34	920.46				
30.87999	920.431.90999	920.2332.98999	920.06 33.25	92034.79999	919.69				
35.17	919.62 35.28	919.5937.01999	919.06 37.61	918.8538.84999	918.38				
39.87999	917.85 40.62	917.541.14999	917.2843.78999	916.1543.95999	916.06				
44.45	915.9445.43999	915.73 47.36	915.3447.53999	915.348.09999	915.2				
48.95999	915.03 50.64	914.46 51.64	914.1252.51999	913.8253.75999	913.42				
56.23	912.5857.73999	912.1259.54999	911.4760.32999	911.19 61.36	910.85				
62.62	910.564.03999	910.2264.43999	910.1466.32999	909.77 66.78	909.68				
66.89999	909.6668.12999	909.48 68.73	909.3968.79999	909.38 70.25	909.22				
71.12999	909.1771.79999	909.1272.43999	909.0872.93999	909.0673.70999	909.04				
75.89999	908.9776.68999	908.9579.14999	908.9180.89999	908.8881.89999	908.89				
83.09	908.9 84.53	908.984.67999	908.89 84.75	908.8986.25999	908.86				
87.22	908.8488.25999	908.78 89.97	908.7590.20999	908.74 91.28	908.73				
92.2	908.72 92.48	908.7292.59999	908.71 92.92	908.71 95.25	908.64				
97.36	908.698.43999	908.56 100.24	908.45 101.39	908.36 102.72	908.26				
105.44	907.97 106.79	907.79 107.78	907.74 108.89	907.7 109.77	907.68				
112.46	907.62 112.92	907.61 113.79	907.63 116.89	907.6 118.77	907.61				
119.01	907.6 119.21	907.6 121.9	907.55 122.61	907.54 123.83	907.51				
124.84	907.45 126.24	907.35 127.19	907.29 127.54	907.27 129.33	907.15				
132.89	907.2 134.84	907.24 137.71	907.32 138.56	907.37 138.78	907.39				
139.26	907.4 140.15	907.39 141.2	907.4 141.89	907.43 143.83	907.44				
145.99	907.45 146.98	907.39 147.77	907.41 148.89	907.45 150.08	907.51				
150.64	907.55 152.21	907.64 153.52	907.7 157.17	907.24 158.01	907.36				
158.53	906.56 159.16	905.59 159.71	905.45 160.85	905.35 161.99	905.26				
164.21	905.3 165.88	905.34 167.56	905.37 168.89	905.53 170.25	906.58				
172.25	906.58 175.11	906.48 176.52	906.53 177.02	906.31 177.85	906.09				
178.14	905.99 178.31	905.94 178.58	906.12 178.65	906.18 178.83	906.31				
179.42	906.72 184.95	910.12 185.28	910.66 186.28	912.12 187.03	912.98				
187.95	913.77 190.51	916.38 192.31	917.27 193.22	917.62 193.51	917.7				
194.24	917.86 197.08	918.48 199.47	918.88 200.36	919.07 201.69	919.32				
201.8	919.34 203.18	919.68 208.33	920.81 209.63	921.14 209.91	921.16				
211.81	921.68 213.69	922.14 215.07	922.55 216.3	922.84 216.84	923.01				
220.1	923.79 220.28	923.83 220.41	923.85 224.4	924.96 225.85	925.48				
226.67	925.72 227.7	926.05 228.46	926.28 229.51	926.56 230.83	926.89				
232.53	927.27 233.92	927.59 234.53	927.8 235.55	928.03 236.68	928.32				
238.62	928.91 238.85	928.99 239.77	929.31 240.73	929.65 241.19	929.81				
244.45	930.84 246.26	931.34 246.43	931.38 246.47	931.39 246.54	931.41				
249.84	932.12 251.41	932.57 251.86	932.7 252.41	932.83 253.5	932.97				

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254.36	933.07	254.76	933.13	255.01	933.17	257.86	933.6	259.4	933.61
261.89	933.73	263.4	933.84	264.14	933.88	265.3	933.96	266.43	933.97
268.8	933.93	269.63	933.91	271.09	933.9	273.27	933.72	274.28	933.66
275.28	933.66	276.75	933.73	279.12	933.89	280.2	933.91	280.98	933.92
281.65	933.95								

Manning's n Values	num=	3
Sta n Val	Sta n Val	Sta n Val
0 .05	158.53 .035	170.25 .1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
158.53	170.25	99.96	101.59	105	.1	.3	

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 2793

INPUT

Description:

Station Elevation Data	num=	185		
Sta Elev	Sta Elev	Sta Elev	Sta Elev	Sta Elev
0 920.08	2099915 920.082	509979 920.024	289978 920.055	189972 920.05
6.709991	920.048	689987 920.1110	88998 920.1112	02998 920.1312
12.42999	920.1214	10999 920.0314	15999 920.0315	85999 920.0416
19.55998	919.9620	43999 919.921	45999 919.8822	73999 919.8123
25.11998	919.7127	67999 919.3529	13998 919.0229	17999 919.0129
31.23999	918.4832	26999 918.135	82999 916.8638	60999 916.1139
39.65999	915.940	65999 915.742	53999 915.3543	47998 915.1544
46.36998	914.5746	60999 914.5147	57999 914.2349	11998 913.7850
52.00998	913.1452	95999 912.8854	63998 912.355	12999 912.1455
56.49998	911.657	94998 911.0558	60999 910.7759	25998 910.5863
64.79999	909.6565	94998 909.5566	61998 909.4971	25998 909.3571
73.27998	909.2973	54999 909.2773	69998 909.2675	14999 909.1978
78.58998	909.0582	28999 909.0583	06999 909.0883	70999 909.0884
85.71999	909.1287	13998 909.1187	55998 909.189	83998 908.9890
93.96999	908.9794	16998 908.9798	71999 908.7599	79999 908.67
103.15	908.57	105.56 908.44	105.64 908.44	105.86 908.42
107.81	908.31	108.84 908.2	109.67 908.11	110.77 908.01
113.1	907.8	115.56 907.57	119.32 907.43	119.47 907.43
121.48	907.34	121.6 907.33	123.82 907.09	124.77 907.03
126.81	906.94	128.68 907.03	130.27 907.12	131.76 907.14
133.99	907.13	134.88 907.12	136.65 907.06	137.69 906.99
141.5	906.7	142.63 906.62	143.66 906.65	145.74 906.68
151.03	906.71	151.66 905.75	152.29 904.78	152.59 904.6
154.86	904.38	156.39 904.47	159.98 904.42	160.39 904.65
164.2	905.61	165.36 905.9	166.51 906.19	168.01 906.57

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173.72	906.52	174.49	906.58	175.84	906.79	177.74	907.11	178.86	907.31
179.76	907.38	180.74	907.62	184.37	908.55	186.07	909.05	186.42	909.22
190.04	910.73	190.5	910.92	192.27	911.55	194.52	912.65	194.62	912.73
195.5	913.11	200.75	914.98	201.28	915.03	205.25	916.44	206.27	916.47
206.51	916.53	209.83	917.57	213.03	918.33	213.9	918.58	214.12	918.65
215.57	919.02	216.29	919.23	216.38	919.24	217.05	919.48	218.63	919.84
219.47	919.9	222.98	920.5	223.26	920.53	225.43	920.94	225.46	920.94
225.5	920.95	227.53	921.56	227.66	921.6	229.07	921.99	230.55	922.42
233.38	923.38	235.88	924.14	236.14	924.22	236.46	924.31	238.83	925.06
243.49	926.28	245.15	926.55	245.66	926.63	246.01	926.66	246.98	926.94
250.74	928.25	251.35	928.45	252.27	928.69	252.9	928.85	255.38	929.44
256.75	929.66	258.27	929.89	260	930.12	261.53	930.34	262.83	930.52

Manning's n Values	num=	3
Sta n Val Sta n Val	Sta n Val	Sta n Val
0 .05 151.03	.035 168.01	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
151.03	168.01	100.29	100.29	100.29	.1	.3	

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 2692.71

INPUT

Description:

Station Elevation Data	num=	204		
Sta Elev Sta Elev Sta Elev Sta Elev	Sta Elev	Sta Elev		
0 918.87 5200195	918.471 309998	917.721 990021	917.053 790009	915.9
4.920013 916.07 6.5	916.088 300018	916.3711 80002	916.77 14.44	916.79
15.22 916.8 16.38	916.8516 92999	916.8618 24002	916.9418 48001	916.95
21.75 917.0123 64001	917.0524 39001	917.0725 46001	917.0827 14001	917.07
29 917.0429 40001	917.0432 34001	916.95 34.69	916.8736 40001	916.84
36.59001 916.84 37.25	916.8338 35001	916.838 98001	916.7941 85001	916.76
43.33 916.743 89001	916.744 06001	916.69 45.72	916.5849 09001	916.06
49.11 916.0549 14001	916.0554 34001	915.1554 39001	915.1454 49001	915.1
56.45001 914.28 57.05	914.0558 87001	913.3159 45001	913.0960 59001	912.68
61.04001 912.5261 68001	912.2564 79001	910.99 65.11	910.8565 99001	910.52
68.07001 909.6769 12001	909.33 71.19	909.1 72.05	909.02 73.88	908.84
76.47 908.7277 03001	908.7178 70001	908.63 79.13	908.679 48001	908.6
82.64001 908.43 83.08	908.3983 70001	908.3685 54001	908.2286 68001	908.14
87.02 908.1287 18001	908.11 88.36	908.06 90.27	907.9991 06001	907.97
91.62001 907.96 94.88	907.9198 03001	907.87 98.05	907.8799 71001	907.89
102.08 907.86 102.76	907.87 103.14	907.86 106.64	907.81 106.78	907.8
106.95 907.8 108.71	907.71 110.77	907.63 111.95	907.58 113.25	907.55
113.33 907.55 113.88	907.54 118.35	907.5 120.51	907.47 121.18	907.47

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125.66	907.44	125.89	907.44	127.33	907.45	129.58	907.46	130.02	907.44
131.26	907.4	132.43	907.38	134.06	907.32	134.82	907.29	135.95	907.25
136.67	907.22	138.17	907.17	138.8	907.15	140.23	907.07	140.68	907.04
140.79	907.04	144.17	906.88	145.81	906.78	147.97	906.71	149.9	906.68
150.4	906.67	150.82	906.66	153.81	906.61	154.17	906.61	156.69	906.47
158.38	906.36	159.67	906.28	159.93	906.26	160.41	906.23	161.67	906.09
162.06	906.06	164.29	905.83	167.3	905.9	168.99	905.99	172.18	906.13
174.58	905.03	175.47	904.62	176.97	903.93	177.46	903.69	178.61	903.67
179.76	903.66	181.33	903.8	182.9	903.93	183.76	904.79	184.61	905.65
185.52	905.47	188.87	905.45	190.04	905.46	190.78	905.42	192.62	905.48
194.1	905.63	196.43	905.5	197.61	905.69	198.44	905.74	200.35	906
201.06	906.11	201.66	906.11	203.76	906.04	205.22	906.3	206.15	906.47
206.85	906.68	207.91	906.99	209.26	907.47	210.59	908.15	212.96	909.58
213.19	909.78	213.6	910.1	214.13	910.53	215.5	911.37	219.34	913.6
220.42	914.01	224.48	915.53	224.5	915.55	224.56	915.57	229.06	917.43
230.15	917.7	231.12	917.92	232.59	918.31	232.72	918.34	233.04	918.42
235.14	918.89	237.46	919.41	238.42	919.57	239.53	919.71	240.6	919.88
241.66	920.04	242.71	920.21	243.63	920.42	244.04	920.51	245.58	920.82
247.65	921.17	249.93	921.58	252.74	922.15	253.06	922.21	253.69	922.3
256.85	922.81	258.29	923.22	258.91	923.46	259.48	923.63	261.52	924.31
262.54	924.58	263.35	924.8	265.55	925.48	266.53	925.77	268.55	926.3
270.44	927.08	272.59	927.96	273.01	928.12	273.38	928.29	275.06	928.98
275.54	929.24	276.39	929.63	277.36	929.88	278.32	930.12		

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 172.18 .035 184.61 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 172.18 184.61 103.1 101.44 100.42 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 2591.27

INPUT

Description:

Station Elevation Data num= 226

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	919.082	190002	918.77	2.72998	918.694	709991	918.555	779999	918.3
7.859985	918.029	130005	917.75	10.81	917.5913	63998	917.2214	20999	917.16
14.47	917.1216	25998	916.7216	29001	916.7216	47998	916.6920	23999	916.1
20.85001	916.08	22.47	916.0523	51999	916.0125	04001	915.9726	26999	915.81
29.00998	915.36	32	915.01	35.92	914.3436	04999	914.3237	25999	914.21
38.34	914.11	38.47	914.1	40.87	913.82	41.61	913.7542	95999	913.63
43.54999	913.5646	56999	913.43	47.42	913.38	48.62	913.2349	68999	913.08

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51.7	912.8352.03999	912.852.89999	912.7353.82999	912.66	54.09	912.64
54.82999	912.61 56.17	912.5759.03999	912.4559.50999	912.47	60.78	912.58
61.47	912.6361.65999	912.64 63.09	912.69 64.59	912.71	66.06	912.73
67.23	912.7567.98999	912.7669.95999	912.75 70.03	912.7571.56999		912.7
72.95999	912.6875.20999	912.69 76.56	912.7177.34999	912.7477.78999		912.75
82.67999	911.1984.01999	910.8584.25999	910.7184.87999	910.4385.81999		910.02
86.26999	909.8787.51999	909.51 89.28	909.2291.39999	908.9592.12999		908.99
92.61	909.03 93.39	909.0594.67999	909.0695.62999	909.0596.32999		909.02
98.45999	908.9599.23999	908.92 100.51	908.87 103.12	908.81 103.53		908.8
103.73	908.79 106.68	908.73 108.49	908.81 109.38	908.85 109.79		908.87
111.23	908.98 111.52	909 111.79	909.02 114.76	909.2 116.6		909.38
117.45	909.44 118.21	909.49 119.6	909.6 120.63	909.62 122.65		909.61
125.26	909.58 125.61	909.57 126.11	909.58 128.56	909.66 130.14		909.69
131.53	909.74 133.38	909.77 133.63	909.78 136.16	909.6 136.9		909.56
137.46	909.52 138	909.5 139.51	909.32 143.43	908.79 144.79		908.67
145.96	908.46 148.13	908.14 148.63	908.05 149.85	907.73 149.98		907.72
153.43	907.39 154.31	907.32 155.8	907.1 157.11	906.89 158.05		906.83
159.47	906.71 160.34	906.63 161.49	906.54 163.16	906.43 163.51		906.4
163.94	906.36 165.35	906.22 166.64	906.02 166.93	905.97 168.28		905.7
168.79	905.61 170.57	905.26 170.91	905.2 171.29	905.18 173.13		905.04
174.62	904.97 175.88	904.91 176.39	904.9 183.46	904.9 184.24		904.87
185.04	904.86 185.45	904.85 186.38	904.84 187.42	904.87 191.07		904.71
191.8	903.87 192.54	903.03 193.12	902.89 196.54	902.94 197.51		902.93
200.01	902.91 200.49	902.92 200.98	902.93 202.49	903.31 205.41		903.64
205.52	903.66 206.32	903.7 209.59	903.88 209.64	903.88 211.04		903.92
211.29	903.94 211.69	903.93 212.83	903.94 213.34	903.92 216.01		904.11
217.02	904.18 218.64	904.71 218.85	904.75 218.93	904.76 219.12		904.79
219.29	904.91 222.91	908.06 224.11	909.59 224.15	909.64 224.17		909.67
224.22	909.75 226.65	913.33 230.09	917.17 230.27	917.33 232.41		918.05
236.13	919.34 236.17	919.35 236.57	919.37 239.28	919.46 239.49		919.47
241.91	919.8 243.07	919.99 243.97	920.31 244.83	920.64 247.25		921.66
247.59	921.81 248	921.98 249.92	922.55 251.7	923.1 252		923.2
252.16	923.24 253.77	923.69 255.44	924 257.7	924.42 258.17		924.52
258.35	924.54 259.89	924.94 260.4	925.07 261.68	925.41 262.46		925.61
262.5	925.63 262.54	925.64 262.59	925.65 265.59	926.45 265.7		926.48
267.99	927.38 269.4	927.85 270.11	928.09 270.24	928.15 270.66		928.3
272.52	928.99 275.52	930 276.45	930.33 277.65	930.74 279.1		931.09
279.59	931.21 279.93	931.3 282.01	931.95 283.54	932.4 283.58		932.41
285.65	933					

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 191.07 .035 218.64 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 191.07 218.64 47.53 50.98 55.1 .1 .3

CROSS SECTION

171-150-Revised-An.rep

RIVER: Bluestone Creek

REACH: Align (1)

RS: 2540.29

INPUT

Description:

Station Elevation Data

num= 269

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	917.552.829987	916.653.799988	916.435.359985	916.036.799988	915.74				
7.339996	915.638.720001	915.339.640015	915.2910.82001	915.09	12.5	914.85			
13.22	914.815.42999	914.6716.73001	914.5918.07001	914.3619.60001	914.21				
19.95999	914.18	22.47	913.9322.95999	913.88	23.41	913.8423.64999	913.81		
26.59	913.43	27.37	913.4	30.19	912.9230.32999	912.91	31.97	912.83	
32.79999	912.79	32.84	912.7932.89001	912.7835.89999	912.3337.82999	912.2			
38.54001	912.1239.07999	912.14	39.63	912.1541.98999	912.24	45	912.06		
45.95001	912.04	47.81	911.71	48.56	911.51	48.78	911.4849.73999	911.25	
50.14001	911.1750.29999	911.1551.20001	911.0552.60999	910.9153.07001	910.89				
56.53	911.08	57.66	911.21	58.47	911.28	59.81	911.3962.29001	911.35	
62.78	911.3463.60999	911.32	66.72	911.28	66.91	911.29	68.16	911.31	
69.34	911.3270.57001	911.3374.73001	911.3976.17001	911.3977.04001	911.38				
79.81	911.3380.17001	911.3280.45001	911.32	82.63	911.383.42999	911.33			
85.03	911.3885.57999	911.3786.20999	911.3887.79001	911.05	90.16	909.97			
92.45001	909.01	92.72	908.8395.14001	907.54	95.19	907.51	95.31	907.48	
100.08	907.05	101.85	907.12	103.14	907.17	103.95	907.19	105.32	907.24
106.42	907.27	110.1	907.54	110.39	907.56	110.51	907.56	110.79	907.59
112.45	907.76	113.36	907.9	114.55	908.09	115.24	908.17	117.83	908.47
119.21	908.55	120.33	908.58	122.76	908.65	123.85	908.68	124.65	908.7
126.41	908.72	127.59	908.7	128.46	908.73	128.55	908.73	128.97	908.71
132.47	908.65	134.77	908.6	139.88	908.03	140.93	907.94	143.33	907.65
144.88	907.44	145.75	907.35	146.46	907.29	147.85	907.1	150.04	906.94
151.04	906.8	153.77	906.61	154.72	906.54	155.71	906.5	156.49	906.49
158.55	906.44	159.74	906.43	161.52	906.41	163.89	906.26	164.88	906.19
166.14	906.04	166.59	905.99	166.78	905.96	170.34	905.3	171.19	905.13
173.21	904.96	174.21	904.84	174.51	904.8	175.05	904.74	176.67	904.72
177.37	904.71	177.92	904.71	178.69	904.69	179.54	904.68	181.22	904.62
182.97	904.56	185.41	904.52	187.49	904.51	189.48	904.51	191.02	904.52
192.11	904.51	192.46	904.53	194.27	904.61	195.81	904.61	196.77	904.6
198.44	904.53	201.17	904.28	201.44	904.26	203.31	903.77	204.39	902.97
205.1	902.62	207.19	902.58	209.66	902.46	212.9	902.65	214.97	902.96
215.57	904.87	216.17	906.77	218.75	909.05	219.46	909.45	220.29	909.9
222.94	911.35	224.4	911.68	224.76	911.79	228.19	912.86	229.3	913
230.1	913.1	231.62	913.19	234.13	913.52	234.91	913.71	236.3	914.09
237.03	914.27	237.57	914.38	239.73	914.79	242.52	915.09	243.81	915.26
244.79	915.36	245.33	915.42	245.46	915.43	247.45	915.61	250.01	915.97
251.82	916.08	252.25	916.11	253.78	916.28	254.45	916.35	257.4	916.74
258.11	916.83	259.12	916.99	261.07	917.19	261.82	917.23	262.56	917.31
263.09	917.31	263.65	917.34	264.11	917.41	266.23	917.72	268.11	917.96

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268.55	918	268.9	918.03	269.37	918.06	272.48	918.22	272.55	918.23
274.51	918.62	275.61	918.85	275.72	918.87	276.84	919.13	278.3	919.33
279.82	919.49	281.5	919.65	282.72	919.75	283.18	919.79	283.41	919.81
286.83	920.41	287.53	920.45	290.13	920.79	291.61	920.96	293.24	921.09
294.69	921.25	295.26	921.28	296.66	921.32	298.18	921.41	300.33	921.41
300.4	921.4	301.41	921.37	302.81	921.03	304.15	920.8	306.62	920.55
307.01	920.51	307.75	920.43	308.44	920.31	309.06	920.18	310.45	919.94
311.13	919.83	313.02	919.66	313.08	919.65	313.1	919.65	315.6	919.19
316.9	918.96	317.24	918.88	317.49	918.82	319.44	918.39	320.41	918.31
322.1	918.19	323.6	918.26	325.52	917.99	329.36	917.58	329.57	917.56
329.97	917.52	331.5	917.45	334.25	917.33	334.61	917.31	334.78	917.3
335.09	917.27	337.14	917.07	339.37	917.92	340.51	918.2	341.69	918.44
342.57	919.12	342.79	919.2	343.17	919.5	344.13	920.06	345.04	920.34
346.5	921.03	347.78	921.35	348.6	921.42	351.04	921.69	351.11	921.69
351.15	921.7	352.79	921.92	353.99	922.37	355	922.71		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	198.44	.035	215.57	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	198.44	215.57		59.68	59.68		.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	128.46	920	F

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 2480.61

INPUT

Description:

Station Elevation Data num= 205

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	919.9700012	918.61.880005	918.243.679993	917.675.789978	917.07				
8.289978	916.358.319977	916.3511.48999	915.6613.22998	915.2514.76999	914.96				
15.41998	914.8216.42999	914.5817.10999	914.4218.75998	914.0420.50998	913.63				
23.00998	913.0724.82999	912.7226.35001	912.47 26.88	912.3928.01999	912.27				
29.12	912.15 31.06	911.94 31.2	911.9231.43999	911.88 33.59	911.59				
34.60999	911.4535.95999	911.1836.15999	911.1536.95999	911.0240.25999	910.48				
41.2	910.36 43.62	910.12 45.23	910.01 45.67	910.0246.35999	910.04				
50.28	910.19 50.7	910.1851.49998	910.1452.65999	910 53.73	909.89				
54.60999	909.7756.00999	909.6856.34999	909.6556.92999	909.6458.38998	909.58				
60.09999	909.49 60.31	909.4763.84999	909.2464.06999	909.2164.50999	909.28				
67.84999	909.8368.75999	909.96 69.81	910.1871.79999	910.28 73.03	910.3				
73.51999	910.374.63998	910.3177.68999	910.2779.57999	910.3280.53999	910.34				



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81.60999	910.3785	06999	910.3885	10999	910.3886	62999	910.3490	07999	910.43
90.50999	910.4490	68999	910.4591	48999	910.593	84999	910.7194	50999	910.91
95.49998	911.195	95999	911.1697	37999	910.9599	56999	910.94	100.92	910.83
104.31	909.38	105.13	908.97	105.53	908.73	106.94	907.81	110.04	906.73
111	906.36	111.2	906.32	113.15	906.43	114.27	906.49	115.45	906.6
115.94	906.64	115.99	906.64	118.85	906.87	120.07	906.95	120.08	906.95
120.28	906.96	122.53	907.06	122.69	907.07	124.87	907.28	125.67	907.34
126.62	907.42	126.9	907.43	128.14	907.43	128.58	907.47	130.1	907.52
132.55	907.6	133.79	907.64	134.39	907.63	136.49	907.57	137.2	907.5
139.64	907.12	139.87	907.09	144.12	906.44	145.21	906.4	146.79	906.42
148.85	906.34	150.01	906.31	151.02	906.25	151.73	906.22	152.95	906.16
153.65	906.09	155.82	905.87	158.15	905.58	159.24	905.31	160.66	904.76
161.08	904.32	162.28	903.61	163.4	902.94	165.72	901.55	167.77	901.31
169.81	901.08	174	900.48	176.67	900.01	179.87	900.07	180.41	900.08
180.65	900.09	181.05	900.1	183.06	900.14	188.57	900.21	189.85	900.88
191.13	901.56	192.99	905.84	195.99	907.97	196.66	908.73	196.84	908.84
197.95	909.45	198.82	909.95	199.7	910.48	201.07	911.12	206.18	912.59
208.53	912.81	208.85	912.85	209.03	912.83	209.96	912.71	211.72	912.63
213.44	912.59	214.18	912.57	216.39	912.58	217.11	912.58	219.5	912.79
219.81	912.83	220.06	912.87	223.06	913.39	224.21	913.8	228.59	915.37
228.95	915.53	229.52	915.71	230.1	915.93	231.73	916.45	233.77	917.13
234.34	917.3	234.96	917.49	236.39	917.92	238.32	918.4	238.88	918.53
240.38	918.88	240.63	918.94	240.71	918.96	242.56	919.51	243.05	919.68
245.79	920.42	247.64	920.85	248.07	920.97	248.65	921.08	249.87	921.35
250.41	921.44	251.04	921.59	253.75	922.07	257.22	922.35	258.46	922.43
259.15	922.38	260.55	922.58	261.51	922.65	262.07	922.7	264.11	922.55
265.85	922.72	267.18	922.52	267.99	922.52	270.57	922.4	271.62	922.7
273.7	923.48	275.52	923.69	276.73	923.82	277.91	923.91	279.44	924
280.64	924.03	282.44	924.23	283.09	924.24	283.35	924.27	283.46	924.28

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 165.72 .035 191.13 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 165.72 191.13 74.5 95.65 117.1 .1 .3

Ineffective Flow num= 1  
 Sta L Sta R Elev Permanent  
 0 133.79 920 F

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 2384.96

INPUT  
 Description:

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Station Elevation Data		num= 284							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	923.06	.25	922.96	.960022	922.753	.150024	921.93	.430023	921.83
3.680023	921.715	.720001	920.896	.029999	920.776	.120026	920.747	.240021	920.36
9.900024	919.2711	.01001	918.77	11.91	918.4213	.73001	917.81	15.53	917.26
16.29001	917.1118	.01001	916.7719	.55002	916.5721	.10001	916.2222	.30002	915.81
23.62003	915.3624	.08002	915.2424	.61002	915.03	27.13	913.9429	.21002	913.13
29.49002	913.0330	.27002	912.7532	.89001	911.7733	.09003	911.6733	.80002	911.39
35.96002	910.5836	.83002	910.2439	.46002	909.3440	.15002	909.0640	.96002	908.67
42.82001	908.05	43.19	907.93	43.91	907.7	45.28	907.27	45.66	907.17
46.23001	907.11	49.03	906.78	49.41	906.7650	.74002	906.751	.51001	906.68
53.48001	906.6654	.04001	906.6554	.54001	906.6456	.48001	906.4958	.17001	906.41
58.56	906.3860	.12003	906.5560	.98001	906.62	62.69	906.7164	.33002	906.88
65.13	906.93	66.78	906.9768	.37003	906.8668	.52002	906.8568	.59003	906.85
68.65002	906.8468	.73001	906.8369	.82001	906.78	70.56	906.7471	.67001	906.65
73.26001	906.5475	.05002	906.32	76.97	906.28	79.75	906.25	80.38	906.26
81.90002	906.4682	.11002	906.49	83.72	906.8685	.21002	907.26	88.03	907.82
88.70001	90889	.51001	908.1892	.07001	908.1894	.32001	908.0994	.73001	908.08
96.74002	907.9297	.42001	907.8898	.80002	907.88	100.82	907.86	101.94	907.86
103.09	907.87	104.8	907.79	106.22	907.8	108.76	907.95	108.79	907.95
108.79	907.96	108.8	907.96	108.85	907.97	111.52	908.48	112.39	908.63
113.35	908.66	113.69	908.6	115.47	908.43	116.32	908.38	118.63	908.09
120.01	908.07	120.27	908.05	120.49	908.05	122.33	907.98	122.85	907.94
123.06	907.94	123.16	907.92	124.84	907.75	127.48	907.48	128	907.4
130.58	907.08	132.17	906.84	132.36	906.81	132.96	905.05	134.36	904.9
135.81	904.76	138.43	904.5	139.5	904.39	141.23	904.21	142.71	904.06
144.24	903.91	145.65	903.77	147.15	903.62	149.45	903.36	151.17	903.14
153.64	902.83	155.11	902.65	156.7	902.45	157.45	902.35	159.07	902.15
160.3	901.99	161.41	901.85	162.88	901.73	164.44	901.59	166.41	901.42
167.46	901.33	169.94	901.32	172.95	901.32	174.93	901.31	176.53	901.31
177.95	901.3	179.77	901.3	182.03	901.29	182.96	901.29	184.8	901.28
185.09	901.3	186.85	901.4	188.21	901.47	189.19	901.53	191.29	901.65
193.09	901.75	194.62	901.84	195.23	901.89	195.72	901.93	196.79	902.01
198.02	902.11	199.73	902.25	201.25	902.37	203.45	902.55	205.09	902.68
206.79	902.84	209.09	903.04	210.06	903.13	211.24	903.24	213.18	903.41
215.13	903.59	216.61	903.72	217.86	903.83	219.51	903.98	221.41	904.15
221.49	904.16	221.58	904.17	222.1	904.22	223.54	904.45	225.15	904.7
226.39	904.9	227.32	905.05	228.12	905.18	229.08	905.32	230.02	905.45
231.2	905.62	233.1	905.88	233.92	906	235.8	906.26	237.43	906.49
238.61	906.65	238.89	908.06	240.49	908.22	242.25	908.39	243.79	908.55
244.33	908.64	245.19	908.65	246.46	908.69	248.34	908.82	252.86	908.83
252.98	908.83	253.03	908.84	253.09	908.83	255.48	908.87	256.91	908.9
257.96	908.99	258.55	909.06	259.08	909.11	260.97	909.22	261.13	909.24
261.15	909.24	261.27	909.25	262.88	909.41	263.63	909.49	265.32	909.72
266.36	909.87	267.57	910.01	269.3	910.1	271.88	910.27	271.91	910.27
272.21	910.29	272.62	910.29	276.95	910.26	278.04	910.26	280.42	910.28
280.96	910.27	281.9	910.27	282.76	910.26	283.9	910.25	285.67	910.22
286.51	910.22	287.12	910.13	291.45	909.81	292.48	909.7	293.5	909.7

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294.17	909.62	294.9	909.41	295.66	909.36	301.86	909.61	301.91	909.6
302.33	909.61	303.57	910.01	303.94	910.12	304.78	910.36	306.86	911.01
308.79	911.68	309.79	912.05	309.9	912.09	311.29	912.7	313.7	913.41
315.43	913.99	316.13	914.2	317.16	914.48	317.6	914.55	319.09	914.85
321.03	915.21	321.27	915.26	323.26	915.42	324.48	915.51	326.27	915.62
331.55	915.87	332.13	915.91	332.39	915.91	332.66	915.93	334.85	916.06
336.66	916.21	338.26	916.37	340.44	916.62	340.89	916.68	342.37	916.85
343.09	916.94	345.28	917.34	346.15	917.49	347.44	917.69	348.23	917.82
349.77	917.96	351.29	918.16	353.85	918.48	356.53	918.98	357.25	919.11
359.03	919.4	359.69	919.55	360.32	919.7	362.64	920.15	362.85	920.19
362.91	920.2	364.31	920.35	365.11	920.52	366.2	920.66		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	159.07	.035	198.02	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	159.07	198.02		26.15	26.15		.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	147	907.5	F
207	366.2	907.5	F

BRIDGE

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 2378.96

INPUT

Description: Bridge C  
 Distance from Upstream XS = 6  
 Deck/Roadway Width = 14  
 Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num=	6	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
		122.46	907	900	152.46	907.83	900	152.46	907.83	905.33
		202.46	907.83	905.33	202.46	907.83	900	232.46	906	900

Upstream Bridge Cross Section Data

Station	Elevation	Data	num=	284	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	923.06	.25	922.96	.960022	922.753.150024	921.93.430023	921.83					
3.680023	921.715.720001	920.896.029999	920.776.120026	920.747.240021	920.36							
9.900024	919.2711.01001	918.77	11.91	918.4213.73001	917.81	15.53	917.26					
16.29001	917.1118.01001	916.7719.55002	916.5721.10001	916.2222.30002	915.81							
23.62003	915.3624.08002	915.2424.61002	915.03	27.13	913.9429.21002	913.13						

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29.49002	913.0330.27002	912.7532.89001	911.7733.09003	911.6733.80002	911.39
35.96002	910.5836.83002	910.2439.46002	909.3440.15002	909.0640.96002	908.67
42.82001	908.05 43.19	907.93 43.91	907.7 45.28	907.27 45.66	907.17
46.23001	907.11 49.03	906.78 49.41	906.7650.74002	906.751.51001	906.68
53.48001	906.6654.04001	906.6554.54001	906.6456.48001	906.4958.17001	906.41
58.56	906.3860.12003	906.5560.98001	906.62 62.69	906.7164.33002	906.88
65.13	906.93 66.78	906.9768.37003	906.8668.52002	906.8568.59003	906.85
68.65002	906.8468.73001	906.8369.82001	906.78 70.56	906.7471.67001	906.65
73.26001	906.5475.05002	906.32 76.97	906.28 79.75	906.25 80.38	906.26
81.90002	906.4682.11002	906.49 83.72	906.8685.21002	907.26 88.03	907.82
88.70001	90889.51001	908.1892.07001	908.1894.32001	908.0994.73001	908.08
96.74002	907.9297.42001	907.8898.80002	907.88 100.82	907.86 101.94	907.86
103.09	907.87 104.8	907.79 106.22	907.8 108.76	907.95 108.79	907.95
108.79	907.96 108.8	907.96 108.85	907.97 111.52	908.48 112.39	908.63
113.35	908.66 113.69	908.6 115.47	908.43 116.32	908.38 118.63	908.09
120.01	908.07 120.27	908.05 120.49	908.05 122.33	907.98 122.85	907.94
123.06	907.94 123.16	907.92 124.84	907.75 127.48	907.48 128	907.4
130.58	907.08 132.17	906.84 132.36	906.81 132.96	905.05 134.36	904.9
135.81	904.76 138.43	904.5 139.5	904.39 141.23	904.21 142.71	904.06
144.24	903.91 145.65	903.77 147.15	903.62 149.45	903.36 151.17	903.14
153.64	902.83 155.11	902.65 156.7	902.45 157.45	902.35 159.07	902.15
160.3	901.99 161.41	901.85 162.88	901.73 164.44	901.59 166.41	901.42
167.46	901.33 169.94	901.32 172.95	901.32 174.93	901.31 176.53	901.31
177.95	901.3 179.77	901.3 182.03	901.29 182.96	901.29 184.8	901.28
185.09	901.3 186.85	901.4 188.21	901.47 189.19	901.53 191.29	901.65
193.09	901.75 194.62	901.84 195.23	901.89 195.72	901.93 196.79	902.01
198.02	902.11 199.73	902.25 201.25	902.37 203.45	902.55 205.09	902.68
206.79	902.84 209.09	903.04 210.06	903.13 211.24	903.24 213.18	903.41
215.13	903.59 216.61	903.72 217.86	903.83 219.51	903.98 221.41	904.15
221.49	904.16 221.58	904.17 222.1	904.22 223.54	904.45 225.15	904.7
226.39	904.9 227.32	905.05 228.12	905.18 229.08	905.32 230.02	905.45
231.2	905.62 233.1	905.88 233.92	906 235.8	906.26 237.43	906.49
238.61	906.65 238.89	908.06 240.49	908.22 242.25	908.39 243.79	908.55
244.33	908.64 245.19	908.65 246.46	908.69 248.34	908.82 252.86	908.83
252.98	908.83 253.03	908.84 253.09	908.83 255.48	908.87 256.91	908.9
257.96	908.99 258.55	909.06 259.08	909.11 260.97	909.22 261.13	909.24
261.15	909.24 261.27	909.25 262.88	909.41 263.63	909.49 265.32	909.72
266.36	909.87 267.57	910.01 269.3	910.1 271.88	910.27 271.91	910.27
272.21	910.29 272.62	910.29 276.95	910.26 278.04	910.26 280.42	910.28
280.96	910.27 281.9	910.27 282.76	910.26 283.9	910.25 285.67	910.22
286.51	910.22 287.12	910.13 291.45	909.81 292.48	909.7 293.5	909.7
294.17	909.62 294.9	909.41 295.66	909.36 301.86	909.61 301.91	909.6
302.33	909.61 303.57	910.01 303.94	910.12 304.78	910.36 306.86	911.01
308.79	911.68 309.79	912.05 309.9	912.09 311.29	912.7 313.7	913.41
315.43	913.99 316.13	914.2 317.16	914.48 317.6	914.55 319.09	914.85
321.03	915.21 321.27	915.26 323.26	915.42 324.48	915.51 326.27	915.62
331.55	915.87 332.13	915.91 332.39	915.91 332.66	915.93 334.85	916.06
336.66	916.21 338.26	916.37 340.44	916.62 340.89	916.68 342.37	916.85

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343.09	916.94	345.28	917.34	346.15	917.49	347.44	917.69	348.23	917.82
349.77	917.96	351.29	918.16	353.85	918.48	356.53	918.98	357.25	919.11
359.03	919.4	359.69	919.55	360.32	919.7	362.64	920.15	362.85	920.19
362.91	920.2	364.31	920.35	365.11	920.52	366.2	920.66		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	159.07	.035	198.02	.05

Bank Sta: Left Right Coeff Contr. Expan.

159.07	198.02	.3	.5
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	147	907.5	F
207	366.2	907.5	F

Downstream Deck/Roadway Coordinates

num= 6

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
100.13	907	900	130.13	907.83	900	130.13	907.83	905.33
180.13	907.83	905.33	180.13	907.83	900	210.13	906	900

Downstream Bridge Cross Section Data

Station Elevation Data num= 265

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	922.43	.730011	922.171	720001	921.822	.339996	921.643	.589996	921.3
4.76001	921.016	.149994	920.337	.070007	919.95	8.5	919.321	.26001	918.7
11.91	918.07	13.56	917.481	5.08002	917.011	6.32001	916.72	17.66	916.45
20.77002	915.48	21.53	915.262	2.45999	914.952	3.23001	914.692	5.57001	913.92
26.77002	913.462	8.08002	912.982	9.98001	912.263	0.77002	911.973	1.49002	911.69
31.75	911.58	33.41	910.93	35.59	910.14	35.87	910.04	36.47	909.8
40.23001	908.414	1.02002	908.14	41.22	908.08	41.34	908.04	41.72	907.95
46	906.66	47.59	906.548	.92001	906.375	0.29001	906.345	1.79001	906.27
52.37	906.26	53.94	906.2	55	906.215	6.77002	906.225	8.42001	906.27
60.82001	906.336	0.98001	906.336	1.08002	906.346	1.17999	906.34	62.34	906.33
65.89001	906.31	66.22	906.296	8.60001	906.270	1.14999	906.157	2.20001	906.02
73.08002	905.977	4.32001	905.947	4.51001	905.947	4.83002	905.927	7.45999	905.81
78.35001	905.857	9.67999	905.938	0.80002	905.98	81.16	906.02	83.03	906.19
85.42999	906.728	5.45999	906.728	5.92001	906.83	87.53	907.24	87.62	907.26
88.16	907.34	88.25	907.338	8.70999	907.299	1.54001	907.139	2.39999	907.04
95.70001	907.12	98.33	907.1	101.32	907.09	103.78	906.95	104.36	906.92
105.64	906.85	106.87	906.75	107.28	906.74	107.66	906.74	108.21	906.73
110.44	904.82	110.91	904.74	111.53	904.65	112.71	904.46	113.55	904.33
115.18	904.07	118.01	903.62	120.01	903.31	121.16	903.12	121.94	903
123.03	902.83	124.74	902.69	126.18	902.57	126.98	902.51	128.61	902.37
130.16	902.25	131.17	902.16	131.92	902.1	132.87	902.02	134.21	901.91
135.98	901.77	137.66	901.63	138.51	901.61	139.02	901.6	140.37	901.56
141.04	901.54	141.97	901.51	144	901.46	145.35	901.42	147.49	901.36

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148.76	901.34	149.75	901.33	151.57	901.32	153.58	901.3	155.69	901.29
159.46	901.25	161.41	901.24	162.39	901.23	164.84	901.21	165.62	901.2
166.61	901.2	167.37	901.19	168.49	901.18	170.67	901.41	173.01	901.66
174.22	901.79	175.32	901.91	176.85	902.07	178.85	902.28	181.08	902.52
182.74	902.7	184.79	902.93	186.23	903.1	188.37	903.34	189.68	903.49
190.84	903.62	192.06	903.76	193.05	903.88	193.85	903.97	194.85	904.08
195.92	904.21	197.43	904.38	198.37	904.49	199.05	904.57	199.3	904.59
202.1	904.86	203.28	904.97	205.8	905.21	206.52	905.28	207.31	905.36
209.24	905.54	210.06	905.62	211.23	905.73	212.99	905.9	213.55	905.97
216.59	906.37	217.42	906.48	218.33	906.6	219.65	906.78	220.87	906.94
222	907.09	224	907.35	225.25	907.52	226.57	907.69	228.74	907.98
229.9	907.72	230.27	907.72	230.31	907.73	233.49	907.84	233.66	907.86
233.91	907.91	235.83	908.01	237.35	908.33	238.62	908.44	239.39	908.39
240.91	908.71	243.47	909.27	243.96	909.26	244.17	909.28	244.49	909.32
244.75	909.34	250.28	909.35	251.15	909.33	253.24	909.6	255.82	910.11
257.23	910.29	259.08	910.49	259.98	910.56	260.32	910.6	261.14	910.72
262.25	910.78	263.59	910.84	266.31	910.93	266.52	910.93	269.01	911.05
270.53	911.11	270.63	911.12	270.71	911.12	272.87	911.25	274.76	911.37
275.04	911.38	276.64	911.49	278.51	911.57	278.63	911.58	278.74	911.58
279.97	911.65	281.2	911.68	286.81	911.79	288.96	911.79	289.14	911.8
290.23	911.76	291.01	911.74	291.21	911.74	294.54	911.71	297.01	911.67
297.66	911.67	300.34	911.65	302.69	911.63	303.69	911.6	304.49	911.58
305.63	911.52	306.16	911.43	306.57	911.35	307.47	911.21	308.59	911.05
309.14	910.99	313.43	910.6	314.84	910.37	315.09	910.41	316.17	910.77
317.06	911.15	319.04	911.88	319.25	911.94	319.89	912.19	322.75	913.27
323.03	913.38	325.26	914.07	326.93	914.6	327.34	914.75	328.89	915.15
329.83	915.32	331.55	915.55	332.08	915.61	333.35	915.69	334.28	915.78
337.01	916.19	338.74	916.45	339.07	916.49	340.83	916.76	341	916.79
342.89	917.17	344.23	917.35	344.83	917.44	345.26	917.51	348.86	918.11
350.48	918.45	352.86	918.86	353.35	918.94	353.64	919.01	353.85	919.05

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1 131.92 .035 176.85 .05

Bank Sta: Left Right Coeff Contr. Expan.  
 131.92 176.85 .3 .5  
 Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 0 125 907.5 F  
 185 353.85 907.5 F

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: Align (1) RS: 2358.81

INPUT

Description:

Station Elevation Data		num= 265									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	922.43	.730011	922.171	7.20001	921.822	3.39996	921.643	5.89996	921.3		
4.76001	921.016	.149994	920.337	.070007	919.95	8.5	919.321	0.26001	918.7		
11.91	918.07	13.56	917.481	5.08002	917.011	6.32001	916.72	17.66	916.45		
20.77002	915.48	21.53	915.262	2.45999	914.952	3.23001	914.692	5.57001	913.92		
26.77002	913.462	8.08002	912.982	9.98001	912.263	0.77002	911.973	1.49002	911.69		
31.75	911.58	33.41	910.93	35.59	910.14	35.87	910.04	36.47	909.8		
40.23001	908.414	1.02002	908.14	41.22	908.08	41.34	908.04	41.72	907.95		
46	906.66	47.59	906.548	9.92001	906.375	0.29001	906.345	1.79001	906.27		
52.37	906.26	53.94	906.2	55	906.215	6.77002	906.225	8.42001	906.27		
60.82001	906.336	0.98001	906.336	1.08002	906.346	1.17999	906.34	62.34	906.33		
65.89001	906.31	66.22	906.296	8.60001	906.270	1.14999	906.157	2.20001	906.02		
73.08002	905.977	4.32001	905.947	4.51001	905.947	4.83002	905.927	7.45999	905.81		
78.35001	905.857	9.67999	905.938	0.80002	905.98	81.16	906.02	83.03	906.19		
85.42999	906.728	5.45999	906.728	5.92001	906.83	87.53	907.24	87.62	907.26		
88.16	907.34	88.25	907.338	8.70999	907.299	1.54001	907.139	2.39999	907.04		
95.70001	907.12	98.33	907.1	101.32	907.09	103.78	906.95	104.36	906.92		
105.64	906.85	106.87	906.75	107.28	906.74	107.66	906.74	108.21	906.73		
110.44	904.82	110.91	904.74	111.53	904.65	112.71	904.46	113.55	904.33		
115.18	904.07	118.01	903.62	120.01	903.31	121.16	903.12	121.94	903		
123.03	902.83	124.74	902.69	126.18	902.57	126.98	902.51	128.61	902.37		

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130.16	902.25	131.17	902.16	131.92	902.1	132.87	902.02	134.21	901.91
135.98	901.77	137.66	901.63	138.51	901.61	139.02	901.6	140.37	901.56
141.04	901.54	141.97	901.51	144	901.46	145.35	901.42	147.49	901.36
148.76	901.34	149.75	901.33	151.57	901.32	153.58	901.3	155.69	901.29
159.46	901.25	161.41	901.24	162.39	901.23	164.84	901.21	165.62	901.2
166.61	901.2	167.37	901.19	168.49	901.18	170.67	901.41	173.01	901.66
174.22	901.79	175.32	901.91	176.85	902.07	178.85	902.28	181.08	902.52
182.74	902.7	184.79	902.93	186.23	903.1	188.37	903.34	189.68	903.49
190.84	903.62	192.06	903.76	193.05	903.88	193.85	903.97	194.85	904.08
195.92	904.21	197.43	904.38	198.37	904.49	199.05	904.57	199.3	904.59
202.1	904.86	203.28	904.97	205.8	905.21	206.52	905.28	207.31	905.36
209.24	905.54	210.06	905.62	211.23	905.73	212.99	905.9	213.55	905.97
216.59	906.37	217.42	906.48	218.33	906.6	219.65	906.78	220.87	906.94
222	907.09	224	907.35	225.25	907.52	226.57	907.69	228.74	907.98
229.9	907.72	230.27	907.72	230.31	907.73	233.49	907.84	233.66	907.86
233.91	907.91	235.83	908.01	237.35	908.33	238.62	908.44	239.39	908.39
240.91	908.71	243.47	909.27	243.96	909.26	244.17	909.28	244.49	909.32
244.75	909.34	250.28	909.35	251.15	909.33	253.24	909.6	255.82	910.11
257.23	910.29	259.08	910.49	259.98	910.56	260.32	910.6	261.14	910.72
262.25	910.78	263.59	910.84	266.31	910.93	266.52	910.93	269.01	911.05
270.53	911.11	270.63	911.12	270.71	911.12	272.87	911.25	274.76	911.37
275.04	911.38	276.64	911.49	278.51	911.57	278.63	911.58	278.74	911.58
279.97	911.65	281.2	911.68	286.81	911.79	288.96	911.79	289.14	911.8
290.23	911.76	291.01	911.74	291.21	911.74	294.54	911.71	297.01	911.67
297.66	911.67	300.34	911.65	302.69	911.63	303.69	911.6	304.49	911.58
305.63	911.52	306.16	911.43	306.57	911.35	307.47	911.21	308.59	911.05
309.14	910.99	313.43	910.6	314.84	910.37	315.09	910.41	316.17	910.77
317.06	911.15	319.04	911.88	319.25	911.94	319.89	912.19	322.75	913.27
323.03	913.38	325.26	914.07	326.93	914.6	327.34	914.75	328.89	915.15
329.83	915.32	331.55	915.55	332.08	915.61	333.35	915.69	334.28	915.78
337.01	916.19	338.74	916.45	339.07	916.49	340.83	916.76	341	916.79
342.89	917.17	344.23	917.35	344.83	917.44	345.26	917.51	348.86	918.11
350.48	918.45	352.86	918.86	353.35	918.94	353.64	919.01	353.85	919.05

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1 131.92 .035 176.85 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 131.92 176.85 127.91 100.28 70.7 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 0 125 907.5 F  
 185 353.85 907.5 F

CROSS SECTION



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RIVER: Bluestone Creek  
 REACH: Align (1)

RS: 2258.53

INPUT

Description:

Station Elevation Data

num= 210

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	922.4	922.4799805	922.291	922.329987	922.032	922.429993	921.783	921.570007	921.54
5.910004	921.086	921.679993	920.936	920.880005	920.9210	920.23999	920.7	10.31	920.69
11.35001	920.6512	920.44998	920.58	15.72	920.2617	920.57001	920.118	920.67999	919.96
19.20999	919.920	920.25998	919.6822	919.51999	919.28	23.19	919.09	24.62	918.64
25.87	918.28	27.03	917.86	29.47	917.0230	917.32999	916.7131	916.98999	916.02
34.40999	914.88	36.25	914.0136	914.54999	913.87	37.39	913.48	39.23	911.93
41.40999	909.66	41.84	908.6542	908.76999	907.445	907.00999	904.9746	904.10999	904.29
48.43999	903.3449	903.17999	903.4250	903.18999	902.5351	902.20999	901.63	52.39	901.5
53.56999	901.37	56.84	901.458	901.48999	901.2260	901.31999	901.03	61.31	901.05
62.01999	901.07	63.73	901.1265	901.25999	901.2565	901.90999	901.3	67.03	901.39
68.56999	901.7469	901.29999	901.9170	901.10999	902.0972	902.39999	902.9373	902.46999	903.07
73.5	903.07	75.56	903.35	78.67	903.54	79.17	903.61	79.67	903.71
80.06	903.7381	903.71999	903.68	85.17	903.7187	903.10999	903.7389	903.98999	903.82
91.03	903.8791	903.43999	903.9	91.7	903.9393	903.18999	904.03	93.98	904.07
95.06999	904.11	96	904.1298	904.10999	904.2	98.34	904.2	98.5	904.21
99.09	904.23	100.73	904.27	102.08	904.29	103.41	904.26	107.01	904.34
107.07	904.34	108.92	904.29	109.69	904.25	111.65	904.14	113.64	904.09
114.15	904.07	114.68	904.03	115.86	903.97	116.78	903.88	117.28	903.83
117.74	903.81	121.82	903.94	122.02	903.98	123.37	904.17	124.41	904.32
124.9	904.36	125.25	904.41	127.96	904.87	129.72	904.94	130.4	904.95
131.59	904.94	132.26	904.95	132.46	904.91	138.43	904.48	138.83	904.41
139.66	904.3	143.71	903.89	144.12	903.89	145.97	903.79	148.14	903.98
148.33	903.99	148.54	904.01	148.79	904.03	151.37	904.18	153.26	904.11
155.2	904.1	156.41	904.13	157.73	904.13	159.56	904.23	160.22	904.26
160.86	904.3	162.12	904.36	163.02	904.38	166.41	904.69	166.52	904.7
166.59	904.71	166.64	904.71	170.35	905.06	172.11	905.29	173.24	905.43
173.91	905.53	174.39	905.63	176.64	905.89	177.13	905.96	177.33	905.99
177.41	906	177.64	906.1	185.01	909.46	185.02	909.47	189.26	910.6
189.5	910.62	192.43	910.78	194.99	910.89	195.14	910.9	198.18	911.23
199.03	911.31	200.67	911.45	203.19	911.58	203.8	911.6	205.49	911.66
208.56	911.81	209.64	911.84	209.71	911.84	212.68	911.99	213.65	912.02
215.12	912.04	217.17	912.09	218.9	912.12	219.83	912.11	220.23	912.13
221.56	912.19	222.98	912.19	223.51	912.18	223.98	912.18	226.75	912.16
229.33	912.14	230.44	912.12	231.98	912.06	233.49	912	235.14	911.95
237.17	911.79	238.11	911.76	239.41	911.67	242.2	911.48	243.47	911.21
243.64	911.18	243.79	911.14	247.62	910.57	249.81	910.95	252.4	911.84
252.61	911.93	254.18	912.51	254.89	912.77	255.63	913.07	256.63	913.41
257.69	913.75	259.48	914.6	259.7	914.72	259.86	914.77	263.1	915.76
264.45	915.96	265.55	916.18	268.94	916.79	269.19	916.83	269.33	916.85
270.51	916.99	271.67	917.23	272.44	917.37	274.96	917.77	276.24	917.98
278.69	918.35	281.4	918.76	281.97	918.86	284.12	919.21	284.39	919.25

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284.95 919.38 286.51 919.73 287.24 919.9 288.29 920.12 288.93 920.21

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .149.17999 .035 75.56 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 49.17999 75.56 61.13 59.37 57.75 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 2199.16

INPUT

Description:

Station Elevation Data num= 214

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	923.02	1300049	923.01	8399963	922.931	2799999	922.891	7799999	922.8
4.130005	922.455	699982	922.295	850006	922.276	669983	922.217	639984	922.12
10.09	921.96	10.37	921.93	11.72	921.761	3.17999	921.491	4.60999	921.29
15.60001	921.111	7.16998	920.891	9.50998	920.262	20.04999	920.142	20.32001	920.08
24.10001	918.99	24.84	918.82	7.53998	918.18	27.59	918.17	28.40999	917.94
29.09999	917.75	29.15999	917.74	30.59999	917.34	32.03	916.79	33.20999	916.31
33.87999	916.16	35.79999	915.48	37.20999	914.94	38.37999	914.46	39.62999	914.02
40.09999	913.84	43.87	912.58	44.03999	912.52	44.12	912.49	46.23999	911.33
46.31999	911.25	46.42999	911.11	47.53999	909.64	47.62	909.57	48.04999	908.9
49.14999	907.16	50.75999	905.54	51.37	905.22	52.01999	904.98	53.06999	904.48
54.17	904.27	54.98999	904.13	56.03	903.8	57.73	903.55	58.85999	903.33
61.53999	902.86	2.78999	900.57	65.12	899.79	67.82999	899.62	70.67	899.62
74.50999	899.58	78.09999	899.67	78.64999	900.09	79.37999	900.49	80.10999	900.89
80.98999	903.27	85.75	903.66	86.93999	903.66	87.78	903.6	88.42	903.58
90.31	903.52	90.75999	903.49	92.12999	903.37	93.23	903.28	94.71999	903.2
94.98999	903.29	6.71999	903.25	97.59999	903.28	100.49	903.35	100.75	903.34
100.91	903.35	102.3	903.42	102.77	903.45	104.32	903.45	105.92	903.44
106.42	903.43	107.74	903.38	108.79	903.33	109.08	903.32	110.42	903.28
112.31	903.19	113.08	903.16	114.02	903.19	116.28	903.22	118.86	903.34
121.84	903.45	122.44	903.5	123.69	903.6	125.18	903.75	128.07	903.79
130.43	903.86	132.7	903.9	134.45	903.83	135.19	903.8	135.4	903.79
138.76	903.63	140.13	903.7	140.69	903.73	141.17	903.76	142.08	903.8
143.06	903.83	144.47	903.82	146.91	903.89	148.45	903.85	149.1	903.83
150.22	903.79	152.06	903.78	153.03	903.79	155.27	903.99	156.29	904.09
157.02	904.18	157.18	904.2	159.9	904.52	162.06	904.71	164.95	904.98
166.06	905.05	167.7	905.12	168.24	905.11	169.91	905.12	170.91	905.23
172.07	905.37	173.96	905.73	174.83	905.86	176.63	905.98	176.67	905.98
177.84	906.07	178.63	906.11	179.28	906.14	180.93	906.6	183.7	907.56
184.02	907.75	184.77	908.23	185.1	908.45	186.23	909.22	186.59	909.45

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190.3	911.14	190.58	911.25	191.29	911.43	191.82	911.56	195.95	912.21
196.36	912.27	196.77	912.27	197.41	912.24	200.13	912.15	201.76	912.07
203.14	912.11	204.24	912.16	206.9	912.19	208.64	912.2	208.92	912.21
210.47	912.24	211.75	912.28	213.2	912.34	214.55	912.39	215.37	912.41
216.61	912.45	216.9	912.46	219.14	912.53	219.81	912.53	220.92	912.55
221.97	912.57	224.46	912.62	226.44	912.65	227.05	912.66	229.86	912.72
231.55	912.74	233.15	912.74	234.04	912.75	236.93	912.7	238.97	912.67
239.96	912.66	241.62	912.62	243.95	912.59	244.2	912.59	246.05	912.55
248.07	912.49	249.08	912.44	250.71	912.36	251.23	912.3	252.79	912.08
253.68	911.98	254.24	911.92	254.52	911.83	256.35	911.45	257.36	911.24
258.13	911.08	259.61	911.46	260.47	911.7	262.56	912.61	263.71	913.12
266.68	914.4	267.03	914.55	267.26	914.67	268.72	915.21	268.94	915.3
271.33	915.93	274.87	917.64	275.76	917.95	277.61	918.48	278.15	918.58
279.57	918.85	280.29	919	283.3	919.63	283.68	919.71		

Manning's n Values num= 3  
 Sta n Val Sta n Val  
 0 .161.53999 .03580.98999 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 61.5399980.98999 51.96 51.96 51.96 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 2147.2

INPUT

Description:

Station Elevation Data num= 212

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	919.46	.0499	919.44	2.47998	918.865	3.29987	918.255	6.66983	918.17
6.469971	917.99	8.48999	917.55	10.35999	917.17	10.5	917.15	10.59998	917.11
12.23999	916.51	13.64999	916.06	15.44998	915.41	16.43997	915.23	19.23999	914.09
20.35999	913.62	21.90997	913.24	23.78998	912.51	23.81998	912.51	23.88998	912.48
24.41998	912.22	25.59999	911.66	25.90999	911.55	27.92999	910.97	30.06999	910.06
31.16998	909.72	31.92999	909.52	35.75998	908.21	37.30998	907.63	37.63998	907.59
38.55998	907.45	39.07999	907.37	39.67999	907.17	42.64998	905.61	42.71999	905.57
42.83998	905.51	45.49998	904.07	46.73999	903.54	47.09999	903.37	48.97998	902.99
50.67999	902.85	52.13998	902.92	52.79999	902.94	53.29999	902.93	53.41998	902.94
53.86998	902.97	56.31999	903.15	56.93999	903.03	56.94998	903.03	56.02998	903.14
64.86998	903.15	67.93999	903.15	69.16998	903.13	71.49998	903.25	71.82999	903.28
73.49998	903.47	74.27998	903.57	76.72998	903.58	76.77998	903.58	78.53998	903.44
79.14998	903.48	80.94998	903.26	81.74998	903.25	82.21999	903.25	83.28998	903.23
84.63998	903.15	87.74998	903.12	89.42999	903.08	89.104999	902.75	89.69998	902.66
93.28998	902.55	95.48999	901.81	96.53998	901.64	98.33998	899.93	99.81999	899.16
105.58	899.25	108.29	899.32	110.48	899.61	112.68	899.9	115.31	900.3

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115.97	901.51	116.64	902.73	119.16	903.11	119.66	903.21	121.15	903.04
121.53	903.04	121.97	903.05	125.05	903.07	126.9	903.02	127.48	903.02
128.4	903.06	129.66	903.07	130.67	903.12	131.57	903.16	133.32	903.22
134.58	903.29	136.4	903.31	138.2	903.36	138.95	903.29	139.79	903.25
140.97	903.24	142.21	903.29	143.43	903.44	144.63	903.52	145.04	903.53
145.62	903.5	146.46	903.43	146.63	903.45	146.92	903.47	147.6	903.53
150.86	903.71	151.98	903.81	153.43	903.92	154.53	903.99	155.72	904.06
156.42	904.11	160.11	904.64	160.18	904.65	160.24	904.66	160.34	904.67
163.04	904.88	164.94	905.11	166.71	905.5	168.73	905.89	170.47	906.2
170.63	906.23	170.78	906.28	172.44	906.75	174.81	907.11	176.5	907.35
179.59	907.47	180.96	907.5	181.64	907.48	183.02	907.63	184.13	907.7
184.98	907.87	188.66	909.84	188.8	909.94	188.86	909.97	189.55	910.31
190.42	910.74	190.57	910.81	191.31	911.22	195.09	912.55	195.72	912.81
196.46	913.07	197.06	913.14	197.7	913.21	198.26	913.26	198.8	913.3
199.41	913.31	203.69	913.36	203.88	913.36	205.39	913.34	205.84	913.32
207.84	913.32	209.25	913.25	211.15	913.22	213.35	913.22	213.56	913.21
213.78	913.21	214.12	913.19	215.45	913.14	218.65	912.99	219.54	912.95
221.51	913	223.36	913.09	223.7	913.11	223.97	913.14	225.81	913.37
226.16	913.41	226.95	913.46	228.27	913.54	228.53	913.55	231.31	913.61
231.71	913.62	232.93	913.67	234.91	913.75	236.42	913.75	237.93	913.76
238.39	913.76	239.57	913.77	241.37	913.72	241.91	913.71	242.13	913.7
243.89	913.68	245.6	913.59	247.4	913.42	247.51	913.41	248.87	913.33
252.84	913.12	253.94	913	254.63	912.92	255.14	912.81	256.21	912.55
258.06	912.64	261.46	912.92	262.99	913.75	263.89	914.22	265.03	914.78
266.47	915.51	267.28	915.93	268.83	916.75	269.26	916.97	270.07	917.29
273.43	918.62	273.54	918.66	276.59	919.62	276.96	919.75	277.21	919.83
280.27	920.83	280.36	920.85						

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .193.28998 .035 116.64 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 93.28998 116.64 106.46 108.38 111.4 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 2038.82

INPUT

Description:

Station Elevation Data num= 284  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev  
 0 920.23 1.97998 919.783.569977 919.573.949982 919.484.199982 919.44  
 6.849976 918.867.910004 918.618.809998 918.369.940002 918.06 10.88 917.77  
 14.56 916.63 15.22 916.4417.89999 915.5821.29999 913.72 22.69 912.95

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22.87	912.8723.03998	912.83	23.31	912.67	23.5	912.56	25.31	911.64	
25.5	911.53	26.06	911.16	27.16	910.4628.03998	909.93	28.62	909.57	
29.23999	909.1730.01999	908.6930.60999	908.3931.49998	907.96	32.95	907.24			
33.27998	907.0733.39999	907.0235.25999	906.1635.66998	906.0237.39999		905.51			
37.65999	905.4538.35999	905.339.95999	905.01	41.06	904.5242.16998	903.93			
43.15999	903.3843.62999	903.1144.00999	902.9245.63998	902.0846.74998		901.78			
47.88998	901.5848.99998	901.5449.35999	901.5350.81999	901.3951.07999		901.37			
51.31999	901.3552.06999	901.353.41998	901.1353.88998	901.1656.29999		901.21			
57.89999	901.2158.20999	901.2358.57999	901.360.68999	901.4661.48999		901.52			
63.41998	901.5264.51999	901.5165.00999	901.51	66.2	901.5366.87999	901.54			
67.06	901.5569.26999	901.66	69.81	901.6969.88998	901.6970.40999	901.7			
72.66998	901.76	72.87	901.7675.02998	901.777.35999	901.7	78.7	901.72		
79.21999	901.7580.73999	901.8181.26999	901.8383.41998	901.96	83.95	901.98			
84.50999	901.99	86.62	901.9787.24998	901.9389.12999	901.989.46999	901.9			
89.89999	901.9291.59999	902.0192.96999	901.9994.49998	901.99	95.81	901.94			
96.62999	901.9197.17999	901.8998.25999	901.9599.41998	902.1199.98999		902.17			
100.38	902.23	102.02	902.46	103.23	902.58	104.3	902.68	105.87	902.79
106.18	902.8	107.09	902.83	108.23	902.86	108.53	902.87	110.59	902.94
110.83	902.95	111.08	902.96	113.12	903.12	113.49	903.15	115.08	903.26
115.58	903.29	117.99	903.29	119.91	903.23	120.35	903.22	120.86	903.21
122.74	903.14	123.27	903.12	124.27	903.14	125.28	903.16	127.09	903.21
127.18	903.2	127.76	903.21	129.33	903.21	131.02	903.2	131.4	903.19
132.82	903.11	134.63	902.92	135.28	902.82	135.72	902.72	137.34	902.35
137.84	902.25	139.55	901.98	139.92	901.94	140.25	901.91	142.08	901.77
142.17	901.76	143.37	901.65	144.16	901.54	145.09	901.42	145.81	901.27
147.79	900.87	148.3	900.64	148.65	900.51	150.28	899.92	151.7	899.58
152.2	899.65	152.98	899.18	153.76	898.71	154.6	898.45	155.43	898.19
156.4	898.24	157.38	898.28	159.02	898.38	159.47	898.4	160.66	898.47
161.4	898.56	162.11	898.64	163.56	898.8	165.11	899.07	166.67	899.33
167.89	901.18	168.41	901.96	168.8	902.55	169.11	903.02	172.46	904
172.81	904.28	173.45	904.44	174.14	904.41	174.93	904.38	175.5	904.42
176.58	904.53	177.7	904.84	178.46	905.04	180.3	905.68	180.38	905.71
180.5	905.75	182.19	906.29	183.37	906.68	184.01	906.9	185.88	907.66
186.08	907.74	186.15	907.77	188.09	908.58	189.08	908.98	190.04	909.35
191.25	909.87	192.04	910.24	192.45	910.52	193.53	911.2	194.13	911.59
196.09	913.02	196.6	913.38	197.82	914.19	200.56	915.06	201.22	915.3
201.37	915.32	203.4	915.39	203.81	915.38	204.71	915.39	205.7	915.42
206.11	915.44	207.4	915.47	208.81	915.51	209.37	915.51	211.11	915.49
211.44	915.49	212.87	915.51	213.66	915.53	213.82	915.53	216.13	915.54
216.27	915.54	216.5	915.55	218.8	915.58	220.16	915.63	220.38	915.63
221.87	915.67	222.22	915.68	224.02	915.78	225.41	915.92	226.19	916.05
226.9	916.19	227.92	916.42	228.33	916.51	229.36	916.72	229.82	916.82
230.77	916.98	231.21	917.06	232.82	917.32	233	917.35	234.36	917.5
235.97	917.64	236.11	917.66	236.37	917.69	237.8	917.89	238.29	917.98
239.73	918.28	240.2	918.38	240.74	918.5	242.13	918.76	243.08	918.89
244.1	918.99	245.36	919.08	246.26	919.14	247.88	919.28	248.52	919.33
249.46	919.39	250.6	919.49	251.54	919.54	252.72	919.62	254.49	919.78
254.93	919.82	257.02	920.02	257.12	920.03	257.78	920.08	259.4	920.23

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259.59	920.24	260.02	920.27	261.58	920.39	262.63	920.46	263.41	920.51
264.39	920.58	265.38	920.65	265.95	920.7	267.47	920.85	268.43	920.95
268.99	921.01	270.38	921.15	271.07	921.23	272.31	921.35	273.9	921.54
274.33	921.59	274.93	921.65	276.35	921.83	277	921.89	278.58	922.07
278.66	922.08	278.73	922.09	280.29	922.27	281.24	922.41	283.68	922.71
284.03	922.75	285.78	922.9	286.07	922.92	286.24	922.94		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	147.79	.035	167.89	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	147.79	167.89		146.84	146.84		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 1891.98

INPUT

Description:

Station Elevation Data num= 361

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	910.381	559998	910.052	119995	909.912	869995	909.744	199982	909.42
4.919983	909.286	039978	908.997	009979	908.768	069977	908.498	139984	908.47
9.23999	908.161	026999	907.921	144998	907.551	221997	907.321	410999	906.77
14.25	906.731	653998	906.11	16.59	906.1	16.78	906.05	18.53	905.56
18.84998	905.48	20.5	905.07	20.87	904.982	096997	904.952	282999	904.52
23.62	904.342	497998	904.06	26.12	903.842	617999	903.832	729999	903.68
28.28998	903.552	943997	903.433	013998	903.373	179999	903.273	181998	903.26
33.5	903.133	451999	902.983	53998	902.833	679999	902.653	722998	902.58
38.38998	902.363	891998	902.263	919998	902.214	063998	901.964	240997	901.58
42.51999	901.55	42.56	901.554	482999	901.254	494998	901.23	45.06	901.22
45.51999	901.134	690997	900.884	737997	900.814	875998	900.68	49.87	900.63
50.64999	900.575	164999	900.475	284998	900.415	343997	900.375	531998	900.27
55.51999	900.265	576999	900.25	57.5	900.165	838998	900.13	59.56	900.1
60.28	900.06	61.28	900.026	226999	899.996	289999	899.976	417999	899.9
64.84	899.876	57999	899.846	603998	899.836	685999	899.786	790997	899.76
68.73999	899.746	971997	899.771	919998	899.61	72.03	899.672	07999	899.6
73.90997	899.45	74.53	899.474	54999	899.4	76.87	899.287	72999	899.25
78.78	899.167	97999	899.180	06998	899.078	195999	898.898	257999	898.83
82.69998	898.828	485999	898.638	612997	898.698	672998	898.728	745999	898.77
88.22998	898.828	865999	898.848	974998	898.859	139998	898.689	160999	898.66
92.14998	898.739	307999	898.179	375998	897.769	400998	897.619	610999	896.99
97.04999	896.729	820999	896.389	922998	896.5	100.24	896.62	102.46	897.14
104.68	897.66	104.85	898.94	106.41	899.05	106.86	899.17	108.04	899.33
109.08	899.47	109.56	899.52	110.83	899.61	112.33	899.84	112.58	899.87

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113.19	899.93	114.47	900.06	114.88	900.1	116.45	900.19	116.97	900.21
117.53	900.22	119.75	900.28	119.92	900.27	120.28	900.25	121.94	900.32
122.21	900.33	122.31	900.34	123.83	900.53	125.39	900.69	125.47	900.7
125.62	900.72	126.96	900.9	127.64	901.08	128.65	901.33	129.26	901.52
129.57	901.61	130.96	902.09	131.35	902.16	132.82	902.42	133.87	902.56
134.38	902.61	136.01	902.67	136.55	902.72	139.04	903.12	139.29	903.16
139.34	903.16	139.44	903.2	141.59	904.14	141.64	904.17	141.9	904.31
143.22	905	143.49	905.16	144.88	905.85	145.29	906.07	146.09	906.48
146.98	906.93	147.98	907.46	148.64	907.82	149.2	908.12	150.55	908.87
153.39	909.51	153.6	909.55	153.69	909.56	155.81	909.65	155.83	909.66
156.02	909.68	157.67	909.84	158.52	909.92	159	909.96	160.88	910.13
160.94	910.13	161	910.14	162.87	910.2	163.85	910.24	164.78	910.27
166.25	910.31	167	910.33	167.43	910.35	169.33	910.43	169.76	910.44
171.71	910.5	172.12	910.51	173.98	910.6	174.18	910.6	175.8	910.65
176	910.65	177.68	910.72	178.79	910.76	179.66	910.8	180.39	910.82
181.4	910.84	182.41	910.93	183.19	910.99	185.13	911.15	185.69	911.18
186.8	911.22	187.9	911.27	188.66	911.3	189.78	911.34	191.12	911.4
191.57	911.42	191.94	911.44	193.46	911.52	194.64	911.61	195.84	911.66
197.77	911.8	198.14	911.83	198.41	911.84	200.54	911.96	200.87	911.98
202.07	912.04	202.35	912.06	203.92	912.16	205.54	912.26	206.2	912.31
206.45	912.32	208.35	912.07	210.32	912.24	210.98	912.09	212.17	911.99
214.11	911.87	215.15	911.55	216.07	911.27	216.52	911.11	217.68	910.69
218.8	910.28	219.41	910.08	219.65	910.01	223.07	909.16	223.08	909.15
223.09	909.15	223.19	909.17	226.77	909.71	227.05	909.79	227.24	909.89
227.92	910.06	228.8	910.27	229.37	910.35	230.4	910.47	231.03	910.43
232.05	910.39	233.74	910.15	233.87	910.14	233.98	910.14	236.04	910.08
237.46	910.21	238.35	910.35	239.85	910.68	240.23	910.75	240.77	910.87
241.98	911.13	242.39	911.22	243.82	911.43	245.28	911.64	245.89	911.73
246.12	911.76	246.6	911.83	248.36	912.14	249.65	912.24	250.24	912.3
251.09	912.46	252.18	912.66	252.93	912.83	254	913.07	255.21	913.3
255.93	913.43	256.45	913.51	258.14	913.79	259.24	913.91	259.83	913.99
261.2	914.2	261.99	914.3	263.25	914.44	264.2	914.55	265.08	914.65
265.9	914.74	267.35	914.92	267.83	914.99	268.11	915.03	270.15	915.2
270.56	915.27	271.48	915.39	272.26	915.5	274.03	915.78	274.05	915.78
276.03	916.09	276.51	916.15	277.82	916.32	278.69	916.45	279.83	916.62
281.11	916.81	282.27	916.96	283.45	917.07	284.45	917.18	286.24	917.42
286.27	917.42	286.3	917.43	288.1	917.57	289.68	917.68	290.47	917.73
291.21	917.79	292.98	917.99	293.99	918.08	294.65	918.15	296.04	918.28
296.6	918.33	297.09	918.36	298.96	918.45	299.24	918.48	299.98	918.55
300.94	918.62	302.27	918.77	302.5	918.8	302.67	918.81	304.45	918.9
304.99	918.88	305.58	918.89	307.49	918.94	307.78	918.94	309.12	918.97
310.05	918.99	310.55	919	311.01	919.01	312.05	919.04	313.08	919.05
313.77	919.07	315	919.11	315.91	919.15	316.26	919.18	318.69	919.32
318.9	919.34	319.36	919.37	321.09	919.49	321.94	919.54	322.83	919.64
324.29	919.79	324.84	919.85	325.48	919.91	326.51	920.02	327.53	920.12
328.09	920.19	329.88	920.35	330.02	920.36	330.07	920.37	332.03	920.55
332.56	920.6	334.29	920.8	334.9	920.87	336.11	920.99	336.57	921.03
336.83	921.06	339.02	921.36	339.78	921.44	341.62	921.74	342.23	921.78

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343.36 922

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .192.14998 .035 104.85 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 92.14998 104.85 55.57 55.57 55.57 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 1836.41

INPUT

Description:

Station Elevation Data num= 410

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	911.39	1	911.362.049988	911.322.449982	911.264.519989	911.03			
5.019989	910.985.130005	910.957.029999	910.467.470001	910.378.899994	910.13				
9.589996	9109.850006	909.9511.44998	909.6212.44998	909.4313.32999	909.28				
14.12	909.0715.75998	908.4716.25998	908.316.41998	908.2418.19998	907.63				
19.31	907.420.07999	907.2821.50998	907.1623.29999	906.78 23.72	906.65				
24.22998	906.49 25.31	906.12 26.97	905.46 27.12	905.4129.50998	904.52				
29.91	904.39 30.75	904.1532.14999	903.78 32.94	903.5834.10999	903.36				
35.45999	903.1536.01999	903.136.57999	903.0337.95999	902.8 39	902.73				
39.92999	902.6741.03998	902.6641.82999	902.6542.69998	902.6144.17999	902.48				
44.26999	902.47 45.94	902.34 46.62	902.2947.91998	902.2248.50998	902.18				
49.75	902.16 50.81	902.0951.23999	902.06 52.88	901.9653.28998	901.94				
55.01999	901.8355.60001	901.7956.97998	901.757.64999	901.6658.85999	901.57				
59.56	901.53 60.84	901.51 61.66	901.4962.29999	901.5 63.59	901.51				
65.03	901.4965.32999	901.4865.82999	901.45 66.88	901.3867.20999	901.34				
68.98999	901.2969.22998	901.28 70.63	901.2271.13998	901.271.20999	901.19				
71.66998	901.17 73.25	901.173.50998	901.09 74.12	901.07 75.69	901.02				
77.75	901.02 77.97	901.03 80.19	901.08 80.37	901.0882.25998	901.04				
82.53998	901.0584.20999	901.06 84.78	901.06 86.63	901.1386.94998	901.14				
88.56	901.14 89.81	901.17 90.81	901.2 91.44	901.293.76999	901.21				
94.04999	901.2194.28998	901.296.57999	901.296.73999	901.2198.92999	901.19				
99.16998	901.1999.66998	901.18 101.1	901.15 102.99	901.14 103.03	901.14				
105.05	901.13 106.06	901.11 107.31	901.08 108.24	901.01 109.46	900.97				
110.32	900.92 111.75	900.83 112.86	900.7 113.55	900.58 114.5	900.37				
115.17	900.15 116.42	899.8 117.05	899.64 118.3	899.38 119.68	899.35				
120.45	899.36 121.3	899.38 122.14	899.41 123.12	899.44 123.96	899.47				
125.12	899.49 125.67	899.5 126.16	899.51 127.66	899.56 130.47	899.56				
131.68	899.58 132.41	899.56 133.61	899.51 134.27	899.49 135.17	899.47				
136.27	899.5 137.54	899.5 138.76	899.49 139.75	899.5 141.07	899.56				
141.55	899.58 142.97	899.65 143.88	899.66 145.63	899.68 145.89	899.67				



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146.36	899.68	147.76	899.72	148.53	899.71	150.01	899.72	151.22	899.75
152	899.74	153.04	899.68	153.62	899.66	154.08	899.62	155.06	899.55
156.2	899.44	156.98	899.41	158.43	899.31	159.28	899.29	160.95	899.17
161.77	899.1	162.94	898.98	163.92	898.85	164.71	898.79	165.76	898.67
166.77	898.54	167.21	898.49	168.34	898.37	169.04	898.25	169.86	898.18
170.9	898.11	171.9	898.07	173.3	898.01	173.52	898	174.08	897.92
175.61	898.03	176.1	897.84	176.34	897.75	176.72	897.6	177.23	897.4
178.08	897.06	178.84	896.76	181.78	896.22	182.41	896.23	183.04	896.25
183.64	896.9	184.27	897.58	184.76	898.11	185.51	898.91	186.37	898.77
186.61	899	186.86	899.15	188.1	899.48	189.94	900.06	190.33	900.09
191.28	900.23	191.65	900.27	191.95	900.32	193.58	900.62	195.42	901.32
195.67	901.41	196.04	901.64	197.53	902.62	198.37	903.25	199.29	903.99
200.2	904.68	200.63	905.04	201	905.32	201.57	905.75	201.83	905.92
202.75	906.45	204.11	906.67	207	907.3	207.35	907.4	207.5	907.41
208.67	907.46	209.7	907.5	210.19	907.52	210.9	907.53	211.93	907.55
212.56	907.55	213.7	907.56	214.18	907.57	214.43	907.57	215.55	907.59
216.49	907.62	217.41	907.65	218.55	907.68	219.17	907.69	221.67	907.69
223.71	907.71	223.99	907.72	225.83	907.72	226.74	907.74	227.24	907.73
228.94	907.73	229.19	907.72	231.18	907.68	231.65	907.68	232.25	907.69
233.77	907.68	234.72	907.69	235.5	907.69	236.35	907.67	237.67	907.68
238.74	907.51	241.41	907.16	241.65	907.05	242.43	906.71	243.41	906.3
244.05	906.02	244.45	905.85	245.38	905.46	245.5	905.41	246.08	905.19
247.23	904.76	247.44	904.69	249.69	903.81	249.83	903.77	250.5	903.65
252.23	903.33	253.34	903.26	254.59	903.28	255.07	903.28	256.41	903.18
257.3	903.12	258.03	903.06	259.49	902.99	260.07	902.96	260.32	902.96
262.19	902.94	262.2	902.94	263.6	903.01	264.96	903.07	265.54	903.08
266.13	903.1	267.82	903.09	269.84	903.16	269.9	903.16	271.89	903.29
273.31	903.28	273.7	903.28	274.61	903.27	275.48	903.26	275.74	903.27
277.67	903.28	278.32	903.31	280.51	903.39	280.62	903.4	281.05	903.45
282.66	903.65	283.13	903.72	284.45	903.96	285.51	904.16	286.05	904.27
287.68	904.52	288.11	904.6	289.84	904.78	290.22	904.83	291.1	904.89
291.77	904.94	292.14	904.97	293.41	905.09	294.78	905.27	295.18	905.32
297.42	905.67	297.52	905.68	297.69	905.71	299.6	905.99	300.86	906.11
302.12	906.31	303.4	906.47	304.36	906.58	305.48	906.71	306.09	906.8
307.39	906.94	307.93	906.99	308.23	907.03	309.98	907.22	311.9	907.58
312.15	907.62	312.34	907.67	314.1	908.14	315.12	908.45	315.75	908.62
316.55	908.76	317.88	908.97	318.58	909.12	320.3	909.37	321.54	909.56
322.12	909.64	322.59	909.74	324.17	910.1	325.8	910.5	326.45	910.62
327.9	910.96	328.69	911.13	329.05	911.17	330.96	911.38	331.3	911.41
332.35	911.51	333.56	911.68	333.98	911.73	334.46	911.81	335.81	912.08
337.09	912.39	338.2	912.66	339.58	912.97	340.14	913.08	340.5	913.18
342.05	913.42	343.18	913.63	344.01	913.75	345.42	914.05	346.01	914.16
346.37	914.23	348.22	914.56	349.89	914.97	350.55	915.11	350.91	915.18
352.02	915.36	352.98	915.51	353.93	915.66	354.75	915.78	355.22	915.88
356.77	916.2	357.84	916.44	359.31	916.75	360.04	916.86	360.66	916.98
362.13	917.25	362.59	917.34	362.8	917.39	364.37	917.69	365.21	917.92
366.39	918.11	367.86	918.31	368.56	918.4	370.41	918.58	370.66	918.6
370.73	918.62	371.16	918.71	372.77	919.02	373.08	919.07	374.78	919.31

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375.42	919.36	376.41	919.44	377.2	919.54	378.35	919.72	379	919.84
380.14	920.04	381.91	920.34	382.2	920.4	382.43	920.44	384.55	920.84
385.15	920.97	387.16	921.33	387.41	921.39	388.94	921.79	389.24	921.87
390.29	922.14	391.47	922.34	392.28	922.48	393.7	922.66	394.37	922.73
394.79	922.77	396.31	922.9	397.84	923.02	398.17	923.05	398.18	923.06

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	175.61	.035	184.76	.1

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	175.61	184.76		51.9	51.9	51.9		.1	.3
Ineffective Flow			num=	1					
Sta L	Sta R	Elev	Permanent						
237.67	398.18	915	F						

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 1784.51

INPUT

Description:

Station Elevation Data num= 379

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	913.49	3300171	913.321	420013	912.81	730011	912.622	899994	911.94
3.860016	911.394	830017	910.897	110016	909.797	230011	909.747	339996	909.69
9.540009	908.661	024002	908.311	130002	907.781	254001	907.191	308002	906.95
13.64999	906.73	15.12	906.151	689001	905.55	17.38	905.39	17.81	905.26
19.67001	904.62	20.59	904.362	182001	904.01	23.16	903.72	23.97	903.51
25.16	903.11	25.53	902.97	27	902.4	27.37	902.31	28.98001	901.97
29.63	901.86	30.59	901.73	31.52002	901.65	33.27002	901.59	33.62	901.56
33.89001	901.55	35.03	901.63	35.99002	901.66	37.02002	901.69	37.98001	901.72
38.21002	901.72	39.07001	901.67	40.31	901.59	44.80002	901.57	44.29001	901.56
43.66	901.54	44	901.53	45.55002	901.44	49.95001	901.42	46.03	901.42
48.08002	901.34	48.62	901.34	50.04001	901.36	51.20001	901.37	52.24002	901.38
53.75	901.38	55.30002	901.33	55.67001	901.31	56.23001	901.28	57.70001	901.2
59.24002	901.19	62.81	901.19	64.31	901.18	64.82001	901.17	66.36002	901.15
66.62	901.14	68.06	901.12	68.44	901.12	69.60001	901.09	70.02002	901.08
70.71002	901.05	72.30002	901	74.09	900.97	74.61002	900.96	76.61002	900.96
77.54001	900.95	78.20001	900.95	79.38	900.96	80.39999	900.96	81.77002	900.94
83.38	900.93	84.05002	900.92	85.12	900.92	85.87	900.93	86.57001	900.94
86.94	900.94	88.86002	900.89	89.23001	900.87	90.92999	900.79	91.14999	900.78
91.94	900.76	92.87	900.73	93.14001	900.73	94.74002	900.68	95.67001	900.67
96.66	900.79	98.14001	900.68	98.36002	900.68	99.86002	900.65	100.6	900.63
101.94	900.56	103.42	900.41	103.97	900.34	105.17	900.11	105.89	900
106.2	899.95	107.65	899.74	108.44	899.62	109.44	899.42	111.07	899.16

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111.53	899.12	111.89	899.09	113.92	899	114.49	899	115.79	899.02
115.82	899.02	117.07	899.01	119.08	899.06	119.12	899.06	119.16	899.07
121.4	899.1	123.01	899.08	123.52	899.08	123.83	899.1	125.87	899.21
126.34	899.22	127.99	899.29	128.72	899.27	128.79	899.27	130.12	899.24
132	899.15	132.16	899.15	132.34	899.14	134.92	899.14	136.11	899.13
137.91	899.04	138.09	899.03	138.56	899.02	139.89	898.96	140.68	898.95
141.87	898.95	142.46	898.93	143.89	898.88	144.15	898.87	144.87	898.85
145.89	898.83	146.06	898.83	148.08	898.84	148.75	898.83	150.42	898.85
150.85	898.84	153.04	898.87	153.36	898.87	154.1	898.86	155.54	898.84
156.14	898.82	157.41	898.74	158.1	898.66	158.69	898.6	160.07	898.45
160.66	898.41	161.28	898.46	162.31	898.52	163.11	898.61	163.76	898.67
164.96	898.72	165.9	898.75	166.68	898.71	168.15	898.64	169.64	898.64
170.88	898.6	173.69	898.33	173.75	898.32	173.78	898.31	173.84	898.29
175.38	897.66	176.02	897.38	176.48	897.14	176.88	897.15	178.45	896.96
179.55	896.84	180.59	896.72	181.27	896.64	182.08	896.54	182.83	896.46
183.68	896.36	183.93	896.33	184.31	896.29	186.36	896.15	186.92	896.09
188.41	895.98	188.93	896.09	189.63	896.24	189.92	896.3	191.44	896.61
192.01	897.56	192.18	897.83	193.28	899.62	195.06	899.71	197.77	899.65
198.1	899.65	198.17	899.64	199.47	899.47	200.17	899.36	201.08	899.25
201.49	899.21	202.49	899.15	202.93	899.17	204.24	899.27	204.45	899.29
205.21	899.47	206.3	899.73	206.55	899.82	207.7	900.22	208.09	900.36
208.78	900.64	209.82	901	210.56	901.3	212.39	901.6	213.89	901.72
214.8	901.73	215.31	901.73	216.37	901.8	217.5	901.91	217.6	901.92
218.91	902.02	218.95	902.02	219.03	902.03	220.7	902.09	221.43	902.11
224.33	902.11	225.97	902.13	227.09	902.17	227.55	902.21	229.29	902.33
229.53	902.35	229.83	902.35	231.64	902.33	232.62	902.33	234.1	902.35
234.79	902.39	235.89	902.45	236.42	902.5	237.29	902.59	237.54	902.61
238.6	902.65	239.72	902.7	239.98	902.7	241.97	902.75	242.28	902.76
242.75	902.77	243.93	902.78	244.77	902.8	245.85	902.85	246.72	902.88
247.46	902.92	248.81	902.9	249.4	902.9	249.57	902.88	250.19	902.81
251.6	902.69	252.93	902.31	253.9	901.99	254.66	901.65	255.41	901.27
256.36	900.95	258.04	900.51	258.67	900.48	259.48	900.42	260.03	900.4
260.54	900.39	260.81	900.39	262.11	900.42	263.45	900.48	263.63	900.48
265.26	900.5	267.3	900.5	268.78	900.51	269.03	900.51	270.81	900.49
271.5	900.51	273.4	900.59	273.93	900.6	276.42	900.6	277.53	900.59
277.97	900.59	278.97	900.54	279.9	900.49	281.47	900.43	281.76	900.42
281.86	900.42	283.98	900.46	284.6	900.45	285.67	900.46	286.65	900.45
287.37	900.45	288.59	900.46	289.59	900.52	290.77	900.56	291.29	900.6
292.42	900.68	293.81	900.75	294.16	900.77	294.46	900.78	296.07	900.82
297.62	900.84	299.68	900.84	300.45	900.82	301.59	900.81	302.48	900.84
303.53	900.85	304.53	900.87	305.77	900.88	306.19	900.86	307.27	900.83
308.15	900.8	310.12	900.74	310.25	900.73	310.39	900.74	312.2	900.77
313.37	900.86	314.54	900.97	315.92	901.16	316.53	901.24	317.14	901.29
318.58	901.42	320.05	901.52	320.59	901.56	321.05	901.6	322.79	901.74
323.89	901.84	325.05	901.91	326.82	902.06	327.08	902.08	327.28	902.1
328.96	902.31	330.16	902.46	331.05	902.59	332.44	902.77	333.16	902.87
334.64	903.05	335.7	903.23	336.71	903.4	338.11	903.61	338.38	903.64
339.92	903.96	340.42	904.06	342.1	904.49	342.75	904.66	344.21	904.94

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345.6	905.22	346.4	905.37	346.8	905.44	347.82	905.64	349.14	905.92
349.6	906.03	351.16	906.41	351.23	906.42	351.32	906.46	352.83	907.01
353.94	907.4	354.51	907.57	355.54	907.88	356.29	908.07	356.61	908.15
358.19	908.54	358.61	908.65	359.93	908.95	361.35	909.28	361.59	909.33
363.33	909.69	363.74	909.8	365.87	910.41	365.92	910.42	367.87	910.96
367.95	910.98	369.7	911.37	370.71	911.62	372.07	912		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	175.38	.035	192.18	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	175.38	192.18		145.4	105.03		.1	.3
Ineffective Flow			num=	1				
Sta L	Sta R	Elev	Permanent					
248.81	372.07	910	F					

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 1679.48

INPUT

Description:

Station Elevation Data num= 481

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	904.861	690002	904.562	549988	904.468	429993	901.989	589996	901.43
10.20999	901.4314	47998	901.0718	48999	902.65	18.81	902.7118	98999	902.7
19.17999	902.78	20.84	902.924	95999	903.13	26.13	903.0927	44998	902.97
27.91	902.7628	03998	903.01	28.25	902.94	28.66	902.9	29.12	902.76
29.53	902.7829	89999	902.6330	28998	902.7130	56998	902.6331	28998	902.76
31.34998	902.7731	42999	902.78	32.87	902.7133	28998	902.68	33.62	902.66
34.79999	902.5836	34998	902.5436	47998	902.53	37.12	902.5138	69998	902.42
38.94	902.41	39.5	902.3840	32999	902.3140	70999	902.29	41.91	902.19
43.09998	901.9245	07999	901.6245	67999	901.5247	20999	901.09	47.25	901.08
47.31	901.07	48.53	900.74	49.22	900.6450	98999	900.73	53.72	900.75
55.34	901.1456	81998	901.5157	92999	901.63	59.44	901.759	59998	901.72
61.78	902.08	62.41	902.1563	16998	902.1567	26999	902.9267	42999	902.92
68.04999	902.9	68.84	902.8869	19998	902.8670	07999	902.8270	75998	902.8
71.73999	902.7772	45999	902.7673	66998	902.71	75.56	902.66	75.62	902.66
75.66998	902.6577	28998	902.6979	01999	902.69	79.31	902.68	81.06	902.63
82.13	902.62	82.97	902.684	56998	902.5285	16998	902.4786	67999	902.35
87.60999	902.3489	03998	902.36	89.53	902.4390	00998	902.591	48999	902.82
93.03	903.4393	89999	903.7294	67999	903.9497	07999	90599	25998	905.59
100.84	905.86	102.23	906.17	104.99	906.49	106.5	906.47	108.33	906.6
109.3	906.47	110.46	906.47	110.98	906.44	111.45	906.4	112.79	906.41
113.69	906.39	114.97	906.49	115.35	906.42	115.52	906.47	115.85	906.37

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117.1	906.48	118.34	906.17	119.98	906.39	122.04	906.87	123.66	906.91
124.37	906.92	125.59	906.68	126	906.6	126.2	906.56	127.32	906.3
128.1	906.16	129.25	906	130.3	905.97	131.25	906.06	132.55	906.07
133.76	906.11	134.33	906.12	134.9	906.12	136.4	906.2	137.85	906.29
139.7	906.48	139.99	906.52	140.41	906.57	141	906.64	141.49	906.66
143.42	906.8	143.71	906.83	143.79	906.84	145.71	907.1	146.87	907.28
147.75	907.44	148.55	907.59	149.78	907.8	151.49	908.09	151.76	908.12
151.95	908.16	153.81	908.43	155.15	908.64	155.68	908.69	156.85	908.84
157.64	908.92	157.98	909	159.68	909.23	160.63	909.37	161.41	909.45
162.81	909.63	163.52	909.69	164.82	909.81	165.74	909.86	166.51	909.9
167.71	909.91	169.83	910.01	170.2	910.01	170.46	910.03	171.84	909.95
172.88	910.03	173.21	910.01	174.27	909.93	175.1	909.84	177	909.76
177.15	909.75	179.84	909.67	180.12	909.65	180.48	909.61	182.45	909.32
183.1	909.21	183.92	909.09	184.67	909.01	185.31	908.94	186.75	908.81
187.29	908.76	189.19	908.58	189.7	908.51	190.51	908.34	191.58	908.19
192.53	908.08	193.32	907.99	194.05	907.88	195.38	907.69	196.91	907.58
197.29	907.55	199.18	907.37	199.36	907.35	201.72	907.19	201.78	907.19
201.87	907.18	204.08	907.02	205.78	906.93	206.04	906.9	206.28	906.87
208.04	906.62	209.39	906.44	209.82	906.36	211.16	906.16	211.81	906.1
213.07	906.01	213.72	905.95	214.93	905.85	215.9	905.75	216.68	905.65
217.97	905.54	219.6	905.42	220.11	905.38	220.42	905.38	222.45	905.26
222.72	905.24	223.92	905.12	225.07	905.06	225.65	905.04	227.57	904.9
229.08	904.65	230.12	904.29	231.47	903.89	231.88	903.74	233.02	903.21
233.9	902.67	234.66	902.19	235.83	901.57	236.5	901.26	237.12	901.02
238.12	900.76	238.54	900.68	239.56	900.52	240.03	900.41	240.38	900.22
241.63	899.41	241.75	899.33	242.26	898.97	242.44	898.21	242.6	897.01
244.13	896.88	245.17	896.8	246.27	896.71	247.23	896.63	248.45	896.53
249.81	896.42	250.64	896.36	252.06	896.24	253.74	896.09	254.83	896
255.17	895.97	255.24	895.96	255.38	895.95	255.89	895.91	256.66	895.84
258.3	895.7	259.52	895.59	260.83	895.47	262.19	895.35	263.21	895.27
264.55	895.27	265.5	895.28	266.48	895.29	267.58	895.29	268.18	895.3
269	895.3	271.16	895.32	272.42	895.32	273.93	895.33	274.84	895.34
276.46	895.35	277.02	895.35	278.31	895.36	279.83	895.37	280.37	895.37
281.09	895.38	282.44	895.39	283.9	895.39	284.1	895.4	284.44	895.4
285.72	895.41	287.27	895.41	288.95	895.5	290	895.56	290.87	895.61
292.1	895.67	292.94	895.72	293.88	895.77	295.13	895.83	297.18	895.95
297.92	896	298.46	896.03	299.48	896.1	300.07	896.14	300.47	896.16
300.84	896.19	302.01	896.26	303.01	896.33	304.5	896.42	305.77	896.5
306.58	896.55	308.3	896.66	309.11	896.74	310.53	896.88	312.11	897.03
313.45	897.16	314.5	897.26	316.2	897.42	316.89	897.49	317.33	897.53
317.92	897.59	321.18	897.9	321.72	897.97	322.87	898.13	324.74	898.39
326.13	898.58	327.49	898.76	329.09	898.98	329.85	899.08	330.38	899.16
331.6	899.32	332.91	899.5	333.73	899.61	334.28	899.68	335.39	899.81
336.55	899.95	337.76	900.09	338.38	900.16	339.14	900.25	339.99	900.35
340.56	900.42	340.98	900.67	342.47	900.67	343.24	900.77	344.15	900.87
344.68	900.91	346.08	900.97	347.64	901.07	348.35	901.11	348.92	901.12
350.32	901.17	351.16	901.21	352.22	901.24	353.79	901.33	354.16	901.35
354.46	901.37	356.13	901.45	356.76	901.47	357.98	901.5	360.1	901.5

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360.23	901.51	361.92	901.53	363.18	901.64	363.78	901.68	364.03	901.7
364.64	901.75	365.41	901.81	366.31	901.86	367.21	901.89	368.25	901.91
369.64	901.92	370.12	901.93	370.7	901.94	371.72	901.98	372.11	902.06
373.61	902.14	373.81	902.16	375.23	902.34	376.73	902.43	379.83	901.83
380.05	901.74	380.38	901.58	381.74	900.96	382.42	900.72	384.21	900.23
385.48	900.12	386.23	900.07	387.35	900.01	388.43	899.94	389.12	899.91
390.34	899.88	391.04	899.87	392.1	899.85	393.18	899.84	393.55	899.83
394.48	899.81	395.43	899.81	397.21	899.82	397.32	899.82	397.67	899.83
399.55	899.88	400.03	899.89	402.43	899.92	404.76	899.92	405.53	899.91
406.77	899.92	408.66	899.92	409.15	899.9	410.45	899.83	412.49	899.75
412.55	899.75	414.84	899.81	415.09	899.83	416.78	899.9	417.48	899.97
419.35	900.09	420.38	900.16	421.48	900.25	423.01	900.27	423.13	900.28
424.74	900.31	425.72	900.33	427.22	900.36	428.11	900.37	430.45	900.37
431.95	900.38	432.44	900.39	434.48	900.38	434.69	900.38	436.02	900.37
436.74	900.36	436.86	900.36	438.93	900.32	439.53	900.32	441.15	900.37
442.01	900.44	442.97	900.51	443.43	900.54	444.82	900.65	445.23	900.7
446.73	900.94	447.35	901.02	448.38	901.15	449.64	901.27	450.27	901.34
450.7	901.39	452.04	901.55	452.97	901.66	454.19	901.8	455.46	901.94
456.71	902.06	457.67	902.13	458.76	902.21	460.49	902.36	460.79	902.38
461.01	902.4	462.61	902.54	463.88	902.63	464.56	902.71	466.43	902.8
466.66	902.82	466.74	902.82	468.61	902.98	469.51	903.08	470.7	903.21
471.35	903.36	473.23	903.8	473.28	903.82	473.43	903.85	475.13	904.24
475.69	904.36	477.69	904.86	477.87	904.89	479.33	905.21	479.99	905.36
480.06	905.37	480.78	905.57	482.02	905.92	482.14	905.96	484.28	906.77
484.34	906.8	484.42	906.82	486.61	907.43	487.38	907.57	488.89	907.79
489.76	908.03	490.68	908.31	492.43	908.79	492.97	908.96	493.18	909.04
494.23	909.43	495.08	909.76	495.51	909.93	496.73	910.45	497.3	910.67
497.49	910.73								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1 252.06 .035 302.01 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 252.06 302.01 27.83 27.83 27.83 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 0 240 902.8 F  
 310 497.49 902.8 F

BRIDGE

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 1673.48

INPUT  
 Description:

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Distance from Upstream XS = 6  
 Deck/Roadway Width = 14  
 Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num= 6														
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
205.41		900		890	245.41		903.33		890	245.41		903.33		900.33
305.41		903.33		900.33	305.41		903.33		890	335.41		900		890

Upstream Bridge Cross Section Data

Station Elevation Data num= 481											
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	904.861.690002	904.562.549988	904.468.429993	901.989.589996	901.43						
10.20999	901.4314.47998	901.0718.48999	902.65 18.81	902.7118.98999	902.7						
19.17999	902.78 20.84	902.924.95999	903.13 26.13	903.0927.44998	902.97						
27.91	902.7628.03998	903.01 28.25	902.94 28.66	902.9 29.12	902.76						
29.53	902.7829.89999	902.6330.28998	902.7130.56998	902.6331.28998	902.76						
31.34998	902.7731.42999	902.78 32.87	902.7133.28998	902.68 33.62	902.66						
34.79999	902.5836.34998	902.5436.47998	902.53 37.12	902.5138.69998	902.42						
38.94	902.41 39.5	902.3840.32999	902.3140.70999	902.29 41.91	902.19						
43.09998	901.9245.07999	901.6245.67999	901.5247.20999	901.09 47.25	901.08						
47.31	901.07 48.53	900.74 49.22	900.6450.98999	900.73 53.72	900.75						
55.34	901.1456.81998	901.5157.92999	901.63 59.44	901.759.59998	901.72						
61.78	902.08 62.41	902.1563.16998	902.1567.26999	902.9267.42999	902.92						
68.04999	902.9 68.84	902.8869.19998	902.8670.07999	902.8270.75998	902.8						
71.73999	902.7772.45999	902.7673.66998	902.71 75.56	902.66 75.62	902.66						
75.66998	902.6577.28998	902.6979.01999	902.69 79.31	902.68 81.06	902.63						
82.13	902.62 82.97	902.684.56998	902.5285.16998	902.4786.67999	902.35						
87.60999	902.3489.03998	902.36 89.53	902.4390.00998	902.591.48999	902.82						
93.03	903.4393.89999	903.7294.67999	903.9497.07999	90599.25998	905.59						
100.84	905.86 102.23	906.17 104.99	906.49 106.5	906.47 108.33	906.6						
109.3	906.47 110.46	906.47 110.98	906.44 111.45	906.4 112.79	906.41						
113.69	906.39 114.97	906.49 115.35	906.42 115.52	906.47 115.85	906.37						
117.1	906.48 118.34	906.17 119.98	906.39 122.04	906.87 123.66	906.91						
124.37	906.92 125.59	906.68 126	906.6 126.2	906.56 127.32	906.3						
128.1	906.16 129.25	906 130.3	905.97 131.25	906.06 132.55	906.07						
133.76	906.11 134.33	906.12 134.9	906.12 136.4	906.2 137.85	906.29						
139.7	906.48 139.99	906.52 140.41	906.57 141	906.64 141.49	906.66						
143.42	906.8 143.71	906.83 143.79	906.84 145.71	907.1 146.87	907.28						
147.75	907.44 148.55	907.59 149.78	907.8 151.49	908.09 151.76	908.12						
151.95	908.16 153.81	908.43 155.15	908.64 155.68	908.69 156.85	908.84						
157.64	908.92 157.98	909 159.68	909.23 160.63	909.37 161.41	909.45						
162.81	909.63 163.52	909.69 164.82	909.81 165.74	909.86 166.51	909.9						
167.71	909.91 169.83	910.01 170.2	910.01 170.46	910.03 171.84	909.95						
172.88	910.03 173.21	910.01 174.27	909.93 175.1	909.84 177	909.76						
177.15	909.75 179.84	909.67 180.12	909.65 180.48	909.61 182.45	909.32						
183.1	909.21 183.92	909.09 184.67	909.01 185.31	908.94 186.75	908.81						
187.29	908.76 189.19	908.58 189.7	908.51 190.51	908.34 191.58	908.19						

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192.53	908.08	193.32	907.99	194.05	907.88	195.38	907.69	196.91	907.58
197.29	907.55	199.18	907.37	199.36	907.35	201.72	907.19	201.78	907.19
201.87	907.18	204.08	907.02	205.78	906.93	206.04	906.9	206.28	906.87
208.04	906.62	209.39	906.44	209.82	906.36	211.16	906.16	211.81	906.1
213.07	906.01	213.72	905.95	214.93	905.85	215.9	905.75	216.68	905.65
217.97	905.54	219.6	905.42	220.11	905.38	220.42	905.38	222.45	905.26
222.72	905.24	223.92	905.12	225.07	905.06	225.65	905.04	227.57	904.9
229.08	904.65	230.12	904.29	231.47	903.89	231.88	903.74	233.02	903.21
233.9	902.67	234.66	902.19	235.83	901.57	236.5	901.26	237.12	901.02
238.12	900.76	238.54	900.68	239.56	900.52	240.03	900.41	240.38	900.22
241.63	899.41	241.75	899.33	242.26	898.97	242.44	898.21	242.6	897.01
244.13	896.88	245.17	896.8	246.27	896.71	247.23	896.63	248.45	896.53
249.81	896.42	250.64	896.36	252.06	896.24	253.74	896.09	254.83	896
255.17	895.97	255.24	895.96	255.38	895.95	255.89	895.91	256.66	895.84
258.3	895.7	259.52	895.59	260.83	895.47	262.19	895.35	263.21	895.27
264.55	895.27	265.5	895.28	266.48	895.29	267.58	895.29	268.18	895.3
269	895.3	271.16	895.32	272.42	895.32	273.93	895.33	274.84	895.34
276.46	895.35	277.02	895.35	278.31	895.36	279.83	895.37	280.37	895.37
281.09	895.38	282.44	895.39	283.9	895.39	284.1	895.4	284.44	895.4
285.72	895.41	287.27	895.41	288.95	895.5	290	895.56	290.87	895.61
292.1	895.67	292.94	895.72	293.88	895.77	295.13	895.83	297.18	895.95
297.92	896	298.46	896.03	299.48	896.1	300.07	896.14	300.47	896.16
300.84	896.19	302.01	896.26	303.01	896.33	304.5	896.42	305.77	896.5
306.58	896.55	308.3	896.66	309.11	896.74	310.53	896.88	312.11	897.03
313.45	897.16	314.5	897.26	316.2	897.42	316.89	897.49	317.33	897.53
317.92	897.59	321.18	897.9	321.72	897.97	322.87	898.13	324.74	898.39
326.13	898.58	327.49	898.76	329.09	898.98	329.85	899.08	330.38	899.16
331.6	899.32	332.91	899.5	333.73	899.61	334.28	899.68	335.39	899.81
336.55	899.95	337.76	900.09	338.38	900.16	339.14	900.25	339.99	900.35
340.56	900.42	340.98	900.67	342.47	900.67	343.24	900.77	344.15	900.87
344.68	900.91	346.08	900.97	347.64	901.07	348.35	901.11	348.92	901.12
350.32	901.17	351.16	901.21	352.22	901.24	353.79	901.33	354.16	901.35
354.46	901.37	356.13	901.45	356.76	901.47	357.98	901.5	360.1	901.5
360.23	901.51	361.92	901.53	363.18	901.64	363.78	901.68	364.03	901.7
364.64	901.75	365.41	901.81	366.31	901.86	367.21	901.89	368.25	901.91
369.64	901.92	370.12	901.93	370.7	901.94	371.72	901.98	372.11	902.06
373.61	902.14	373.81	902.16	375.23	902.34	376.73	902.43	379.83	901.83
380.05	901.74	380.38	901.58	381.74	900.96	382.42	900.72	384.21	900.23
385.48	900.12	386.23	900.07	387.35	900.01	388.43	899.94	389.12	899.91
390.34	899.88	391.04	899.87	392.1	899.85	393.18	899.84	393.55	899.83
394.48	899.81	395.43	899.81	397.21	899.82	397.32	899.82	397.67	899.83
399.55	899.88	400.03	899.89	402.43	899.92	404.76	899.92	405.53	899.91
406.77	899.92	408.66	899.92	409.15	899.9	410.45	899.83	412.49	899.75
412.55	899.75	414.84	899.81	415.09	899.83	416.78	899.9	417.48	899.97
419.35	900.09	420.38	900.16	421.48	900.25	423.01	900.27	423.13	900.28
424.74	900.31	425.72	900.33	427.22	900.36	428.11	900.37	430.45	900.37
431.95	900.38	432.44	900.39	434.48	900.38	434.69	900.38	436.02	900.37
436.74	900.36	436.86	900.36	438.93	900.32	439.53	900.32	441.15	900.37



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442.01	900.44	442.97	900.51	443.43	900.54	444.82	900.65	445.23	900.7
446.73	900.94	447.35	901.02	448.38	901.15	449.64	901.27	450.27	901.34
450.7	901.39	452.04	901.55	452.97	901.66	454.19	901.8	455.46	901.94
456.71	902.06	457.67	902.13	458.76	902.21	460.49	902.36	460.79	902.38
461.01	902.4	462.61	902.54	463.88	902.63	464.56	902.71	466.43	902.8
466.66	902.82	466.74	902.82	468.61	902.98	469.51	903.08	470.7	903.21
471.35	903.36	473.23	903.8	473.28	903.82	473.43	903.85	475.13	904.24
475.69	904.36	477.69	904.86	477.87	904.89	479.33	905.21	479.99	905.36
480.06	905.37	480.78	905.57	482.02	905.92	482.14	905.96	484.28	906.77
484.34	906.8	484.42	906.82	486.61	907.43	487.38	907.57	488.89	907.79
489.76	908.03	490.68	908.31	492.43	908.79	492.97	908.96	493.18	909.04
494.23	909.43	495.08	909.76	495.51	909.93	496.73	910.45	497.3	910.67
497.49	910.73								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	252.06	.035	302.01	.1

Bank Sta: Left Right Coeff Contr. Expan.

252.06	302.01	.3	.5
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Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	240	902.8	F
310	497.49	902.8	F

Downstream Deck/Roadway Coordinates

num= 6

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
240.23	900	890	280.23	903.33	890	280.23	903.33	900.33
340.23	903.33	900.33	340.23	903.33	890	370.23	900	890

Downstream Bridge Cross Section Data

Station Elevation Data num= 476

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	904.69	1.01001	904.442	4.29993	904.116	4.29993	902.557	6.00006	902.46
8.76001	902.610	9.8001	901.48	13.87	900.9	15.59	901.2317	5.1001	901.08
18.73999	901.219	1.0001	901.28	22.06	902.4522	2.23999	902.4825	4.5999	903.13
25.54999	903.1327	0.7999	903.2227	5.1001	903.1927	6.0999	903.1427	6.4001	903.2
27.89001	903.1128	3.9999	903.0628	5.7999	903.29	1.0001	903.0429	1.7999	903
29.62	903.0829	9.5001	903.08	31.47	903.01	32.12	902.97	33.47	902.82
34.63	902.735	4.5001	902.6436	3.2999	902.5737	4.2001	902.5538	1.7999	902.58
39.39999	902.6140	3.5999	902.58	41.69	902.642	4.5999	902.6243	7.6001	902.61
44.38	902.5845	9.8001	902.4946	5.1001	902.47	48.37	902.09	48.87	901.95
50.95001	901.851	2.3001	901.851	5.1999	901.87	54.5	902.57	56.62	903.19
57.57001	903.358	3.9001	903.3159	8.2001	903.34	60.97	903.3261	8.5999	903.29
63.16	903.2763	4.2001	903.26	63.72	903.2665	2.3999	903.2166	1.7001	903.17
67.34	903.16	68.5	903.1	68.62	903.0970	2.9001	903.11	72.78	903.05
72.98001	903.05	75.19	903.12	75.38	903.1276	9.2999	903.0378	8.9001	902.89

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78.98001	902.8979.07999	902.88	81.09	902.87	82.25	902.86	83.09	902.84
83.98001	902.8385.04999	902.8186.20001		902.7887.39999		902.84	89.03	903.01
	89.72	903.1490.98999	903.6991.67001	903.9691.95001		904.1593.26001		904.94
94.04999	905.38	95.03	905.7697.39999	906.3997.48001		906.4	101.11	906.92
	101.65	906.97	102.2	907.05	103.1	907.22	104.19	907.38
	105.7	907.86						
	106.01	907.94	106.12	907.97	106.44	908	109.34	908.13
	111.97	908.12						
	112.11	908.11	112.2	908.11	113.43	907.93	114.14	907.82
	114.25	907.8						
	115.63	907.59	116.37	907.49	117.02	907.38	117.42	907.32
	118.55	907.19						
	120.37	907.21	121.2	907.21	122.45	907.14	123.5	907.15
	124.36	907.02						
	125.34	906.89	126.37	906.72	128.04	906.64	129.63	906.82
	129.97	906.87						
	130.07	906.87	130.3	906.91	132.38	907.28	133.53	907.35
	135.26	907.28						
	135.81	907.27	136.39	907.32	137.8	907.52	139.4	907.83
	139.45	907.84						
	139.53	907.85	141.24	908.05	142.16	908.18	143.03	908.27
	144.53	908.45						
	144.66	908.46	144.98	908.51	146.91	908.78	147.28	908.81
	147.9	908.89						
	149.4	909.03	150.29	909.14	151.48	909.24	153.13	909.5
	153.48	909.52						
	154.04	909.58	155.26	909.68	156.37	909.79	157.45	909.86
	158.28	909.89						
	159.6	909.96	161.33	910.07	161.53	910.08	161.88	910.1
	163.47	910.18						
	164.23	910.23	165.21	910.22	166.14	910.24	167.07	910.25
	168.92	910.24						
	169.4	910.24	170.22	910.28	171.07	910.31	172.62	910.34
	172.99	910.35						
	173.45	910.34	175.05	910.28	176.23	910.25	177.38	910.23
	178.61	910.22						
	179.79	910.18	180.99	910.15	181.74	910.05	183.29	909.85
	183.53	909.81						
	183.69	909.79	185.16	909.57	186.53	909.51	187.23	909.45
	188.98	909.22						
	189.3	909.18	191.57	908.78	191.66	908.76	191.74	908.75
	192.18	908.67						
	193.85	908.38	194.58	908.28	195.46	908.14	196.18	908.06
	197.5	907.9						
	198.63	907.72	199.88	907.6	200.88	907.5	201.83	907.33
	203.03	907.2						
	204.24	907.12	205.24	907.07	206.23	907.03	206.99	906.95
	207.84	906.84						
	208.89	906.72	209.36	906.63	211.32	906.37	211.77	906.33
	212.18	906.29						
	214.28	906.12	214.59	906.1	215.86	906.02	216.6	905.97
	218.29	905.73						
	219.44	905.6	219.91	905.54	220.3	905.53	221.72	905.43
	223.08	905.3						
	223.95	905.26	224.79	905.25	225.52	905.23	226.4	905.19
	227.43	905						
	228.64	904.8	229.69	904.54	231.3	904.01	231.53	903.94
	231.98	903.75						
	233.1	903.26	233.99	902.78	234.88	902.31	235.31	902.16
	237.52	901.35						
	237.66	901.31	237.94	901.24	239.73	900.8	241.27	899.95
	241.35	899.9						
	242.3	899.23	243.56	898.37	244.64	897.84	245.85	897.79
	247.85	897.62						
	248.41	897.64	249.01	897.68	249.75	897.71	250.55	897.74
	251.7	897.72						
	251.99	897.71	253.51	897.7	253.78	897.71	254.09	897.72
	256	897.76						
	256.85	897.79	258.37	897.85	258.81	897.87	259.93	897.9
	261.71	897.96						
	262.9	897.97	263.21	897.97	263.44	897.98	264.74	898
	265.63	898.16						
	267.2	898.29	268.02	898.54	268.85	898.81	270.2	898.23
	270.71	898.19						
	272.8	898.01	273.91	897.92	274.86	897.84	276.46	897.71
	277.62	897.61						
	278.39	897.54	279.39	897.46	280.85	897.34	283.41	897.12
	285.83	896.92						
	286.1	896.89	286.71	896.83	287.45	896.75	288.15	896.68
	289.6	896.54						
	290.54	896.44	292.63	896.24	293.62	896.14	294.42	896.05
	295.12	895.99						
	295.77	895.92	297.1	895.79	299.88	895.51	300.63	895.43
	301.41	895.35						
	301.89	895.36	306.91	895.36	307.43	895.37	312.25	895.37
	313.6	895.38						
	317.78	895.38	318.84	895.39	319.86	895.49	321.03	895.6
	323.43	895.84						
	324.18	895.91	325	895.99	325.99	896.09	326.88	896.18
	327.85	896.28						
	328.83	896.37	329.61	896.45	331.74	896.66	332.6	896.74
	333.64	896.85						

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334.91	896.96	335.97	897.06	338	897.23	339.19	897.34	340.43	897.45
341.41	897.53	342.43	897.62	345.47	897.88	346.39	897.96	347.74	898.08
348.68	898.16	349.93	898.27	351.11	898.42	352.87	898.64	353.49	898.72
354.15	898.8	355.04	898.92	356.37	899.08	358.35	899.33	359.59	899.49
360.47	899.6	362.02	899.8	362.49	899.86	363.4	899.97	364.32	900.09
364.85	900.15	365.75	900.27	368.12	900.57	369.25	900.62	370.63	900.72
370.86	900.75	371.45	900.8	372.72	900.93	373.22	900.96	374.24	901.08
374.39	901.09	375.61	901.23	376.18	901.3	377.16	901.41	377.8	901.44
379.45	901.51	379.97	901.53	381.73	901.74	381.86	901.75	381.97	901.76
383.08	902.04	383.33	902.09	384.68	902.46	385.46	902.6	386.89	902.63
389.62	902.01	389.8	902	389.91	901.95	391.35	901.34	391.89	901.11
392.92	900.71	393.53	900.48	394.77	900.1	395.45	899.9	396.96	899.73
397.59	899.64	397.91	899.62	399.59	899.53	400.18	899.53	401.18	899.52
401.91	899.51	403.31	899.51	405.35	899.46	406.72	899.49	407	899.5
408.53	899.53	410.53	899.53	411.91	899.52	412.54	899.51	414.24	899.49
414.61	899.49	414.75	899.48	416.79	899.45	417.59	899.46	419.35	899.43
419.52	899.43	421.16	899.41	422.77	899.43	423.25	899.43	423.56	899.45
425.44	899.51	425.72	899.52	425.82	899.53	427.5	899.65	428.72	899.77
429.27	899.82	430.89	899.94	432.01	900.01	433.37	900.08	434.43	900.1
435.47	900.11	435.97	900.12	436.62	900.13	437.75	900.14	438.38	900.15
440.02	900.18	440.48	900.19	441.94	900.18	442.91	900.18	444.75	900.14
444.83	900.14	447.18	900.11	447.3	900.11	449.32	900.14	451.32	900.15
453.54	900.2	455	900.31	455.71	900.36	456.08	900.39	458.35	900.63
458.43	900.64	460.19	900.79	460.75	900.86	461.77	900.99	462.75	901.1
463.87	901.25	464.84	901.37	466.06	901.54	468.09	901.66	469.48	901.75
470.36	901.82	471.8	901.97	472.74	902.07	474.35	902.2	474.67	902.23
475.99	902.28	476.67	902.31	476.84	902.32	478.45	902.37	479.16	902.4
479.91	902.43	480.38	902.46	481.73	902.55	483.02	902.74	483.89	902.89
485.23	903.31	485.78	903.43	486.87	903.66	487.91	903.81	488.66	903.88
489.71	903.98	490.06	904.01	491.47	904.33	492.03	904.51	493.32	904.92
494.18	905.17	496.28	905.88	496.34	905.9	496.39	905.91	498.34	906.5
498.96	906.64	500.01	906.91	501	907.25	501.98	907.59	502.69	907.87
503.68	908.28	504.71	908.69	505.5	909.02	507.05	909.73	508.55	910.29
508.75	910.36								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1 293.62 .035 325.99 .1

Bank Sta: Left Right Coeff Contr. Expan.  
 293.62 325.99 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 0 275 902.8 F  
 345 508.75 902.8 F

Upstream Embankment side slope = 0 horiz. to 1.0 vertical  
 Downstream Embankment side slope = 0 horiz. to 1.0 vertical

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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: Align (1) RS: 1651.65

INPUT

Description:

Station Elevation Data		num= 476	
Sta	Elev	Sta	Elev
0	904.69	1.01001	904.442
8.76001	902.610	1.98001	901.48
18.73999	901.219	1.10001	901.28
25.54999	903.1327	1.07999	903.2227
27.89001	903.1128	1.39999	903.0628
29.62	903.0829	1.95001	903.08
34.63	902.735	1.45001	902.6436
39.39999	902.6140	1.35999	902.58
44.38	902.5845	1.98001	902.4946
50.95001	901.851	1.23001	901.851
57.57001	903.358	1.39001	903.3159
63.16	903.2763	1.42001	903.26
67.34	903.16	68.5	903.1
72.98001	903.05	75.19	903.12
78.98001	902.8979	1.07999	902.88
83.98001	902.8385	1.04999	902.8186

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89.72	903.14	90.98	999	903.69	91.67	001	903.96	91.95	001	904.15	93.26	001	904.94
94.04	999	905.38	95.03	905.76	97.39	999	906.39	97.48	001	906.4	101.11	906.92	
101.65	906.97	102.2	907.05	103.1	907.22	104.19	907.38	105.7	907.86				
106.01	907.94	106.12	907.97	106.44	908	109.34	908.13	111.97	908.12				
112.11	908.11	112.2	908.11	113.43	907.93	114.14	907.82	114.25	907.8				
115.63	907.59	116.37	907.49	117.02	907.38	117.42	907.32	118.55	907.19				
120.37	907.21	121.2	907.21	122.45	907.14	123.5	907.15	124.36	907.02				
125.34	906.89	126.37	906.72	128.04	906.64	129.63	906.82	129.97	906.87				
130.07	906.87	130.3	906.91	132.38	907.28	133.53	907.35	135.26	907.28				
135.81	907.27	136.39	907.32	137.8	907.52	139.4	907.83	139.45	907.84				
139.53	907.85	141.24	908.05	142.16	908.18	143.03	908.27	144.53	908.45				
144.66	908.46	144.98	908.51	146.91	908.78	147.28	908.81	147.9	908.89				
149.4	909.03	150.29	909.14	151.48	909.24	153.13	909.5	153.48	909.52				
154.04	909.58	155.26	909.68	156.37	909.79	157.45	909.86	158.28	909.89				
159.6	909.96	161.33	910.07	161.53	910.08	161.88	910.1	163.47	910.18				
164.23	910.23	165.21	910.22	166.14	910.24	167.07	910.25	168.92	910.24				
169.4	910.24	170.22	910.28	171.07	910.31	172.62	910.34	172.99	910.35				
173.45	910.34	175.05	910.28	176.23	910.25	177.38	910.23	178.61	910.22				
179.79	910.18	180.99	910.15	181.74	910.05	183.29	909.85	183.53	909.81				
183.69	909.79	185.16	909.57	186.53	909.51	187.23	909.45	188.98	909.22				
189.3	909.18	191.57	908.78	191.66	908.76	191.74	908.75	192.18	908.67				
193.85	908.38	194.58	908.28	195.46	908.14	196.18	908.06	197.5	907.9				
198.63	907.72	199.88	907.6	200.88	907.5	201.83	907.33	203.03	907.2				
204.24	907.12	205.24	907.07	206.23	907.03	206.99	906.95	207.84	906.84				
208.89	906.72	209.36	906.63	211.32	906.37	211.77	906.33	212.18	906.29				
214.28	906.12	214.59	906.1	215.86	906.02	216.6	905.97	218.29	905.73				
219.44	905.6	219.91	905.54	220.3	905.53	221.72	905.43	223.08	905.3				
223.95	905.26	224.79	905.25	225.52	905.23	226.4	905.19	227.43	905				
228.64	904.8	229.69	904.54	231.3	904.01	231.53	903.94	231.98	903.75				
233.1	903.26	233.99	902.78	234.88	902.31	235.31	902.16	237.52	901.35				
237.66	901.31	237.94	901.24	239.73	900.8	241.27	899.95	241.35	899.9				
242.3	899.23	243.56	898.37	244.64	897.84	245.85	897.79	247.85	897.62				
248.41	897.64	249.01	897.68	249.75	897.71	250.55	897.74	251.7	897.72				
251.99	897.71	253.51	897.7	253.78	897.71	254.09	897.72	256	897.76				
256.85	897.79	258.37	897.85	258.81	897.87	259.93	897.9	261.71	897.96				
262.9	897.97	263.21	897.97	263.44	897.98	264.74	898	265.63	898.16				
267.2	898.29	268.02	898.54	268.85	898.81	270.2	898.23	270.71	898.19				
272.8	898.01	273.91	897.92	274.86	897.84	276.46	897.71	277.62	897.61				
278.39	897.54	279.39	897.46	280.85	897.34	283.41	897.12	285.83	896.92				
286.1	896.89	286.71	896.83	287.45	896.75	288.15	896.68	289.6	896.54				
290.54	896.44	292.63	896.24	293.62	896.14	294.42	896.05	295.12	895.99				
295.77	895.92	297.1	895.79	299.88	895.51	300.63	895.43	301.41	895.35				
301.89	895.36	306.91	895.36	307.43	895.37	312.25	895.37	313.6	895.38				
317.78	895.38	318.84	895.39	319.86	895.49	321.03	895.6	323.43	895.84				
324.18	895.91	325	895.99	325.99	896.09	326.88	896.18	327.85	896.28				
328.83	896.37	329.61	896.45	331.74	896.66	332.6	896.74	333.64	896.85				
334.91	896.96	335.97	897.06	338	897.23	339.19	897.34	340.43	897.45				
341.41	897.53	342.43	897.62	345.47	897.88	346.39	897.96	347.74	898.08				

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348.68	898.16	349.93	898.27	351.11	898.42	352.87	898.64	353.49	898.72
354.15	898.8	355.04	898.92	356.37	899.08	358.35	899.33	359.59	899.49
360.47	899.6	362.02	899.8	362.49	899.86	363.4	899.97	364.32	900.09
364.85	900.15	365.75	900.27	368.12	900.57	369.25	900.62	370.63	900.72
370.86	900.75	371.45	900.8	372.72	900.93	373.22	900.96	374.24	901.08
374.39	901.09	375.61	901.23	376.18	901.3	377.16	901.41	377.8	901.44
379.45	901.51	379.97	901.53	381.73	901.74	381.86	901.75	381.97	901.76
383.08	902.04	383.33	902.09	384.68	902.46	385.46	902.6	386.89	902.63
389.62	902.01	389.8	902	389.91	901.95	391.35	901.34	391.89	901.11
392.92	900.71	393.53	900.48	394.77	900.1	395.45	899.9	396.96	899.73
397.59	899.64	397.91	899.62	399.59	899.53	400.18	899.53	401.18	899.52
401.91	899.51	403.31	899.51	405.35	899.46	406.72	899.49	407	899.5
408.53	899.53	410.53	899.53	411.91	899.52	412.54	899.51	414.24	899.49
414.61	899.49	414.75	899.48	416.79	899.45	417.59	899.46	419.35	899.43
419.52	899.43	421.16	899.41	422.77	899.43	423.25	899.43	423.56	899.45
425.44	899.51	425.72	899.52	425.82	899.53	427.5	899.65	428.72	899.77
429.27	899.82	430.89	899.94	432.01	900.01	433.37	900.08	434.43	900.1
435.47	900.11	435.97	900.12	436.62	900.13	437.75	900.14	438.38	900.15
440.02	900.18	440.48	900.19	441.94	900.18	442.91	900.18	444.75	900.14
444.83	900.14	447.18	900.11	447.3	900.11	449.32	900.14	451.32	900.15
453.54	900.2	455	900.31	455.71	900.36	456.08	900.39	458.35	900.63
458.43	900.64	460.19	900.79	460.75	900.86	461.77	900.99	462.75	901.1
463.87	901.25	464.84	901.37	466.06	901.54	468.09	901.66	469.48	901.75
470.36	901.82	471.8	901.97	472.74	902.07	474.35	902.2	474.67	902.23
475.99	902.28	476.67	902.31	476.84	902.32	478.45	902.37	479.16	902.4
479.91	902.43	480.38	902.46	481.73	902.55	483.02	902.74	483.89	902.89
485.23	903.31	485.78	903.43	486.87	903.66	487.91	903.81	488.66	903.88
489.71	903.98	490.06	904.01	491.47	904.33	492.03	904.51	493.32	904.92
494.18	905.17	496.28	905.88	496.34	905.9	496.39	905.91	498.34	906.5
498.96	906.64	500.01	906.91	501	907.25	501.98	907.59	502.69	907.87
503.68	908.28	504.71	908.69	505.5	909.02	507.05	909.73	508.55	910.29
508.75	910.36								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .1 293.62 .035 325.99 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 293.62 325.99 69.09 69.09 69.09 .3 .5

Ineffective Flow num= 2  
 Sta L Sta R Elev Permanent  
 0 275 902.8 F  
 345 508.75 902.8 F

CROSS SECTION

RIVER: Bluestone Creek

REACH: Align (1)

RS: 1582.56

INPUT

Description:

Station Elevation Data

num= 482

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	924.172.780029	924.42.960022	924.393.280029	924.413.630005	924.47				
4.059998	924.554.530029	924.565.090027	924.7317.609999	925.9521.53003	924.53				
22.20001	924.2923.59998	923.8824.28003	923.525.77002	922.6426.57001	922.17				
27.42999	921.6828.35999	921.2129.33002	920.7135.46997	918.0739.78003	915.89				
43.92999	911.3745.33002	909.8346.28998	909.7851.57001	906.9252.32001	906.71				
53.06	906.853.17999	906.8154.78003	906.9955.59998	906.9457.57001	906.87				
60.03	906.87	65.44	906.867.04999	906.867.70999	906.8169.14001	906.82			
70.69	906.82	72.34	906.69	73.22	906.5873.85999	906.5377.39001	906.2		
79.01999	905.9383.60999	905.4	88.38	904.4389.14001	904.2491.17999	903.77			
91.72	903.64	92.44	903.36	94.47	903.1996.45999	903.4396.57999	903.37		
96.92001	903.3	103.22	901.54	104.72	901.63	106.96	901.86	110.28	902.56
111.11	902.89	112.9	903.19	113.13	903.22	113.54	903.22	115.7	903.26
115.82	903.22	116.37	903.17	116.45	903.17	117.78	903.16	118.94	903.08
119.76	903.03	120.62	903	121.5	902.99	122.46	903.02	124.22	902.96
125.02	902.93	126.09	902.86	127.16	902.81	128.04	902.75	128.76	902.73
129.97	902.84	130.79	902.8	131.75	902.75	132.67	902.73	133.76	902.73
134.97	902.87	135.78	902.92	137.02	903.04	139.23	903.08	139.47	903.1
139.75	903.14	141.98	903.39	143.34	903.4	144.56	903.49	145.55	903.52
146.41	903.49	147.88	903.5	149.76	903.52	149.97	903.53	150.12	903.52
151.99	903.48	152.48	903.48	153.44	903.52	154	903.53	154.9	903.54
156.33	903.56	156.99	903.53	157.78	903.53	159.18	903.6	160.6	903.64
161.18	903.65	161.57	903.65	163.64	903.56	163.76	903.56	164.3	903.55
165.5	903.53	166.13	903.54	167.14	903.58	169.25	903.48	171.45	903.32
171.68	903.33	173.87	903.42	174	903.45	175.32	903.58	175.77	903.63
175.85	903.65	177.36	903.94	178.21	904.12	179.37	904.62	180.07	904.9
181.44	905.52	183	906.3	183.65	906.66	187.19	906.93	187.49	906.98
189.88	907.22	191.42	907.39	191.75	907.47	193.2	907.85	194.56	908.15
195.19	908.22	197.34	908.32	198.39	908.22	199.52	908.12	199.77	908.09
200.22	907.99	201.59	907.72	202.54	907.58	202.98	907.54	204.32	907.4
205.06	907.44	206.76	907.47	207.24	907.52	208.84	907.61	209.11	907.63
210.58	907.67	211.37	907.66	213.92	907.47	214.23	907.47	214.5	907.49
216.35	907.73	216.68	907.78	217.79	907.9	218.26	907.98	220.11	908.16
220.49	908.18	222.13	908.29	222.28	908.29	223.66	908.26	223.99	908.29
225.5	908.37	227.15	908.69	228.75	908.84	229.96	908.96	231.45	909.16
232.75	909.28	233	909.31	233.35	909.35	236.27	909.6	237.53	909.69
238.67	909.8	241.34	909.94	241.68	909.95	242.5	910.02	243.47	910.11
243.84	910.13	245.37	910.18	246.11	910.21	247.31	910.23	249.44	910.28
249.65	910.28	249.76	910.29	250.23	910.29	253.63	910.31	255.74	910.33
257.9	910.33	258.07	910.34	259.56	910.36	261.1	910.39	261.51	910.39
262.23	910.4	263.44	910.4	264	910.39	265.52	910.36	266.11	910.36
268.33	910.32	269.14	910.3	271.31	910.12	271.43	910.1	271.56	910.09
273.73	909.91	274.3	909.88	276.33	909.76	276.42	909.75	276.73	909.69

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278.21	909.44	278.94	909.26	279.86	909.07	280.91	908.91	281.88	908.8
282.48	908.72	283.55	908.58	284.83	908.41	285.5	908.28	287.54	907.92
288.58	907.65	290.1	907.38	291.21	907.22	292.24	907.15	293.69	907.1
294.18	907.09	295.01	907.01	295.87	906.97	297.08	906.89	297.62	906.86
297.9	906.82	299.47	906.55	300.93	906.4	303.73	906.14	303.91	906.12
303.99	906.11	305.89	905.86	307.04	905.66	307.81	905.56	308.77	905.48
309.89	905.39	310.47	905.34	311.89	905.29	312.32	905.29	314.16	905.25
314.22	905.25	314.31	905.23	316.27	904.9	317.53	904.56	318.14	904.42
319.71	903.91	319.9	903.86	319.97	903.83	321.76	903.04	322.23	902.78
324.09	902.13	325.84	901.62	326.97	901.32	327.77	901.08	328.46	900.75
329.87	899.96	329.99	899.88	330.44	899.48	333.63	898.1	334.43	897.7
335.07	897.67	336.6	897.81	337.18	897.84	337.97	897.87	339.09	897.86
339.78	897.85	340.48	897.85	341.97	897.86	343.65	897.89	344.39	897.89
345.46	897.91	346.28	897.93	347.83	898	349.11	898.04	349.67	898.07
350.47	898.08	351.28	898.1	352.4	898.12	352.83	898.13	352.97	898.13
355.13	898.31	355.45	898.36	356.38	898.74	357.65	899.19	359.15	899.58
359.53	899.61	361.22	899.64	361.29	899.64	362.86	899.49	363.17	899.45
364.37	899.39	364.73	899.36	365.99	899.33	366.33	899.32	367.48	899.31
369.6	899.26	370.76	899.24	371.84	899.21	372.72	899.17	374.26	899.11
375.64	898.99	376.34	898.91	377.6	898.79	378.2	898.73	378.62	898.72
381.24	898.74	381.76	898.75	383.38	898.72	384.46	898.72	385.91	898.73
388.1	898.78	388.38	898.78	390.44	898.8	391.54	898.84	392.15	898.86
392.68	898.89	393.7	898.95	395.9	899.05	396.94	899.07	398.24	899.14
398.9	899.16	400.31	899.22	400.71	899.22	402.09	899.2	403.59	899.17
403.96	899.15	405.72	898.92	406.23	898.89	407.25	898.85	408.41	898.78
409.46	898.72	410.34	898.68	410.99	898.66	412.05	898.62	412.68	898.62
413.3	898.63	414.37	898.6	415.16	898.59	417.24	898.6	419.34	898.6
420.44	898.56	420.97	898.55	422.41	898.5	423.29	898.45	424.73	898.35
425.34	898.31	427.27	898.13	428.85	897.96	429.17	897.93	429.42	897.89
432.11	897.65	433.25	897.27	434.38	896.9	434.84	896.8	435.38	896.68
436.08	896.54	437.78	896.17	438.68	894.99	439.64	894.47	441.41	894.35
441.79	894.34	442.36	894.32	444.52	894.24	446.55	894.16	448.38	893.98
448.83	894.42	449.28	894.85	451.09	895.88	452.05	896.42	452.9	896.9
454.48	897.05	455.04	897.12	455.48	897.19	455.76	897.24	456.02	897.25
457.37	897.22	457.93	897.21	458.11	897.2	459.69	897.15	461.27	897.09
461.69	897.07	463.66	897.02	463.91	897.01	465.66	896.99	465.93	896.99
467.39	896.96	467.96	896.94	469.07	896.92	469.71	896.91	471.99	896.8
472.16	896.8	473.67	896.73	474.45	896.7	474.53	896.69	476.35	896.6
477.18	896.55	479.07	896.46	479.33	896.44	479.48	896.43	481.8	896.3
482.38	896.27	484.03	896.16	484.69	896.14	486.33	896.03	486.72	896.01
488.71	895.98	488.92	895.98	490.56	896	491.16	896	492.76	896.01
493.48	896.01	495.26	896	495.75	896.01	497.65	895.98	498.02	895.98
499.96	896.03	500.4	896.05	502.13	896.15	502.85	896.18	504.22	896.24
505.33	896.25	509.55	896.25	511.16	896.24	511.22	896.24	511.29	896.25
512.99	896.31	516.04	896.31	516.36	896.3	517.23	896.29	518.61	896.28
519.32	896.27	520.73	896.27	522.8	896.26	523.42	896.26	525.85	896.27
527.43	896.39	528.38	896.46	529.76	896.78	530.73	896.96	531.2	897.06
533.62	897.58	533.68	897.58	536.65	898	536.9	898.04	539.32	897.98



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539.56	897.99	540.95	897.93	541.76	897.84	543.68	897.89	543.86	897.91
543.94	897.92	544.98	898.02	545.75	898.09	545.86	898.09	548.2	898.34
548.83	898.43	550.29	898.76	551.42	899.18	552.91	899.91	553.94	900.52
554.8	901.15	555.85	901.89	556.31	902.19	557.76	903.2	558.82	903.83
559.87	904.65	560.56	905.09	561.92	905.91	562.35	906.21	563.13	906.57
564.87	907.37	565.47	907.52	566.26	907.81	567.86	908.52	568.65	908.96
569.62	909.54	570.5	910						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.1	437.78	.035	452.05	.05

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
	437.78	452.05		61.68	69.18		.1	.3
Ineffective Flow			num=	1				
Sta L	Sta R	Elev	Permanent					
0	359.15	915	F					

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 1513.38

INPUT

Description:

Station Elevation Data num= 488

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	922.0225	52997	924.16	25.69	924.1525	97998	924.1726	29999	924.22
26.69	924.29	27.12	924.31	27.62	924.4638	98999	925.5742	57001	924.29
43.17999	924.0744	45001	923.6945	06998	923.3646	42999	922.5847	15997	922.15
47.94998	921.7148	79999	921.2849	67999	920.8455	29999	918.44	59.25	916.47
63.06	912.3664	34998	910.9665	97998	910.88	74.84	906.1274	88998	906.11
74.92999	906.1175	39999	906.14	75.78	906.12	80.59	906.13	81.59	906.15
83.12	906.186	38998	905.9188	10999	905.9589	45999	905.87	90.28	905.93
92.41998	905.82	93.84	905.79	94.84	905.7196	45999	905.6599	81998	905.56
101.31	905.39	102.51	905.29	102.85	905.23	104.69	905.04	107.63	904.68
110.65	904.56	111.62	904.48	116.11	903.9	119.38	903.62	122.28	903.71
124.24	903.76	124.63	903.76	125.45	903.64	125.98	903.65	126.9	903.77
128.96	903.61	129.73	903.64	129.87	903.63	130.11	903.62	130.57	903.65
131.62	903.73	135.06	904.19	136.89	904.2	137.87	904.25	138.17	904.3
139.33	904.48	140.17	904.65	140.99	904.78	142.1	904.9	143.67	905.06
143.94	905.08	145.54	905.21	146.11	905.24	147.33	905.32	148.36	905.39
149.21	905.38	150.54	905.4	151.44	905.41	152.66	905.46	153.63	905.57
154.1	905.62	155	905.68	155.61	905.67	156.95	905.65	157.66	905.63
159.42	905.62	160.17	905.63	161.69	905.61	161.77	905.61	163.3	905.6
163.53	905.6	165.44	905.55	165.69	905.55	167.75	905.59	167.89	905.59
168.51	905.63	169.96	905.75	170.23	905.76	171.08	905.78	171.96	905.8

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173.74	905.86	174.11	905.87	174.18	905.88	174.32	905.9	176.41	906.21
178	906.58	178.7	906.64	180.34	906.95	180.95	907.07	181.31	907.15
183.16	907.39	184.63	907.54	185.02	907.59	186.63	907.73	187.26	907.8
188.68	907.91	189.45	907.9	190.3	907.9	191.51	907.94	191.78	907.96
193.34	908.2	193.76	908.26	195.39	908.38	197.34	908.54	197.4	908.55
197.61	908.6	199.58	909.09	199.82	909.09	200.27	909.15	201.85	909.34
202.66	909.54	204	909.71	205.5	910.07	206.29	910.14	207.73	910.26
207.95	910.28	209.93	910.27	210.09	910.27	212.34	910.22	213.69	910.26
214.37	910.25	216.05	910.25	217.53	910.18	218.07	910.18	218.85	910.13
220.33	910.08	222.78	910.08	223	910.06	225.29	910.05	225.31	910.05
225.47	910.06	226.67	910.12	227.96	910.15	228.28	910.15	228.88	910.16
230.42	910.2	231.82	910.26	232.23	910.27	232.42	910.28	234.24	910.26
234.86	910.26	236.48	910.27	236.85	910.27	238.19	910.28	239.58	910.29
240.33	910.34	242.15	910.38	242.44	910.38	244.34	910.46	244.62	910.47
246	910.57	246.53	910.61	246.66	910.62	248.3	910.77	249.6	910.83
250.73	910.82	252.07	910.87	252.75	910.89	253.65	910.95	254.62	911
255.36	911.02	256.56	911.05	258.32	911.18	258.45	911.19	258.72	911.22
260.22	911.33	261.02	911.38	261.86	911.48	263.15	911.58	264.01	911.59
265.45	911.62	266.26	911.64	267.76	911.65	268.53	911.66	270.58	911.66
271.97	911.6	272.14	911.6	273.61	911.61	274.12	911.62	276.11	911.66
276.52	911.67	276.63	911.67	277.43	911.66	278.97	911.64	279.2	911.63
280.94	911.61	281.43	911.63	282.69	911.65	284.11	911.62	284.79	911.62
285.6	911.59	286.85	911.53	287.91	911.5	288.72	911.45	289.41	911.41
290.53	911.33	292	911.24	292.1	911.23	292.87	911.15	294.08	911.03
294.15	911.02	294.21	911.02	296.35	910.88	297.04	910.84	298.34	910.76
299.46	910.67	300.54	910.65	301.75	910.66	302.9	910.61	304.63	910.57
304.79	910.57	305.04	910.55	306.59	910.44	307.8	910.34	308.56	910.3
309.11	910.26	310.73	910.18	311.15	910.16	312.38	910.06	313.7	909.98
314.04	909.95	316.04	909.68	316.35	909.63	316.67	909.57	318.89	909.15
319.3	909.09	320.86	908.85	321.37	908.78	322.98	908.59	323.94	908.47
324.91	908.32	326.08	908.19	326.43	908.15	328.09	907.89	328.52	907.8
329.81	907.51	330.18	907.43	330.57	907.34	331.85	907.02	332.21	906.94
333.46	906.6	334.66	906.26	335.04	906.17	337.28	905.84	337.52	905.8
339.51	905.58	339.69	905.56	340.96	905.39	341.57	905.32	342.36	905.22
342.46	905.2	342.8	905.16	344.42	904.96	344.83	904.89	346.21	904.67
346.63	904.6	347.07	904.52	348.44	904.24	349.02	904.14	350.61	903.8
352.24	903.7	352.5	903.66	352.77	903.62	354.42	903.27	355.74	902.72
356.39	902.37	356.96	901.92	357.43	901.48	357.72	901.2	358.06	900.83
358.97	900.26	359.96	899.45	362.65	898.65	363.15	898.64	364.1	898.61
365.02	898.56	365.42	898.56	366.67	898.57	367.43	898.62	368.7	898.72
369.61	898.75	370.91	898.77	371.83	898.78	373.09	898.79	374.46	898.82
374.78	898.83	375.08	898.84	376.44	898.89	377.53	898.88	378.47	898.83
379.87	898.74	380.29	898.72	381.35	898.72	381.85	898.71	382.06	898.73
384.58	899.29	384.85	899.4	385.66	899.74	386.11	899.88	388.62	900.29
389.77	900.26	390.75	900.05	391.46	899.9	393.1	899.59	393.2	899.59
394.89	899.41	395.49	899.39	396.43	899.37	397.02	899.36	398.31	899.32
400.13	899.28	400.18	899.28	401.97	899.22	403.15	899.17	404.07	899.14
405.25	899.1	406.09	899.09	407.86	899.07	408.69	899.07	409.91	899

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410.65	898.96	411.43	898.93	412.57	898.88	414.47	898.88	415.46	898.9
416.49	898.94	417.81	899	418.66	899.05	419.4	899.09	420.97	899.15
421.56	899.18	422.69	899.22	424.43	899.25	425.05	899.25	426.76	899.27
427.38	899.29	428.71	899.24	428.99	899.22	430.43	899.08	431.16	899.02
432.69	898.92	433.06	898.88	434.37	898.76	436.09	898.68	436.29	898.67
436.58	898.65	438.24	898.59	439.69	898.57	440.4	898.55	440.98	898.57
442.6	898.57	444.2	898.59	444.57	898.57	445.31	898.56	446.07	898.53
447.82	898.53	449.98	898.57	450.51	898.59	452.6	898.66	452.82	898.66
453.17	898.68	453.89	898.7	454.82	898.74	456.8	898.75	456.95	898.75
458.97	898.74	460.92	898.74	461.51	898.73	462.75	898.71	463.46	898.7
464.31	898.68	466.25	898.66	466.57	898.67	467.22	898.66	468.85	898.61
469.66	898.58	470.49	898.53	471.54	898.45	471.95	898.42	472.71	898.36
474.07	898.25	474.55	898.15	476.85	897.72	476.94	897.7	477.04	897.68
478.61	897.4	480.14	897.05	480.24	897.03	480.34	897.01	482.39	896.59
482.94	896.48	484.65	896.23	485.5	896.14	486.73	896.03	488.18	896.04
488.71	896.05	490	896.13	490.37	896.16	490.83	896.17	492.16	896.21
492.5	896.22	492.98	896.2	494.16	896.17	495.25	896.09	495.89	896.05
496.01	896.04	496.06	896.04	496.19	896	498.62	895.57	499.85	894.44
501.09	893.3	501.64	893.01	502.2	892.72	505.1	892.53	507.5	892.23
508.52	892.83	509.53	893.44	510.69	894.14	511.32	894.52	511.84	894.84
512.68	896.8	513.4	898.48	513.93	898.77	516.09	901.26	518.29	902.41
518.55	902.55	518.74	902.63	519.3	902.86	520.49	903.29	520.66	903.35
521.7	903.62	522.52	903.85	522.64	903.89	524.96	904.93	524.98	904.94
525.01	904.95	527.21	906.19	528.49	906.83	528.94	907.08	529.81	907.6
530.7	908.13	531.35	908.47	533.21	909.24	533.86	909.48	535.16	909.96
535.77	910.26	536.89	910.81	538.42	911.3	539.14	911.58	539.72	911.86
541.12	912.65	541.83	913.04	542.61	913.47	543.82	914.04	544.64	914.38
546.21	915.1	546.45	915.19	547.93	915.69	548.78	915.92	549.75	916.12
551.54	916.45	551.87	916.52	552	916.57	552.45	916.69	554.44	917.21
555.43	917.41	556.52	917.63	556.55	917.64				

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 494.16 .035 512.68 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 494.16 512.68 41.35 41.35 41.35 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 1472.03

INPUT

Description:

Station Elevation Data num= 484  
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev



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325.31	910.27	325.71	910.19	327.76	909.9	327.97	909.87	328.29	909.83
330.2401	909.62	331.56	909.46	332.3	909.38	334.25	909.1	334.37	909.08
336.36	908.76	337.63	908.5	338.61	908.32	340.56	907.94	341.03	907.85
342.41	907.6	342.94	907.51	344.33	907.26	344.46	907.24	345.87	907
346.42	906.9	349.4	906.42	349.91	906.34	350.23	906.28	352.16	905.94
352.59	905.86	352.69	905.84	354.51	905.52	356.36	905.25356.4901	905.23	905.23
358.6	904.88	359.16	904.81	360.26	904.67	361.43	904.62	362.12	904.56
362.86	904.46364.2401	904.32	365.18	904.18	366.35	903.99	903.99	367.46	903.78
368.38	903.63	369.3	903.46	370.15	903.32	370.9	903.19	372.29	902.96
373.03	902.8374.2401	902.53	375.11	902.28	375.5	902.18	902.18	376.54	902.13
378.31	901.93	379.01	901.97	381.05	902.14	381.15	902.15	382.95	902.2
384.52	902.24	385.18	902.26	386.16	902.3	387.42	902.38	387.77	902.4
389.39	902.46	390.62	902.5	391.47	902.52	393.29	902.57	393.87	902.58
395.01	902.59	395.9	902.59	396.33	902.58	397.94	902.52	398.81	902.45
400.02	902.31	400.56	902.25	401.55	902.12	402	902.03	402.77	901.8
403.38	901.65	404.39	901.33	404.91	901.16	406.17	900.73	406.66	900.56
407.16	900.47	408.52	900.19	409.13	900.08	410.73	899.87	411.3	899.8
412.57	899.67	413.3	899.62	413.81	899.57	415.26	899.42	415.55	899.4
417.95	899.33	418.35	899.34	418.85	899.36	420.62	899.38	422.29	899.38
422.89	899.37	424.91	899.37	425.83	899.38	426.54	899.4	428.19	899.42
429.56	899.38	430.28	899.39	431.39	899.38	431.96	899.37	432.31	899.37
434.22	899.27	434.93	899.25	436.55	899.19	436.9	899.17	438.79	899.16
439.07	899.16	440.71	899.12	441.36	899.09	442.34	899.05	444.74	898.92
447.15	898.77	447.67	898.73	449	898.66	449.61	898.64	450.6	898.61
451.99	898.56	452.24	898.55	452.47	898.54	454.21	898.46	455.42	898.41
456.12	898.4	456.64	898.38	458.34	898.24	459.11	898.16	460.72	897.93
461.38	897.83	463.08	897.6	463.69	897.54	464.89	897.38	466.08	897.2
466.59	897.13	468.44	896.87	470.46	896.72	471.57	896.66	471.98	896.63
472.09	896.62	473.62	896.5	473.69	896.5	475.73	896.28	475.86	896.27
477.41	896.16	478.14	896.11	478.2	896.11	478.39	896.1	480.49	896.02
481.48	895.99	482.48	895.95	483.86	895.98	484.11	895.98	484.54	896
485.98	896.08	486.39	896.09	487.69	896.15	488.49	896.18	488.83	896.19
490.11	896.24	491.81	896.24	493.41	896.26	493.79	896.26	495.35	896.2
495.85	896.13	497.32	895.93	497.84	895.85	498.29	895.8	499.46	895.74
499.71	895.74	501.7	895.47	502.3	894.58	502.89	893.69	503.75	893.43
504.6	893.16	506.29	892.59	507.85	892.57	509.46	892.35	510.45	892.71
511.43	893.06	512.7	893.62512.8701	893.7	513.47	893.97	893.97	513.72	894.08
513.98	894.19	514.5	894.21	514.73	894.22	515.61	894.24	517.65	896.35
518.3	897.04	520.21	897.11520.4301	897.55520.4901	897.89	521.4	897.89	521.4	901.11
523.0601	903.46	524.47	904.25	525.21	904.54	526.14	904.99526.8701	905.33	905.33
527.58	905.74	529.11	906.58	530.77	907.31	531.11	907.48531.6801	907.71	907.71
532.69	908.14	533.1	908.34534.7401	909.08	534.83	909.12	536.19	909.8	909.8
537.27	910.24	537.91	910.52539.2401	911.06	539.65	911.24541.4301	911.24541.4301	912.15	912.15
541.5601	912.21	544.11	913.03	544.27	913.09	545	913.31	547.15	913.98
547.95	914.33	549.29	914.91	549.34	914.93	551.21	915.72	551.35	915.77
553.08	916.35554.4301	916.57	555.05	916.7	556.46	917.06556.6801	917.06556.6801	917.13	917.13
557.27	917.36	558.26	917.76	558.77	917.97	559.89	918.51	561.2	919.06
562.33	919.37	563.98	919.96	564.3	920.08564.5601	920.18566.1801	920.18566.1801	920.79	920.79

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568.23 921.55 568.3 921.57 568.4 921.61 570.28 922.19

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 495.35 .035 517.65 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 495.35 517.65 46.62 48.33 49.76 .1 .3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 1423.7

INPUT

Description:

Station Elevation Data num= 483

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	944.7	29	921.1550.85004	922.96	51.06	922.9651.20001	922.99		
51.38	923.0251.58002	923.03	51.81	923.0957.04999	923.658.72003	923.03			
59	922.9359.60004	922.7659.89001	922.6160.52002	922.26	60.87	922.06			
61.23004	921.8662.04999	921.4764.70001	920.3866.57001	919.48	68.38	917.6			
69	916.9674.33002	916.6877.85004	914.8479.39001	91483.08002	916.86				
86.07001	915.187.90002	915.73	89.72	915.7690.82001	916.9991.06003	916.94			
91.42001	916.8992.80002	917.9293.32001	917.9696.08002	918.61	100.07	918.17			
102.48	917.86	103.49	917.89	105.64	917.93	107.1	918	107.54	918.04
109.12	918.04	111.22	918.07	112	918.04	114.29	918.06	116.98	918.17
119.68	918.06	120.84	917.85	121.68	917.76	122.25	917.72	124.05	917.73
124.4	917.73	125	917.66	126.68	917.51	128.07	917.28	128.55	917.22
129.01	917.17	130.23	917.08	131.09	917.08	132.5	916.88	134.29	916.91
134.41	916.92	134.49	916.92	136.25	916.97	137.78	916.99	138.47	917.01
139.54	917.01	140.59	917.03	141.21	917.02	142.77	916.99	144.08	916.92
145.92	916.73	146.94	916.66	147.92	916.57	149.02	916.55	149.79	916.53
150.82	916.48	152.55	916.37	152.68	916.36	152.83	916.33	154.22	916.09
156.59	915.95	156.97	915.96	158.61	916.16	158.83	916.17	160.66	916.34
161.04	916.35	162.36	916.37	163.12	916.38	163.45	916.38	165.12	916.4
166.78	916.45	167.35	916.46	167.85	916.54	169.57	916.73	170.7	916.88
171.41	916.99	172.43	917.18	173.11	917.31	173.94	917.41	175	917.55
175.46	917.55	176.69	917.58	176.91	917.58	178.1	917.59	178.76	917.6
180.02	917.63	181	917.66	182.41	917.67	182.99	917.67	184.22	917.65
186.32	917.58	186.53	917.58	187.36	917.56	188.81	917.53	189.24	917.5
190.76	917.42	192.17	917.33	192.35	917.32	194.23	917.18	194.37	917.17
196.82	917.12	197.11	917.1	197.45	917.09	199.41	916.99	200.07	916.95
201.42	916.83	202.85	916.73	203.13	916.71	203.41	916.7	204.91	916.64
206.48	916.57	206.73	916.56	206.9	916.55	208.77	916.52	209.51	916.51
211	916.5	211.32	916.49	214.12	916.47	214.89	916.5	215.62	916.48
217.22	916.48	218.68	916.49	218.83	916.49	220.73	916.43	221.12	916.42

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224.02	916.42	225.69	916.41	226.35	916.41	228.21	916.46	229.15	916.63
230.06	916.79	231.52	917.17	231.78	917.22	233.7	917.47	234.39	917.54
234.97	917.6	236.51	917.66	237.91	917.61	238.25	917.65	239.31	917.62
240.36	917.46	240.93	917.5	243.7	917.26	246.27	917.02	246.57	916.97
246.89	916.99	249.31	916.68	249.45	916.66	250.85	916.39	251.17	916.33
251.22	916.32	252.66	916.12	253.08	916.09	254.21	915.97	255.52	916.01
257.12	915.93	257.94	915.88	259.73	915.48	260.44	915.28	260.67	915.24
262.46	914.89	263.33	914.71	263.46	914.69	264.03	914.64	265.53	914.5
267.14	914.38	268.19	914.33	268.84	914.31	269.55	914.27	271.38	914.17
272.9	914.06	274.31	913.94	274.92	913.91	276.31	913.77	277.05	913.69
278.04	913.61	279.26	913.53	280.94	913.43	281.04	913.43	281.72	913.37
283.05	913.25	283.24	913.23	285.17	913.08	286.01	912.99	287.15	912.91
288.92	912.77	289.05	912.76	289.16	912.76	290.97	912.68	293	912.57
294.79	912.5	295.14	912.47	296.77	912.32	297.03	912.3	298.51	912.21
299.67	912.25	300.85	912.23	301.87	912.18	302.83	912.06	303.47	911.99
304.99	911.83	305.17	911.81	305.24	911.8	307.18	911.67	307.78	911.62
309.57	911.51	311.1	911.44	312.7	911.32	312.94	911.3	315.22	911.07
315.44	911.05	317.81	910.92	318.03	910.9	319.67	910.81	320.74	910.73
321.79	910.61	323.21	910.44	324.26	910.4	325.37	910.31	327.09	910.12
327.35	910.09	327.78	910.07	329.23	909.99	330.33	909.91	332.02	909.78
333.23	909.67	333.95	909.63	335.82	909.45	336.28	909.41	337.59	909.29
337.96	909.26	338.85	909.19	339.67	909.12	340.51	909.05	342.71	908.84
342.81	908.84	345.18	908.63	345.54	908.6	347.3	908.35	348.72	908.17
349.54	908.06	350.02	908	352.02	907.64	353.18	907.42	353.86	907.3
354.07	907.25	355.85	906.98	357.25	906.65	357.33	906.63	358.79	906.37
360.07	906.16	360.55	906.11	361.94	906	362.55	905.98	363.56	905.95
364.8	905.89	365.61	905.86	367.02	905.79	368.15	905.72	369.1	905.57
370.48	905.38	370.95	905.29	371.88	905.16	372.74	905.02	373.19	904.96
374.79	904.76	375.02	904.74	375.17	904.72	376.38	904.57	377.92	904.37
378.29	904.31	378.44	904.29	378.93	904.23	382.47	904.01	383.4	904.07
386.15	904.05	386.34	904.07	388.6	904.39	389.09	904.49	390.23	904.69
391.81	904.8	392.63	904.87	393.75	904.86	395.44	904.65	396.93	904.46
397.47	904.39	397.67	904.37	398.02	904.34	399.96	904.18	401.84	904.07
402.69	904.03	403.42	903.98	405.21	903.87	405.43	903.86	411.47	903.86
411.97	903.87	413.23	903.89	414.57	903.88	415.17	903.87	415.97	903.85
417.28	903.83	417.91	903.81	419.56	903.75	420.26	903.73	421.63	903.67
422.69	903.64	424.67	903.58	425.25	903.55	427.42	903.37	427.67	903.35
427.85	903.31	430.17	902.83	430.54	902.7	431.71	902.23	432.68	901.88
433.02	901.72	433.61	901.47	434.28	901.15	435.32	900.64	437.16	900.09
437.32	900.03	437.75	899.94	439.14	899.61	439.59	899.55	440.37	899.47
441.63	899.36	443.21	899.26	443.71	899.24	445.57	899.27	446.35	899.27
447.42	899.26	449.11	899.23	449.23	899.23	451.12	899.21	452.15	899.19
453.22	899.18	454.12	899.18	455.6	899.17	456.62	899.2	457.78	899.26
459.32	899.35	459.46	899.35	459.61	899.37	461.03	899.46	462.07	899.53
462.82	899.6	463.61	899.64	464.98	899.66	466.59	899.6	467.45	899.53
469.08	899.33	469.56	899.27	469.95	899.23	471.38	899.07	472.35	899
473.55	898.88	473.98	898.85	475.07	898.76	475.9	898.68	476.84	898.65
478	898.58	479.27	898.53	479.58	898.52	481.3	898.44	481.82	898.42

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482.66	898.39	483.75	898.33	485.4	898.27	485.64	898.25	487.74	897.99
488.52	897.84	489.82	897.61	490.83	897.4	491.15	897.33	491.97	897.17
492.59	897.04	493.53	896.87	495.19	896.53	496.64	896.23	497.02	896.16
497.13	896.15	498.98	895.95	499.5	895.89	500.81	895.81	501.28	895.78
502.8	895.71	502.98	895.7	503.05	895.7	504.67	895.63	505.45	895.56
506.49	895.48	507.22	895.38	508.42	894.95	509.02	893.54	509.61	892.13
512.58	891.51	515.23	891.17	517.58	890.77	519.01	890.86	520.43	890.96
521.77	891.8	523.1	892.65	525.11	893.14	527.13	893.64	527.65	894.27
528.12	894.73	529.15	895.41	530.31	896.18	531.25	896.56	531.37	896.61
531.61	896.73	532.61	897.21	533.17	897.5	534.1	898.13	535.65	899.17
536.82	900.43	537.77	901.24	539.08	902.57	540.95	903.53	542.05	904.33
543.25	904.96	544.42	905.56	545.85	906	546.64	906.19	547.56	906.38
548.73	906.6	549.61	906.92	550.81	907.38	551.8	907.79	552.84	908.29
554.17	908.82	554.88	909.07	556.52	909.59	556.92	909.71	558.85	910.47
558.97	910.51	561.15	911.45	561.44	911.55	563.41	912.28	563.87	912.44
565.61	913.1	565.83	913.18	567.18	913.76	568.24	914.23	568.36	914.29
568.48	914.34	571.22	915.26	571.97	915.43	573.61	915.89	575.23	916.25
576.41	916.45	577.92	916.72	578.83	916.93	581.58	917.46	581.66	917.48
583.17	917.91	583.7	918.01	584.46	918.18	585.96	918.67	586.22	918.75
588.42	919.39	589.63	919.7	589.89	919.76				

Manning's n Values			num=	3	
Sta	n Val	Sta	n Val	Sta	n Val
0	.05	506.49	.035	529.15	.1

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	506.49	529.15		55.39	55.39	55.39		.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 1368.31

INPUT

Description:

Station Elevation Data			num=	481					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	920.12	.0899	920.121.359985	920.111.769989	920.113.920013	920.21			
5.799988	920.176.290009		920.157.940002	920.149.019989	920.22	10.69	920.38		
12.72	920.5515.04999		921.2617.88998	921.85	19.12	922.0825.29001	923.28		
26.75	923.59	27.25	923.59	29.22	924.0830.17999	924.3331.04999	924.51		
31.41	924.6336.95001		925.9837.48001	926.1737.85999	926.2740.13998	926.86			
41.35999	927.0641.82001		927.1942.14999	927.1744.23001	927.0144.26999	927.04			
44.28	926.97	44.37	927.4344.38998	927.4244.39999	927.4344.42999	927.42			
44.47	927.4645.17999		927.6147.76001	928.1448.48999	928.24	48.81	928.24		
48.95001	928.2549.23001		928.29	50.78	928.15	51.56	928.3153.35001	928.7	
55.23001	928.756.01001		928.72	56.72	928.73	57.44	928.7559.01999	928.8	



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59.23001	928.81	59.41	928.861.10999	928.7961.70999	928.7962.63998	928.81
63.54001	928.8165.13998		928.84	65.75	928.8266.42001	928.82
68.54001	928.8769.26001		928.8770.67001		928.871.23001	928.7973.01001
73.35001	928.7575.20001		928.78	75.72	928.877.48001	928.8378.17001
80.20999	928.84	80.41	928.8582.04999		928.8782.17001	928.8783.32999
84.32999	928.7685.07999		928.7786.63998	928.83	87.5	928.8388.70999
89.26999	928.8390.17999		928.8291.26001	928.7892.29999		928.75
	94.34	928.63	95.66	928.4697.04001	928.31	97.19
	99.22	928.2299.32001		928.22	101.55	928.24
	105.5	928.12	106.6	928.08	107.61	928.06
111.04	928.02	111.35	928.02	111.59	928	113.18
114.99	927.87	116.04	927.83	117.35	927.75	117.84
120.44	927.55	121.97	927.41	122.95	927.33	123.94
125.79	927.12	126.03	927.12	127.7	927.05	128.91
	129.5	926.99	131.01	926.94	131.26	926.92
	134.4	926.85	135.14	926.83	136.73	926.76
139.52	926.65	140.88	926.55	141.89	926.48	143.4
145.13	926.22	145.39	926.19	145.87	926.17	147.07
149.36	925.92	149.69	925.88	150.83	925.78	151.69
153.67	925.52	154.39	925.46	155.92	925.29	156.29
159.12	924.97	159.57	924.93	160.22	924.88	161.38
163.51	924.56	165.19	924.38	165.56	924.35	167.36
169.91	923.94	170.34	923.9	170.56	923.88	172.11
173.95	923.62	176.21	923.41	176.24	923.41	178.01
179.82	923.18	180.17	923.16	182.09	923.02	183.74
184.65	922.82	185.91	922.72	186.86	922.63	187.48
189.33	922.35	191.04	922.2	191.53	922.16	191.61
194.07	921.84	194.33	921.81	194.91	921.74	196.31
200.01	921.11	200.07	921.1	200.17	921.09	201.81
204.05	920.6	204.68	920.52	205.93	920.35	206.8
208.96	919.97	209.96	919.84	210.69	919.75	211.66
213.38	919.36	213.45	919.35	213.75	919.32	215.97
218.46	918.7	218.53	918.69	218.55	918.69	220.56
	222.5	918.17	223.83	918	224.17	917.96
227.08	917.56	227.94	917.44	228.94	917.28	230.23
232.54	916.78	232.84	916.74	234.28	916.54	236.08
236.52	916.24	238.24	915.98	240.08	915.75	240.1
243.81	915.22	244.43	915.13	244.82	915.08	246.3
247.91	914.68	248.73	914.57	249.81	914.42	250.39
252.54	914.06	254.12	913.85	254.37	913.82	256.06
258.77	913.26	259.08	913.22	261.02	912.96	261.14
	263.1	912.7	264.44	912.55	265.12	912.48
267.98	912.18	268.91	912.08	269.91	911.98	270.64
273.32	911.63	274.25	911.56	274.88	911.51	276.03
	277.9	911.23	278.63	911.16	279.83	911.05
283.39	910.77	284.19	910.7	284.47	910.68	285.76
287.11	910.45	288.74	910.31	290.1	910.2	290.66
292.37	910.01	293.96	909.88	294.91	909.81	295.72

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297.82	909.59	299	909.48	299.73	909.41	300.66	909.33	301.99	909.2
303.6	909.06	303.73	909.05	305.32	908.89	305.69	908.86	307.51	908.69
308	908.64	309.65	908.46	309.83	908.44	309.94	908.4	310.15	908.36
312.78	907.92	313.45	907.69	315.03	907.29	315.26	907.2	316.84	906.67
317.81	906.44	319.31	906.08	319.56	906.04	321.12	905.72	321.67	905.62
323.08	905.37	323.61	905.29	325.54	905	325.76	904.97	325.99	904.94
328.01	904.73	328.91	904.62	330.54	904.41	331.23	904.26	332.51	904
333.45	903.72	334.86	903.35	336.42	902.87	336.76	902.77	337.25	902.62
338.75	902.17	339.6	901.93	340.8	901.6	342.2	901.19	342.74	901.03
343.26	900.85	344.72	900.3	346.05	899.69	346.26	899.6	346.44	899.51
347.69	898.9	348.94	898.31	350.03	897.88	351.29	897.6	352.45	897.35
354.37	897.23	356.49	897.23	356.79	897.22	357.22	897.22	358.61	897.23
360.29	897.14	360.45	897.14	362.35	897.04	363.47	897.06	364.36	897.05
365.43	897.06	366.44	897.04	367.81	897.01	368.72	896.98	369.97	896.9
370.48	896.88	372.43	896.69	372.61	896.67	372.92	896.63	374.74	896.44
376.47	896.28	376.61	896.27	376.92	896.24	378.44	896.09	379.45	896.01
380.21	895.96	380.31	895.96	381.26	895.86	382.06	895.78	382.38	895.76
384.12	895.65	384.77	895.61	386.86	895.51	387.01	895.51	387.81	895.52
389.02	895.55	389.21	895.56	391.02	895.62	391.39	895.64	393.07	895.75
393.88	895.81	394.9	895.91	395.8	896.01	397.02	896.09	397.75	896.14
399.11	896.2	399.48	896.21	400.8	896.24	402.05	896.18	402.5	896.18
403.96	896.07	404.41	896.05	406.99	895.55	407.19	895.34	408.06	894.8
408.95	894.25	409.45	893.94	410.71	893.15	412.6	892.51	414.01	892.35
414.34	892.31	415.42	892.18	416.76	892.16	418.1	892.15	419.74	892.14
420.07	892.13	421.38	892.12	423.68	892.62	426.1	893.1	426.61	893.86
427.12	894.61	427.73	895.16	427.75	895.18	427.79	895.2	429.54	895.82
430.68	896.08	431.47	896.28	432.92	896.67	433.05	896.69	433.44	896.83
434.57	897.19	435.42	897.51	436.34	897.85	436.67	897.95	437.28	898.1
438.55	898.38	440	898.7	440.43	898.8	440.84	898.92	442.79	899.4
444.6	900.23	444.87	900.35	445.23	900.56	446.87	901.5	447.94	901.97
449.07	902.39	450.72	902.92	450.86	902.98	452.6	903.65	453.22	903.9
454.73	904.54	454.74	904.54	456.39	905.17	456.75	905.34	458.37	906.28
459.04	906.64	461.03	907.46	461.12	907.5	461.27	907.54	463.15	908.07
465.04	908.66	465.2	908.7	465.32	908.74	467.22	909.25	468.07	909.46
469.37	909.8	471.17	910.28	471.76	910.48	472.16	910.61	473.93	911.2
474.53	911.33	475.83	911.49	476.24	911.56	478.18	911.88	478.38	911.92
478.82	912.05	480.36	912.5	480.97	912.7	482.09	913.1	483.14	913.39
483.93	913.65	485.53	914.14	486.1	914.32	487.82	915.05	488.38	915.21
488.53	915.26								

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .05 406.99 .035 429.54 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.  
 406.99 429.54 121.43 121.43 121.43 .1 .3

CROSS SECTION

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RIVER: Bluestone Creek  
 REACH: Align (1) RS: 1246.88

INPUT

Description:

Station Elevation Data		num= 250							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	913.61.289978	913.31.959991	913.153.669983	912.764.289978	912.62				
5.549988	912.376.839996	912.136.899994	912.128.849976	911.769.069977	911.71				
9.269989	911.68	11	911.37	11.59	911.2611.68997	911.2412.90997	910.96		
13.78998	910.7714.38998	910.6516.01999	910.2816.66998	910.0618.32999	909.33				
18.70999	909.1718.87999	909.120.55998	908.3321.51999	908.0322.49998	907.78				
24.03999	907.5224.82999	907.4225.89999	907.3327.13998	907.1527.99998	907				
29.37999	906.7730.25998	906.6931.57999	906.6532.44998	906.6733.52998	906.77				
34.64999	906.8735.24998	906.9336.16998	906.9637.32999	90738.01999	907.01				
39.27998	90740.16998	90740.64999	907.0142.15999	907.0542.66998	907.06				
44.53999	907.0847.12999	907.0848.03999	907.0548.46999	907.0449.45999	907				
50.15999	906.9750.32999	906.9752.33998	906.8752.63998	906.8553.21999	906.8				
54.32999	906.7156.37999	906.3756.68999	906.3256.98999	906.2358.14999	905.66				
59.87999	904.8360.15999	904.6760.77998	904.2861.90999	903.5562.47998	903.16				
63.52998	902.4564.08998	902.0864.99998	901.4665.23999	901.366.56999	900.45				
66.76999	900.3467.57999	899.8968.64999	899.3168.89999	899.1870.34999	898.53				
70.88998	898.3871.81999	898.0973.03999	897.973.95999	897.775.83998	897.44				
76.12999	897.4377.38998	897.3977.77998	897.3877.90999	897.3979.22998	897.45				
80.80998	897.5480.87999	897.5580.93999	897.5582.36998	897.5984.79999	897.53				
84.97998	897.585.70999	897.5687.44998	895.2988.48999	893.9490.17999	891.73				
90.49998	891.6191.48999	891.2192.79999	890.6994.81999	890.5796.40999	890.47				
96.93999	890.4997.20999	890.597.45999	890.5197.78999	890.5298.88998	890.56				
101.79	891.07	103.88	891.4	105.98	891.73	107.79	892.25	107.99	892.3
108.24	892.37	110.05	892.88	110.72	893.07	111.29	893.23	112.2	893.49
112.64	893.62	114.12	894.03	114.96	894.26	115.16	894.3	115.38	894.33
117.26	894.46	118.59	894.57	118.81	894.59	120.49	894.72	120.6	894.73
121.22	894.81	122.88	895	123.12	895.02	123.89	895.03	125.36	895.04
125.94	895.01	127.07	894.96	127.93	894.95	128.93	894.93	129.63	894.93
130.85	894.97	131.58	895	132.1	895.03	133.54	895.1	134.99	895.18
135.5	895.18	137.14	895.28	137.52	895.34	139.16	895.49	139.61	895.54
139.71	895.54	140.2	895.56	142	895.64	144.23	895.64	145.26	895.62
146.49	895.59	147.95	895.56	148.88	895.54	149.72	895.53	150.73	895.53
152.02	895.51	153.04	895.53	153.71	895.54	155.06	895.55	156.25	895.6
157.41	895.56	158.47	895.52	159.43	895.48	161.79	895.3	161.8	895.3
163.94	895.19	164.79	895.17	165.92	895.11	166.69	895.07	168.14	894.94
168.42	894.92	169.64	894.85	171.14	894.91	171.43	894.93	171.72	894.93
173.51	894.92	175.25	894.9	175.95	894.89	176.34	894.86	178.18	894.71
178.72	894.67	178.84	894.66	181.14	894.52	181.28	894.51	181.43	894.51
183.7	894.48	184.98	894.41	186.97	894.29	188.27	894.27	189.89	894.42
190.1	894.43	191.39	894.45	193.24	894.43	193.43	894.43	195.61	894.38

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196.46	894.33	197.22	894.3	199.12	894.17	199.19	894.17	200.98	894.05
201.55	894.02	202.54	893.96	203.54	893.97	204.75	894.02	205.33	894.01
207.26	894.02	207.94	894.01	209.24	894	211.32	894.01	211.92	894.02
214.25	894.06	214.63	894.08	215.67	894.17	216.74	894.23	217.14	894.24
218.8	894.4	220.04	894.61	222.54	895.1	222.65	895.12	222.82	895.16
223.21	895.27	226.55	896.3	227.39	896.59	227.73	896.67	228.72	896.86
230.79	897.36	235.1	898.55	236.55	898.98	236.65	899	237.6	899.33
239.14	899.98	240.37	900.51	241.01	900.83	248.04	904.18	248.16	904.24
248.17	904.25	248.19	904.26	248.33	904.32	254.59	907.3	255.06	907.49
259.82	908.32	261.27	908.75	266.97	909.79	267.12	909.82	267.29	909.85
267.56	909.9	270.9	910.84	271.87	911.14	273.18	911.47	273.33	911.5

Manning's n Values	num=	3
Sta n Val Sta n Val	Sta n Val	Sta n Val
0 .0587.44998	.035 122.88	.1

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
87.44998	122.88	119.57	119.57	119.57	.1	.3

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 1127.31

INPUT

Description:

Station Elevation Data	num=	219			
Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev	Sta Elev	Sta Elev			
0 911.26 .519989	911.21.230011	911.112.600006	910.933.549988	910.83	
4.410004	910.755.540009	910.656.290009	910.596.880005	910.49 8.01001	910.29
9.630005	910.039.929993	909.9910.07001	909.97 12.28	909.77 12.41	909.74
14.42001	909.36 14.97	909.17 16.91	908.49 17.09	908.4318.17999	908.03
18.87	907.7819.01001	907.74 20.5	907.5221.10001	907.43 21.81	907.33
22.89001	907.1223.20999	907.05 23.38	907.0224.01001	906.9 24.5	906.81
28.42999	904.96 29.13	904.6929.95001	903.9930.35001	903.6431.92999	902.48
32.10999	902.36 32.34	902.2533.29999	901.7334.76999	901.01 34.94	900.92
34.95999	900.9235.10999	900.8636.98999	900.19 37.91	900.1140.42001	900.46
41.28	900.67 41.81	900.9142.42999	901.1842.79001	901.34 43.16	901.49
43.94	901.8245.89001	902.1146.98001	902.1247.67001	902.11 49.12	902.07
49.29999	902.0750.17001	902.0850.73999	902.09 50.91	902.151.98999	902.13
53.16	902.1453.98999	902.1355.42999	902.1357.07001	902.1657.54001	902.18
58.14001	902.1759.35001	902.1460.29999	902.13 61.09	902.0961.64001	902.08
63.64999	901.85 65.88	901.0366.14001	900.966.51001	900.73 67.58	900.22
68.06	900.03 69.19	899.51 69.87	899.21 70.89	898.6871.35001	898.43
72.25	898.01 73.12	897.6573.46001	897.48 74.88	896.81 75.2	896.65
76.19	896.29 77.47	895.84 78.52	895.6980.14999	895.6380.89999	895.59
82.08	895.57 82.48	895.56 82.72	895.58 84.03	895.7 84.97	895.79

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84.98	895.8	86.36	895.99	87.85	001	896.08	88	896.09	88.28	999	895.99	
92.2	895.72	94.21	001	894.52	95.14	999	893.97	96.88	892.94	98.07	001	891.48
101.88	891.45	104.48	891.16	104.92	891.12	106.39	890.73	109.07	890.92			
110.41	891.53	110.94	892.67	111.1	893.02	111.37	893.61	111.71	894.34			
119.56	894.84	119.61	894.84	121.97	894.67	122.76	894.64	124.48	894.51			
127.62	894.34	128.5	894.29	129.39	894.25	133.03	894.31	133.13	894.32			
133.27	894.33	135.52	894.62	136.76	894.64	139.71	894.62	141.89	894.64			
143.49	894.56	145.97	894.48	146.8	894.43	148.22	894.43	152.81	894.44			
156.66	894.73	158.3	894.77	159.16	894.78	160.05	894.75	160.91	894.71			
161.44	894.65	165.41	894.46	168.99	893.77	170.63	893.62	174.9	893.37			
177.67	893.28	181.69	893.33	183.97	893.32	184.26	893.31	184.8	893.3			
186.58	893.24	187.61	893.21	188.22	893.19	193.46	893.04	197.16	892.84			
198.53	892.76	199.43	892.82	203.52	892.82	203.58	892.83	205.46	893.06			
205.53	893.07	206.19	893.25	207.2	893.51	208.72	893.64	210.04	893.73			
211.87	893.81	215.26	894.02	219.91	895.17	220.76	895.32	221.9	895.8			
224.29	897.02	226.3	898.08	229.64	900.04	231.08	900.52	233.82	901.73			
234.89	902.1	239.06	903.53	240.89	904.09	242.03	904.3	244.66	904.75			
245.59	904.98	247.68	905.39	250.14	905.79	251.71	906	252.74	906.12			
255.75	906.44	259.33	906.82	263.49	907.16	265.98	907.41	267.05	907.54			
269.24	907.69	273.37	908.13	274.92	908.24	276.65	908.39	278.57	908.64			
279	908.69	279.12	908.7	279.45	908.71	287.88	909.39	288.09	909.4			
289.15	909.46	290.76	909.52	292.17	909.7	292.7	909.72	295.43	909.87			
299.75	910.14	300.76	910.23	301.03	910.22	304.35	910.35	307.68	910.45			
310.61	910.27	311.32	910.3	312.8	910.14	313.87	910.14	317.53	910.66			
318.54	910.76	319.26	910.89	321.8	911.01	323	911.14					

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.0594	21001	.035	111.71	.1

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	94.21	001	111.71	103.35	103.35	103.35	.1	.3	
Ineffective Flow			num=	1					
Sta L	Sta R	Elev	Permanent						
159.16	323	905	F						

CROSS SECTION

RIVER: Bluestone Creek  
 REACH: Align (1) RS: 1023.96

INPUT

Description:

Station Elevation Data num= 157

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	913.08	2399902	912.99	6899719	912.85	1079987	912.75	209991	911.04
6.23999	910.71	111.17999	908.31	112.21997	907.86	112.46997	907.73	14.45999	906.61

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14.59	906.5514.67999	906.4916.67999	905.1218.31998	903.7224.92999	901.17
25.46999	900.6926.30998	900.5433.10999	901.3533.44998	901.3933.58998	901.39
36.00998	901.3838.24998	901.3738.50998	901.3740.58998	901.3841.66998	901.37
43.28998	901.3744.32999	901.3645.36998	901.3346.54999	901.1949.88998	900.38
50.31999	900.3251.78998	899.9554.06999	899.5354.36998	899.4154.42999	899.37
61.05998	895.6561.50998	895.4365.64998	893.1467.09999	890.8467.88998	889.59
69.35999	889.3970.65999	889.274.56999	889.6176.92999	89080.40999	890.57
81.33998	890.7281.79999	891.1384.09999	893.1584.19998	893.1885.69998	893.52
87.48999	893.6888.41998	893.9389.63998	894.0191.24998	894.0391.67999	894.03
93.86998	893.9996.05998	894.0197.11998	894 102.2	893.79 102.39	893.77
105.6	893.66 106.59	893.65 106.86	893.64 107.46	893.62 113.58	893.41
114.87	893.32 118.18	893.41 119.51	893.38 121.49	893.31 124.96	893.33
125.56	893.33 130.09	893.17 130.66	893.14 131.78	893.06 132.19	893.06
134.24	892.91 139.98	892.94 140.26	892.93 140.31	892.93 143.78	892.43
145.94	892.3 149.44	892.06 151.17	892.11 151.74	892.09 153.76	892.45
154.57	892.52 158.94	893.13 160.08	893.42 161.67	893.64 163.91	893.94
167.09	894.94 167.37	895.07 167.65	895.26 171.53	898.01 173.58	899.15
179.72	901.48 180.28	901.69 180.37	901.72 180.66	901.77 182.85	902.14
186.45	902.77 186.66	902.8 188.11	903 188.78	903.08 189.17	903.13
191.62	903.4 192.81	903.5 193.43	903.56 197.29	903.97 197.32	903.98
197.35	903.98 204.33	904.59 207.25	904.85 207.39	904.86 207.61	904.88
213.57	905.39 217.34	905.34 218.9	905.29 220.89	905.16 222.57	905.11
222.92	905.11 223.86	905.19 224.58	905.22 225.37	905.27 226.66	905.28
228.18	905.26 231.93	905.23 232.32	905.23 235.14	904.92 236.1	904.96
240.64	905.11 241.79	905.08 244.57	904.5 245.62	904.79 246.53	905.17
248	906.03 249.15	906.58 250.55	906.84 251.22	907.22 257.1	908.99
257.66	909.13 259.13	909.49 260.58	909.87 261.22	910 261.72	910.1
262.79	910.38 265.68	910.95 267.03	911.23 268.54	911.31 269.84	911.36
271.02	911.31 271.39	911.28 271.7	911.24 273.49	911.15 276.13	911.41
277.69	911.54 281.11	912.3			

Manning's n Values num= 3  
 Sta n Val Sta n Val Sta n Val  
 0 .0565.64998 .03584.09999 .1

Bank Sta: Left Right Coeff Contr. Expan.  
 65.6499884.09999 .1 .3

SUMMARY OF MANNING'S N VALUES

River:Bluestone Creek

Reach	River Sta.	n1	n2	n3
Align (1)	9505.57	.05	.035	.1
Align (1)	9327.36	.05	.035	.05

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Align (1)	9112.88	.05	.035	.1
Align (1)	8893.47	.05	.035	.1
Align (1)	8694.47	.05	.035	.1
Align (1)	8502.63	.05	.035	.1
Align (1)	8312.06	.05	.035	.1
Align (1)	8092.65	.05	.035	.1
Align (1)	7909.32	.05	.035	.1
Align (1)	7703.66	.05	.035	.1
Align (1)	7500.63	.1	.035	.05
Align (1)	7359.7	.05	.035	.05
Align (1)	7155.83	.05	.035	.05
Align (1)	6967.63	.05	.035	.05
Align (1)	6671.12	.05	.035	.05
Align (1)	6456.57	.05	.035	.1
Align (1)	6296.61	.05	.035	.1
Align (1)	6151.32	.05	.035	.1
Align (1)	5993.5	.05	.035	.1
Align (1)	5874.57	.05	.035	.1
Align (1)	5766.87	.05	.035	.1
Align (1)	5631.82	.05	.035	.1
Align (1)	5483.31	.05	.035	.1
Align (1)	5339.61	.05	.035	.1
Align (1)	5216.26	.05	.035	.1
Align (1)	4942.13	.05	.035	.05
Align (1)	4652.11	.05	.035	.05
Align (1)	4394.46	.05	.035	.05
Align (1)	4118.13	.1	.035	.05
Align (1)	4004.96	.1	.035	.05
Align (1)	3887.33	.1	.035	.05
Align (1)	3774.24	.1	.035	.05
Align (1)	3655.76	.05	.035	.05
Align (1)	3522.15	.05	.035	.05
Align (1)	3474.34	.05	.035	.05
Align (1)	3419.48	.05	.035	.05
Align (1)	3307.29	.05	.035	.05
Align (1)	3301.29			
		Bridge		
Align (1)	3273.98	.05	.035	.05
Align (1)	3220.4	.05	.035	.1
Align (1)	3147.68	.05	.035	.1
Align (1)	3097.2	.05	.035	.1
Align (1)	2991.1	.05	.035	.1
Align (1)	2894.59	.05	.035	.1
Align (1)	2793	.05	.035	.1
Align (1)	2692.71	.05	.035	.1
Align (1)	2591.27	.05	.035	.1
Align (1)	2540.29	.05	.035	.1
Align (1)	2480.61	.05	.035	.1
Align (1)	2384.96	.1	.035	.05

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		Bridge			
Align (1)	2378.96				
Align (1)	2358.81	.1	.035		.05
Align (1)	2258.53	.1	.035		.05
Align (1)	2199.16	.1	.035		.05
Align (1)	2147.2	.1	.035		.05
Align (1)	2038.82	.1	.035		.05
Align (1)	1891.98	.1	.035		.1
Align (1)	1836.41	.1	.035		.1
Align (1)	1784.51	.1	.035		.1
Align (1)	1679.48	.1	.035		.1
Align (1)	1673.48	Bridge			
Align (1)	1651.65	.1	.035		.1
Align (1)	1582.56	.1	.035		.05
Align (1)	1513.38	.05	.035		.1
Align (1)	1472.03	.05	.035		.1
Align (1)	1423.7	.05	.035		.1
Align (1)	1368.31	.05	.035		.1
Align (1)	1246.88	.05	.035		.1
Align (1)	1127.31	.05	.035		.1
Align (1)	1023.96	.05	.035		.1

SUMMARY OF REACH LENGTHS

River: Bluestone Creek

Reach	River Sta.	Left	Channel	Right
Align (1)	9505.57	178.21	178.21	178.21
Align (1)	9327.36	214.48	214.48	214.48
Align (1)	9112.88	217.06	219.41	222.31
Align (1)	8893.47	199	199	199
Align (1)	8694.47	191.84	191.84	191.84
Align (1)	8502.63	191.57	190.57	189.78
Align (1)	8312.06	219.41	219.41	219.41
Align (1)	8092.65	188.66	183.33	182.95
Align (1)	7909.32	200.4	205.66	210.75
Align (1)	7703.66	202.31	203.03	204.11
Align (1)	7500.63	140.93	140.93	140.93
Align (1)	7359.7	206.43	203.87	200.3
Align (1)	7155.83	185.26	188.2	190.24
Align (1)	6967.63	309.39	296.51	279.44
Align (1)	6671.12	206.34	214.55	217.5
Align (1)	6456.57	159.96	159.96	159.96
Align (1)	6296.61	145.29	145.29	145.29
Align (1)	6151.32	156.75	157.82	163.2



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Align (1)	5993.5	118.34	118.93	119.21
Align (1)	5874.57	110.24	107.7	103.67
Align (1)	5766.87	134.05	135.05	135.79
Align (1)	5631.82	148.97	148.51	148.05
Align (1)	5483.31	145.04	143.7	141.88
Align (1)	5339.61	123.35	123.35	123.35
Align (1)	5216.26	257	274.13	291
Align (1)	4942.13	310	290.02	279.8
Align (1)	4652.11	244	257.65	271.8
Align (1)	4394.46	287.76	276.33	261.85
Align (1)	4118.13	116.57	113.17	111.58
Align (1)	4004.96	117.63	117.63	117.63
Align (1)	3887.33	113.09	113.09	113.09
Align (1)	3774.24	118.48	118.48	118.48
Align (1)	3655.76	127	133.61	140.51
Align (1)	3522.15	47.81	47.81	47.81
Align (1)	3474.34	49.33	54.86	58.55
Align (1)	3419.48	139	112.19	71.7
Align (1)	3307.29	33.31	33.31	33.31
Align (1)	3301.29	Bridge		
Align (1)	3273.98	56.05	53.58	50.5
Align (1)	3220.4	69.73	72.72	75.32
Align (1)	3147.68	50.48	50.48	50.48
Align (1)	3097.2	107.52	106.1	104.95
Align (1)	2991.1	96.51	96.51	96.51
Align (1)	2894.59	99.96	101.59	105
Align (1)	2793	100.29	100.29	100.29
Align (1)	2692.71	103.1	101.44	100.42
Align (1)	2591.27	47.53	50.98	55.1
Align (1)	2540.29	59.68	59.68	59.68
Align (1)	2480.61	74.5	95.65	117.1
Align (1)	2384.96	26.15	26.15	26.15
Align (1)	2378.96	Bridge		
Align (1)	2358.81	127.91	100.28	70.7
Align (1)	2258.53	61.13	59.37	57.75
Align (1)	2199.16	51.96	51.96	51.96
Align (1)	2147.2	106.46	108.38	111.4
Align (1)	2038.82	146.84	146.84	146.84
Align (1)	1891.98	55.57	55.57	55.57
Align (1)	1836.41	51.9	51.9	51.9
Align (1)	1784.51	145.4	105.03	62.75
Align (1)	1679.48	27.83	27.83	27.83
Align (1)	1673.48	Bridge		
Align (1)	1651.65	69.09	69.09	69.09
Align (1)	1582.56	61.68	69.18	79.58
Align (1)	1513.38	41.35	41.35	41.35
Align (1)	1472.03	46.62	48.33	49.76
Align (1)	1423.7	55.39	55.39	55.39

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Align (1)	1368.31	121.43	121.43	121.43
Align (1)	1246.88	119.57	119.57	119.57
Align (1)	1127.31	103.35	103.35	103.35
Align (1)	1023.96			

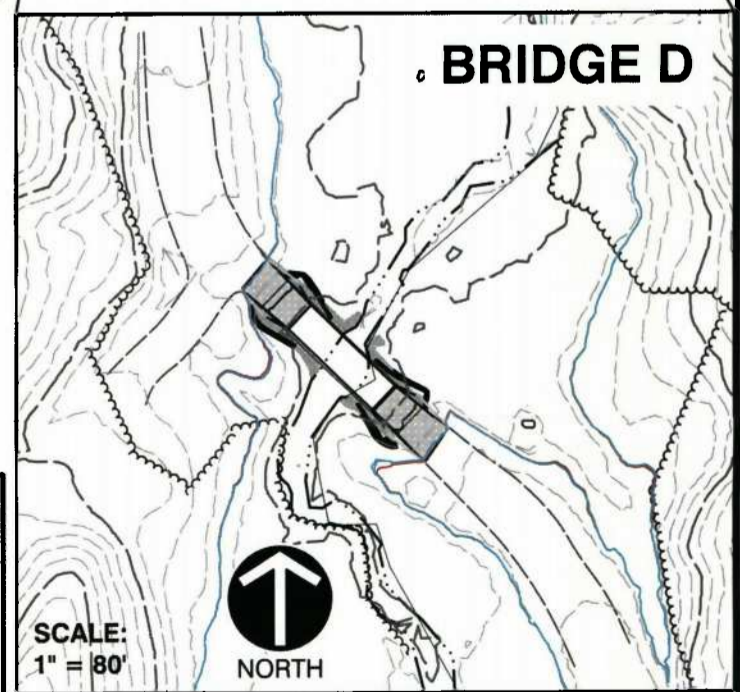
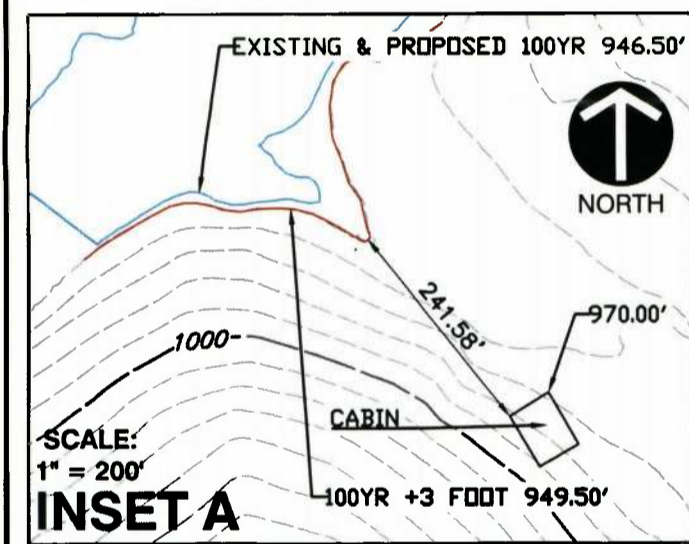
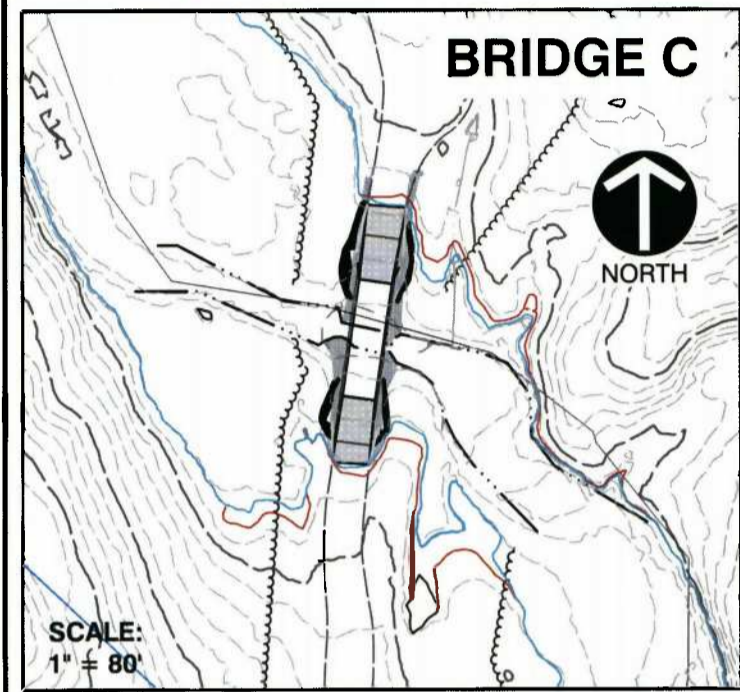
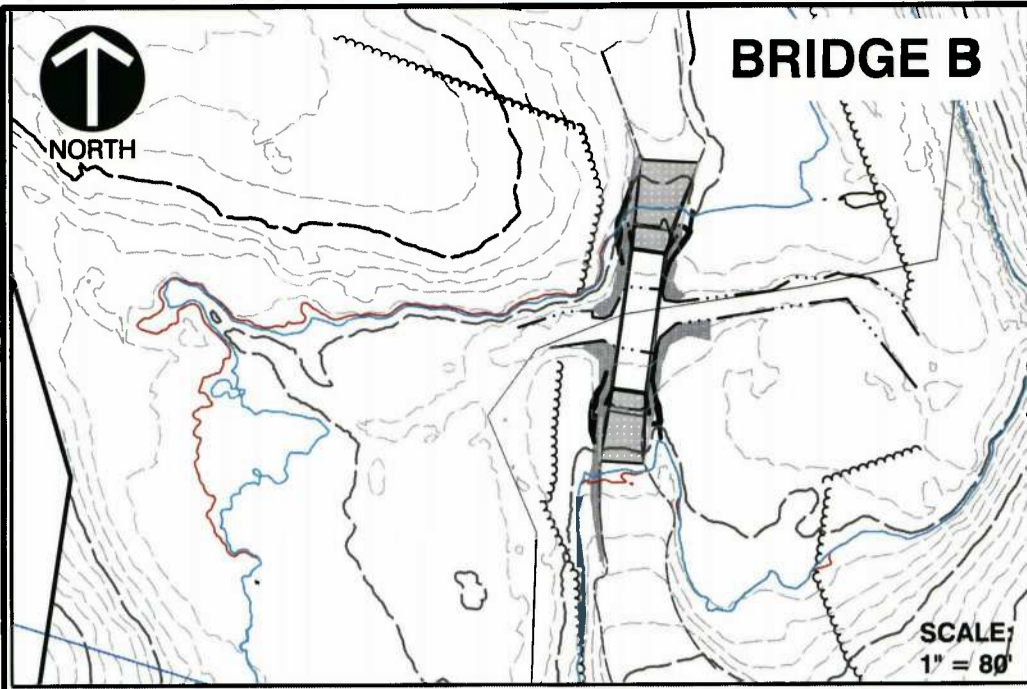
SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS  
River: Bluestone Creek

Reach	River Sta.	Contr.	Expan.
Align (1)	9505.57	.1	.3
Align (1)	9327.36	.1	.3
Align (1)	9112.88	.1	.3
Align (1)	8893.47	.1	.3
Align (1)	8694.47	.1	.3
Align (1)	8502.63	.1	.3
Align (1)	8312.06	.1	.3
Align (1)	8092.65	.1	.3
Align (1)	7909.32	.1	.3
Align (1)	7703.66	.1	.3
Align (1)	7500.63	.1	.3
Align (1)	7359.7	.1	.3
Align (1)	7155.83	.1	.3
Align (1)	6967.63	.1	.3
Align (1)	6671.12	.1	.3
Align (1)	6456.57	.1	.3
Align (1)	6296.61	.1	.3
Align (1)	6151.32	.1	.3
Align (1)	5993.5	.1	.3
Align (1)	5874.57	.1	.3
Align (1)	5766.87	.1	.3
Align (1)	5631.82	.1	.3
Align (1)	5483.31	.1	.3
Align (1)	5339.61	.1	.3
Align (1)	5216.26	.1	.3
Align (1)	4942.13	.1	.3
Align (1)	4652.11	.1	.3
Align (1)	4394.46	.1	.3
Align (1)	4118.13	.1	.3
Align (1)	4004.96	.1	.3
Align (1)	3887.33	.1	.3
Align (1)	3774.24	.1	.3
Align (1)	3655.76	.1	.3
Align (1)	3522.15	.1	.3

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Align (1)	3474.34	.1	.3
Align (1)	3419.48	.1	.3
Align (1)	3307.29	.3	.5
Align (1)	3301.29	Bridge	
Align (1)	3273.98	.3	.5
Align (1)	3220.4	.1	.3
Align (1)	3147.68	.1	.3
Align (1)	3097.2	.1	.3
Align (1)	2991.1	.1	.3
Align (1)	2894.59	.1	.3
Align (1)	2793	.1	.3
Align (1)	2692.71	.1	.3
Align (1)	2591.27	.1	.3
Align (1)	2540.29	.1	.3
Align (1)	2480.61	.1	.3
Align (1)	2384.96	.3	.5
Align (1)	2378.96	Bridge	
Align (1)	2358.81	.3	.5
Align (1)	2258.53	.1	.3
Align (1)	2199.16	.1	.3
Align (1)	2147.2	.1	.3
Align (1)	2038.82	.1	.3
Align (1)	1891.98	.1	.3
Align (1)	1836.41	.1	.3
Align (1)	1784.51	.1	.3
Align (1)	1679.48	.3	.5
Align (1)	1673.48	Bridge	
Align (1)	1651.65	.3	.5
Align (1)	1582.56	.1	.3
Align (1)	1513.38	.1	.3
Align (1)	1472.03	.1	.3
Align (1)	1423.7	.1	.3
Align (1)	1368.31	.1	.3
Align (1)	1246.88	.1	.3
Align (1)	1127.31	.1	.3
Align (1)	1023.96	.1	.3

**APPENDIX G**  
**FEMA Floodplain Exhibit**



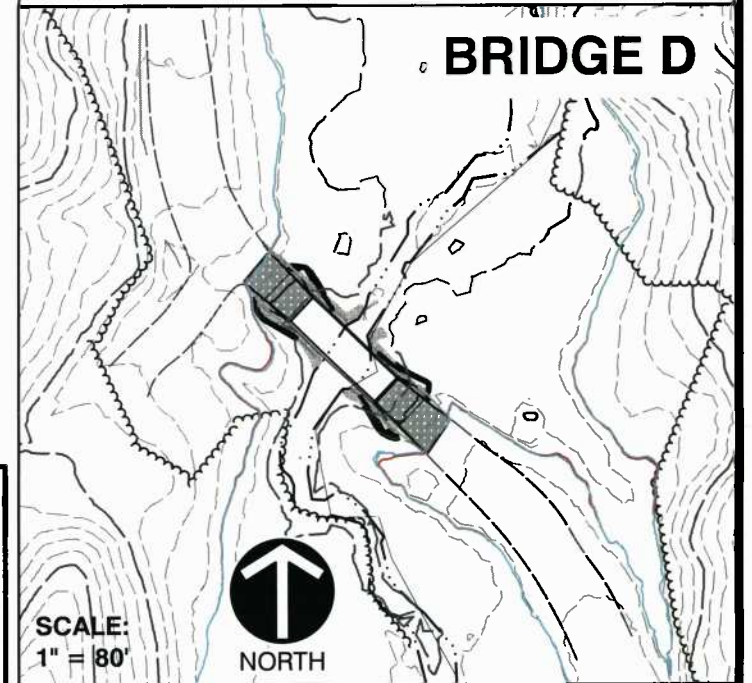
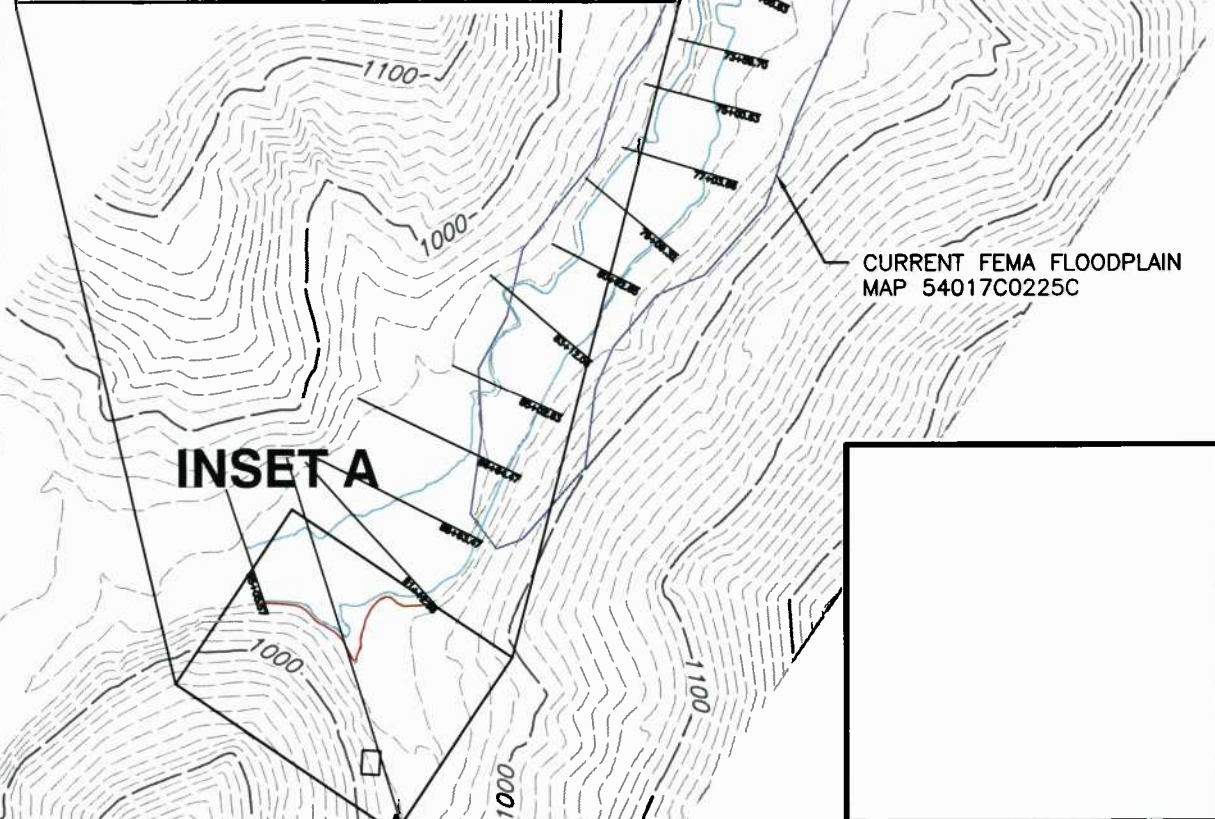
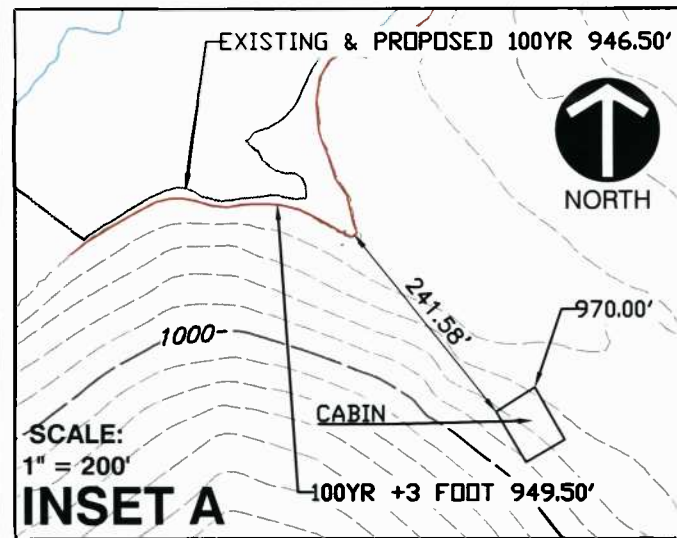
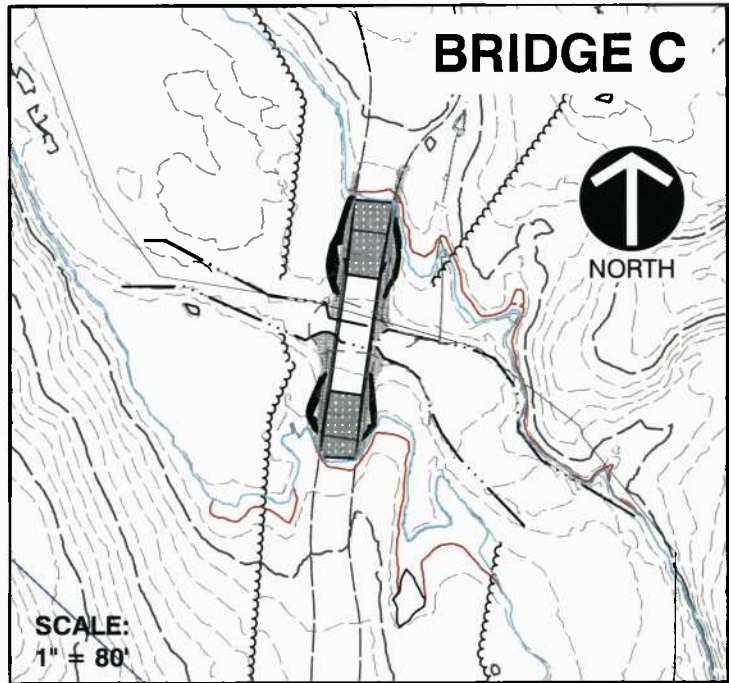
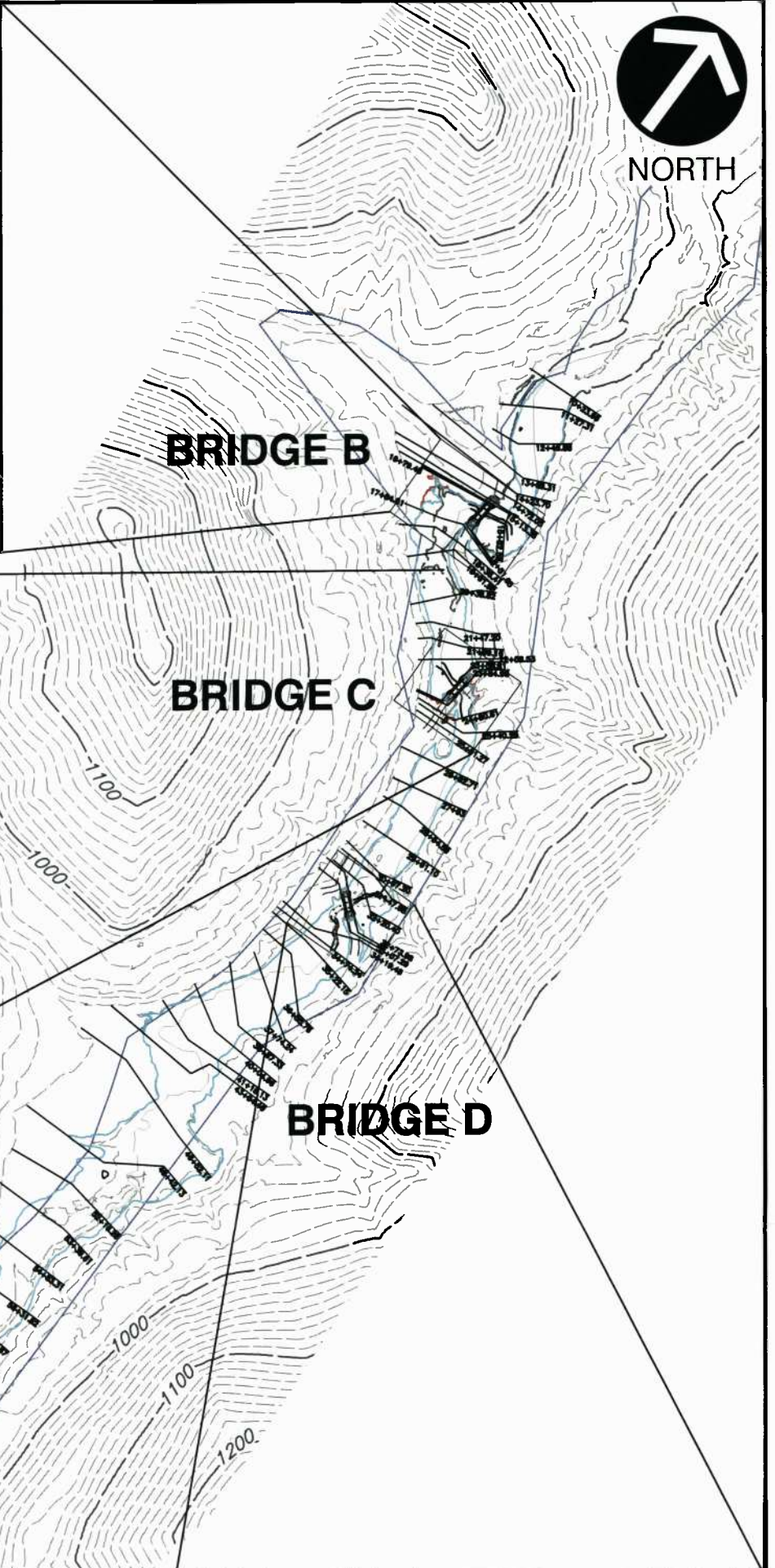
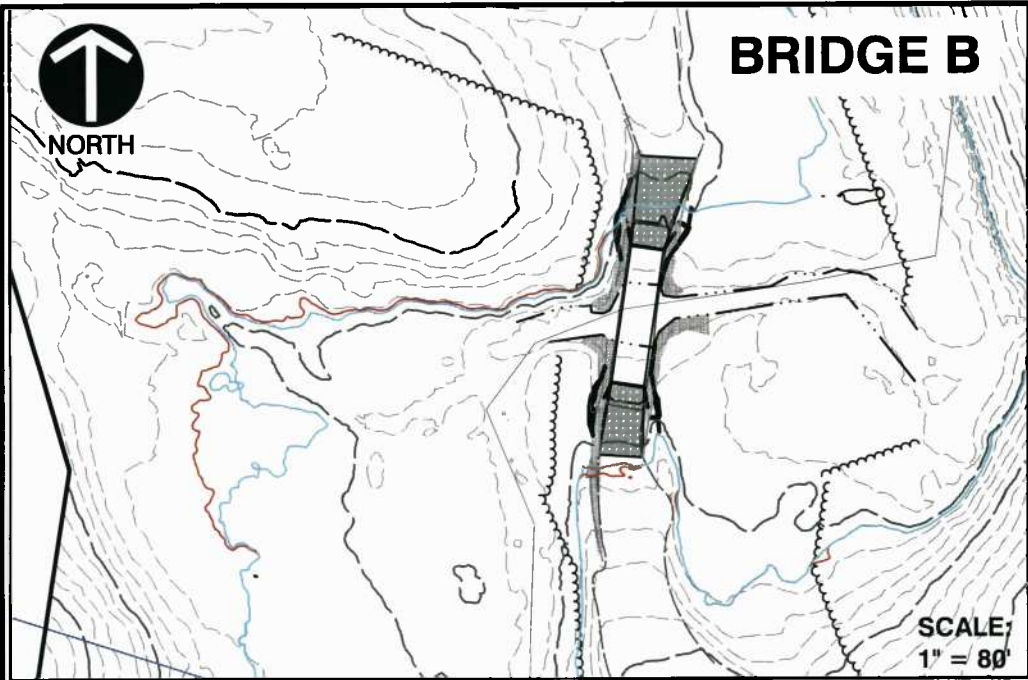
**LEGEND**

	EXISTING FEMA FLOOD ELEVATION
	EXISTING FLOOD ELEVATION LINE
	PROPOSED FLOOD ELEVATION LINE

**Civil & Environmental Consultants, Inc.**  
 600 Marketplace Ave · Suite 200 · Bridgeport, WV 26330  
 Ph: 304.933.3119 · Fax: 304.933.3327  
 www.cecinc.com

DRAWN BY:	DBS	CHECKED BY:	JDR	APPROVED BY:	SAC	FIGURE NO.:	1
DATE:	APRIL 2017	DWG SCALE:	1" = 200'	PROJECT NO.:	171-150		

EQT PRODUCTION COMPANY  
 OXF 157 BRIDGE CROSSINGS  
 WEST UNION DISTRICT  
 DODDRIDGE COUNTY, WV  
**FLOODPLAIN  
 EXHIBIT**



**LEGEND**

	EXISTING FEMA FLOOD ELEVATION
	EXISTING FLOOD ELEVATION LINE
	PROPOSED FLOOD ELEVATION LINE

**CEC**

**Civil & Environmental Consultants, Inc.**

600 Marketplace Ave · Suite 200 · Bridgeport, WV 26330  
Ph: 304.933.3119 · Fax: 304.933.3327  
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DRAWN BY:	DBS	CHECKED BY:	JDR	APPROVED BY:	SAC	FIGURE NO.:	1
DATE:	APRIL 2017	DWG SCALE:	1" = 200'	PROJECT NO.:	171-150		

EQT PRODUCTION COMPANY  
OXF 157 BRIDGE CROSSINGS  
WEST UNION DISTRICT  
DODDRIDGE COUNTY, WV

**FLOODPLAIN  
EXHIBIT**