REPORT NARRATIVE

FRA-33-24.76 Hydraulic Report

U. S. Route 33 Over Georges Creek

Introduction

The purpose of this report is to present the drainage design for the widening of U.S. Route 33 in southeastern Franklin County, Ohio. The overall project will provide additional lanes in each direction of U. S. Route 33 on the median side. The work at the structures carrying U. S. Route 33 over Georges Creek will widen each structure on the median side to accommodate the additional travel lane in each direction.

Project Description

The project area is located in southeastern Franklin County and is entirely within the watershed of the Georges Creek. Two existing structures constructed in 1963 carry U.S. 33 over the waters of Georges Creek (Structure File Number 2502194 [Left] and 2502224 [Right]). Each bridge is a three span continuous reinforced concrete slab structure with span lengths of 24 feet, 30 feet, and 24 feet. The existing deck width of each structure is 39 feet from parapet to parapet. The deck is a concrete deck with a 2.25" concrete wearing surface overlay. The substructure is a capped pile substructure.

This project will widen each structure by reconstructing the abutments of both bridges, adding piers and extending the pier cap, widening the deck, and providing a new parapet wall. The widened structures will meet at the centerline and functionally become one single structure. All work will occur between the two existing structures. The existing upstream face of SFN 2502194 and the existing downstream face of SFN 2502224 will not be modified.

Drainage Criteria

The project area spans multiple jurisdictions, but the two structures are located entirely within Madison Township, Franklin County, Ohio. The drainage criteria of the current ODOT Location and Design Manual, Volume 2 will govern the drainage design for the project. The following storm events will be used for the design of this project:

- 2% AEP: Hydraulic Design Storm, Flood Hazard Evaluation
- 1% AEP: Design Check Storm, Floodplain Elevation Comparison, Scour Design Storm
- 0.2% AEP: Scour Check Storm

Georges Creek - Flood Plain and Flood Hazard Study

Georges Creek in the project area has been modeled by FEMA and is the subject of a published Flood Insurance Study, complete with cross-sections and flow data for various points along its length where tributary flows enter. This FIS is the basis of the flood plain analysis for this project. Two FEMA cross-sections (Cross-Sections E and F) lie within the project stream study limits. These offer a starting point for the analysis and also act to help calibrate the hydraulic model. The Flood Insurance Study for this waterway was originally published 16th June 2011 (FIS 39049CV001D-004D). Subsequent to this study, two Letters of Map Revision were issued covering the project area:

- Case No. 19-05-3292P (Effective 19th December 2019): Revised floodway data for cross-sections U through AD and revised the entire profile of Georges Creek, including the project area.
- Case No. 22-05-1492P (Effective 5th December 2023): Revised floodway data and base flood elevations for cross-sections B through F and revised profile between those cross-sections. This LOMR changed the base flood elevations at cross-sections E and F, both of which lie within the project area.

The hydraulic analysis of this project site will use the data from the original FIS except where it has been supplanted or amended as a result of the two Letters of Map Revision. The Letters of Map Revision changed base flood elevations in the project area but did not change the flow rate data from the original FIS.

Modeling Parameters

The Army Corps of Engineers' HEC-RAS River Analysis system was used to model Georges Creek through the project area. In order to provide for adequate modeling of the contraction and expansion area, the model of the main stem of Georges Creek extends 1,000 feet downstream of the project structures and 1,400 feet upstream the project structures. This provides room to model the contraction of the flow upstream of the structure and model the expansion after the water passes through the structures. The model is based on a subcritical flow regime and uses FEMA flow data and water surface elevations in conjunction with Franklin County Auditor mapping to establish flood levels. Bathymetric survey data was collected at many of the cross-sections and is used to model the creek bed. This provides the best correlation to the FIS, as the FIS states that Franklin County mapping was used to develop contours and adjust cross-sections for the project. The existing project structures used survey data for dimensions and elevations. Proposed project structures were based on the proposed modifications to the structure. This generated two hydraulic models – an existing model calibrated to the FIS and a proposed model that adjusted the structures in the existing model to match the proposed structure work in this project.

HEC-RAS input consisted of cross-sections cut from Franklin County Auditor's contour mapping. Cross-sections were cut immediately up and downstream of the bridge and then at intervals of 100 to 300 feet as needed to model flow transitions. Station 10+00 was arbitrarily assigned to the intersection between the stream centerline and the centerline of U.S. 33. Cross-section stationing was then based off of distance along the stream center from this point. Franklin County mapping allowed the width of the cross-sections to pick up the high ground on both sides of the channel in order to allow the model to calculate the water surface elevations without running out of known topography.

Parameters for the individual HEC-RAS cross-sections were based on the HEC-RAS manual and field data. The existing stream is generally a straight channel flowing from northeast to southwest with some minor obstructions. The channel upstream of the bridges has a gentle "S" curve beginning approximately 500 feet north of structure 2502194. The overbanks on each side of the channel through the entire project area are lightly wooded in the immediate vicinity of the creek with open fields in the upland areas directly behind the trees. The open land north of U. S. 33 is largely uncultivated grassland, while the land south of U. S. 33 is cultivated crop land. North of U. S. Route 33, a recently constructed industrial facility is located a few hundred feet east of Georges Creek. South of U. S. Route 33, the only active land use is Dill's Greenhouse located adjacent to U. S. Route 33 and several hundred feet west of Georges Creek.

The Manning's "n" value for the stream channel is based on a clean winding stream with minor obstructions. The values of 0.035 to 0.040 were used and are based on using the normal value given in Table 3-1, Line A.1.d for "Clean, winding, some weeds and stones" as the channel description. For the overbanks, the density of the woods appears to be moderate although the width of the wooded areas adjacent to the creek are somewhat narrow. The HEC-RAS manual recommends a Manning's "n" value of 0.045 to 0.11 for medium to dense brush. For these areas, values of 0.045 to 0.05 were used, as the brush quickly gives way to open grassland or cultivated cropland.

Several cross sections contain local high points in the upland areas. These local high points were incorporated into the model but were not modeled as levees since water can reach areas beyond the high point before overtopping it. Ineffective flow areas were added near the bridge to model expansion and contraction areas where water was likely to stagnate and not flow.

The two existing bridges were modeled as a single opening in HEC-RAS, consistent with the guidance that "[i]f the parallel bridges are very close to each other, and the flow will not be able to expand between the bridges, the bridges can be modeled as a single bridge." The embankment between the two existing structures is a continuation of the sloped abutment of each structure and prevents any expansion of flow in the roughly 70 feet of space between the structures. The roadway information and bridge low chord data is based on the field survey of the existing 1963

bridges.

The proposed conditions model the structure as a single structure opening since the proposed work effectively creates a single continuous bridge from the upstream face of SFN 2502194 to the downstream face of SFN 2502224. Because the existing structure pair is modeled as a single structure, the proposed structure model is effectively identical to the existing model since no changes are proposed to the most upstream and downstream faces of the crossing. Therefore, obtaining a calibrated model of the existing conditions also furnishes a calibrated model of the proposed conditions.

Flow Data

The flow data for the 2% AEP, 1% AEP, and 0.2% AEP storm events is based on the FIS flow data given at the bridge carrying railroad tracks over Georges Creek approximately 6,000 feet downstream of the project structures. No major creeks or tributaries appear to contribute to Georges Creek between the railroad bridge and the project structures and the use of the FIS flows at the railroad bridge are appropriate. This flow data given in the FIS indicates a 2% AEP flow of 4,718 cfs, a 1% AEP flow of 5,126 cfs, and a 0.2% AEP flow of 7,408 cfs. Since the FIS flows cover all storm events required to meet the design criteria, no additional analysis was necessary with other hydrologic methods.

FEMA Calibration

The existing model was calibrated to the FEMA model by using known water surface elevations at the lower end of the project. Cross-section 1+70 is the most downstream section and is located at FEMA cross-section E. The initial water surface elevation for the 1% AEP event was set at 750.80, corresponding to the base flood elevation in the FIS/Letter of Map Revison for FEMA cross-section E. Initial water surface elevations for the 2% AEP and 0.2% AEP were interpolated from the graphical stream profile at FEMA cross-section E. The initial water surface elevations for the 2% AEP and 0.2% AEP events were 750.50 and 751.70 respectively.

Examination of the cross-sections and field data then led to the setting of ineffective flow areas. This led to the generation of the existing condition profile. We then compared the overall appearance of the profile to the FEMA model and water surface elevations at FEMA cross-sections close to the HEC-RAS sections. See table 1-1 below for comparisons.

Table 1-1

HEC-RAS Station	FEMA Cross-Section	2% AEP		1% AEP		0.2% AEP	
		HEC-RAS	FEMA	HEC-RAS	FEMA	HEC-RAS	FEMA
1+70	E	750.50	750.5	750.80	750.8	751.70	751.7
20+94	F	754.58	754.6	754.80	754.8	755.21	755.6

The calibration indicates a very close correlation to the elevations in the FEMA model across all events, although the elevations at cross-section 1+70 are all boundary conditions set by FEMA cross-section E. At cross-section 20+94, the 2% AEP and 1% AEP elevations are identical to FEMA cross-section F. The 0.2% AEP elevation is 0.4 feet lower. The profile of the stream at the bridge indicates a hydraulic jump which the FEMA profile does not have. This jump likely exists but is not modeled by the FEMA model since the bridge sits in the middle of the 2,000-foot gap between FEMA cross-sections. The HEC-RAS model provides a number of additional cross-sections near the bridge with which the hydraulic jump is better modeled.

The overall profile of the flow is very similar to the FEMA model. The FEMA profile indicates that the U. S. Route 33 bridges have a superstructure depth of almost 12 feet (top elevation near 758.5 and low chord at elevation 746). It is not entirely clear whether this is a graphical error on the profile, but the similarity between the FEMA profile and HEC-RAS profile suggest that it is, since the HEC-RAS model used survey data for deck and low chord elevations and correlates to the FEMA water surface lines.

Summary of Existing Conditions

The existing flow regimes for the storm events as they flow through the project structures generally show a free-flowing channel downstream of the structure and a backwater effect upstream of the structures. For all profiles, the flow is very slow and sluggish across a wide floodplain. Although the FEMA maps do not show water flowing over U. S. Route 33, there is a roadway sag west of the bridges with a low point of 751.9. Based on model elevations (and even the FEMA profile), flow in the overbank almost certainly overtops the roadway embankment but not to an extent that it causes overtopping of the bridges. All storm events show a hydraulic jump located downstream of the structures before leveling out upstream of the structures. Water surface elevations for all events are higher than the low chord elevation at the upstream face of the bridge, but the overtopping of the roadway west of the bridges provides some relief for the high flow events.

Proposed Conditions

The model for the proposed conditions is based off of the existing conditions model with modifications to the U.S. 33 structures. The structural modification is a deck widening on the inside edge of both bridges that creates a single structure for the entire roadway crossing. Because the HEC-RAS modeling approach for adjacent parallel bridges treats the bridge pair as a single structure from the upstream face of the first bridge to the downstream face of the second bridge, the proposed bridge model is identical to the existing model. No other changes were made, as the project does not propose any stream modifications. Structure work will be limited to superstructure widening between the existing bridges and will not change the structure model.

Additional piers will be added to the two existing sets of piers, but all work will be done inside the limits of the current bridge limits in the model.

The results of the proposed model show no change between existing and proposed conditions for all storm events. This is to be expected, as the models are identical owing to modeling the existing parallel bridges as a single structure. The following table summarizes the flow for existing and proposed conditions at the section upstream of the bridge. All output tables are attached in the appendices.

Table 1-2

Station	Event	Flow (cfs)	Condition	Elevation (ft)	Velocity (ft/s)
10+74	2% AEP	4,718	Existing	754.12	2.40
			Proposed	754.12	2.40
10+74	1% AEP	5,126	Existing	754.45	2.26
			Proposed	754.45	2.26
10+74	0.2% AEP	7,408	Existing	754.67	3.00
			Proposed	754.67	3.00

The HEC-RAS analysis, calibrated by the FEMA FIS, shows that the proposed work on the U.S. 33 structures causes no increase in the 100-year floodplain and has no significant impact on the behavior of the 100-year storm event.

Fill in the FEMA 100-Year Floodplain

The project places negligible fill in the FEMA 100-year floodplain. The only proposed work will be to add piers and pier caps between the two existing parallel structures. The existing embankment between the bridges will become a sloped abutment under the superstructure of the proposed structure and will not require additional fill. Should it be necessary to compensate for the volume of concrete from the piers and pier caps, one of the adjacent upstream roadside ditches could be dredged slightly to provide compensatory storage for the minimal storage lost from the new bridge substructure elements.

Flood Hazard Evaluation

Since the proposed work produces no change to the flood profile of the 2% AEP, there are no increased flood hazards. The extent of the 2% AEP flooding is unoccupied land adjacent to Georges Creek. Active land use at Dill's Greenhouse and the industrial site in the northeast quadrant of the crossing are located in upland areas at elevations higher than the 2% AEP elevations. The only areas inundated by the 2% AEP flow are open grassland and some cultivated land south of U. S. Route 33.

APPENDIX A

FEMA MAP AND FIS DATA

National Flood Hazard Layer FIRMette

FEMA

82°50'37"W 39°51'57"N

82°50'W 39°51'30"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/2/2025 at 3:59 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	Franklin County Ohio (Unincorporated Areas)	FILL BRIDGE	1D HYDRAULIC ANALYSIS FLOODWAY UPDATED TOPOGRAPHIC DATA
	COMMUNITY NO.: 390167		
IDENTIFIER	Canal Winchester	APPROXIMATE LATITUDE & LONGITUDE: 39.858, -84.841 SOURCE: Other DATUM: NAD 83	

ANNOTATED MAPPING ENCLOSURES	ANNOTATED STUDY ENCLOSURES
TYPE: FIRM* NO.: 39049C0451K DATE: June 17, 2008 TYPE: FIRM NO.: 39049C0452K DATE: June 17, 2008	DATE OF EFFECTIVE FLOOD INSURANCE STUDY: June 16, 2011 PROFILES: 94P, 95P, AND 101P FLOODWAY DATA TABLE: 9

Enclosures reflect changes to flooding sources affected by this revision.
* FIRM - Flood Insurance Rate Map

FLOODING SOURCE(S) & REVISED REACH(ES) See Page 2 for Additional Flooding Sources

Georges Creek - from approximately 560 feet downstream of the Railroad to approximately 750 feet upstream of Columbus Lancaster Road.

SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Georges Creek	BFEs*	BFEs	YES	YES
	Floodway	Floodway	YES	YES
	Zone AE	Zone AE	YES	YES
	Zone X (Shaded)	Zone X (Shaded)	YES	YES

* BFEs – Base (1-percent-annual-chance) Flood Elevations

DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Mapping and Insurance eXchange toll free at 1-877-336-2627 (1-877-FEMA-MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional information about the NFIP is available on the FEMA website at https://www.fema.gov/flood-insurance.

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

OTHER FLOODING SOURCES AFFECTED BY THIS REVISION

FLOODING SOURCE(S) & REVISED REACH(ES)

Georges Creek Overland Flow - from the confluence with Georges Creek to approximately 1,600 feet above the confluence with Georges Creek.

SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Georges Creek Overland Flow	BFEs	BFEs	YES	NONE
	Zone AE	Zone AE	YES	YES

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Mapping and Insurance eXchange toll free at 1-877-336-2627 (1-877-FEMA-MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on the FEMA website at https://www.fema.gov/flood-insurance.

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LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

OTHER COMMUNITIES AFFECTED BY THIS REVISION

CID Number: 390169 **Name:** Village of Canal Winchester, Ohio

AFFECTED MAP PANELS	AFFECTED PORTIONS OF THE FLOOD INSURANCE STUDY REPORT
TYPE: FIRM NO.: 39049C0451K DATE: June 17, 2008 TYPE: FIRM NO.: 39049C0452K DATE: June 17, 2008	DATE OF EFFECTIVE FLOOD INSURANCE STUDY: June 16, 2011 PROFILES: 94P, 95P, AND 101P FLOODWAY DATA TABLE: 9

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Mapping and Insurance eXchange toll free at 1-877-336-2627 (1-877-FEMA-MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on the FEMA website at https://www.fema.gov/flood-insurance.

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LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS report and FIRM, and the modifications made by this LOMR, are the minimum requirements for continued NFIP participation and do not supersede more stringent State/Commonwealth or local requirements to which the regulations apply.

We provide the floodway designation to your community as a tool to regulate floodplain development. Therefore, the floodway revision we have described in this letter, while acceptable to us, must also be acceptable to your community and adopted by appropriate community action, as specified in Paragraph 60.3(d) of the NFIP regulations.

NFIP regulations Subparagraph 60.3(b)(7) requires communities to ensure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management ordinances; therefore, responsibility for maintenance of the altered or relocated watercourse, including any related appurtenances such as bridges, culverts, and other drainage structures, rests with your community. We may request that your community submit a description and schedule of maintenance activities necessary to ensure this requirement.

COMMUNITY REMINDERS

We based this determination on the 1-percent-annual-chance flood discharges computed in the FIS for your community without considering subsequent changes in watershed characteristics that could increase flood discharges. Future development of projects upstream could cause increased flood discharges, which could cause increased flood hazards. A comprehensive restudy of your community's flood hazards would consider the cumulative effects of development on flood discharges subsequent to the publication of the FIS report for your community and could, therefore, establish greater flood hazards in this area.

Your community must regulate all proposed floodplain development and ensure that permits required by Federal and/or State/Commonwealth law have been obtained. State/Commonwealth or community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction or may limit development in floodplain areas. If your State/Commonwealth or community has adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum NFIP requirements.

We will not print and distribute this LOMR to primary users, such as local insurance agents or mortgage lenders; instead, the community will serve as a repository for the new data. We encourage you to disseminate the information in this LOMR by preparing a news release for publication in your community's newspaper that describes the revision and explains how your community will provide the data and help interpret the NFIP maps. In that way, interested persons, such as property owners, insurance agents, and mortgage lenders, can benefit from the information.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Mapping and Insurance eXchange toll free at 1-877-336-2627 (1-877-FEMA-MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional information about the NFIP is available on the FEMA website at https://www.fema.gov/flood-insurance.

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LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

This revision has met our criteria for removing an area from the 1-percent-annual-chance floodplain to reflect the placement of fill. However, we encourage you to require that the lowest adjacent grade and lowest floor (including basement) of any structure placed within the subject area be elevated to or above the Base (1-percent-annual-chance) Flood Elevation.

We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Mary Beth Caruso
Director, Mitigation Division
Federal Emergency Management Agency, Region V
536 South Clark Street, Sixth Floor
Chicago, IL 60605
(312) 408-5500

STATUS OF THE COMMUNITY NFIP MAPS

We will not physically revise and republish the FIRM and FIS report for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panels and FIS report warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Mapping and Insurance eXchange toll free at 1-877-336-2627 (1-877-FEMA-MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional information about the NFIP is available on the FEMA website at https://www.fema.gov/flood-insurance.

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LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

PUBLIC NOTIFICATION OF REVISION

A notice of changes will be published in the *Federal Register*. This information also will be published in your local newspaper on or about the dates listed below, and through FEMA's Flood Hazard Mapping website at https://www.floodmaps.fema.gov/fhm/bfe_status/bfe_main.asp

LOCAL NEWSPAPER

Name: *The Daily Reporter*
Dates: July 31, 2023 and August 7, 2023

Within 90 days of the second publication in the local newspaper, any interested party may request that we reconsider this determination. Any request for reconsideration must be based on scientific or technical data. Therefore, this letter will be effective only after the 90-day appeal period has elapsed and we have resolved any appeals that we receive during this appeal period. Until this LOMR is effective, the revised flood hazard determination presented in this LOMR may be changed.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Mapping and Insurance eXchange toll free at 1-877-336-2627 (1-877-FEMA-MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on the FEMA website at https://www.fema.gov/flood-insurance.

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FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	WIDTH REDUCED FROM PRIOR STUDY	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE (FEET)
Georges Creek									
A	2,130[1]	251		722	1.7	739.4	735.7[2]	736.1	0.4
B	4,665[1]	205		1,771	2.9	748.1	748.1	748.4	0.3
C	5,994[1]	249		1,793	4.1	748.8	748.8	749.1	0.3
D	7,356[1]	196		1,248	2.1	749.7	749.7	750.1	0.4
E	8,336[1]	404		1,811	2.8	750.8	750.8	751.3	0.5
F	10,184[1]	520		3,039	1.4	754.8	754.8	754.9	0.1
G	10,667[1]	485		1,579	2.7	755.1	755.1	755.3	0.2
H	12,210[1]	650		2,727	0.5	757.7	757.7	757.8	0.1
I	13,355[1]	530		1,576	0.9	757.8	757.8	757.9	0.1
J	14,270[1]	121		213	6.5	759.2	759.2	759.2	0.0
K	15,260[1]	188		487	2.8	762.3	762.3	762.5	0.2
L	16,130[1]	160		447	3.1	763.3	763.3	763.6	0.3
M	17,220[1]	212		704	1.3	764.2	764.2	764.5	0.3
N	18,410[1]	58		286	3.2	764.7	764.7	765.0	0.3
O	19,445[1]	358		1,601	0.6	765.0	765.0	765.2	0.2
P	20,520[1]	30		143	6.5	765.0	765.0	765.1	0.1
Q	22,879[1]	58		304	3.0	771.6	771.6	771.6	0.0
R	24,458[1]	200		818	2.1	775.9	775.9	776.3	0.4
S	25,448[1]	166		656	2.6	776.3	776.3	776.6	0.3
T	26,313[1]	303		1,035	1.8	776.7	776.7	776.9	0.2
U	27,223[1]	162		457	1.7	777.0	777.0	777.2	0.2
V	28,093[1]	380		1,001	0.8	777.4	777.4	777.5	0.1
W	28,813[1]	229		483	1.6	777.6	777.6	777.7	0.1
X	29,953[1]	120		190	4.0	779.2	779.2	779.3	0.1
Y	30,853[1]	225		403	1.9	781.7	781.7	781.9	0.2
Z	32,023[1]	112		240	4.8	783.7	783.7	783.9	0.2

REVISED DATA

REVISED TO REFLECT LOMR EFFECTIVE DECEMBER 20, 2019

[1]Feet above confluence with Little Walnut Creek [2]Elevation without considering backwater effects from Little Walnut Creek

Table 9

FEDERAL EMERGENCY MANAGEMENT AGENCY

FRANKLIN COUNTY, OHIO
AND INCORPORATED AREAS

FLOODWAY DATA

Georges Creek

REVISED TO
REFLECT LOMR
EFFECTIVE: December 5, 2023

FLOODING SOURCE		FLOODWAY				1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	WIDTH REDUCED FROM PRIOR STUDY	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE (FEET)
Georges Creek Overland Flow									
A	234[1]	*		*	*	745.0[2]	*	*	*
B	706[1]	*		*	*	745.0[2]	*	*	*

REVISED DATA

[1]Feet above confluence with Georges Creek [2]Elevation computed with consideration of backwater effect from Georges Creek * Data not available

Table 9

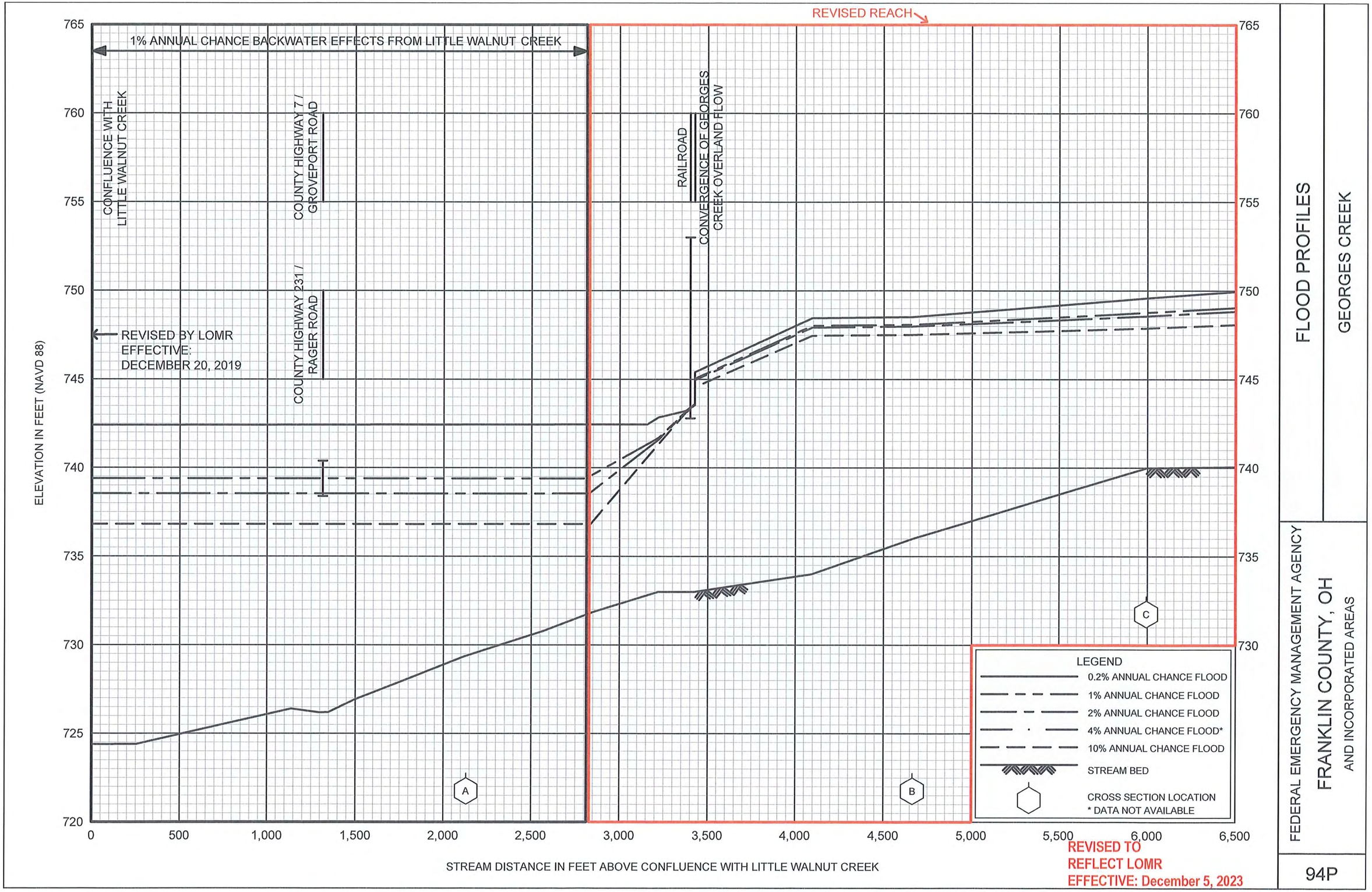
FEDERAL EMERGENCY MANAGEMENT AGENCY

FRANKLIN COUNTY, OHIO
AND INCORPORATED AREAS

FLOODWAY DATA

Georges Creek Overland Flow

REVISED TO
REFLECT LOMR
EFFECTIVE: December 5, 2023



REVISED TO
REFLECT LOMR
EFFECTIVE: December 5, 2023

FLOOD PROFILES

GEORGES CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FRANKLIN COUNTY, OH

AND INCORPORATED AREAS

94P

REVISED REACH

COLUMBUS LANCASTER ROAD
U.S. HIGHWAY 33

WINCHESTER PIKE
COUNTY HIGHWAY 376

CONFLUENCE OF
SOUTH FORK GEORGES CREEK

REVISED BY LOMR
EFFECTIVE:
DECEMBER 20, 2019

ELEVATION IN FEET (NAVD 88)

775
770
765
760
755
750
745
740
735
730

6,500 7,000 7,500 8,000 8,500 9,000 9,500 10,000 10,500 11,000 11,500 12,000 12,500 13,000

STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH LITTLE WALNUT CREEK

D E F G H

LEGEND
- 0.2% ANNUAL CHANCE FLOOD
- 1% ANNUAL CHANCE FLOOD
- 2% ANNUAL CHANCE FLOOD
- 4% ANNUAL CHANCE FLOOD*
- 10% ANNUAL CHANCE FLOOD
- STREAM BED
- CROSS SECTION LOCATION

* DATA NOT AVAILABLE

REVISED TO
REFLECT LOMR
EFFECTIVE: December 5, 2023

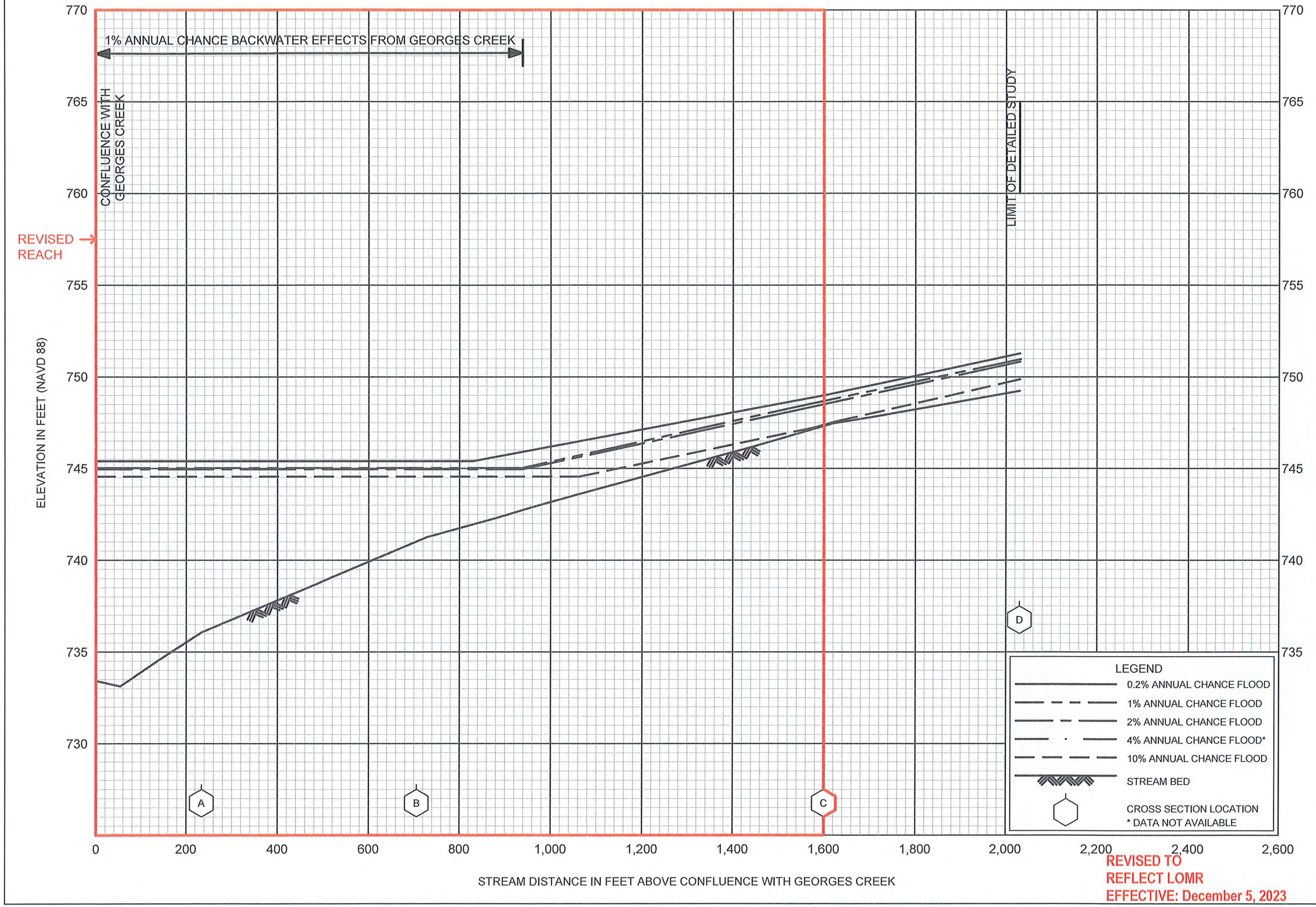
FLOOD PROFILES

GEORGES CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

FRANKLIN COUNTY, OH
AND INCORPORATED AREAS

95P



REVISED TO
REFLECT LOMR
EFFECTIVE: December 5, 2023

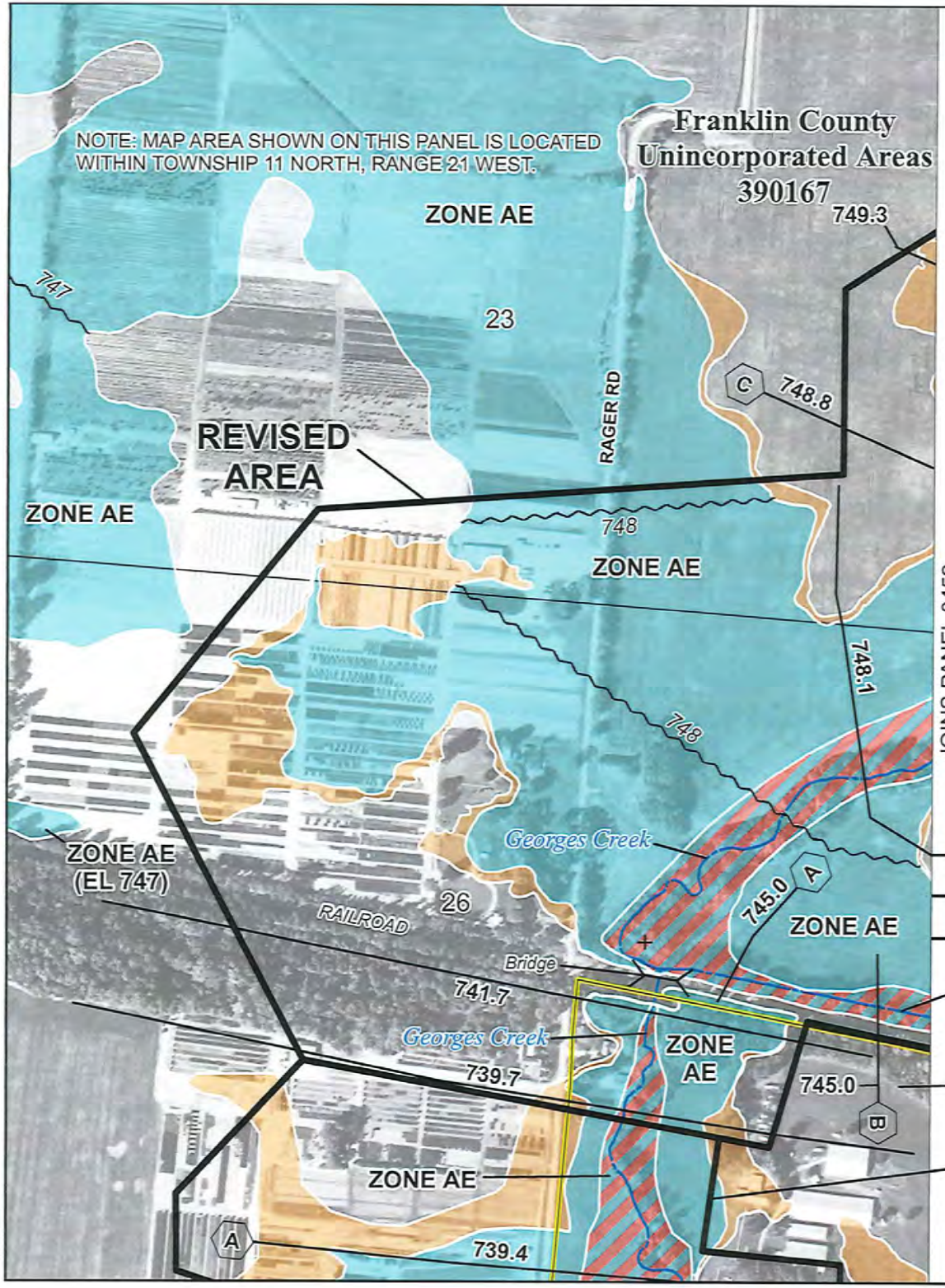
FLOOD PROFILES

GEORGES CREEK OVERLAND FLOW

FEDERAL EMERGENCY MANAGEMENT AGENCY

FRANKLIN COUNTY, OH
AND INCORPORATED AREAS

101P



SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes. *Zone X*

SCALE

Map Projection:
NAD 1983 StatePlane Ohio South FIPS 3402 Feet:
Western Hemisphere; Vertical Datum: NAVD 88

N

1 inch = 500 feet 1:6,000

0 250 500 1,000 Feet

0 75 150 300 Meters

FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

FRANKLIN COUNTY, OHIO
and Incorporated Areas

PANEL 451 OF 465

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
CANAL WINCHESTER, VILLAGE OF	390169	0451	K
COLUMBUS, CITY OF	390170	0451	K
FRANKLIN COUNTY	390167	0451	K
GROVEPORT, VILLAGE OF	390174	0451	K

REVISED TO REFLECT LOMR EFFECTIVE: December 5, 2023

VERSION NUMBER
2.1.3.0

MAP NUMBER
39049C0451K

MAP REVISED
JUNE 17, 2008

MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 11 NORTH, RANGE 21 WEST AND TOWNSHIP 15 NORTH, RANGE 20 WEST.

AREA REVISED BY LOMR EFFECTIVE DECEMBER 20, 2019

680000 FT

JOINS PANEL 0451

REVISED AREA

Franklin County Unincorporated Areas 390167

Georges Creek

675000 FT

Georges Creek Overland Flow

WINCHESTER PIKE

BIXBY RD

BRISTOL RIDGE DR

BLACKMER RIDGE BLVD

WRIGLEY ST

RAGER RD

COLUMBUS LANCASTER ROAD

14

13

23

24

26

25

33

Bridge

ZONE AE

City of Columbus 390170

Village of Canal Winchester 390169

South Fork Georges Creek

757.7

758

755.1

757

756

755

754.8

754.3

752.0

751.1

750.8

750.4

750.3

749.7

749.3

748.8

748.1

748

749

750

751

740

A

B

C

D

E

F

G

H

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) Zone A, V, A99
- With BFE or Depth Zone AE, AO, AH, VE, AR
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
- Future Conditions 1% Annual Chance Flood Hazard Zone X
- Area with Reduced Flood Risk due to Levee See Notes. Zone X

SCALE

Map Projection: NAD 1983 StatePlane Ohio South FIPS 3402 Feet, Western Hemisphere; Vertical Datum: NAVD 88

1 inch = 500 feet 1:6,000

0 250 500 1,000 Feet

0 75 150 300 Meters

FEMA National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

FRANKLIN COUNTY, OHIO
and Incorporated Areas

PANEL 452 OF 465

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
CANAL WINCHESTER, VILLAGE OF	390169	0452	K
COLUMBUS, CITY OF	390170	0452	K
FRANKLIN COUNTY	390167	0452	K

REVISED TO REFLECT LOMR EFFECTIVE: December 5, 2023

VERSION NUMBER 2.1.3.0

MAP NUMBER 39049C0452K

MAP REVISED JUNE 17, 2008

Table 8. Summary of Roughness Coefficients

Stream	Channel "n"	Overbank "n"
Alum Creek	0.036-0.050	0.042-0.140
Barbee Ditch	0.035-0.055	0.080-0.150
Barnes Ditch	0.035-0.050	0.060-0.200
Baumgardner Ditch	0.030-0.048	0.030-0.080
Beem Ditch	0.035-0.040	0.030-0.110
Big Darby Creek	0039-0.064	0.043-0.068
Big Run	0035-0.040	0.045-0.300
Big Walnut Creek	0.035-0.050	0.020-0.085
Billingsley Ditch	0.040-0.050	0.550-0.070
Bishop Run	0.030-0.035	0.040-0.080
Blacklick Creek	0.025-0.062	0.035-0.100
Blacklick Creek Lateral D	0.045-0.072	0.042-0.091
Blacklick Creek Lateral G-B	0.075	0.092
Blacklick Creek Lateral K	0.049-0.078	0.032-0.083
Blacklick Creek Tributary C	0.075	0.083-0.090
Blau Ditch	0.040-0.055	0.080-0.160
Brown Run	0.030-0.060	0.035-0.110
Clover Groff Ditch	0.028-0.036	0.045-0.070
Coble-Bowman Ditch	0.058-0.073	0.090-0.105
Cosgray Ditch	0.030-0.060	0.080-0.200
Cramer Ditch	0.035-0.055	0.060-0.120
Dry Run	0.040-0.060	0.080-0.160
Dysar Ditch	0.036-0.063	0.060-0.095
Early Run	0.045-0.050	0.050-0.075
French Run	0.048-0.061	0.065-0.085
French Run (Lateral G-A)	0.028-0.059	0.034-0.090
Georges Creek	030-0.050	0.030-0.100
Grant Run	0.012-0.048	0.060-0.078
Grove City Creek 1	0.040-0.075	0.030-0.075
Grove City Creek 2	0.020-0.045	0.040-0.080
Haines Ditch	0.050	0.085-0.090
Hamilton Ditch	0.035-0.045	0.050-0.075
Hayden Run	0.030-0.050	0.040-0.075
Faust County Ditch	0.030-0.050	0.040-0.150
Hellbranch Run	0.035-0.040	0.045-0.065
McCoy Ditch	0.035-0.040	0.045-0.065
Indian Run	0.025-0.050	0.055-0.100
North Fork Indian Run	0.025-0.050	0.055-0.100
Lisle Ditch	0.035-0.040	0.060-0.070
Little Darby Creek	0.045-0.060	0.053-0.079
Little Walnut Creek	0.030-0.050	0.030-0.080
Marsh Run	0.030-0.048	0.030-0.080
Martin Grove Ditch	0.042-0.083	0.041-0.076
Mason Run	0.035-0.054	0.043-0.090
Molcomb Ditch	0.035-0.050	0.045-0.150
Mulberry Run	0.040-0.075	0.030-0.075
West Water Run	0.020-0.045	0.004-0.080
Olentangy River	0.032-0.062	0.025-0.138

APPENDIX B

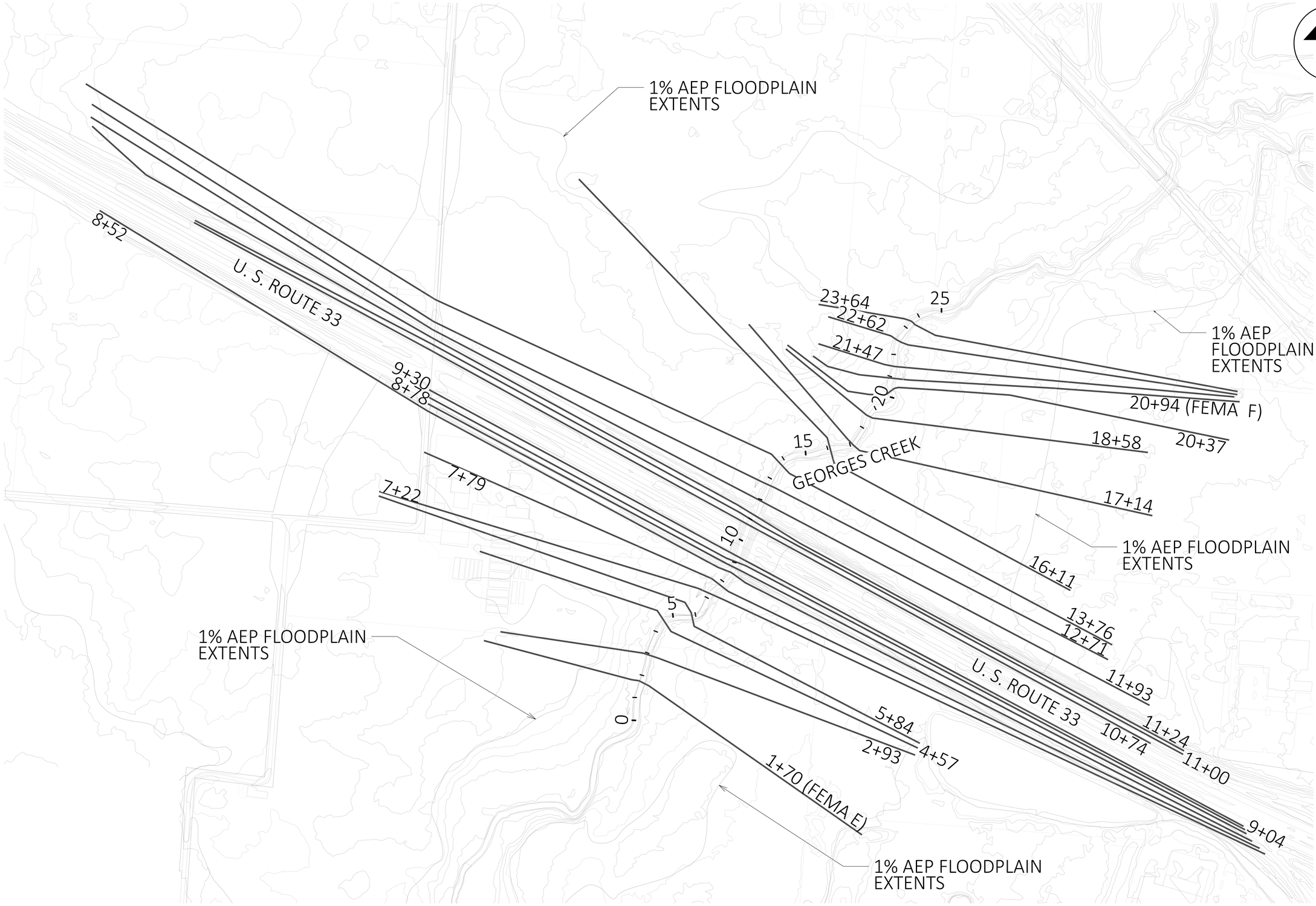
HYDROLOGIC DATA

Table 7. Summary of Discharges

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cfs)			
		10-percent-annual-chance	2-percent-annual-chance	1-percent-annual-chance	0.2-percent-annual-chance
French Run					
At confluence with Blacklick Creek	5.46	1,765	2,333	2,700	3,461
Just US of French Run (Lateral G-A)	2.87	1,009	1,343	1,500	2,037
French Run (Lateral G-A)					
At confluence with French Run	2.59	795	1,037	1,187	1,524
At cross-section G	2.10	678	895	1,027	1,325
Georges Creek					
At confluence with Little Walnut Creek	14.4	1,368	1,432	1,448	1,509
At C&O Railroad	14.4	3,258	4,718	5,126	7,408
Approximately 2.26 miles US of confluence with Little Walnut Creek	4.4	901	1,272	1,374	1,836
Georges Creek Overland Flow					
Overland Flow Path	*	5	365	485	865
Georges Creek Split Flow					
Just DS of divergence from Georges Creek	*	150	380	400	695
Grant Run					
Just US of confluence with the Scioto River	*	*	*	*	*
Just US of confluence of Patzer Ditch	*	*	*	*	*
At Borror Road	3.46	655	1,269	1,623	2,729
Grove City Creek 1					
At confluence with the Scioto River	7.94	1,400	2,700	3,500	5,900
Haines Ditch					
At confluence with Blacklick Creek	2.2	*	*	1,182	*
Hamilton Ditch					
At confluence with Hellbranch Run	5.86	1,180	2,160	2,700	4,400
At Feder Road Bridge	4.67	940	1,721	2,151	3,506
At Walker Road Bridge	3.32	668	1,223	1,530	2,492
At Roberts Road Bridge	2.55	513	940	1,175	1,914
Hayden Run					
At confluence with the Scioto River	8.30	1,580	2,490	3,750	6,300
Approximately 1.83 miles US of confluence with the Scioto River	8.00	1,225	2,280	2,910	4,890
At CONRAIL	4.79	599	907	1,042	1,488
At Hayden Run Road, approximately 0.4 miles US of Avery Road	4.00	530	805	926	1,326
Hellbranch Run					
At confluence with Big Darby Creek	36.29	4,150	7,500	9,400	15,000
At Beatty Road Bridge	32.55	3,722	6,727	8,431	13,454

APPENDIX C

HEC-RAS – EXISTING



HORIZONTAL SCALE IN FEET
0 100 200 400

GEORGES CREEK - CROSS-SECTION MAP

FRA-33-24.76

DESIGN AGENCY	.
DESIGNER	ECH
REVIEWER	JWE 04-09-25
PROJECT ID	119387
SHEET	XS-1
TOTAL	1

HEC-RAS HEC-RAS 6.3.1 September 2022
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: FRA-33-2476-2502224
Project File : FRA-33-2476-2502224.prj
Run Date and Time: 4/4/2025 8:37:06 AM

Project in English units

PLAN DATA

Plan Title: Existing
Plan File : C:\HEC-RAS\FRA-33-2476-2502224\FRA-33-2476-2502224.p01

Geometry Title: Existing
Geometry File : C:\HEC-RAS\FRA-33-2476-2502224\FRA-33-2476-2502224.g01

Flow Title : Georges Creek FIS
Flow File : C:\HEC-RAS\FRA-33-2476-2502224\FRA-33-2476-2502224.f01

Plan Summary Information:
Number of: Cross Sections = 24 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: Georges Creek FIS
Flow File : C:\HEC-RAS\FRA-33-2476-2502224\FRA-33-2476-2502224.f01

Flow Data (cfs)

River	Reach	RS	4% AEP	2% AEP	1% AEP	0.2% AEP
Georges Creek	Main	2364	4100	4718	5126	7408

Boundary Conditions

River	Reach	Profile	Upstream Downstream
Georges Creek	Main	4% AEP	Known WS = 750.2
Georges Creek	Main	2% AEP	Known WS = 750.5
Georges Creek	Main	1% AEP	Known WS = 750.8
Georges Creek	Main	0.2% AEP	Known WS = 751.7

GEOMETRY DATA

Geometry Title: Existing
Geometry File : C:\HEC-RAS\FRA-33-2476-2502224\FRA-33-2476-2502224.g01

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 2364

INPUT
Description: Cross Section 23+64
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	758.3	23	758	267	756	485	755.3	584	756
737	757.3	909	756	969	754	1036	752	1242	750
1258	749.9	1280	751.1	1300	749.9	1345	750.3	1390	749.7
1409	750.1	1444	749.41	1450	749.71	1457	746.27	1466	745.17
1476	745.31	1481	748.55	1498	749.88	1524	750	1694	752
1745	754	1785	756	1877	757				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	1450	.04	1498	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1450	1498	102	102	.1	.3

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 2262

INPUT
Description: Cross Section 22+62
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	758.3	17	758	270	756	473	755.2	608	756
779	757.4	925	756	1012	754	1101	752	1303	750
1368	749.5	1445	750.3	1462	750	1485	749.16	1494	747.49
1499	745.31	1510	744.5	1517	744.94	1524	750.78	1539	750.98
1571	752	1724	754	1759	756	1796	758	1825	758.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	1485	.04	1524	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1485	1524	110	115	124	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	1445	750.3	T

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 2147

INPUT
Description: Cross Section 21+47
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	758	264	756	480	755.1	672	756	773	756.5
853	756	1037	754	1138	752	1167	751.7	1223	752.2
1238	752	1336	750	1469	749.56	1477	748.95	1479	745.57
1489	744.61	1498	744.5	1506	745.47	1510	749.03	1519	749.36
1612	750	1651	752	1682	754	1728	756	1792	758
1837	758.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	1469	.04	1519	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1469	1519	52	53	56	.1	.3

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 2094

INPUT
Description: Cross Section 20+94 (FEMA F)
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	757.7	291	756	507	755.1	737	756	806	756.5
863	756	1115	754	1227	752	1383	750	1499	748
1508	746	1519	744.7	1529	744.7	1536	746	1545	748
1691	750	1743	752	1794	754	1830	756	1887	758

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	1499	.045	1545	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1499	1545	46	57	72	.1	.3

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 2037

INPUT
Description: Cross Section 20+37
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	756.9	493	756	1093	754	1177	752	1352	750
1485	748.08	1495	746.75	1502	744.91	1511	743.54	1514	744.18
1521	745.42	1523	747.57	1530	747.54	1727	750	1784	752
1833	754	1869	756	2030	756.3				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	1485	.045	1523	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1485	1523	227	179	139	.1	.3

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 1858

INPUT
Description: Cross Section 18+58
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	758.6	26	758	152	756	789	754	895	752
1034	750	1212	747.68	1220	747.47	1226	744.16	1232	743.53
1241	743.39	1247	743.98	1253	749	1263	749.3	1403	750
1467	752	1512	754	1558	756	1697	756.5		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	1212	.04	1263	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1212	1263	157	144	142	.1	.3

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 1714

INPUT
Description: Cross Section 17+14
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	757	313	756	425	754	507	753.5	644	754.1
770	753.7	900	754.1	1025	752	1261	750	1323	748.74
1329	748.67	1332	745.11	1339	743.69	1343	743.93	1349	743.38
1359	743.96	1361	747.31	1373	748.24	1438	749	1502	747.5
1521	748	1610	750	1669	752	1725	754	2020	756
2044	756.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	1323	.04	1373	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1323	1373	116	103	98	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
1438	2044	749	T

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 1611

INPUT
Description: Cross Section 16+11
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	758.5	18	758	130	756	235	754	336	752
555	751.5	743	752.1	766	752	1195	750	1198	749.77
1210	745.93	1213	743.38	1222	743.8	1234	743.21	1240	743.71
1245	745.77	1249	746.74	1390	748	1480	750	1576	752
1795	754	2230	756	2410	755.7				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	1198	.04	1249	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1198	1249	219	235	242	.1	.3

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 1376

INPUT
Description: Cross Section 13+76
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	760.1	12	760	169	758	370	756	556	754
691	752	913	751.1	1198	749.7	1333	750.5	1457	750
1615	748	1628	747.41	1635	747.48	1638	742.3	1647	741.93
1652	742.3	1663	743.27	1667	747.25	1688	747.75	1830	748
1923	750	2063	752	2170	752.5	2277	752	2552	750.4
3327	751.7	3454	752.2	3709	741.7	3900	742.7	3967	752
4444	749.7	4510	750	4765	752	5076	754	5121	754.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	1635	.04	1688	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1635	1688	96	105	115	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
2170	5121	752.5	T

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 1271

INPUT
Description: Cross Section 12+71
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	760.9	38	760	133	758	428	756	566	754
689	752	1214	750	1293	749.7	1406	750.2	1492	749.9
1564	750.1	1597	750	1640	748.01	1647	748.22	1657	744.46
1660	745.91	1664	742.97	1671	742.33	1678	742.13	1683	742.5
1685	746.15	1690	747.8	1828	748	1923	750	2579	750.3
3179	750	3278	752	3295	753.5	3325	751.7	3456	752.2
3721	751.6	3916	752.7	4031	749.7	4227	752	4467	749.7
4543	750	4641	752	5017	754	5063	754.7		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	1647	.04	1690	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1647	1690	82	79	75	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	1406	754	T
2579	5063	754	T

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 1193

INPUT
Description: Cross Section 11+93
Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	758.6	336	758	592	756	774	754	925	752
1585	750	1665	749.7	1769	750.1	1816	749.7	1854	750.2
1868	750	1892	747.55	1897	747.22	1901	746.01	1903	742.89
1914	742.3	1926	742.72	1931	746.77	1939	746.13	1956	748.2
1969	748	2015	747.7	2054	748	2160	750	2402	750.2
2732	750	2955	749.7	3029	750	3241	750.2	3415	750
3434	749.7	3480	750.2	3498	749.7	3514	752	3534	753.4
3559	750	4122	752	4157	752.5	4230	752	4333	750.9

```
    4706   749.2    4799     750    4924     752    5225     754    5293   754.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .055    1868     .04    1956    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1868    1956               71      69      67             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0    1854     754       T
    2402    5293     754       T

CROSS SECTION


RIVER: Georges Creek
REACH: Main              RS: 1124

INPUT
Description: Cross Section 11+24
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   755.5      97     756     448   755.9     813     754    1244   752.1
    1709     752    2050     750    2102     748    2114     744    2120     742
    2128   741.8    2141   741.6    2145   741.9    2148     744    2158     746
    2227     748    2752     748    2882   747.7    3055     748    3630     750
    3714     752    3744   753.4    3772     752    3812     750    4659     748
    5000     750    5150     752    5424     754    5502   754.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .055    2102     .04    2158    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          2102    2158               24      24      24             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    2227    5502     754       T

CROSS SECTION


RIVER: Georges Creek
REACH: Main              RS: 1100

INPUT
Description: Cross Section 11+00
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     758     500     756    1002     754    1716     752    2101     750
    2113     748    2119     746    2126     744    2136     742    2137   741.7
    2147   741.8    2156     744    2166     746    2219     748    2383   750.1
    2535     750    2831     749    3247     750    3696     752    3740   753.5
    3783     752    4182     752    4557     754    4905     756

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .055    2101     .04    2219    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          2101    2219               26      26      26             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    2383    4905     754       T

CROSS SECTION


RIVER: Georges Creek
REACH: Main              RS: 1074
```

INPUT
Description: Cross Section 10+74
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	760	531	758	566	757.9	898	756	1562	754
1949	752	1952	750.88	1980	744.85	1984	742.31	1990	741.63
1998	741.7	2006	742.38	2015	745.97	2029	751.07	2047	751.9
2266	752	2644	751.5	3564	752	3585	753.4	3637	754
4281	756	4757	758						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	1952	.04	2029	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1952	2029	145	144	145	.3	.5

BRIDGE

RIVER: Georges Creek
REACH: Main RS: 1000

INPUT
Description: FRA-33-24.76 2502224
Distance from Upstream XS = 9.4
Deck/Roadway Width = 133.7
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 17

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	760.5	740	400	760	740	943	758	740
1416	756	740	1892	754	740	1949.9	754	740
1950	754	752.12	2031	753.66	751.74	2031.1	753.66	740
2449	752	740	2651	751.9	740	2819	752	740
3417	754	740	3511	754.3	740	3637	754.8	740
4281	756.5	740	4757	758.3	740			

Upstream Bridge Cross Section Data
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	760	531	758	566	757.9	898	756	1562	754
1949	752	1952	750.88	1980	744.85	1984	742.31	1990	741.63
1998	741.7	2006	742.38	2015	745.97	2029	751.07	2047	751.9
2266	752	2644	751.5	3564	752	3585	753.4	3637	754
4281	756	4757	758						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	1952	.04	2029	.05

Bank Sta: Left	Right	Coeff Contr.	Expan.
1952	2029	.3	.5

Downstream Deck/Roadway Coordinates
num= 20

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	759.5	740	157	760	740	525	760.5	740
925	760	740	1468	760	740	1941	756	740
2417	754	740	2462.9	753.98	740	2463	753.98	752.19
2541	753.66	751.66	2541.1	753.66	740	2555	753.59	740
2974	752	740	3176	751.9	740	3344	752	740
3942	754	740	4036	754.3	740	4162	754.8	740
4806	756.5	740	5282	758.3	740			

Downstream Bridge Cross Section Data
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	759.5	209	760	538	760.3	924	760	1368	758
1863	756	2314	754	2463	751.74	2482	745.96	2487	742.68

```
    2490     742    2504  741.78    2513  742.67    2518  745.34    2536  749.58
    2538     750    2544     752    2710     752    3181   751.4    3645     752
    3967     752    4036   753.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .055    2463     .04    2536    .045

Bank Sta: Left   Right    Coeff Contr.   Expan.
          2463    2536             .3       .5

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         =   751.9
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Abutments =  1

Abutment Data
Upstream     num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1950  752.19    1986  740.19    1995  739.74    2031  751.74
Downstream     num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    2463  752.19    2499  740.19    2505  739.74    2541  751.74

Number of Piers =  2

Pier Data
Pier Station     Upstream=    1975    Downstream=    2500
Upstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       1     740        1  750.49     2.5   750.5     2.5   752.5
Downstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       1     740        1  750.49     2.5   750.5     2.5   752.5

Pier Data
Pier Station     Upstream=    2006    Downstream=    2531
Upstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       1     740        1  750.49     2.5   750.5     2.5   752.5
Downstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       1     740        1  750.49     2.5   750.5     2.5   752.5

Number of Bridge Coefficient Sets =  1

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

High Flow Method
       Energy Only

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

CROSS SECTION


RIVER: Georges Creek
REACH: Main              RS: 930
```

INPUT
Description: Cross Section 9+30
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	759.5	209	760	538	760.3	924	760	1368	758
1863	756	2314	754	2463	751.74	2482	745.96	2487	742.68
2490	742	2504	741.78	2513	742.67	2518	745.34	2536	749.58
2538	750	2544	752	2710	752	3181	751.4	3645	752
3967	752	4036	753.8						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	2463	.04	2536	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2463	2536	26	26	.3	.5

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 904

INPUT
Description: Cross Section 9+04
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	759.3	339	760	556	760.2	768	760	1208	758
1594	756	1975	754	2251	752	2482	750	2486	748
2490	746	2494	744	2500	742.3	2505	742.1	2517	742.1
2522	742.3	2527	744	2534	746	2551	748	2655	747.9
2670	748	2757	748.8	3463	750	3749	749.9	3965	749.5
3991	750	4011	752	4039	753.5				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	2482	.04	2551	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2482	2551	26	26	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
2757	4039	753	T

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 878

INPUT
Description: Cross Section 8+78
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	758.2	509	759.8	818	758	1006	756	1409	754
1494	754	1781	752	2076	750	2244	750	2488	748
2494	746	2502	744	2509	743	2514	742.1	2526	742.1
2532	743	2540	744	2557	746	2747	748	3037	748
3258	747	3421	748	3968	747.7	3992	748	4006	750
4021	752	4039	753.7						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	2488	.035	2557	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2488	2557	25	25	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	2244	753	T
3037	4039	753	T

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 852

INPUT
Description: Cross Section 8+52
Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	757.5	179	756.1	470	756.1	797	756	1044	754
1177	754	1365	752	1402	751.5	1502	752.3	1553	752
1689	750	1917	748	2158	746	2280	747.7	2403	746
2418	748	2511	748	2527	746	2538	744	2547	743
2554	742.4	2565	742.3	2568	743	2576	744	2615	746
2642	746.1	2711	746.1	2711	745.7	2949	746	3066	748
3267	748.2	3512	750	3732	750.5	3884	750	4016	749.9
4031	750	4065	753	4262	750	4792	749.6	5089	750
5178	752	5540	754	5742	756				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	2527	.035	2615	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2527	2615	74	73	67	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	2418	753	F
3732	5742	753	F

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 779

INPUT
Description: Cross Section 7+79
Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	756.7	94	756	173	754	291	753.8	386	754
416	754.1	492	753.6	528	754	629	756	642	756.1
655	756	692	753.5	749	754.3	782	754	842	752
937	752	1011	750	1234	748	1332	750	1377	754
1422	751.9	1472	752.3	1510	752	1544	749.9	1553	750
2110	752	2155	752.3	2229	752	2296	751	2372	752.1
2524	750	2594	748	2603	744	2610	743	2614	742.4
2624	742.6	2637	746	2667	747.1	2698	745.9	2824	748
2852	750	2947	750.3	3334	752	3386	752.3	3417	752
3578	751.7	3987	752	4041	755				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	2594	.035	2637	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2594	2637	49	57	62	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	2372	752.1	T

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 722

INPUT
Description: Cross Section 7+22

Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	756.5	28	756	116	754	148	752	794	750
816	750.2	840	750	1054	752	1443	754	1591	752
1872	751	2133	752	2165	752.4	2196	752	2291	751.5
2408	752.4	2475	751.8	2491	752.2	2506	752	2567	750
2622	748	2644	747.1	2653	746.26	2657	742.22	2675	742.27
2680	742.74	2687	747.44	2707	746.82	2735	748.2	2750	747.5
2795	748.7	2853	747.5	2878	748	2923	750	2968	750.5
3015	750	3068	749.5	3130	750	3475	752	3741	752.5
4178	754	4190	754.3						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	2644	.04	2687	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2644	2687	156	138	124	.3 .5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	2408	752.4	T

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 584

INPUT
Description: Cross Section 5+84
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	753.5	47	752	247	750	286	749.8	323	750
493	752.3	686	751	830	752	939	754.5	1011	752
1037	750	1058	748	1115	747.39	1123	747.09	1132	742.11
1141	741.35	1151	743.06	1158	747.11	1167	746.38	1223	745.7
1278	746.2	1306	745.9	1322	746	1386	748	1581	750
1890	752	2623	754	2639	754.2				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	1115	.04	1158	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1115	1158	116	127	134 .1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	939	754.5	T

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 457

INPUT
Description: Cross Section 4+57
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	753.5	50	752	277	750	294	749.8	321	750
482	752.1	685	751.1	939	753.5	1021	752	1049	750
1081	748	1206	746	1218	745.33	1231	742.45	1237	741.92
1248	742.2	1257	745.14	1285	746.32	1379	748	1445	750
1741	752	2104	754	2118	754.2				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	1218	.035	1285	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1218	1285	145	165	173 .1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	939	753.5	T

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 293

INPUT
Description: Cross Section 2+93
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	753.5	84	752	262	750	279	749.9	300	750
715	751.2	1039	750	1074	748	1217	746.26	1225	742.11
1231	741.71	1248	741.4	1254	746.08	1260	746.52	1281	746
1307	745.7	1334	746	1365	748	1394	750	1423	752
1827	754	1899	754.5						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	1217	.035	1260	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1217	1260	130	123	121	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	715	751.2	T

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 170

INPUT
Description: Cross Section 1+70 (FEMA E)
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	758.2	12	758	27	756	47	754	90	752
174	750	343	749.5	530	750	700	751.7	862	750
944	748	1134	745.68	1146	741.68	1149	741.34	1165	741.14
1173	741.92	1179	746.21	1248	746	1277	748	1315	750
1421	752	1823	754	1884	754.5				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.045	1134	.035	1179	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1134	1179	0	0	0	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	700	751.7	T

SUMMARY OF MANNING'S N VALUES

River:Georges Creek

Reach	River Sta.	n1	n2	n3
Main	2364	.05	.04	.05
Main	2262	.05	.04	.05
Main	2147	.05	.04	.05
Main	2094	.05	.045	.05
Main	2037	.055	.045	.055
Main	1858	.055	.04	.055
Main	1714	.055	.04	.055

Main	1611	.055	.04	.055
Main	1376	.055	.04	.055
Main	1271	.055	.04	.055
Main	1193	.055	.04	.055
Main	1124	.055	.04	.055
Main	1100	.055	.04	.055
Main	1074	.05	.04	.05
Main	1000	Bridge		
Main	930	.055	.04	.045
Main	904	.055	.04	.045
Main	878	.055	.035	.045
Main	852	.055	.035	.045
Main	779	.055	.035	.045
Main	722	.055	.04	.045
Main	584	.055	.04	.045
Main	457	.045	.035	.045
Main	293	.045	.035	.045
Main	170	.045	.035	.045

SUMMARY OF REACH LENGTHS

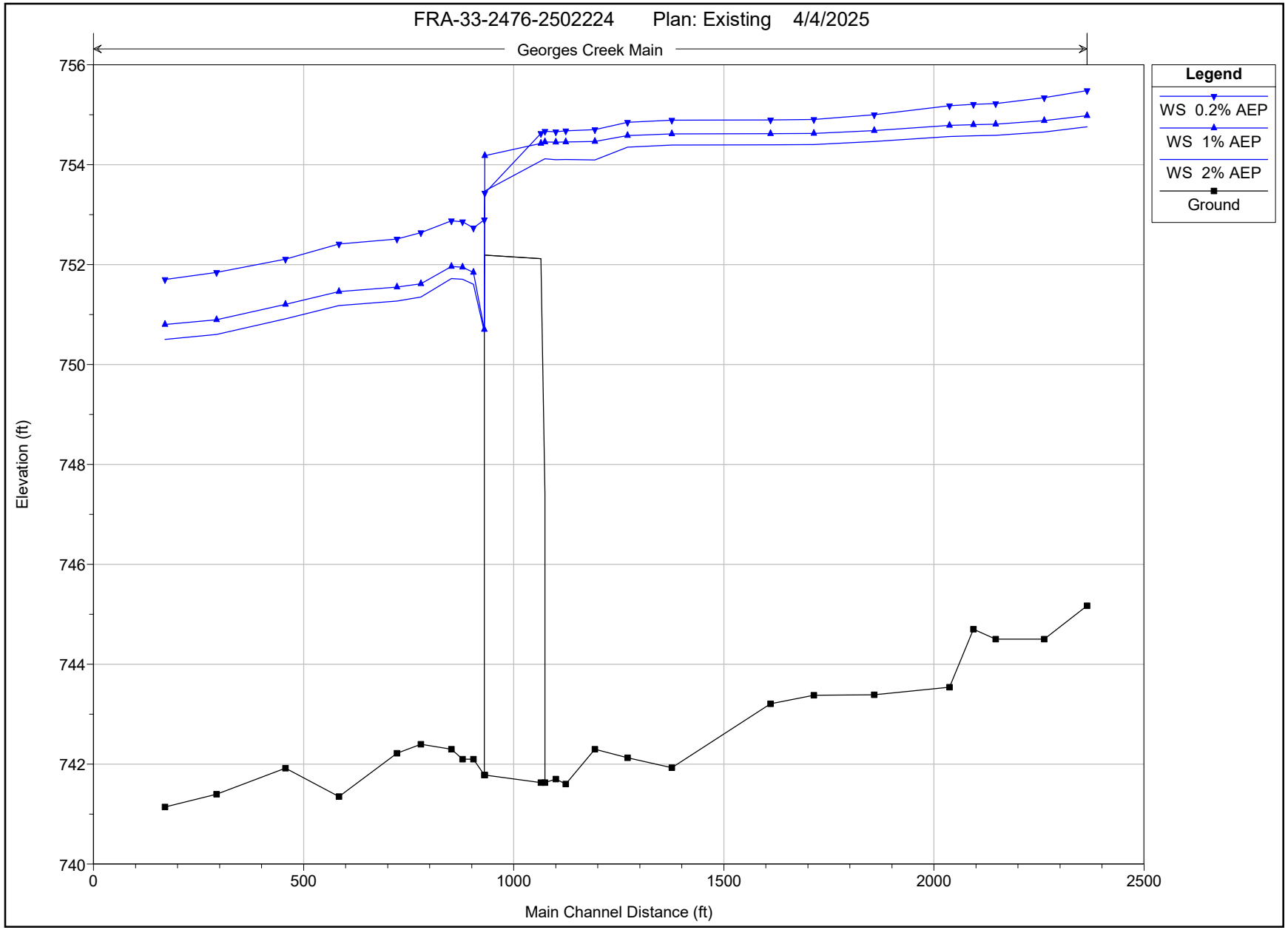
River: Georges Creek

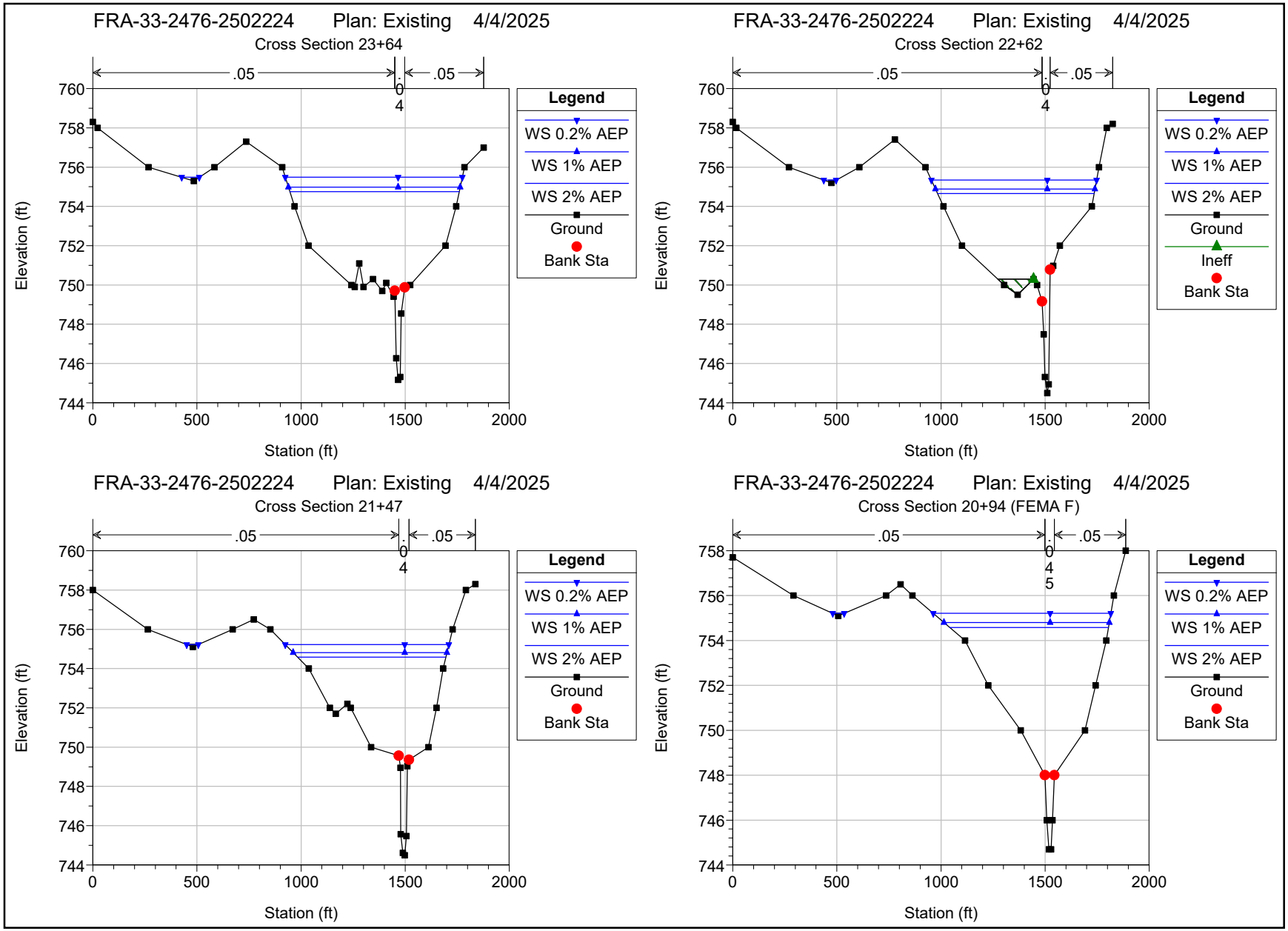
Reach	River Sta.	Left	Channel	Right
Main	2364	102	102	102
Main	2262	110	115	124
Main	2147	52	53	56
Main	2094	46	57	72
Main	2037	227	179	139
Main	1858	157	144	142
Main	1714	116	103	98
Main	1611	219	235	242
Main	1376	96	105	115
Main	1271	82	79	75
Main	1193	71	69	67
Main	1124	24	24	24
Main	1100	26	26	26
Main	1074	145	144	145
Main	1000	Bridge		
Main	930	26	26	26
Main	904	26	26	26
Main	878	25	25	25
Main	852	74	73	67
Main	779	49	57	62
Main	722	156	138	124
Main	584	116	127	134
Main	457	145	165	173
Main	293	130	123	121
Main	170	0	0	0

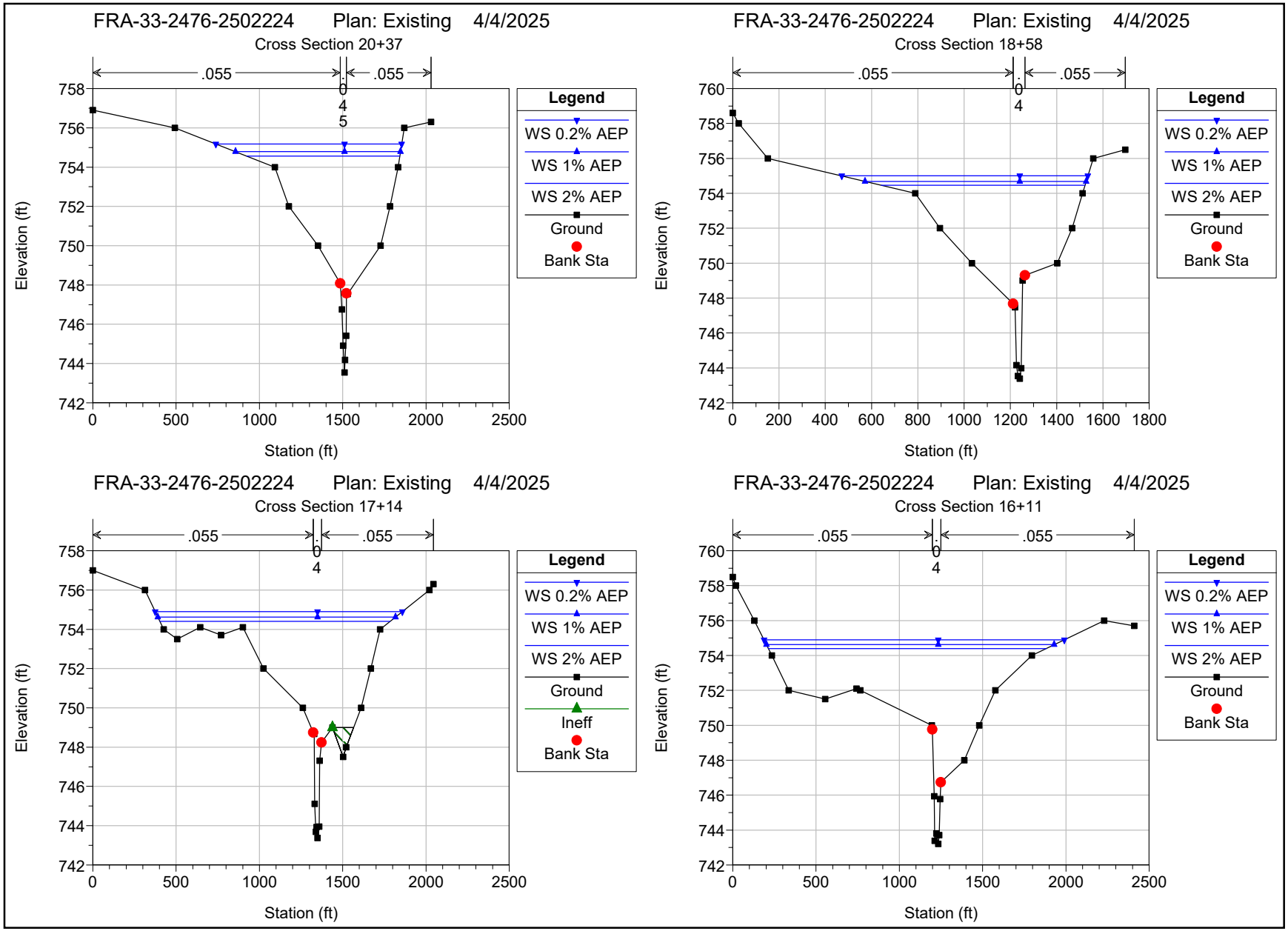
SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Georges Creek

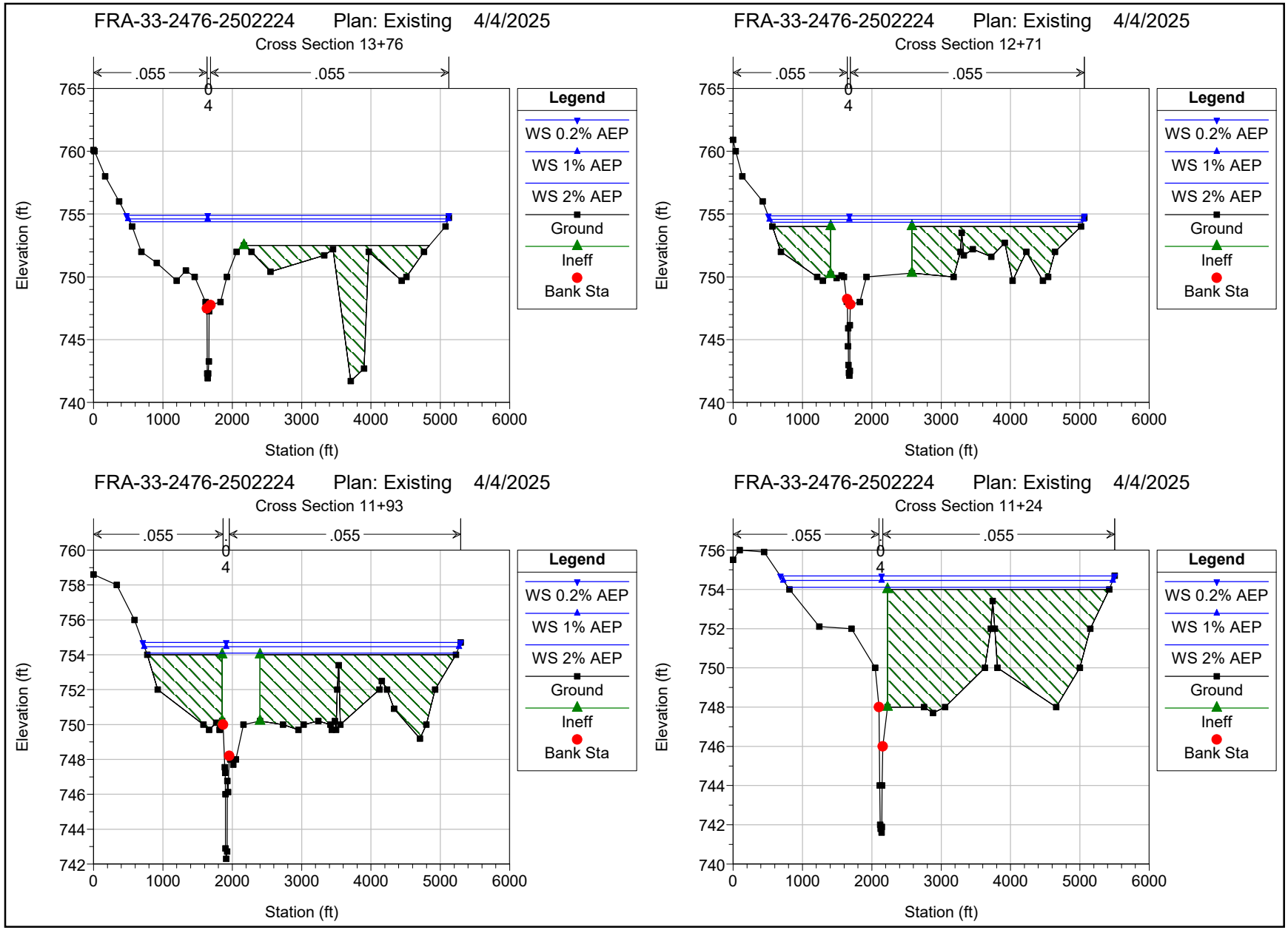
Reach	River Sta.	Contr.	Expan.
Main	2364	.1	.3
Main	2262	.1	.3
Main	2147	.1	.3
Main	2094	.1	.3
Main	2037	.1	.3
Main	1858	.1	.3
Main	1714	.1	.3
Main	1611	.1	.3

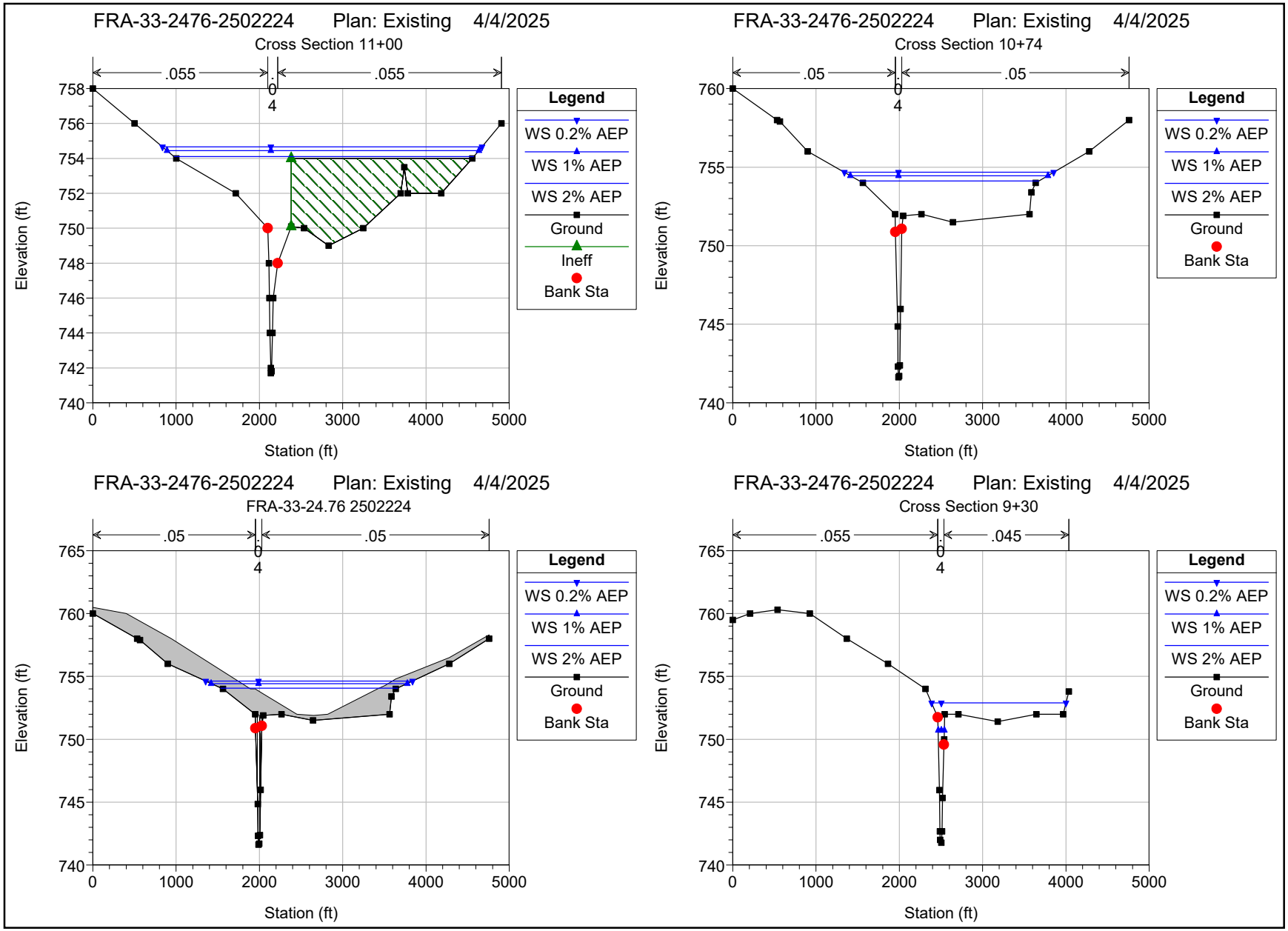
Main	1376		.3	.5
Main	1271		.3	.5
Main	1193		.3	.5
Main	1124		.3	.5
Main	1100		.3	.5
Main	1074		.3	.5
Main	1000	Bridge		
Main	930		.3	.5
Main	904		.3	.5
Main	878		.3	.5
Main	852		.3	.5
Main	779		.3	.5
Main	722		.3	.5
Main	584		.1	.3
Main	457		.1	.3
Main	293		.1	.3
Main	170		.1	.3

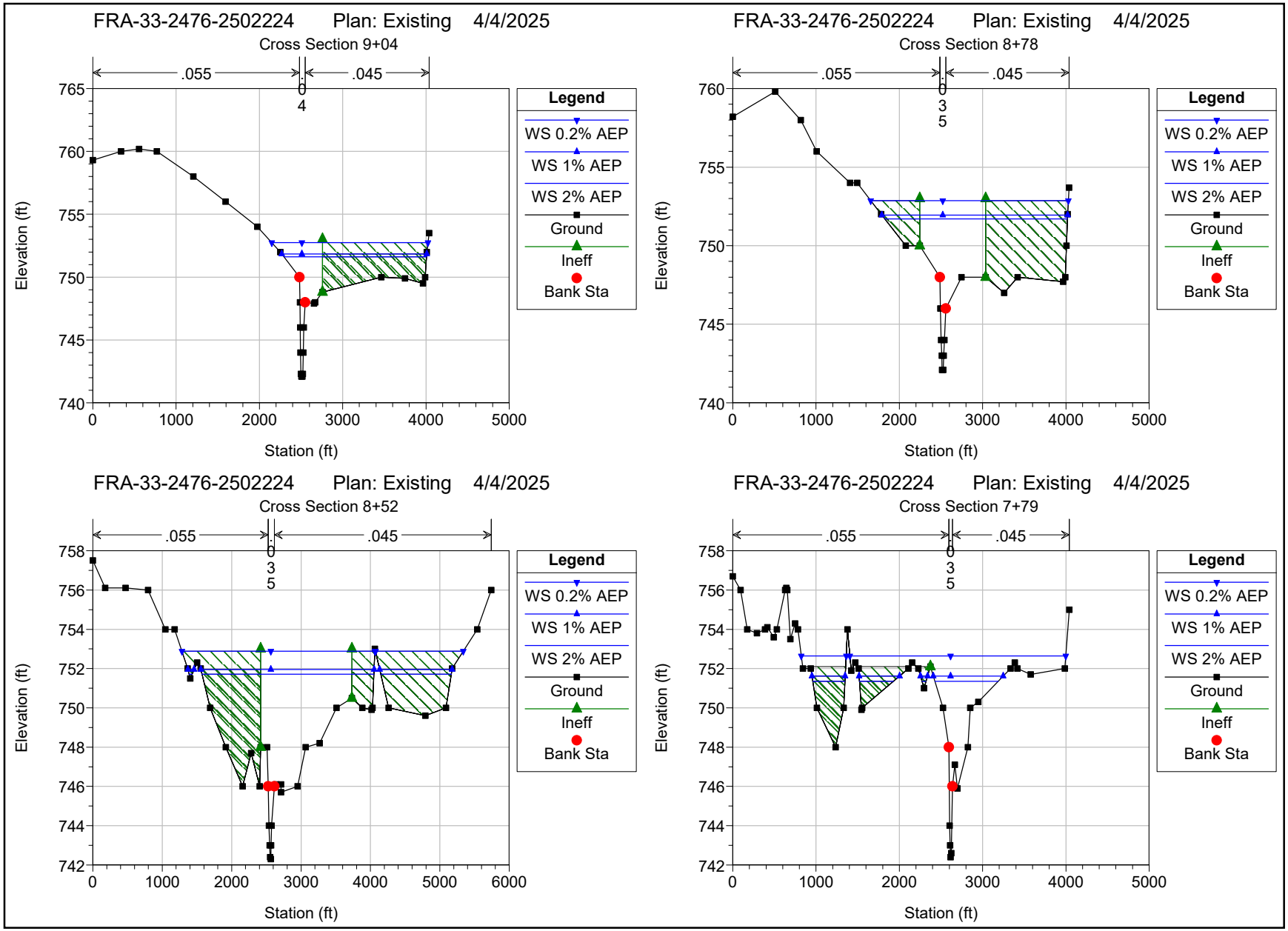

FRA-33-2476-2502224 Plan: Existing 4/4/2025
Georges Creek Main
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Elevation (ft)
Main Channel Distance (ft)
756
754
752
750
748
746
744
742
740
0
500
1000
1500
2000
2500

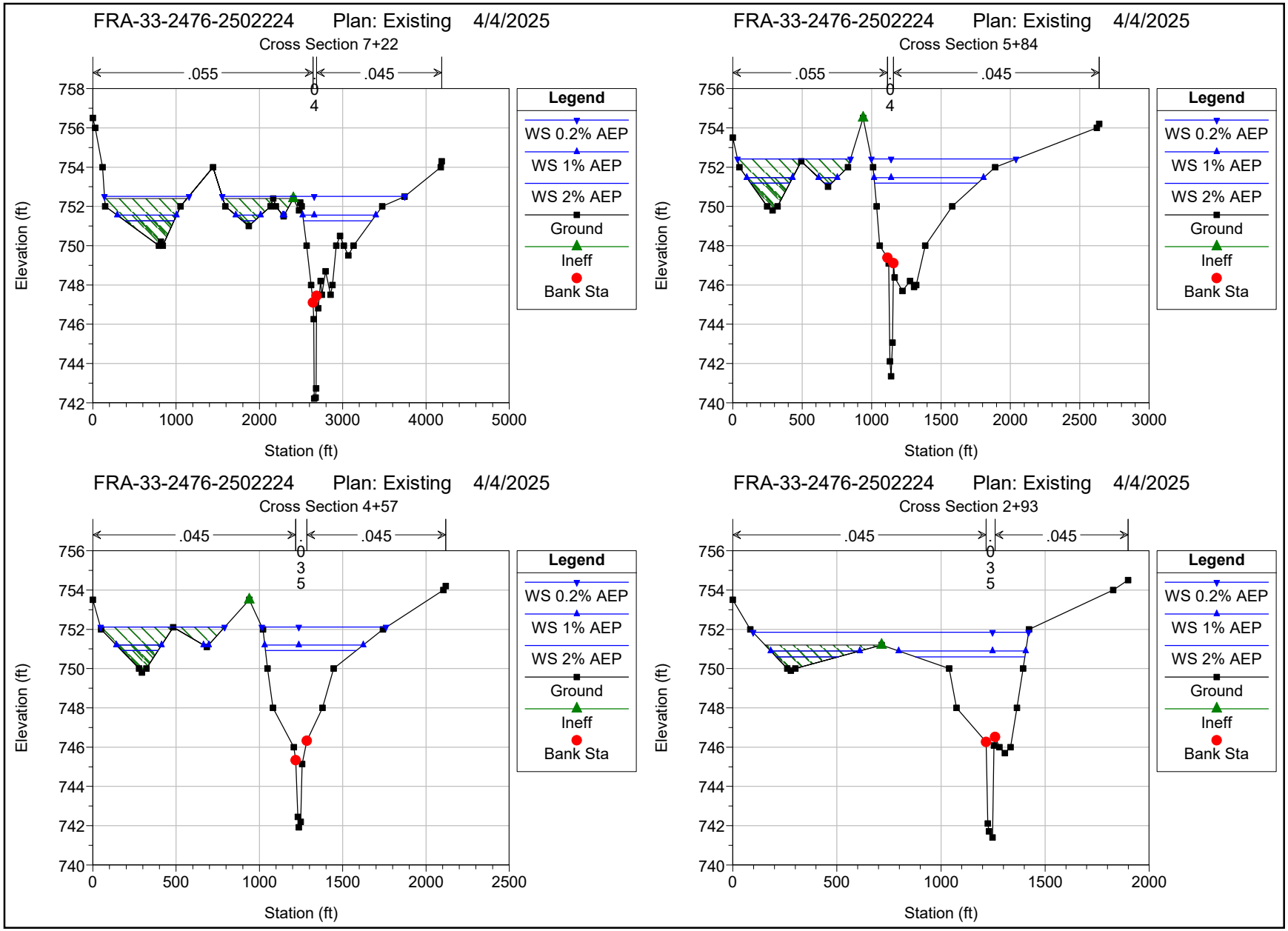

FRA-33-2476-2502224 Plan: Existing 4/4/2025
Cross Section 23+64
.05
.05
.04
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Bank Sta
FRA-33-2476-2502224 Plan: Existing 4/4/2025
Cross Section 22+62
.05
.05
.04
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta
FRA-33-2476-2502224 Plan: Existing 4/4/2025
Cross Section 21+47
.05
.05
.04
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Bank Sta
FRA-33-2476-2502224 Plan: Existing 4/4/2025
Cross Section 20+94 (FEMA F)
.05
.05
.045
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Bank Sta


FRA-33-2476-2502224 Plan: Existing 4/4/2025
Cross Section 20+37
.055
.055
0.045
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Bank Sta
FRA-33-2476-2502224 Plan: Existing 4/4/2025
Cross Section 18+58
.055
.055
0.04
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Bank Sta
FRA-33-2476-2502224 Plan: Existing 4/4/2025
Cross Section 17+14
.055
.055
0.04
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta
FRA-33-2476-2502224 Plan: Existing 4/4/2025
Cross Section 16+11
.055
.055
0.04
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Bank Sta

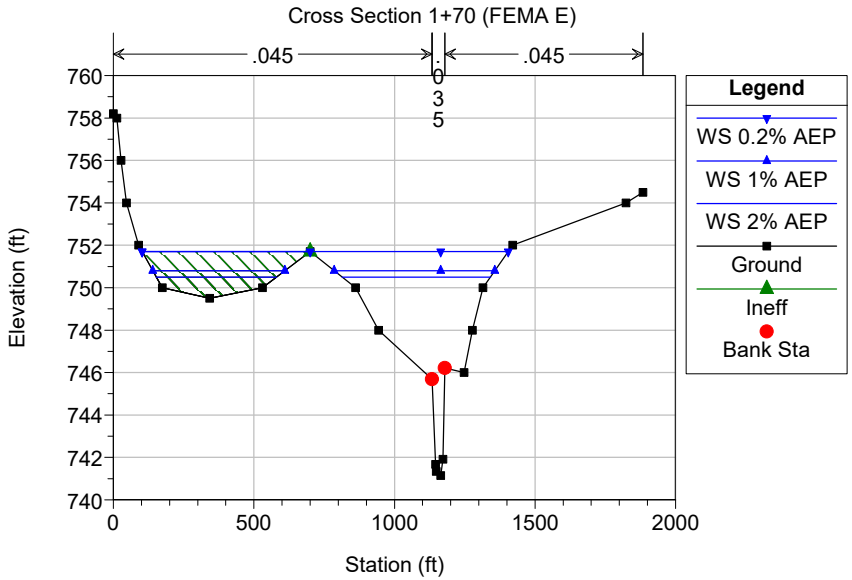

FRA-33-2476-2502224 Plan: Existing 4/4/2025
Cross Section 13+76
.055
.055
0
4
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta
FRA-33-2476-2502224 Plan: Existing 4/4/2025
Cross Section 12+71
.055
.055
0
4
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta
FRA-33-2476-2502224 Plan: Existing 4/4/2025
Cross Section 11+93
.055
.055
0
4
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta
FRA-33-2476-2502224 Plan: Existing 4/4/2025
Cross Section 11+24
.055
.055
0
4
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta


FRA-33-2476-2502224 Plan: Existing 4/4/2025
Cross Section 11+00
.055
.055
0
4
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FRA-33-2476-2502224 Plan: Existing 4/4/2025
Cross Section 10+74
.05
.05
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Bank Sta
Elevation (ft)
Station (ft)
FRA-33-2476-2502224 Plan: Existing 4/4/2025
FRA-33-24.76 2502224
.05
.05
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Bank Sta
Elevation (ft)
Station (ft)
FRA-33-2476-2502224 Plan: Existing 4/4/2025
Cross Section 9+30
.055
.045
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Bank Sta
Elevation (ft)
Station (ft)


FRA-33-2476-2502224 Plan: Existing 4/4/2025
Cross Section 9+04
.055
.045
0
4
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta
FRA-33-2476-2502224 Plan: Existing 4/4/2025
Cross Section 8+78
.055
.045
0
3
5
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta
FRA-33-2476-2502224 Plan: Existing 4/4/2025
Cross Section 8+52
.055
.045
0
3
5
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta
FRA-33-2476-2502224 Plan: Existing 4/4/2025
Cross Section 7+79
.055
.045
0
3
5
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta


FRA-33-2476-2502224 Plan: Existing 4/4/2025
Cross Section 7+22
.055
.045
0.04
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta
FRA-33-2476-2502224 Plan: Existing 4/4/2025
Cross Section 5+84
.055
.045
0.04
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta
FRA-33-2476-2502224 Plan: Existing 4/4/2025
Cross Section 4+57
.045
.045
0.035
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta
FRA-33-2476-2502224 Plan: Existing 4/4/2025
Cross Section 2+93
.045
.045
0.035
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta

FRA-33-2476-2502224 Plan: Existing 4/4/2025



HEC-RAS Plan: Existing River: Georges Creek Reach: Main

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)	
Main	2364	2% AEP	4718.00	745.17	754.76		754.80	0.000387	2.72	3093.89	813.81	0.18
Main	2364	1% AEP	5126.00	745.17	754.98		755.03	0.000387	2.77	3277.74	825.02	0.18
Main	2364	0.2% AEP	7408.00	745.17	755.49		755.56	0.000568	3.50	3708.49	934.24	0.22
Main	2262	2% AEP	4718.00	744.50	754.66		754.75	0.000683	3.80	2440.49	752.03	0.23
Main	2262	1% AEP	5126.00	744.50	754.88		754.97	0.000672	3.83	2612.15	765.83	0.23
Main	2262	0.2% AEP	7408.00	744.50	755.34		755.48	0.000993	4.82	2973.21	852.93	0.28
Main	2147	2% AEP	4718.00	744.50	754.59		754.67	0.000620	3.52	2477.29	712.39	0.22
Main	2147	1% AEP	5126.00	744.50	754.81		754.90	0.000625	3.60	2640.43	738.26	0.22
Main	2147	0.2% AEP	7408.00	744.50	755.22		755.37	0.000988	4.68	2958.43	841.81	0.28
Main	2094	2% AEP	4718.00	744.70	754.58		754.64	0.000431	2.88	2888.87	762.36	0.17
Main	2094	1% AEP	5126.00	744.70	754.80		754.86	0.000442	2.96	3063.49	794.66	0.17
Main	2094	0.2% AEP	7408.00	744.70	755.21		755.31	0.000718	3.89	3401.61	907.70	0.22
Main	2037	2% AEP	4718.00	743.54	754.56		754.61	0.000390	2.75	3351.73	918.95	0.16
Main	2037	1% AEP	5126.00	743.54	754.79		754.83	0.000406	2.85	3565.01	990.01	0.17
Main	2037	0.2% AEP	7408.00	743.54	755.18		755.26	0.000673	3.77	3981.58	1115.82	0.21
Main	1858	2% AEP	4718.00	743.39	754.46		754.53	0.000459	3.21	3070.76	881.18	0.19
Main	1858	1% AEP	5126.00	743.39	754.68		754.75	0.000484	3.35	3271.10	955.68	0.20
Main	1858	0.2% AEP	7408.00	743.39	755.00		755.12	0.000844	4.53	3591.03	1063.88	0.27
Main	1714	2% AEP	4718.00	743.38	754.40		754.46	0.000423	3.09	3566.16	1382.03	0.18
Main	1714	1% AEP	5126.00	743.38	754.62		754.68	0.000420	3.13	3875.69	1426.88	0.18
Main	1714	0.2% AEP	7408.00	743.38	754.90		755.00	0.000704	4.14	4285.05	1484.11	0.24
Main	1611	2% AEP	4718.00	743.21	754.40		754.42	0.000178	2.16	5351.21	1668.04	0.12
Main	1611	1% AEP	5126.00	743.21	754.62		754.64	0.000179	2.20	5723.82	1727.30	0.12
Main	1611	0.2% AEP	7408.00	743.21	754.90		754.94	0.000306	2.93	6211.72	1801.95	0.16
Main	1376	2% AEP	4718.00	741.93	754.39		754.40	0.000048	1.10	12021.46	4581.96	0.06
Main	1376	1% AEP	5126.00	741.93	754.61		754.62	0.000045	1.08	13036.26	4616.66	0.06
Main	1376	0.2% AEP	7408.00	741.93	754.89		754.90	0.000071	1.39	14310.18	4647.72	0.08
Main	1271	2% AEP	4718.00	742.13	754.35		754.38	0.000263	2.62	6843.12	4498.29	0.15
Main	1271	1% AEP	5126.00	742.13	754.58		754.60	0.000208	2.37	7888.66	4529.49	0.13
Main	1271	0.2% AEP	7408.00	742.13	754.85		754.88	0.000288	2.84	9091.95	4555.47	0.15
Main	1193	2% AEP	4718.00	742.30	754.09		754.29	0.000937	4.42	3234.09	4468.42	0.28
Main	1193	1% AEP	5126.00	742.30	754.46		754.56	0.000534	3.44	4909.96	4538.43	0.21
Main	1193	0.2% AEP	7408.00	742.30	754.70		754.82	0.000722	4.07	5997.01	4582.98	0.25
Main	1124	2% AEP	4718.00	741.60	754.11		754.20	0.000403	3.54	4163.90	4643.20	0.19
Main	1124	1% AEP	5126.00	741.60	754.46		754.51	0.000290	3.06	5804.31	4749.22	0.16
Main	1124	0.2% AEP	7408.00	741.60	754.68		754.76	0.000440	3.82	6877.21	4817.31	0.20
Main	1100	2% AEP	4718.00	741.70	754.10		754.19	0.000376	2.93	4011.74	3597.83	0.18
Main	1100	1% AEP	5126.00	741.70	754.45		754.51	0.000286	2.63	5287.78	3745.53	0.16
Main	1100	0.2% AEP	7408.00	741.70	754.66		754.75	0.000457	3.38	6092.46	3835.75	0.20
Main	1074	2% AEP	4718.00	741.63	754.12	750.41	754.15	0.000253	2.40	4744.97	2151.60	0.15
Main	1074	1% AEP	5126.00	741.63	754.46	750.71	754.49	0.000214	2.26	5512.64	2373.50	0.13
Main	1074	0.2% AEP	7408.00	741.63	754.67	752.80	754.72	0.000365	3.00	6033.37	2512.89	0.18
Main	1000		Bridge									
Main	930	2% AEP	4718.00	741.78	750.65	750.38	753.01	0.012023	12.34	384.11	73.36	0.93
Main	930	1% AEP	5126.00	741.78	750.70	750.69	753.44	0.013788	13.28	388.01	73.69	0.99
Main	930	0.2% AEP	7408.00	741.78	752.90	752.90	753.46	0.003193	7.79	2176.37	1614.56	0.50
Main	904	2% AEP	4718.00	742.10	751.61		751.88	0.001515	5.16	1343.80	1710.52	0.34
Main	904	1% AEP	5126.00	742.10	751.85		752.13	0.001489	5.23	1457.30	1740.56	0.34
Main	904	0.2% AEP	7408.00	742.10	752.74		753.09	0.001647	5.95	1943.96	1875.27	0.37
Main	878	2% AEP	4718.00	742.10	751.70		751.76	0.000266	2.69	3163.04	2194.22	0.17
Main	878	1% AEP	5126.00	742.10	751.95		752.00	0.000264	2.73	3354.17	2231.58	0.17
Main	878	0.2% AEP	7408.00	742.10	752.86		752.93	0.000303	3.15	4078.88	2372.45	0.19
Main	852	2% AEP	4718.00	742.30	751.72	747.44	751.74	0.000101	1.64	5271.60	3538.09	0.10
Main	852	1% AEP	5126.00	742.30	751.96	747.53	751.98	0.000099	1.66	5589.12	3631.97	0.10
Main	852	0.2% AEP	7408.00	742.30	752.88	747.99	752.90	0.000111	1.89	6796.69	4045.42	0.11
Main	779	2% AEP	4718.00	742.40	751.35		751.64	0.001534	6.18	1704.33	1603.99	0.40
Main	779	1% AEP	5126.00	742.40	751.62		751.88	0.001447	6.14	1914.57	1808.74	0.39
Main	779	0.2% AEP	7408.00	742.40	752.64		752.83	0.001151	5.96	4151.09	3131.44	0.36
Main	722	2% AEP	4718.00	742.22	751.27		751.52	0.001877	5.84	1714.86	1560.42	0.38

HEC-RAS Plan: Existing River: Georges Creek Reach: Main (Continued)

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)	
Main	722	1% AEP	5126.00	742.22	751.55		751.77	0.001642	5.60	1952.62	1905.60	0.36
Main	722	0.2% AEP	7408.00	742.22	752.51		752.74	0.001680	6.12	3183.21	3206.37	0.37
Main	584	2% AEP	4718.00	741.35	751.18		751.28	0.000870	3.92	2206.39	1077.05	0.26
Main	584	1% AEP	5126.00	741.35	751.46		751.56	0.000825	3.92	2419.99	1253.94	0.25
Main	584	0.2% AEP	7408.00	741.35	752.41		752.53	0.000924	4.49	3264.04	1855.41	0.27
Main	457	2% AEP	4718.00	741.92	750.92		751.15	0.001121	5.03	1612.78	762.53	0.34
Main	457	1% AEP	5126.00	741.92	751.20		751.43	0.001071	5.05	1774.92	894.51	0.34
Main	457	0.2% AEP	7408.00	741.92	752.11		752.38	0.001181	5.76	2377.79	1491.03	0.36
Main	293	2% AEP	4718.00	741.40	750.60		750.92	0.001589	6.25	1428.48	824.58	0.40
Main	293	1% AEP	5126.00	741.40	750.90		751.21	0.001531	6.30	1596.60	1037.56	0.40
Main	293	0.2% AEP	7408.00	741.40	751.84		752.16	0.001519	6.77	2626.37	1322.92	0.40
Main	170	2% AEP	4718.00	741.14	750.50	748.49	750.74	0.001067	5.45	1666.03	954.15	0.34
Main	170	1% AEP	5126.00	741.14	750.80	748.65	751.03	0.001036	5.51	1830.84	1041.23	0.33
Main	170	0.2% AEP	7408.00	741.14	751.70	749.37	751.98	0.001203	6.35	2405.39	1302.50	0.37

HEC-RAS Plan: Existing River: Georges Creek Reach: Main

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)
Main	2364	2% AEP	754.80	754.76	0.05	0.05	0.00	2639.65	970.10	1108.25	813.81
Main	2364	1% AEP	755.03	754.98	0.05	0.05	0.00	2883.65	1018.55	1223.80	825.02
Main	2364	0.2% AEP	755.56	755.49	0.08	0.08	0.01	4210.71	1372.78	1824.51	934.24
Main	2262	2% AEP	754.75	754.66	0.09	0.07	0.00	2987.96	1224.49	505.55	752.03
Main	2262	1% AEP	754.97	754.88	0.09	0.07	0.00	3260.75	1270.32	594.93	765.83
Main	2262	0.2% AEP	755.48	755.34	0.14	0.11	0.00	4745.02	1684.62	978.37	852.93
Main	2147	2% AEP	754.67	754.59	0.09	0.03	0.01	2174.58	1399.40	1144.03	712.39
Main	2147	1% AEP	754.90	754.81	0.09	0.03	0.01	2407.50	1472.47	1246.03	738.26
Main	2147	0.2% AEP	755.37	755.22	0.14	0.04	0.01	3592.17	2009.68	1806.15	841.81
Main	2094	2% AEP	754.64	754.58	0.06	0.02	0.00	1828.70	1154.94	1734.37	762.36
Main	2094	1% AEP	754.86	754.80	0.06	0.03	0.00	2008.06	1220.11	1897.84	794.66
Main	2094	0.2% AEP	755.31	755.21	0.10	0.04	0.01	2968.94	1675.12	2763.94	907.70
Main	2037	2% AEP	754.61	754.56	0.04	0.08	0.00	1605.08	940.50	2172.43	918.95
Main	2037	1% AEP	754.83	754.79	0.05	0.08	0.00	1744.74	1000.06	2381.20	990.01
Main	2037	0.2% AEP	755.26	755.18	0.08	0.14	0.00	2572.77	1380.39	3454.84	1115.82
Main	1858	2% AEP	754.53	754.46	0.07	0.07	0.00	1981.95	1398.30	1337.76	881.18
Main	1858	1% AEP	754.75	754.68	0.07	0.07	0.00	2137.95	1496.27	1491.78	955.68
Main	1858	0.2% AEP	755.12	755.00	0.12	0.11	0.01	3099.89	2097.08	2211.04	1063.88
Main	1714	2% AEP	754.46	754.40	0.06	0.03	0.01	1223.90	1354.58	2139.52	1382.03
Main	1714	1% AEP	754.68	754.62	0.06	0.03	0.01	1485.42	1407.20	2233.38	1426.88
Main	1714	0.2% AEP	755.00	754.90	0.10	0.05	0.02	2401.88	1917.54	3088.59	1484.11
Main	1611	2% AEP	754.42	754.40	0.02	0.02	0.01	1956.17	1040.93	1720.91	1668.04
Main	1611	1% AEP	754.64	754.62	0.02	0.02	0.01	2209.12	1083.94	1832.94	1727.30
Main	1611	0.2% AEP	754.94	754.90	0.04	0.03	0.01	3321.48	1485.43	2601.09	1801.95
Main	1376	2% AEP	754.40	754.39	0.00	0.01	0.01	1793.92	561.96	2362.12	4581.96
Main	1376	1% AEP	754.62	754.61	0.00	0.01	0.01	1890.66	563.77	2671.57	4616.66
Main	1376	0.2% AEP	754.90	754.89	0.01	0.01	0.01	2639.14	742.99	4025.87	4647.72
Main	1271	2% AEP	754.38	754.35	0.03	0.03	0.05	715.60	1130.00	2872.40	4498.29
Main	1271	1% AEP	754.60	754.58	0.02	0.02	0.02	837.08	1045.48	3243.44	4529.49
Main	1271	0.2% AEP	754.88	754.85	0.03	0.03	0.03	1285.40	1283.63	4838.97	4555.47
Main	1193	2% AEP	754.29	754.09	0.20	0.04	0.05	35.13	3097.54	1585.33	4468.42
Main	1193	1% AEP	754.56	754.46	0.09	0.03	0.02	226.43	2522.69	2376.88	4538.43
Main	1193	0.2% AEP	754.82	754.70	0.11	0.04	0.02	498.41	3075.68	3833.92	4582.98
Main	1124	2% AEP	754.20	754.11	0.09	0.01	0.00	2427.78	2109.96	180.27	4643.20
Main	1124	1% AEP	754.51	754.46	0.06	0.01	0.00	2591.54	1887.71	646.75	4749.22
Main	1124	0.2% AEP	754.76	754.68	0.08	0.01	0.00	3653.05	2404.46	1350.50	4817.31
Main	1100	2% AEP	754.19	754.10	0.08	0.01	0.02	1514.45	2883.35	320.20	3597.83
Main	1100	1% AEP	754.51	754.45	0.06	0.01	0.01	1712.52	2689.06	724.42	3745.53
Main	1100	0.2% AEP	754.75	754.66	0.09	0.01	0.02	2505.60	3541.82	1360.58	3835.75
Main	1074	2% AEP	754.15	754.12	0.04	0.01	0.01	213.81	1569.78	2934.42	2151.60
Main	1074	1% AEP	754.49	754.46	0.03	0.00	0.01	285.00	1540.31	3300.69	2373.50
Main	1074	0.2% AEP	754.72	754.67	0.05	0.01	0.01	466.07	2091.96	4849.98	2512.89
Main	1000		Bridge								
Main	930	2% AEP	753.01	750.65	2.36	0.09	1.04		4712.13	5.87	73.36
Main	930	1% AEP	753.44	750.70	2.74	0.09	1.23		5118.92	7.08	73.69
Main	930	0.2% AEP	753.46	752.90	0.56	0.06	0.11	46.66	4234.43	3126.92	1614.56
Main	904	2% AEP	751.88	751.61	0.28	0.01	0.11	135.25	2481.53	2101.22	1710.52
Main	904	1% AEP	752.13	751.85	0.28	0.01	0.11	194.25	2603.00	2328.75	1740.56
Main	904	0.2% AEP	753.09	752.74	0.35	0.02	0.14	577.70	3323.68	3506.62	1875.27
Main	878	2% AEP	751.76	751.70	0.05	0.00	0.02	564.57	1437.45	2715.99	2194.22
Main	878	1% AEP	752.00	751.95	0.05	0.00	0.02	647.75	1505.41	2972.84	2231.58
Main	878	0.2% AEP	752.93	752.86	0.07	0.00	0.02	1090.00	1933.96	4384.05	2372.45

HEC-RAS Plan: Existing River: Georges Creek Reach: Main (Continued)

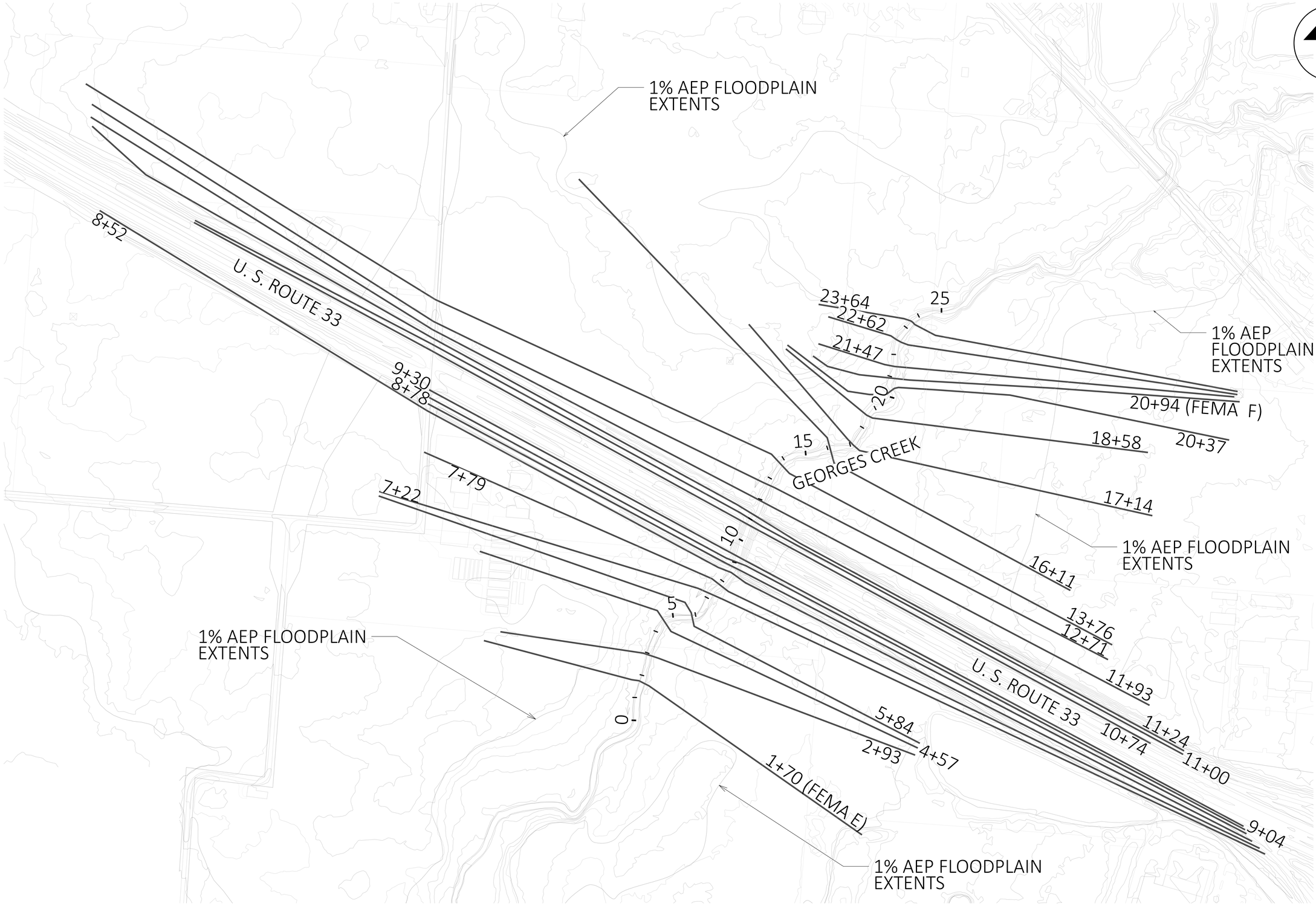
Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
			(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Main	852	2% AEP	751.74	751.72	0.02	0.02	0.08	281.06	1098.05	3338.90	3538.09
Main	852	1% AEP	751.98	751.96	0.02	0.02	0.08	308.09	1146.19	3671.72	3631.97
Main	852	0.2% AEP	752.90	752.88	0.02	0.02	0.05	456.58	1459.22	5492.20	4045.42
Main	779	2% AEP	751.64	751.35	0.28	0.10	0.02	302.07	1964.10	2451.84	1603.99
Main	779	1% AEP	751.88	751.62	0.27	0.09	0.03	371.15	2022.18	2732.67	1808.74
Main	779	0.2% AEP	752.83	752.64	0.19	0.08	0.01	976.65	2224.48	4206.87	3131.44
Main	722	2% AEP	751.52	751.27	0.25	0.16	0.07	429.57	1862.15	2426.27	1560.42
Main	722	1% AEP	751.77	751.55	0.22	0.15	0.06	480.33	1852.64	2793.03	1905.60
Main	722	0.2% AEP	752.74	752.51	0.23	0.16	0.06	393.01	2280.68	4734.31	3206.37
Main	584	2% AEP	751.28	751.18	0.10	0.13	0.01	393.22	1208.55	3116.23	1077.05
Main	584	1% AEP	751.56	751.46	0.10	0.12	0.01	440.70	1254.26	3431.04	1253.94
Main	584	0.2% AEP	752.53	752.41	0.12	0.13	0.02	686.89	1621.12	5099.99	1855.41
Main	457	2% AEP	751.15	750.92	0.23	0.21	0.01	1550.60	2271.03	896.37	762.53
Main	457	1% AEP	751.43	751.20	0.23	0.20	0.01	1710.55	2378.71	1036.74	894.51
Main	457	0.2% AEP	752.38	752.11	0.27	0.21	0.00	2488.80	3058.63	1860.57	1491.03
Main	293	2% AEP	750.92	750.60	0.32	0.16	0.03	1155.88	2027.11	1535.01	824.58
Main	293	1% AEP	751.21	750.90	0.32	0.16	0.03	1311.89	2121.47	1692.64	1037.56
Main	293	0.2% AEP	752.16	751.84	0.32	0.17	0.01	2495.14	2556.34	2356.52	1322.92
Main	170	2% AEP	750.74	750.50	0.24			1691.92	2003.58	1022.50	954.15
Main	170	1% AEP	751.03	750.80	0.23			1903.93	2096.77	1125.30	1041.23
Main	170	0.2% AEP	751.98	751.70	0.28			3024.79	2674.50	1708.71	1302.50

HEC-RAS Plan: Existing River: Georges Creek Reach: Main

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)
Main	1100	2% AEP	754.19	754.10		0.01	0.02	3597.83	1514.45	2883.35	320.20	2.93
Main	1100	1% AEP	754.51	754.45		0.01	0.01	3745.53	1712.52	2689.06	724.42	2.63
Main	1100	0.2% AEP	754.75	754.66		0.01	0.02	3835.75	2505.60	3541.82	1360.58	3.38
Main	1074	2% AEP	754.15	754.12	750.41	0.01	0.01	2151.60	213.81	1569.78	2934.42	2.40
Main	1074	1% AEP	754.49	754.46	750.71	0.00	0.01	2373.50	285.00	1540.31	3300.69	2.26
Main	1074	0.2% AEP	754.72	754.67	752.80	0.01	0.01	2512.89	466.07	2091.96	4849.98	3.00
Main	1000 BR U	2% AEP	754.14	754.07	750.64	0.42	0.04	1565.92	1.39	1258.51	3458.10	2.67
Main	1000 BR U	1% AEP	754.48	754.43	753.05	0.23	0.00	1753.32	24.52	1124.50	3976.98	2.25
Main	1000 BR U	0.2% AEP	754.71	754.62	753.46	0.61	0.13	1849.38	66.10	1470.85	5871.05	2.86
Main	1000 BR D	2% AEP	753.67	753.48	750.59	0.01	0.65	1200.39		2100.63	2617.37	4.75
Main	1000 BR D	1% AEP	754.24	754.18	753.04	0.00	0.80	1624.88	4.09	1170.60	3951.31	2.50
Main	1000 BR D	0.2% AEP	753.96	753.43	753.43	0.01	0.01	1176.35		3408.17	3999.83	7.71
Main	930	2% AEP	753.01	750.65	750.38	0.09	1.04	73.36		4712.13	5.87	12.34
Main	930	1% AEP	753.44	750.70	750.69	0.09	1.23	73.69		5118.92	7.08	13.28
Main	930	0.2% AEP	753.46	752.90	752.90	0.06	0.11	1614.56	46.66	4234.43	3126.92	7.79
Main	904	2% AEP	751.88	751.61		0.01	0.11	1710.52	135.25	2481.53	2101.22	5.16
Main	904	1% AEP	752.13	751.85		0.01	0.11	1740.56	194.25	2603.00	2328.75	5.23
Main	904	0.2% AEP	753.09	752.74		0.02	0.14	1875.27	577.70	3323.68	3506.62	5.95

APPENDIX D

HEC-RAS – PROPOSED



HORIZONTAL SCALE IN FEET
0 100 200 400

GEORGES CREEK - CROSS-SECTION MAP

FRA-33-24.76

DESIGN AGENCY	.
DESIGNER	ECH
REVIEWER	JWE 04-09-25
PROJECT ID	119387
SHEET	XS-1
TOTAL	1

HEC-RAS HEC-RAS 6.3.1 September 2022
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: FRA-33-2476-2502224
Project File : FRA-33-2476-2502224.prj
Run Date and Time: 4/4/2025 8:36:49 AM

Project in English units

PLAN DATA

Plan Title: Proposed
Plan File : C:\HEC-RAS\FRA-33-2476-2502224\FRA-33-2476-2502224.p02

Geometry Title: Proposed
Geometry File : C:\HEC-RAS\FRA-33-2476-2502224\FRA-33-2476-2502224.g02

Flow Title : Georges Creek FIS
Flow File : C:\HEC-RAS\FRA-33-2476-2502224\FRA-33-2476-2502224.f01

Plan Description:
Proposed bridge - widened on inside in each direction. Total width out-to-out remains the same as existing.

Plan Summary Information:

Number of:	Cross Sections	= 24	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: Georges Creek FIS
Flow File : C:\HEC-RAS\FRA-33-2476-2502224\FRA-33-2476-2502224.f01

Flow Data (cfs)

River	Reach	RS	4% AEP	2% AEP	1% AEP	0.2% AEP
Georges Creek	Main	2364	4100	4718	5126	7408

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Georges Creek	Main	4% AEP		Known WS = 750.2
Georges Creek	Main	2% AEP		Known WS = 750.5
Georges Creek	Main	1% AEP		Known WS = 750.8
Georges Creek	Main	0.2% AEP		Known WS = 751.7

GEOMETRY DATA

Geometry Title: Proposed
Geometry File : C:\HEC-RAS\FRA-33-2476-2502224\FRA-33-2476-2502224.g02

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 2364

INPUT
Description: Cross Section 23+64
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	758.3	23	758	267	756	485	755.3	584	756
737	757.3	909	756	969	754	1036	752	1242	750
1258	749.9	1280	751.1	1300	749.9	1345	750.3	1390	749.7
1409	750.1	1444	749.41	1450	749.71	1457	746.27	1466	745.17
1476	745.31	1481	748.55	1498	749.88	1524	750	1694	752
1745	754	1785	756	1877	757				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	1450	.04	1498	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1450	1498	102	102	.1	.3

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 2262

INPUT
Description: Cross Section 22+62
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	758.3	17	758	270	756	473	755.2	608	756
779	757.4	925	756	1012	754	1101	752	1303	750
1368	749.5	1445	750.3	1462	750	1485	749.16	1494	747.49
1499	745.31	1510	744.5	1517	744.94	1524	750.78	1539	750.98
1571	752	1724	754	1759	756	1796	758	1825	758.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	1485	.04	1524	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1485	1524	110	115	124	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	1445	750.3	T

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 2147

INPUT
Description: Cross Section 21+47
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	758	264	756	480	755.1	672	756	773	756.5
853	756	1037	754	1138	752	1167	751.7	1223	752.2
1238	752	1336	750	1469	749.56	1477	748.95	1479	745.57
1489	744.61	1498	744.5	1506	745.47	1510	749.03	1519	749.36
1612	750	1651	752	1682	754	1728	756	1792	758
1837	758.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	1469	.04	1519	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1469	1519	52	53	56	.1	.3

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 2094

INPUT
Description: Cross Section 20+94 (FEMA F)
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	757.7	291	756	507	755.1	737	756	806	756.5
863	756	1115	754	1227	752	1383	750	1499	748
1508	746	1519	744.7	1529	744.7	1536	746	1545	748
1691	750	1743	752	1794	754	1830	756	1887	758

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	1499	.045	1545	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1499	1545	46	57	72	.1	.3

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 2037

INPUT
Description: Cross Section 20+37
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	756.9	493	756	1093	754	1177	752	1352	750
1485	748.08	1495	746.75	1502	744.91	1511	743.54	1514	744.18
1521	745.42	1523	747.57	1530	747.54	1727	750	1784	752
1833	754	1869	756	2030	756.3				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	1485	.045	1523	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1485	1523	227	179	139	.1	.3

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 1858

INPUT
Description: Cross Section 18+58
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	758.6	26	758	152	756	789	754	895	752
1034	750	1212	747.68	1220	747.47	1226	744.16	1232	743.53
1241	743.39	1247	743.98	1253	749	1263	749.3	1403	750
1467	752	1512	754	1558	756	1697	756.5		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	1212	.04	1263	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1212	1263	157	144	142	.1	.3

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 1714

INPUT
Description: Cross Section 17+14
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	757	313	756	425	754	507	753.5	644	754.1
770	753.7	900	754.1	1025	752	1261	750	1323	748.74
1329	748.67	1332	745.11	1339	743.69	1343	743.93	1349	743.38
1359	743.96	1361	747.31	1373	748.24	1438	749	1502	747.5
1521	748	1610	750	1669	752	1725	754	2020	756
2044	756.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	1323	.04	1373	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1323	1373	116	103	98	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
1438	2044	749	T

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 1611

INPUT
Description: Cross Section 16+11
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	758.5	18	758	130	756	235	754	336	752
555	751.5	743	752.1	766	752	1195	750	1198	749.77
1210	745.93	1213	743.38	1222	743.8	1234	743.21	1240	743.71
1245	745.77	1249	746.74	1390	748	1480	750	1576	752
1795	754	2230	756	2410	755.7				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	1198	.04	1249	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1198	1249	219	235	242	.1	.3

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 1376

INPUT
Description: Cross Section 13+76
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	760.1	12	760	169	758	370	756	556	754
691	752	913	751.1	1198	749.7	1333	750.5	1457	750
1615	748	1628	747.41	1635	747.48	1638	742.3	1647	741.93
1652	742.3	1663	743.27	1667	747.25	1688	747.75	1830	748
1923	750	2063	752	2170	752.5	2277	752	2552	750.4
3327	751.7	3454	752.2	3709	741.7	3900	742.7	3967	752
4444	749.7	4510	750	4765	752	5076	754	5121	754.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	1635	.04	1688	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1635	1688	96	105	115	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
2170	5121	752.5	T

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 1271

INPUT
Description: Cross Section 12+71
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	760.9	38	760	133	758	428	756	566	754
689	752	1214	750	1293	749.7	1406	750.2	1492	749.9
1564	750.1	1597	750	1640	748.01	1647	748.22	1657	744.46
1660	745.91	1664	742.97	1671	742.33	1678	742.13	1683	742.5
1685	746.15	1690	747.8	1828	748	1923	750	2579	750.3
3179	750	3278	752	3295	753.5	3325	751.7	3456	752.2
3721	751.6	3916	752.7	4031	749.7	4227	752	4467	749.7
4543	750	4641	752	5017	754	5063	754.7		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	1647	.04	1690	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1647	1690	82	79	75	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	1406	754	T
2579	5063	754	T

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 1193

INPUT
Description: Cross Section 11+93
Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	758.6	336	758	592	756	774	754	925	752
1585	750	1665	749.7	1769	750.1	1816	749.7	1854	750.2
1868	750	1892	747.55	1897	747.22	1901	746.01	1903	742.89
1914	742.3	1926	742.72	1931	746.77	1939	746.13	1956	748.2

1969	748	2015	747.7	2054	748	2160	750	2402	750.2
2732	750	2955	749.7	3029	750	3241	750.2	3415	750
3434	749.7	3480	750.2	3498	749.7	3514	752	3534	753.4
3559	750	4122	752	4157	752.5	4230	752	4333	750.9
4706	749.2	4799	750	4924	752	5225	754	5293	754.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	1868	.04	1956	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1868	1956	71	69	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	1854	754	T
2402	5293	754	T

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 1124

INPUT
Description: Cross Section 11+24
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	755.5	97	756	448	755.9	813	754	1244	752.1
1709	752	2050	750	2102	748	2114	744	2120	742
2128	741.8	2141	741.6	2145	741.9	2148	744	2158	746
2227	748	2752	748	2882	747.7	3055	748	3630	750
3714	752	3744	753.4	3772	752	3812	750	4659	748
5000	750	5150	752	5424	754	5502	754.7		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	2102	.04	2158	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2102	2158	24	24	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
2227	5502	754	T

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 1100

INPUT
Description: Cross Section 11+00
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	758	500	756	1002	754	1716	752	2101	750
2113	748	2119	746	2126	744	2136	742	2137	741.7
2147	741.8	2156	744	2166	746	2219	748	2383	750.1
2535	750	2831	749	3247	750	3696	752	3740	753.5
3783	752	4182	752	4557	754	4905	756		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	2101	.04	2219	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2101	2219	26	26	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
2383	4905	754	T

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 1074

INPUT
Description: Cross Section 10+74
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	760	531	758	566	757.9	898	756	1562	754
1949	752	1952	750.88	1980	744.85	1984	742.31	1990	741.63
1998	741.7	2006	742.38	2015	745.97	2029	751.07	2047	751.9
2266	752	2644	751.5	3564	752	3585	753.4	3637	754
4281	756	4757	758						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	1952	.04	2029	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1952	2029	145	144	145	.3	.5

BRIDGE

RIVER: Georges Creek
REACH: Main RS: 1000

INPUT
Description: FRA-33-24.76 2502224 Proposed
Distance from Upstream XS = 9.4
Deck/Roadway Width = 133.7
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 17

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	760.5	740	400	760	740	943	758	740
1416	756	740	1892	754	740	1949.9	754	740
1950	754	752.12	2031	753.66	751.74	2031.1	753.66	740
2449	752	740	2651	751.9	740	2819	752	740
3417	754	740	3511	754.3	740	3637	754.8	740
4281	756.5	740	4757	758.3	740			

Upstream Bridge Cross Section Data
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	760	531	758	566	757.9	898	756	1562	754
1949	752	1952	750.88	1980	744.85	1984	742.31	1990	741.63
1998	741.7	2006	742.38	2015	745.97	2029	751.07	2047	751.9
2266	752	2644	751.5	3564	752	3585	753.4	3637	754
4281	756	4757	758						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	1952	.04	2029	.05

Bank Sta: Left	Right	Coeff Contr.	Expan.
1952	2029	.3	.5

Downstream Deck/Roadway Coordinates
num= 20

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	759.5	740	157	760	740	525	760.5	740
925	760	740	1468	760	740	1941	756	740
2417	754	740	2462.9	753.98	740	2463	753.98	752.19
2541	753.66	751.66	2541.1	753.66	740	2555	753.59	740
2974	752	740	3176	751.9	740	3344	752	740
3942	754	740	4036	754.3	740	4162	754.8	740
4806	756.5	740	5282	758.3	740			

Downstream Bridge Cross Section Data

```
Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   759.5     209     760     538   760.3     924     760    1368     758
    1863     756    2314     754    2463  751.74    2482  745.96    2487  742.68
    2490     742    2504  741.78    2513  742.67    2518  745.34    2536  749.58
    2538     750    2544     752    2710     752    3181   751.4    3645     752
    3967     752    4036   753.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .055    2463     .04    2536    .045

Bank Sta: Left   Right    Coeff Contr.   Expan.
          2463    2536             .3       .5

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         =   751.9
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Abutments =  1

Abutment Data
Upstream     num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1950  752.19    1986  740.19    1995  739.74    2031  751.74
Downstream     num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    2463  752.19    2499  740.19    2505  739.74    2541  751.74

Number of Piers =  2

Pier Data
Pier Station     Upstream=    1975    Downstream=    2500
Upstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       1     740        1  750.49     2.5   750.5     2.5   752.5
Downstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       1     740        1  750.49     2.5   750.5     2.5   752.5

Pier Data
Pier Station     Upstream=    2006    Downstream=    2531
Upstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       1     740        1  750.49     2.5   750.5     2.5   752.5
Downstream     num=       4
    Width   Elev    Width   Elev    Width   Elev    Width   Elev
       1     740        1  750.49     2.5   750.5     2.5   752.5

Number of Bridge Coefficient Sets =  1

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

High Flow Method
       Energy Only

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

CROSS SECTION
```

RIVER: Georges Creek
REACH: Main RS: 930

INPUT
Description: Cross Section 9+30
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	759.5	209	760	538	760.3	924	760	1368	758
1863	756	2314	754	2463	751.74	2482	745.96	2487	742.68
2490	742	2504	741.78	2513	742.67	2518	745.34	2536	749.58
2538	750	2544	752	2710	752	3181	751.4	3645	752
3967	752	4036	753.8						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	2463	.04	2536	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2463	2536	26	26	.3	.5

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 904

INPUT
Description: Cross Section 9+04
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	759.3	339	760	556	760.2	768	760	1208	758
1594	756	1975	754	2251	752	2482	750	2486	748
2490	746	2494	744	2500	742.3	2505	742.1	2517	742.1
2522	742.3	2527	744	2534	746	2551	748	2655	747.9
2670	748	2757	748.8	3463	750	3749	749.9	3965	749.5
3991	750	4011	752	4039	753.5				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	2482	.04	2551	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2482	2551	26	26	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
2757	4039	753	T

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 878

INPUT
Description: Cross Section 8+78
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	758.2	509	759.8	818	758	1006	756	1409	754
1494	754	1781	752	2076	750	2244	750	2488	748
2494	746	2502	744	2509	743	2514	742.1	2526	742.1
2532	743	2540	744	2557	746	2747	748	3037	748
3258	747	3421	748	3968	747.7	3992	748	4006	750
4021	752	4039	753.7						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	2488	.035	2557	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2488	2557	25	25	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	2244	753	T
3037	4039	753	T

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 852

INPUT
Description: Cross Section 8+52
Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	757.5	179	756.1	470	756.1	797	756	1044	754
1177	754	1365	752	1402	751.5	1502	752.3	1553	752
1689	750	1917	748	2158	746	2280	747.7	2403	746
2418	748	2511	748	2527	746	2538	744	2547	743
2554	742.4	2565	742.3	2568	743	2576	744	2615	746
2642	746.1	2711	746.1	2711	745.7	2949	746	3066	748
3267	748.2	3512	750	3732	750.5	3884	750	4016	749.9
4031	750	4065	753	4262	750	4792	749.6	5089	750
5178	752	5540	754	5742	756				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	2527	.035	2615	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2527	2615	74	73	67	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	2418	753	F
3732	5742	753	F

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 779

INPUT
Description: Cross Section 7+79
Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	756.7	94	756	173	754	291	753.8	386	754
416	754.1	492	753.6	528	754	629	756	642	756.1
655	756	692	753.5	749	754.3	782	754	842	752
937	752	1011	750	1234	748	1332	750	1377	754
1422	751.9	1472	752.3	1510	752	1544	749.9	1553	750
2110	752	2155	752.3	2229	752	2296	751	2372	752.1
2524	750	2594	748	2603	744	2610	743	2614	742.4
2624	742.6	2637	746	2667	747.1	2698	745.9	2824	748
2852	750	2947	750.3	3334	752	3386	752.3	3417	752
3578	751.7	3987	752	4041	755				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	2594	.035	2637	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2594	2637	49	57	62	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	2372	752.1	T

CROSS SECTION

RIVER: Georges Creek

REACH: Main RS: 722

INPUT
Description: Cross Section 7+22
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	756.5	28	756	116	754	148	752	794	750
816	750.2	840	750	1054	752	1443	754	1591	752
1872	751	2133	752	2165	752.4	2196	752	2291	751.5
2408	752.4	2475	751.8	2491	752.2	2506	752	2567	750
2622	748	2644	747.1	2653	746.26	2657	742.22	2675	742.27
2680	742.74	2687	747.44	2707	746.82	2735	748.2	2750	747.5
2795	748.7	2853	747.5	2878	748	2923	750	2968	750.5
3015	750	3068	749.5	3130	750	3475	752	3741	752.5
4178	754	4190	754.3						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	2644	.04	2687	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
2644	2687	156	138	124	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	2408	752.4	T

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 584

INPUT
Description: Cross Section 5+84
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	753.5	47	752	247	750	286	749.8	323	750
493	752.3	686	751	830	752	939	754.5	1011	752
1037	750	1058	748	1115	747.39	1123	747.09	1132	742.11
1141	741.35	1151	743.06	1158	747.11	1167	746.38	1223	745.7
1278	746.2	1306	745.9	1322	746	1386	748	1581	750
1890	752	2623	754	2639	754.2				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	1115	.04	1158	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1115	1158	116	127	134	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	939	754.5	T

CROSS SECTION

RIVER: Georges Creek
REACH: Main RS: 457

INPUT
Description: Cross Section 4+57
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	753.5	50	752	277	750	294	749.8	321	750
482	752.1	685	751.1	939	753.5	1021	752	1049	750
1081	748	1206	746	1218	745.33	1231	742.45	1237	741.92
1248	742.2	1257	745.14	1285	746.32	1379	748	1445	750
1741	752	2104	754	2118	754.2				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
       0    .045    1218    .035    1285    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1218    1285             145     165     173             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0     939   753.5       T

CROSS SECTION


RIVER: Georges Creek
REACH: Main               RS: 293

INPUT
Description: Cross Section 2+93
Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   753.5      84     752     262     750     279   749.9     300     750
     715   751.2    1039     750    1074     748    1217  746.26    1225  742.11
    1231  741.71    1248   741.4    1254  746.08    1260  746.52    1281     746
    1307   745.7    1334     746    1365     748    1394     750    1423     752
    1827     754    1899   754.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .045    1217    .035    1260    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1217    1260             130     123     121             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0     715   751.2       T

CROSS SECTION


RIVER: Georges Creek
REACH: Main               RS: 170

INPUT
Description: Cross Section 1+70 (FEMA E)
Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   758.2      12     758      27     756      47     754      90     752
     174     750     343   749.5     530     750     700   751.7     862     750
     944     748    1134  745.68    1146  741.68    1149  741.34    1165  741.14
    1173  741.92    1179  746.21    1248     746    1277     748    1315     750
    1421     752    1823     754    1884   754.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .045    1134    .035    1179    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1134    1179               0       0       0             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0     700   751.7       T



SUMMARY OF MANNING'S N VALUES

River:Georges Creek

      Reach          River Sta.       n1        n2        n3

 Main                 2364              .05       .04       .05
 Main                 2262              .05       .04       .05
 Main                 2147              .05       .04       .05
```

Main	2094	.05	.045	.05
Main	2037	.055	.045	.055
Main	1858	.055	.04	.055
Main	1714	.055	.04	.055
Main	1611	.055	.04	.055
Main	1376	.055	.04	.055
Main	1271	.055	.04	.055
Main	1193	.055	.04	.055
Main	1124	.055	.04	.055
Main	1100	.055	.04	.055
Main	1074	.05	.04	.05
Main	1000	Bridge		
Main	930	.055	.04	.045
Main	904	.055	.04	.045
Main	878	.055	.035	.045
Main	852	.055	.035	.045
Main	779	.055	.035	.045
Main	722	.055	.04	.045
Main	584	.055	.04	.045
Main	457	.045	.035	.045
Main	293	.045	.035	.045
Main	170	.045	.035	.045

SUMMARY OF REACH LENGTHS

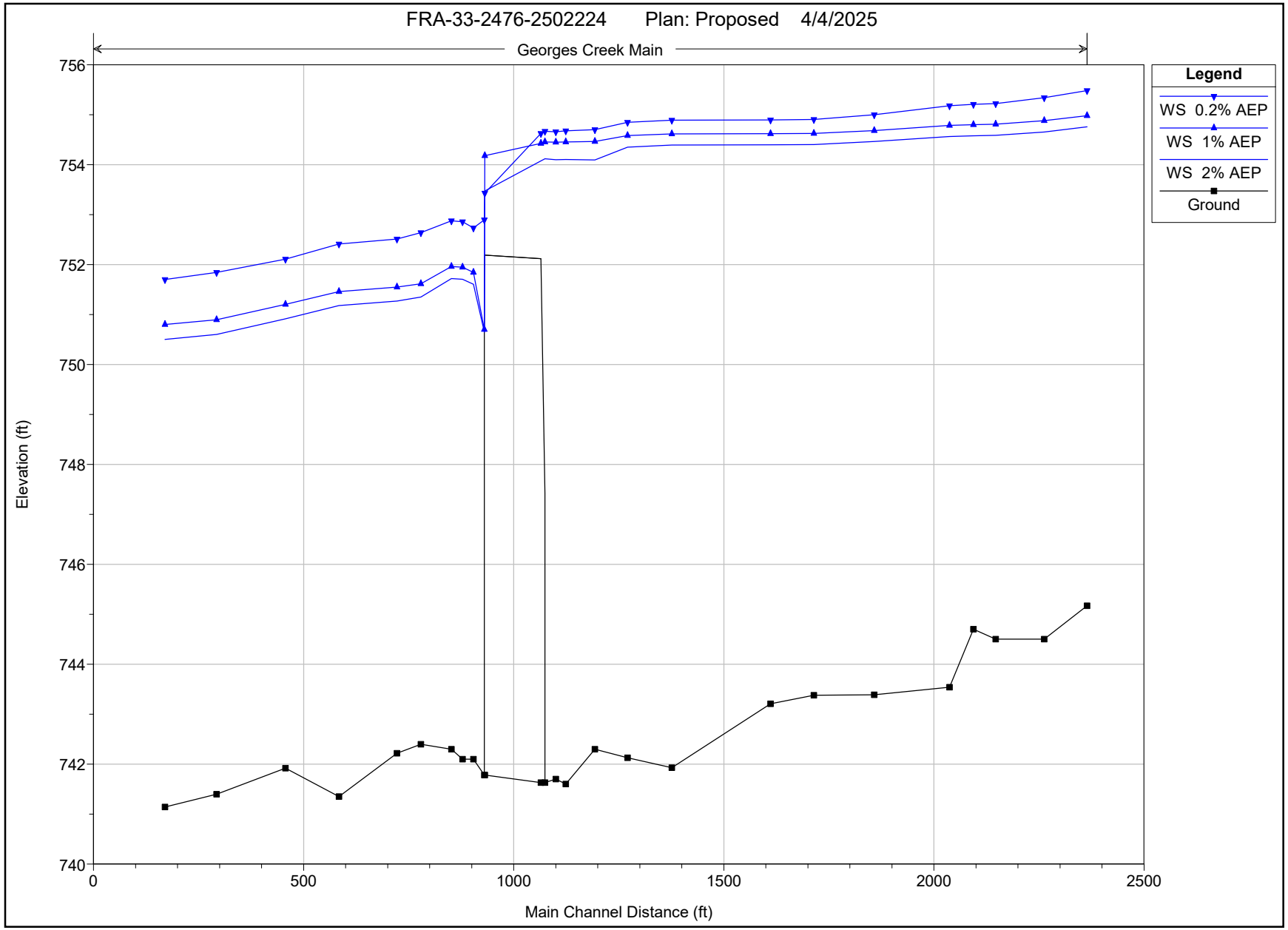
River: Georges Creek

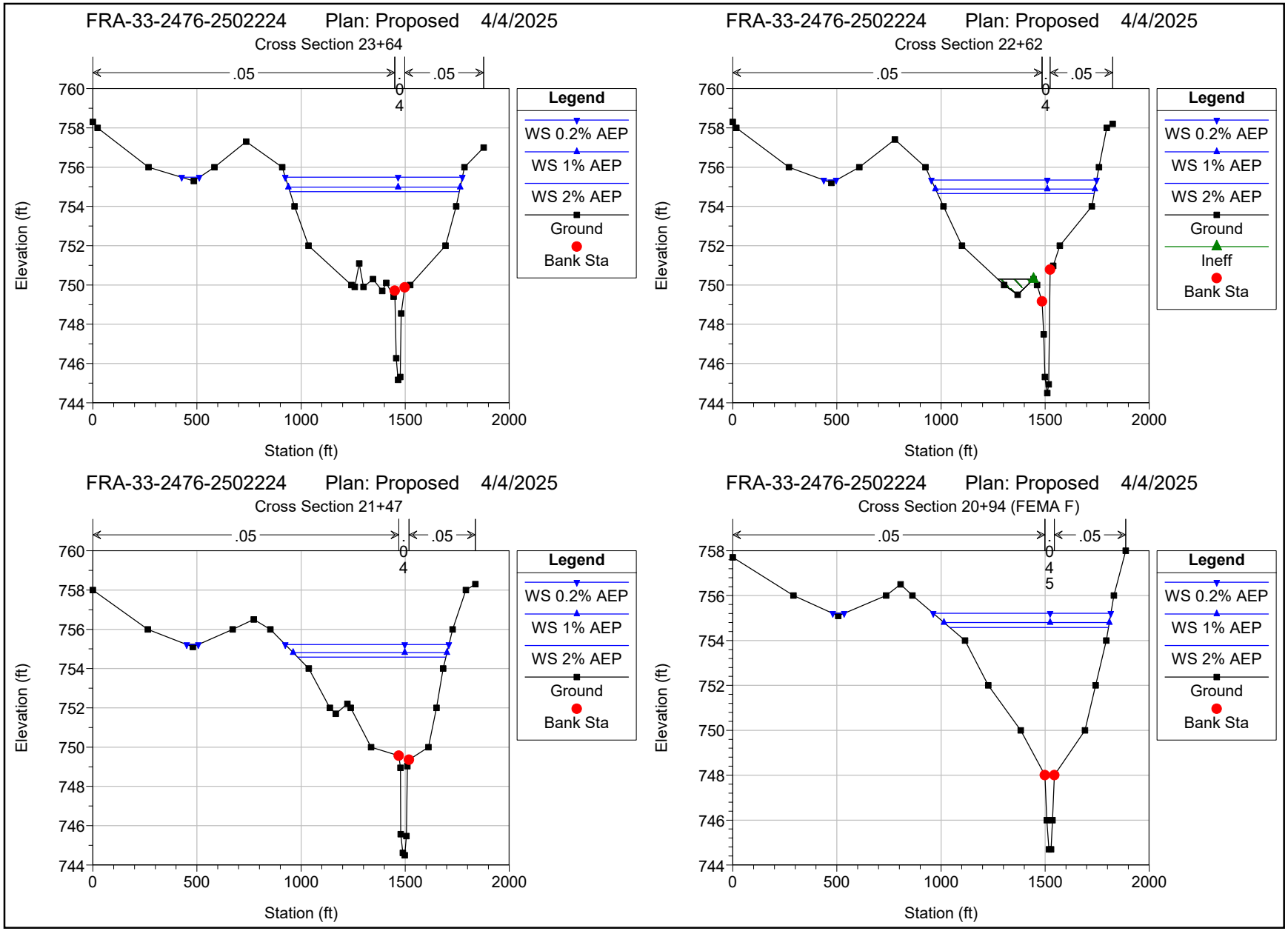
Reach	River Sta.	Left	Channel	Right
Main	2364	102	102	102
Main	2262	110	115	124
Main	2147	52	53	56
Main	2094	46	57	72
Main	2037	227	179	139
Main	1858	157	144	142
Main	1714	116	103	98
Main	1611	219	235	242
Main	1376	96	105	115
Main	1271	82	79	75
Main	1193	71	69	67
Main	1124	24	24	24
Main	1100	26	26	26
Main	1074	145	144	145
Main	1000	Bridge		
Main	930	26	26	26
Main	904	26	26	26
Main	878	25	25	25
Main	852	74	73	67
Main	779	49	57	62
Main	722	156	138	124
Main	584	116	127	134
Main	457	145	165	173
Main	293	130	123	121
Main	170	0	0	0

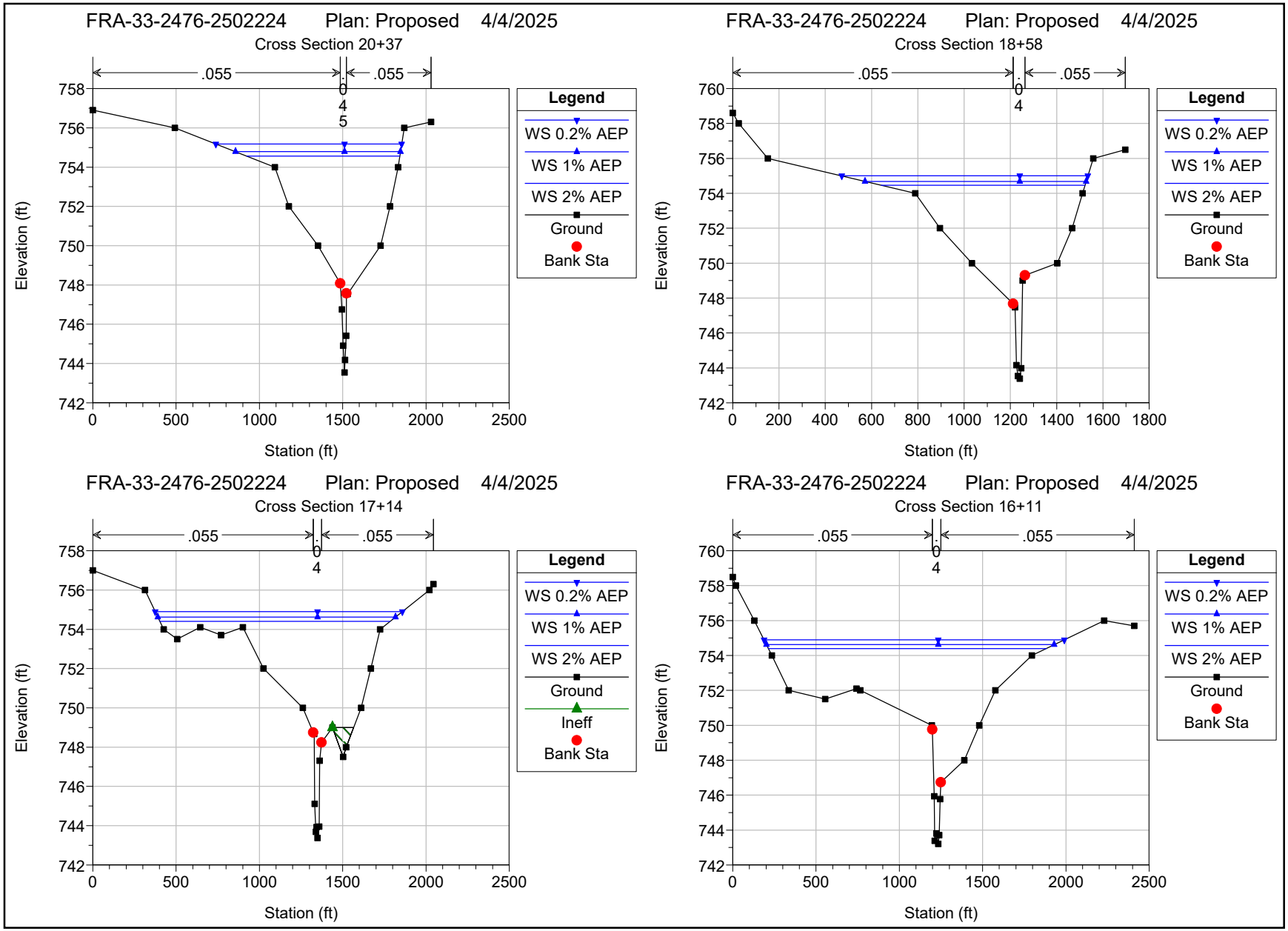
SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Georges Creek

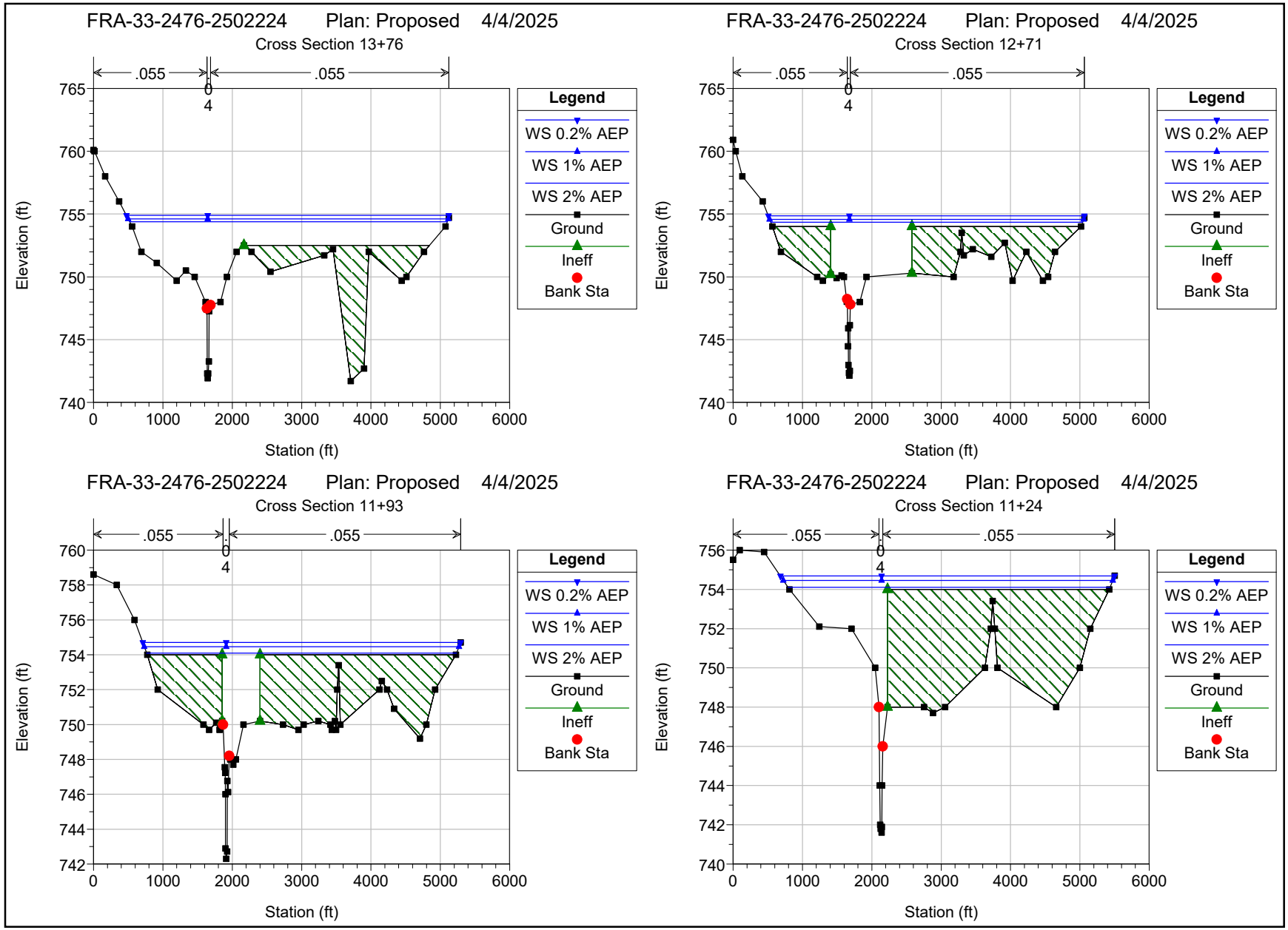
Reach	River Sta.	Contr.	Expan.
Main	2364	.1	.3
Main	2262	.1	.3
Main	2147	.1	.3
Main	2094	.1	.3

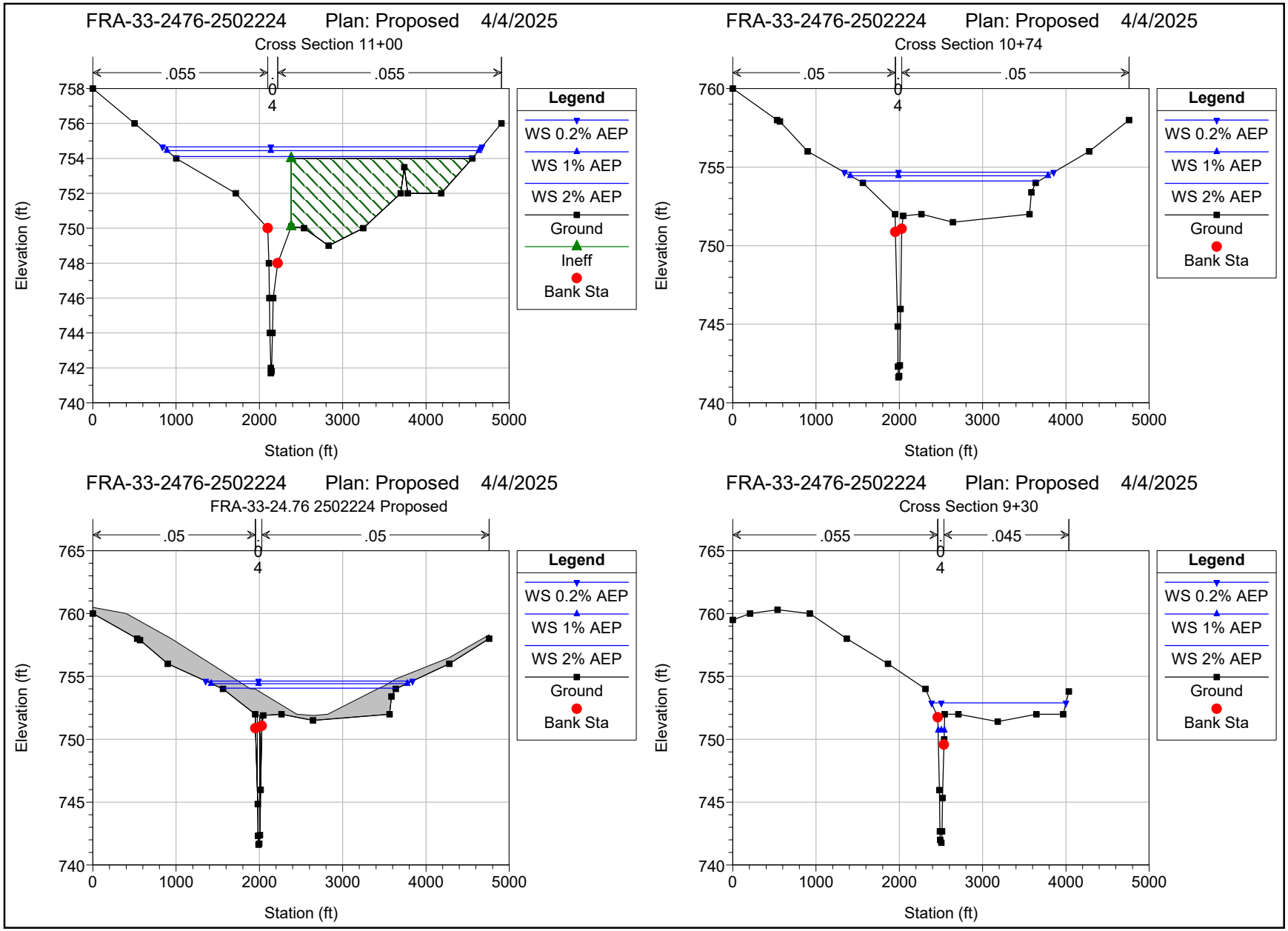
Main	2037		.1	.3
Main	1858		.1	.3
Main	1714		.1	.3
Main	1611		.1	.3
Main	1376		.3	.5
Main	1271		.3	.5
Main	1193		.3	.5
Main	1124		.3	.5
Main	1100		.3	.5
Main	1074		.3	.5
Main	1000	Bridge		
Main	930		.3	.5
Main	904		.3	.5
Main	878		.3	.5
Main	852		.3	.5
Main	779		.3	.5
Main	722		.3	.5
Main	584		.1	.3
Main	457		.1	.3
Main	293		.1	.3
Main	170		.1	.3

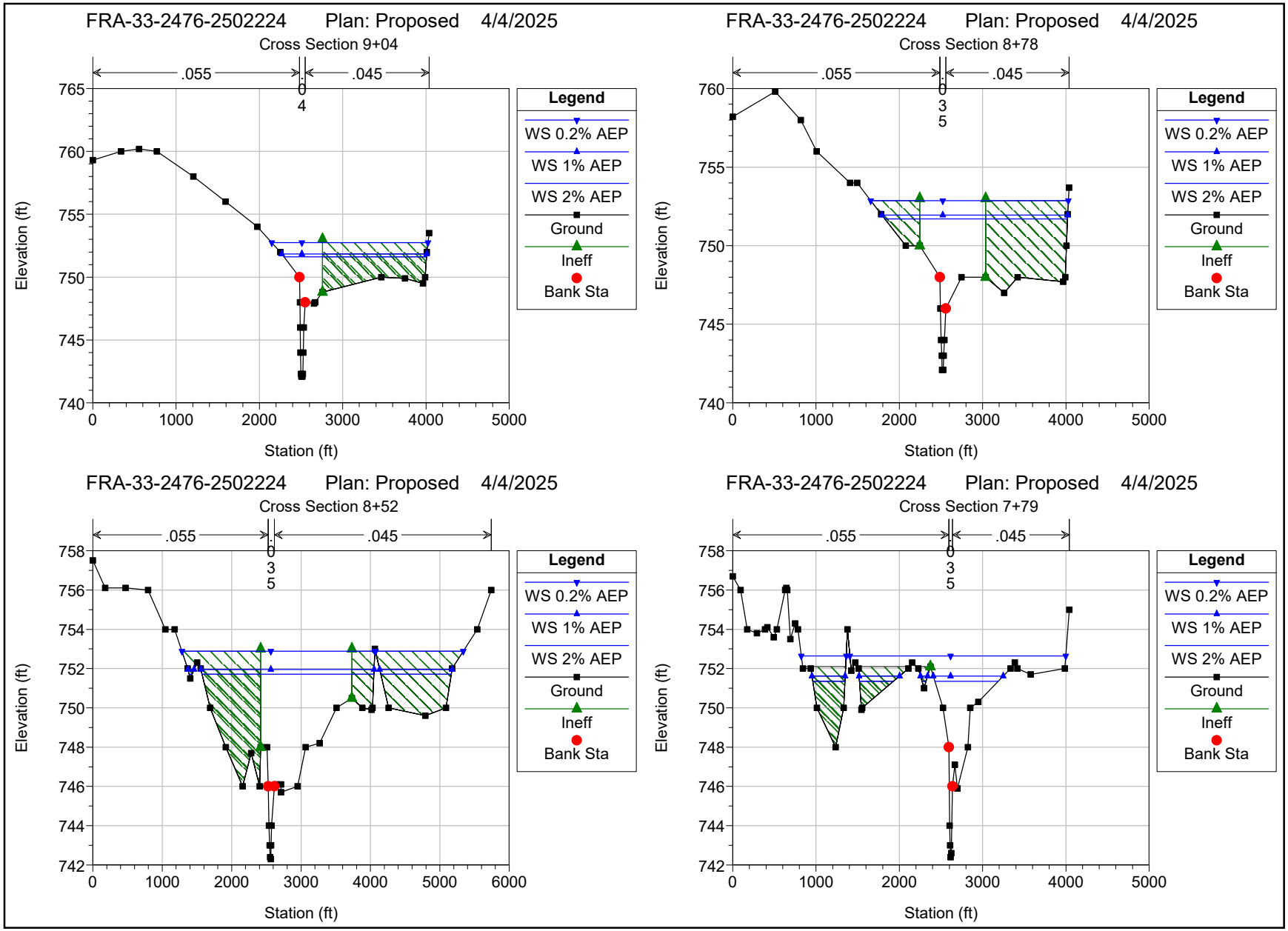

FRA-33-2476-2502224 Plan: Proposed 4/4/2025
Georges Creek Main
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Elevation (ft)
Main Channel Distance (ft)
756
754
752
750
748
746
744
742
740
0
500
1000
1500
2000
2500

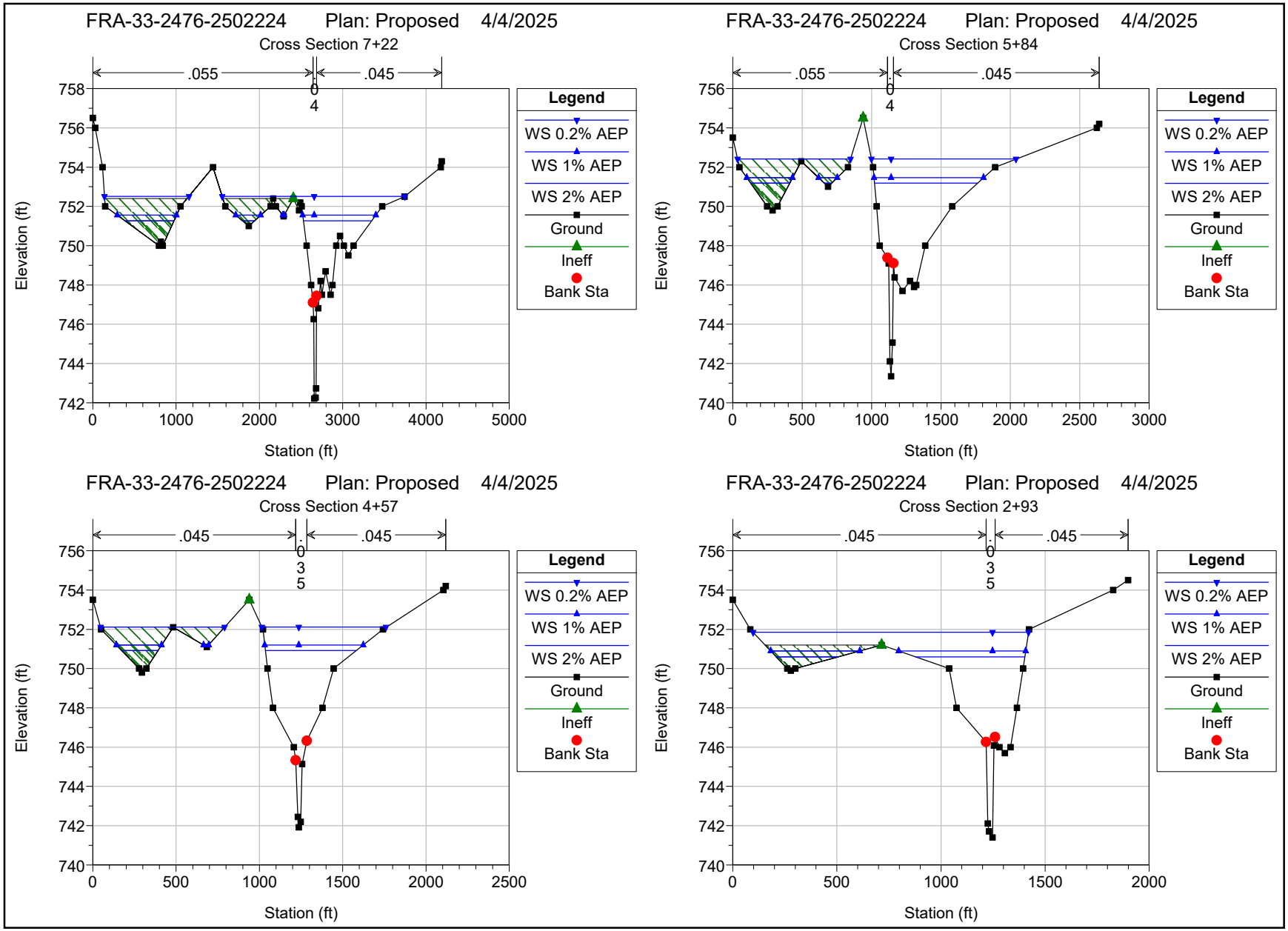

FRA-33-2476-2502224 Plan: Proposed 4/4/2025
Cross Section 23+64
.05
.05
.04
Elevation (ft)
760
758
756
754
752
750
748
746
744
0
500
1000
1500
2000
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Bank Sta
FRA-33-2476-2502224 Plan: Proposed 4/4/2025
Cross Section 22+62
.05
.05
.04
Elevation (ft)
760
758
756
754
752
750
748
746
744
0
500
1000
1500
2000
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta
FRA-33-2476-2502224 Plan: Proposed 4/4/2025
Cross Section 21+47
.05
.05
.04
Elevation (ft)
760
758
756
754
752
750
748
746
744
0
500
1000
1500
2000
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Bank Sta
FRA-33-2476-2502224 Plan: Proposed 4/4/2025
Cross Section 20+94 (FEMA F)
.05
.05
.045
Elevation (ft)
758
756
754
752
750
748
746
744
0
500
1000
1500
2000
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Bank Sta


FRA-33-2476-2502224 Plan: Proposed 4/4/2025
Cross Section 20+37
.055
.055
0.045
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Bank Sta
FRA-33-2476-2502224 Plan: Proposed 4/4/2025
Cross Section 18+58
.055
.055
0.04
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Bank Sta
FRA-33-2476-2502224 Plan: Proposed 4/4/2025
Cross Section 17+14
.055
.055
0.04
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta
FRA-33-2476-2502224 Plan: Proposed 4/4/2025
Cross Section 16+11
.055
.055
0.04
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Bank Sta

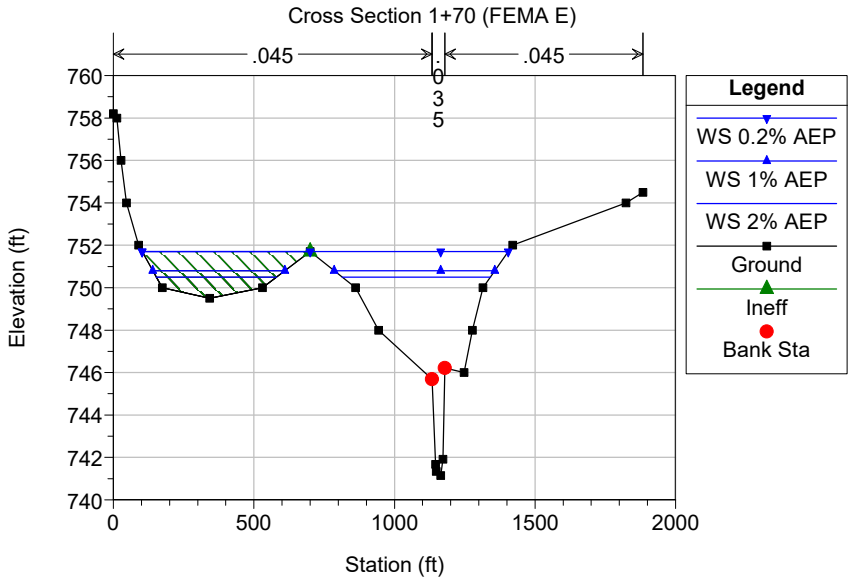

FRA-33-2476-2502224 Plan: Proposed 4/4/2025
Cross Section 13+76
.055
.055
0
4
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta
FRA-33-2476-2502224 Plan: Proposed 4/4/2025
Cross Section 12+71
.055
.055
0
4
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta
FRA-33-2476-2502224 Plan: Proposed 4/4/2025
Cross Section 11+93
.055
.055
0
4
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta
FRA-33-2476-2502224 Plan: Proposed 4/4/2025
Cross Section 11+24
.055
.055
0
4
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta


FRA-33-2476-2502224 Plan: Proposed 4/4/2025
Cross Section 11+00
.055
.055
0
4
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta
FRA-33-2476-2502224 Plan: Proposed 4/4/2025
Cross Section 10+74
.05
.05
Elevation (ft)
Station (ft)
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Bank Sta
FRA-33-2476-2502224 Plan: Proposed 4/4/2025
FRA-33-24.76 2502224 Proposed
.05
.05
Elevation (ft)
Station (ft)
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Bank Sta
FRA-33-2476-2502224 Plan: Proposed 4/4/2025
Cross Section 9+30
.055
.045
Elevation (ft)
Station (ft)
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Bank Sta


FRA-33-2476-2502224 Plan: Proposed 4/4/2025
Cross Section 9+04
.055
.045
0.04
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta
FRA-33-2476-2502224 Plan: Proposed 4/4/2025
Cross Section 8+78
.055
.045
0.035
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta
FRA-33-2476-2502224 Plan: Proposed 4/4/2025
Cross Section 8+52
.055
.045
0.035
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta
FRA-33-2476-2502224 Plan: Proposed 4/4/2025
Cross Section 7+79
.055
.045
0.035
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta


FRA-33-2476-2502224 Plan: Proposed 4/4/2025
Cross Section 7+22
.055
.045
0.04
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta
FRA-33-2476-2502224 Plan: Proposed 4/4/2025
Cross Section 5+84
.055
.045
0.04
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta
FRA-33-2476-2502224 Plan: Proposed 4/4/2025
Cross Section 4+57
.045
.045
0.035
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta
FRA-33-2476-2502224 Plan: Proposed 4/4/2025
Cross Section 2+93
.045
.045
0.035
Elevation (ft)
Station (ft)
Legend
WS 0.2% AEP
WS 1% AEP
WS 2% AEP
Ground
Ineff
Bank Sta

FRA-33-2476-2502224 Plan: Proposed 4/4/2025



HEC-RAS Plan: Proposed River: Georges Creek Reach: Main

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)	
Main	2364	2% AEP	4718.00	745.17	754.76		754.80	0.000387	2.72	3093.89	813.81	0.18
Main	2364	1% AEP	5126.00	745.17	754.98		755.03	0.000387	2.77	3277.74	825.02	0.18
Main	2364	0.2% AEP	7408.00	745.17	755.49		755.56	0.000568	3.50	3708.49	934.24	0.22
Main	2262	2% AEP	4718.00	744.50	754.66		754.75	0.000683	3.80	2440.49	752.03	0.23
Main	2262	1% AEP	5126.00	744.50	754.88		754.97	0.000672	3.83	2612.15	765.83	0.23
Main	2262	0.2% AEP	7408.00	744.50	755.34		755.48	0.000993	4.82	2973.21	852.93	0.28
Main	2147	2% AEP	4718.00	744.50	754.59		754.67	0.000620	3.52	2477.29	712.39	0.22
Main	2147	1% AEP	5126.00	744.50	754.81		754.90	0.000625	3.60	2640.43	738.26	0.22
Main	2147	0.2% AEP	7408.00	744.50	755.22		755.37	0.000988	4.68	2958.43	841.81	0.28
Main	2094	2% AEP	4718.00	744.70	754.58		754.64	0.000431	2.88	2888.87	762.36	0.17
Main	2094	1% AEP	5126.00	744.70	754.80		754.86	0.000442	2.96	3063.49	794.66	0.17
Main	2094	0.2% AEP	7408.00	744.70	755.21		755.31	0.000718	3.89	3401.61	907.70	0.22
Main	2037	2% AEP	4718.00	743.54	754.56		754.61	0.000390	2.75	3351.73	918.95	0.16
Main	2037	1% AEP	5126.00	743.54	754.79		754.83	0.000406	2.85	3565.01	990.01	0.17
Main	2037	0.2% AEP	7408.00	743.54	755.18		755.26	0.000673	3.77	3981.58	1115.82	0.21
Main	1858	2% AEP	4718.00	743.39	754.46		754.53	0.000459	3.21	3070.76	881.18	0.19
Main	1858	1% AEP	5126.00	743.39	754.68		754.75	0.000484	3.35	3271.10	955.68	0.20
Main	1858	0.2% AEP	7408.00	743.39	755.00		755.12	0.000844	4.53	3591.03	1063.88	0.27
Main	1714	2% AEP	4718.00	743.38	754.40		754.46	0.000423	3.09	3566.16	1382.03	0.18
Main	1714	1% AEP	5126.00	743.38	754.62		754.68	0.000420	3.13	3875.69	1426.88	0.18
Main	1714	0.2% AEP	7408.00	743.38	754.90		755.00	0.000704	4.14	4285.05	1484.11	0.24
Main	1611	2% AEP	4718.00	743.21	754.40		754.42	0.000178	2.16	5351.21	1668.04	0.12
Main	1611	1% AEP	5126.00	743.21	754.62		754.64	0.000179	2.20	5723.82	1727.30	0.12
Main	1611	0.2% AEP	7408.00	743.21	754.90		754.94	0.000306	2.93	6211.72	1801.95	0.16
Main	1376	2% AEP	4718.00	741.93	754.39		754.40	0.000048	1.10	12021.46	4581.96	0.06
Main	1376	1% AEP	5126.00	741.93	754.61		754.62	0.000045	1.08	13036.26	4616.66	0.06
Main	1376	0.2% AEP	7408.00	741.93	754.89		754.90	0.000071	1.39	14310.18	4647.72	0.08
Main	1271	2% AEP	4718.00	742.13	754.35		754.38	0.000263	2.62	6843.12	4498.29	0.15
Main	1271	1% AEP	5126.00	742.13	754.58		754.60	0.000208	2.37	7888.66	4529.49	0.13
Main	1271	0.2% AEP	7408.00	742.13	754.85		754.88	0.000288	2.84	9091.95	4555.47	0.15
Main	1193	2% AEP	4718.00	742.30	754.09		754.29	0.000937	4.42	3234.09	4468.42	0.28
Main	1193	1% AEP	5126.00	742.30	754.46		754.56	0.000534	3.44	4909.96	4538.43	0.21
Main	1193	0.2% AEP	7408.00	742.30	754.70		754.82	0.000722	4.07	5997.01	4582.98	0.25
Main	1124	2% AEP	4718.00	741.60	754.11		754.20	0.000403	3.54	4163.90	4643.20	0.19
Main	1124	1% AEP	5126.00	741.60	754.46		754.51	0.000290	3.06	5804.31	4749.22	0.16
Main	1124	0.2% AEP	7408.00	741.60	754.68		754.76	0.000440	3.82	6877.21	4817.31	0.20
Main	1100	2% AEP	4718.00	741.70	754.10		754.19	0.000376	2.93	4011.74	3597.83	0.18
Main	1100	1% AEP	5126.00	741.70	754.45		754.51	0.000286	2.63	5287.78	3745.53	0.16
Main	1100	0.2% AEP	7408.00	741.70	754.66		754.75	0.000457	3.38	6092.46	3835.75	0.20
Main	1074	2% AEP	4718.00	741.63	754.12	750.41	754.15	0.000253	2.40	4744.97	2151.60	0.15
Main	1074	1% AEP	5126.00	741.63	754.46	750.71	754.49	0.000214	2.26	5512.64	2373.50	0.13
Main	1074	0.2% AEP	7408.00	741.63	754.67	752.80	754.72	0.000365	3.00	6033.37	2512.89	0.18
Main	1000		Bridge									
Main	930	2% AEP	4718.00	741.78	750.65	750.38	753.01	0.012023	12.34	384.11	73.36	0.93
Main	930	1% AEP	5126.00	741.78	750.70	750.69	753.44	0.013788	13.28	388.01	73.69	0.99
Main	930	0.2% AEP	7408.00	741.78	752.90	752.90	753.46	0.003193	7.79	2176.37	1614.56	0.50
Main	904	2% AEP	4718.00	742.10	751.61		751.88	0.001515	5.16	1343.80	1710.52	0.34
Main	904	1% AEP	5126.00	742.10	751.85		752.13	0.001489	5.23	1457.30	1740.56	0.34
Main	904	0.2% AEP	7408.00	742.10	752.74		753.09	0.001647	5.95	1943.96	1875.27	0.37
Main	878	2% AEP	4718.00	742.10	751.70		751.76	0.000266	2.69	3163.04	2194.22	0.17
Main	878	1% AEP	5126.00	742.10	751.95		752.00	0.000264	2.73	3354.17	2231.58	0.17
Main	878	0.2% AEP	7408.00	742.10	752.86		752.93	0.000303	3.15	4078.88	2372.45	0.19
Main	852	2% AEP	4718.00	742.30	751.72	747.44	751.74	0.000101	1.64	5271.60	3538.09	0.10
Main	852	1% AEP	5126.00	742.30	751.96	747.53	751.98	0.000099	1.66	5589.12	3631.97	0.10
Main	852	0.2% AEP	7408.00	742.30	752.88	747.99	752.90	0.000111	1.89	6796.69	4045.42	0.11
Main	779	2% AEP	4718.00	742.40	751.35		751.64	0.001534	6.18	1704.33	1603.99	0.40
Main	779	1% AEP	5126.00	742.40	751.62		751.88	0.001447	6.14	1914.57	1808.74	0.39
Main	779	0.2% AEP	7408.00	742.40	752.64		752.83	0.001151	5.96	4151.09	3131.44	0.36
Main	722	2% AEP	4718.00	742.22	751.27		751.52	0.001877	5.84	1714.86	1560.42	0.38

HEC-RAS Plan: Proposed River: Georges Creek Reach: Main (Continued)

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)	
Main	722	1% AEP	5126.00	742.22	751.55		751.77	0.001642	5.60	1952.62	1905.60	0.36
Main	722	0.2% AEP	7408.00	742.22	752.51		752.74	0.001680	6.12	3183.21	3206.37	0.37
Main	584	2% AEP	4718.00	741.35	751.18		751.28	0.000870	3.92	2206.39	1077.05	0.26
Main	584	1% AEP	5126.00	741.35	751.46		751.56	0.000825	3.92	2419.99	1253.94	0.25
Main	584	0.2% AEP	7408.00	741.35	752.41		752.53	0.000924	4.49	3264.04	1855.41	0.27
Main	457	2% AEP	4718.00	741.92	750.92		751.15	0.001121	5.03	1612.78	762.53	0.34
Main	457	1% AEP	5126.00	741.92	751.20		751.43	0.001071	5.05	1774.92	894.51	0.34
Main	457	0.2% AEP	7408.00	741.92	752.11		752.38	0.001181	5.76	2377.79	1491.03	0.36
Main	293	2% AEP	4718.00	741.40	750.60		750.92	0.001589	6.25	1428.48	824.58	0.40
Main	293	1% AEP	5126.00	741.40	750.90		751.21	0.001531	6.30	1596.60	1037.56	0.40
Main	293	0.2% AEP	7408.00	741.40	751.84		752.16	0.001519	6.77	2626.37	1322.92	0.40
Main	170	2% AEP	4718.00	741.14	750.50	748.49	750.74	0.001067	5.45	1666.03	954.15	0.34
Main	170	1% AEP	5126.00	741.14	750.80	748.65	751.03	0.001036	5.51	1830.84	1041.23	0.33
Main	170	0.2% AEP	7408.00	741.14	751.70	749.37	751.98	0.001203	6.35	2405.39	1302.50	0.37

HEC-RAS Plan: Proposed River: Georges Creek Reach: Main

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)
Main	2364	2% AEP	754.80	754.76	0.05	0.05	0.00	2639.65	970.10	1108.25	813.81
Main	2364	1% AEP	755.03	754.98	0.05	0.05	0.00	2883.65	1018.55	1223.80	825.02
Main	2364	0.2% AEP	755.56	755.49	0.08	0.08	0.01	4210.71	1372.78	1824.51	934.24
Main	2262	2% AEP	754.75	754.66	0.09	0.07	0.00	2987.96	1224.49	505.55	752.03
Main	2262	1% AEP	754.97	754.88	0.09	0.07	0.00	3260.75	1270.32	594.93	765.83
Main	2262	0.2% AEP	755.48	755.34	0.14	0.11	0.00	4745.02	1684.62	978.37	852.93
Main	2147	2% AEP	754.67	754.59	0.09	0.03	0.01	2174.58	1399.40	1144.03	712.39
Main	2147	1% AEP	754.90	754.81	0.09	0.03	0.01	2407.50	1472.47	1246.03	738.26
Main	2147	0.2% AEP	755.37	755.22	0.14	0.04	0.01	3592.17	2009.68	1806.15	841.81
Main	2094	2% AEP	754.64	754.58	0.06	0.02	0.00	1828.70	1154.94	1734.37	762.36
Main	2094	1% AEP	754.86	754.80	0.06	0.03	0.00	2008.06	1220.11	1897.84	794.66
Main	2094	0.2% AEP	755.31	755.21	0.10	0.04	0.01	2968.94	1675.12	2763.94	907.70
Main	2037	2% AEP	754.61	754.56	0.04	0.08	0.00	1605.08	940.50	2172.43	918.95
Main	2037	1% AEP	754.83	754.79	0.05	0.08	0.00	1744.74	1000.06	2381.20	990.01
Main	2037	0.2% AEP	755.26	755.18	0.08	0.14	0.00	2572.77	1380.39	3454.84	1115.82
Main	1858	2% AEP	754.53	754.46	0.07	0.07	0.00	1981.95	1398.30	1337.76	881.18
Main	1858	1% AEP	754.75	754.68	0.07	0.07	0.00	2137.95	1496.27	1491.78	955.68
Main	1858	0.2% AEP	755.12	755.00	0.12	0.11	0.01	3099.89	2097.08	2211.04	1063.88
Main	1714	2% AEP	754.46	754.40	0.06	0.03	0.01	1223.90	1354.58	2139.52	1382.03
Main	1714	1% AEP	754.68	754.62	0.06	0.03	0.01	1485.42	1407.20	2233.38	1426.88
Main	1714	0.2% AEP	755.00	754.90	0.10	0.05	0.02	2401.88	1917.54	3088.59	1484.11
Main	1611	2% AEP	754.42	754.40	0.02	0.02	0.01	1956.17	1040.93	1720.91	1668.04
Main	1611	1% AEP	754.64	754.62	0.02	0.02	0.01	2209.12	1083.94	1832.94	1727.30
Main	1611	0.2% AEP	754.94	754.90	0.04	0.03	0.01	3321.48	1485.43	2601.09	1801.95
Main	1376	2% AEP	754.40	754.39	0.00	0.01	0.01	1793.92	561.96	2362.12	4581.96
Main	1376	1% AEP	754.62	754.61	0.00	0.01	0.01	1890.66	563.77	2671.57	4616.66
Main	1376	0.2% AEP	754.90	754.89	0.01	0.01	0.01	2639.14	742.99	4025.87	4647.72
Main	1271	2% AEP	754.38	754.35	0.03	0.03	0.05	715.60	1130.00	2872.40	4498.29
Main	1271	1% AEP	754.60	754.58	0.02	0.02	0.02	837.08	1045.48	3243.44	4529.49
Main	1271	0.2% AEP	754.88	754.85	0.03	0.03	0.03	1285.40	1283.63	4838.97	4555.47
Main	1193	2% AEP	754.29	754.09	0.20	0.04	0.05	35.13	3097.54	1585.33	4468.42
Main	1193	1% AEP	754.56	754.46	0.09	0.03	0.02	226.43	2522.69	2376.88	4538.43
Main	1193	0.2% AEP	754.82	754.70	0.11	0.04	0.02	498.41	3075.68	3833.92	4582.98
Main	1124	2% AEP	754.20	754.11	0.09	0.01	0.00	2427.78	2109.96	180.27	4643.20
Main	1124	1% AEP	754.51	754.46	0.06	0.01	0.00	2591.54	1887.71	646.75	4749.22
Main	1124	0.2% AEP	754.76	754.68	0.08	0.01	0.00	3653.05	2404.46	1350.50	4817.31
Main	1100	2% AEP	754.19	754.10	0.08	0.01	0.02	1514.45	2883.35	320.20	3597.83
Main	1100	1% AEP	754.51	754.45	0.06	0.01	0.01	1712.52	2689.06	724.42	3745.53
Main	1100	0.2% AEP	754.75	754.66	0.09	0.01	0.02	2505.60	3541.82	1360.58	3835.75
Main	1074	2% AEP	754.15	754.12	0.04	0.01	0.01	213.81	1569.78	2934.42	2151.60
Main	1074	1% AEP	754.49	754.46	0.03	0.00	0.01	285.00	1540.31	3300.69	2373.50
Main	1074	0.2% AEP	754.72	754.67	0.05	0.01	0.01	466.07	2091.96	4849.98	2512.89
Main	1000		Bridge								
Main	930	2% AEP	753.01	750.65	2.36	0.09	1.04		4712.13	5.87	73.36
Main	930	1% AEP	753.44	750.70	2.74	0.09	1.23		5118.92	7.08	73.69
Main	930	0.2% AEP	753.46	752.90	0.56	0.06	0.11	46.66	4234.43	3126.92	1614.56
Main	904	2% AEP	751.88	751.61	0.28	0.01	0.11	135.25	2481.53	2101.22	1710.52
Main	904	1% AEP	752.13	751.85	0.28	0.01	0.11	194.25	2603.00	2328.75	1740.56
Main	904	0.2% AEP	753.09	752.74	0.35	0.02	0.14	577.70	3323.68	3506.62	1875.27
Main	878	2% AEP	751.76	751.70	0.05	0.00	0.02	564.57	1437.45	2715.99	2194.22
Main	878	1% AEP	752.00	751.95	0.05	0.00	0.02	647.75	1505.41	2972.84	2231.58
Main	878	0.2% AEP	752.93	752.86	0.07	0.00	0.02	1090.00	1933.96	4384.05	2372.45

HEC-RAS Plan: Proposed River: Georges Creek Reach: Main (Continued)

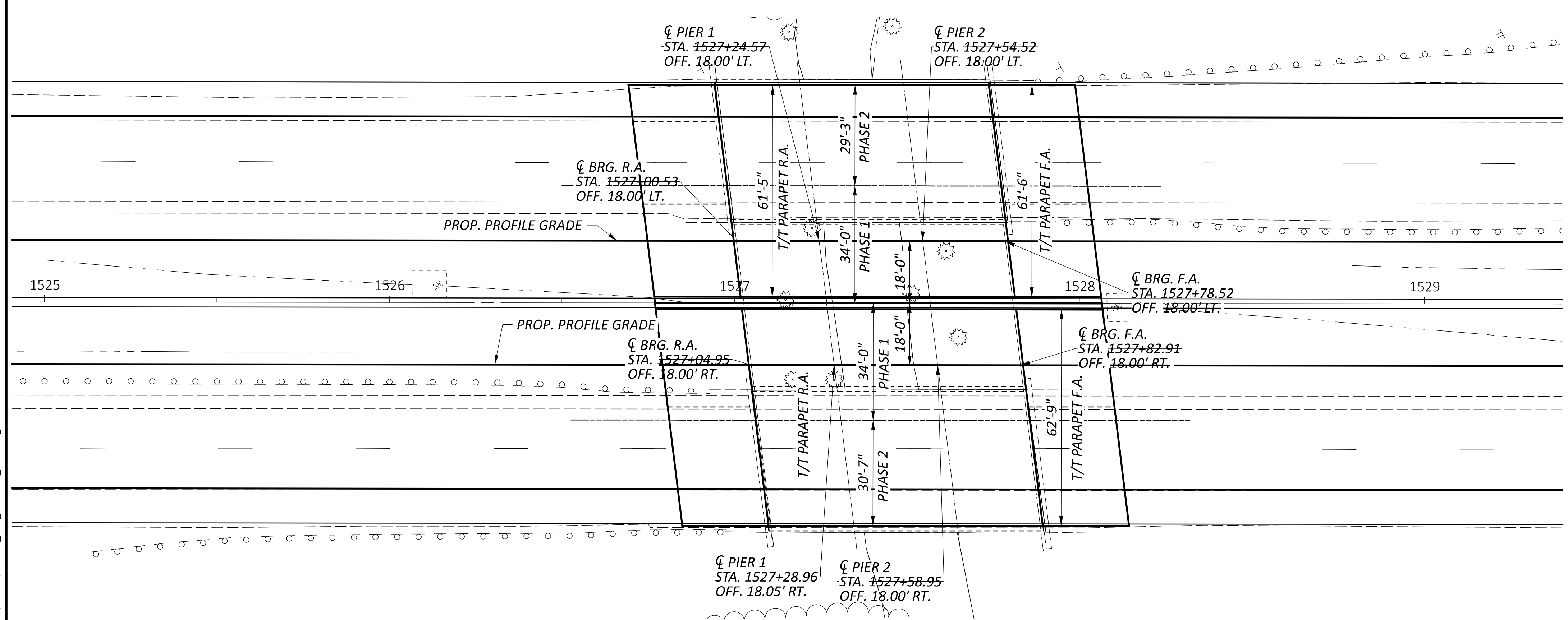
Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
			(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Main	852	2% AEP	751.74	751.72	0.02	0.02	0.08	281.06	1098.05	3338.90	3538.09
Main	852	1% AEP	751.98	751.96	0.02	0.02	0.08	308.09	1146.19	3671.72	3631.97
Main	852	0.2% AEP	752.90	752.88	0.02	0.02	0.05	456.58	1459.22	5492.20	4045.42
Main	779	2% AEP	751.64	751.35	0.28	0.10	0.02	302.07	1964.10	2451.84	1603.99
Main	779	1% AEP	751.88	751.62	0.27	0.09	0.03	371.15	2022.18	2732.67	1808.74
Main	779	0.2% AEP	752.83	752.64	0.19	0.08	0.01	976.65	2224.48	4206.87	3131.44
Main	722	2% AEP	751.52	751.27	0.25	0.16	0.07	429.57	1862.15	2426.27	1560.42
Main	722	1% AEP	751.77	751.55	0.22	0.15	0.06	480.33	1852.64	2793.03	1905.60
Main	722	0.2% AEP	752.74	752.51	0.23	0.16	0.06	393.01	2280.68	4734.31	3206.37
Main	584	2% AEP	751.28	751.18	0.10	0.13	0.01	393.22	1208.55	3116.23	1077.05
Main	584	1% AEP	751.56	751.46	0.10	0.12	0.01	440.70	1254.26	3431.04	1253.94
Main	584	0.2% AEP	752.53	752.41	0.12	0.13	0.02	686.89	1621.12	5099.99	1855.41
Main	457	2% AEP	751.15	750.92	0.23	0.21	0.01	1550.60	2271.03	896.37	762.53
Main	457	1% AEP	751.43	751.20	0.23	0.20	0.01	1710.55	2378.71	1036.74	894.51
Main	457	0.2% AEP	752.38	752.11	0.27	0.21	0.00	2488.80	3058.63	1860.57	1491.03
Main	293	2% AEP	750.92	750.60	0.32	0.16	0.03	1155.88	2027.11	1535.01	824.58
Main	293	1% AEP	751.21	750.90	0.32	0.16	0.03	1311.89	2121.47	1692.64	1037.56
Main	293	0.2% AEP	752.16	751.84	0.32	0.17	0.01	2495.14	2556.34	2356.52	1322.92
Main	170	2% AEP	750.74	750.50	0.24			1691.92	2003.58	1022.50	954.15
Main	170	1% AEP	751.03	750.80	0.23			1903.93	2096.77	1125.30	1041.23
Main	170	0.2% AEP	751.98	751.70	0.28			3024.79	2674.50	1708.71	1302.50

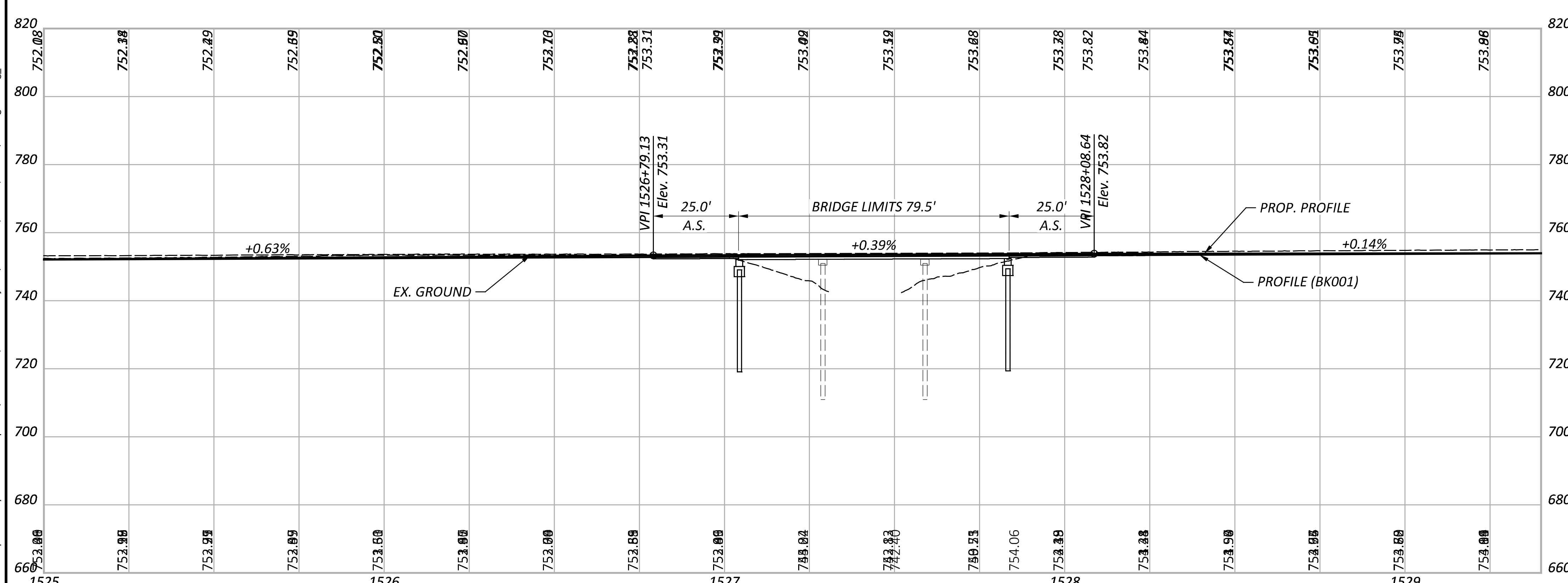
HEC-RAS Plan: Proposed River: Georges Creek Reach: Main

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)
Main	1100	2% AEP	754.19	754.10		0.01	0.02	3597.83	1514.45	2883.35	320.20	2.93
Main	1100	1% AEP	754.51	754.45		0.01	0.01	3745.53	1712.52	2689.06	724.42	2.63
Main	1100	0.2% AEP	754.75	754.66		0.01	0.02	3835.75	2505.60	3541.82	1360.58	3.38
Main	1074	2% AEP	754.15	754.12	750.41	0.01	0.01	2151.60	213.81	1569.78	2934.42	2.40
Main	1074	1% AEP	754.49	754.46	750.71	0.00	0.01	2373.50	285.00	1540.31	3300.69	2.26
Main	1074	0.2% AEP	754.72	754.67	752.80	0.01	0.01	2512.89	466.07	2091.96	4849.98	3.00
Main	1000 BR U	2% AEP	754.14	754.07	750.64	0.42	0.04	1565.92	1.39	1258.51	3458.10	2.67
Main	1000 BR U	1% AEP	754.48	754.43	753.05	0.23	0.00	1753.32	24.52	1124.50	3976.98	2.25
Main	1000 BR U	0.2% AEP	754.71	754.62	753.46	0.61	0.13	1849.38	66.10	1470.85	5871.05	2.86
Main	1000 BR D	2% AEP	753.67	753.48	750.59	0.01	0.65	1200.39		2100.63	2617.37	4.75
Main	1000 BR D	1% AEP	754.24	754.18	753.04	0.00	0.80	1624.88	4.09	1170.60	3951.31	2.50
Main	1000 BR D	0.2% AEP	753.96	753.43	753.43	0.01	0.01	1176.35		3408.17	3999.83	7.71
Main	930	2% AEP	753.01	750.65	750.38	0.09	1.04	73.36		4712.13	5.87	12.34
Main	930	1% AEP	753.44	750.70	750.69	0.09	1.23	73.69		5118.92	7.08	13.28
Main	930	0.2% AEP	753.46	752.90	752.90	0.06	0.11	1614.56	46.66	4234.43	3126.92	7.79
Main	904	2% AEP	751.88	751.61		0.01	0.11	1710.52	135.25	2481.53	2101.22	5.16
Main	904	1% AEP	752.13	751.85		0.01	0.11	1740.56	194.25	2603.00	2328.75	5.23
Main	904	0.2% AEP	753.09	752.74		0.02	0.14	1875.27	577.70	3323.68	3506.62	5.95

APPENDIX E

SITE PLAN





BENCHMARK DATA

BM #1 STA.	,	ELEV. ,	OFFSET ,
BM #2 STA.	,	ELEV. ,	OFFSET ,
BM #3 STA.	,	ELEV. ,	OFFSET ,
BM #4 STA.	,	ELEV. ,	OFFSET ,

FOR ADDITIONAL BENCHMARK INFORMATION. SEE ROADWAY PLAN SHEET

NOTES

EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

DESIGN TRAFFIC:
20XX ADT = 20XX ADTT =
20XX ADT = 20XX ADTT =
DIRECTIONAL DISTRIBUTION =

LEGEND

BORING LOCATION
- CHANNEL EXCAVATION
* - PHASE 1 CONSTRUCTION
** - PHASE 2 CONSTRUCTION
● 16'-6" REQUIRED MINIMUM VERTICAL CLEARANCE
15'-9¼" ACTUAL MINIMUM VERTICAL CLEARANCE

HYDRAULIC DATA

DRAINAGE AREA = SQ. MILES
Q ( ) = CFS V ( ) = FT/S
Q ( ) = CFS V ( ) = FT/S
STRUCTURE CLEARS THE YEAR
DESIGN HW BY FEET.

EXISTING STRUCTURE

TYPE: CONTINUOUS REINFORCED CONCRETE SLAB WITH CAPPED PILE SUBSTRUCTURE

SPANS: 24'-0", 30'-0", 24'-0" C/C BEARINGS
ROADWAY: 39'-0" F/F PARAPET
LOADING: HS/20-44 & ALTERNATIVE MILITARY LOADING
SKEW: 7° R.F.
WEARING SURFACE: 2¼" CONCRETE OVERLAY
APPROACH SLABS: 25'-0" LONG
ALIGNMENT: TANGENT
CROWN: 0.016
STRUCTURE FILE NUMBER: 2502194/2502224 (L/R)
DATE BUILT: 1963
DISPOSITION: SUPERSTRUCTURE WIDENING

PROPOSED STRUCTURE

TYPE: CONTINUOUS REINFORCED CONCRETE SLAB WITH CAPPED PILE SUBSTRUCTURE

SPANS: 24'-0", 30'-0", 24'-0" C/C BEARINGS
ROADWAY: TOE/TOE PARAPET
LOADING: HL93 AND ______ FUTURE WEARING SURFACE
SKEW:
WEARING SURFACE:
APPROACH SLABS: LONG (AS-1-15, AS-2-15)
ALIGNMENT:
CROWN: FT/FT
DECK AREA: SF
COORDINATES: LATITUDE
LONGITUDE

HORIZONTAL SCALE IN FEET 0 5 10 20

SITE PLAN
BRIDGE NO. FRA-33-29.00 L/R OVER GEORGE CREEK

SFN 2502194
SFN 2502224
DESIGN AGENCY
DESIGNER MMS | CHECKER EDW
REVIEWER JWE 09/01/24
PROJECT ID 119387
SUBSET 0 | TOTAL 0
SHEET P.0 | TOTAL 0

FRA-33-24.27

MODEL: Sheet_SurvFt PAPERSIZE: 17x11 (in.) DATE: 3/14/2025 TIME: 3:34:23 PM USER: meets
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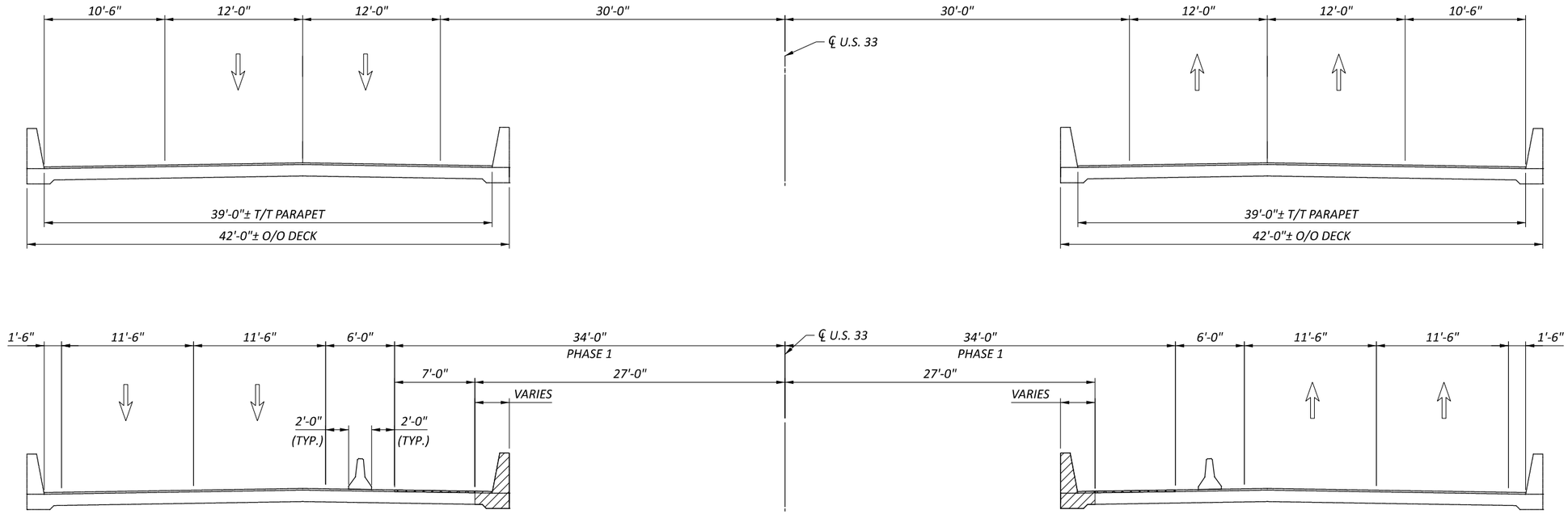

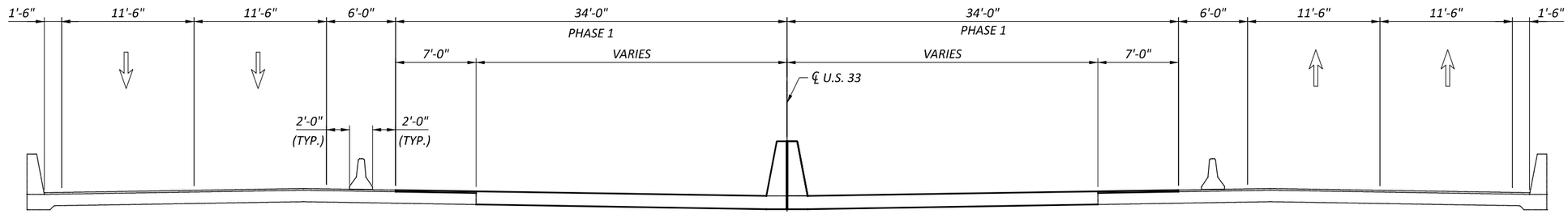

- *ITEM 202- PORTIONS OF STRUCTURE REMOVED*

- *ITEM 808 - SURFACE PREPARATION USING HYDRODEMOLITION*

SHEET TITLE
SHEET SUB-TITLE
SHEET SUB-TITLE 2

SFN	0
SFN	0
DESIGN AGENCY	
DESIGNER	XXX
CHECKER	XXX
REVIEWER	XXX MM-DD-YY
PROJECT ID	0
SUBSET	0
TOTAL	0
SHEET	P.0
TOTAL	0

CTY-RTE-SECTION

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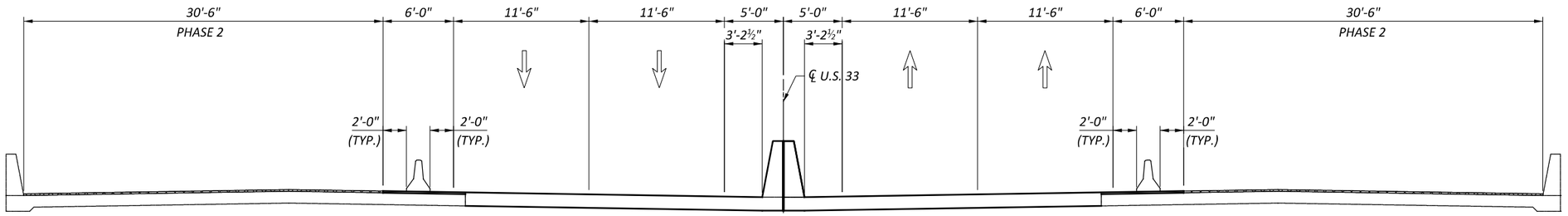
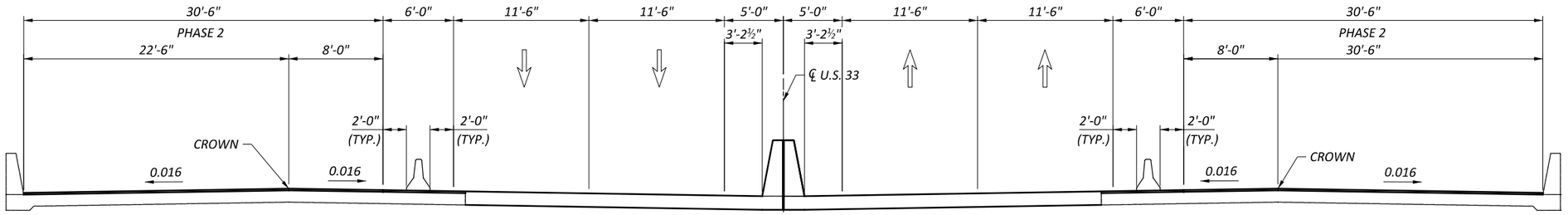


PHASE 2 REMOVAL



PHASE 2 CONSTRUCTION

- *ITEM 808 - SURFACE PREPARATION USING HYDRODEMOLITION*

CTY-RTE-SECTION

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SHEET TITLE
SHEET SUB-TITLE
SHEET SUB-TITLE 2

SFN	0
SFN	0
DESIGN AGENCY	
DESIGNER	CHECKER
XXX	XXX
REVIEWER	XXX MM-DD-YY
PROJECT ID	0
SUBSET	TOTAL
0	0
SHEET	TOTAL
P.0	0

APPENDIX F

NO-RISE CERTIFICATE

Form LD-50
Revised July 2024

No-Rise Certification Form

This is to certify that I am a qualified licensed professional engineer in the State of Ohio.

It is to further certify that the attached technical data supports the fact that the proposed roadway project: FRA-33-24.76 (Name of Project) will not create any increase to the 1-percent-annual-chance flood elevations on the Georges Creek (Name of Stream) at published cross-sections in the Flood Insurance Study (FIS) for Franklin County and Incorporated Areas (39049CV001D), dated 16th June 2011 (Name of Community/FIS) As modified by Letters of Map Revision 19-05-3292P and 22-05-1492P and will not create any increase to the 1-percent-annual-chance flood elevations at unpublished cross-sections in the vicinity of the proposed roadway project.

Engineer's Name: Erich Horn

Signature: [signature] **Date:** 7th Apr 2025

Phone Number: 614-823-4949 **E-MAIL:** erichh@resourceinternational.com

Agency/Firm: Resource International Inc.

Address: 6350 Presidential Gateway

City: Columbus **State:** Ohio **Zip Code:** 43231

ENGINEERS SEAL:

APPENDIX G

SITE PHOTOS

Georges Creek – Upstream Channel

Georges Creek – Downstream Channel

Georges Creek – Structure Opening

(Looking Downstream from under Westbound Structure)

Georges Creek – Downstream Channel

(Looking Downstream from Eastbound Existing Structure)