PI NO. 0013943 WALKER COUNTY

SR 1 (US 27) OVER WEST CHICKAMAUGA CREEK

HYDRAULIC AND HYDROLOGICAL STUDY

EXAMINED AND APPROVED:

July 26, 2019
DATE

WILLIAM M. DUVALL, P.E.

STATE BRIDGE ENGINEER

___FEMA and Community Coordination Required
_X_Community Coordination Only Required
___No FEMA or Community Coordination Required

PI NO. 0013943 WALKER COUNTY

SR 1 (US 27) OVER WEST CHICKAMAUGA CREEK

HYDRAULIC AND HYDROLOGICAL REPORT

This project involves the replacement of the existing 411 ft long by 82 ft wide (gutter to gutter) bridge at the crossing of State Route 1 (US 27) over West Chickamauga Creek. The proposed replacement structure is to be a 425 ft long by 78 ft wide (gutter to gutter) PSC beam bridge with stub abutments located along the existing alignment. The proposed span arrangement for the bridge will consist of one 40 ft long span, four 60 ft long spans, and one 145 ft long span. The bents of the proposed bridge are to be built at 90 degrees to the roadway centerline to align with the flood flow at this site. The bents of the existing bridge are built at 90 degrees to the roadway centerline. The drainage area of 120 sq mi was obtained using the StreamStats software. The hydraulic slope was obtained from the USGS Quad maps for this area.

The gutter to gutter bridge width of 78 ft was obtained from the Bridge and Structures Design Manual, Section 2.9.2.1 for a State Route with over 2000 vpd traffic. The proposed typical section is composed of four 12 ft travel lanes with a 14 ft median and 8 ft shoulders and will be built on a 2.0 % normal crown. The design year ADT is 24,250 vpd and the speed design is 55 mph. The design storm is the 50 year storm as per the Drainage Manual for a State Route.

The proposed site is located in Unincorporated Walker County in Georgia. Walker County participates in the National Flood Insurance Program administered by the Federal Emergency Management Agency (FEMA). A detailed Flood Insurance Study (Walker County, Georgia) dated September 5, 2007 covers this reach of West Chickamauga Creek. However, HEC-2 data could not be located by FEMA for this reach of West Chickamauga Creek. Therefore, the existing bridge

was modeled in HEC-RAS in order to duplicate the floodway data shown in the Flood Insurance Study. The proposed bridge was modeled in HEC-RAS computer program version 5.0.6, and the results of this analysis indicate that the proposed replacement bridge will not create any increase in the 100 year regulatory base flood elevations, regulatory floodway elevations, or regulatory floodway widths outside of the right of way limits along this reach of West Chickamauga Creek.

The proposed bridge replacement is consistent with regulatory floodways at this site, since the proposed construction will not increase the floodway widths or elevations from the existing condition outside of the right of way limits. In accordance with Section NS 23 CFR 650A of the Federal-Aid Policy Guide, coordination with FEMA will not be required. A Letter of Concurrence from the affected community is required, since the project crosses a regulatory floodway. Tables and associated information concerning the FEMA floodways are included in this study.

The 2, 50, 100, and 500 year storm discharges were obtained from the latest USGS publication, "Magnitude and Frequency of Rural Floods in the Southeastern United States, 2006: Volume 1, Georgia." The entire drainage basin is located in Region 1. The floodstage elevations, areas of opening, velocities and backwaters for the existing and proposed structures were calculated by using the HEC-RAS computer program. The existing and proposed bridges clear the 50 and 100 year storms with no flow over the roadway occurring during either storm.

The existing bridge has channel velocities of 6.56 fps for the 50 year flood and 6.90 fps for the 100 year flood. The natural channel velocities are 5.60 fps and 5.79 fps for the 50 and 100 year floods, respectively. The existing structure creates 0.61 ft of backwater during the 50 year flood and 0.64 ft of backwater during the 100 year flood. The existing bridge is not listed on the Historic Bridge Inventory.

The proposed 425 ft long bridge was chosen as the replacement for this site as the shortest

bridge that satisfies FEMA requirements for a regulatory floodway. The bridge will be benched into original ground on the west side of the creek. The chosen span arrangement avoids placing an intermediate bent in the creek and provides proper clearance from the creek banks. The proposed 425 ft long bridge has channel velocities of 6.37 fps and 6.73 fps for the 50 and 100 year floods, respectively. The proposed structure creates 0.46 ft of backwater during the 50 year flood and 0.50 ft of backwater during the 100 year flood. The maximum calculated contraction scour depth for the proposed bridge for the 100 year flood is 5.0 ft. (See the attached Predicted Scour Report.)

A risk assessment was performed and no risk was found due to the fact that the proposed bridge reduces the 50 and 100 year channel velocities and backwater from the existing condition. In addition, there are no structures within the limits of the floodplain. Guide bank calculations, performed as prescribed in the FHWA publication, HEC No. 23, "Bridge Scour and Stream Instability Countermeasures," indicate that guide banks are not required at either end of the proposed bridge. Calculations for riprap, using the method shown in the FHWA publication, HEC No. 23, "Bridge Scour and Stream Instability Countermeasures," indicate that Type I riprap is sufficient at both endrolls of the proposed bridge.

Calculations for deck drainage were performed using the method shown in the FHWA publication, HEC No. 21, "Design of Bridge Deck Drainage," and the results indicate that deck drains are required. This site is an MS4 stormwater permit area, so a deck drain system will be placed on the bridge.

The District has informed this Office that State Route 1 (US 27) is to remain open to traffic during the proposed construction. Traffic will be maintained by staged construction. The required

maps, calculations, computer runs, roadway sheets, and preliminary layout are included in the following pages.

June 24, 2019

Prepared by: Cindy Pollard

Checked By: Susan Beck

PI NO. 0013943 WALKER COUNTY

SR 1 (US 27) OVER WEST CHICKAMAUGA CREEK

HYDRAULIC SITE INSPECTION

A hydraulic site inspection was made at the crossing of State Route 1 (US 27) over West Chickamauga Creek on March 5, 2019. The existing structure consists of eight 30 ft long, two 53 ft long, and one 65 ft long steel beam spans with spillthrough abutments on the original bridge portion and stub abutments on the two widened portions. The 30 ft long spans are composed of concrete web wall intermediate bents on the original portion and h-pile intermediate bents on the two widened portions. The 53 ft long and 65 ft long spans have concrete web wall intermediate bents associated with the original bridge construction and concrete intermediate bents for the two widenings. The bents of the existing bridge are built at 90 degrees to the roadway centerline.

At the time of the site inspection, the water was flowing in the river at a fast rate. The water was approximately 10 to 12 ft deep upstream and downstream from the existing bridge. The river banks are well defined and are approximately 15 to 18 ft high upstream and downstream from the existing bridge. The riverbed is composed of sand. The channel approaches the site at approximately 90 degrees and is approximately 90 ft wide upstream and 80 ft wide downstream from the existing bridge. No scour was observed.

The floodplain is relatively flat on the east side of the creek, but on the west side of the creek, the groundline elevation rapidly increases on both the upstream and downstream sides. The creek is located slightly to the east of the abrupt rise in the groundline elevation. The upstream floodplain is heavily vegetated with dense undergrowth for approximately 700 ft to the east side of the creek. The floodplain is composed of pasture with low grass beyond the heavily

vegetated area. The upstream and downstream floodplains on the west side of the creek are composed of cut grass with a moderate amount of trees and shrubs. The downstream floodplain is composed of pasture with tall grass on the east side of the creek. Trees and dense undergrowth are located on both banks of the creek on the downstream side of the existing bridge.

An overhead utility line is located approximately 50 ft from the existing roadway on the upstream side. Another overhead utility line is located approximately 90 ft from the roadway on the west side of the creek on the downstream side. Wood frame structures are located on the west side of the river on the upstream side. An industrial facility is located on the west side of the creek on the downstream side.

March 7, 2019

Prepared by: Cindy Pollard

PI NO. 0013943 WALKER COUNTY

SR 1 (US 27) OVER WEST CHICKAMAUGA CREEK

FLOODWAY NOTES

HEC-2 data could not be located by FEMA for this reach of West Chickamauga Creek. Therefore, the existing bridge floodway model was run using cross sections obtained from the survey data. Cross section E was obtained from LIDAR data. The Manning's n-values and discharges were taken from the Flood Insurance Study. The resulting existing bridge model closely approximated the published elevations, and the floodway widths were duplicated in the model. The proposed bridge was placed into the model. Results indicate that the proposed bridge will not create any increase to the 100 year regulatory flood elevations, regulatory floodway elevations, or regulatory floodway widths along this reach of West Chickamauga Creek in Walker County, Georgia.

June 24, 2019

Prepared by: Cindy Pollard

PI NO. 0013943 WALKER COUNTY

SR 1 (US 27) OVER WEST CHICKAMAUGA CREEK

PREDICTED SCOUR REPORT

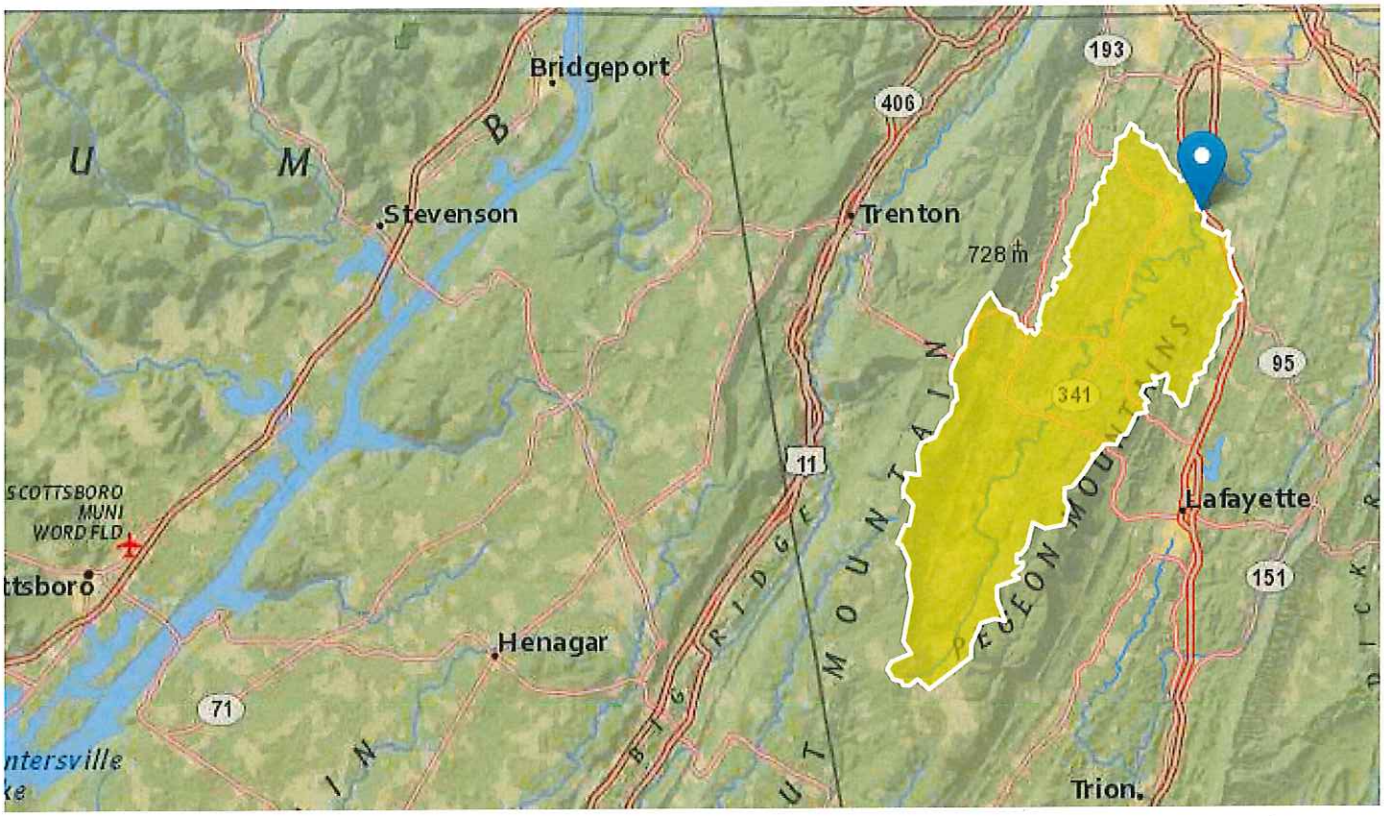
Theoretical scour depths for the proposed bridge at this site were calculated by using the methods shown in the FHWA publication, HEC No. 18, "Evaluating Scour at Bridges". Contraction and local pier scour were calculated for the 100 and 500 year storms, as called for in this publication. The predicted scour depths at each intermediate bent of the proposed bridge will be provided to the Office of Materials Soils Lab and the Bridge Structural Designer for inclusion in the analysis and design of the bridge foundations. Tables and calculations showing these predicted scour depths are included in this study.

June 24, 2019

Prepared by: Cindy Pollard

StreamStats Report

Region ID: GA
Workspace ID: GA20190221202356363000
Clicked Point (Latitude, Longitude): 34.87343, -85.26901
Time: 2019-02-21 15:24:14 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	120	square miles
PCTREG1	Percentage of drainage area located in Region 1	100	percent
PCTREG2	Percentage of drainage area located in Region 2	0	percent
PCTREG3	Percentage of drainage area located in Region 3	0	percent
PCTREG4	Percentage of drainage area located in Region 4	0	percent
PCTREG5	Percentage of drainage area located in Region 5	0	percent

Parameter Code	Parameter Description	Value	Unit
LC06IMP	Percentage of impervious area determined from NLCD 2006 impervious dataset	1.12	percent
BSLDEM10M	Mean basin slope computed from 10 m DEM	16.445	percent

Peak-Flow Statistics Parameters [Peak Southeast US over 1 sqmi 2009 5043]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	120	square miles	1	9000
PCTREG1	Percent Area in Region 1	100	percent	0	100
PCTREG2	Percent Area in Region 2	0	percent	0	100
PCTREG3	Percent Area in Region 3	0	percent	0	100
PCTREG4	Percent Area in Region 4	0	percent	0	100
PCTREG5	Percent Area in Region 5	0	percent	0	100

Peak-Flow Statistics Flow Report [Peak Southeast US over 1 sqmi 2009 5043]

PIl: Prediction Interval-Lower, Plu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PIl	Plu	SEp
2 Year Peak Flood	3540	ft^3/s	2040	6140	34.5
5 Year Peak Flood	5940	ft^3/s	3450	10200	34
10 Year Peak Flood	7640	ft^3/s	4370	13300	35.1
25 Year Peak Flood	9770	ft^3/s	5400	17700	37.5
50 Year Peak Flood	11700	ft^3/s	6250	21800	39.6
100 Year Peak Flood	13300	ft^3/s	6910	25800	41.9
200 Year Peak Flood	14900	ft^3/s	7510	29800	44.3
500 Year Peak Flood	17500	ft^3/s	8320	36700	47.7

Peak-Flow Statistics Citations

Gotvald, A.J., Feaster, T.D., and Weaver, J.C.,2009, Magnitude and Frequency of Rural Floods in the Southeastern United States, 2006: Volume 1, Georgia: U.S. Geological Survey Scientific Investigations Report 2009-5043, 120 p. (http://pubs.usgs.gov/sir/2009/5043/)

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Walker County

Slope Calculation (Quad Maps)

Upstream Elevation =	721.78		
Downstream Elevation =	705.37		
Horizontal Distance =	28772.79		
Slope =	0.00057	ft/ft	**USE**
	3.01	ft/mi	

Slope Calculation (Survey WS Elevation)

500' Upstream =	702.65	
500' Downstream =	700.14	
Horizontal Distance =	1000	
Slope =	0.00251	ft/ft
	13.25	ft/mi

SR 1 (US 27) OVER WEST CHICKAMAUGA CREEK
WALKER COUNTY
PI NO. 0013943

50 YEAR STORM

ENGLISH	EXISTING BRIDGE L= 411 (90)	PROPOSED BRIDGE L= 425 (90)
FLOODSTAGE	719.42	719.43
DISCHARGE THRU BRIDGE (ft^3/s)	11700	11700
DISCHARGE OVER ROAD (ft^3/s)	0	0
AREA OF BRIDGE OPENING(ft^2)	2740	2927
VELOCITY THRU BRIDGE (ft/s)	4.27	4.00
CHANNEL VELOCITY (ft/s)	6.56	6.37
BACKWATER(ft)	0.61	0.46
APPROACH W/O BRDG	720.00	720.00
APPROACH W/BRIDGE	720.61	720.46
NATURAL CHANNEL VELOCITY =	5.60	5.60

100 YEAR STORM

	EXISTING BRIDGE L =411 (90)	PROPOSED BRIDGE L = 425 (90)
FLOODSTAGE	720.15	720.16
DISCHARGE THRU BRIDGE (ft^3/s)	13300	13300
DISCHARGE OVER ROAD (ft^3)	0	0
AREA OF BRIDGE OPENING(ft^2)	3013	3212
VELOCITY THRU BRIDGE (ft/s)	4.41	4.14
CHANNEL VELOCITY (ft/s)	6.90	6.73
BACKWATER(ft)	0.64	0.50
APPROACH W/O BRDG	720.77	720.77
APPROACH W/BRIDGE	721.41	721.27
NATURAL CHANNEL VELOCITY =	5.79	5.79
2 YEAR FLOODSTAGE =		713.83

SR 1 (US 27) OVER WEST CHICKAMAUGA CREEK
WALKER COUNTY
PI NO. 0013943

500 YEAR STORM

ENGLISH	EXISTING BRIDGE L= 411 (90)	PROPOSED BRIDGE L= 425 (90)
FLOODSTAGE	721.88	721.90
DISCHARGE THRU BRIDGE (ft^3/s)	17500	17500
DISCHARGE OVER ROAD (ft^3/s)	0	0
AREA OF BRIDGE OPENING(ft^2)	3626	3895
VELOCITY THRU BRIDGE (ft/s)	4.83	4.49
CHANNEL VELOCITY (ft/s)	7.90	7.59
BACKWATER(ft)	0.73	0.58
APPROACH W/O BRDG	722.55	722.55
APPROACH W/BRIDGE	723.28	723.13
NATURAL CHANNEL VELOCITY =	6.18	6.18

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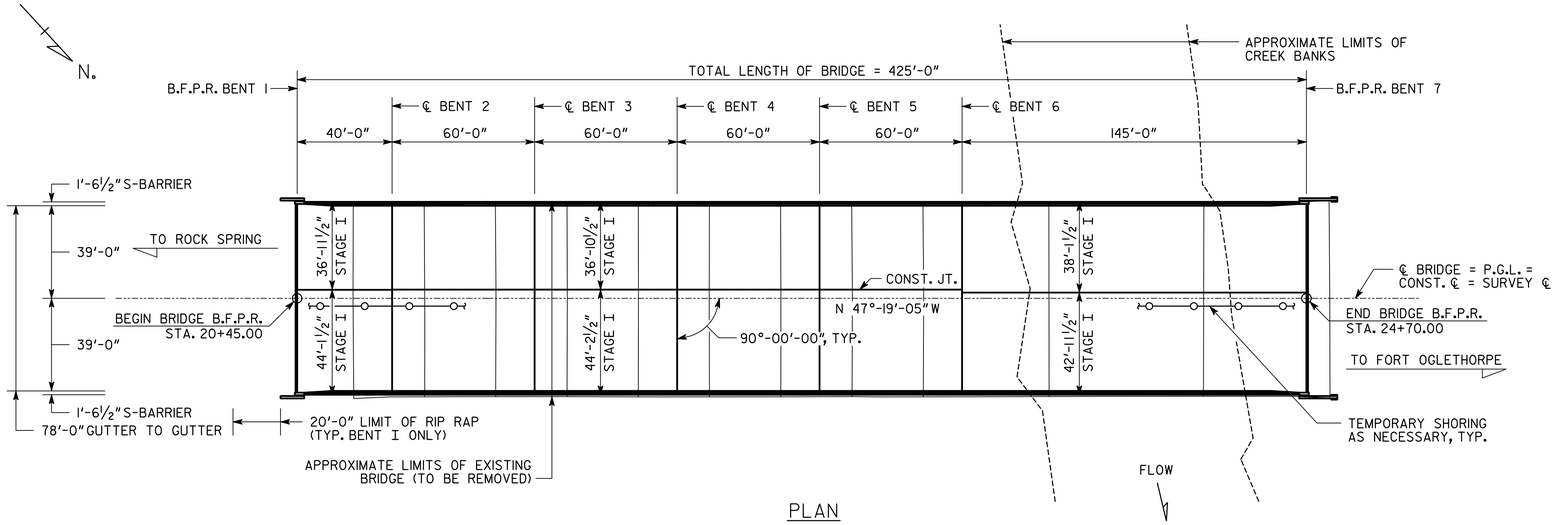
PROPOSED 425 FT BRIDGE

PROFILE GRADE ELEVATION	730.01
DEPTH OF CROSS SLOPE	0.78
DEPTH OF SLAB AND BEAM	7.00 *
BOTTOM OF BEAM ELEVATION	722.23

BOTTOM OF BEAM ELEVATION	722.23
50 YEAR FLOODSTAGE ELEVATION	719.43
CLEARANCE	2.80

BOTTOM OF BEAM ELEVATION	722.23
100 YEAR FLOODSTAGE ELEVATION	720.16
CLEARANCE	2.07

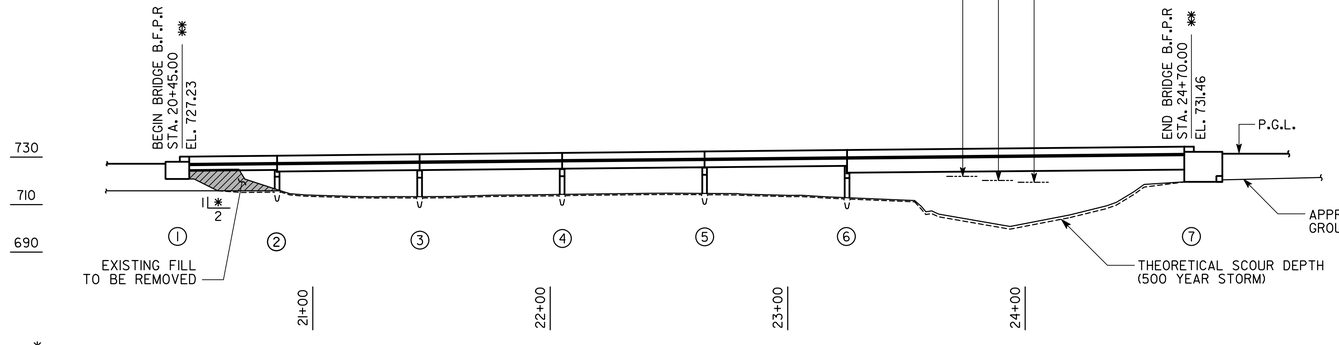
*CLEARANCE CALCULATED FOR 72" BULB TEE PSC BEAMS.



PLAN

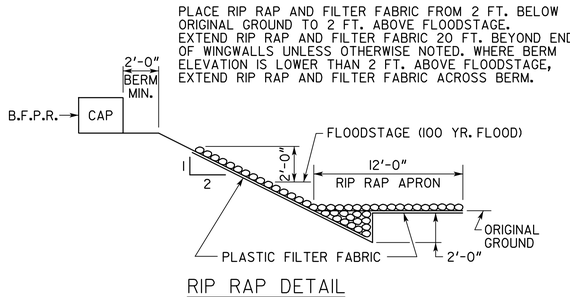
BM #2674 - BM TVA PLATE WC9 (LEI-D),
43.73 FT LT OF STATION 24+78.69, ELEV. = 727.78 FT.

** STATIONS AND ELEVATIONS ARE ALONG PROFILE GRADE LINE AT THE INTERSECTION OF PROFILE GRADE LINE AND B.F.P.R.



✱ SLOPE NORMAL TO END BENT.
NOTE: END BENT PILES NOT SHOWN.

ELEVATION



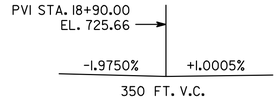
RIP RAP DETAIL
BENT 1 ONLY
NO SCALE

BERM ELEVATIONS (FT) ⊛	
END BENT	ELEVATIONS
1 LT	722.51
1 RT	720.96
6 LT	723.07
6 RT	721.51

⊛ NOTE: FOR BRIDGE ENDROLL STAKING PURPOSES ONLY.

THEORETICAL SCOUR DEPTHS (FT)						
LOCATION	100 YEAR STORM			500 YEAR STORM		
	GENERAL	LOCAL	TOTAL	GENERAL	LOCAL	TOTAL
BENTS 2-6	0.0	3.7	3.7	0.5	4.7	5.2

THE 500 YEAR SCOUR IN THE CHANNEL IS 5.6 FT.



PROPOSED VERTICAL CURVE DATA

PROPOSED BRIDGE CONSISTS OF

1 - 40'-0" TYPE I MOD PSC BEAM SPAN ---------- SPECIAL DESIGN
4 - 60'-0" TYPE II PSC BEAM SPANS ---------- SPECIAL DESIGN
1 - 145'-0" BULB TEE, 72 IN, PSC BEAM SPAN ---------- SPECIAL DESIGN
5 - CONCRETE INTERMEDIATE BENTS ---------- SPECIAL DESIGN
2 - PILE END BENTS ---------- SPECIAL DESIGN
24" TYPE I RIP RAP

TRAFFIC DATA

TRAFFIC ---------- ADT = 17,325 (2022)
ADT = 24,250 (2042)
DESIGN SPEED ---------- 55 MPH
TRUCKS ---------- 5.0/6.0 %
24 HR TRUCKS ---------- 1.5 %
DIRECTIONAL ---------- 68/64 %

DESIGN DATA

SPECIFICATIONS ---------- AASHTO LRFD 7TH EDITION, 2014
DESIGN VEHICLE LIVE LOAD ---------- HL-93
FUTURE PAVING ALLOWANCE ---------- 30 LBS PER SQ FT

EXISTING UTILITES

OVERHEAD UTILITIES LOCATED 50 FT UPSTREAM AND 90 FT DOWNSTREAM FROM EXISTING BRIDGE.

PROPOSED UTILITES

6" DIAMETER WATER MAIN

DRAINAGE DATA

DRAINAGE AREA ---------- 120.0 SQ MILES

FLOOD FREQUENCY	TOTAL DISCHARGE	MEAN VELOCITY	AREA OF OPENING UNDER FLOODSTAGE	BACKWATER
50 YEAR	11,700 CFS	4.00 FPS	2,927 SQ FT	0.46 FT
100 YEAR	13,300 CFS	4.14 FPS	3,212 SQ FT	0.50 FT
500 YEAR	17,500 CFS	4.49 FPS	3,895 SQ FT	0.58 FT

NOTES

CROSS-SLOPE - THE PROPOSED BRIDGE SHALL HAVE A CONSTANT CROSS SLOPE OF 2.0% SLOPING DOWN TO THE RIGHT.

DECK DRAINS - DECK DRAIN SYSTEM REQUIRED.

BENT LAYOUT - ALL BENTS ARE PARALLEL.

BEAM ELEVATION - MINIMUM BOTTOM OF BEAM ELEVATION FOR PROPOSED BRIDGE SHALL BE NO LOWER THAN ELEVATION 721.43 FT.

BRIDGE REMOVAL - REMOVE THE EXISTING BRIDGE. REMOVE THE EXISTING SUBSTRUCTURE AS PER THE SPECIFICATIONS.

TRAFFIC CONTROLS - TRAFFIC TO BE MAINTAINED BY STAGED CONSTRUCTION. SEE CONSTRUCTION SEQUENCE FOR DETAIL.

BRIDGE SERIAL NO. 295-0004-0
BRIDGE I.D. NO. 295-0000ID-020.72N
PROJECT P.I. NO. 0013943
BRIDGE NO. 1

GEORGIA
DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION-OFFICE OF BRIDGES AND STRUCTURES

PRELIMINARY LAYOUT
SR 1 (US 27)
OVER WEST CHICKAMAUGA CREEK
WALKER COUNTY 0013943

DRAWING NO. 35-0001
BRIDGE SHEET 1 OF 4

SCALE: 1" = 30'-0" (UNLESS OTHERWISE NOTED) AUGUST 2019

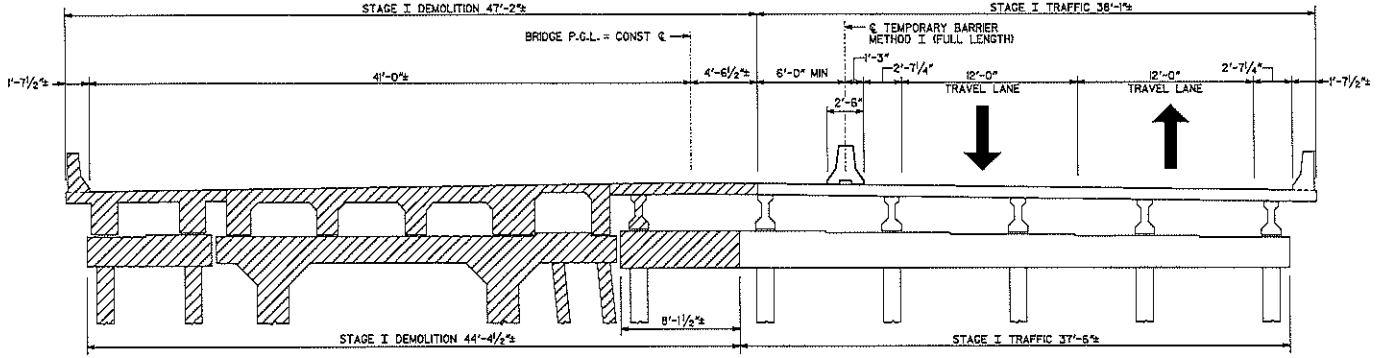
DESIGNED	CRP	CHECKED	STB	REVIEWED	DLC/SKG
DRAWN	AMO	DESIGN GROUP	STB	APPROVED	WMD

1 INCH WHEN PRINTED FULL SIZE

W0013943.DGN

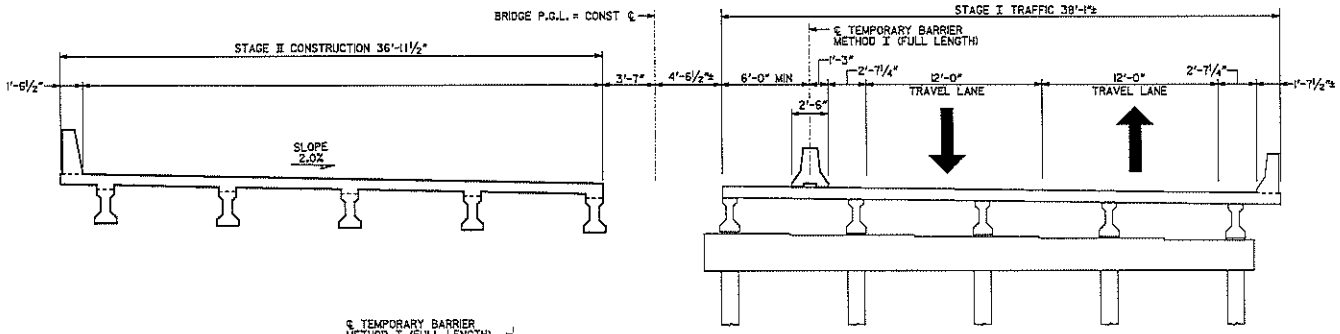
DATE | BY | REVISIONS

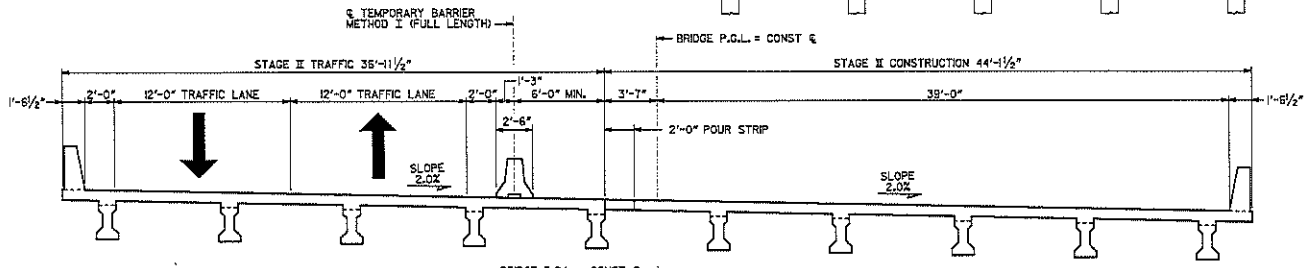
13237 PM 8/20/2019 dpollard

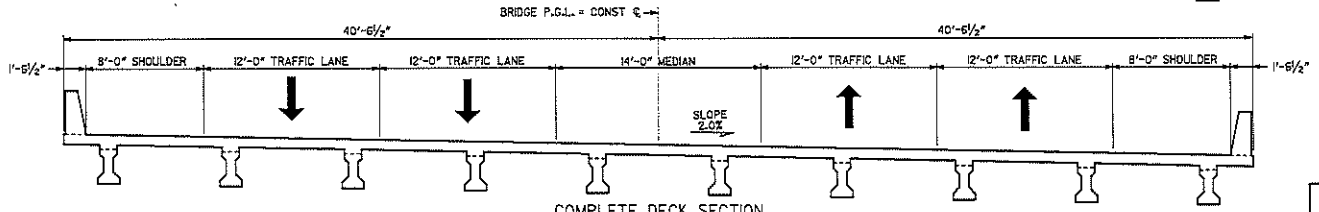


EXISTING DECK SECTION

SPANS 1 - 8







COMPLETE DECK SECTION

SPAN 1 (TYPE I MOD PSC BEAMS)

CONSTRUCTION SEQUENCE

1. PLACE TEMPORARY BARRIER AND MAINTAIN 2 - 12-0" TRAVEL LANES ON EXISTING BRIDGE. PLACE TEMPORARY SHORING AS NECESSARY.
2. REMOVE PORTION OF EXISTING BRIDGE AND BULID STAGE I ACCORDING TO PLANS.
3. RELOCATE TEMPORARY BARRIER ACCORDING TO PLANS. SHIFT TRAFFIC TO STAGE I CONSTRUCTION, MAINTAINING 2 - 12'-0" TRAVEL LANES.
4. REMOVE REMAINDER OF EXISTING BRIDGE AND BUILD STAGE II ACCORDING TO PLANS.
5. REMOVE TEMPORARY BARRIER, SHIFT TRAFFIC TO PERMANENT LOCATIONS, AND OPEN COMPLETED BRIDGE TO TRAFFIC.

THE AFOREMENTIONED SEQUENCE SHALL BE COORDINATED WITH ROADWAY OPERATIONS, SEE ROADWAY PLANS. IN LIEU OF THE ABOVE CONSTRUCTION SEQUENCE, THE CONTRACTOR MAY SUBMIT A PROPOSED CONSTRUCTION SEQUENCE FOR APPROVAL BY THE ENGINEER

INDICATES EXISTING BRIDGE TO BE REMOVED.

P.I. NO. 0013943

BRIDGE NO.1

GEORGIA
DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION-OFFICE OF BRIDGES AND STRUCTURES

CONSTRUCTION SEQUENCE
SR 1 (US 27)
OVER WEST CHICKAMAUGA CREEK
WALKER COUNTY 0013943

SCALE: 1/4" = 1'-0" AUGUST 2019

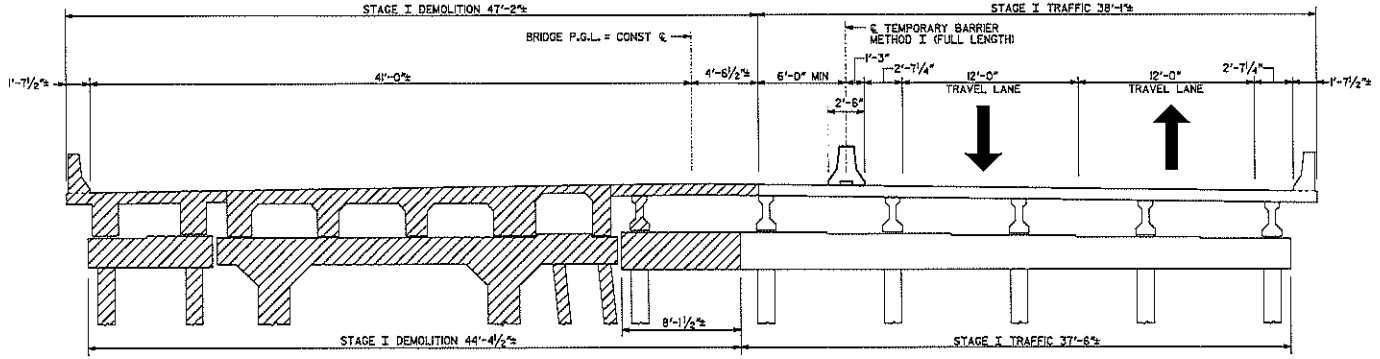
DESIGNED CRP CHECKED STB REVIEWED SKG/DLC
DRAWN AMD DESIGN GROUP STB APPROVED WMD

DRAWING NO. 35-0002
BRIDGE SHEET 2 OF 4

1 INCH WHEN PRINTED FULL SIZE

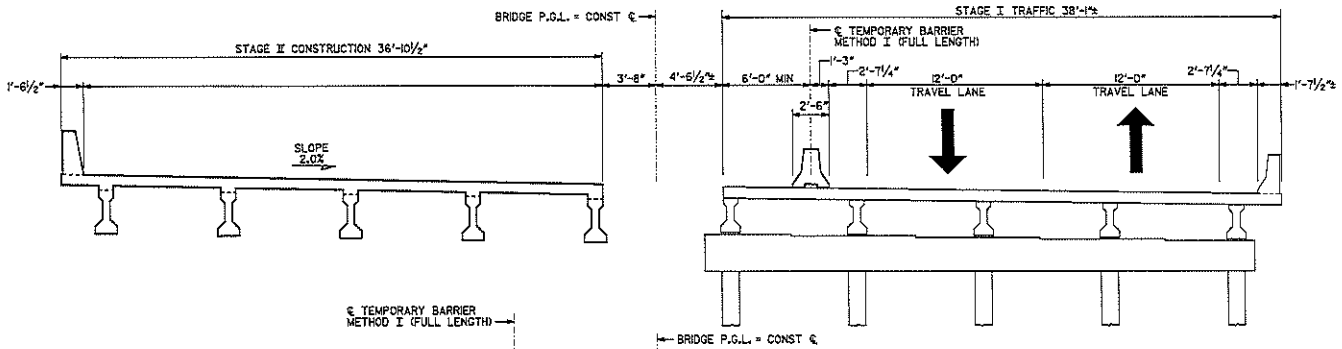
W0013943.DGN

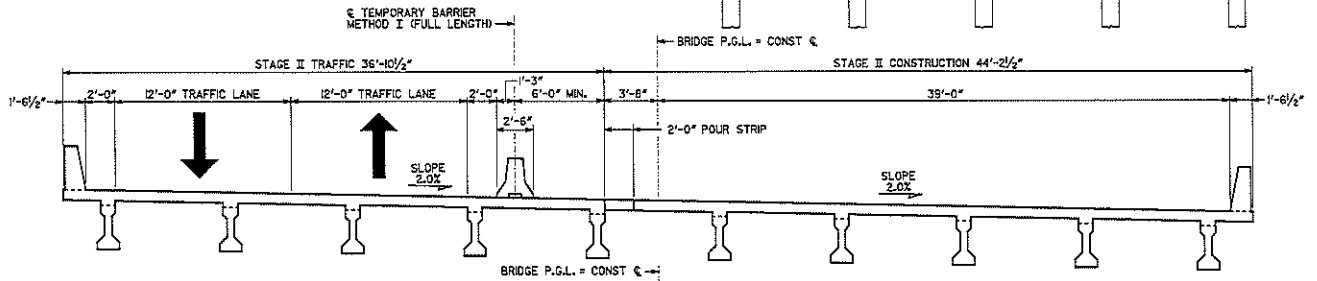
DATE | BY | REVISIONS

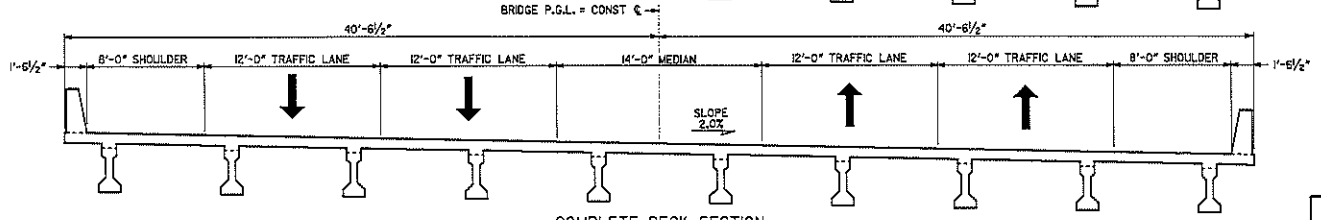


EXISTING DECK SECTION

SPANS 1 - 8







COMPLETE DECK SECTION

SPANS 2-5 (TYPE II PSC BEAMS)

CONSTRUCTION SEQUENCE

1. PLACE TEMPORAY BARRIER AND MAINTAIN 2 - 12-0" TRAVEL LANES ON EXISTING BRIDGE. PLACE TEMPORARY SHORING AS NECESSARY.
2. REMOVE PORTION OF EXISTING BRIDGE AND BULID STAGE I ACCORDING TO PLANS.
3. RELOCATE TEMPORARY BARRIER ACCORDING TO PLANS. SHIFT TRAFFIC TO STAGE I CONSTRUCTION, MAINTAINING 2 - 12'-0" TRAVEL LANES.
4. REMOVE REMAINDER OF EXISTING BRIDGE AND BUILD STAGE II ACCORDING TO PLANS.
5. REMOVE TEMPORARY BARRIER, SHIFT TRAFFIC TO PERMANENT LOCATIONS, AND OPEN COMPLETED BRIDGE TO TRAFFIC.

THE AFOREMENTIONED SEQUENCE SHALL BE COORDINATED WITH ROADWAY OPERATIONS, SEE ROADWAY PLANS. IN LIEU OF THE ABOVE CONSTRUCTION SEQUENCE, THE CONTRACTOR MAY SUBMIT A PROPOSED CONSTRUCTION SEQUENCE FOR APPROVAL BY THE ENGINEER

INDICATES EXISTING BRIDGE TO BE REMOVED.

P.I. NO. 0013943

BRIDGE NO.1

GEORGIA
DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION-OFFICE OF BRIDGES AND STRUCTURES

CONSTRUCTION SEQUENCE
SR 1 (US 27)
OVER WEST CHICKAMAUGA CREEK
WALKER COUNTY 0013943

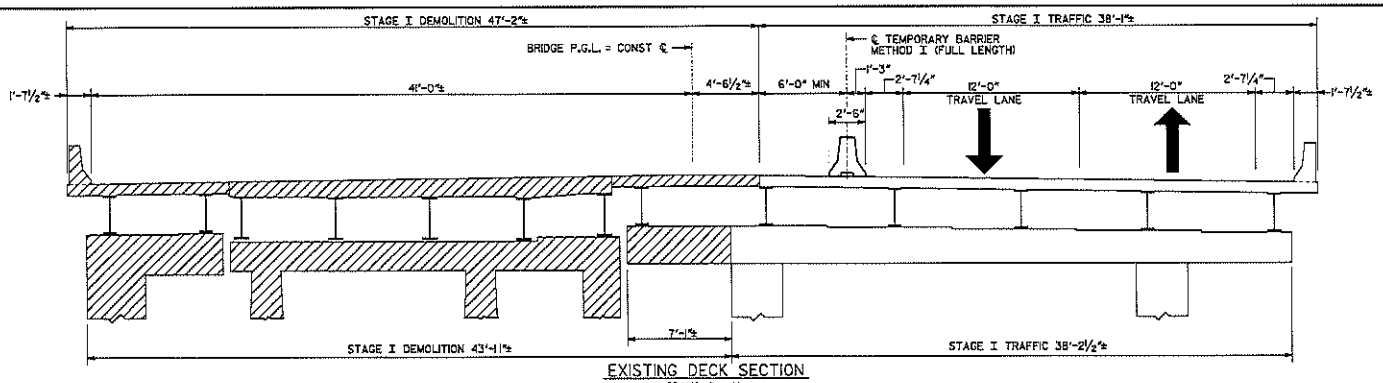
SCALE: 1/4"= 1'-0" AUGUST 2019

DESIGNED CRP CHECKED STB REVIEWED SKC/DLC
DRAWN AMG DESIGN GROUP STB APPROVED WMD

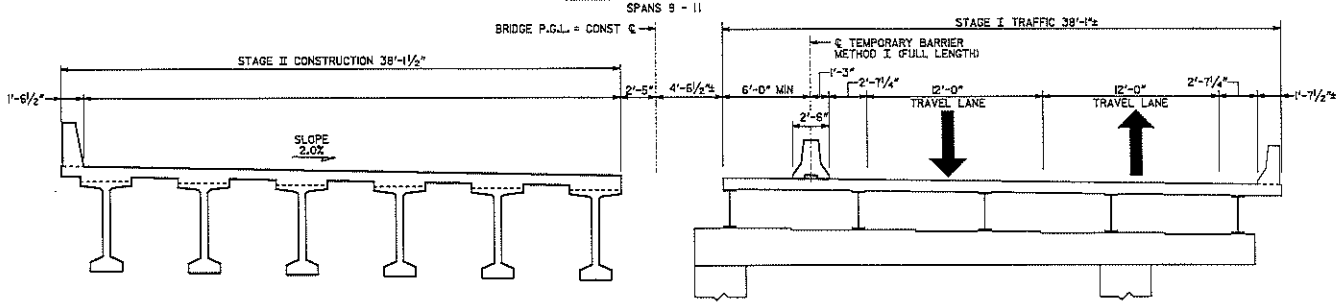
DRAWING NO. 35-0002
BRIDGE SHEET 3 OF 4

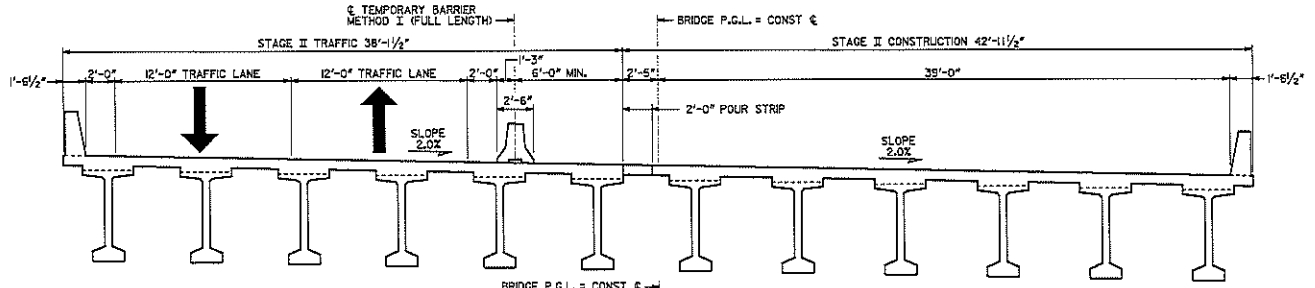
DATE | BY | REVISIONS

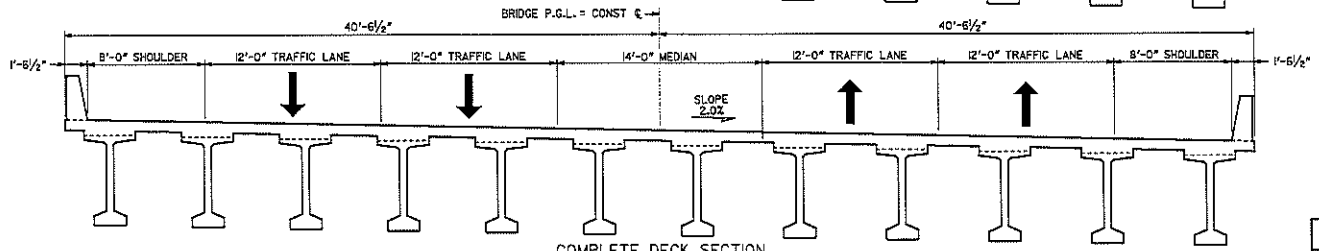
1 INCH WHEN PRINTED FULL SIZE



EXISTING DECK SECTION







COMPLETE DECK SECTION
SPAN 6 (72" BULB TEE)

CONSTRUCTION SEQUENCE

1. PLACE TEMPORAY BARRIER AND MAINTAIN 2 - 12-0" TRAVEL LANES ON EXISTING BRIDGE. PLACE TEMPORARY SHORING AS NECESSARY.
2. REMOVE PORTION OF EXISTING BRIDGE AND BULID STAGE I ACCORDING TO PLANS.
3. RELOCATE TEMPORARY BARRIER ACCORDING TO PLANS. SHIFT TRAFFIC TO STAGE I CONSTRUCTION, MAINTAINING 2 - 12'-0" TRAVEL LANES.
4. REMOVE REMAINDER OF EXISTING BRIDGE AND BUILD STAGE II ACCORDING TO PLANS.
5. REMOVE TEMPORARY BARRIER, SHIFT TRAFFIC TO PERMANENT LOCATIONS, AND OPEN COMPLETED BRIDGE TO TRAFFIC.

THE AFOREMENTIONED SEQUENCE SHALL BE COORDINATED WITH ROADWAY OPERATIONS, SEE ROADWAY PLANS. IN LIEU OF THE ABOVE CONSTRUCTION SEQUENCE, THE CONTRACTOR MAY SUBMIT A PROPOSED CONSTRUCTION SEQUENCE FOR APPROVAL BY THE ENGINEER

INDICATES EXISTING BRIDGE TO BE REMOVED.

P.I. NO. 0013943

BRIDGE NO.1

GEORGIA
DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION-OFFICE OF BRIDGES AND STRUCTURES

CONSTRUCTION SEQUENCE
SR 1 (US 27)
OVER WEST CHICKAMAUGA CREEK
WALKER COUNTY 0013943

SCALE: 1/4"= 1'-0" AUGUST 2019

DESIGNED CRP CHECKED STB REVIEWED SKG/DLC
DRAWN ANG DESIGN GROUP STB APPROVED WMD

DRAWING NO. 35-0002
BRIDGE SHEET 4 OF 4

DATE | REVISIONS | BY

1 INCH WHEN PRINTED FULL SIZE

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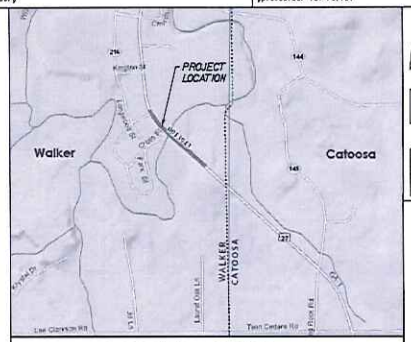


LOCATION SKETCH

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PLAN AND PROFILE OF PROPOSED
BRIDGE REPLACEMENT
SR 1/US 27 AT WEST CHICKAMAUGA CREEK

FEDERAL AID PROJECT

WALKER COUNTY

FEDERAL ROUTE • US 27

STATE ROUTE • SR 1

P.I. NO. 0013943

NOTE :
ALL REFERENCES IN THIS DOCUMENT, WHICH INCLUDES ALL PAPERS, WRITINGS, DOCUMENTS, DRAWINGS, OR PHOTOGRAPHS USED, OR TO BE USED IN CONNECTION WITH THIS DOCUMENT, TO "STATE HIGHWAY DEPARTMENT OF GEORGIA", "STATE HIGHWAY DEPARTMENT", GEORGIA STATE HIGHWAY DEPARTMENT", "HIGHWAY DEPARTMENT", OR "DEPARTMENT" WHEN THE CONTEXT THEREOF MEANS THE STATE HIGHWAY DEPARTMENT OF GEORGIA, AND SHALL BE DEEMED TO MEAN THE DEPARTMENT OF TRANSPORTATION.

DESIGN DATA:	
TRAFFIC A.D.T.:	17,325 (2022)
TRAFFIC A.D.T.:	24,250 (2042)
TRAFFIC D.H.V.:	2,410/2,040 (2042)
DIRECTIONAL DIST:	68% / 64%
% TRUCKS:	5.0% / 6.0%
24 HR. TRUCKS %:	1.5%
SPEED DESIGN:	55 MPH

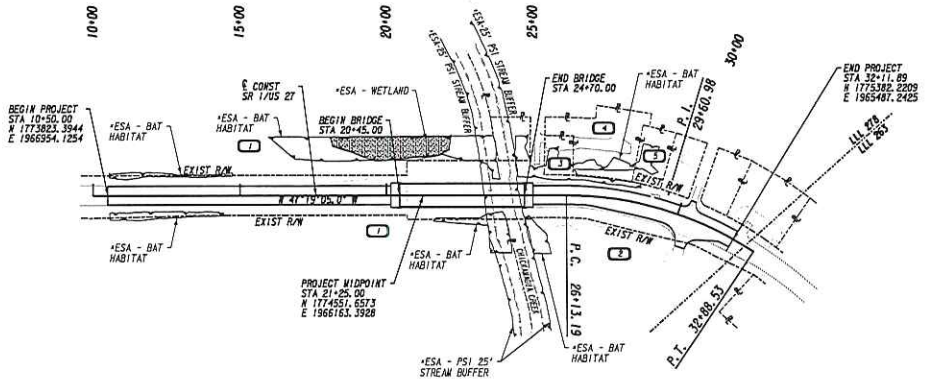
LOCATION & DESIGN APPROVAL DATE:

FUNCTIONAL CLASS:
PRINCIPAL ARTERIAL

THIS PROJECT IS 100% IN WALKER COUNTY AND IS 100% IN CONG. DIST. NO. 14.

PROJECT DESIGNATION: EXEMPT

THIS PROJECT HAS BEEN PREPARED USING THE HORIZONTAL GEORGIA COORDINATE SYSTEM OF 1984 (NAD 1983/94 WEST ZONE, AND THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988.



* ESA - SEE GENERAL NOTES 'ENVIRONMENTAL RESOURCES IMPACT TABLE' FOR CONSTRUCTION RESTRICTIONS.

SCALE IN FEET
0 200 400 800

LENGTH OF PROJECT	COUNTY No. 295 Project No. MILES
NET LENGTH OF ROADWAY	0.331
NET LENGTH OF BRIDGES	0.078
NET LENGTH OF PROJECT	0.409
NET LENGTH OF EXCEPTIONS	0.000
GROSS LENGTH OF PROJECT	0.409

THE DATA, TOGETHER WITH ALL OTHER INFORMATION SHOWN ON THESE PLANS OR IN ANYWAY INDICATED THEREBY, WHETHER BY DRAWINGS OR NOTES, OR IN ANY OTHER MANNER, ARE BASED UPON FIELD INVESTIGATIONS AND ARE BELIEVED TO BE INDICATIVE OF ACTUAL CONDITIONS. HOWEVER, THE SAME ARE SHOWN AS INFORMATION ONLY, ARE NOT GUARANTEED, AND DO NOT BIND THE DEPARTMENT OF TRANSPORTATION IN ANY WAY. THE ATTENTION OF BIDDER IS SPECIFICALLY DIRECTED TO SUBSECTIONS 102.04, 102.05, AND 104.03 OF THE SPECIFICATIONS.

LONG ENGINEERING
2550 HERITAGE CT. SUITE 250 ATLANTA, GA 30339
TEL 770.951.2495 FAX 770.951.2496 www.longeng.com

PREPARED BY: _____ DESIGN

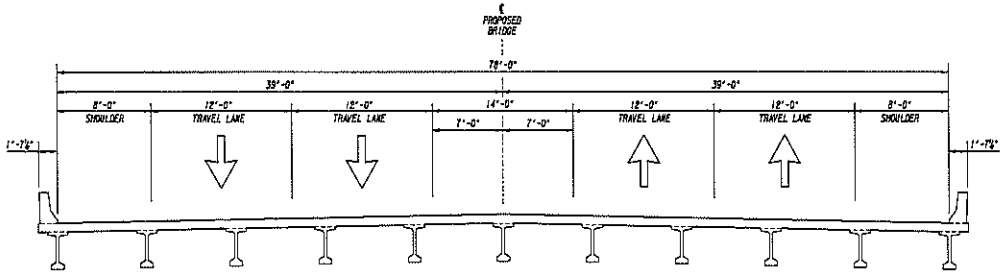
RECOMMENDED FOR APPROVAL BY: _____ STATE PROGRAM DELIVERY ADMINISTRATOR

DATE _____ CHIEF ENGINEER

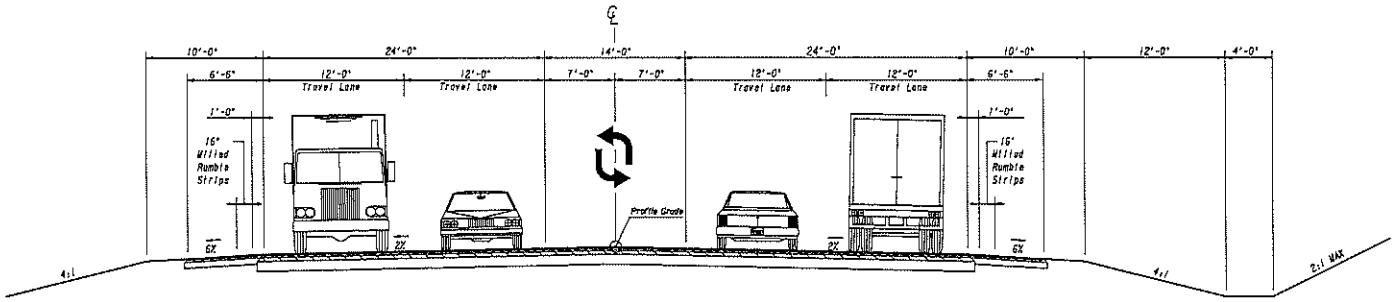
PLANS COMPLETED	- -
REVISIONS	

DRAWING No. 01-0001

CONTR 01/31/2015



TYPICAL SECTION NO. 2
BRIDGE



TYPICAL SECTION NO. 1
ROADWAY

LONG ENGINEERING

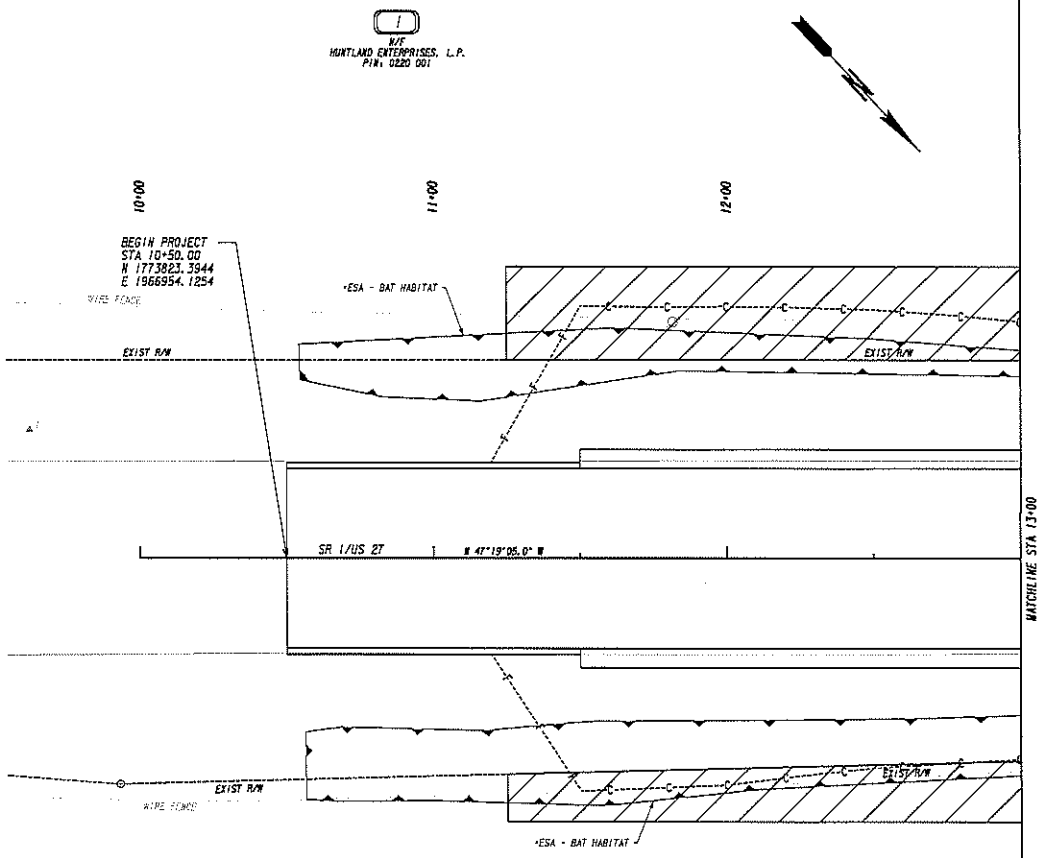
NOT TO SCALE

REVISION DATES

TYPICAL SECTIONS
SR 1/US 27 AT WEST CHICKAMAUGA CREEK

CHECKED: DATE:
BACKCHECKED: DATE:
CORRECTED: DATE:
VERIFIED: DATE:

DRAWING No.
05-0001



CONTROL POINTS						
LABEL	STATION	OFFSET	NORTHING	EASTING	ELEVATION	DESCRIPTION
PT *1	8+62.36	44.31' LT	1773731.4310	1966988.5739	740.243	½ REBAR CAPPED
PT *102	25+12.46	38.54' RT	1774842.5595	1965904.5668	727.722	PK NAIL
PT *106	30+23.41	63.72' LT	1777459.7090	1965270.1175	739.430	BRASS DISC
PT *107	N/A	N/A	1775179.0495	1965501.3196	745.080	BRASS DISC
PT *4674	24+78.69	43.73' LT	1965873.6	1774759.1	727.783	BM TVA PLATE WC9 (LEI-D)

* ESA - SEE GENERAL NOTES 'ENVIRONMENTAL RESOURCES IMPACT TABLE' FOR CONSTRUCTION RESTRICTIONS.

PROPERTY AND EXISTING R/W LINE
REQUIRED R/W LINE
CONSTRUCTION LIMITS
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES
EASEMENT FOR CONSTR OF SLOPES
EASEMENT FOR CONSTR OF DRIVES

BEGIN LIMIT OF ACCESS.....BLA
END LIMIT OF ACCESS.....ELA
LIMIT OF ACCESS
REQ'D R/W & LIMIT OF ACCESS
ORANGE BARRIER FENCE
ESA - ENV. SENSITIVE AREA (SEE ERIT TABLE)

LONG ENGINEERING

SCALE IN FEET
0 20 40 80

REVISION DATES

CONSTRUCTION PLAN
SR 1/US 27 AT WEST CHICKAMAUGA CREEK

CHECKED: DATE:
BACKCHECKED: DATE:
CORRECTED: DATE:
VERIFIED: DATE:

DRAWING No. 13-0001

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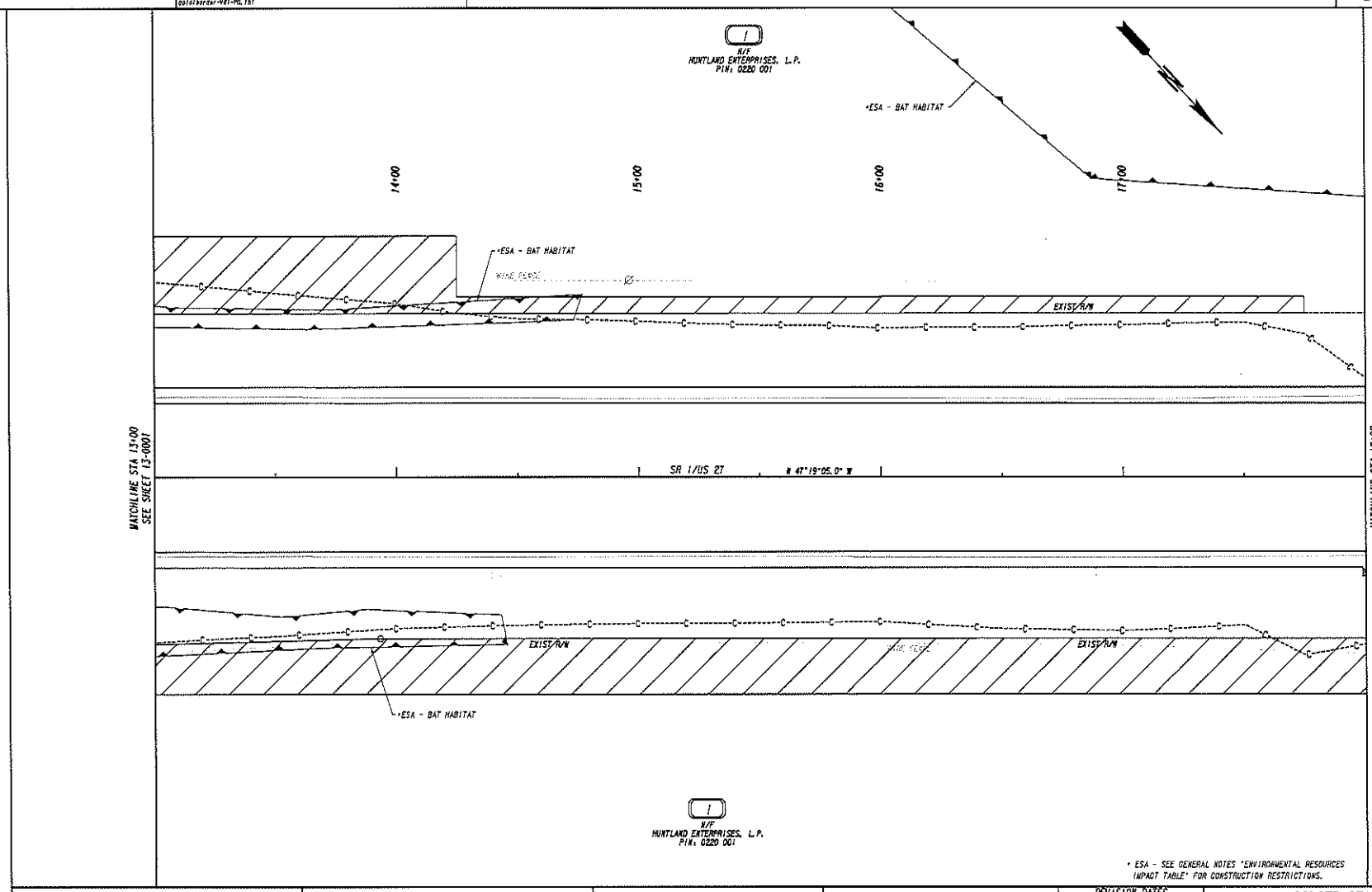

* ESA - SEE GENERAL NOTES "ENVIRONMENTAL RESOURCES IMPACT TABLE" FOR CONSTRUCTION RESTRICTIONS.

PROPERTY AND EXISTING R/W LINE
REQUIRED R/W LINE
CONSTRUCTION LIMITS
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES
EASEMENT FOR CONSTR OF SLOPES
EASEMENT FOR CONSTR OF DRIVES

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END LIMIT OF ACCESS.....ELA
LIMIT OF ACCESS
REQ'D R/W & LIMIT OF ACCESS
ORANGE BARRIER FENCE
ESA - ENV. SENSITIVE AREA (SEE ERIT TABLE)

LONG ENGINEERING

SCALE IN FEET
0 20 40 80

REVISION DATES

CONSTRUCTION PLAN

SR 1/US 27 AT WEST CHICKMAUGA CREEK

CHECKED:	DATE:	DRAWING No.	
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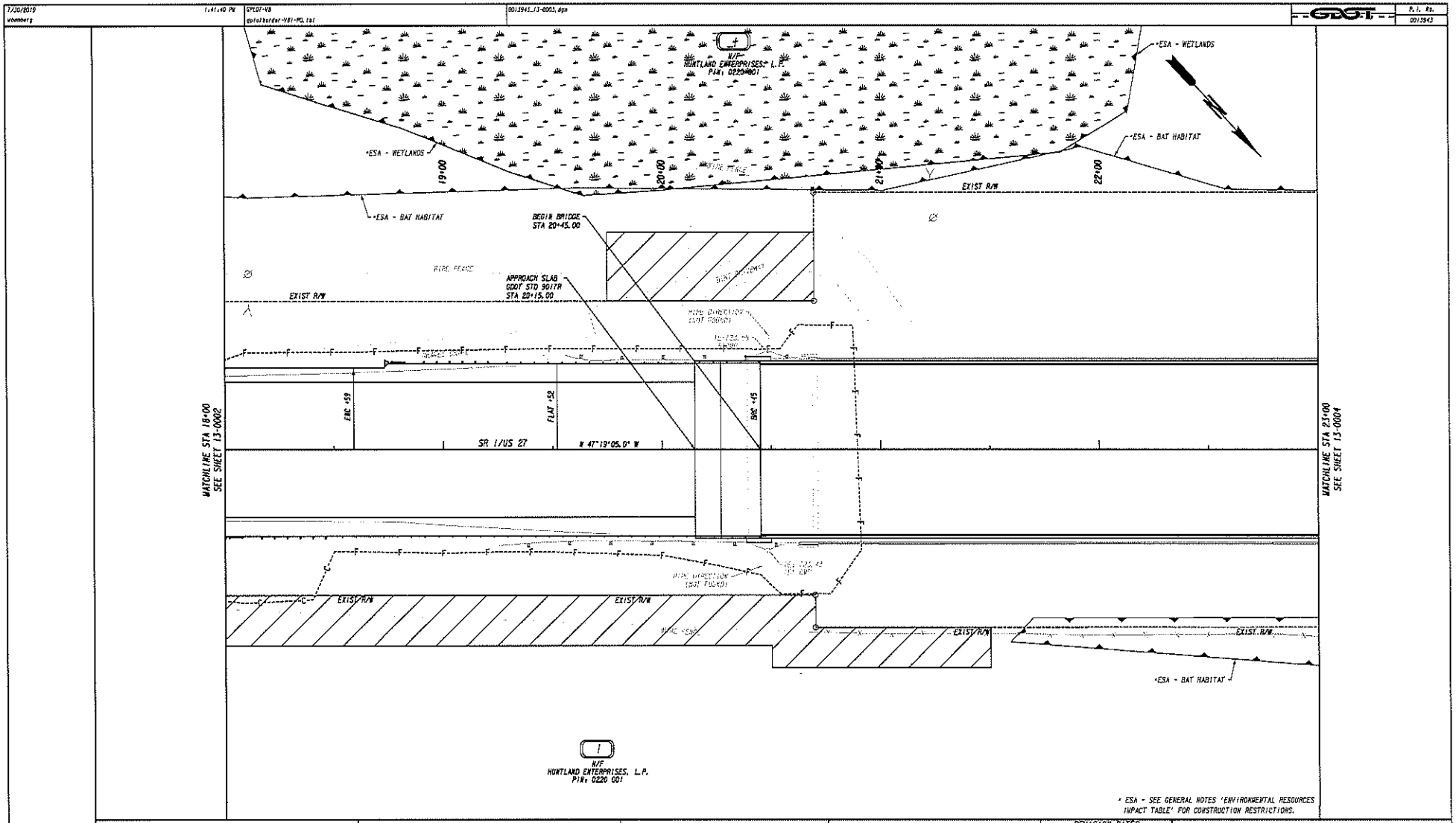
VERIFIED:	DATE:	13-0002	



* ESA - SEE GENERAL NOTES 'ENVIRONMENTAL RESOURCES IMPACT TABLE' FOR CONSTRUCTION RESTRICTIONS.

PROPERTY AND EXISTING R/W LINE
REQUIRED R/W LINE
CONSTRUCTION LIMITS
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES
EASEMENT FOR CONSTR OF SLOPES
EASEMENT FOR CONSTR OF DRIVES

BEGIN LIMIT OF ACCESS.....BLA
END LIMIT OF ACCESS.....ELA
LIMIT OF ACCESS
REQ'D R/W & LIMIT OF ACCESS
ORANGE BARRIER FENCE
ESA - ENV. SENSITIVE AREA (SEE ERIT TABLE)

LONG ENGINEERING

SCALE IN FEET
0 20 40 80

REVISION DATES

CONSTRUCTION PLAN
SR 1/US 27 AT WEST CHICKAMAUGA CREEK

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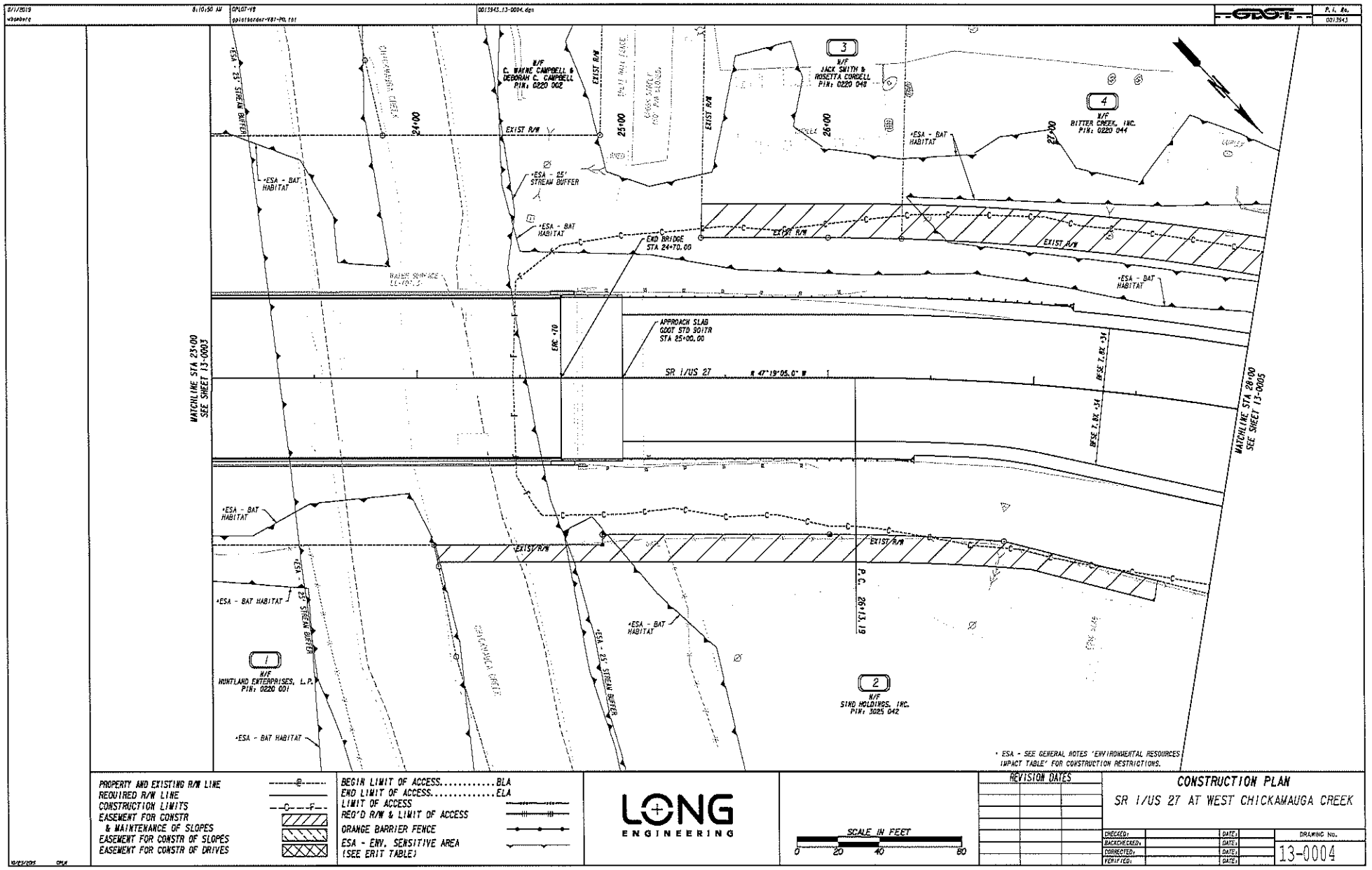
BACKCHECKED:		DATE:	13-0003
CORRECTED:		DATE:	
VERIFIED:		DATE:	


GDOT
P. I. No. 0013943
3
N/F
JACK SMITH & ROSETTA CORDELL
PIN: 0220 048
4
N/F
BITTER CREEK, INC.
PIN: 0220 044
N/F
C. WAYNE CAMPBELL & DEBORAH C. CAMPBELL
PIN: 0220 002
EXIST R/W
24+00
25+00
26+00
27+00
*ESA - 25' STREAM BUFFER
*ESA - BAT HABITAT
END BRIDGE STA 24+70.00
APPROACH SLAB GDOT STD 9017R STA 25+00.00
SR 1/US 27
N 47°19'05.0" W
MATCHLINE STA 23+00 SEE SHEET 13-0003
MATCHLINE STA 28+00 SEE SHEET 13-0005
P.C. 26+13.19
1
N/F
HUNTLAND ENTERPRISES, L.P.
PIN: 0220 001
2
N/F
SIND HOLDINGS, INC.
PIN: 3025 042
* ESA - SEE GENERAL NOTES 'ENVIRONMENTAL RESOURCES IMPACT TABLE' FOR CONSTRUCTION RESTRICTIONS.
PROPERTY AND EXISTING R/W LINE
REQUIRED R/W LINE
CONSTRUCTION LIMITS
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES
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BEGIN LIMIT OF ACCESS.....BLA
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LIMIT OF ACCESS
REQ'D R/W & LIMIT OF ACCESS
ORANGE BARRIER FENCE
ESA - ENV. SENSITIVE AREA (SEE ERIT TABLE)
LONG ENGINEERING
SCALE IN FEET
0 20 40 80
REVISION DATES
CONSTRUCTION PLAN
SR 1/US 27 AT WEST CHICKAMAUGA CREEK
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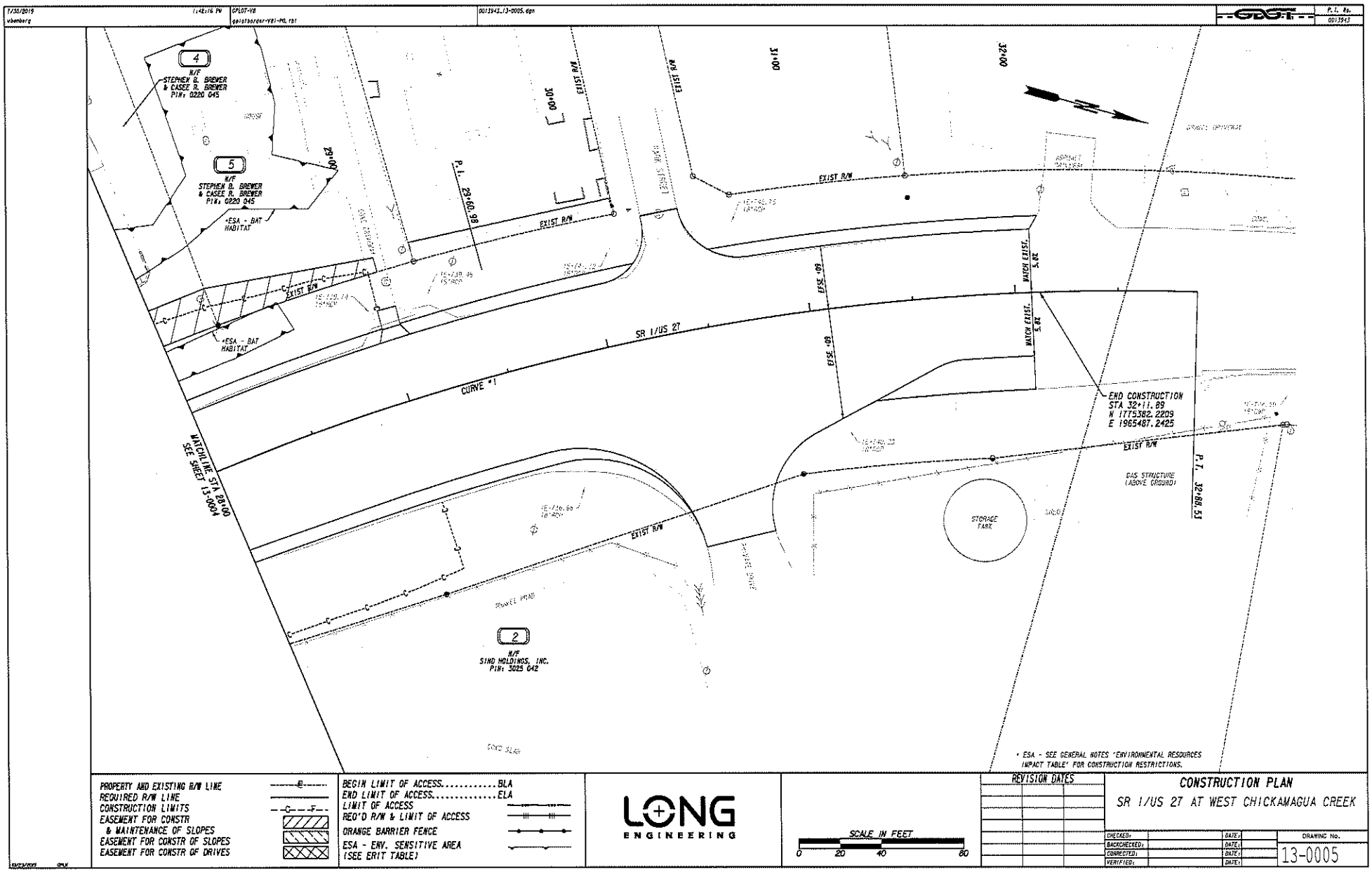
CORRECTED:
VERIFIED:
DRAWING No.
13-0004



PROPERTY AND EXISTING R/W LINE
REQUIRED R/W LINE
CONSTRUCTION LIMITS
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES
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END LIMIT OF ACCESS.....ELA
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REQ'D R/W & LIMIT OF ACCESS
ORANGE BARRIER FENCE
ESA - ENV. SENSITIVE AREA (SEE ERIT TABLE)

LONG ENGINEERING

SCALE IN FEET
0 20 40 80

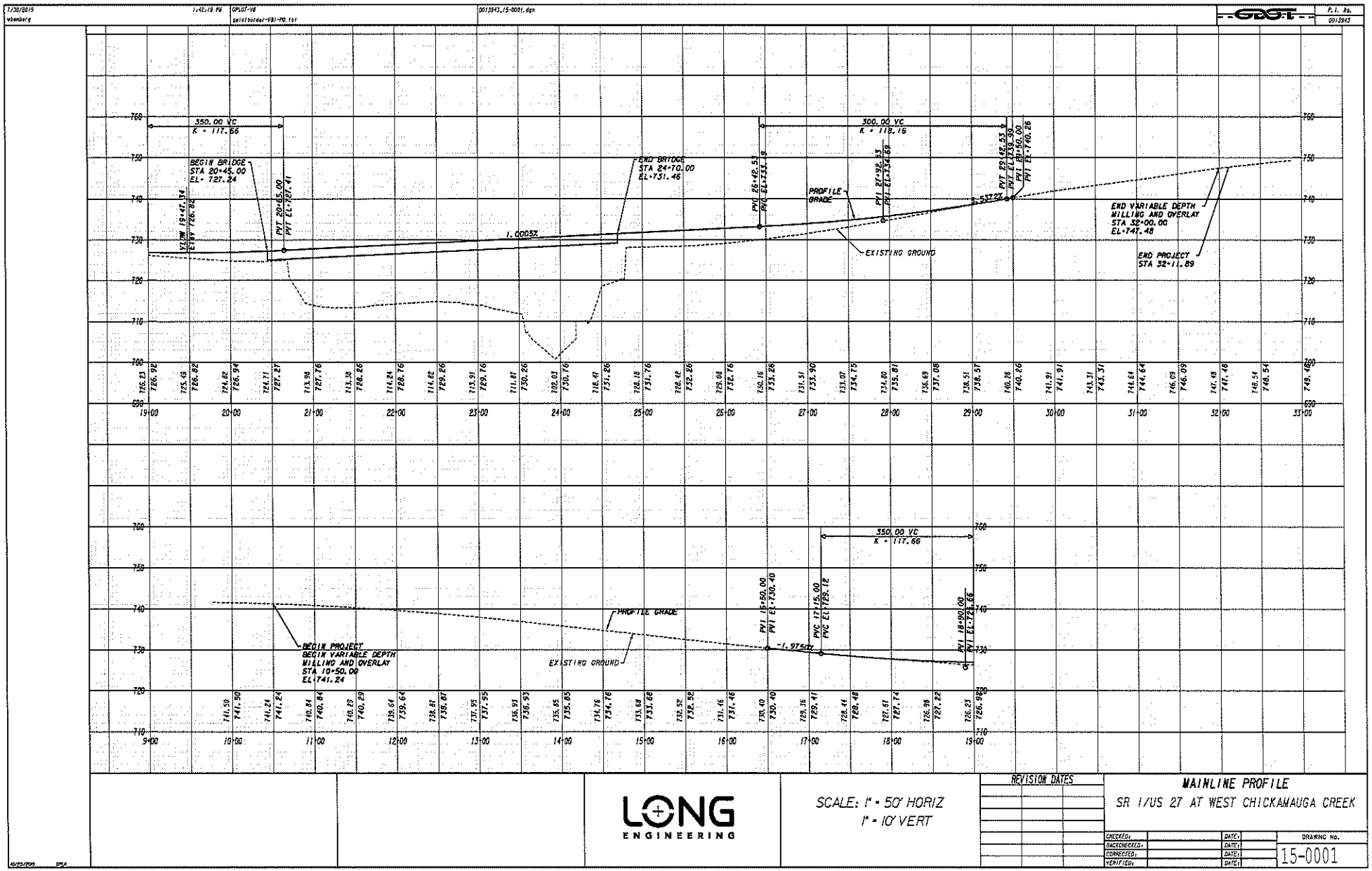
REVISION DATES

CONSTRUCTION PLAN

SR 1/US 27 AT WEST CHICKAMAGUA CREEK

CHECKED: DATE:
BACKCHECKED: DATE:
CORRECTED: DATE:
VERIFIED: DATE:

DRAWING No. 13-0005



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vbamberg splotbuilder-V81-P0.tbl

LONG ENGINEERING

SCALE: 1" = 50' HORIZ
1" = 10' VERT

REVISION DATES

MAINLINE PROFILE
SR 1/US 27 AT WEST CHICKAMAUGA CREEK

CHECKED:		DATE:	DRAWING No.
BACKCHECKED:		DATE:	15-0001
CORRECTED:		DATE:	
VERIFIED:		DATE:	

SR 1 (US 27) over West Chickamauga Creek
PI No. 0013943 Walker County
100 Year Storm
Hydraulic Design Data
Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	4.28	17.38	4.5
	Approach Velocity (ft/s):	1.32	7.91	1.94
	Br Average Depth (ft):	2.4	14.46	1.4
	BR Opening Flow (cfs):	923.28	12365.47	11.26
	BR Top WD (ft):	273.67	78.67	5.67
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	2192.5	10955.71	151.79
	Approach Top WD (ft):	388.3	79.67	17.38
	K1 Coefficient:	0.69	0.69	0.69
Results				
	Scour Depth Ys (ft):	0	4.99	0
	Critical Velocity (ft/s):	1.54	1.94	1.55
	Equation:	Clear	Live	Live

Pier Scour
Pier: #1 (CL = 2085)

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	3.5
	Grain Size D50 (mm):	0.38
	Depth Upstream (ft):	2.07
	Velocity Upstream (ft/s):	1.4
	K1 Nose Shape:	1.1
	Pier Angle:	0
	Pier Length (ft):	78
	K2 Angle Coef:	1
	K3 Bed Cond Coef:	1.1
	Grain Size D90 (mm):	0.57
	K4 Armouring Coef:	1
Results		
	Scour Depth Ys (ft):	3.3
	Froude #:	0.17
	Equation:	CSU equation

Pier: #2 (CL = 2145)

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	3.5
	Grain Size D50 (mm):	0.38
	Depth Upstream (ft):	3.19
	Velocity Upstream (ft/s):	1.58

K1 Nose Shape:	1.1
Pier Angle:	0
Pier Length (ft):	78
K2 Angle Coef:	1
K3 Bed Cond Coef:	1.1
Grain Size D90 (mm):	0.57
K4 Armouring Coef:	1

Results

Scour Depth Ys (ft):	3.69
Froude #:	0.16
Equation:	CSU equation

Pier: #3 (CL = 2205)

Input Data

Pier Shape:	Square nose
Pier Width (ft):	3.5
Grain Size D50 (mm):	0.38
Depth Upstream (ft):	2.7
Velocity Upstream (ft/s):	1.47
K1 Nose Shape:	1.1
Pier Angle:	0
Pier Length (ft):	78
K2 Angle Coef:	1
K3 Bed Cond Coef:	1.1
Grain Size D90 (mm):	0.57
K4 Armouring Coef:	1

Results

Scour Depth Ys (ft):	3.5
Froude #:	0.16
Equation:	CSU equation

Pier: #4 (CL = 2265)

Input Data

Pier Shape:	Square nose
Pier Width (ft):	3.5
Grain Size D50 (mm):	0.38
Depth Upstream (ft):	2.03
Velocity Upstream (ft/s):	1.23
K1 Nose Shape:	1.1
Pier Angle:	0
Pier Length (ft):	78
K2 Angle Coef:	1
K3 Bed Cond Coef:	1.1
Grain Size D90 (mm):	0.57
K4 Armouring Coef:	1

Results

Scour Depth Ys (ft):	3.12
Froude #:	0.15
Equation:	CSU equation

Pier: #5 (CL = 2325)

Input Data

Pier Shape:	Square nose
Pier Width (ft):	4
Grain Size D50 (mm):	0.38
Depth Upstream (ft):	2.34
Velocity Upstream (ft/s):	1.46
K1 Nose Shape:	1.1
Pier Angle:	0
Pier Length (ft):	78
K2 Angle Coef:	1
K3 Bed Cond Coef:	1.1
Grain Size D90 (mm):	0.57
K4 Armouring Coef:	1

Results

Scour Depth Ys (ft):	3.72
Froude #:	0.17
Equation:	CSU equation

SR 1 (US 27) over West Chickamauga Creek
PI No. 0013943 Walker County
500 Year Storm
Hydraulic Design Data
Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	5.13	19.24	5.43
	Approach Velocity (ft/s):	1.54	8.79	2.28
	Br Average Depth (ft):	3.93	16.09	1.97
	BR Opening Flow (cfs):	2123.82	15336.76	39.42
	BR Top WD (ft):	281.26	78.67	10.63
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	3766.01	13473.97	260.03
	Approach Top WD (ft):	475.8	79.67	20.98
	K1 Coefficient:	0.69	0.69	0.69
Results				
	Scour Depth Ys (ft):	0.53	5.6	0
	Critical Velocity (ft/s):	1.58	1.97	1.6
	Equation:	Clear	Live	Live

Pier Scour
Pier: #1 (CL = 2085)

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	3.5
	Grain Size D50 (mm):	0.38
	Depth Upstream (ft):	3.98
	Velocity Upstream (ft/s):	2.02
	K1 Nose Shape:	1.1
	Pier Angle:	0
	Pier Length (ft):	78
	K2 Angle Coef:	1
	K3 Bed Cond Coef:	1.1
	Grain Size D90 (mm):	0.57
	K4 Armouring Coef:	1
Results		
	Scour Depth Ys (ft):	4.23
	Froude #:	0.18
	Equation:	CSU equation

Pier: #2 (CL = 2145)

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	3.5
	Grain Size D50 (mm):	0.38
	Depth Upstream (ft):	5.11
	Velocity Upstream (ft/s):	2.18

K1 Nose Shape:	1.1
Pier Angle:	0
Pier Length (ft):	78
K2 Angle Coef:	1
K3 Bed Cond Coef:	1.1
Grain Size D90 (mm):	0.57
K4 Armouring Coef:	1

Results

Scour Depth Ys (ft):	4.51
Froude #:	0.17
Equation:	CSU equation

Pier: #3 (CL = 2205)

Input Data

Pier Shape:	Square nose
Pier Width (ft):	3.5
Grain Size D50 (mm):	0.38
Depth Upstream (ft):	4.61
Velocity Upstream (ft/s):	2.09
K1 Nose Shape:	1.1
Pier Angle:	0
Pier Length (ft):	78
K2 Angle Coef:	1
K3 Bed Cond Coef:	1.1
Grain Size D90 (mm):	0.57
K4 Armouring Coef:	1

Results

Scour Depth Ys (ft):	4.37
Froude #:	0.17
Equation:	CSU equation

Pier: #4 (CL = 2265)

Input Data

Pier Shape:	Square nose
Pier Width (ft):	3.5
Grain Size D50 (mm):	0.38
Depth Upstream (ft):	3.95
Velocity Upstream (ft/s):	1.89
K1 Nose Shape:	1.1
Pier Angle:	0
Pier Length (ft):	78
K2 Angle Coef:	1
K3 Bed Cond Coef:	1.1
Grain Size D90 (mm):	0.57
K4 Armouring Coef:	1

Results

Scour Depth Ys (ft):	4.09
Froude #:	0.17
Equation:	CSU equation

Pier: #5 (CL = 2325)

Input Data

Pier Shape:	Square nose
Pier Width (ft):	4
Grain Size D50 (mm):	0.38
Depth Upstream (ft):	4.25
Velocity Upstream (ft/s):	2.07
K1 Nose Shape:	1.1
Pier Angle:	0
Pier Length (ft):	78
K2 Angle Coef:	1
K3 Bed Cond Coef:	1.1
Grain Size D90 (mm):	0.57
K4 Armouring Coef:	1

Results

Scour Depth Ys (ft):	4.69
Froude #:	0.18
Equation:	CSU equation

Plan: Pro425BrGDOT W Chickamauga Cr 1 RS: 722 Profile: 100 Year Storm

	Pos	Left Sta	Right Sta	Flow	Area	W.P.	Percent	Hydr	Velocity	Shear	Power
		(ft)	(ft)	(cfs)	(sq ft)	(ft)	Conv	Depth(ft)	(ft/s)	(lb/sq ft)	(lb/ft s)
1	LOB	1894.60	1948.38	0.12	1.25	11.84	0.00	0.11	0.10	0.01	0.00
2	LOB	1948.38	2002.16	22.73	52.12	53.81	0.17	0.97	0.44	0.07	0.03
3	LOB	2002.16	2055.94	101.64	128.03	53.82	0.76	2.38	0.79	0.17	0.13
4	LOB	2055.94	2109.72	308.52	249.28	53.83	2.32	4.64	1.24	0.33	0.41
5	LOB	2109.72	2163.50	449.34	312.38	53.84	3.38	5.81	1.44	0.41	0.59
6	LOB	2163.50	2217.28	436.12	306.77	53.81	3.28	5.70	1.42	0.40	0.57
7	LOB	2217.28	2271.06	362.92	274.70	53.79	2.73	5.11	1.32	0.36	0.48
8	LOB	2271.06	2324.84	511.09	338.36	54.19	3.84	6.29	1.51	0.44	0.67
9	Chan	2324.84	2332.81	612.44	103.55	9.61	4.60	13.00	5.91	0.76	4.52
10	Chan	2332.81	2340.77	915.26	123.31	8.14	6.88	15.48	7.42	1.07	7.97
11	Chan	2340.77	2348.74	1084.94	136.57	8.14	8.16	17.14	7.94	1.19	9.44
12	Chan	2348.74	2356.71	1266.22	149.84	8.14	9.52	18.81	8.45	1.30	11.02
13	Chan	2356.71	2364.68	1454.12	162.67	8.12	10.93	20.42	8.94	1.42	12.68
14	Chan	2364.68	2372.64	1434.77	160.74	8.04	10.79	20.18	8.93	1.42	12.64
15	Chan	2372.64	2380.61	1306.63	151.97	8.04	9.82	19.07	8.60	1.34	11.51
16	Chan	2380.61	2388.58	1182.74	143.15	8.04	8.89	17.97	8.26	1.26	10.42
17	Chan	2388.58	2396.54	1064.56	134.38	8.04	8.00	16.87	7.92	1.18	9.38
18	Chan	2396.54	2404.51	634.04	118.47	12.77	4.77	14.87	5.35	0.66	3.52
19	ROB	2404.51	2487.20	151.79	78.25	19.57	1.14	4.50	1.94	0.28	0.55

FHWA GUIDE BANK CALCULATIONS

Project: PI No. 0013943
County: Walker
Date: June, 2019

STRUCTURE: **SR 1 (US 27) over West Chickamauga Creek**

LEFT SIDE:

Q_{100} = 13,300 cfs

$$\frac{Q_f}{Q_{100}} = \frac{K_f}{K_{100}} = \frac{104}{624} = 0.17$$

MEAN VELOCITY = 4.14 fps

LENGTH OF GUIDE BANK = < 50 ft

RIGHT SIDE:

Q_{100} = 13,300 cfs

$$\frac{Q_f}{Q_{100}} = \frac{K_f}{K_{100}} = \frac{32}{4784} = 0.01$$

MEAN VELOCITY = 4.14 fps

LENGTH OF GUIDE BANK = <50 ft

COMMENTS: Guide banks are not required at this site.

The above equations are shown in the FHWA publication HEC No. 23, "Bridge Scour and Stream Instability Countermeasures."

SR 1 (US 27) over West Chickamauga Creek
Walker County
PI No. 0013943

PROPOSED 425 FT BY 78 FT BRIDGE

ENDROLL RIPRAP CALCULATIONS (100 YEAR STORM)
METHOD IN HEC-23,"BRIDGE SCOUR AND STREAM INSTABILITY COUNTERMEASURES"

	Vertical Abutment
BRIDGE ABUTMENT LOCATION BENT 1	20+63.13
SET BACK LENGTH =	302.78
MAIN CHANNEL AREA @ BRIDGE =	1555.65
TOP WIDTH OF MAIN CHANNEL @ BRIDGE =	88.43
AVERAGE DEPTH OF MAIN CHANNEL @ BR =	17.5918806
SET BACK RATIO =	17.2113492
CHARACTERISTIC AVG VELOCITY CALCULATIONS	
(SEE PAGES 120,121)	
DISCHARGE @ ABUTMENT =	2772
AREA @ ABUTMENT =	1602
AVERAGE VELOCITY, V =	1.73033708
AREA OF OVERBANK FLOW @ BRIDGE =	1602
LENGTH OF OVERBANK FLOW @ BRIDGE =	296.24
AVERAGE DEPTH OF OVERBANK FLOW =	5.40777748
FROUDE NUMBER =	0.13112738
IF FROUDE NUMBER <= 0.80, THEN D50 =	0.0501547
IF FROUDE NUMBER > 0.80, THEN D50 =	1.13192821
MEDIAN STONE DIAMETER REQUIRED, D50 =	0.0501547
TYPE OF RIPRAP REQUIRED =	TYPE 3

Use Type I riprap at both endrolls per Drainage Manual.

SR 1 (US 27) over West Chickamauga Creek
Walker County
PI No. 0013943

PROPOSED 415 FT BY 78 FT BRIDGE

RIPRAP APRON LENGTH

NOTE: MINIMUM RIPRAP APRON LENGTH: 8 FT
MAXIMUM RIPRAP APRON LENGTH: 25 FT

Upstream Cross Section (RS 497)

	100 Year Floodstage Elevation	**Toe of Endroll Elevation**	
	719.86	719.16	**Left Side**
	N/A	N/A	**Right Side**
Apron Length		1.40	**Left Side**
		N/A	**Right Side**

Downstream Cross Section (RS 300)

	100 Year Floodstage Elevation	**Toe of Endroll Elevation**	
	720.16	714.40	**Left Side**
	N/A	N/A	**Right Side**
Apron Length		11.52	**Left Side**
		N/A	**Right Side**

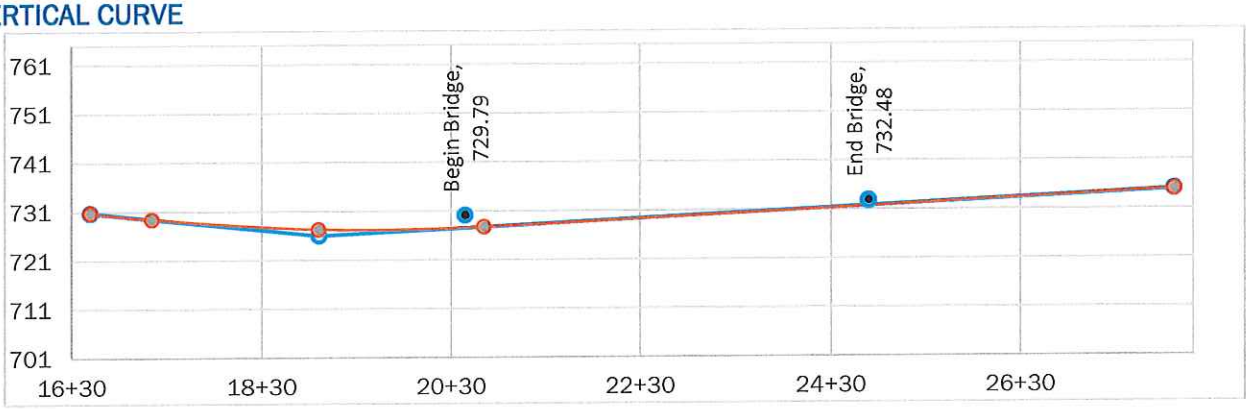
Use 12 FT Riprap Apron Bent 1 Only

Georgia Department of Transportation

Deck Drainage Analysis

PI No. 0013943

VERTICAL CURVE

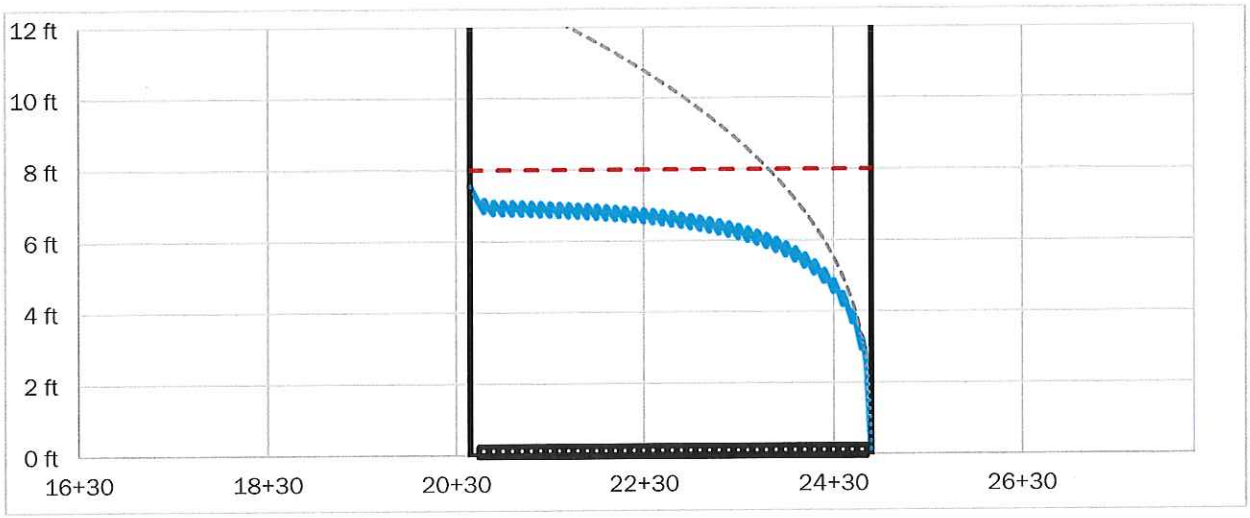


DESIGN DATA

W_p	=	78.00	ft	*Width of pavement being drained*
T	=	8.00	ft	*Maximum allowable spread*
n	=	0.016	-	*Manning's coefficient -- typically, n = 0.016*
C	=	0.90	-	*Runoff -- typically, C = 0.9 for pavements*
i	=	7.50	in/hr	*Design intensity*

BRIDGE DATA

Beg	=	20+45.00	-	*Beginning station of bridge*
End	=	24+70.00	-	*End station of bridge*



ANALYSIS SUMMARY

The maximum spread without drains is 13.83 ft at station 20+45.00

The maximum spread with drains included is 7.54 ft at station 20+45.00

With an allowable spread of 8.00 ft, this bridge is hydraulicly sufficienct.

DECK DRAIN ANALYSIS REPORT

VERTICAL CURVE DATA

PVI Station	PVI Elevation	LVC
16+50.00	730.40	-
18+90.00	725.66	350.00
27+92.53	734.69	-

SUPERELEVATION DATA

SE Station	SE Rate (%)
00+00.00	2.0%

DECK DRAIN DATA

Drain No. 1

Drain Type:	GDOT 4" Scupper		
Station:	20+60.00	Flow:	0.964 cfs
Elevation:	727.36	***Efficiency:***	***12.2 %***
Grade:	0.0096 ft/ft	Flow Depth:	0.14 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 2

Drain Type:	GDOT 4" Scupper		
Station:	20+70.00	Flow:	0.962 cfs
Elevation:	727.46	***Efficiency:***	***12.3 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.14 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 3

Drain Type:	GDOT 4" Scupper		
Station:	20+80.00	Flow:	0.959 cfs
Elevation:	727.56	***Efficiency:***	***12.3 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.14 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 4

Drain Type:	GDOT 4" Scupper		
Station:	20+90.00	Flow:	0.957 cfs
Elevation:	727.66	***Efficiency:***	***12.3 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.14 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 5

Drain Type:	GDOT 4" Scupper		
Station:	21+00.00	Flow:	0.954 cfs
Elevation:	727.76	***Efficiency:***	***12.4 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.14 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 6

Drain Type:	GDOT 4" Scupper		
Station:	21+10.00	Flow:	0.950 cfs
Elevation:	727.86	***Efficiency:***	***12.4 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.14 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 7

Drain Type:	GDOT 4" Scupper		
Station:	21+20.00	Flow:	0.947 cfs
Elevation:	727.96	***Efficiency:***	***12.4 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.14 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 8

Drain Type:	GDOT 4" Scupper		
Station:	21+30.00	Flow:	0.943 cfs
Elevation:	728.06	***Efficiency:***	***12.4 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.14 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 9

Drain Type:	GDOT 4" Scupper		
Station:	21+40.00	Flow:	0.939 cfs
Elevation:	728.16	***Efficiency:***	***12.4 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.14 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 10

Drain Type:	GDOT 4" Scupper		
Station:	21+50.00	Flow:	0.934 cfs
Elevation:	728.26	***Efficiency:***	***12.5 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.14 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 11

Drain Type:	GDOT 4" Scupper		
Station:	21+60.00	Flow:	0.929 cfs
Elevation:	728.36	***Efficiency:***	***12.5 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.14 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 12

Drain Type:	GDOT 4" Scupper		
Station:	21+70.00	Flow:	0.924 cfs
Elevation:	728.46	***Efficiency:***	***12.5 %***

Grade:	0.0100 ft/ft	Flow Depth:	0.14 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 13

Drain Type:	GDOT 4" Scupper		
Station:	21+80.00	Flow:	0.918 cfs
Elevation:	728.56	***Efficiency:***	***12.5 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.14 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 14

Drain Type:	GDOT 4" Scupper		
Station:	21+90.00	Flow:	0.912 cfs
Elevation:	728.66	***Efficiency:***	***12.6 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.14 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 15

Drain Type:	GDOT 4" Scupper		
Station:	22+00.00	Flow:	0.905 cfs
Elevation:	728.76	***Efficiency:***	***12.6 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.14 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 16

Drain Type:	GDOT 4" Scupper		
Station:	22+10.00	Flow:	0.897 cfs
Elevation:	728.86	***Efficiency:***	***12.6 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.14 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 17

Drain Type:	GDOT 4" Scupper		
Station:	22+20.00	Flow:	0.889 cfs
Elevation:	728.96	***Efficiency:***	***12.7 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.13 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 18

Drain Type:	GDOT 4" Scupper		
Station:	22+30.00	Flow:	0.880 cfs
Elevation:	729.06	***Efficiency:***	***12.7 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.13 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 19

Drain Type:	GDOT 4" Scupper

Station:	22+40.00	Flow:	0.871 cfs
Elevation:	729.16	***Efficiency:***	***12.8 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.13 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 20

Drain Type:	GDOT 4" Scupper		
Station:	22+50.00	Flow:	0.860 cfs
Elevation:	729.26	***Efficiency:***	***12.8 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.13 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 21

Drain Type:	GDOT 4" Scupper		
Station:	22+60.00	Flow:	0.849 cfs
Elevation:	729.36	***Efficiency:***	***12.9 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.13 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 22

Drain Type:	GDOT 4" Scupper		
Station:	22+70.00	Flow:	0.836 cfs
Elevation:	729.46	***Efficiency:***	***13.0 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.13 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 23

Drain Type:	GDOT 4" Scupper		
Station:	22+80.00	Flow:	0.822 cfs
Elevation:	729.56	***Efficiency:***	***13.0 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.13 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 24

Drain Type:	GDOT 4" Scupper		
Station:	22+90.00	Flow:	0.808 cfs
Elevation:	729.66	***Efficiency:***	***13.1 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.13 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 25

Drain Type:	GDOT 4" Scupper		
Station:	23+00.00	Flow:	0.791 cfs
Elevation:	729.76	***Efficiency:***	***13.2 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.13 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 26

Drain Type:	GDOT 4" Scupper		
Station:	23+10.00	Flow:	0.774 cfs
Elevation:	729.86	***Efficiency:***	***13.3 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.13 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 27

Drain Type:	GDOT 4" Scupper		
Station:	23+20.00	Flow:	0.754 cfs
Elevation:	729.96	***Efficiency:***	***13.5 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.13 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 28

Drain Type:	GDOT 4" Scupper		
Station:	23+30.00	Flow:	0.733 cfs
Elevation:	730.06	***Efficiency:***	***13.6 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.12 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 29

Drain Type:	GDOT 4" Scupper		
Station:	23+40.00	Flow:	0.709 cfs
Elevation:	730.16	***Efficiency:***	***13.7 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.12 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 30

Drain Type:	GDOT 4" Scupper		
Station:	23+50.00	Flow:	0.684 cfs
Elevation:	730.26	***Efficiency:***	***13.9 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.12 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 31

Drain Type:	GDOT 4" Scupper		
Station:	23+60.00	Flow:	0.656 cfs
Elevation:	730.36	***Efficiency:***	***14.1 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.12 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 32

Drain Type:	GDOT 4" Scupper		
Station:	23+70.00	Flow:	0.625 cfs
Elevation:	730.46	***Efficiency:***	***14.4 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.12 ft

Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 33

Drain Type:	GDOT 4" Scupper		
Station:	23+80.00	Flow:	0.591 cfs
Elevation:	730.56	***Efficiency:***	***14.7 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.11 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 34

Drain Type:	GDOT 4" Scupper		
Station:	23+90.00	Flow:	0.553 cfs
Elevation:	730.66	***Efficiency:***	***15.0 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.11 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 35

Drain Type:	GDOT 4" Scupper		
Station:	24+00.00	Flow:	0.511 cfs
Elevation:	730.76	***Efficiency:***	***15.5 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.11 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 36

Drain Type:	GDOT 4" Scupper		
Station:	24+10.00	Flow:	0.464 cfs
Elevation:	730.86	***Efficiency:***	***16.0 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.10 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 37

Drain Type:	GDOT 4" Scupper		
Station:	24+20.00	Flow:	0.412 cfs
Elevation:	730.96	***Efficiency:***	***16.7 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.10 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 38

Drain Type:	GDOT 4" Scupper		
Station:	24+30.00	Flow:	0.354 cfs
Elevation:	731.06	***Efficiency:***	***17.6 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.09 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 39

Drain Type:	GDOT 4" Scupper		
Station:	24+40.00	Flow:	0.287 cfs

Elevation:	731.16	***Efficiency:***	***19.0 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.09 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 40

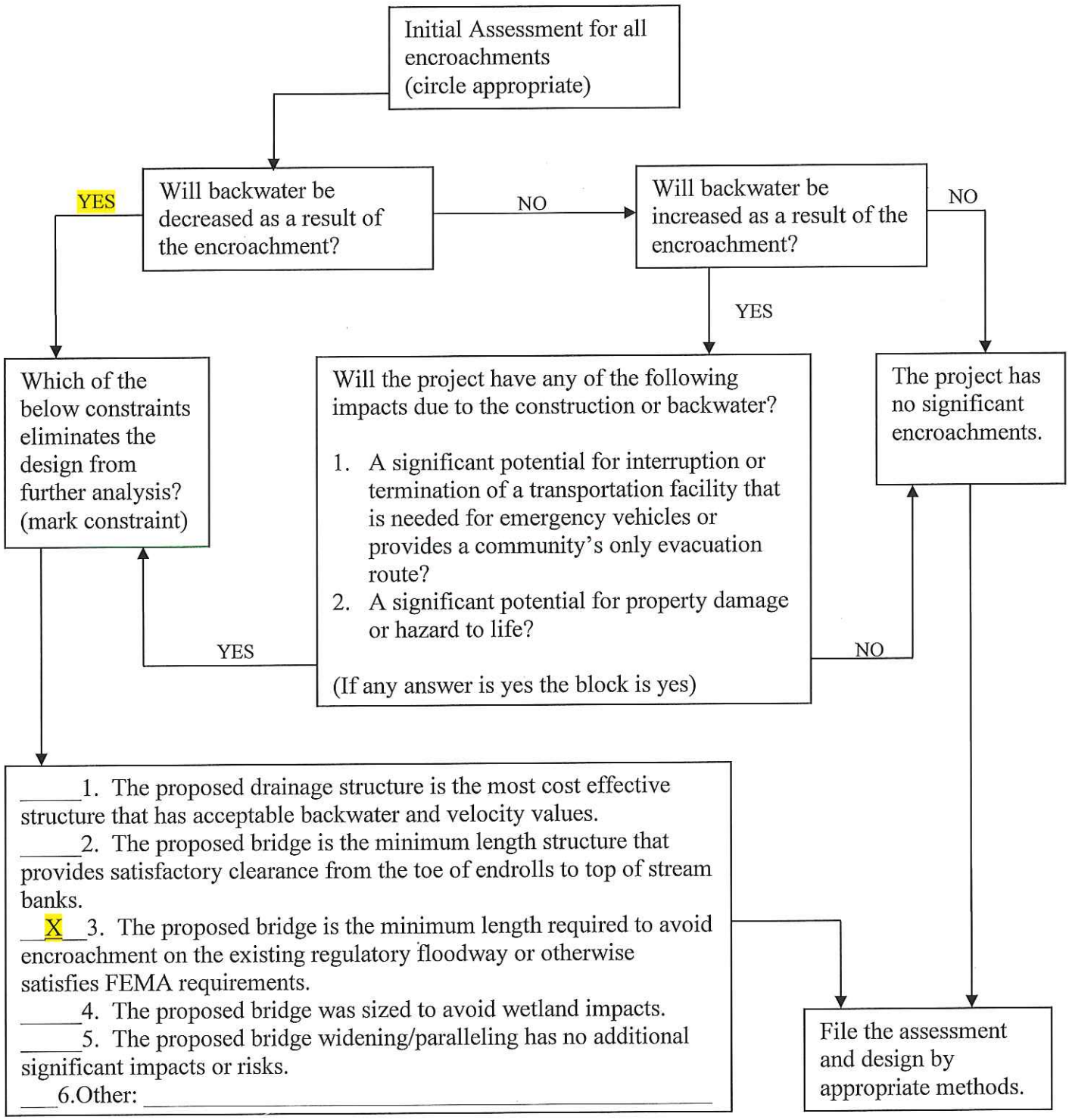
Drain Type:	GDOT 4" Scupper		
Station:	24+50.00	Flow:	0.211 cfs
Elevation:	731.26	***Efficiency:***	***21.1 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.08 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

Drain No. 41

Drain Type:	GDOT 4" Scupper		
Station:	24+60.00	Flow:	0.121 cfs
Elevation:	731.36	***Efficiency:***	***25.6 %***
Grade:	0.0100 ft/ft	Flow Depth:	0.06 ft
Cross Slope:	0.0200 ft/ft	Behavior:	Grade

APPENDIX B

RISK ASSESSMENT



HYDRAULIC ENGINEERING FIELD REPORT

I. *HYDRAULIC AND HYDROLOGICAL DATA REQUIRED FOR ALL EXISTING OR PROPOSED BRIDGE STREAM CROSSING PROJECTS*

A. Project Location

Project No.: MPOPD1701093 County: WALKER District: 6

P.I. No.: 0013943 Stream Name: CHICKAMAUGA CREEK Route: 1

Surveyed By: LONG ENGINEERING, INC. Date: 7/10/18

B. Site Information

Floodplain and Stream Channel description:

1. Flat, rolling, mountainous, etc.: ROLLING

2. Wooded, heavily vegetated, pasture, swampy, etc.: WOODED, PASTURE

3. Stream channel description: well-defined banks, meandering, debris, etc.

   WELL DEFINED BANKS, TOP CREEK BLENDS WITH TOP SLOPE

4. Is there any fill in the upstream or downstream floodplain, which will affect the natural drainage or limit the floodplain width at this site?

   No affects.

C. Required Existing Bridge Information at Project Site

1. Bridge Identification No.: 295-0004-0
2. Date Built: 1987
3. Skew angle of bridge bents: 0°
4. Height of curb, parapet or barrier: 2.7

Substructure Information:

1. Column type (concrete, steel, etc): CONCRETE, STEEL
2. Size of columns: 1'x1' I BEAM, 30"x24", 30"x30", 42"X36"
3. Number of columns per bent: VARIES, 6, 9, 12
4. Guide Bank (Spur Dike) length, elevation and location (if applicable):

   N/A

5. Note any scour problems at intermediate bents or abutments:

Note: The above information is required for all bridges within the floodplain (main and overflow bridges) along the roadway. In addition, the location, size and number of barrels are required for all box culverts located within the floodplain.

D. Normal Water Surface Data

	WS ELEV
500 feet upstream of survey centerline:	702.65
At the survey centerline:	700.79
500 feet downstream of survey centerline:	700.14
Normal high tide:	N/A
Normal low tide:	N/A

E. Historical Flood Data

1. Extreme high water elevation at site: 714.9 Date: _____
2. Highest observed tide elevation: _____ Date: _____
3. Location of extreme high water elevation (upstream/downstream face of bridge at the centerline or station and offset if not at bridge):

_____

4. Source of high water information: FIELD OBSERVATION

_____

5. Location and floor elevation of any houses/buildings/structures that have been flooded:
N/A

_____

6. Information about flood (number of times structure has been flooded, water surface elevations and date(s) of flood):
N/A

_____

7. Location and floor elevation of any houses/buildings/structures that have floor elevations within 2 feet of the extreme high water elevation:
N/A

_____

F. Benchmark Information

Location 1:

1. Benchmark Name: 4674 Elevation: 727.783
2. Location *(project stations/offset)*: LOCATED NEAR THE NORTHWEST CORNER OF BRIDGE

Northing: 1774759.1 Easting: 1965873.6

3. Physical description: BM TVA PLATE WC9 (LEI-D)

Location 2:

1. Benchmark Name: _____ Elevation: _____
2. Location *(project stations/offset)*: _____

Northing: _____ _____

3. Physical description: _____

Location 3:

1. Benchmark Name: _____ Elevation: _____
2. Location *(project stations/offset)*: _____

Northing: _____ Easting: _____

3. Physical description: _____

G. Upstream and Downstream Structures

Structure 1

1. Structure Type (railroad/highway bridge, culvert): No Upstream / Downstream Structures Identified
2. Route Number (if applicable): _____
3. Distance from proposed structure along stream centerline: _____
4. Length of bridge or culvert size: _____
5. Superstructure (slab thickness, beam depth): _____
6. Substructure information: _____
7. Column Type (concrete, steel, etc.): _____
8. Size of Column: _____
9. Number of Columns per bent: _____

Structure 2

1. Structure Type (railroad/highway bridge, culvert): No Upstream / Downstream Structures Identified
2. Route Number (if applicable): _____
3. Distance from proposed structure along stream centerline: _____
4. Length of bridge or culvert size: _____
5. Superstructure (slab thickness, beam depth): _____
6. Substructure information: _____
7. Column Type (concrete, steel, etc.): _____
8. Size of Column: _____
9. Number of Columns per bent: _____

Structure 3

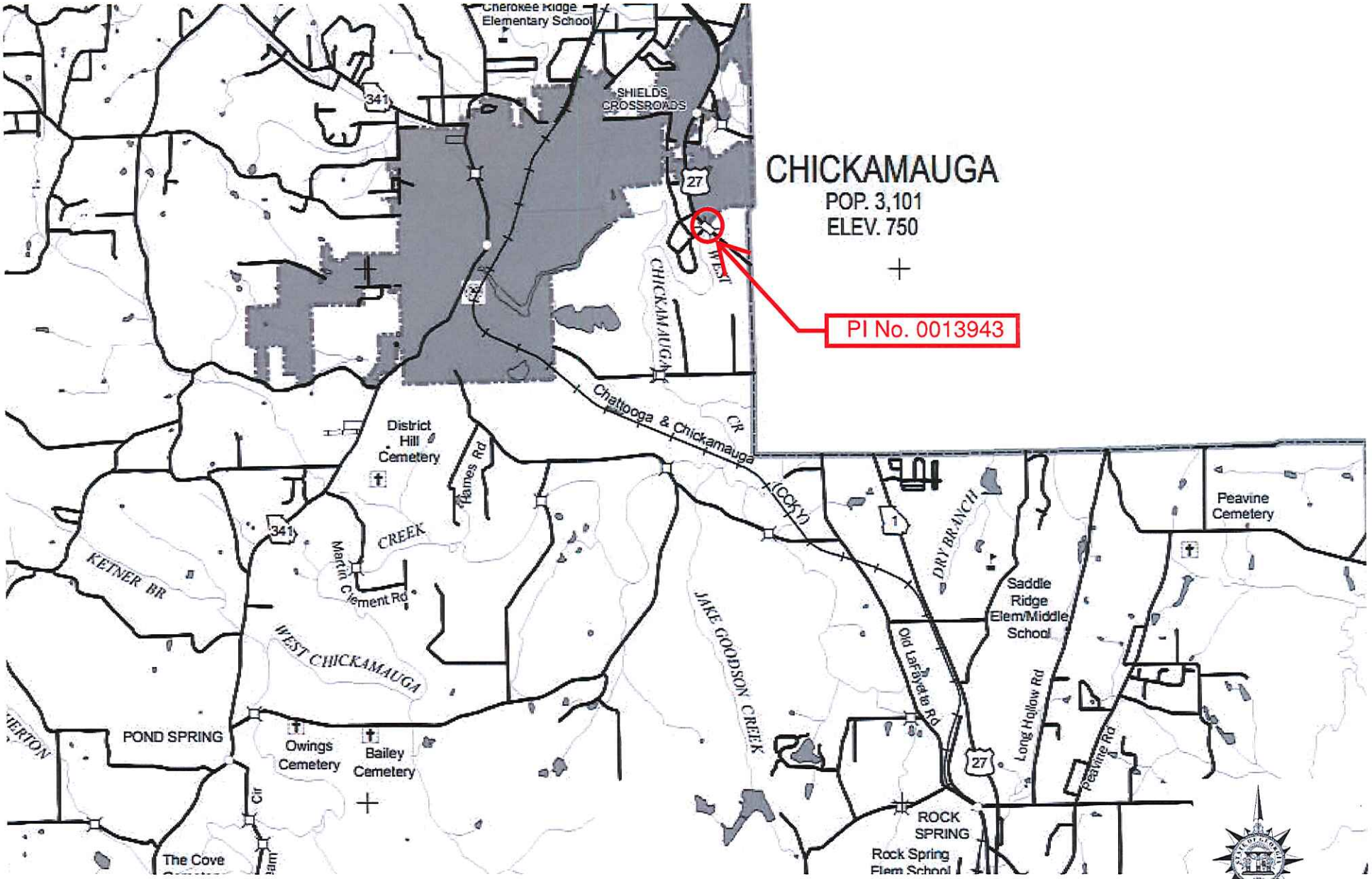
1. Structure Type (railroad/highway bridge, culvert): No Upstream / Downstream Structures Identified
2. Route Number (if applicable): _____
3. Distance from proposed structure along stream centerline: _____
4. Length of bridge or culvert size: _____
5. Superstructure (slab thickness, beam depth): _____
6. Substructure information: _____
7. Column Type (concrete, steel, etc.): _____
8. Size of Column: _____
9. Number of Columns per bent: _____

NOTE: The above information is required for all bridges or culverts, which lie within 2000 feet upstream or downstream of the project bridge, unless otherwise directed by the Office of Bridge Hydraulics.

H. Miscellaneous Information

1. Are there water surfaces affected by other factors (high water from other streams, reservoirs, etc.):
   No other factors Identified

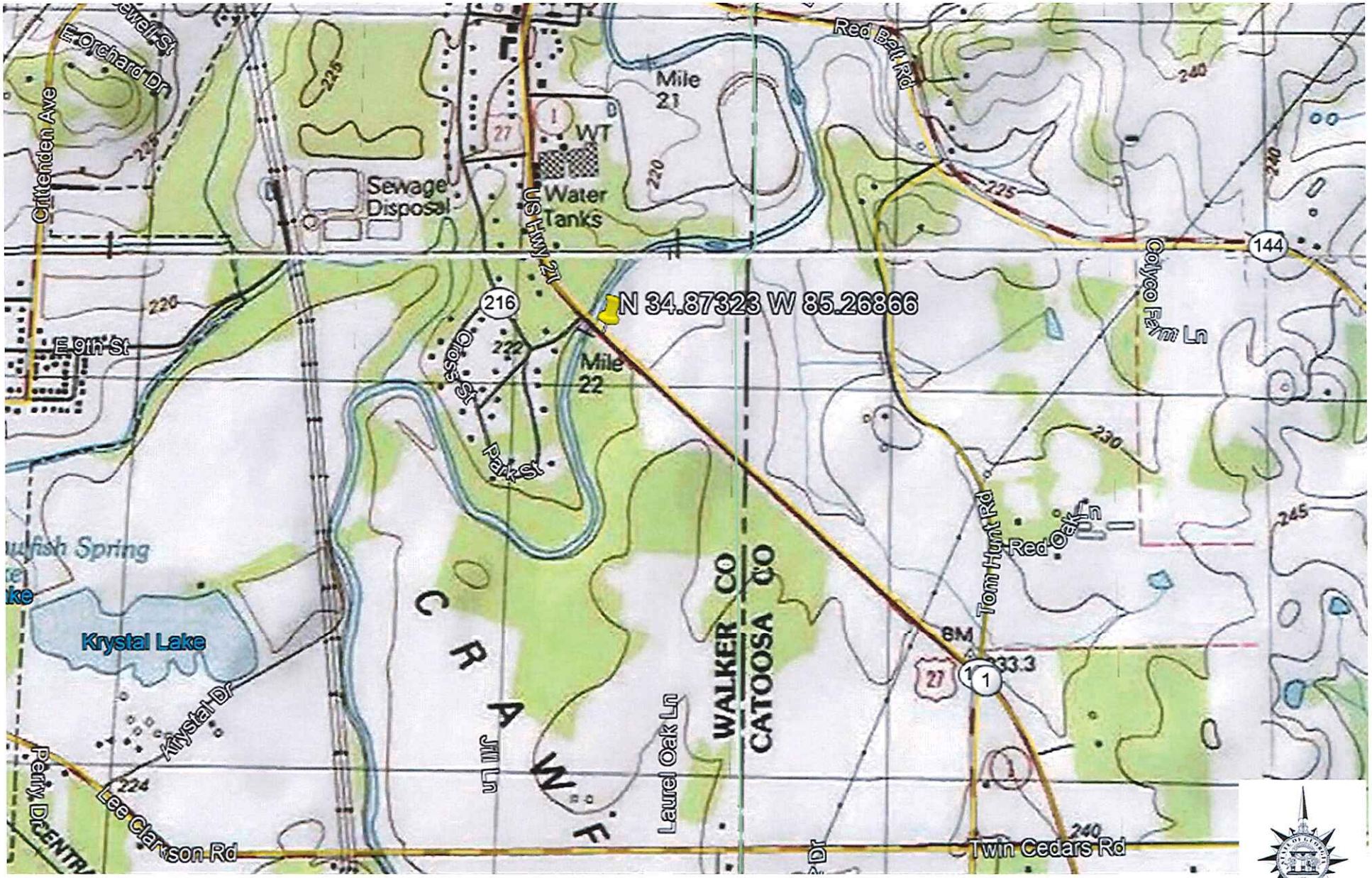
2. Give location (horizontal distance to dam or spill way along stream centerline), length, width and elevation of dam and spillway, if applicable:
   N/A



COUNTY MAP

Structure No. 295-0004-0

SR 1 (US 27) over West Chickamauga Creek
Walker County
PI# 0013943



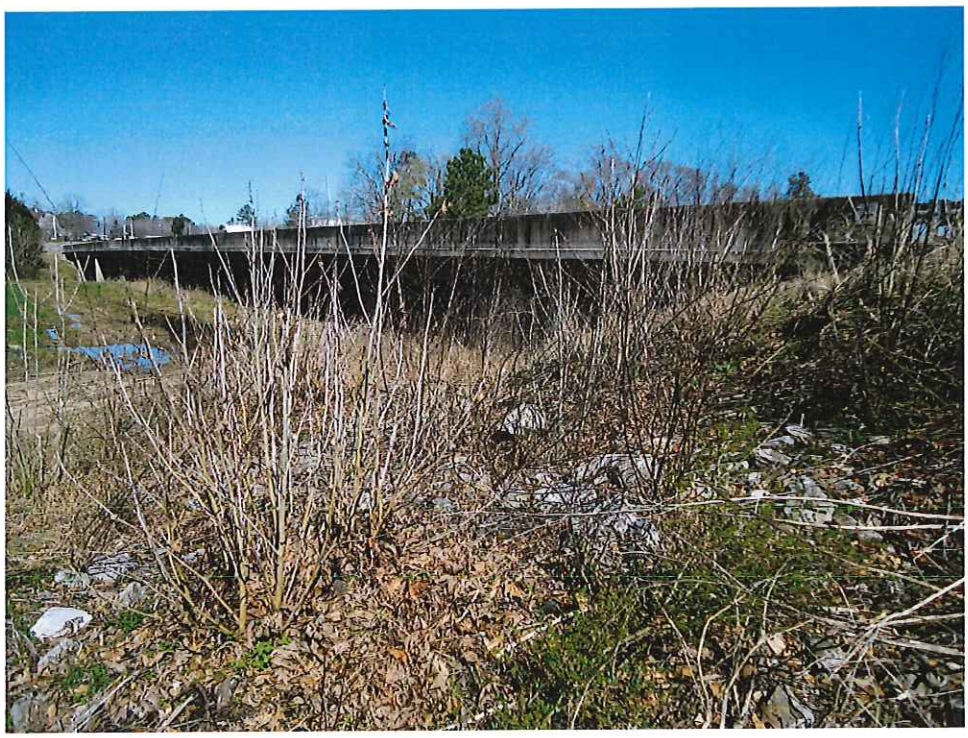
QUAD MAP

Structure No. 295-0004-0

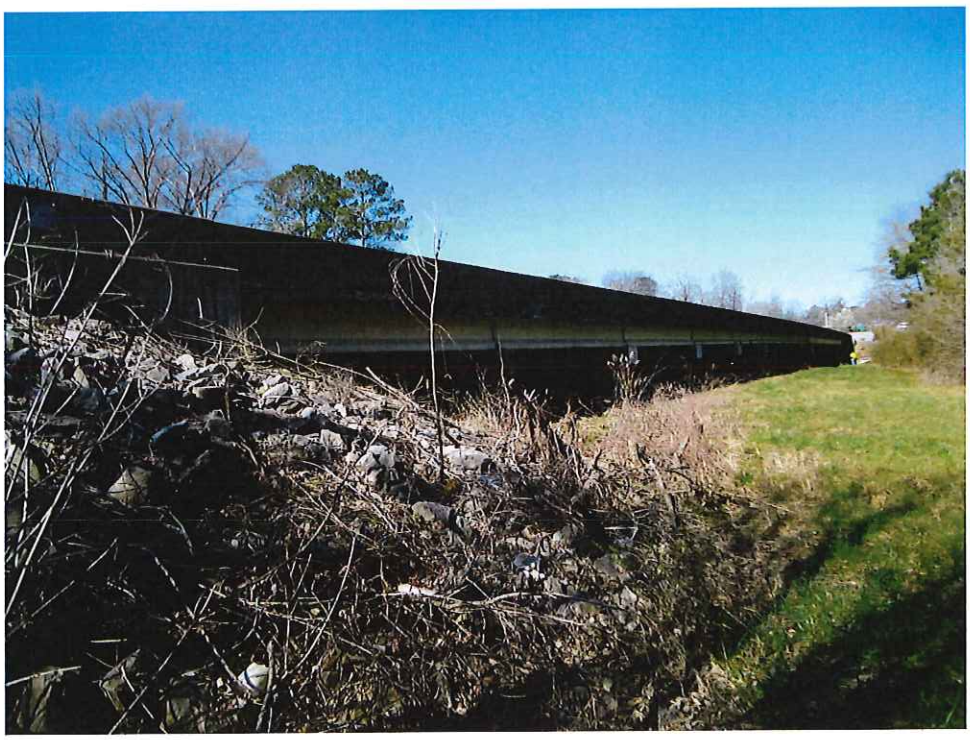
SR 1 (US 27) over West Chickamauga Creek
Walker County
PI# 0013943

SR 1 (US 27) Looking East at Existing Bridge

SR 1 (US 27) Looking West at Existing Bridge



Upstream Face of Existing Bridge



Downstream Face of Existing Bridge

West Chickamauga Creek Looking Upstream from Existing Bridge

West Chickamauga Creek Looking Downstream from Existing Bridge

Upstream Floodplain East Side of Creek near Creek Bank

Upstream Pasture East Side of Creek

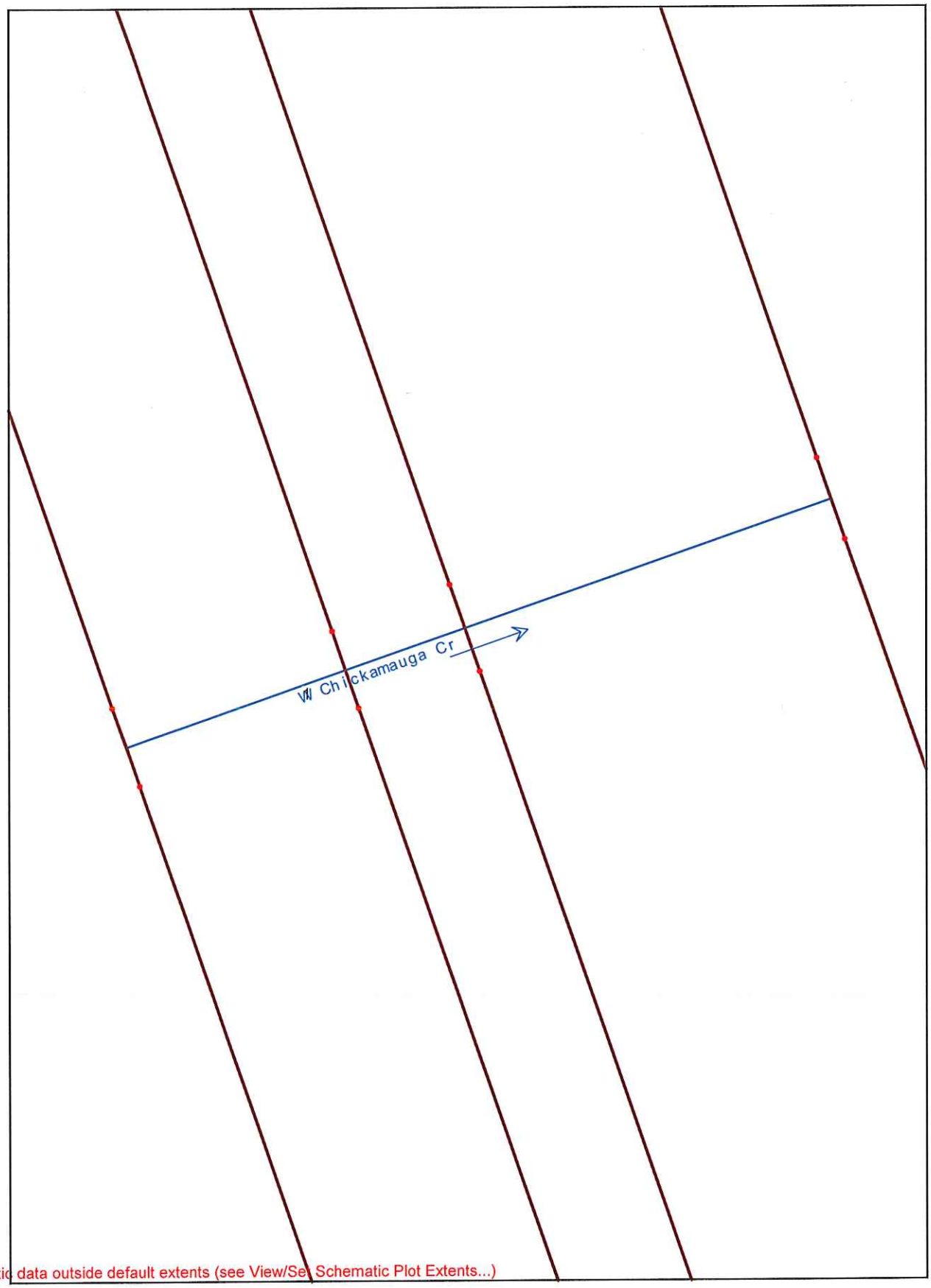
Upstream Floodplain West Side of Creek

Downstream Floodplain East Side of Creek

Downstream Creek Bank West Side of Creek

Downstream Floodplain West Side of Creek

HEC-RAS OUTPUT
NATURAL CONDITION



Some schematic data outside default extents (see View/Set Schematic Plot Extents...)

HEC-RAS HEC-RAS 5.0.6 November 2018
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
XXXXXXX  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
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PROJECT DATA
Project Title: SR 1 over W Chickamauga Creek
Project File : SR1overWChickam.prj
Run Date and Time: 6/24/2019 1:54:02 PM

Project in English units

PLAN DATA

Plan Title: Natural Condition Adj DSC
Plan File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.p10

Geometry Title: Natural Condition GDOT Adj DSC
Geometry File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.g11

Flow Title : Flow Data Quad Map Slope
Flow File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.f02

Plan Summary Information:

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

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

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

FLOW DATA

Flow Title: Flow Data Quad Map Slope
Flow File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.f02

Flow Data (cfs)

River	Reach	RS	2 Year Storm	50 Year Storm	100 Year Storm	500 Year Storm
W Chickamauga Cr	1	722	3540	11700	13300	17500

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
W Chickamauga Cr1		2 Year Storm		Normal S = 0.0005738
W Chickamauga Cr1		50 Year Storm		Normal S = 0.0005738
W Chickamauga Cr1		100 Year Storm		Normal S = 0.0005738
W Chickamauga Cr1		500 Year Storm		Normal S = 0.0005738

GEOMETRY DATA

Geometry Title: Natural Condition GDOT Adj DSC
Geometry File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.g11

CROSS SECTION

RIVER: W Chickamauga Cr
REACH: 1 RS: 722

INPUT
Description: Approach Section. Adjust Elevations for Quad Map Slope -0.15'
Station Elevation Data num= 500

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
980.33	755.4	986.4	755.38	995.11	755.35	996.4	755.33	1004	755.26
1006.4	755.21	1016.4	755	1026.4	754.79	1036.4	754.58	1040.28	754.5
1046.4	754.22	1051.14	754.01	1056.4	753.71	1062.49	753.36	1066.4	753.24
1076.4	752.96	1086.4	752.67	1096.4	752.39	1099.19	752.31	1106.4	751.92
1111.95	751.61	1116.4	751.52	1126.4	751.3	1136.4	751.09	1146.4	750.88
1149.7	750.81	1156.4	750.57	1166.4	750.22	1166.41	750.22	1176.4	750.12
1186.4	750.03	1196.4	749.93	1200.74	749.89	1206.4	749.87	1214.28	749.84
1216.4	749.77	1226.4	749.47	1236.4	749.16	1246.4	748.85	1251.97	748.68
1256.4	748.55	1264.97	748.3	1266.4	748.21	1276.4	747.55	1286.4	746.9
1296.4	746.25	1298.43	746.12	1306.4	745.7	1313.37	745.33	1316.4	745.12
1326.4	744.44	1336.4	743.76	1346.4	743.08	1347.52	743.01	1356.4	742.48
1363.69	742.04	1366.4	741.87	1376.4	741.23	1386.4	740.59	1394.95	740.05
1396.4	739.95	1406.4	739.23	1413.61	738.72	1416.4	738.58	1426.4	738.07
1436.4	737.56	1445.4	737.1	1446.4	737.04	1456.4	736.39	1464.51	735.86
1466.4	735.78	1476.4	735.33	1486.4	734.88	1495.08	734.49	1496.4	734.42
1506.4	733.84	1513.88	733.4	1516.4	733.31	1526.4	732.94	1532.19	732.73
1536.4	732.57	1546.4	732.21	1554.28	731.92	1556.4	731.85	1566.4	731.51
1573.29	731.28	1576.4	731.19	1586.4	730.92	1596.4	730.65	1598.86	730.58
1606.4	730.41	1616.4	730.19	1626.4	729.96	1627.65	729.94	1636.4	729.77
1646.4	729.58	1650.73	729.49	1656.4	729.38	1666.4	729.18	1668.9	729.13
1676.4	728.95	1683.84	728.76	1686.4	728.8	1696.4	728.94	1706.4	729.09
1707.93	729.11	1716.4	728.84	1721.99	728.66	1726.4	728.45	1736.4	727.98
1746.4	727.52	1756.02	727.07	1756.4	727.02	1761.52	726.41	1766.4	726.12
1776.4	725.53	1786.4	724.93	1792.82	724.55	1796.4	724.46	1799.52	724.37
1805.9	724.35	1806.4	724.34	1816.4	724.06	1826.4	723.78	1836.4	723.49
1846.4	723.21	1855.11	722.96	1856.4	722.93	1866.4	722.71	1867.48	722.68
1876.4	722.69	1886.4	722.71	1896.4	722.72	1904.59	722.73	1906.4	722.69
1910.99	722.59	1916.4	722.31	1926.4	721.79	1936.4	721.28	1938.8	721.15
1946.4	721.16	1951.69	721.17	1956.4	720.97	1966.4	720.53	1968.34	720.45
1968.41	720.44	1976.4	720.18	1984.12	719.92	1986.4	719.89	1996.4	719.73
2006.4	719.57	2008.4	719.54	2016.4	719.34	2026.4	719.08	2028.94	719.01
2036.4	718.71	2046.4	718.29	2049.85	718.15	2053.54	717.87	2056.4	717.75
2057.39	717.71	2066.4	717.38	2075.15	717.05	2076.4	716.96	2080.12	716.67
2085.94	716.47	2086.4	716.44	2089.32	716.25	2096.4	715.94	2098.97	715.83
2106.15	715.82	2106.4	715.81	2116.4	715.7	2126.4	715.59	2136.4	715.47
2146.4	715.36	2150.45	715.32	2156.4	714.99	2157.53	714.93	2162.15	715.56
2166.4	715.55	2176.4	715.51	2179.1	715.51	2184.22	715.37	2186.4	715.34
2188.2	715.32	2195.9	715.29	2196.4	715.31	2201.24	715.53	2206.08	715.97
2206.4	715.97	2216.4	715.91	2222.48	715.87	2226.4	715.9	2236.4	715.99
2243.47	716.06	2246.4	716.13	2256.4	716.38	2262.67	716.54	2266.4	716.54
2276	716.56	2286	716.79	2287.95	716.84	2296	715.72	2306	714.34
2310.91	713.66	2316	712.82	2324.84	711.36	2326	710.28	2326.64	709.69
2329.23	707.33	2334.74	706.23	2336	705.96	2346	703.87	2356	701.78
2362.98	700.31	2366	700.73	2376	702.11	2386	703.5	2396	704.88
2396.37	704.93	2402.29	705.67	2402.58	707.05	2404.51	712.27	2406	713.04
2416	718.22	2422.46	721.57	2424.21	722.47	2426	723.4	2430.48	725.71
2432.63	726.29	2436	727.52	2456.4	727.56	2457.47	727.85	2460.57	728.4
2462.37	728.82	2466.4	729.18	2473.71	729.85	2476.4	730.17	2486.4	731.37
2496.4	732.57	2504.81	733.57	2506.4	733.65	2516.4	734.13	2522.55	734.42
2526.4	734.55	2530.87	734.69	2536.4	735.44	2541.37	736.1	2546.4	736.68
2556.4	737.81	2556.87	737.87	2559.35	738	2563.49	738.29	2566.4	738.44

2566.55	738.45	2576.4	739.11	2586.4	739.78	2596.4	740.46	2599	740.63
2600	740.7	2608.89	741.26	2610	741.38	2610.05	741.39	2612.66	741.5
2613.19	741.53	2619.48	741.91	2619.79	741.93	2626.39	742.33	2628.71	742.47
2632.99	742.72	2637.95	743.02	2639.06	743.08	2639.59	743.1	2646.19	743.34
2647.18	743.37	2649.47	743.45	2651	743.47	2652.79	743.54	2656.42	743.66
2659.4	743.76	2665.65	743.97	2666	743.98	2672.6	744.2	2674.89	744.28
2679.2	744.42	2684.12	744.58	2685.8	744.64	2689.64	744.76	2692.07	744.84
2692.4	744.86	2693.35	744.89	2693.81	744.9	2699	745	2700	745.02
2706.6	745.16	2709.23	745.21	2713.2	745.29	2718.47	745.39	2719.8	745.42
2726.4	745.54	2727.7	745.57	2729.07	745.6	2730.75	745.68	2733	745.71
2736.94	745.76	2739.6	745.8	2743.08	745.84	2746.17	745.86	2746.2	745.86
2752.8	745.89	2755.41	745.9	2759.4	745.92	2764.64	745.94	2766	745.95
2767.04	745.95	2772.6	745.95	2773.88	745.95	2779.2	745.95	2780.8	745.96
2783.11	745.82	2783.33	745.81	2785.8	745.8	2786.3	745.8	2786.87	745.82
2787.42	745.82	2792.34	745.71	2792.4	745.71	2795.32	745.64	2795.48	745.63
2795.93	745.62	2797.82	745.58	2799	745.58	2800	745.55	2806.6	745.36
2808.07	745.32	2809.23	745.36	2812.44	745.46	2812.91	745.33	2813.2	745.34
2815.5	745.35	2818.47	745.33	2819.8	745.32	2826.4	745.29	2827.27	745.29
2827.7	745.23	2830.5	744.87	2833	744.83	2836.94	744.77	2839.6	744.72
2840.94	744.7	2846.17	744.63	2846.2	744.63	2852.8	744.54	2855.41	744.51
2859.4	744.45	2864.64	744.39	2866	744.37	2867.17	744.35	2872.6	744.25
2873.88	744.23	2875.07	744.2	2879.2	744.06	2880.1	744.03	2883.11	744.01
2885.14	743.99	2885.8	743.98	2892.34	743.87	2892.4	743.87	2893.23	743.86
2899	743.52	2900	743.35	2901.06	743.18	2901.06	743.16	2901.27	743.17
2901.43	743.14	2903.04	743.14	2906.6	743.11	2909.23	743.08	2909.87	743.07
2913.2	743.33	2914.87	743.46	2918.47	743.54	2919.8	743.58	2926.4	743.74
2927.7	743.77	2928.94	743.8	2933	743.89	2936.94	743.98	2939.6	744.04
2946.17	744.19	2946.2	744.19	2952.8	744.33	2955.41	744.39	2958.33	744.46
2958.88	744.45	2959.4	744.45	2959.46	744.45	2959.75	744.44	2960.36	744.44
2960.67	744.43	2961.08	744.43	2961.14	744.44	2961.52	744.53	2961.75	744.58
2962.18	744.66	2962.38	744.7	2962.75	744.77	2963.09	744.83	2963.3	744.87
2963.69	744.93	2963.96	744.97	2964.13	744.99	2964.45	745.03	2964.64	745.05
2964.76	745.07	2964.89	745.08	2965.05	745.1	2965.13	745.1	2965.32	745.12
2965.58	745.13	2965.7	745.14	2965.95	745.15	2966	745.15	2966.08	745.15
2966.26	745.16	2966.53	745.15	2966.76	745.15	2966.91	745.14	2967.01	745.14
2967.22	745.12	2967.38	745.11	2967.48	745.1	2967.71	745.07	2967.94	745.05
2968.1	745.02	2968.32	744.99	2968.44	744.97	2968.71	744.93	2968.86	744.9
2969.17	744.84	2969.33	744.81	2969.6	744.76	2970.03	744.66	2970.54	744.54
2970.82	744.47	2970.96	744.44	2971.1	744.44	2971.66	744.45	2972.19	744.46
2972.53	744.46	2972.6	744.46	2973.17	744.47	2973.61	744.48	2973.88	744.48
2973.9	744.48	2974.42	744.49	2974.67	744.5	2979.2	744.5	2983.11	744.51
2985.8	744.51	2992.34	744.52	2992.4	744.52	2993.78	744.52	2999	744.51
3000	744.51	3006.6	744.51	3009.23	744.5	3011.26	744.5	3011.39	744.5
3011.58	744.53	3013.2	744.53	3015.01	744.52	3015.54	744.5	3015.69	744.5
3018.47	744.7	3019.8	744.8	3021.64	744.93	3026.4	745.21	3027.7	745.29
3027.87	745.3	3033	745.4	3033.41	745.41	3036.44	745.41	3036.94	745.4
3039.6	745.4	3042.29	745.39	3044.61	745.35	3046.17	745.3	3046.2	745.3
3046.7	745.28	3047.49	745.06	3051.45	745.33	3051.6	745.32	3052.8	745.33
3055.41	745.35	3058.91	745.38	3059.4	745.41	3064.64	745.7	3066	745.77

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
980.33	.065	1666.4	.1	2324.84	.04	2404.51	.065

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2324.84	2404.51	225	225	.1	.3

CROSS SECTION

RIVER: W Chickamauga Cr
REACH: 1 RS: 497

INPUT
Description: Upstream Face of Existing and Proposed Bridges. Adjust Elevations for Quad Map Slope +0.07' Adjust Again +1.64'

Station Elevation Data num= 500

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
980.33	756.69	986.4	756.67	995.11	756.64	996.4	756.62	1004	756.55
1006.4	756.5	1016.4	756.29	1026.4	756.08	1036.4	755.87	1040.28	755.79
1046.4	755.51	1051.14	755.3	1056.4	755	1062.49	754.65	1066.4	754.53
1076.4	754.25	1086.4	753.96	1096.4	753.68	1099.19	753.6	1106.4	753.21
1111.95	752.9	1116.4	752.81	1126.4	752.59	1136.4	752.38	1146.4	752.17
1149.7	752.1	1156.4	751.86	1166.4	751.51	1166.41	751.51	1176.4	751.41
1186.4	751.32	1196.4	751.22	1200.74	751.18	1206.4	751.16	1214.28	751.13
1216.4	751.06	1226.4	750.76	1236.4	750.45	1246.4	750.14	1251.97	749.97
1256.4	749.84	1264.97	749.59	1266.4	749.5	1276.4	748.84	1286.4	748.19
1296.4	747.54	1298.43	747.41	1306.4	746.99	1313.37	746.62	1316.4	746.41
1326.4	745.73	1336.4	745.05	1346.4	744.37	1347.52	744.3	1356.4	743.77

1363.69	743.33	1366.4	743.16	1376.4	742.52	1386.4	741.88	1394.95	741.34
1396.4	741.24	1406.4	740.52	1413.61	740.01	1416.4	739.87	1426.4	739.36
1436.4	738.85	1445.4	738.39	1446.4	738.33	1456.4	737.68	1464.51	737.15
1466.4	737.07	1476.4	736.62	1486.4	736.17	1495.08	735.78	1496.4	735.71
1506.4	735.13	1513.88	734.69	1516.4	734.6	1526.4	734.23	1532.19	734.02
1536.4	733.86	1546.4	733.5	1554.28	733.21	1556.4	733.14	1566.4	732.8
1573.29	732.57	1576.4	732.48	1586.4	732.21	1596.4	731.94	1598.86	731.87
1606.4	731.7	1616.4	731.48	1626.4	731.25	1627.65	731.23	1636.4	731.06
1646.4	730.87	1650.73	730.78	1656.4	730.67	1666.4	730.47	1668.9	730.42
1676.4	730.24	1683.84	730.05	1686.4	730.09	1696.4	730.23	1706.4	730.38
1707.93	730.4	1716.4	730.13	1721.99	729.95	1726.4	729.74	1736.4	729.27
1746.4	728.81	1756.02	728.36	1756.4	728.31	1761.52	727.7	1766.4	727.41
1776.4	726.82	1786.4	726.22	1792.82	725.84	1796.4	725.75	1799.52	725.66
1805.9	725.64	1806.4	725.63	1816.4	725.35	1826.4	725.07	1836.4	724.78
1846.4	724.5	1855.11	724.25	1856.4	724.22	1866.4	724	1867.48	723.97
1876.4	723.98	1886.4	724	1896.4	724.01	1904.59	724.02	1906.4	723.98
1910.99	723.88	1916.4	723.6	1926.4	723.08	1936.4	722.57	1938.8	722.44
1946.4	722.45	1951.69	722.46	1956.4	722.26	1966.4	721.82	1968.34	721.74
1968.41	721.73	1976.4	721.47	1984.12	721.21	1986.4	721.18	1996.4	721.02
2006.4	720.86	2008.4	720.83	2016.4	720.63	2026.4	720.37	2028.94	720.3
2036.4	720	2046.4	719.58	2049.85	719.44	2053.54	719.16	2056.4	719.04
2057.39	719	2066.4	718.67	2075.15	718.34	2076.4	718.25	2080.12	717.96
2085.94	717.76	2086.4	717.73	2089.32	717.54	2096.4	717.23	2098.97	717.12
2106.15	717.11	2106.4	717.1	2116.4	716.99	2126.4	716.88	2136.4	716.76
2146.4	716.65	2150.45	716.61	2156.4	716.28	2157.53	716.22	2162.15	716.85
2166.4	716.84	2176.4	716.8	2179.1	716.8	2184.22	716.66	2186.4	716.63
2188.2	716.61	2195.9	716.58	2196.4	716.6	2201.24	716.82	2206.08	717.26
2206.4	717.26	2216.4	717.2	2222.48	717.16	2226.4	717.19	2236.4	717.28
2243.47	717.35	2246.4	717.42	2256.4	717.67	2262.67	717.83	2266.4	717.83
2276.4	717.83	2286.4	717.83	2287.28	717.83	2296.4	717.82	2306.4	717.81
2308.98	717.8	2316.4	717.67	2326.4	717.5	2328.2	717.46	2336.4	715.38
2339.07	714.7	2344.26	713.74	2345.14	711.69	2346.4	709.12	2346.52	708.87
2356.4	706.9	2366.4	704.9	2373.78	703.43	2375.36	703.11	2376.4	702.9
2386.4	700.89	2389.94	700.18	2396.4	702.22	2406.4	705.37	2411.76	707.06
2416.4	708.68	2420.51	710.12	2421.3	712.44	2422.93	716.87	2426.4	718.58
2429.3	720.01	2436.4	722.15	2438.26	722.71	2446.4	725.61	2452.6	727.83
2456.4	728.85	2457.47	729.14	2460.57	729.69	2462.37	730.11	2466.4	730.47
2473.71	731.14	2476.4	731.46	2486.4	732.66	2496.4	733.86	2504.81	734.86
2506.4	734.94	2516.4	735.42	2522.55	735.71	2526.4	735.84	2530.87	735.98
2536.4	736.73	2541.37	737.39	2546.4	737.97	2556.4	739.1	2556.87	739.16
2559.35	739.29	2563.49	739.58	2566.4	739.73	2566.55	739.74	2576.4	740.4
2586.4	741.07	2596.4	741.75	2599	741.92	2600	741.99	2608.89	742.55
2610	742.67	2610.05	742.68	2612.66	742.79	2613.19	742.82	2619.48	743.2
2619.79	743.22	2626.39	743.62	2628.71	743.76	2632.99	744.01	2637.95	744.31
2639.06	744.37	2639.59	744.39	2646.19	744.63	2647.18	744.66	2649.47	744.74
2651	744.76	2652.79	744.83	2656.42	744.95	2659.4	745.05	2665.65	745.26
2666	745.27	2672.6	745.49	2674.89	745.57	2679.2	745.71	2684.12	745.87
2685.8	745.93	2689.64	746.05	2692.07	746.13	2692.4	746.15	2693.35	746.18
2693.81	746.19	2699	746.29	2700	746.31	2706.6	746.45	2709.23	746.5
2713.2	746.58	2718.47	746.68	2719.8	746.71	2726.4	746.83	2727.7	746.86
2729.07	746.89	2730.75	746.97	2733	747	2736.94	747.05	2739.6	747.09
2743.08	747.13	2746.17	747.15	2746.2	747.15	2752.8	747.18	2755.41	747.19
2759.4	747.21	2764.64	747.23	2766	747.24	2767.04	747.24	2772.6	747.24
2773.88	747.24	2779.2	747.24	2780.8	747.25	2783.11	747.11	2783.33	747.1
2785.8	747.09	2786.3	747.09	2786.87	747.11	2787.42	747.11	2792.34	747
2792.4	747	2795.32	746.93	2795.48	746.92	2795.93	746.91	2797.82	746.87
2799	746.87	2800	746.84	2806.6	746.65	2808.07	746.61	2809.23	746.65
2812.44	746.75	2812.91	746.62	2813.2	746.63	2815.5	746.64	2818.47	746.62
2819.8	746.61	2826.4	746.58	2827.27	746.58	2827.7	746.52	2830.5	746.16
2833	746.12	2836.94	746.06	2839.6	746.01	2840.94	745.99	2846.17	745.92
2846.2	745.92	2852.8	745.83	2855.41	745.8	2859.4	745.74	2864.64	745.68
2866	745.66	2867.17	745.64	2872.6	745.54	2873.88	745.52	2875.07	745.49
2879.2	745.35	2880.1	745.32	2883.11	745.3	2885.14	745.28	2885.8	745.27
2892.34	745.16	2892.4	745.16	2893.23	745.15	2899	744.81	2900	744.64
2901.06	744.47	2901.06	744.45	2901.27	744.46	2901.43	744.43	2903.04	744.43
2906.6	744.4	2909.23	744.37	2909.87	744.36	2913.2	744.62	2914.87	744.75
2918.47	744.83	2919.8	744.87	2926.4	745.03	2927.7	745.06	2928.94	745.09
2933	745.18	2936.94	745.27	2939.6	745.33	2946.17	745.48	2946.2	745.48
2952.8	745.62	2955.41	745.68	2958.33	745.75	2958.88	745.74	2959.4	745.74
2959.46	745.74	2959.75	745.73	2960.36	745.73	2960.67	745.72	2961.08	745.72
2961.14	745.73	2961.52	745.82	2961.75	745.87	2962.18	745.95	2962.38	745.99
2962.75	746.06	2963.09	746.12	2963.3	746.16	2963.69	746.22	2963.96	746.26
2964.13	746.28	2964.45	746.32	2964.64	746.34	2964.76	746.36	2964.89	746.37
2965.05	746.39	2965.13	746.39	2965.32	746.41	2965.58	746.42	2965.7	746.43
2965.95	746.44	2966	746.44	2966.08	746.44	2966.26	746.45	2966.53	746.44
2966.76	746.44	2966.91	746.43	2967.01	746.43	2967.22	746.41	2967.38	746.4
2967.48	746.39	2967.71	746.36	2967.94	746.34	2968.1	746.31	2968.32	746.28
2968.44	746.26	2968.71	746.22	2968.86	746.19	2969.17	746.13	2969.33	746.1
2969.6	746.05	2970.03	745.95	2970.54	745.83	2970.82	745.76	2970.96	745.73

2971.1	745.73	2971.66	745.74	2972.19	745.75	2972.53	745.75	2972.6	745.75
2973.17	745.76	2973.61	745.77	2973.88	745.77	2973.9	745.77	2974.42	745.78
2974.67	745.79	2979.2	745.79	2983.11	745.8	2985.8	745.8	2992.34	745.81
2992.4	745.81	2993.78	745.81	2999	745.8	3000	745.8	3006.6	745.8
3009.23	745.79	3011.26	745.79	3011.39	745.79	3011.58	745.82	3013.2	745.82
3015.01	745.81	3015.54	745.79	3015.69	745.79	3018.47	745.99	3019.8	746.09
3021.64	746.22	3026.4	746.5	3027.7	746.58	3027.87	746.59	3033	746.69
3033.41	746.7	3036.44	746.7	3036.94	746.69	3039.6	746.69	3042.29	746.68
3044.61	746.64	3046.17	746.59	3046.2	746.59	3046.7	746.57	3047.49	746.35
3051.45	746.62	3051.6	746.61	3052.8	746.62	3055.41	746.64	3058.91	746.67

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
980.33	.065	1683.84	.1	2344.26	.04	2422.93	.065

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2344.26	2422.93	122	122	.1	.3

Sediment Elevation = 700.18

CROSS SECTION

RIVER: W Chickamauga Cr
REACH: 1 RS: 375

INPUT
Description: Downstream Face of Existing and Proposed Bridges. Adjust Elevations to Quad Map Slope -0.07'

Station Elevation Data num= 483

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
986.4	749.4	994.83	749.38	996.4	749.39	1006.4	749.43	1016.4	749.47
1017.31	749.48	1026.4	749.54	1036.4	749.61	1036.84	749.62	1046.4	749.36
1056.4	749.08	1066.4	748.81	1068.39	748.75	1076.4	748.52	1086.4	748.24
1092.59	748.06	1096.4	747.88	1106.4	747.39	1116.4	746.91	1119.01	746.79
1126.4	746.71	1136.4	746.59	1145.06	746.5	1146.4	746.46	1156.4	746.14
1166.4	745.83	1176.4	745.51	1176.72	745.5	1186.4	745.15	1196.4	744.79
1199.54	744.67	1206.4	744.33	1216.4	743.82	1225.98	743.33	1226.4	743.29
1236.4	742.33	1239.75	742.01	1246.4	741.77	1256.4	741.4	1266.4	741.03
1275.6	740.69	1276.4	740.65	1286.4	740.17	1291.42	739.93	1296.4	739.51
1306.4	738.68	1316.4	737.85	1325.08	737.13	1326.4	737.08	1335.41	736.71
1336.4	736.65	1346.4	736.02	1356.4	735.39	1366.4	734.76	1372.1	734.4
1376.4	734.15	1381.61	733.84	1386.4	733.65	1396.4	733.26	1406.4	732.87
1416.4	732.47	1417.59	732.43	1426.4	732.1	1427.61	732.06	1436.4	731.81
1446.4	731.53	1456.4	731.25	1466.4	730.97	1467.33	730.95	1474.86	730.74
1476.4	730.7	1486.4	730.43	1496.4	730.17	1506.4	729.9	1516.4	729.64
1517.74	729.6	1525.79	729.4	1526.4	729.39	1536.4	729.28	1546.4	729.16
1556.4	729.05	1561.87	728.99	1566.4	728.86	1573.65	728.66	1576.4	728.64
1586.4	728.57	1596.4	728.5	1606.4	728.43	1609.42	728.41	1616.4	728.47
1622.69	728.52	1626.4	728.56	1636.4	728.66	1646.4	728.75	1656.4	728.85
1656.71	728.85	1666.4	728.74	1670.12	728.7	1676.4	728.71	1686.4	728.73
1696.4	728.74	1703.47	728.76	1706.4	728.64	1716.29	728.23	1716.4	728.22
1726.4	727.81	1736.4	727.39	1746.4	726.97	1749.28	726.85	1756.4	726.35
1766.4	725.63	1766.7	725.61	1776.4	724.93	1786.4	724.22	1796.4	723.51
1803.94	722.98	1806.4	722.86	1816.4	722.4	1819.54	722.25	1826.4	721.73
1836.4	720.98	1846.4	720.22	1851.37	719.84	1856.4	719.55	1857.57	719.49
1866.4	718.83	1876.4	718.09	1886.4	717.35	1888.96	717.16	1896.4	716.81
1905.16	716.39	1906.4	716.36	1916.4	716.1	1925.28	715.88	1926.4	715.85
1936.4	715.6	1946.4	715.34	1949.51	715.26	1956.4	715.14	1966.4	714.96
1976.4	714.79	1984.96	714.63	1986.4	714.61	1996.4	714.48	1998.7	714.45
2006.4	714.45	2013.23	714.45	2016.4	714.43	2025.6	714.37	2025.61	714.37
2026.4	714.39	2036.4	714.57	2044.85	714.73	2046.4	714.7	2056.4	714.52
2065.47	714.35	2066.4	714.35	2076.4	714.34	2077.53	714.34	2086.4	714.43
2090.33	714.46	2096.4	714.42	2106.4	714.36	2116.4	714.3	2126.06	714.24
2126.4	714.24	2136.4	714.19	2142.48	714.16	2146.4	714.18	2156.4	714.24
2166.1	714.29	2166.4	714.29	2176.4	714.51	2186.4	714.72	2189.74	714.79
2196.4	714.75	2206.4	714.7	2211.18	714.67	2216.4	714.67	2226.4	714.68
2233.17	714.68	2236.4	714.74	2246.4	714.93	2256.4	715.12	2260.72	715.2
2266.4	715.36	2276.4	715.65	2277.44	715.68	2284.4	715.55	2286.4	715.44
2294.35	714.99	2296.4	714.99	2306.4	715.02	2313.3	715.04	2316.4	714.96
2326.4	714.71	2336.4	714.46	2346.4	714.22	2356.4	713.97	2362.97	713.8
2365.91	713.65	2366.4	712.58	2368.58	707.78	2369.05	706.86	2376.4	704.81
2386.4	702.02	2390.45	700.88	2396.4	699.27	2406.4	696.55	2411.26	695.23
2416.4	696.68	2426.4	699.5	2436.4	702.33	2446.4	705.15	2446.69	705.24
2451.22	706.47	2451.84	707.57	2454.34	712.06	2456.4	713	2456.64	713.1
2457.68	713.92	2458.65	714.46	2466.4	719.09	2469.01	720.65	2475.1	724.1
2476.4	724.17	2483.89	724.56	2486.4	724.7	2496.4	725.24	2497.91	725.32
2500.97	725.16	2505.97	725.69	2506.4	725.71	2507.98	725.77	2515.36	726.78
2516.4	727.13	2525.69	730.21	2526.4	730.46	2527.8	730.97	2536.4	732.84
2546.4	735.01	2552.2	736.27	2556.4	737.03	2566.4	738.85	2566.93	738.95

2576.4	739.9	2582.12	740.48	2586.4	740.67	2596.4	741.11	2599	741.22
2600	741.26	2600.21	741.27	2610	741.42	2613.19	741.47	2616.95	741.53
2620.34	741.46	2620.62	741.46	2627.49	741.32	2631.52	741.24	2633.81	741.2
2634.64	741.16	2640.26	740.9	2641.79	740.78	2642.42	740.73	2643.94	740.61
2648.86	740.03	2648.94	740.02	2650.45	740.01	2652.13	740.11	2652.75	740.11
2653.33	740.12	2655.65	740.16	2656.1	740.17	2663.25	740.2	2664.23	740.21
2670.36	740.24	2670.4	740.24	2675.14	740.24	2676.12	740.24	2677.55	740.23
2684.7	740.18	2686.04	740.16	2691.85	740.12	2696.94	740.08	2699	740.06
2700	740.05	2707.07	739.99	2708.28	739.98	2708.51	739.98	2710.9	740.01
2714.14	740.04	2721.21	740.11	2721.81	740.11	2728.29	740.18	2732.71	740.22
2735.36	740.25	2740.79	740.3	2742.43	740.31	2743.62	740.31	2749.5	740.33
2754.52	740.35	2756.57	740.35	2759.32	740.36	2763.64	740.39	2765.42	740.4
2770.71	740.43	2775.64	740.46	2776.33	740.47	2777.79	740.47	2784.86	740.48
2787.23	740.49	2791.93	740.5	2794.95	740.51	2798.14	740.52	2799	740.52
2800	740.53	2807.07	740.55	2810.9	740.57	2814.14	740.58	2821.21	740.61
2821.81	740.62	2825.19	740.63	2828.29	740.64	2832.71	740.65	2835.36	740.66
2842.09	740.68	2842.43	740.68	2843.62	740.68	2849.5	740.69	2854.52	740.69
2856.57	740.69	2863.64	740.7	2865.42	740.7	2870.71	740.71	2874.71	740.71
2876.33	740.71	2877.79	740.72	2884.86	740.73	2887.23	740.74	2891.93	740.75
2898.14	740.76	2899	740.76	2900	740.77	2907.07	740.78	2910.9	740.78
2914.14	740.79	2921.21	740.8	2921.81	740.8	2924.37	740.8	2928.29	740.85
2932.22	740.91	2932.71	740.91	2935.36	740.92	2942.43	740.94	2943.62	740.95
2946.24	740.96	2949.5	740.99	2954.52	741.03	2956.57	741.05	2963.64	741.12
2965.42	741.14	2970.71	741.19	2976.24	741.24	2976.33	741.24	2977.79	741.2
2984.86	741.04	2987.23	740.98	2989.05	740.94	2991.93	740.93	2993.82	740.92
2997.67	740.93	2998.14	740.88	2999	740.78	3000	740.62	3007.07	739.52
3007.8	739.4	3010.9	739.79	3012.79	740.03	3014.14	740.16	3021.21	740.88
3021.81	740.94	3023.21	741.08	3024.06	741.17	3024.31	741.19	3024.32	741.19
3024.36	741.19	3024.38	741.19	3024.42	741.2	3024.48	741.2	3024.52	741.2
3024.65	741.22	3024.76	741.23	3025.14	741.26	3025.68	741.3	3026.61	741.32
3028.19	741.34	3028.29	741.34	3029.11	741.35	3030.72	741.37	3031.42	741.38
3032.67	741.39	3032.71	741.39	3033.73	741.4	3034.35	741.4	3035.36	741.4
3035.43	741.4	3035.95	741.41	3036.27	741.41	3036.85	741.41	3042.43	741.39
3043.62	741.38	3049.5	741.36	3054.52	741.34	3056.57	741.34	3056.81	741.33
3057.55	741.33	3058.41	741.33	3058.9	741.33	3060.02	741.32	3060.66	741.32
3061.74	741.32	3063.64	741.34	3064.92	741.35	3065.11	741.34	3065.27	741.33
3065.42	741.32	3065.46	741.32	3067.01	741.35	3070.18	741.42	3070.71	741.44
3070.94	741.44	3072.06	741.46	3072.85	741.48	3073.25	741.49	3073.88	741.5
3074.13	741.51	3074.55	741.52	3074.87	741.52	3075.06	741.53	3075.94	741.51
3076.11	741.53	3076.33	741.52	3077.52	741.5	3077.79	741.52	3079.2	741.66
3079.21	741.65	3084.86	741.83	3087.23	741.9	3091.93	742.05	3096.59	742.19
3098.14	742.25	3100	742.32	3107.07	742.58	3110.9	742.72	3112.58	742.78
3114.14	742.82	3121.21	742.96	3121.81	742.97	3128.29	743.1	3132.71	743.18
3135.36	743.23	3142.43	743.37	3143.62	743.4	3148.27	743.49	3149.5	743.51
3154.52	743.6	3156.57	743.63	3156.92	743.64	3163.64	743.61	3163.87	743.6
3165.42	743.59	3166.15	743.59	3170.71	743.59	3176.33	743.58	3176.39	743.58
3177.79	743.58	3184.86	743.58	3187.23	743.58	3191.93	743.58	3192.95	743.58
3193.27	743.58	3198.14	743.58	3199	743.58				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
986.4	.065	2336.4	.1	2365.91	.04	2454.34	.1	2526.4	.065

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2365.91	2454.34	375	375	.1	.3

Sediment Elevation = 700.11

CROSS SECTION

RIVER: W Chickamauga Cr
REACH: 1 RS: 0

INPUT
Description: Exit Section. Adjust Elevations to Quad Map Slope -0.02' Adjust Again -0.23'
Station Elevation Data num= 485

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
986.4	748.27	994.83	748.25	996.4	748.26	1006.4	748.3	1016.4	748.34
1017.31	748.35	1026.4	748.41	1036.4	748.48	1036.84	748.49	1046.4	748.23
1056.4	747.95	1066.4	747.68	1068.39	747.62	1076.4	747.39	1086.4	747.11
1092.59	746.93	1096.4	746.75	1106.4	746.26	1116.4	745.78	1119.01	745.66
1126.4	745.58	1136.4	745.46	1145.06	745.37	1146.4	745.33	1156.4	745.01
1166.4	744.7	1176.4	744.38	1176.72	744.37	1186.4	744.02	1196.4	743.66
1199.54	743.54	1206.4	743.2	1216.4	742.69	1225.98	742.2	1226.4	742.16
1236.4	741.2	1239.75	740.88	1246.4	740.64	1256.4	740.27	1266.4	739.9
1275.6	739.56	1276.4	739.52	1286.4	739.04	1291.42	738.8	1296.4	738.38
1306.4	737.55	1316.4	736.72	1325.08	736	1326.4	735.95	1335.41	735.58
1336.4	735.52	1346.4	734.89	1356.4	734.26	1366.4	733.63	1372.1	733.27

1376.4	733.02	1381.61	732.71	1386.4	732.52	1396.4	732.13	1406.4	731.74
1416.4	731.34	1417.59	731.3	1426.4	730.97	1427.61	730.93	1436.4	730.68
1446.4	730.4	1456.4	730.12	1466.4	729.84	1467.33	729.82	1474.86	729.61
1476.4	729.57	1486.4	729.3	1496.4	729.04	1506.4	728.77	1516.4	728.51
1517.74	728.47	1525.79	728.27	1526.4	728.26	1536.4	728.15	1546.4	728.03
1556.4	727.92	1561.87	727.86	1566.4	727.73	1573.65	727.53	1576.4	727.51
1586.4	727.44	1596.4	727.37	1606.4	727.3	1609.42	727.28	1616.4	727.34
1622.69	727.39	1626.4	727.43	1636.4	727.53	1646.4	727.62	1656.4	727.72
1656.71	727.72	1666.4	727.61	1670.12	727.57	1676.4	727.58	1686.4	727.6
1696.4	727.61	1703.47	727.63	1706.4	727.51	1716.29	727.1	1716.4	727.09
1726.4	726.68	1736.4	726.26	1746.4	725.84	1749.28	725.72	1756.4	725.22
1766.4	724.5	1766.7	724.48	1776.4	723.8	1786.4	723.09	1796.4	722.38
1803.94	721.85	1806.4	721.73	1816.4	721.27	1819.54	721.12	1826.4	720.6
1836.4	719.85	1846.4	719.09	1851.37	718.71	1856.4	718.42	1857.57	718.36
1866.4	717.7	1876.4	716.96	1886.4	716.22	1888.96	716.03	1896.4	715.68
1905.16	715.26	1906.4	715.23	1916.4	714.97	1925.28	714.75	1926.4	714.72
1936.4	714.47	1946.4	714.21	1949.51	714.13	1956.4	714.01	1966.4	713.83
1976.4	713.66	1984.96	713.5	1986.4	713.48	1996.4	713.35	1998.7	713.32
2006.4	713.32	2013.23	713.32	2016.4	713.3	2025.6	713.24	2025.61	713.24
2026.4	713.26	2036.4	713.44	2044.85	713.6	2046.4	713.57	2056.4	713.39
2065.47	713.22	2066.4	713.22	2076.4	713.21	2077.53	713.21	2086.4	713.3
2090.33	713.33	2096.4	713.29	2106.4	713.23	2116.4	713.17	2126.06	713.11
2126.4	713.11	2136.4	713.06	2142.48	713.03	2146.4	713.05	2156.4	713.11
2166.1	713.16	2166.4	713.16	2176.4	713.38	2186.4	713.59	2189.74	713.66
2196.4	713.62	2206.4	713.57	2211.18	713.54	2216.4	713.54	2226.4	713.55
2233.17	713.55	2236.4	713.61	2246.4	713.8	2256.4	713.99	2260.72	714.07
2266.4	714.23	2276.4	714.52	2277.44	714.55	2284.4	714.42	2286.4	714.31
2294.35	713.86	2296.4	713.86	2306.4	713.89	2313.3	713.91	2316.4	713.83
2326.4	713.58	2336.4	713.33	2346.4	713.09	2356.4	712.84	2362.97	712.67
2369.63	711.96	2371.2	711.93	2371.73	711.92	2371.8	711.92	2371.96	711.99
2372	712	2372.74	712.21	2375.35	705.56	2375.83	704.34	2379.63	703.88
2389.63	702.67	2393.46	702.21	2399.63	701.4	2409.63	700.1	2411.26	699.89
2417.06	700.93	2419.63	701.24	2429.63	702.48	2439.63	703.71	2449.63	704.95
2453.02	705.37	2453.23	705.83	2455.66	712.8	2458.42	714.45	2466.4	717.96
2469.01	719.52	2475.1	722.97	2476.4	723.04	2483.89	723.43	2486.4	723.57
2496.4	724.11	2497.91	724.19	2500.97	724.03	2505.97	724.56	2506.4	724.58
2507.98	724.64	2515.36	725.65	2516.4	726	2525.69	729.08	2526.4	729.33
2527.8	729.84	2536.4	731.71	2546.4	733.88	2552.2	735.14	2556.4	735.9
2566.4	737.72	2566.93	737.82	2576.4	738.77	2582.12	739.35	2586.4	739.54
2596.4	739.98	2599	740.09	2600	740.13	2600.21	740.14	2610	740.29
2613.19	740.34	2616.95	740.4	2620.34	740.33	2620.62	740.33	2627.49	740.19
2631.52	740.11	2633.81	740.07	2634.64	740.03	2640.26	739.77	2641.79	739.65
2642.42	739.6	2643.94	739.48	2648.86	738.9	2648.94	738.89	2650.45	738.88
2652.13	738.98	2652.75	738.98	2653.33	738.99	2655.65	739.03	2656.1	739.04
2663.25	739.07	2664.23	739.08	2670.36	739.11	2670.4	739.11	2675.14	739.11
2676.12	739.11	2677.55	739.1	2684.7	739.05	2686.04	739.03	2691.85	738.99
2696.94	738.95	2699	738.93	2700	738.92	2707.07	738.86	2708.28	738.85
2708.51	738.85	2710.9	738.88	2714.14	738.91	2721.21	738.98	2721.81	738.98
2728.29	739.05	2732.71	739.09	2735.36	739.12	2740.79	739.17	2742.43	739.18
2743.62	739.18	2749.5	739.2	2754.52	739.22	2756.57	739.22	2759.32	739.23
2763.64	739.26	2765.42	739.27	2770.71	739.3	2775.64	739.33	2776.33	739.34
2777.79	739.34	2784.86	739.35	2787.23	739.36	2791.93	739.37	2794.95	739.38
2798.14	739.39	2799	739.39	2800	739.4	2807.07	739.42	2810.9	739.44
2814.14	739.45	2821.21	739.48	2821.81	739.49	2825.19	739.5	2828.29	739.51
2832.71	739.52	2835.36	739.53	2842.09	739.55	2842.43	739.55	2843.62	739.55
2849.5	739.56	2854.52	739.56	2856.57	739.56	2863.64	739.57	2865.42	739.57
2870.71	739.58	2874.71	739.58	2876.33	739.58	2877.79	739.59	2884.86	739.6
2887.23	739.61	2891.93	739.62	2898.14	739.63	2899	739.63	2900	739.64
2907.07	739.65	2910.9	739.65	2914.14	739.66	2921.21	739.67	2921.81	739.67
2924.37	739.67	2928.29	739.72	2932.22	739.78	2932.71	739.78	2935.36	739.79
2942.43	739.81	2943.62	739.82	2946.24	739.83	2949.5	739.86	2954.52	739.9
2956.57	739.92	2963.64	739.99	2965.42	740.01	2970.71	740.06	2976.24	740.11
2976.33	740.11	2977.79	740.07	2984.86	739.91	2987.23	739.85	2989.05	739.81
2991.93	739.8	2993.82	739.79	2997.67	739.8	2998.14	739.75	2999	739.65
3000	739.49	3007.07	738.39	3007.8	738.27	3010.9	738.66	3012.79	738.9
3014.14	739.03	3021.21	739.75	3021.81	739.81	3023.21	739.95	3024.06	740.04
3024.31	740.06	3024.32	740.06	3024.36	740.06	3024.38	740.06	3024.42	740.07
3024.48	740.07	3024.52	740.07	3024.65	740.09	3024.76	740.1	3025.14	740.13
3025.68	740.17	3026.61	740.19	3028.19	740.21	3028.29	740.21	3029.11	740.22
3030.72	740.24	3031.42	740.25	3032.67	740.26	3032.71	740.26	3033.73	740.27
3034.35	740.27	3035.36	740.27	3035.43	740.27	3035.95	740.28	3036.27	740.28
3036.85	740.28	3042.43	740.26	3043.62	740.25	3049.5	740.23	3054.52	740.21
3056.57	740.21	3056.81	740.2	3057.55	740.2	3058.41	740.2	3058.9	740.2
3060.02	740.19	3060.66	740.19	3061.74	740.19	3063.64	740.21	3064.92	740.22
3065.11	740.21	3065.27	740.2	3065.42	740.19	3065.46	740.19	3067.01	740.22
3070.18	740.29	3070.71	740.31	3070.94	740.31	3072.06	740.33	3072.85	740.35
3073.25	740.36	3073.88	740.37	3074.13	740.38	3074.55	740.39	3074.87	740.39
3075.06	740.4	3075.94	740.38	3076.11	740.4	3076.33	740.39	3077.52	740.37
3077.79	740.39	3079.2	740.53	3079.21	740.52	3084.86	740.7	3087.23	740.77

3091.93	740.92	3096.59	741.06	3098.14	741.12	3100	741.19	3107.07	741.45
3110.9	741.59	3112.58	741.65	3114.14	741.69	3121.21	741.83	3121.81	741.84
3128.29	741.97	3132.71	742.05	3135.36	742.1	3142.43	742.24	3143.62	742.27
3148.27	742.36	3149.5	742.38	3154.52	742.47	3156.57	742.5	3156.92	742.51
3163.64	742.48	3163.87	742.47	3165.42	742.46	3166.15	742.46	3170.71	742.46
3176.33	742.45	3176.39	742.45	3177.79	742.45	3184.86	742.45	3187.23	742.45
3191.93	742.45	3192.95	742.45	3193.27	742.45	3198.14	742.45	3199	742.45

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
986.4	.065	2346.4	.1	2372.74	.04	2455.66	.1	2526.4	.065

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2372.74	2455.66	0	0	.1	.3

Sediment Elevation = 699.895

SUMMARY OF MANNING'S N VALUES

River:W Chickamauga Cr

Reach	River Sta.	n1	n2	n3	n4	n5
1	722	.065	.1	.04	.065	
1	497	.065	.1	.04	.065	
1	375	.065	.1	.04	.1	.065
1	0	.065	.1	.04	.1	.065

SUMMARY OF REACH LENGTHS

River: W Chickamauga Cr

Reach	River Sta.	Left	Channel	Right
1	722	225	225	225
1	497	122	122	122
1	375	375	375	375
1	0	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: W Chickamauga Cr

Reach	River Sta.	Contr.	Expan.
1	722	.1	.3
1	497	.1	.3
1	375	.1	.3
1	0	.1	.3

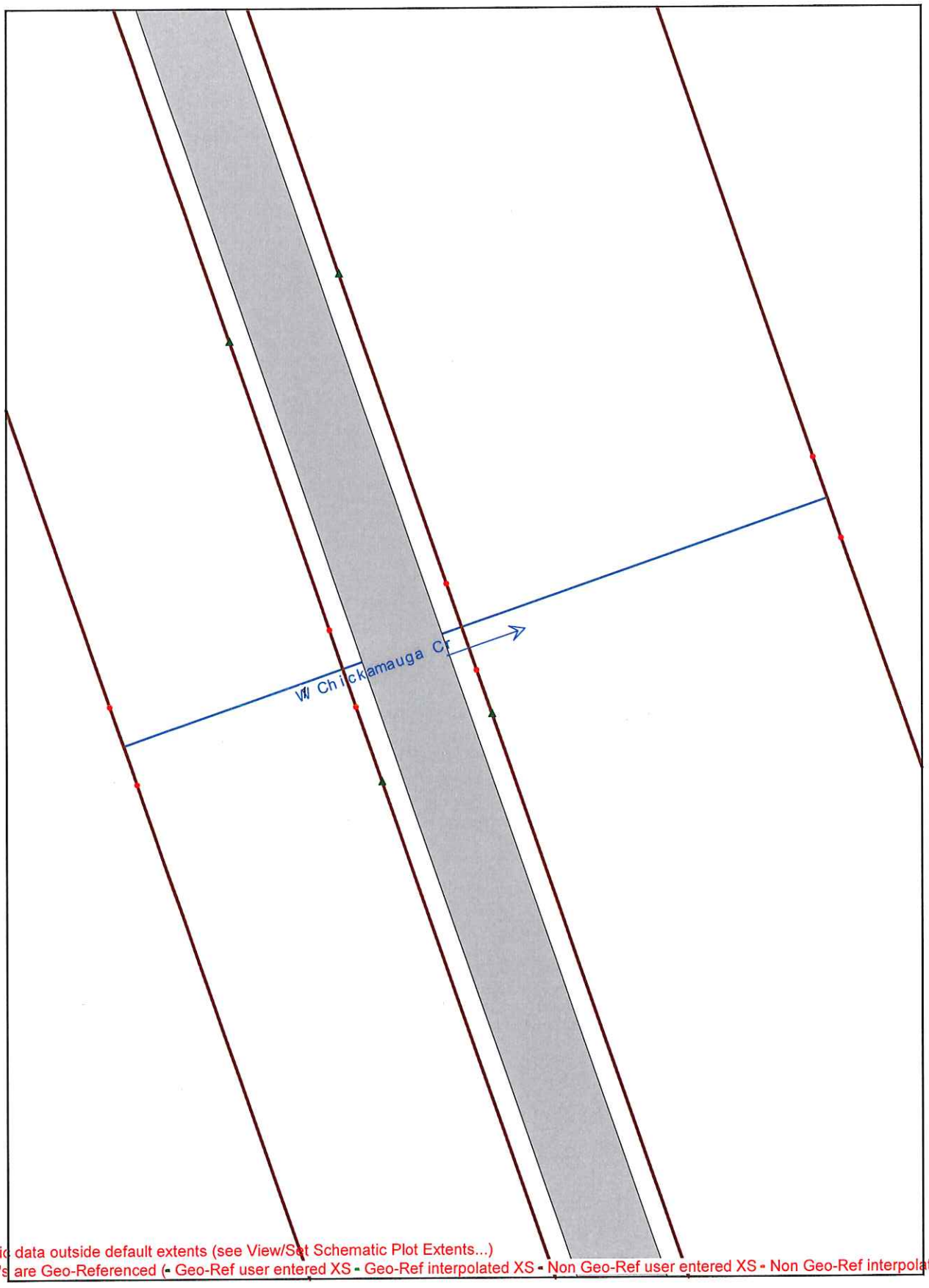
HEC-RAS Plan: NaturalAdjDsc River: W Chickamauga Cr Reach: 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	722	2 Year Storm	3540.00	700.31	714.10		714.39	0.000693	4.34	839.34	100.32	0.24
1	722	50 Year Storm	11700.00	700.31	720.00		720.84	0.001251	7.90	2544.68	437.74	0.35
1	722	100 Year Storm	13300.00	700.31	720.77		721.67	0.001297	8.30	2890.01	459.97	0.36
1	722	500 Year Storm	17500.00	700.31	722.55		723.58	0.001383	9.16	3765.82	512.71	0.37
1	497	2 Year Storm	3540.00	700.18	713.74		714.17	0.001278	5.25	673.76	77.53	0.31
1	497	50 Year Storm	11700.00	700.18	718.64	713.96	720.34	0.003043	10.67	1461.51	359.19	0.51
1	497	100 Year Storm	13300.00	700.18	719.26	714.77	721.14	0.003222	11.32	1692.47	375.60	0.53
1	497	500 Year Storm	17500.00	700.18	720.81	718.47	723.00	0.003475	12.60	2303.93	422.70	0.56
1	375	2 Year Storm	3540.00	700.11	713.82		714.02	0.000412	3.55	1001.78	95.51	0.19
1	375	50 Year Storm	11700.00	700.11	719.44		719.80	0.000600	5.60	3783.68	608.71	0.24
1	375	100 Year Storm	13300.00	700.11	720.18		720.54	0.000605	5.79	4237.50	621.23	0.24
1	375	500 Year Storm	17500.00	700.11	721.93		722.31	0.000608	6.18	5347.66	647.44	0.25
1	0	2 Year Storm	3540.00	699.90	713.59	706.51	713.83	0.000574	3.97	981.82	369.40	0.21
1	0	50 Year Storm	11700.00	699.90	719.27	711.37	719.55	0.000575	5.27	4186.04	624.59	0.23
1	0	100 Year Storm	13300.00	699.90	720.01	712.11	720.30	0.000574	5.43	4651.46	635.62	0.23
1	0	500 Year Storm	17500.00	699.90	721.76	715.99	722.06	0.000575	5.80	5788.10	667.19	0.24

HEC-RAS Plan: NaturalAdjDsc River: W Chickamauga Cr Reach: 1

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
			(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
1	722	2 Year Storm	714.39	714.10	0.29	0.21	0.01	10.75	3527.55	1.70	100.32
1	722	50 Year Storm	720.84	720.00	0.84	0.42	0.09	1458.29	10135.48	106.23	437.74
1	722	100 Year Storm	721.67	720.77	0.90	0.44	0.10	2005.85	11154.90	139.25	459.97
1	722	500 Year Storm	723.58	722.55	1.03	0.47	0.12	3639.01	13622.00	238.99	512.71
1	497	2 Year Storm	714.17	713.74	0.43	0.08	0.07		3540.00		77.53
1	497	50 Year Storm	720.34	718.64	1.71	0.14	0.40	420.86	11275.73	3.41	359.19
1	497	100 Year Storm	721.14	719.26	1.88	0.14	0.45	772.67	12519.43	7.90	375.60
1	497	500 Year Storm	723.00	720.81	2.19	0.15	0.54	1998.34	15471.44	30.22	422.70
1	375	2 Year Storm	714.02	713.82	0.20	0.18	0.00	0.02	3539.12	0.87	95.51
1	375	50 Year Storm	719.80	719.44	0.36	0.22	0.02	3287.64	8374.17	38.19	608.71
1	375	100 Year Storm	720.54	720.18	0.37	0.22	0.02	4222.83	9028.04	49.14	621.23
1	375	500 Year Storm	722.31	721.93	0.38	0.22	0.02	6824.21	10593.91	81.87	647.44
1	0	2 Year Storm	713.83	713.59	0.24			26.43	3513.48	0.09	369.40
1	0	50 Year Storm	719.55	719.27	0.28			4516.28	7153.90	29.81	624.59
1	0	100 Year Storm	720.30	720.01	0.28			5562.92	7697.02	40.06	635.62
1	0	500 Year Storm	722.06	721.76	0.30			8369.45	9058.92	71.62	667.19

HEC-RAS OUTPUT
EXISTING 411' BRIDGE



Some schematic data outside default extents (see View/Set Schematic Plot Extents...)
None of the XS's are Geo-Referenced (- Geo-Ref user entered XS - Geo-Ref interpolated XS - Non Geo-Ref user entered XS - Non Geo-Ref interpolated XS)

HEC-RAS HEC-RAS 5.0.6 November 2018
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
XXXXXXX  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
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PROJECT DATA
Project Title: SR 1 over W Chickamauga Creek
Project File : SR1overWChickam.prj
Run Date and Time: 6/24/2019 1:57:57 PM

Project in English units

PLAN DATA

Plan Title: Existing 411' Bridge Adj DSC
Plan File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.p09

Geometry Title: Existing 411' Bridge GDOT Adj DSC
Geometry File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.g09

Flow Title : Flow Data Quad Map Slope
Flow File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.f02

Plan Summary Information:

Number of: Cross Sections	=	4	Multiple Openings	=	0
Culverts	=	0	Inline Structures	=	0
Bridges	=	1	Lateral Structures	=	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

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

FLOW DATA

Flow Title: Flow Data Quad Map Slope
Flow File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.f02

Flow Data (cfs)

River	Reach	RS	2 Year Storm	50 Year Storm	100 Year Storm	500 Year Storm
W Chickamauga Cr	1	722	3540	11700	13300	17500

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
W Chickamauga Cr	1	2 Year Storm		Normal S = 0.0005738
W Chickamauga Cr	1	50 Year Storm		Normal S = 0.0005738
W Chickamauga Cr	1	100 Year Storm		Normal S = 0.0005738
W Chickamauga Cr	1	500 Year Storm		Normal S = 0.0005738

GEOMETRY DATA

Geometry Title: Existing 411' Bridge GDOT Adj DSC
Geometry File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.g09

CROSS SECTION

RIVER: W Chickamauga Cr
REACH: 1 RS: 722

INPUT
Description: Approach Section. Adjust Elevations to Quad Map Slope -0.15'
Station Elevation Data num= 500

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
980.33	755.4	986.4	755.38	995.11	755.35	996.4	755.33	1004	755.26
1006.4	755.21	1016.4	755	1026.4	754.79	1036.4	754.58	1040.28	754.5
1046.4	754.22	1051.14	754.01	1056.4	753.71	1062.49	753.36	1066.4	753.24
1076.4	752.96	1086.4	752.67	1096.4	752.39	1099.19	752.31	1106.4	751.92
1111.95	751.61	1116.4	751.52	1126.4	751.3	1136.4	751.09	1146.4	750.88
1149.7	750.81	1156.4	750.57	1166.4	750.22	1166.41	750.22	1176.4	750.12
1186.4	750.03	1196.4	749.93	1200.74	749.89	1206.4	749.87	1214.28	749.84
1216.4	749.77	1226.4	749.47	1236.4	749.16	1246.4	748.85	1251.97	748.68
1256.4	748.55	1264.97	748.3	1266.4	748.21	1276.4	747.55	1286.4	746.9
1296.4	746.25	1298.43	746.12	1306.4	745.7	1313.37	745.33	1316.4	745.12
1326.4	744.44	1336.4	743.76	1346.4	743.08	1347.52	743.01	1356.4	742.48
1363.69	742.04	1366.4	741.87	1376.4	741.23	1386.4	740.59	1394.95	740.05
1396.4	739.95	1406.4	739.23	1413.61	738.72	1416.4	738.58	1426.4	738.07
1436.4	737.56	1445.4	737.1	1446.4	737.04	1456.4	736.39	1464.51	735.86
1466.4	735.78	1476.4	735.33	1486.4	734.88	1495.08	734.49	1496.4	734.42
1506.4	733.84	1513.88	733.4	1516.4	733.31	1526.4	732.94	1532.19	732.73
1536.4	732.57	1546.4	732.21	1554.28	731.92	1556.4	731.85	1566.4	731.51
1573.29	731.28	1576.4	731.19	1586.4	730.92	1596.4	730.65	1598.86	730.58
1606.4	730.41	1616.4	730.19	1626.4	729.96	1627.65	729.94	1636.4	729.77
1646.4	729.58	1650.73	729.49	1656.4	729.38	1666.4	729.18	1668.9	729.13
1676.4	728.95	1683.84	728.76	1686.4	728.8	1696.4	728.94	1706.4	729.09
1707.93	729.11	1716.4	728.84	1721.99	728.66	1726.4	728.45	1736.4	727.98
1746.4	727.52	1756.02	727.07	1756.4	727.02	1761.52	726.41	1766.4	726.12
1776.4	725.53	1786.4	724.93	1792.82	724.55	1796.4	724.46	1799.52	724.37
1805.9	724.35	1806.4	724.34	1816.4	724.06	1826.4	723.78	1836.4	723.49
1846.4	723.21	1855.11	722.96	1856.4	722.93	1866.4	722.71	1867.48	722.68
1876.4	722.69	1886.4	722.71	1896.4	722.72	1904.59	722.73	1906.4	722.69
1910.99	722.59	1916.4	722.31	1926.4	721.79	1936.4	721.28	1938.8	721.15
1946.4	721.16	1951.69	721.17	1956.4	720.97	1966.4	720.53	1968.34	720.45
1968.41	720.44	1976.4	720.18	1984.12	719.92	1986.4	719.89	1996.4	719.73
2006.4	719.57	2008.4	719.54	2016.4	719.34	2026.4	719.08	2028.94	719.01
2036.4	718.71	2046.4	718.29	2049.85	718.15	2053.54	717.87	2056.4	717.75
2057.39	717.71	2066.4	717.38	2075.15	717.05	2076.4	716.96	2080.12	716.67
2085.94	716.47	2086.4	716.44	2089.32	716.25	2096.4	715.94	2098.97	715.83
2106.15	715.82	2106.4	715.81	2116.4	715.7	2126.4	715.59	2136.4	715.47
2146.4	715.36	2150.45	715.32	2156.4	714.99	2157.53	714.93	2162.15	715.56
2166.4	715.55	2176.4	715.51	2179.1	715.51	2184.22	715.37	2186.4	715.34
2188.2	715.32	2195.9	715.29	2196.4	715.31	2201.24	715.53	2206.08	715.97
2206.4	715.97	2216.4	715.91	2222.48	715.87	2226.4	715.9	2236.4	715.99
2243.47	716.06	2246.4	716.13	2256.4	716.38	2262.67	716.54	2266.4	716.54
2276	716.56	2286	716.79	2287.95	716.84	2296	715.72	2306	714.34
2310.91	713.66	2316	712.82	2324.84	711.36	2326	710.28	2326.64	709.69
2329.23	707.33	2334.74	706.23	2336	705.96	2346	703.87	2356	701.78
2362.98	700.31	2366	700.73	2376	702.11	2386	703.5	2396	704.88
2396.37	704.93	2402.29	705.67	2402.58	707.05	2404.51	712.27	2406	713.04
2416	718.22	2422.46	721.57	2424.21	722.47	2426	723.4	2430.48	725.71
2432.63	726.29	2436	727.52	2456.4	727.56	2457.47	727.85	2460.57	728.4
2462.37	728.82	2466.4	729.18	2473.71	729.85	2476.4	730.17	2486.4	731.37
2496.4	732.57	2504.81	733.57	2506.4	733.65	2516.4	734.13	2522.55	734.42
2526.4	734.55	2530.87	734.69	2536.4	735.44	2541.37	736.1	2546.4	736.68
2556.4	737.81	2556.87	737.87	2559.35	738	2563.49	738.29	2566.4	738.44

2566.55	738.45	2576.4	739.11	2586.4	739.78	2596.4	740.46	2599	740.63
2600	740.7	2608.89	741.26	2610	741.38	2610.05	741.39	2612.66	741.5
2613.19	741.53	2619.48	741.91	2619.79	741.93	2626.39	742.33	2628.71	742.47
2632.99	742.72	2637.95	743.02	2639.06	743.08	2639.59	743.1	2646.19	743.34
2647.18	743.37	2649.47	743.45	2651	743.47	2652.79	743.54	2656.42	743.66
2659.4	743.76	2665.65	743.97	2666	743.98	2672.6	744.2	2674.89	744.28
2679.2	744.42	2684.12	744.58	2685.8	744.64	2689.64	744.76	2692.07	744.84
2692.4	744.86	2693.35	744.89	2693.81	744.9	2699	745	2700	745.02
2706.6	745.16	2709.23	745.21	2713.2	745.29	2718.47	745.39	2719.8	745.42
2726.4	745.54	2727.7	745.57	2729.07	745.6	2730.75	745.68	2733	745.71
2736.94	745.76	2739.6	745.8	2743.08	745.84	2746.17	745.86	2746.2	745.86
2752.8	745.89	2755.41	745.9	2759.4	745.92	2764.64	745.94	2766	745.95
2767.04	745.95	2772.6	745.95	2773.88	745.95	2779.2	745.95	2780.8	745.96
2783.11	745.82	2783.33	745.81	2785.8	745.8	2786.3	745.8	2786.87	745.82
2787.42	745.82	2792.34	745.71	2792.4	745.71	2795.32	745.64	2795.48	745.63
2795.93	745.62	2797.82	745.58	2799	745.58	2800	745.55	2806.6	745.36
2808.07	745.32	2809.23	745.36	2812.44	745.46	2812.91	745.33	2813.2	745.34
2815.5	745.35	2818.47	745.33	2819.8	745.32	2826.4	745.29	2827.27	745.29
2827.7	745.23	2830.5	744.87	2833	744.83	2836.94	744.77	2839.6	744.72
2840.94	744.7	2846.17	744.63	2846.2	744.63	2852.8	744.54	2855.41	744.51
2859.4	744.45	2864.64	744.39	2866	744.37	2867.17	744.35	2872.6	744.25
2873.88	744.23	2875.07	744.2	2879.2	744.06	2880.1	744.03	2883.11	744.01
2885.14	743.99	2885.8	743.98	2892.34	743.87	2892.4	743.87	2893.23	743.86
2899	743.52	2900	743.35	2901.06	743.18	2901.06	743.16	2901.27	743.17
2901.43	743.14	2903.04	743.14	2906.6	743.11	2909.23	743.08	2909.87	743.07
2913.2	743.33	2914.87	743.46	2918.47	743.54	2919.8	743.58	2926.4	743.74
2927.7	743.77	2928.94	743.8	2933	743.89	2936.94	743.98	2939.6	744.04
2946.17	744.19	2946.2	744.19	2952.8	744.33	2955.41	744.39	2958.33	744.46
2958.88	744.45	2959.4	744.45	2959.46	744.45	2959.75	744.44	2960.36	744.44
2960.67	744.43	2961.08	744.43	2961.14	744.44	2961.52	744.53	2961.75	744.58
2962.18	744.66	2962.38	744.7	2962.75	744.77	2963.09	744.83	2963.3	744.87
2963.69	744.93	2963.96	744.97	2964.13	744.99	2964.45	745.03	2964.64	745.05
2964.76	745.07	2964.89	745.08	2965.05	745.1	2965.13	745.1	2965.32	745.12
2965.58	745.13	2965.7	745.14	2965.95	745.15	2966	745.15	2966.08	745.15
2966.26	745.16	2966.53	745.15	2966.76	745.15	2966.91	745.14	2967.01	745.14
2967.22	745.12	2967.38	745.11	2967.48	745.1	2967.71	745.07	2967.94	745.05
2968.1	745.02	2968.32	744.99	2968.44	744.97	2968.71	744.93	2968.86	744.9
2969.17	744.84	2969.33	744.81	2969.6	744.76	2970.03	744.66	2970.54	744.54
2970.82	744.47	2970.96	744.44	2971.1	744.44	2971.66	744.45	2972.19	744.46
2972.53	744.46	2972.6	744.46	2973.17	744.47	2973.61	744.48	2973.88	744.48
2973.9	744.48	2974.42	744.49	2974.67	744.5	2979.2	744.5	2983.11	744.51
2985.8	744.51	2992.34	744.52	2992.4	744.52	2993.78	744.52	2999	744.51
3000	744.51	3006.6	744.51	3009.23	744.5	3011.26	744.5	3011.39	744.5
3011.58	744.53	3013.2	744.53	3015.01	744.52	3015.54	744.5	3015.69	744.5
3018.47	744.7	3019.8	744.8	3021.64	744.93	3026.4	745.21	3027.7	745.29
3027.87	745.3	3033	745.4	3033.41	745.41	3036.44	745.41	3036.94	745.4
3039.6	745.4	3042.29	745.39	3044.61	745.35	3046.17	745.3	3046.2	745.3
3046.7	745.28	3047.49	745.06	3051.45	745.33	3051.6	745.32	3052.8	745.33
3055.41	745.35	3058.91	745.38	3059.4	745.41	3064.64	745.7	3066	745.77

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
980.33	.065	1666.4	.1	2324.84	.04	2404.51	.065

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2324.84	2404.51	225	225	.3	.5

CROSS SECTION

RIVER: W Chickamauga Cr
REACH: 1 RS: 497

INPUT
Description: Upstream Face of Existing and Proposed Bridges. Adjust Elevations to Quad Map Slope +0.07' Adjust Again +1.64'
Station Elevation Data num= 500

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
980.33	756.69	986.4	756.67	995.11	756.64	996.4	756.62	1004	756.55
1006.4	756.5	1016.4	756.29	1026.4	756.08	1036.4	755.87	1040.28	755.79
1046.4	755.51	1051.14	755.3	1056.4	755	1062.49	754.65	1066.4	754.53
1076.4	754.25	1086.4	753.96	1096.4	753.68	1099.19	753.6	1106.4	753.21
1111.95	752.9	1116.4	752.81	1126.4	752.59	1136.4	752.38	1146.4	752.17
1149.7	752.1	1156.4	751.86	1166.4	751.51	1166.41	751.51	1176.4	751.41
1186.4	751.32	1196.4	751.22	1200.74	751.18	1206.4	751.16	1214.28	751.13
1216.4	751.06	1226.4	750.76	1236.4	750.45	1246.4	750.14	1251.97	749.97
1256.4	749.84	1264.97	749.59	1266.4	749.5	1276.4	748.84	1286.4	748.19
1296.4	747.54	1298.43	747.41	1306.4	746.99	1313.37	746.62	1316.4	746.41
1326.4	745.73	1336.4	745.05	1346.4	744.37	1347.52	744.3	1356.4	743.77

1363.69	743.33	1366.4	743.16	1376.4	742.52	1386.4	741.88	1394.95	741.34
1396.4	741.24	1406.4	740.52	1413.61	740.01	1416.4	739.87	1426.4	739.36
1436.4	738.85	1445.4	738.39	1446.4	738.33	1456.4	737.68	1464.51	737.15
1466.4	737.07	1476.4	736.62	1486.4	736.17	1495.08	735.78	1496.4	735.71
1506.4	735.13	1513.88	734.69	1516.4	734.6	1526.4	734.23	1532.19	734.02
1536.4	733.86	1546.4	733.5	1554.28	733.21	1556.4	733.14	1566.4	732.8
1573.29	732.57	1576.4	732.48	1586.4	732.21	1596.4	731.94	1598.86	731.87
1606.4	731.7	1616.4	731.48	1626.4	731.25	1627.65	731.23	1636.4	731.06
1646.4	730.87	1650.73	730.78	1656.4	730.67	1666.4	730.47	1668.9	730.42
1676.4	730.24	1683.84	730.05	1686.4	730.09	1696.4	730.23	1706.4	730.38
1707.93	730.4	1716.4	730.13	1721.99	729.95	1726.4	729.74	1736.4	729.27
1746.4	728.81	1756.02	728.36	1756.4	728.31	1761.52	727.7	1766.4	727.41
1776.4	726.82	1786.4	726.22	1792.82	725.84	1796.4	725.75	1799.52	725.66
1805.9	725.64	1806.4	725.63	1816.4	725.35	1826.4	725.07	1836.4	724.78
1846.4	724.5	1855.11	724.25	1856.4	724.22	1866.4	724	1867.48	723.97
1876.4	723.98	1886.4	724	1896.4	724.01	1904.59	724.02	1906.4	723.98
1910.99	723.88	1916.4	723.6	1926.4	723.08	1936.4	722.57	1938.8	722.44
1946.4	722.45	1951.69	722.46	1956.4	722.26	1966.4	721.82	1968.34	721.74
1968.41	721.73	1976.4	721.47	1984.12	721.21	1986.4	721.18	1996.4	721.02
2006.4	720.86	2008.4	720.83	2016.4	720.63	2026.4	720.37	2028.94	720.3
2036.4	720	2046.4	719.58	2049.85	719.44	2053.54	719.16	2056.4	719.04
2057.39	719	2066.4	718.67	2075.15	718.34	2076.4	718.25	2080.12	717.96
2085.94	717.76	2086.4	717.73	2089.32	717.54	2096.4	717.23	2098.97	717.12
2106.15	717.11	2106.4	717.1	2116.4	716.99	2126.4	716.88	2136.4	716.76
2146.4	716.65	2150.45	716.61	2156.4	716.28	2157.53	716.22	2162.15	716.85
2166.4	716.84	2176.4	716.8	2179.1	716.8	2184.22	716.66	2186.4	716.63
2188.2	716.61	2195.9	716.58	2196.4	716.6	2201.24	716.82	2206.08	717.26
2206.4	717.26	2216.4	717.2	2222.48	717.16	2226.4	717.19	2236.4	717.28
2243.47	717.35	2246.4	717.42	2256.4	717.67	2262.67	717.83	2266.4	717.83
2276.4	717.83	2286.4	717.83	2287.28	717.83	2296.4	717.82	2306.4	717.81
2308.98	717.8	2316.4	717.67	2326.4	717.5	2328.2	717.46	2336.4	715.38
2339.07	714.7	2344.26	713.74	2345.14	711.69	2346.4	709.12	2346.52	708.87
2356.4	706.9	2366.4	704.9	2373.78	703.43	2375.36	703.11	2376.4	702.9
2386.4	700.89	2389.94	700.18	2396.4	702.22	2406.4	705.37	2411.76	707.06
2416.4	708.68	2420.51	710.12	2421.3	712.44	2422.93	716.87	2426.4	718.58
2429.3	720.01	2436.4	722.15	2438.26	722.71	2446.4	725.61	2452.6	727.83
2456.4	728.85	2457.47	729.14	2460.57	729.69	2462.37	730.11	2466.4	730.47
2473.71	731.14	2476.4	731.46	2486.4	732.66	2496.4	733.86	2504.81	734.86
2506.4	734.94	2516.4	735.42	2522.55	735.71	2526.4	735.84	2530.87	735.98
2536.4	736.73	2541.37	737.39	2546.4	737.97	2556.4	739.1	2556.87	739.16
2559.35	739.29	2563.49	739.58	2566.4	739.73	2566.55	739.74	2576.4	740.4
2586.4	741.07	2596.4	741.75	2599	741.92	2600	741.99	2608.89	742.55
2610	742.67	2610.05	742.68	2612.66	742.79	2613.19	742.82	2619.48	743.2
2619.79	743.22	2626.39	743.62	2628.71	743.76	2632.99	744.01	2637.95	744.31
2639.06	744.37	2639.59	744.39	2646.19	744.63	2647.18	744.66	2649.47	744.74
2651	744.76	2652.79	744.83	2656.42	744.95	2659.4	745.05	2665.65	745.26
2666	745.27	2672.6	745.49	2674.89	745.57	2679.2	745.71	2684.12	745.87
2685.8	745.93	2689.64	746.05	2692.07	746.13	2692.4	746.15	2693.35	746.18
2693.81	746.19	2699	746.29	2700	746.31	2706.6	746.45	2709.23	746.5
2713.2	746.58	2718.47	746.68	2719.8	746.71	2726.4	746.83	2727.7	746.86
2729.07	746.89	2730.75	746.97	2733	747	2736.94	747.05	2739.6	747.09
2743.08	747.13	2746.17	747.15	2746.2	747.15	2752.8	747.18	2755.41	747.19
2759.4	747.21	2764.64	747.23	2766	747.24	2767.04	747.24	2772.6	747.24
2773.88	747.24	2779.2	747.24	2780.8	747.25	2783.11	747.11	2783.33	747.1
2785.8	747.09	2786.3	747.09	2786.87	747.11	2787.42	747.11	2792.34	747
2792.4	747	2795.32	746.93	2795.48	746.92	2795.93	746.91	2797.82	746.87
2799	746.87	2800	746.84	2806.6	746.65	2808.07	746.61	2809.23	746.65
2812.44	746.75	2812.91	746.62	2813.2	746.63	2815.5	746.64	2818.47	746.62
2819.8	746.61	2826.4	746.58	2827.27	746.58	2827.7	746.52	2830.5	746.16
2833	746.12	2836.94	746.06	2839.6	746.01	2840.94	745.99	2846.17	745.92
2846.2	745.92	2852.8	745.83	2855.41	745.8	2859.4	745.74	2864.64	745.68
2866	745.66	2867.17	745.64	2872.6	745.54	2873.88	745.52	2875.07	745.49
2879.2	745.35	2880.1	745.32	2883.11	745.3	2885.14	745.28	2885.8	745.27
2892.34	745.16	2892.4	745.16	2893.23	745.15	2899	744.81	2900	744.64
2901.06	744.47	2901.06	744.45	2901.27	744.46	2901.43	744.43	2903.04	744.43
2906.6	744.4	2909.23	744.37	2909.87	744.36	2913.2	744.62	2914.87	744.75
2918.47	744.83	2919.8	744.87	2926.4	745.03	2927.7	745.06	2928.94	745.09
2933	745.18	2936.94	745.27	2939.6	745.33	2946.17	745.48	2946.2	745.48
2952.8	745.62	2955.41	745.68	2958.33	745.75	2958.88	745.74	2959.4	745.74
2959.46	745.74	2959.75	745.73	2960.36	745.73	2960.67	745.72	2961.08	745.72
2961.14	745.73	2961.52	745.82	2961.75	745.87	2962.18	745.95	2962.38	745.99
2962.75	746.06	2963.09	746.12	2963.3	746.16	2963.69	746.22	2963.96	746.26
2964.13	746.28	2964.45	746.32	2964.64	746.34	2964.76	746.36	2964.89	746.37
2965.05	746.39	2965.13	746.39	2965.32	746.41	2965.58	746.42	2965.7	746.43
2965.95	746.44	2966	746.44	2966.08	746.44	2966.26	746.45	2966.53	746.44
2966.76	746.44	2966.91	746.43	2967.01	746.43	2967.22	746.41	2967.38	746.4
2967.48	746.39	2967.71	746.36	2967.94	746.34	2968.1	746.31	2968.32	746.28
2968.44	746.26	2968.71	746.22	2968.86	746.19	2969.17	746.13	2969.33	746.1
2969.6	746.05	2970.03	745.95	2970.54	745.83	2970.82	745.76	2970.96	745.73

2971.1	745.73	2971.66	745.74	2972.19	745.75	2972.53	745.75	2972.6	745.75
2973.17	745.76	2973.61	745.77	2973.88	745.77	2973.9	745.77	2974.42	745.78
2974.67	745.79	2979.2	745.79	2983.11	745.8	2985.8	745.8	2992.34	745.81
2992.4	745.81	2993.78	745.81	2999	745.8	3000	745.8	3006.6	745.8
3009.23	745.79	3011.26	745.79	3011.39	745.79	3011.58	745.82	3013.2	745.82
3015.01	745.81	3015.54	745.79	3015.69	745.79	3018.47	745.99	3019.8	746.09
3021.64	746.22	3026.4	746.5	3027.7	746.58	3027.87	746.59	3033	746.69
3033.41	746.7	3036.44	746.7	3036.94	746.69	3039.6	746.69	3042.29	746.68
3044.61	746.64	3046.17	746.59	3046.2	746.59	3046.7	746.57	3047.49	746.35
3051.45	746.62	3051.6	746.61	3052.8	746.62	3055.41	746.64	3058.91	746.67

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
980.33	.065	1683.84	.1	2344.26	.04	2422.93	.065

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2344.26	2422.93	122	122	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
980.33	2049.35	726.04	T
2499.93	3058.91	726.04	T

Sediment Elevation = 700.18

BRIDGE

RIVER: W Chickamauga Cr
REACH: 1 RS: 436

INPUT
Description: Existing 411' Bridge
Distance from Upstream XS = 20
Deck/Roadway Width = 82
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates num= 32

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1100	740.84	0	1200	739.64	0	1300	737.95	0
1400	735.85	0	1500	733.68	0	1600	731.46	0
1700	729.36	0	1800	727.67	0	1900	726.23	0
2000	724.82	0	2069.35	724.33	0	2069.35	724.33	721
2098.84	724.69	721.36	2128.86	725.03	721.7	2158.86	725.38	722.05
2188.88	725.78	722.45	2219.02	726.08	722.75	2248.88	726.41	723.08
2278.89	726.71	723.38	2309	727	723.67	2309	727	723
2362	727.27	723.27	2427	727.41	723.41	2479.93	727.49	723.49
2479.93	727.49	0	2500	728.18	0	2600	729.08	0
2700	731.51	0	2800	734.8	0	2900	738.51	0
3000	741.91	0	3100	744.64	0			

Upstream Bridge Cross Section Data
Station Elevation Data num= 500

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
980.33	756.69	986.4	756.67	995.11	756.64	996.4	756.62	1004	756.55
1006.4	756.5	1016.4	756.29	1026.4	756.08	1036.4	755.87	1040.28	755.79
1046.4	755.51	1051.14	755.3	1056.4	755	1062.49	754.65	1066.4	754.53
1076.4	754.25	1086.4	753.96	1096.4	753.68	1099.19	753.6	1106.4	753.21
1111.95	752.9	1116.4	752.81	1126.4	752.59	1136.4	752.38	1146.4	752.17
1149.7	752.1	1156.4	751.86	1166.4	751.51	1166.41	751.51	1176.4	751.41
1186.4	751.32	1196.4	751.22	1200.74	751.18	1206.4	751.16	1214.28	751.13
1216.4	751.06	1226.4	750.76	1236.4	750.45	1246.4	750.14	1251.97	749.97
1256.4	749.84	1264.97	749.59	1266.4	749.5	1276.4	748.84	1286.4	748.19
1296.4	747.54	1298.43	747.41	1306.4	746.99	1313.37	746.62	1316.4	746.41
1326.4	745.73	1336.4	745.05	1346.4	744.37	1347.52	744.3	1356.4	743.77
1363.69	743.33	1366.4	743.16	1376.4	742.52	1386.4	741.88	1394.95	741.34
1396.4	741.24	1406.4	740.52	1413.61	740.01	1416.4	739.87	1426.4	739.36
1436.4	738.85	1445.4	738.39	1446.4	738.33	1456.4	737.68	1464.51	737.15
1466.4	737.07	1476.4	736.62	1486.4	736.17	1495.08	735.78	1496.4	735.71
1506.4	735.13	1513.88	734.69	1516.4	734.6	1526.4	734.23	1532.19	734.02
1536.4	733.86	1546.4	733.5	1554.28	733.21	1556.4	733.14	1566.4	732.8
1573.29	732.57	1576.4	732.48	1586.4	732.21	1596.4	731.94	1598.86	731.87
1606.4	731.7	1616.4	731.48	1626.4	731.25	1627.65	731.23	1636.4	731.06
1646.4	730.87	1650.73	730.78	1656.4	730.67	1666.4	730.47	1668.9	730.42
1676.4	730.24	1683.84	730.05	1686.4	730.09	1696.4	730.23	1706.4	730.38
1707.93	730.4	1716.4	730.13	1721.99	729.95	1726.4	729.74	1736.4	729.27
1746.4	728.81	1756.02	728.36	1756.4	728.31	1761.52	727.7	1766.4	727.41
1776.4	726.82	1786.4	726.22	1792.82	725.84	1796.4	725.75	1799.52	725.66
1805.9	725.64	1806.4	725.63	1816.4	725.35	1826.4	725.07	1836.4	724.78
1846.4	724.5	1855.11	724.25	1856.4	724.22	1866.4	724	1867.48	723.97
1876.4	723.98	1886.4	724	1896.4	724.01	1904.59	724.02	1906.4	723.98

1910.99	723.88	1916.4	723.6	1926.4	723.08	1936.4	722.57	1938.8	722.44
1946.4	722.45	1951.69	722.46	1956.4	722.26	1966.4	721.82	1968.34	721.74
1968.41	721.73	1976.4	721.47	1984.12	721.21	1986.4	721.18	1996.4	721.02
2006.4	720.86	2008.4	720.83	2016.4	720.63	2026.4	720.37	2028.94	720.3
2036.4	720	2046.4	719.58	2049.85	719.44	2053.54	719.16	2056.4	719.04
2057.39	719	2066.4	718.67	2075.15	718.34	2076.4	718.25	2080.12	717.96
2085.94	717.76	2086.4	717.73	2089.32	717.54	2096.4	717.23	2098.97	717.12
2106.15	717.11	2106.4	717.1	2116.4	716.99	2126.4	716.88	2136.4	716.76
2146.4	716.65	2150.45	716.61	2156.4	716.28	2157.53	716.22	2162.15	716.85
2166.4	716.84	2176.4	716.8	2179.1	716.8	2184.22	716.66	2186.4	716.63
2188.2	716.61	2195.9	716.58	2196.4	716.6	2201.24	716.82	2206.08	717.26
2206.4	717.26	2216.4	717.2	2222.48	717.16	2226.4	717.19	2236.4	717.28
2243.47	717.35	2246.4	717.42	2256.4	717.67	2262.67	717.83	2266.4	717.83
2276.4	717.83	2286.4	717.83	2287.28	717.83	2296.4	717.82	2306.4	717.81
2308.98	717.8	2316.4	717.67	2326.4	717.5	2328.2	717.46	2336.4	715.38
2339.07	714.7	2344.26	713.74	2345.14	711.69	2346.4	709.12	2346.52	708.87
2356.4	706.9	2366.4	704.9	2373.78	703.43	2375.36	703.11	2376.4	702.9
2386.4	700.89	2389.94	700.18	2396.4	702.22	2406.4	705.37	2411.76	707.06
2416.4	708.68	2420.51	710.12	2421.3	712.44	2422.93	716.87	2426.4	718.58
2429.3	720.01	2436.4	722.15	2438.26	722.71	2446.4	725.61	2452.6	727.83
2456.4	728.85	2457.47	729.14	2460.57	729.69	2462.37	730.11	2466.4	730.47
2473.71	731.14	2476.4	731.46	2486.4	732.66	2496.4	733.86	2504.81	734.86
2506.4	734.94	2516.4	735.42	2522.55	735.71	2526.4	735.84	2530.87	735.98
2536.4	736.73	2541.37	737.39	2546.4	737.97	2556.4	739.1	2556.87	739.16
2559.35	739.29	2563.49	739.58	2566.4	739.73	2566.55	739.74	2576.4	740.4
2586.4	741.07	2596.4	741.75	2599	741.92	2600	741.99	2608.89	742.55
2610	742.67	2610.05	742.68	2612.66	742.79	2613.19	742.82	2619.48	743.2
2619.79	743.22	2626.39	743.62	2628.71	743.76	2632.99	744.01	2637.95	744.31
2639.06	744.37	2639.59	744.39	2646.19	744.63	2647.18	744.66	2649.47	744.74
2651	744.76	2652.79	744.83	2656.42	744.95	2659.4	745.05	2665.65	745.26
2666	745.27	2672.6	745.49	2674.89	745.57	2679.2	745.71	2684.12	745.87
2685.8	745.93	2689.64	746.05	2692.07	746.13	2692.4	746.15	2693.35	746.18
2693.81	746.19	2699	746.29	2700	746.31	2706.6	746.45	2709.23	746.5
2713.2	746.58	2718.47	746.68	2719.8	746.71	2726.4	746.83	2727.7	746.86
2729.07	746.89	2730.75	746.97	2733	747	2736.94	747.05	2739.6	747.09
2743.08	747.13	2746.17	747.15	2746.2	747.15	2752.8	747.18	2755.41	747.19
2759.4	747.21	2764.64	747.23	2766	747.24	2767.04	747.24	2772.6	747.24
2773.88	747.24	2779.2	747.24	2780.8	747.25	2783.11	747.11	2783.33	747.1
2785.8	747.09	2786.3	747.09	2786.87	747.11	2787.42	747.11	2792.34	747
2792.4	747	2795.32	746.93	2795.48	746.92	2795.93	746.91	2797.82	746.87
2799	746.87	2800	746.84	2806.6	746.65	2808.07	746.61	2809.23	746.65
2812.44	746.75	2812.91	746.62	2813.2	746.63	2815.5	746.64	2818.47	746.62
2819.8	746.61	2826.4	746.58	2827.27	746.58	2827.7	746.52	2830.5	746.16
2833	746.12	2836.94	746.06	2839.6	746.01	2840.94	745.99	2846.17	745.92
2846.2	745.92	2852.8	745.83	2855.41	745.8	2859.4	745.74	2864.64	745.68
2866	745.66	2867.17	745.64	2872.6	745.54	2873.88	745.52	2875.07	745.49
2879.2	745.35	2880.1	745.32	2883.11	745.3	2885.14	745.28	2885.8	745.27
2892.34	745.16	2892.4	745.16	2893.23	745.15	2899	744.81	2900	744.64
2901.06	744.47	2901.06	744.45	2901.27	744.46	2901.43	744.43	2903.04	744.43
2906.6	744.4	2909.23	744.37	2909.87	744.36	2913.2	744.62	2914.87	744.75
2918.47	744.83	2919.8	744.87	2926.4	745.03	2927.7	745.06	2928.94	745.09
2933	745.18	2936.94	745.27	2939.6	745.33	2946.17	745.48	2946.2	745.48
2952.8	745.62	2955.41	745.68	2958.33	745.75	2958.88	745.74	2959.4	745.74
2959.46	745.74	2959.75	745.73	2960.36	745.73	2960.67	745.72	2961.08	745.72
2961.14	745.73	2961.52	745.82	2961.75	745.87	2962.18	745.95	2962.38	745.99
2962.75	746.06	2963.09	746.12	2963.3	746.16	2963.69	746.22	2963.96	746.26
2964.13	746.28	2964.45	746.32	2964.64	746.34	2964.76	746.36	2964.89	746.37
2965.05	746.39	2965.13	746.39	2965.32	746.41	2965.58	746.42	2965.7	746.43
2965.95	746.44	2966	746.44	2966.08	746.44	2966.26	746.45	2966.53	746.44
2966.76	746.44	2966.91	746.43	2967.01	746.43	2967.22	746.41	2967.38	746.4
2967.48	746.39	2967.71	746.36	2967.94	746.34	2968.1	746.31	2968.32	746.28
2968.44	746.26	2968.71	746.22	2968.86	746.19	2969.17	746.13	2969.33	746.1
2969.6	746.05	2970.03	745.95	2970.54	745.83	2970.82	745.76	2970.96	745.73
2971.1	745.73	2971.66	745.74	2972.19	745.75	2972.53	745.75	2972.6	745.75
2973.17	745.76	2973.61	745.77	2973.88	745.77	2973.9	745.77	2974.42	745.78
2974.67	745.79	2979.2	745.79	2983.11	745.8	2985.8	745.8	2992.34	745.81
2992.4	745.81	2993.78	745.81	2999	745.8	3000	745.8	3006.6	745.8
3009.23	745.79	3011.26	745.79	3011.39	745.79	3011.58	745.82	3013.2	745.82
3015.01	745.81	3015.54	745.79	3015.69	745.79	3018.47	745.99	3019.8	746.09
3021.64	746.22	3026.4	746.5	3027.7	746.58	3027.87	746.59	3033	746.69
3033.41	746.7	3036.44	746.7	3036.94	746.69	3039.6	746.69	3042.29	746.68
3044.61	746.64	3046.17	746.59	3046.2	746.59	3046.7	746.57	3047.49	746.35
3051.45	746.62	3051.6	746.61	3052.8	746.62	3055.41	746.64	3058.91	746.67

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
980.33	.065	1683.84	.1	2344.26	.04	2422.93	.065

Bank Sta: Left Right Coeff Contr. Expan.

2344.26 2422.93 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
980.33	2049.35	726.04	T
2499.93	3058.91	726.04	T

Sediment Elevation = 700.18

Downstream Deck/Roadway Coordinates

num= 32

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1100	740.84	0	1200	739.64	0	1300	737.95	0
1400	735.85	0	1500	733.68	0	1600	731.46	0
1700	729.36	0	1800	727.67	0	1900	726.23	0
2000	724.82	0	2069.35	724.33	0	2069.35	724.33	721
2098.84	724.69	721.36	2128.86	725.03	721.7	2158.86	725.38	722.05
2188.88	725.78	722.45	2219.02	726.08	722.75	2248.88	726.41	723.08
2278.89	726.71	723.38	2309	727	723.67	2309	727	723
2362	727.27	723.27	2427	727.41	723.41	2479.93	727.49	723.49
2479.93	727.49	0	2500	728.18	0	2600	729.08	0
2700	731.51	0	2800	734.8	0	2900	738.51	0
3000	741.91	0	3100	744.64	0			

Downstream Bridge Cross Section Data

Station Elevation Data num= 483

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
986.4	749.4	994.83	749.38	996.4	749.39	1006.4	749.43	1016.4	749.47
1017.31	749.48	1026.4	749.54	1036.4	749.61	1036.84	749.62	1046.4	749.36
1056.4	749.08	1066.4	748.81	1068.39	748.75	1076.4	748.52	1086.4	748.24
1092.59	748.06	1096.4	747.88	1106.4	747.39	1116.4	746.91	1119.01	746.79
1126.4	746.71	1136.4	746.59	1145.06	746.5	1146.4	746.46	1156.4	746.14
1166.4	745.83	1176.4	745.51	1176.72	745.5	1186.4	745.15	1196.4	744.79
1199.54	744.67	1206.4	744.33	1216.4	743.82	1225.98	743.33	1226.4	743.29
1236.4	742.33	1239.75	742.01	1246.4	741.77	1256.4	741.4	1266.4	741.03
1275.6	740.69	1276.4	740.65	1286.4	740.17	1291.42	739.93	1296.4	739.51
1306.4	738.68	1316.4	737.85	1325.08	737.13	1326.4	737.08	1335.41	736.71
1336.4	736.65	1346.4	736.02	1356.4	735.39	1366.4	734.76	1372.1	734.4
1376.4	734.15	1381.61	733.84	1386.4	733.65	1396.4	733.26	1406.4	732.87
1416.4	732.47	1417.59	732.43	1426.4	732.1	1427.61	732.06	1436.4	731.81
1446.4	731.53	1456.4	731.25	1466.4	730.97	1467.33	730.95	1474.86	730.74
1476.4	730.7	1486.4	730.43	1496.4	730.17	1506.4	729.9	1516.4	729.64
1517.74	729.6	1525.79	729.4	1526.4	729.39	1536.4	729.28	1546.4	729.16
1556.4	729.05	1561.87	728.99	1566.4	728.86	1573.65	728.66	1576.4	728.64
1586.4	728.57	1596.4	728.5	1606.4	728.43	1609.42	728.41	1616.4	728.47
1622.69	728.52	1626.4	728.56	1636.4	728.66	1646.4	728.75	1656.4	728.85
1656.71	728.85	1666.4	728.74	1670.12	728.7	1676.4	728.71	1686.4	728.73
1696.4	728.74	1703.47	728.76	1706.4	728.64	1716.29	728.23	1716.4	728.22
1726.4	727.81	1736.4	727.39	1746.4	726.97	1749.28	726.85	1756.4	726.35
1766.4	725.63	1766.7	725.61	1776.4	724.93	1786.4	724.22	1796.4	723.51
1803.94	722.98	1806.4	722.86	1816.4	722.4	1819.54	722.25	1826.4	721.73
1836.4	720.98	1846.4	720.22	1851.37	719.84	1856.4	719.55	1857.57	719.49
1866.4	718.83	1876.4	718.09	1886.4	717.35	1888.96	717.16	1896.4	716.81
1905.16	716.39	1906.4	716.36	1916.4	716.1	1925.28	715.88	1926.4	715.85
1936.4	715.6	1946.4	715.34	1949.51	715.26	1956.4	715.14	1966.4	714.96
1976.4	714.79	1984.96	714.63	1986.4	714.61	1996.4	714.48	1998.7	714.45
2006.4	714.45	2013.23	714.45	2016.4	714.43	2025.6	714.37	2025.61	714.37
2026.4	714.39	2036.4	714.57	2044.85	714.73	2046.4	714.7	2056.4	714.52
2065.47	714.35	2066.4	714.35	2076.4	714.34	2077.53	714.34	2086.4	714.43
2090.33	714.46	2096.4	714.42	2106.4	714.36	2116.4	714.3	2126.06	714.24
2126.4	714.24	2136.4	714.19	2142.48	714.16	2146.4	714.18	2156.4	714.24
2166.1	714.29	2166.4	714.29	2176.4	714.51	2186.4	714.72	2189.74	714.79
2196.4	714.75	2206.4	714.7	2211.18	714.67	2216.4	714.67	2226.4	714.68
2233.17	714.68	2236.4	714.74	2246.4	714.93	2256.4	715.12	2260.72	715.2
2266.4	715.36	2276.4	715.65	2277.44	715.68	2284.4	715.55	2286.4	715.44
2294.35	714.99	2296.4	714.99	2306.4	715.02	2313.3	715.04	2316.4	714.96
2326.4	714.71	2336.4	714.46	2346.4	714.22	2356.4	713.97	2362.97	713.8
2365.91	713.65	2366.4	712.58	2368.58	707.78	2369.05	706.86	2376.4	704.81
2386.4	702.02	2390.45	700.88	2396.4	699.27	2406.4	696.55	2411.26	695.23
2416.4	696.68	2426.4	699.5	2436.4	702.33	2446.4	705.15	2446.69	705.24
2451.22	706.47	2451.84	707.57	2454.34	712.06	2456.4	713	2456.64	713.1
2457.68	713.92	2458.65	714.46	2466.4	719.09	2469.01	720.65	2475.1	724.1
2476.4	724.17	2483.89	724.56	2486.4	724.7	2496.4	725.24	2497.91	725.32
2500.97	725.16	2505.97	725.69	2506.4	725.71	2507.98	725.77	2515.36	726.78
2516.4	727.13	2525.69	730.21	2526.4	730.46	2527.8	730.97	2536.4	732.84
2546.4	735.01	2552.2	736.27	2556.4	737.03	2566.4	738.85	2566.93	738.95
2576.4	739.9	2582.12	740.48	2586.4	740.67	2596.4	741.11	2599	741.22
2600	741.26	2600.21	741.27	2610	741.42	2613.19	741.47	2616.95	741.53
2620.34	741.46	2620.62	741.46	2627.49	741.32	2631.52	741.24	2633.81	741.2
2634.64	741.16	2640.26	740.9	2641.79	740.78	2642.42	740.73	2643.94	740.61
2648.86	740.03	2648.94	740.02	2650.45	740.01	2652.13	740.11	2652.75	740.11

2653.33	740.12	2655.65	740.16	2656.1	740.17	2663.25	740.2	2664.23	740.21
2670.36	740.24	2670.4	740.24	2675.14	740.24	2676.12	740.24	2677.55	740.23
2684.7	740.18	2686.04	740.16	2691.85	740.12	2696.94	740.08	2699	740.06
2700	740.05	2707.07	739.99	2708.28	739.98	2708.51	739.98	2710.9	740.01
2714.14	740.04	2721.21	740.11	2721.81	740.11	2728.29	740.18	2732.71	740.22
2735.36	740.25	2740.79	740.3	2742.43	740.31	2743.62	740.31	2749.5	740.33
2754.52	740.35	2756.57	740.35	2759.32	740.36	2763.64	740.39	2765.42	740.4
2770.71	740.43	2775.64	740.46	2776.33	740.47	2777.79	740.47	2784.86	740.48
2787.23	740.49	2791.93	740.5	2794.95	740.51	2798.14	740.52	2799	740.52
2800	740.53	2807.07	740.55	2810.9	740.57	2814.14	740.58	2821.21	740.61
2821.81	740.62	2825.19	740.63	2828.29	740.64	2832.71	740.65	2835.36	740.66
2842.09	740.68	2842.43	740.68	2843.62	740.68	2849.5	740.69	2854.52	740.69
2856.57	740.69	2863.64	740.7	2865.42	740.7	2870.71	740.71	2874.71	740.71
2876.33	740.71	2877.79	740.72	2884.86	740.73	2887.23	740.74	2891.93	740.75
2898.14	740.76	2899	740.76	2900	740.77	2907.07	740.78	2910.9	740.78
2914.14	740.79	2921.21	740.8	2921.81	740.8	2924.37	740.8	2928.29	740.85
2932.22	740.91	2932.71	740.91	2935.36	740.92	2942.43	740.94	2943.62	740.95
2946.24	740.96	2949.5	740.99	2954.52	741.03	2956.57	741.05	2963.64	741.12
2965.42	741.14	2970.71	741.19	2976.24	741.24	2976.33	741.24	2977.79	741.2
2984.86	741.04	2987.23	740.98	2989.05	740.94	2991.93	740.93	2993.82	740.92
2997.67	740.93	2998.14	740.88	2999	740.78	3000	740.62	3007.07	739.52
3007.8	739.4	3010.9	739.79	3012.79	740.03	3014.14	740.16	3021.21	740.88
3021.81	740.94	3023.21	741.08	3024.06	741.17	3024.31	741.19	3024.32	741.19
3024.36	741.19	3024.38	741.19	3024.42	741.2	3024.48	741.2	3024.52	741.2
3024.65	741.22	3024.76	741.23	3025.14	741.26	3025.68	741.3	3026.61	741.32
3028.19	741.34	3028.29	741.34	3029.11	741.35	3030.72	741.37	3031.42	741.38
3032.67	741.39	3032.71	741.39	3033.73	741.4	3034.35	741.4	3035.36	741.4
3035.43	741.4	3035.95	741.41	3036.27	741.41	3036.85	741.41	3042.43	741.39
3043.62	741.38	3049.5	741.36	3054.52	741.34	3056.57	741.34	3056.81	741.33
3057.55	741.33	3058.41	741.33	3058.9	741.33	3060.02	741.32	3060.66	741.32
3061.74	741.32	3063.64	741.34	3064.92	741.35	3065.11	741.34	3065.27	741.33
3065.42	741.32	3065.46	741.32	3067.01	741.35	3070.18	741.42	3070.71	741.44
3070.94	741.44	3072.06	741.46	3072.85	741.48	3073.25	741.49	3073.88	741.5
3074.13	741.51	3074.55	741.52	3074.87	741.52	3075.06	741.53	3075.94	741.51
3076.11	741.53	3076.33	741.52	3077.52	741.5	3077.79	741.52	3079.2	741.66
3079.21	741.65	3084.86	741.83	3087.23	741.9	3091.93	742.05	3096.59	742.19
3098.14	742.25	3100	742.32	3107.07	742.58	3110.9	742.72	3112.58	742.78
3114.14	742.82	3121.21	742.96	3121.81	742.97	3128.29	743.1	3132.71	743.18
3135.36	743.23	3142.43	743.37	3143.62	743.4	3148.27	743.49	3149.5	743.51
3154.52	743.6	3156.57	743.63	3156.92	743.64	3163.64	743.61	3163.87	743.6
3165.42	743.59	3166.15	743.59	3170.71	743.59	3176.33	743.58	3176.39	743.58
3177.79	743.58	3184.86	743.58	3187.23	743.58	3191.93	743.58	3192.95	743.58
3193.27	743.58	3198.14	743.58	3199	743.58				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
986.4	.065	2336.4	.1	2365.91	.04	2454.34	.1	2526.4	.065

Bank Sta: Left Right Coeff Contr. Expan.
2365.91 2454.34 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
986.4	2049.35	724.26	T
2499.93	3199	724.26	T

Sediment Elevation = 700.11

Upstream Embankment side slope = 2 horiz. to 1.0 vertical
Downstream Embankment side slope = 2 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins = 724.33
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Abutments = 2

Abutment Data
Upstream num= 3

Sta	Elev	Sta	Elev	Sta	Elev
1032.29	0	2474.93	721.32	2479.93	721.32

Downstream num= 3

Sta	Elev	Sta	Elev	Sta	Elev
1032.29	0	2474.93	721.32	2479.93	721.32

Abutment Data
Upstream num= 3

Sta	Elev	Sta	Elev	Sta	Elev
2069.35	718.83	2074.35	718.83	3507.01	0

Downstream num= 3

Sta	Elev	Sta	Elev	Sta	Elev
2069.35	718.83	2074.35	718.83	3507.01	0

Number of Piers = 10

Pier Data
Pier Station Upstream= 2098.84 Downstream= 2098.84
Upstream num= 2

Width	Elev	Width	Elev
2	0	2	722.53

Downstream num= 2

Width	Elev	Width	Elev
2	0	2	722.53

Pier Data
Pier Station Upstream= 2128.86 Downstream= 2128.86
Upstream num= 2

Width	Elev	Width	Elev
2	0	2	722.87

Downstream num= 2

Width	Elev	Width	Elev
2	0	2	722.87

Pier Data
Pier Station Upstream= 2158.86 Downstream= 2158.86
Upstream num= 2

Width	Elev	Width	Elev
2	0	2	723.22

Downstream num= 2

Width	Elev	Width	Elev
2	0	2	723.22

Pier Data
Pier Station Upstream= 2188.88 Downstream= 2188.88
Upstream num= 2

Width	Elev	Width	Elev
2	0	2	723.62

Downstream num= 2

Width	Elev	Width	Elev
2	0	2	723.62

Pier Data
Pier Station Upstream= 2219.02 Downstream= 2219.02
Upstream num= 2

Width	Elev	Width	Elev
2	0	2	723.92

Downstream num= 2

Width	Elev	Width	Elev
2	0	2	723.92

Pier Data
Pier Station Upstream= 2248.88 Downstream= 2248.88
Upstream num= 2

Width	Elev	Width	Elev
2	0	2	724.25

Downstream num= 2

Width	Elev	Width	Elev
2	0	2	724.25

Pier Data
Pier Station Upstream= 2278.89 Downstream= 2278.89
Upstream num= 2

Width	Elev	Width	Elev
2	0	2	724.55

Downstream num= 2

Width	Elev	Width	Elev
2	0	2	724.55

Pier Data
Pier Station Upstream= 2309 Downstream= 2309
Upstream num= 2

Width	Elev	Width	Elev
2	0	2	724.5

Downstream num= 2

Width	Elev	Width	Elev
2	0	2	724.5

Pier Data
Pier Station Upstream= 2362 Downstream= 2362

```
Upstream      num=        2
    Width    Elev     Width    Elev
        3       0         3  724.77
Downstream    num=        2
    Width    Elev     Width    Elev
        3       0         3  724.77

Pier Data
Pier Station     Upstream=    2427    Downstream=    2427
Upstream      num=        2
    Width    Elev     Width    Elev
        3       0         3  724.91
Downstream    num=        2
    Width    Elev     Width    Elev
        3       0         3  724.91

Number of Bridge Coefficient Sets =  1

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

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: W Chickamauga Cr
REACH: 1                  RS: 375

INPUT
Description: Downstream Face of Existing and Proposed Bridges.  Adjust
             Elevations to Quad Map Slope -0.07'
Station Elevation Data    num=     483
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
   986.4   749.4   994.83  749.38    996.4  749.39   1006.4  749.43   1016.4  749.47
 1017.31  749.48   1026.4  749.54   1036.4  749.61  1036.84  749.62   1046.4  749.36
  1056.4  749.08   1066.4  748.81  1068.39  748.75   1076.4  748.52   1086.4  748.24
 1092.59  748.06   1096.4  747.88   1106.4  747.39   1116.4  746.91  1119.01  746.79
  1126.4  746.71   1136.4  746.59  1145.06   746.5   1146.4  746.46   1156.4  746.14
  1166.4  745.83   1176.4  745.51  1176.72   745.5   1186.4  745.15   1196.4  744.79
 1199.54  744.67   1206.4  744.33   1216.4  743.82  1225.98  743.33   1226.4  743.29
  1236.4  742.33  1239.75  742.01   1246.4  741.77   1256.4   741.4   1266.4  741.03
  1275.6  740.69   1276.4  740.65   1286.4  740.17  1291.42  739.93   1296.4  739.51
  1306.4  738.68   1316.4  737.85  1325.08  737.13   1326.4  737.08  1335.41  736.71
  1336.4  736.65   1346.4  736.02   1356.4  735.39   1366.4  734.76   1372.1   734.4
  1376.4  734.15  1381.61  733.84   1386.4  733.65   1396.4  733.26   1406.4  732.87
  1416.4  732.47  1417.59  732.43   1426.4   732.1  1427.61  732.06   1436.4  731.81
  1446.4  731.53   1456.4  731.25   1466.4  730.97  1467.33  730.95  1474.86  730.74
  1476.4   730.7   1486.4  730.43   1496.4  730.17   1506.4   729.9   1516.4  729.64
 1517.74   729.6  1525.79   729.4   1526.4  729.39   1536.4  729.28   1546.4  729.16
  1556.4  729.05  1561.87  728.99   1566.4  728.86  1573.65  728.66   1576.4  728.64
  1586.4  728.57   1596.4   728.5   1606.4  728.43  1609.42  728.41   1616.4  728.47
 1622.69  728.52   1626.4  728.56   1636.4  728.66   1646.4  728.75   1656.4  728.85
 1656.71  728.85   1666.4  728.74  1670.12   728.7   1676.4  728.71   1686.4  728.73
  1696.4  728.74  1703.47  728.76   1706.4  728.64  1716.29  728.23   1716.4  728.22
  1726.4  727.81   1736.4  727.39   1746.4  726.97  1749.28  726.85   1756.4  726.35
  1766.4  725.63   1766.7  725.61   1776.4  724.93   1786.4  724.22   1796.4  723.51
 1803.94  722.98   1806.4  722.86   1816.4   722.4  1819.54  722.25   1826.4  721.73
  1836.4  720.98   1846.4  720.22  1851.37  719.84   1856.4  719.55  1857.57  719.49
  1866.4  718.83   1876.4  718.09   1886.4  717.35  1888.96  717.16   1896.4  716.81
 1905.16  716.39   1906.4  716.36   1916.4   716.1  1925.28  715.88   1926.4  715.85
  1936.4   715.6   1946.4  715.34  1949.51  715.26   1956.4  715.14   1966.4  714.96
  1976.4  714.79  1984.96  714.63   1986.4  714.61   1996.4  714.48   1998.7  714.45
  2006.4  714.45  2013.23  714.45   2016.4  714.43   2025.6  714.37  2025.61  714.37
  2026.4  714.39   2036.4  714.57  2044.85  714.73   2046.4   714.7   2056.4  714.52
 2065.47  714.35   2066.4  714.35   2076.4  714.34  2077.53  714.34   2086.4  714.43
 2090.33  714.46   2096.4  714.42   2106.4  714.36   2116.4   714.3  2126.06  714.24
  2126.4  714.24   2136.4  714.19  2142.48  714.16   2146.4  714.18   2156.4  714.24
  2166.1  714.29   2166.4  714.29   2176.4  714.51   2186.4  714.72  2189.74  714.79
  2196.4  714.75   2206.4   714.7  2211.18  714.67   2216.4  714.67   2226.4  714.68
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2233.17	714.68	2236.4	714.74	2246.4	714.93	2256.4	715.12	2260.72	715.2
2266.4	715.36	2276.4	715.65	2277.44	715.68	2284.4	715.55	2286.4	715.44
2294.35	714.99	2296.4	714.99	2306.4	715.02	2313.3	715.04	2316.4	714.96
2326.4	714.71	2336.4	714.46	2346.4	714.22	2356.4	713.97	2362.97	713.8
2365.91	713.65	2366.4	712.58	2368.58	707.78	2369.05	706.86	2376.4	704.81
2386.4	702.02	2390.45	700.88	2396.4	699.27	2406.4	696.55	2411.26	695.23
2416.4	696.68	2426.4	699.5	2436.4	702.33	2446.4	705.15	2446.69	705.24
2451.22	706.47	2451.84	707.57	2454.34	712.06	2456.4	713	2456.64	713.1
2457.68	713.92	2458.65	714.46	2466.4	719.09	2469.01	720.65	2475.1	724.1
2476.4	724.17	2483.89	724.56	2486.4	724.7	2496.4	725.24	2497.91	725.32
2500.97	725.16	2505.97	725.69	2506.4	725.71	2507.98	725.77	2515.36	726.78
2516.4	727.13	2525.69	730.21	2526.4	730.46	2527.8	730.97	2536.4	732.84
2546.4	735.01	2552.2	736.27	2556.4	737.03	2566.4	738.85	2566.93	738.95
2576.4	739.9	2582.12	740.48	2586.4	740.67	2596.4	741.11	2599	741.22
2600	741.26	2600.21	741.27	2610	741.42	2613.19	741.47	2616.95	741.53
2620.34	741.46	2620.62	741.46	2627.49	741.32	2631.52	741.24	2633.81	741.2
2634.64	741.16	2640.26	740.9	2641.79	740.78	2642.42	740.73	2643.94	740.61
2648.86	740.03	2648.94	740.02	2650.45	740.01	2652.13	740.11	2652.75	740.11
2653.33	740.12	2655.65	740.16	2656.1	740.17	2663.25	740.2	2664.23	740.21
2670.36	740.24	2670.4	740.24	2675.14	740.24	2676.12	740.24	2677.55	740.23
2684.7	740.18	2686.04	740.16	2691.85	740.12	2696.94	740.08	2699	740.06
2700	740.05	2707.07	739.99	2708.28	739.98	2708.51	739.98	2710.9	740.01
2714.14	740.04	2721.21	740.11	2721.81	740.11	2728.29	740.18	2732.71	740.22
2735.36	740.25	2740.79	740.3	2742.43	740.31	2743.62	740.31	2749.5	740.33
2754.52	740.35	2756.57	740.35	2759.32	740.36	2763.64	740.39	2765.42	740.4
2770.71	740.43	2775.64	740.46	2776.33	740.47	2777.79	740.47	2784.86	740.48
2787.23	740.49	2791.93	740.5	2794.95	740.51	2798.14	740.52	2799	740.52
2800	740.53	2807.07	740.55	2810.9	740.57	2814.14	740.58	2821.21	740.61
2821.81	740.62	2825.19	740.63	2828.29	740.64	2832.71	740.65	2835.36	740.66
2842.09	740.68	2842.43	740.68	2843.62	740.68	2849.5	740.69	2854.52	740.69
2856.57	740.69	2863.64	740.7	2865.42	740.7	2870.71	740.71	2874.71	740.71
2876.33	740.71	2877.79	740.72	2884.86	740.73	2887.23	740.74	2891.93	740.75
2898.14	740.76	2899	740.76	2900	740.77	2907.07	740.78	2910.9	740.78
2914.14	740.79	2921.21	740.8	2921.81	740.8	2924.37	740.8	2928.29	740.85
2932.22	740.91	2932.71	740.91	2935.36	740.92	2942.43	740.94	2943.62	740.95
2946.24	740.96	2949.5	740.99	2954.52	741.03	2956.57	741.05	2963.64	741.12
2965.42	741.14	2970.71	741.19	2976.24	741.24	2976.33	741.24	2977.79	741.2
2984.86	741.04	2987.23	740.98	2989.05	740.94	2991.93	740.93	2993.82	740.92
2997.67	740.93	2998.14	740.88	2999	740.78	3000	740.62	3007.07	739.52
3007.8	739.4	3010.9	739.79	3012.79	740.03	3014.14	740.16	3021.21	740.88
3021.81	740.94	3023.21	741.08	3024.06	741.17	3024.31	741.19	3024.32	741.19
3024.36	741.19	3024.38	741.19	3024.42	741.2	3024.48	741.2	3024.52	741.2
3024.65	741.22	3024.76	741.23	3025.14	741.26	3025.68	741.3	3026.61	741.32
3028.19	741.34	3028.29	741.34	3029.11	741.35	3030.72	741.37	3031.42	741.38
3032.67	741.39	3032.71	741.39	3033.73	741.4	3034.35	741.4	3035.36	741.4
3035.43	741.4	3035.95	741.41	3036.27	741.41	3036.85	741.41	3042.43	741.39
3043.62	741.38	3049.5	741.36	3054.52	741.34	3056.57	741.34	3056.81	741.33
3057.55	741.33	3058.41	741.33	3058.9	741.33	3060.02	741.32	3060.66	741.32
3061.74	741.32	3063.64	741.34	3064.92	741.35	3065.11	741.34	3065.27	741.33
3065.42	741.32	3065.46	741.32	3067.01	741.35	3070.18	741.42	3070.71	741.44
3070.94	741.44	3072.06	741.46	3072.85	741.48	3073.25	741.49	3073.88	741.5
3074.13	741.51	3074.55	741.52	3074.87	741.52	3075.06	741.53	3075.94	741.51
3076.11	741.53	3076.33	741.52	3077.52	741.5	3077.79	741.52	3079.2	741.66
3079.21	741.65	3084.86	741.83	3087.23	741.9	3091.93	742.05	3096.59	742.19
3098.14	742.25	3100	742.32	3107.07	742.58	3110.9	742.72	3112.58	742.78
3114.14	742.82	3121.21	742.96	3121.81	742.97	3128.29	743.1	3132.71	743.18
3135.36	743.23	3142.43	743.37	3143.62	743.4	3148.27	743.49	3149.5	743.51
3154.52	743.6	3156.57	743.63	3156.92	743.64	3163.64	743.61	3163.87	743.6
3165.42	743.59	3166.15	743.59	3170.71	743.59	3176.33	743.58	3176.39	743.58
3177.79	743.58	3184.86	743.58	3187.23	743.58	3191.93	743.58	3192.95	743.58
3193.27	743.58	3198.14	743.58	3199	743.58				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
986.4	.065	2336.4	.1	2365.91	.04	2454.34	.1	2526.4	.065

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2365.91	2454.34	375	375	375	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
986.4	2049.35	724.26	T
2499.93	3199	724.26	T

Sediment Elevation = 700.11

CROSS SECTION

RIVER: W Chickamauga Cr
REACH: 1 RS: 0

INPUT
Description: Exit Section. Adjust Elevations to Quad Map Slope -0.02' Adjust Again -0.23'
Station Elevation Data num= 485

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
986.4	748.27	994.83	748.25	996.4	748.26	1006.4	748.3	1016.4	748.34
1017.31	748.35	1026.4	748.41	1036.4	748.48	1036.84	748.49	1046.4	748.23
1056.4	747.95	1066.4	747.68	1068.39	747.62	1076.4	747.39	1086.4	747.11
1092.59	746.93	1096.4	746.75	1106.4	746.26	1116.4	745.78	1119.01	745.66
1126.4	745.58	1136.4	745.46	1145.06	745.37	1146.4	745.33	1156.4	745.01
1166.4	744.7	1176.4	744.38	1176.72	744.37	1186.4	744.02	1196.4	743.66
1199.54	743.54	1206.4	743.2	1216.4	742.69	1225.98	742.2	1226.4	742.16
1236.4	741.2	1239.75	740.88	1246.4	740.64	1256.4	740.27	1266.4	739.9
1275.6	739.56	1276.4	739.52	1286.4	739.04	1291.42	738.8	1296.4	738.38
1306.4	737.55	1316.4	736.72	1325.08	736	1326.4	735.95	1335.41	735.58
1336.4	735.52	1346.4	734.89	1356.4	734.26	1366.4	733.63	1372.1	733.27
1376.4	733.02	1381.61	732.71	1386.4	732.52	1396.4	732.13	1406.4	731.74
1416.4	731.34	1417.59	731.3	1426.4	730.97	1427.61	730.93	1436.4	730.68
1446.4	730.4	1456.4	730.12	1466.4	729.84	1467.33	729.82	1474.86	729.61
1476.4	729.57	1486.4	729.3	1496.4	729.04	1506.4	728.77	1516.4	728.51
1517.74	728.47	1525.79	728.27	1526.4	728.26	1536.4	728.15	1546.4	728.03
1556.4	727.92	1561.87	727.86	1566.4	727.73	1573.65	727.53	1576.4	727.51
1586.4	727.44	1596.4	727.37	1606.4	727.3	1609.42	727.28	1616.4	727.34
1622.69	727.39	1626.4	727.43	1636.4	727.53	1646.4	727.62	1656.4	727.72
1656.71	727.72	1666.4	727.61	1670.12	727.57	1676.4	727.58	1686.4	727.6
1696.4	727.61	1703.47	727.63	1706.4	727.51	1716.29	727.1	1716.4	727.09
1726.4	726.68	1736.4	726.26	1746.4	725.84	1749.28	725.72	1756.4	725.22
1766.4	724.5	1766.7	724.48	1776.4	723.8	1786.4	723.09	1796.4	722.38
1803.94	721.85	1806.4	721.73	1816.4	721.27	1819.54	721.12	1826.4	720.6
1836.4	719.85	1846.4	719.09	1851.37	718.71	1856.4	718.42	1857.57	718.36
1866.4	717.7	1876.4	716.96	1886.4	716.22	1888.96	716.03	1896.4	715.68
1905.16	715.26	1906.4	715.23	1916.4	714.97	1925.28	714.75	1926.4	714.72
1936.4	714.47	1946.4	714.21	1949.51	714.13	1956.4	714.01	1966.4	713.83
1976.4	713.66	1984.96	713.5	1986.4	713.48	1996.4	713.35	1998.7	713.32
2006.4	713.32	2013.23	713.32	2016.4	713.3	2025.6	713.24	2025.61	713.24
2026.4	713.26	2036.4	713.44	2044.85	713.6	2046.4	713.57	2056.4	713.39
2065.47	713.22	2066.4	713.22	2076.4	713.21	2077.53	713.21	2086.4	713.3
2090.33	713.33	2096.4	713.29	2106.4	713.23	2116.4	713.17	2126.06	713.11
2126.4	713.11	2136.4	713.06	2142.48	713.03	2146.4	713.05	2156.4	713.11
2166.1	713.16	2166.4	713.16	2176.4	713.38	2186.4	713.59	2189.74	713.66
2196.4	713.62	2206.4	713.57	2211.18	713.54	2216.4	713.54	2226.4	713.55
2233.17	713.55	2236.4	713.61	2246.4	713.8	2256.4	713.99	2260.72	714.07
2266.4	714.23	2276.4	714.52	2277.44	714.55	2284.4	714.42	2286.4	714.31
2294.35	713.86	2296.4	713.86	2306.4	713.89	2313.3	713.91	2316.4	713.83
2326.4	713.58	2336.4	713.33	2346.4	713.09	2356.4	712.84	2362.97	712.67
2369.63	711.96	2371.2	711.93	2371.73	711.92	2371.8	711.92	2371.96	711.99
2372	712	2372.74	712.21	2375.35	705.56	2375.83	704.34	2379.63	703.88
2389.63	702.67	2393.46	702.21	2399.63	701.4	2409.63	700.1	2411.26	699.89
2417.06	700.93	2419.63	701.24	2429.63	702.48	2439.63	703.71	2449.63	704.95
2453.02	705.37	2453.23	705.83	2455.66	712.8	2458.42	714.45	2466.4	717.96
2469.01	719.52	2475.1	722.97	2476.4	723.04	2483.89	723.43	2486.4	723.57
2496.4	724.11	2497.91	724.19	2500.97	724.03	2505.97	724.56	2506.4	724.58
2507.98	724.64	2515.36	725.65	2516.4	726	2525.69	729.08	2526.4	729.33
2527.8	729.84	2536.4	731.71	2546.4	733.88	2552.2	735.14	2556.4	735.9
2566.4	737.72	2566.93	737.82	2576.4	738.77	2582.12	739.35	2586.4	739.54
2596.4	739.98	2599	740.09	2600	740.13	2600.21	740.14	2610	740.29
2613.19	740.34	2616.95	740.4	2620.34	740.33	2620.62	740.33	2627.49	740.19
2631.52	740.11	2633.81	740.07	2634.64	740.03	2640.26	739.77	2641.79	739.65
2642.42	739.6	2643.94	739.48	2648.86	738.9	2648.94	738.89	2650.45	738.88
2652.13	738.98	2652.75	738.98	2653.33	738.99	2655.65	739.03	2656.1	739.04
2663.25	739.07	2664.23	739.08	2670.36	739.11	2670.4	739.11	2675.14	739.11
2676.12	739.11	2677.55	739.1	2684.7	739.05	2686.04	739.03	2691.85	738.99
2696.94	738.95	2699	738.93	2700	738.92	2707.07	738.86	2708.28	738.85
2708.51	738.85	2710.9	738.88	2714.14	738.91	2721.21	738.98	2721.81	738.98
2728.29	739.05	2732.71	739.09	2735.36	739.12	2740.79	739.17	2742.43	739.18
2743.62	739.18	2749.5	739.2	2754.52	739.22	2756.57	739.22	2759.32	739.23
2763.64	739.26	2765.42	739.27	2770.71	739.3	2775.64	739.33	2776.33	739.34
2777.79	739.34	2784.86	739.35	2787.23	739.36	2791.93	739.37	2794.95	739.38
2798.14	739.39	2799	739.39	2800	739.4	2807.07	739.42	2810.9	739.44
2814.14	739.45	2821.21	739.48	2821.81	739.49	2825.19	739.5	2828.29	739.51
2832.71	739.52	2835.36	739.53	2842.09	739.55	2842.43	739.55	2843.62	739.55
2849.5	739.56	2854.52	739.56	2856.57	739.56	2863.64	739.57	2865.42	739.57
2870.71	739.58	2874.71	739.58	2876.33	739.58	2877.79	739.59	2884.86	739.6
2887.23	739.61	2891.93	739.62	2898.14	739.63	2899	739.63	2900	739.64
2907.07	739.65	2910.9	739.65	2914.14	739.66	2921.21	739.67	2921.81	739.67
2924.37	739.67	2928.29	739.72	2932.22	739.78	2932.71	739.78	2935.36	739.79
2942.43	739.81	2943.62	739.82	2946.24	739.83	2949.5	739.86	2954.52	739.9
2956.57	739.92	2963.64	739.99	2965.42	740.01	2970.71	740.06	2976.24	740.11

2976.33	740.11	2977.79	740.07	2984.86	739.91	2987.23	739.85	2989.05	739.81
2991.93	739.8	2993.82	739.79	2997.67	739.8	2998.14	739.75	2999	739.65
3000	739.49	3007.07	738.39	3007.8	738.27	3010.9	738.66	3012.79	738.9
3014.14	739.03	3021.21	739.75	3021.81	739.81	3023.21	739.95	3024.06	740.04
3024.31	740.06	3024.32	740.06	3024.36	740.06	3024.38	740.06	3024.42	740.07
3024.48	740.07	3024.52	740.07	3024.65	740.09	3024.76	740.1	3025.14	740.13
3025.68	740.17	3026.61	740.19	3028.19	740.21	3028.29	740.21	3029.11	740.22
3030.72	740.24	3031.42	740.25	3032.67	740.26	3032.71	740.26	3033.73	740.27
3034.35	740.27	3035.36	740.27	3035.43	740.27	3035.95	740.28	3036.27	740.28
3036.85	740.28	3042.43	740.26	3043.62	740.25	3049.5	740.23	3054.52	740.21
3056.57	740.21	3056.81	740.2	3057.55	740.2	3058.41	740.2	3058.9	740.2
3060.02	740.19	3060.66	740.19	3061.74	740.19	3063.64	740.21	3064.92	740.22
3065.11	740.21	3065.27	740.2	3065.42	740.19	3065.46	740.19	3067.01	740.22
3070.18	740.29	3070.71	740.31	3070.94	740.31	3072.06	740.33	3072.85	740.35
3073.25	740.36	3073.88	740.37	3074.13	740.38	3074.55	740.39	3074.87	740.39
3075.06	740.4	3075.94	740.38	3076.11	740.4	3076.33	740.39	3077.52	740.37
3077.79	740.39	3079.2	740.53	3079.21	740.52	3084.86	740.7	3087.23	740.77
3091.93	740.92	3096.59	741.06	3098.14	741.12	3100	741.19	3107.07	741.45
3110.9	741.59	3112.58	741.65	3114.14	741.69	3121.21	741.83	3121.81	741.84
3128.29	741.97	3132.71	742.05	3135.36	742.1	3142.43	742.24	3143.62	742.27
3148.27	742.36	3149.5	742.38	3154.52	742.47	3156.57	742.5	3156.92	742.51
3163.64	742.48	3163.87	742.47	3165.42	742.46	3166.15	742.46	3170.71	742.46
3176.33	742.45	3176.39	742.45	3177.79	742.45	3184.86	742.45	3187.23	742.45
3191.93	742.45	3192.95	742.45	3193.27	742.45	3198.14	742.45	3199	742.45

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
986.4	.065	2346.4	.1	2372.74	.04	2455.66	.1	2526.4	.065

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2372.74	2455.66	0	0	.1	.3

Sediment Elevation = 699.895

SUMMARY OF MANNING'S N VALUES

River:W Chickamauga Cr

Reach	River Sta.	n1	n2	n3	n4	n5
1	722	.065	.1	.04	.065	
1	497	.065	.1	.04	.065	
1	436	Bridge				
1	375	.065	.1	.04	.1	.065
1	0	.065	.1	.04	.1	.065

SUMMARY OF REACH LENGTHS

River: W Chickamauga Cr

Reach	River Sta.	Left	Channel	Right
1	722	225	225	225
1	497	122	122	122
1	436	Bridge		
1	375	375	375	375
1	0	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: W Chickamauga Cr

Reach	River Sta.	Contr.	Expan.
1	722	.3	.5
1	497	.3	.5
1	436	Bridge	
1	375	.3	.5
1	0	.1	.3

HEC-RAS Plan: ExistBrAdjDsc River: W Chickamauga Cr Reach: 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	722	2 Year Storm	3540.00	700.31	714.25		714.53	0.000660	4.27	854.23	101.66	0.23
1	722	50 Year Storm	11700.00	700.31	720.61		721.34	0.001051	7.42	2816.27	456.00	0.32
1	722	100 Year Storm	13300.00	700.31	721.41		722.19	0.001093	7.80	3191.11	488.23	0.33
1	722	500 Year Storm	17500.00	700.31	723.28		724.18	0.001177	8.67	4172.28	581.93	0.35
1	497	2 Year Storm	3540.00	700.18	713.88	708.73	714.29	0.001217	5.17	684.32	78.31	0.31
1	497	50 Year Storm	11700.00	700.18	719.38	713.96	720.79	0.002400	9.82	1737.40	377.41	0.46
1	497	100 Year Storm	13300.00	700.18	720.14	714.77	721.62	0.002438	10.25	2025.69	396.87	0.47
1	497	500 Year Storm	17500.00	700.18	722.03	718.44	723.61	0.002400	11.01	2751.07	474.46	0.47
1	436		Bridge									
1	375	2 Year Storm	3540.00	700.11	713.83		714.03	0.000410	3.54	1002.69	95.89	0.19
1	375	50 Year Storm	11700.00	700.11	719.42		719.88	0.000713	6.10	3062.18	608.47	0.26
1	375	100 Year Storm	13300.00	700.11	720.15		720.64	0.000740	6.40	3367.73	620.89	0.27
1	375	500 Year Storm	17500.00	700.11	721.88		722.44	0.000793	7.05	4095.48	646.81	0.28
1	0	2 Year Storm	3540.00	699.90	713.59	706.51	713.83	0.000574	3.97	981.82	369.40	0.21
1	0	50 Year Storm	11700.00	699.90	719.27	711.35	719.55	0.000575	5.27	4186.12	624.60	0.23
1	0	100 Year Storm	13300.00	699.90	720.01	712.11	720.30	0.000574	5.43	4651.46	635.62	0.23
1	0	500 Year Storm	17500.00	699.90	721.76	715.99	722.06	0.000575	5.80	5788.10	667.19	0.24

HEC-RAS Plan: ExistBrAdjDsc River: W Chickamauga Cr Reach: 1

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
			(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
1	722	2 Year Storm	714.53	714.25	0.28	0.20	0.04	12.06	3525.90	2.04	101.66
1	722	50 Year Storm	721.34	720.61	0.73	0.34	0.20	1699.56	9881.34	119.11	456.00
1	722	100 Year Storm	722.19	721.41	0.78	0.35	0.21	2255.30	10889.76	154.94	488.23
1	722	500 Year Storm	724.18	723.28	0.90	0.37	0.20	3846.70	13388.84	264.46	581.93
1	497	2 Year Storm	714.29	713.88	0.42	0.03	0.01	0.00	3540.00		78.31
1	497	50 Year Storm	720.79	719.38	1.41	0.06	0.07	732.58	10959.66	7.76	377.41
1	497	100 Year Storm	721.62	720.14	1.48	0.06	0.08	1235.19	12049.17	15.64	396.87
1	497	500 Year Storm	723.61	722.03	1.58	0.07	0.13	2864.81	14580.63	54.56	474.46
1	436		Bridge								
1	375	2 Year Storm	714.03	713.83	0.19	0.18	0.01	0.02	3539.10	0.88	95.89
1	375	50 Year Storm	719.88	719.42	0.46	0.24	0.09	2544.00	9114.60	41.40	608.47
1	375	100 Year Storm	720.64	720.15	0.49	0.24	0.10	3282.88	9963.17	53.95	620.89
1	375	500 Year Storm	722.44	721.88	0.56	0.25	0.13	5353.03	12054.51	92.46	646.81
1	0	2 Year Storm	713.83	713.59	0.24			26.43	3513.48	0.09	369.40
1	0	50 Year Storm	719.55	719.27	0.28			4516.35	7153.84	29.82	624.60
1	0	100 Year Storm	720.30	720.01	0.28			5562.92	7697.02	40.06	635.62
1	0	500 Year Storm	722.06	721.76	0.30			8369.45	9058.92	71.62	667.19

HEC-RAS Plan: ExistBrAdjDsc River: W Chickamauga Cr Reach: 1

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
1	722	2 Year Storm	714.53	714.25		0.20	0.04	101.66	12.06	3525.90	2.04	4.27
1	722	50 Year Storm	721.34	720.61		0.34	0.20	456.00	1699.56	9881.34	119.11	7.42
1	722	100 Year Storm	722.19	721.41		0.35	0.21	488.23	2255.30	10889.76	154.94	7.80
1	722	500 Year Storm	724.18	723.28		0.37	0.20	581.93	3846.70	13388.84	264.46	8.67
1	497	2 Year Storm	714.29	713.88	708.73	0.03	0.01	78.31	0.00	3540.00		5.17
1	497	50 Year Storm	720.79	719.38	713.96	0.06	0.07	377.41	732.58	10959.66	7.76	9.82
1	497	100 Year Storm	721.62	720.14	714.77	0.06	0.08	396.87	1235.19	12049.17	15.64	10.25
1	497	500 Year Storm	723.61	722.03	718.44	0.07	0.13	474.46	2864.81	14580.63	54.56	11.01
1	436 BR U	2 Year Storm	714.25	713.80	708.86	0.08	0.12	74.85	0.00	3540.00		5.41
1	436 BR U	50 Year Storm	720.66	719.04	714.20	0.18	0.54	337.15	660.36	11033.71	5.93	10.52
1	436 BR U	100 Year Storm	721.48	719.73	715.04	0.19	0.58	337.38	1104.41	12185.44	10.14	11.06
1	436 BR U	500 Year Storm	723.42	721.39	718.91	0.22	0.65	312.46	2413.74	15059.49	26.77	12.28
1	436 BR D	2 Year Storm	714.05	713.83	705.90	0.01	0.01	91.07	0.03	3538.85	1.13	3.79
1	436 BR D	50 Year Storm	719.94	719.40	711.18	0.02	0.04	375.57	2394.17	9249.71	56.12	6.56
1	436 BR D	100 Year Storm	720.71	720.13	711.97	0.02	0.05	376.78	3068.57	10157.57	73.86	6.90
1	436 BR D	500 Year Storm	722.55	721.82	715.97	0.02	0.09	313.99	4603.57	12763.91	132.52	7.90
1	375	2 Year Storm	714.03	713.83		0.18	0.01	95.89	0.02	3539.10	0.88	3.54
1	375	50 Year Storm	719.88	719.42		0.24	0.09	608.47	2544.00	9114.60	41.40	6.10
1	375	100 Year Storm	720.64	720.15		0.24	0.10	620.89	3282.88	9963.17	53.95	6.40
1	375	500 Year Storm	722.44	721.88		0.25	0.13	646.81	5353.03	12054.51	92.46	7.05
1	0	2 Year Storm	713.83	713.59	706.51			369.40	26.43	3513.48	0.09	3.97
1	0	50 Year Storm	719.55	719.27	711.35			624.60	4516.35	7153.84	29.82	5.27
1	0	100 Year Storm	720.30	720.01	712.11			635.62	5562.92	7697.02	40.06	5.43
1	0	500 Year Storm	722.06	721.76	715.99			667.19	8369.45	9058.92	71.62	5.80

Plan: ExistBrAdjDsc W Chickamauga Cr 1 RS: 436 Profile: 2 Year Storm

E.G. US. (ft)	714.29	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	713.88	E.G. Elev (ft)	714.25	714.05
Q Total (cfs)	3540.00	W.S. Elev (ft)	713.80	713.83
Q Bridge (cfs)	3540.00	Crit W.S. (ft)	708.86	705.90
Q Weir (cfs)		Max Chl Dpth (ft)	13.62	13.72
Weir Sta Lft (ft)		Vel Total (ft/s)	5.41	3.78
Weir Sta Rgt (ft)		Flow Area (sq ft)	654.04	937.56
Weir Submerg		Froude # Chl	0.32	0.20
Weir Max Depth (ft)		Specif Force (cu ft)	3807.05	5986.10
Min El Weir Flow (ft)	724.34	Hydr Depth (ft)	8.74	10.30
Min El Prs (ft)	723.67	W.P. Total (ft)	98.99	127.38
Delta EG (ft)	0.27	Conv. Total (cfs)	85729.8	135421.7
Delta WS (ft)	0.04	Top Width (ft)	74.85	91.07
BR Open Area (sq ft)	2780.27	Frctn Loss (ft)	0.08	0.01
BR Open Vel (ft/s)	5.41	C & E Loss (ft)	0.12	0.01
BR Sluice Coef		Shear Total (lb/sq ft)	0.70	0.31
BR Sel Method	Energy only	Power Total (lb/ft s)	3.81	1.19

Plan: ExistBrAdjDsc W Chickamauga Cr 1 RS: 436 Profile: 50 Year Storm

E.G. US. (ft)	720.79	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	719.38	E.G. Elev (ft)	720.66	719.94
Q Total (cfs)	11700.00	W.S. Elev (ft)	719.04	719.40
Q Bridge (cfs)	11700.00	Crit W.S. (ft)	714.20	711.18
Q Weir (cfs)		Max Chl Dpth (ft)	18.86	19.29
Weir Sta Lft (ft)		Vel Total (ft/s)	7.64	4.27
Weir Sta Rgt (ft)		Flow Area (sq ft)	1532.05	2739.95
Weir Submerg		Froude # Chl	0.50	0.28
Weir Max Depth (ft)		Specif Force (cu ft)	11818.96	17293.96
Min El Weir Flow (ft)	724.34	Hydr Depth (ft)	4.54	7.30
Min El Prs (ft)	723.67	W.P. Total (ft)	405.96	511.78
Delta EG (ft)	0.91	Conv. Total (cfs)	183045.5	320779.3
Delta WS (ft)	-0.04	Top Width (ft)	337.15	375.57
BR Open Area (sq ft)	2780.27	Frctn Loss (ft)	0.18	0.02
BR Open Vel (ft/s)	7.64	C & E Loss (ft)	0.54	0.04
BR Sluice Coef		Shear Total (lb/sq ft)	0.96	0.44
BR Sel Method	Energy only	Power Total (lb/ft s)	7.35	1.90

Plan: ExistBrAdjDsc W Chickamauga Cr 1 RS: 436 Profile: 100 Year Storm

E.G. US. (ft)	721.62	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	720.14	E.G. Elev (ft)	721.48	720.71
Q Total (cfs)	13300.00	W.S. Elev (ft)	719.73	720.13
Q Bridge (cfs)	13300.00	Crit W.S. (ft)	715.04	711.97
Q Weir (cfs)		Max Chl Dpth (ft)	19.55	20.02
Weir Sta Lft (ft)		Vel Total (ft/s)	7.53	4.41
Weir Sta Rgt (ft)		Flow Area (sq ft)	1766.41	3012.95
Weir Submerg		Froude # Chl	0.51	0.29
Weir Max Depth (ft)		Specif Force (cu ft)	13577.21	19733.17
Min El Weir Flow (ft)	724.34	Hydr Depth (ft)	5.24	8.00
Min El Prs (ft)	723.67	W.P. Total (ft)	420.23	528.43
Delta EG (ft)	0.98	Conv. Total (cfs)	202753.9	354159.7
Delta WS (ft)	-0.01	Top Width (ft)	337.38	376.78
BR Open Area (sq ft)	2780.27	Frctn Loss (ft)	0.19	0.02
BR Open Vel (ft/s)	7.53	C & E Loss (ft)	0.58	0.05

Plan: ExistBrAdjDsc W Chickamauga Cr 1 RS: 436 Profile: 100 Year Storm (Continued)

BR Sluice Coef		Shear Total (lb/sq ft)	1.13	0.50
BR Sel Method	Energy only	Power Total (lb/ft s)	8.50	2.22

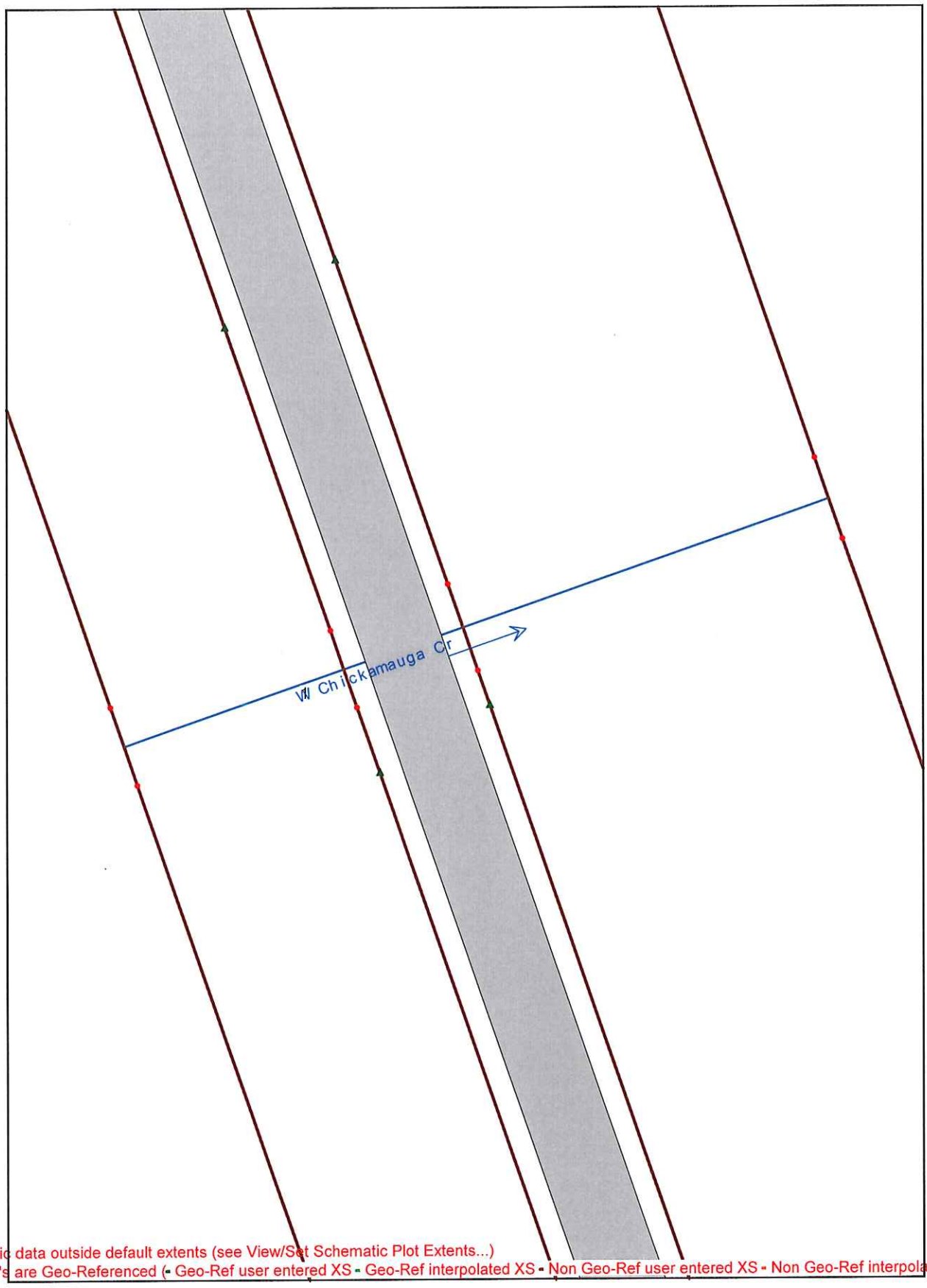
Plan: ExistBrAdjDsc W Chickamauga Cr 1 RS: 436 Profile: 500 Year Storm

E.G. US. (ft)	723.61	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	722.03	E.G. Elev (ft)	723.42	722.55
Q Total (cfs)	17500.00	W.S. Elev (ft)	721.39	721.82
Q Bridge (cfs)	17500.00	Crit W.S. (ft)	718.91	715.97
Q Weir (cfs)		Max Chl Dpth (ft)	21.21	21.71
Weir Sta Lft (ft)		Vel Total (ft/s)	7.53	4.83
Weir Sta Rgt (ft)		Flow Area (sq ft)	2323.71	3626.24
Weir Submerg		Froude # Chl	0.44	0.26
Weir Max Depth (ft)		Specif Force (cu ft)	18637.33	26469.32
Min El Weir Flow (ft)	724.34	Hydr Depth (ft)	7.44	11.55
Min El Prs (ft)	723.67	W.P. Total (ft)	490.08	631.14
Delta EG (ft)	1.17	Conv. Total (cfs)	253495.4	426372.6
Delta WS (ft)	0.15	Top Width (ft)	312.46	313.99
BR Open Area (sq ft)	2780.27	Frctn Loss (ft)	0.22	0.02
BR Open Vel (ft/s)	7.53	C & E Loss (ft)	0.65	0.09
BR Sluice Coef		Shear Total (lb/sq ft)	1.41	0.60
BR Sel Method	Energy only	Power Total (lb/ft s)	10.62	2.92

Plan: ExistBrAdjDsc W Chickamauga Cr 1 RS: 436 BR D Profile: 100 Year Storm

E.G. Elev (ft)	720.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.58	Wt. n-Val.	0.068	0.040	0.100
W.S. Elev (ft)	720.13	Reach Len. (ft)	20.00	20.00	20.00
Crit W.S. (ft)	711.97	Flow Area (sq ft)	1484.10	1471.99	56.86
E.G. Slope (ft/ft)	0.001410	Area (sq ft)	1484.10	1471.99	56.86
Q Total (cfs)	13300.00	Flow (cfs)	3068.57	10157.57	73.86
Top Width (ft)	376.78	Top Width (ft)	277.56	85.43	13.79
Vel Total (ft/s)	4.41	Avg. Vel. (ft/s)	2.07	6.90	1.30
Max Chl Dpth (ft)	20.02	Hydr. Depth (ft)	5.35	17.23	4.12
Conv. Total (cfs)	354159.7	Conv. (cfs)	81711.5	270481.3	1966.9
Length Wtd. (ft)	20.00	Wetted Per. (ft)	378.63	133.80	16.01
Min Ch El (ft)	700.11	Shear (lb/sq ft)	0.35	0.97	0.31
Alpha	1.92	Stream Power (lb/ft s)	0.71	6.68	0.41
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	25.86	13.51	0.49
C & E Loss (ft)	0.05	Cum SA (acres)	4.73	0.78	0.13

HEC-RAS OUTPUT
PROPOSED 425' BRIDGE



Some schematic data outside default extents (see View/Set Schematic Plot Extents...)
None of the XS's are Geo-Referenced (- Geo-Ref user entered XS - Geo-Ref interpolated XS - Non Geo-Ref user entered XS - Non Geo-Ref interpolated XS)

HEC-RAS HEC-RAS 5.0.6 November 2018
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
XXXXXXX  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: SR 1 over W Chickamauga Creek
Project File : SR1overWChickam.prj
Run Date and Time: 6/28/2019 9:04:59 AM

Project in English units

PLAN DATA

Plan Title: Proposed 425' Bridge
Plan File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.p32

Geometry Title: Proposed 425' Bridge GDOT Adj DSC
Geometry File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.g28

Flow Title : Flow Data Quad Map Slope
Flow File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.f02

Plan Summary Information:

Number of:	Cross Sections	= 4	Multiple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 1	Lateral Structures	=	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

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

FLOW DATA

Flow Title: Flow Data Quad Map Slope
Flow File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.f02

Flow Data (cfs)

River	Reach	RS	2 Year Storm	50 Year Storm	100 Year Storm	500 Year Storm
W Chickamauga Cr	1	722	3540	11700	13300	17500

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
W Chickamauga Cr	1	2 Year Storm		Normal S = 0.0005738
W Chickamauga Cr	1	50 Year Storm		Normal S = 0.0005738
W Chickamauga Cr	1	100 Year Storm		Normal S = 0.0005738
W Chickamauga Cr	1	500 Year Storm		Normal S = 0.0005738

GEOMETRY DATA

Geometry Title: Proposed 425' Bridge GDOT Adj DSC
Geometry File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.g28

CROSS SECTION

RIVER: W Chickamauga Cr
REACH: 1 RS: 722

INPUT
Description: Approach Section. Adjust Elevations for Quad Map Slope -0.15'
Station Elevation Data num= 500

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
980.33	755.4	986.4	755.38	995.11	755.35	996.4	755.33	1004	755.26
1006.4	755.21	1016.4	755	1026.4	754.79	1036.4	754.58	1040.28	754.5
1046.4	754.22	1051.14	754.01	1056.4	753.71	1062.49	753.36	1066.4	753.24
1076.4	752.96	1086.4	752.67	1096.4	752.39	1099.19	752.31	1106.4	751.92
1111.95	751.61	1116.4	751.52	1126.4	751.3	1136.4	751.09	1146.4	750.88
1149.7	750.81	1156.4	750.57	1166.4	750.22	1166.41	750.22	1176.4	750.12
1186.4	750.03	1196.4	749.93	1200.74	749.89	1206.4	749.87	1214.28	749.84
1216.4	749.77	1226.4	749.47	1236.4	749.16	1246.4	748.85	1251.97	748.68
1256.4	748.55	1264.97	748.3	1266.4	748.21	1276.4	747.55	1286.4	746.9
1296.4	746.25	1298.43	746.12	1306.4	745.7	1313.37	745.33	1316.4	745.12
1326.4	744.44	1336.4	743.76	1346.4	743.08	1347.52	743.01	1356.4	742.48
1363.69	742.04	1366.4	741.87	1376.4	741.23	1386.4	740.59	1394.95	740.05
1396.4	739.95	1406.4	739.23	1413.61	738.72	1416.4	738.58	1426.4	738.07
1436.4	737.56	1445.4	737.1	1446.4	737.04	1456.4	736.39	1464.51	735.86
1466.4	735.78	1476.4	735.33	1486.4	734.88	1495.08	734.49	1496.4	734.42
1506.4	733.84	1513.88	733.4	1516.4	733.31	1526.4	732.94	1532.19	732.73
1536.4	732.57	1546.4	732.21	1554.28	731.92	1556.4	731.85	1566.4	731.51
1573.29	731.28	1576.4	731.19	1586.4	730.92	1596.4	730.65	1598.86	730.58
1606.4	730.41	1616.4	730.19	1626.4	729.96	1627.65	729.94	1636.4	729.77
1646.4	729.58	1650.73	729.49	1656.4	729.38	1666.4	729.18	1668.9	729.13
1676.4	728.95	1683.84	728.76	1686.4	728.8	1696.4	728.94	1706.4	729.09
1707.93	729.11	1716.4	728.84	1721.99	728.66	1726.4	728.45	1736.4	727.98
1746.4	727.52	1756.02	727.07	1756.4	727.02	1761.52	726.41	1766.4	726.12
1776.4	725.53	1786.4	724.93	1792.82	724.55	1796.4	724.46	1799.52	724.37
1805.9	724.35	1806.4	724.34	1816.4	724.06	1826.4	723.78	1836.4	723.49
1846.4	723.21	1855.11	722.96	1856.4	722.93	1866.4	722.71	1867.48	722.68
1876.4	722.69	1886.4	722.71	1896.4	722.72	1904.59	722.73	1906.4	722.69
1910.99	722.59	1916.4	722.31	1926.4	721.79	1936.4	721.28	1938.8	721.15
1946.4	721.16	1951.69	721.17	1956.4	720.97	1966.4	720.53	1968.34	720.45
1968.41	720.44	1976.4	720.18	1984.12	719.92	1986.4	719.89	1996.4	719.73
2006.4	719.57	2008.4	719.54	2016.4	719.34	2026.4	719.08	2028.94	719.01
2036.4	718.71	2046.4	718.29	2049.85	718.15	2053.54	717.87	2056.4	717.75
2057.39	717.71	2066.4	717.38	2075.15	717.05	2076.4	716.96	2080.12	716.67
2085.94	716.47	2086.4	716.44	2089.32	716.25	2096.4	715.94	2098.97	715.83
2106.15	715.82	2106.4	715.81	2116.4	715.7	2126.4	715.59	2136.4	715.47
2146.4	715.36	2150.45	715.32	2156.4	714.99	2157.53	714.93	2162.15	715.56
2166.4	715.55	2176.4	715.51	2179.1	715.51	2184.22	715.37	2186.4	715.34
2188.2	715.32	2195.9	715.29	2196.4	715.31	2201.24	715.53	2206.08	715.97
2206.4	715.97	2216.4	715.91	2222.48	715.87	2226.4	715.9	2236.4	715.99
2243.47	716.06	2246.4	716.13	2256.4	716.38	2262.67	716.54	2266.4	716.54
2276	716.56	2286	716.79	2287.95	716.84	2296	715.72	2306	714.34
2310.91	713.66	2316	712.82	2324.84	711.36	2326	710.28	2326.64	709.69
2329.23	707.33	2334.74	706.23	2336	705.96	2346	703.87	2356	701.78
2362.98	700.31	2366	700.73	2376	702.11	2386	703.5	2396	704.88
2396.37	704.93	2402.29	705.67	2402.58	707.05	2404.51	712.27	2406	713.04
2416	718.22	2422.46	721.57	2424.21	722.47	2426	723.4	2430.48	725.71
2432.63	726.29	2436	727.52	2456.4	727.56	2457.47	727.85	2460.57	728.4
2462.37	728.82	2466.4	729.18	2473.71	729.85	2476.4	730.17	2486.4	731.37
2496.4	732.57	2504.81	733.57	2506.4	733.65	2516.4	734.13	2522.55	734.42
2526.4	734.55	2530.87	734.69	2536.4	735.44	2541.37	736.1	2546.4	736.68
2556.4	737.81	2556.87	737.87	2559.35	738	2563.49	738.29	2566.4	738.44

2566.55	738.45	2576.4	739.11	2586.4	739.78	2596.4	740.46	2599	740.63
2600	740.7	2608.89	741.26	2610	741.38	2610.05	741.39	2612.66	741.5
2613.19	741.53	2619.48	741.91	2619.79	741.93	2626.39	742.33	2628.71	742.47
2632.99	742.72	2637.95	743.02	2639.06	743.08	2639.59	743.1	2646.19	743.34
2647.18	743.37	2649.47	743.45	2651	743.47	2652.79	743.54	2656.42	743.66
2659.4	743.76	2665.65	743.97	2666	743.98	2672.6	744.2	2674.89	744.28
2679.2	744.42	2684.12	744.58	2685.8	744.64	2689.64	744.76	2692.07	744.84
2692.4	744.86	2693.35	744.89	2693.81	744.9	2699	745	2700	745.02
2706.6	745.16	2709.23	745.21	2713.2	745.29	2718.47	745.39	2719.8	745.42
2726.4	745.54	2727.7	745.57	2729.07	745.6	2730.75	745.68	2733	745.71
2736.94	745.76	2739.6	745.8	2743.08	745.84	2746.17	745.86	2746.2	745.86
2752.8	745.89	2755.41	745.9	2759.4	745.92	2764.64	745.94	2766	745.95
2767.04	745.95	2772.6	745.95	2773.88	745.95	2779.2	745.95	2780.8	745.96
2783.11	745.82	2783.33	745.81	2785.8	745.8	2786.3	745.8	2786.87	745.82
2787.42	745.82	2792.34	745.71	2792.4	745.71	2795.32	745.64	2795.48	745.63
2795.93	745.62	2797.82	745.58	2799	745.58	2800	745.55	2806.6	745.36
2808.07	745.32	2809.23	745.36	2812.44	745.46	2812.91	745.33	2813.2	745.34
2815.5	745.35	2818.47	745.33	2819.8	745.32	2826.4	745.29	2827.27	745.29
2827.7	745.23	2830.5	744.87	2833	744.83	2836.94	744.77	2839.6	744.72
2840.94	744.7	2846.17	744.63	2846.2	744.63	2852.8	744.54	2855.41	744.51
2859.4	744.45	2864.64	744.39	2866	744.37	2867.17	744.35	2872.6	744.25
2873.88	744.23	2875.07	744.2	2879.2	744.06	2880.1	744.03	2883.11	744.01
2885.14	743.99	2885.8	743.98	2892.34	743.87	2892.4	743.87	2893.23	743.86
2899	743.52	2900	743.35	2901.06	743.18	2901.06	743.16	2901.27	743.17
2901.43	743.14	2903.04	743.14	2906.6	743.11	2909.23	743.08	2909.87	743.07
2913.2	743.33	2914.87	743.46	2918.47	743.54	2919.8	743.58	2926.4	743.74
2927.7	743.77	2928.94	743.8	2933	743.89	2936.94	743.98	2939.6	744.04
2946.17	744.19	2946.2	744.19	2952.8	744.33	2955.41	744.39	2958.33	744.46
2958.88	744.45	2959.4	744.45	2959.46	744.45	2959.75	744.44	2960.36	744.44
2960.67	744.43	2961.08	744.43	2961.14	744.44	2961.52	744.53	2961.75	744.58
2962.18	744.66	2962.38	744.7	2962.75	744.77	2963.09	744.83	2963.3	744.87
2963.69	744.93	2963.96	744.97	2964.13	744.99	2964.45	745.03	2964.64	745.05
2964.76	745.07	2964.89	745.08	2965.05	745.1	2965.13	745.1	2965.32	745.12
2965.58	745.13	2965.7	745.14	2965.95	745.15	2966	745.15	2966.08	745.15
2966.26	745.16	2966.53	745.15	2966.76	745.15	2966.91	745.14	2967.01	745.14
2967.22	745.12	2967.38	745.11	2967.48	745.1	2967.71	745.07	2967.94	745.05
2968.1	745.02	2968.32	744.99	2968.44	744.97	2968.71	744.93	2968.86	744.9
2969.17	744.84	2969.33	744.81	2969.6	744.76	2970.03	744.66	2970.54	744.54
2970.82	744.47	2970.96	744.44	2971.1	744.44	2971.66	744.45	2972.19	744.46
2972.53	744.46	2972.6	744.46	2973.17	744.47	2973.61	744.48	2973.88	744.48
2973.9	744.48	2974.42	744.49	2974.67	744.5	2979.2	744.5	2983.11	744.51
2985.8	744.51	2992.34	744.52	2992.4	744.52	2993.78	744.52	2999	744.51
3000	744.51	3006.6	744.51	3009.23	744.5	3011.26	744.5	3011.39	744.5
3011.58	744.53	3013.2	744.53	3015.01	744.52	3015.54	744.5	3015.69	744.5
3018.47	744.7	3019.8	744.8	3021.64	744.93	3026.4	745.21	3027.7	745.29
3027.87	745.3	3033	745.4	3033.41	745.41	3036.44	745.41	3036.94	745.4
3039.6	745.4	3042.29	745.39	3044.61	745.35	3046.17	745.3	3046.2	745.3
3046.7	745.28	3047.49	745.06	3051.45	745.33	3051.6	745.32	3052.8	745.33
3055.41	745.35	3058.91	745.38	3059.4	745.41	3064.64	745.7	3066	745.77

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
980.33	.065	1666.4	.1	2324.84	.04	2404.51	.065

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2324.84	2404.51	225	225	.3	.5

CROSS SECTION

RIVER: W Chickamauga Cr
REACH: 1 RS: 497

INPUT
Description: Upstream Face of Existing and Proposed Bridges. Adjust Elevations for Quad Map Slope +0.07' Adjust Again +1.64'

Station Elevation Data num= 500

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
980.33	756.69	986.4	756.67	995.11	756.64	996.4	756.62	1004	756.55
1006.4	756.5	1016.4	756.29	1026.4	756.08	1036.4	755.87	1040.28	755.79
1046.4	755.51	1051.14	755.3	1056.4	755	1062.49	754.65	1066.4	754.53
1076.4	754.25	1086.4	753.96	1096.4	753.68	1099.19	753.6	1106.4	753.21
1111.95	752.9	1116.4	752.81	1126.4	752.59	1136.4	752.38	1146.4	752.17
1149.7	752.1	1156.4	751.86	1166.4	751.51	1166.41	751.51	1176.4	751.41
1186.4	751.32	1196.4	751.22	1200.74	751.18	1206.4	751.16	1214.28	751.13
1216.4	751.06	1226.4	750.76	1236.4	750.45	1246.4	750.14	1251.97	749.97
1256.4	749.84	1264.97	749.59	1266.4	749.5	1276.4	748.84	1286.4	748.19
1296.4	747.54	1298.43	747.41	1306.4	746.99	1313.37	746.62	1316.4	746.41
1326.4	745.73	1336.4	745.05	1346.4	744.37	1347.52	744.3	1356.4	743.77

1363.69	743.33	1366.4	743.16	1376.4	742.52	1386.4	741.88	1394.95	741.34
1396.4	741.24	1406.4	740.52	1413.61	740.01	1416.4	739.87	1426.4	739.36
1436.4	738.85	1445.4	738.39	1446.4	738.33	1456.4	737.68	1464.51	737.15
1466.4	737.07	1476.4	736.62	1486.4	736.17	1495.08	735.78	1496.4	735.71
1506.4	735.13	1513.88	734.69	1516.4	734.6	1526.4	734.23	1532.19	734.02
1536.4	733.86	1546.4	733.5	1554.28	733.21	1556.4	733.14	1566.4	732.8
1573.29	732.57	1576.4	732.48	1586.4	732.21	1596.4	731.94	1598.86	731.87
1606.4	731.7	1616.4	731.48	1626.4	731.25	1627.65	731.23	1636.4	731.06
1646.4	730.87	1650.73	730.78	1656.4	730.67	1666.4	730.47	1668.9	730.42
1676.4	730.24	1683.84	730.05	1686.4	730.09	1696.4	730.23	1706.4	730.38
1707.93	730.4	1716.4	730.13	1721.99	729.95	1726.4	729.74	1736.4	729.27
1746.4	728.81	1756.02	728.36	1756.4	728.31	1761.52	727.7	1766.4	727.41
1776.4	726.82	1786.4	726.22	1792.82	725.84	1796.4	725.75	1799.52	725.66
1805.9	725.64	1806.4	725.63	1816.4	725.35	1826.4	725.07	1836.4	724.78
1846.4	724.5	1855.11	724.25	1856.4	724.22	1866.4	724	1867.48	723.97
1876.4	723.98	1886.4	724	1896.4	724.01	1904.59	724.02	1906.4	723.98
1910.99	723.88	1916.4	723.6	1926.4	723.08	1936.4	722.57	1938.8	722.44
1946.4	722.45	1951.69	722.46	1956.4	722.26	1966.4	721.82	1968.34	721.74
1968.41	721.73	1976.4	721.47	1984.12	721.21	1986.4	721.18	1996.4	721.02
2006.4	720.86	2008.4	720.83	2016.4	720.63	2026.4	720.37	2028.94	720.3
2036.4	720	2046.4	719.58	2049.85	719.44	2053.54	719.16	2056.4	719.04
2057.39	719	2066.4	718.67	2075.15	718.34	2076.4	718.25	2080.12	717.96
2085.94	717.76	2086.4	717.73	2089.32	717.54	2096.4	717.23	2098.97	717.12
2106.15	717.11	2106.4	717.1	2116.4	716.99	2126.4	716.88	2136.4	716.76
2146.4	716.65	2150.45	716.61	2156.4	716.28	2157.53	716.22	2162.15	716.85
2166.4	716.84	2176.4	716.8	2179.1	716.8	2184.22	716.66	2186.4	716.63
2188.2	716.61	2195.9	716.58	2196.4	716.6	2201.24	716.82	2206.08	717.26
2206.4	717.26	2216.4	717.2	2222.48	717.16	2226.4	717.19	2236.4	717.28
2243.47	717.35	2246.4	717.42	2256.4	717.67	2262.67	717.83	2266.4	717.83
2276.4	717.83	2286.4	717.83	2287.28	717.83	2296.4	717.82	2306.4	717.81
2308.98	717.8	2316.4	717.67	2326.4	717.5	2328.2	717.46	2336.4	715.38
2339.07	714.7	2344.26	713.74	2345.14	711.69	2346.4	709.12	2346.52	708.87
2356.4	706.9	2366.4	704.9	2373.78	703.43	2375.36	703.11	2376.4	702.9
2386.4	700.89	2389.94	700.18	2396.4	702.22	2406.4	705.37	2411.76	707.06
2416.4	708.68	2420.51	710.12	2421.3	712.44	2422.93	716.87	2426.4	718.58
2429.3	720.01	2436.4	722.15	2438.26	722.71	2446.4	725.61	2452.6	727.83
2456.4	728.85	2457.47	729.14	2460.57	729.69	2462.37	730.11	2466.4	730.47
2473.71	731.14	2476.4	731.46	2486.4	732.66	2496.4	733.86	2504.81	734.86
2506.4	734.94	2516.4	735.42	2522.55	735.71	2526.4	735.84	2530.87	735.98
2536.4	736.73	2541.37	737.39	2546.4	737.97	2556.4	739.1	2556.87	739.16
2559.35	739.29	2563.49	739.58	2566.4	739.73	2566.55	739.74	2576.4	740.4
2586.4	741.07	2596.4	741.75	2599	741.92	2600	741.99	2608.89	742.55
2610	742.67	2610.05	742.68	2612.66	742.79	2613.19	742.82	2619.48	743.2
2619.79	743.22	2626.39	743.62	2628.71	743.76	2632.99	744.01	2637.95	744.31
2639.06	744.37	2639.59	744.39	2646.19	744.63	2647.18	744.66	2649.47	744.74
2651	744.76	2652.79	744.83	2656.42	744.95	2659.4	745.05	2665.65	745.26
2666	745.27	2672.6	745.49	2674.89	745.57	2679.2	745.71	2684.12	745.87
2685.8	745.93	2689.64	746.05	2692.07	746.13	2692.4	746.15	2693.35	746.18
2693.81	746.19	2699	746.29	2700	746.31	2706.6	746.45	2709.23	746.5
2713.2	746.58	2718.47	746.68	2719.8	746.71	2726.4	746.83	2727.7	746.86
2729.07	746.89	2730.75	746.97	2733	747	2736.94	747.05	2739.6	747.09
2743.08	747.13	2746.17	747.15	2746.2	747.15	2752.8	747.18	2755.41	747.19
2759.4	747.21	2764.64	747.23	2766	747.24	2767.04	747.24	2772.6	747.24
2773.88	747.24	2779.2	747.24	2780.8	747.25	2783.11	747.11	2783.33	747.1
2785.8	747.09	2786.3	747.09	2786.87	747.11	2787.42	747.11	2792.34	747
2792.4	747	2795.32	746.93	2795.48	746.92	2795.93	746.91	2797.82	746.87
2799	746.87	2800	746.84	2806.6	746.65	2808.07	746.61	2809.23	746.65
2812.44	746.75	2812.91	746.62	2813.2	746.63	2815.5	746.64	2818.47	746.62
2819.8	746.61	2826.4	746.58	2827.27	746.58	2827.7	746.52	2830.5	746.16
2833	746.12	2836.94	746.06	2839.6	746.01	2840.94	745.99	2846.17	745.92
2846.2	745.92	2852.8	745.83	2855.41	745.8	2859.4	745.74	2864.64	745.68
2866	745.66	2867.17	745.64	2872.6	745.54	2873.88	745.52	2875.07	745.49
2879.2	745.35	2880.1	745.32	2883.11	745.3	2885.14	745.28	2885.8	745.27
2892.34	745.16	2892.4	745.16	2893.23	745.15	2899	744.81	2900	744.64
2901.06	744.47	2901.06	744.45	2901.27	744.46	2901.43	744.43	2903.04	744.43
2906.6	744.4	2909.23	744.37	2909.87	744.36	2913.2	744.62	2914.87	744.75
2918.47	744.83	2919.8	744.87	2926.4	745.03	2927.7	745.06	2928.94	745.09
2933	745.18	2936.94	745.27	2939.6	745.33	2946.17	745.48	2946.2	745.48
2952.8	745.62	2955.41	745.68	2958.33	745.75	2958.88	745.74	2959.4	745.74
2959.46	745.74	2959.75	745.73	2960.36	745.73	2960.67	745.72	2961.08	745.72
2961.14	745.73	2961.52	745.82	2961.75	745.87	2962.18	745.95	2962.38	745.99
2962.75	746.06	2963.09	746.12	2963.3	746.16	2963.69	746.22	2963.96	746.26
2964.13	746.28	2964.45	746.32	2964.64	746.34	2964.76	746.36	2964.89	746.37
2965.05	746.39	2965.13	746.39	2965.32	746.41	2965.58	746.42	2965.7	746.43
2965.95	746.44	2966	746.44	2966.08	746.44	2966.26	746.45	2966.53	746.44
2966.76	746.44	2966.91	746.43	2967.01	746.43	2967.22	746.41	2967.38	746.4
2967.48	746.39	2967.71	746.36	2967.94	746.34	2968.1	746.31	2968.32	746.28
2968.44	746.26	2968.71	746.22	2968.86	746.19	2969.17	746.13	2969.33	746.1
2969.6	746.05	2970.03	745.95	2970.54	745.83	2970.82	745.76	2970.96	745.73

2971.1	745.73	2971.66	745.74	2972.19	745.75	2972.53	745.75	2972.6	745.75
2973.17	745.76	2973.61	745.77	2973.88	745.77	2973.9	745.77	2974.42	745.78
2974.67	745.79	2979.2	745.79	2983.11	745.8	2985.8	745.8	2992.34	745.81
2992.4	745.81	2993.78	745.81	2999	745.8	3000	745.8	3006.6	745.8
3009.23	745.79	3011.26	745.79	3011.39	745.79	3011.58	745.82	3013.2	745.82
3015.01	745.81	3015.54	745.79	3015.69	745.79	3018.47	745.99	3019.8	746.09
3021.64	746.22	3026.4	746.5	3027.7	746.58	3027.87	746.59	3033	746.69
3033.41	746.7	3036.44	746.7	3036.94	746.69	3039.6	746.69	3042.29	746.68
3044.61	746.64	3046.17	746.59	3046.2	746.59	3046.7	746.57	3047.49	746.35
3051.45	746.62	3051.6	746.61	3052.8	746.62	3055.41	746.64	3058.91	746.67

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
980.33	.065	1683.84	.1	2344.26	.04	2422.93	.065

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2344.26	2422.93	122	122	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
980.33	2025	726.46	T
2490	3058.91	726.46	T

Sediment Elevation = 700.18

BRIDGE

RIVER: W Chickamauga Cr
REACH: 1 RS: 436

INPUT
Description: Proposed 415' Bridge
Distance from Upstream XS = 22
Deck/Roadway Width = 78
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 29

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1050	741.55	0	1100	741.11	0	1200	739.91	0
1300	738.26	0	1400	736.18	0	1500	734.04	0
1600	731.89	0	1700	729.74	0	1800	727.95	0
1900	727.03	0	2000	726.98	0	2045	726.46	0
2045	726.46	723.13	2085	726.83	723.5	2085	726.83	722.83
2145	727.43	723.43	2205	728.03	724.03	2265	728.63	724.63
2325	729.23	725.23	2325	729.23	722.23	2470	730.68	723.68
2470	730.68	0	2500	731.76	0	2600	732.76	0
2700	734.09	0	2800	736.22	0	2900	739.16	0
3000	742.39	0	3100	745.28	0			

Upstream Bridge Cross Section Data
Station Elevation Data num= 500

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
980.33	756.69	986.4	756.67	995.11	756.64	996.4	756.62	1004	756.55
1006.4	756.5	1016.4	756.29	1026.4	756.08	1036.4	755.87	1040.28	755.79
1046.4	755.51	1051.14	755.3	1056.4	755	1062.49	754.65	1066.4	754.53
1076.4	754.25	1086.4	753.96	1096.4	753.68	1099.19	753.6	1106.4	753.21
1111.95	752.9	1116.4	752.81	1126.4	752.59	1136.4	752.38	1146.4	752.17
1149.7	752.1	1156.4	751.86	1166.4	751.51	1166.41	751.51	1176.4	751.41
1186.4	751.32	1196.4	751.22	1200.74	751.18	1206.4	751.16	1214.28	751.13
1216.4	751.06	1226.4	750.76	1236.4	750.45	1246.4	750.14	1251.97	749.97
1256.4	749.84	1264.97	749.59	1266.4	749.5	1276.4	748.84	1286.4	748.19
1296.4	747.54	1298.43	747.41	1306.4	746.99	1313.37	746.62	1316.4	746.41
1326.4	745.73	1336.4	745.05	1346.4	744.37	1347.52	744.3	1356.4	743.77
1363.69	743.33	1366.4	743.16	1376.4	742.52	1386.4	741.88	1394.95	741.34
1396.4	741.24	1406.4	740.52	1413.61	740.01	1416.4	739.87	1426.4	739.36
1436.4	738.85	1445.4	738.39	1446.4	738.33	1456.4	737.68	1464.51	737.15
1466.4	737.07	1476.4	736.62	1486.4	736.17	1495.08	735.78	1496.4	735.71
1506.4	735.13	1513.88	734.69	1516.4	734.6	1526.4	734.23	1532.19	734.02
1536.4	733.86	1546.4	733.5	1554.28	733.21	1556.4	733.14	1566.4	732.8
1573.29	732.57	1576.4	732.48	1586.4	732.21	1596.4	731.94	1598.86	731.87
1606.4	731.7	1616.4	731.48	1626.4	731.25	1627.65	731.23	1636.4	731.06
1646.4	730.87	1650.73	730.78	1656.4	730.67	1666.4	730.47	1668.9	730.42
1676.4	730.24	1683.84	730.05	1686.4	730.09	1696.4	730.23	1706.4	730.38
1707.93	730.4	1716.4	730.13	1721.99	729.95	1726.4	729.74	1736.4	729.27
1746.4	728.81	1756.02	728.36	1756.4	728.31	1761.52	727.7	1766.4	727.41
1776.4	726.82	1786.4	726.22	1792.82	725.84	1796.4	725.75	1799.52	725.66
1805.9	725.64	1806.4	725.63	1816.4	725.35	1826.4	725.07	1836.4	724.78
1846.4	724.5	1855.11	724.25	1856.4	724.22	1866.4	724	1867.48	723.97
1876.4	723.98	1886.4	724	1896.4	724.01	1904.59	724.02	1906.4	723.98
1910.99	723.88	1916.4	723.6	1926.4	723.08	1936.4	722.57	1938.8	722.44

1946.4	722.45	1951.69	722.46	1956.4	722.26	1966.4	721.82	1968.34	721.74
1968.41	721.73	1976.4	721.47	1984.12	721.21	1986.4	721.18	1996.4	721.02
2006.4	720.86	2008.4	720.83	2016.4	720.63	2026.4	720.37	2028.94	720.3
2036.4	720	2046.4	719.58	2049.85	719.44	2053.54	719.16	2056.4	719.04
2057.39	719	2066.4	718.67	2075.15	718.34	2076.4	718.25	2080.12	717.96
2085.94	717.76	2086.4	717.73	2089.32	717.54	2096.4	717.23	2098.97	717.12
2106.15	717.11	2106.4	717.1	2116.4	716.99	2126.4	716.88	2136.4	716.76
2146.4	716.65	2150.45	716.61	2156.4	716.28	2157.53	716.22	2162.15	716.85
2166.4	716.84	2176.4	716.8	2179.1	716.8	2184.22	716.66	2186.4	716.63
2188.2	716.61	2195.9	716.58	2196.4	716.6	2201.24	716.82	2206.08	717.26
2206.4	717.26	2216.4	717.2	2222.48	717.16	2226.4	717.19	2236.4	717.28
2243.47	717.35	2246.4	717.42	2256.4	717.67	2262.67	717.83	2266.4	717.83
2276.4	717.83	2286.4	717.83	2287.28	717.83	2296.4	717.82	2306.4	717.81
2308.98	717.8	2316.4	717.67	2326.4	717.5	2328.2	717.46	2336.4	715.38
2339.07	714.7	2344.26	713.74	2345.14	711.69	2346.4	709.12	2346.52	708.87
2356.4	706.9	2366.4	704.9	2373.78	703.43	2375.36	703.11	2376.4	702.9
2386.4	700.89	2389.94	700.18	2396.4	702.22	2406.4	705.37	2411.76	707.06
2416.4	708.68	2420.51	710.12	2421.3	712.44	2422.93	716.87	2426.4	718.58
2429.3	720.01	2436.4	722.15	2438.26	722.71	2446.4	725.61	2452.6	727.83
2456.4	728.85	2457.47	729.14	2460.57	729.69	2462.37	730.11	2466.4	730.47
2473.71	731.14	2476.4	731.46	2486.4	732.66	2496.4	733.86	2504.81	734.86
2506.4	734.94	2516.4	735.42	2522.55	735.71	2526.4	735.84	2530.87	735.98
2536.4	736.73	2541.37	737.39	2546.4	737.97	2556.4	739.1	2556.87	739.16
2559.35	739.29	2563.49	739.58	2566.4	739.73	2566.55	739.74	2576.4	740.4
2586.4	741.07	2596.4	741.75	2599	741.92	2600	741.99	2608.89	742.55
2610	742.67	2610.05	742.68	2612.66	742.79	2613.19	742.82	2619.48	743.2
2619.79	743.22	2626.39	743.62	2628.71	743.76	2632.99	744.01	2637.95	744.31
2639.06	744.37	2639.59	744.39	2646.19	744.63	2647.18	744.66	2649.47	744.74
2651	744.76	2652.79	744.83	2656.42	744.95	2659.4	745.05	2665.65	745.26
2666	745.27	2672.6	745.49	2674.89	745.57	2679.2	745.71	2684.12	745.87
2685.8	745.93	2689.64	746.05	2692.07	746.13	2692.4	746.15	2693.35	746.18
2693.81	746.19	2699	746.29	2700	746.31	2706.6	746.45	2709.23	746.5
2713.2	746.58	2718.47	746.68	2719.8	746.71	2726.4	746.83	2727.7	746.86
2729.07	746.89	2730.75	746.97	2733	747	2736.94	747.05	2739.6	747.09
2743.08	747.13	2746.17	747.15	2746.2	747.15	2752.8	747.18	2755.41	747.19
2759.4	747.21	2764.64	747.23	2766	747.24	2767.04	747.24	2772.6	747.24
2773.88	747.24	2779.2	747.24	2780.8	747.25	2783.11	747.11	2783.33	747.1
2785.8	747.09	2786.3	747.09	2786.87	747.11	2787.42	747.11	2792.34	747
2792.4	747	2795.32	746.93	2795.48	746.92	2795.93	746.91	2797.82	746.87
2799	746.87	2800	746.84	2806.6	746.65	2808.07	746.61	2809.23	746.65
2812.44	746.75	2812.91	746.62	2813.2	746.63	2815.5	746.64	2818.47	746.62
2819.8	746.61	2826.4	746.58	2827.27	746.58	2827.7	746.52	2830.5	746.16
2833	746.12	2836.94	746.06	2839.6	746.01	2840.94	745.99	2846.17	745.92
2846.2	745.92	2852.8	745.83	2855.41	745.8	2859.4	745.74	2864.64	745.68
2866	745.66	2867.17	745.64	2872.6	745.54	2873.88	745.52	2875.07	745.49
2879.2	745.35	2880.1	745.32	2883.11	745.3	2885.14	745.28	2885.8	745.27
2892.34	745.16	2892.4	745.16	2893.23	745.15	2899	744.81	2900	744.64
2901.06	744.47	2901.06	744.45	2901.27	744.46	2901.43	744.43	2903.04	744.43
2906.6	744.4	2909.23	744.37	2909.87	744.36	2913.2	744.62	2914.87	744.75
2918.47	744.83	2919.8	744.87	2926.4	745.03	2927.7	745.06	2928.94	745.09
2933	745.18	2936.94	745.27	2939.6	745.33	2946.17	745.48	2946.2	745.48
2952.8	745.62	2955.41	745.68	2958.33	745.75	2958.88	745.74	2959.4	745.74
2959.46	745.74	2959.75	745.73	2960.36	745.73	2960.67	745.72	2961.08	745.72
2961.14	745.73	2961.52	745.82	2961.75	745.87	2962.18	745.95	2962.38	745.99
2962.75	746.06	2963.09	746.12	2963.3	746.16	2963.69	746.22	2963.96	746.26
2964.13	746.28	2964.45	746.32	2964.64	746.34	2964.76	746.36	2964.89	746.37
2965.05	746.39	2965.13	746.39	2965.32	746.41	2965.58	746.42	2965.7	746.43
2965.95	746.44	2966	746.44	2966.08	746.44	2966.26	746.45	2966.53	746.44
2966.76	746.44	2966.91	746.43	2967.01	746.43	2967.22	746.41	2967.38	746.4
2967.48	746.39	2967.71	746.36	2967.94	746.34	2968.1	746.31	2968.32	746.28
2968.44	746.26	2968.71	746.22	2968.86	746.19	2969.17	746.13	2969.33	746.1
2969.6	746.05	2970.03	745.95	2970.54	745.83	2970.82	745.76	2970.96	745.73
2971.1	745.73	2971.66	745.74	2972.19	745.75	2972.53	745.75	2972.6	745.75
2973.17	745.76	2973.61	745.77	2973.88	745.77	2973.9	745.77	2974.42	745.78
2974.67	745.79	2979.2	745.79	2983.11	745.8	2985.8	745.8	2992.34	745.81
2992.4	745.81	2993.78	745.81	2999	745.8	3000	745.8	3006.6	745.8
3009.23	745.79	3011.26	745.79	3011.39	745.79	3011.58	745.82	3013.2	745.82
3015.01	745.81	3015.54	745.79	3015.69	745.79	3018.47	745.99	3019.8	746.09
3021.64	746.22	3026.4	746.5	3027.7	746.58	3027.87	746.59	3033	746.69
3033.41	746.7	3036.44	746.7	3036.94	746.69	3039.6	746.69	3042.29	746.68
3044.61	746.64	3046.17	746.59	3046.2	746.59	3046.7	746.57	3047.49	746.35
3051.45	746.62	3051.6	746.61	3052.8	746.62	3055.41	746.64	3058.91	746.67

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
980.33	.065	1683.84	.1	2344.26	.04	2422.93	.065

Bank Sta: Left	Right	Coeff Contr.	Expan.
2344.26	2422.93	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
980.33	2025	726.46	T
2490	3058.91	726.46	T

Sediment Elevation = 700.18

Downstream Deck/Roadway Coordinates num= 29

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1050	741.55	0	1100	741.11	0	1200	739.91	0
1300	738.26	0	1400	736.18	0	1500	734.04	0
1600	731.89	0	1700	729.74	0	1800	727.95	0
1900	727.03	0	2000	726.98	0	2045	726.46	0
2045	726.46	723.13	2085	726.83	723.5	2085	726.83	722.83
2145	727.43	723.43	2205	728.03	724.03	2265	728.63	724.63
2325	729.23	725.23	2325	729.23	722.23	2470	730.68	723.68
2470	730.68	0	2500	731.76	0	2600	732.76	0
2700	734.09	0	2800	736.22	0	2900	739.16	0
3000	742.39	0	3100	745.28	0			

Downstream Bridge Cross Section Data
Station Elevation Data num= 483

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
986.4	749.4	994.83	749.38	996.4	749.39	1006.4	749.43	1016.4	749.47
1017.31	749.48	1026.4	749.54	1036.4	749.61	1036.84	749.62	1046.4	749.36
1056.4	749.08	1066.4	748.81	1068.39	748.75	1076.4	748.52	1086.4	748.24
1092.59	748.06	1096.4	747.88	1106.4	747.39	1116.4	746.91	1119.01	746.79
1126.4	746.71	1136.4	746.59	1145.06	746.5	1146.4	746.46	1156.4	746.14
1166.4	745.83	1176.4	745.51	1176.72	745.5	1186.4	745.15	1196.4	744.79
1199.54	744.67	1206.4	744.33	1216.4	743.82	1225.98	743.33	1226.4	743.29
1236.4	742.33	1239.75	742.01	1246.4	741.77	1256.4	741.4	1266.4	741.03
1275.6	740.69	1276.4	740.65	1286.4	740.17	1291.42	739.93	1296.4	739.51
1306.4	738.68	1316.4	737.85	1325.08	737.13	1326.4	737.08	1335.41	736.71
1336.4	736.65	1346.4	736.02	1356.4	735.39	1366.4	734.76	1372.1	734.4
1376.4	734.15	1381.61	733.84	1386.4	733.65	1396.4	733.26	1406.4	732.87
1416.4	732.47	1417.59	732.43	1426.4	732.1	1427.61	732.06	1436.4	731.81
1446.4	731.53	1456.4	731.25	1466.4	730.97	1467.33	730.95	1474.86	730.74
1476.4	730.7	1486.4	730.43	1496.4	730.17	1506.4	729.9	1516.4	729.64
1517.74	729.6	1525.79	729.4	1526.4	729.39	1536.4	729.28	1546.4	729.16
1556.4	729.05	1561.87	728.99	1566.4	728.86	1573.65	728.66	1576.4	728.64
1586.4	728.57	1596.4	728.5	1606.4	728.43	1609.42	728.41	1616.4	728.47
1622.69	728.52	1626.4	728.56	1636.4	728.66	1646.4	728.75	1656.4	728.85
1656.71	728.85	1666.4	728.74	1670.12	728.7	1676.4	728.71	1686.4	728.73
1696.4	728.74	1703.47	728.76	1706.4	728.64	1716.29	728.23	1716.4	728.22
1726.4	727.81	1736.4	727.39	1746.4	726.97	1749.28	726.85	1756.4	726.35
1766.4	725.63	1766.7	725.61	1776.4	724.93	1786.4	724.22	1796.4	723.51
1803.94	722.98	1806.4	722.86	1816.4	722.4	1819.54	722.25	1826.4	721.73
1836.4	720.98	1846.4	720.22	1851.37	719.84	1856.4	719.55	1857.57	719.49
1866.4	718.83	1876.4	718.09	1886.4	717.35	1888.96	717.16	1896.4	716.81
1905.16	716.39	1906.4	716.36	1916.4	716.1	1925.28	715.88	1926.4	715.85
1936.4	715.6	1946.4	715.34	1949.51	715.26	1956.4	715.14	1966.4	714.96
1976.4	714.79	1984.96	714.63	1986.4	714.61	1996.4	714.48	1998.7	714.45
2006.4	714.45	2013.23	714.45	2016.4	714.43	2025.6	714.37	2025.61	714.37
2026.4	714.39	2036.4	714.57	2044.85	714.73	2046.4	714.7	2056.4	714.52
2065.47	714.35	2066.4	714.35	2076.4	714.34	2077.53	714.34	2086.4	714.43
2090.33	714.46	2096.4	714.42	2106.4	714.36	2116.4	714.3	2126.06	714.24
2126.4	714.24	2136.4	714.19	2142.48	714.16	2146.4	714.18	2156.4	714.24
2166.1	714.29	2166.4	714.29	2176.4	714.51	2186.4	714.72	2189.74	714.79
2196.4	714.75	2206.4	714.7	2211.18	714.67	2216.4	714.67	2226.4	714.68
2233.17	714.68	2236.4	714.74	2246.4	714.93	2256.4	715.12	2260.72	715.2
2266.4	715.36	2276.4	715.65	2277.44	715.68	2284.4	715.55	2286.4	715.44
2294.35	714.99	2296.4	714.99	2306.4	715.02	2313.3	715.04	2316.4	714.96
2326.4	714.71	2336.4	714.46	2346.4	714.22	2356.4	713.97	2362.97	713.8
2365.91	713.65	2366.4	712.58	2368.58	707.78	2369.05	706.86	2376.4	704.81
2386.4	702.02	2390.45	700.88	2396.4	699.27	2406.4	696.55	2411.26	695.23
2416.4	696.68	2426.4	699.5	2436.4	702.33	2446.4	705.15	2446.69	705.24
2451.22	706.47	2451.84	707.57	2454.34	712.06	2456.4	713	2456.64	713.1
2457.68	713.92	2458.65	714.46	2466.4	719.09	2469.01	720.65	2475.1	724.1
2476.4	724.17	2483.89	724.56	2486.4	724.7	2496.4	725.24	2497.91	725.32
2500.97	725.16	2505.97	725.69	2506.4	725.71	2507.98	725.77	2515.36	726.78
2516.4	727.13	2525.69	730.21	2526.4	730.46	2527.8	730.97	2536.4	732.84
2546.4	735.01	2552.2	736.27	2556.4	737.03	2566.4	738.85	2566.93	738.95
2576.4	739.9	2582.12	740.48	2586.4	740.67	2596.4	741.11	2599	741.22
2600	741.26	2600.21	741.27	2610	741.42	2613.19	741.47	2616.95	741.53
2620.34	741.46	2620.62	741.46	2627.49	741.32	2631.52	741.24	2633.81	741.2
2634.64	741.16	2640.26	740.9	2641.79	740.78	2642.42	740.73	2643.94	740.61
2648.86	740.03	2648.94	740.02	2650.45	740.01	2652.13	740.11	2652.75	740.11
2653.33	740.12	2655.65	740.16	2656.1	740.17	2663.25	740.2	2664.23	740.21
2670.36	740.24	2670.4	740.24	2675.14	740.24	2676.12	740.24	2677.55	740.23

2684.7	740.18	2686.04	740.16	2691.85	740.12	2696.94	740.08	2699	740.06
2700	740.05	2707.07	739.99	2708.28	739.98	2708.51	739.98	2710.9	740.01
2714.14	740.04	2721.21	740.11	2721.81	740.11	2728.29	740.18	2732.71	740.22
2735.36	740.25	2740.79	740.3	2742.43	740.31	2743.62	740.31	2749.5	740.33
2754.52	740.35	2756.57	740.35	2759.32	740.36	2763.64	740.39	2765.42	740.4
2770.71	740.43	2775.64	740.46	2776.33	740.47	2777.79	740.47	2784.86	740.48
2787.23	740.49	2791.93	740.5	2794.95	740.51	2798.14	740.52	2799	740.52
2800	740.53	2807.07	740.55	2810.9	740.57	2814.14	740.58	2821.21	740.61
2821.81	740.62	2825.19	740.63	2828.29	740.64	2832.71	740.65	2835.36	740.66
2842.09	740.68	2842.43	740.68	2843.62	740.68	2849.5	740.69	2854.52	740.69
2856.57	740.69	2863.64	740.7	2865.42	740.7	2870.71	740.71	2874.71	740.71
2876.33	740.71	2877.79	740.72	2884.86	740.73	2887.23	740.74	2891.93	740.75
2898.14	740.76	2899	740.76	2900	740.77	2907.07	740.78	2910.9	740.78
2914.14	740.79	2921.21	740.8	2921.81	740.8	2924.37	740.8	2928.29	740.85
2932.22	740.91	2932.71	740.91	2935.36	740.92	2942.43	740.94	2943.62	740.95
2946.24	740.96	2949.5	740.99	2954.52	741.03	2956.57	741.05	2963.64	741.12
2965.42	741.14	2970.71	741.19	2976.24	741.24	2976.33	741.24	2977.79	741.2
2984.86	741.04	2987.23	740.98	2989.05	740.94	2991.93	740.93	2993.82	740.92
2997.67	740.93	2998.14	740.88	2999	740.78	3000	740.62	3007.07	739.52
3007.8	739.4	3010.9	739.79	3012.79	740.03	3014.14	740.16	3021.21	740.88
3021.81	740.94	3023.21	741.08	3024.06	741.17	3024.31	741.19	3024.32	741.19
3024.36	741.19	3024.38	741.19	3024.42	741.2	3024.48	741.2	3024.52	741.2
3024.65	741.22	3024.76	741.23	3025.14	741.26	3025.68	741.3	3026.61	741.32
3028.19	741.34	3028.29	741.34	3029.11	741.35	3030.72	741.37	3031.42	741.38
3032.67	741.39	3032.71	741.39	3033.73	741.4	3034.35	741.4	3035.36	741.4
3035.43	741.4	3035.95	741.41	3036.27	741.41	3036.85	741.41	3042.43	741.39
3043.62	741.38	3049.5	741.36	3054.52	741.34	3056.57	741.34	3056.81	741.33
3057.55	741.33	3058.41	741.33	3058.9	741.33	3060.02	741.32	3060.66	741.32
3061.74	741.32	3063.64	741.34	3064.92	741.35	3065.11	741.34	3065.27	741.33
3065.42	741.32	3065.46	741.32	3067.01	741.35	3070.18	741.42	3070.71	741.44
3070.94	741.44	3072.06	741.46	3072.85	741.48	3073.25	741.49	3073.88	741.5
3074.13	741.51	3074.55	741.52	3074.87	741.52	3075.06	741.53	3075.94	741.51
3076.11	741.53	3076.33	741.52	3077.52	741.5	3077.79	741.52	3079.2	741.66
3079.21	741.65	3084.86	741.83	3087.23	741.9	3091.93	742.05	3096.59	742.19
3098.14	742.25	3100	742.32	3107.07	742.58	3110.9	742.72	3112.58	742.78
3114.14	742.82	3121.21	742.96	3121.81	742.97	3128.29	743.1	3132.71	743.18
3135.36	743.23	3142.43	743.37	3143.62	743.4	3148.27	743.49	3149.5	743.51
3154.52	743.6	3156.57	743.63	3156.92	743.64	3163.64	743.61	3163.87	743.6
3165.42	743.59	3166.15	743.59	3170.71	743.59	3176.33	743.58	3176.39	743.58
3177.79	743.58	3184.86	743.58	3187.23	743.58	3191.93	743.58	3192.95	743.58
3193.27	743.58	3198.14	743.58	3199	743.58				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
986.4	.065	2336.4	.1	2365.91	.04	2454.34	.1	2526.4	.065

Bank Sta: Left Right Coeff Contr. Expan.
2365.91 2454.34 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
986.4	2025	726.46	T
2490	3199	726.46	T

Sediment Elevation = 700.11

Upstream Embankment side slope = 2 horiz. to 1.0 vertical
Downstream Embankment side slope = 2 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins = 726.46
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Abutments = 2

Abutment Data
Upstream num= 3

Sta	Elev	Sta	Elev	Sta	Elev
2045	720.96	2050	720.96	3491.92	0

Downstream num= 3

Sta	Elev	Sta	Elev	Sta	Elev
2045	720.96	2050	720.96	3491.92	0

Abutment Data
Upstream num= 3

Sta	Elev	Sta	Elev	Sta	Elev
2465	0	2465	721.51	2470	721.51

Downstream num= 3

Sta	Elev	Sta	Elev	Sta	Elev
2465	0	2465	721.51	2470	721.51

Number of Piers = 5

Pier Data
Pier Station Upstream= 2085 Downstream= 2085
Upstream num= 2
Width	Elev	Width	Elev
3.5	0	3.5	724.33

Downstream num= 2
Width	Elev	Width	Elev
3.5	0	3.5	724.33

Pier Data
Pier Station Upstream= 2145 Downstream= 2145
Upstream num= 2
Width	Elev	Width	Elev
3.5	0	3.5	724.93

Downstream num= 2
Width	Elev	Width	Elev
3.5	0	3.5	724.93

Pier Data
Pier Station Upstream= 2205 Downstream= 2205
Upstream num= 2
Width	Elev	Width	Elev
3.5	0	3.5	725.53

Downstream num= 2
Width	Elev	Width	Elev
3.5	0	3.5	725.53

Pier Data
Pier Station Upstream= 2265 Downstream= 2265
Upstream num= 2
Width	Elev	Width	Elev
3.5	0	3.5	726.13

Downstream num= 2
Width	Elev	Width	Elev
3.5	0	3.5	726.13

Pier Data
Pier Station Upstream= 2325 Downstream= 2325
Upstream num= 2
Width	Elev	Width	Elev
4	0	4	725.23

Downstream num= 2
Width	Elev	Width	Elev
4	0	4	725.23

Number of Bridge Coefficient Sets = 1

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

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: W Chickamauga Cr
REACH: 1 RS: 375

INPUT
Description: Downstream Face of Existing and Proposed Bridges. Adjust
Elevations to Quad Map Slope -0.07'
Station Elevation Data num= 483
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
986.4	749.4	994.83	749.38	996.4	749.39	1006.4	749.43	1016.4	749.47
1017.31	749.48	1026.4	749.54	1036.4	749.61	1036.84	749.62	1046.4	749.36
1056.4	749.08	1066.4	748.81	1068.39	748.75	1076.4	748.52	1086.4	748.24
1092.59	748.06	1096.4	747.88	1106.4	747.39	1116.4	746.91	1119.01	746.79

1126.4	746.71	1136.4	746.59	1145.06	746.5	1146.4	746.46	1156.4	746.14
1166.4	745.83	1176.4	745.51	1176.72	745.5	1186.4	745.15	1196.4	744.79
1199.54	744.67	1206.4	744.33	1216.4	743.82	1225.98	743.33	1226.4	743.29
1236.4	742.33	1239.75	742.01	1246.4	741.77	1256.4	741.4	1266.4	741.03
1275.6	740.69	1276.4	740.65	1286.4	740.17	1291.42	739.93	1296.4	739.51
1306.4	738.68	1316.4	737.85	1325.08	737.13	1326.4	737.08	1335.41	736.71
1336.4	736.65	1346.4	736.02	1356.4	735.39	1366.4	734.76	1372.1	734.4
1376.4	734.15	1381.61	733.84	1386.4	733.65	1396.4	733.26	1406.4	732.87
1416.4	732.47	1417.59	732.43	1426.4	732.1	1427.61	732.06	1436.4	731.81
1446.4	731.53	1456.4	731.25	1466.4	730.97	1467.33	730.95	1474.86	730.74
1476.4	730.7	1486.4	730.43	1496.4	730.17	1506.4	729.9	1516.4	729.64
1517.74	729.6	1525.79	729.4	1526.4	729.39	1536.4	729.28	1546.4	729.16
1556.4	729.05	1561.87	728.99	1566.4	728.86	1573.65	728.66	1576.4	728.64
1586.4	728.57	1596.4	728.5	1606.4	728.43	1609.42	728.41	1616.4	728.47
1622.69	728.52	1626.4	728.56	1636.4	728.66	1646.4	728.75	1656.4	728.85
1656.71	728.85	1666.4	728.74	1670.12	728.7	1676.4	728.71	1686.4	728.73
1696.4	728.74	1703.47	728.76	1706.4	728.64	1716.29	728.23	1716.4	728.22
1726.4	727.81	1736.4	727.39	1746.4	726.97	1749.28	726.85	1756.4	726.35
1766.4	725.63	1766.7	725.61	1776.4	724.93	1786.4	724.22	1796.4	723.51
1803.94	722.98	1806.4	722.86	1816.4	722.4	1819.54	722.25	1826.4	721.73
1836.4	720.98	1846.4	720.22	1851.37	719.84	1856.4	719.55	1857.57	719.49
1866.4	718.83	1876.4	718.09	1886.4	717.35	1888.96	717.16	1896.4	716.81
1905.16	716.39	1906.4	716.36	1916.4	716.1	1925.28	715.88	1926.4	715.85
1936.4	715.6	1946.4	715.34	1949.51	715.26	1956.4	715.14	1966.4	714.96
1976.4	714.79	1984.96	714.63	1986.4	714.61	1996.4	714.48	1998.7	714.45
2006.4	714.45	2013.23	714.45	2016.4	714.43	2025.6	714.37	2025.61	714.37
2026.4	714.39	2036.4	714.57	2044.85	714.73	2046.4	714.7	2056.4	714.52
2065.47	714.35	2066.4	714.35	2076.4	714.34	2077.53	714.34	2086.4	714.43
2090.33	714.46	2096.4	714.42	2106.4	714.36	2116.4	714.3	2126.06	714.24
2126.4	714.24	2136.4	714.19	2142.48	714.16	2146.4	714.18	2156.4	714.24
2166.1	714.29	2166.4	714.29	2176.4	714.51	2186.4	714.72	2189.74	714.79
2196.4	714.75	2206.4	714.7	2211.18	714.67	2216.4	714.67	2226.4	714.68
2233.17	714.68	2236.4	714.74	2246.4	714.93	2256.4	715.12	2260.72	715.2
2266.4	715.36	2276.4	715.65	2277.44	715.68	2284.4	715.55	2286.4	715.44
2294.35	714.99	2296.4	714.99	2306.4	715.02	2313.3	715.04	2316.4	714.96
2326.4	714.71	2336.4	714.46	2346.4	714.22	2356.4	713.97	2362.97	713.8
2365.91	713.65	2366.4	712.58	2368.58	707.78	2369.05	706.86	2376.4	704.81
2386.4	702.02	2390.45	700.88	2396.4	699.27	2406.4	696.55	2411.26	695.23
2416.4	696.68	2426.4	699.5	2436.4	702.33	2446.4	705.15	2446.69	705.24
2451.22	706.47	2451.84	707.57	2454.34	712.06	2456.4	713	2456.64	713.1
2457.68	713.92	2458.65	714.46	2466.4	719.09	2469.01	720.65	2475.1	724.1
2476.4	724.17	2483.89	724.56	2486.4	724.7	2496.4	725.24	2497.91	725.32
2500.97	725.16	2505.97	725.69	2506.4	725.71	2507.98	725.77	2515.36	726.78
2516.4	727.13	2525.69	730.21	2526.4	730.46	2527.8	730.97	2536.4	732.84
2546.4	735.01	2552.2	736.27	2556.4	737.03	2566.4	738.85	2566.93	738.95
2576.4	739.9	2582.12	740.48	2586.4	740.67	2596.4	741.11	2599	741.22
2600	741.26	2600.21	741.27	2610	741.42	2613.19	741.47	2616.95	741.53
2620.34	741.46	2620.62	741.46	2627.49	741.32	2631.52	741.24	2633.81	741.2
2634.64	741.16	2640.26	740.9	2641.79	740.78	2642.42	740.73	2643.94	740.61
2648.86	740.03	2648.94	740.02	2650.45	740.01	2652.13	740.11	2652.75	740.11
2653.33	740.12	2655.65	740.16	2656.1	740.17	2663.25	740.2	2664.23	740.21
2670.36	740.24	2670.4	740.24	2675.14	740.24	2676.12	740.24	2677.55	740.23
2684.7	740.18	2686.04	740.16	2691.85	740.12	2696.94	740.08	2699	740.06
2700	740.05	2707.07	739.99	2708.28	739.98	2708.51	739.98	2710.9	740.01
2714.14	740.04	2721.21	740.11	2721.81	740.11	2728.29	740.18	2732.71	740.22
2735.36	740.25	2740.79	740.3	2742.43	740.31	2743.62	740.31	2749.5	740.33
2754.52	740.35	2756.57	740.35	2759.32	740.36	2763.64	740.39	2765.42	740.4
2770.71	740.43	2775.64	740.46	2776.33	740.47	2777.79	740.47	2784.86	740.48
2787.23	740.49	2791.93	740.5	2794.95	740.51	2798.14	740.52	2799	740.52
2800	740.53	2807.07	740.55	2810.9	740.57	2814.14	740.58	2821.21	740.61
2821.81	740.62	2825.19	740.63	2828.29	740.64	2832.71	740.65	2835.36	740.66
2842.09	740.68	2842.43	740.68	2843.62	740.68	2849.5	740.69	2854.52	740.69
2856.57	740.69	2863.64	740.7	2865.42	740.7	2870.71	740.71	2874.71	740.71
2876.33	740.71	2877.79	740.72	2884.86	740.73	2887.23	740.74	2891.93	740.75
2898.14	740.76	2899	740.76	2900	740.77	2907.07	740.78	2910.9	740.78
2914.14	740.79	2921.21	740.8	2921.81	740.8	2924.37	740.8	2928.29	740.85
2932.22	740.91	2932.71	740.91	2935.36	740.92	2942.43	740.94	2943.62	740.95
2946.24	740.96	2949.5	740.99	2954.52	741.03	2956.57	741.05	2963.64	741.12
2965.42	741.14	2970.71	741.19	2976.24	741.24	2976.33	741.24	2977.79	741.2
2984.86	741.04	2987.23	740.98	2989.05	740.94	2991.93	740.93	2993.82	740.92
2997.67	740.93	2998.14	740.88	2999	740.78	3000	740.62	3007.07	739.52
3007.8	739.4	3010.9	739.79	3012.79	740.03	3014.14	740.16	3021.21	740.88
3021.81	740.94	3023.21	741.08	3024.06	741.17	3024.31	741.19	3024.32	741.19
3024.36	741.19	3024.38	741.19	3024.42	741.2	3024.48	741.2	3024.52	741.2
3024.65	741.22	3024.76	741.23	3025.14	741.26	3025.68	741.3	3026.61	741.32
3028.19	741.34	3028.29	741.34	3029.11	741.35	3030.72	741.37	3031.42	741.38
3032.67	741.39	3032.71	741.39	3033.73	741.4	3034.35	741.4	3035.36	741.4
3035.43	741.4	3035.95	741.41	3036.27	741.41	3036.85	741.41	3042.43	741.39
3043.62	741.38	3049.5	741.36	3054.52	741.34	3056.57	741.34	3056.81	741.33

3057.55	741.33	3058.41	741.33	3058.9	741.33	3060.02	741.32	3060.66	741.32
3061.74	741.32	3063.64	741.34	3064.92	741.35	3065.11	741.34	3065.27	741.33
3065.42	741.32	3065.46	741.32	3067.01	741.35	3070.18	741.42	3070.71	741.44
3070.94	741.44	3072.06	741.46	3072.85	741.48	3073.25	741.49	3073.88	741.5
3074.13	741.51	3074.55	741.52	3074.87	741.52	3075.06	741.53	3075.94	741.51
3076.11	741.53	3076.33	741.52	3077.52	741.5	3077.79	741.52	3079.2	741.66
3079.21	741.65	3084.86	741.83	3087.23	741.9	3091.93	742.05	3096.59	742.19
3098.14	742.25	3100	742.32	3107.07	742.58	3110.9	742.72	3112.58	742.78
3114.14	742.82	3121.21	742.96	3121.81	742.97	3128.29	743.1	3132.71	743.18
3135.36	743.23	3142.43	743.37	3143.62	743.4	3148.27	743.49	3149.5	743.51
3154.52	743.6	3156.57	743.63	3156.92	743.64	3163.64	743.61	3163.87	743.6
3165.42	743.59	3166.15	743.59	3170.71	743.59	3176.33	743.58	3176.39	743.58
3177.79	743.58	3184.86	743.58	3187.23	743.58	3191.93	743.58	3192.95	743.58
3193.27	743.58	3198.14	743.58	3199	743.58				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
986.4	.065	2336.4	.1	2365.91	.04	2454.34	.1	2526.4	.065

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2365.91	2454.34	375	375	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
986.4	2025	726.46	T
2490	3199	726.46	T

Sediment Elevation = 700.11

CROSS SECTION

RIVER: W Chickamauga Cr
REACH: 1 RS: 0

INPUT
Description: Exit Section. Adjust Elevations to Quad Map Slope -0.02' Adjust Again =0.23'
Station Elevation Data num= 485

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
986.4	748.27	994.83	748.25	996.4	748.26	1006.4	748.3	1016.4	748.34
1017.31	748.35	1026.4	748.41	1036.4	748.48	1036.84	748.49	1046.4	748.23
1056.4	747.95	1066.4	747.68	1068.39	747.62	1076.4	747.39	1086.4	747.11
1092.59	746.93	1096.4	746.75	1106.4	746.26	1116.4	745.78	1119.01	745.66
1126.4	745.58	1136.4	745.46	1145.06	745.37	1146.4	745.33	1156.4	745.01
1166.4	744.7	1176.4	744.38	1176.72	744.37	1186.4	744.02	1196.4	743.66
1199.54	743.54	1206.4	743.2	1216.4	742.69	1225.98	742.2	1226.4	742.16
1236.4	741.2	1239.75	740.88	1246.4	740.64	1256.4	740.27	1266.4	739.9
1275.6	739.56	1276.4	739.52	1286.4	739.04	1291.42	738.8	1296.4	738.38
1306.4	737.55	1316.4	736.72	1325.08	736	1326.4	735.95	1335.41	735.58
1336.4	735.52	1346.4	734.89	1356.4	734.26	1366.4	733.63	1372.1	733.27
1376.4	733.02	1381.61	732.71	1386.4	732.52	1396.4	732.13	1406.4	731.74
1416.4	731.34	1417.59	731.3	1426.4	730.97	1427.61	730.93	1436.4	730.68
1446.4	730.4	1456.4	730.12	1466.4	729.84	1467.33	729.82	1474.86	729.61
1476.4	729.57	1486.4	729.3	1496.4	729.04	1506.4	728.77	1516.4	728.51
1517.74	728.47	1525.79	728.27	1526.4	728.26	1536.4	728.15	1546.4	728.03
1556.4	727.92	1561.87	727.86	1566.4	727.73	1573.65	727.53	1576.4	727.51
1586.4	727.44	1596.4	727.37	1606.4	727.3	1609.42	727.28	1616.4	727.34
1622.69	727.39	1626.4	727.43	1636.4	727.53	1646.4	727.62	1656.4	727.72
1656.71	727.72	1666.4	727.61	1670.12	727.57	1676.4	727.58	1686.4	727.6
1696.4	727.61	1703.47	727.63	1706.4	727.51	1716.29	727.1	1716.4	727.09
1726.4	726.68	1736.4	726.26	1746.4	725.84	1749.28	725.72	1756.4	725.22
1766.4	724.5	1766.7	724.48	1776.4	723.8	1786.4	723.09	1796.4	722.38
1803.94	721.85	1806.4	721.73	1816.4	721.27	1819.54	721.12	1826.4	720.6
1836.4	719.85	1846.4	719.09	1851.37	718.71	1856.4	718.42	1857.57	718.36
1866.4	717.7	1876.4	716.96	1886.4	716.22	1888.96	716.03	1896.4	715.68
1905.16	715.26	1906.4	715.23	1916.4	714.97	1925.28	714.75	1926.4	714.72
1936.4	714.47	1946.4	714.21	1949.51	714.13	1956.4	714.01	1966.4	713.83
1976.4	713.66	1984.96	713.5	1986.4	713.48	1996.4	713.35	1998.7	713.32
2006.4	713.32	2013.23	713.32	2016.4	713.3	2025.6	713.24	2025.61	713.24
2026.4	713.26	2036.4	713.44	2044.85	713.6	2046.4	713.57	2056.4	713.39
2065.47	713.22	2066.4	713.22	2076.4	713.21	2077.53	713.21	2086.4	713.3
2090.33	713.33	2096.4	713.29	2106.4	713.23	2116.4	713.17	2126.06	713.11
2126.4	713.11	2136.4	713.06	2142.48	713.03	2146.4	713.05	2156.4	713.11
2166.1	713.16	2166.4	713.16	2176.4	713.38	2186.4	713.59	2189.74	713.66
2196.4	713.62	2206.4	713.57	2211.18	713.54	2216.4	713.54	2226.4	713.55
2233.17	713.55	2236.4	713.61	2246.4	713.8	2256.4	713.99	2260.72	714.07
2266.4	714.23	2276.4	714.52	2277.44	714.55	2284.4	714.42	2286.4	714.31
2294.35	713.86	2296.4	713.86	2306.4	713.89	2313.3	713.91	2316.4	713.83
2326.4	713.58	2336.4	713.33	2346.4	713.09	2356.4	712.84	2362.97	712.67
2369.63	711.96	2371.2	711.93	2371.73	711.92	2371.8	711.92	2371.96	711.99

2372	712	2372.74	712.21	2375.35	705.56	2375.83	704.34	2379.63	703.88
2389.63	702.67	2393.46	702.21	2399.63	701.4	2409.63	700.1	2411.26	699.89
2417.06	700.93	2419.63	701.24	2429.63	702.48	2439.63	703.71	2449.63	704.95
2453.02	705.37	2453.23	705.83	2455.66	712.8	2458.42	714.45	2466.4	717.96
2469.01	719.52	2475.1	722.97	2476.4	723.04	2483.89	723.43	2486.4	723.57
2496.4	724.11	2497.91	724.19	2500.97	724.03	2505.97	724.56	2506.4	724.58
2507.98	724.64	2515.36	725.65	2516.4	726	2525.69	729.08	2526.4	729.33
2527.8	729.84	2536.4	731.71	2546.4	733.88	2552.2	735.14	2556.4	735.9
2566.4	737.72	2566.93	737.82	2576.4	738.77	2582.12	739.35	2586.4	739.54
2596.4	739.98	2599	740.09	2600	740.13	2600.21	740.14	2610	740.29
2613.19	740.34	2616.95	740.4	2620.34	740.33	2620.62	740.33	2627.49	740.19
2631.52	740.11	2633.81	740.07	2634.64	740.03	2640.26	739.77	2641.79	739.65
2642.42	739.6	2643.94	739.48	2648.86	738.9	2648.94	738.89	2650.45	738.88
2652.13	738.98	2652.75	738.98	2653.33	738.99	2655.65	739.03	2656.1	739.04
2663.25	739.07	2664.23	739.08	2670.36	739.11	2670.4	739.11	2675.14	739.11
2676.12	739.11	2677.55	739.1	2684.7	739.05	2686.04	739.03	2691.85	738.99
2696.94	738.95	2699	738.93	2700	738.92	2707.07	738.86	2708.28	738.85
2708.51	738.85	2710.9	738.88	2714.14	738.91	2721.21	738.98	2721.81	738.98
2728.29	739.05	2732.71	739.09	2735.36	739.12	2740.79	739.17	2742.43	739.18
2743.62	739.18	2749.5	739.2	2754.52	739.22	2756.57	739.22	2759.32	739.23
2763.64	739.26	2765.42	739.27	2770.71	739.3	2775.64	739.33	2776.33	739.34
2777.79	739.34	2784.86	739.35	2787.23	739.36	2791.93	739.37	2794.95	739.38
2798.14	739.39	2799	739.39	2800	739.4	2807.07	739.42	2810.9	739.44
2814.14	739.45	2821.21	739.48	2821.81	739.49	2825.19	739.5	2828.29	739.51
2832.71	739.52	2835.36	739.53	2842.09	739.55	2842.43	739.55	2843.62	739.55
2849.5	739.56	2854.52	739.56	2856.57	739.56	2863.64	739.57	2865.42	739.57
2870.71	739.58	2874.71	739.58	2876.33	739.58	2877.79	739.59	2884.86	739.6
2887.23	739.61	2891.93	739.62	2898.14	739.63	2899	739.63	2900	739.64
2907.07	739.65	2910.9	739.65	2914.14	739.66	2921.21	739.67	2921.81	739.67
2924.37	739.67	2928.29	739.72	2932.22	739.78	2932.71	739.78	2935.36	739.79
2942.43	739.81	2943.62	739.82	2946.24	739.83	2949.5	739.86	2954.52	739.9
2956.57	739.92	2963.64	739.99	2965.42	740.01	2970.71	740.06	2976.24	740.11
2976.33	740.11	2977.79	740.07	2984.86	739.91	2987.23	739.85	2989.05	739.81
2991.93	739.8	2993.82	739.79	2997.67	739.8	2998.14	739.75	2999	739.65
3000	739.49	3007.07	738.39	3007.8	738.27	3010.9	738.66	3012.79	738.9
3014.14	739.03	3021.21	739.75	3021.81	739.81	3023.21	739.95	3024.06	740.04
3024.31	740.06	3024.32	740.06	3024.36	740.06	3024.38	740.06	3024.42	740.07
3024.48	740.07	3024.52	740.07	3024.65	740.09	3024.76	740.1	3025.14	740.13
3025.68	740.17	3026.61	740.19	3028.19	740.21	3028.29	740.21	3029.11	740.22
3030.72	740.24	3031.42	740.25	3032.67	740.26	3032.71	740.26	3033.73	740.27
3034.35	740.27	3035.36	740.27	3035.43	740.27	3035.95	740.28	3036.27	740.28
3036.85	740.28	3042.43	740.26	3043.62	740.25	3049.5	740.23	3054.52	740.21
3056.57	740.21	3056.81	740.2	3057.55	740.2	3058.41	740.2	3058.9	740.2
3060.02	740.19	3060.66	740.19	3061.74	740.19	3063.64	740.21	3064.92	740.22
3065.11	740.21	3065.27	740.2	3065.42	740.19	3065.46	740.19	3067.01	740.22
3070.18	740.29	3070.71	740.31	3070.94	740.31	3072.06	740.33	3072.85	740.35
3073.25	740.36	3073.88	740.37	3074.13	740.38	3074.55	740.39	3074.87	740.39
3075.06	740.4	3075.94	740.38	3076.11	740.4	3076.33	740.39	3077.52	740.37
3077.79	740.39	3079.2	740.53	3079.21	740.52	3084.86	740.7	3087.23	740.77
3091.93	740.92	3096.59	741.06	3098.14	741.12	3100	741.19	3107.07	741.45
3110.9	741.59	3112.58	741.65	3114.14	741.69	3121.21	741.83	3121.81	741.84
3128.29	741.97	3132.71	742.05	3135.36	742.1	3142.43	742.24	3143.62	742.27
3148.27	742.36	3149.5	742.38	3154.52	742.47	3156.57	742.5	3156.92	742.51
3163.64	742.48	3163.87	742.47	3165.42	742.46	3166.15	742.46	3170.71	742.46
3176.33	742.45	3176.39	742.45	3177.79	742.45	3184.86	742.45	3187.23	742.45
3191.93	742.45	3192.95	742.45	3193.27	742.45	3198.14	742.45	3199	742.45

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
986.4	.065	2346.4	.1	2372.74	.04	2455.66	.1	2526.4	.065

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2372.74	2455.66	0	0	.1	.3

Sediment Elevation = 699.895

SUMMARY OF MANNING'S N VALUES

River:W Chickamauga Cr

Reach	River Sta.	n1	n2	n3	n4	n5
1	722	.065	.1	.04	.065	
1	497	.065	.1	.04	.065	
1	436	Bridge				
1	375	.065	.1	.04	.1	.065
1	0	.065	.1	.04	.1	.065

SUMMARY OF REACH LENGTHS

River: W Chickamauga Cr

Reach	River Sta.	Left	Channel	Right
1	722	225	225	225
1	497	122	122	122
1	436	Bridge		
1	375	375	375	375
1	0	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: W Chickamauga Cr

Reach	River Sta.	Contr.	Expan.
1	722	.3	.5
1	497	.3	.5
1	436	Bridge	
1	375	.3	.5
1	0	.1	.3

HEC-RAS Plan: Pro425BrGDOT River: W Chickamauga Cr Reach: 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	722	2 Year Storm	3540.00	700.31	714.19		714.47	0.000673	4.30	848.22	101.12	0.24
1	722	50 Year Storm	11700.00	700.31	720.46		721.22	0.001096	7.53	2749.60	452.28	0.33
1	722	100 Year Storm	13300.00	700.31	721.27		722.08	0.001135	7.91	3125.80	485.35	0.33
1	722	500 Year Storm	17500.00	700.31	723.13		724.07	0.001222	8.79	4086.88	576.45	0.35
1	497	2 Year Storm	3540.00	700.18	713.81	708.73	714.23	0.001247	5.21	679.05	77.92	0.31
1	497	50 Year Storm	11700.00	700.18	719.12	713.96	720.63	0.002610	10.12	1638.44	372.96	0.48
1	497	100 Year Storm	13300.00	700.18	719.86	714.77	721.47	0.002672	10.60	1920.38	389.25	0.49
1	497	500 Year Storm	17500.00	700.18	721.78	718.47	723.46	0.002582	11.30	2695.60	467.67	0.49
1	436		Bridge									
1	375	2 Year Storm	3540.00	700.11	713.83		714.03	0.000410	3.54	1002.69	95.89	0.19
1	375	50 Year Storm	11700.00	700.11	719.43		719.87	0.000687	5.99	3183.65	608.58	0.26
1	375	100 Year Storm	13300.00	700.11	720.16		720.62	0.000709	6.26	3507.73	621.03	0.26
1	375	500 Year Storm	17500.00	700.11	721.90		722.42	0.000752	6.87	4279.52	647.01	0.28
1	0	2 Year Storm	3540.00	699.90	713.59	706.51	713.83	0.000574	3.97	981.82	369.40	0.21
1	0	50 Year Storm	11700.00	699.90	719.27	711.35	719.55	0.000575	5.27	4186.12	624.60	0.23
1	0	100 Year Storm	13300.00	699.90	720.01	712.11	720.30	0.000574	5.43	4651.46	635.62	0.23
1	0	500 Year Storm	17500.00	699.90	721.76	715.99	722.06	0.000575	5.80	5788.10	667.19	0.24

HEC-RAS Plan: Pro425BrGDOT River: W Chickamauga Cr Reach: 1

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
			(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
1	722	2 Year Storm	714.47	714.19	0.29	0.20	0.04	11.52	3526.58	1.90	101.12
1	722	50 Year Storm	721.22	720.46	0.75	0.36	0.23	1640.02	9943.97	116.01	452.28
1	722	100 Year Storm	722.08	721.27	0.81	0.37	0.24	2192.50	10955.71	151.79	485.35
1	722	500 Year Storm	724.07	723.13	0.93	0.39	0.22	3766.01	13473.97	260.03	576.45
1	497	2 Year Storm	714.23	713.81	0.42	0.03	0.00	0.00	3540.00		77.92
1	497	50 Year Storm	720.63	719.12	1.51	0.06	0.02	616.97	11077.01	6.02	372.96
1	497	100 Year Storm	721.47	719.86	1.61	0.06	0.03	1068.07	12218.90	13.03	389.25
1	497	500 Year Storm	723.46	721.78	1.68	0.06	0.10	2712.18	14739.14	48.68	467.67
1	436		Bridge								
1	375	2 Year Storm	714.03	713.83	0.19	0.18	0.01	0.02	3539.10	0.88	95.89
1	375	50 Year Storm	719.87	719.43	0.44	0.24	0.08	2706.74	8952.52	40.74	608.58
1	375	100 Year Storm	720.62	720.16	0.46	0.24	0.09	3484.05	9762.98	52.97	621.03
1	375	500 Year Storm	722.42	721.90	0.52	0.25	0.11	5652.68	11756.92	90.40	647.01
1	0	2 Year Storm	713.83	713.59	0.24			26.43	3513.48	0.09	369.40
1	0	50 Year Storm	719.55	719.27	0.28			4516.35	7153.84	29.82	624.60
1	0	100 Year Storm	720.30	720.01	0.28			5562.92	7697.02	40.06	635.62
1	0	500 Year Storm	722.06	721.76	0.30			8369.45	9058.92	71.62	667.19

HEC-RAS Plan: Pro425BrGDOT River: W Chickamauga Cr Reach: 1

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)
1	722	2 Year Storm	714.47	714.19		0.20	0.04	101.12	11.52	3526.58	1.90	4.30
1	722	50 Year Storm	721.22	720.46		0.36	0.23	452.28	1640.02	9943.97	116.01	7.53
1	722	100 Year Storm	722.08	721.27		0.37	0.24	485.35	2192.50	10955.71	151.79	7.91
1	722	500 Year Storm	724.07	723.13		0.39	0.22	576.45	3766.01	13473.97	260.03	8.79
1	497	2 Year Storm	714.23	713.81	708.73	0.03	0.00	77.92	0.00	3540.00		5.21
1	497	50 Year Storm	720.63	719.12	713.96	0.06	0.02	372.96	616.97	11077.01	6.02	10.12
1	497	100 Year Storm	721.47	719.86	714.77	0.06	0.03	389.25	1068.07	12218.90	13.03	10.60
1	497	500 Year Storm	723.46	721.78	718.47	0.06	0.10	467.67	2712.18	14739.14	48.68	11.30
1	436 BR U	2 Year Storm	714.20	713.78	708.78	0.05	0.12	77.75	0.00	3540.00		5.23
1	436 BR U	50 Year Storm	720.55	718.98	713.97	0.10	0.52	351.42	550.25	11144.52	5.23	10.28
1	436 BR U	100 Year Storm	721.37	719.66	714.81	0.11	0.57	358.01	923.28	12365.47	11.26	10.87
1	436 BR U	500 Year Storm	723.30	721.29	718.20	0.12	0.66	370.56	2123.82	15336.76	39.42	12.11
1	436 BR D	2 Year Storm	714.04	713.84	705.69	0.01	0.00	96.27	0.02	3539.09	0.89	3.54
1	436 BR D	50 Year Storm	719.92	719.40	710.61	0.02	0.04	393.89	2158.67	9497.85	43.48	6.37
1	436 BR D	100 Year Storm	720.69	720.13	711.37	0.02	0.05	395.33	2771.68	10472.49	55.82	6.73
1	436 BR D	500 Year Storm	722.51	721.83	713.22	0.02	0.08	407.00	4473.57	12949.38	77.05	7.59
1	375	2 Year Storm	714.03	713.83		0.18	0.01	95.89	0.02	3539.10	0.88	3.54
1	375	50 Year Storm	719.87	719.43		0.24	0.08	608.58	2706.74	8952.52	40.74	5.99
1	375	100 Year Storm	720.62	720.16		0.24	0.09	621.03	3484.05	9762.98	52.97	6.26
1	375	500 Year Storm	722.42	721.90		0.25	0.11	647.01	5652.68	11756.92	90.40	6.87
1	0	2 Year Storm	713.83	713.59	706.51			369.40	26.43	3513.48	0.09	3.97
1	0	50 Year Storm	719.55	719.27	711.35			624.60	4516.35	7153.84	29.82	5.27
1	0	100 Year Storm	720.30	720.01	712.11			635.62	5562.92	7697.02	40.06	5.43
1	0	500 Year Storm	722.06	721.76	715.99			667.19	8369.45	9058.92	71.62	5.80

Plan: Pro425BrGDOT W Chickamauga Cr 1 RS: 436 Profile: 2 Year Storm

E.G. US. (ft)	714.23	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	713.81	E.G. Elev (ft)	714.20	714.04
Q Total (cfs)	3540.00	W.S. Elev (ft)	713.78	713.84
Q Bridge (cfs)	3540.00	Crit W.S. (ft)	708.78	705.69
Q Weir (cfs)		Max Chl Dpth (ft)	13.60	13.73
Weir Sta Lft (ft)		Vel Total (ft/s)	5.23	3.53
Weir Sta Rgt (ft)		Flow Area (sq ft)	676.66	1003.61
Weir Submerg		Froude # Chl	0.31	0.19
Weir Max Depth (ft)		Specif Force (cu ft)	3871.12	6424.53
Min El Weir Flow (ft)	726.47	Hydr Depth (ft)	8.70	10.42
Min El Prs (ft)	725.23	W.P. Total (ft)	85.89	106.18
Delta EG (ft)	0.20	Conv. Total (cfs)	99686.2	174980.3
Delta WS (ft)	-0.02	Top Width (ft)	77.75	96.27
BR Open Area (sq ft)	3253.57	Frctn Loss (ft)	0.05	0.01
BR Open Vel (ft/s)	5.23	C & E Loss (ft)	0.12	0.00
BR Sluice Coef		Shear Total (lb/sq ft)	0.62	0.24
BR Sel Method	Energy only	Power Total (lb/ft s)	3.24	0.85

Plan: Pro425BrGDOT W Chickamauga Cr 1 RS: 436 Profile: 50 Year Storm

E.G. US. (ft)	720.63	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	719.12	E.G. Elev (ft)	720.55	719.92
Q Total (cfs)	11700.00	W.S. Elev (ft)	718.98	719.40
Q Bridge (cfs)	11700.00	Crit W.S. (ft)	713.97	710.61
Q Weir (cfs)		Max Chl Dpth (ft)	18.80	19.29
Weir Sta Lft (ft)		Vel Total (ft/s)	7.50	4.00
Weir Sta Rgt (ft)		Flow Area (sq ft)	1560.26	2926.61
Weir Submerg		Froude # Chl	0.49	0.27
Weir Max Depth (ft)		Specif Force (cu ft)	11951.21	18396.06
Min El Weir Flow (ft)	726.47	Hydr Depth (ft)	4.44	7.43
Min El Prs (ft)	725.23	W.P. Total (ft)	378.76	454.71
Delta EG (ft)	0.76	Conv. Total (cfs)	223984.9	419720.7
Delta WS (ft)	-0.31	Top Width (ft)	351.42	393.89
BR Open Area (sq ft)	3253.57	Frctn Loss (ft)	0.10	0.02
BR Open Vel (ft/s)	7.50	C & E Loss (ft)	0.52	0.04
BR Sluice Coef		Shear Total (lb/sq ft)	0.70	0.31
BR Sel Method	Energy only	Power Total (lb/ft s)	5.26	1.25

Plan: Pro425BrGDOT W Chickamauga Cr 1 RS: 436 Profile: 100 Year Storm

E.G. US. (ft)	721.47	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	719.86	E.G. Elev (ft)	721.37	720.69
Q Total (cfs)	13300.00	W.S. Elev (ft)	719.66	720.13
Q Bridge (cfs)	13300.00	Crit W.S. (ft)	714.81	711.37
Q Weir (cfs)		Max Chl Dpth (ft)	19.48	20.02
Weir Sta Lft (ft)		Vel Total (ft/s)	7.38	4.14
Weir Sta Rgt (ft)		Flow Area (sq ft)	1802.07	3211.61
Weir Submerg		Froude # Chl	0.50	0.28
Weir Max Depth (ft)		Specif Force (cu ft)	13730.15	20969.58
Min El Weir Flow (ft)	726.47	Hydr Depth (ft)	5.03	8.12
Min El Prs (ft)	725.23	W.P. Total (ft)	392.42	464.27
Delta EG (ft)	0.84	Conv. Total (cfs)	248620.8	464028.8
Delta WS (ft)	-0.30	Top Width (ft)	358.01	395.33
BR Open Area (sq ft)	3253.57	Frctn Loss (ft)	0.11	0.02
BR Open Vel (ft/s)	7.38	C & E Loss (ft)	0.57	0.05

Plan: Pro425BrGDOT W Chickamauga Cr 1 RS: 436 Profile: 100 Year Storm (Continued)

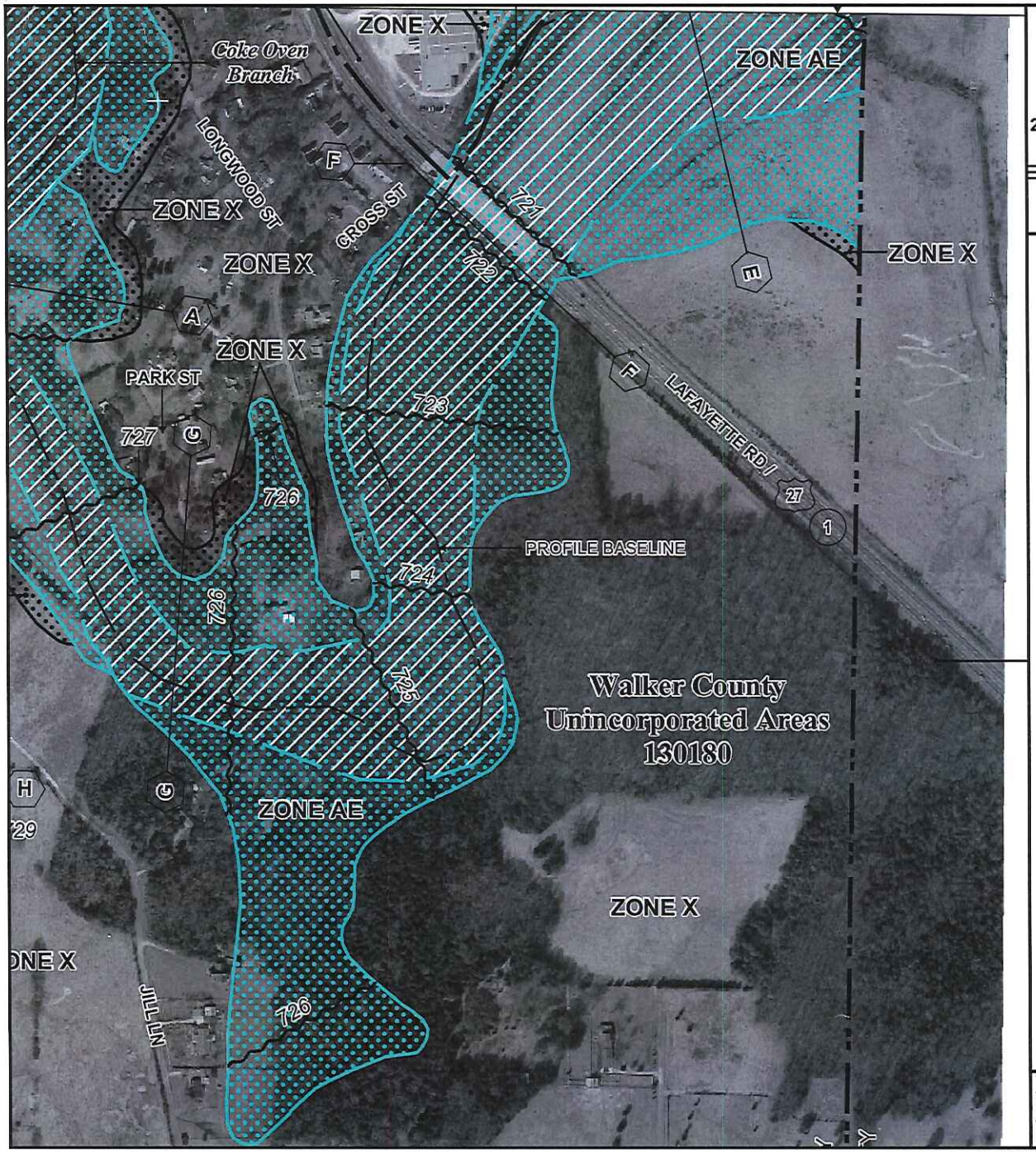
BR Sluice Coef		Shear Total (lb/sq ft)	0.82	0.35
BR Sel Method	Energy only	Power Total (lb/ft s)	6.06	1.47

Plan: Pro425BrGDOT W Chickamauga Cr 1 RS: 436 Profile: 500 Year Storm

E.G. US. (ft)	723.46	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	721.78	E.G. Elev (ft)	723.30	722.51
Q Total (cfs)	17500.00	W.S. Elev (ft)	721.29	721.83
Q Bridge (cfs)	17500.00	Crit W.S. (ft)	718.20	713.22
Q Weir (cfs)		Max Chl Dpth (ft)	21.11	21.72
Weir Sta Lft (ft)		Vel Total (ft/s)	7.31	4.49
Weir Sta Rgt (ft)		Flow Area (sq ft)	2393.23	3894.94
Weir Submerg		Froude # Chl	0.53	0.30
Weir Max Depth (ft)		Specif Force (cu ft)	18830.58	28043.25
Min El Weir Flow (ft)	726.47	Hydr Depth (ft)	6.46	9.57
Min El Prs (ft)	725.23	W.P. Total (ft)	422.17	495.80
Delta EG (ft)	1.04	Conv. Total (cfs)	315103.5	576234.1
Delta WS (ft)	-0.12	Top Width (ft)	370.56	407.00
BR Open Area (sq ft)	3253.57	Frctn Loss (ft)	0.12	0.02
BR Open Vel (ft/s)	7.31	C & E Loss (ft)	0.66	0.08
BR Sluice Coef		Shear Total (lb/sq ft)	1.09	0.45
BR Sel Method	Energy only	Power Total (lb/ft s)	7.98	2.03

Plan: Pro425BrGDOT W Chickamauga Cr 1 RS: 436 BR D Profile: 100 Year Storm

E.G. Elev (ft)	720.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.56	Wt. n-Val.	0.068	0.040	0.100
W.S. Elev (ft)	720.13	Reach Len. (ft)	22.00	22.00	22.00
Crit W.S. (ft)	711.37	Flow Area (sq ft)	1602.03	1555.65	53.92
E.G. Slope (ft/ft)	0.000822	Area (sq ft)	1602.03	1555.65	53.92
Q Total (cfs)	13300.00	Flow (cfs)	2771.68	10472.49	55.82
Top Width (ft)	395.33	Top Width (ft)	296.24	88.43	10.66
Vel Total (ft/s)	4.14	Avg. Vel. (ft/s)	1.73	6.73	1.04
Max Chl Dpth (ft)	20.02	Hydr. Depth (ft)	5.41	17.59	5.06
Conv. Total (cfs)	464028.8	Conv. (cfs)	96702.3	365378.8	1947.7
Length Wtd. (ft)	22.00	Wetted Per. (ft)	352.19	97.85	14.23
Min Ch El (ft)	700.11	Shear (lb/sq ft)	0.23	0.82	0.19
Alpha	2.12	Stream Power (lb/ft s)	0.40	5.49	0.20
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	26.01	13.60	0.50
C & E Loss (ft)	0.05	Cum SA (acres)	4.76	0.78	0.13



MAP SCALE 1" = 500'

250 0 500 1000 FEET

METE

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0082D

FIRM

FLOOD INSURANCE RATE MAP

WALKER COUNTY, GEORGIA

AND INCORPORATED AREAS

PANEL 82 OF 375

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CHICKAMAUGA, CITY OF	130181	0082	D
WALKER COUNTY	130180	0082	D

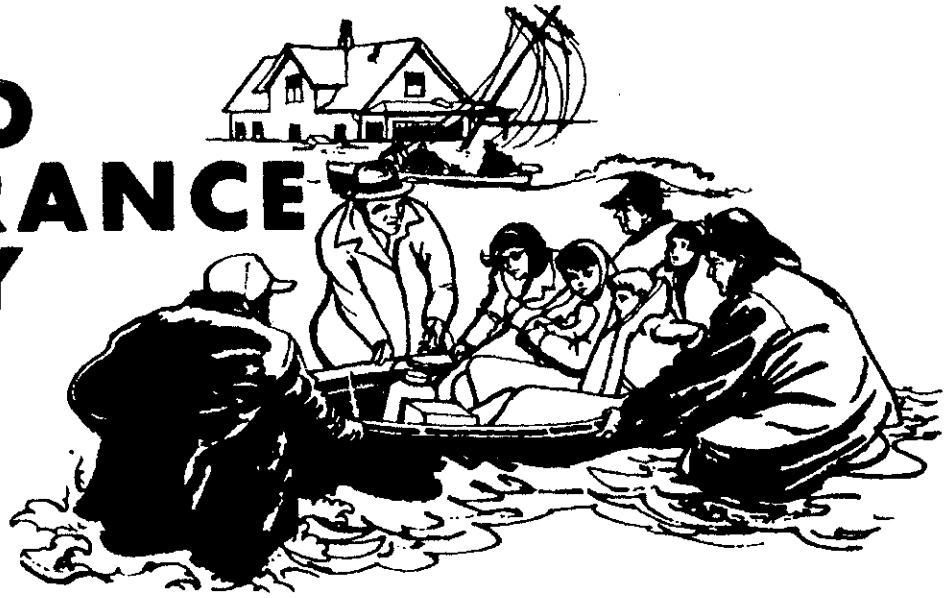
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
13295C0082D

EFFECTIVE DATE
SEPTEMBER 5, 2007

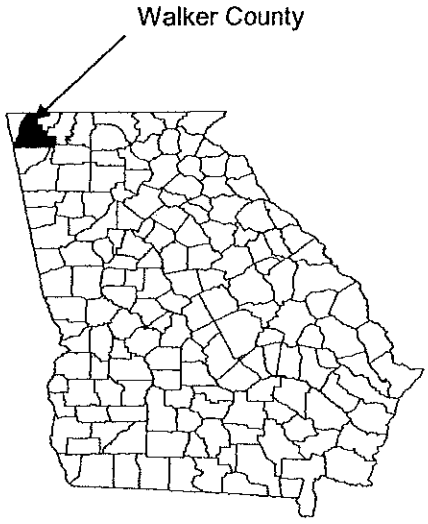
Federal Emergency Management Agency

FLOOD INSURANCE STUDY



WALKER COUNTY, GEORGIA
AND INCORPORATED AREAS

Community Name	*Community Number*
CHICKAMAUGA, CITY OF	130181
LAFAYETTE, CITY OF	130182
LOOKOUT MOUNTAIN, CITY OF	130448
ROSSVILLE, CITY OF	130183
WALKER COUNTY (UNINCORPORATED AREAS)	130180



Effective: September 5, 2007

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
13295CV000A

Table 2 - Summary of Discharges (Continued)

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
UNNAMED TRIBUTARY TO WEST CHICKAMAUGA CREEK					
At mile 1.68	1.59	620	950	1,100	1,500
At mile 2.62	1.16	500	760	900	1,240
WEST CHICKAMAUGA CREEK					
At mile 23.6	110.0	10,998	16,309	19,434	26,245
At mile 24.8	99.4	10,500	15,500	18,500	25,000
WILLIAMS STREET TRIBUTARY					
At confluence with Tributary to Chattanooga Creek	0.26	450	600	660	810
At Walnut Street	0.14	255	350	400	490

3.2 Hydraulic Analyses

Stream cross sections for the hydraulic analyses were field surveyed at bridges and other strategic locations and supplemented with valley cross sections taken by photogrammetric methods at sufficiently close intervals to accurately compute water surface elevations (WSELs).

Cross sections previously used in the Chattanooga Creek analyses were modified and supplemented to reflect modifications to the stream channel and overbanks, channel improvements, and bridge modifications. Data used to modify the cross sections were field surveyed.

The locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway is computed (Section 4.2), selected cross section locations are also shown on the FIRM.

WSELs of floods for the selected recurrence intervals, for all streams studied in detail, were computed using the USACE HEC-2 computer program (Reference 17).

For Chattanooga Creek, from the downstream county boundary to Nickajack Road, the revised hydraulic analysis was performed using the HEC-2 step-backwater computer program (Reference 18). Starting WSELS were taken from the FIS for the City of Chattanooga, Hamilton County, Tennessee (Reference 19).

The downstream segment of Chattanooga Creek, near the confluence with the Tennessee River, is subject to two types of flooding: flooding from the headwaters of Chattanooga Creek, and backwater flooding from the Tennessee

No detailed studies were made for several smaller streams in Walker County, Georgia, because of the lack of current or planned development along these streams. The 1-percent-annual-chance flood for these streams was approximated using cross sections obtained by photogrammetric methods and slope-area computations using the HEC-2 program.

For Chattanooga Creek, roughness coefficients (Manning's "n") were taken from the previously effective FIS and modified to reflect changes in the stream reaches.

Channel roughness factors (Manning's "n") for these computations were determined on the basis of field inspection of channel and flood plain areas, on previous studies by the TVA, and computed coefficients based on known flood profiles.

The Manning's "n" values for all detailed studied streams are listed in Table 3.

Table 3 - Manning's "n" Values

Stream	Channel "n"	Overbank "n"
Andrews Street Tributary	0.030-0.035	0.035-0.060
Carden Avenue Tributary	0.035-0.040	0.050-0.120
Chattanooga Creek	0.040-0.060	0.080-0.200
Chattooga Creek	0.035-0.070	0.100-0.120
Chattooga Creek Tributary	0.040-0.065	0.080-0.120
Coke Oven Branch	0.045-0.050	0.060-0.150
Coke Oven Branch Tributary No. 1	0.035-0.050	0.060-0.150
Coke Oven Branch Tributary No. 3	0.060	0.005-0.070
Crawfish Creek	0.040-0.050	0.070-0.120
Crawfish Spring Branch	0.040	0.085-0.150
Dry Creek	0.035-0.045	0.060-0.150
Dry Creek No. 2	0.043-0.050	0.070-0.150
Dry Creek Tributary No. 4 West	0.030-0.060	0.060-0.150
Ellis Branch	0.040-0.050	0.070-0.150
North Dry Creek Tributary No. 1	0.045-0.055	0.080-0.150
South Dry Creek Tributary No. 2	0.040-0.055	0.060-0.150
Spring Creek	0.035-0.045	0.060-0.125
Spring Creek Tributary No. 1	0.035-0.045	0.060-0.125
Spring Creek Tributary No. 2	0.035-0.045	0.060-0.125
Town Creek	0.035-0.045	0.060-0.125
Town Creek Tributary No. 1	0.035-0.045	0.060-0.125
Town Creek Tributary No. 2	0.035-0.045	0.060-0.125
Tributary to Chattanooga Creek	0.035-0.050	0.040-0.120
Unnamed Tributary to Unnamed Tributary to West Chickamauga Creek	0.040	0.060-0.150
Unnamed Tributary to West Chickamauga Creek	0.040	0.040-0.150
West Chickamauga Creek	0.012-0.035	0.019-0.150
Williams Street Tributary	0.030-0.045	0.060-0.150

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
WEST CHICKAMAUGA CREEK								
A	106,022	590[2]	6,415	3.3	716.0	716.0	717.0	1.0
B	108,874	690	6,285	3.3	716.5	716.5	717.3	0.8
C	109,402	650	4,765	3.4	716.5	716.5	717.3	0.8
D	113,414	710	5,505	3.8	719.6	719.6	720.4	0.8
E	114,946	580[2]	5,430	3.9	720.3	720.3	721.1	0.8
F	116,054	495	3,875	5.4	721.8	721.8	722.5	0.7
G	119,170	270	3,445	6.1	726.4	726.4	726.4	0.0
H	122,074	150	2,575	7.7	728.9	728.9	729.2	0.3
I	124,819	400	5,180	3.8	730.9	730.9	731.2	0.3
J	125,770	300	4,570	4.2	731.2	731.2	731.5	0.3
K	128,885	450	5,225	3.6	732.2	732.2	732.7	0.5
L	131,261	450	3,815	4.8	732.8	732.8	733.3	0.5

[1]Feet above mouth

[2]Portion of this stream along cross section is outside of county boundary

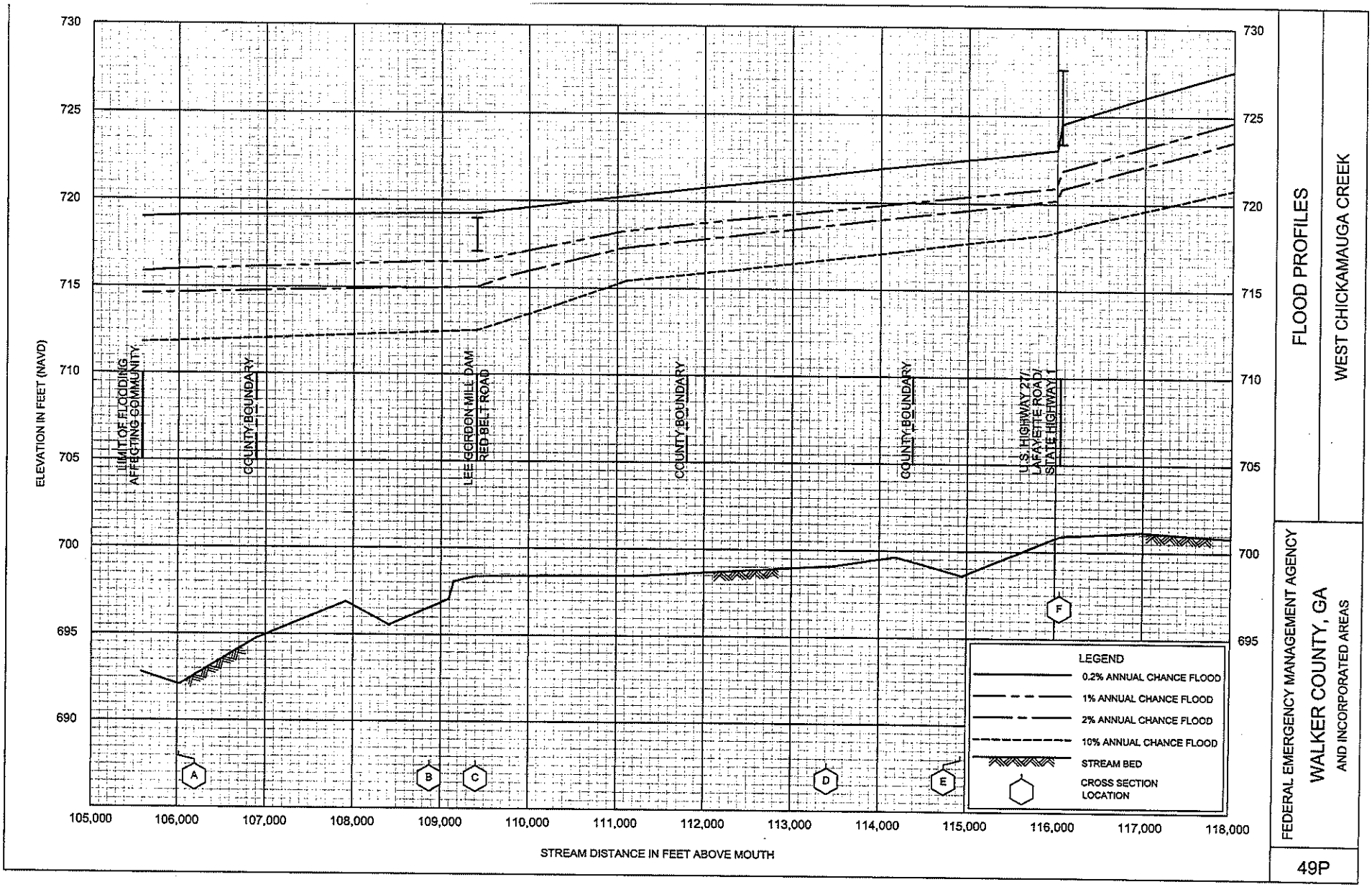
TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

WALKER COUNTY, GA
AND INCORPORATED AREAS

FLOODWAY DATA

WEST CHICKAMAUGA CREEK



FLOOD PROFILES

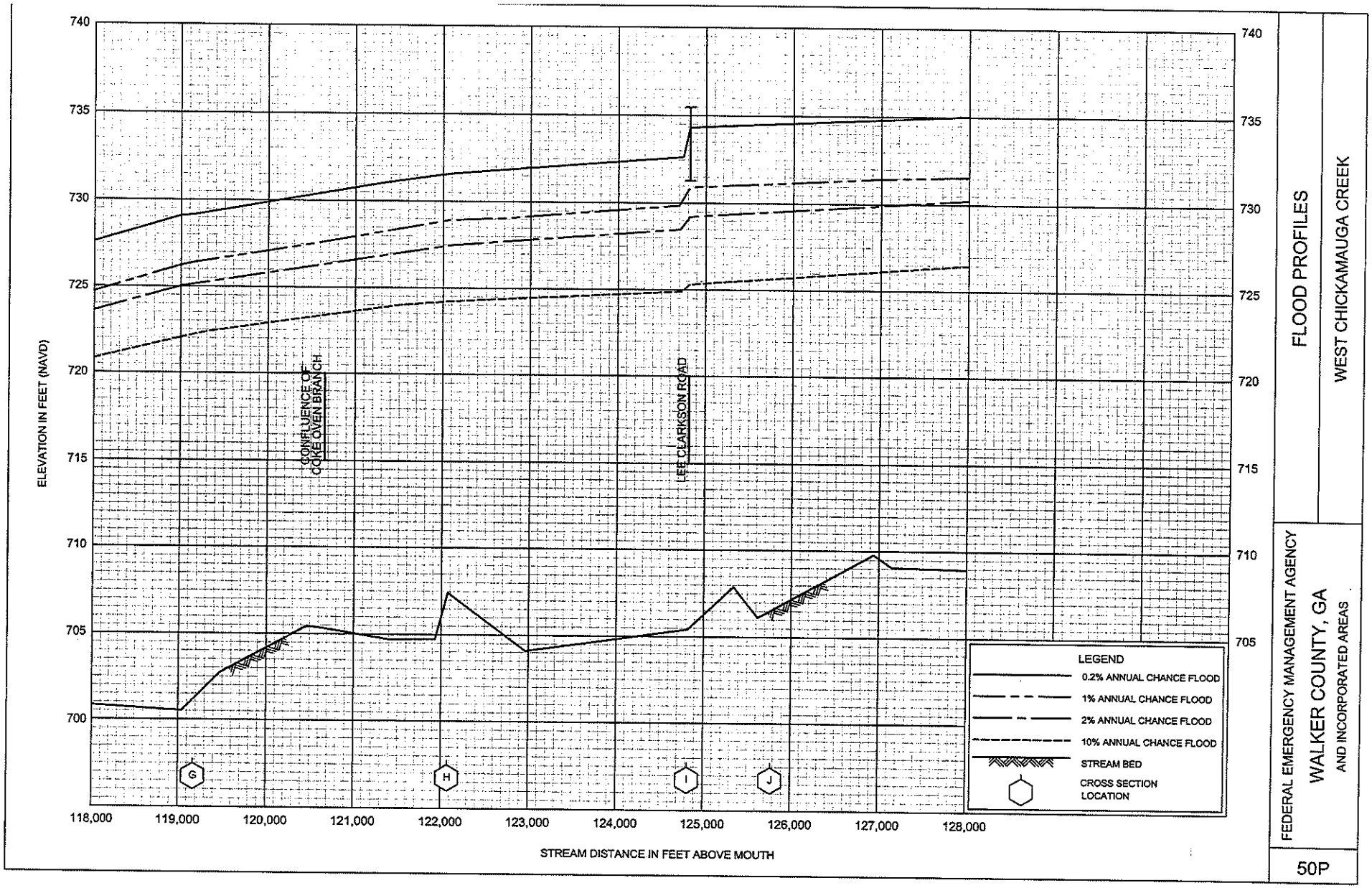
WEST CHICKAMAUGA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WALKER COUNTY, GA

AND INCORPORATED AREAS

49P



FLOOD PROFILES

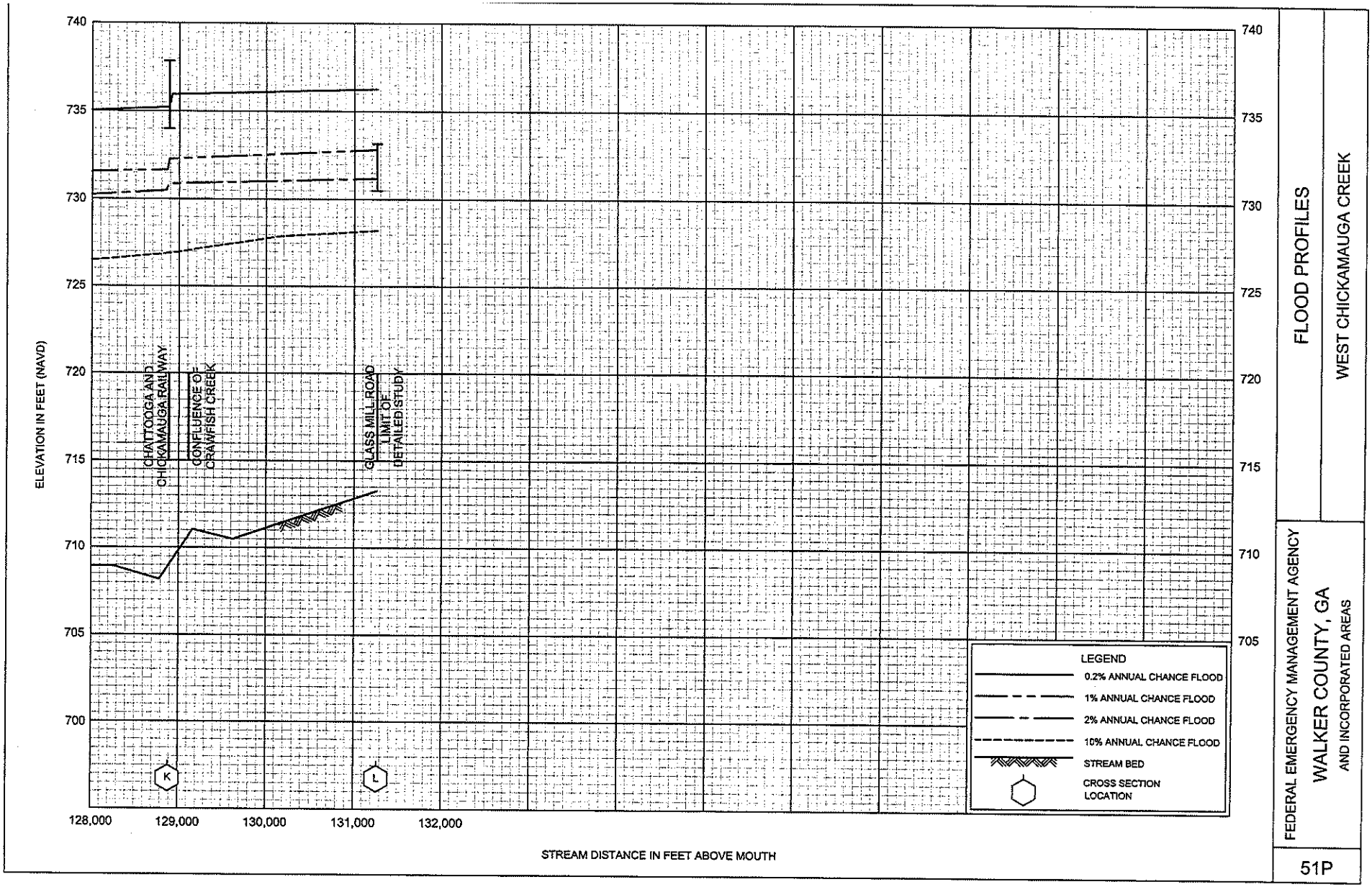
WEST CHICKAMAUGA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WALKER COUNTY, GA

AND INCORPORATED AREAS

50P



FLOOD PROFILES

WEST CHICKAMAUGA CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WALKER COUNTY, GA

AND INCORPORATED AREAS

51P

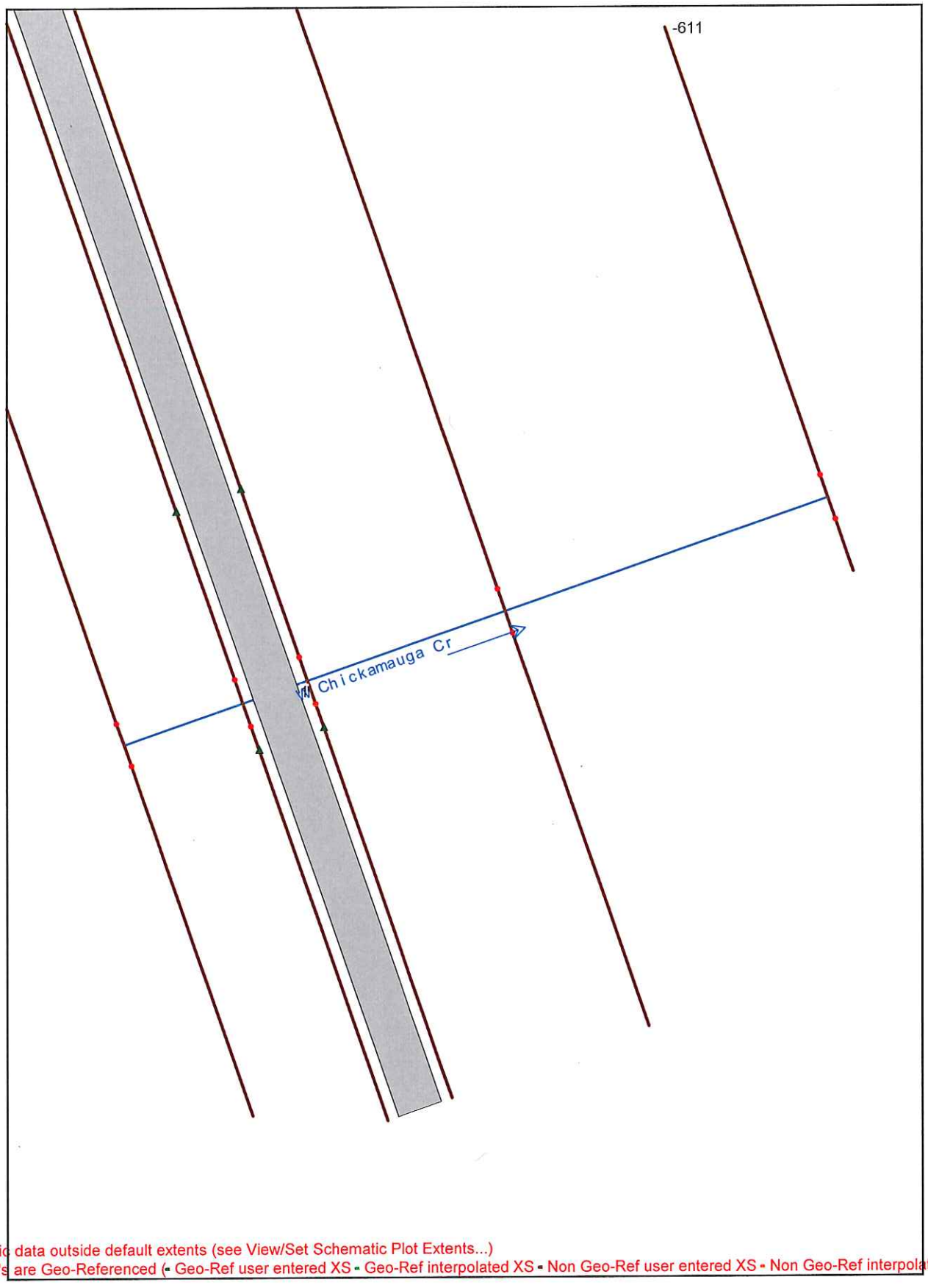
SR 1 (US 27) over West Chickamauga Creek
Walker County
PI NO. 0013943

FLOODWAY DATA FOR WEST CHICKAMAUGA CREEK, WALKER CO, GEORGIA*

PUBLISHED FIS VALUES					EXISTING BRIDGE FLOODWAY					PROPOSED BRIDGE FLOODWAY					DELTA F/W ELEV
SECTION	WIDTH (FT)	WITHOUT FLDWAY	WITH FLDWAY	INCREASE (FT)	SECTION	WIDTH (FT)	WITHOUT FLDWAY	WITH FLDWAY	INCREASE (FT)	SECTION	WIDTH (FT)	WITHOUT FLDWAY	WITH FLDWAY	INCREASE (FT)	B-A (FT)
				0.0	**722**	480.18	721.19	722.18	0.99	**722**	477.38	721.04	722.04	1.00	-0.14
F 497	495	721.8	722.5	0.7	**F 497**	402.27	721.03	722.00	0.97	**F 497**	425.00	720.91	721.89	0.98	-0.11
				0.0	**375**	402.10	720.76	721.83	1.07	**375**	425.00	720.78	721.85	1.07	0.02
				0.0	**0**	495.00	720.60	721.57	0.97	**0**	495.00	720.60	721.57	0.97	0.00
E -611	580	720.3	721.1	0.8	**E -611**	580.00	720.30	721.10	0.80	**E -611**	580.00	720.30	721.10	0.80	0.00

* Elevations are NAVD88

EXISTING 411' BRIDGE
FLOODWAY MODEL
WEST CHICKAMAUGA CREEK



Some schematic data outside default extents (see View/Set Schematic Plot Extents...)
None of the XS's are Geo-Referenced (- Geo-Ref user entered XS - Geo-Ref interpolated XS - Non Geo-Ref user entered XS - Non Geo-Ref interpolated XS)

HEC-RAS HEC-RAS 5.0.6 November 2018
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
XXXXXXX  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
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PROJECT DATA
Project Title: SR 1 over W Chickamauga Creek
Project File : SR1overWChickam.prj
Run Date and Time: 6/25/2019 2:48:33 PM

Project in English units

PLAN DATA

Plan Title: Existing 411' Bridge Floodway Model
Plan File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.p28

Geometry Title: Existing 411' Bridge Floodway Model
Geometry File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.g26

Flow Title : Floodway Flow Data FIS SWSEL
Flow File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.f05

Plan Summary Information:
Number of: Cross Sections = 5 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 1 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: Between every coordinate point (HEC2 Style)
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = W Chickamauga Cr Reach = 1

RS	Profile	Method	Value1	Value2
722	PF 2	1	1904	2399
497	PF 2	1	2069	2480
375	PF 2	1	2069	2480
0	PF 2	1	1931	2426
-611	PF 2	1	416	996

FLOW DATA

Flow Title: Floodway Flow Data FIS SWSEL

Flow File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.f05

Flow Data (cfs)

River	Reach	RS	PF 1	PF 2
W Chickamauga Cr	1	722	19434	19434

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
W Chickamauga Cr	1	PF 1		Known WS = 720.3
W Chickamauga Cr	1	PF 2		Known WS = 721.1

GEOMETRY DATA

Geometry Title: Existing 411' Bridge Floodway Model
Geometry File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.g26

CROSS SECTION

RIVER: W Chickamauga Cr
REACH: 1 RS: 722

INPUT
Description: Approach Section. Adjust Elevations to Quad Map Slope -0.15'
Station Elevation Data num= 500

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
980.33	755.4	986.4	755.38	995.11	755.35	996.4	755.33	1004	755.26
1006.4	755.21	1016.4	755	1026.4	754.79	1036.4	754.58	1040.28	754.5
1046.4	754.22	1051.14	754.01	1056.4	753.71	1062.49	753.36	1066.4	753.24
1076.4	752.96	1086.4	752.67	1096.4	752.39	1099.19	752.31	1106.4	751.92
1111.95	751.61	1116.4	751.52	1126.4	751.3	1136.4	751.09	1146.4	750.88
1149.7	750.81	1156.4	750.57	1166.4	750.22	1166.41	750.22	1176.4	750.12
1186.4	750.03	1196.4	749.93	1200.74	749.89	1206.4	749.87	1214.28	749.84
1216.4	749.77	1226.4	749.47	1236.4	749.16	1246.4	748.85	1251.97	748.68
1256.4	748.55	1264.97	748.3	1266.4	748.21	1276.4	747.55	1286.4	746.9
1296.4	746.25	1298.43	746.12	1306.4	745.7	1313.37	745.33	1316.4	745.12
1326.4	744.44	1336.4	743.76	1346.4	743.08	1347.52	743.01	1356.4	742.48
1363.69	742.04	1366.4	741.87	1376.4	741.23	1386.4	740.59	1394.95	740.05
1396.4	739.95	1406.4	739.23	1413.61	738.72	1416.4	738.58	1426.4	738.07
1436.4	737.56	1445.4	737.1	1446.4	737.04	1456.4	736.39	1464.51	735.86
1466.4	735.78	1476.4	735.33	1486.4	734.88	1495.08	734.49	1496.4	734.42
1506.4	733.84	1513.88	733.4	1516.4	733.31	1526.4	732.94	1532.19	732.73
1536.4	732.57	1546.4	732.21	1554.28	731.92	1556.4	731.85	1566.4	731.51
1573.29	731.28	1576.4	731.19	1586.4	730.92	1596.4	730.65	1598.86	730.58
1606.4	730.41	1616.4	730.19	1626.4	729.96	1627.65	729.94	1636.4	729.77
1646.4	729.58	1650.73	729.49	1656.4	729.38	1666.4	729.18	1668.9	729.13
1676.4	728.95	1683.84	728.76	1686.4	728.8	1696.4	728.94	1706.4	729.09
1707.93	729.11	1716.4	728.84	1721.99	728.66	1726.4	728.45	1736.4	727.98
1746.4	727.52	1756.02	727.07	1756.4	727.02	1761.52	726.41	1766.4	726.12
1776.4	725.53	1786.4	724.93	1792.82	724.55	1796.4	724.46	1799.52	724.37
1805.9	724.35	1806.4	724.34	1816.4	724.06	1826.4	723.78	1836.4	723.49
1846.4	723.21	1855.11	722.96	1856.4	722.93	1866.4	722.71	1867.48	722.68
1876.4	722.69	1886.4	722.71	1896.4	722.72	1904.59	722.73	1906.4	722.69
1910.99	722.59	1916.4	722.31	1926.4	721.79	1936.4	721.28	1938.8	721.15
1946.4	721.16	1951.69	721.17	1956.4	720.97	1966.4	720.53	1968.34	720.45
1968.41	720.44	1976.4	720.18	1984.12	719.92	1986.4	719.89	1996.4	719.73
2006.4	719.57	2008.4	719.54	2016.4	719.34	2026.4	719.08	2028.94	719.01
2036.4	718.71	2046.4	718.29	2049.85	718.15	2053.54	717.87	2056.4	717.75
2057.39	717.71	2066.4	717.38	2075.15	717.05	2076.4	716.96	2080.12	716.67
2085.94	716.47	2086.4	716.44	2089.32	716.25	2096.4	715.94	2098.97	715.83
2106.15	715.82	2106.4	715.81	2116.4	715.7	2126.4	715.59	2136.4	715.47
2146.4	715.36	2150.45	715.32	2156.4	714.99	2157.53	714.93	2162.15	715.56
2166.4	715.55	2176.4	715.51	2179.1	715.51	2184.22	715.37	2186.4	715.34
2188.2	715.32	2195.9	715.29	2196.4	715.31	2201.24	715.53	2206.08	715.97
2206.4	715.97	2216.4	715.91	2222.48	715.87	2226.4	715.9	2236.4	715.99
2243.47	716.06	2246.4	716.13	2256.4	716.38	2262.67	716.54	2266.4	716.54
2276	716.56	2286	716.79	2287.95	716.84	2296	715.72	2306	714.34
2310.91	713.66	2316	712.82	2324.84	711.36	2326	710.28	2326.64	709.69
2329.23	707.33	2334.74	706.23	2336	705.96	2346	703.87	2356	701.78
2362.98	700.31	2366	700.73	2376	702.11	2386	703.5	2396	704.88

2396.37	704.93	2402.29	705.67	2402.58	707.05	2404.51	712.27	2406	713.04
2416	718.22	2422.46	721.57	2424.21	722.47	2426	723.4	2430.48	725.71
2432.63	726.29	2436	727.52	2456.4	727.56	2457.47	727.85	2460.57	728.4
2462.37	728.82	2466.4	729.18	2473.71	729.85	2476.4	730.17	2486.4	731.37
2496.4	732.57	2504.81	733.57	2506.4	733.65	2516.4	734.13	2522.55	734.42
2526.4	734.55	2530.87	734.69	2536.4	735.44	2541.37	736.1	2546.4	736.68
2556.4	737.81	2556.87	737.87	2559.35	738	2563.49	738.29	2566.4	738.44
2566.55	738.45	2576.4	739.11	2586.4	739.78	2596.4	740.46	2599	740.63
2600	740.7	2608.89	741.26	2610	741.38	2610.05	741.39	2612.66	741.5
2613.19	741.53	2619.48	741.91	2619.79	741.93	2626.39	742.33	2628.71	742.47
2632.99	742.72	2637.95	743.02	2639.06	743.08	2639.59	743.1	2646.19	743.34
2647.18	743.37	2649.47	743.45	2651	743.47	2652.79	743.54	2656.42	743.66
2659.4	743.76	2665.65	743.97	2666	743.98	2672.6	744.2	2674.89	744.28
2679.2	744.42	2684.12	744.58	2685.8	744.64	2689.64	744.76	2692.07	744.84
2692.4	744.86	2693.35	744.89	2693.81	744.9	2699	745	2700	745.02
2706.6	745.16	2709.23	745.21	2713.2	745.29	2718.47	745.39	2719.8	745.42
2726.4	745.54	2727.7	745.57	2729.07	745.6	2730.75	745.68	2733	745.71
2736.94	745.76	2739.6	745.8	2743.08	745.84	2746.17	745.86	2746.2	745.86
2752.8	745.89	2755.41	745.9	2759.4	745.92	2764.64	745.94	2766	745.95
2767.04	745.95	2772.6	745.95	2773.88	745.95	2779.2	745.95	2780.8	745.96
2783.11	745.82	2783.33	745.81	2785.8	745.8	2786.3	745.8	2786.87	745.82
2787.42	745.82	2792.34	745.71	2792.4	745.71	2795.32	745.64	2795.48	745.63
2795.93	745.62	2797.82	745.58	2799	745.58	2800	745.55	2806.6	745.36
2808.07	745.32	2809.23	745.36	2812.44	745.46	2812.91	745.33	2813.2	745.34
2815.5	745.35	2818.47	745.33	2819.8	745.32	2826.4	745.29	2827.27	745.29
2827.7	745.23	2830.5	744.87	2833	744.83	2836.94	744.77	2839.6	744.72
2840.94	744.7	2846.17	744.63	2846.2	744.63	2852.8	744.54	2855.41	744.51
2859.4	744.45	2864.64	744.39	2866	744.37	2867.17	744.35	2872.6	744.25
2873.88	744.23	2875.07	744.2	2879.2	744.06	2880.1	744.03	2883.11	744.01
2885.14	743.99	2885.8	743.98	2892.34	743.87	2892.4	743.87	2893.23	743.86
2899	743.52	2900	743.35	2901.06	743.18	2901.06	743.16	2901.27	743.17
2901.43	743.14	2903.04	743.14	2906.6	743.11	2909.23	743.08	2909.87	743.07
2913.2	743.33	2914.87	743.46	2918.47	743.54	2919.8	743.58	2926.4	743.74
2927.7	743.77	2928.94	743.8	2933	743.89	2936.94	743.98	2939.6	744.04
2946.17	744.19	2946.2	744.19	2952.8	744.33	2955.41	744.39	2958.33	744.46
2958.88	744.45	2959.4	744.45	2959.46	744.45	2959.75	744.44	2960.36	744.44
2960.67	744.43	2961.08	744.43	2961.14	744.44	2961.52	744.53	2961.75	744.58
2962.18	744.66	2962.38	744.7	2962.75	744.77	2963.09	744.83	2963.3	744.87
2963.69	744.93	2963.96	744.97	2964.13	744.99	2964.45	745.03	2964.64	745.05
2964.76	745.07	2964.89	745.08	2965.05	745.1	2965.13	745.1	2965.32	745.12
2965.58	745.13	2965.7	745.14	2965.95	745.15	2966	745.15	2966.08	745.15
2966.26	745.16	2966.53	745.15	2966.76	745.15	2966.91	745.14	2967.01	745.14
2967.22	745.12	2967.38	745.11	2967.48	745.1	2967.71	745.07	2967.94	745.05
2968.1	745.02	2968.32	744.99	2968.44	744.97	2968.71	744.93	2968.86	744.9
2969.17	744.84	2969.33	744.81	2969.6	744.76	2970.03	744.66	2970.54	744.54
2970.82	744.47	2970.96	744.44	2971.1	744.44	2971.66	744.45	2972.19	744.46
2972.53	744.46	2972.6	744.46	2973.17	744.47	2973.61	744.48	2973.88	744.48
2973.9	744.48	2974.42	744.49	2974.67	744.5	2979.2	744.5	2983.11	744.51
2985.8	744.51	2992.34	744.52	2992.4	744.52	2993.78	744.52	2999	744.51
3000	744.51	3006.6	744.51	3009.23	744.5	3011.26	744.5	3011.39	744.5
3011.58	744.53	3013.2	744.53	3015.01	744.52	3015.54	744.5	3015.69	744.5
3018.47	744.7	3019.8	744.8	3021.64	744.93	3026.4	745.21	3027.7	745.29
3027.87	745.3	3033	745.4	3033.41	745.41	3036.44	745.41	3036.94	745.4
3039.6	745.4	3042.29	745.39	3044.61	745.35	3046.17	745.3	3046.2	745.3
3046.7	745.28	3047.49	745.06	3051.45	745.33	3051.6	745.32	3052.8	745.33
3055.41	745.35	3058.91	745.38	3059.4	745.41	3064.64	745.7	3066	745.77

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
980.33	.15	1666.4	.1	2324.84	.035	2404.51	.15

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2324.84	2404.51	225	225	.3	.5

CROSS SECTION

RIVER: W Chickamauga Cr
REACH: 1 RS: 497

INPUT
Description: Upstream Face of Existing and Proposed Bridges. Copy RS 375 to 497. Adjust Elevations +0.07'.
Station Elevation Data num= 483

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
986.4	749.47	994.83	749.45	996.4	749.46	1006.4	749.5	1016.4	749.54
1017.31	749.55	1026.4	749.61	1036.4	749.68	1036.84	749.69	1046.4	749.43
1056.4	749.15	1066.4	748.88	1068.39	748.82	1076.4	748.59	1086.4	748.31
1092.59	748.13	1096.4	747.95	1106.4	747.46	1116.4	746.98	1119.01	746.86

1126.4	746.78	1136.4	746.66	1145.06	746.57	1146.4	746.53	1156.4	746.21
1166.4	745.9	1176.4	745.58	1176.72	745.57	1186.4	745.22	1196.4	744.86
1199.54	744.74	1206.4	744.4	1216.4	743.89	1225.98	743.4	1226.4	743.36
1236.4	742.4	1239.75	742.08	1246.4	741.84	1256.4	741.47	1266.4	741.1
1275.6	740.76	1276.4	740.72	1286.4	740.24	1291.42	740	1296.4	739.58
1306.4	738.75	1316.4	737.92	1325.08	737.2	1326.4	737.15	1335.41	736.78
1336.4	736.72	1346.4	736.09	1356.4	735.46	1366.4	734.83	1372.1	734.47
1376.4	734.22	1381.61	733.91	1386.4	733.72	1396.4	733.33	1406.4	732.94
1416.4	732.54	1417.59	732.5	1426.4	732.17	1427.61	732.13	1436.4	731.88
1446.4	731.6	1456.4	731.32	1466.4	731.04	1467.33	731.02	1474.86	730.81
1476.4	730.77	1486.4	730.5	1496.4	730.24	1506.4	729.97	1516.4	729.71
1517.74	729.67	1525.79	729.47	1526.4	729.46	1536.4	729.35	1546.4	729.23
1556.4	729.12	1561.87	729.06	1566.4	728.93	1573.65	728.73	1576.4	728.71
1586.4	728.64	1596.4	728.57	1606.4	728.5	1609.42	728.48	1616.4	728.54
1622.69	728.59	1626.4	728.63	1636.4	728.73	1646.4	728.82	1656.4	728.92
1656.71	728.92	1666.4	728.81	1670.12	728.77	1676.4	728.78	1686.4	728.8
1696.4	728.81	1703.47	728.83	1706.4	728.71	1716.29	728.3	1716.4	728.29
1726.4	727.88	1736.4	727.46	1746.4	727.04	1749.28	726.92	1756.4	726.42
1766.4	725.7	1766.7	725.68	1776.4	725	1786.4	724.29	1796.4	723.58
1803.94	723.05	1806.4	722.93	1816.4	722.47	1819.54	722.32	1826.4	721.8
1836.4	721.05	1846.4	720.29	1851.37	719.91	1856.4	719.62	1857.57	719.56
1866.4	718.9	1876.4	718.16	1886.4	717.42	1888.96	717.23	1896.4	716.88
1905.16	716.46	1906.4	716.43	1916.4	716.17	1925.28	715.95	1926.4	715.92
1936.4	715.67	1946.4	715.41	1949.51	715.33	1956.4	715.21	1966.4	715.03
1976.4	714.86	1984.96	714.7	1986.4	714.68	1996.4	714.55	1998.7	714.52
2006.4	714.52	2013.23	714.52	2016.4	714.5	2025.6	714.44	2025.61	714.44
2026.4	714.46	2036.4	714.64	2044.85	714.8	2046.4	714.77	2056.4	714.59
2065.47	714.42	2066.4	714.42	2076.4	714.41	2077.53	714.41	2086.4	714.5
2090.33	714.53	2096.4	714.49	2106.4	714.43	2116.4	714.37	2126.06	714.31
2126.4	714.31	2136.4	714.26	2142.48	714.23	2146.4	714.25	2156.4	714.31
2166.1	714.36	2166.4	714.36	2176.4	714.58	2186.4	714.79	2189.74	714.86
2196.4	714.82	2206.4	714.77	2211.18	714.74	2216.4	714.74	2226.4	714.75
2233.17	714.75	2236.4	714.81	2246.4	715	2256.4	715.19	2260.72	715.27
2266.4	715.43	2276.4	715.72	2277.44	715.75	2284.4	715.62	2286.4	715.51
2294.35	715.06	2296.4	715.06	2306.4	715.09	2313.3	715.11	2316.4	715.03
2326.4	714.78	2336.4	714.53	2346.4	714.29	2356.4	714.04	2362.97	713.87
2365.91	713.72	2366.4	712.65	2368.58	707.85	2369.05	706.93	2376.4	704.88
2386.4	702.09	2390.45	700.95	2396.4	699.34	2406.4	696.62	2411.26	695.3
2416.4	696.75	2426.4	699.57	2436.4	702.4	2446.4	705.22	2446.69	705.31
2451.22	706.54	2451.84	707.64	2454.34	712.13	2456.4	713.07	2456.64	713.17
2457.68	713.99	2458.65	714.53	2466.4	719.16	2469.01	720.72	2475.1	724.17
2476.4	724.24	2483.89	724.63	2486.4	724.77	2496.4	725.31	2497.91	725.39
2500.97	725.23	2505.97	725.76	2506.4	725.78	2507.98	725.84	2515.36	726.85
2516.4	727.2	2525.69	730.28	2526.4	730.53	2527.8	731.04	2536.4	732.91
2546.4	735.08	2552.2	736.34	2556.4	737.1	2566.4	738.92	2566.93	739.02
2576.4	739.97	2582.12	740.55	2586.4	740.74	2596.4	741.18	2599	741.29
2600	741.33	2600.21	741.34	2610	741.49	2613.19	741.54	2616.95	741.6
2620.34	741.53	2620.62	741.53	2627.49	741.39	2631.52	741.31	2633.81	741.27
2634.64	741.23	2640.26	740.97	2641.79	740.85	2642.42	740.8	2643.94	740.68
2648.86	740.1	2648.94	740.09	2650.45	740.08	2652.13	740.18	2652.75	740.18
2653.33	740.19	2655.65	740.23	2656.1	740.24	2663.25	740.27	2664.23	740.28
2670.36	740.31	2670.4	740.31	2675.14	740.31	2676.12	740.31	2677.55	740.3
2684.7	740.25	2686.04	740.23	2691.85	740.19	2696.94	740.15	2699	740.13
2700	740.12	2707.07	740.06	2708.28	740.05	2708.51	740.05	2710.9	740.08
2714.14	740.11	2721.21	740.18	2721.81	740.18	2728.29	740.25	2732.71	740.29
2735.36	740.32	2740.79	740.37	2742.43	740.38	2743.62	740.38	2749.5	740.4
2754.52	740.42	2756.57	740.42	2759.32	740.43	2763.64	740.46	2765.42	740.47
2770.71	740.5	2775.64	740.53	2776.33	740.54	2777.79	740.54	2784.86	740.55
2787.23	740.56	2791.93	740.57	2794.95	740.58	2798.14	740.59	2799	740.59
2800	740.6	2807.07	740.62	2810.9	740.64	2814.14	740.65	2821.21	740.68
2821.81	740.69	2825.19	740.7	2828.29	740.71	2832.71	740.72	2835.36	740.73
2842.09	740.75	2842.43	740.75	2843.62	740.75	2849.5	740.76	2854.52	740.76
2856.57	740.76	2863.64	740.77	2865.42	740.77	2870.71	740.78	2874.71	740.78
2876.33	740.78	2877.79	740.79	2884.86	740.8	2887.23	740.81	2891.93	740.82
2898.14	740.83	2899	740.83	2900	740.84	2907.07	740.85	2910.9	740.85
2914.14	740.86	2921.21	740.87	2921.81	740.87	2924.37	740.87	2928.29	740.92
2932.22	740.98	2932.71	740.98	2935.36	740.99	2942.43	741.01	2943.62	741.02
2946.24	741.03	2949.5	741.06	2954.52	741.1	2956.57	741.12	2963.64	741.19
2965.42	741.21	2970.71	741.26	2976.24	741.31	2976.33	741.31	2977.79	741.27
2984.86	741.11	2987.23	741.05	2989.05	741.01	2991.93	741	2993.82	740.99
2997.67	741	2998.14	740.95	2999	740.85	3000	740.69	3007.07	739.59
3007.8	739.47	3010.9	739.86	3012.79	740.1	3014.14	740.23	3021.21	740.95
3021.81	741.01	3023.21	741.15	3024.06	741.24	3024.31	741.26	3024.32	741.26
3024.36	741.26	3024.38	741.26	3024.42	741.27	3024.48	741.27	3024.52	741.27
3024.65	741.29	3024.76	741.3	3025.14	741.33	3025.68	741.37	3026.61	741.39
3028.19	741.41	3028.29	741.41	3029.11	741.42	3030.72	741.44	3031.42	741.45
3032.67	741.46	3032.71	741.46	3033.73	741.47	3034.35	741.47	3035.36	741.47
3035.43	741.47	3035.95	741.48	3036.27	741.48	3036.85	741.48	3042.43	741.46
3043.62	741.45	3049.5	741.43	3054.52	741.41	3056.57	741.41	3056.81	741.4

3057.55	741.4	3058.41	741.4	3058.9	741.4	3060.02	741.39	3060.66	741.39
3061.74	741.39	3063.64	741.41	3064.92	741.42	3065.11	741.41	3065.27	741.4
3065.42	741.39	3065.46	741.39	3067.01	741.42	3070.18	741.49	3070.71	741.51
3070.94	741.51	3072.06	741.53	3072.85	741.55	3073.25	741.56	3073.88	741.57
3074.13	741.58	3074.55	741.59	3074.87	741.59	3075.06	741.6	3075.94	741.58
3076.11	741.6	3076.33	741.59	3077.52	741.57	3077.79	741.59	3079.2	741.73
3079.21	741.72	3084.86	741.9	3087.23	741.97	3091.93	742.12	3096.59	742.26
3098.14	742.32	3100	742.39	3107.07	742.65	3110.9	742.79	3112.58	742.85
3114.14	742.89	3121.21	743.03	3121.81	743.04	3128.29	743.17	3132.71	743.25
3135.36	743.3	3142.43	743.44	3143.62	743.47	3148.27	743.56	3149.5	743.58
3154.52	743.67	3156.57	743.7	3156.92	743.71	3163.64	743.68	3163.87	743.67
3165.42	743.66	3166.15	743.66	3170.71	743.66	3176.33	743.65	3176.39	743.65
3177.79	743.65	3184.86	743.65	3187.23	743.65	3191.93	743.65	3192.95	743.65
3193.27	743.65	3198.14	743.65	3199	743.65				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
986.4	.15	2336.4	.1	2365.91	.035	2454.34	.1	2526.4	.15

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2365.91	2454.34	122	122	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
986.4	2049.35	724.33	T
2499.93	3199	724.33	T

Sediment Elevation = 700.18

BRIDGE

RIVER: W Chickamauga Cr
REACH: 1 RS: 436

INPUT
Description: Existing 411' Bridge
Distance from Upstream XS = 20
Deck/Roadway Width = 82
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 32

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1100	740.84	0	1200	739.64	0	1300	737.95	0
1400	735.85	0	1500	733.68	0	1600	731.46	0
1700	729.36	0	1800	727.67	0	1900	726.23	0
2000	724.82	0	2069.35	724.33	0	2069.35	724.33	721
2098.84	724.69	721.36	2128.86	725.03	721.7	2158.86	725.38	722.05
2188.88	725.78	722.45	2219.02	726.08	722.75	2248.88	726.41	723.08
2278.89	726.71	723.38	2309	727	723.67	2309	727	723
2362	727.27	723.27	2427	727.41	723.41	2479.93	727.49	723.49
2479.93	727.49	0	2500	728.18	0	2600	729.08	0
2700	731.51	0	2800	734.8	0	2900	738.51	0
3000	741.91	0	3100	744.64	0			

Upstream Bridge Cross Section Data
Station Elevation Data num= 483

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
986.4	749.47	994.83	749.45	996.4	749.46	1006.4	749.5	1016.4	749.54
1017.31	749.55	1026.4	749.61	1036.4	749.68	1036.84	749.69	1046.4	749.43
1056.4	749.15	1066.4	748.88	1068.39	748.82	1076.4	748.59	1086.4	748.31
1092.59	748.13	1096.4	747.95	1106.4	747.46	1116.4	746.98	1119.01	746.86
1126.4	746.78	1136.4	746.66	1145.06	746.57	1146.4	746.53	1156.4	746.21
1166.4	745.9	1176.4	745.58	1176.72	745.57	1186.4	745.22	1196.4	744.86
1199.54	744.74	1206.4	744.4	1216.4	743.89	1225.98	743.4	1226.4	743.36
1236.4	742.4	1239.75	742.08	1246.4	741.84	1256.4	741.47	1266.4	741.1
1275.6	740.76	1276.4	740.72	1286.4	740.24	1291.42	740	1296.4	739.58
1306.4	738.75	1316.4	737.92	1325.08	737.2	1326.4	737.15	1335.41	736.78
1336.4	736.72	1346.4	736.09	1356.4	735.46	1366.4	734.83	1372.1	734.47
1376.4	734.22	1381.61	733.91	1386.4	733.72	1396.4	733.33	1406.4	732.94
1416.4	732.54	1417.59	732.5	1426.4	732.17	1427.61	732.13	1436.4	731.88
1446.4	731.6	1456.4	731.32	1466.4	731.04	1467.33	731.02	1474.86	730.81
1476.4	730.77	1486.4	730.5	1496.4	730.24	1506.4	729.97	1516.4	729.71
1517.74	729.67	1525.79	729.47	1526.4	729.46	1536.4	729.35	1546.4	729.23
1556.4	729.12	1561.87	729.06	1566.4	728.93	1573.65	728.73	1576.4	728.71
1586.4	728.64	1596.4	728.57	1606.4	728.5	1609.42	728.48	1616.4	728.54
1622.69	728.59	1626.4	728.63	1636.4	728.73	1646.4	728.82	1656.4	728.92
1656.71	728.92	1666.4	728.81	1670.12	728.77	1676.4	728.78	1686.4	728.8
1696.4	728.81	1703.47	728.83	1706.4	728.71	1716.29	728.3	1716.4	728.29
1726.4	727.88	1736.4	727.46	1746.4	727.04	1749.28	726.92	1756.4	726.42
1766.4	725.7	1766.7	725.68	1776.4	725	1786.4	724.29	1796.4	723.58

1803.94	723.05	1806.4	722.93	1816.4	722.47	1819.54	722.32	1826.4	721.8
1836.4	721.05	1846.4	720.29	1851.37	719.91	1856.4	719.62	1857.57	719.56
1866.4	718.9	1876.4	718.16	1886.4	717.42	1888.96	717.23	1896.4	716.88
1905.16	716.46	1906.4	716.43	1916.4	716.17	1925.28	715.95	1926.4	715.92
1936.4	715.67	1946.4	715.41	1949.51	715.33	1956.4	715.21	1966.4	715.03
1976.4	714.86	1984.96	714.7	1986.4	714.68	1996.4	714.55	1998.7	714.52
2006.4	714.52	2013.23	714.52	2016.4	714.5	2025.6	714.44	2025.61	714.44
2026.4	714.46	2036.4	714.64	2044.85	714.8	2046.4	714.77	2056.4	714.59
2065.47	714.42	2066.4	714.42	2076.4	714.41	2077.53	714.41	2086.4	714.5
2090.33	714.53	2096.4	714.49	2106.4	714.43	2116.4	714.37	2126.06	714.31
2126.4	714.31	2136.4	714.26	2142.48	714.23	2146.4	714.25	2156.4	714.31
2166.1	714.36	2166.4	714.36	2176.4	714.58	2186.4	714.79	2189.74	714.86
2196.4	714.82	2206.4	714.77	2211.18	714.74	2216.4	714.74	2226.4	714.75
2233.17	714.75	2236.4	714.81	2246.4	715	2256.4	715.19	2260.72	715.27
2266.4	715.43	2276.4	715.72	2277.44	715.75	2284.4	715.62	2286.4	715.51
2294.35	715.06	2296.4	715.06	2306.4	715.09	2313.3	715.11	2316.4	715.03
2326.4	714.78	2336.4	714.53	2346.4	714.29	2356.4	714.04	2362.97	713.87
2365.91	713.72	2366.4	712.65	2368.58	707.85	2369.05	706.93	2376.4	704.88
2386.4	702.09	2390.45	700.95	2396.4	699.34	2406.4	696.62	2411.26	695.3
2416.4	696.75	2426.4	699.57	2436.4	702.4	2446.4	705.22	2446.69	705.31
2451.22	706.54	2451.84	707.64	2454.34	712.13	2456.4	713.07	2456.64	713.17
2457.68	713.99	2458.65	714.53	2466.4	719.16	2469.01	720.72	2475.1	724.17
2476.4	724.24	2483.89	724.63	2486.4	724.77	2496.4	725.31	2497.91	725.39
2500.97	725.23	2505.97	725.76	2506.4	725.78	2507.98	725.84	2515.36	726.85
2516.4	727.2	2525.69	730.28	2526.4	730.53	2527.8	731.04	2536.4	732.91
2546.4	735.08	2552.2	736.34	2556.4	737.1	2566.4	738.92	2566.93	739.02
2576.4	739.97	2582.12	740.55	2586.4	740.74	2596.4	741.18	2599	741.29
2600	741.33	2600.21	741.34	2610	741.49	2613.19	741.54	2616.95	741.6
2620.34	741.53	2620.62	741.53	2627.49	741.39	2631.52	741.31	2633.81	741.27
2634.64	741.23	2640.26	740.97	2641.79	740.85	2642.42	740.8	2643.94	740.68
2648.86	740.1	2648.94	740.09	2650.45	740.08	2652.13	740.18	2652.75	740.18
2653.33	740.19	2655.65	740.23	2656.1	740.24	2663.25	740.27	2664.23	740.28
2670.36	740.31	2670.4	740.31	2675.14	740.31	2676.12	740.31	2677.55	740.3
2684.7	740.25	2686.04	740.23	2691.85	740.19	2696.94	740.15	2699	740.13
2700	740.12	2707.07	740.06	2708.28	740.05	2708.51	740.05	2710.9	740.08
2714.14	740.11	2721.21	740.18	2721.81	740.18	2728.29	740.25	2732.71	740.29
2735.36	740.32	2740.79	740.37	2742.43	740.38	2743.62	740.38	2749.5	740.4
2754.52	740.42	2756.57	740.42	2759.32	740.43	2763.64	740.46	2765.42	740.47
2770.71	740.5	2775.64	740.53	2776.33	740.54	2777.79	740.54	2784.86	740.55
2787.23	740.56	2791.93	740.57	2794.95	740.58	2798.14	740.59	2799	740.59
2800	740.6	2807.07	740.62	2810.9	740.64	2814.14	740.65	2821.21	740.68
2821.81	740.69	2825.19	740.7	2828.29	740.71	2832.71	740.72	2835.36	740.73
2842.09	740.75	2842.43	740.75	2843.62	740.75	2849.5	740.76	2854.52	740.76
2856.57	740.76	2863.64	740.77	2865.42	740.77	2870.71	740.78	2874.71	740.78
2876.33	740.78	2877.79	740.79	2884.86	740.8	2887.23	740.81	2891.93	740.82
2898.14	740.83	2899	740.83	2900	740.84	2907.07	740.85	2910.9	740.85
2914.14	740.86	2921.21	740.87	2921.81	740.87	2924.37	740.87	2928.29	740.92
2932.22	740.98	2932.71	740.98	2935.36	740.99	2942.43	741.01	2943.62	741.02
2946.24	741.03	2949.5	741.06	2954.52	741.1	2956.57	741.12	2963.64	741.19
2965.42	741.21	2970.71	741.26	2976.24	741.31	2976.33	741.31	2977.79	741.27
2984.86	741.11	2987.23	741.05	2989.05	741.01	2991.93	741	2993.82	740.99
2997.67	741	2998.14	740.95	2999	740.85	3000	740.69	3007.07	739.59
3007.8	739.47	3010.9	739.86	3012.79	740.1	3014.14	740.23	3021.21	740.95
3021.81	741.01	3023.21	741.15	3024.06	741.24	3024.31	741.26	3024.32	741.26
3024.36	741.26	3024.38	741.26	3024.42	741.27	3024.48	741.27	3024.52	741.27
3024.65	741.29	3024.76	741.3	3025.14	741.33	3025.68	741.37	3026.61	741.39
3028.19	741.41	3028.29	741.41	3029.11	741.42	3030.72	741.44	3031.42	741.45
3032.67	741.46	3032.71	741.46	3033.73	741.47	3034.35	741.47	3035.36	741.47
3035.43	741.47	3035.95	741.48	3036.27	741.48	3036.85	741.48	3042.43	741.46
3043.62	741.45	3049.5	741.43	3054.52	741.41	3056.57	741.41	3056.81	741.4
3057.55	741.4	3058.41	741.4	3058.9	741.4	3060.02	741.39	3060.66	741.39
3061.74	741.39	3063.64	741.41	3064.92	741.42	3065.11	741.41	3065.27	741.4
3065.42	741.39	3065.46	741.39	3067.01	741.42	3070.18	741.49	3070.71	741.51
3070.94	741.51	3072.06	741.53	3072.85	741.55	3073.25	741.56	3073.88	741.57
3074.13	741.58	3074.55	741.59	3074.87	741.59	3075.06	741.6	3075.94	741.58
3076.11	741.6	3076.33	741.59	3077.52	741.57	3077.79	741.59	3079.2	741.73
3079.21	741.72	3084.86	741.9	3087.23	741.97	3091.93	742.12	3096.59	742.26
3098.14	742.32	3100	742.39	3107.07	742.65	3110.9	742.79	3112.58	742.85
3114.14	742.89	3121.21	743.03	3121.81	743.04	3128.29	743.17	3132.71	743.25
3135.36	743.3	3142.43	743.44	3143.62	743.47	3148.27	743.56	3149.5	743.58
3154.52	743.67	3156.57	743.7	3156.92	743.71	3163.64	743.68	3163.87	743.67
3165.42	743.66	3166.15	743.66	3170.71	743.66	3176.33	743.65	3176.39	743.65
3177.79	743.65	3184.86	743.65	3187.23	743.65	3191.93	743.65	3192.95	743.65
3193.27	743.65	3198.14	743.65	3199	743.65				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
986.4	.15	2336.4	.1	2365.91	.035	2454.34	.1	2526.4	.15

Bank Sta: Left Right Coeff Contr. Expan.
2365.91 2454.34 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
986.4	2049.35	724.33	T
2499.93	3199	724.33	T

Sediment Elevation = 700.18

Downstream Deck/Roadway Coordinates
num= 32

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1100	740.84	0	1200	739.64	0	1300	737.95	0
1400	735.85	0	1500	733.68	0	1600	731.46	0
1700	729.36	0	1800	727.67	0	1900	726.23	0
2000	724.82	0	2069.35	724.33	0	2069.35	724.33	721
2098.84	724.69	721.36	2128.86	725.03	721.7	2158.86	725.38	722.05
2188.88	725.78	722.45	2219.02	726.08	722.75	2248.88	726.41	723.08
2278.89	726.71	723.38	2309	727	723.67	2309	727	723
2362	727.27	723.27	2427	727.41	723.41	2479.93	727.49	723.49
2479.93	727.49	0	2500	728.18	0	2600	729.08	0
2700	731.51	0	2800	734.8	0	2900	738.51	0
3000	741.91	0	3100	744.64	0			

Downstream Bridge Cross Section Data
Station Elevation Data num= 483

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
986.4	749.4	994.83	749.38	996.4	749.39	1006.4	749.43	1016.4	749.47
1017.31	749.48	1026.4	749.54	1036.4	749.61	1036.84	749.62	1046.4	749.36
1056.4	749.08	1066.4	748.81	1068.39	748.75	1076.4	748.52	1086.4	748.24
1092.59	748.06	1096.4	747.88	1106.4	747.39	1116.4	746.91	1119.01	746.79
1126.4	746.71	1136.4	746.59	1145.06	746.5	1146.4	746.46	1156.4	746.14
1166.4	745.83	1176.4	745.51	1176.72	745.5	1186.4	745.15	1196.4	744.79
1199.54	744.67	1206.4	744.33	1216.4	743.82	1225.98	743.33	1226.4	743.29
1236.4	742.33	1239.75	742.01	1246.4	741.77	1256.4	741.4	1266.4	741.03
1275.6	740.69	1276.4	740.65	1286.4	740.17	1291.42	739.93	1296.4	739.51
1306.4	738.68	1316.4	737.85	1325.08	737.13	1326.4	737.08	1335.41	736.71
1336.4	736.65	1346.4	736.02	1356.4	735.39	1366.4	734.76	1372.1	734.4
1376.4	734.15	1381.61	733.84	1386.4	733.65	1396.4	733.26	1406.4	732.87
1416.4	732.47	1417.59	732.43	1426.4	732.1	1427.61	732.06	1436.4	731.81
1446.4	731.53	1456.4	731.25	1466.4	730.97	1467.33	730.95	1474.86	730.74
1476.4	730.7	1486.4	730.43	1496.4	730.17	1506.4	729.9	1516.4	729.64
1517.74	729.6	1525.79	729.4	1526.4	729.39	1536.4	729.28	1546.4	729.16
1556.4	729.05	1561.87	728.99	1566.4	728.86	1573.65	728.66	1576.4	728.64
1586.4	728.57	1596.4	728.5	1606.4	728.43	1609.42	728.41	1616.4	728.47
1622.69	728.52	1626.4	728.56	1636.4	728.66	1646.4	728.75	1656.4	728.85
1656.71	728.85	1666.4	728.74	1670.12	728.7	1676.4	728.71	1686.4	728.73
1696.4	728.74	1703.47	728.76	1706.4	728.64	1716.29	728.23	1716.4	728.22
1726.4	727.81	1736.4	727.39	1746.4	726.97	1749.28	726.85	1756.4	726.35
1766.4	725.63	1766.7	725.61	1776.4	724.93	1786.4	724.22	1796.4	723.51
1803.94	722.98	1806.4	722.86	1816.4	722.4	1819.54	722.25	1826.4	721.73
1836.4	720.98	1846.4	720.22	1851.37	719.84	1856.4	719.55	1857.57	719.49
1866.4	718.83	1876.4	718.09	1886.4	717.35	1888.96	717.16	1896.4	716.81
1905.16	716.39	1906.4	716.36	1916.4	716.1	1925.28	715.88	1926.4	715.85
1936.4	715.6	1946.4	715.34	1949.51	715.26	1956.4	715.14	1966.4	714.96
1976.4	714.79	1984.96	714.63	1986.4	714.61	1996.4	714.48	1998.7	714.45
2006.4	714.45	2013.23	714.45	2016.4	714.43	2025.6	714.37	2025.61	714.37
2026.4	714.39	2036.4	714.57	2044.85	714.73	2046.4	714.7	2056.4	714.52
2065.47	714.35	2066.4	714.35	2076.4	714.34	2077.53	714.34	2086.4	714.43
2090.33	714.46	2096.4	714.42	2106.4	714.36	2116.4	714.3	2126.06	714.24
2126.4	714.24	2136.4	714.19	2142.48	714.16	2146.4	714.18	2156.4	714.24
2166.1	714.29	2166.4	714.29	2176.4	714.51	2186.4	714.72	2189.74	714.79
2196.4	714.75	2206.4	714.7	2211.18	714.67	2216.4	714.67	2226.4	714.68
2233.17	714.68	2236.4	714.74	2246.4	714.93	2256.4	715.12	2260.72	715.2
2266.4	715.36	2276.4	715.65	2277.44	715.68	2284.4	715.55	2286.4	715.44
2294.35	714.99	2296.4	714.99	2306.4	715.02	2313.3	715.04	2316.4	714.96
2326.4	714.71	2336.4	714.46	2346.4	714.22	2356.4	713.97	2362.97	713.8
2365.91	713.65	2366.4	712.58	2368.58	707.78	2369.05	706.86	2376.4	704.81
2386.4	702.02	2390.45	700.88	2396.4	699.27	2406.4	696.55	2411.26	695.23
2416.4	696.68	2426.4	699.5	2436.4	702.33	2446.4	705.15	2446.69	705.24
2451.22	706.47	2451.84	707.57	2454.34	712.06	2456.4	713	2456.64	713.1
2457.68	713.92	2458.65	714.46	2466.4	719.09	2469.01	720.65	2475.1	724.1
2476.4	724.17	2483.89	724.56	2486.4	724.7	2496.4	725.24	2497.91	725.32
2500.97	725.16	2505.97	725.69	2506.4	725.71	2507.98	725.77	2515.36	726.78
2516.4	727.13	2525.69	730.21	2526.4	730.46	2527.8	730.97	2536.4	732.84
2546.4	735.01	2552.2	736.27	2556.4	737.03	2566.4	738.85	2566.93	738.95
2576.4	739.9	2582.12	740.48	2586.4	740.67	2596.4	741.11	2599	741.22
2600	741.26	2600.21	741.27	2610	741.42	2613.19	741.47	2616.95	741.53
2620.34	741.46	2620.62	741.46	2627.49	741.32	2631.52	741.24	2633.81	741.2
2634.64	741.16	2640.26	740.9	2641.79	740.78	2642.42	740.73	2643.94	740.61

2648.86	740.03	2648.94	740.02	2650.45	740.01	2652.13	740.11	2652.75	740.11
2653.33	740.12	2655.65	740.16	2656.1	740.17	2663.25	740.2	2664.23	740.21
2670.36	740.24	2670.4	740.24	2675.14	740.24	2676.12	740.24	2677.55	740.23
2684.7	740.18	2686.04	740.16	2691.85	740.12	2696.94	740.08	2699	740.06
2700	740.05	2707.07	739.99	2708.28	739.98	2708.51	739.98	2710.9	740.01
2714.14	740.04	2721.21	740.11	2721.81	740.11	2728.29	740.18	2732.71	740.22
2735.36	740.25	2740.79	740.3	2742.43	740.31	2743.62	740.31	2749.5	740.33
2754.52	740.35	2756.57	740.35	2759.32	740.36	2763.64	740.39	2765.42	740.4
2770.71	740.43	2775.64	740.46	2776.33	740.47	2777.79	740.47	2784.86	740.48
2787.23	740.49	2791.93	740.5	2794.95	740.51	2798.14	740.52	2799	740.52
2800	740.53	2807.07	740.55	2810.9	740.57	2814.14	740.58	2821.21	740.61
2821.81	740.62	2825.19	740.63	2828.29	740.64	2832.71	740.65	2835.36	740.66
2842.09	740.68	2842.43	740.68	2843.62	740.68	2849.5	740.69	2854.52	740.69
2856.57	740.69	2863.64	740.7	2865.42	740.7	2870.71	740.71	2874.71	740.71
2876.33	740.71	2877.79	740.72	2884.86	740.73	2887.23	740.74	2891.93	740.75
2898.14	740.76	2899	740.76	2900	740.77	2907.07	740.78	2910.9	740.78
2914.14	740.79	2921.21	740.8	2921.81	740.8	2924.37	740.8	2928.29	740.85
2932.22	740.91	2932.71	740.91	2935.36	740.92	2942.43	740.94	2943.62	740.95
2946.24	740.96	2949.5	740.99	2954.52	741.03	2956.57	741.05	2963.64	741.12
2965.42	741.14	2970.71	741.19	2976.24	741.24	2976.33	741.24	2977.79	741.2
2984.86	741.04	2987.23	740.98	2989.05	740.94	2991.93	740.93	2993.82	740.92
2997.67	740.93	2998.14	740.88	2999	740.78	3000	740.62	3007.07	739.52
3007.8	739.4	3010.9	739.79	3012.79	740.03	3014.14	740.16	3021.21	740.88
3021.81	740.94	3023.21	741.08	3024.06	741.17	3024.31	741.19	3024.32	741.19
3024.36	741.19	3024.38	741.19	3024.42	741.2	3024.48	741.2	3024.52	741.2
3024.65	741.22	3024.76	741.23	3025.14	741.26	3025.68	741.3	3026.61	741.32
3028.19	741.34	3028.29	741.34	3029.11	741.35	3030.72	741.37	3031.42	741.38
3032.67	741.39	3032.71	741.39	3033.73	741.4	3034.35	741.4	3035.36	741.4
3035.43	741.4	3035.95	741.41	3036.27	741.41	3036.85	741.41	3042.43	741.39
3043.62	741.38	3049.5	741.36	3054.52	741.34	3056.57	741.34	3056.81	741.33
3057.55	741.33	3058.41	741.33	3058.9	741.33	3060.02	741.32	3060.66	741.32
3061.74	741.32	3063.64	741.34	3064.92	741.35	3065.11	741.34	3065.27	741.33
3065.42	741.32	3065.46	741.32	3067.01	741.35	3070.18	741.42	3070.71	741.44
3070.94	741.44	3072.06	741.46	3072.85	741.48	3073.25	741.49	3073.88	741.5
3074.13	741.51	3074.55	741.52	3074.87	741.52	3075.06	741.53	3075.94	741.51
3076.11	741.53	3076.33	741.52	3077.52	741.5	3077.79	741.52	3079.2	741.66
3079.21	741.65	3084.86	741.83	3087.23	741.9	3091.93	742.05	3096.59	742.19
3098.14	742.25	3100	742.32	3107.07	742.58	3110.9	742.72	3112.58	742.78
3114.14	742.82	3121.21	742.96	3121.81	742.97	3128.29	743.1	3132.71	743.18
3135.36	743.23	3142.43	743.37	3143.62	743.4	3148.27	743.49	3149.5	743.51
3154.52	743.6	3156.57	743.63	3156.92	743.64	3163.64	743.61	3163.87	743.6
3165.42	743.59	3166.15	743.59	3170.71	743.59	3176.33	743.58	3176.39	743.58
3177.79	743.58	3184.86	743.58	3187.23	743.58	3191.93	743.58	3192.95	743.58
3193.27	743.58	3198.14	743.58	3199	743.58				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
986.4	.07	2336.4	.1	2365.91	.035	2454.34	.1	2526.4	.07

Bank Sta: Left Right Coeff Contr. Expan.
2365.91 2454.34 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
986.4	2049.35	724.26	T
2499.93	3199	724.26	T

Sediment Elevation = 700.11

Upstream Embankment side slope = 2 horiz. to 1.0 vertical
Downstream Embankment side slope = 2 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins = 724.33
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Abutments = 2

Abutment Data
Upstream num= 3

Sta	Elev	Sta	Elev	Sta	Elev
1032.29	0	2474.93	721.32	2479.93	721.32

Downstream num= 3

Sta	Elev	Sta	Elev	Sta	Elev
1032.29	0	2474.93	721.32	2479.93	721.32

Abutment Data
Upstream num= 3

Sta	Elev	Sta	Elev	Sta	Elev
2069.35	718.83	2074.35	718.83	3507.01	0

```
Downstream     num=        3
     Sta    Elev     Sta    Elev     Sta    Elev
 2069.35  718.83 2074.35  718.83 3507.01       0

Number of Piers =  10

Pier Data
Pier Station     Upstream= 2098.84    Downstream= 2098.84
Upstream     num=        2
    Width   Elev    Width   Elev
        2       0        2  722.53
Downstream     num=        2
    Width   Elev    Width   Elev
        2       0        2  722.53

Pier Data
Pier Station     Upstream= 2128.86    Downstream= 2128.86
Upstream     num=        2
    Width   Elev    Width   Elev
        2       0        2  722.87
Downstream     num=        2
    Width   Elev    Width   Elev
        2       0        2  722.87

Pier Data
Pier Station     Upstream= 2158.86    Downstream= 2158.86
Upstream     num=        2
    Width   Elev    Width   Elev
        2       0        2  723.22
Downstream     num=        2
    Width   Elev    Width   Elev
        2       0        2  723.22

Pier Data
Pier Station     Upstream= 2188.88    Downstream= 2188.88
Upstream     num=        2
    Width   Elev    Width   Elev
        2       0        2  723.62
Downstream     num=        2
    Width   Elev    Width   Elev
        2       0        2  723.62

Pier Data
Pier Station     Upstream= 2219.02    Downstream= 2219.02
Upstream     num=        2
    Width   Elev    Width   Elev
        2       0        2  723.92
Downstream     num=        2
    Width   Elev    Width   Elev
        2       0        2  723.92

Pier Data
Pier Station     Upstream= 2248.88    Downstream= 2248.88
Upstream     num=        2
    Width   Elev    Width   Elev
        2       0        2  724.25
Downstream     num=        2
    Width   Elev    Width   Elev
        2       0        2  724.25

Pier Data
Pier Station     Upstream= 2278.89    Downstream= 2278.89
Upstream     num=        2
    Width   Elev    Width   Elev
        2       0        2  724.55
Downstream     num=        2
    Width   Elev    Width   Elev
        2       0        2  724.55

Pier Data
Pier Station     Upstream=    2309    Downstream=    2309
Upstream     num=        2
    Width   Elev    Width   Elev
        2       0        2   724.5
Downstream     num=        2
    Width   Elev    Width   Elev
        2       0        2   724.5

Pier Data
```

Pier Station Upstream= 2362 Downstream= 2362
Upstream num= 2

Width	Elev	Width	Elev
3	0	3	724.77

Downstream num= 2

Width	Elev	Width	Elev
3	0	3	724.77

Pier Data
Pier Station Upstream= 2427 Downstream= 2427
Upstream num= 2

Width	Elev	Width	Elev
3	0	3	724.91

Downstream num= 2

Width	Elev	Width	Elev
3	0	3	724.91

Number of Bridge Coefficient Sets = 1

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

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: W Chickamauga Cr
REACH: 1 RS: 375

INPUT
Description: Downstream Face of Existing and Proposed Bridges. Adjust
Elevations to Quad Map Slope -0.07'
Station Elevation Data num= 483

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
986.4	749.4	994.83	749.38	996.4	749.39	1006.4	749.43	1016.4	749.47
1017.31	749.48	1026.4	749.54	1036.4	749.61	1036.84	749.62	1046.4	749.36
1056.4	749.08	1066.4	748.81	1068.39	748.75	1076.4	748.52	1086.4	748.24
1092.59	748.06	1096.4	747.88	1106.4	747.39	1116.4	746.91	1119.01	746.79
1126.4	746.71	1136.4	746.59	1145.06	746.5	1146.4	746.46	1156.4	746.14
1166.4	745.83	1176.4	745.51	1176.72	745.5	1186.4	745.15	1196.4	744.79
1199.54	744.67	1206.4	744.33	1216.4	743.82	1225.98	743.33	1226.4	743.29
1236.4	742.33	1239.75	742.01	1246.4	741.77	1256.4	741.4	1266.4	741.03
1275.6	740.69	1276.4	740.65	1286.4	740.17	1291.42	739.93	1296.4	739.51
1306.4	738.68	1316.4	737.85	1325.08	737.13	1326.4	737.08	1335.41	736.71
1336.4	736.65	1346.4	736.02	1356.4	735.39	1366.4	734.76	1372.1	734.4
1376.4	734.15	1381.61	733.84	1386.4	733.65	1396.4	733.26	1406.4	732.87
1416.4	732.47	1417.59	732.43	1426.4	732.1	1427.61	732.06	1436.4	731.81
1446.4	731.53	1456.4	731.25	1466.4	730.97	1467.33	730.95	1474.86	730.74
1476.4	730.7	1486.4	730.43	1496.4	730.17	1506.4	729.9	1516.4	729.64
1517.74	729.6	1525.79	729.4	1526.4	729.39	1536.4	729.28	1546.4	729.16
1556.4	729.05	1561.87	728.99	1566.4	728.86	1573.65	728.66	1576.4	728.64
1586.4	728.57	1596.4	728.5	1606.4	728.43	1609.42	728.41	1616.4	728.47
1622.69	728.52	1626.4	728.56	1636.4	728.66	1646.4	728.75	1656.4	728.85
1656.71	728.85	1666.4	728.74	1670.12	728.7	1676.4	728.71	1686.4	728.73
1696.4	728.74	1703.47	728.76	1706.4	728.64	1716.29	728.23	1716.4	728.22
1726.4	727.81	1736.4	727.39	1746.4	726.97	1749.28	726.85	1756.4	726.35
1766.4	725.63	1766.7	725.61	1776.4	724.93	1786.4	724.22	1796.4	723.51
1803.94	722.98	1806.4	722.86	1816.4	722.4	1819.54	722.25	1826.4	721.73
1836.4	720.98	1846.4	720.22	1851.37	719.84	1856.4	719.55	1857.57	719.49
1866.4	718.83	1876.4	718.09	1886.4	717.35	1888.96	717.16	1896.4	716.81
1905.16	716.39	1906.4	716.36	1916.4	716.1	1925.28	715.88	1926.4	715.85
1936.4	715.6	1946.4	715.34	1949.51	715.26	1956.4	715.14	1966.4	714.96
1976.4	714.79	1984.96	714.63	1986.4	714.61	1996.4	714.48	1998.7	714.45
2006.4	714.45	2013.23	714.45	2016.4	714.43	2025.6	714.37	2025.61	714.37
2026.4	714.39	2036.4	714.57	2044.85	714.73	2046.4	714.7	2056.4	714.52
2065.47	714.35	2066.4	714.35	2076.4	714.34	2077.53	714.34	2086.4	714.43
2090.33	714.46	2096.4	714.42	2106.4	714.36	2116.4	714.3	2126.06	714.24
2126.4	714.24	2136.4	714.19	2142.48	714.16	2146.4	714.18	2156.4	714.24
2166.1	714.29	2166.4	714.29	2176.4	714.51	2186.4	714.72	2189.74	714.79

2196.4	714.75	2206.4	714.7	2211.18	714.67	2216.4	714.67	2226.4	714.68
2233.17	714.68	2236.4	714.74	2246.4	714.93	2256.4	715.12	2260.72	715.2
2266.4	715.36	2276.4	715.65	2277.44	715.68	2284.4	715.55	2286.4	715.44
2294.35	714.99	2296.4	714.99	2306.4	715.02	2313.3	715.04	2316.4	714.96
2326.4	714.71	2336.4	714.46	2346.4	714.22	2356.4	713.97	2362.97	713.8
2365.91	713.65	2366.4	712.58	2368.58	707.78	2369.05	706.86	2376.4	704.81
2386.4	702.02	2390.45	700.88	2396.4	699.27	2406.4	696.55	2411.26	695.23
2416.4	696.68	2426.4	699.5	2436.4	702.33	2446.4	705.15	2446.69	705.24
2451.22	706.47	2451.84	707.57	2454.34	712.06	2456.4	713	2456.64	713.1
2457.68	713.92	2458.65	714.46	2466.4	719.09	2469.01	720.65	2475.1	724.1
2476.4	724.17	2483.89	724.56	2486.4	724.7	2496.4	725.24	2497.91	725.32
2500.97	725.16	2505.97	725.69	2506.4	725.71	2507.98	725.77	2515.36	726.78
2516.4	727.13	2525.69	730.21	2526.4	730.46	2527.8	730.97	2536.4	732.84
2546.4	735.01	2552.2	736.27	2556.4	737.03	2566.4	738.85	2566.93	738.95
2576.4	739.9	2582.12	740.48	2586.4	740.67	2596.4	741.11	2599	741.22
2600	741.26	2600.21	741.27	2610	741.42	2613.19	741.47	2616.95	741.53
2620.34	741.46	2620.62	741.46	2627.49	741.32	2631.52	741.24	2633.81	741.2
2634.64	741.16	2640.26	740.9	2641.79	740.78	2642.42	740.73	2643.94	740.61
2648.86	740.03	2648.94	740.02	2650.45	740.01	2652.13	740.11	2652.75	740.11
2653.33	740.12	2655.65	740.16	2656.1	740.17	2663.25	740.2	2664.23	740.21
2670.36	740.24	2670.4	740.24	2675.14	740.24	2676.12	740.24	2677.55	740.23
2684.7	740.18	2686.04	740.16	2691.85	740.12	2696.94	740.08	2699	740.06
2700	740.05	2707.07	739.99	2708.28	739.98	2708.51	739.98	2710.9	740.01
2714.14	740.04	2721.21	740.11	2721.81	740.11	2728.29	740.18	2732.71	740.22
2735.36	740.25	2740.79	740.3	2742.43	740.31	2743.62	740.31	2749.5	740.33
2754.52	740.35	2756.57	740.35	2759.32	740.36	2763.64	740.39	2765.42	740.4
2770.71	740.43	2775.64	740.46	2776.33	740.47	2777.79	740.47	2784.86	740.48
2787.23	740.49	2791.93	740.5	2794.95	740.51	2798.14	740.52	2799	740.52
2800	740.53	2807.07	740.55	2810.9	740.57	2814.14	740.58	2821.21	740.61
2821.81	740.62	2825.19	740.63	2828.29	740.64	2832.71	740.65	2835.36	740.66
2842.09	740.68	2842.43	740.68	2843.62	740.68	2849.5	740.69	2854.52	740.69
2856.57	740.69	2863.64	740.7	2865.42	740.7	2870.71	740.71	2874.71	740.71
2876.33	740.71	2877.79	740.72	2884.86	740.73	2887.23	740.74	2891.93	740.75
2898.14	740.76	2899	740.76	2900	740.77	2907.07	740.78	2910.9	740.78
2914.14	740.79	2921.21	740.8	2921.81	740.8	2924.37	740.8	2928.29	740.85
2932.22	740.91	2932.71	740.91	2935.36	740.92	2942.43	740.94	2943.62	740.95
2946.24	740.96	2949.5	740.99	2954.52	741.03	2956.57	741.05	2963.64	741.12
2965.42	741.14	2970.71	741.19	2976.24	741.24	2976.33	741.24	2977.79	741.2
2984.86	741.04	2987.23	740.98	2989.05	740.94	2991.93	740.93	2993.82	740.92
2997.67	740.93	2998.14	740.88	2999	740.78	3000	740.62	3007.07	739.52
3007.8	739.4	3010.9	739.79	3012.79	740.03	3014.14	740.16	3021.21	740.88
3021.81	740.94	3023.21	741.08	3024.06	741.17	3024.31	741.19	3024.32	741.19
3024.36	741.19	3024.38	741.19	3024.42	741.2	3024.48	741.2	3024.52	741.2
3024.65	741.22	3024.76	741.23	3025.14	741.26	3025.68	741.3	3026.61	741.32
3028.19	741.34	3028.29	741.34	3029.11	741.35	3030.72	741.37	3031.42	741.38
3032.67	741.39	3032.71	741.39	3033.73	741.4	3034.35	741.4	3035.36	741.4
3035.43	741.4	3035.95	741.41	3036.27	741.41	3036.85	741.41	3042.43	741.39
3043.62	741.38	3049.5	741.36	3054.52	741.34	3056.57	741.34	3056.81	741.33
3057.55	741.33	3058.41	741.33	3058.9	741.33	3060.02	741.32	3060.66	741.32
3061.74	741.32	3063.64	741.34	3064.92	741.35	3065.11	741.34	3065.27	741.33
3065.42	741.32	3065.46	741.32	3067.01	741.35	3070.18	741.42	3070.71	741.44
3070.94	741.44	3072.06	741.46	3072.85	741.48	3073.25	741.49	3073.88	741.5
3074.13	741.51	3074.55	741.52	3074.87	741.52	3075.06	741.53	3075.94	741.51
3076.11	741.53	3076.33	741.52	3077.52	741.5	3077.79	741.52	3079.2	741.66
3079.21	741.65	3084.86	741.83	3087.23	741.9	3091.93	742.05	3096.59	742.19
3098.14	742.25	3100	742.32	3107.07	742.58	3110.9	742.72	3112.58	742.78
3114.14	742.82	3121.21	742.96	3121.81	742.97	3128.29	743.1	3132.71	743.18
3135.36	743.23	3142.43	743.37	3143.62	743.4	3148.27	743.49	3149.5	743.51
3154.52	743.6	3156.57	743.63	3156.92	743.64	3163.64	743.61	3163.87	743.6
3165.42	743.59	3166.15	743.59	3170.71	743.59	3176.33	743.58	3176.39	743.58
3177.79	743.58	3184.86	743.58	3187.23	743.58	3191.93	743.58	3192.95	743.58
3193.27	743.58	3198.14	743.58	3199	743.58				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
986.4	.07	2336.4	.1	2365.91	.035	2454.34	.1	2526.4	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2365.91	2454.34	375	375	375	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
986.4	2049.35	724.26	T
2499.93	3199	724.26	T

Sediment Elevation = 700.11

CROSS SECTION

RIVER: W Chickamauga Cr

REACH: 1 RS: 0

INPUT
Description: Exit Section. Adjust Elevations to Quad Map Slope -0.02' Adjust Again -0.23'
Station Elevation Data num= 485

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
986.4	748.27	994.83	748.25	996.4	748.26	1006.4	748.3	1016.4	748.34
1017.31	748.35	1026.4	748.41	1036.4	748.48	1036.84	748.49	1046.4	748.23
1056.4	747.95	1066.4	747.68	1068.39	747.62	1076.4	747.39	1086.4	747.11
1092.59	746.93	1096.4	746.75	1106.4	746.26	1116.4	745.78	1119.01	745.66
1126.4	745.58	1136.4	745.46	1145.06	745.37	1146.4	745.33	1156.4	745.01
1166.4	744.7	1176.4	744.38	1176.72	744.37	1186.4	744.02	1196.4	743.66
1199.54	743.54	1206.4	743.2	1216.4	742.69	1225.98	742.2	1226.4	742.16
1236.4	741.2	1239.75	740.88	1246.4	740.64	1256.4	740.27	1266.4	739.9
1275.6	739.56	1276.4	739.52	1286.4	739.04	1291.42	738.8	1296.4	738.38
1306.4	737.55	1316.4	736.72	1325.08	736	1326.4	735.95	1335.41	735.58
1336.4	735.52	1346.4	734.89	1356.4	734.26	1366.4	733.63	1372.1	733.27
1376.4	733.02	1381.61	732.71	1386.4	732.52	1396.4	732.13	1406.4	731.74
1416.4	731.34	1417.59	731.3	1426.4	730.97	1427.61	730.93	1436.4	730.68
1446.4	730.4	1456.4	730.12	1466.4	729.84	1467.33	729.82	1474.86	729.61
1476.4	729.57	1486.4	729.3	1496.4	729.04	1506.4	728.77	1516.4	728.51
1517.74	728.47	1525.79	728.27	1526.4	728.26	1536.4	728.15	1546.4	728.03
1556.4	727.92	1561.87	727.86	1566.4	727.73	1573.65	727.53	1576.4	727.51
1586.4	727.44	1596.4	727.37	1606.4	727.3	1609.42	727.28	1616.4	727.34
1622.69	727.39	1626.4	727.43	1636.4	727.53	1646.4	727.62	1656.4	727.72
1656.71	727.72	1666.4	727.61	1670.12	727.57	1676.4	727.58	1686.4	727.6
1696.4	727.61	1703.47	727.63	1706.4	727.51	1716.29	727.1	1716.4	727.09
1726.4	726.68	1736.4	726.26	1746.4	725.84	1749.28	725.72	1756.4	725.22
1766.4	724.5	1766.7	724.48	1776.4	723.8	1786.4	723.09	1796.4	722.38
1803.94	721.85	1806.4	721.73	1816.4	721.27	1819.54	721.12	1826.4	720.6
1836.4	719.85	1846.4	719.09	1851.37	718.71	1856.4	718.42	1857.57	718.36
1866.4	717.7	1876.4	716.96	1886.4	716.22	1888.96	716.03	1896.4	715.68
1905.16	715.26	1906.4	715.23	1916.4	714.97	1925.28	714.75	1926.4	714.72
1936.4	714.47	1946.4	714.21	1949.51	714.13	1956.4	714.01	1966.4	713.83
1976.4	713.66	1984.96	713.5	1986.4	713.48	1996.4	713.35	1998.7	713.32
2006.4	713.32	2013.23	713.32	2016.4	713.3	2025.6	713.24	2025.61	713.24
2026.4	713.26	2036.4	713.44	2044.85	713.6	2046.4	713.57	2056.4	713.39
2065.47	713.22	2066.4	713.22	2076.4	713.21	2077.53	713.21	2086.4	713.3
2090.33	713.33	2096.4	713.29	2106.4	713.23	2116.4	713.17	2126.06	713.11
2126.4	713.11	2136.4	713.06	2142.48	713.03	2146.4	713.05	2156.4	713.11
2166.1	713.16	2166.4	713.16	2176.4	713.38	2186.4	713.59	2189.74	713.66
2196.4	713.62	2206.4	713.57	2211.18	713.54	2216.4	713.54	2226.4	713.55
2233.17	713.55	2236.4	713.61	2246.4	713.8	2256.4	713.99	2260.72	714.07
2266.4	714.23	2276.4	714.52	2277.44	714.55	2284.4	714.42	2286.4	714.31
2294.35	713.86	2296.4	713.86	2306.4	713.89	2313.3	713.91	2316.4	713.83
2326.4	713.58	2336.4	713.33	2346.4	713.09	2356.4	712.84	2362.97	712.67
2369.63	711.96	2371.2	711.93	2371.73	711.92	2371.8	711.92	2371.96	711.99
2372	712	2372.74	712.21	2375.35	705.56	2375.83	704.34	2379.63	703.88
2389.63	702.67	2393.46	702.21	2399.63	701.4	2409.63	700.1	2411.26	699.89
2417.06	700.93	2419.63	701.24	2429.63	702.48	2439.63	703.71	2449.63	704.95
2453.02	705.37	2453.23	705.83	2455.66	712.8	2458.42	714.45	2466.4	717.96
2469.01	719.52	2475.1	722.97	2476.4	723.04	2483.89	723.43	2486.4	723.57
2496.4	724.11	2497.91	724.19	2500.97	724.03	2505.97	724.56	2506.4	724.58
2507.98	724.64	2515.36	725.65	2516.4	726	2525.69	729.08	2526.4	729.33
2527.8	729.84	2536.4	731.71	2546.4	733.88	2552.2	735.14	2556.4	735.9
2566.4	737.72	2566.93	737.82	2576.4	738.77	2582.12	739.35	2586.4	739.54
2596.4	739.98	2599	740.09	2600	740.13	2600.21	740.14	2610	740.29
2613.19	740.34	2616.95	740.4	2620.34	740.33	2620.62	740.33	2627.49	740.19
2631.52	740.11	2633.81	740.07	2634.64	740.03	2640.26	739.77	2641.79	739.65
2642.42	739.6	2643.94	739.48	2648.86	738.9	2648.94	738.89	2650.45	738.88
2652.13	738.98	2652.75	738.98	2653.33	738.99	2655.65	739.03	2656.1	739.04
2663.25	739.07	2664.23	739.08	2670.36	739.11	2670.4	739.11	2675.14	739.11
2676.12	739.11	2677.55	739.1	2684.7	739.05	2686.04	739.03	2691.85	738.99
2696.94	738.95	2699	738.93	2700	738.92	2707.07	738.86	2708.28	738.85
2708.51	738.85	2710.9	738.88	2714.14	738.91	2721.21	738.98	2721.81	738.98
2728.29	739.05	2732.71	739.09	2735.36	739.12	2740.79	739.17	2742.43	739.18
2743.62	739.18	2749.5	739.2	2754.52	739.22	2756.57	739.22	2759.32	739.23
2763.64	739.26	2765.42	739.27	2770.71	739.3	2775.64	739.33	2776.33	739.34
2777.79	739.34	2784.86	739.35	2787.23	739.36	2791.93	739.37	2794.95	739.38
2798.14	739.39	2799	739.39	2800	739.4	2807.07	739.42	2810.9	739.44
2814.14	739.45	2821.21	739.48	2821.81	739.49	2825.19	739.5	2828.29	739.51
2832.71	739.52	2835.36	739.53	2842.09	739.55	2842.43	739.55	2843.62	739.55
2849.5	739.56	2854.52	739.56	2856.57	739.56	2863.64	739.57	2865.42	739.57
2870.71	739.58	2874.71	739.58	2876.33	739.58	2877.79	739.59	2884.86	739.6
2887.23	739.61	2891.93	739.62	2898.14	739.63	2899	739.63	2900	739.64
2907.07	739.65	2910.9	739.65	2914.14	739.66	2921.21	739.67	2921.81	739.67
2924.37	739.67	2928.29	739.72	2932.22	739.78	2932.71	739.78	2935.36	739.79
2942.43	739.81	2943.62	739.82	2946.24	739.83	2949.5	739.86	2954.52	739.9

2956.57	739.92	2963.64	739.99	2965.42	740.01	2970.71	740.06	2976.24	740.11
2976.33	740.11	2977.79	740.07	2984.86	739.91	2987.23	739.85	2989.05	739.81
2991.93	739.8	2993.82	739.79	2997.67	739.8	2998.14	739.75	2999	739.65
3000	739.49	3007.07	738.39	3007.8	738.27	3010.9	738.66	3012.79	738.9
3014.14	739.03	3021.21	739.75	3021.81	739.81	3023.21	739.95	3024.06	740.04
3024.31	740.06	3024.32	740.06	3024.36	740.06	3024.38	740.06	3024.42	740.07
3024.48	740.07	3024.52	740.07	3024.65	740.09	3024.76	740.1	3025.14	740.13
3025.68	740.17	3026.61	740.19	3028.19	740.21	3028.29	740.21	3029.11	740.22
3030.72	740.24	3031.42	740.25	3032.67	740.26	3032.71	740.26	3033.73	740.27
3034.35	740.27	3035.36	740.27	3035.43	740.27	3035.95	740.28	3036.27	740.28
3036.85	740.28	3042.43	740.26	3043.62	740.25	3049.5	740.23	3054.52	740.21
3056.57	740.21	3056.81	740.2	3057.55	740.2	3058.41	740.2	3058.9	740.2
3060.02	740.19	3060.66	740.19	3061.74	740.19	3063.64	740.21	3064.92	740.22
3065.11	740.21	3065.27	740.2	3065.42	740.19	3065.46	740.19	3067.01	740.22
3070.18	740.29	3070.71	740.31	3070.94	740.31	3072.06	740.33	3072.85	740.35
3073.25	740.36	3073.88	740.37	3074.13	740.38	3074.55	740.39	3074.87	740.39
3075.06	740.4	3075.94	740.38	3076.11	740.4	3076.33	740.39	3077.52	740.37
3077.79	740.39	3079.2	740.53	3079.21	740.52	3084.86	740.7	3087.23	740.77
3091.93	740.92	3096.59	741.06	3098.14	741.12	3100	741.19	3107.07	741.45
3110.9	741.59	3112.58	741.65	3114.14	741.69	3121.21	741.83	3121.81	741.84
3128.29	741.97	3132.71	742.05	3135.36	742.1	3142.43	742.24	3143.62	742.27
3148.27	742.36	3149.5	742.38	3154.52	742.47	3156.57	742.5	3156.92	742.51
3163.64	742.48	3163.87	742.47	3165.42	742.46	3166.15	742.46	3170.71	742.46
3176.33	742.45	3176.39	742.45	3177.79	742.45	3184.86	742.45	3187.23	742.45
3191.93	742.45	3192.95	742.45	3193.27	742.45	3198.14	742.45	3199	742.45

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
986.4	.07	2346.4	.1	2372.74	.035	2455.66	.1	2526.4	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2372.74	2455.66	611	611	.1	.3

Sediment Elevation = 699.895

CROSS SECTION

RIVER: W Chickamauga Cr
REACH: 1 RS: -611

INPUT
Description: FIS XS E
Station Elevation Data num= 483

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
58.43	734.29	62.13	734.2	64.09	734.21	64.82	734.21	67.79	733.86
69.26	733.69	69.79	733.7	75.93	733.53	76.23	733.56	77.47	733.48
80.32	733.56	82.42	733.43	83.96	733.37	85	733.22	86.57	733.15
90.74	733.12	93.71	732.99	96.08	732.99	96.83	732.99	99.84	732.84
102.7	732.71	104.3	732.71	108.06	732.43	109.59	732.23	110.48	732.28
111.92	732.15	113.65	731.98	114.83	731.91	118.64	731.88	120.24	731.84
122.77	731.65	128.17	731.34	130.89	731.25	131.84	731.15	134.66	731.03
136.24	730.96	136.9	730.86	138.54	730.6	141.58	730.53	142.94	730.54
143.53	730.48	145.28	730.37	147.93	730.12	149.53	729.9	151.11	729.76
151.92	729.75	154.38	729.7	156.08	729.5	157.66	729.18	158.66	729.16
161.88	728.89	162.83	728.83	163.41	728.75	167.73	728.19	169.47	727.95
169.68	727.93	171.9	727.59	173.9	727.36	176.18	727.1	176.2	727.09
178.6	726.57	179.97	726.39	182.75	725.97	184.84	725.57	185.4	725.43
186.43	725.25	189.61	724.62	190.44	724.41	191.76	724.16	194.23	723.63
196.66	723.13	197.95	723.05	202.45	722.07	202.62	722.04	204.9	721.97
207.54	721.59	208.86	721.46	209.27	721.43	213.91	720.95	215.22	720.84
215.41	720.81	215.53	720.8	215.64	720.79	218.81	720.5	220.79	720.27
223.25	720.02	224.36	719.82	226.03	719.69	228.29	719.33	229.83	719.35
230.48	719.22	233.28	718.71	234.54	718.62	236.15	718.34	237.03	718.3
240.56	718.14	241.01	718.1	243.35	717.94	243.68	717.91	246.36	717.44
247.96	717.16	248.08	717.14	248.36	717.11	250.36	716.89	253.93	716.56
254.5	716.54	254.94	716.5	259.31	716.36	261.33	716.15	263.88	716.01
263.99	716	264.15	715.99	268.39	715.5	270.69	715.54	271.05	715.51
273.63	715.3	275.49	715.13	275.98	715.02	278.43	714.51	282.54	714.15
284.51	713.79	285.46	713.81	287.94	713.67	290.12	713.57	291.52	713.6
292.86	713.59	294.89	713.57	297.28	713.52	299.59	713.51	300.13	713.47
300.6	713.46	303.02	713.27	304.32	713.17	304.57	713.15	305.14	713.11
307.29	713.02	309.15	712.87	311.59	712.87	313.09	712.69	315.88	712.7
318.84	712.63	320.94	712.76	321.53	712.74	324.42	712.67	325.89	712.63
326.28	712.59	326.71	712.57	329	712.42	333.04	712.18	333.55	712.19
335.07	712.34	336.41	712.5	336.86	712.47	341.01	712.37	343.53	712.14
343.93	712.15	344.34	712.15	348.71	712.05	348.86	712.05	351.48	712.39
353.06	712.42	356.22	712.38	356.65	712.38	359.15	712.3	359.68	712.31
363.88	712.35	366.51	712.03	367.13	711.97	367.68	711.96	371.94	711.86
372.53	711.88	374.87	711.88	379	711.7	379.76	711.62	380.31	711.63

382.89	711.62	385.8	711.74	387.9	711.97	390.63	712.05	391.05	712.06
391.42	712.05	396.09	711.71	398.13	711.77	401.07	711.94	404.13	711.77
405	711.8	407.05	711.95	409.83	711.89	412	711.93	413.34	711.74
417.67	711.69	420.02	711.65	422.18	711.76	423.05	711.87	424.42	711.88
427.94	711.86	429.47	711.86	430.96	711.82	435.47	711.69	435.87	711.68
436.09	711.68	439.16	711.61	443.82	711.68	443.97	711.68	444.37	711.67
447.11	711.66	447.72	711.63	450.95	711.62	451.71	711.62	451.85	711.62
452	711.62	455.06	711.48	457.82	711.6	459.75	711.63	462.27	711.67
462.92	711.64	463.52	711.65	467.9	711.68	470.31	711.45	470.74	711.44
472.06	711.53	475.57	711.78	477.55	711.68	478.73	711.61	483	711.87
483.59	711.88	486.01	711.98	486.66	711.99	490.41	712.07	491.6	712.03
494.27	712.05	494.62	712.04	494.91	712.01	499.33	711.73	501.33	711.87
502.71	711.97	505.6	711.92	507.37	711.95	508.88	712	510.65	712.05
515.37	711.91	515.47	711.91	515.51	711.91	517.69	711.78	553.84	711.87
554.28	711.85	555.38	711.87	557.34	711.86	558.71	711.85	561.77	711.71
563.04	711.74	564.63	711.76	566.47	711.66	569.04	711.48	571.69	711.73
572.23	711.78	575.98	711.54	576.67	711.55	577.48	711.58	579.68	711.63
582.25	711.75	584.13	711.7	587.8	711.38	591.32	711.68	594.49	711.99
594.7	712.02	594.86	712.03	595.94	712.02	598.76	711.98	599.18	712
599.97	711.98	602.2	712.09	605.26	712.36	606.7	712.5	607.63	712.52
609.64	712.43	611.03	712.51	614	712.74	616.72	712.91	617.26	712.91
617.74	712.95	620.43	713.18	621.47	713.24	621.65	713.26	621.85	713.25
624.53	713.24	627.58	713.6	628.8	713.7	629.4	713.7	631.74	713.59
634.5	713.7	636.12	713.71	637.68	713.58	639.12	713.54	640.29	713.47
643.37	713.2	645.59	712.71	646.2	712.62	646.66	712.68	650.45	713.27
652.81	713.33	653.39	713.35	654.02	713.35	657.51	713.44	659.89	713.62
660.87	713.64	663.44	713.49	664.86	713.51	667.45	713.59	667.83	713.59
668.33	713.57	674.36	713.63	674.68	713.66	674.92	713.65	678.98	713.32
679.04	713.31	682.02	713.41	682.72	713.39	686.06	713.18	686.57	713.21
688.98	713.25	692.55	713.21	693.03	713.22	693.3	713.21	695.74	713.31
697.75	713.18	699.88	713.13	701.15	713.32	702.85	713.44	704.95	713.55
706.86	713.56	708.86	713.72	709.81	713.81	712.57	714.26	713.8	714.28
715.61	714.27	716.71	714.22	719.4	714.05	720.76	714.04	721.92	714.13
723.61	714.26	729.62	714.04	730.61	713.98	733.25	713.9	734.42	713.86
734.75	713.89	737.6	714.09	740.16	714.17	741.49	714.24	743.27	713.96
744.35	714.04	747.34	714.16	748.48	714.07	749.09	714.12	754.07	713.75
756.33	713.71	758	713.83	761.41	713.78	762.17	713.79	762.66	713.76
765.09	713.78	768.48	713.8	769.1	713.81	769.46	713.84	771.92	713.93
775.52	714.15	775.76	714.16	775.91	714.18	778.78	714.25	780	714.25
782.75	714.24	783.82	714.31	785.88	714.36	788.12	714.23	789.73	714.1
790.84	714.06	792.7	714.03	794.03	713.94	796.43	714.03	797.24	714.07
799.53	713.91	800.79	713.85	801.44	713.87	804.33	713.89	810.03	713.68
810.09	713.68	810.11	713.68	810.13	713.68	810.19	713.68	815.27	713.78
818.48	713.82	820.08	713.83	821.5	713.87	826.28	714.03	828.44	713.99
829.98	714	831.53	714.11	832.68	714.21	835.74	714.18	836.42	714.19
838.13	714.26	844.56	714.44	845.59	714.48	846.75	714.5	849.55	714.59
851.82	714.86	852.5	714.91	856.05	714.96	856.18	714.97	859.22	715.16
861.92	714.95	863.25	715.02	864.76	715.33	867.3	715.51	869.9	715.34
871.67	715.47	872.58	715.52	873.38	715.54	876.39	715	878.44	714.39
904.79	712.11	907.4	705.46	907.88	704.24	911.68	703.78	921.68	702.57
925.51	702.11	931.68	701.3	941.68	700	943.31	699.79	949.11	700.83
951.68	701.14	961.68	702.38	971.68	703.61	981.68	704.85	985.07	705.27
985.28	705.73	987.71	712.7	990.28	713.33	991.45	713.8	993.78	714.26
994.3	714.34	997.28	714.86	997.78	714.93	1000.07	715.07	1000.59	715.16
1003.17	716.76	1004.58	717.8	1006.62	719.07	1008.79	720.49	1009.89	721.32
1011.66	722.66	1015.95	725.78	1017.45	727.13	1019.99	729.23	1021.77	730.42
1024.19	732.66	1024.33	732.78	1027.08	734.46	1028.23	735.36	1033.47	739.27
1033.52	739.31	1038.18	740.23	1039.47	740.35	1040.46	740.34	1042.32	740.25
1044.96	739.97	1045.75	739.89	1046.87	739.93	1051.65	739.92	1054	739.78
1054.38	739.78	1056.28	739.87	1057.69	739.95	1058.14	739.95	1059.9	739.89
1062.25	740.14	1063.78	740.17	1064.31	740.13	1073.82	739.83	1075.88	739.8
1077.73	740.22	1078.78	739.72	1085.8	740.3				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
58.43	.07	873.38	.1	904.79	.035	987.71	.1	1058.14	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
904.79	987.71	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:W Chickamauga Cr

Reach	River Sta.	n1	n2	n3	n4	n5
1	722	.15	.1	.035	.15	

1	497		.15	.1	.035	.1	.15
1	436	Bridge					
1	375		.07	.1	.035	.1	.07
1	0		.07	.1	.035	.1	.07
1	-611		.07	.1	.035	.1	.07

SUMMARY OF REACH LENGTHS

River: W Chickamauga Cr

Reach	River Sta.		Left	Channel	Right
1	722		225	225	225
1	497		122	122	122
1	436	Bridge			
1	375		375	375	375
1	0		611	611	611
1	-611		0	0	0

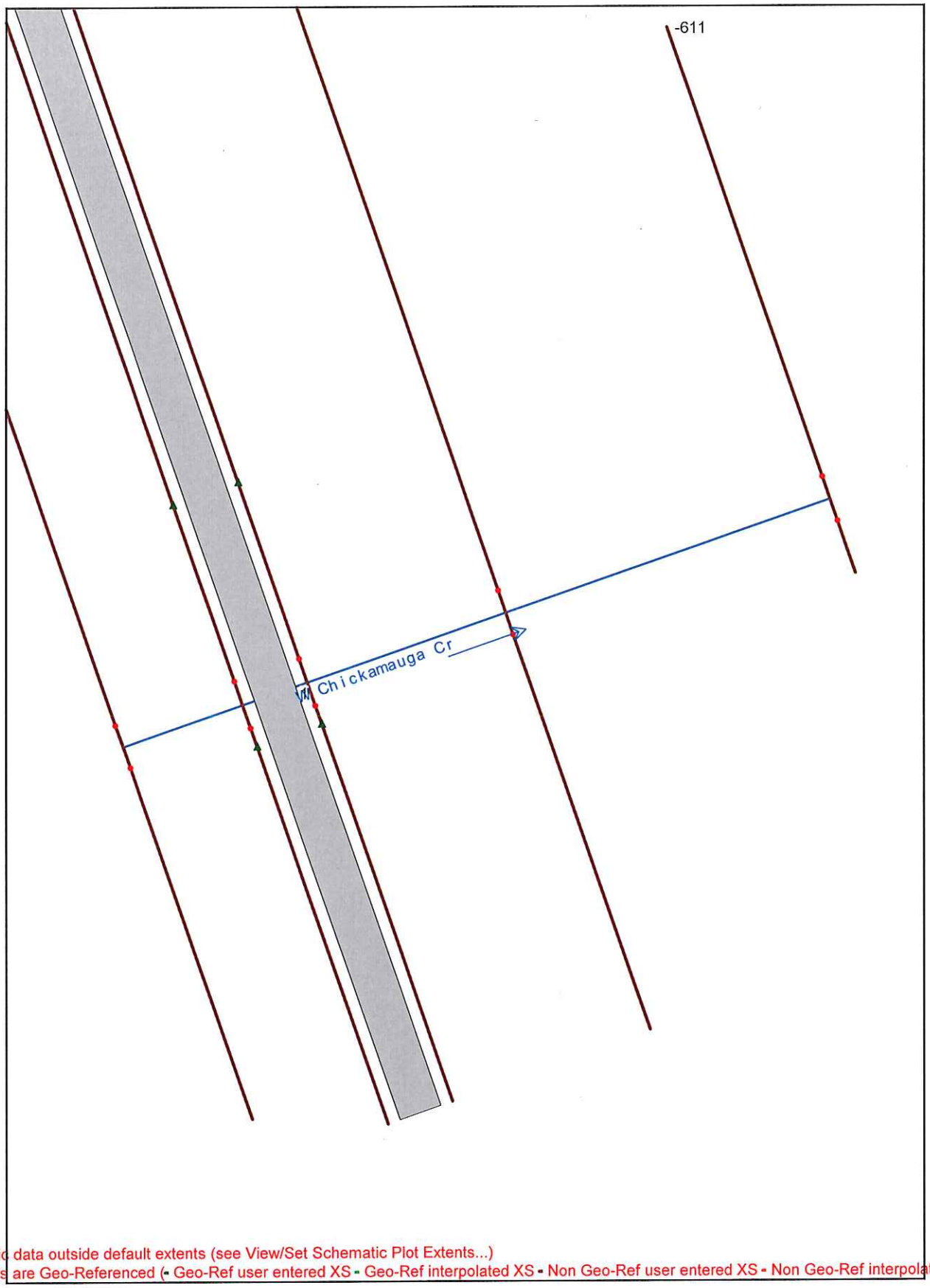
SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: W Chickamauga Cr

Reach	River Sta.		Contr.	Expan.
1	722		.3	.5
1	497		.3	.5
1	436	Bridge		
1	375		.3	.5
1	0		.1	.3
1	-611		.1	.3

HEC-RAS Plan: Exist411BrFW River: W Chickamauga Cr Reach: 1

Reach	River Sta	Profile	W.S. Elev	Prof Delta WS	E.G. Elev	Top Wdth Act	Q Left	Q Channel	Q Right	Enc Sta L	Ch Sta L	Ch Sta R	Enc Sta R
			(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)
1	722	PF 1	721.19		722.98	483.71	3165.99	16172.17	95.84		2324.84	2404.51	
1	722	PF 2	722.18	0.99	723.68	480.18	4265.57	15168.43		1904.00	2324.84	2404.51	2399.00
1	497	PF 1	721.03		722.43	420.20	2656.86	16667.35	109.79		2365.91	2454.34	
1	497	PF 2	722.00	0.98	723.22	402.27	2839.65	16462.96	131.39	2069.00	2365.91	2454.34	2480.00
1	436 BR U	PF 1	720.67		722.31	377.58	2562.14	16733.55	138.32		2365.91	2454.34	
1	436 BR U	PF 2	721.74	1.07	723.13	320.39	2790.50	16472.37	171.13	2069.00	2365.91	2454.34	2480.00
1	436 BR D	PF 1	720.74		721.87	377.81	4552.86	14755.32	125.81		2365.91	2454.34	
1	436 BR D	PF 2	721.81	1.07	722.76	314.87	4839.12	14440.60	154.28	2069.00	2365.91	2454.34	2480.00
1	375	PF 1	720.76		721.79	419.85	4502.07	14838.22	93.71		2365.91	2454.34	
1	375	PF 2	721.83	1.07	722.69	402.10	4829.67	14490.79	113.54	2069.00	2365.91	2454.34	2480.00
1	0	PF 1	720.60		721.20	644.45	7787.65	11575.82	70.52		2372.74	2455.66	
1	0	PF 2	721.57	0.97	722.15	495.00	10668.48	8765.52		1931.00	2372.74	2455.66	2426.00
1	-611	PF 1	720.30		720.67	787.97	9657.30	9662.88	113.82		904.79	987.71	
1	-611	PF 2	721.10	0.80	721.56	580.00	8672.34	10684.06	77.60	416.00	904.79	987.71	996.00

PROPOSED 425' BRIDGE
FLOODWAY MODEL
WEST CHICKAMAUGA CREEK



Some schematic data outside default extents (see View/Set Schematic Plot Extents...)
None of the XS's are Geo-Referenced (- Geo-Ref user entered XS - Geo-Ref interpolated XS - Non Geo-Ref user entered XS - Non Geo-Ref interpolated XS)

HEC-RAS HEC-RAS 5.0.6 November 2018
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
XXXXXXX  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: SR 1 over W Chickamauga Creek
Project File : SR1overWChickam.prj
Run Date and Time: 6/27/2019 11:11:48 AM

Project in English units

PLAN DATA

Plan Title: Proposed 425' Bridge Floodway Model
Plan File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.p33

Geometry Title: Proposed 425' Bridge Floodway Model
Geometry File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.g29

Flow Title : Floodway Flow Data FIS SWSEL
Flow File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.f05

Plan Summary Information:
Number of: Cross Sections = 5 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 1 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: Between every coordinate point (HEC2 Style)
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = W Chickamauga Cr Reach = 1

RS	Profile	Method	Value1	Value2
722	PF 2	1	1904	2399
497	PF 2	1	2045	2470
375	PF 2	1	2045	2470
0	PF 2	1	1931	2426
-611	PF 2	1	416	996

FLOW DATA

Flow Title: Floodway Flow Data FIS SWSEL

Flow File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.f05

Flow Data (cfs)

River	Reach	RS	PF 1	PF 2
W Chickamauga Cr	1	722	19434	19434

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
W Chickamauga Cr	1	PF 1		Known WS = 720.3
W Chickamauga Cr	1	PF 2		Known WS = 721.1

GEOMETRY DATA

Geometry Title: Proposed 425' Bridge Floodway Model
Geometry File : C:\Users\cipollard\Documents\HEC-RAS 5.0.6 Data\SR 1 US 27 over West Chickamauga Creek\SR1overWChickam.g29

CROSS SECTION

RIVER: W Chickamauga Cr
REACH: 1 RS: 722

INPUT
Description: Approach Section. Adjust Elevations for Quad Map Slope -0.15'
Station Elevation Data num= 500

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
980.33	755.4	986.4	755.38	995.11	755.35	996.4	755.33	1004	755.26
1006.4	755.21	1016.4	755	1026.4	754.79	1036.4	754.58	1040.28	754.5
1046.4	754.22	1051.14	754.01	1056.4	753.71	1062.49	753.36	1066.4	753.24
1076.4	752.96	1086.4	752.67	1096.4	752.39	1099.19	752.31	1106.4	751.92
1111.95	751.61	1116.4	751.52	1126.4	751.3	1136.4	751.09	1146.4	750.88
1149.7	750.81	1156.4	750.57	1166.4	750.22	1166.41	750.22	1176.4	750.12
1186.4	750.03	1196.4	749.93	1200.74	749.89	1206.4	749.87	1214.28	749.84
1216.4	749.77	1226.4	749.47	1236.4	749.16	1246.4	748.85	1251.97	748.68
1256.4	748.55	1264.97	748.3	1266.4	748.21	1276.4	747.55	1286.4	746.9
1296.4	746.25	1298.43	746.12	1306.4	745.7	1313.37	745.33	1316.4	745.12
1326.4	744.44	1336.4	743.76	1346.4	743.08	1347.52	743.01	1356.4	742.48
1363.69	742.04	1366.4	741.87	1376.4	741.23	1386.4	740.59	1394.95	740.05
1396.4	739.95	1406.4	739.23	1413.61	738.72	1416.4	738.58	1426.4	738.07
1436.4	737.56	1445.4	737.1	1446.4	737.04	1456.4	736.39	1464.51	735.86
1466.4	735.78	1476.4	735.33	1486.4	734.88	1495.08	734.49	1496.4	734.42
1506.4	733.84	1513.88	733.4	1516.4	733.31	1526.4	732.94	1532.19	732.73
1536.4	732.57	1546.4	732.21	1554.28	731.92	1556.4	731.85	1566.4	731.51
1573.29	731.28	1576.4	731.19	1586.4	730.92	1596.4	730.65	1598.86	730.58
1606.4	730.41	1616.4	730.19	1626.4	729.96	1627.65	729.94	1636.4	729.77
1646.4	729.58	1650.73	729.49	1656.4	729.38	1666.4	729.18	1668.9	729.13
1676.4	728.95	1683.84	728.76	1686.4	728.8	1696.4	728.94	1706.4	729.09
1707.93	729.11	1716.4	728.84	1721.99	728.66	1726.4	728.45	1736.4	727.98
1746.4	727.52	1756.02	727.07	1756.4	727.02	1761.52	726.41	1766.4	726.12
1776.4	725.53	1786.4	724.93	1792.82	724.55	1796.4	724.46	1799.52	724.37
1805.9	724.35	1806.4	724.34	1816.4	724.06	1826.4	723.78	1836.4	723.49
1846.4	723.21	1855.11	722.96	1856.4	722.93	1866.4	722.71	1867.48	722.68
1876.4	722.69	1886.4	722.71	1896.4	722.72	1904.59	722.73	1906.4	722.69
1910.99	722.59	1916.4	722.31	1926.4	721.79	1936.4	721.28	1938.8	721.15
1946.4	721.16	1951.69	721.17	1956.4	720.97	1966.4	720.53	1968.34	720.45
1968.41	720.44	1976.4	720.18	1984.12	719.92	1986.4	719.89	1996.4	719.73
2006.4	719.57	2008.4	719.54	2016.4	719.34	2026.4	719.08	2028.94	719.01
2036.4	718.71	2046.4	718.29	2049.85	718.15	2053.54	717.87	2056.4	717.75
2057.39	717.71	2066.4	717.38	2075.15	717.05	2076.4	716.96	2080.12	716.67
2085.94	716.47	2086.4	716.44	2089.32	716.25	2096.4	715.94	2098.97	715.83
2106.15	715.82	2106.4	715.81	2116.4	715.7	2126.4	715.59	2136.4	715.47
2146.4	715.36	2150.45	715.32	2156.4	714.99	2157.53	714.93	2162.15	715.56
2166.4	715.55	2176.4	715.51	2179.1	715.51	2184.22	715.37	2186.4	715.34
2188.2	715.32	2195.9	715.29	2196.4	715.31	2201.24	715.53	2206.08	715.97
2206.4	715.97	2216.4	715.91	2222.48	715.87	2226.4	715.9	2236.4	715.99
2243.47	716.06	2246.4	716.13	2256.4	716.38	2262.67	716.54	2266.4	716.54
2276	716.56	2286	716.79	2287.95	716.84	2296	715.72	2306	714.34
2310.91	713.66	2316	712.82	2324.84	711.36	2326	710.28	2326.64	709.69
2329.23	707.33	2334.74	706.23	2336	705.96	2346	703.87	2356	701.78
2362.98	700.31	2366	700.73	2376	702.11	2386	703.5	2396	704.88

2396.37	704.93	2402.29	705.67	2402.58	707.05	2404.51	712.27	2406	713.04
2416	718.22	2422.46	721.57	2424.21	722.47	2426	723.4	2430.48	725.71
2432.63	726.29	2436	727.52	2456.4	727.56	2457.47	727.85	2460.57	728.4
2462.37	728.82	2466.4	729.18	2473.71	729.85	2476.4	730.17	2486.4	731.37
2496.4	732.57	2504.81	733.57	2506.4	733.65	2516.4	734.13	2522.55	734.42
2526.4	734.55	2530.87	734.69	2536.4	735.44	2541.37	736.1	2546.4	736.68
2556.4	737.81	2556.87	737.87	2559.35	738	2563.49	738.29	2566.4	738.44
2566.55	738.45	2576.4	739.11	2586.4	739.78	2596.4	740.46	2599	740.63
2600	740.7	2608.89	741.26	2610	741.38	2610.05	741.39	2612.66	741.5
2613.19	741.53	2619.48	741.91	2619.79	741.93	2626.39	742.33	2628.71	742.47
2632.99	742.72	2637.95	743.02	2639.06	743.08	2639.59	743.1	2646.19	743.34
2647.18	743.37	2649.47	743.45	2651	743.47	2652.79	743.54	2656.42	743.66
2659.4	743.76	2665.65	743.97	2666	743.98	2672.6	744.2	2674.89	744.28
2679.2	744.42	2684.12	744.58	2685.8	744.64	2689.64	744.76	2692.07	744.84
2692.4	744.86	2693.35	744.89	2693.81	744.9	2699	745	2700	745.02
2706.6	745.16	2709.23	745.21	2713.2	745.29	2718.47	745.39	2719.8	745.42
2726.4	745.54	2727.7	745.57	2729.07	745.6	2730.75	745.68	2733	745.71
2736.94	745.76	2739.6	745.8	2743.08	745.84	2746.17	745.86	2746.2	745.86
2752.8	745.89	2755.41	745.9	2759.4	745.92	2764.64	745.94	2766	745.95
2767.04	745.95	2772.6	745.95	2773.88	745.95	2779.2	745.95	2780.8	745.96
2783.11	745.82	2783.33	745.81	2785.8	745.8	2786.3	745.8	2786.87	745.82
2787.42	745.82	2792.34	745.71	2792.4	745.71	2795.32	745.64	2795.48	745.63
2795.93	745.62	2797.82	745.58	2799	745.58	2800	745.55	2806.6	745.36
2808.07	745.32	2809.23	745.36	2812.44	745.46	2812.91	745.33	2813.2	745.34
2815.5	745.35	2818.47	745.33	2819.8	745.32	2826.4	745.29	2827.27	745.29
2827.7	745.23	2830.5	744.87	2833	744.83	2836.94	744.77	2839.6	744.72
2840.94	744.7	2846.17	744.63	2846.2	744.63	2852.8	744.54	2855.41	744.51
2859.4	744.45	2864.64	744.39	2866	744.37	2867.17	744.35	2872.6	744.25
2873.88	744.23	2875.07	744.2	2879.2	744.06	2880.1	744.03	2883.11	744.01
2885.14	743.99	2885.8	743.98	2892.34	743.87	2892.4	743.87	2893.23	743.86
2899	743.52	2900	743.35	2901.06	743.18	2901.06	743.16	2901.27	743.17
2901.43	743.14	2903.04	743.14	2906.6	743.11	2909.23	743.08	2909.87	743.07
2913.2	743.33	2914.87	743.46	2918.47	743.54	2919.8	743.58	2926.4	743.74
2927.7	743.77	2928.94	743.8	2933	743.89	2936.94	743.98	2939.6	744.04
2946.17	744.19	2946.2	744.19	2952.8	744.33	2955.41	744.39	2958.33	744.46
2958.88	744.45	2959.4	744.45	2959.46	744.45	2959.75	744.44	2960.36	744.44
2960.67	744.43	2961.08	744.43	2961.14	744.44	2961.52	744.53	2961.75	744.58
2962.18	744.66	2962.38	744.7	2962.75	744.77	2963.09	744.83	2963.3	744.87
2963.69	744.93	2963.96	744.97	2964.13	744.99	2964.45	745.03	2964.64	745.05
2964.76	745.07	2964.89	745.08	2965.05	745.1	2965.13	745.1	2965.32	745.12
2965.58	745.13	2965.7	745.14	2965.95	745.15	2966	745.15	2966.08	745.15
2966.26	745.16	2966.53	745.15	2966.76	745.15	2966.91	745.14	2967.01	745.14
2967.22	745.12	2967.38	745.11	2967.48	745.1	2967.71	745.07	2967.94	745.05
2968.1	745.02	2968.32	744.99	2968.44	744.97	2968.71	744.93	2968.86	744.9
2969.17	744.84	2969.33	744.81	2969.6	744.76	2970.03	744.66	2970.54	744.54
2970.82	744.47	2970.96	744.44	2971.1	744.44	2971.66	744.45	2972.19	744.46
2972.53	744.46	2972.6	744.46	2973.17	744.47	2973.61	744.48	2973.88	744.48
2973.9	744.48	2974.42	744.49	2974.67	744.5	2979.2	744.5	2983.11	744.51
2985.8	744.51	2992.34	744.52	2992.4	744.52	2993.78	744.52	2999	744.51
3000	744.51	3006.6	744.51	3009.23	744.5	3011.26	744.5	3011.39	744.5
3011.58	744.53	3013.2	744.53	3015.01	744.52	3015.54	744.5	3015.69	744.5
3018.47	744.7	3019.8	744.8	3021.64	744.93	3026.4	745.21	3027.7	745.29
3027.87	745.3	3033	745.4	3033.41	745.41	3036.44	745.41	3036.94	745.4
3039.6	745.4	3042.29	745.39	3044.61	745.35	3046.17	745.3	3046.2	745.3
3046.7	745.28	3047.49	745.06	3051.45	745.33	3051.6	745.32	3052.8	745.33
3055.41	745.35	3058.91	745.38	3059.4	745.41	3064.64	745.7	3066	745.77

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
980.33	.15	1666.4	.1	2324.84	.035	2404.51	.15

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2324.84	2404.51	225	225	.3	.5

CROSS SECTION

RIVER: W Chickamauga Cr
REACH: 1 RS: 497

INPUT
Description: Upstream Face of Existing and Proposed Bridges. Copy RS 375
Station Elevation Data num= 483

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
986.4	749.47	994.83	749.45	996.4	749.46	1006.4	749.5	1016.4	749.54
1017.31	749.55	1026.4	749.61	1036.4	749.68	1036.84	749.69	1046.4	749.43
1056.4	749.15	1066.4	748.88	1068.39	748.82	1076.4	748.59	1086.4	748.31
1092.59	748.13	1096.4	747.95	1106.4	747.46	1116.4	746.98	1119.01	746.86
1126.4	746.78	1136.4	746.66	1145.06	746.57	1146.4	746.53	1156.4	746.21

1166.4	745.9	1176.4	745.58	1176.72	745.57	1186.4	745.22	1196.4	744.86
1199.54	744.74	1206.4	744.4	1216.4	743.89	1225.98	743.4	1226.4	743.36
1236.4	742.4	1239.75	742.08	1246.4	741.84	1256.4	741.47	1266.4	741.1
1275.6	740.76	1276.4	740.72	1286.4	740.24	1291.42	740	1296.4	739.58
1306.4	738.75	1316.4	737.92	1325.08	737.2	1326.4	737.15	1335.41	736.78
1336.4	736.72	1346.4	736.09	1356.4	735.46	1366.4	734.83	1372.1	734.47
1376.4	734.22	1381.61	733.91	1386.4	733.72	1396.4	733.33	1406.4	732.94
1416.4	732.54	1417.59	732.5	1426.4	732.17	1427.61	732.13	1436.4	731.88
1446.4	731.6	1456.4	731.32	1466.4	731.04	1467.33	731.02	1474.86	730.81
1476.4	730.77	1486.4	730.5	1496.4	730.24	1506.4	729.97	1516.4	729.71
1517.74	729.67	1525.79	729.47	1526.4	729.46	1536.4	729.35	1546.4	729.23
1556.4	729.12	1561.87	729.06	1566.4	728.93	1573.65	728.73	1576.4	728.71
1586.4	728.64	1596.4	728.57	1606.4	728.5	1609.42	728.48	1616.4	728.54
1622.69	728.59	1626.4	728.63	1636.4	728.73	1646.4	728.82	1656.4	728.92
1656.71	728.92	1666.4	728.81	1670.12	728.77	1676.4	728.78	1686.4	728.8
1696.4	728.81	1703.47	728.83	1706.4	728.71	1716.29	728.3	1716.4	728.29
1726.4	727.88	1736.4	727.46	1746.4	727.04	1749.28	726.92	1756.4	726.42
1766.4	725.7	1766.7	725.68	1776.4	725	1786.4	724.29	1796.4	723.58
1803.94	723.05	1806.4	722.93	1816.4	722.47	1819.54	722.32	1826.4	721.8
1836.4	721.05	1846.4	720.29	1851.37	719.91	1856.4	719.62	1857.57	719.56
1866.4	718.9	1876.4	718.16	1886.4	717.42	1888.96	717.23	1896.4	716.88
1905.16	716.46	1906.4	716.43	1916.4	716.17	1925.28	715.95	1926.4	715.92
1936.4	715.67	1946.4	715.41	1949.51	715.33	1956.4	715.21	1966.4	715.03
1976.4	714.86	1984.96	714.7	1986.4	714.68	1996.4	714.55	1998.7	714.52
2006.4	714.52	2013.23	714.52	2016.4	714.5	2025.6	714.44	2025.61	714.44
2026.4	714.46	2036.4	714.64	2044.85	714.8	2046.4	714.77	2056.4	714.59
2065.47	714.42	2066.4	714.42	2076.4	714.41	2077.53	714.41	2086.4	714.5
2090.33	714.53	2096.4	714.49	2106.4	714.43	2116.4	714.37	2126.06	714.31
2126.4	714.31	2136.4	714.26	2142.48	714.23	2146.4	714.25	2156.4	714.31
2166.1	714.36	2166.4	714.36	2176.4	714.58	2186.4	714.79	2189.74	714.86
2196.4	714.82	2206.4	714.77	2211.18	714.74	2216.4	714.74	2226.4	714.75
2233.17	714.75	2236.4	714.81	2246.4	715	2256.4	715.19	2260.72	715.27
2266.4	715.43	2276.4	715.72	2277.44	715.75	2284.4	715.62	2286.4	715.51
2294.35	715.06	2296.4	715.06	2306.4	715.09	2313.3	715.11	2316.4	715.03
2326.4	714.78	2336.4	714.53	2346.4	714.29	2356.4	714.04	2362.97	713.87
2365.91	713.72	2366.4	712.65	2368.58	707.85	2369.05	706.93	2376.4	704.88
2386.4	702.09	2390.45	700.95	2396.4	699.34	2406.4	696.62	2411.26	695.3
2416.4	696.75	2426.4	699.57	2436.4	702.4	2446.4	705.22	2446.69	705.31
2451.22	706.54	2451.84	707.64	2454.34	712.13	2456.4	713.07	2456.64	713.17
2457.68	713.99	2458.65	714.53	2466.4	719.16	2469.01	720.72	2475.1	724.17
2476.4	724.24	2483.89	724.63	2486.4	724.77	2496.4	725.31	2497.91	725.39
2500.97	725.23	2505.97	725.76	2506.4	725.78	2507.98	725.84	2515.36	726.85
2516.4	727.2	2525.69	730.28	2526.4	730.53	2527.8	731.04	2536.4	732.91
2546.4	735.08	2552.2	736.34	2556.4	737.1	2566.4	738.92	2566.93	739.02
2576.4	739.97	2582.12	740.55	2586.4	740.74	2596.4	741.18	2599	741.29
2600	741.33	2600.21	741.34	2610	741.49	2613.19	741.54	2616.95	741.6
2620.34	741.53	2620.62	741.53	2627.49	741.39	2631.52	741.31	2633.81	741.27
2634.64	741.23	2640.26	740.97	2641.79	740.85	2642.42	740.8	2643.94	740.68
2648.86	740.1	2648.94	740.09	2650.45	740.08	2652.13	740.18	2652.75	740.18
2653.33	740.19	2655.65	740.23	2656.1	740.24	2663.25	740.27	2664.23	740.28
2670.36	740.31	2670.4	740.31	2675.14	740.31	2676.12	740.31	2677.55	740.3
2684.7	740.25	2686.04	740.23	2691.85	740.19	2696.94	740.15	2699	740.13
2700	740.12	2707.07	740.06	2708.28	740.05	2708.51	740.05	2710.9	740.08
2714.14	740.11	2721.21	740.18	2721.81	740.18	2728.29	740.25	2732.71	740.29
2735.36	740.32	2740.79	740.37	2742.43	740.38	2743.62	740.38	2749.5	740.4
2754.52	740.42	2756.57	740.42	2759.32	740.43	2763.64	740.46	2765.42	740.47
2770.71	740.5	2775.64	740.53	2776.33	740.54	2777.79	740.54	2784.86	740.55
2787.23	740.56	2791.93	740.57	2794.95	740.58	2798.14	740.59	2799	740.59
2800	740.6	2807.07	740.62	2810.9	740.64	2814.14	740.65	2821.21	740.68
2821.81	740.69	2825.19	740.7	2828.29	740.71	2832.71	740.72	2835.36	740.73
2842.09	740.75	2842.43	740.75	2843.62	740.75	2849.5	740.76	2854.52	740.76
2856.57	740.76	2863.64	740.77	2865.42	740.77	2870.71	740.78	2874.71	740.78
2876.33	740.78	2877.79	740.79	2884.86	740.8	2887.23	740.81	2891.93	740.82
2898.14	740.83	2899	740.83	2900	740.84	2907.07	740.85	2910.9	740.85
2914.14	740.86	2921.21	740.87	2921.81	740.87	2924.37	740.87	2928.29	740.92
2932.22	740.98	2932.71	740.98	2935.36	740.99	2942.43	741.01	2943.62	741.02
2946.24	741.03	2949.5	741.06	2954.52	741.1	2956.57	741.12	2963.64	741.19
2965.42	741.21	2970.71	741.26	2976.24	741.31	2976.33	741.31	2977.79	741.27
2984.86	741.11	2987.23	741.05	2989.05	741.01	2991.93	741	2993.82	740.99
2997.67	741	2998.14	740.95	2999	740.85	3000	740.69	3007.07	739.59
3007.8	739.47	3010.9	739.86	3012.79	740.1	3014.14	740.23	3021.21	740.95
3021.81	741.01	3023.21	741.15	3024.06	741.24	3024.31	741.26	3024.32	741.26
3024.36	741.26	3024.38	741.26	3024.42	741.27	3024.48	741.27	3024.52	741.27
3024.65	741.29	3024.76	741.3	3025.14	741.33	3025.68	741.37	3026.61	741.39
3028.19	741.41	3028.29	741.41	3029.11	741.42	3030.72	741.44	3031.42	741.45
3032.67	741.46	3032.71	741.46	3033.73	741.47	3034.35	741.47	3035.36	741.47
3035.43	741.47	3035.95	741.48	3036.27	741.48	3036.85	741.48	3042.43	741.46
3043.62	741.45	3049.5	741.43	3054.52	741.41	3056.57	741.41	3056.81	741.4
3057.55	741.4	3058.41	741.4	3058.9	741.4	3060.02	741.39	3060.66	741.39

3061.74	741.39	3063.64	741.41	3064.92	741.42	3065.11	741.41	3065.27	741.4
3065.42	741.39	3065.46	741.39	3067.01	741.42	3070.18	741.49	3070.71	741.51
3070.94	741.51	3072.06	741.53	3072.85	741.55	3073.25	741.56	3073.88	741.57
3074.13	741.58	3074.55	741.59	3074.87	741.59	3075.06	741.6	3075.94	741.58
3076.11	741.6	3076.33	741.59	3077.52	741.57	3077.79	741.59	3079.2	741.73
3079.21	741.72	3084.86	741.9	3087.23	741.97	3091.93	742.12	3096.59	742.26
3098.14	742.32	3100	742.39	3107.07	742.65	3110.9	742.79	3112.58	742.85
3114.14	742.89	3121.21	743.03	3121.81	743.04	3128.29	743.17	3132.71	743.25
3135.36	743.3	3142.43	743.44	3143.62	743.47	3148.27	743.56	3149.5	743.58
3154.52	743.67	3156.57	743.7	3156.92	743.71	3163.64	743.68	3163.87	743.67
3165.42	743.66	3166.15	743.66	3170.71	743.66	3176.33	743.65	3176.39	743.65
3177.79	743.65	3184.86	743.65	3187.23	743.65	3191.93	743.65	3192.95	743.65
3193.27	743.65	3198.14	743.65	3199	743.65				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
986.4	.15	2336.4	.1	2365.91	.035	2454.34	.1	2526.4	.15

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

2365.91	2454.34	122	122	122	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
986.4	2025	726.46	T
2490	3199	726.46	T

Sediment Elevation = 700.18

BRIDGE

RIVER: W Chickamauga Cr
REACH: 1 RS: 436

INPUT
Description: Proposed 415' Bridge
Distance from Upstream XS = 22
Deck/Roadway Width = 78
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 29

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1050	741.55	0	1100	741.11	0	1200	739.91	0
1300	738.26	0	1400	736.18	0	1500	734.04	0
1600	731.89	0	1700	729.74	0	1800	727.95	0
1900	727.03	0	2000	726.98	0	2045	726.46	0
2045	726.46	723.13	2085	726.83	723.5	2085	726.83	722.83
2145	727.43	723.43	2205	728.03	724.03	2265	728.63	724.63
2325	729.23	725.23	2325	729.23	722.23	2470	730.68	723.68
2470	730.68	0	2500	731.76	0	2600	732.76	0
2700	734.09	0	2800	736.22	0	2900	739.16	0
3000	742.39	0	3100	745.28	0			

Upstream Bridge Cross Section Data
Station Elevation Data num= 483

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
986.4	749.47	994.83	749.45	996.4	749.46	1006.4	749.5	1016.4	749.54
1017.31	749.55	1026.4	749.61	1036.4	749.68	1036.84	749.69	1046.4	749.43
1056.4	749.15	1066.4	748.88	1068.39	748.82	1076.4	748.59	1086.4	748.31
1092.59	748.13	1096.4	747.95	1106.4	747.46	1116.4	746.98	1119.01	746.86
1126.4	746.78	1136.4	746.66	1145.06	746.57	1146.4	746.53	1156.4	746.21
1166.4	745.9	1176.4	745.58	1176.72	745.57	1186.4	745.22	1196.4	744.86
1199.54	744.74	1206.4	744.4	1216.4	743.89	1225.98	743.4	1226.4	743.36
1236.4	742.4	1239.75	742.08	1246.4	741.84	1256.4	741.47	1266.4	741.1
1275.6	740.76	1276.4	740.72	1286.4	740.24	1291.42	740	1296.4	739.58
1306.4	738.75	1316.4	737.92	1325.08	737.2	1326.4	737.15	1335.41	736.78
1336.4	736.72	1346.4	736.09	1356.4	735.46	1366.4	734.83	1372.1	734.47
1376.4	734.22	1381.61	733.91	1386.4	733.72	1396.4	733.33	1406.4	732.94
1416.4	732.54	1417.59	732.5	1426.4	732.17	1427.61	732.13	1436.4	731.88
1446.4	731.6	1456.4	731.32	1466.4	731.04	1467.33	731.02	1474.86	730.81
1476.4	730.77	1486.4	730.5	1496.4	730.24	1506.4	729.97	1516.4	729.71
1517.74	729.67	1525.79	729.47	1526.4	729.46	1536.4	729.35	1546.4	729.23
1556.4	729.12	1561.87	729.06	1566.4	728.93	1573.65	728.73	1576.4	728.71
1586.4	728.64	1596.4	728.57	1606.4	728.5	1609.42	728.48	1616.4	728.54
1622.69	728.59	1626.4	728.63	1636.4	728.73	1646.4	728.82	1656.4	728.92
1656.71	728.92	1666.4	728.81	1670.12	728.77	1676.4	728.78	1686.4	728.8
1696.4	728.81	1703.47	728.83	1706.4	728.71	1716.29	728.3	1716.4	728.29
1726.4	727.88	1736.4	727.46	1746.4	727.04	1749.28	726.92	1756.4	726.42
1766.4	725.7	1766.7	725.68	1776.4	725	1786.4	724.29	1796.4	723.58
1803.94	723.05	1806.4	722.93	1816.4	722.47	1819.54	722.32	1826.4	721.8
1836.4	721.05	1846.4	720.29	1851.37	719.91	1856.4	719.62	1857.57	719.56

1866.4	718.9	1876.4	718.16	1886.4	717.42	1888.96	717.23	1896.4	716.88
1905.16	716.46	1906.4	716.43	1916.4	716.17	1925.28	715.95	1926.4	715.92
1936.4	715.67	1946.4	715.41	1949.51	715.33	1956.4	715.21	1966.4	715.03
1976.4	714.86	1984.96	714.7	1986.4	714.68	1996.4	714.55	1998.7	714.52
2006.4	714.52	2013.23	714.52	2016.4	714.5	2025.6	714.44	2025.61	714.44
2026.4	714.46	2036.4	714.64	2044.85	714.8	2046.4	714.77	2056.4	714.59
2065.47	714.42	2066.4	714.42	2076.4	714.41	2077.53	714.41	2086.4	714.5
2090.33	714.53	2096.4	714.49	2106.4	714.43	2116.4	714.37	2126.06	714.31
2126.4	714.31	2136.4	714.26	2142.48	714.23	2146.4	714.25	2156.4	714.31
2166.1	714.36	2166.4	714.36	2176.4	714.58	2186.4	714.79	2189.74	714.86
2196.4	714.82	2206.4	714.77	2211.18	714.74	2216.4	714.74	2226.4	714.75
2233.17	714.75	2236.4	714.81	2246.4	715	2256.4	715.19	2260.72	715.27
2266.4	715.43	2276.4	715.72	2277.44	715.75	2284.4	715.62	2286.4	715.51
2294.35	715.06	2296.4	715.06	2306.4	715.09	2313.3	715.11	2316.4	715.03
2326.4	714.78	2336.4	714.53	2346.4	714.29	2356.4	714.04	2362.97	713.87
2365.91	713.72	2366.4	712.65	2368.58	707.85	2369.05	706.93	2376.4	704.88
2386.4	702.09	2390.45	700.95	2396.4	699.34	2406.4	696.62	2411.26	695.3
2416.4	696.75	2426.4	699.57	2436.4	702.4	2446.4	705.22	2446.69	705.31
2451.22	706.54	2451.84	707.64	2454.34	712.13	2456.4	713.07	2456.64	713.17
2457.68	713.99	2458.65	714.53	2466.4	719.16	2469.01	720.72	2475.1	724.17
2476.4	724.24	2483.89	724.63	2486.4	724.77	2496.4	725.31	2497.91	725.39
2500.97	725.23	2505.97	725.76	2506.4	725.78	2507.98	725.84	2515.36	726.85
2516.4	727.2	2525.69	730.28	2526.4	730.53	2527.8	731.04	2536.4	732.91
2546.4	735.08	2552.2	736.34	2556.4	737.1	2566.4	738.92	2566.93	739.02
2576.4	739.97	2582.12	740.55	2586.4	740.74	2596.4	741.18	2599	741.29
2600	741.33	2600.21	741.34	2610	741.49	2613.19	741.54	2616.95	741.6
2620.34	741.53	2620.62	741.53	2627.49	741.39	2631.52	741.31	2633.81	741.27
2634.64	741.23	2640.26	740.97	2641.79	740.85	2642.42	740.8	2643.94	740.68
2648.86	740.1	2648.94	740.09	2650.45	740.08	2652.13	740.18	2652.75	740.18
2653.33	740.19	2655.65	740.23	2656.1	740.24	2663.25	740.27	2664.23	740.28
2670.36	740.31	2670.4	740.31	2675.14	740.31	2676.12	740.31	2677.55	740.3
2684.7	740.25	2686.04	740.23	2691.85	740.19	2696.94	740.15	2699	740.13
2700	740.12	2707.07	740.06	2708.28	740.05	2708.51	740.05	2710.9	740.08
2714.14	740.11	2721.21	740.18	2721.81	740.18	2728.29	740.25	2732.71	740.29
2735.36	740.32	2740.79	740.37	2742.43	740.38	2743.62	740.38	2749.5	740.4
2754.52	740.42	2756.57	740.42	2759.32	740.43	2763.64	740.46	2765.42	740.47
2770.71	740.5	2775.64	740.53	2776.33	740.54	2777.79	740.54	2784.86	740.55
2787.23	740.56	2791.93	740.57	2794.95	740.58	2798.14	740.59	2799	740.59
2800	740.6	2807.07	740.62	2810.9	740.64	2814.14	740.65	2821.21	740.68
2821.81	740.69	2825.19	740.7	2828.29	740.71	2832.71	740.72	2835.36	740.73
2842.09	740.75	2842.43	740.75	2843.62	740.75	2849.5	740.76	2854.52	740.76
2856.57	740.76	2863.64	740.77	2865.42	740.77	2870.71	740.78	2874.71	740.78
2876.33	740.78	2877.79	740.79	2884.86	740.8	2887.23	740.81	2891.93	740.82
2898.14	740.83	2899	740.83	2900	740.84	2907.07	740.85	2910.9	740.85
2914.14	740.86	2921.21	740.87	2921.81	740.87	2924.37	740.87	2928.29	740.92
2932.22	740.98	2932.71	740.98	2935.36	740.99	2942.43	741.01	2943.62	741.02
2946.24	741.03	2949.5	741.06	2954.52	741.1	2956.57	741.12	2963.64	741.19
2965.42	741.21	2970.71	741.26	2976.24	741.31	2976.33	741.31	2977.79	741.27
2984.86	741.11	2987.23	741.05	2989.05	741.01	2991.93	741	2993.82	740.99
2997.67	741	2998.14	740.95	2999	740.85	3000	740.69	3007.07	739.59
3007.8	739.47	3010.9	739.86	3012.79	740.1	3014.14	740.23	3021.21	740.95
3021.81	741.01	3023.21	741.15	3024.06	741.24	3024.31	741.26	3024.32	741.26
3024.36	741.26	3024.38	741.26	3024.42	741.27	3024.48	741.27	3024.52	741.27
3024.65	741.29	3024.76	741.3	3025.14	741.33	3025.68	741.37	3026.61	741.39
3028.19	741.41	3028.29	741.41	3029.11	741.42	3030.72	741.44	3031.42	741.45
3032.67	741.46	3032.71	741.46	3033.73	741.47	3034.35	741.47	3035.36	741.47
3035.43	741.47	3035.95	741.48	3036.27	741.48	3036.85	741.48	3042.43	741.46
3043.62	741.45	3049.5	741.43	3054.52	741.41	3056.57	741.41	3056.81	741.4
3057.55	741.4	3058.41	741.4	3058.9	741.4	3060.02	741.39	3060.66	741.39
3061.74	741.39	3063.64	741.41	3064.92	741.42	3065.11	741.41	3065.27	741.4
3065.42	741.39	3065.46	741.39	3067.01	741.42	3070.18	741.49	3070.71	741.51
3070.94	741.51	3072.06	741.53	3072.85	741.55	3073.25	741.56	3073.88	741.57
3074.13	741.58	3074.55	741.59	3074.87	741.59	3075.06	741.6	3075.94	741.58
3076.11	741.6	3076.33	741.59	3077.52	741.57	3077.79	741.59	3079.2	741.73
3079.21	741.72	3084.86	741.9	3087.23	741.97	3091.93	742.12	3096.59	742.26
3098.14	742.32	3100	742.39	3107.07	742.65	3110.9	742.79	3112.58	742.85
3114.14	742.89	3121.21	743.03	3121.81	743.04	3128.29	743.17	3132.71	743.25
3135.36	743.3	3142.43	743.44	3143.62	743.47	3148.27	743.56	3149.5	743.58
3154.52	743.67	3156.57	743.7	3156.92	743.71	3163.64	743.68	3163.87	743.67
3165.42	743.66	3166.15	743.66	3170.71	743.66	3176.33	743.65	3176.39	743.65
3177.79	743.65	3184.86	743.65	3187.23	743.65	3191.93	743.65	3192.95	743.65
3193.27	743.65	3198.14	743.65	3199	743.65				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
986.4	.15	2336.4	.1	2365.91	.035	2454.34	.1	2526.4	.15

Bank Sta: Left Right Coeff Contr. Expan.

Left	Right	Coeff Contr.	Expan.
2365.91	2454.34	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
986.4	2025	726.46	T
2490	3199	726.46	T

Sediment Elevation = 700.18

Downstream Deck/Roadway Coordinates num= 29

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
1050	741.55	0	1100	741.11	0	1200	739.91	0
1300	738.26	0	1400	736.18	0	1500	734.04	0
1600	731.89	0	1700	729.74	0	1800	727.95	0
1900	727.03	0	2000	726.98	0	2045	726.46	0
2045	726.46	723.13	2085	726.83	723.5	2085	726.83	722.83
2145	727.43	723.43	2205	728.03	724.03	2265	728.63	724.63
2325	729.23	725.23	2325	729.23	722.23	2470	730.68	723.68
2470	730.68	0	2500	731.76	0	2600	732.76	0
2700	734.09	0	2800	736.22	0	2900	739.16	0
3000	742.39	0	3100	745.28	0			

Downstream Bridge Cross Section Data
Station Elevation Data num= 483

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
986.4	749.4	994.83	749.38	996.4	749.39	1006.4	749.43	1016.4	749.47
1017.31	749.48	1026.4	749.54	1036.4	749.61	1036.84	749.62	1046.4	749.36
1056.4	749.08	1066.4	748.81	1068.39	748.75	1076.4	748.52	1086.4	748.24
1092.59	748.06	1096.4	747.88	1106.4	747.39	1116.4	746.91	1119.01	746.79
1126.4	746.71	1136.4	746.59	1145.06	746.5	1146.4	746.46	1156.4	746.14
1166.4	745.83	1176.4	745.51	1176.72	745.5	1186.4	745.15	1196.4	744.79
1199.54	744.67	1206.4	744.33	1216.4	743.82	1225.98	743.33	1226.4	743.29
1236.4	742.33	1239.75	742.01	1246.4	741.77	1256.4	741.4	1266.4	741.03
1275.6	740.69	1276.4	740.65	1286.4	740.17	1291.42	739.93	1296.4	739.51
1306.4	738.68	1316.4	737.85	1325.08	737.13	1326.4	737.08	1335.41	736.71
1336.4	736.65	1346.4	736.02	1356.4	735.39	1366.4	734.76	1372.1	734.4
1376.4	734.15	1381.61	733.84	1386.4	733.65	1396.4	733.26	1406.4	732.87
1416.4	732.47	1417.59	732.43	1426.4	732.1	1427.61	732.06	1436.4	731.81
1446.4	731.53	1456.4	731.25	1466.4	730.97	1467.33	730.95	1474.86	730.74
1476.4	730.7	1486.4	730.43	1496.4	730.17	1506.4	729.9	1516.4	729.64
1517.74	729.6	1525.79	729.4	1526.4	729.39	1536.4	729.28	1546.4	729.16
1556.4	729.05	1561.87	728.99	1566.4	728.86	1573.65	728.66	1576.4	728.64
1586.4	728.57	1596.4	728.5	1606.4	728.43	1609.42	728.41	1616.4	728.47
1622.69	728.52	1626.4	728.56	1636.4	728.66	1646.4	728.75	1656.4	728.85
1656.71	728.85	1666.4	728.74	1670.12	728.7	1676.4	728.71	1686.4	728.73
1696.4	728.74	1703.47	728.76	1706.4	728.64	1716.29	728.23	1716.4	728.22
1726.4	727.81	1736.4	727.39	1746.4	726.97	1749.28	726.85	1756.4	726.35
1766.4	725.63	1766.7	725.61	1776.4	724.93	1786.4	724.22	1796.4	723.51
1803.94	722.98	1806.4	722.86	1816.4	722.4	1819.54	722.25	1826.4	721.73
1836.4	720.98	1846.4	720.22	1851.37	719.84	1856.4	719.55	1857.57	719.49
1866.4	718.83	1876.4	718.09	1886.4	717.35	1888.96	717.16	1896.4	716.81
1905.16	716.39	1906.4	716.36	1916.4	716.1	1925.28	715.88	1926.4	715.85
1936.4	715.6	1946.4	715.34	1949.51	715.26	1956.4	715.14	1966.4	714.96
1976.4	714.79	1984.96	714.63	1986.4	714.61	1996.4	714.48	1998.7	714.45
2006.4	714.45	2013.23	714.45	2016.4	714.43	2025.6	714.37	2025.61	714.37
2026.4	714.39	2036.4	714.57	2044.85	714.73	2046.4	714.7	2056.4	714.52
2065.47	714.35	2066.4	714.35	2076.4	714.34	2077.53	714.34	2086.4	714.43
2090.33	714.46	2096.4	714.42	2106.4	714.36	2116.4	714.3	2126.06	714.24
2126.4	714.24	2136.4	714.19	2142.48	714.16	2146.4	714.18	2156.4	714.24
2166.1	714.29	2166.4	714.29	2176.4	714.51	2186.4	714.72	2189.74	714.79
2196.4	714.75	2206.4	714.7	2211.18	714.67	2216.4	714.67	2226.4	714.68
2233.17	714.68	2236.4	714.74	2246.4	714.93	2256.4	715.12	2260.72	715.2
2266.4	715.36	2276.4	715.65	2277.44	715.68	2284.4	715.55	2286.4	715.44
2294.35	714.99	2296.4	714.99	2306.4	715.02	2313.3	715.04	2316.4	714.96
2326.4	714.71	2336.4	714.46	2346.4	714.22	2356.4	713.97	2362.97	713.8
2365.91	713.65	2366.4	712.58	2368.58	707.78	2369.05	706.86	2376.4	704.81
2386.4	702.02	2390.45	700.88	2396.4	699.27	2406.4	696.55	2411.26	695.23
2416.4	696.68	2426.4	699.5	2436.4	702.33	2446.4	705.15	2446.69	705.24
2451.22	706.47	2451.84	707.57	2454.34	712.06	2456.4	713	2456.64	713.1
2457.68	713.92	2458.65	714.46	2466.4	719.09	2469.01	720.65	2475.1	724.1
2476.4	724.17	2483.89	724.56	2486.4	724.7	2496.4	725.24	2497.91	725.32
2500.97	725.16	2505.97	725.69	2506.4	725.71	2507.98	725.77	2515.36	726.78
2516.4	727.13	2525.69	730.21	2526.4	730.46	2527.8	730.97	2536.4	732.84
2546.4	735.01	2552.2	736.27	2556.4	737.03	2566.4	738.85	2566.93	738.95
2576.4	739.9	2582.12	740.48	2586.4	740.67	2596.4	741.11	2599	741.22
2600	741.26	2600.21	741.27	2610	741.42	2613.19	741.47	2616.95	741.53
2620.34	741.46	2620.62	741.46	2627.49	741.32	2631.52	741.24	2633.81	741.2
2634.64	741.16	2640.26	740.9	2641.79	740.78	2642.42	740.73	2643.94	740.61
2648.86	740.03	2648.94	740.02	2650.45	740.01	2652.13	740.11	2652.75	740.11
2653.33	740.12	2655.65	740.16	2656.1	740.17	2663.25	740.2	2664.23	740.21
2670.36	740.24	2670.4	740.24	2675.14	740.24	2676.12	740.24	2677.55	740.23

2684.7	740.18	2686.04	740.16	2691.85	740.12	2696.94	740.08	2699	740.06
2700	740.05	2707.07	739.99	2708.28	739.98	2708.51	739.98	2710.9	740.01
2714.14	740.04	2721.21	740.11	2721.81	740.11	2728.29	740.18	2732.71	740.22
2735.36	740.25	2740.79	740.3	2742.43	740.31	2743.62	740.31	2749.5	740.33
2754.52	740.35	2756.57	740.35	2759.32	740.36	2763.64	740.39	2765.42	740.4
2770.71	740.43	2775.64	740.46	2776.33	740.47	2777.79	740.47	2784.86	740.48
2787.23	740.49	2791.93	740.5	2794.95	740.51	2798.14	740.52	2799	740.52
2800	740.53	2807.07	740.55	2810.9	740.57	2814.14	740.58	2821.21	740.61
2821.81	740.62	2825.19	740.63	2828.29	740.64	2832.71	740.65	2835.36	740.66
2842.09	740.68	2842.43	740.68	2843.62	740.68	2849.5	740.69	2854.52	740.69
2856.57	740.69	2863.64	740.7	2865.42	740.7	2870.71	740.71	2874.71	740.71
2876.33	740.71	2877.79	740.72	2884.86	740.73	2887.23	740.74	2891.93	740.75
2898.14	740.76	2899	740.76	2900	740.77	2907.07	740.78	2910.9	740.78
2914.14	740.79	2921.21	740.8	2921.81	740.8	2924.37	740.8	2928.29	740.85
2932.22	740.91	2932.71	740.91	2935.36	740.92	2942.43	740.94	2943.62	740.95
2946.24	740.96	2949.5	740.99	2954.52	741.03	2956.57	741.05	2963.64	741.12
2965.42	741.14	2970.71	741.19	2976.24	741.24	2976.33	741.24	2977.79	741.2
2984.86	741.04	2987.23	740.98	2989.05	740.94	2991.93	740.93	2993.82	740.92
2997.67	740.93	2998.14	740.88	2999	740.78	3000	740.62	3007.07	739.52
3007.8	739.4	3010.9	739.79	3012.79	740.03	3014.14	740.16	3021.21	740.88
3021.81	740.94	3023.21	741.08	3024.06	741.17	3024.31	741.19	3024.32	741.19
3024.36	741.19	3024.38	741.19	3024.42	741.2	3024.48	741.2	3024.52	741.2
3024.65	741.22	3024.76	741.23	3025.14	741.26	3025.68	741.3	3026.61	741.32
3028.19	741.34	3028.29	741.34	3029.11	741.35	3030.72	741.37	3031.42	741.38
3032.67	741.39	3032.71	741.39	3033.73	741.4	3034.35	741.4	3035.36	741.4
3035.43	741.4	3035.95	741.41	3036.27	741.41	3036.85	741.41	3042.43	741.39
3043.62	741.38	3049.5	741.36	3054.52	741.34	3056.57	741.34	3056.81	741.33
3057.55	741.33	3058.41	741.33	3058.9	741.33	3060.02	741.32	3060.66	741.32
3061.74	741.32	3063.64	741.34	3064.92	741.35	3065.11	741.34	3065.27	741.33
3065.42	741.32	3065.46	741.32	3067.01	741.35	3070.18	741.42	3070.71	741.44
3070.94	741.44	3072.06	741.46	3072.85	741.48	3073.25	741.49	3073.88	741.5
3074.13	741.51	3074.55	741.52	3074.87	741.52	3075.06	741.53	3075.94	741.51
3076.11	741.53	3076.33	741.52	3077.52	741.5	3077.79	741.52	3079.2	741.66
3079.21	741.65	3084.86	741.83	3087.23	741.9	3091.93	742.05	3096.59	742.19
3098.14	742.25	3100	742.32	3107.07	742.58	3110.9	742.72	3112.58	742.78
3114.14	742.82	3121.21	742.96	3121.81	742.97	3128.29	743.1	3132.71	743.18
3135.36	743.23	3142.43	743.37	3143.62	743.4	3148.27	743.49	3149.5	743.51
3154.52	743.6	3156.57	743.63	3156.92	743.64	3163.64	743.61	3163.87	743.6
3165.42	743.59	3166.15	743.59	3170.71	743.59	3176.33	743.58	3176.39	743.58
3177.79	743.58	3184.86	743.58	3187.23	743.58	3191.93	743.58	3192.95	743.58
3193.27	743.58	3198.14	743.58	3199	743.58				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
986.4	.07	2336.4	.1	2365.91	.035	2454.34	.1	2526.4	.07

Bank Sta: Left Right Coeff Contr. Expan.
2365.91 2454.34 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
986.4	2025	726.46	T
2490	3199	726.46	T

Sediment Elevation = 700.11

Upstream Embankment side slope = 2 horiz. to 1.0 vertical
Downstream Embankment side slope = 2 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .98
Elevation at which weir flow begins = 726.46
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Abutments = 2

Abutment Data
Upstream num= 3

Sta	Elev	Sta	Elev	Sta	Elev
2045	720.96	2050	720.96	3491.92	0

Downstream num= 3

Sta	Elev	Sta	Elev	Sta	Elev
2045	720.96	2050	720.96	3491.92	0

Abutment Data
Upstream num= 3

Sta	Elev	Sta	Elev	Sta	Elev
2465	0	2465	721.51	2470	721.51

Downstream num= 3

Sta	Elev	Sta	Elev	Sta	Elev
2465	0	2465	721.51	2470	721.51

Number of Piers = 5

Pier Data
Pier Station Upstream= 2085 Downstream= 2085
Upstream num= 2
Width	Elev	Width	Elev
3.5	0	3.5	724.33

Downstream num= 2
Width	Elev	Width	Elev
3.5	0	3.5	724.33

Pier Data
Pier Station Upstream= 2145 Downstream= 2145
Upstream num= 2
Width	Elev	Width	Elev
3.5	0	3.5	724.93

Downstream num= 2
Width	Elev	Width	Elev
3.5	0	3.5	724.93

Pier Data
Pier Station Upstream= 2205 Downstream= 2205
Upstream num= 2
Width	Elev	Width	Elev
3.5	0	3.5	725.53

Downstream num= 2
Width	Elev	Width	Elev
3.5	0	3.5	725.53

Pier Data
Pier Station Upstream= 2265 Downstream= 2265
Upstream num= 2
Width	Elev	Width	Elev
3.5	0	3.5	726.13

Downstream num= 2
Width	Elev	Width	Elev
3.5	0	3.5	726.13

Pier Data
Pier Station Upstream= 2325 Downstream= 2325
Upstream num= 2
Width	Elev	Width	Elev
4	0	4	725.23

Downstream num= 2
Width	Elev	Width	Elev
4	0	4	725.23

Number of Bridge Coefficient Sets = 1

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

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: W Chickamauga Cr
REACH: 1 RS: 375

INPUT
Description: Downstream Face of Existing and Proposed Bridges. Adjust
Elevations to Quad Map Slope -0.07'
Station Elevation Data num= 483

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
986.4	749.4	994.83	749.38	996.4	749.39	1006.4	749.43	1016.4	749.47
1017.31	749.48	1026.4	749.54	1036.4	749.61	1036.84	749.62	1046.4	749.36
1056.4	749.08	1066.4	748.81	1068.39	748.75	1076.4	748.52	1086.4	748.24
1092.59	748.06	1096.4	747.88	1106.4	747.39	1116.4	746.91	1119.01	746.79

1126.4	746.71	1136.4	746.59	1145.06	746.5	1146.4	746.46	1156.4	746.14
1166.4	745.83	1176.4	745.51	1176.72	745.5	1186.4	745.15	1196.4	744.79
1199.54	744.67	1206.4	744.33	1216.4	743.82	1225.98	743.33	1226.4	743.29
1236.4	742.33	1239.75	742.01	1246.4	741.77	1256.4	741.4	1266.4	741.03
1275.6	740.69	1276.4	740.65	1286.4	740.17	1291.42	739.93	1296.4	739.51
1306.4	738.68	1316.4	737.85	1325.08	737.13	1326.4	737.08	1335.41	736.71
1336.4	736.65	1346.4	736.02	1356.4	735.39	1366.4	734.76	1372.1	734.4
1376.4	734.15	1381.61	733.84	1386.4	733.65	1396.4	733.26	1406.4	732.87
1416.4	732.47	1417.59	732.43	1426.4	732.1	1427.61	732.06	1436.4	731.81
1446.4	731.53	1456.4	731.25	1466.4	730.97	1467.33	730.95	1474.86	730.74
1476.4	730.7	1486.4	730.43	1496.4	730.17	1506.4	729.9	1516.4	729.64
1517.74	729.6	1525.79	729.4	1526.4	729.39	1536.4	729.28	1546.4	729.16
1556.4	729.05	1561.87	728.99	1566.4	728.86	1573.65	728.66	1576.4	728.64
1586.4	728.57	1596.4	728.5	1606.4	728.43	1609.42	728.41	1616.4	728.47
1622.69	728.52	1626.4	728.56	1636.4	728.66	1646.4	728.75	1656.4	728.85
1656.71	728.85	1666.4	728.74	1670.12	728.7	1676.4	728.71	1686.4	728.73
1696.4	728.74	1703.47	728.76	1706.4	728.64	1716.29	728.23	1716.4	728.22
1726.4	727.81	1736.4	727.39	1746.4	726.97	1749.28	726.85	1756.4	726.35
1766.4	725.63	1766.7	725.61	1776.4	724.93	1786.4	724.22	1796.4	723.51
1803.94	722.98	1806.4	722.86	1816.4	722.4	1819.54	722.25	1826.4	721.73
1836.4	720.98	1846.4	720.22	1851.37	719.84	1856.4	719.55	1857.57	719.49
1866.4	718.83	1876.4	718.09	1886.4	717.35	1888.96	717.16	1896.4	716.81
1905.16	716.39	1906.4	716.36	1916.4	716.1	1925.28	715.88	1926.4	715.85
1936.4	715.6	1946.4	715.34	1949.51	715.26	1956.4	715.14	1966.4	714.96
1976.4	714.79	1984.96	714.63	1986.4	714.61	1996.4	714.48	1998.7	714.45
2006.4	714.45	2013.23	714.45	2016.4	714.43	2025.6	714.37	2025.61	714.37
2026.4	714.39	2036.4	714.57	2044.85	714.73	2046.4	714.7	2056.4	714.52
2065.47	714.35	2066.4	714.35	2076.4	714.34	2077.53	714.34	2086.4	714.43
2090.33	714.46	2096.4	714.42	2106.4	714.36	2116.4	714.3	2126.06	714.24
2126.4	714.24	2136.4	714.19	2142.48	714.16	2146.4	714.18	2156.4	714.24
2166.1	714.29	2166.4	714.29	2176.4	714.51	2186.4	714.72	2189.74	714.79
2196.4	714.75	2206.4	714.7	2211.18	714.67	2216.4	714.67	2226.4	714.68
2233.17	714.68	2236.4	714.74	2246.4	714.93	2256.4	715.12	2260.72	715.2
2266.4	715.36	2276.4	715.65	2277.44	715.68	2284.4	715.55	2286.4	715.44
2294.35	714.99	2296.4	714.99	2306.4	715.02	2313.3	715.04	2316.4	714.96
2326.4	714.71	2336.4	714.46	2346.4	714.22	2356.4	713.97	2362.97	713.8
2365.91	713.65	2366.4	712.58	2368.58	707.78	2369.05	706.86	2376.4	704.81
2386.4	702.02	2390.45	700.88	2396.4	699.27	2406.4	696.55	2411.26	695.23
2416.4	696.68	2426.4	699.5	2436.4	702.33	2446.4	705.15	2446.69	705.24
2451.22	706.47	2451.84	707.57	2454.34	712.06	2456.4	713	2456.64	713.1
2457.68	713.92	2458.65	714.46	2466.4	719.09	2469.01	720.65	2475.1	724.1
2476.4	724.17	2483.89	724.56	2486.4	724.7	2496.4	725.24	2497.91	725.32
2500.97	725.16	2505.97	725.69	2506.4	725.71	2507.98	725.77	2515.36	726.78
2516.4	727.13	2525.69	730.21	2526.4	730.46	2527.8	730.97	2536.4	732.84
2546.4	735.01	2552.2	736.27	2556.4	737.03	2566.4	738.85	2566.93	738.95
2576.4	739.9	2582.12	740.48	2586.4	740.67	2596.4	741.11	2599	741.22
2600	741.26	2600.21	741.27	2610	741.42	2613.19	741.47	2616.95	741.53
2620.34	741.46	2620.62	741.46	2627.49	741.32	2631.52	741.24	2633.81	741.2
2634.64	741.16	2640.26	740.9	2641.79	740.78	2642.42	740.73	2643.94	740.61
2648.86	740.03	2648.94	740.02	2650.45	740.01	2652.13	740.11	2652.75	740.11
2653.33	740.12	2655.65	740.16	2656.1	740.17	2663.25	740.2	2664.23	740.21
2670.36	740.24	2670.4	740.24	2675.14	740.24	2676.12	740.24	2677.55	740.23
2684.7	740.18	2686.04	740.16	2691.85	740.12	2696.94	740.08	2699	740.06
2700	740.05	2707.07	739.99	2708.28	739.98	2708.51	739.98	2710.9	740.01
2714.14	740.04	2721.21	740.11	2721.81	740.11	2728.29	740.18	2732.71	740.22
2735.36	740.25	2740.79	740.3	2742.43	740.31	2743.62	740.31	2749.5	740.33
2754.52	740.35	2756.57	740.35	2759.32	740.36	2763.64	740.39	2765.42	740.4
2770.71	740.43	2775.64	740.46	2776.33	740.47	2777.79	740.47	2784.86	740.48
2787.23	740.49	2791.93	740.5	2794.95	740.51	2798.14	740.52	2799	740.52
2800	740.53	2807.07	740.55	2810.9	740.57	2814.14	740.58	2821.21	740.61
2821.81	740.62	2825.19	740.63	2828.29	740.64	2832.71	740.65	2835.36	740.66
2842.09	740.68	2842.43	740.68	2843.62	740.68	2849.5	740.69	2854.52	740.69
2856.57	740.69	2863.64	740.7	2865.42	740.7	2870.71	740.71	2874.71	740.71
2876.33	740.71	2877.79	740.72	2884.86	740.73	2887.23	740.74	2891.93	740.75
2898.14	740.76	2899	740.76	2900	740.77	2907.07	740.78	2910.9	740.78
2914.14	740.79	2921.21	740.8	2921.81	740.8	2924.37	740.8	2928.29	740.85
2932.22	740.91	2932.71	740.91	2935.36	740.92	2942.43	740.94	2943.62	740.95
2946.24	740.96	2949.5	740.99	2954.52	741.03	2956.57	741.05	2963.64	741.12
2965.42	741.14	2970.71	741.19	2976.24	741.24	2976.33	741.24	2977.79	741.2
2984.86	741.04	2987.23	740.98	2989.05	740.94	2991.93	740.93	2993.82	740.92
2997.67	740.93	2998.14	740.88	2999	740.78	3000	740.62	3007.07	739.52
3007.8	739.4	3010.9	739.79	3012.79	740.03	3014.14	740.16	3021.21	740.88
3021.81	740.94	3023.21	741.08	3024.06	741.17	3024.31	741.19	3024.32	741.19
3024.36	741.19	3024.38	741.19	3024.42	741.2	3024.48	741.2	3024.52	741.2
3024.65	741.22	3024.76	741.23	3025.14	741.26	3025.68	741.3	3026.61	741.32
3028.19	741.34	3028.29	741.34	3029.11	741.35	3030.72	741.37	3031.42	741.38
3032.67	741.39	3032.71	741.39	3033.73	741.4	3034.35	741.4	3035.36	741.4
3035.43	741.4	3035.95	741.41	3036.27	741.41	3036.85	741.41	3042.43	741.39
3043.62	741.38	3049.5	741.36	3054.52	741.34	3056.57	741.34	3056.81	741.33

3057.55	741.33	3058.41	741.33	3058.9	741.33	3060.02	741.32	3060.66	741.32
3061.74	741.32	3063.64	741.34	3064.92	741.35	3065.11	741.34	3065.27	741.33
3065.42	741.32	3065.46	741.32	3067.01	741.35	3070.18	741.42	3070.71	741.44
3070.94	741.44	3072.06	741.46	3072.85	741.48	3073.25	741.49	3073.88	741.5
3074.13	741.51	3074.55	741.52	3074.87	741.52	3075.06	741.53	3075.94	741.51
3076.11	741.53	3076.33	741.52	3077.52	741.5	3077.79	741.52	3079.2	741.66
3079.21	741.65	3084.86	741.83	3087.23	741.9	3091.93	742.05	3096.59	742.19
3098.14	742.25	3100	742.32	3107.07	742.58	3110.9	742.72	3112.58	742.78
3114.14	742.82	3121.21	742.96	3121.81	742.97	3128.29	743.1	3132.71	743.18
3135.36	743.23	3142.43	743.37	3143.62	743.4	3148.27	743.49	3149.5	743.51
3154.52	743.6	3156.57	743.63	3156.92	743.64	3163.64	743.61	3163.87	743.6
3165.42	743.59	3166.15	743.59	3170.71	743.59	3176.33	743.58	3176.39	743.58
3177.79	743.58	3184.86	743.58	3187.23	743.58	3191.93	743.58	3192.95	743.58
3193.27	743.58	3198.14	743.58	3199	743.58				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
986.4	.07	2336.4	.1	2365.91	.035	2454.34	.1	2526.4	.07

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

2365.91	2454.34	375	375	375	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
986.4	2025	726.46	T
2490	3199	726.46	T

Sediment Elevation = 700.11

CROSS SECTION

RIVER: W Chickamauga Cr
REACH: 1 RS: 0

INPUT
Description: Exit Section. Adjust Elevations to Quad Map Slope -0.02' Adjust Again =0.23'

Station Elevation Data num= 485

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
986.4	748.27	994.83	748.25	996.4	748.26	1006.4	748.3	1016.4	748.34
1017.31	748.35	1026.4	748.41	1036.4	748.48	1036.84	748.49	1046.4	748.23
1056.4	747.95	1066.4	747.68	1068.39	747.62	1076.4	747.39	1086.4	747.11
1092.59	746.93	1096.4	746.75	1106.4	746.26	1116.4	745.78	1119.01	745.66
1126.4	745.58	1136.4	745.46	1145.06	745.37	1146.4	745.33	1156.4	745.01
1166.4	744.7	1176.4	744.38	1176.72	744.37	1186.4	744.02	1196.4	743.66
1199.54	743.54	1206.4	743.2	1216.4	742.69	1225.98	742.2	1226.4	742.16
1236.4	741.2	1239.75	740.88	1246.4	740.64	1256.4	740.27	1266.4	739.9
1275.6	739.56	1276.4	739.52	1286.4	739.04	1291.42	738.8	1296.4	738.38
1306.4	737.55	1316.4	736.72	1325.08	736	1326.4	735.95	1335.41	735.58
1336.4	735.52	1346.4	734.89	1356.4	734.26	1366.4	733.63	1372.1	733.27
1376.4	733.02	1381.61	732.71	1386.4	732.52	1396.4	732.13	1406.4	731.74
1416.4	731.34	1417.59	731.3	1426.4	730.97	1427.61	730.93	1436.4	730.68
1446.4	730.4	1456.4	730.12	1466.4	729.84	1467.33	729.82	1474.86	729.61
1476.4	729.57	1486.4	729.3	1496.4	729.04	1506.4	728.77	1516.4	728.51
1517.74	728.47	1525.79	728.27	1526.4	728.26	1536.4	728.15	1546.4	728.03
1556.4	727.92	1561.87	727.86	1566.4	727.73	1573.65	727.53	1576.4	727.51
1586.4	727.44	1596.4	727.37	1606.4	727.3	1609.42	727.28	1616.4	727.34
1622.69	727.39	1626.4	727.43	1636.4	727.53	1646.4	727.62	1656.4	727.72
1656.71	727.72	1666.4	727.61	1670.12	727.57	1676.4	727.58	1686.4	727.6
1696.4	727.61	1703.47	727.63	1706.4	727.51	1716.29	727.1	1716.4	727.09
1726.4	726.68	1736.4	726.26	1746.4	725.84	1749.28	725.72	1756.4	725.22
1766.4	724.5	1766.7	724.48	1776.4	723.8	1786.4	723.09	1796.4	722.38
1803.94	721.85	1806.4	721.73	1816.4	721.27	1819.54	721.12	1826.4	720.6
1836.4	719.85	1846.4	719.09	1851.37	718.71	1856.4	718.42	1857.57	718.36
1866.4	717.7	1876.4	716.96	1886.4	716.22	1888.96	716.03	1896.4	715.68
1905.16	715.26	1906.4	715.23	1916.4	714.97	1925.28	714.75	1926.4	714.72
1936.4	714.47	1946.4	714.21	1949.51	714.13	1956.4	714.01	1966.4	713.83
1976.4	713.66	1984.96	713.5	1986.4	713.48	1996.4	713.35	1998.7	713.32
2006.4	713.32	2013.23	713.32	2016.4	713.3	2025.6	713.24	2025.61	713.24
2026.4	713.26	2036.4	713.44	2044.85	713.6	2046.4	713.57	2056.4	713.39
2065.47	713.22	2066.4	713.22	2076.4	713.21	2077.53	713.21	2086.4	713.3
2090.33	713.33	2096.4	713.29	2106.4	713.23	2116.4	713.17	2126.06	713.11
2126.4	713.11	2136.4	713.06	2142.48	713.03	2146.4	713.05	2156.4	713.11
2166.1	713.16	2166.4	713.16	2176.4	713.38	2186.4	713.59	2189.74	713.66
2196.4	713.62	2206.4	713.57	2211.18	713.54	2216.4	713.54	2226.4	713.55
2233.17	713.55	2236.4	713.61	2246.4	713.8	2256.4	713.99	2260.72	714.07
2266.4	714.23	2276.4	714.52	2277.44	714.55	2284.4	714.42	2286.4	714.31
2294.35	713.86	2296.4	713.86	2306.4	713.89	2313.3	713.91	2316.4	713.83
2326.4	713.58	2336.4	713.33	2346.4	713.09	2356.4	712.84	2362.97	712.67
2369.63	711.96	2371.2	711.93	2371.73	711.92	2371.8	711.92	2371.96	711.99

2372	712	2372.74	712.21	2375.35	705.56	2375.83	704.34	2379.63	703.88
2389.63	702.67	2393.46	702.21	2399.63	701.4	2409.63	700.1	2411.26	699.89
2417.06	700.93	2419.63	701.24	2429.63	702.48	2439.63	703.71	2449.63	704.95
2453.02	705.37	2453.23	705.83	2455.66	712.8	2458.42	714.45	2466.4	717.96
2469.01	719.52	2475.1	722.97	2476.4	723.04	2483.89	723.43	2486.4	723.57
2496.4	724.11	2497.91	724.19	2500.97	724.03	2505.97	724.56	2506.4	724.58
2507.98	724.64	2515.36	725.65	2516.4	726	2525.69	729.08	2526.4	729.33
2527.8	729.84	2536.4	731.71	2546.4	733.88	2552.2	735.14	2556.4	735.9
2566.4	737.72	2566.93	737.82	2576.4	738.77	2582.12	739.35	2586.4	739.54
2596.4	739.98	2599	740.09	2600	740.13	2600.21	740.14	2610	740.29
2613.19	740.34	2616.95	740.4	2620.34	740.33	2620.62	740.33	2627.49	740.19
2631.52	740.11	2633.81	740.07	2634.64	740.03	2640.26	739.77	2641.79	739.65
2642.42	739.6	2643.94	739.48	2648.86	738.9	2648.94	738.89	2650.45	738.88
2652.13	738.98	2652.75	738.98	2653.33	738.99	2655.65	739.03	2656.1	739.04
2663.25	739.07	2664.23	739.08	2670.36	739.11	2670.4	739.11	2675.14	739.11
2676.12	739.11	2677.55	739.1	2684.7	739.05	2686.04	739.03	2691.85	738.99
2696.94	738.95	2699	738.93	2700	738.92	2707.07	738.86	2708.28	738.85
2708.51	738.85	2710.9	738.88	2714.14	738.91	2721.21	738.98	2721.81	738.98
2728.29	739.05	2732.71	739.09	2735.36	739.12	2740.79	739.17	2742.43	739.18
2743.62	739.18	2749.5	739.2	2754.52	739.22	2756.57	739.22	2759.32	739.23
2763.64	739.26	2765.42	739.27	2770.71	739.3	2775.64	739.33	2776.33	739.34
2777.79	739.34	2784.86	739.35	2787.23	739.36	2791.93	739.37	2794.95	739.38
2798.14	739.39	2799	739.39	2800	739.4	2807.07	739.42	2810.9	739.44
2814.14	739.45	2821.21	739.48	2821.81	739.49	2825.19	739.5	2828.29	739.51
2832.71	739.52	2835.36	739.53	2842.09	739.55	2842.43	739.55	2843.62	739.55
2849.5	739.56	2854.52	739.56	2856.57	739.56	2863.64	739.57	2865.42	739.57
2870.71	739.58	2874.71	739.58	2876.33	739.58	2877.79	739.59	2884.86	739.6
2887.23	739.61	2891.93	739.62	2898.14	739.63	2899	739.63	2900	739.64
2907.07	739.65	2910.9	739.65	2914.14	739.66	2921.21	739.67	2921.81	739.67
2924.37	739.67	2928.29	739.72	2932.22	739.78	2932.71	739.78	2935.36	739.79
2942.43	739.81	2943.62	739.82	2946.24	739.83	2949.5	739.86	2954.52	739.9
2956.57	739.92	2963.64	739.99	2965.42	740.01	2970.71	740.06	2976.24	740.11
2976.33	740.11	2977.79	740.07	2984.86	739.91	2987.23	739.85	2989.05	739.81
2991.93	739.8	2993.82	739.79	2997.67	739.8	2998.14	739.75	2999	739.65
3000	739.49	3007.07	738.39	3007.8	738.27	3010.9	738.66	3012.79	738.9
3014.14	739.03	3021.21	739.75	3021.81	739.81	3023.21	739.95	3024.06	740.04
3024.31	740.06	3024.32	740.06	3024.36	740.06	3024.38	740.06	3024.42	740.07
3024.48	740.07	3024.52	740.07	3024.65	740.09	3024.76	740.1	3025.14	740.13
3025.68	740.17	3026.61	740.19	3028.19	740.21	3028.29	740.21	3029.11	740.22
3030.72	740.24	3031.42	740.25	3032.67	740.26	3032.71	740.26	3033.73	740.27
3034.35	740.27	3035.36	740.27	3035.43	740.27	3035.95	740.28	3036.27	740.28
3036.85	740.28	3042.43	740.26	3043.62	740.25	3049.5	740.23	3054.52	740.21
3056.57	740.21	3056.81	740.2	3057.55	740.2	3058.41	740.2	3058.9	740.2
3060.02	740.19	3060.66	740.19	3061.74	740.19	3063.64	740.21	3064.92	740.22
3065.11	740.21	3065.27	740.2	3065.42	740.19	3065.46	740.19	3067.01	740.22
3070.18	740.29	3070.71	740.31	3070.94	740.31	3072.06	740.33	3072.85	740.35
3073.25	740.36	3073.88	740.37	3074.13	740.38	3074.55	740.39	3074.87	740.39
3075.06	740.4	3075.94	740.38	3076.11	740.4	3076.33	740.39	3077.52	740.37
3077.79	740.39	3079.2	740.53	3079.21	740.52	3084.86	740.7	3087.23	740.77
3091.93	740.92	3096.59	741.06	3098.14	741.12	3100	741.19	3107.07	741.45
3110.9	741.59	3112.58	741.65	3114.14	741.69	3121.21	741.83	3121.81	741.84
3128.29	741.97	3132.71	742.05	3135.36	742.1	3142.43	742.24	3143.62	742.27
3148.27	742.36	3149.5	742.38	3154.52	742.47	3156.57	742.5	3156.92	742.51
3163.64	742.48	3163.87	742.47	3165.42	742.46	3166.15	742.46	3170.71	742.46
3176.33	742.45	3176.39	742.45	3177.79	742.45	3184.86	742.45	3187.23	742.45
3191.93	742.45	3192.95	742.45	3193.27	742.45	3198.14	742.45	3199	742.45

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
986.4	.07	2346.4	.1	2372.74	.035	2455.66	.1	2526.4	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2372.74	2455.66	611	611	.1	.3

Sediment Elevation = 699.895

CROSS SECTION

RIVER: W Chickamauga Cr
REACH: 1 RS: -611

INPUT
Description: FIS XS E
Station Elevation Data num= 483

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
58.43	734.29	62.13	734.2	64.09	734.21	64.82	734.21	67.79	733.86
69.26	733.69	69.79	733.7	75.93	733.53	76.23	733.56	77.47	733.48
80.32	733.56	82.42	733.43	83.96	733.37	85	733.22	86.57	733.15
90.74	733.12	93.71	732.99	96.08	732.99	96.83	732.99	99.84	732.84

102.7	732.71	104.3	732.71	108.06	732.43	109.59	732.23	110.48	732.28
111.92	732.15	113.65	731.98	114.83	731.91	118.64	731.88	120.24	731.84
122.77	731.65	128.17	731.34	130.89	731.25	131.84	731.15	134.66	731.03
136.24	730.96	136.9	730.86	138.54	730.6	141.58	730.53	142.94	730.54
143.53	730.48	145.28	730.37	147.93	730.12	149.53	729.9	151.11	729.76
151.92	729.75	154.38	729.7	156.08	729.5	157.66	729.18	158.66	729.16
161.88	728.89	162.83	728.83	163.41	728.75	167.73	728.19	169.47	727.95
169.68	727.93	171.9	727.59	173.9	727.36	176.18	727.1	176.2	727.09
178.6	726.57	179.97	726.39	182.75	725.97	184.84	725.57	185.4	725.43
186.43	725.25	189.61	724.62	190.44	724.41	191.76	724.16	194.23	723.63
196.66	723.13	197.95	723.05	202.45	722.07	202.62	722.04	204.9	721.97
207.54	721.59	208.86	721.46	209.27	721.43	213.91	720.95	215.22	720.84
215.41	720.81	215.53	720.8	215.64	720.79	218.81	720.5	220.79	720.27
223.25	720.02	224.36	719.82	226.03	719.69	228.29	719.33	229.83	719.35
230.48	719.22	233.28	718.71	234.54	718.62	236.15	718.34	237.03	718.3
240.56	718.14	241.01	718.1	243.35	717.94	243.68	717.91	246.36	717.44
247.96	717.16	248.08	717.14	248.36	717.11	250.36	716.89	253.93	716.56
254.5	716.54	254.94	716.5	259.31	716.36	261.33	716.15	263.88	716.01
263.99	716	264.15	715.99	268.39	715.5	270.69	715.54	271.05	715.51
273.63	715.3	275.49	715.13	275.98	715.02	278.43	714.51	282.54	714.15
284.51	713.79	285.46	713.81	287.94	713.67	290.12	713.57	291.52	713.6
292.86	713.59	294.89	713.57	297.28	713.52	299.59	713.51	300.13	713.47
300.6	713.46	303.02	713.27	304.32	713.17	304.57	713.15	305.14	713.11
307.29	713.02	309.15	712.87	311.59	712.87	313.09	712.69	315.88	712.7
318.84	712.63	320.94	712.76	321.53	712.74	324.42	712.67	325.89	712.63
326.28	712.59	326.71	712.57	329	712.42	333.04	712.18	333.55	712.19
335.07	712.34	336.41	712.5	336.86	712.47	341.01	712.37	343.53	712.14
343.93	712.15	344.34	712.15	348.71	712.05	348.86	712.05	351.48	712.39
353.06	712.42	356.22	712.38	356.65	712.38	359.15	712.3	359.68	712.31
363.88	712.35	366.51	712.03	367.13	711.97	367.68	711.96	371.94	711.86
372.53	711.88	374.87	711.88	379	711.7	379.76	711.62	380.31	711.63
382.89	711.62	385.8	711.74	387.9	711.97	390.63	712.05	391.05	712.06
391.42	712.05	396.09	711.71	398.13	711.77	401.07	711.94	404.13	711.77
405	711.8	407.05	711.95	409.83	711.89	412	711.93	413.34	711.74
417.67	711.69	420.02	711.65	422.18	711.76	423.05	711.87	424.42	711.88
427.94	711.86	429.47	711.86	430.96	711.82	435.47	711.69	435.87	711.68
436.09	711.68	439.16	711.61	443.82	711.68	443.97	711.68	444.37	711.67
447.11	711.66	447.72	711.63	450.95	711.62	451.71	711.62	451.85	711.62
452	711.62	455.06	711.48	457.82	711.6	459.75	711.63	462.27	711.67
462.92	711.64	463.52	711.65	467.9	711.68	470.31	711.45	470.74	711.44
472.06	711.53	475.57	711.78	477.55	711.68	478.73	711.61	483	711.87
483.59	711.88	486.01	711.98	486.66	711.99	490.41	712.07	491.6	712.03
494.27	712.05	494.62	712.04	494.91	712.01	499.33	711.73	501.33	711.87
502.71	711.97	505.6	711.92	507.37	711.95	508.88	712	510.65	712.05
515.37	711.91	515.47	711.91	515.51	711.91	517.69	711.78	553.84	711.87
554.28	711.85	555.38	711.87	557.34	711.86	558.71	711.85	561.77	711.71
563.04	711.74	564.63	711.76	566.47	711.66	569.04	711.48	571.69	711.73
572.23	711.78	575.98	711.54	576.67	711.55	577.48	711.58	579.68	711.63
582.25	711.75	584.13	711.7	587.8	711.38	591.32	711.68	594.49	711.99
594.7	712.02	594.86	712.03	595.94	712.02	598.76	711.98	599.18	712
599.97	711.98	602.2	712.09	605.26	712.36	606.7	712.5	607.63	712.52
609.64	712.43	611.03	712.51	614	712.74	616.72	712.91	617.26	712.91
617.74	712.95	620.43	713.18	621.47	713.24	621.65	713.26	621.85	713.25
624.53	713.24	627.58	713.6	628.8	713.7	629.4	713.7	631.74	713.59
634.5	713.7	636.12	713.71	637.68	713.58	639.12	713.54	640.29	713.47
643.37	713.2	645.59	712.71	646.2	712.62	646.66	712.68	650.45	713.27
652.81	713.33	653.39	713.35	654.02	713.35	657.51	713.44	659.89	713.62
660.87	713.64	663.44	713.49	664.86	713.51	667.45	713.59	667.83	713.59
668.33	713.57	674.36	713.63	674.68	713.66	674.92	713.65	678.98	713.32
679.04	713.31	682.02	713.41	682.72	713.39	686.06	713.18	686.57	713.21
688.98	713.25	692.55	713.21	693.03	713.22	693.3	713.21	695.74	713.31
697.75	713.18	699.88	713.13	701.15	713.32	702.85	713.44	704.95	713.55
706.86	713.56	708.86	713.72	709.81	713.81	712.57	714.26	713.8	714.28
715.61	714.27	716.71	714.22	719.4	714.05	720.76	714.04	721.92	714.13
723.61	714.26	729.62	714.04	730.61	713.98	733.25	713.9	734.42	713.86
734.75	713.89	737.6	714.09	740.16	714.17	741.49	714.24	743.27	713.96
744.35	714.04	747.34	714.16	748.48	714.07	749.09	714.12	754.07	713.75
756.33	713.71	758	713.83	761.41	713.78	762.17	713.79	762.66	713.76
765.09	713.78	768.48	713.8	769.1	713.81	769.46	713.84	771.92	713.93
775.52	714.15	775.76	714.16	775.91	714.18	778.78	714.25	780	714.25
782.75	714.24	783.82	714.31	785.88	714.36	788.12	714.23	789.73	714.1
790.84	714.06	792.7	714.03	794.03	713.94	796.43	714.03	797.24	714.07
799.53	713.91	800.79	713.85	801.44	713.87	804.33	713.89	810.03	713.68
810.09	713.68	810.11	713.68	810.13	713.68	810.19	713.68	815.27	713.78
818.48	713.82	820.08	713.83	821.5	713.87	826.28	714.03	828.44	713.99
829.98	714	831.53	714.11	832.68	714.21	835.74	714.18	836.42	714.19
838.13	714.26	844.56	714.44	845.59	714.48	846.75	714.5	849.55	714.59
851.82	714.86	852.5	714.91	856.05	714.96	856.18	714.97	859.22	715.16
861.92	714.95	863.25	715.02	864.76	715.33	867.3	715.51	869.9	715.34

871.67	715.47	872.58	715.52	873.38	715.54	876.39	715	878.44	714.39
904.79	712.11	907.4	705.46	907.88	704.24	911.68	703.78	921.68	702.57
925.51	702.11	931.68	701.3	941.68	700	943.31	699.79	949.11	700.83
951.68	701.14	961.68	702.38	971.68	703.61	981.68	704.85	985.07	705.27
985.28	705.73	987.71	712.7	990.28	713.33	991.45	713.8	993.78	714.26
994.3	714.34	997.28	714.86	997.78	714.93	1000.07	715.07	1000.59	715.16
1003.17	716.76	1004.58	717.8	1006.62	719.07	1008.79	720.49	1009.89	721.32
1011.66	722.66	1015.95	725.78	1017.45	727.13	1019.99	729.23	1021.77	730.42
1024.19	732.66	1024.33	732.78	1027.08	734.46	1028.23	735.36	1033.47	739.27
1033.52	739.31	1038.18	740.23	1039.47	740.35	1040.46	740.34	1042.32	740.25
1044.96	739.97	1045.75	739.89	1046.87	739.93	1051.65	739.92	1054	739.78
1054.38	739.78	1056.28	739.87	1057.69	739.95	1058.14	739.95	1059.9	739.89
1062.25	740.14	1063.78	740.17	1064.31	740.13	1073.82	739.83	1075.88	739.8
1077.73	740.22	1078.78	739.72	1085.8	740.3				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
58.43	.07	873.38	.1	904.79	.035	987.71	.1	1058.14	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
904.79	987.71	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:W Chickamauga Cr

Reach	River Sta.	n1	n2	n3	n4	n5
1	722	.15	.1	.035	.15	
1	497	.15	.1	.035	.1	.15
1	436	Bridge				
1	375	.07	.1	.035	.1	.07
1	0	.07	.1	.035	.1	.07
1	-611	.07	.1	.035	.1	.07

SUMMARY OF REACH LENGTHS

River: W Chickamauga Cr

Reach	River Sta.	Left	Channel	Right
1	722	225	225	225
1	497	122	122	122
1	436	Bridge		
1	375	375	375	375
1	0	611	611	611
1	-611	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: W Chickamauga Cr

Reach	River Sta.	Contr.	Expan.
1	722	.3	.5
1	497	.3	.5
1	436	Bridge	
1	375	.3	.5
1	0	.1	.3
1	-611	.1	.3

HEC-RAS Plan: Pro425BrFW River: W Chickamauga Cr Reach: 1

Reach	River Sta	Profile	W.S. Elev	Prof Delta WS	E.G. Elev	Top Wdth Act	Q Left	Q Channel	Q Right	Enc Sta L	Ch Sta L	Ch Sta R	Enc Sta R
			(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)
1	722	PF 1	721.04		722.90	466.79	3073.70	16266.86	93.44		2324.84	2404.51	
1	722	PF 2	722.04	0.99	723.59	477.38	4165.09	15268.91		1904.00	2324.84	2404.51	2399.00
1	497	PF 1	720.91		722.29	444.34	2774.96	16552.77	106.27		2365.91	2454.34	
1	497	PF 2	721.89	0.98	723.08	425.00	3003.72	16302.98	127.30	2045.00	2365.91	2454.34	2470.00
1	436 BR U	PF 1	720.60		722.20	396.28	2173.93	17164.64	95.43		2365.91	2454.34	
1	436 BR U	PF 2	721.69	1.09	723.02	407.00	2539.76	16784.31	109.94	2045.00	2365.91	2454.34	2470.00
1	436 BR D	PF 1	720.71		721.87	396.51	3917.50	15428.09	88.41		2365.91	2454.34	
1	436 BR D	PF 2	721.81	1.09	722.73	407.00	4486.57	14847.35	100.08	2045.00	2365.91	2454.34	2470.00
1	375	PF 1	720.78		721.75	444.24	4788.51	14553.15	92.35		2365.91	2454.34	
1	375	PF 2	721.85	1.07	722.65	425.00	5171.29	14151.56	111.15	2045.00	2365.91	2454.34	2470.00
1	0	PF 1	720.60		721.20	644.45	7787.65	11575.82	70.52		2372.74	2455.66	
1	0	PF 2	721.57	0.97	722.15	495.00	10668.48	8765.52		1931.00	2372.74	2455.66	2426.00
1	-611	PF 1	720.30		720.67	787.97	9657.30	9662.88	113.82		904.79	987.71	
1	-611	PF 2	721.10	0.80	721.56	580.00	8672.34	10684.06	77.60	416.00	904.79	987.71	996.00

EXISTING 411' BRIDGE
MULTI-PROFILE MODEL
WEST CHICKAMAUGA CREEK

HEC-RAS Plan: ExistBrMP River: W Chickamauga Cr Reach: 1

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
			(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
1	722	10 Year Storm	719.32	718.09	1.22	0.26	0.21	630.29	10343.89	23.82	365.16
1	722	50 Year Storm	721.85	720.17	1.68	0.33	0.25	1904.51	14345.09	59.40	443.21
1	722	100 Year Storm	723.14	721.26	1.87	0.36	0.25	2878.14	16469.48	86.39	485.19
1	722	500 Year Storm	725.76	723.69	2.07	0.38	0.19	5551.32	20530.06	163.62	597.02
1	497	10 Year Storm	718.85	718.04	0.81	0.02	0.04	759.65	10211.69	26.65	586.48
1	497	50 Year Storm	721.27	720.09	1.18	0.03	0.08	1910.01	14333.06	65.93	618.99
1	497	100 Year Storm	722.53	721.15	1.37	0.04	0.10	2704.81	16633.17	96.02	634.77
1	497	500 Year Storm	725.19	723.50	1.69	0.04	0.24	4750.88	21309.38	184.74	676.40
1	436		Bridge								
1	375	10 Year Storm	718.50	717.80	0.70	0.32	0.08	1308.63	9665.56	23.81	583.86
1	375	50 Year Storm	720.69	719.77	0.92	0.36	0.16	3230.49	13022.03	56.48	615.05
1	375	100 Year Storm	721.81	720.79	1.02	0.38	0.19	4514.15	14839.18	80.67	630.30
1	375	500 Year Storm	723.97	722.74	1.22	0.40	0.27	7544.29	18556.43	144.29	663.72
1	0	10 Year Storm	718.10	717.56	0.54	0.45	0.05	2771.73	8211.36	14.91	597.20
1	0	50 Year Storm	720.17	719.57	0.60	0.47	0.07	5739.02	10527.79	42.19	629.02
1	0	100 Year Storm	721.24	720.60	0.63	0.47	0.07	7613.36	11758.08	62.55	644.55
1	0	500 Year Storm	723.29	722.60	0.69	0.48	0.08	11847.65	14280.94	116.41	681.17
1	-611	10 Year Storm	717.59	717.22	0.37			3843.99	7123.80	30.21	756.21
1	-611	50 Year Storm	719.64	719.26	0.38			7361.10	8874.85	73.05	776.61
1	-611	100 Year Storm	720.69	720.30	0.39			9503.65	9828.37	101.98	787.94
1	-611	500 Year Storm	722.73	722.31	0.42			14282.75	11789.52	172.73	809.88

PROPOSED 425' BRIDGE
MULTI-PROFILE MODEL
WEST CHICKAMAUGA CREEK

HEC-RAS Plan: Pro425BrMP River: W Chickamauga Cr Reach: 1

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
			(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
1	722	10 Year Storm	719.21	717.94	1.27	0.27	0.22	576.60	10398.71	22.68	362.79
1	722	50 Year Storm	721.73	719.97	1.76	0.35	0.28	1800.70	14451.33	56.98	436.71
1	722	100 Year Storm	723.00	721.05	1.95	0.38	0.27	2799.65	16551.30	83.05	466.86
1	722	500 Year Storm	725.54	723.28	2.26	0.41	0.26	5239.70	20849.19	156.11	581.87
1	497	10 Year Storm	718.71	717.88	0.83	0.02	0.01	745.69	10226.96	25.35	584.13
1	497	50 Year Storm	721.10	719.90	1.20	0.03	0.04	1909.52	14336.49	62.99	616.07
1	497	100 Year Storm	722.34	720.94	1.40	0.03	0.07	2718.78	16623.23	91.99	631.60
1	497	500 Year Storm	724.87	723.12	1.75	0.04	0.17	4750.66	21320.04	174.30	670.35
1	436		Bridge								
1	375	10 Year Storm	718.49	717.80	0.69	0.32	0.08	1363.45	9610.84	23.71	583.92
1	375	50 Year Storm	720.68	719.78	0.89	0.36	0.14	3355.02	12897.91	56.07	615.23
1	375	100 Year Storm	721.79	720.80	0.99	0.37	0.18	4681.11	14672.92	79.97	630.49
1	375	500 Year Storm	723.93	722.76	1.17	0.40	0.24	7803.44	18298.82	142.74	664.18
1	0	10 Year Storm	718.10	717.56	0.54	0.45	0.05	2771.73	8211.36	14.91	597.20
1	0	50 Year Storm	720.17	719.57	0.60	0.47	0.07	5738.98	10527.84	42.19	629.02
1	0	100 Year Storm	721.24	720.60	0.63	0.47	0.07	7613.40	11758.04	62.56	644.55
1	0	500 Year Storm	723.29	722.60	0.69	0.48	0.08	11847.65	14280.94	116.41	681.17
1	-611	10 Year Storm	717.59	717.22	0.37			3843.99	7123.80	30.21	756.21
1	-611	50 Year Storm	719.64	719.26	0.38			7361.10	8874.85	73.05	776.61
1	-611	100 Year Storm	720.69	720.30	0.39			9503.65	9828.37	101.98	787.94
1	-611	500 Year Storm	722.73	722.31	0.42			14282.75	11789.52	172.73	809.88