Stormwater Narrative – TVL Development (being Lot A of Rock Hill Quarries Plat 2)

Introduction

This report was prepared by Stock & Associates Consulting Engineers, Inc. for T-V Acquisition LLC for a property located at 1200 North Rock Hill Rd. in Ladue, Missouri, for the proposed project titled "TVL". The site lies within the Deer Creek watershed and is located along Deer Creek with Litzsinger Road to the North, Old Warson Rd. to the South and McKnight Rd. to the East. The total tract of property is approximately 50 Acres and known as Lot A Rock Hill Quarries Plat 2 and intended to be redeveloped through a Planned Development District Procedure in the City of Ladue. The development will included three (3) proposed Planning Areas, Single Family Residential on proposed lots A1 & A2, and Multi Family Residential and Mixed-Use Commercial Development on proposed lot A3. Deer Creek bifurcates the approximate 50 Ac. site and the creek will be within the proposed Common Ground for the PD District.

The existing site was the former McCarthy Headquarters and construction yard for Castle Contracting. The McCarthy Headquarters building was demolished in 2022. The site lies within the FEMA Floodway, Flood Zone "AE" and Flood Zone "X" per FIRM No. 29189C0326KH effective date of 2/4/15 & LOMR (Case: 23-07-0790P) panel 326 of 445 issue date of 1/5/24 and effective date of 5/20/24. The recent LOMR corrected the existing 100 yr. base flood elevation and floodway limits. The existing site with unattenuated flow drains to Deer Creek.

The proposed "TVL" Development will include improving and increasing the flood storage directly along the banks of Deer Creek by benching the banks of the Ordinary High-Water Mark and removing the Rock Hill Rd. bridge spanning Deer Creek. Fill will be placed on the subject site to raise the property above the 100 yr. Base Flood Elevation of Deer Creek, and the Deer Creek Floodway and Floodplain will be remapped via CLMOR (Conditional Letter of Map Revision) process. The development consists of constructing 42 single family residential homes and a 235 unit luxury apartment building containing garage parking and restaurant/retail space.
Six (6) nested bioretention basins are proposed to provide Water Quality (WQv), Channel Protection (CPv), Volume Reduction and Flood Protection (2yr-24hr & 100yr-24hr) Volume. The six (6) nested bioretention basins will discharge to Deer Creek, maintaining the existing drainage pattern except with BMP's implemented.

All drainage calculations are in accordance with MSD's "Rules & Regulations and Engineering Design Requirements for Sanitary Sewer and Stormwater Drainage Facilities" dated February 2018.

Stormwater Quality (WQv)

The 02/18 MSD Rules and Regulations include stormwater quality management facilities. The proposed project disturbs more than 1 acres; therefore, water quality is required. To achieve the required WQv six (6) nested bioretention basin are proposed to provide Water Quality (WQv). The total water quality volume/infiltration for each sub area was determined using the equation Volume = P x Rv x A in accordance with the MSD's rules and regulations for 1.14 inches of

rainfall. Quality/Quantity Management of the 1.14" rainfall event will be provided using Nested Bio-Retention Basin BMPs.

Channel Protection (CPv)

To protect channels from erosion, a 24-hour extended detention of the 1-yr, 24-hour storm event is to be provided. The rationale for this criterion is that runoff will be stored and released in such a gradual manner that critical erosive velocities during bankfull and near-bankfull events will seldom be exceeded or prolonged in downstream channels. Channel Protection is provided in the six (6) nested bioretention basins.

Volume Reduction

MSD has adopted water reduction requirements for development projects to design and implement controls to prevent or minimize water quality impacts by effectively utilizing water quality strategies and technologies, including those that reduce runoff volume, to the maximum extent practicable. Volume reduction will be achieved via the six (6) nested detention basins.

Flood Protection

The proposed project has a differential runoff greater than 2.0 c.f.s., which requires detention be provided. The subject site lies within the sensitive Deer Creek Watershed, which is held to "zero increase" release rate. To protect downstream areas from flooding, stormwater will be detained on site and released at a rate not exceeding the existing discharge rate. The six (6) nested detention basins are designed to detain the 2yr-24hr and 100yr-24hr storm.

Addressing Section 110-122 of the City of Ladue Zoning and Planning Ordinance
Stream Buffer Benefits

(1) *Protecting, restoring and maintaining the chemical, physical and biological integrity of streams and their water resources.*

- Physical Integrity - The stream banks will be vegetated which provide natural filtration and structurally stabilize the slope, while slowing storm water runoff.
- Chemical Integrity – the vegetation will take up nitrogen and phosphorus and filter pollutants from surface runoff.
- Biological Integrity – live stakes will create shade and woody debris and the vegetation will provide leaf litter which is habitat for insects.

(2) *Removing pollutants delivered in urban stormwater*

- *The proposed TVL Development will provide six (6) stormwater management basins designed in accordance with the Metropolitan St. Louis Sewer District's Best Management Practices (BMP) to prevent/reduce pollutants in stormwater runoff. The Water Quality (WQv) component of the bioretention basins filters suspended solids & pollutants for the first 1.14" rainfall event.*

(3) *Reducing erosion and controlling sedimentation.*

- The vegetated slopes and rip rap revetement will slow storm water runoff, thereby reducing erosive potential and will also filter sediment from the runoff

(4) *Protecting and stabilizing stream banks*

- The proposed measures include short term (prior to vegetation establishment) and long-term solutions designed to withstand the stream velocities to reduce erosion and scour.

(5) *Providing for infiltration of stormwater runoff*

- *The proposed TVL development will provide six (6) nested bioretention basins. These type of basins are designed to manage the site's Water Quality (WQv), Channel Protection (CPv), 2yr-24 hour & 100yr-24 Flood Detention (FPv) and Volume Reduction requirements for the 1.14" rainfall event in accordance with the Metropolitan St. Louis Sewer District & City of the Ladue. Bioretention stores, filters, and infiltrates stormwater runoff. The basin is a depressed landscape feature comprised of vegetation; organic soil that will drain well and provide a growing media for plants; a graded filter of sands and gravels below the soil; a perforated underdrain pipe beneath the*

graded filter to ensure the bioretention will drain, and overflow structure to pass storms larger than the bioretention design storm.

(6) Maintaining base flow of streams

- *On-site detention is provided via the six (6) nested stormwater management basins. The subject site is in a sensitive watershed, Deer Creek. This is a "zero increase" release rate watershed per The Metropolitan St. Louis Sewer District Rules and Regulations. The basins are designed to detain the Water Quality (1.14" storm), 1yr-24 hour (Channel Protection), and the 2yr-24hours & 100yr-24 hour storms and release the stormwater runoff from the site at a rate that does not exceed the existing discharge rate. Today, the entire site with unattenuated flow discharges to Deer Creek, the existing drainage pattern will be maintained, but with BMP's implemented.*

(7) Contributing organic matter that is a source of food and energy for the aquatic ecosystem.

- The vegetated slopes and live staking will provide lea litter and root organic matter.

(8) Providing tree canopy to shade streams and promote desirable aquatic habitat.

- The willow live stakes will provide shade as they become established.

(9) Providing riparian wildlife habitat

- The vegetation and willows will provide layered vertical cover providing habitat or diverse species and will provide shade or lower water temps or aquatic li e.

(10) *Furnishing scenic value and recreational opportunity.*

- *The vegetated slopes and sweeping arc form mimics shape of natural creeks. Plantings will be native species with seasonal variations in height, color, form and texture.*
- *The regional trail located above the floodway will provide all season access and the opportunity to function as a spine for other pedestrian networks to interface with areas of the site.*

(11) *Providing opportunities for the protection and restoration of greenspace.*

- *Per Ordinance 2401, bioretention basins, landscape retention basins, and other BMP's included in the stormwater management plan for the development are considered "greenspace". All of the proposed stormwater management basins will be in a recorded BMP Reserve Area as required by the Metropolitan St. Louis Sewer District. The Reserve Areas In addition to a recorded maintenance agreement between the*

owner/developer/subsequent Homeowners Association and MSD to ensure the stormwater basin will be maintained. To remain in compliance with the District's requirements, an annual BMP Maintenance Report is required to be submitted to MSD no later than March 31st following the reporting year.

Rock Hill Quarries - Flood Study

Deer Creek
City of Ladue, MO; City of Rock Hill, MO

Prepared for:

T-V Acquisition LLC
12647 Olive Blvd, Suite 510
St. Louis, MO 63141

Prepared By:

Stock & Associates Consulting Engineers, Inc.
257 Chesterfield Business Parkway
St. Louis, MO 63005

Stock Project No. 224-7700.2
MSD Review No. 26FLPLS-

Date: March 19, 2026

Prepared By:

Eric J. Fischer

Eric J. Fischer, P.E.
Civil Engineer
License No. PE-2009018719

Under Direct Supervision of:

STATE OF MISSOURI
GEORGE MICHAEL STOCK
NUMBER PE-25116
PROFESSIONAL ENGINEER

George M. Stock, P.E.
Civil Engineer
License No. E-25116

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LOMR 23-07-0790P

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I. EXECUTIVE SUMMARY

Introduction

This Flood Study was prepared by Stock & Associates Consulting Engineers, Inc. for T-V Acquisition LLC for a property located at 1200 North Rock Hill Rd. in Ladue, Missouri. The site lies within the Deer Creek watershed and is located along Deer Creek with Old Warson Rd. to the South and McKnight Rd. to the East. The total tract of property is approximately 77 Acres. Rock Hill Quarries property consists of Two (2) Platted Lots, Lot A which is 49.66 Acres and intended to be redeveloped through a Planned Development District Procedure in the City of Ladue. It will include a Mix of Uses in three (3) Planning Areas, Single Family Residential, Multi Family Residential and Commercial Development. Lot B, which is 26.80 acres, is the active Landfill which has been in operation since 1975 and Operates via a Special use Permit through the City of Ladue. It is scheduled to cease operation on 12/31/29 and through a Closure permit issued by the Missouri Department of Natural resources will be closed by 12/31/30.

The purpose of this study is to analyze the site and adjacent 100 yr. floodplain of Deer Creek to determine how much area could possibly be reclaimed from the floodplain. In the proposed condition, this area would be raised above the 100 yr. Base Flood Elevation (BFE) of Deer Creek, and the Deer Creek Floodway and Floodplain would be remapped via a CLOMR (Conditional Letter of Map Revision) process.

A LOMR, 23-07-0790P, was issued by FEMA on May 20, 2024. This LOMR corrected the existing 100 yr. BFE and Floodway Limits.

The FIS reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground and structure elevations can be referenced and compared. Until recently, the standard vertical datum in use for newly created or revised FIS reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD29). With the finalization of the North American Vertical Datum of 1988 (NAVD88), many FIS reports and FIRMs are being prepared using the NAVD88 as the referenced vertical datum. All flood elevations shown in the St. Louis County FIS report and on the FIRM are referenced to NAVD88 (please see Appendix VII). Deer Creek has an Average Conversion Factor of -0.29. Therefore, to equate the elevations shown in this flood study based on NGVD29 to the published FIS results NAVD88 one will need to subtract 0.29 ft. to the elevations shown in this study, see Appendix III.

Example: Cross Section 4.148 (Section AJ)

Model Elevation = 470.96

FIS published elevation = 470.67 (470.7)

Pre-Project Conditions

For the hydraulic analysis of this area, the hydraulic model from the FEMA project library was obtained. This model was in hard copy form and used a HEC-2 model for the hydraulic analysis. For this study, this model was converted to a HEC-RAS model.

The table below shows the starting water surface boundary conditions used for the hydraulic models.

Cross Section	100 Yr. Starting Water Surface Elevation (ft.)*	15 Yr. Starting Water Surface Elevation (ft.)**	100 Yr. Flow Rate (cfs)*	15 Yr. Flow Rate (cfs)**
4.036	470.33	467.45	17,035	11,750

*FROM HEC-2 DATA OBTAINED FROM FEMA FOR DEER CREEK

**FROM FLOOD FREQUENCY PROBABILITY PLOTS USING HEC-2 DATA OBTAINED FROM FEMA FOR DEER CREEK

FEMA's HEC-2 model was used to create a corrected effective model of Deer Creek to correct the existing 100 yr. BFE and Floodway limits. A LOMR, 23-07-0790P, was issued by FEMA on May 20, 2024. For the purposes of this study the LOMR model becomes the Effective Model for this analysis.

The cross sections (shown on C1: Existing Conditions Plan) were revised to reflect a Surdex aerial topography survey and a topographical survey of the site dated January 14, 2026. The cross sections were updated to reflect this new aerial topography. These revisions to the model were required to create an accurate model of the existing site conditions. A comparison of the elevations from this Existing Conditions Model and the Effective Model for the 100 yr. floodplain is as shown on Table 1 of this report.

Table 1: Comparison of Existing Conditions Model vs. HEC-RAS Effective Model (100 Yr. BFE)

Flood Data from Deer Creek HEC-RAS Effective Model				Flood Data from Deer Creek HEC-RAS Existing Conditions Model					
Station/ Section	Profile	100 yr Flow	100 yr. Elev. E1(ft.)	Station/ Section	Profile	100 yr Flow	100 yr. Elev. E2(ft.)	Difference E2-E1	Location of X-Section
4.743	100-yr	16,358	476.93	4.743	100-yr	16,358	476.67	-0.26	Upstream of Project
4.625	100-yr	16,358	476.29	4.625	100-yr	16,358	475.71	-0.58	Onsite Section
4.612	100-yr	16,358	474.16	4.612	100-yr	16,358	474.09	-0.07	Onsite Section
4.563	100-yr	16,358	474.55	4.563	100-yr	16,358	473.84	-0.71	Onsite Section
4.464	100-yr	16,358	474.54	4.464	100-yr	16,358	473.98	-0.56	Onsite Section
4.419	100-yr	16,358	474.05	4.419	100-yr	16,358	473.60	-0.45	Onsite Section
4.365	100-yr	17,157	473.13	4.365	100-yr	17,157	472.58	-0.55	Onsite Section
4.259	100-yr	17,157	472.52	4.259	100-yr	17,157	472.26	-0.26	Onsite Section
4.165	100-yr	17,157	472.33	4.165	100-yr	17,157	472.11	-0.22	Onsite Section
4.160	100-yr	17,157	472.18	4.160	100-yr	17,157	472.05	-0.13	Onsite Section
4.158	100-yr	Bridge		4.158	100-yr	Bridge		-	Onsite Section
4.157	100-yr	17,157	471.98	4.157	100-yr	17,157	471.96	-0.02	Onsite Section
4.148	100-yr	17,157	471.88	4.148	100-yr	17,157	471.81	-0.07	Onsite Section
4.080	100-yr	17,157	471.50	4.080	100-yr	17,157	471.48	-0.02	Onsite Section
4.073	100-yr	17,157	471.53	4.073	100-yr	17,157	471.43	-0.10	Onsite Section
4.069	100-yr	17,157	471.20	4.069	100-yr	17,157	471.20	0.00	Onsite Section
4.060	100-yr	Bridge		4.060	100-yr	Bridge		-	Downstream of Project
4.057	100-yr	17,035	470.67	4.057	100-yr	17,035	470.67	0.00	Downstream of Project
4.049	100-yr	17,035	470.60	4.049	100-yr	17,035	470.60	0.00	Downstream of Project
4.036	100-yr	17,035	470.33	4.036	100-yr	17,035	470.33	0.00	Downstream of Project

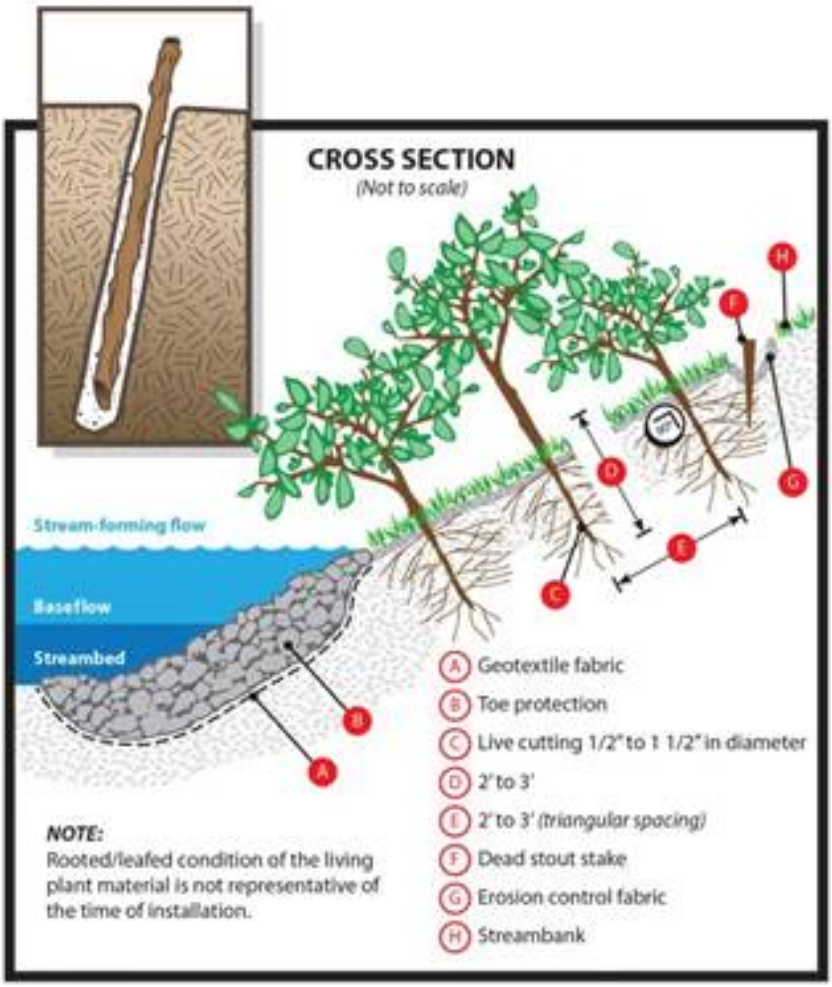
Proposed Conditions

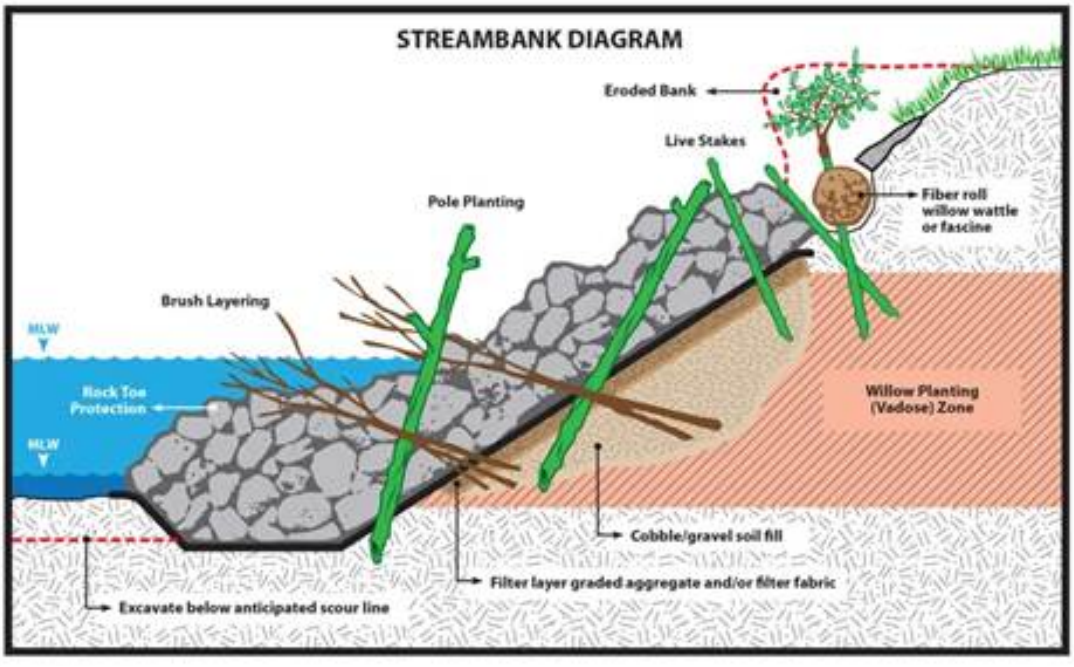
The Existing Conditions Model was modified to include improving and increasing the flood storage area directly along the banks of Deer Creek by benching the banks above the OHWM, fill placed on the property, and the removal of the Rock Hill Rd. bridge. Per the SCI Engineering, Inc. report titled "Wetland and Waterbody Delineation Report and Section 404/401 Permit Application," dated April 29, 2021, Deer Creek Ordinary High-Water Mark (OHWM) was frequently observed at or near the toe of the slope of its banks. The observed OHWM is between 15 and 35 feet in width depending on the location along the length of the stream and water depths range between 6 and 18 inches. The mannings 'n' coefficient was revised to reflect the proposed condition along the portion of the project with the benched banks. Mannings 'n' value between 0.045 and 0.075, a floodplain condition with light brush and trees will be used in the proposed conditions model between sections 4.080 and 4.464.

SCI Engineering, Inc. (project Geotechnical Engineer and Environmental Engineer) and Loomis Associates (project Landscape Architect) will assist in preparing a bank stabilization plan for the proposed work. The project intends to use a combination of hard armor for high velocity reaches with willow stakes/live stakes (examples shown below) with trees and shrubs along the top of the bank. Other forms of stabilization will include heavy willow staking with turf reinforcement mats and native grass seeding or grass plugs.

Below are a few examples of what is proposed for the bank stabilization and armoring.




CROSS SECTION
(Not to scale)
Stream-forming flow
Baseflow
Streambed
A
B
C
D
E
F
G
H
NOTE:
Rooted/leafed condition of the living plant material is not representative of the time of installation.
A Geotextile fabric
B Toe protection
C Live cutting 1/2" to 1 1/2" in diameter
D 2' to 3'
E 2' to 3' (triangular spacing)
F Dead stout stake
G Erosion control fabric
H Streambank


STREAMBANK DIAGRAM
Eroded Bank
Live Stakes
Pole Planting
Fiber roll willow wattle or fascine
Brush Layering
MLW
Rock Toe Protection
MLW
Willow Planting (Vadose) Zone
Cobble/gravel soil fill
Filter layer graded aggregate and/or filter fabric
Excavate below anticipated scour line



Due to the removal of the bridge the expansion and contraction coefficients for sections 4.157, 4.16 and 4.165 were lowered down to 0.1 and 0.3. Fill would be placed to a minimum elevation of 474 to allow a buildable pad out of the floodplain as shown on C2: Proposed Conditions Plan. Table 2 is a comparison of the Proposed Conditions Model vs. the Existing Conditions Model.

Table 2: Comparison of Existing Conditions Model vs. Proposed Conditions Model (100 Yr. BFE)

Flood Data from Deer Creek HEC-RAS Existing Conditions Model				Flood Data from Deer Creek HEC-RAS Proposed Conditions Model					
Station/ Section	Profile	100 yr Flow	100 yr. Elev. E1(ft.)	Station/ Section	Profile	100 yr Flow	100 yr. Elev. E2(ft.)	Difference E2-E1	Location of X-Section
4.743	100-yr	16,358	476.67	4.743	100-yr	16,358	476.67	0.00	Upstream of Project
4.625	100-yr	16,358	475.71	4.625	100-yr	16,358	475.71	0.00	Onsite Section
4.612	100-yr	16,358	474.09	4.612	100-yr	16,358	474.08	-0.01	Onsite Section
4.563	100-yr	16,358	473.84	4.563	100-yr	16,358	473.83	-0.01	Onsite Section
4.464	100-yr	16,358	473.98	4.464	100-yr	16,358	473.68	-0.30	Onsite Section
4.419	100-yr	16,358	473.60	4.419	100-yr	16,358	473.32	-0.28	Onsite Section
4.365	100-yr	17,157	472.58	4.365	100-yr	17,157	472.58	0.00	Onsite Section
4.259	100-yr	17,157	472.26	4.259	100-yr	17,157	472.13	-0.13	Onsite Section
4.165	100-yr	17,157	472.11	4.165	100-yr	17,157	471.70	-0.41	Onsite Section
4.160	100-yr	17,157	472.05	4.160	100-yr	17,157	471.70	-0.35	Onsite Section
4.158	100-yr	Bridge							
4.157	100-yr	17,157	471.96	4.157	100-yr	17,157	471.69	-0.27	Onsite Section
4.148	100-yr	17,157	471.81	4.148	100-yr	17,157	471.69	-0.12	Onsite Section
4.080	100-yr	17,157	471.48	4.080	100-yr	17,157	471.24	-0.24	Onsite Section
4.073	100-yr	17,157	471.43	4.073	100-yr	17,157	471.20	-0.23	Onsite Section
4.069	100-yr	17,157	471.20	4.069	100-yr	17,157	471.20	0.00	Onsite Section
4.060	100-yr	Bridge		4.060	100-yr	Bridge		-	Downstream of Project
4.057	100-yr	17,035	470.67	4.057	100-yr	17,035	470.67	0.00	Downstream of Project
4.049	100-yr	17,035	470.60	4.049	100-yr	17,035	470.60	0.00	Downstream of Project
4.036	100-yr	17,035	470.33	4.036	100-yr	17,035	470.33	0.00	Downstream of Project

The City of Ladue Code 124-14(a)(6) states that "any proposed alteration or relocation of any watercourse shall not diminish the flood carrying capacity of the watercourse." We have calculated the existing and proposed flood carrying capacity within our property to be as follows:

Existing Flood Carrying Capacity of the Watercourse: 340,296 c.y.
Proposed Flood Carrying Capacity of the Watercourse: 345,884 c.y.

Per MSD requirements, 15-year flows were added to the HECRAS model. These flows and corresponding starting water surface elevations were determined using a Flood Frequency Probability Plot of the known flood frequency flows and elevations and interpolating to get the approximate 15-year flow and corresponding starting water surface elevation. The Flood Frequency Probability Plots for the 15-year flows are included in Appendix II. A comparison of the elevations from the Corrected Effective/Existing Conditions model and the Proposed Conditions model for the 15-year floodplain is as shown on Table 4 of this report.

Table 4: Comparison of Existing Conditions Model vs. Proposed Conditions Model (15 Yr. BFE)

Flood Data from Deer Creek HEC-RAS Existing Conditions Model				Flood Data from Deer Creek HEC-RAS Proposed Conditions Model					
Station/ Section	Profile	100 yr Flow	100 yr. Elev. E1(ft.)	Station/ Section	Profile	100 yr Flow	100 yr. Elev. E2(ft.)	Difference E2-E1	Location of X-Section
4.743	15-yr	16,358	474.52	4.743	15-yr	16,358	474.30	-0.22	Upstream of Project
4.625	15-yr	16,358	473.72	4.625	15-yr	16,358	473.43	-0.29	Onsite Section
4.612	15-yr	16,358	472.58	4.612	15-yr	16,358	472.22	-0.36	Onsite Section
4.563	15-yr	16,358	472.31	4.563	15-yr	16,358	471.86	-0.45	Onsite Section
4.464	15-yr	16,358	472.19	4.464	15-yr	16,358	471.62	-0.57	Onsite Section
4.419	15-yr	16,358	471.94	4.419	15-yr	16,358	471.46	-0.48	Onsite Section
4.365	15-yr	17,157	471.19	4.365	15-yr	17,157	471.00	-0.19	Onsite Section
4.259	15-yr	17,157	470.88	4.259	15-yr	17,157	470.69	-0.19	Onsite Section
4.165	15-yr	17,157	470.76	4.165	15-yr	17,157	470.41	-0.35	Onsite Section
4.160	15-yr	17,157	470.71	4.160	15-yr	17,157	470.41	-0.30	Onsite Section
4.158	15-yr	Bridge							
4.157	15-yr	17,157	470.64	4.157	15-yr	17,157	470.41	-0.23	Onsite Section
4.148	15-yr	17,157	470.52	4.148	15-yr	17,157	470.41	-0.11	Onsite Section
4.080	15-yr	17,157	470.29	4.080	15-yr	17,157	470.15	-0.14	Onsite Section
4.073	15-yr	17,157	470.26	4.073	15-yr	17,157	470.09	-0.17	Onsite Section
4.069	15-yr	17,157	470.06	4.069	15-yr	17,157	470.06	0.00	Onsite Section
4.060	15-yr	Bridge		4.060	15-yr	Bridge		-	Downstream of Project
4.057	15-yr	17,035	467.51	4.057	15-yr	17,035	467.51	0.00	Downstream of Project
4.049	15-yr	17,035	467.50	4.049	15-yr	17,035	467.50	0.00	Downstream of Project
4.036	15-yr	17,035	467.45	4.036	15-yr	17,035	467.45	0.00	Downstream of Project

Preliminary FEMA Maps

It should be noted that FEMA is in the process of updating the flood maps for Deer Creek. The latest preliminary maps available on FEMA's website indicate that the 100 yr. BFE for Deer Creek within the project site will be decreasing approximately 1 foot (See Appendix III). Because the effective maps have the more conservative elevations the effective mapping and modeling will remain the basis of this flood study.

Floodway Model

Table 3 shows a comparison of the Floodway Model vs. the Proposed Conditions Model. The table shows that the floodway elevations are within the 1 ft. threshold per FEMA requirements. This flood study will require a CLOMR to adjust the floodway limits as shown on C2: Proposed Conditions Plan.

Table 3: Comparison of Corrected Effective/Ex Cond Floodway Model vs. Corrected Effective/Ex Cond Model (100 Yr. BFE)

Flood Data from Deer Creek HEC-RAS Proposed Conditions Model				Flood Data from Deer Creek HEC-RAS Proposed Conditions Model-Floodway					
Station/ Section	Profile	100 yr Flow	100 yr. Elev. E1(ft.)	Station/ Section	Profile	100 yr Flow	100 yr. Elev. E2(ft.)	Difference E2-E1	Location of X-Section
4.743	100-yr	16,358	476.67	4.743	FW	16,358	477.37	0.70	Upstream of Project
4.625	100-yr	16,358	475.71	4.625	FW	16,358	476.35	0.64	Onsite Section
4.612	100-yr	16,358	474.08	4.612	FW	16,358	474.60	0.52	Onsite Section
4.563	100-yr	16,358	473.83	4.563	FW	16,358	474.33	0.50	Onsite Section
4.464	100-yr	16,358	473.68	4.464	FW	16,358	474.09	0.41	Onsite Section
4.419	100-yr	16,358	473.32	4.419	FW	16,358	473.95	0.63	Onsite Section
4.365	100-yr	17,157	472.58	4.365	FW	17,157	473.25	0.67	Onsite Section
4.259	100-yr	17,157	472.13	4.259	FW	17,157	472.89	0.76	Onsite Section
4.165	100-yr	17,157	471.70	4.165	FW	17,157	472.55	0.85	Onsite Section
4.160	100-yr	17,157	471.70	4.160	FW	17,157	472.55	0.85	Onsite Section
4.157	100-yr	17,157	471.69	4.157	FW	17,157	472.54	0.85	Onsite Section
4.148	100-yr	17,157	471.69	4.148	FW	17,157	472.55	0.86	Onsite Section
4.080	100-yr	17,157	471.24	4.080	FW	17,157	472.17	0.93	Onsite Section
4.073	100-yr	17,157	471.20	4.073	FW	17,157	471.82	0.62	Onsite Section
4.069	100-yr	17,157	471.20	4.069	FW	17,157	471.77	0.57	Onsite Section
4.060	100-yr	Bridge		4.060	FW	Bridge		-	Downstream of Project
4.057	100-yr	17,035	470.67	4.057	FW	17,035	470.94	0.27	Downstream of Project
4.049	100-yr	17,035	470.60	4.049	FW	17,035	470.69	0.09	Downstream of Project
4.036	100-yr	17,035	470.33	4.036	FW	17,035	470.52	0.19	Downstream of Project

This flood study will be subject to review by the City of Ladue, City of Rock Hill and MSD for compliance with current floodplain regulations. The SCI Engineering, Inc. report also includes applications for a Section 404 of the Clean Water Act Permit from the U.S. Army Corps of Engineers (USACE) and a Section 401 Water Quality Certification from Missouri Department of Natural Resources (MDNR) for the bridge removal and the point source discharges into Deer Creek. Once the City of Ladue has approved the study the CLOMR will be submitted to FEMA for review and approval. MDNR will be one of the permitting agencies for land disturbance and stormwater discharge for any future development.

Velocity Analysis

The City of Ladue has restrictions on the development of floodplain, floodway and floodway fringe as it relates to mean flow velocity in the creek as outlined in Ordinance 2103. The ordinance states “for any other work of any kind or description which makes any changes in said areas must do such work in a manner that will result in no increase in water surface elevation (equal to or less than 0.00 feet) and no increase in mean flow velocity (equal to or less than 0.00 feet per second).” MSD also has regulations on the velocity within the creek which states “channel and overbank (flood plain) velocities should generally not increase by more than fifty percent (50%) over pre-developed conditions” as outlined in their Rules and Regulations dated February 1, 2018 (both included in Appendix IV). The City of Ladue’s Floodplain Management Board previously granted a variance for increase flow velocity for the Phase One flood study on February 6, 2019.

Table 5: Comparison of Existing Conditions Model vs. Proposed Conditions Model (Velocities)

Flood Data from Deer Creek HEC-RAS Existing Conditions Model				Flood Data from Deer Creek HEC-RAS Proposed Conditions Model					
Station/ Section	Profile	100 yr Flow	100 yr. Velocity V1(ft.)	Station/ Section	Profile	100 yr Flow	100 yr. Velo. V2(ft.)	Difference V2-V1(%)	Location of X-Section
4.743	100-yr	16,358	5.53	4.743	100-yr	16,358	5.53	0%	Upstream of Project
4.625	100-yr	16,358	6.73	4.625	100-yr	16,358	6.73	0%	Onsite Section
4.612	100-yr	16,358	11.90	4.612	100-yr	16,358	11.90	0%	Onsite Section
4.563	100-yr	16,358	10.01	4.563	100-yr	16,358	10.02	0%	Onsite Section
4.464	100-yr	16,358	5.51	4.464	100-yr	16,358	7.37	34%	Onsite Section
4.419	100-yr	16,358	6.11	4.419	100-yr	16,358	7.22	18%	Onsite Section
4.365	100-yr	17,157	8.75	4.365	100-yr	17,157	8.61	-2%	Onsite Section
4.259	100-yr	17,157	5.78	4.259	100-yr	17,157	6.53	13%	Onsite Section
4.165	100-yr	17,157	4.14	4.165	100-yr	17,157	6.75	63%	Onsite Section
4.160	100-yr	17,157	5.08	4.160	100-yr	17,157	6.61	30%	Onsite Section
4.158	100-yr	Bridge							
4.157	100-yr	17,157	4.99	4.157	100-yr	17,157	6.52	31%	Onsite Section
4.148	100-yr	17,157	5.78	4.148	100-yr	17,157	6.17	7%	Onsite Section
4.080	100-yr	17,157	6.23	4.080	100-yr	17,157	7.40	19%	Onsite Section
4.073	100-yr	17,157	5.35	4.073	100-yr	17,157	6.44	20%	Onsite Section
4.069	100-yr	17,157	7.85	4.069	100-yr	17,157	7.85	0%	Onsite Section
4.060	100-yr	Bridge		4.060	100-yr	Bridge			Downstream of Project
4.057	100-yr	17,035	8.45	4.057	100-yr	17,035	8.45	0%	Downstream of Project
4.049	100-yr	17,035	6.99	4.049	100-yr	17,035	6.99	0%	Downstream of Project
4.036	100-yr	17,035	7.89	4.036	100-yr	17,035	7.89	0%	Downstream of Project

The table above shows the existing velocities within the creek as compared to the proposed velocities. The velocities range from a 2% decrease to a 34% increase, with the exception of one isolated location where the velocity increases from 4.14 ft./sec to 6.75 ft./sec (63% increase). The velocity increases are limited to the channel modifications located within the site and return to existing conditions at the upstream limits of the project. The highest increase is located at the former Rock Hill Road Bridge location. This is to be expected because the original bridge acted as a constriction to the natural flow of the Creek. The entire reestablished channel through the Rock Hill Quarry property will be armored with vegetation to mitigate velocity increases as previously discussed.

While the increase in velocities do not meet the requirements as set forth by the City of Ladue, they are within the tolerances of the MSD regulations with the exception of section 4.165. It should also be noted that the changes in velocity are due to the removal of the existing Rock Hill Rd. bridge and the constriction the bridge caused within the creek and will be mitigated with armoring. This project will request a variance from the City of Ladue Zoning Board of Adjustment due to the increase in velocities within Deer Creek.

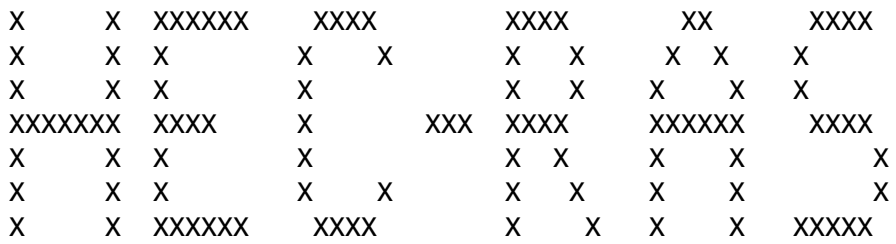
Conclusions

The purpose of this study was to analyze the 100 yr. floodplain of Deer Creek to demonstrate that the Creek modifications do not have an adverse impact on the 100 Yr. elevations of Deer Creek. The results obtained show that the proposed work will not create an adverse impact on the 100-year water surface elevations of Deer Creek or the surrounding properties. This flood study will require a CLOMR to adjust the floodway and floodplain limits as shown on C2: Proposed Conditions Plan.

II. HEC-RAS Output – Deer Creek Effective Model

- HEC-RAS Input
- 100 Yr.-Flood Profile Table
- Cross Sections Showing 100 yr Water Surface Elevation

HEC-RAS HEC-RAS 6.6 September 2024
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California



PROJECT DATA
Project Title: 7700.2FS-CLOMR
Project File : 7700.prj
Run Date and Time: 3/17/2026 10:16:31 AM

Project in English units

Project Description:
DEER CREEK
RIVER DES PERES STUDY JUNE 1982
RETURN PERIODS
OF 10, 50, 100 AND 500 YEAR
DEER CREEK
RIVER DES PERES STUDY JUNE
1982
RETURN PERIODS OF 10, 50, 100 AND 500 YEAR

PLAN DATA

Plan Title: Effective Model
Plan File : o:\DRAW7700\20247700\Floodstudy\Hec-Ras Files\7700.p01

Geometry Title: Effective Model
Geometry File : o:\DRAW7700\20247700\Floodstudy\Hec-Ras Files\7700.g03

Flow Title : Imported Flow 01
Flow File : o:\DRAW7700\20247700\Floodstudy\Hec-Ras Files\7700.f01

Plan Description:
Effective Model

Plan Summary Information:
Number of: Cross Sections = 18 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 2 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

Encroachment Data
Equal Conveyance = True
Left Offset = 0

Right Offset = 0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
5.259	15 Yr.	0	0	0
5.029	15 Yr.	0	0	0
5.022	15 Yr.	0	0	0
5.021	15 Yr.	0	0	0
5.018	15 Yr.	0	0	0
5.017	15 Yr.	0	0	0
5.013	15 Yr.	0	0	0
4.859	15 Yr.	0	0	0
4.743	15 Yr.	0	0	0
4.625	15 Yr.	0	0	0
4.612	15 Yr.	0	0	0
4.563	15 Yr.	0	0	0
4.464	15 Yr.	0	0	0
4.419	15 Yr.	0	0	0
4.365	15 Yr.	0	0	0
4.259	15 Yr.	0	0	0
4.165	15 Yr.	0	0	0
4.16	15 Yr.	0	0	0
4.157	15 Yr.	0	0	0
4.148	15 Yr.	0	0	0
4.080	15 Yr.	0	0	0
4.073	15 Yr.	0	0	0
4.069	15 Yr.	0	0	0
4.057	15 Yr.	0	0	0
4.049	15 Yr.	0	0	0
4.036	15 Yr.	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
5.259	50 Yr.	0	0	0
5.029	50 Yr.	0	0	0
5.022	50 Yr.	0	0	0
5.021	50 Yr.	0	0	0
5.018	50 Yr.	0	0	0

5.017	50 Yr.	0	0	0
5.013	50 Yr.	0	0	0
4.859	50 Yr.	0	0	0
4.743	50 Yr.	0	0	0
4.625	50 Yr.	0	0	0
4.612	50 Yr.	0	0	0
4.563	50 Yr.	0	0	0
4.464	50 Yr.	0	0	0
4.419	50 Yr.	0	0	0
4.365	50 Yr.	0	0	0
4.259	50 Yr.	0	0	0
4.165	50 Yr.	0	0	0
4.16	50 Yr.	0	0	0
4.157	50 Yr.	0	0	0
4.148	50 Yr.	0	0	0
4.080	50 Yr.	0	0	0
4.073	50 Yr.	0	0	0
4.069	50 Yr.	0	0	0
4.057	50 Yr.	0	0	0
4.049	50 Yr.	0	0	0
4.036	50 Yr.	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
5.259	100 Yr.	0	0	0
5.029	100 Yr.	0	0	0
5.022	100 Yr.	0	0	0
5.021	100 Yr.	0	0	0
5.018	100 Yr.	0	0	0
5.017	100 Yr.	0	0	0
5.013	100 Yr.	0	0	0
4.859	100 Yr.	0	0	0
4.743	100 Yr.	0	0	0
4.625	100 Yr.	0	0	0
4.612	100 Yr.	0	0	0
4.563	100 Yr.	0	0	0
4.464	100 Yr.	0	0	0
4.419	100 Yr.	0	0	0

4.365	100 Yr.	0	0	0
4.259	100 Yr.	0	0	0
4.165	100 Yr.	0	0	0
4.16	100 Yr.	0	0	0
4.157	100 Yr.	0	0	0
4.148	100 Yr.	0	0	0
4.080	100 Yr.	0	0	0
4.073	100 Yr.	0	0	0
4.069	100 Yr.	0	0	0
4.057	100 Yr.	0	0	0
4.049	100 Yr.	0	0	0
4.036	100 Yr.	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
5.259	500 Yr.	0	0	0
5.029	500 Yr.	0	0	0
5.022	500 Yr.	0	0	0
5.021	500 Yr.	0	0	0
5.018	500 Yr.	0	0	0
5.017	500 Yr.	0	0	0
5.013	500 Yr.	0	0	0
4.859	500 Yr.	0	0	0
4.743	500 Yr.	0	0	0
4.625	500 Yr.	0	0	0
4.612	500 Yr.	0	0	0
4.563	500 Yr.	0	0	0
4.464	500 Yr.	0	0	0
4.419	500 Yr.	0	0	0
4.365	500 Yr.	0	0	0
4.259	500 Yr.	0	0	0
4.165	500 Yr.	0	0	0
4.16	500 Yr.	0	0	0
4.157	500 Yr.	0	0	0
4.148	500 Yr.	0	0	0
4.080	500 Yr.	0	0	0
4.073	500 Yr.	0	0	0
4.069	500 Yr.	0	0	0

4.057	500 Yr.	0	0	0
4.049	500 Yr.	0	0	0
4.036	500 Yr.	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
5.259	FW	1	760	1214
5.029	FW	1	884	1263
5.022	FW	1	866	1250
5.021	FW	1	866	1250
5.018	FW	1	862	1247
5.017	FW	1	862	1247
5.013	FW	1	855	1245
4.859	FW	1	964	1682
4.743	FW	1	949	1337
4.625	FW	1	912	1828
4.612	FW	1	948	1845
4.563	FW	1	887	1857
4.464	FW	1	374	1360
4.419	FW	1	238	1048
4.365	FW	1	295	1039
4.259	FW	1	443	1101
4.165	FW	1	4377	5107
4.16	FW	1	4376	5096
4.157	FW	1	4377	5093
4.148	FW	1	4380	5083
4.080	FW	1	619	1172
4.073	FW	1	647	1195
4.069	FW	1	658	1194
4.057	FW	1	708	1198
4.049	FW	1	721	1196
4.036	FW	1	855	1157

FLOW DATA

Flow Title: Imported Flow 01
Flow File : o:\DRAW7700\20247700\Floodstudy\Hec-Ras Files\7700.f01

Flow Data (cfs)

River	Reach	RS	10 Yr.	15 Yr.	50 Yr.	100 Yr.	500 Yr.	FW
RIVER-1	Reach-1	4.743	10212	11300	14451	16358	19884	16358
RIVER-1	Reach-1	4.419	10212	11300	14451	16358	19884	16358
RIVER-1	Reach-1	4.365	10647	11770	15166	17157	20828	17157
RIVER-1	Reach-1	4.069	10647	11770	15166	17157	20828	17157
RIVER-1	Reach-1	4.057	10631	11750	15084	17035	20761	17035
RIVER-1	Reach-1	4.036	10631	11750	15084	17035	20761	17035

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RIVER-1	Reach-1	10 Yr.		Known WS = 466.8
RIVER-1	Reach-1	15 Yr.		Known WS = 467.45
RIVER-1	Reach-1	50 Yr.		Known WS = 469.35
RIVER-1	Reach-1	100 Yr.		Known WS = 470.33
RIVER-1	Reach-1	500 Yr.		Known WS = 471.68
RIVER-1	Reach-1	FW		Known WS = 470.52

GEOMETRY DATA

Geometry Title: Effective Model
Geometry File : o:\DRAW7700\20247700\Floodstudy\Hec-Ras Files\7700.g03

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4.743

INPUT
Description: 4.743
LADUE FIS 25044 STANLEY SURVEY SECT - APROX. 250 FT. D.S.
OF TWOMILE
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
900	481	938	480	938	472	956	472	990	456
1000	455.3	1016	456	1067	466	1407	466	1480	482

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
900	.08	956	.04	1067	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
956	1067	680	766	771	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4.625

INPUT
Description: 4.625
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
862.8	484	923.8	472	944	470	983.4	456	1000	454.4
1017.3	456	1040.7	458	1083.3	470	1132.5	474	1229.2	474

```
  1259.1     472  1732.4     472  1764.4     458  1811.7     458  1875.9     476
  1904.2     480

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   862.8      .1     944     .04  1083.3      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           944  1083.3              110     105      64             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  1732.4  1864.4     472       T

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.612

INPUT
Description: 4.612
 LADUE FIS 24349  STANLEY SURVEY SECT
Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     885     482   925.7     474   943.8     472   963.6  471.08   980.8  456.98
    1000  454.06  1022.2  456.23  1035.7   465.2  1060.1     466  1085.2  476.65
  1097.6     476  1133.4  474.91  1149.2     476  1168.2   476.3    1195     476
  1256.4     474  1278.8     474    1739     472    1776     458    1792     456
    1805     456    1849     470    2075     500

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     885      .1   963.6     .04  1035.7      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         963.6  1035.7              270     255     240             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
```

```
    1739    2075     472       T

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.563

INPUT
Description: 4.563
 LADUE FIS 24094  STANLEY SURVEY SECT
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     781     480   851.7     474   890.6     470   936.8     468   960.5     466
   972.5  465.37   989.8  454.27    1000  453.43    1033  455.25  1078.5  472.33
    1087     474  1116.5     476  1163.7   476.5  1262.8     476  1342.4     474
    1676     472    1759     470    1791     458    1807     456    1816     456
    2087     500

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     781      .1   972.5     .04  1078.5      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         972.5  1078.5              480   522.5     525             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    1759    2087     470       T

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.464

INPUT
Description: 4.464
Station Elevation Data    num=      24
```

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     185     480     226     470     260     468     437     468     458     464
     523     475   959.3  474.72   985.6  453.51    1000  453.42  1023.5  453.71
  1045.5  467.69  1051.8     468  1080.4     470  1176.4  471.03    1254     470
    1320     456    1338     456    1367     476    1377     476    1403     460
    1487     460    1576     485    1639     487    1997     512

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     185     .05   959.3    .045  1045.5     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         959.3  1045.5              218     238     238             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    1254    1367     470       T
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
    1377    1576     476

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.419

INPUT
Description: 4.419
 JUNCTION WITH SABAGO
Station Elevation Data    num=      27
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
      45     480     129     470     324     466     341     464     408     476
   927.4     476   949.4  463.14   953.7  462.79   967.1  456.91     975     456
   982.7  453.92    1000  452.92  1017.8  454.13  1053.7  478.31  1066.2  478.31
  1090.8   464.5  1163.2     462  1183.7     465  1364.3     468  1446.6     468
    1488     471  1575.1     472  1593.1     470  1653.9     469  1676.4   466.5
  1701.2     470    1741     511
```

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
      45     .05   927.4    .045  1053.7     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         927.4  1053.7              261     285     286             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  1066.2    1741  478.31

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.365

INPUT
Description: 4.365
 LADUE FIS 23049  STANLEY SURVEY SECT - APROX. 300 FT. D.S.
             OF SEBAGO
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     144     480     314     468     393     466     398   465.5     451     474
   863.5  470.82   905.8  470.28   931.6     472   941.8     472   979.3  452.93
    1000  452.64  1021.6  453.12    1050  477.04    1062  477.04  1084.4     468
  1103.5     466  1156.1   465.5  1164.9     466  1186.7   469.7  1208.4     470
  1366.1     471  1409.3     472  1512.2   472.6  1548.2     476  1626.5   476.8
  1689.1     476  1702.8     474  1732.1     474    1795     502

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     144     .05   941.8    .045    1050     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         941.8    1050              580     560     520             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
    1062    1795  477.04
```

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4.259

INPUT
Description: 4.259
LADUE FIS 22489 STANLEY SURVEY SECT.
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
325	480	371	474	443	470	478	468	873.4	467.43
914.9	467.85	942.1	467.45	962.1	468.15	988.9	452.3	993.1	451.13
1000	450.84	1014.8	451.74	1028.3	452.38	1037.6	460.17	1067.3	462.41
1090.5	471.24	1106.9	472	1120	472	1145.1	473.6	1190.7	473.6
1203.5	474	1224.5	474.7	1231	474	1242.4	473	1257.1	473
1304.5	475	1368.2	476	1394.1	476.7	1411.8	475.4	1436.4	476
1491.1	477	1622.1	477.8	1651.5	481.5	1816	484	1844	485
1860	498								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
325	.05	962.1	.045	1037.6	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
962.1 1037.6 480 500 530 .1 .3
Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
695	798	490	T

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4.165

INPUT

```
Description: 4.165
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    4058     480    4197     474    4429     468    4529     466    4635     464
    4850     464    4910     466    4935     466  4953.2  465.49  4980.8  450.18
    5000  449.16    5016  450.11    5040   459.6    5050     470    5054     466
    5100     466    5116     466    5116     481    5198     481    5198     466
    5247     466    5315     468    5442     470    5556     475    5707     480
    5744     485

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    4058     .05  4953.2    .045    5050     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        4953.2    5050               28      28      28             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    4572    4711     490       T

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.16

INPUT
Description: 4.16
This is a REPEATED section.
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    4031     480    4199     474    4345     470    4525     466    4697     464
    4869     464  4913.6   465.4  4930.5   466.1  4957.7   468.1  4975.9  468.52
  4980.1  450.18    5000  449.16  5017.4  450.11  5038.3  468.75    5052   467.6
  5109.2   465.7    5227     466    5342     468    5414     470    5581     476
    5581     490    5714     490    5715     481    5738     483

Manning's n Values        num=       3
```

```
     Sta   n Val     Sta   n Val     Sta   n Val
    4031    .075  4975.9    .045  5038.3    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        4975.9  5038.3               14      14      14             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    4578    4700     490       T
    5117    5179     481       T

BRIDGE


RIVER: RIVER-1
REACH: Reach-1            RS: 4.158

INPUT
Description: Rock Hill Road Bridge
Distance from Upstream XS =       1
Deck/Roadway Width        =      12
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
  4975.9  468.52   465.2  5038.3  468.75  465.85

Upstream Bridge Cross Section Data
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    4031     480    4199     474    4345     470    4525     466    4697     464
    4869     464  4913.6   465.4  4930.5   466.1  4957.7   468.1  4975.9  468.52
  4980.1  450.18    5000  449.16  5017.4  450.11  5038.3  468.75    5052   467.6
  5109.2   465.7    5227     466    5342     468    5414     470    5581     476
    5581     490    5714     490    5715     481    5738     483

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    4031    .075  4975.9    .045  5038.3    .075
```

```
Bank Sta: Left   Right    Coeff Contr.   Expan.
        4975.9  5038.3             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    4578    4700     490       T
    5117    5179     481       T

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    4976   468.8   465.7  5039.7  469.12  466.22

Downstream Bridge Cross Section Data
Station Elevation Data    num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    4031     480    4199     474    4345     470    4525     466    4690     464
    4863     464  4913.3   465.6  4928.3   466.2    4954     468  4967.6   468.6
    4976   468.8  4985.9  450.03    5000  449.16  5017.5  450.02  5039.7  469.12
  5049.4   468.4  5079.1   466.6    5103     466    5234     466    5326     468
    5585     476    5585     490    5714     490    5715     481    5738     483

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    4031    .075    4976    .045  5039.7    .075

Bank Sta: Left   Right    Coeff Contr.   Expan.
          4976  5039.7             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    4581    4694     490       T
    5122    5173     481       T

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
```

```
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

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

High Flow Method
       Energy Only

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

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.157

INPUT
Description: 4.157
 LADUE FIS 21947  D.S. FACE OF ROCK HILL RD.
Station Elevation Data    num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    4031     480    4199     474    4345     470    4525     466    4690     464
    4863     464  4913.3   465.6  4928.3   466.2    4954     468  4967.6   468.6
    4976   468.8  4985.9  450.03    5000  449.16  5017.5  450.02  5039.7  469.12
  5049.4   468.4  5079.1   466.6    5103     466    5234     466    5326     468
    5585     476    5585     490    5714     490    5715     481    5738     483

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

```
    4031    .075    4976    .045  5039.7    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          4976  5039.7               43      43      43             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    4581    4694     490       T
    5122    5173     481       T

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.148

INPUT
Description: 4.148
Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    4023     480    4211     474    4377     470    4513     466    4692     464
    4824     464    4900     464    4962     464    4982   449.3    5000     448
    5015   450.2    5030   463.4    5036     470    5072     470    5082     468
    5341     468    5479     474    5500     474    5501     490    5710     490
    5711     478    5730     481

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    4023    .075    4962    .045    5030    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          4962    5030               300     308     255             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    4587    4674     490       T
    5135    5151     481       T

CROSS SECTION
```

RIVER: RIVER-1
REACH: Reach-1 RS: 4.080

INPUT
Description: 4.080
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
381.7	480	489.6	474	533.6	472	590.5	470	678.9	468
708.5	466	730.3	464	847.7	462	853.7	462	971.9	460
989.5	448.5	1000	447.15	1011	448.5	1044	468	1151.5	468
1267	468	1304.1	470	1516.9	470	1585.6	472	1797.2	474

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
381.7	.075	971.9	.045	1044	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
971.9	1044	80	92	105	.3	.5

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4.073

INPUT
Description: 4.073
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
449.2	480	523	476	567.7	474	618.1	472	690	470
715	465	740	462	908	460.3	958	461	979	454.3
990	447.9	1000	446.9	1014	447.5	1023	454.8	1036	461
1050	467.6	1080	465	1098	463	1235	465	1485	468
1541.9	470	1649	472	1690	474	1691	490	1800	490
1801	475	1870	477	1930	480	1955	483	1990	486

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
   449.2    .075     958    .045    1036    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           958    1036               18      18      40             .3       .5

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.069

INPUT
Description: 4.069
This is a REPEATED section.
Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   456.7     480   537.9     476   582.3     474   639.9     472   700.8     470
     765     468     842     466     943   461.1     944   461.1     981   460.3
     984     448    1003   447.5    1022   447.5    1025   456.6    1026   456.6
    1056   459.3    1057   459.4    1206   466.7    1430     468  1555.6     470
  1683.8     472  1863.4     474

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   456.7    .075     981    .045    1025    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           981    1025               64      64      64             .3       .5

BRIDGE


RIVER: RIVER-1
REACH: Reach-1            RS: 4.060

INPUT
Description: S. McKnight Road Bridge
```

```
Distance from Upstream XS =      .5
Deck/Roadway Width        =      63
Weir Coefficient          =     2.4
Upstream  Deck/Roadway Coordinates
    num=      24
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     350     486     486     400     483     483     460     480     480
     525     477     477     595     474     474     690     471     471
     765     468     468     842     466     466     943   465.7   461.1
     944   465.7     464    1003   465.5   463.8    1056   465.2   463.7
    1057   465.2   459.3    1206   466.7   466.7    1430     468     468
    1780     468     468    1880     468     468    1935     471     471
    2050     471     471    2080     474     474    2100     477     477
    2110     480     480    2125     483     483    2150     486     486

Upstream Bridge Cross Section Data
Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   456.7     480   537.9     476   582.3     474   639.9     472   700.8     470
     765     468     842     466     943   461.1     944   461.1     981   460.3
     984     448    1003   447.5    1022   447.5    1025   456.6    1026   456.6
    1056   459.3    1057   459.4    1206   466.7    1430     468  1555.6     470
  1683.8     472  1863.4     474

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   456.7    .075     981    .045    1025    .075

Bank Sta: Left   Right    Coeff Contr.   Expan.
           981    1025             .3       .5

Downstream  Deck/Roadway Coordinates
    num=      24
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     350     486     486     400     483     483     460     480     480
     525     477     477     595     474     474     690     471     471
     765     468     468     842     466     466     943   465.7   461.1
     944   465.7     464    1003   465.5   463.8    1056   465.2   463.7
```

```
    1057   465.2   459.3    1206   466.7   466.7    1430     468     468
    1780     468     468    1880     468     468    1935     471     471
    2050     471     471    2080     474     474    2100     477     477
    2110     480     480    2125     483     483    2150     486     486

Downstream Bridge Cross Section Data
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     350     486     400     483   462.5     480   497.4     476   572.5     474
     634     472   715.9     470     765     468     842     466     943   461.1
     944   461.1     981   460.3     984     448    1003   447.5    1022   447.5
    1025   456.6    1026   456.6    1056   459.3    1057   459.4    1206   466.7
    1430     468  1604.7     470  1708.8     472    1905     474

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     350    .075     981    .045    1025    .075

Bank Sta: Left   Right    Coeff Contr.   Expan.
           981    1025             .3       .5

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =   465.2
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=    1003    Downstream=    1003
Upstream     num=       2
    Width   Elev    Width   Elev
       6   447.5       6   464.8
Downstream     num=       2
    Width   Elev    Width   Elev
```

```
       6   447.5       6   464.8

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Yarnell                KVal =    1.25
Selected Low Flow Methods = Yarnell

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =.6726728
           Max Low Cord                =   464.8

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: RIVER-1
REACH: Reach-1            RS: 4.057

INPUT
Description: 4.057
 LADUE FIS 21422  D.S. FACE OF MCKNIGHT RD. - ROCK HILL
             CORPORATE LIMITS
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     350     486     400     483   462.5     480   497.4     476   572.5     474
     634     472   715.9     470     765     468     842     466     943   461.1
     944   461.1     981   460.3     984     448    1003   447.5    1022   447.5
    1025   456.6    1026   456.6    1056   459.3    1057   459.4    1206   466.7
    1430     468  1604.7     470  1708.8     472    1905     474
```

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     350    .075     981    .045    1025    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           981    1025               43      43      43             .3       .5

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.049

INPUT
Description: 4.049
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   459.1     480   514.5     476     552     474   613.4     472   654.5     470
     950     465     965     460     977     455     985   446.8    1015   446.8
    1030     455    1050     460    1070     465  1605.4     470  1707.3     472
  1903.2     474

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   459.1     .07     950     .04    1070     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           950    1070              100      70      20             .1       .3

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.036

INPUT
Description: 4.036
```

BRENTWOOD FIS =4.15

Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
731	480	794.1	474	819.8	472	853.5	470	867	465
963	460	973	455	985	445.9	1015	445.9	1055	465
1268.9	468	1583.4	470	1703.1	472	1880.4	474		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
731	.07	963	.04	1055	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
963	1055	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:RIVER-1

Reach	River Sta.	n1	n2	n3
Reach-1	4.743	.08	.04	.1
Reach-1	4.625	.1	.04	.1
Reach-1	4.612	.1	.04	.1
Reach-1	4.563	.1	.04	.1
Reach-1	4.464	.05	.045	.03
Reach-1	4.419	.05	.045	.03
Reach-1	4.365	.05	.045	.03
Reach-1	4.259	.05	.045	.03
Reach-1	4.165	.05	.045	.08
Reach-1	4.16	.075	.045	.075
Reach-1	4.158	Bridge		
Reach-1	4.157	.075	.045	.075
Reach-1	4.148	.075	.045	.075
Reach-1	4.080	.075	.045	.075
Reach-1	4.073	.075	.045	.075
Reach-1	4.069	.075	.045	.075

Reach-1	4.060	Bridge		
Reach-1	4.057	.075	.045	.075
Reach-1	4.049	.07	.04	.06
Reach-1	4.036	.07	.04	.06

SUMMARY OF REACH LENGTHS

River: RIVER-1

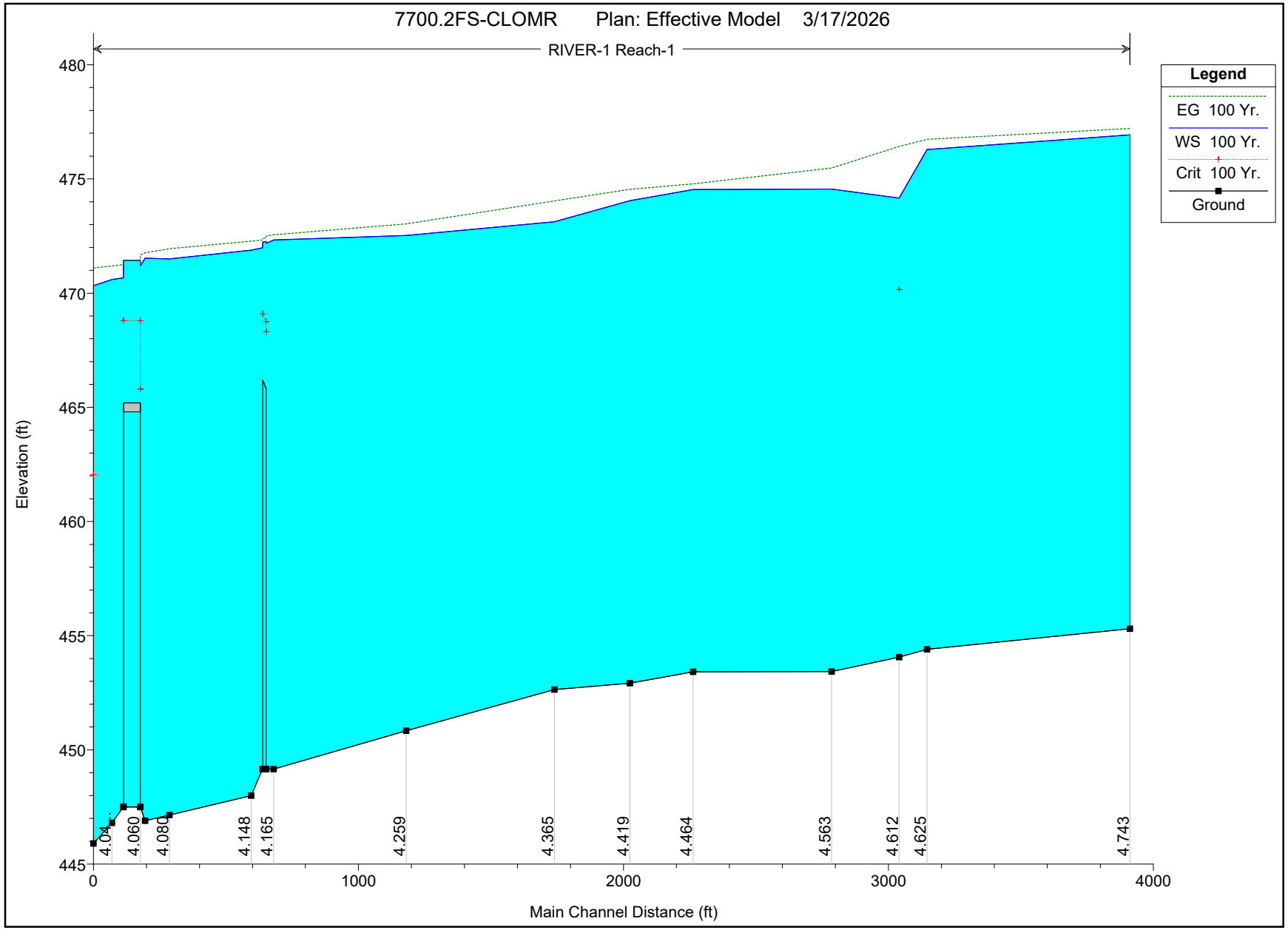
Reach	River Sta.	Left	Channel	Right
Reach-1	4.743	680	766	771
Reach-1	4.625	110	105	64
Reach-1	4.612	270	255	240
Reach-1	4.563	480	522.5	525
Reach-1	4.464	218	238	238
Reach-1	4.419	261	285	286
Reach-1	4.365	580	560	520
Reach-1	4.259	480	500	530
Reach-1	4.165	28	28	28
Reach-1	4.16	14	14	14
Reach-1	4.158	Bridge		
Reach-1	4.157	43	43	43
Reach-1	4.148	300	308	255
Reach-1	4.080	80	92	105
Reach-1	4.073	18	18	40
Reach-1	4.069	64	64	64
Reach-1	4.060	Bridge		
Reach-1	4.057	43	43	43
Reach-1	4.049	100	70	20
Reach-1	4.036	0	0	0

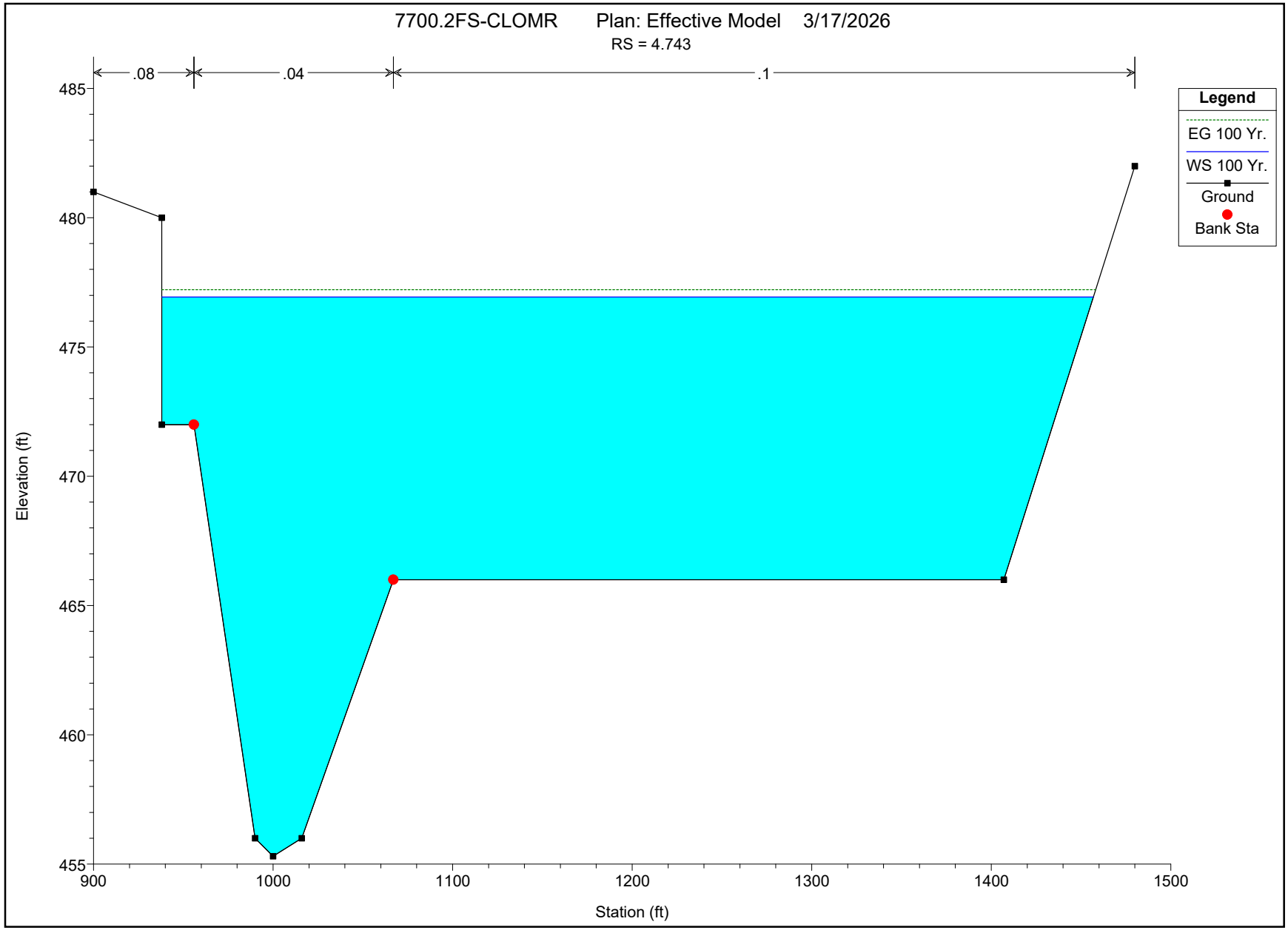
SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: RIVER-1

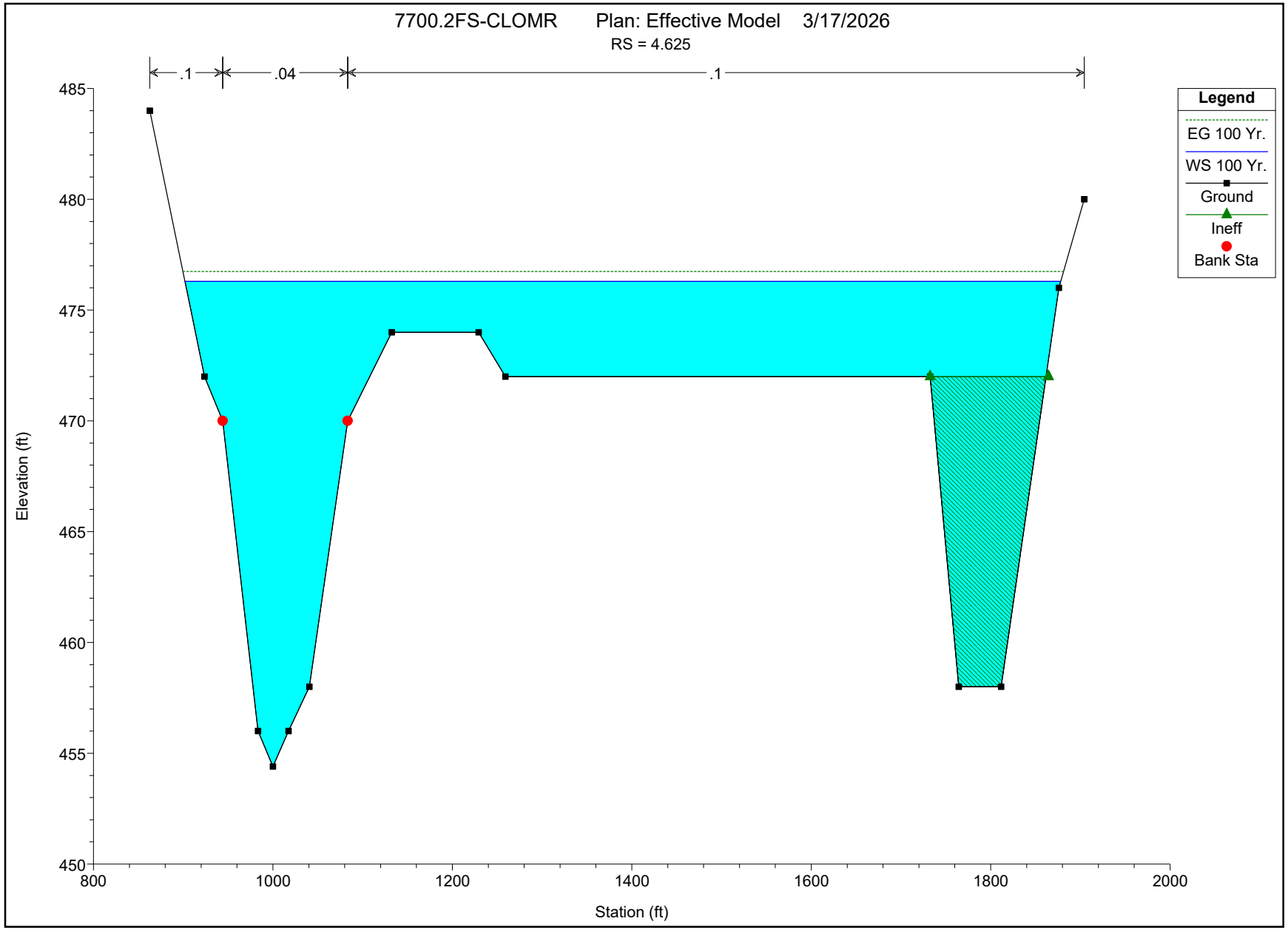
Reach	River Sta.	Contr.	Expan.
Reach-1	4.743	.1	.3
Reach-1	4.625	.1	.3
Reach-1	4.612	.1	.3
Reach-1	4.563	.1	.3
Reach-1	4.464	.1	.3
Reach-1	4.419	.1	.3
Reach-1	4.365	.1	.3
Reach-1	4.259	.1	.3
Reach-1	4.165	.3	.5
Reach-1	4.16	.3	.5
Reach-1	4.158	Bridge	
Reach-1	4.157	.3	.5
Reach-1	4.148	.1	.3
Reach-1	4.080	.3	.5
Reach-1	4.073	.3	.5
Reach-1	4.069	.3	.5
Reach-1	4.060	Bridge	
Reach-1	4.057	.3	.5
Reach-1	4.049	.1	.3
Reach-1	4.036	.1	.3

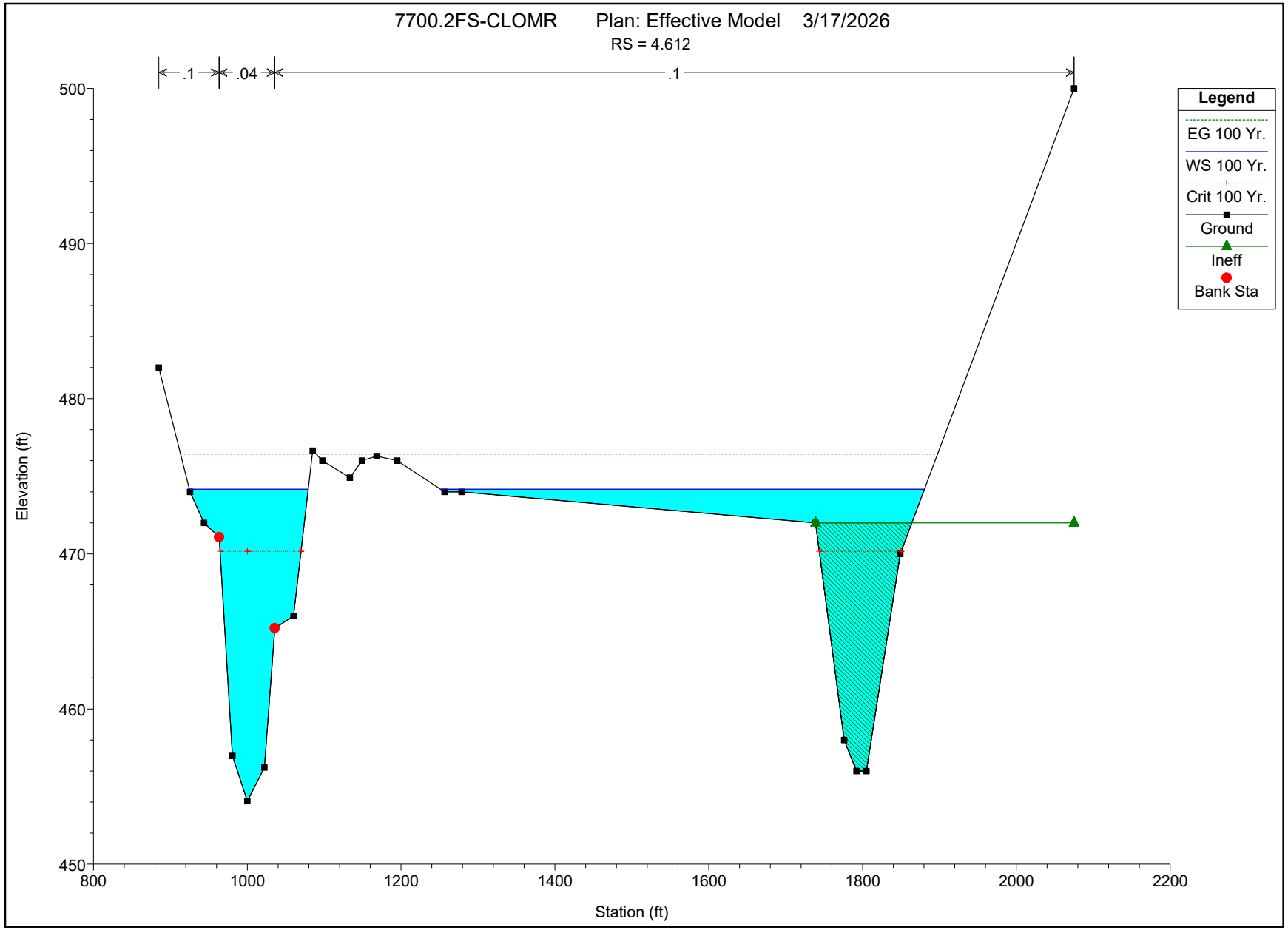
HEC-RAS Plan: Eff Model River: RIVER-1 Reach: Reach-1 Profile: 100 Yr.

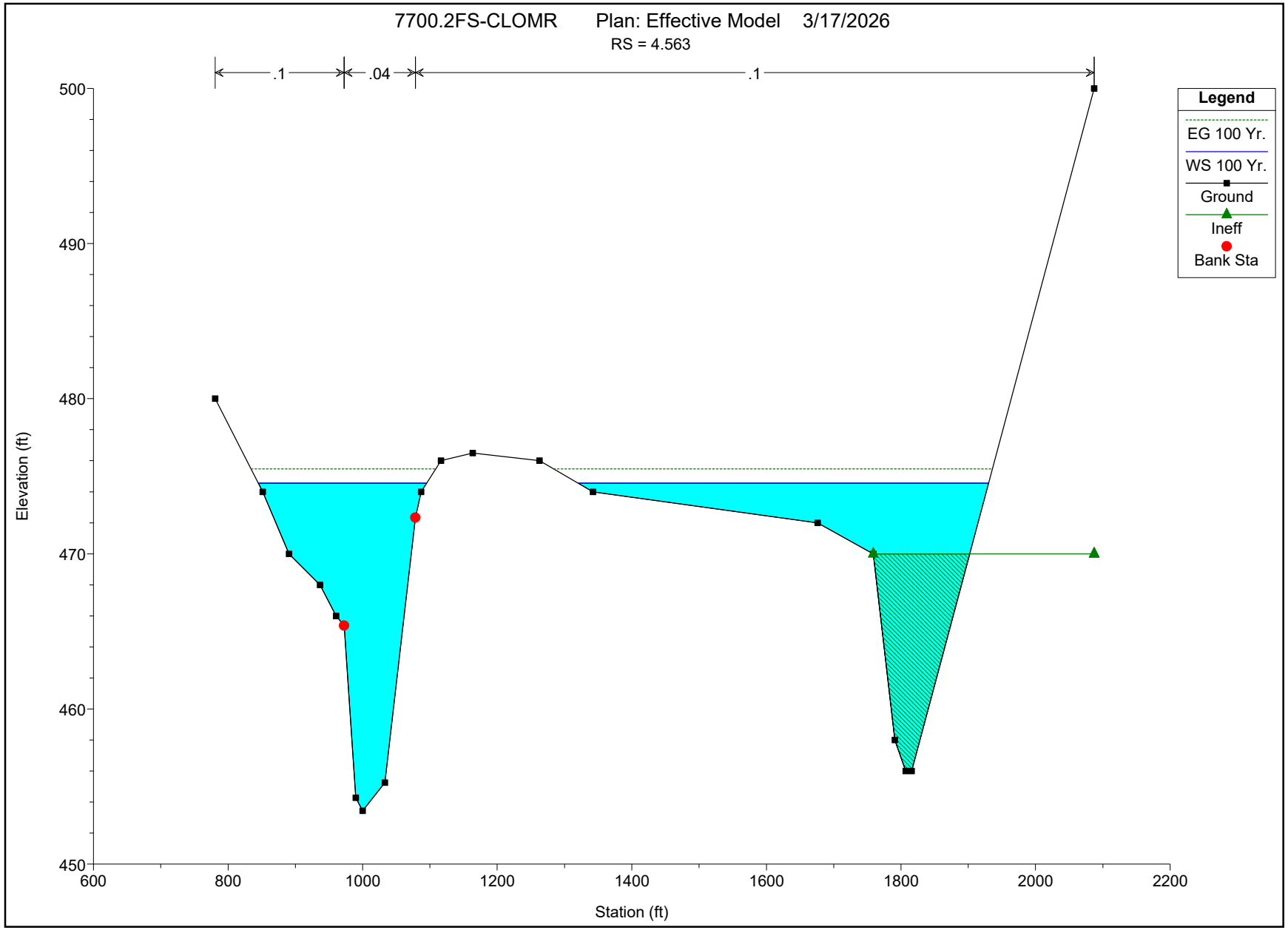
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	4.743	100 Yr.	16358.00	455.30	476.93		477.22	0.000543	5.41	5881.66	518.86	0.24
Reach-1	4.625	100 Yr.	16358.00	454.40	476.29		476.74	0.000672	5.96	5515.25	975.95	0.26
Reach-1	4.612	100 Yr.	16358.00	454.06	474.16	470.16	476.43	0.003462	12.80	2322.99	783.38	0.57
Reach-1	4.563	100 Yr.	16358.00	453.43	474.55		475.48	0.001463	8.42	3815.01	859.86	0.38
Reach-1	4.464	100 Yr.	16358.00	453.42	474.54		474.78	0.000670	4.99	4658.62	718.25	0.22
Reach-1	4.419	100 Yr.	16358.00	452.92	474.05		474.55	0.001289	6.52	3328.78	418.84	0.31
Reach-1	4.365	100 Yr.	17157.00	452.64	473.13		474.04	0.002248	8.64	2903.44	685.77	0.40
Reach-1	4.259	100 Yr.	17157.00	450.84	472.52		473.04	0.001160	7.07	3801.73	730.58	0.30
Reach-1	4.165	100 Yr.	17157.00	449.16	472.33		472.55	0.000579	5.01	6319.93	1151.48	0.21
Reach-1	4.16	100 Yr.	17157.00	449.16	472.18	468.31	472.50	0.001165	6.48	5991.13	1209.39	0.26
Reach-1	4.158		Bridge									
Reach-1	4.157	100 Yr.	17157.00	449.16	471.98		472.33	0.001315	6.78	5747.45	1182.21	0.29
Reach-1	4.148	100 Yr.	17157.00	448.00	471.88		472.27	0.000997	6.77	5870.32	1131.37	0.27
Reach-1	4.080	100 Yr.	17157.00	447.15	471.50		471.94	0.001191	7.06	5308.69	1020.84	0.30
Reach-1	4.073	100 Yr.	17157.00	446.90	471.53		471.77	0.000606	5.42	6979.86	988.86	0.22
Reach-1	4.069	100 Yr.	17157.00	447.50	471.20	465.80	471.67	0.001328	7.85	5481.48	967.87	0.29
Reach-1	4.060		Bridge									
Reach-1	4.057	100 Yr.	17035.00	447.50	470.67		471.25	0.001588	8.45	5042.88	951.20	0.32
Reach-1	4.049	100 Yr.	17035.00	446.80	470.60		471.19	0.000998	6.99	4458.53	993.80	0.31
Reach-1	4.036	100 Yr.	17035.00	445.90	470.33	462.06	471.10	0.001044	7.89	3726.53	755.21	0.32

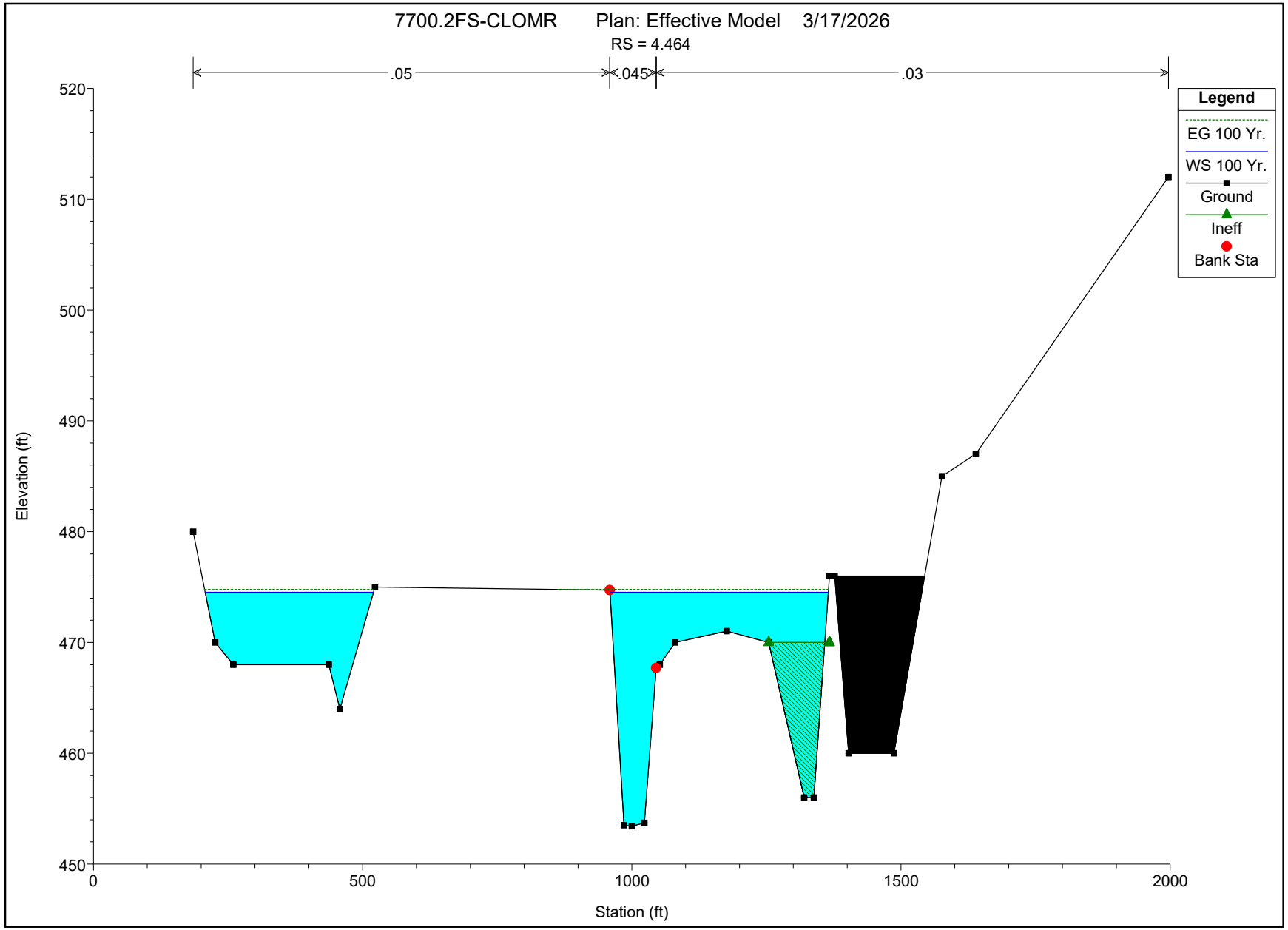

7700.2FS-CLOMR Plan: Effective Model 3/17/2026
RIVER-1 Reach-1
Legend
EG 100 Yr.
WS 100 Yr.
Crit 100 Yr.
Ground
Elevation (ft)
Main Channel Distance (ft)
480
475
470
465
460
455
450
445
0
1000
2000
3000
4000
4.04
4.060
4.080
4.148
4.165
4.259
4.365
4.419
4.464
4.563
4.612
4.625
4.743

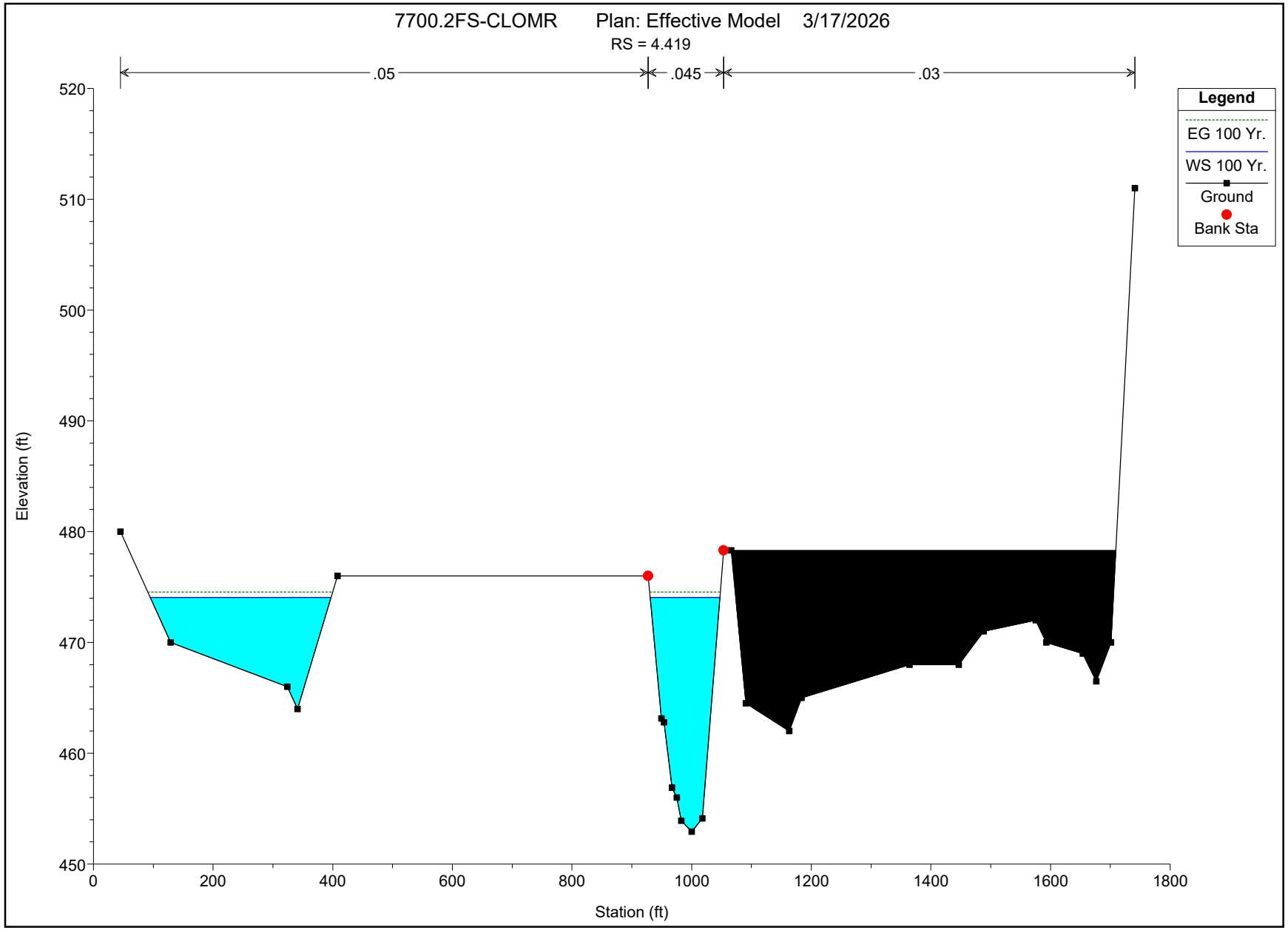

7700.2FS-CLOMR Plan: Effective Model 3/17/2026
RS = 4.743
.08
.04
.1
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Bank Sta
Elevation (ft)
Station (ft)
485
480
475
470
465
460
455
900
1000
1100
1200
1300
1400
1500

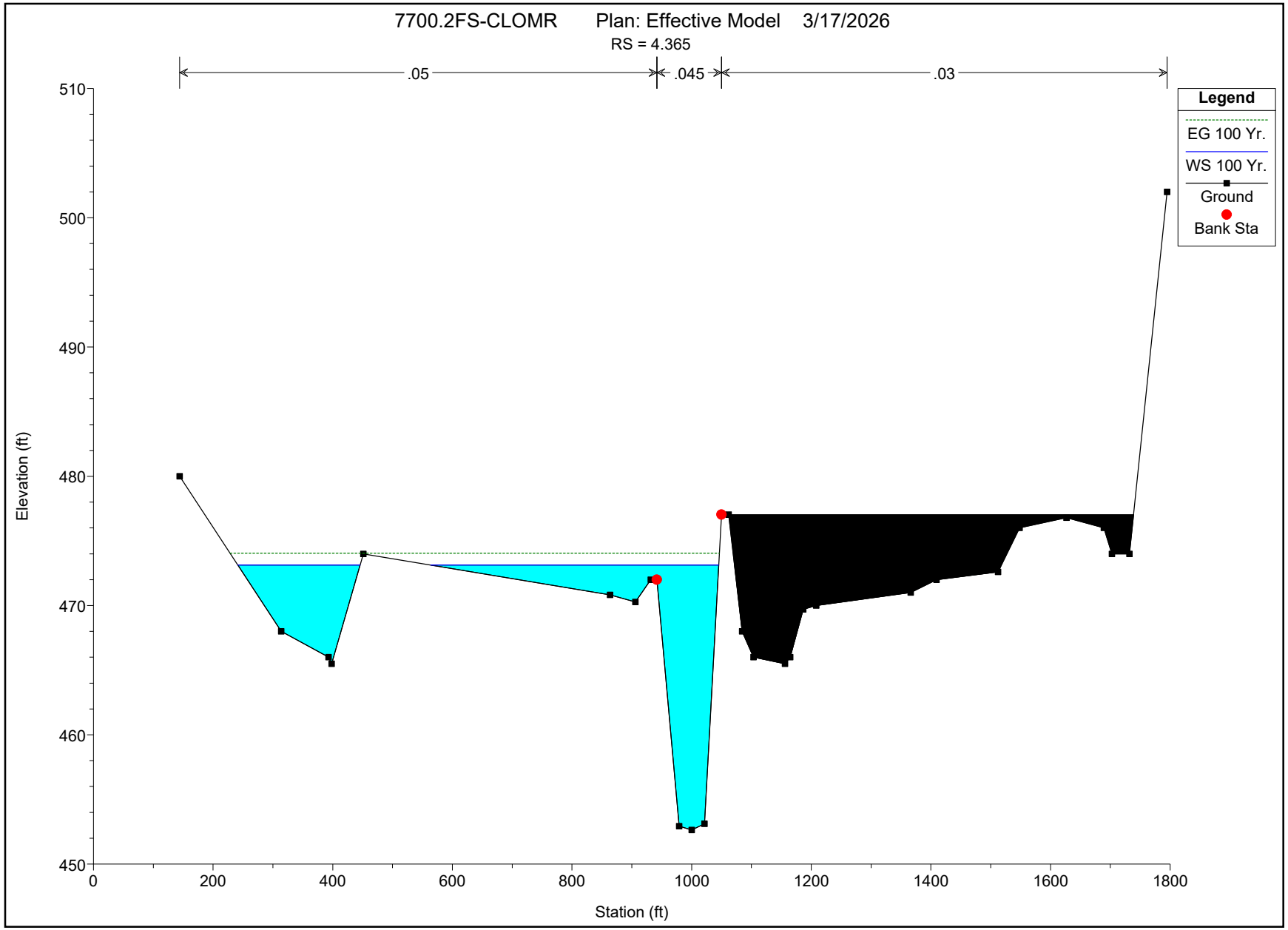

7700.2FS-CLOMR Plan: Effective Model 3/17/2026
RS = 4.625
.1
.04
.1
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
485
480
475
470
465
460
455
450
800
1000
1200
1400
1600
1800
2000
Station (ft)

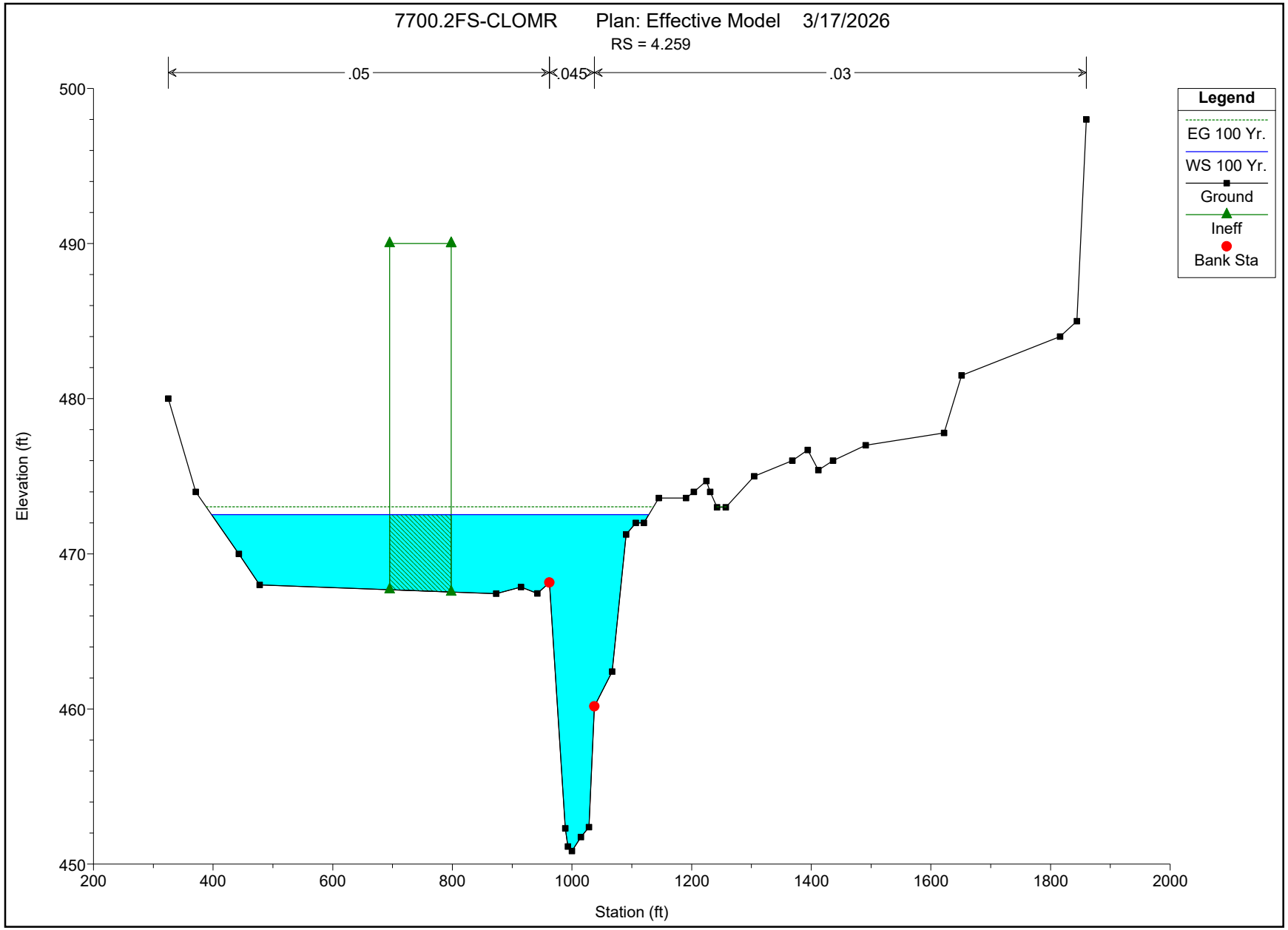

7700.2FS-CLOMR Plan: Effective Model 3/17/2026
RS = 4.612
.1
.04
.1
Legend
EG 100 Yr.
WS 100 Yr.
Crit 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
500
490
480
470
460
450
800
1000
1200
1400
1600
1800
2000
2200

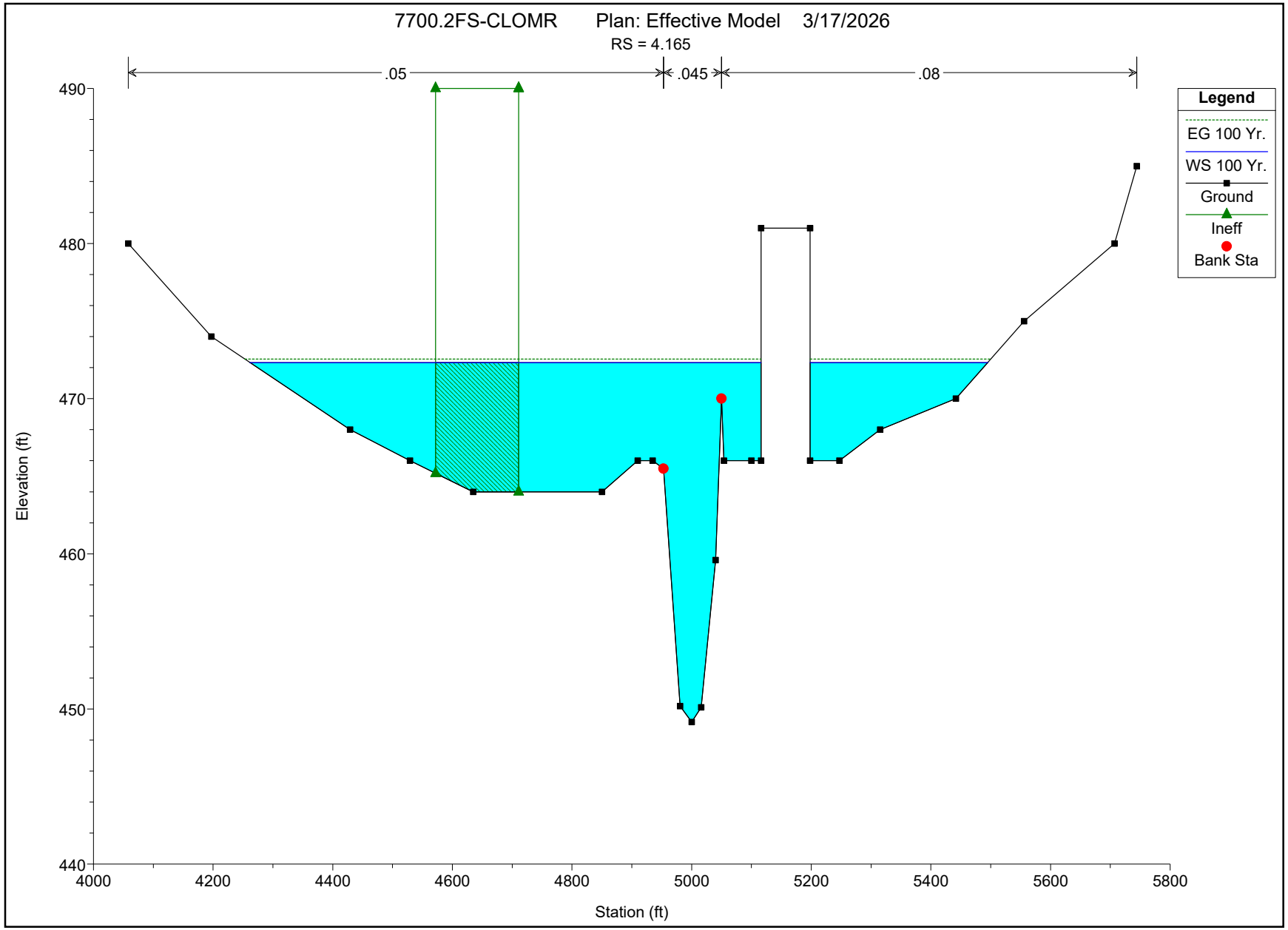

7700.2FS-CLOMR Plan: Effective Model 3/17/2026
RS = 4.563
.1
.04
.1
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
500
490
480
470
460
450
600
800
1000
1200
1400
1600
1800
2000
2200

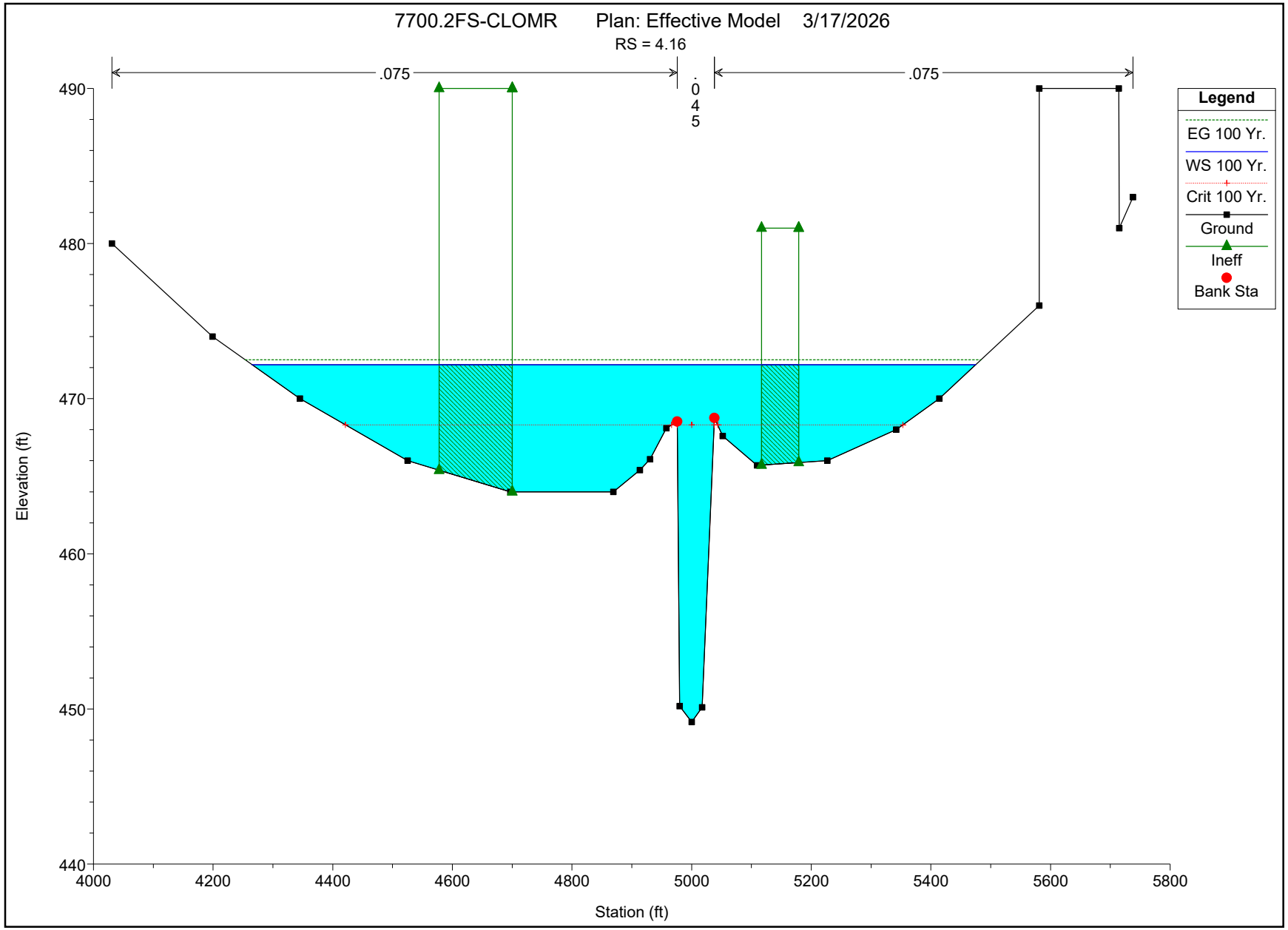

7700.2FS-CLOMR Plan: Effective Model 3/17/2026
RS = 4.464
.05
.045
.03
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
520
510
500
490
480
470
460
450
0
500
1000
1500
2000

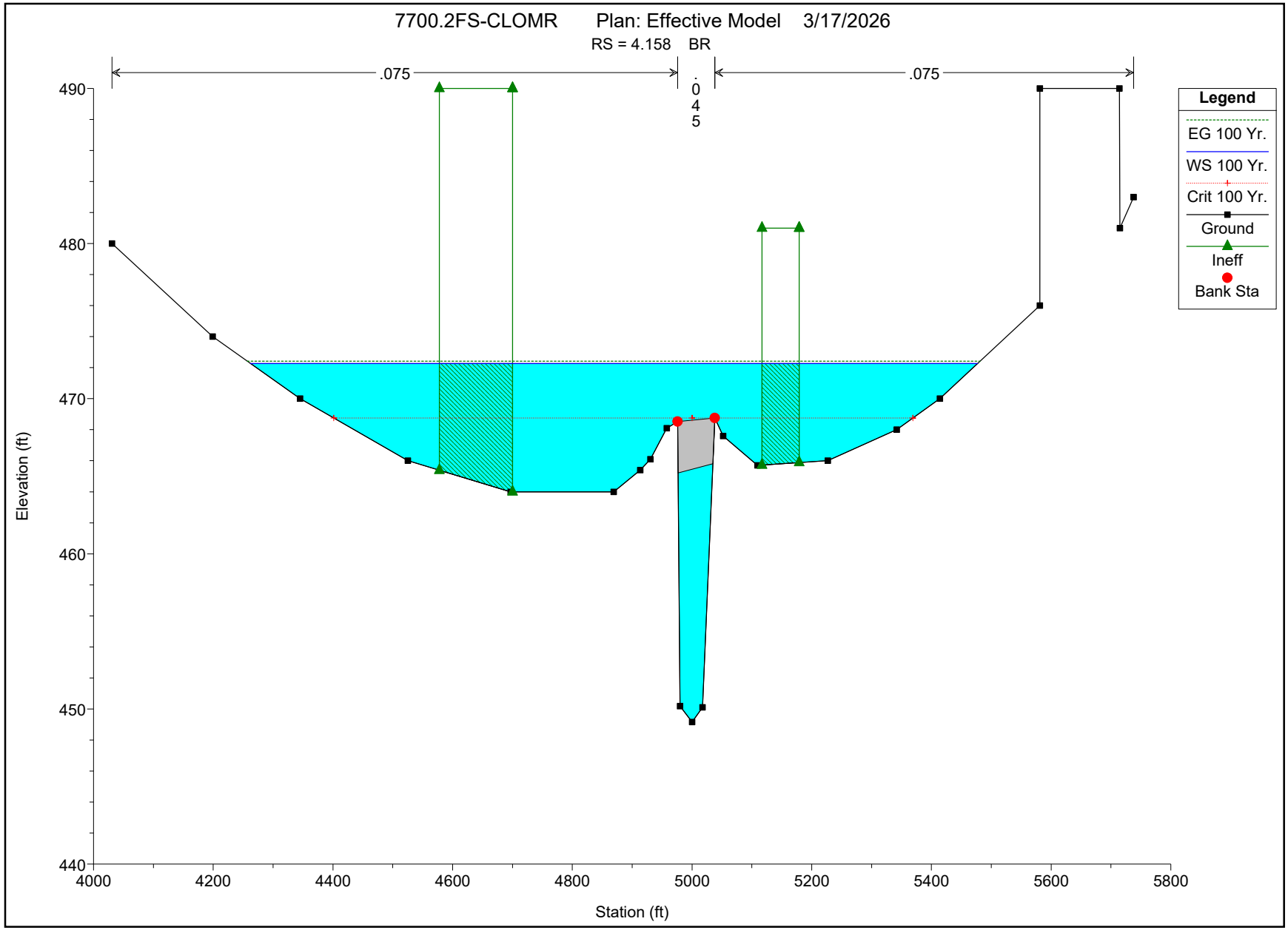

7700.2FS-CLOMR Plan: Effective Model 3/17/2026
RS = 4.419
.05
.045
.03
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Bank Sta
Elevation (ft)
Station (ft)
520
510
500
490
480
470
460
450
0
200
400
600
800
1000
1200
1400
1600
1800

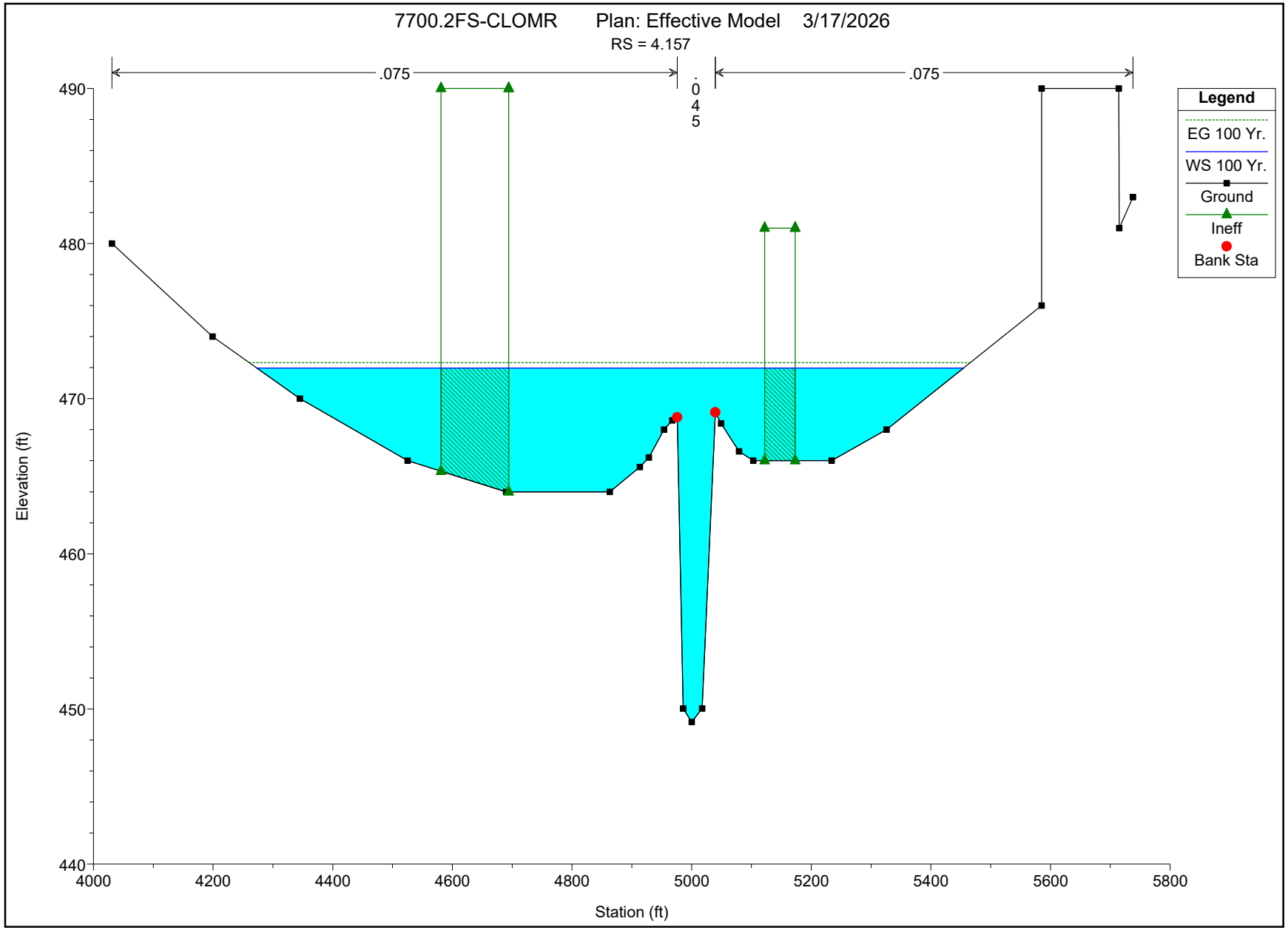

7700.2FS-CLOMR Plan: Effective Model 3/17/2026
RS = 4.365
.05
.045
.03
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Bank Sta
Elevation (ft)
Station (ft)
510
500
490
480
470
460
450
0
200
400
600
800
1000
1200
1400
1600
1800

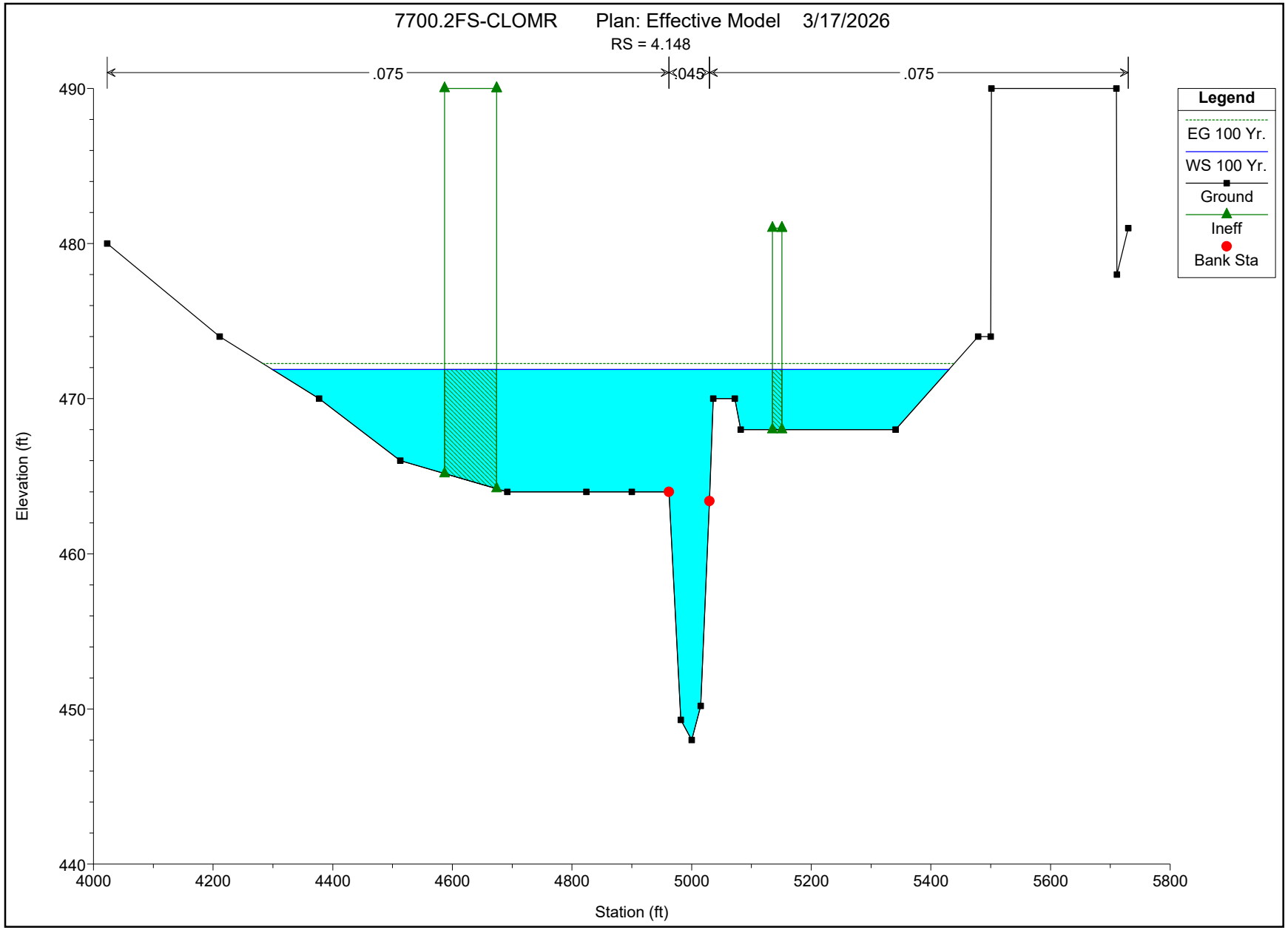

7700.2FS-CLOMR Plan: Effective Model 3/17/2026
RS = 4.259
.05
.045
.03
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
500
490
480
470
460
450
200
400
600
800
1000
1200
1400
1600
1800
2000

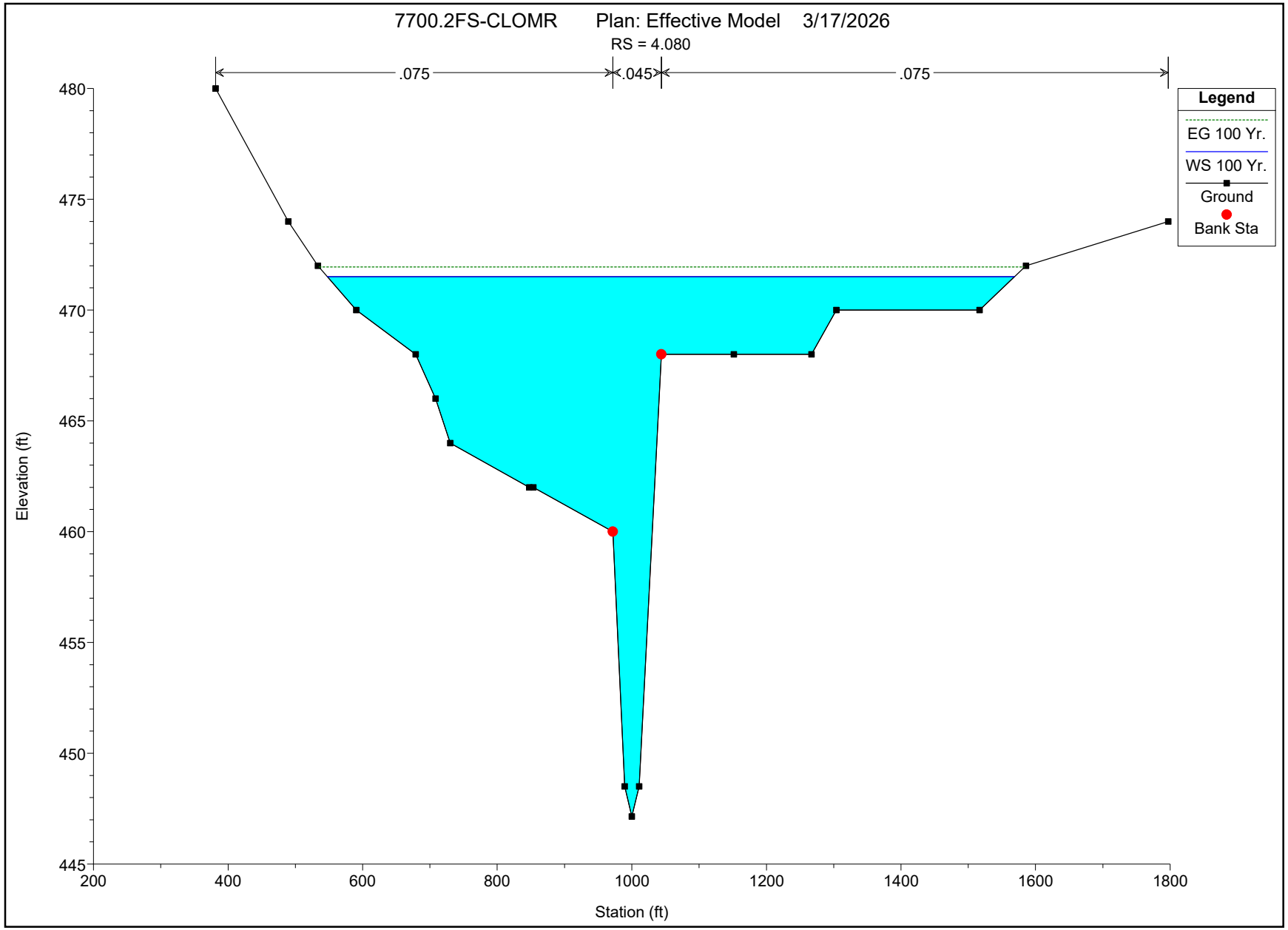

7700.2FS-CLOMR Plan: Effective Model 3/17/2026
RS = 4.165
.05
.045
.08
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
490
480
470
460
450
440
4000
4200
4400
4600
4800
5000
5200
5400
5600
5800
Station (ft)

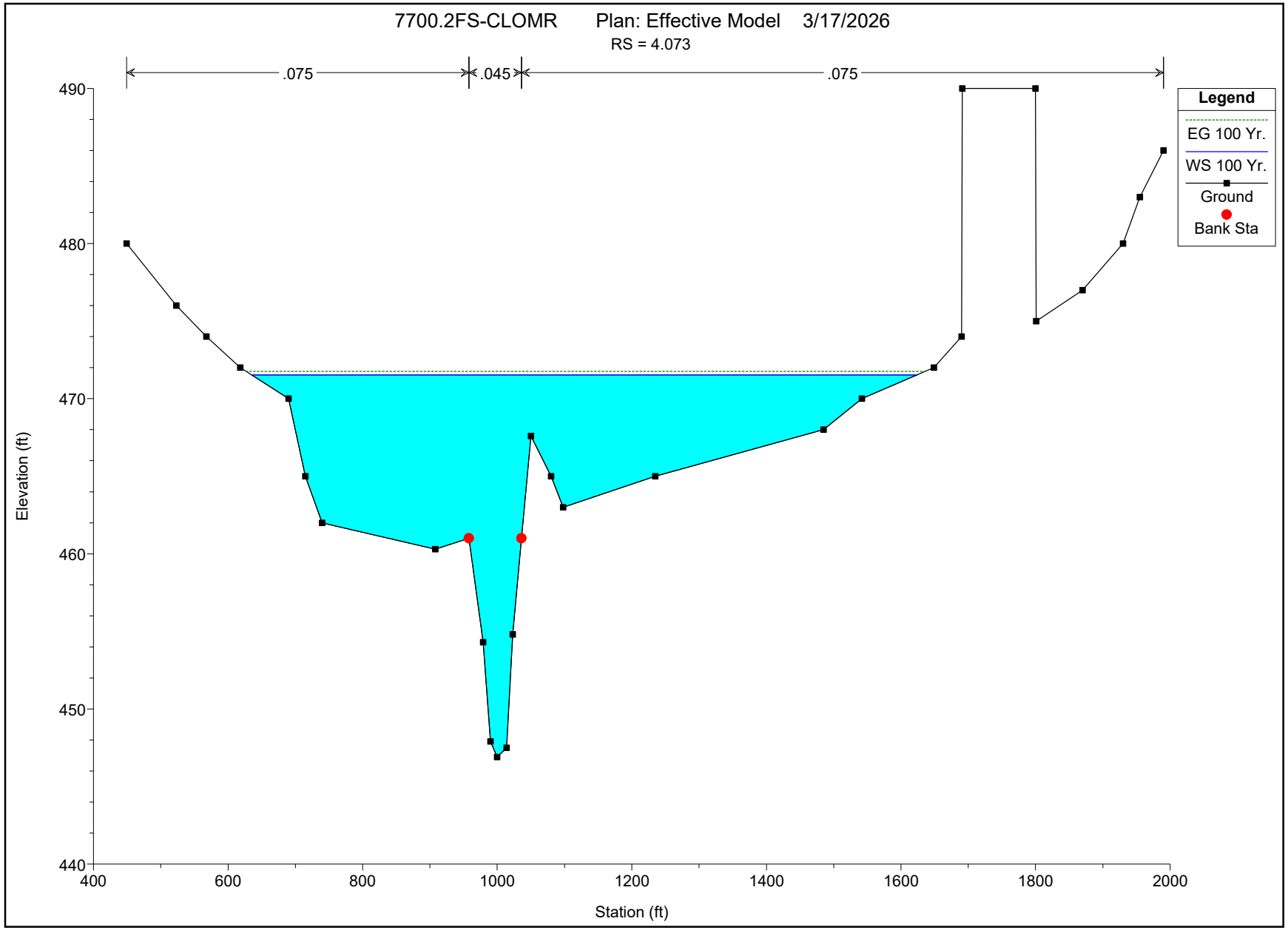

7700.2FS-CLOMR Plan: Effective Model 3/17/2026
RS = 4.16
.075
.045
.075
Legend
EG 100 Yr.
WS 100 Yr.
Crit 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
490
480
470
460
450
440
4000
4200
4400
4600
4800
5000
5200
5400
5600
5800

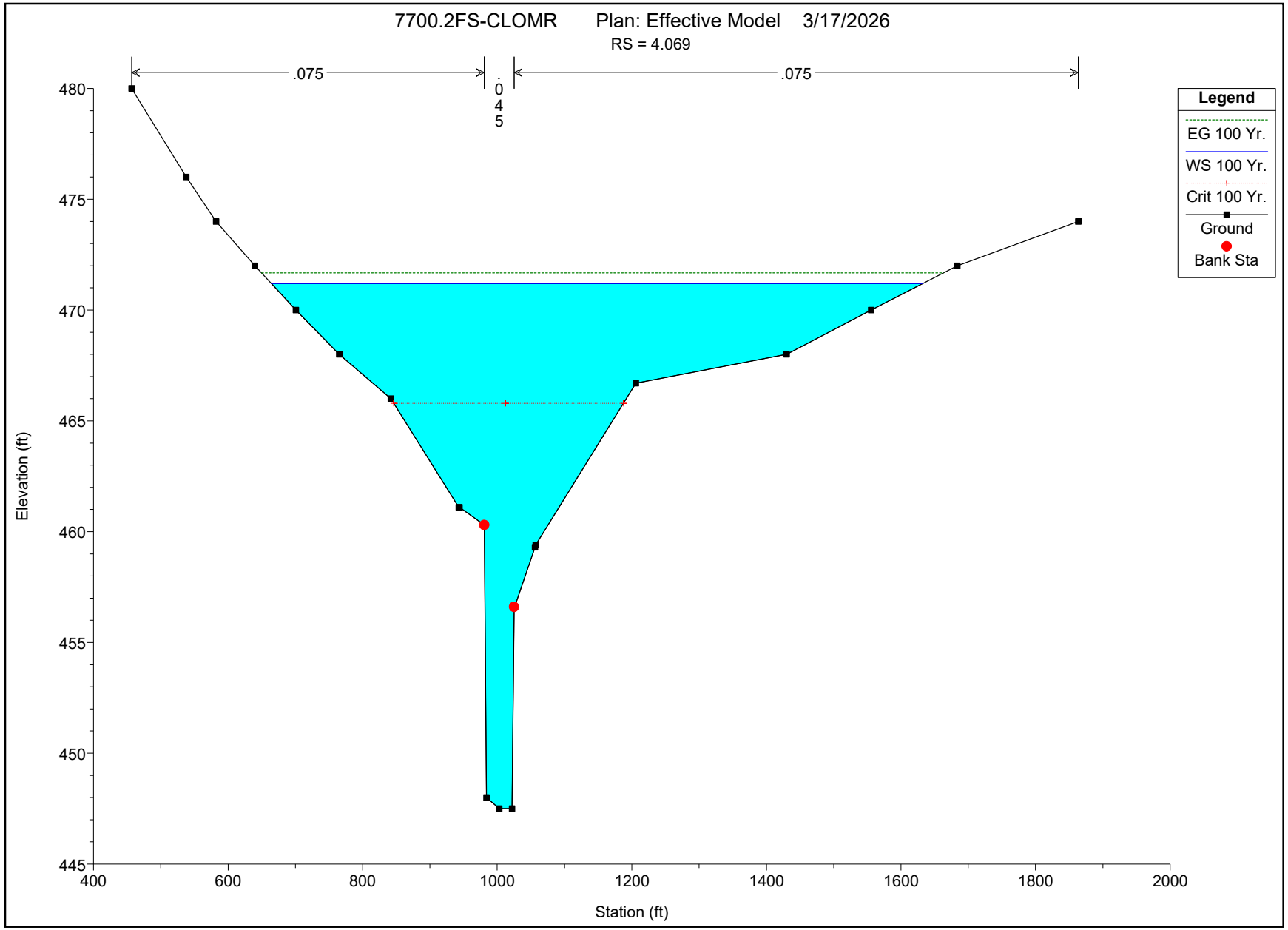

7700.2FS-CLOMR Plan: Effective Model 3/17/2026
RS = 4.158 BR
.075
.045
.075
Legend
EG 100 Yr.
WS 100 Yr.
Crit 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
490
480
470
460
450
440
4000
4200
4400
4600
4800
5000
5200
5400
5600
5800
Station (ft)

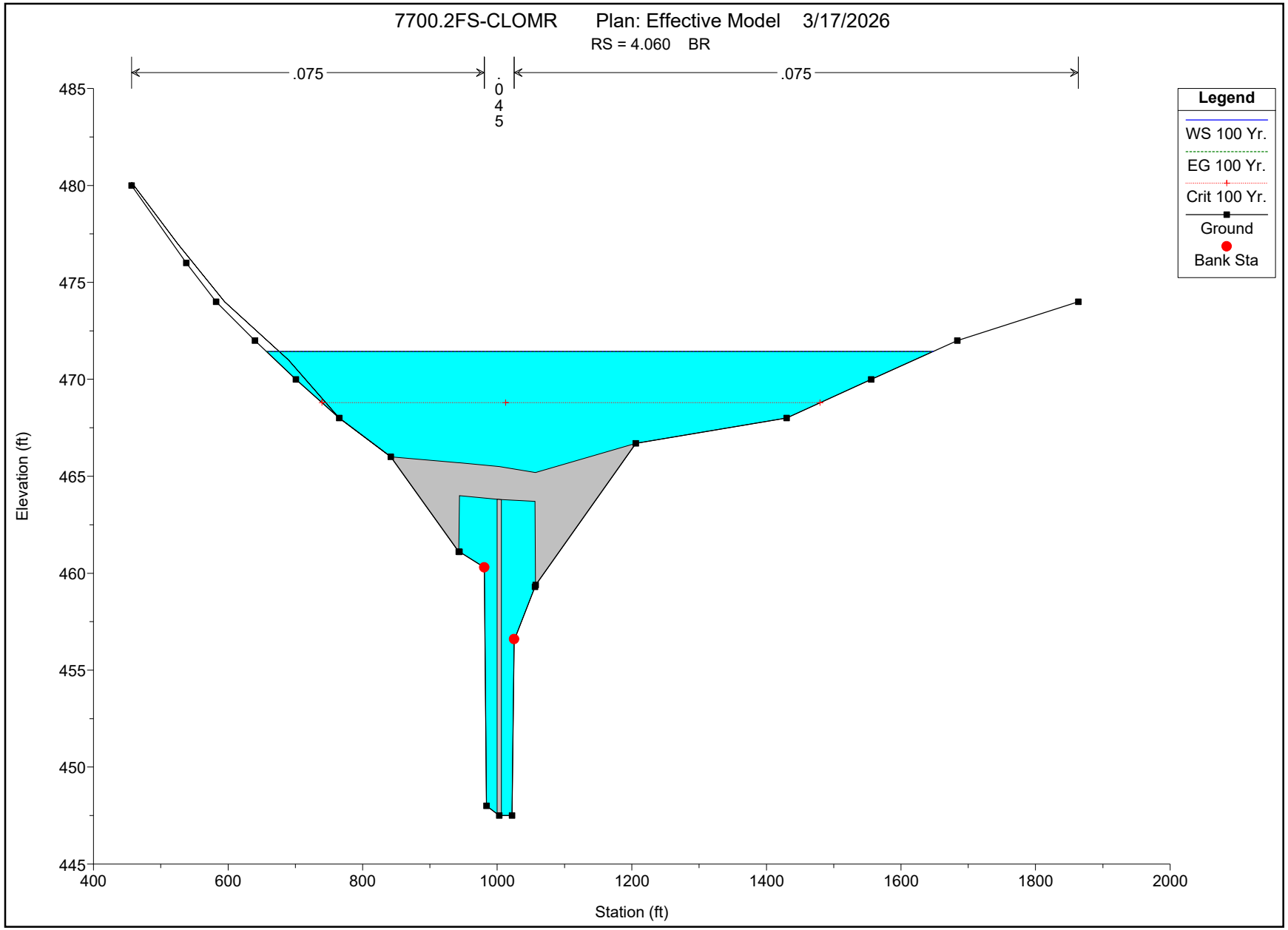

7700.2FS-CLOMR Plan: Effective Model 3/17/2026
RS = 4.157
.075
.045
.075
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
490
480
470
460
450
440
4000
4200
4400
4600
4800
5000
5200
5400
5600
5800
Station (ft)

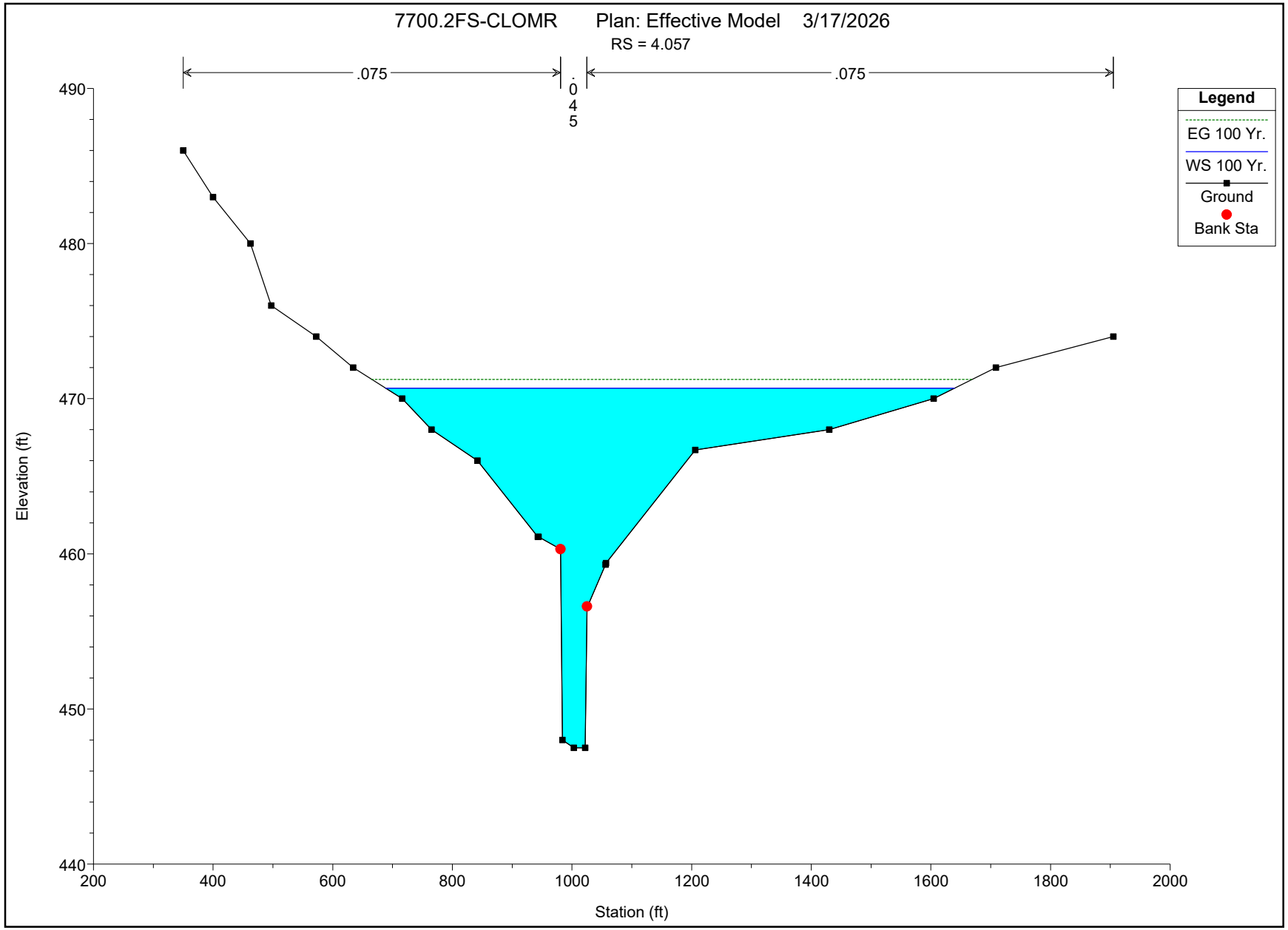

7700.2FS-CLOMR Plan: Effective Model 3/17/2026
RS = 4.148
.075
.045
.075
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
490
480
470
460
450
440
4000
4200
4400
4600
4800
5000
5200
5400
5600
5800
Station (ft)

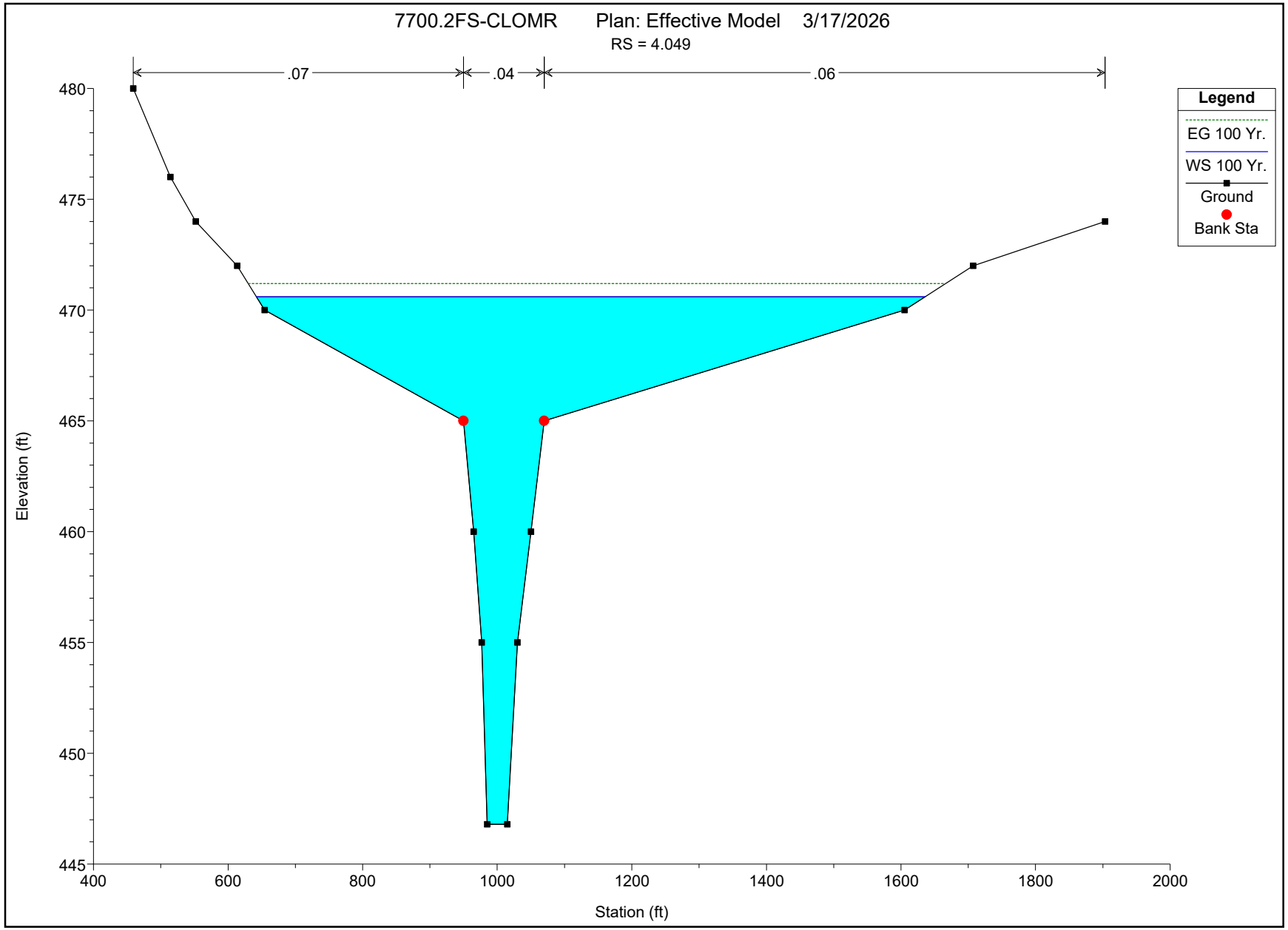

7700.2FS-CLOMR Plan: Effective Model 3/17/2026
RS = 4.080
.075
.045
.075
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Bank Sta
Elevation (ft)
Station (ft)
480
475
470
465
460
455
450
445
200
400
600
800
1000
1200
1400
1600
1800

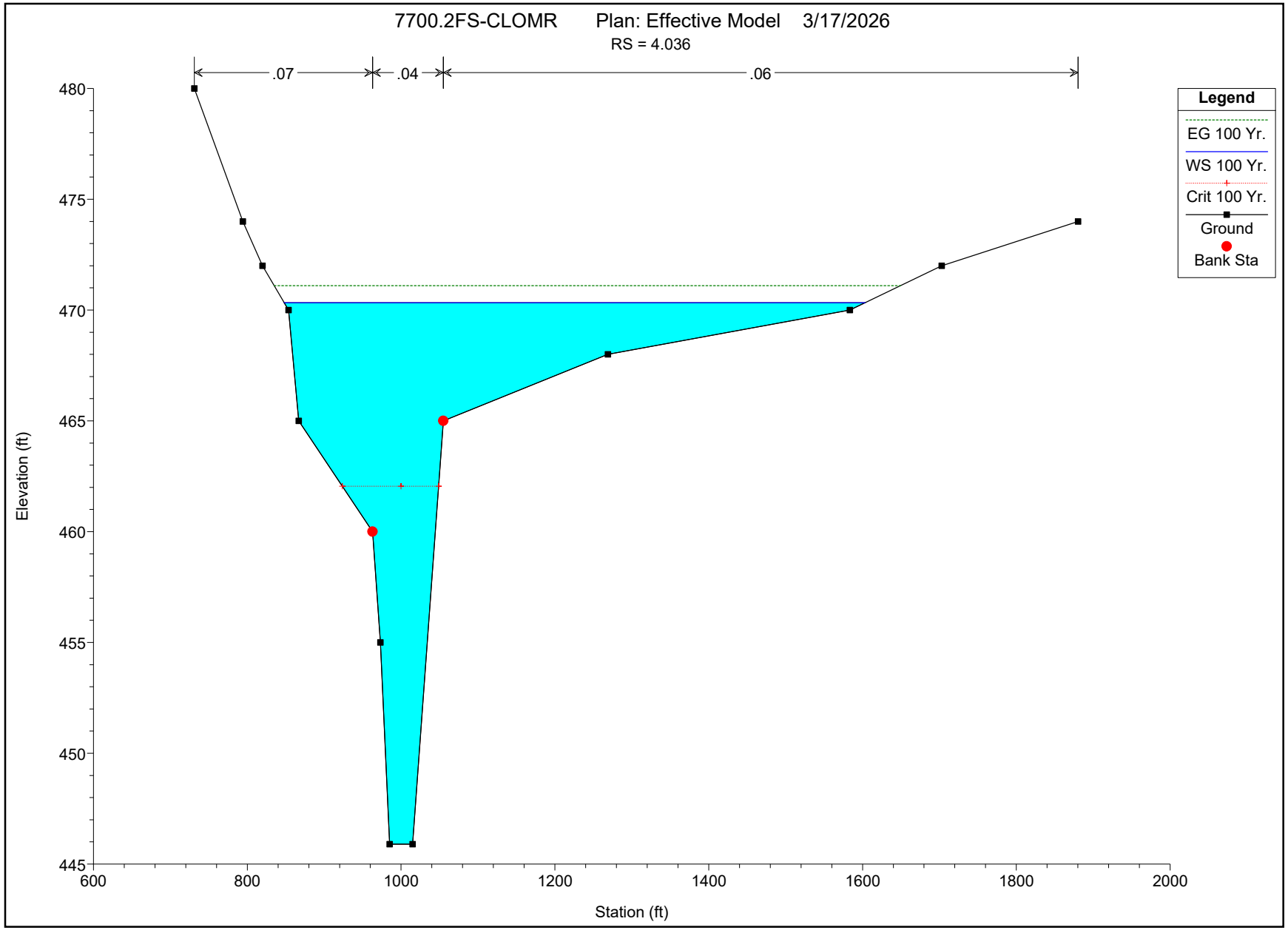

7700.2FS-CLOMR Plan: Effective Model 3/17/2026
RS = 4.073
.075
.045
.075
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Bank Sta
Elevation (ft)
Station (ft)
490
480
470
460
450
440
400
600
800
1000
1200
1400
1600
1800
2000


7700.2FS-CLOMR Plan: Effective Model 3/17/2026
RS = 4.069
.075
.045
.075
Legend
EG 100 Yr.
WS 100 Yr.
Crit 100 Yr.
Ground
Bank Sta
Elevation (ft)
480
475
470
465
460
455
450
445
400
600
800
1000
1200
1400
1600
1800
2000
Station (ft)


7700.2FS-CLOMR Plan: Effective Model 3/17/2026
RS = 4.060 BR
.075
.045
.075
Legend
WS 100 Yr.
EG 100 Yr.
Crit 100 Yr.
Ground
Bank Sta
Elevation (ft)
Station (ft)
485
480
475
470
465
460
455
450
445
400
600
800
1000
1200
1400
1600
1800
2000


7700.2FS-CLOMR Plan: Effective Model 3/17/2026
RS = 4.057
.075
.045
.075
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Bank Sta
Elevation (ft)
Station (ft)
490
480
470
460
450
440
200
400
600
800
1000
1200
1400
1600
1800
2000

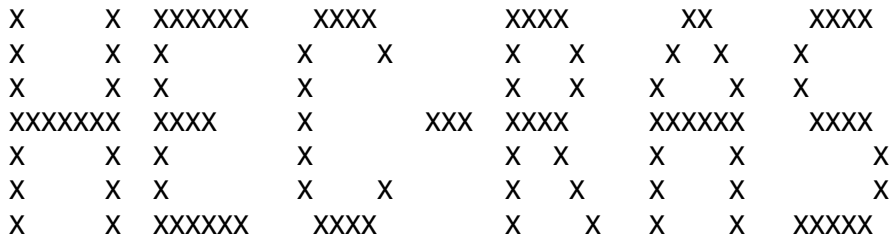

7700.2FS-CLOMR Plan: Effective Model 3/17/2026
RS = 4.049
.07
.04
.06
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Bank Sta
Elevation (ft)
480
475
470
465
460
455
450
445
400
600
800
1000
1200
1400
1600
1800
2000
Station (ft)


7700.2FS-CLOMR Plan: Effective Model 3/17/2026
RS = 4.036
.07
.04
.06
Legend
EG 100 Yr.
WS 100 Yr.
Crit 100 Yr.
Ground
Bank Sta
Elevation (ft)
480
475
470
465
460
455
450
445
600
800
1000
1200
1400
1600
1800
2000
Station (ft)

III. HEC-RAS Output – Deer Creek Existing Conditions Model

- HEC-RAS Input
- 15 Yr. and 100 Yr.-Flood Profile Table
- Cross Sections Showing 100 yr Water Surface Elevation

HEC-RAS HEC-RAS 6.6 September 2024
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California



PROJECT DATA
Project Title: 7700.2FS-CLOMR
Project File : 7700.prj
Run Date and Time: 3/17/2026 10:23:22 AM

Project in English units

Project Description:
DEER CREEK
RIVER DES PERES STUDY JUNE 1982
RETURN PERIODS
OF 10, 50, 100 AND 500 YEAR
DEER CREEK
RIVER DES PERES STUDY JUNE
1982
RETURN PERIODS OF 10, 50, 100 AND 500 YEAR

```
PLAN DATA

Plan Title: Existing Conditions Model
Plan File : o:\DRAW7700\20247700\Floodstudy\Hec-Ras Files\7700.p02

           Geometry Title: Existing Conditions Model
           Geometry File : o:\DRAW7700\20247700\Floodstudy\Hec-Ras Files\7700.g01

           Flow Title    : Imported Flow 01
           Flow File     : o:\DRAW7700\20247700\Floodstudy\Hec-Ras Files\7700.f01

Plan Description:
Existing Conditions Model


Plan Summary Information:
Number of:  Cross Sections =   18    Multiple Openings  =    0
            Culverts       =    0    Inline Structures  =    0
            Bridges        =    2    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

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

Right Offset = 0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
5.259	15 Yr.	0	0	0
5.029	15 Yr.	0	0	0
5.022	15 Yr.	0	0	0
5.021	15 Yr.	0	0	0
5.018	15 Yr.	0	0	0
5.017	15 Yr.	0	0	0
5.013	15 Yr.	0	0	0
4.859	15 Yr.	0	0	0
4.743	15 Yr.	0	0	0
4.625	15 Yr.	0	0	0
4.612	15 Yr.	0	0	0
4.563	15 Yr.	0	0	0
4.464	15 Yr.	0	0	0
4.419	15 Yr.	0	0	0
4.365	15 Yr.	0	0	0
4.259	15 Yr.	0	0	0
4.165	15 Yr.	0	0	0
4.16	15 Yr.	0	0	0
4.157	15 Yr.	0	0	0
4.148	15 Yr.	0	0	0
4.080	15 Yr.	0	0	0
4.073	15 Yr.	0	0	0
4.069	15 Yr.	0	0	0
4.057	15 Yr.	0	0	0
4.049	15 Yr.	0	0	0
4.036	15 Yr.	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
5.259	50 Yr.	0	0	0
5.029	50 Yr.	0	0	0
5.022	50 Yr.	0	0	0
5.021	50 Yr.	0	0	0
5.018	50 Yr.	0	0	0

5.017	50 Yr.	0	0	0
5.013	50 Yr.	0	0	0
4.859	50 Yr.	0	0	0
4.743	50 Yr.	0	0	0
4.625	50 Yr.	0	0	0
4.612	50 Yr.	0	0	0
4.563	50 Yr.	0	0	0
4.464	50 Yr.	0	0	0
4.419	50 Yr.	0	0	0
4.365	50 Yr.	0	0	0
4.259	50 Yr.	0	0	0
4.165	50 Yr.	0	0	0
4.16	50 Yr.	0	0	0
4.157	50 Yr.	0	0	0
4.148	50 Yr.	0	0	0
4.080	50 Yr.	0	0	0
4.073	50 Yr.	0	0	0
4.069	50 Yr.	0	0	0
4.057	50 Yr.	0	0	0
4.049	50 Yr.	0	0	0
4.036	50 Yr.	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
5.259	100 Yr.	0	0	0
5.029	100 Yr.	0	0	0
5.022	100 Yr.	0	0	0
5.021	100 Yr.	0	0	0
5.018	100 Yr.	0	0	0
5.017	100 Yr.	0	0	0
5.013	100 Yr.	0	0	0
4.859	100 Yr.	0	0	0
4.743	100 Yr.	0	0	0
4.625	100 Yr.	0	0	0
4.612	100 Yr.	0	0	0
4.563	100 Yr.	0	0	0
4.464	100 Yr.	0	0	0
4.419	100 Yr.	0	0	0

4.365	100 Yr.	0	0	0
4.259	100 Yr.	0	0	0
4.165	100 Yr.	0	0	0
4.16	100 Yr.	0	0	0
4.157	100 Yr.	0	0	0
4.148	100 Yr.	0	0	0
4.080	100 Yr.	0	0	0
4.073	100 Yr.	0	0	0
4.069	100 Yr.	0	0	0
4.057	100 Yr.	0	0	0
4.049	100 Yr.	0	0	0
4.036	100 Yr.	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
5.259	500 Yr.	0	0	0
5.029	500 Yr.	0	0	0
5.022	500 Yr.	0	0	0
5.021	500 Yr.	0	0	0
5.018	500 Yr.	0	0	0
5.017	500 Yr.	0	0	0
5.013	500 Yr.	0	0	0
4.859	500 Yr.	0	0	0
4.743	500 Yr.	0	0	0
4.625	500 Yr.	0	0	0
4.612	500 Yr.	0	0	0
4.563	500 Yr.	0	0	0
4.464	500 Yr.	0	0	0
4.419	500 Yr.	0	0	0
4.365	500 Yr.	0	0	0
4.259	500 Yr.	0	0	0
4.165	500 Yr.	0	0	0
4.16	500 Yr.	0	0	0
4.157	500 Yr.	0	0	0
4.148	500 Yr.	0	0	0
4.080	500 Yr.	0	0	0
4.073	500 Yr.	0	0	0
4.069	500 Yr.	0	0	0

4.057	500 Yr.	0	0	0
4.049	500 Yr.	0	0	0
4.036	500 Yr.	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
5.259	FW	1	760	1214
5.029	FW	1	884	1263
5.022	FW	1	866	1250
5.021	FW	1	866	1250
5.018	FW	1	862	1247
5.017	FW	1	862	1247
5.013	FW	1	855	1245
4.859	FW	1	964	1682
4.743	FW	1	949	1337
4.625	FW	1	912	1828
4.612	FW	1	948	1845
4.563	FW	1	887	1857
4.464	FW	1	374	1360
4.419	FW	1	238	1048
4.365	FW	1	295	1039
4.259	FW	1	443	1101
4.165	FW	1	4377	5107
4.16	FW	1	4376	5096
4.157	FW	1	4377	5093
4.148	FW	1	4380	5083
4.080	FW	1	619	1172
4.073	FW	1	647	1195
4.069	FW	1	658	1194
4.057	FW	1	708	1198
4.049	FW	1	721	1196
4.036	FW	1	855	1157

FLOW DATA

Flow Title: Imported Flow 01
Flow File : o:\DRAW7700\20247700\Floodstudy\Hec-Ras Files\7700.f01

Flow Data (cfs)

River	Reach	RS	10 Yr.	15 Yr.	50 Yr.	100 Yr.	500 Yr.	FW
RIVER-1	Reach-1	4.743	10212	11300	14451	16358	19884	16358
RIVER-1	Reach-1	4.419	10212	11300	14451	16358	19884	16358
RIVER-1	Reach-1	4.365	10647	11770	15166	17157	20828	17157
RIVER-1	Reach-1	4.069	10647	11770	15166	17157	20828	17157
RIVER-1	Reach-1	4.057	10631	11750	15084	17035	20761	17035
RIVER-1	Reach-1	4.036	10631	11750	15084	17035	20761	17035

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RIVER-1	Reach-1	10 Yr.		Known WS = 466.8
RIVER-1	Reach-1	15 Yr.		Known WS = 467.45
RIVER-1	Reach-1	50 Yr.		Known WS = 469.35
RIVER-1	Reach-1	100 Yr.		Known WS = 470.33
RIVER-1	Reach-1	500 Yr.		Known WS = 471.68
RIVER-1	Reach-1	FW		Known WS = 470.52

GEOMETRY DATA

Geometry Title: Existing Conditions Model
Geometry File : o:\DRAW7700\20247700\Floodstudy\Hec-Ras Files\7700.g01

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4.743

INPUT
Description: 4.743
LADUE FIS 25044 STANLEY SURVEY SECT - APROX. 250 FT. D.S.
OF TWOMILE
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
900	481	938	480	938	472	956	472	990	456
1000	455.3	1016	456	1067	466	1407	466	1480	482

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
900	.08	956	.04	1067	.1

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
956	1067	680	766	771	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4.625

INPUT
Description: 4.625
Station Elevation Data num= 405

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
817.08	488.39	817.19	488.38	818.04	488.33	822.72	488.36	823.03	488.37
826.93	488.16	827.599	488.19	828.599	488.06	831.3699	487.66	832.81	487.51

837.8599	486.53	844.71	484.99	847.95	484.31	849.15	484.02	852.2	483.02
853.5999	482.65	858.03	481.33	863.08	479.44	868.1299	477.18	869.7	476.56
871.3699	475.83	873.17	475.14	875.54	474.58	878.22	473.93	883.27	473.07
888.31	472.54	893.3599	472.27	898.4	472	903.45	471.6	904.71	471.46
906.93	471.15	908.4899	470.99	910.54	470.73	913.54	470.35	915.82	469.96
916.3799	469.84	918.58	469.44	920.2599	469.06	922.21	468.48	923.6299	468.14
928.05	467.48	928.67	467.38	929.1499	467.34	933.33	467.25	933.7399	467.23
934.33	467.11	937.6099	466.69	938.83	466.41	943.92	463.68	946.1499	463.22
946.92	463.09	949.0099	462.68	954.1	462.16	954.6999	462.01	958.97	460.3
959.19	460.29	959.5099	460.13	964.28	459.02	967.5199	458.39	969.37	458
974.4599	455.36	976.0699	455.12	978.3899	455.15	979.55	455.04	980.3399	454.99
984.4499	454.85	989.73	454.89	995.11	455	996.72	454.88	1000	454.4
1000.46	454.68	1000.68	454.67	1006.25	455.02	1007.93	455.04	1015.41	454.99
1019.14	454.91	1022.73	454.98	1022.88	454.99	1023.17	455.02	1026.62	455.24
1028.52	455.63	1030.35	456.28	1034.09	458.45	1037.83	462.3	1039.66	463.79
1041.56	464.33	1045	464.98	1045.22	465.03	1049.04	465.66	1050.79	466
1052.77	466.67	1055.92	467.94	1056.36	468.11	1056.51	468.17	1056.82	468.31
1061.93	470.67	1063.98	471.4	1067.5	472.57	1067.72	472.63	1068.18	472.72
1071.46	473.13	1073.06	473.28	1078.63	473	1078.93	472.98	1079.54	472.95
1082.67	472.73	1084.2	472.69	1089.77	472.61	1090.91	472.62	1101.35	472.52
1102.27	472.54	1106.47	472.73	1112.04	472.83	1112.56	472.86	1116.3	473.27
1117.61	473.5	1120.04	474.12	1121.43	474.59	1123.18	475.12	1123.77	475.2
1124.99	475.32	1127.51	475.4	1128.75	475.48	1131.25	475.22	1132.35	475.17
1134.99	475	1136.36	475	1138.72	474.92	1139.88	475	1145.45	475.53
1146.2	475.62	1147.72	475.76	1153.67	476.01	1157.41	476.08	1162.15	476.08
1164.88	476.14	1167.55	476.23	1169.78	476.44	1170.52	476.55	1172.63	476.79
1174.09	476.81	1176.72	476.74	1187.87	476.71	1191.3	476.76	1195.32	476.91
1195.61	476.95	1198.03	476.98	1199.91	477.21	1203.11	477.65	1204.22	477.73
1207.72	478.14	1208.19	478.18	1208.52	478.2	1210.33	478.37	1213.27	478.59
1213.92	478.61	1217.13	478.58	1218.35	478.63	1228.52	478.62	1238.48	478.46
1238.65	478.45	1243.76	478.47	1251.12	478.22	1251.56	478.2	1255.86	478.05
1264.08	477.64	1268.78	477.57	1269.16	477.57	1273.08	477.35	1275.92	477.26
1279.32	477.18	1281.69	477.08	1282.12	477.07	1289.49	476.8	1290.3	476.76
1294.52	476.5	1307.51	475.89	1316.12	475.64	1319.32	475.64	1325.52	475.5
1329.03	475.33	1340.29	474.92	1346.25	474.83	1350.32	474.9	1350.55	474.9
1351.09	474.89	1354.86	474.77	1360.62	474.6	1376.38	474.44	1381.31	474.28
1386.02	474.22	1393.59	474.03	1401.26	473.97	1406.11	474.04	1406.34	474.04
1406.5	474.05	1411.42	474.13	1416.51	474.06	1418.51	474.09	1421.59	474.12

1431.75	473.9	1443.31	473.99	1449.51	474.08	1457.15	474.12	1458.15	474.14
1462.23	474.29	1462.46	474.28	1466.76	474.17	1467.31	474.17	1472.39	474.35
1474.31	474.39	1475.37	474.44	1479.67	474.47	1480.51	474.51	1482.56	474.54
1487.64	474.46	1488.28	474.46	1492.58	474.53	1496.89	474.54	1499.11	474.51
1501.19	474.44	1502.88	474.45	1505.31	474.41	1505.5	474.41	1507.96	474.35
1514.1	474.45	1522.71	474.44	1523.2	474.43	1523.91	474.44	1527.02	474.54
1528.28	474.55	1533.36	474.44	1535.62	474.52	1536.31	474.53	1538.44	474.59
1543.53	474.55	1544.23	474.51	1548.54	474.42	1553.69	474.42	1554.91	474.35
1557.14	474.18	1561.11	474.01	1561.45	473.99	1565.75	473.82	1568.93	473.65
1570.06	473.65	1573.51	473.73	1574.01	473.73	1578.66	473.57	1579.71	473.54
1584.17	473.36	1589.25	473.29	1591.58	473.21	1592.1	473.17	1594.33	473.07
1599.41	472.94	1604.45	472.85	1608.79	472.68	1609.58	472.63	1613.1	472.44
1614.66	472.38	1619.74	472.1	1626.01	471.85	1629.3	471.65	1630.31	471.62
1634.98	471.63	1635.5	471.66	1638.92	471.99	1640.06	472.05	1641.7	471.95
1643.22	471.8	1645.14	471.7	1650.22	471.71	1651.83	471.8	1654.1	471.83
1656.14	471.91	1660.3	472.17	1660.44	472.18	1664.74	472.33	1685.1	472.6
1685.79	472.62	1686.26	472.62	1690.57	472.75	1695.95	472.76	1701.03	473.15
1703.48	473.1	1703.7	473.1	1707.78	473.04	1709.9	473.13	1711.19	473.14
1712.09	473.01	1716.1	472.26	1716.27	472.24	1717.06	472.11	1720.7	471.59
1721.35	471.51	1722.3	471.13	1725	470.27	1726.43	469.64	1728.5	468.85
1729.3	468.52	1733.61	466.9	1734.7	466.43	1736.59	465.68	1737.91	465.36
1740.9	465.06	1741.68	464.9	1742.22	464.69	1745.21	463.08	1746.52	462.35
1746.76	462.24	1753.3	457.97	1755.13	456.69	1756.92	455.55	1759.43	455.58
1762	455.61	1767.08	455.48	1771.9	456.15	1772.16	456.18	1772.34	456.19
1777.24	456.58	1782.32	456.62	1787.4	455.62	1789.56	455.88	1790.5	455.89
1792.48	456.07	1793.86	456.4	1796.7	457.37	1797.56	457.6	1798.17	457.69
1802.47	458.09	1802.65	458.13	1802.9	458.18	1806.78	459.27	1807.73	459.46
1809.09	459.89	1811.08	460.44	1812.81	461.01	1815.29	461.9	1817.89	462.87
1819.69	463.8	1821.49	464.64	1823.99	465.89	1827.69	467.81	1828.05	467.98
1828.3	468.08	1832.6	469.92	1833.13	470.16	1833.89	470.34	1838.21	471.29
1840.09	471.78	1841.21	472.03	1843.29	472.61	1848.37	473.55	1849.82	473.58
1852.49	473.84	1853.45	473.88	1854.12	473.92	1857.81	474.06	1858.42	474.07
1858.53	474.08	1863.61	474.36	1864.89	474.46	1867.03	474.59	1868.7	474.73
1873.78	475.31	1878.86	475.75	1879.94	475.86	1883.49	476.07	1883.94	476.11
1884.25	476.15	1888.55	476.68	1889.69	476.76	1892.86	476.88	1895.89	477.13
1897.16	477.26	1899.18	477.42	1909.34	478.73	1910.07	478.8	1914.38	478.98
1914.49	478.99	1918.68	479.49	1922.98	479.84	1929.66	480.64	1934.75	481.81
1935.9	482.15	1939.29	482.9	1939.83	483.04	1940.2	483.19	1944.5	484.59

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 1944.91  484.71 1945.49  484.92 1948.81  486.27 1949.99  486.66 1957.42  489.27
 1957.89  489.46 1960.15  490.27 1965.23  491.84 1966.02  492.04 1970.29  493.19
 1970.42  493.19 1974.63  492.82 1975.39  492.79 1976.49  492.84 1976.66  492.85

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  817.08      .1  910.54     .04  1067.5      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        910.54  1067.5              110     105      64             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  1709.9  1864.4  473.13       T

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.612

INPUT
Description: 4.612
 LADUE FIS 24349  STANLEY SURVEY SECT
Station Elevation Data    num=     466
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
841.1001  486.49844.9501  486.12845.2001  486.09849.6001  485.76849.9501  485.72
855.4601  484.79864.9601  483.46884.9701  481.16889.9701   480.4891.3601  480.09
  896.49  479.02   898.4  478.74899.9701   478.4  906.75  476.27  908.16   475.7
909.9701  475.11  911.88  474.85  913.04  474.65914.9701  474.38  917.01  474.27
  917.92  474.18924.9801  473.75  927.27  473.67927.6801  473.67929.9801  473.59
934.9801  472.68939.9801  471.59942.3201  471.56  942.66  471.57944.9801  471.54
947.2001  471.64  947.79  471.64  949.99  471.73952.0801  471.54  952.91  471.45
  954.99  471.26956.9601  471.18  958.04  471.11  959.99  471.02961.8401   470.3
  963.17  469.74  964.99  469.02  969.99  464.17971.6001  462.31973.4301  460.09
  974.99  458.28976.4801  457.42978.5601  456.34  979.99  455.53981.3601  455.33
983.6901  455.06     985  454.87    1000  454.06 1000.84  454.69    1005  454.96
  1014.7  456.67 1015.01  456.72  1015.3  456.76  1019.9  457.31 1020.02  457.32
 1020.13  457.35 1024.95  458.46  1025.1  458.49 1029.77  459.33 1030.02  459.39
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1030.3	459.59	1034.59	463.29	1035.03	463.61	1035.5	463.73	1039.41	464.54
1040.03	464.7	1040.7	464.71	1044.23	464.44	1045.03	464.45	1055.04	465.03
1060.04	466.7	1065.05	469.01	1070.05	471.5	1071.9	472.68	1073.16	473.4
1075.06	474.62	1077.1	475.24	1077.98	475.55	1080.06	476.17	1082.3	476.22
1082.8	476.24	1085.06	476.29	1087.5	476.11	1087.63	476.11	1090.07	475.93
1092.45	475.59	1092.7	475.55	1095.07	475.21	1097.27	474.99	1097.9	474.95
1102.59	474.48	1102.76	474.47	1105.26	474.26	1106.6	474.11	1110.49	473.6
1110.61	473.6	1111	473.58	1114.62	473.46	1115.71	473.4	1120.94	473.58
1122.63	473.59	1125.26	473.53	1126.16	473.53	1126.64	473.56	1130.65	473.92
1136.61	474.6	1142.68	474.99	1147.06	475.45	1152.29	475.69	1157.39	476.18
1162.46	475.69	1166.77	475.78	1167.42	475.81	1167.7	475.81	1171.75	476.01
1177.69	476.03	1179.96	476.16	1180.41	476.2	1182.76	476.32	1184.73	476.59
1186.09	476.68	1187.83	476.88	1189.06	477.07	1192.22	477.68	1192.91	477.8
1193.39	477.83	1197.72	478.46	1197.98	478.51	1198.35	478.56	1203.05	479.09
1213.2	479.35	1235.14	479.32	1236.66	479.29	1238.57	479.3	1240.99	479.25
1241.27	479.23	1253.79	478.73	1253.97	478.72	1274.09	478.21	1289.31	477.54
1294.38	477.12	1299.46	476.54	1309.6	475.72	1310.23	475.66	1314.68	475.31
1314.84	475.3	1319.75	474.91	1329.9	474.43	1340.05	474.26	1340.53	474.26
1344.85	474.35	1345.12	474.35	1349.18	474.23	1350.19	474.22	1362.16	473.81
1365.41	473.77	1370.82	473.44	1375.15	473.27	1375.56	473.26	1380.64	473.31
1385.71	473.29	1390.78	472.92	1401.11	472.95	1405.44	473.04	1412.94	472.85
1414.09	472.85	1422.75	472.64	1426.3	472.64	1427.08	472.72	1431.33	472.97
1431.57	472.99	1435.73	473.28	1437.46	473.33	1440.06	473.33	1441.52	473.4
1443.6	473.3	1444.39	473.24	1446.6	473.17	1451.67	473.2	1453.04	473.25
1455.86	473.25	1456.74	473.27	1457.37	473.27	1461.7	473.15	1477.04	473.12
1487.19	472.88	1487.66	472.86	1502.41	472.62	1513.63	472.7	1517.17	472.79
1517.63	472.79	1517.95	472.81	1522.28	472.91	1522.7	472.9	1537.92	472.95
1539.59	472.93	1541.69	473	1543	473	1543.92	472.98	1547.82	472.65
1548.07	472.64	1548.25	472.62	1553.15	472.29	1558.22	472.1	1563.29	472.07
1565.56	472.1	1566.22	472.12	1569.88	472.15	1572.35	472.22	1573.44	472.23
1574.21	472.26	1578.48	472.51	1583.59	472.52	1588.66	472.05	1590.74	472.12
1591.52	472.12	1593.74	472.22	1595.85	472.16	1596.87	472.04	1598.81	471.93
1600.18	472	1603	472.06	1603.88	472.1	1604.5	472.1	1608.11	472.19
1608.83	472.22	1608.96	472.22	1609.13	472.23	1614.03	472.4	1624.18	471.62
1626.14	471.62	1627.53	471.7	1630.47	471.73	1634.33	471.64	1637.53	471.77
1639.12	471.88	1643.45	471.73	1644.47	471.66	1645.92	471.61	1647.78	471.59
1649.55	471.51	1654.62	471.09	1659.7	470.81	1660.76	470.88	1664.31	471.29
1664.77	471.32	1665.09	471.3	1669.42	470.85	1669.84	470.83	1674.92	470.78

1679.99	471.15	1682.4	471.37	1682.71	471.41	1685.06	471.64	1690.14	472.52
1691.06	472.51	1694.97	472.34	1695.21	472.34	1695.38	472.33	1705.36	472.31
1710.43	472.51	1712.69	472.52	1713.36	472.55	1715.51	472.57	1721.35	472.22
1725.62	471.71	1730	471.49	1730.73	471.44	1735.8	470.95	1740.88	470.25
1742.99	469.63	1744.02	469.28	1745.95	468.68	1747.31	468.21	1750.15	467.33
1751.02	467.03	1755.97	465.78	1756.1	465.75	1756.28	465.69	1760.3	464.45
1761.17	464.14	1771.32	455.91	1773.28	455.74	1774.67	455.71	1776.39	455.6
1777.61	455.6	1786.26	455.78	1786.54	455.79	1786.93	455.77	1790.59	455.69
1791.61	455.63	1796.69	455.6	1801.76	456.15	1803.57	457.17	1805.33	458.38
1806.84	459.28	1807.9	459.83	1811.46	461.43	1811.91	461.66	1816.98	462.46
1817.59	462.59	1820.88	463.38	1827.13	464.66	1829.54	465.48	1829.85	465.57
1832.2	466.35	1837.28	467.35	1838.19	467.49	1842.11	468.28	1842.35	468.32
1842.52	468.37	1846.85	469.47	1847.43	469.58	1848.25	469.76	1851.17	470.46
1852.5	470.74	1862.65	472.64	1872.77	474.84	1872.91	474.88	1877.87	475.95
1878.9	476.06	1881.47	476.25	1890.12	477.34	1893.09	477.66	1898.16	477.99
1898.78	478.07	1902.34	478.58	1903.1	478.7	1903.24	478.71	1907.43	479.14
1908.31	479.25	1909.56	479.35	1911.76	479.48	1913.38	479.63	1915.69	479.94
1916.09	479.98	1918.46	480.32	1923.53	480.72	1924.74	480.76	1927.95	480.8
1928.61	480.82	1929.07	480.78	1933.68	480.56	1934.08	480.61	1937.73	481
1938.75	481.13	1940.21	480.98	1942.05	480.75	1943.83	480.59	1948.9	480.94
1953.98	481.88	1959.05	483.1	1959.36	483.24	1963.69	485.06	1964.12	485.23
1964.74	485.46	1974.27	489.16	1976.67	489.76	1977	489.81	1979.34	490.33
1981	490.87	1983.13	491.74	1984.42	492.2	1985.33	492.41	1989.26	493.46
1989.66	493.55	1993.98	494.29	1994.57	494.38	1995.39	494.47	1998.31	494.87
1999.64	494.98	2001.52	495.38	2002.64	495.65	2004.71	496.07	2006.97	495.96
2007.65	495.96	2009.79	495.89	2011.29	495.97	2013.78	496.19	2019.92	496.6
2020.03	496.6	2024.28	496.8	2025.01	496.82	2030.08	497.56	2032.18	497.49
2032.93	497.45	2035.16	497.39	2037.26	497.43	2040.23	497.51	2045.3	497.34
2050.24	497.48	2050.57	497.5	2055.45	497.94	2060.52	498.54	2065.6	498.95
2070.67	499.1	2076.21	499.13	2080.82	499.02	2087.36	499.46	2089.19	499.63
2096.04	500.04	2097.84	500.09	2099.62	500.21	2101.12	500.27	2106.19	500.27
2106.5	500.31	2111.26	501.08	2115.15	501.86	2116.34	502.12	2118.01	502.29
2119.48	502.53	2126.48	503.08	2128.14	503.04	2130.27	502.91	2131.56	502.87
2132.46	502.93	2136.41	503.41	2136.63	503.43	2136.79	503.43	2141.12	503.33
2142.54	503.35	2145.45	503.51	2146.78	503.51	2148.67	503.63	2149.77	503.67
2151.85	503.82	2154.1	503.83	2156.93	503.82	2158.43	503.92	2160.93	504.22
2162	504.31	2167.06	504.4	2171.41	504.38	2172.15	504.39	2177.22	504.6
2193.05	504.79	2197.72	504.76	2202.59	504.87	2212.74	505.33	2222.89	505.55

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 2223.34  505.58 2227.67  505.81  2258.4  506.79 2283.77  506.93 2283.93  506.94
 2288.26  506.98 2288.85     507 2305.57   507.2 2308.07  507.18 2319.29  507.29
 2324.36  507.46 2343.68  507.83 2344.51  507.86 2344.66  507.86 2344.86  507.87
 2348.84   507.9 2381.65  508.56 2385.25  508.54 2400.47  508.83 2400.77  508.84
 2404.05     509

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
841.1001      .1956.9601     .04 1039.41      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      956.9601 1039.41              270     255     240             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
 1713.36    2075  472.55       T

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.563

INPUT
Description: 4.563
 LADUE FIS 24094  STANLEY SURVEY SECT
Station Elevation Data    num=     500
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  697.28   485.1  707.28  485.03  712.29  484.72  713.09  484.64  716.61  484.23
721.8101  483.66  722.29  483.62   732.3  482.51  737.41  482.31  742.03  482.25
742.3101  482.25  742.61  482.24  751.67  481.77752.3101  481.75  753.01  481.66
  756.49  481.32757.3199  481.22762.3199  481.02  763.41  480.96  766.14  480.75
  767.33  480.68  777.33  479.95  782.34  479.91  787.34  480.03  792.34  479.67
   794.6  479.22795.0699  479.15  797.35   478.7  802.35  477.89  804.72  477.68
     805  477.65  812.36  477.03  814.36  476.83   815.4  476.69  817.36   476.5
  819.18  476.48   820.6   476.5  824.01  476.45  825.79  476.49  827.37  476.46
828.8299  476.31  830.99     476  833.65  475.72  837.39  475.19  837.59  475.17
  842.96  474.28848.3299  473.24  849.25  473.15   851.6  472.96  855.05   472.6
  856.97  472.34859.0699  472.22  864.68  471.31   865.3  471.19  868.54  470.49
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869.81	470.26	875.18	470.34	876.26	470.25	880.11	470887.8299		469.7	
892.71	469.61	899.21	469.32	899.41	469.32	902.03	469.19	903.26	469.21	
906.41	469.6	907.12	469.66	907.4	469.66	907.53	469.65	910.72	469.18	
913.28	469.03	917.86	468.91	919.53	468.81	921.43	468.78928.5799		468.29	
932.15	467.91	932.27	467.91	938.31	467.56	942.86	467.1	946.43	466.83	
950.8199	466.6957.0799		466.49	957.22	466.49	960.71	466.54	963.34	466.21	
964.28	465.93	965.53	465.38	971.42	462.14	975.86	459.98	978.56	458.54	
982.11	457.14985.6999		455.29	988.37	454.59	989.28	454.47	1000	453.43	
1012.69	454.49	1015.35	454.78	1016.61	454.99	1019.1	455.52	1020.15	455.65	
1022.14	455.97	1022.85	456.18	1024.35	456.78	1026.6	457.88	1027.68	458.58	
1030.36	459.67	1030.69	459.73	1034.11	460.57	1037.86	461.64	1038.75	461.93	
1041.23	462.98	1041.61	463.15	1044.28	464.12	1045.37	464.35	1047.65	464.98	
1049.12	465.53	1049.82	465.81	1052.87	467.39	1055.35	468.61	1056.63	468.97	
1060.38	469.91	1060.89	470.05	1062.32	470.37	1064.13	470.86	1066.42	471.2	
1067.88	471.34	1070.96	471.79	1071.64	471.9	1071.96	471.96	1075.33	472.93	
1078.97	474.13	1081.07	474.63	1082.62	474.94	1083.55	475.08	1100.84	475.51	
1101.03	475.52	1112.69	475.67	1118.52	475.64	1129.71	475.85	1130	475.86	
1130.18	475.86	1136.01	476.18	1140.94	476.29	1147.66	476.62	1148.23	476.64	
1151.87	476.72	1153.49	476.82	1155.52	476.9	1158.89	476.96	1159.16	476.96	
1159.32	476.97	1159.96	476.99	1162.81	477.14	1170.1	477.42	1173.74	477.66	
1177.39	477.78	1188.08	478.46	1188.47	478.49	1189.05	478.5	1202.9	478.87	
1211.08	479.36	1211.31	479.37	1221.22	479.64	1226.28	479.64	1241.16	479.31	
1241.73	479.29	1246.07	479.23	1246.56	479.21	1251.63	479.21	1266.84	478.47	
1267.79	478.39	1271.58	478.2	1271.91	478.17	1272.14	478.16	1297.25	476.39	
1298.21	476.34	1301.99	476.05	1302.32	476.03	1307.39	475.8	1312.46	475.24	
1320.24	474.71	1332.41	474.16	1332.73	474.14	1332.96	474.14	1342.87	473.87	
1347.94	473.83	1350.34	473.91	1350.66	473.93	1353.01	474.02	1358.08	474.35	
1359.03	474.37	1362.82	474.54	1363.15	474.55	1363.38	474.52	1364.76	474.17	
1368.22	473.39	1368.91	473.3	1372.07	473.06	1373.29	472.87	1383.42	472.3	
1385.1	472.26	1387.16	472.26	1388.49	472.23	1393.56	472.27	1393.79	472.29	
1398.63	472.64	1399.32	472.58	1402.48	472.46	1405.4	472.18	1406.83	472	
1408.77	471.85	1411.17	471.89	1411.49	471.88	1413.84	471.89	1415.52	472.14	
1417.57	472.3	1419.86	472.59	1423.65	473.26	1423.98	473.31	1428.55	472.87	
1429.74	472.9	1432.89	472.71	1434.11	472.78	1439.18	472.62	1441.58	472.32	
1441.9	472.26	1444.25	471.91	1449.32	471.78	1450.27	471.81	1458.96	472.34	
1463.31	472.41	1464.53	472.45	1469.6	472.38	1472	472.57	1474.66	472.79	
1484.48	472.66	1484.8	472.65	1485.03	472.65	1489.87	472.4	1490.57	472.39	
1493.72	472.29	1494.94	472.28	1500.01	472.58	1502.41	472.46	1502.73	472.45	

1505.08	472.34	1519.79	472.42	1525.35	472.29	1527.07	472.34	1528.48	472.43
1530.42	472.47	1532.82	472.34	1533.15	472.34	1540.56	472.1	1545.63	472.22
1550.7	472.48	1551.4	472.47	1560.84	472.46	1563.24	472.3	1563.56	472.29
1570.98	471.86	1571.93	471.86	1575.73	471.65	1576.04	471.64	1576.27	471.62
1580.61	471.47	1581.12	471.47	1586.19	471.23	1602.2	472.63	1606.46	472.75
1606.67	472.76	1610.84	473.05	1611.57	473.08	1612.62	472.98	1615.16	472.67
1621.73	472.1	1623.8	472.06	1624.92	472.01	1631.88	471.8	1632.44	471.77
1636.76	471.78	1636.95	471.76	1641.08	471.44	1642.03	471.41	1647.11	471.49
1649.54	471.45	1649.72	471.44	1657.26	471.38	1662.34	471.08	1677.56	470.61
1682.64	470.66	1687.72	471.28	1688.59	471.29	1692.62	471.23	1692.79	471.23
1692.91	471.24	1697.23	471.82	1697.87	471.92	1702.94	472.06	1708.02	471.84
1713.1	471.75	1718.17	471.93	1718.83	471.88	1723.15	471.66	1723.4	471.66
1727.47	471.76	1728.33	471.72	1729.55	471.7	1731.78	471.57	1735.71	471.5
1736.1	471.5	1743.55	471.16	1744.74	470.91	1748.01	470.35	1748.63	470.23
1753.38	469.5	1753.71	469.43	1754.17	469.29	1757.7	468.15	1758.78	467.83
1766.34	466.22	1766.48	466.2	1770.66	465.32	1772.63	464.82	1774.01	464.5
1774.98	464	1779.09	461.79	1780.5	460.66	1783.62	458.09	1784.16	457.63
1784.94	457.35	1787.94	455.98	1789.24	455.56	1799.39	455.57	1804.47	455.96
1809.56	455.93	1813.85	456.12	1814.62	456.17	1815.71	456.91	1818.17	458.47
1819.7	459.52	1821.87	460.18	1822.49	460.38	1824.77	461.05	1829.85	461.24
1831.13	461.36	1834.92	461.63	1839.77	462.15	1840	462.18	1840.33	462.2
1845.08	462.64	1846.49	462.97	1848.41	463.54	1850.15	463.9	1855.23	465.13
1860.31	467.5	1861.37	468.1	1864.95	469.88	1865.38	470.11	1870	472.3
1870.46	472.51	1875.53	474.63	1877.26	475.28	1878.64	475.83	1880.61	476.55
1882.96	476.69	1883.41	476.76	1885.69	476.97	1890.76	477.92	1891.6	477.9
1895.72	477.97	1895.92	477.97	1896.38	478.01	1900.24	478.29	1900.91	478.36
1905.99	479.17	1908.03	479.23	1908.88	479.21	1913.2	479.43	1916.14	479.55
1917.52	479.51	1920.34	479.36	1921.22	479.33	1921.84	479.33	1926.3	479.63
1926.5	479.64	1930.48	479.78	1931.37	479.84	1936.45	479.58	1938.8	479.32
1939.11	479.29	1941.52	479.01	1946.6	479.14	1947.75	479.15	1951.11	478.94
1951.68	478.93	1952.07	478.96	1956.39	479.54	1956.75	479.6	1961.83	479.49
1966.91	480.51	1969.35	481.39	1969.58	481.48	1971.98	482.36	1973.67	483.37
1975.73	484.48	1977.99	485.82	1981.89	487.92	1982.13	488.07	1982.31	488.14
1987.21	490.22	1992.29	491.82	1997.36	492.83	2002.44	494.02	2007.51	494.87
2008.22	494.97	2012.27	495.28	2012.54	495.31	2012.66	495.32	2017.67	495.54
2018.81	495.63	2021.18	495.87	2022.74	495.97	2024.97	496.19	2025.5	496.23
2032.9	497.05	2034.14	497.08	2037.97	497.25	2042.78	497.23	2043.05	497.24
2043.43	497.24	2047.1	497.33	2048.12	497.31	2053.2	497.39	2058.28	497.71

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 2064.38  498.75 2068.05  499.22 2068.43  499.28 2068.69  499.28  2073.5  499.55
 2083.66  499.03 2088.73  499.15 2090.29  499.22 2092.67  499.43 2098.82  499.76
 2099.19  499.77 2103.25  499.82 2103.96  499.84 2109.04   500.1 2116.21  500.71
 2117.29  500.86 2124.27  501.58 2129.17  502.91 2129.34  502.96 2129.59  503.05
 2133.49  504.57 2134.42  504.88 2135.75  504.86  2137.8  504.87 2139.49  504.83
 2146.44  503.82 2148.06  503.67 2149.65  503.47 2150.76  503.55 2154.21  503.92
 2154.72  503.95 2155.08  503.95  2159.4  503.89  2159.8  503.89 2163.72  504.13
 2166.52  504.22 2168.04   504.3 2172.36  504.35 2172.68  504.36 2175.03   504.4
 2176.68  504.38 2185.18  504.38 2185.32  504.39 2215.55  504.85 2215.76  504.85
 2219.87  504.91 2235.94  505.65 2237.15  505.68 2241.02  505.84 2241.47  505.87
 2261.32   506.5  2266.4  506.54 2271.48  506.74  2271.7  506.74 2314.23     507
  2314.9  506.99 2332.18  507.22 2337.47  507.42 2369.62   507.8 2392.65  507.96
 2408.53  508.32 2417.87  508.74 2418.56  508.78 2418.68  508.79 2427.63  509.31

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  697.28      .1  960.71     .04 1060.89      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        960.71 1060.89              480   522.5     525             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
 1727.47    2087  471.76       T

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.464

INPUT
Description: 4.464
Station Elevation Data    num=     493
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  150.42   480.6152.3299  480.57  172.24  479.71172.6599   479.7177.8999  479.28
183.1499  477.81  184.18  477.48188.1599  476.11193.6399  474.03198.8899  472.35
204.1299  471.07209.3799  470.04     224  468.17225.1199  468.06235.6099  467.67
  235.95  467.67255.8599  466.65256.5899  466.63259.8399  466.64277.5701  466.04
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287.71	465.92	288.0601	465.88	298.5601	465.65	303.6399	465.79	303.8001	465.8			
304.1099	465.81	307.62	465.84	309.05	465.92	315.59	465.99	324.7799	466.39			
327.1599	466.57	327.5299	466.59	331.5199	466.97	334.85	467.53	335.2799	467.55			
335.5	467.59	336.2	467.7	339.48	468.08	340.5199	468.14	345.7699	468.05			
347.44	467.93	350.22	467.82	351.01	467.77	351.43	467.79	352.73	467.82			
355.4099	467.72	363.37	467.86	365.59	468.14	366.75	468.21	369.25	468.23			
372	468.01	379.3	466.26	380.96	466.08	382.49	465.82	383.2799	465.74			
387.73	465.47	388.6399	465.38	391.25	465.31	392.98	465.03	395.23	465.06			
396.33	465.2	398.23	465.33	403.19	466.93	403.47	467.03	404.01	467.15			
407.1699	467.93	408.72	468.25	413.96	468.3	429.7	467.32	440.19	465.95			
445.44	465.44	450.68	464.68	462.9199	463.56	466.4199	463.15	466.8999	463.08			
468.43	462.82	471.6699	462.36	474.87	463.33	476.9099	464.02	478.85	464.39			
482.1599	465.15	482.83	465.34	487.3999	466.43	492.6499	468	497.8999	469.36			
498.76	469.66	502.74	470.96	503.1399	471.08	508.3899	472.88	513.63	474.46			
524.12	475.56	529.37	475.72	571.34	475.6	581.83	475.28	597.56	474.29			
608.06	474.93	623.7899	475.09	629.0399	475.37	634.55	475.31	638.13	475.28			
639.5299	475.22	642.11	475.31	644.7799	475.42	650.0199	475.39	655.2699	475.24			
666	475.34	686.74	474.94	691.99	474.69	702.48	474.51	718.22	474.79			
725.73	475.2	728.71	475.24	729.72	475.19	733.7	475.28	733.96	475.28			
745.6399	474.84	749.82	474.81	765.19	474.96	765.43	474.97	765.55	474.98			
765.94	474.97	769.5399	475.08	770.68	475.16	772.88	475.17	773.5199	475.1			
775.9199	474.97	781.1699	475.04	782.47	475	791.6599	474.86	793.43	474.92			
795.93	475.09	796.8999	475.13	797.4099	475.12	802.1499	474.88	828.38	474.84			
829.26	474.81	838.87	474.72	857.1399	474.94	857.4099	474.95	880.84	474.97			
881.0299	474.96	891.33	474.79	900.94	475	918.8899	475.03	920.85	474.96			
922.8	475.02	924.83	475	926.38	474.89	928.0199	474.89	928.6599	474.97			
929.94	475.27	932.3899	475.74	933.61	475.82	936.12	475.7	937.24	475.95			
939.19	476.29	941.1599	476.75	943.58	476.94	944.7799	476.91	947.3	476.2			
948.36	475.8	950.36	475.11	951.0299	474.72	952.38	473.84	954.76	472.45			
955.95	471.63	958.49	469.59	961.5299	466.99	963.6	465.02	965.95	462.87			
967.12	461.85	969.68	460.25	970.62	459.72	972.71	458.49	973.4099	458			
977.1399	455.13	978.2899	454.54	980.86	454.24	983.88	454.01	984.59	454			
988.32	453.77	989.46	453.73	999.74	453.62	1000	453.42	1000.28	453.61			
1003.81	453.68	1003.92	453.69	1005.39	453.71	1014.88	453.59	1015.7	453.64			
1015.98	453.71	1016.57	454.05	1019.62	455.96	1021.28	456.83	1023.55	459.42			
1026.58	462.76	1027.47	463.3	1030.02	465.15	1031.87	466.43	1032.87	466.61			
1037.17	467.41	1042.47	467.91	1047.09	468.1	1047.77	468.16	1051.01	468.7			
1053.06	468.98	1054.94	469.05	1058.36	469.07	1058.86	469.06	1068.96	469.4			

1070.63	469.51	1086.33	469.89	1090.14	470.11	1094.18	470.12	1100.74	470.43
1102.03	470.42	1105.95	470.26	1113.8	470.33	1116.63	470.44	1121.65	470.42
1137.82	470.76	1148.41	470.73	1153.04	470.56	1171.52	470.52	1173.24	470.57
1176.6	470.77	1186.11	470.85	1186.77	470.84	1198.99	470.97	1200.21	470.89
1232.53	470.79	1237.55	471.08	1241.9	471.89	1242.7	472.02	1247.79	471.76
1250.11	471.77	1250.48	471.73	1252.87	471.87	1254.77	471.63	1256.35	471.22
1257.96	470.95	1263.04	471.04	1267.65	470.85	1268.13	470.79	1268.82	470.54
1271.94	469.29	1273.21	468.87	1280.52	465.43	1281.3	465.15	1283.38	464.25
1289.1	462.11	1292.56	461.32	1293.4	461.11	1293.55	461.06	1297.69	460.05
1303.72	458.31	1308.8	455.31	1313.89	453.73	1329.14	453.74	1334.23	456.95
1339.31	461	1344.4	464.84	1349.18	468.97	1349.48	469.24	1349.92	469.57
1353.48	472.47	1354.57	473.29	1356.15	474.21	1357.77	475.09	1359.65	476.2
1362.06	476.42	1362.39	476.46	1364.74	476.69	1374.87	476.39	1375.08	476.27
1379.22	473.6	1379.99	473.12	1381.1	472.37	1383.52	470.87	1385.08	469.77
1387.34	468.65	1387.81	468.4	1390.16	467.29	1395.24	466.84	1400.33	466.61
1400.68	466.62	1404.97	466.65	1405.41	466.64	1420.67	466.81	1443.48	466.52
1443.6	466.51	1446.09	466.44	1456.26	466.42	1456.47	466.41	1466.43	466.39
1471.52	466.52	1473.63	466.68	1474.67	466.81	1477.93	467.14	1481.68	467.67
1482.22	467.76	1485.1	468.35	1486.51	468.71	1486.77	468.81	1491.85	470.63
1496.94	473.01	1499.38	474.48	1499.62	474.63	1502.02	476.08	1503.67	476.84
1505.86	477.7	1507.11	478.25	1507.97	478.56	1512.1	480.39	1512.26	480.43
1512.61	480.42	1516.55	479.99	1517.28	480.01	1518.34	480.24	1520.84	480.55
1522.36	480.94	1524.57	481.75	1525.13	481.98	1527.45	482.78	1529.42	482.49
1530.81	482.14	1532.53	481.83	1533.71	481.31	1537.05	480.25	1537.62	480.02
1540.11	479.6	1542.3	479.11	1542.7	479.03	1547.79	478.86	1549.53	479.14
1550.88	479.31	1552.87	479.67	1557.96	481.93	1559.46	482.66	1562	484.06
1563.04	484.59	1567.62	485.32	1568.24	485.39	1572.34	485.45	1573.21	485.49
1574.48	485.67	1576.63	486.09	1578.29	486.29	1583.38	486.36	1588.46	487.22
1593.55	487.36	1593.79	487.35	1595.12	487.17	1598.09	486.66	1598.63	486.6
1599.43	486.59	1602.38	486.45	1603.72	486.45	1613.89	486.87	1622.63	487.54
1623.83	487.68	1624.06	487.72	1629.14	488.21	1636.71	488.69	1636.86	488.69
1639.31	488.81	1641	489.14	1643.09	489.81	1644.4	490.11	1649.33	490.66
1649.48	490.68	1653.87	489.6	1654.57	489.49	1659.65	489.66	1664.73	489.59
1666.75	489.62	1668.05	489.55	1669.82	489.54	1671.04	489.6	1674.28	489.64
1674.9	489.67	1677.64	489.98	1683.91	490.91	1685.07	491.05	1692.5	491.62
1693	491.63	1695.24	491.77	1705.15	492.63	1705.37	492.66	1709.66	493.34
1710.5	493.4	1711.71	493.59	1713.95	493.85	1715.58	494.14	1722.54	494.66
1724.19	494.94	1725.75	495.14	1726.83	495.11	1730.42	494.87	1730.84	494.86

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 1731.12  494.88 1732.65  494.92 1735.41  495.07 1736.66  495.19  1739.7  495.73
 1741.01  495.81  1742.9  496.46 1743.99   496.8 1746.09  497.54 1748.29  497.93
 1749.14  498.12 1751.17  498.52 1756.26  499.03 1756.87  499.05 1761.16  498.73
 1761.34  498.71 1766.43  498.47 1767.85  498.89 1769.74  499.54 1771.51  500.01
  1776.6  500.28 1778.33  500.33 1780.33  500.26 1782.62   500.3 1786.77  500.24
  1791.2  500.56 1796.94  501.74 1799.04  502.32 1799.78  502.48 1802.02  503.15
 1804.07  503.47 1805.28   503.6 1807.11  503.86 1812.19   504.3 1812.66  504.38
 1815.17  504.68 1817.28  504.83 1821.24  505.48 1827.45  506.16 1829.82   506.2
 1830.23  506.24 1834.11  506.41 1842.68  507.21 1847.78   507.4 1848.94  507.35
 1851.28  507.18 1852.87  507.13 1855.18  507.22 1855.57  507.22 1863.04  507.57
 1864.15  507.65 1868.12  508.13 1868.44  508.12 1870.18   508.2 1873.21  508.19
 1877.03  508.04 1878.29  508.02 1893.55   508.5 1894.19  508.49 1897.69  508.84
 1898.63  508.89 1919.94  509.44  1923.8  509.72 1925.19  509.78 1939.31     510
  1941.4  509.93 1942.51  509.94 1944.39   509.9 1945.69  509.96 1948.75  509.94
 1949.48  509.96 1949.98     510 1964.73  510.43 1969.82  510.72 1971.44   510.9
  1974.9  511.36 1979.94   511.7  1988.6  511.93 1990.16  511.94 1992.41  512.39
  1992.9   512.5 1995.24  512.96 2000.33  513.15 2010.06  513.16  2010.5  513.15
 2015.58  513.13 2020.66  512.79 2035.92  514.41 2036.08  514.42  2040.1   514.8
 2048.55  515.17 2048.68  515.17 2066.43  515.78

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  150.42     .05  958.49    .045 1032.87     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        958.49 1032.87              218     238     238             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
 1252.87    1367  471.87       T
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
    1377    1576     476

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.419
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INPUT
Description: 4.419
 JUNCTION WITH SABAGO
Station Elevation Data   num=   456

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
34.55	480.53	37.29	480.39	37.79	480.38	41.4401	480.14	42.9401	480.07
48.0799	479.59	49.73	479.35	53.22	478.77	53.87	478.62	58.02	477.86
58.36	477.81	58.93	477.59	62.16	476.4	63.51	475.85	65.6999	475.12
66.31	474.93	68.65	474.13	70.46	473.71	72.47	473.13	73.79	472.79
74.6	472.69	78.75	472.08	78.93	472.05	79.24	472.02	94.36	470.84
99.34	470.63	99.56	470.631	20.0799	469.581	20.1999	469.58	120.72	469.55
135.5	469.04	140.65	468.77	140.93	468.761	45.0701	468.71	150.93	468.44
178.24	467.67	186.53	467.69	202.36	467.24	212.64	467.27	215.55	467.34
227.63	467.33	233.21	467.48	243.5	467.34	248.53	467.45	248.71	467.45
249.01	467.43	252.86	467.3	253.78	467.2	258.93	467.07	265.29	465.78
268.84	464.95	269.21	464.872	69.4401	464.86	270.39	464.97	273.59	465.29
274.35	465.33	275.61	465.12	277.73	464.66	279.5	464.42	281.88	464.51
282.38	464.58	284.64	464.76	286.02	465.27	289.15	466.3	290.17	466.66
294.31	467.97	294.92	468.1	305.21	467.28	315.5	467.15	316.24	467.08
319.1901	466.85	320.64	466.71	325.78	465.71	330.92	464.31	331.62	464.14
335.77	463.283	36.0701	463.19	336.55	463.16	339.91	463.01	341.21	462.89
343.3201	462.89	344.06	462.85	346.35	462.913	48.1999	462.89	350.09	462.95
351.49	462.96	352.35	463.01	356.5	463.13	356.64	463.13	360.64	463.66
361.78	463.79	366.92	464.98	372.06	466.483	73.0799	466.72	377.18	467.8
377.29	467.84	381.37	469.1	382.35	469.43	392.63	473.18	397.78	474.48
397.9499	474.5	402.92	475.02	408.06	475.31	410.39	475.39	414.53	475.42
420.05	475.36	439.41	475.44	441.43	475.4	443.55	475.41	444.06	475.4
485.01	475.144	85.1999	475.13	485.52	475.145	05.5799	475.43	505.73	475.44
509.88	475.49	510.91	475.475	21.1999	475.43	526.34	475.2	526.46	475.2
536.63	475.375	51.3299	475.24	552.05	475.285	57.1999	475.42	559.62	475.34
560	475.31	562.34	475.19	572.06	475.2	572.62	475.21	573.55	475.18
576.21	475.15	577.77	475.1	582.91	475.13	588.05	475.03	600.63	475.19
601.0799	475.19	609.37	475.27	613.52	475.43	618.91	475.41	624.05	475.6
629.1901	475.53	634.24	475.63	634.49	475.63	659.12	475.81	660.05	475.85
663.26	475.866	65.1901	475.826	70.3299	475.82	671.55	475.97	675.12	476.04
675.48	476.076	75.6999	476.05	676.62	475.99	685.76	475.86	696.05	476.22
696.43	476.22	722.51	475.93	729.29	475.96	729.59	475.97	737.88	476.06

747.47	476.29	752.62	476.21	762.75	476.31	762.9	476.32	763.14	476.32
766.9	476.49	768.04	476.52	779.34	476.46	783.46	476.52	804.21	476.54
804.9	476.56	809.18	476.62	834.9	476.66	837.37	476.72	837.63	476.72
845.18	476.89	845.66	476.94	850.33	477.33	869.05	477.07	912.68	477.28
918.22	477.07	922.46	476.2	923.76	476.02	926.21	475.8	929.3	475.5
929.96	475.28	931.35	474.74	933.71	473.7	934.83	473.07	941.21	468.13
944.96	465.43	945.91	464.81	948.58	463.81	948.71	463.75	951.45	462.88
954.6	462.4	956.22	462.09	956.99	461.85	959.16	460.47	959.97	459.97
962.53	458.32	963.72	457.74	966.22	456.99	966.34	456.96	967.85	456.54
967.95	456.52	972.87	455.86	977.88	454.32	982.89	453.75	997.95	453.72
1000	452.92	1002.83	453.6	1002.96	453.6	1007.82	453.71	1007.98	453.71
1012.8	453.77	1012.9	453.78	1017.9	453.73	1018.01	453.74	1022.77	453.64
1022.9	453.65	1027.75	456.97	1027.9	457.07	1028.04	457.25	1032.74	462.75
1032.9	462.95	1033.06	463.07	1037.72	467.28	1037.9	467.42	1038.08	467.54
1042.71	470.71	1042.9	470.85	1043.09	470.98	1047.69	473.79	1047.9	473.93
1048.11	474.01	1052.67	475.92	1052.9	476.01	1053.12	476.09	1057.66	477.95
1057.9	478.04	1062.9	478	1063.16	477.99	1067.63	477.91	1067.9	477.91
1068.17	477.83	1072.61	476.41	1072.9	476.33	1073.19	476.13	1077.9	472.98
1078.21	472.76	1082.58	469.87	1082.9	469.64	1083.22	469.57	1087.56	468.54
1087.9	468.47	1092.9	468.16	1093.25	468.15	1093.63	468.15	1097.65	468.09
1097.96	468.08	1098.39	468.08	1103.03	467.98	1108.1	468.13	1113.17	468.62
1118.24	469.27	1128.38	471.23	1133.44	472.32	1134.92	472.56	1136.73	472.91
1138.51	473.18	1148.65	474.35	1149.76	474.5	1153.72	475.12	1154.1	475.16
1158.45	475.54	1158.79	475.58	1163.86	476.39	1179.07	479.93	1184.14	480.88
1188.85	481.55	1189.21	481.59	1199.35	482.47	1209.49	484	1214.9	485.07
1219.25	486.13	1219.63	486.23	1224.7	487.18	1234.84	488.79	1236.62	488.97
1238.42	489.08	1239.9	489.22	1240.96	489.26	1244.51	489.48	1244.97	489.5
1249.65	489.45	1250.04	489.44	1255.11	489.61	1262.67	489.69	1262.78	489.7
1271.36	489.86	1274.95	490.06	1285.53	490.37	1290.6	490.39	1293.07	490.46
1293.22	490.47	1295.67	490.53	1306.1	491.06	1321.02	491.4	1327.82	491.43
1332.16	491.54	1335.84	491.45	1341.93	491.5	1345.19	491.46	1346.36	491.48
1348.01	491.43	1349.53	491.43	1351.43	491.36	1353.87	491.4	1354.1	491.4
1361.57	491.57	1362.56	491.57	1366.28	491.5	1366.64	491.5	1371.24	491.28
1371.71	491.27	1372.37	491.28	1375.59	491.38	1386.92	491.45	1397.06	491.25
1397.3	491.24	1401.64	491.18	1402.13	491.15	1407.2	491.11	1412.27	490.94
1422.41	490.81	1427.48	490.65	1427.7	490.65	1442.69	490.08	1445.07	490.03
1445.43	490.03	1457.6	489.82	1457.89	489.82	1458.1	489.81	1468.03	489.71
1475.47	489.9	1475.87	489.92	1483.24	490.17	1492.84	490.19	1498.45	490.04

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 1505.87  490.16 1506.31  490.18 1508.59  490.24 1518.73  490.32  1518.9  490.33
 1523.24  490.43 1530.66  490.34 1544.08  489.98 1544.96  489.99 1549.15  489.95
  1549.3  489.94 1555.02  489.75 1557.99  489.71 1559.28  489.67 1564.35  489.16
 1575.36  489.08 1579.37  489.19  1579.7  489.19 1584.63  489.31 1591.55  488.96
 1592.73  488.87 1594.77  488.78 1601.41  488.66 1603.72  488.52 1609.81   488.4
 1609.98   488.4 1615.05  487.92 1620.12  487.07 1621.99  486.81 1623.13  486.69
 1625.19  486.39 1627.47  486.12 1628.08  486.07 1630.26  485.83 1631.81  485.88
 1634.17  485.86 1635.33  485.88 1640.25  485.64  1640.5  485.64  1641.1  485.62
 1644.84  485.55 1645.47  485.56 1646.34  485.67 1649.18  485.73 1650.54  485.95
 1652.43  485.62 1653.53  485.57 1655.61  485.12 1660.67  484.19 1665.74  483.57
 1666.55  483.45 1670.81  482.67  1671.4   482.6 1675.88     482 1683.93  480.74
 1686.02  480.45 1691.09   480.6 1696.16  480.91 1696.95  481.06 1701.23  482.03
 1701.69  482.63 1705.64   488.1  1706.3  489.38 1707.23  490.49 1709.98  494.64
 1711.37  496.12 1713.31   497.4 1714.33  498.23 1716.44  499.49 1718.67  500.62
  1719.4  500.96 1721.51  501.99 1723.01  502.94 1725.49  504.62 1726.58  505.32
 1727.35  505.77 1731.58  508.52  1731.7  508.58 1731.99  508.71 1736.04  510.45
 1736.72  510.78 1737.67  510.92 1740.38  511.41 1741.79  511.61 1743.76  511.46
 1744.73  511.36 1746.86  511.22 1751.93  511.61 1762.02  512.05 1767.13  512.08
 1768.11  512.04 1770.78  511.99  1774.2  511.84 1775.13  511.78 1777.27   511.7
 1779.47  511.85 1787.41  512.47 1792.46  513.01 1792.58  513.03 1796.84  513.59
 1807.69  514.82 1809.87  514.95 1814.21  515.31 1816.82  515.42 1817.83   515.5
 1827.97  515.36

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   34.55     .05  926.21    .045 1052.67     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        926.21 1052.67              261     285     286             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  1066.2    1741  478.31

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.365
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INPUT
Description: 4.365
 LADUE FIS 23049 STANLEY SURVEY SECT - APROX. 300 FT. D.S.
             OF SEBAGO
Station Elevation Data   num=   473

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
191.0301	473.97	191.18	473.98	195.12	474.34	196.1601	474.41	203.47	474.59
204.48	474.62	06.4201	474.65	211.81	474.67	226.94	474.78	232.69	474.88
236.86	474.89	237.19	474.9	242.32	475.28	247.45	475.32	57.6701	473.94
257.84	473.91	267.97	472.42	70.2601	472.12	270.97	472.05	273.1	471.79
274.43	471.65	277.62	471.26	278.23	471.2	278.61	471.17	82.7801	471.02
283.35	470.96	84.2701	470.72	286.96	469.93	288.48	469.55	90.9201	469.04
291.1301	468.99	293.61	468.48	303.6501	467.77	303.87	467.75	312.0001	467.25
319.2601	466.69	320.35	466.65	324.1601	466.63	324.3901	466.62	324.5301	466.61
328.7	466.12	329.5201	466.07	332.8801	466.49	334.6501	466.74	337.05	466.64
339.7701	466.55	341.23	466.58	344.11	466.75	344.9001	466.78	345.4001	466.77
347.57	466.56	349.57	466.31	350.0301	466.27	357.4101	466.21	357.9201	466.19
362.1	466.22	364.06	466.19	365.4201	466.2	370.45	465.96	380.81	465.53
387.1501	465.53	90.6601	465.59	395.49	465.55	396.19	465.58	397.31	465.58
399.6701	465.67	401.32	465.64	403.84	465.51	403.96	465.51	406.45	465.44
411.58	465.44	416.37	466.58	416.71	466.67	421.84	468.44	426.97	469.81
432.1	471.3	437.2	472.41	437.31	472.43	442.35	473.13	447.48	473.44
458.11	473.48	462.87	473.43	68.0001	473.26	478.2601	473.29	483.1601	473.16
498.7701	472.73	503.69	472.75	03.9001	472.69	510.34	472.66	516.56	472.6
516.99	472.59	519.2901	472.58	520.73	472.63	523.6401	472.89	524.4201	472.93
527.0401	472.71	529.08	472.49	534.68	472.3	536.94	472.3	537.43	472.29
539.81	472.32	544.93	472.18	549.47	472.29	550.24	472.29	554.1301	472.13
556.8901	472.08	558.3	472.08	560.32	472.04	562.48	472.09	563.5401	472.15
565.45	472.22	570.58	472.34	570.83	472.35	585.97	472.31	596.22	472.52
601.35	472.52	603.43	472.49	606.48	472.46	608.4001	472.5	611.61	472.62
620.9201	472.59	627.0001	472.48	629.2701	472.56	30.0301	472.53	632.1301	472.58
637.62	472.57	647.5201	472.66	654.32	472.65	669.93	472.71	678.2901	472.76
679.36	472.75	683.23	472.65	683.4201	472.65	687.71	472.27	688.55	472.23
703.1701	472.24	704.4101	472.26	708.59	472.42	709.06	472.43	714.19	472.32
716.47	472.31	716.94	472.3	719.32	472.29	724.45	472.17	725.2801	472.14
729.46	472.05	729.58	472.05	729.7701	472.04	734.71	471.88	739.84	471.83
750.1	471.9	750.33	471.91	754.5101	471.92	755.22	471.9	762.86	471.9

763.0201	471.89	775.3801	471.77	775.74	471.76	786.0001	471.74	796.23	471.52
811.6401	471.36	816.21	471.22	816.77	471.21	817.12	471.19	821.3	471.07
827.03	470.99	829.5101	471.03	829.65	471.03	833.8201	471.08	837.29	471.08
842.17	471.04	842.42	471.03	854.7001	470.94	868.0601	470.95	878.3201	470.79
883.4501	470.75	883.92	470.74	888.58	470.81	889.35	470.84	892.27	471
893.71	471.03	896.0001	470.92	896.4401	470.89	898.84	470.79	900.62	470.79
903.97	470.84	904.79	470.78	908.97	470.36	909.3	470.36	913.1401	470.58
919.35	470.6	921.49	470.66	924.48	470.71	925.66	470.92	929.2501	472.24
929.61	472.33	929.84	472.35	930.83	472.31	934.74	471.79	935.9	471.68
938.19	471.33	939.87	471.24	945	470.11	950.11	468.42	951.1	467.93
953.92	466.75	955.13	466.13	956.54	465.5	960.14	463.93	965.16	462.11
970.17	457.04	972.54	455.45	972.84	455.27	975.19	453.71	977.2	453.31
978.27	453.04	980.2	452.64	985.22	452.66	990.23	452.82	995.25	452.67
1000	452.64	1009.79	452.75	1020.32	452.74	1021.74	453.16	1023.76	453.83
1025.33	454.3	1027.17	456.21	1028.42	457.48	1030.35	459.5	1032.6	461.08
1033.07	461.4	1035.36	463	1040.38	465.88	1047.04	471.38	1048.9	472.82
1050.41	474.05	1051.7	474.69	1054.34	476.14	1055.42	476.69	1060.44	476.66
1065.21	476.73	1065.45	476.74	1065.66	476.65	1070.32	474.69	1070.47	474.63
1070.64	474.61	1074.98	473.9	1075.48	473.84	1080.5	473.58	1085.52	473.74
1090.57	474	1090.84	474	1095.28	473.89	1095.61	473.89	1100.66	474.27
1104.16	474.61	1105.71	474.73	1110.76	475.51	1113.03	475.79	1113.6	475.85
1115.8	476.12	1120.85	477.19	1125.9	478.01	1126.35	478.09	1130.94	479
1135.22	479.6	1135.99	479.72	1139.66	480.43	1141.04	480.72	1142.85	481.05
1144.1	481.3	1152.97	482.99	1156.18	483.63	1157.41	483.85	1161.22	484.58
1161.85	484.68	1166.25	485.29	1166.41	485.31	1171.32	486.09	1172.1	486.26
1176.36	487.24	1177.95	487.35	1179.6	487.43	1181.41	487.57	1183.8	488.12
1184.04	488.18	1186.46	488.73	1191.51	489.78	1192.91	490	1196.55	490.62
1197.35	490.67	1201.6	490.84	1201.79	490.84	1206.65	490.91	1207.2	490.93
1211.69	491.15	1216.74	491.48	1223.98	491.8	1226.83	491.96	1231.88	492.16
1232.85	492.17	1236.45	492.16	1236.93	492.17	1241.97	492.4	1246.17	492.5
1247.02	492.51	1267.21	493.67	1268.36	493.78	1271.54	493.97	1272.25	494.03
1272.79	494.06	1277.23	494.41	1277.39	494.43	1281.67	494.87	1292.44	495.78
1294.94	495.93	1297.49	496.07	1299.42	496.13	1302.54	496.26	1308.3	496.31
1312.49	496.44	1317.17	496.38	1317.68	496.38	1318.34	496.4	1321.61	496.57
1322.72	496.61	1327.77	496.98	1332.82	497.79	1337.86	498.79	1342.91	499.62
1348.24	500.21	1353	500.68	1353.44	500.7	1357.11	501.02	1358.05	501.07
1359.29	501.06	1361.55	501	1363.1	501	1373.19	500.9	1383.29	501.13
1383.74	501.15	1388.18	501.22	1388.33	501.22	1388.54	501.23	1398.43	501.45

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 1403.47  501.48 1405.93  501.62 1406.09  501.62 1408.52  501.76  1414.8  501.76
 1417.79  501.83 1418.61  501.83 1423.63  501.98 1423.82  501.99 1428.71  502.18
 1433.75  502.23  1438.8  502.21 1441.18  502.29 1441.43  502.29 1445.87  502.43
 1454.75  502.56 1458.73   502.5 1458.99   502.5 1459.18  502.51 1468.06  502.63
 1469.08  502.67 1470.43  502.69  1472.5  502.67 1474.13   502.7 1476.28  502.63
 1476.93  502.65 1481.37  502.45 1484.22  502.37 1489.27  502.51 1494.32  502.47
 1494.69  502.46 1499.36  502.44 1504.41  502.63 1505.53  502.65 1534.15  503.69
 1534.63   503.7 1534.78  503.71 1539.06  504.07 1539.74  504.14 1540.63  504.36
  1543.5  505.15 1544.79  505.45 1549.83  504.58 1552.33  504.61 1554.88  504.64
 1556.82  504.49 1559.93  504.22 1561.25  504.06 1564.97  503.66 1565.69  503.56
 1569.88  503.05 1570.02  503.03 1570.13  503.03 1574.57  502.68 1575.73  502.61
 1580.11  502.41 1592.32  502.45 1593.28  502.43  1600.3  502.35 1601.19  502.35
 1604.98  502.44 1605.63  502.44 1610.07  502.24  1610.4  502.24 1610.82  502.21
 1615.44     502 1620.49  501.84 1632.26  501.82 1640.68  501.93 1645.57  501.78
 1645.72  501.78 1645.92  501.76 1650.01  501.45 1650.77  501.38 1655.82  500.19
 1663.32  498.58 1663.47  498.55 1667.76  497.62 1669.32  497.32  1672.2  496.69
 1675.17  495.95 1681.02  494.58  1686.1  493.91 1691.14     493 1692.72  492.69
 1694.39   492.4 1696.19  492.03 1701.24   490.9 1711.33  488.45 1712.14  488.29
 1716.38  487.66 1716.58  487.62 1725.45  486.12 1726.47  485.96 1727.82  485.82
 1731.52  485.47 1733.67  485.31 1734.33  485.25 1736.57  485.09 1746.66  485.27
 1747.64  485.44 1751.22  485.93 1751.71  486.02 1752.08  486.15 1756.52  488.32
 1756.75  488.42 1757.07   488.6 1760.95   490.6  1761.8  491.11 1762.92  492.09
 1765.39   494.3 1766.85  495.56 1771.89  500.59 1774.27  501.96 1774.62  502.15
 1776.94  503.46 1781.99  503.65 1783.14  503.53 1786.32  503.29 1787.04  503.22
 1787.58  503.13 1792.02  502.27 1792.17  502.24 1796.46  501.53 1797.13  501.43
 1798.01  501.51  1800.9  501.83 1802.11  501.93

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
191.0301     .05  939.87    .045 1047.04     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        939.87 1047.04              580     560     520             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
    1062    1795  477.04

CROSS SECTION
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RIVER: RIVER-1
REACH: Reach-1 RS: 4.259

INPUT
Description: 4.259
LADUE FIS 22489 STANLEY SURVEY SECT.
Station Elevation Data num= 472

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
334.31	477.47	334.41	477.45	335.02	477.34	338.75	476.75	339.38	476.64
344.45	475.83	346.37	475.38	347.43	475.29	349.53	474.67	351.76	474.29
352.4799	474.24	354.5999	473.94	356.0999	473.81	358.58	473.54	359.67	473.44
360.44	473.27	364.68	472.61	364.78	472.59	365.01	472.57	369.1099	472.27
369.81	472.24	379.95	471.96	385.02	471.7	386.46	471.65	389.0999	471.64
390.09	471.61	390.8	471.57	395	471.24	395.14	471.22	400.24	470.85
412.49	470.44	415.45	470.31	421.17	470.17	425.5	469.99	425.71	469.98
447.19	469.19	455.87	468.76	456.02	468.76	456.2299	468.75	461.09	468.63
466.16	468.29	471.2299	467.65	477.55	467.35	481.89	467.2	486.44	466.96
486.74	466.95	492.84	466.83	494.9	466.74	496.58	466.74	501.65	467.5
503.58	467.84	506.7299	468.35	507.92	468.65	511.15	469.6	511.8	469.76
512.25	469.74	514.96	469.42	516.59	469.19	516.87	469.16	517.26	469.08
520.93	468.39	521.94	468.15	523.3599	467.89	525.27	467.49	527.01	467.18
529.46	467.07	529.5999	467.07	537.15	466.83	542.2199	466.78	557.44	466.05
559.9699	466.09	564.3	466.12	566.08	466.19	572.65	466.34	582.79	466.14
587.8599	466.12	590.33	466.07	590.49	466.07	592.93	466.01	598	466.01
603.07	465.84	603.34	465.84	608.14	465.74	608.8	465.76	613.2199	465.36
623.3599	465.36	633.5	465.01	633.7	465.01	634.92	465.12	638.04	465.32
638.57	465.33	639.31	465.39	642.38	465.5	643.64	465.61	648.71	465.24
651.05	465.35	651.52	465.38	653.78	465.49	655.39	465.49	659.7299	465.55
663.7299	465.73	663.93	465.73	664.07	465.74	668.4	465.8	669.83	465.81
672.74	465.77	674.07	465.78	679.14	466.41	681.42	466.42	684.21	466.4
689.28	466.57	690.09	466.56	694.24	466.39	694.3499	466.39	698.77	466.75
699.42	466.79	704.49	466.66	714.64	466.67	724.76	466.98	724.89	466.99
729.13	467.07	729.8499	467.11	730.8599	467.17	733.4699	467.15	739.99	467.03
755.27	467.09	760.27	467.04	770.42	467.09	775.49	467.22	780.56	467.24
785.52	467.32	785.63	467.33	785.78	467.32	790.7	467.31	797.99	467.41
798.53	467.43	816.05	467.58	820.2199	467.33	821.13	467.31	824.56	467.41

828.5	467.46	828.89	467.46	833.2299	467.53	834.6099	467.52	841.41	467.6
841.91	467.6	846.24	467.52	846.81	467.52	851.55	467.6	856.62	467.63
859.02	467.69	859.26	467.7	861.69	467.75	863.59	467.72	871.84	467.64
872.27	467.65	876.61	467.64	876.91	467.65	877.33	467.63	880.94	467.59
885.28	467.47	887.05	467.45	889.53	467.48	892.12	467.51	897.19	467.64
898.29	467.65	902.26	467.62	907.33	467.8	912.4	467.89	913.95	467.98
915.64	468.03	917.47	468.16	919.98	468	922.55	467.84	924.32	467.79
926.15	467.68	932.69	467.51	932.99	467.51	937.1	467.58	937.98	467.57
940.75	467.4	943.61	467.27	948.23	467.36	949.25	467.35	951.94	467.17
954.88	466.85	957.13	466.45	959.36	465.99	960.51	465.6	963.06	464.18
964.17	463.61	966.77	462.22	967.98	461.65	970.48	460.32	971.78	459.52
974.19	457.49	977.41	454.63	977.9	454.29	978.83	453.83	983.05	452.21
985.32	451.95	986.92	451.82	1000	450.58	1014.91	451.66	1016.98	451.77
1018.61	451.98	1021.69	452.69	1022.31	452.85	1022.64	453.01	1023.7	453.77
1026.01	455.38	1028.29	457.09	1029.71	458.07	1032.37	459.48	1033.41	459.96
1033.95	460.13	1039.61	460.51	1043.06	460.8	1044.5	460.91	1045.27	460.95
1050.93	460.85	1055.6	461.19	1056.58	461.22	1059.3	461.35	1062.24	461.57
1063	461.65	1066.7	462.22	1067.9	462.52	1070.39	463.36	1073.56	464.55
1074.09	464.8	1077.79	466.9	1079.22	467.83	1081.49	469.11	1084.87	471.15
1085.19	471.29	1085.79	471.43	1088.89	471.95	1095.88	472.7	1096.29	472.74
1096.47	472.72	1099.99	472.49	1101.85	472.41	1103.68	472.47	1107.15	472.52
1107.38	472.52	1107.51	472.51	1111.08	472.39	1113.16	472.39	1114.78	472.43
1118.48	472.58	1118.82	472.59	1125.24	472.53	1126	472.51	1128.55	472.51
1134.47	472.39	1134.67	472.39	1134.82	472.4	1139.72	472.67	1140.39	472.73
1143.63	472.92	1144.77	473.03	1152.22	474.34	1152.45	474.39	1154.88	474.82
1159.93	475.92	1164.99	476.85	1169.98	477.91	1170.09	477.93	1174.49	478.67
1175.09	478.79	1180.15	479.93	1181.81	480.27	1183.31	480.54	1185.2	480.94
1187.72	481.55	1190.25	482.12	1192.13	482.47	1193.65	482.79	1195.31	483.1
1200.36	484.16	1200.95	484.26	1205.36	485.08	1205.49	485.1	1209.76	485.89
1210.46	486	1211.41	486.05	1214.17	486.25	1215.52	486.29	1220.57	486.24
1225.62	485.87	1227.4	485.71	1230.68	485.46	1231.81	485.4	1236.22	485.1
1240.63	484.95	1240.78	484.95	1241	484.94	1245.03	484.6	1245.84	484.59
1246.91	484.64	1249.44	484.83	1250.89	484.87	1252.83	485	1253.85	485.09
1255.94	485.21	1262.67	485.92	1266.05	486.21	1267.08	486.34	1270.59	486.72
1271.1	486.79	1271.49	486.83	1275.89	487.51	1276.16	487.54	1281.21	488.22
1286.26	489.09	1293.53	490.22	1294.26	490.31	1296.37	490.61	1297.94	490.69
1300.18	490.74	1301.42	490.8	1306.1	490.88	1316.58	490.8	1323.85	491.02
1324.39	491.02	1331.74	491.26	1341.85	492.09	1342.02	492.11	1346.9	492.73

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 1347.53  492.82 1350.84  493.25 1362.06  494.73 1367.11   495.3 1372.89  495.51
 1377.12  495.58 1377.29  495.59  1381.7   495.9 1382.27  495.93 1388.95  496.06
 1392.38  496.16 1394.87  496.09 1399.34     496 1402.48     496 1403.75  496.03
 1407.54  496.06 1408.16  496.08 1412.56   496.3 1417.64  496.16 1418.54  496.15
 1421.38  496.03  1422.7  496.01  1430.2  496.59 1430.38  496.61  1432.8  496.83
 1437.86  496.77 1439.02  496.81 1446.95  497.17 1447.83   497.2 1447.96  497.21
 1452.24  497.25 1468.17  497.86 1473.23  497.91  1483.1  498.18 1483.33  498.19
 1488.39  498.23 1503.55  498.69  1508.6   498.6 1513.96  498.81 1518.37  498.89
 1523.76  498.85 1528.81  498.98 1536.01  499.39 1538.92  499.54 1543.97  499.54
 1548.75  499.38 1549.23  499.38 1553.64  499.54 1560.58  499.67 1564.18  499.78
  1566.5  499.81 1574.29  499.98 1579.34     500 1580.09  500.04 1584.26  500.21
  1584.4  500.22 1589.45  500.37  1594.5  500.48 1602.01  500.85 1602.14  500.86
 1604.61  500.96 1609.66  500.81 1614.72  500.53 1615.36  500.46 1619.77  500.04
 1624.18  499.28 1629.88  498.45 1634.93   498.1 1637.41  497.79 1637.52  497.78
 1639.98  497.48 1641.82  497.33 1643.44  497.14 1645.03     497 1646.22  496.95
 1649.36  496.89 1650.09  496.86 1650.63  496.89 1655.04  497.23 1655.27  497.23
 1659.45  497.15 1660.19  497.15 1672.68  497.66 1673.03  497.67 1675.35  497.77
 1680.41   497.8 1690.31  498.03 1690.51  498.03 1690.78  498.04 1694.72  498.12
 1695.57  498.12 1700.62  498.64 1705.67  498.17 1707.95  498.14 1708.54  498.14
 1720.83  498.05 1726.29  497.89 1729.99   497.9 1735.99  497.79 1741.04  497.89
  1746.1  497.92 1751.15  498.01 1752.03     498 1755.89  497.89 1756.44  497.89
 1760.85  497.97 1761.26  497.97 1769.67  497.81 1771.36   497.8 1773.64  497.65
 1774.08  497.63 1776.42  497.47 1781.47   496.7 1786.52  495.84  1787.3  495.69
 1791.58  494.78 1791.71  494.76 1796.63  493.87 1797.31  493.82 1801.68  493.42
 1806.74  493.44 1811.79  492.95 1816.84  492.28 1821.89  491.84 1822.57   491.8
  1826.9  491.63    1832   491.5 1837.05  491.49 1842.11  491.26 1844.61  491.29
 1847.16  491.33 1849.02   491.7 1850.58  492.12 1852.21  492.47 1857.27  494.27
 1857.84  494.54 1861.77  496.17 1862.25  496.38 1862.41  496.43 1866.66  497.51
 1867.37  497.66 1870.78   497.9

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  334.31     .05  951.94    .045 1043.06     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        951.94 1043.06              480     500     530             .1       .3

CROSS SECTION
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RIVER: RIVER-1
REACH: Reach-1 RS: 4.165

INPUT
Description: 4.165
Station Elevation Data num= 490

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4058	480	4197	474	4321.29	469.62	4326.34	469.62	4331.39	469.53
4333.73	469.54	4334.18	469.53	4336.45	469.53	4342.55	469.39	4346.01	469.2
4351.37	469.06	4356.66	469.1	4361.71	468.93	4363.76	468.91	4364.6	468.92
4366.76	468.87	4369	468.73	4373.41	468.49	4375.59	468.41	4376.87	468.34
4377.82	468.32	4381.92	468.12	4382.23	468.12	4386.64	468.05	4386.98	468.04
4391.05	468.03	4392.03	468.04	4402.13	467.97	4404.28	467.86	4407.19	467.69
4408.69	467.68	4417.51	467.76	4432.45	467.21	4434.74	467.29	4435.15	467.31
4439.56	467.45	4440.66	467.45	4442.56	467.49	4443.97	467.46	4446.57	467.5
4447.61	467.49	4448.38	467.51	4452.66	467.54	4452.79	467.52	4457.2	466.98
4457.72	466.94	4458.4	466.94	4461.61	467.05	4467.82	467.05	4474.84	466.78
4487.98	466.3	4493.09	466.12	4503.19	465.7	4505.71	465.53	4508.24	465.35
4513.3	465.09	4514.53	465.07	4517.56	465.11	4518.35	465.1	4518.94	465.13
4523.35	465.46	4523.47	465.46	4527.76	465.53	4528.46	465.52	4533.51	465.51
4538.56	465.66	4545.4	465.72	4549.81	465.7	4553.05	465.77	4553.72	465.77
4558.63	465.65	4558.77	465.65	4563.04	465.47	4563.83	465.46	4568.88	465.71
4573.93	465.55	4584.04	464.97	4585.09	464.94	4588.54	464.76	4593.91	464.63
4594.14	464.63	4594.46	464.62	4599.2	464.59	4614.36	464.19	4620.37	464.11
4624.03	463.95	4629.19	463.86	4629.51	463.86	4629.95	463.84	4633.6	463.82
4639.62	463.61	4641.78	463.59	4642.42	463.6	4654.78	463.51	4659.83	463.31
4660.06	463.29	4664.88	463.1	4665.44	463.12	4668.88	463.17	4669.94	463.2
4671.36	463.28	4673.29	463.46	4674.99	463.55	4680.04	463.68	4682.11	464.03
4685.1	464.56	4690.15	464.32	4695.02	463.96	4695.2	463.95	4695.34	463.95
4699.75	463.78	4700.25	463.77	4700.93	463.78	4704.16	463.76	4705.31	463.78
4712.77	463.7	4712.98	463.7	4717.39	463.63	4720.47	463.56	4725.52	463.77
4735.03	463.76	4740.68	463.75	4745.73	463.97	4755.84	463.89	4760.89	463.99
4765.58	463.92	4765.94	463.92	4770.3	463.8	4783.53	463.61	4791.21	463.58
4796.76	463.47	4801.17	463.52	4801.5	463.52	4811.42	463.32	4816.47	463.36
4821.52	463.29	4826.58	463.01	4827.63	462.74	4831.07	461.69	4831.63	461.54
4832.04	461.48	4834.89	461.11	4836.45	460.95	4836.68	460.94	4836.99	461.05

4840.86	462.66	4841.73	462.97	4846.79	463.51	4851.84	463.65	4856.89	464
4867	464.52	4867.32	464.54	4871.73	464.71	4872.05	464.71	4877.1	464.36
4880.55	464.2	4882.16	464.15	4887.21	464.2	4892.26	464.34	4902.06	464.82
4902.37	464.84	4907.42	465.3	4907.97	465.31	4911.42	465.45	4922.58	465.39
4924.65	465.43	4925.72	465.43	4927.63	465.46	4929.06	465.52	4931.63	465.51
4932.69	465.54	4933.47	465.52	4937.55	465.47	4937.88	465.47	4942.29	465.38
4946.7	465.33	4947.84	465.32	4952.9	464.74	4955.29	464.43	4955.52	464.41
4957.95	464.04	4959.93	463.95	4961.21	463.78	4963	463.66	4964.34	463.29
4967.13	462.22	4968.06	461.94	4968.75	461.51	4973.11	459.05	4977.34	456.34
4977.57	456.2	4978.16	455.82	4978.91	455.06	4982.06	451.5	4983.2	450.39
4988.23	450.18	5000	449.16	5008.98	450.17	5013.37	450.1	5013.79	450.15
5017.95	450.7	5018.46	450.76	5019.12	451.01	5022.44	451.74	5023.5	452.19
5024.86	453.12	5026.92	454.85	5028.54	455.89	5030.6	457.11	5031.41	457.55
5035.89	460.3	5036.35	460.62	5038.61	462.06	5043.65	464.89	5044.83	465.59
5047.91	467.27	5048.69	467.72	5049.3	467.54	5053.7	465.84	5053.98	465.73
5058.23	463.99	5058.78	463.8	5059.49	463.84	5062.69	463.96	5063.82	464.02
5068.86	464.12	5078.94	464.46	5080.56	464.45	5082.64	464.4	5088.43	464.4
5093.95	464.52	5094.07	464.52	5094.22	464.53	5099.11	464.78	5104.15	464.74
5109.19	464.8	5111.58	464.94	5111.81	464.95	5116.28	465.2	5117.37	465.24
5119.27	465.34	5120.74	465.46	5123.16	465.77	5124.32	465.88	5125.21	465.93
5128.95	465.92	5129.36	465.94	5129.67	465.93	5134.4	465.53	5139.44	465.67
5143.07	465.72	5144.48	465.71	5152	465.83	5152.1	465.83	5156.46	465.92
5159.61	466.01	5164.65	466.28	5165.39	466.23	5169.47	465.84	5169.86	465.82
5174.33	465.96	5174.73	465.98	5175.26	466.03	5178.79	466.3	5179.77	466.4
5184.81	466.61	5194.9	466.32	5199.94	466.39	5204.2	466.22	5204.98	466.2
5210.05	466.19	5214.51	465.95	5215.06	465.91	5215.78	465.89	5218.98	465.75
5220.1	465.72	5227.35	465.73	5227.91	465.71	5235.23	465.77	5240.27	465.55
5245.31	465.42	5250.23	465.71	5250.35	465.72	5250.51	465.72	5254.7	465.85
5255.39	465.89	5256.29	465.9	5259.16	465.97	5265.48	466.04	5270.52	466.22
5275.56	466.29	5281.49	466.66	5285.24	467.19	5285.64	467.23	5288.39	467.39
5290.42	467.56	5290.68	467.55	5291.03	467.53	5294.89	467.58	5295.73	467.5
5310.85	467.54	5312.75	467.79	5314.18	467.79	5315.89	467.97	5317.21	468.37
5319.97	469.54	5320.93	469.86	5321.68	470.07	5325.76	471.32	5325.97	471.39
5326.14	471.42	5327.45	471.82	5330.61	472.83	5331.02	472.97	5331.54	473.09
5335.07	474.71	5336.06	474.86	5337.33	474.86	5339.54	474.56	5343.12	474.69
5344	474.6	5346.14	474.77	5348.47	475.28	5348.91	475.37	5352.94	476.25
5354.7	476.93	5356.22	477.31	5357.4	477.49	5360.49	478.22	5361.26	478.35
5361.87	478.56	5366.52	478.58	5370.8	478.1	5371.35	478.1	5372.06	478.04

5375.26	477.46	5376.39	477.4	5377.85	477.43	5379.73	477.39	5381.43	477.45
5383.64	477.65	5384.19	477.68	5386.47	477.93	5388.66	477.76	5389.43	477.62
5391.51	477.41	5397.59	477.36	5401.01	477.59	5401.6	477.59	5402.05	477.55
5405.59	477.45	5406.52	477.41	5406.64	477.41	5406.79	477.42	5410.98	477.85
5411.68	477.87	5416.72	477.77	5418.37	477.63	5419.91	477.53	5421.76	477.36
5424.16	476.63	5424.38	476.54	5426.8	475.86	5428.84	475.61	5429.95	475.52
5431.85	475.31	5433.31	475.31	5435.74	475.38	5436.89	475.39	5437.77	475.29
5441.52	474.78	5441.93	474.73	5442.24	474.65	5446.71	473.41	5446.97	473.36
5447.31	473.35	5451.17	473.32	5462.09	473.1	5464.57	473.62	5464.68	473.66
5467.14	474.23	5469.03	474.44	5470.47	474.55	5472.18	474.73	5473.5	474.76
5476.25	474.69	5477.22	474.7	5477.96	474.92	5482.04	475.48	5482.26	475.54
5482.43	475.54	5486.89	476.13	5487.3	476.17	5487.83	476.21	5491.36	476.63
5492.34	476.68	5493.62	476.69	5495.82	476.57	5497.38	476.61	5499.41	476.32
5500.29	476.17	5502.43	475.88	5504.75	475.46	5505.2	475.43	5507.47	475.09
5509.22	475.12	5510.99	475.04	5512.51	475.04	5513.68	475.21	5516.77	475.35
5517.55	475.44	5518.15	475.35	5522.56	475.18	5522.79	475.18	5527.63	475.28
5528.35	475.32	5531.54	475.4	5534.14	475.54	5536.01	475.56	5542.76	476.1
5544.94	476.07	5545.72	476.03	5547.8	475.99	5549.41	476.01	5551.5	475.94
5552.84	475.94	5553.87	476.01	5557.29	476.13	5557.88	476.16	5558.34	476.21
5562.8	476.86	5562.92	476.88	5563.08	476.91	5567.27	477.95	5567.96	478.06
5573.01	477.49	5574.66	477.56	5576.2	477.49	5580.45	477.82	5580.66	477.84
5583.09	478.04	5588.13	478.09	5589.59	478.01	5592.02	477.56	5593.17	477.46
5594.06	477.46	5597.81	477.59	5598.21	477.59	5602.99	477.41	5603.6	477.41
5607.45	477.31	5608.3	477.32	5609.39	477.36	5616.38	477.53	5623.42	477.52
5625.31	477.59	5626.75	477.59	5629.78	477.65	5632.54	477.41	5633.5	477.4
5634.25	477.46	5638.33	477.91	5638.55	477.93	5639.99	477.94	5643.18	478.06
5644.12	478.09	5648.63	478.29	5655.7	478.27	5656.57	478.3	5658.71	478.26
5663.75	478.36	5668.79	478.49	5669.97	478.61	5673.06	478.71	5673.84	478.78
5674.43	478.81	5683.36	478.79	5683.92	478.78	5688.96	478.74	5690.43	478.92
5692.29	479.24	5694	479.43	5699.04	479.38	5701.22	479.54	5702	479.58
5704.08	479.72	5705.69	479.73	5709.13	479.7	5710.15	479.91	5712.38	480.3

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4058	.05	4946.7	.045	5044.83	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
4946.7	5044.83	28	28	.3	.5

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Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  5105.2  5188.3     480       T

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.16

INPUT
Description: 4.16
This is a REPEATED section.
Station Elevation Data    num=     500
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    4127     476 4323.02  469.13 4393.75  467.52 4398.17  467.52 4398.81  467.51
 4399.67  467.49 4402.58  467.44 4403.86  467.41 4405.58   467.4 4406.99  467.39
 4408.91  467.37  4411.4  467.34  4411.5  467.34 4413.97  467.31 4415.81  467.29
 4417.41  467.26 4419.02  467.24 4420.22  467.22 4423.33  467.21 4424.07   467.2
 4424.63  467.19 4428.44  467.14 4429.04  467.13 4429.24  467.13 4433.45  467.11
 4434.18  467.11 4435.16  467.12 4437.86  467.14 4439.23  467.15 4441.07  467.14
 4442.27  467.12 4444.28  467.11 4446.68  467.08 4446.99  467.08 4449.34  467.05
 4451.09  467.03  4452.9  467.03 4454.39  467.02  4455.5  467.01 4458.82  466.97
 4459.44  466.97 4459.91  466.96 4463.09  466.93 4464.32  466.91  4464.5   466.9
 4464.74   466.9 4468.73   466.8 4469.55  466.78 4470.65  466.74 4473.14  466.67
  4474.6  466.62 4476.57  466.58 4477.55  466.57 4479.65  466.52 4481.96  466.46
 4482.48  466.45 4484.71   466.4 4486.37  466.35  4488.4  466.26 4489.76  466.22
 4490.78  466.17 4494.31  465.98 4494.81  465.96 4495.19  465.94 4497.75  465.87
  4499.6  465.81 4499.87   465.8 4500.23  465.78 4504.01  465.58 4504.92  465.54
 4506.14  465.51 4508.42  465.44 4509.97  465.39 4512.06  465.34 4512.83  465.32
 4515.03  465.26 4517.24  465.19 4517.97  465.17 4520.08   465.1 4521.65  465.07
 4523.89  465.03 4525.13  465.01 4526.06     465  4529.8  464.95 4530.18  464.95
 4530.47  464.94 4532.41  464.93 4534.88  464.91 4535.24   464.9 4535.72  464.89
 4539.29  464.83 4540.29  464.81 4541.63  464.81  4543.7  464.79 4545.34  464.79
 4547.55  464.76 4548.11  464.76 4550.39  464.73 4552.52  464.71 4553.47  464.71
 4555.45  464.69 4556.93  464.67 4559.38  464.62  4560.5  464.59 4561.34  464.57
  4565.3  464.48 4565.55  464.48 4565.75  464.47 4567.06  464.47 4570.16  464.45
 4570.61  464.44 4571.21  464.43 4574.57  464.32 4618.53   463.8 4618.66   463.8
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4621.14	463.75	4623.07	463.68	4624.45	463.62	4626.19	463.56	4627.48	463.55
4630.37	463.56	4631.24	463.56	4631.89	463.55	4636.37	463.55	4727.25	462.47
4728.91	462.46	4809.65	462.08	4812.7	462.07	4813.14	462.07	4813.74	462.08
4817.11	462.09	4818.2	462.09	4823.25	462.18	4825.57	462.18	4830.34	462.24
4834.75	462.31	4837.4	462.34	4843.32	462.43	4843.57	462.43	4849.23	462.54
4852.39	462.64	4853.57	462.67	4856.8	462.75	4858.62	462.8	4861.06	462.89
4861.21	462.89	4863.67	462.98	4865.62	463.08	4866.98	463.15	4868.73	463.24
4870.03	463.29	4872.89	463.43	4873.78	463.47	4874.44	463.52	4878.81	463.86
4878.85	463.86	4878.96	463.87	4883.26	464.1	4883.88	464.14	4884.73	464.19
4887.67	464.33	4888.94	464.41	4890.64	464.48	4892.08	464.55	4893.99	464.63
4896.49	464.73	4896.56	464.73	4899.04	464.83	4900.9	464.9	4902.47	464.96
4904.1	465.02	4905.31	465.05	4908.39	465.07	4909.15	465.09	4909.72	465.09
4913.61	465.12	4914.13	465.13	4914.3	465.13	4918.54	465.24	4919.25	465.26
4920.22	465.29	4922.95	465.38	4924.31	465.42	4926.13	465.51	4927.36	465.57
4929.36	465.66	4931.77	465.79	4932.05	465.8	4934.41	465.93	4936.18	466.03
4937.96	466.11	4939.47	466.19	4940.59	466.28	4943.88	466.55	4944.52	466.6
4945	466.64	4948.27	466.88	4949.41	466.97	4949.57	466.98	4949.79	467
4953.82	467.39	4954.62	467.45	4955.71	467.54	4958.23	467.66	4959.68	467.79
4961.62	467.93	4962.64	468	4964.73	468.14	4967.05	467.72	4967.54	467.64
4967.66	467.62	4969.78	467.24	4971.52	465.57	4973.29	464.09	4974.81	462.67
4976.01	461.42	4979.03	458.15	4979.85	457.28	4980.49	456.5	4984.77	450.63
5000	449.16	5015.12	450.27	5016.38	450.38	5019.24	450.84	5020.15	450.94
5020.87	452.12	5024.98	458.77	5025.19	459.12	5025.35	459.38	5026.68	461.12
5027.99	462.73	5029.83	464.99	5030.23	465.36	5030.75	465.64	5034.3	466.9
5035.27	467.48	5036.53	467.75	5038.76	467.57	5040.31	468.03	5042.32	468.07
5043.23	468.09	5045.35	468.14	5047.69	468.09	5048.11	468.08	5050.4	468.03
5052.16	467.93	5053.9	467.81	5055.44	467.72	5056.62	467.65	5059.69	467.43
5060.48	467.38	5061.09	467.35	5065.48	467	5065.55	467	5065.81	466.98
5070.02	466.6	5070.56	466.55	5071.27	466.49	5074.48	466.15	5075.6	466.07
5077.05	465.98	5078.95	465.87	5080.64	465.77	5082.84	465.63	5083.41	465.59
5085.69	465.45	5087.88	465.39	5088.63	465.39	5090.73	465.35	5092.34	465.29
5094.42	465.22	5095.77	465.17	5096.81	465.14	5100.21	465.07	5100.81	465.06
5101.28	465.06	5104.88	465.07	5106	465.07	5110.21	465.01	5110.89	465.01
5111.78	465.06	5114.67	465.19	5115.93	465.25	5117.57	465.32	5119.14	465.36
5120.98	465.44	5123.36	465.43	5123.6	465.43	5126.02	465.42	5128.07	465.47
5129.15	465.49	5131.06	465.52	5132.53	465.51	5134.94	465.48	5136.1	465.47
5137	465.42	5140.73	465.19	5141.14	465.17	5141.46	465.17	5143.95	465.19
5145.93	465.2	5146.18	465.2	5146.51	465.19	5150.39	465.07	5151.22	465.04

5152.3	465.05	5154.86	465.07	5156.27	465.09	5158.09	465.07	5159.32	465.09
5161.31	465.06	5163.79	465.08	5163.88	465.08	5166.35	465.1	5168.25	465.15
5169.67	465.18	5171.39	465.22	5172.72	465.26	5175.46	465.37	5176.43	465.41
5177.18	465.41	5181.25	465.5	5183.01	465.5	5186.11	465.49	5186.51	465.5
5187.03	465.51	5190.58	465.55	5191.56	465.58	5192.82	465.59	5195.05	465.61
5196.6	465.63	5198.61	465.62	5199.51	465.63	5201.64	465.6	5203.98	465.55
5204.4	465.54	5206.68	465.49	5208.44	465.44	5210.19	465.37	5211.72	465.32
5212.91	465.33	5215.98	465.34	5216.76	465.34	5217.37	465.33	5221.76	465.3
5221.81	465.29	5221.84	465.3	5222.08	465.3	5226.3	465.42	5226.85	465.43
5227.55	465.42	5230.77	465.35	5231.89	465.34	5233.34	465.34	5235.23	465.37
5236.93	465.37	5239.13	465.39	5239.7	465.4	5241.97	465.42	5244.16	465.46
5244.92	465.47	5247.01	465.51	5248.63	465.55	5250.71	465.59	5252.05	465.62
5253.09	465.65	5256.49	465.77	5257.1	465.79	5257.56	465.79	5261.15	465.8
5262.02	465.81	5262.14	465.81	5262.28	465.82	5266.49	466.23	5267.18	466.27
5268.07	466.3	5270.95	466.4	5272.22	466.44	5273.86	466.42	5275.42	466.37
5277.26	466.36	5279.65	466.53	5279.88	466.54	5282.3	466.71	5284.35	466.74
5285.44	466.74	5287.34	466.75	5288.82	466.78	5291.23	466.81	5292.39	466.82
5293.28	466.84	5297.01	466.97	5297.43	466.98	5297.75	466.97	5300.22	466.93
5302.21	466.89	5302.47	466.89	5302.8	466.9	5306.68	467.06	5307.51	467.09
5308.59	467.35	5311.14	467.83	5312.55	468.18	5314.38	468.03	5315.61	467.93
5317.59	467.78	5320.07	467.65	5320.17	467.64	5322.63	467.5	5324.54	467.6
5325.96	467.7	5327.68	467.8	5329	467.92	5331.74	467.98	5332.72	468.05
5333.47	468.14	5337.53	468.34	5337.76	468.37	5337.93	468.37	5339.28	468.46
5342.4	468.7	5342.8	468.72	5343.32	468.76	5346.86	469.16	5347.84	469.21
5349.11	469.26	5351.33	469.32	5354.9	469.43	5355.79	469.4	5364.72	469.5
5366.47	469.54	5368.01	469.56	5369.19	469.6	5372.26	469.69	5373.05	469.72
5373.66	469.73	5378.35	469.87	5382.59	469.93	5383.84	469.96	5387.05	470.11
5388.17	470.17	5398.26	470.43	5400.45	470.47	5401.21	470.48	5403.3	470.52
5404.91	470.58	5406.99	470.65	5408.34	470.7	5409.38	470.74	5412.78	470.87
5413.38	470.9	5413.84	470.92	5417.42	471.12	5418.31	471.18	5418.42	471.18
5418.57	471.19	5422.77	471.45	5423.46	471.5	5424.36	471.56	5427.24	471.75
5428.51	471.84	5430.15	472.04	5431.7	472.18	5433.55	472.42	5435.94	472.4
5436.17	472.42	5438.59	472.34	5440.63	472.23	5441.72	472.22	5443.63	472.14
5448.67	472.14	5449.56	472.15	5453.3	472.1	5456.49	472.1	5458.49	472.11
5464.88	472.14	5467.43	472.22	5468.84	472.25	5470.67	472.28	5471.89	472.29
5478.92	472.39	5480.82	472.44	5482.24	472.48	5483.96	472.52	5485.29	472.54
5488.03	472.59	5489	472.61	5489.75	472.63	5493.82	472.78	5494.04	472.78
5494.22	472.79	5495.55	472.85	5498.68	472.97	5499.09	472.99	5499.61	473.05

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 5503.15  473.55 5504.13  473.66  5505.4  473.97 5507.61  474.62 5509.17  474.96

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    4127    .075 4967.05    .045 5035.27    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       4967.05 5035.27               14      14      14             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    5117    5179     481       T

BRIDGE


RIVER: RIVER-1
REACH: Reach-1            RS: 4.158

INPUT
Description: Rock Hill Road Bridge
Distance from Upstream XS =       1
Deck/Roadway Width        =      12
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
  4975.9  468.52   465.2  5038.3  468.75  465.85

Upstream Bridge Cross Section Data
Station Elevation Data    num=     500
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    4127     476 4323.02  469.13 4393.75  467.52 4398.17  467.52 4398.81  467.51
 4399.67  467.49 4402.58  467.44 4403.86  467.41 4405.58   467.4 4406.99  467.39
 4408.91  467.37  4411.4  467.34  4411.5  467.34 4413.97  467.31 4415.81  467.29
 4417.41  467.26 4419.02  467.24 4420.22  467.22 4423.33  467.21 4424.07   467.2
 4424.63  467.19 4428.44  467.14 4429.04  467.13 4429.24  467.13 4433.45  467.11
 4434.18  467.11 4435.16  467.12 4437.86  467.14 4439.23  467.15 4441.07  467.14
 4442.27  467.12 4444.28  467.11 4446.68  467.08 4446.99  467.08 4449.34  467.05
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4451.09	467.03	4452.9	467.03	4454.39	467.02	4455.5	467.01	4458.82	466.97
4459.44	466.97	4459.91	466.96	4463.09	466.93	4464.32	466.91	4464.5	466.9
4464.74	466.9	4468.73	466.8	4469.55	466.78	4470.65	466.74	4473.14	466.67
4474.6	466.62	4476.57	466.58	4477.55	466.57	4479.65	466.52	4481.96	466.46
4482.48	466.45	4484.71	466.4	4486.37	466.35	4488.4	466.26	4489.76	466.22
4490.78	466.17	4494.31	465.98	4494.81	465.96	4495.19	465.94	4497.75	465.87
4499.6	465.81	4499.87	465.8	4500.23	465.78	4504.01	465.58	4504.92	465.54
4506.14	465.51	4508.42	465.44	4509.97	465.39	4512.06	465.34	4512.83	465.32
4515.03	465.26	4517.24	465.19	4517.97	465.17	4520.08	465.1	4521.65	465.07
4523.89	465.03	4525.13	465.01	4526.06	465	4529.8	464.95	4530.18	464.95
4530.47	464.94	4532.41	464.93	4534.88	464.91	4535.24	464.9	4535.72	464.89
4539.29	464.83	4540.29	464.81	4541.63	464.81	4543.7	464.79	4545.34	464.79
4547.55	464.76	4548.11	464.76	4550.39	464.73	4552.52	464.71	4553.47	464.71
4555.45	464.69	4556.93	464.67	4559.38	464.62	4560.5	464.59	4561.34	464.57
4565.3	464.48	4565.55	464.48	4565.75	464.47	4567.06	464.47	4570.16	464.45
4570.61	464.44	4571.21	464.43	4574.57	464.32	4618.53	463.8	4618.66	463.8
4621.14	463.75	4623.07	463.68	4624.45	463.62	4626.19	463.56	4627.48	463.55
4630.37	463.56	4631.24	463.56	4631.89	463.55	4636.37	463.55	4727.25	462.47
4728.91	462.46	4809.65	462.08	4812.7	462.07	4813.14	462.07	4813.74	462.08
4817.11	462.09	4818.2	462.09	4823.25	462.18	4825.57	462.18	4830.34	462.24
4834.75	462.31	4837.4	462.34	4843.32	462.43	4843.57	462.43	4849.23	462.54
4852.39	462.64	4853.57	462.67	4856.8	462.75	4858.62	462.8	4861.06	462.89
4861.21	462.89	4863.67	462.98	4865.62	463.08	4866.98	463.15	4868.73	463.24
4870.03	463.29	4872.89	463.43	4873.78	463.47	4874.44	463.52	4878.81	463.86
4878.85	463.86	4878.96	463.87	4883.26	464.1	4883.88	464.14	4884.73	464.19
4887.67	464.33	4888.94	464.41	4890.64	464.48	4892.08	464.55	4893.99	464.63
4896.49	464.73	4896.56	464.73	4899.04	464.83	4900.9	464.9	4902.47	464.96
4904.1	465.02	4905.31	465.05	4908.39	465.07	4909.15	465.09	4909.72	465.09
4913.61	465.12	4914.13	465.13	4914.3	465.13	4918.54	465.24	4919.25	465.26
4920.22	465.29	4922.95	465.38	4924.31	465.42	4926.13	465.51	4927.36	465.57
4929.36	465.66	4931.77	465.79	4932.05	465.8	4934.41	465.93	4936.18	466.03
4937.96	466.11	4939.47	466.19	4940.59	466.28	4943.88	466.55	4944.52	466.6
4945	466.64	4948.27	466.88	4949.41	466.97	4949.57	466.98	4949.79	467
4953.82	467.39	4954.62	467.45	4955.71	467.54	4958.23	467.66	4959.68	467.79
4961.62	467.93	4962.64	468	4964.73	468.14	4967.05	467.72	4967.54	467.64
4967.66	467.62	4969.78	467.24	4971.52	465.57	4973.29	464.09	4974.81	462.67
4976.01	461.42	4979.03	458.15	4979.85	457.28	4980.49	456.5	4984.77	450.63
5000	449.16	5015.12	450.27	5016.38	450.38	5019.24	450.84	5020.15	450.94

5020.87	452.12	5024.98	458.77	5025.19	459.12	5025.35	459.38	5026.68	461.12
5027.99	462.73	5029.83	464.99	5030.23	465.36	5030.75	465.64	5034.3	466.9
5035.27	467.48	5036.53	467.75	5038.76	467.57	5040.31	468.03	5042.32	468.07
5043.23	468.09	5045.35	468.14	5047.69	468.09	5048.11	468.08	5050.4	468.03
5052.16	467.93	5053.9	467.81	5055.44	467.72	5056.62	467.65	5059.69	467.43
5060.48	467.38	5061.09	467.35	5065.48	467	5065.55	467	5065.81	466.98
5070.02	466.6	5070.56	466.55	5071.27	466.49	5074.48	466.15	5075.6	466.07
5077.05	465.98	5078.95	465.87	5080.64	465.77	5082.84	465.63	5083.41	465.59
5085.69	465.45	5087.88	465.39	5088.63	465.39	5090.73	465.35	5092.34	465.29
5094.42	465.22	5095.77	465.17	5096.81	465.14	5100.21	465.07	5100.81	465.06
5101.28	465.06	5104.88	465.07	5106	465.07	5110.21	465.01	5110.89	465.01
5111.78	465.06	5114.67	465.19	5115.93	465.25	5117.57	465.32	5119.14	465.36
5120.98	465.44	5123.36	465.43	5123.6	465.43	5126.02	465.42	5128.07	465.47
5129.15	465.49	5131.06	465.52	5132.53	465.51	5134.94	465.48	5136.1	465.47
5137	465.42	5140.73	465.19	5141.14	465.17	5141.46	465.17	5143.95	465.19
5145.93	465.2	5146.18	465.2	5146.51	465.19	5150.39	465.07	5151.22	465.04
5152.3	465.05	5154.86	465.07	5156.27	465.09	5158.09	465.07	5159.32	465.09
5161.31	465.06	5163.79	465.08	5163.88	465.08	5166.35	465.1	5168.25	465.15
5169.67	465.18	5171.39	465.22	5172.72	465.26	5175.46	465.37	5176.43	465.41
5177.18	465.41	5181.25	465.5	5183.01	465.5	5186.11	465.49	5186.51	465.5
5187.03	465.51	5190.58	465.55	5191.56	465.58	5192.82	465.59	5195.05	465.61
5196.6	465.63	5198.61	465.62	5199.51	465.63	5201.64	465.6	5203.98	465.55
5204.4	465.54	5206.68	465.49	5208.44	465.44	5210.19	465.37	5211.72	465.32
5212.91	465.33	5215.98	465.34	5216.76	465.34	5217.37	465.33	5221.76	465.3
5221.81	465.29	5221.84	465.3	5222.08	465.3	5226.3	465.42	5226.85	465.43
5227.55	465.42	5230.77	465.35	5231.89	465.34	5233.34	465.34	5235.23	465.37
5236.93	465.37	5239.13	465.39	5239.7	465.4	5241.97	465.42	5244.16	465.46
5244.92	465.47	5247.01	465.51	5248.63	465.55	5250.71	465.59	5252.05	465.62
5253.09	465.65	5256.49	465.77	5257.1	465.79	5257.56	465.79	5261.15	465.8
5262.02	465.81	5262.14	465.81	5262.28	465.82	5266.49	466.23	5267.18	466.27
5268.07	466.3	5270.95	466.4	5272.22	466.44	5273.86	466.42	5275.42	466.37
5277.26	466.36	5279.65	466.53	5279.88	466.54	5282.3	466.71	5284.35	466.74
5285.44	466.74	5287.34	466.75	5288.82	466.78	5291.23	466.81	5292.39	466.82
5293.28	466.84	5297.01	466.97	5297.43	466.98	5297.75	466.97	5300.22	466.93
5302.21	466.89	5302.47	466.89	5302.8	466.9	5306.68	467.06	5307.51	467.09
5308.59	467.35	5311.14	467.83	5312.55	468.18	5314.38	468.03	5315.61	467.93
5317.59	467.78	5320.07	467.65	5320.17	467.64	5322.63	467.5	5324.54	467.6
5325.96	467.7	5327.68	467.8	5329	467.92	5331.74	467.98	5332.72	468.05

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 5333.47  468.14 5337.53  468.34 5337.76  468.37 5337.93  468.37 5339.28  468.46
  5342.4   468.7  5342.8  468.72 5343.32  468.76 5346.86  469.16 5347.84  469.21
 5349.11  469.26 5351.33  469.32  5354.9  469.43 5355.79   469.4 5364.72   469.5
 5366.47  469.54 5368.01  469.56 5369.19   469.6 5372.26  469.69 5373.05  469.72
 5373.66  469.73 5378.35  469.87 5382.59  469.93 5383.84  469.96 5387.05  470.11
 5388.17  470.17 5398.26  470.43 5400.45  470.47 5401.21  470.48  5403.3  470.52
 5404.91  470.58 5406.99  470.65 5408.34   470.7 5409.38  470.74 5412.78  470.87
 5413.38   470.9 5413.84  470.92 5417.42  471.12 5418.31  471.18 5418.42  471.18
 5418.57  471.19 5422.77  471.45 5423.46   471.5 5424.36  471.56 5427.24  471.75
 5428.51  471.84 5430.15  472.04  5431.7  472.18 5433.55  472.42 5435.94   472.4
 5436.17  472.42 5438.59  472.34 5440.63  472.23 5441.72  472.22 5443.63  472.14
 5448.67  472.14 5449.56  472.15  5453.3   472.1 5456.49   472.1 5458.49  472.11
 5464.88  472.14 5467.43  472.22 5468.84  472.25 5470.67  472.28 5471.89  472.29
 5478.92  472.39 5480.82  472.44 5482.24  472.48 5483.96  472.52 5485.29  472.54
 5488.03  472.59    5489  472.61 5489.75  472.63 5493.82  472.78 5494.04  472.78
 5494.22  472.79 5495.55  472.85 5498.68  472.97 5499.09  472.99 5499.61  473.05
 5503.15  473.55 5504.13  473.66  5505.4  473.97 5507.61  474.62 5509.17  474.96

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    4127    .075 4967.05    .045 5035.27    .075

Bank Sta: Left   Right    Coeff Contr.   Expan.
       4967.05 5035.27            .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    5117    5179     481       T

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    4976   468.8   465.7  5039.7  469.12  466.22

Downstream Bridge Cross Section Data
Station Elevation Data    num=     457
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    4136     476 4330.08  469.18 4332.56   469.1 4332.64   469.1 4335.13  469.02
 4337.05  469.01 4338.48  468.96 4340.19  468.94 4341.46  468.96 4344.39  468.93
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4345.24	468.94	4345.87	468.92	4350.18	468.86	4350.28	468.87	4350.29	468.86
4350.31	468.86	4354.69	468.98	4355.34	468.97	4356.23	468.92	4359.1	468.8
4360.4	468.74	4362.14	468.69	4363.51	468.66	4365.45	468.6	4367.92	468.51
4368.06	468.51	4370.5	468.41	4372.33	468.35	4373.97	468.27	4375.56	468.22
4376.74	468.11	4379.89	467.9	4380.61	467.84	4381.15	467.83	4384.84	467.77
4385.56	467.78	4385.8	467.78	4389.97	467.68	4390.71	467.67	4391.72	467.63
4394.38	467.55	4395.77	467.49	4397.63	467.53	4398.79	467.58	4400.82	467.6
4403.2	467.64	4403.55	467.63	4405.87	467.65	4407.61	467.63	4409.46	467.57
4410.93	467.54	4412.02	467.51	4415.38	467.51	4415.98	467.49	4416.43	467.48
4419.49	467.44	4420.84	467.43	4426.08	467.43	4427.21	467.42	4429.65	467.44
4431.14	467.43	4434.06	467.43	4436.19	467.41	4438.47	467.29	4439.04	467.27
4441.24	467.15	4442.88	467.14	4444.96	467.07	4446.3	467.04	4447.29	467.04
4450.87	467	4451.35	466.99	4451.7	467	4454.15	467.01	4456.11	467.06
4456.79	467.06	4460.52	467.12	4461.45	467.12	4462.7	467.13	4464.93	467.18
4466.51	467.18	4468.62	467.07	4469.34	467.03	4471.56	466.93	4473.75	466.83
4474.53	466.79	4476.61	466.7	4478.16	466.61	4480.45	466.5	4481.67	466.43
4482.57	466.35	4486.36	466.09	4486.72	466.06	4486.98	466.04	4488.8	465.95
4491.39	465.84	4491.77	465.83	4492.28	465.82	4495.8	465.78	4496.82	465.76
4498.19	465.73	4500.21	465.71	4501.88	465.66	4504.11	465.54	4504.62	465.49
4506.93	465.39	4509.03	465.3	4510.02	465.25	4511.98	465.16	4513.44	465.14
4515.94	465.1	4517.04	465.08	4517.85	465.05	4521.85	464.85	4522.09	464.85
4522.26	464.84	4523.46	464.83	4526.67	464.81	4527.14	464.81	4527.77	464.79
4531.08	464.71	4532.19	464.68	4533.69	464.67	4535.49	464.65	4537.25	464.64
4539.6	464.61	4539.9	464.61	4542.3	464.58	4544.31	464.53	4545.52	464.52
4547.35	464.48	4548.72	464.47	4551.43	464.44	4552.41	464.43	4553.13	464.45
4557.35	464.43	4557.46	464.44	4557.54	464.44	4558.11	464.49	4561.95	464.79
4562.51	464.8	4563.26	464.75	4566.36	464.42	4567.56	464.36	4714.1	462.68
4716.3	462.62	4769.22	462.49	4769.68	462.48	4770.3	462.5	4773.63	462.64
4774.73	462.66	4776.22	462.65	4778.04	462.65	4779.79	462.64	4782.13	462.59
4782.45	462.59	4784.84	462.54	4786.86	462.49	4788.05	462.48	4789.89	462.45
4791.27	462.42	4793.96	462.37	4794.94	462.34	4795.68	462.34	4799.88	462.3
4800.09	462.3	4800.7	462.29	4804.5	462.26	4805.79	462.26	4808.91	462.25
4810.1	462.25	4811.71	462.27	4813.32	462.28	4815.16	462.29	4817.62	462.38
4817.73	462.39	4820.21	462.47	4822.14	462.46	4823.54	462.45	4825.26	462.44
4826.55	462.45	4829.45	462.47	4830.31	462.48	4830.96	462.49	4835.36	462.53
4835.37	462.53	4839.78	462.51	4840.42	462.51	4841.28	462.54	4844.19	462.69
4845.47	462.74	4847.2	462.77	4848.6	462.81	4850.53	462.85	4853	462.92
4853.11	462.92	4855.58	462.97	4857.41	463.01	4859.03	463.06	4860.63	463.1

4861.82	463.11	4864.95	463.19	4865.68	463.2	4866.23	463.22	4870.01	463.33
4870.64	463.36	4870.86	463.36	4875.05	463.53	4875.79	463.55	4876.78	463.59
4879.46	463.73	4880.84	463.78	4882.69	463.83	4883.87	463.88	4885.9	463.92
4888.28	464	4888.61	464.01	4890.95	464.1	4892.69	464.16	4894.52	464.3
4896	464.37	4897.1	464.43	4900.44	464.59	4901.05	464.62	4901.51	464.64
4904.67	464.78	4905.92	464.84	4906.11	464.85	4906.35	464.86	4910.33	464.99
4911.16	465.03	4912.27	465.05	4914.74	465.07	4916.21	465.11	4918.18	465.14
4919.15	465.16	4921.27	465.18	4923.56	465.23	4924.1	465.25	4926.32	465.3
4927.97	465.54	4930.01	465.71	4931.37	465.89	4932.38	465.9	4935.93	466.2
4936.42	466.21	4936.79	466.21	4939.32	466.38	4941.2	466.47	4941.48	466.48
4941.85	466.5	4945.61	466.65	4946.53	466.71	4947.76	466.87	4950.02	467.21
4951.58	467.4	4953.68	467.62	4954.43	467.71	4956.64	467.94	4958.84	467.96
4959.59	468.02	4961.69	468.08	4963.25	467.88	4965.51	467.91	4966.49	467.81
4966.74	467.79	4967.68	466.97	4971.28	464.56	4971.78	464.15	4972.17	463.62
4975.34	457.67	4976.65	455.09	4976.82	454.84	4977.02	454.68	4981.14	451.03
4981.85	450.48	4982.77	450.41	5000	449.16	5017.23	450.22	5021.52	451.59
5022.15	452.13	5022.97	452.78	5026	455.47	5026.73	456.04	5027.19	456.4
5028.73	457.61	5030.47	459.11	5032.23	460.44	5034.52	462.71	5034.94	463.05
5037.28	465.49	5039.4	466.95	5040.31	467.21	5042.32	468.4	5043.87	469.05
5046.1	468.98	5047.36	469.37	5048.33	469.08	5051.89	468.67	5052.4	468.54
5052.8	468.46	5055.87	468.21	5057.26	468.11	5057.44	468.09	5057.67	468.08
5061.73	467.85	5062.48	467.81	5063.46	467.77	5066.19	467.65	5067.52	467.59
5069.25	467.52	5070.66	467.46	5072.57	467.38	5075.04	467.24	5075.12	467.23
5077.61	467.09	5079.59	466.93	5080.83	466.83	5082.65	466.68	5084.05	466.55
5086.62	466.33	5087.69	466.23	5088.52	466.16	5092.41	465.89	5092.73	465.86
5092.98	465.83	5094.94	465.63	5097.45	465.37	5097.77	465.35	5098.19	465.34
5101.91	465.26	5102.81	465.24	5103.98	465.21	5106.38	465.13	5107.86	465.09
5109.77	465.1	5112.9	465.1	5115.31	465.11	5115.56	465.12	5117.94	465.13
5119.78	465.17	5121.35	465.21	5122.98	465.25	5124.24	465.28	5127.14	465.35
5128.02	465.37	5128.71	465.37	5132.92	465.4	5133.17	465.4	5134	465.38
5137.64	465.28	5138.11	465.27	5138.71	465.27	5142.1	465.24	5143.15	465.23
5146.57	465.23	5148.19	465.24	5150.29	465.19	5151.03	465.17	5153.23	465.12
5155.5	465.05	5156.08	465.04	5158.27	464.97	5159.96	464.92	5161.87	464.86
5163.31	464.82	5164.43	464.8	5167.65	464.59	5168.35	464.57	5168.89	464.52
5173.07	464.35	5262.66	465.78	5264.14	465.81	5266.06	466.04	5267.13	466.23
5269.18	466.44	5271.59	466.27	5271.85	466.28	5274.22	466.17	5276.06	466.19
5277.64	466.19	5279.27	466.2	5280.52	466.2	5283.42	466.28	5284.31	466.28
5284.99	466.32	5289.21	466.42	5289.35	466.43	5289.45	466.44	5290.27	466.48

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 5293.92  466.69 5294.39  466.71    5295  466.72 5298.39  466.82 5299.43  466.85
 5300.79  466.89 5302.85  466.98 5304.47  467.03 5306.58   467.6 5307.32   467.8
 5309.51   468.4 5311.78  468.01 5312.37  467.91 5314.56  467.53 5316.25  467.52
 5318.15  467.53  5319.6  467.52 5320.71  467.55 5323.94  467.62 5324.64  467.64
 5325.18  467.69 5329.34  468.12 5329.64  468.15 5329.68  468.15 5329.73  468.16
 5334.11  468.85 5334.72  468.94 5335.52  468.96 5338.57  468.88 5339.76  468.92
 5341.31  468.84 5343.04  468.75 5344.81  468.66  5347.1   468.7 5404.98  470.68
  5405.3   470.7 5405.55  470.72 5407.48  470.94 5410.02  471.22 5410.34  471.25
 5410.77  471.26 5414.48  471.41 5415.39  471.42 5416.56   471.4 5418.95  471.27
 5420.43  471.26 5422.35  471.37 5423.41  471.44 5425.47  471.55 5427.88  471.84
 5428.13  471.88 5430.51  472.18 5432.34  472.67 5433.92  473.05 5435.55  473.48
 5436.81  473.06 5439.71  472.28 5440.59  471.99 5445.74  471.99 5446.54     472
  5450.2  472.06 5450.68  472.06 5451.29  472.05 5454.67  472.05 5455.72  472.04
 5457.08  472.05 5459.13  472.08

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    4136    .075 4965.51    .045 5043.87    .075

Bank Sta: Left   Right    Coeff Contr.   Expan.
       4965.51 5043.87            .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    5122    5173     481       T

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Energy
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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: RIVER-1
REACH: Reach-1 RS: 4.157

INPUT
Description: 4.157
LADUE FIS 21947 D.S. FACE OF ROCK HILL RD.
Station Elevation Data num= 457

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4136	476	4330.08	469.18	4332.56	469.1	4332.64	469.1	4335.13	469.02
4337.05	469.01	4338.48	468.96	4340.19	468.94	4341.46	468.96	4344.39	468.93
4345.24	468.94	4345.87	468.92	4350.18	468.86	4350.28	468.87	4350.29	468.86
4350.31	468.86	4354.69	468.98	4355.34	468.97	4356.23	468.92	4359.1	468.8
4360.4	468.74	4362.14	468.69	4363.51	468.66	4365.45	468.6	4367.92	468.51
4368.06	468.51	4370.5	468.41	4372.33	468.35	4373.97	468.27	4375.56	468.22
4376.74	468.11	4379.89	467.9	4380.61	467.84	4381.15	467.83	4384.84	467.77
4385.56	467.78	4385.8	467.78	4389.97	467.68	4390.71	467.67	4391.72	467.63
4394.38	467.55	4395.77	467.49	4397.63	467.53	4398.79	467.58	4400.82	467.6
4403.2	467.64	4403.55	467.63	4405.87	467.65	4407.61	467.63	4409.46	467.57
4410.93	467.54	4412.02	467.51	4415.38	467.51	4415.98	467.49	4416.43	467.48
4419.49	467.44	4420.84	467.43	4426.08	467.43	4427.21	467.42	4429.65	467.44
4431.14	467.43	4434.06	467.43	4436.19	467.41	4438.47	467.29	4439.04	467.27
4441.24	467.15	4442.88	467.14	4444.96	467.07	4446.3	467.04	4447.29	467.04
4450.87	467	4451.35	466.99	4451.7	467	4454.15	467.01	4456.11	467.06
4456.79	467.06	4460.52	467.12	4461.45	467.12	4462.7	467.13	4464.93	467.18

4466.51	467.18	4468.62	467.07	4469.34	467.03	4471.56	466.93	4473.75	466.83
4474.53	466.79	4476.61	466.7	4478.16	466.61	4480.45	466.5	4481.67	466.43
4482.57	466.35	4486.36	466.09	4486.72	466.06	4486.98	466.04	4488.8	465.95
4491.39	465.84	4491.77	465.83	4492.28	465.82	4495.8	465.78	4496.82	465.76
4498.19	465.73	4500.21	465.71	4501.88	465.66	4504.11	465.54	4504.62	465.49
4506.93	465.39	4509.03	465.3	4510.02	465.25	4511.98	465.16	4513.44	465.14
4515.94	465.1	4517.04	465.08	4517.85	465.05	4521.85	464.85	4522.09	464.85
4522.26	464.84	4523.46	464.83	4526.67	464.81	4527.14	464.81	4527.77	464.79
4531.08	464.71	4532.19	464.68	4533.69	464.67	4535.49	464.65	4537.25	464.64
4539.6	464.61	4539.9	464.61	4542.3	464.58	4544.31	464.53	4545.52	464.52
4547.35	464.48	4548.72	464.47	4551.43	464.44	4552.41	464.43	4553.13	464.45
4557.35	464.43	4557.46	464.44	4557.54	464.44	4558.11	464.49	4561.95	464.79
4562.51	464.8	4563.26	464.75	4566.36	464.42	4567.56	464.36	4714.1	462.68
4716.3	462.62	4769.22	462.49	4769.68	462.48	4770.3	462.5	4773.63	462.64
4774.73	462.66	4776.22	462.65	4778.04	462.65	4779.79	462.64	4782.13	462.59
4782.45	462.59	4784.84	462.54	4786.86	462.49	4788.05	462.48	4789.89	462.45
4791.27	462.42	4793.96	462.37	4794.94	462.34	4795.68	462.34	4799.88	462.3
4800.09	462.3	4800.7	462.29	4804.5	462.26	4805.79	462.26	4808.91	462.25
4810.1	462.25	4811.71	462.27	4813.32	462.28	4815.16	462.29	4817.62	462.38
4817.73	462.39	4820.21	462.47	4822.14	462.46	4823.54	462.45	4825.26	462.44
4826.55	462.45	4829.45	462.47	4830.31	462.48	4830.96	462.49	4835.36	462.53
4835.37	462.53	4839.78	462.51	4840.42	462.51	4841.28	462.54	4844.19	462.69
4845.47	462.74	4847.2	462.77	4848.6	462.81	4850.53	462.85	4853	462.92
4853.11	462.92	4855.58	462.97	4857.41	463.01	4859.03	463.06	4860.63	463.1
4861.82	463.11	4864.95	463.19	4865.68	463.2	4866.23	463.22	4870.01	463.33
4870.64	463.36	4870.86	463.36	4875.05	463.53	4875.79	463.55	4876.78	463.59
4879.46	463.73	4880.84	463.78	4882.69	463.83	4883.87	463.88	4885.9	463.92
4888.28	464	4888.61	464.01	4890.95	464.1	4892.69	464.16	4894.52	464.3
4896	464.37	4897.1	464.43	4900.44	464.59	4901.05	464.62	4901.51	464.64
4904.67	464.78	4905.92	464.84	4906.11	464.85	4906.35	464.86	4910.33	464.99
4911.16	465.03	4912.27	465.05	4914.74	465.07	4916.21	465.11	4918.18	465.14
4919.15	465.16	4921.27	465.18	4923.56	465.23	4924.1	465.25	4926.32	465.3
4927.97	465.54	4930.01	465.71	4931.37	465.89	4932.38	465.9	4935.93	466.2
4936.42	466.21	4936.79	466.21	4939.32	466.38	4941.2	466.47	4941.48	466.48
4941.85	466.5	4945.61	466.65	4946.53	466.71	4947.76	466.87	4950.02	467.21
4951.58	467.4	4953.68	467.62	4954.43	467.71	4956.64	467.94	4958.84	467.96
4959.59	468.02	4961.69	468.08	4963.25	467.88	4965.51	467.91	4966.49	467.81
4966.74	467.79	4967.68	466.97	4971.28	464.56	4971.78	464.15	4972.17	463.62

4975.34	457.67	4976.65	455.09	4976.82	454.84	4977.02	454.68	4981.14	451.03
4981.85	450.48	4982.77	450.41	5000	449.16	5017.23	450.22	5021.52	451.59
5022.15	452.13	5022.97	452.78	5026	455.47	5026.73	456.04	5027.19	456.4
5028.73	457.61	5030.47	459.11	5032.23	460.44	5034.52	462.71	5034.94	463.05
5037.28	465.49	5039.4	466.95	5040.31	467.21	5042.32	468.4	5043.87	469.05
5046.1	468.98	5047.36	469.37	5048.33	469.08	5051.89	468.67	5052.4	468.54
5052.8	468.46	5055.87	468.21	5057.26	468.11	5057.44	468.09	5057.67	468.08
5061.73	467.85	5062.48	467.81	5063.46	467.77	5066.19	467.65	5067.52	467.59
5069.25	467.52	5070.66	467.46	5072.57	467.38	5075.04	467.24	5075.12	467.23
5077.61	467.09	5079.59	466.93	5080.83	466.83	5082.65	466.68	5084.05	466.55
5086.62	466.33	5087.69	466.23	5088.52	466.16	5092.41	465.89	5092.73	465.86
5092.98	465.83	5094.94	465.63	5097.45	465.37	5097.77	465.35	5098.19	465.34
5101.91	465.26	5102.81	465.24	5103.98	465.21	5106.38	465.13	5107.86	465.09
5109.77	465.1	5112.9	465.1	5115.31	465.11	5115.56	465.12	5117.94	465.13
5119.78	465.17	5121.35	465.21	5122.98	465.25	5124.24	465.28	5127.14	465.35
5128.02	465.37	5128.71	465.37	5132.92	465.4	5133.17	465.4	5134	465.38
5137.64	465.28	5138.11	465.27	5138.71	465.27	5142.1	465.24	5143.15	465.23
5146.57	465.23	5148.19	465.24	5150.29	465.19	5151.03	465.17	5153.23	465.12
5155.5	465.05	5156.08	465.04	5158.27	464.97	5159.96	464.92	5161.87	464.86
5163.31	464.82	5164.43	464.8	5167.65	464.59	5168.35	464.57	5168.89	464.52
5173.07	464.35	5262.66	465.78	5264.14	465.81	5266.06	466.04	5267.13	466.23
5269.18	466.44	5271.59	466.27	5271.85	466.28	5274.22	466.17	5276.06	466.19
5277.64	466.19	5279.27	466.2	5280.52	466.2	5283.42	466.28	5284.31	466.28
5284.99	466.32	5289.21	466.42	5289.35	466.43	5289.45	466.44	5290.27	466.48
5293.92	466.69	5294.39	466.71	5295	466.72	5298.39	466.82	5299.43	466.85
5300.79	466.89	5302.85	466.98	5304.47	467.03	5306.58	467.6	5307.32	467.8
5309.51	468.4	5311.78	468.01	5312.37	467.91	5314.56	467.53	5316.25	467.52
5318.15	467.53	5319.6	467.52	5320.71	467.55	5323.94	467.62	5324.64	467.64
5325.18	467.69	5329.34	468.12	5329.64	468.15	5329.68	468.15	5329.73	468.16
5334.11	468.85	5334.72	468.94	5335.52	468.96	5338.57	468.88	5339.76	468.92
5341.31	468.84	5343.04	468.75	5344.81	468.66	5347.1	468.7	5404.98	470.68
5405.3	470.7	5405.55	470.72	5407.48	470.94	5410.02	471.22	5410.34	471.25
5410.77	471.26	5414.48	471.41	5415.39	471.42	5416.56	471.4	5418.95	471.27
5420.43	471.26	5422.35	471.37	5423.41	471.44	5425.47	471.55	5427.88	471.84
5428.13	471.88	5430.51	472.18	5432.34	472.67	5433.92	473.05	5435.55	473.48
5436.81	473.06	5439.71	472.28	5440.59	471.99	5445.74	471.99	5446.54	472
5450.2	472.06	5450.68	472.06	5451.29	472.05	5454.67	472.05	5455.72	472.04
5457.08	472.05	5459.13	472.08						

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Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    4136    .075 4965.51    .045 5043.87    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       4965.51 5043.87               43      43      43             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    5122    5173     481       T

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.148

INPUT
Description: 4.148
Station Elevation Data    num=     500
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    4145     476 4339.54  470.25 4359.13     470 4359.75  469.99 4369.86  469.82
 4370.96  469.76 4373.44  469.62 4374.91  469.54 4376.88  469.41 4377.85  469.34
 4379.96   469.2 4382.26  469.06 4382.79  469.03 4385.02   468.9 4430.12   469.5
 4430.49   469.5  4440.6  469.17 4441.95  469.05    4444  468.86 4445.65  468.72
 4447.86  468.47 4448.41  468.41  4450.7  468.16 4452.82  467.99 4453.78  467.94
 4455.76   467.8 4457.23  467.77 4459.69  467.74 4460.81  467.71 4461.64   467.7
 4465.61  467.55 4465.86  467.54 4466.05  467.52 4467.34  467.34 4470.46  466.92
 4514.56  464.63 4516.39  464.56 4518.85  464.61 4518.97  464.61 4521.44  464.66
 4523.38  464.71 4524.76  464.76  4526.5  464.81 4527.79  464.78 4530.68  464.68
 4531.55  464.66  4532.2  464.65 4536.59  464.58 4536.65  464.58 4541.02  464.42
 4541.65   464.4 4542.51  464.38 4545.43  464.34 4546.71  464.31 4548.42  464.28
 4549.84  464.24 4551.76   464.2 4554.25  464.17 4554.34  464.17 4556.81  464.14
 4558.66  464.11 4560.25  464.11 4561.87  464.09 4563.07  464.09 4566.17   464.1
 4566.92   464.1 4567.48  464.11  4576.3  464.84 4577.02  464.89    4578  464.87
 4580.71  464.82 4582.08  464.79 4583.92  464.67 4585.12  464.61 4587.13  464.47
 4589.53  464.48 4589.83  464.49 4592.18  464.51 4593.94  464.54 4595.75  464.54
 4597.24  464.56 4598.35  464.54 4601.66  464.48 4602.29  464.47 4602.76  464.46
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4605.96	464.44	4607.17	464.43	4607.34	464.42	4607.58	464.42	4611.58	464.35
4612.39	464.34	4613.49	464.39	4615.99	464.45	4617.45	464.52	4619.41	464.56
4629.22	464.71	4631.24	464.74	4632.61	464.76	4633.63	464.76	4637.15	464.77
4638.04	464.77	4640.62	464.73	4642.45	464.7	4642.71	464.69	4643.07	464.68
4646.86	464.61	4647.76	464.59	4648.98	464.58	4651.26	464.58	4652.82	464.57
4654.9	464.59	4655.67	464.6	4657.87	464.62	4660.08	464.6	4660.82	464.6
4662.92	464.58	4664.49	464.57	4666.73	464.57	4667.98	464.56	4668.9	464.55
4672.65	464.53	4673.03	464.53	4673.31	464.52	4675.27	464.49	4677.72	464.44
4678.08	464.44	4678.56	464.42	4682.13	464.29	4683.13	464.28	4684.48	464.25
4686.54	464.21	4688.19	464.18	4690.39	464.13	4690.95	464.11	4693.24	464.06
4695.36	464.02	4794.3	463.16	4796.79	463.12	4796.87	463.12	4799.35	463.08
4801.2	463.03	4802.78	463.02	4804.4	462.98	4805.61	462.99	4808.7	463.01
4809.46	463.02	4810.02	463.02	4813.89	463.04	4814.61	463.04	4818.84	463.09
4819.56	463.09	4820.53	463.1	4823.25	463.12	4824.61	463.13	4826.44	463.17
4827.66	463.2	4829.67	463.25	4832.07	463.45	4832.36	463.47	4834.72	463.66
4836.48	463.76	4838.28	463.85	4839.77	463.93	4840.89	463.97	4844.19	464.1
4844.83	464.12	4845.3	464.14	4848.55	464.26	4849.71	464.3	4849.88	464.31
4850.11	464.32	4854.12	464.49	4854.93	464.53	4856.02	464.57	4858.53	464.67
4859.98	464.72	4861.94	464.74	4862.94	464.76	4865.04	464.78	4867.35	464.82
4867.85	464.82	4870.09	464.86	4871.76	464.83	4873.77	464.8	4875.14	464.78
4876.17	464.74	4879.68	464.66	4880.2	464.64	4880.58	464.63	4883.2	464.6
4884.99	464.59	4885.25	464.58	4885.6	464.58	4889.4	464.54	4890.3	464.53
4891.51	464.54	4893.81	464.58	4895.35	464.59	4897.43	464.59	4898.22	464.58
4900.41	464.59	4902.63	464.61	4903.34	464.61	4905.46	464.63	4907.04	464.65
4909.26	464.68	4910.51	464.7	4911.45	464.69	4915.18	464.67	4915.86	464.67
4917.86	464.66	4920.27	464.64	4920.62	464.63	4921.09	464.64	4937.91	464.55
4938.84	464.55	4940.83	464.54	4942.32	464.5	4944.75	464.43	4945.88	464.4
4946.73	464.38	4950.67	464.31	4950.94	464.3	4951.14	464.31	4952.51	464.25
4955.55	464.17	4956.58	464.17	4959.96	464.22	4961.04	464.23	4961.5	464.16
4962.47	463.99	4964.42	463.79	4966.08	463.48	4968.21	462.03	4968.9	461.54
4971.12	460.06	4973.39	458.5	4973.96	458.08	4976.16	456.55	4977.87	454.65
4979.7	452.37	4981.19	450.68	5000	448	5021.5	450.52	5022.73	451.24
5025.68	452.71	5026.54	453.19	5027.19	453.97	5031.47	461.08	5031.58	461.22
5031.66	461.28	5032.29	461.79	5036.12	464.9	5036.62	465.31	5037.26	465.8
5040.59	469.06	5041.66	469.81	5043.05	470.78	5045.06	472.25	5046.7	473.4
5048.84	473.56	5049.52	473.62	5051.74	473.78	5053.99	473.8	5054.63	473.87
5056.79	473.93	5058.45	474.2	5060.42	474.7	5061.83	474.96	5062.92	475.13
5066.2	475.38	5066.87	475.47	5067.38	475.54	5071.36	475.82	5071.85	475.84

5071.91	475.84	5071.99	475.81	5076.31	474.18	5076.95	473.94	5077.78	473.42
5080.78	471.72	5081.99	470.93	5083.57	470.25	5085.24	469.51	5087.03	468.74
5089.36	468.04	5089.71	467.91	5092.08	467.23	5094.17	467.06	5095.15	467
5097.12	466.85	5098.64	466.69	5100.93	466.46	5102.16	466.33	5103.1	466.25
5106.72	465.9	5107.2	465.85	5107.57	465.82	5110.42	465.61	5112.03	465.5
5112.51	465.5	5116.5	465.64	5117.28	465.65	5118.3	465.66	5120.96	465.7
5122.32	465.71	5124.09	465.68	5125.43	465.67	5127.37	465.63	5129.88	465.66
5129.9	465.66	5132.41	465.7	5134.36	465.67	5135.67	465.65	5137.45	465.62
5138.83	465.65	5141.45	465.69	5142.49	465.71	5143.29	465.68	5147.24	465.57
5147.53	465.56	5147.76	465.55	5149.49	465.48	5152.22	465.35	5152.57	465.34
5153.03	465.36	5156.69	465.51	5157.62	465.55	5158.82	465.59	5161.15	465.69
5162.66	465.74	5164.61	465.8	5165.62	465.83	5167.7	465.89	5170.08	465.97
5170.4	465.97	5172.74	466.03	5174.55	466.32	5176.18	466.39	5177.78	466.6
5179.01	466.91	5181.97	467.42	5182.82	467.62	5183.48	467.81	5187.76	469.08
5187.86	469.11	5187.94	469.12	5188.56	469.15	5192.41	469.37	5192.91	469.46
5193.55	469.33	5196.87	468.43	5197.95	468.23	5199.34	468.41	5201.34	468.31
5202.99	468.61	5205.13	469.38	5205.8	469.7	5208.03	470.44	5210.27	469.82
5210.91	469.72	5213.07	469.19	5214.73	468.83	5216.7	468.17	5218.11	467.83
5219.2	467.89	5222.49	467.79	5223.15	467.82	5223.67	467.88	5227.63	468.18
5228.13	468.21	5228.2	468.21	5228.28	468.2	5232.6	467.61	5233.24	467.55
5234.07	467.6	5237.06	467.47	5238.28	467.57	5239.86	467.32	5241.53	467.16
5243.32	466.84	5245.65	466.81	5245.99	466.81	5248.36	466.78	5250.46	466.66
5251.43	466.67	5253.4	466.6	5254.92	466.66	5257.22	466.59	5258.44	466.62
5259.39	466.67	5263.01	466.43	5263.49	466.44	5263.85	466.45	5266.69	466.65
5268.32	466.84	5268.53	466.86	5268.8	466.9	5272.78	467.66	5273.57	467.78
5274.59	467.83	5277.25	467.97	5278.61	468.03	5280.38	467.73	5281.71	467.44
5283.65	467.14	5286.16	466.8	5286.18	466.79	5288.69	466.47	5290.64	466.7
5291.95	466.7	5293.73	466.85	5295.11	467.35	5297.74	468.09	5298.78	468.44
5299.57	468.4	5303.53	469.26	5303.82	469.26	5304.04	469.22	5305.76	468.77
5308.5	467.95	5308.86	467.93	5309.32	467.93	5312.97	467.96	5313.9	467.98
5315.11	468.02	5317.44	468.09	5318.94	468.15	5320.89	468.26	5321.9	468.3
5323.98	468.43	5326.37	468.5	5326.68	468.5	5329.02	468.56	5330.83	468.61
5332.47	468.64	5334.07	468.69	5335.3	468.73	5338.26	468.81	5339.11	468.84
5339.76	468.86	5344.05	469.02	5344.23	469.02	5344.83	469.04	5348.69	469.19
5349.19	469.21	5349.84	469.2	5353.16	469.23	5354.23	469.21	5355.63	469.22
5357.62	469.25	5359.27	469.26	5361.41	469.27	5362.09	469.28	5364.31	469.3
5366.55	469.38	5367.2	469.4	5369.36	469.47	5371.02	469.51	5372.99	469.55
5374.4	469.59	5375.48	469.6	5378.78	469.66	5419.3	471.04	5419.77	471.06

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 5420.14  471.08 5422.96  471.26  5424.6  471.36 5424.81  471.37 5425.09  471.41
 5429.07  471.92 5429.85  472.04 5430.87  472.12 5433.53  472.48  5434.9  472.58
 5436.66  472.26    5438  471.95 5439.94  471.64 5442.45   471.8 5442.46   471.8
 5444.98  471.95 5446.93  472.14 5448.24  472.22 5450.02  472.38 5451.39  472.41
 5454.03  472.44 5455.06  472.46 5455.86  472.47 5459.82  472.53  5460.1  472.53
 5460.32  472.54 5462.03  472.61 5464.79  472.72 5465.14  472.73 5465.61  472.77
 5469.25  473.04 5470.19  473.12 5471.39  473.16 5473.72   473.2 5475.23  473.26

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    4145    .075 4959.96    .045 5037.26    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       4959.96 5037.26              300     308     255             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    5135    5151     481       T

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.080

INPUT
Description: 4.080
Station Elevation Data    num=     489
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  476.85  473.04  479.13  472.95479.5799  472.93  481.85  472.84484.0899  472.72
  484.62   472.7  486.85  472.59489.0499   472.5  489.66  472.48  491.85  472.39
  494.02  472.31494.6999  472.29  496.85  472.21  498.98  472.09523.7999     471
  548.61  469.96  550.11   469.9  551.86  469.85553.5799   469.8608.1699   468.1
610.5599   468.1  611.86  468.09  613.14  468.05   615.6  467.98  616.86  467.94
   618.1  467.91  620.63  467.86  621.86  467.83623.0599   467.8625.6699  467.74
  626.86  467.71659.4199  466.81661.1799  466.79  661.88  466.79662.4199   466.7
666.3399  465.78  666.86  465.65666.9299  465.64  667.02  465.63671.2999  464.95
  671.98  464.95  672.87  465.04  675.74  465.59  677.02  465.67678.7099  465.43
680.1799  465.31682.0699     465684.5599  464.65  684.62  464.64  687.12  464.35
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689.0499 464.3 690.41 464.29 692.16 464.25 693.49 464.25 696.25 464.32
697.2099 464.33697.9299 464.36 702.1 464.53 702.25 464.54 703.23 464.54
706.8099 464.51707.2999 464.5 748.87 463.66751.2099 463.3752.7199 462.83
754.7199 462.53 755.64 462.31757.7699 462.04760.0799 461.9 760.56 461.88
762.81 461.75764.5199 461.72766.4099 461.69 767.86 461.66768.9599 461.63
772.25 461.59772.9099 461.58773.3999 461.57777.0199 461.65777.8399 461.68
777.9499 461.68 778.1 461.69782.2799 461.9 783 461.94783.9499 461.98
786.7199 462.1 788.05 462.16 789.79 462.26791.1599 462.36793.0899 462.47
795.6 462.56795.6399 462.56798.1399 462.62 800.04 462.69 801.49 462.76
803.19 462.82 804.48 462.84807.3299 462.84 808.23 462.85 808.92 462.85
813.18 462.8 813.36 462.8 813.92 462.78 817.8 462.64818.3299 462.62
819.0199 462.6 822.24 462.49 823.37 462.46 824.87 462.41 826.67 462.36
828.42 462.31830.7199 462.21 831.11 462.2833.4699 462.1 835.55 462.05
836.56 462.03838.5099 461.98 839.99 461.92842.4099 461.8 843.56 461.76
844.43 461.73 848.25 461.61 848.61 461.6 848.87 461.59850.8199 461.51
853.31 461.42853.6499 461.41 854.1 461.39 857.75 461.3858.6999 461.27
859.9499 461.2 862.19 461.07 863.74 460.99 865.79 460.91 866.63 460.86
868.79 460.78871.0699 460.73871.6399 460.73873.8399 460.68875.5099 460.66
877.49 460.61 878.88 460.59879.9499 460.6883.3299 460.58 883.93 460.59
884.3899 460.6887.7099 460.72888.8299 460.76 888.98 460.76 889.18 460.79
893.2599 461.03894.0199 461.14895.0199 461.4897.6999 462.13899.0699 462.48
900.87 463.02902.1399 463.34 904.12 463.96906.5799 463.52906.7199 463.5
909.1599 463.07911.0199 462.64 912.56 462.12914.2099 461.7915.4599 461.58
918.4099 461.24919.2599 461.16919.8999 461.15 924.25 460.92924.3399 460.92
924.61 460.91928.7799 460.83 929.35 460.83 930.1 460.9933.2199 461.09
934.3999 461.21935.9499 461.31937.6599 461.43 939.44 461.56 941.79 461.73
942.1 461.77 944.49 461.91 946.54 461.91947.6399 461.92 949.54 461.93
950.98 461.94 953.49 462.04954.5799 462.06 955.42 461.97959.3299 461.42
959.63 461.39 959.85 461.36 961.5 461.22 964.29 461.01 964.68 460.98
965.18 460.77 968.73 459.54969.7199 459.11971.0199 458.35 973.17 456.98
974.7699 456.06 976.87 454.43 977.61 453.82979.8199 452.13 982.05 451.13
982.7199 450.81 984.12 450.17 984.86 449.84 1000 447.15 1015.14 449.67
1017.57 450.72 1017.79 450.82 1020.19 451.86 1022.01 452.75 1023.64 453.47
1025.23 454.23 1026.45 455.06 1029.49 456.99 1030.28 457.52 1030.88 458.09
1035.3 462.5 1035.32 462.53 1035.33 462.53 1039.76 465.1 1040.37 465.46
1041.18 466.01 1044.2 468.24 1045.42 469.05 1047.02 469.08 1048.64 469.03
1050.47 469.1 1052.87 468.94 1053.08 468.91 1055.51 468.79 1057.52 469.95
1058.72 470.39 1060.56 471.36 1061.96 471.47 1064.56 471.22 1065.61 471.26

1066.4	470.82	1070.41	469.58	1070.65	469.45	1070.84	469.42	1072.19	469.46
1075.28	469.48	1075.7	469.49	1076.26	469.49	1079.72	469.4	1080.75	469.41
1082.1	469.23	1084.16	468.91	1085.79	468.72	1087.95	468.66	1088.6	468.64
1090.84	468.58	1093.04	468.62	1093.79	468.63	1095.89	468.67	1097.47	468.64
1099.64	468.62	1100.93	468.6	1101.91	468.59	1105.49	468.55	1106.35	468.55
1109.09	468.56	1110.79	468.57	1111.03	468.57	1111.33	468.56	1115.23	468.44
1116.07	468.42	1117.18	468.41	1119.67	468.35	1121.12	468.34	1123.03	468.3
1124.11	468.28	1126.17	468.23	1128.55	468.19	1128.87	468.18	1131.21	468.14
1132.99	468.09	1134.72	468.03	1136.26	467.98	1137.43	467.94	1140.56	467.82
1141.31	467.79	1141.87	467.77	1145.98	467.61	1146.31	467.6	1146.35	467.6
1146.41	467.59	1150.75	467.5	1151.4	467.48	1152.26	467.45	1155.19	467.37
1156.45	467.33	1158.1	467.27	1159.63	467.22	1161.49	467.15	1163.95	467.06
1164.07	467.06	1166.54	466.96	1168.5	466.93	1169.79	466.91	1171.58	466.88
1172.94	466.85	1175.64	466.78	1176.63	466.76	1177.38	466.74	1181.49	466.62
1181.82	466.62	1182.88	466.63	1186.26	466.66	1186.72	466.66	1187.33	466.64
1190.7	466.54	1191.77	466.52	1193.18	466.46	1195.14	466.41	1196.82	466.34
1199.03	466.31	1199.58	466.31	1201.86	466.28	1204.02	466.24	1204.87	466.23
1206.91	466.2	1208.46	466.21	1210.72	466.24	1211.96	466.26	1212.9	466.26
1216.56	466.27	1217.34	466.27	1219.78	466.25	1221.78	466.24	1222.05	466.23
1222.41	466.23	1226.22	466.15	1227.1	466.14	1228.26	466.13	1230.66	466.07
1232.14	466.08	1234.1	466.35	1235.09	466.49	1237.19	466.78	1239.53	466.79
1239.95	466.75	1242.24	466.71	1243.97	466.72	1245.8	466.79	1247.28	466.81
1248.41	466.82	1251.64	466.81	1252.33	466.81	1252.85	466.83	1256.67	466.98
1257.29	467.01	1257.49	467.01	1261.73	466.86	1262.42	466.85	1263.33	466.87
1266.17	466.93	1267.47	466.96	1269.18	467	1270.61	467.04	1344.69	468.12
1346.45	468.1	1349.89	468.05	1350.73	468.05	1353.88	468.08	1355.92	468.1
1357.59	468.12	1409.61	469.28	1412.08	469.29	1413.33	469.31	1415.76	469.36
1417.04	469.39	1417.7	469.41	1419.72	469.45	1420.76	469.47	1423.31	469.51
1424.47	469.53	1426.74	469.59	1428.19	469.64	1428.93	469.66	1431.22	469.71
1431.9	469.73	1434.55	469.8	1435.62	469.83	1437.72	469.85	1439.34	469.85
1440.16	469.87	1442.72	469.93	1443.05	469.93	1445.78	470.03	1446.77	470.06
1448.7	470.11	1450.48	470.1	1451.39	470.11	1454.22	470.11	1457.01	470.12
1457.91	470.11	1459.68	470.1	1461.63	470.1	1462.63	470.12	1465.34	470.19
1465.72	470.19	1468.24	470.24	1469.06	470.23	1470.66	470.23	1472.78	470.22
1473.86	470.21	1476.49	470.24	1524.41	470.93	1524.79	470.94	1525.55	470.96
1528.51	471.03	1530.02	471.07	1532.22	471.08	1534.71	471.1	1535.64	471.1
1535.94	471.09	1536.53	471.07	1539.65	470.96	1541.25	470.94	1543.37	470.95
1546.21	470.91	1547.51	470.91	1550.8	470.93	1552.49	470.95	1554.52	471

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  1557.7  471.06  1558.1  471.07 1558.23  471.08 1558.48  471.09 1561.95  471.25
 1563.72   471.3 1565.66  471.33  1569.2  471.42 1569.34  471.43 1569.46  471.43
 1573.09  471.53 1574.95  471.59 1576.81  471.63 1580.44  471.74 1580.57  471.74
  1580.7  471.75 1584.24  471.87 1586.18  471.95 1587.96  472.03 1591.42  472.18
 1591.67  472.19  1591.8  472.19  1592.2   472.2 1595.39  472.21 1597.42  472.27
  1599.1  472.33 1599.96  472.35 1602.49   472.4 1602.84   472.4 1603.01  472.41
 1664.25     473 1666.36  472.96 1669.01  472.96 1669.82  472.95  1670.1  472.97
 1670.67  472.99 1673.84  473.15 1675.39  473.21 1677.57  473.26 1679.93  473.31
 1680.96  473.33 1681.31  473.33 1682.03  473.34 1685.05  473.37 1686.53  473.38
 1688.78  473.43 1690.84  473.48 1692.09   473.5 1692.52  473.51  1693.4  473.51
 1696.26  473.52 1697.66  473.52    1700  473.54 1701.76  473.56 1775.61  473.03
 1778.18  472.95 1778.47  472.94 1781.18  472.87 1781.35  472.87

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  476.85    .075  965.18    .045 1045.42    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        965.18 1045.42               80      92     105             .3       .5

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.073

INPUT
Description: 4.073
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   525.7     475   723.7     464   755.7     467     827     463   924.8     462
   943.6     460   986.9     450    1000   446.9  1024.1     450  1066.4     465
  1084.4     469  1088.8     469  1192.8     467  1297.6     466  1587.2     471
    1649     472    1690     474    1691     490    1800     490    1801     475
    1870     477    1930     480    1955     483    1990     486

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

```
   525.7    .075   943.6    .045  1066.4    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         943.6  1066.4                18      18      40             .3       .5

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.069

INPUT
Description: 4.069
This is a REPEATED section.
Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   456.7     480   537.9     476   582.3     474   639.9     472   700.8     470
     765     468     842     466     943   461.1     944   461.1     981   460.3
     984     448    1003   447.5    1022   447.5    1025   456.6    1026   456.6
    1056   459.3    1057   459.4    1206   466.7    1430     468  1555.6     470
  1683.8     472  1863.4     474

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   456.7    .075     981    .045    1025    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           981    1025                64      64      64             .3       .5

BRIDGE


RIVER: RIVER-1
REACH: Reach-1            RS: 4.060

INPUT
Description: S. McKnight Road Bridge
Distance from Upstream XS =      .5
```

Deck/Roadway Width = 63
Weir Coefficient = 2.4
Upstream Deck/Roadway Coordinates
num= 24

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
350	486	486	400	483	483	460	480	480
525	477	477	595	474	474	690	471	471
765	468	468	842	466	466	943	465.7	461.1
944	465.7	464	1003	465.5	463.8	1056	465.2	463.7
1057	465.2	459.3	1206	466.7	466.7	1430	468	468
1780	468	468	1880	468	468	1935	471	471
2050	471	471	2080	474	474	2100	477	477
2110	480	480	2125	483	483	2150	486	486

Upstream Bridge Cross Section Data
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
456.7	480	537.9	476	582.3	474	639.9	472	700.8	470
765	468	842	466	943	461.1	944	461.1	981	460.3
984	448	1003	447.5	1022	447.5	1025	456.6	1026	456.6
1056	459.3	1057	459.4	1206	466.7	1430	468	1555.6	470
1683.8	472	1863.4	474						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
456.7	.075	981	.045	1025	.075

Bank Sta: Left	Right	Coeff Contr.	Expan.
981	1025	.3	.5

Downstream Deck/Roadway Coordinates
num= 24

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
350	486	486	400	483	483	460	480	480
525	477	477	595	474	474	690	471	471
765	468	468	842	466	466	943	465.7	461.1
944	465.7	464	1003	465.5	463.8	1056	465.2	463.7
1057	465.2	459.3	1206	466.7	466.7	1430	468	468

```
    1780     468     468    1880     468     468    1935     471     471
    2050     471     471    2080     474     474    2100     477     477
    2110     480     480    2125     483     483    2150     486     486

Downstream Bridge Cross Section Data
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     350     486     400     483   462.5     480   497.4     476   572.5     474
     634     472   715.9     470     765     468     842     466     943   461.1
     944   461.1     981   460.3     984     448    1003   447.5    1022   447.5
    1025   456.6    1026   456.6    1056   459.3    1057   459.4    1206   466.7
    1430     468  1604.7     470  1708.8     472    1905     474

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     350    .075     981    .045    1025    .075

Bank Sta: Left   Right    Coeff Contr.   Expan.
           981    1025             .3       .5

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =   465.2
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=    1003    Downstream=    1003
Upstream     num=       2
    Width   Elev    Width   Elev
       6   447.5       6   464.8
Downstream     num=       2
    Width   Elev    Width   Elev
       6   447.5       6   464.8
```

```
Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Yarnell                KVal =    1.25
Selected Low Flow Methods = Yarnell

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =.6726728
           Max Low Cord                =   464.8

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: RIVER-1
REACH: Reach-1            RS: 4.057

INPUT
Description: 4.057
 LADUE FIS 21422  D.S. FACE OF MCKNIGHT RD. - ROCK HILL
             CORPORATE LIMITS
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     350     486     400     483   462.5     480   497.4     476   572.5     474
     634     472   715.9     470     765     468     842     466     943   461.1
     944   461.1     981   460.3     984     448    1003   447.5    1022   447.5
    1025   456.6    1026   456.6    1056   459.3    1057   459.4    1206   466.7
    1430     468  1604.7     470  1708.8     472    1905     474
```

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     350    .075     981    .045    1025    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           981    1025               43      43      43             .3       .5

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.049

INPUT
Description: 4.049
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   459.1     480   514.5     476     552     474   613.4     472   654.5     470
     950     465     965     460     977     455     985   446.8    1015   446.8
    1030     455    1050     460    1070     465  1605.4     470  1707.3     472
  1903.2     474

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   459.1     .07     950     .04    1070     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           950    1070               100      70      20             .1       .3

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.036

INPUT
Description: 4.036
 BRENTWOOD FIS =4.15
```

Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
731	480	794.1	474	819.8	472	853.5	470	867	465
963	460	973	455	985	445.9	1015	445.9	1055	465
1268.9	468	1583.4	470	1703.1	472	1880.4	474		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
731	.07	963	.04	1055	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
963	1055	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:RIVER-1

Reach	River Sta.	n1	n2	n3
Reach-1	4.743	.08	.04	.1
Reach-1	4.625	.1	.04	.1
Reach-1	4.612	.1	.04	.1
Reach-1	4.563	.1	.04	.1
Reach-1	4.464	.05	.045	.03
Reach-1	4.419	.05	.045	.03
Reach-1	4.365	.05	.045	.03
Reach-1	4.259	.05	.045	.03
Reach-1	4.165	.05	.045	.08
Reach-1	4.16	.075	.045	.075
Reach-1	4.158	Bridge		
Reach-1	4.157	.075	.045	.075
Reach-1	4.148	.075	.045	.075
Reach-1	4.080	.075	.045	.075
Reach-1	4.073	.075	.045	.075
Reach-1	4.069	.075	.045	.075
Reach-1	4.060	Bridge		

Reach-1	4.057	.075	.045	.075
Reach-1	4.049	.07	.04	.06
Reach-1	4.036	.07	.04	.06

SUMMARY OF REACH LENGTHS

River: RIVER-1

Reach	River Sta.	Left	Channel	Right
Reach-1	4.743	680	766	771
Reach-1	4.625	110	105	64
Reach-1	4.612	270	255	240
Reach-1	4.563	480	522.5	525
Reach-1	4.464	218	238	238
Reach-1	4.419	261	285	286
Reach-1	4.365	580	560	520
Reach-1	4.259	480	500	530
Reach-1	4.165	28	28	28
Reach-1	4.16	14	14	14
Reach-1	4.158	Bridge		
Reach-1	4.157	43	43	43
Reach-1	4.148	300	308	255
Reach-1	4.080	80	92	105
Reach-1	4.073	18	18	40
Reach-1	4.069	64	64	64
Reach-1	4.060	Bridge		
Reach-1	4.057	43	43	43
Reach-1	4.049	100	70	20
Reach-1	4.036	0	0	0

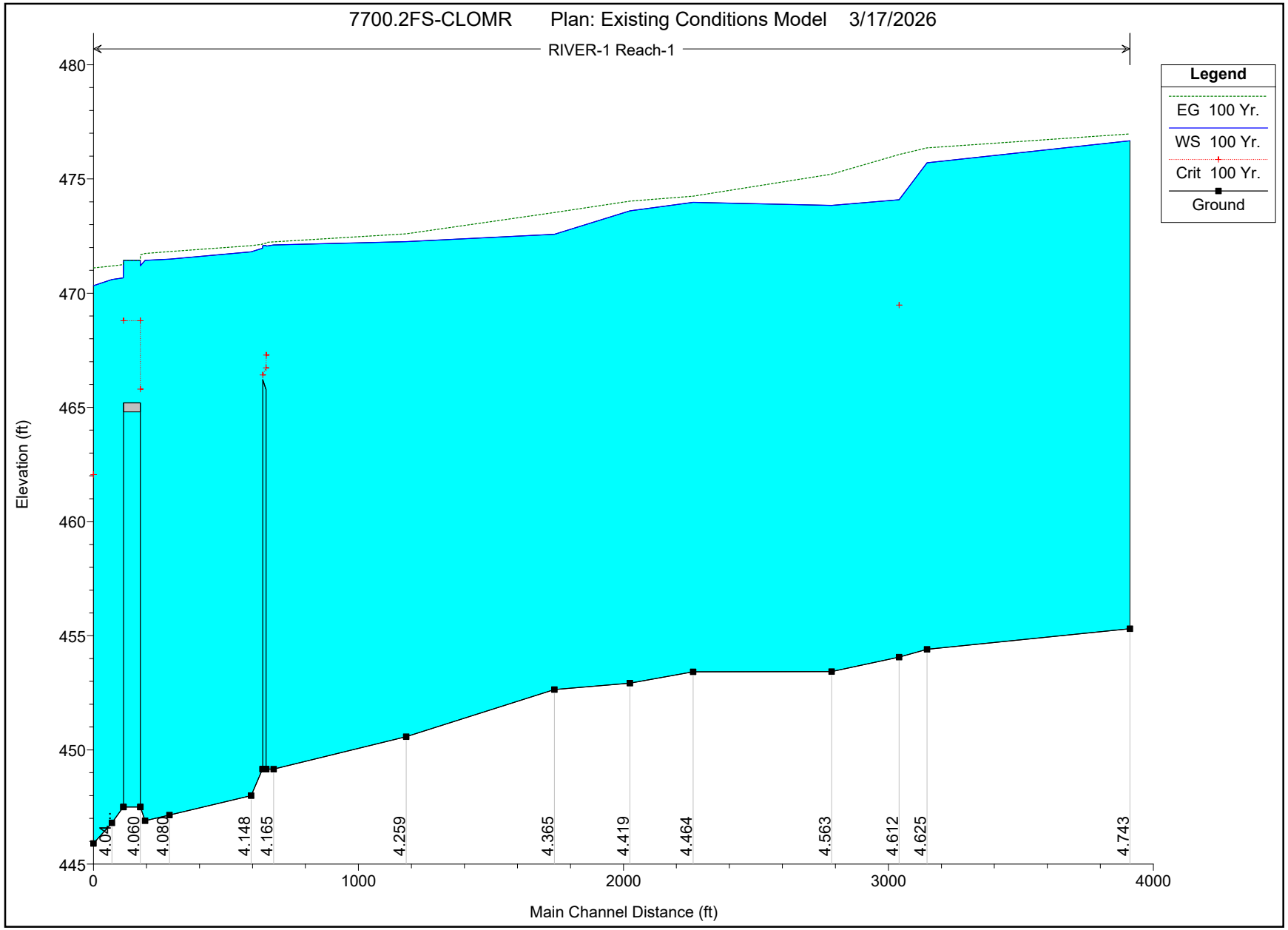
SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

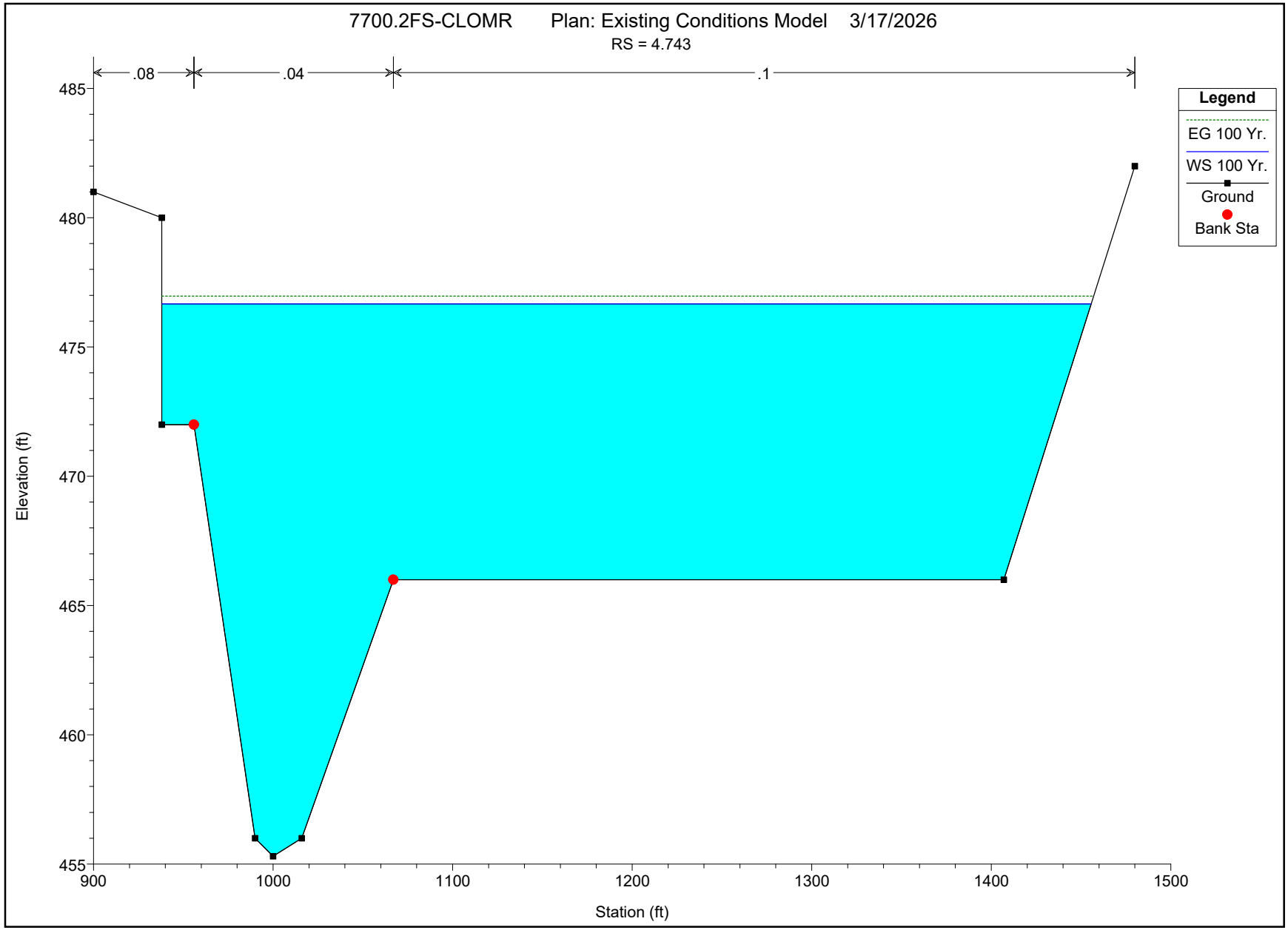
River: RIVER-1

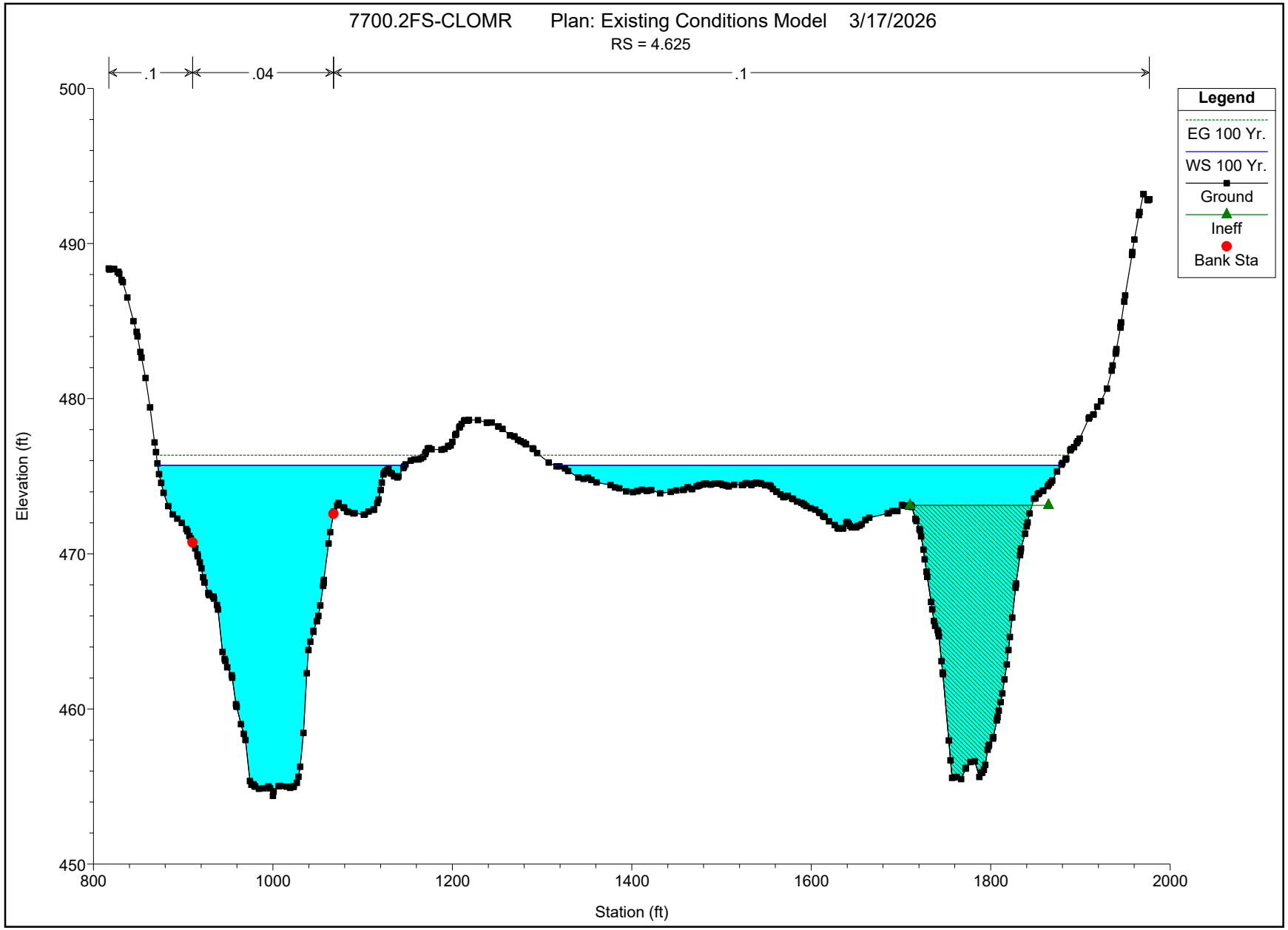
Reach	River Sta.	Contr.	Expan.
Reach-1	4.743	.1	.3
Reach-1	4.625	.1	.3
Reach-1	4.612	.1	.3
Reach-1	4.563	.1	.3
Reach-1	4.464	.1	.3
Reach-1	4.419	.1	.3
Reach-1	4.365	.1	.3
Reach-1	4.259	.1	.3
Reach-1	4.165	.3	.5
Reach-1	4.16	.3	.5
Reach-1	4.158	Bridge	
Reach-1	4.157	.3	.5
Reach-1	4.148	.1	.3
Reach-1	4.080	.3	.5
Reach-1	4.073	.3	.5
Reach-1	4.069	.3	.5
Reach-1	4.060	Bridge	
Reach-1	4.057	.3	.5
Reach-1	4.049	.1	.3
Reach-1	4.036	.1	.3

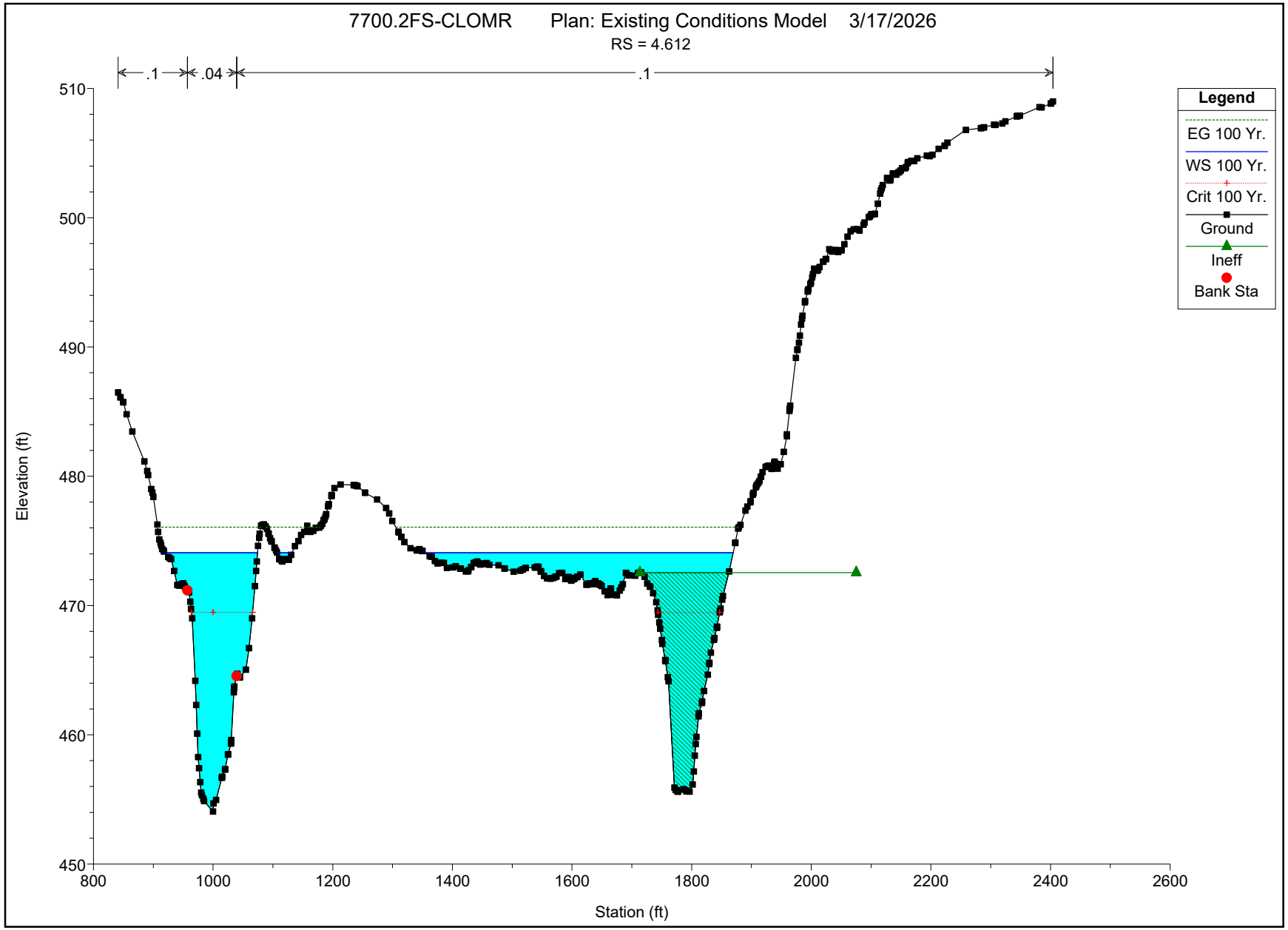
HEC-RAS Plan: Ex Cond River: RIVER-1 Reach: Reach-1

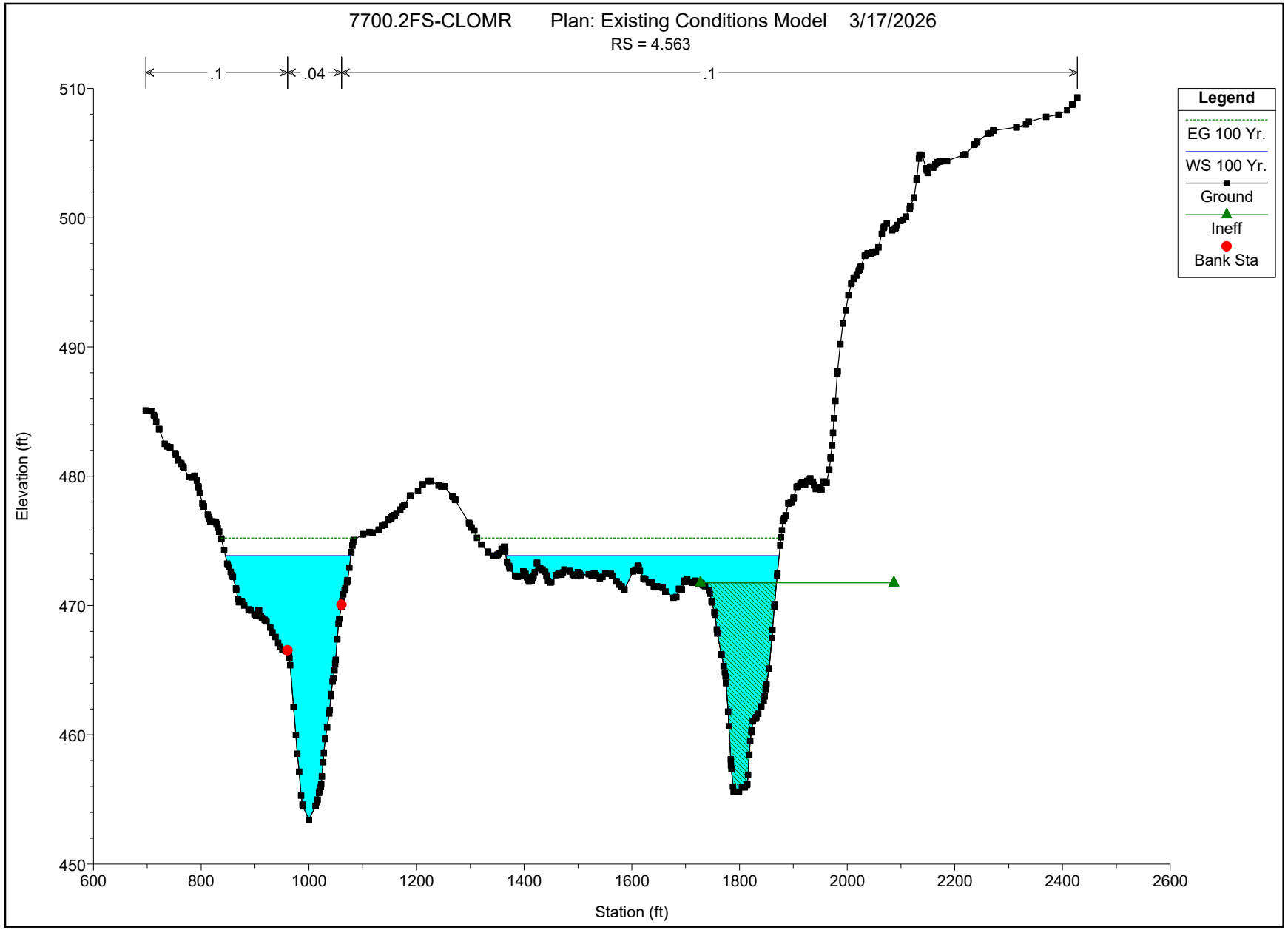
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	4.743	15 Yr.	11300.00	455.30	474.52		474.74	0.000501	4.67	4644.16	507.86	0.22
Reach-1	4.743	100 Yr.	16358.00	455.30	476.67		476.97	0.000580	5.53	5747.52	517.68	0.24
Reach-1	4.625	15 Yr.	11300.00	454.40	473.72		474.22	0.000870	5.71	2290.13	521.14	0.29
Reach-1	4.625	100 Yr.	16358.00	454.40	475.71		476.37	0.000990	6.73	3712.45	840.12	0.31
Reach-1	4.612	15 Yr.	11300.00	454.06	472.58	466.82	473.99	0.002421	9.72	1441.41	449.87	0.47
Reach-1	4.612	100 Yr.	16358.00	454.06	474.09	469.48	476.07	0.003151	11.90	2347.00	695.41	0.54
Reach-1	4.563	15 Yr.	11300.00	453.43	472.31		473.34	0.001812	8.35	1843.68	561.83	0.41
Reach-1	4.563	100 Yr.	16358.00	453.43	473.84		475.21	0.002245	10.01	2913.00	741.50	0.47
Reach-1	4.464	15 Yr.	11300.00	453.42	472.19		472.49	0.000889	5.48	3203.80	704.88	0.25
Reach-1	4.464	100 Yr.	16358.00	453.42	473.98		474.25	0.000774	5.51	4473.70	721.79	0.24
Reach-1	4.419	15 Yr.	11300.00	452.92	471.94		472.28	0.000941	5.34	2868.59	417.38	0.26
Reach-1	4.419	100 Yr.	16358.00	452.92	473.60		474.02	0.001123	6.11	3579.50	436.98	0.28
Reach-1	4.365	15 Yr.	11770.00	452.64	471.19		471.88	0.001870	7.20	2012.87	369.47	0.36
Reach-1	4.365	100 Yr.	17157.00	452.64	472.58		473.53	0.002413	8.75	2659.96	634.12	0.41
Reach-1	4.259	15 Yr.	11770.00	450.58	470.88		471.16	0.000688	4.94	3642.03	684.61	0.23
Reach-1	4.259	100 Yr.	17157.00	450.58	472.26		472.60	0.000833	5.78	4603.60	722.30	0.25
Reach-1	4.165	15 Yr.	11770.00	449.16	470.76		470.87	0.000359	3.53	5793.75	1035.00	0.16
Reach-1	4.165	100 Yr.	17157.00	449.16	472.11		472.25	0.000440	4.14	7104.59	1077.63	0.18
Reach-1	4.16	15 Yr.	11770.00	449.16	470.71	465.88	470.84	0.000600	4.37	6031.10	1130.58	0.20
Reach-1	4.16	100 Yr.	17157.00	449.16	472.05	467.29	472.22	0.000725	5.08	7511.23	1190.70	0.22
Reach-1	4.158		Bridge									
Reach-1	4.157	15 Yr.	11770.00	449.16	470.64		470.77	0.000539	4.24	6095.65	1115.06	0.19
Reach-1	4.157	100 Yr.	17157.00	449.16	471.96		472.14	0.000668	4.99	7550.91	1177.95	0.21
Reach-1	4.148	15 Yr.	11770.00	448.00	470.52		470.73	0.000622	4.88	5329.13	1033.08	0.21
Reach-1	4.148	100 Yr.	17157.00	448.00	471.81		472.08	0.000790	5.78	6700.25	1109.25	0.24
Reach-1	4.080	15 Yr.	11770.00	447.15	470.29		470.53	0.000663	5.08	4804.57	929.34	0.22
Reach-1	4.080	100 Yr.	17157.00	447.15	471.48		471.82	0.000907	6.23	5995.81	1058.68	0.26
Reach-1	4.073	15 Yr.	11770.00	446.90	470.26		470.47	0.000419	4.26	5041.07	933.10	0.19
Reach-1	4.073	100 Yr.	17157.00	446.90	471.43		471.74	0.000602	5.35	6190.31	1023.99	0.23
Reach-1	4.069	15 Yr.	11770.00	447.50	470.06	463.17	470.41	0.000955	6.44	4440.01	860.14	0.24
Reach-1	4.069	100 Yr.	17157.00	447.50	471.20	465.80	471.67	0.001328	7.85	5481.48	967.87	0.29
Reach-1	4.060		Bridge									
Reach-1	4.057	15 Yr.	11750.00	447.50	467.51		468.48	0.002435	9.46	2574.02	562.74	0.38
Reach-1	4.057	100 Yr.	17035.00	447.50	470.67		471.25	0.001588	8.45	5042.88	951.20	0.32
Reach-1	4.049	15 Yr.	11750.00	446.80	467.50		468.33	0.001532	7.47	2018.24	535.80	0.37
Reach-1	4.049	100 Yr.	17035.00	446.80	470.60		471.19	0.000998	6.99	4458.53	993.80	0.31
Reach-1	4.036	15 Yr.	11750.00	445.90	467.45	459.01	468.22	0.001149	7.39	2127.30	369.30	0.33
Reach-1	4.036	100 Yr.	17035.00	445.90	470.33	462.06	471.10	0.001044	7.89	3726.53	755.21	0.32

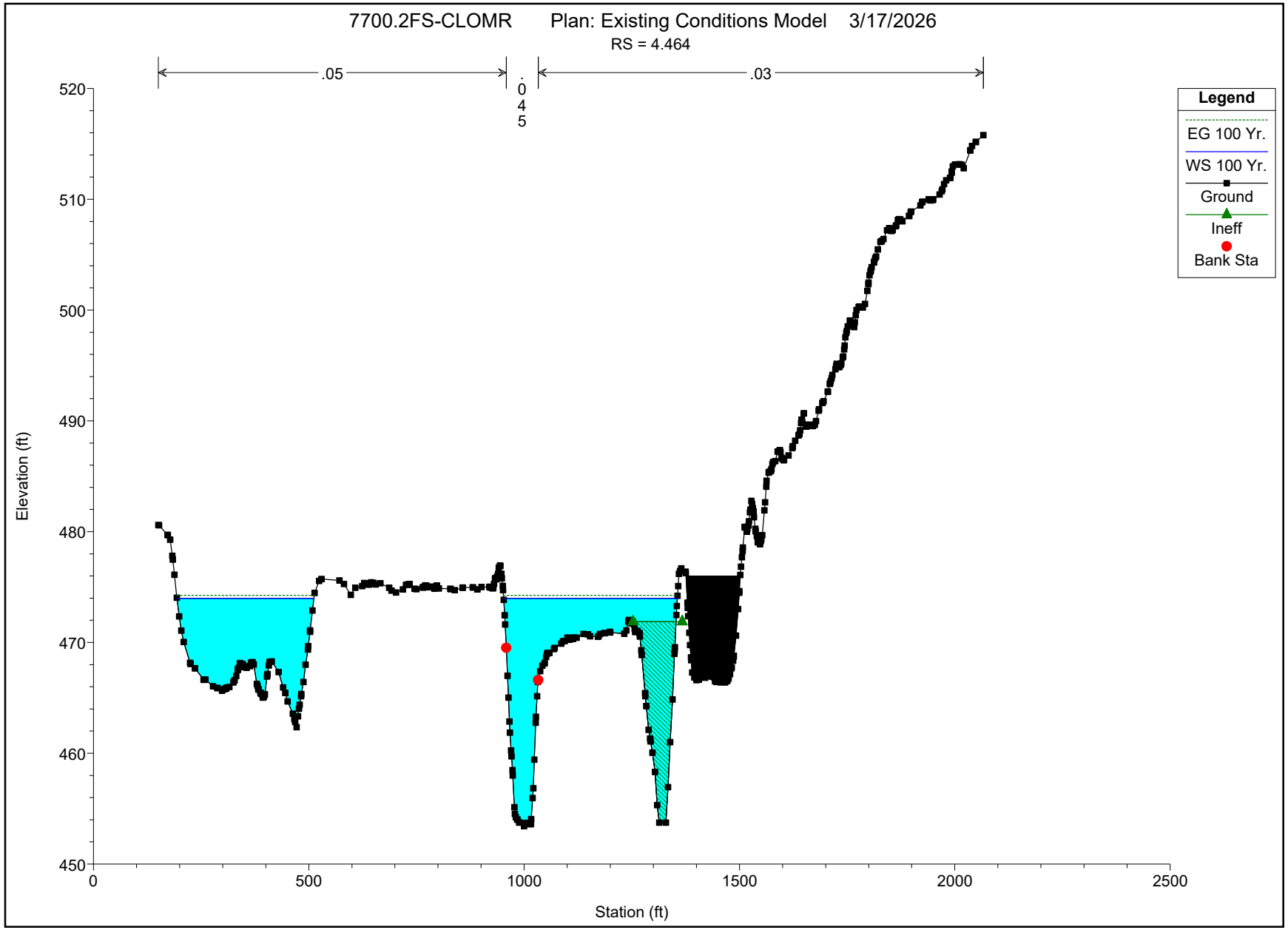

7700.2FS-CLOMR Plan: Existing Conditions Model 3/17/2026
RIVER-1 Reach-1
Legend
EG 100 Yr.
WS 100 Yr.
Crit 100 Yr.
Ground
Elevation (ft)
Main Channel Distance (ft)
480
475
470
465
460
455
450
445
0
1000
2000
3000
4000
4.04
4.060
4.080
4.148
4.165
4.259
4.365
4.419
4.464
4.563
4.612
4.625
4.743

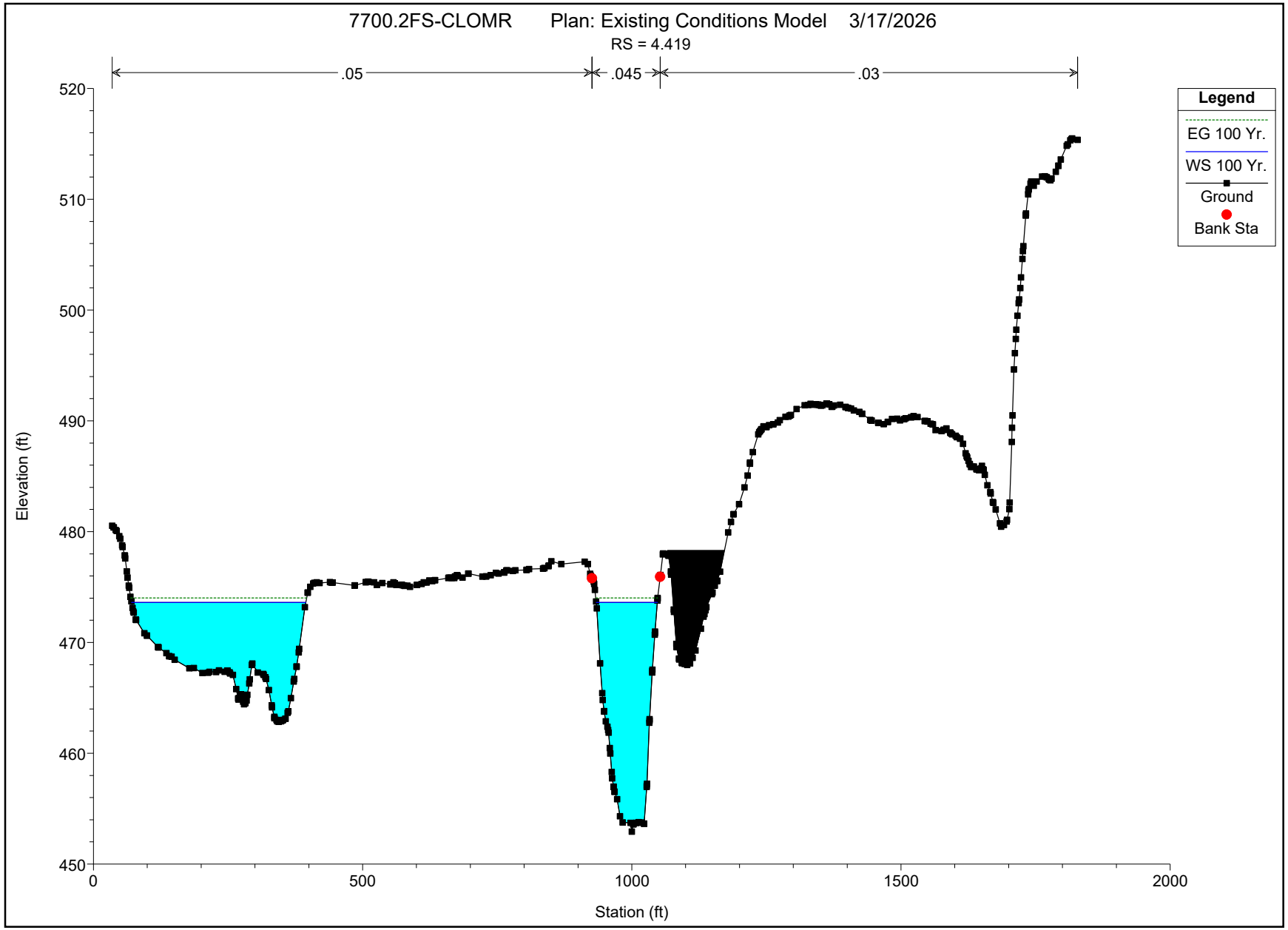

7700.2FS-CLOMR Plan: Existing Conditions Model 3/17/2026
RS = 4.743
.08
.04
.1
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Bank Sta
Elevation (ft)
485
480
475
470
465
460
455
900
1000
1100
1200
1300
1400
1500
Station (ft)

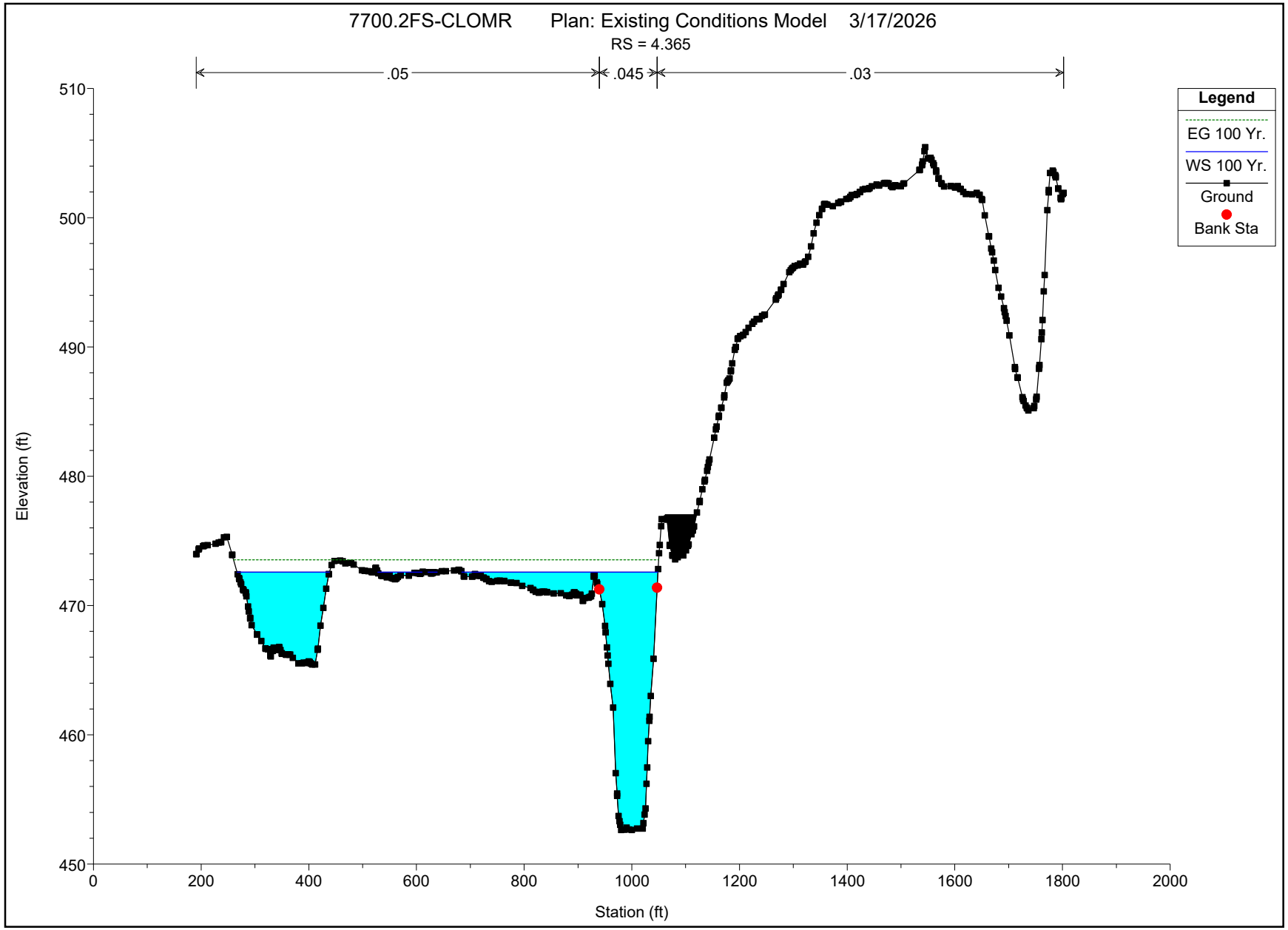

7700.2FS-CLOMR Plan: Existing Conditions Model 3/17/2026
RS = 4.625
.1
.04
.1
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
500
490
480
470
460
450
800
1000
1200
1400
1600
1800
2000

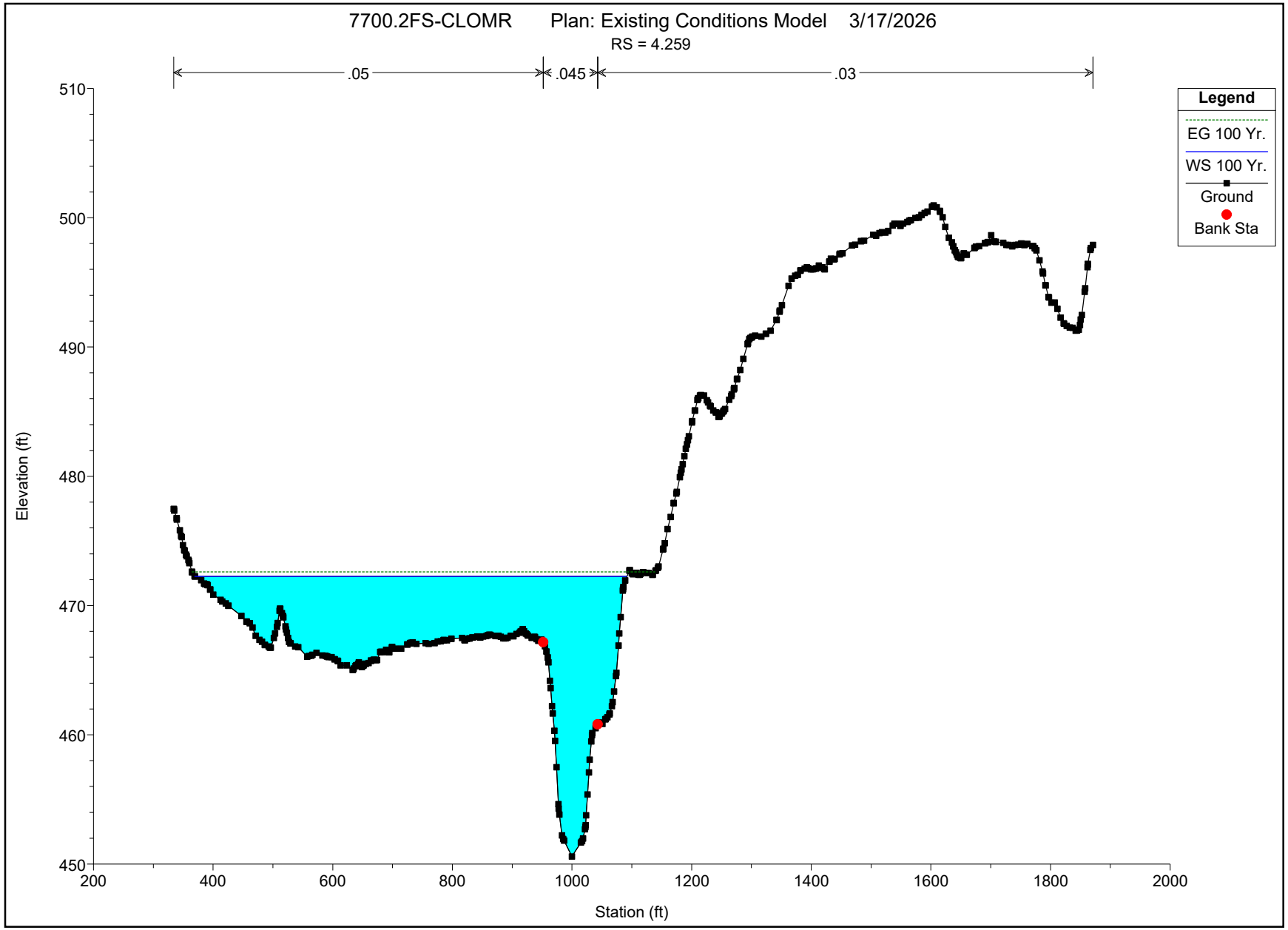

7700.2FS-CLOMR Plan: Existing Conditions Model 3/17/2026
RS = 4.612
.1
.04
.1
Legend
EG 100 Yr.
WS 100 Yr.
Crit 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
510
500
490
480
470
460
450
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
Station (ft)

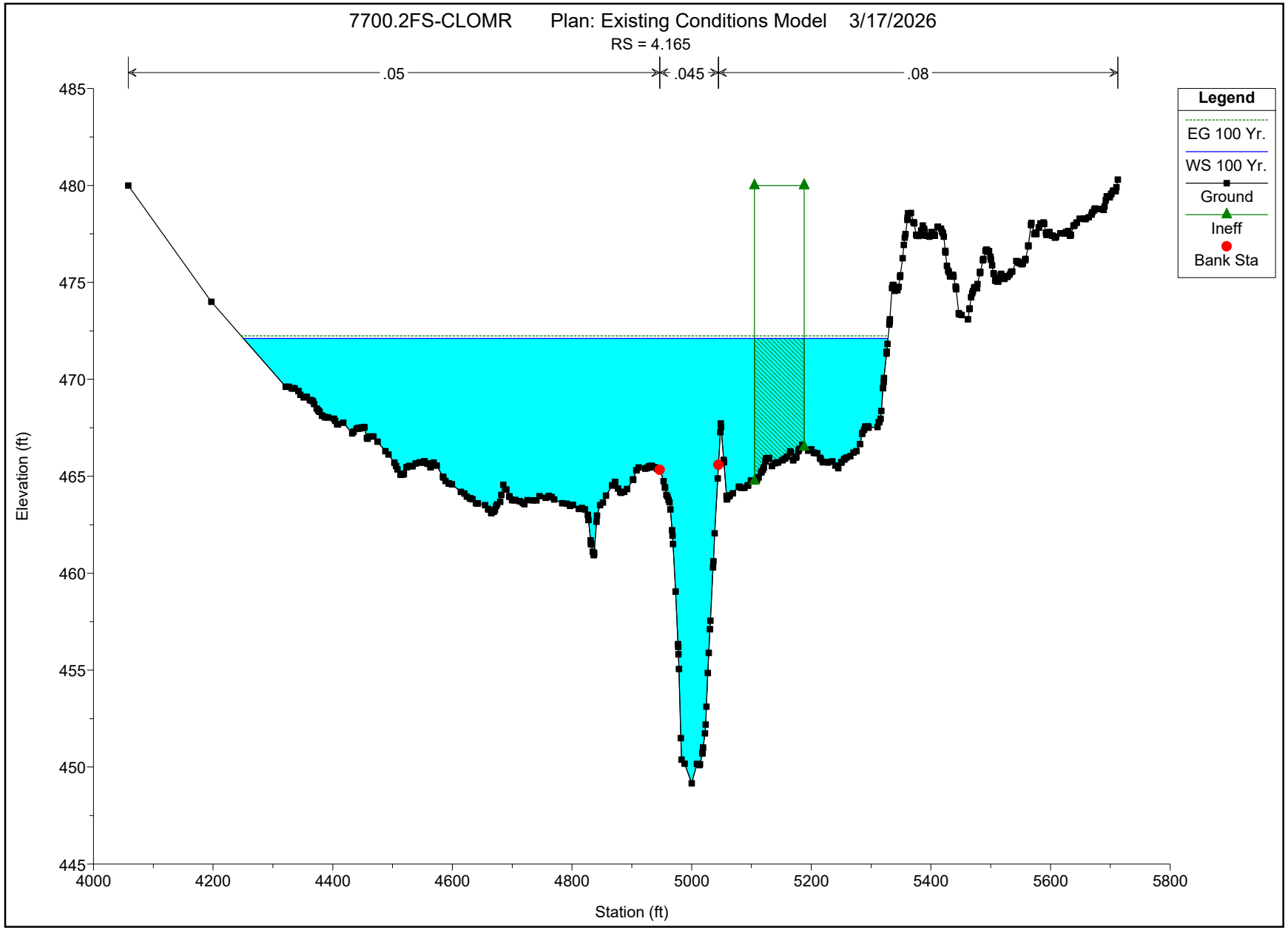

7700.2FS-CLOMR Plan: Existing Conditions Model 3/17/2026
RS = 4.563
.1
.04
.1
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
510
500
490
480
470
460
450
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600

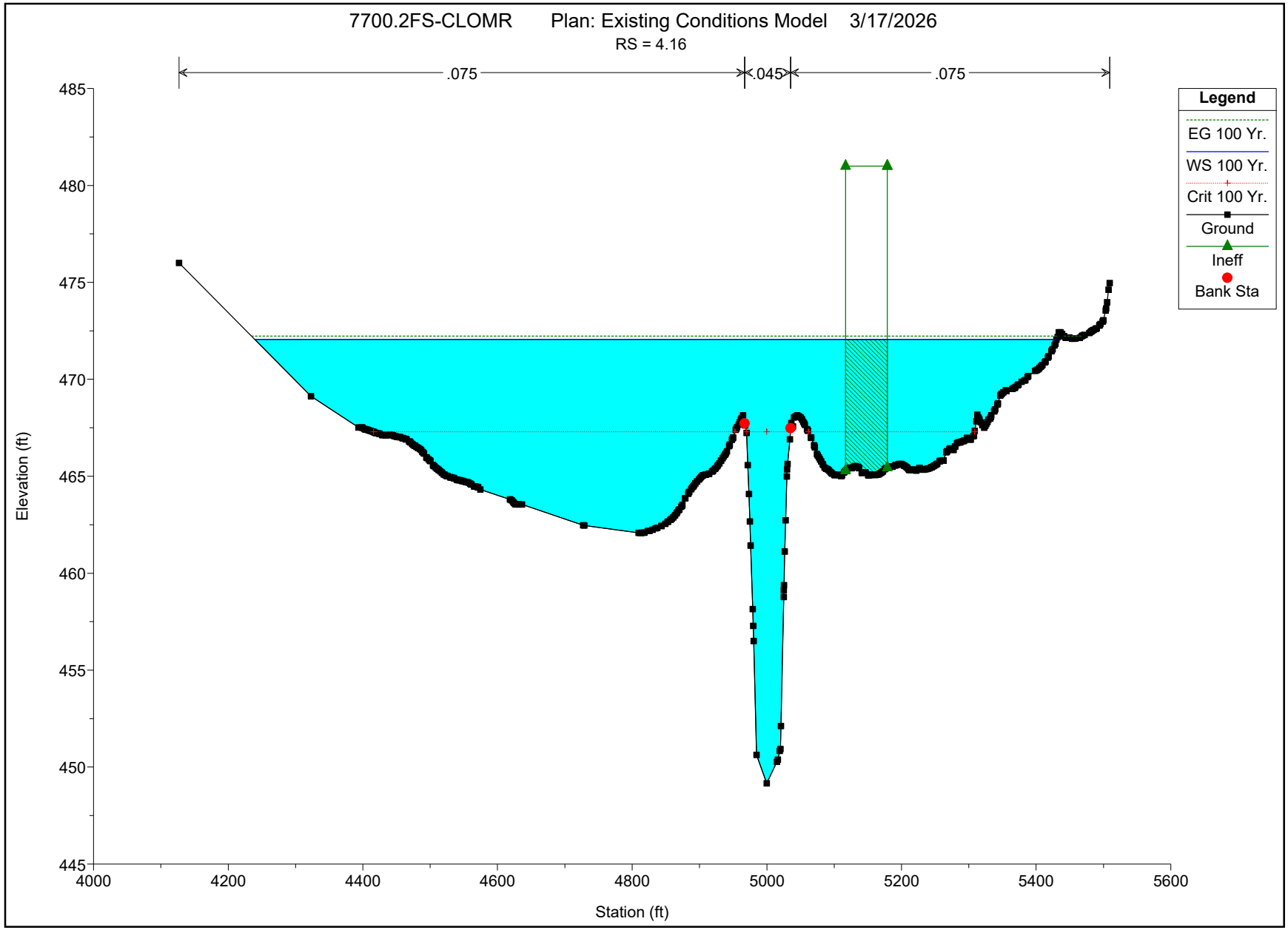

7700.2FS-CLOMR Plan: Existing Conditions Model 3/17/2026
RS = 4.464
.05
.045
.03
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
520
510
500
490
480
470
460
450
0
500
1000
1500
2000
2500
Station (ft)

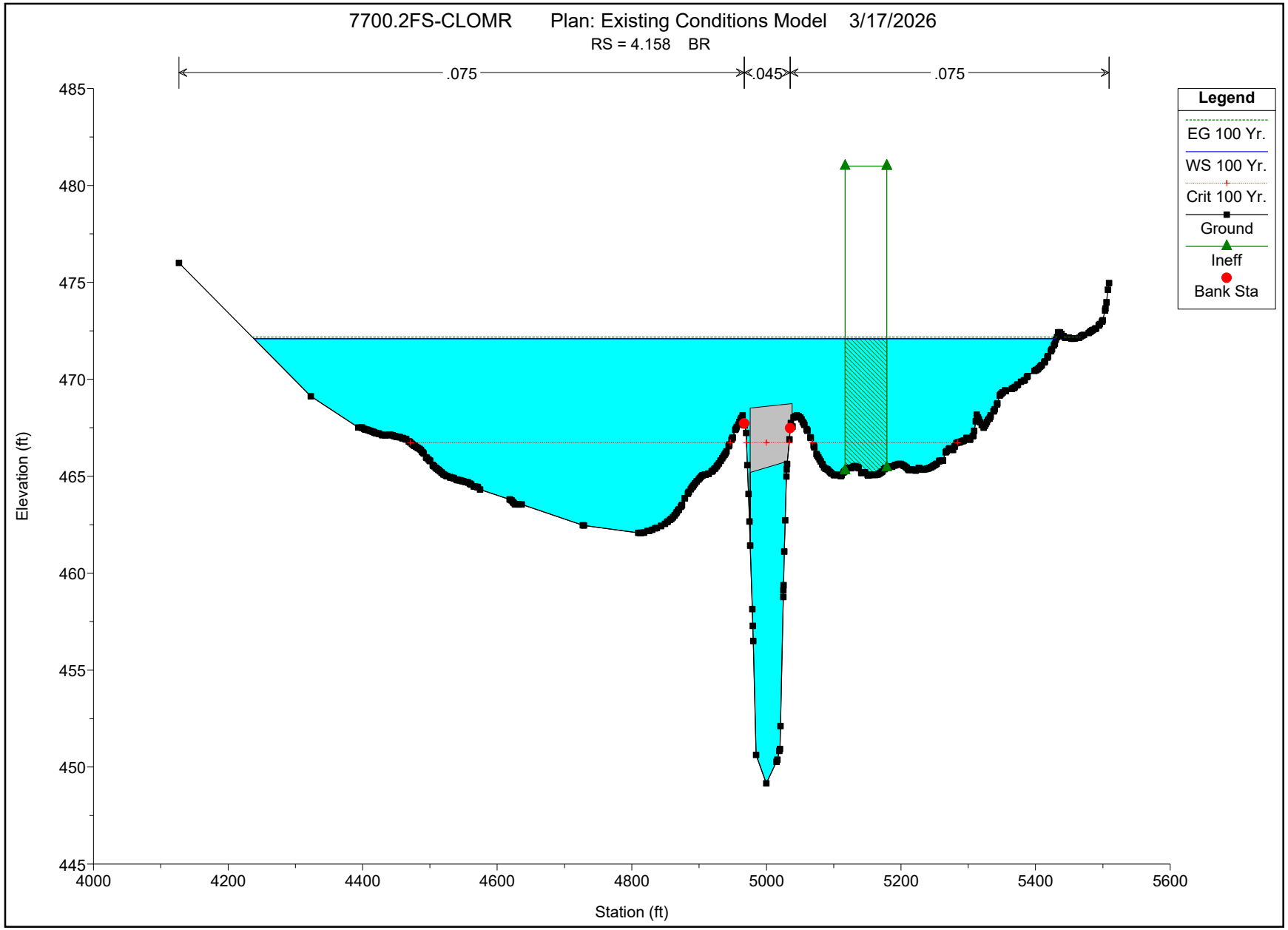

7700.2FS-CLOMR Plan: Existing Conditions Model 3/17/2026
RS = 4.419
.05
.045
.03
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Bank Sta
Elevation (ft)
520
510
500
490
480
470
460
450
0
500
1000
1500
2000
Station (ft)

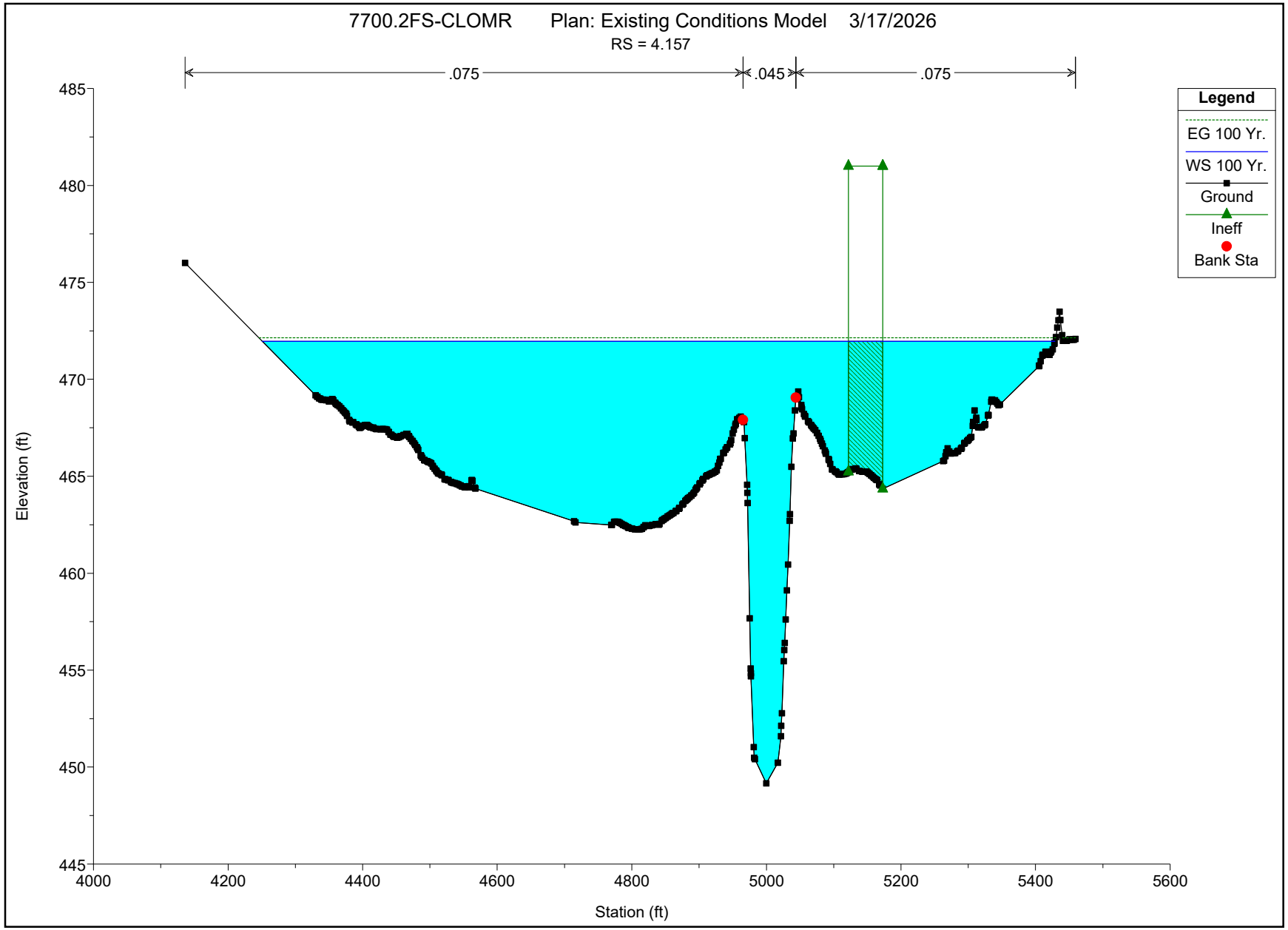

7700.2FS-CLOMR Plan: Existing Conditions Model 3/17/2026
RS = 4.365
.05
.045
.03
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Bank Sta
Elevation (ft)
Station (ft)
510
500
490
480
470
460
450
0
200
400
600
800
1000
1200
1400
1600
1800
2000

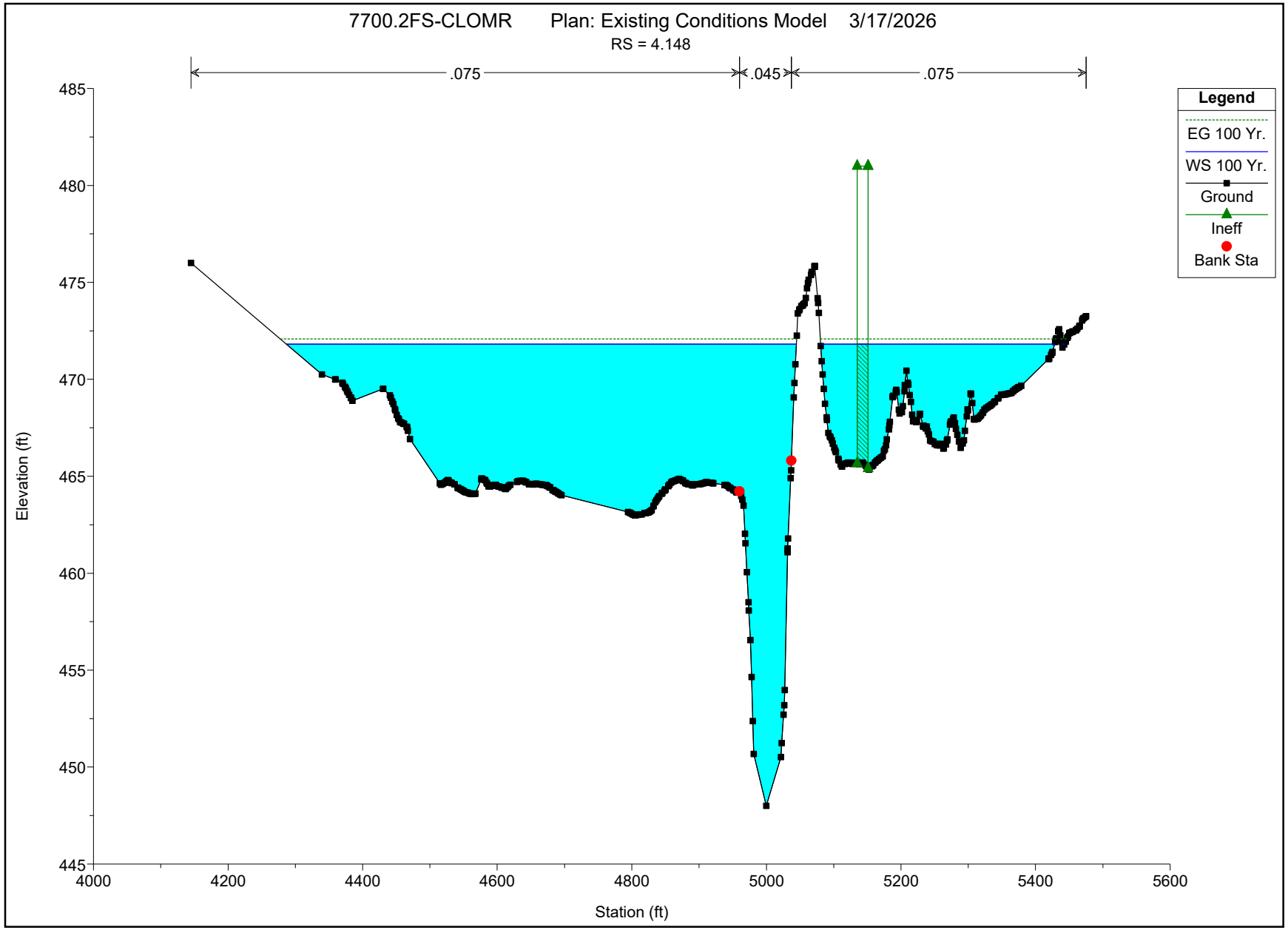

7700.2FS-CLOMR Plan: Existing Conditions Model 3/17/2026
RS = 4.259
.05
.045
.03
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Bank Sta
Elevation (ft)
Station (ft)
510
500
490
480
470
460
450
200
400
600
800
1000
1200
1400
1600
1800
2000

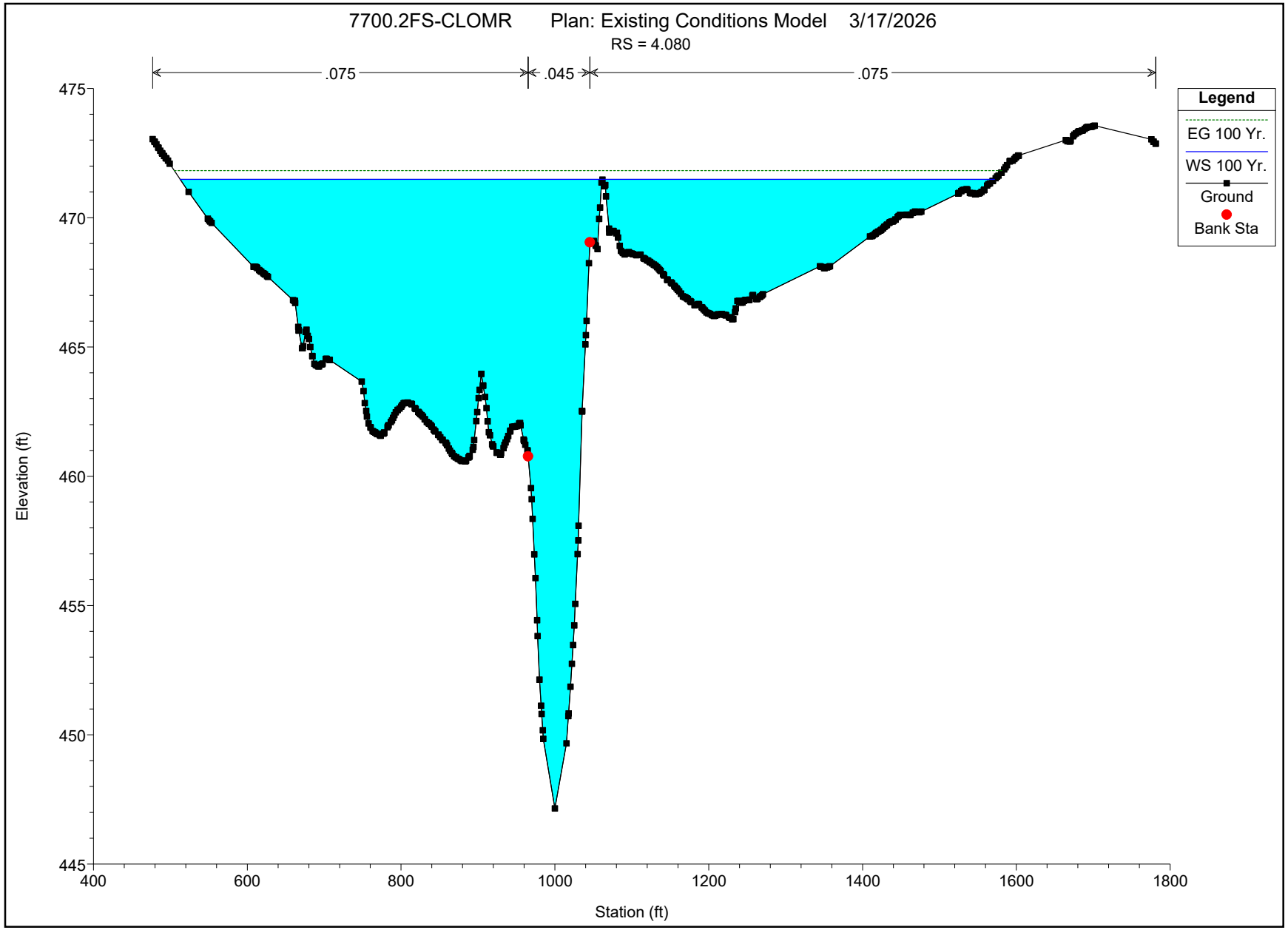

7700.2FS-CLOMR Plan: Existing Conditions Model 3/17/2026
RS = 4.165
.05
.045
.08
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
485
480
475
470
465
460
455
450
445
4000
4200
4400
4600
4800
5000
5200
5400
5600
5800

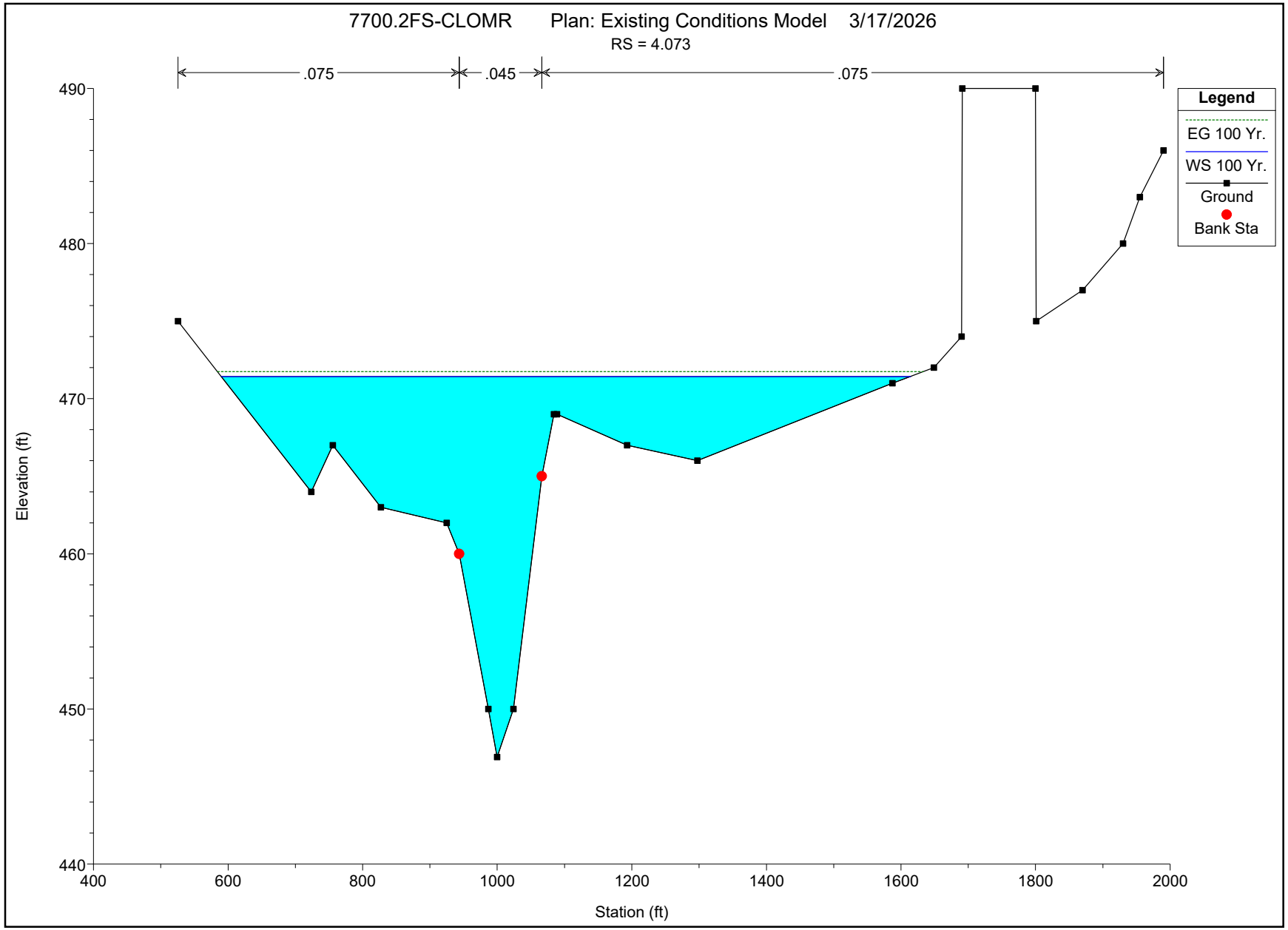

7700.2FS-CLOMR Plan: Existing Conditions Model 3/17/2026
RS = 4.16
.075
.045
.075
Legend
EG 100 Yr.
WS 100 Yr.
Crit 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
485
480
475
470
465
460
455
450
445
4000
4200
4400
4600
4800
5000
5200
5400
5600
Station (ft)

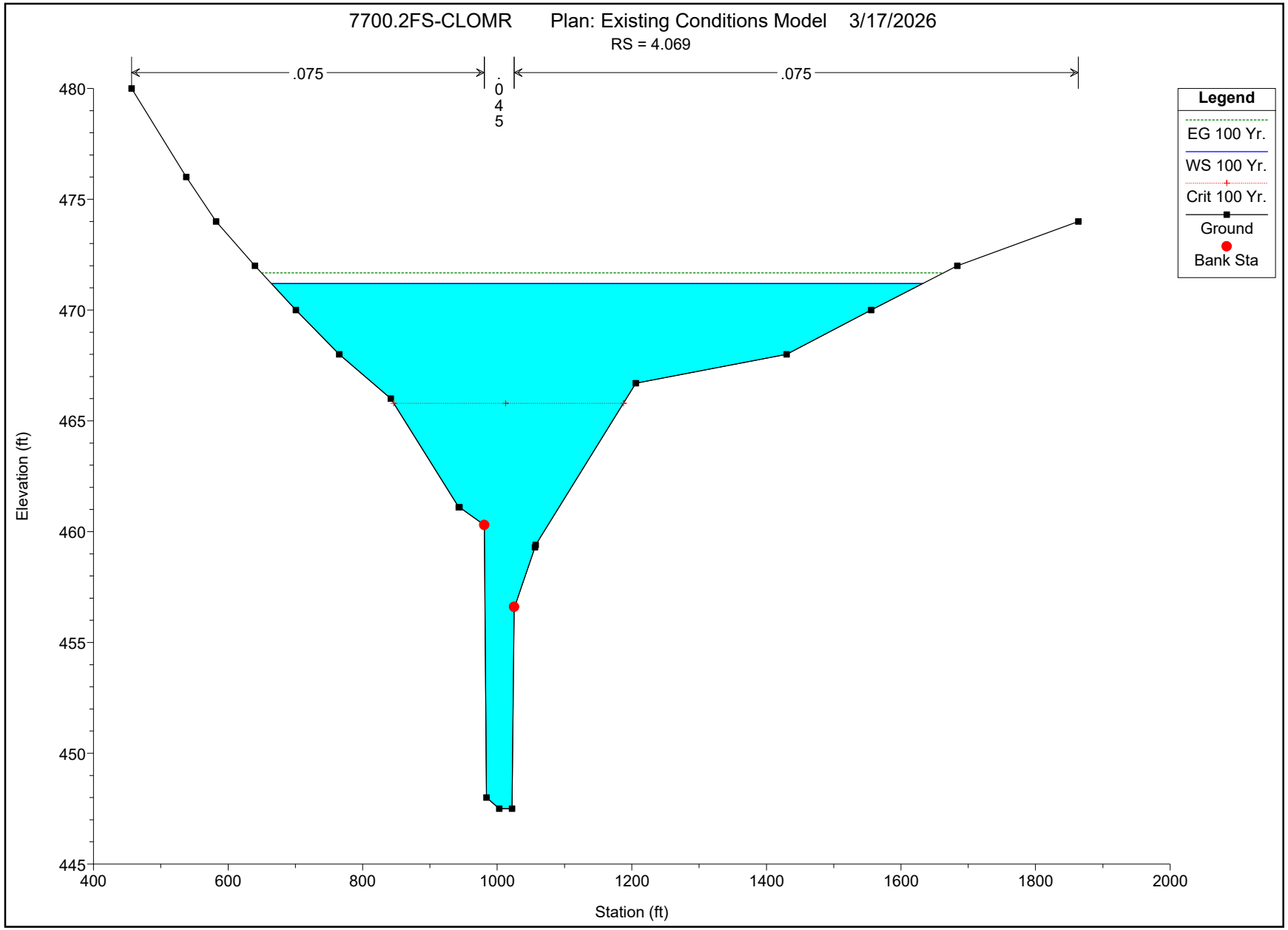

7700.2FS-CLOMR Plan: Existing Conditions Model 3/17/2026
RS = 4.158 BR
.075
.045
.075
Legend
EG 100 Yr.
WS 100 Yr.
Crit 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
485
480
475
470
465
460
455
450
445
4000
4200
4400
4600
4800
5000
5200
5400
5600
Station (ft)

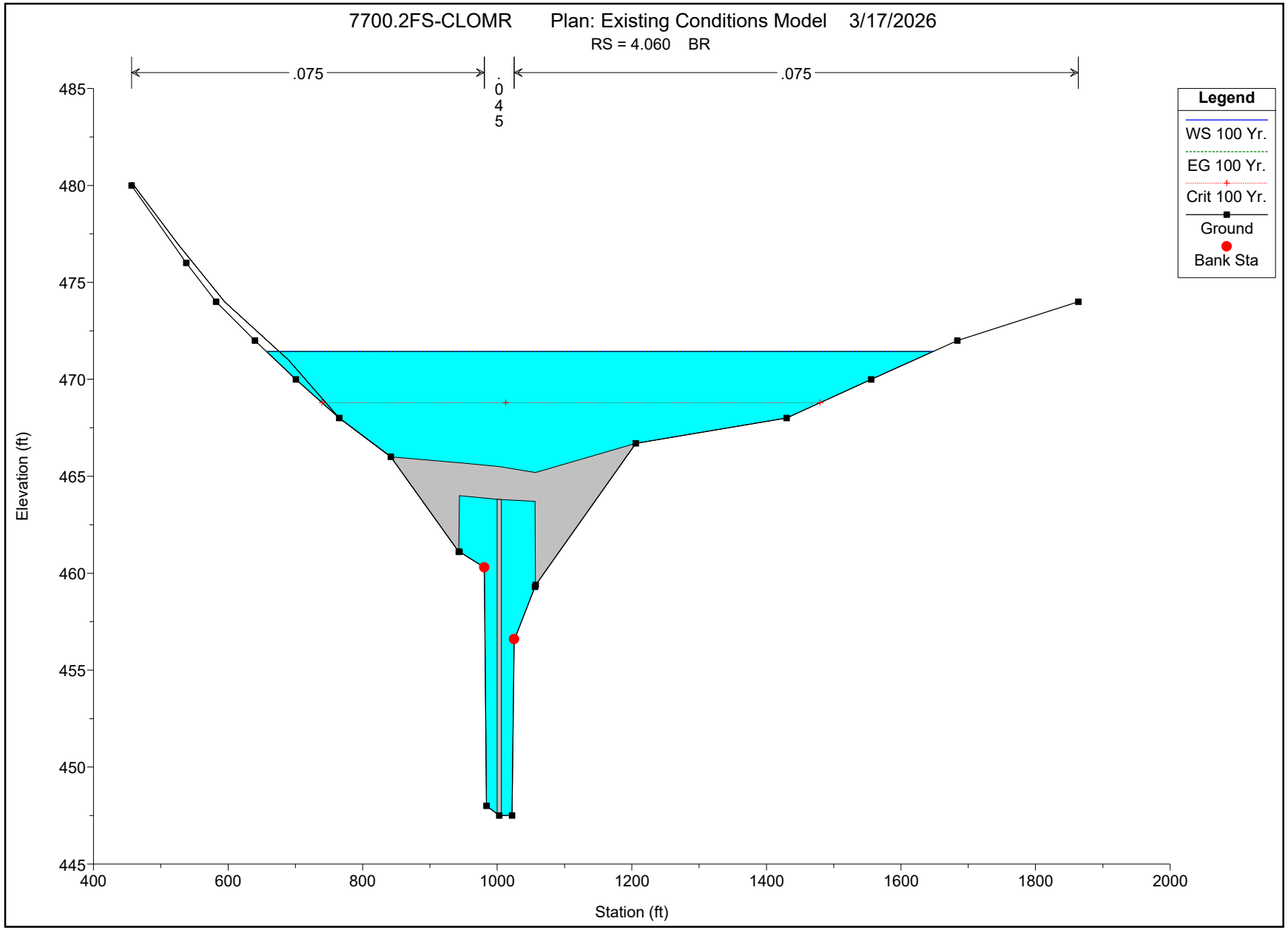

7700.2FS-CLOMR Plan: Existing Conditions Model 3/17/2026
RS = 4.157
.075
.045
.075
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
485
480
475
470
465
460
455
450
445
4000
4200
4400
4600
4800
5000
5200
5400
5600
Station (ft)

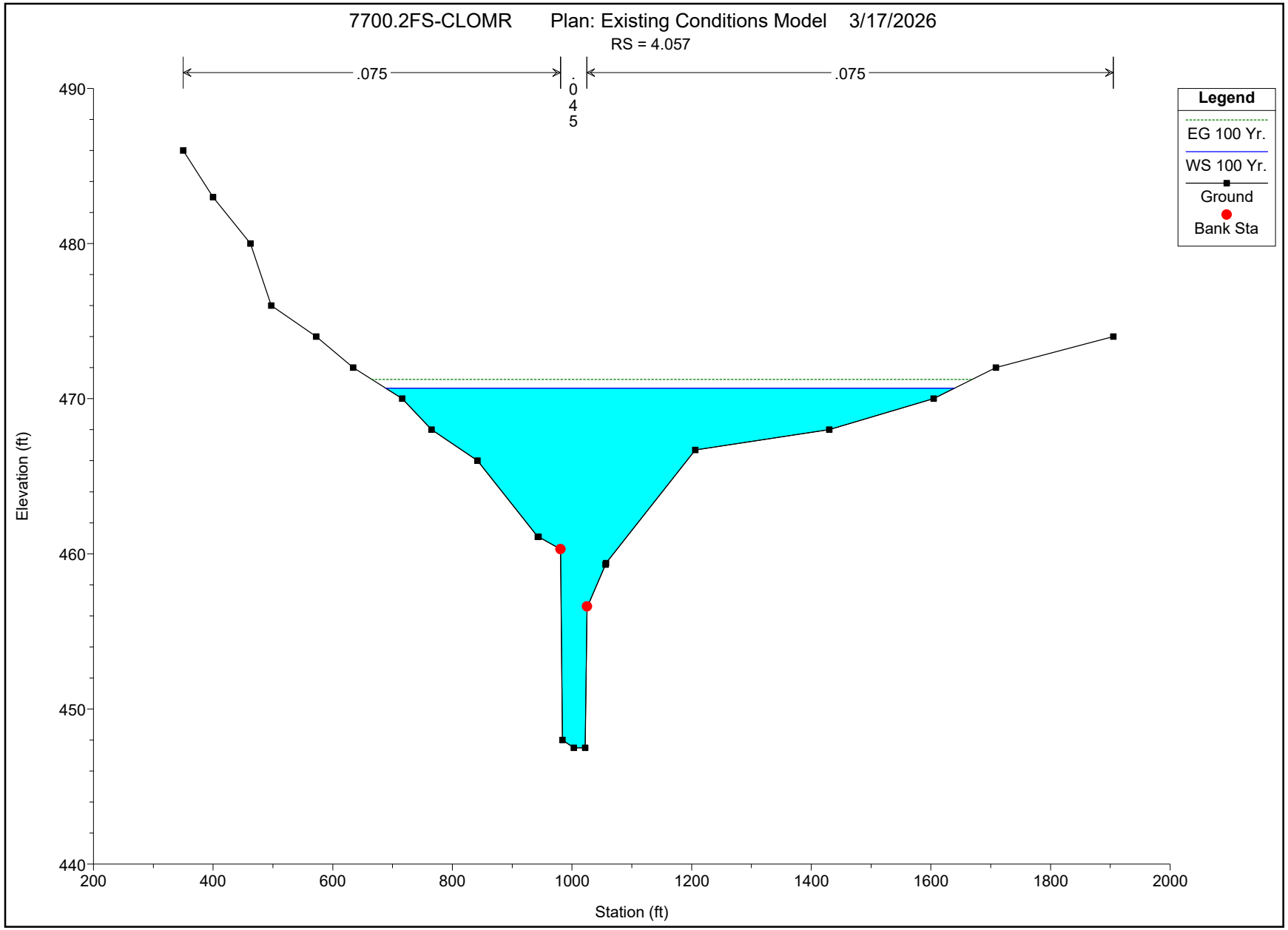

7700.2FS-CLOMR Plan: Existing Conditions Model 3/17/2026
RS = 4.148
.075
.045
.075
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
485
480
475
470
465
460
455
450
445
4000
4200
4400
4600
4800
5000
5200
5400
5600
Station (ft)

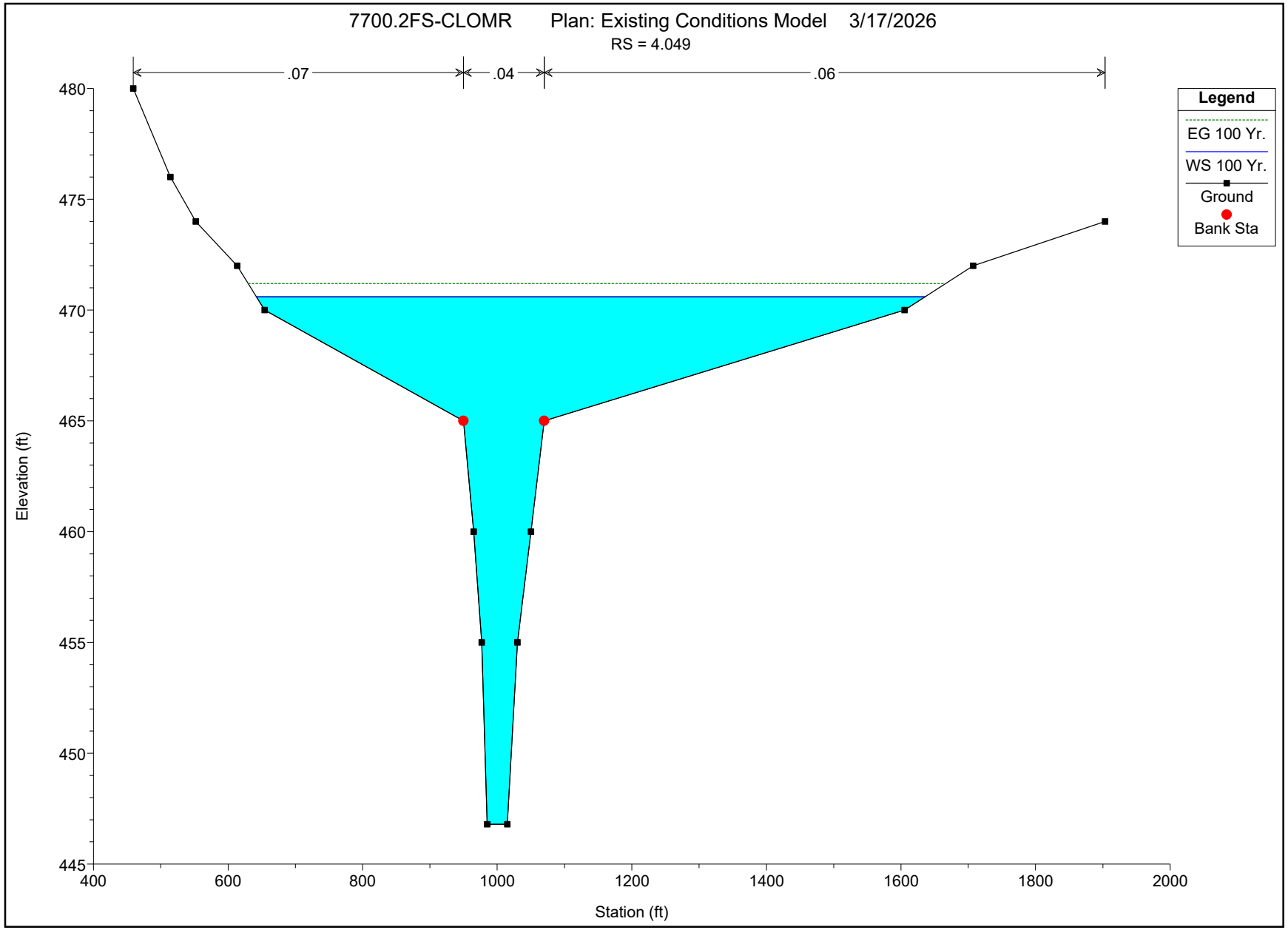

7700.2FS-CLOMR Plan: Existing Conditions Model 3/17/2026
RS = 4.080
.075
.045
.075
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Bank Sta
Elevation (ft)
Station (ft)
475
470
465
460
455
450
445
400
600
800
1000
1200
1400
1600
1800

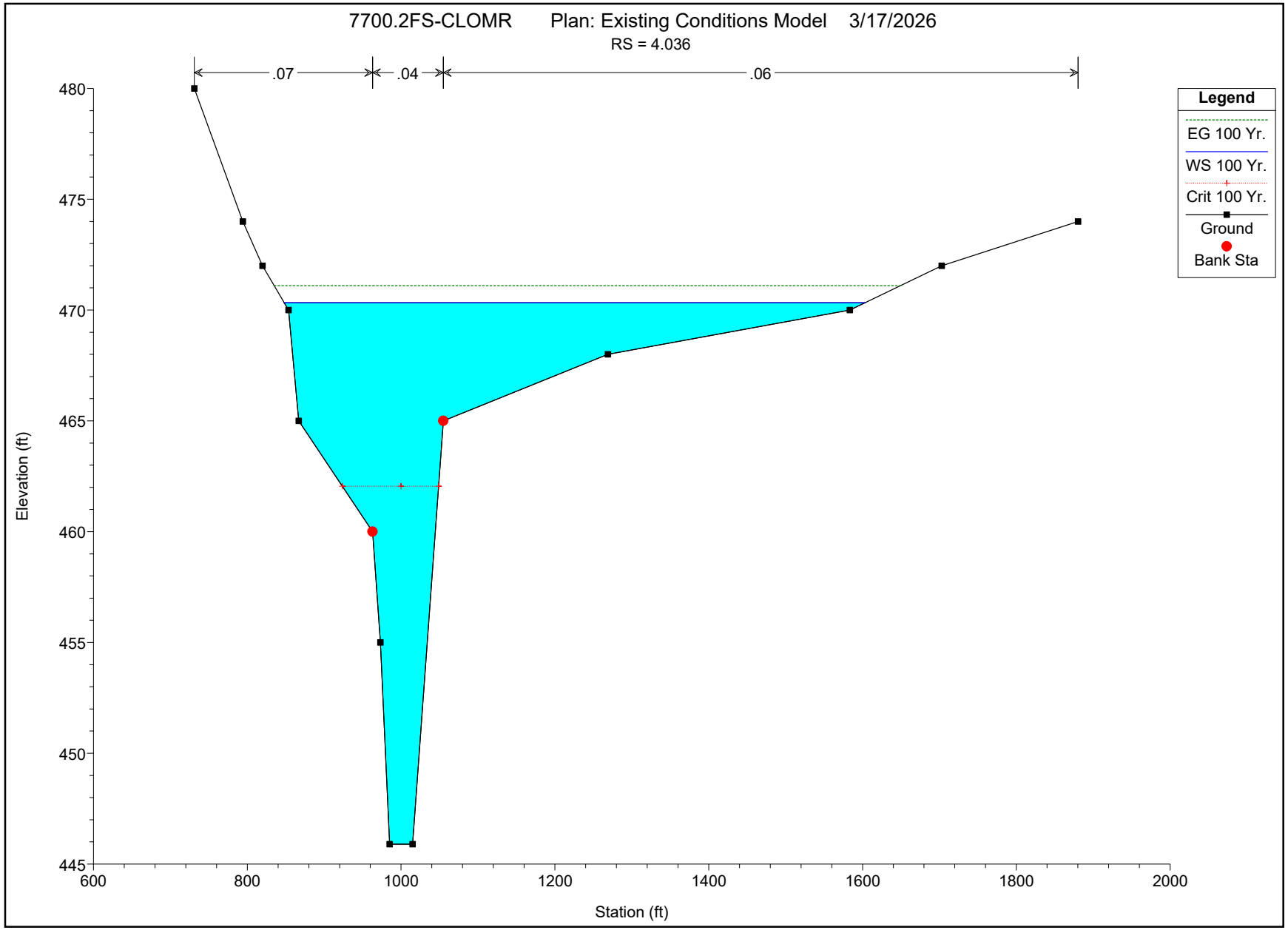

7700.2FS-CLOMR Plan: Existing Conditions Model 3/17/2026
RS = 4.073
.075
.045
.075
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Bank Sta
Elevation (ft)
Station (ft)
490
480
470
460
450
440
400
600
800
1000
1200
1400
1600
1800
2000


7700.2FS-CLOMR Plan: Existing Conditions Model 3/17/2026
RS = 4.069
.075
.045
.075
Legend
EG 100 Yr.
WS 100 Yr.
Crit 100 Yr.
Ground
Bank Sta
Elevation (ft)
480
475
470
465
460
455
450
445
400
600
800
1000
1200
1400
1600
1800
2000
Station (ft)


7700.2FS-CLOMR Plan: Existing Conditions Model 3/17/2026
RS = 4.060 BR
.075
.045
.075
Legend
WS 100 Yr.
EG 100 Yr.
Crit 100 Yr.
Ground
Bank Sta
Elevation (ft)
485
480
475
470
465
460
455
450
445
400
600
800
1000
1200
1400
1600
1800
2000
Station (ft)


7700.2FS-CLOMR Plan: Existing Conditions Model 3/17/2026
RS = 4.057
.075
.045
.075
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Bank Sta
Elevation (ft)
490
480
470
460
450
440
200
400
600
800
1000
1200
1400
1600
1800
2000
Station (ft)

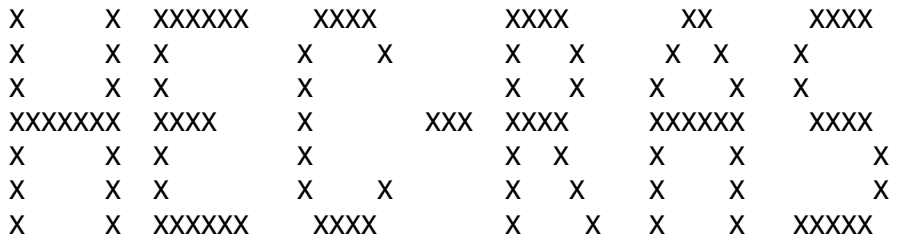

7700.2FS-CLOMR Plan: Existing Conditions Model 3/17/2026
RS = 4.049
.07
.04
.06
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Bank Sta
Elevation (ft)
480
475
470
465
460
455
450
445
400
600
800
1000
1200
1400
1600
1800
2000
Station (ft)


7700.2FS-CLOMR Plan: Existing Conditions Model 3/17/2026
RS = 4.036
.07
.04
.06
Legend
EG 100 Yr.
WS 100 Yr.
Crit 100 Yr.
Ground
Bank Sta
Elevation (ft)
480
475
470
465
460
455
450
445
600
800
1000
1200
1400
1600
1800
2000
Station (ft)

IV. HEC-RAS Output – Deer Creek Proposed Conditions Model

- HEC-RAS Input
- 15 Yr. and 100 Yr.-Flood Profile Table
- Cross Sections Showing 100 yr Water Surface Elevation

HEC-RAS HEC-RAS 6.6 September 2024
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California



PROJECT DATA
Project Title: 7700.2FS-CLOMR
Project File : 7700.prj
Run Date and Time: 3/17/2026 10:30:41 AM

Project in English units

Project Description:
DEER CREEK
RIVER DES PERES STUDY JUNE 1982
RETURN PERIODS
OF 10, 50, 100 AND 500 YEAR
DEER CREEK
RIVER DES PERES STUDY JUNE
1982
RETURN PERIODS OF 10, 50, 100 AND 500 YEAR

```
PLAN DATA

Plan Title: Proposed Conditions Model
Plan File : o:\DRAW7700\20247700\Floodstudy\Hec-Ras Files\7700.p03

           Geometry Title: Proposed Conditions Model
           Geometry File : o:\DRAW7700\20247700\Floodstudy\Hec-Ras Files\7700.g02

           Flow Title    : Imported Flow 01
           Flow File     : o:\DRAW7700\20247700\Floodstudy\Hec-Ras Files\7700.f01

Plan Description:
Proposed Conditions Model


Plan Summary Information:
Number of:  Cross Sections =   18    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

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

Right Offset = 0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
5.259	15 Yr.	0	0	0
5.029	15 Yr.	0	0	0
5.022	15 Yr.	0	0	0
5.021	15 Yr.	0	0	0
5.018	15 Yr.	0	0	0
5.017	15 Yr.	0	0	0
5.013	15 Yr.	0	0	0
4.859	15 Yr.	0	0	0
4.743	15 Yr.	0	0	0
4.625	15 Yr.	0	0	0
4.612	15 Yr.	0	0	0
4.563	15 Yr.	0	0	0
4.464	15 Yr.	0	0	0
4.419	15 Yr.	0	0	0
4.365	15 Yr.	0	0	0
4.259	15 Yr.	0	0	0
4.165	15 Yr.	0	0	0
4.16	15 Yr.	0	0	0
4.157	15 Yr.	0	0	0
4.148	15 Yr.	0	0	0
4.080	15 Yr.	0	0	0
4.073	15 Yr.	0	0	0
4.069	15 Yr.	0	0	0
4.057	15 Yr.	0	0	0
4.049	15 Yr.	0	0	0
4.036	15 Yr.	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
5.259	50 Yr.	0	0	0
5.029	50 Yr.	0	0	0
5.022	50 Yr.	0	0	0
5.021	50 Yr.	0	0	0
5.018	50 Yr.	0	0	0

5.017	50 Yr.	0	0	0
5.013	50 Yr.	0	0	0
4.859	50 Yr.	0	0	0
4.743	50 Yr.	0	0	0
4.625	50 Yr.	0	0	0
4.612	50 Yr.	0	0	0
4.563	50 Yr.	0	0	0
4.464	50 Yr.	0	0	0
4.419	50 Yr.	0	0	0
4.365	50 Yr.	0	0	0
4.259	50 Yr.	0	0	0
4.165	50 Yr.	0	0	0
4.16	50 Yr.	0	0	0
4.157	50 Yr.	0	0	0
4.148	50 Yr.	0	0	0
4.080	50 Yr.	0	0	0
4.073	50 Yr.	0	0	0
4.069	50 Yr.	0	0	0
4.057	50 Yr.	0	0	0
4.049	50 Yr.	0	0	0
4.036	50 Yr.	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
5.259	100 Yr.	0	0	0
5.029	100 Yr.	0	0	0
5.022	100 Yr.	0	0	0
5.021	100 Yr.	0	0	0
5.018	100 Yr.	0	0	0
5.017	100 Yr.	0	0	0
5.013	100 Yr.	0	0	0
4.859	100 Yr.	0	0	0
4.743	100 Yr.	0	0	0
4.625	100 Yr.	0	0	0
4.612	100 Yr.	0	0	0
4.563	100 Yr.	0	0	0
4.464	100 Yr.	0	0	0
4.419	100 Yr.	0	0	0

4.365	100 Yr.	0	0	0
4.259	100 Yr.	0	0	0
4.165	100 Yr.	0	0	0
4.16	100 Yr.	0	0	0
4.157	100 Yr.	0	0	0
4.148	100 Yr.	0	0	0
4.080	100 Yr.	0	0	0
4.073	100 Yr.	0	0	0
4.069	100 Yr.	0	0	0
4.057	100 Yr.	0	0	0
4.049	100 Yr.	0	0	0
4.036	100 Yr.	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
5.259	500 Yr.	0	0	0
5.029	500 Yr.	0	0	0
5.022	500 Yr.	0	0	0
5.021	500 Yr.	0	0	0
5.018	500 Yr.	0	0	0
5.017	500 Yr.	0	0	0
5.013	500 Yr.	0	0	0
4.859	500 Yr.	0	0	0
4.743	500 Yr.	0	0	0
4.625	500 Yr.	0	0	0
4.612	500 Yr.	0	0	0
4.563	500 Yr.	0	0	0
4.464	500 Yr.	0	0	0
4.419	500 Yr.	0	0	0
4.365	500 Yr.	0	0	0
4.259	500 Yr.	0	0	0
4.165	500 Yr.	0	0	0
4.16	500 Yr.	0	0	0
4.157	500 Yr.	0	0	0
4.148	500 Yr.	0	0	0
4.080	500 Yr.	0	0	0
4.073	500 Yr.	0	0	0
4.069	500 Yr.	0	0	0

4.057	500 Yr.	0	0	0
4.049	500 Yr.	0	0	0
4.036	500 Yr.	0	0	0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
5.259	FW	1	760	1214
5.029	FW	1	884	1263
5.022	FW	1	866	1250
5.021	FW	1	866	1250
5.018	FW	1	862	1247
5.017	FW	1	862	1247
5.013	FW	1	855	1245
4.859	FW	1	964	1682
4.743	FW	1	949	1337
4.625	FW	1	919	1136
4.612	FW	1	946	1104
4.563	FW	1	902	1069
4.464	FW	1	843	1046
4.419	FW	1	831	1045
4.365	FW	1	854	1036
4.259	FW	1	850	1078
4.165	FW	1	4861	5097
4.16	FW	1	4852	5095
4.157	FW	1	4852	5097
4.148	FW	1	4848	5094
4.080	FW	1	876	1089
4.073	FW	1	858	1087
4.069	FW	1	849	1105
4.057	FW	1	821	1165
4.049	FW	1	784	1160
4.036	FW	1	836	1138

FLOW DATA

Flow Title: Imported Flow 01
Flow File : o:\DRAW7700\20247700\Floodstudy\Hec-Ras Files\7700.f01

Flow Data (cfs)

River	Reach	RS	10 Yr.	15 Yr.	50 Yr.	100 Yr.	500 Yr.	FW
RIVER-1	Reach-1	4.743	10212	11300	14451	16358	19884	16358
RIVER-1	Reach-1	4.419	10212	11300	14451	16358	19884	16358
RIVER-1	Reach-1	4.365	10647	11770	15166	17157	20828	17157
RIVER-1	Reach-1	4.069	10647	11770	15166	17157	20828	17157
RIVER-1	Reach-1	4.057	10631	11750	15084	17035	20761	17035
RIVER-1	Reach-1	4.036	10631	11750	15084	17035	20761	17035

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RIVER-1	Reach-1	10 Yr.		Known WS = 466.8
RIVER-1	Reach-1	15 Yr.		Known WS = 467.45
RIVER-1	Reach-1	50 Yr.		Known WS = 469.35
RIVER-1	Reach-1	100 Yr.		Known WS = 470.33
RIVER-1	Reach-1	500 Yr.		Known WS = 471.68
RIVER-1	Reach-1	FW		Known WS = 470.52

GEOMETRY DATA

Geometry Title: Proposed Conditions Model
Geometry File : o:\DRAW7700\20247700\Floodstudy\Hec-Ras Files\7700.g02

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4.743

INPUT
Description: 4.743
LADUE FIS 25044 STANLEY SURVEY SECT - APROX. 250 FT. D.S.
OF TWOMILE
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
900	481	938	480	938	472	956	472	990	456
1000	455.3	1016	456	1067	466	1407	466	1480	482

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
900	.08	956	.04	1067	.1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
956 1067 680 766 771 .1 .3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 4.625

INPUT
Description: 4.625
Station Elevation Data num= 405

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
817.08	488.39	817.19	488.38	818.04	488.33	822.72	488.36	823.03	488.37
826.93	488.16	827.599	488.19	828.599	488.06	831.3699	487.66	832.81	487.51

837.8599	486.53	844.71	484.99	847.95	484.31	849.15	484.02	852.2	483.02
853.5999	482.65	858.03	481.33	863.08	479.44	868.1299	477.18	869.7	476.56
871.3699	475.83	873.17	475.14	875.54	474.58	878.22	473.93	883.27	473.07
888.31	472.54	893.3599	472.27	898.4	472	903.45	471.6	904.71	471.46
906.93	471.15	908.4899	470.99	910.54	470.73	913.54	470.35	915.82	469.96
916.3799	469.84	918.58	469.44	920.2599	469.06	922.21	468.48	923.6299	468.14
928.05	467.48	928.67	467.38	929.1499	467.34	933.33	467.25	933.7399	467.23
934.33	467.11	937.6099	466.69	938.83	466.41	943.92	463.68	946.1499	463.22
946.92	463.09	949.0099	462.68	954.1	462.16	954.6999	462.01	958.97	460.3
959.19	460.29	959.5099	460.13	964.28	459.02	967.5199	458.39	969.37	458
974.4599	455.36	976.0699	455.12	978.3899	455.15	979.55	455.04	980.3399	454.99
984.4499	454.85	989.73	454.89	995.11	455	996.72	454.88	1000	454.4
1000.46	454.68	1000.68	454.67	1006.25	455.02	1007.93	455.04	1015.41	454.99
1019.14	454.91	1022.73	454.98	1022.88	454.99	1023.17	455.02	1026.62	455.24
1028.52	455.63	1030.35	456.28	1034.09	458.45	1037.83	462.3	1039.66	463.79
1041.56	464.33	1045	464.98	1045.22	465.03	1049.04	465.66	1050.79	466
1052.77	466.67	1055.92	467.94	1056.36	468.11	1056.51	468.17	1056.82	468.31
1061.93	470.67	1063.98	471.4	1067.5	472.57	1067.72	472.63	1068.18	472.72
1071.46	473.13	1073.06	473.28	1078.63	473	1078.93	472.98	1079.54	472.95
1082.67	472.73	1084.2	472.69	1089.77	472.61	1090.91	472.62	1101.35	472.52
1102.27	472.54	1106.47	472.73	1112.04	472.83	1112.56	472.86	1116.3	473.27
1117.61	473.5	1120.04	474.12	1121.43	474.59	1123.18	475.12	1123.77	475.2
1124.99	475.32	1127.51	475.4	1128.75	475.48	1131.25	475.22	1132.35	475.17
1134.99	475	1136.36	475	1138.72	474.92	1139.88	475	1145.45	475.53
1146.2	475.62	1147.72	475.76	1153.67	476.01	1157.41	476.08	1162.15	476.08
1164.88	476.14	1167.55	476.23	1169.78	476.44	1170.52	476.55	1172.63	476.79
1174.09	476.81	1176.72	476.74	1187.87	476.71	1191.3	476.76	1195.32	476.91
1195.61	476.95	1198.03	476.98	1199.91	477.21	1203.11	477.65	1204.22	477.73
1207.72	478.14	1208.19	478.18	1208.52	478.2	1210.33	478.37	1213.27	478.59
1213.92	478.61	1217.13	478.58	1218.35	478.63	1228.52	478.62	1238.48	478.46
1238.65	478.45	1243.76	478.47	1251.12	478.22	1251.56	478.2	1255.86	478.05
1264.08	477.64	1268.78	477.57	1269.16	477.57	1273.08	477.35	1275.92	477.26
1279.32	477.18	1281.69	477.08	1282.12	477.07	1289.49	476.8	1290.3	476.76
1294.52	476.5	1307.51	475.89	1316.12	475.64	1319.32	475.64	1325.52	475.5
1329.03	475.33	1340.29	474.92	1346.25	474.83	1350.32	474.9	1350.55	474.9
1351.09	474.89	1354.86	474.77	1360.62	474.6	1376.38	474.44	1381.31	474.28
1386.02	474.22	1393.59	474.03	1401.26	473.97	1406.11	474.04	1406.34	474.04
1406.5	474.05	1411.42	474.13	1416.51	474.06	1418.51	474.09	1421.59	474.12

1431.75	473.9	1443.31	473.99	1449.51	474.08	1457.15	474.12	1458.15	474.14
1462.23	474.29	1462.46	474.28	1466.76	474.17	1467.31	474.17	1472.39	474.35
1474.31	474.39	1475.37	474.44	1479.67	474.47	1480.51	474.51	1482.56	474.54
1487.64	474.46	1488.28	474.46	1492.58	474.53	1496.89	474.54	1499.11	474.51
1501.19	474.44	1502.88	474.45	1505.31	474.41	1505.5	474.41	1507.96	474.35
1514.1	474.45	1522.71	474.44	1523.2	474.43	1523.91	474.44	1527.02	474.54
1528.28	474.55	1533.36	474.44	1535.62	474.52	1536.31	474.53	1538.44	474.59
1543.53	474.55	1544.23	474.51	1548.54	474.42	1553.69	474.42	1554.91	474.35
1557.14	474.18	1561.11	474.01	1561.45	473.99	1565.75	473.82	1568.93	473.65
1570.06	473.65	1573.51	473.73	1574.01	473.73	1578.66	473.57	1579.71	473.54
1584.17	473.36	1589.25	473.29	1591.58	473.21	1592.1	473.17	1594.33	473.07
1599.41	472.94	1604.45	472.85	1608.79	472.68	1609.58	472.63	1613.1	472.44
1614.66	472.38	1619.74	472.1	1626.01	471.85	1629.3	471.65	1630.31	471.62
1634.98	471.63	1635.5	471.66	1638.92	471.99	1640.06	472.05	1641.7	471.95
1643.22	471.8	1645.14	471.7	1650.22	471.71	1651.83	471.8	1654.1	471.83
1656.14	471.91	1660.3	472.17	1660.44	472.18	1664.74	472.33	1685.1	472.6
1685.79	472.62	1686.26	472.62	1690.57	472.75	1695.95	472.76	1701.03	473.15
1703.48	473.1	1703.7	473.1	1707.78	473.04	1709.9	473.13	1711.19	473.14
1712.09	473.01	1716.1	472.26	1716.27	472.24	1717.06	472.11	1720.7	471.59
1721.35	471.51	1722.3	471.13	1725	470.27	1726.43	469.64	1728.5	468.85
1729.3	468.52	1733.61	466.9	1734.7	466.43	1736.59	465.68	1737.91	465.36
1740.9	465.06	1741.68	464.9	1742.22	464.69	1745.21	463.08	1746.52	462.35
1746.76	462.24	1753.3	457.97	1755.13	456.69	1756.92	455.55	1759.43	455.58
1762	455.61	1767.08	455.48	1771.9	456.15	1772.16	456.18	1772.34	456.19
1777.24	456.58	1782.32	456.62	1787.4	455.62	1789.56	455.88	1790.5	455.89
1792.48	456.07	1793.86	456.4	1796.7	457.37	1797.56	457.6	1798.17	457.69
1802.47	458.09	1802.65	458.13	1802.9	458.18	1806.78	459.27	1807.73	459.46
1809.09	459.89	1811.08	460.44	1812.81	461.01	1815.29	461.9	1817.89	462.87
1819.69	463.8	1821.49	464.64	1823.99	465.89	1827.69	467.81	1828.05	467.98
1828.3	468.08	1832.6	469.92	1833.13	470.16	1833.89	470.34	1838.21	471.29
1840.09	471.78	1841.21	472.03	1843.29	472.61	1848.37	473.55	1849.82	473.58
1852.49	473.84	1853.45	473.88	1854.12	473.92	1857.81	474.06	1858.42	474.07
1858.53	474.08	1863.61	474.36	1864.89	474.46	1867.03	474.59	1868.7	474.73
1873.78	475.31	1878.86	475.75	1879.94	475.86	1883.49	476.07	1883.94	476.11
1884.25	476.15	1888.55	476.68	1889.69	476.76	1892.86	476.88	1895.89	477.13
1897.16	477.26	1899.18	477.42	1909.34	478.73	1910.07	478.8	1914.38	478.98
1914.49	478.99	1918.68	479.49	1922.98	479.84	1929.66	480.64	1934.75	481.81
1935.9	482.15	1939.29	482.9	1939.83	483.04	1940.2	483.19	1944.5	484.59

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 1944.91  484.71 1945.49  484.92 1948.81  486.27 1949.99  486.66 1957.42  489.27
 1957.89  489.46 1960.15  490.27 1965.23  491.84 1966.02  492.04 1970.29  493.19
 1970.42  493.19 1974.63  492.82 1975.39  492.79 1976.49  492.84 1976.66  492.85

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  817.08      .1  910.54     .04  1067.5      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        910.54  1067.5              110     105      64             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  1709.9  1864.4  473.13       T

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.612

INPUT
Description: 4.612
 LADUE FIS 24349  STANLEY SURVEY SECT
Station Elevation Data    num=     466
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
841.1001  486.49844.9501  486.12845.2001  486.09849.6001  485.76849.9501  485.72
855.4601  484.79864.9601  483.46884.9701  481.16889.9701   480.4891.3601  480.09
  896.49  479.02   898.4  478.74899.9701   478.4  906.75  476.27  908.16   475.7
909.9701  475.11  911.88  474.85  913.04  474.65914.9701  474.38  917.01  474.27
  917.92  474.18924.9801  473.75  927.27  473.67927.6801  473.67929.9801  473.59
934.9801  472.68939.9801  471.59942.3201  471.56  942.66  471.57944.9801  471.54
947.2001  471.64  947.79  471.64  949.99  471.73952.0801  471.54  952.91  471.45
  954.99  471.26956.9601  471.18  958.04  471.11  959.99  471.02961.8401   470.3
  963.17  469.74  964.99  469.02  969.99  464.17971.6001  462.31973.4301  460.09
  974.99  458.28976.4801  457.42978.5601  456.34  979.99  455.53981.3601  455.33
983.6901  455.06     985  454.87    1000  454.06 1000.84  454.69    1005  454.96
  1014.7  456.67 1015.01  456.72  1015.3  456.76  1019.9  457.31 1020.02  457.32
 1020.13  457.35 1024.95  458.46  1025.1  458.49 1029.77  459.33 1030.02  459.39
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1030.3	459.59	1034.59	463.29	1035.03	463.61	1035.5	463.73	1039.41	464.54
1040.03	464.7	1040.7	464.71	1044.23	464.44	1045.03	464.45	1055.04	465.03
1060.04	466.7	1065.05	469.01	1070.05	471.5	1071.9	472.68	1073.16	473.4
1075.06	474.62	1077.1	475.24	1077.98	475.55	1080.06	476.17	1082.3	476.22
1082.8	476.24	1085.06	476.29	1087.5	476.11	1087.63	476.11	1090.07	475.93
1092.45	475.59	1092.7	475.55	1095.07	475.21	1097.27	474.99	1097.9	474.95
1102.59	474.48	1102.76	474.47	1105.26	474.26	1106.6	474.11	1110.49	473.6
1110.61	473.6	1111	473.58	1114.62	473.46	1115.71	473.4	1120.94	473.58
1122.63	473.59	1125.26	473.53	1126.16	473.53	1126.64	473.56	1130.65	473.92
1136.61	474.6	1142.68	474.99	1147.06	475.45	1152.29	475.69	1157.39	476.18
1162.46	475.69	1166.77	475.78	1167.42	475.81	1167.7	475.81	1171.75	476.01
1177.69	476.03	1179.96	476.16	1180.41	476.2	1182.76	476.32	1184.73	476.59
1186.09	476.68	1187.83	476.88	1189.06	477.07	1192.22	477.68	1192.91	477.8
1193.39	477.83	1197.72	478.46	1197.98	478.51	1198.35	478.56	1203.05	479.09
1213.2	479.35	1235.14	479.32	1236.66	479.29	1238.57	479.3	1240.99	479.25
1241.27	479.23	1253.79	478.73	1253.97	478.72	1274.09	478.21	1289.31	477.54
1294.38	477.12	1299.46	476.54	1309.6	475.72	1310.23	475.66	1314.68	475.31
1314.84	475.3	1319.75	474.91	1329.9	474.43	1340.05	474.26	1340.53	474.26
1344.85	474.35	1345.12	474.35	1349.18	474.23	1350.19	474.22	1362.16	473.81
1365.41	473.77	1370.82	473.44	1375.15	473.27	1375.56	473.26	1380.64	473.31
1385.71	473.29	1390.78	472.92	1401.11	472.95	1405.44	473.04	1412.94	472.85
1414.09	472.85	1422.75	472.64	1426.3	472.64	1427.08	472.72	1431.33	472.97
1431.57	472.99	1435.73	473.28	1437.46	473.33	1440.06	473.33	1441.52	473.4
1443.6	473.3	1444.39	473.24	1446.6	473.17	1451.67	473.2	1453.04	473.25
1455.86	473.25	1456.74	473.27	1457.37	473.27	1461.7	473.15	1477.04	473.12
1487.19	472.88	1487.66	472.86	1502.41	472.62	1513.63	472.7	1517.17	472.79
1517.63	472.79	1517.95	472.81	1522.28	472.91	1522.7	472.9	1537.92	472.95
1539.59	472.93	1541.69	473	1543	473	1543.92	472.98	1547.82	472.65
1548.07	472.64	1548.25	472.62	1553.15	472.29	1558.22	472.1	1563.29	472.07
1565.56	472.1	1566.22	472.12	1569.88	472.15	1572.35	472.22	1573.44	472.23
1574.21	472.26	1578.48	472.51	1583.59	472.52	1588.66	472.05	1590.74	472.12
1591.52	472.12	1593.74	472.22	1595.85	472.16	1596.87	472.04	1598.81	471.93
1600.18	472	1603	472.06	1603.88	472.1	1604.5	472.1	1608.11	472.19
1608.83	472.22	1608.96	472.22	1609.13	472.23	1614.03	472.4	1624.18	471.62
1626.14	471.62	1627.53	471.7	1630.47	471.73	1634.33	471.64	1637.53	471.77
1639.12	471.88	1643.45	471.73	1644.47	471.66	1645.92	471.61	1647.78	471.59
1649.55	471.51	1654.62	471.09	1659.7	470.81	1660.76	470.88	1664.31	471.29
1664.77	471.32	1665.09	471.3	1669.42	470.85	1669.84	470.83	1674.92	470.78

1679.99	471.15	1682.4	471.37	1682.71	471.41	1685.06	471.64	1690.14	472.52
1691.06	472.51	1694.97	472.34	1695.21	472.34	1695.38	472.33	1705.36	472.31
1710.43	472.51	1712.69	472.52	1713.36	472.55	1715.51	472.57	1721.35	472.22
1725.62	471.71	1730	471.49	1730.73	471.44	1735.8	470.95	1740.88	470.25
1742.99	469.63	1744.02	469.28	1745.95	468.68	1747.31	468.21	1750.15	467.33
1751.02	467.03	1755.97	465.78	1756.1	465.75	1756.28	465.69	1760.3	464.45
1761.17	464.14	1771.32	455.91	1773.28	455.74	1774.67	455.71	1776.39	455.6
1777.61	455.6	1786.26	455.78	1786.54	455.79	1786.93	455.77	1790.59	455.69
1791.61	455.63	1796.69	455.6	1801.76	456.15	1803.57	457.17	1805.33	458.38
1806.84	459.28	1807.9	459.83	1811.46	461.43	1811.91	461.66	1816.98	462.46
1817.59	462.59	1820.88	463.38	1827.13	464.66	1829.54	465.48	1829.85	465.57
1832.2	466.35	1837.28	467.35	1838.19	467.49	1842.11	468.28	1842.35	468.32
1842.52	468.37	1846.85	469.47	1847.43	469.58	1848.25	469.76	1851.17	470.46
1852.5	470.74	1862.65	472.64	1872.77	474.84	1872.91	474.88	1877.87	475.95
1878.9	476.06	1881.47	476.25	1890.12	477.34	1893.09	477.66	1898.16	477.99
1898.78	478.07	1902.34	478.58	1903.1	478.7	1903.24	478.71	1907.43	479.14
1908.31	479.25	1909.56	479.35	1911.76	479.48	1913.38	479.63	1915.69	479.94
1916.09	479.98	1918.46	480.32	1923.53	480.72	1924.74	480.76	1927.95	480.8
1928.61	480.82	1929.07	480.78	1933.68	480.56	1934.08	480.61	1937.73	481
1938.75	481.13	1940.21	480.98	1942.05	480.75	1943.83	480.59	1948.9	480.94
1953.98	481.88	1959.05	483.1	1959.36	483.24	1963.69	485.06	1964.12	485.23
1964.74	485.46	1974.27	489.16	1976.67	489.76	1977	489.81	1979.34	490.33
1981	490.87	1983.13	491.74	1984.42	492.2	1985.33	492.41	1989.26	493.46
1989.66	493.55	1993.98	494.29	1994.57	494.38	1995.39	494.47	1998.31	494.87
1999.64	494.98	2001.52	495.38	2002.64	495.65	2004.71	496.07	2006.97	495.96
2007.65	495.96	2009.79	495.89	2011.29	495.97	2013.78	496.19	2019.92	496.6
2020.03	496.6	2024.28	496.8	2025.01	496.82	2030.08	497.56	2032.18	497.49
2032.93	497.45	2035.16	497.39	2037.26	497.43	2040.23	497.51	2045.3	497.34
2050.24	497.48	2050.57	497.5	2055.45	497.94	2060.52	498.54	2065.6	498.95
2070.67	499.1	2076.21	499.13	2080.82	499.02	2087.36	499.46	2089.19	499.63
2096.04	500.04	2097.84	500.09	2099.62	500.21	2101.12	500.27	2106.19	500.27
2106.5	500.31	2111.26	501.08	2115.15	501.86	2116.34	502.12	2118.01	502.29
2119.48	502.53	2126.48	503.08	2128.14	503.04	2130.27	502.91	2131.56	502.87
2132.46	502.93	2136.41	503.41	2136.63	503.43	2136.79	503.43	2141.12	503.33
2142.54	503.35	2145.45	503.51	2146.78	503.51	2148.67	503.63	2149.77	503.67
2151.85	503.82	2154.1	503.83	2156.93	503.82	2158.43	503.92	2160.93	504.22
2162	504.31	2167.06	504.4	2171.41	504.38	2172.15	504.39	2177.22	504.6
2193.05	504.79	2197.72	504.76	2202.59	504.87	2212.74	505.33	2222.89	505.55

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 2223.34  505.58 2227.67  505.81  2258.4  506.79 2283.77  506.93 2283.93  506.94
 2288.26  506.98 2288.85     507 2305.57   507.2 2308.07  507.18 2319.29  507.29
 2324.36  507.46 2343.68  507.83 2344.51  507.86 2344.66  507.86 2344.86  507.87
 2348.84   507.9 2381.65  508.56 2385.25  508.54 2400.47  508.83 2400.77  508.84
 2404.05     509

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
841.1001      .1956.9601     .04 1039.41      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      956.9601 1039.41              270     255     240             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
 1713.36    2075  472.55       T

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.563

INPUT
Description: 4.563
 LADUE FIS 24094  STANLEY SURVEY SECT
Station Elevation Data    num=     500
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  697.28   485.1  707.28  485.03  712.29  484.72  713.09  484.64  716.61  484.23
721.8101  483.66  722.29  483.62   732.3  482.51  737.41  482.31  742.03  482.25
742.3101  482.25  742.61  482.24  751.67  481.77752.3101  481.75  753.01  481.66
  756.49  481.32757.3199  481.22762.3199  481.02  763.41  480.96  766.14  480.75
  767.33  480.68  777.33  479.95  782.34  479.91  787.34  480.03  792.34  479.67
   794.6  479.22795.0699  479.15  797.35   478.7  802.35  477.89  804.72  477.68
     805  477.65  812.36  477.03  814.36  476.83   815.4  476.69  817.36   476.5
  819.18  476.48   820.6   476.5  824.01  476.45  825.79  476.49  827.37  476.46
828.8299  476.31  830.99     476  833.65  475.72  837.39  475.19  837.59  475.17
  842.96  474.28848.3299  473.24  849.25  473.15   851.6  472.96  855.05   472.6
  856.97  472.34859.0699  472.22  864.68  471.31   865.3  471.19  868.54  470.49
```

869.81	470.26	875.18	470.34	876.26	470.25	880.11	470887.8299		469.7	
892.71	469.61	899.21	469.32	899.41	469.32	902.03	469.19	903.26	469.21	
906.41	469.6	907.12	469.66	907.4	469.66	907.53	469.65	910.72	469.18	
913.28	469.03	917.86	468.91	919.53	468.81	921.43	468.78928.5799		468.29	
932.15	467.91	932.27	467.91	938.31	467.56	942.86	467.1	946.43	466.83	
950.8199	466.6957.0799		466.49	957.22	466.49	960.71	466.54	963.34	466.21	
964.28	465.93	965.53	465.38	971.42	462.14	975.86	459.98	978.56	458.54	
982.11	457.14985.6999		455.29	988.37	454.59	989.28	454.47	1000	453.43	
1012.69	454.49	1015.35	454.78	1016.61	454.99	1019.1	455.52	1020.15	455.65	
1022.14	455.97	1022.85	456.18	1024.35	456.78	1026.6	457.88	1027	458	
1027.68	458.58	1030.36	459.67	1030.69	459.73	1034.11	460.57	1037.86	461.64	
1038.75	461.93	1041.23	462.98	1041.61	463.15	1044.28	464.12	1045.37	464.35	
1047.65	464.98	1049.12	465.53	1049.82	465.81	1052.87	467.39	1055.35	468.61	
1056.63	468.97	1060.38	469.91	1060.89	470.05	1062.32	470.37	1064.13	470.86	
1066.42	471.2	1067.88	471.34	1070.96	471.79	1071.64	471.9	1071.96	471.96	
1075.33	472.93	1078.97	474.13	1081.07	474.63	1082.62	474.94	1083.55	475.08	
1100.84	475.51	1101.03	475.52	1112.69	475.67	1118.52	475.64	1129.71	475.85	
1130	475.86	1130.18	475.86	1136.01	476.18	1140.94	476.29	1147.66	476.62	
1148.23	476.64	1151.87	476.72	1153.49	476.82	1155.52	476.9	1158.89	476.96	
1159.16	476.96	1159.32	476.97	1159.96	476.99	1162.81	477.14	1170.1	477.42	
1173.74	477.66	1177.39	477.78	1188.08	478.46	1188.47	478.49	1189.05	478.5	
1202.9	478.87	1211.08	479.36	1211.31	479.37	1221.22	479.64	1226.28	479.64	
1241.16	479.31	1241.73	479.29	1246.07	479.23	1246.56	479.21	1251.63	479.21	
1266.84	478.47	1267.79	478.39	1271.58	478.2	1271.91	478.17	1272.14	478.16	
1297.25	476.39	1298.21	476.34	1301.99	476.05	1302.32	476.03	1307.39	475.8	
1312.46	475.24	1320.24	474.71	1332.41	474.16	1332.73	474.14	1332.96	474.14	
1342.87	473.87	1347.94	473.83	1350.34	473.91	1350.66	473.93	1353.01	474.02	
1358.08	474.35	1359.03	474.37	1362.82	474.54	1363.15	474.55	1363.38	474.52	
1364.76	474.17	1368.22	473.39	1368.91	473.3	1372.07	473.06	1373.29	472.87	
1383.42	472.3	1385.1	472.26	1387.16	472.26	1388.49	472.23	1393.56	472.27	
1393.79	472.29	1398.63	472.64	1399.32	472.58	1402.48	472.46	1405.4	472.18	
1406.83	472	1408.77	471.85	1411.17	471.89	1411.49	471.88	1413.84	471.89	
1415.52	472.14	1417.57	472.3	1419.86	472.59	1423.65	473.26	1423.98	473.31	
1428.55	472.87	1429.74	472.9	1432.89	472.71	1434.11	472.78	1439.18	472.62	
1441.58	472.32	1441.9	472.26	1444.25	471.91	1449.32	471.78	1450.27	471.81	
1458.96	472.34	1463.31	472.41	1464.53	472.45	1469.6	472.38	1472	472.57	
1474.66	472.79	1484.48	472.66	1484.8	472.65	1485.03	472.65	1489.87	472.4	
1490.57	472.39	1493.72	472.29	1494.94	472.28	1500.01	472.58	1502.41	472.46	

1502.73	472.45	1505.08	472.34	1519.79	472.42	1525.35	472.29	1527.07	472.34
1528.48	472.43	1530.42	472.47	1532.82	472.34	1533.15	472.34	1540.56	472.1
1545.63	472.22	1550.7	472.48	1551.4	472.47	1560.84	472.46	1563.24	472.3
1563.56	472.29	1570.98	471.86	1571.93	471.86	1575.73	471.65	1576.04	471.64
1576.27	471.62	1580.61	471.47	1581.12	471.47	1586.19	471.23	1602.2	472.63
1606.46	472.75	1606.67	472.76	1610.84	473.05	1611.57	473.08	1612.62	472.98
1615.16	472.67	1621.73	472.1	1623.8	472.06	1624.92	472.01	1631.88	471.8
1632.44	471.77	1636.76	471.78	1636.95	471.76	1641.08	471.44	1642.03	471.41
1647.11	471.49	1649.54	471.45	1649.72	471.44	1657.26	471.38	1662.34	471.08
1677.56	470.61	1682.64	470.66	1687.72	471.28	1688.59	471.29	1692.62	471.23
1692.79	471.23	1692.91	471.24	1697.23	471.82	1697.87	471.92	1702.94	472.06
1708.02	471.84	1713.1	471.75	1718.17	471.93	1718.83	471.88	1723.15	471.66
1723.4	471.66	1727.47	471.76	1728.33	471.72	1729.55	471.7	1731.78	471.57
1735.71	471.5	1736.1	471.5	1743.55	471.16	1744.74	470.91	1748.01	470.35
1748.63	470.23	1753.38	469.5	1753.71	469.43	1754.17	469.29	1757.7	468.15
1758.78	467.83	1766.34	466.22	1766.48	466.2	1770.66	465.32	1772.63	464.82
1774.01	464.5	1774.98	464	1779.09	461.79	1780.5	460.66	1783.62	458.09
1784.16	457.63	1784.94	457.35	1787.94	455.98	1789.24	455.56	1799.39	455.57
1804.47	455.96	1809.56	455.93	1813.85	456.12	1814.62	456.17	1815.71	456.91
1818.17	458.47	1819.7	459.52	1821.87	460.18	1822.49	460.38	1824.77	461.05
1829.85	461.24	1831.13	461.36	1834.92	461.63	1839.77	462.15	1840	462.18
1840.33	462.2	1845.08	462.64	1846.49	462.97	1848.41	463.54	1850.15	463.9
1855.23	465.13	1860.31	467.5	1861.37	468.1	1864.95	469.88	1865.38	470.11
1870	472.3	1870.46	472.51	1875.53	474.63	1877.26	475.28	1878.64	475.83
1880.61	476.55	1882.96	476.69	1883.41	476.76	1885.69	476.97	1890.76	477.92
1891.6	477.9	1895.72	477.97	1895.92	477.97	1896.38	478.01	1900.24	478.29
1900.91	478.36	1905.99	479.17	1908.03	479.23	1908.88	479.21	1913.2	479.43
1916.14	479.55	1917.52	479.51	1920.34	479.36	1921.22	479.33	1921.84	479.33
1926.3	479.63	1926.5	479.64	1930.48	479.78	1931.37	479.84	1936.45	479.58
1938.8	479.32	1939.11	479.29	1941.52	479.01	1946.6	479.14	1947.75	479.15
1951.11	478.94	1951.68	478.93	1952.07	478.96	1956.39	479.54	1956.75	479.6
1961.83	479.49	1966.91	480.51	1969.35	481.39	1969.58	481.48	1971.98	482.36
1973.67	483.37	1975.73	484.48	1977.99	485.82	1981.89	487.92	1982.13	488.07
1982.31	488.14	1987.21	490.22	1992.29	491.82	1997.36	492.83	2002.44	494.02
2007.51	494.87	2008.22	494.97	2012.27	495.28	2012.54	495.31	2012.66	495.32
2017.67	495.54	2018.81	495.63	2021.18	495.87	2022.74	495.97	2024.97	496.19
2025.5	496.23	2032.9	497.05	2034.14	497.08	2037.97	497.25	2042.78	497.23
2043.05	497.24	2043.43	497.24	2047.1	497.33	2048.12	497.31	2053.2	497.39

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 2058.28  497.71 2064.38  498.75 2068.05  499.22 2068.43  499.28 2068.69  499.28
  2073.5  499.55 2083.66  499.03 2088.73  499.15 2090.29  499.22 2092.67  499.43
 2098.82  499.76 2099.19  499.77 2103.25  499.82 2103.96  499.84 2109.04   500.1
 2116.21  500.71 2117.29  500.86 2124.27  501.58 2129.17  502.91 2129.34  502.96
 2129.59  503.05 2133.49  504.57 2134.42  504.88 2135.75  504.86  2137.8  504.87
 2139.49  504.83 2146.44  503.82 2148.06  503.67 2149.65  503.47 2150.76  503.55
 2154.21  503.92 2154.72  503.95 2155.08  503.95  2159.4  503.89  2159.8  503.89
 2163.72  504.13 2166.52  504.22 2168.04   504.3 2172.36  504.35 2172.68  504.36
 2175.03   504.4 2176.68  504.38 2185.18  504.38 2185.32  504.39 2215.55  504.85
 2215.76  504.85 2219.87  504.91 2235.94  505.65 2237.15  505.68 2241.02  505.84
 2241.47  505.87 2261.32   506.5  2266.4  506.54 2271.48  506.74  2271.7  506.74
 2314.23     507  2314.9  506.99 2332.18  507.22 2337.47  507.42 2369.62   507.8
 2392.65  507.96 2408.53  508.32 2417.87  508.74 2418.56  508.78 2418.68  508.79

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  697.28      .1  960.71     .04 1060.89      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        960.71 1060.89              480   522.5     525             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
 1727.47    2087  471.76       T

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.464

INPUT
Description: 4.464
Station Elevation Data    num=     401
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  150.42   480.6152.3299  480.57  172.24  479.71172.6599   479.7177.8999  479.28
183.1499  477.81  184.18  477.48188.1599  476.11193.6399  474.03198.8899  472.35
204.1299  471.07209.3799  470.04     224  468.17225.1199  468.06235.6099  467.67
  235.95  467.67255.8599  466.65256.5899  466.63259.8399  466.64277.5701  466.04
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287.71	465.92	288.0601	465.88	298.5601	465.65	303.6399	465.79	303.8001	465.8
304.1099	465.81	307.62	465.84	309.05	465.92	315.59	465.99	324.7799	466.39
327.1599	466.57	327.5299	466.59	331.5199	466.97	334.85	467.53	335.2799	467.55
335.5	467.59	336.2	467.7	339.48	468.08	340.5199	468.14	345.7699	468.05
347.44	467.93	350.22	467.82	351.01	467.77	351.43	467.79	352.73	467.82
355.4099	467.72	363.37	467.86	365.59	468.14	366.75	468.21	369.25	468.23
372	468.01	379.3	466.26	380.96	466.08	382.49	465.82	383.2799	465.74
387.73	465.47	388.6399	465.38	391.25	465.31	392.98	465.03	395.23	465.06
396.33	465.2	398.23	465.33	403.19	466.93	403.47	467.03	404.01	467.15
407.1699	467.93	408.72	468.25	413.96	468.3	429.7	467.32	440.19	465.95
445.44	465.44	450.68	464.68	465	464	507.1	478	594.8	480
606.8	484	700.8	484	729.2	478	793.7	476	808	473
826.1	473	889.2	459	973.4099	458	977.1399	455.13	978.2899	454.54
980.86	454.24	983.88	454.01	984.59	454	988.32	453.77	989.46	453.73
999.74	453.62	1000	453.42	1000.28	453.61	1003.81	453.68	1003.92	453.69
1005.39	453.71	1014.88	453.59	1015.7	453.64	1015.98	453.71	1016.57	454.05
1019.62	455.96	1021.28	456.83	1023.55	459.42	1026.58	462.76	1027.47	463.3
1030.02	465.15	1031.87	466.43	1032.87	466.61	1037.17	467.41	1042.47	467.91
1047.09	468.1	1047.77	468.16	1051.01	468.7	1053.06	468.98	1054.94	469.05
1058.36	469.07	1058.86	469.06	1068.96	469.4	1070.63	469.51	1086.33	469.89
1090.14	470.11	1094.18	470.12	1100.74	470.43	1102.03	470.42	1105.95	470.26
1113.8	470.33	1116.63	470.44	1121.65	470.42	1137.82	470.76	1148.41	470.73
1153.04	470.56	1171.52	470.52	1173.24	470.57	1176.6	470.77	1186.11	470.85
1186.77	470.84	1198.99	470.97	1200.21	470.89	1232.53	470.79	1237.55	471.08
1241.9	471.89	1242.7	472.02	1247.79	471.76	1250.11	471.77	1250.48	471.73
1252.87	471.87	1254.77	471.63	1256.35	471.22	1257.96	470.95	1263.04	471.04
1267.65	470.85	1268.13	470.79	1268.82	470.54	1271.94	469.29	1273.21	468.87
1280.52	465.43	1281.3	465.15	1283.38	464.25	1289.1	462.11	1292.56	461.32
1293.4	461.11	1293.55	461.06	1297.69	460.05	1303.72	458.31	1308.8	455.31
1313.89	453.73	1329.14	453.74	1334.23	456.95	1339.31	461	1344.4	464.84
1349.18	468.97	1349.48	469.24	1349.92	469.57	1353.48	472.47	1354.57	473.29
1356.15	474.21	1357.77	475.09	1359.65	476.2	1362.06	476.42	1362.39	476.46
1364.74	476.69	1374.87	476.39	1375.08	476.27	1379.22	473.6	1379.99	473.12
1381.1	472.37	1383.52	470.87	1385.08	469.77	1387.34	468.65	1387.81	468.4
1390.16	467.29	1395.24	466.84	1400.33	466.61	1400.68	466.62	1404.97	466.65
1405.41	466.64	1420.67	466.81	1443.48	466.52	1443.6	466.51	1446.09	466.44
1456.26	466.42	1456.47	466.41	1466.43	466.39	1471.52	466.52	1473.63	466.68
1474.67	466.81	1477.93	467.14	1481.68	467.67	1482.22	467.76	1485.1	468.35

1486.51	468.71	1486.77	468.81	1491.85	470.63	1496.94	473.01	1499.38	474.48
1499.62	474.63	1502.02	476.08	1503.67	476.84	1505.86	477.7	1507.11	478.25
1507.97	478.56	1512.1	480.39	1512.26	480.43	1512.61	480.42	1516.55	479.99
1517.28	480.01	1518.34	480.24	1520.84	480.55	1522.36	480.94	1524.57	481.75
1525.13	481.98	1527.45	482.78	1529.42	482.49	1530.81	482.14	1532.53	481.83
1533.71	481.31	1537.05	480.25	1537.62	480.02	1540.11	479.6	1542.3	479.11
1542.7	479.03	1547.79	478.86	1549.53	479.14	1550.88	479.31	1552.87	479.67
1557.96	481.93	1559.46	482.66	1562	484.06	1563.04	484.59	1567.62	485.32
1568.24	485.39	1572.34	485.45	1573.21	485.49	1574.48	485.67	1576.63	486.09
1578.29	486.29	1583.38	486.36	1588.46	487.22	1593.55	487.36	1593.79	487.35
1595.12	487.17	1598.09	486.66	1598.63	486.6	1599.43	486.59	1602.38	486.45
1603.72	486.45	1613.89	486.87	1622.63	487.54	1623.83	487.68	1624.06	487.72
1629.14	488.21	1636.71	488.69	1636.86	488.69	1639.31	488.81	1641	489.14
1643.09	489.81	1644.4	490.11	1649.33	490.66	1649.48	490.68	1653.87	489.6
1654.57	489.49	1659.65	489.66	1664.73	489.59	1666.75	489.62	1668.05	489.55
1669.82	489.54	1671.04	489.6	1674.28	489.64	1674.9	489.67	1677.64	489.98
1683.91	490.91	1685.07	491.05	1692.5	491.62	1693	491.63	1695.24	491.77
1705.15	492.63	1705.37	492.66	1709.66	493.34	1710.5	493.4	1711.71	493.59
1713.95	493.85	1715.58	494.14	1722.54	494.66	1724.19	494.94	1725.75	495.14
1726.83	495.11	1730.42	494.87	1730.84	494.86	1731.12	494.88	1732.65	494.92
1735.41	495.07	1736.66	495.19	1739.7	495.73	1741.01	495.81	1742.9	496.46
1743.99	496.8	1746.09	497.54	1748.29	497.93	1749.14	498.12	1751.17	498.52
1756.26	499.03	1756.87	499.05	1761.16	498.73	1761.34	498.71	1766.43	498.47
1767.85	498.89	1769.74	499.54	1771.51	500.01	1776.6	500.28	1778.33	500.33
1780.33	500.26	1782.62	500.3	1786.77	500.24	1791.2	500.56	1796.94	501.74
1799.04	502.32	1799.78	502.48	1802.02	503.15	1804.07	503.47	1805.28	503.6
1807.11	503.86	1812.19	504.3	1812.66	504.38	1815.17	504.68	1817.28	504.83
1821.24	505.48	1827.45	506.16	1829.82	506.2	1830.23	506.24	1834.11	506.41
1842.68	507.21	1847.78	507.4	1848.94	507.35	1851.28	507.18	1852.87	507.13
1855.18	507.22	1855.57	507.22	1863.04	507.57	1864.15	507.65	1868.12	508.13
1868.44	508.12	1870.18	508.2	1873.21	508.19	1877.03	508.04	1878.29	508.02
1893.55	508.5	1894.19	508.49	1897.69	508.84	1898.63	508.89	1919.94	509.44
1923.8	509.72	1925.19	509.78	1939.31	510	1941.4	509.93	1942.51	509.94
1944.39	509.9	1945.69	509.96	1948.75	509.94	1949.48	509.96	1949.98	510
1964.73	510.43	1969.82	510.72	1971.44	510.9	1974.9	511.36	1979.94	511.7
1988.6	511.93	1990.16	511.94	1992.41	512.39	1992.9	512.5	1995.24	512.96
2000.33	513.15	2010.06	513.16	2010.5	513.15	2015.58	513.13	2020.66	512.79
2035.92	514.41	2036.08	514.42	2040.1	514.8	2048.55	515.17	2048.68	515.17

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 2066.43  515.78

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  150.42    .075973.4099    .045 1023.55     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      973.4099 1032.87              218     238     238             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  150.42   606.8     484       T
 1252.87    1367  471.87       T
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
    1377    1576     476

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.419

INPUT
Description: 4.419
 JUNCTION WITH SABAGO
Station Elevation Data    num=     281
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   34.55  480.53   37.29  480.39   37.79  480.38 41.4401  480.14 42.9401  480.07
 48.0799  479.59   49.73  479.35   53.22  478.77   53.87  478.62   58.02  477.86
   58.36  477.81   58.93  477.59   62.16   476.4   63.51  475.85 65.6999  475.12
   66.31  474.93   68.65  474.13   70.46  473.71   72.47  473.13   73.79  472.79
    74.6  472.69   78.75  472.08   78.93  472.05   79.24  472.02   94.36  470.84
   99.34  470.63   99.56  470.63120.0799  469.58120.1999  469.58  120.72  469.55
   135.5  469.04  140.65  468.77  140.93  468.76145.0701  468.71  150.93  468.44
  178.24  467.67  186.53  467.69  202.36  467.24  212.64  467.27  215.55  467.34
  227.63  467.33  233.21  467.48   243.5  467.34  248.53  467.45  248.71  467.45
  249.01  467.43  252.86   467.3  253.78   467.2  258.93  467.07   262.8     466
   325.8     465   361.3     468   401.4     480   474.6     482   489.6     486
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581.4	486	599.4	480	671	478	677	476	798.8	476
808	473	820.3	473	862.9	459	963.2	458	963.72	457.74
966.22	456.99	966.34	456.96	967.85	456.54	967.95	456.52	972.87	455.86
977.88	454.32	982.89	453.75	997.95	453.72	1000	452.92	1002.83	453.6
1002.96	453.6	1007.82	453.71	1007.98	453.71	1012.8	453.77	1012.9	453.78
1017.9	453.73	1018.01	453.74	1022.77	453.64	1022.9	453.65	1027.75	456.97
1027.9	457.07	1028.04	457.25	1032.74	462.75	1032.9	462.95	1033.06	463.07
1037.72	467.28	1037.9	467.42	1038.08	467.54	1042.71	470.71	1042.9	470.85
1043.09	470.98	1047.69	473.79	1047.9	473.93	1048.11	474.01	1052.67	475.92
1052.9	476.01	1053.12	476.09	1057.66	477.95	1179.07	479.93	1184.14	480.88
1188.85	481.55	1189.21	481.59	1199.35	482.47	1209.49	484	1214.9	485.07
1219.25	486.13	1219.63	486.23	1224.7	487.18	1234.84	488.79	1236.62	488.97
1238.42	489.08	1239.9	489.22	1240.96	489.26	1244.51	489.48	1244.97	489.5
1249.65	489.45	1250.04	489.44	1255.11	489.61	1262.67	489.69	1262.78	489.7
1271.36	489.86	1274.95	490.06	1285.53	490.37	1290.6	490.39	1293.07	490.46
1293.22	490.47	1295.67	490.53	1306.1	491.06	1321.02	491.4	1327.82	491.43
1332.16	491.54	1335.84	491.45	1341.93	491.5	1345.19	491.46	1346.36	491.48
1348.01	491.43	1349.53	491.43	1351.43	491.36	1353.87	491.4	1354.1	491.4
1361.57	491.57	1362.56	491.57	1366.28	491.5	1366.64	491.5	1371.24	491.28
1371.71	491.27	1372.37	491.28	1375.59	491.38	1386.92	491.45	1397.06	491.25
1397.3	491.24	1401.64	491.18	1402.13	491.15	1407.2	491.11	1412.27	490.94
1422.41	490.81	1427.48	490.65	1427.7	490.65	1442.69	490.08	1445.07	490.03
1445.43	490.03	1457.6	489.82	1457.89	489.82	1458.1	489.81	1468.03	489.71
1475.47	489.9	1475.87	489.92	1483.24	490.17	1492.84	490.19	1498.45	490.04
1505.87	490.16	1506.31	490.18	1508.59	490.24	1518.73	490.32	1518.9	490.33
1523.24	490.43	1530.66	490.34	1544.08	489.98	1544.96	489.99	1549.15	489.95
1549.3	489.94	1555.02	489.75	1557.99	489.71	1559.28	489.67	1564.35	489.16
1575.36	489.08	1579.37	489.19	1579.7	489.19	1584.63	489.31	1591.55	488.96
1592.73	488.87	1594.77	488.78	1601.41	488.66	1603.72	488.52	1609.81	488.4
1609.98	488.4	1615.05	487.92	1620.12	487.07	1621.99	486.81	1623.13	486.69
1625.19	486.39	1627.47	486.12	1628.08	486.07	1630.26	485.83	1631.81	485.88
1634.17	485.86	1635.33	485.88	1640.25	485.64	1640.5	485.64	1641.1	485.62
1644.84	485.55	1645.47	485.56	1646.34	485.67	1649.18	485.73	1650.54	485.95
1652.43	485.62	1653.53	485.57	1655.61	485.12	1660.67	484.19	1665.74	483.57
1666.55	483.45	1670.81	482.67	1671.4	482.6	1675.88	482	1683.93	480.74
1686.02	480.45	1691.09	480.6	1696.16	480.91	1696.95	481.06	1701.23	482.03
1701.69	482.63	1705.64	488.1	1706.3	489.38	1707.23	490.49	1709.98	494.64
1711.37	496.12	1713.31	497.4	1714.33	498.23	1716.44	499.49	1718.67	500.62

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  1719.4  500.96 1721.51  501.99 1723.01  502.94 1725.49  504.62 1726.58  505.32
 1727.35  505.77 1731.58  508.52  1731.7  508.58 1731.99  508.71 1736.04  510.45
 1736.72  510.78 1737.67  510.92 1740.38  511.41 1741.79  511.61 1743.76  511.46
 1744.73  511.36 1746.86  511.22 1751.93  511.61 1762.02  512.05 1767.13  512.08
 1768.11  512.04 1770.78  511.99  1774.2  511.84 1775.13  511.78 1777.27   511.7
 1779.47  511.85 1787.41  512.47 1792.46  513.01 1792.58  513.03 1796.84  513.59
 1807.69  514.82 1809.87  514.95 1814.21  515.31 1816.82  515.42 1817.83   515.5
 1827.97  515.36

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
   34.55     .05   798.8    .075   963.2    .045 1052.67     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         963.2 1052.67              261     285     286             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   34.55   489.6     486       T

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.365

INPUT
Description: 4.365
 LADUE FIS 23049  STANLEY SURVEY SECT - APROX. 300 FT. D.S.
             OF SEBAGO
Station Elevation Data    num=     313
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
191.0301  473.97  191.18  473.98  195.12  474.34196.1601  474.41  203.47  474.59
  204.48   474.6206.4201  474.65  211.81  474.67  226.94  474.78  232.69  474.88
  236.86  474.89  237.19   474.9  242.32  475.28  247.45  475.32257.6701  473.94
  257.84  473.91  267.97  472.42270.2601  472.12  270.97  472.05   273.1  471.79
  274.43  471.65  277.62  471.26  278.23   471.2  278.61  471.17282.7801  471.02
  283.35  470.96284.2701  470.72  286.96  469.93  288.48  469.55290.9201  469.04
291.1301  468.99  293.61  468.48303.6501  467.77  303.87  467.75312.0001  467.25
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319.2601	466.69	320.35	466.653	24.1601	466.633	24.3901	466.623	24.5301	466.61
328.7	466.123	29.5201	466.073	32.8801	466.493	34.6501	466.74	337.05	466.64
339.7701	466.55	341.23	466.58	344.11	466.753	44.9001	466.783	45.4001	466.77
347.57	466.56	349.57	466.313	50.0301	466.273	57.4101	466.213	57.9201	466.19
362.1	466.22	364.06	466.193	65.4201	466.2	370.45	465.96	380.81	465.53
387.1501	465.53	408.2	464	451.9	478	527.9	480	539.9	484
629.9	484	650.4	478	725.4	476	823.5	476	833	473
845.6	473	889.6	459	969.2	458	970.17	457.04	972.54	455.45
972.84	455.27	975.19	453.71	977.2	453.31	978.27	453.04	980.2	452.64
985.22	452.66	990.23	452.82	995.25	452.67	1000	452.64	1009.79	452.75
1020.32	452.74	1021.74	453.16	1023.76	453.83	1025.33	454.3	1027.17	456.21
1028.42	457.48	1030.35	459.5	1032.6	461.08	1033.07	461.4	1035.36	463
1040.38	465.88	1047.04	471.38	1048.9	472.82	1050.41	474.05	1051.7	474.69
1054.34	476.14	1055.42	476.69	1125.9	478.01	1126.35	478.09	1130.94	479
1135.22	479.6	1135.99	479.72	1139.66	480.43	1141.04	480.72	1142.85	481.05
1144.1	481.3	1152.97	482.99	1156.18	483.63	1157.41	483.85	1161.22	484.58
1161.85	484.68	1166.25	485.29	1166.41	485.31	1171.32	486.09	1172.1	486.26
1176.36	487.24	1177.95	487.35	1179.6	487.43	1181.41	487.57	1183.8	488.12
1184.04	488.18	1186.46	488.73	1191.51	489.78	1192.91	490	1196.55	490.62
1197.35	490.67	1201.6	490.84	1201.79	490.84	1206.65	490.91	1207.2	490.93
1211.69	491.15	1216.74	491.48	1223.98	491.8	1226.83	491.96	1231.88	492.16
1232.85	492.17	1236.45	492.16	1236.93	492.17	1241.97	492.4	1246.17	492.5
1247.02	492.51	1267.21	493.67	1268.36	493.78	1271.54	493.97	1272.25	494.03
1272.79	494.06	1277.23	494.41	1277.39	494.43	1281.67	494.87	1292.44	495.78
1294.94	495.93	1297.49	496.07	1299.42	496.13	1302.54	496.26	1308.3	496.31
1312.49	496.44	1317.17	496.38	1317.68	496.38	1318.34	496.4	1321.61	496.57
1322.72	496.61	1327.77	496.98	1332.82	497.79	1337.86	498.79	1342.91	499.62
1348.24	500.21	1353	500.68	1353.44	500.7	1357.11	501.02	1358.05	501.07
1359.29	501.06	1361.55	501	1363.1	501	1373.19	500.9	1383.29	501.13
1383.74	501.15	1388.18	501.22	1388.33	501.22	1388.54	501.23	1398.43	501.45
1403.47	501.48	1405.93	501.62	1406.09	501.62	1408.52	501.76	1414.8	501.76
1417.79	501.83	1418.61	501.83	1423.63	501.98	1423.82	501.99	1428.71	502.18
1433.75	502.23	1438.8	502.21	1441.18	502.29	1441.43	502.29	1445.87	502.43
1454.75	502.56	1458.73	502.5	1458.99	502.5	1459.18	502.51	1468.06	502.63
1469.08	502.67	1470.43	502.69	1472.5	502.67	1474.13	502.7	1476.28	502.63
1476.93	502.65	1481.37	502.45	1484.22	502.37	1489.27	502.51	1494.32	502.47
1494.69	502.46	1499.36	502.44	1504.41	502.63	1505.53	502.65	1534.15	503.69
1534.63	503.7	1534.78	503.71	1539.06	504.07	1539.74	504.14	1540.63	504.36

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  1543.5  505.15 1544.79  505.45 1549.83  504.58 1552.33  504.61 1554.88  504.64
 1556.82  504.49 1559.93  504.22 1561.25  504.06 1564.97  503.66 1565.69  503.56
 1569.88  503.05 1570.02  503.03 1570.13  503.03 1574.57  502.68 1575.73  502.61
 1580.11  502.41 1592.32  502.45 1593.28  502.43  1600.3  502.35 1601.19  502.35
 1604.98  502.44 1605.63  502.44 1610.07  502.24  1610.4  502.24 1610.82  502.21
 1615.44     502 1620.49  501.84 1632.26  501.82 1640.68  501.93 1645.57  501.78
 1645.72  501.78 1645.92  501.76 1650.01  501.45 1650.77  501.38 1655.82  500.19
 1663.32  498.58 1663.47  498.55 1667.76  497.62 1669.32  497.32  1672.2  496.69
 1675.17  495.95 1681.02  494.58  1686.1  493.91 1691.14     493 1692.72  492.69
 1694.39   492.4 1696.19  492.03 1701.24   490.9 1711.33  488.45 1712.14  488.29
 1716.38  487.66 1716.58  487.62 1725.45  486.12 1726.47  485.96 1727.82  485.82
 1731.52  485.47 1733.67  485.31 1734.33  485.25 1736.57  485.09 1746.66  485.27
 1747.64  485.44 1751.22  485.93 1751.71  486.02 1752.08  486.15 1756.52  488.32
 1756.75  488.42 1757.07   488.6 1760.95   490.6  1761.8  491.11 1762.92  492.09
 1765.39   494.3 1766.85  495.56 1771.89  500.59 1774.27  501.96 1774.62  502.15
 1776.94  503.46 1781.99  503.65 1783.14  503.53 1786.32  503.29 1787.04  503.22
 1787.58  503.13 1792.02  502.27 1792.17  502.24 1796.46  501.53 1797.13  501.43
 1798.01  501.51  1800.9  501.83 1802.11  501.93

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
191.0301     .05   823.5    .075   969.2    .045 1047.04     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         969.2 1047.04              580     560     520             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
191.0301   539.9     484       T

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.259

INPUT
Description: 4.259
 LADUE FIS 22489  STANLEY SURVEY SECT.
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Station Elevation Data num= 340

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
334.31	477.47	334.41	477.45	335.02	477.34	338.75	476.75	339.38	476.64
344.45	475.83	346.37	475.38	347.43	475.29	349.53	474.67	351.76	474.29
352.4799	474.243	54.5999	473.943	56.0999	473.81	358.58	473.54	359.67	473.44
360.44	473.27	364.68	472.61	364.78	472.59	365.01	472.573	69.1099	472.27
369.81	472.24	379.95	471.96	385.02	471.7	386.46	471.653	89.0999	471.64
390.09	471.61	390.8	471.57	395	471.24	395.14	471.22	400.24	470.85
412.49	470.44	415.45	470.31	421.17	470.17	425.5	469.99	425.71	469.98
447.19	469.19	455.87	468.76	456.02	468.764	56.2299	468.75	461.09	468.63
466.16	468.294	71.2299	467.65	477.55	467.35	481.89	467.2	486.44	466.96
486.74	466.95	492.84	466.83	494.9	466.74	496.58	466.74	501.65	467.5
503.58	467.845	06.7299	468.35	507.92	468.65	511.15	469.6	511.8	469.76
512.25	469.74	514.96	469.42	516.59	469.19	516.87	469.16	517.26	469.08
520.93	468.39	521.94	468.155	23.3599	467.89	525.27	467.49	527.01	467.18
529.46	467.075	29.5999	467.07	537.15	466.835	42.2199	466.78	557.44	466.05
559.9699	466.09	564.3	466.12	566.08	466.19	572.65	466.34	582.79	466.14
587.8599	466.12	590.33	466.07	590.49	466.07	592.93	466.01	598	466.01
603.07	465.84	603.34	465.84	608.14	465.74	608.8	465.761	3.2199	465.36
623.3599	465.36	633.5	465.01	633.7	465.01	634.92	465.12	638.04	465.32
638.57	465.33	639.31	465.39	641.8	466	642.8	472	645.8	473
646.8	477	649.4	478	661.4	482	719.6	484	733.1	484
751.1	478	818	476	827	473	839	473	881.2	459
973.6	458	974.19	457.49	977.41	454.63	977.9	454.29	978.83	453.83
983.05	452.21	985.32	451.95	986.92	451.82	1000	450.58	1014.91	451.66
1016.98	451.77	1018.61	451.98	1021.69	452.69	1022.31	452.85	1022.64	453.01
1023.7	453.77	1026.01	455.38	1028.29	457.09	1029.71	458.07	1032.37	459.48
1033.41	459.96	1033.95	460.13	1039.61	460.51	1043.06	460.8	1044.5	460.91
1045.27	460.95	1050.93	460.85	1055.6	461.19	1056.58	461.22	1059.3	461.35
1062.24	461.57	1063	461.65	1066.7	462.22	1067.9	462.52	1070.39	463.36
1073.56	464.55	1074.09	464.8	1077.79	466.9	1079.22	467.83	1081.49	469.11
1084.87	471.15	1085.19	471.29	1085.79	471.43	1088.89	471.95	1095.88	472.7
1205.36	485.08	1205.49	485.1	1209.76	485.89	1210.46	486	1211.41	486.05
1214.17	486.25	1215.52	486.29	1220.57	486.24	1225.62	485.87	1227.4	485.71
1230.68	485.46	1231.81	485.4	1236.22	485.1	1240.63	484.95	1240.78	484.95
1241	484.94	1245.03	484.6	1245.84	484.59	1246.91	484.64	1249.44	484.83
1250.89	484.87	1252.83	485	1253.85	485.09	1255.94	485.21	1262.67	485.92
1266.05	486.21	1267.08	486.34	1270.59	486.72	1271.1	486.79	1271.49	486.83

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 1275.89  487.51 1276.16  487.54 1281.21  488.22 1286.26  489.09 1293.53  490.22
 1294.26  490.31 1296.37  490.61 1297.94  490.69 1300.18  490.74 1301.42   490.8
  1306.1  490.88 1316.58   490.8 1323.85  491.02 1324.39  491.02 1331.74  491.26
 1341.85  492.09 1342.02  492.11  1346.9  492.73 1347.53  492.82 1350.84  493.25
 1362.06  494.73 1367.11   495.3 1372.89  495.51 1377.12  495.58 1377.29  495.59
  1381.7   495.9 1382.27  495.93 1388.95  496.06 1392.38  496.16 1394.87  496.09
 1399.34     496 1402.48     496 1403.75  496.03 1407.54  496.06 1408.16  496.08
 1412.56   496.3 1417.64  496.16 1418.54  496.15 1421.38  496.03  1422.7  496.01
  1430.2  496.59 1430.38  496.61  1432.8  496.83 1437.86  496.77 1439.02  496.81
 1446.95  497.17 1447.83   497.2 1447.96  497.21 1452.24  497.25 1468.17  497.86
 1473.23  497.91  1483.1  498.18 1483.33  498.19 1488.39  498.23 1503.55  498.69
  1508.6   498.6 1513.96  498.81 1518.37  498.89 1523.76  498.85 1528.81  498.98
 1536.01  499.39 1538.92  499.54 1543.97  499.54 1548.75  499.38 1549.23  499.38
 1553.64  499.54 1560.58  499.67 1564.18  499.78  1566.5  499.81 1574.29  499.98
 1579.34     500 1580.09  500.04 1584.26  500.21  1584.4  500.22 1589.45  500.37
  1594.5  500.48 1602.01  500.85 1602.14  500.86 1604.61  500.96 1609.66  500.81
 1614.72  500.53 1615.36  500.46 1619.77  500.04 1624.18  499.28 1629.88  498.45
 1634.93   498.1 1637.41  497.79 1637.52  497.78 1639.98  497.48 1641.82  497.33
 1643.44  497.14 1645.03     497 1646.22  496.95 1649.36  496.89 1650.09  496.86
 1650.63  496.89 1655.04  497.23 1655.27  497.23 1659.45  497.15 1660.19  497.15
 1672.68  497.66 1673.03  497.67 1675.35  497.77 1680.41   497.8 1690.31  498.03
 1690.51  498.03 1690.78  498.04 1694.72  498.12 1695.57  498.12 1700.62  498.64
 1705.67  498.17 1707.95  498.14 1708.54  498.14 1720.83  498.05 1726.29  497.89
 1729.99   497.9 1735.99  497.79 1741.04  497.89  1746.1  497.92 1751.15  498.01
 1752.03     498 1755.89  497.89 1756.44  497.89 1760.85  497.97 1761.26  497.97
 1769.67  497.81 1771.36   497.8 1773.64  497.65 1774.08  497.63 1776.42  497.47
 1781.47   496.7 1786.52  495.84  1787.3  495.69 1791.58  494.78 1791.71  494.76
 1796.63  493.87 1797.31  493.82 1801.68  493.42 1806.74  493.44 1811.79  492.95
 1816.84  492.28 1821.89  491.84 1822.57   491.8  1826.9  491.63    1832   491.5
 1837.05  491.49 1842.11  491.26 1844.61  491.29 1847.16  491.33 1849.02   491.7
 1850.58  492.12 1852.21  492.47 1857.27  494.27 1857.84  494.54 1861.77  496.17
 1862.25  496.38 1862.41  496.43 1866.66  497.51 1867.37  497.66 1870.78   497.9

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
  334.31     .05     818    .045   973.6    .045 1043.06    .045

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

```
         973.6 1043.06              480     500     530             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  334.31   661.4     482       T

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.165

INPUT
Description: 4.165
Station Elevation Data    num=      90
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    4058     480    4197     474 4321.29  469.62 4326.34  469.62 4331.39  469.53
 4333.73  469.54 4334.18  469.53 4336.45  469.53 4342.55  469.39 4346.01   469.2
 4351.37  469.06 4356.66   469.1 4361.71  468.93 4363.76  468.91  4364.6  468.92
 4366.76  468.87    4369  468.73 4373.41  468.49 4375.59  468.41 4376.87  468.34
 4377.82  468.32 4381.92  468.12 4382.23  468.12 4386.64  468.05 4386.98  468.04
 4391.05  468.03 4392.03  468.04 4402.13  467.97 4404.28  467.86 4407.19  467.69
 4408.69  467.68 4417.51  467.76 4432.45  467.21 4434.74  467.29 4435.15  467.31
 4439.56  467.45 4440.66  467.45 4442.56  467.49 4443.97  467.46 4446.57   467.5
 4447.61  467.49 4448.38  467.51 4452.66  467.54 4452.79  467.52  4457.2  466.98
 4457.72  466.94  4458.4  466.94 4461.61  467.05 4467.82  467.05 4474.84  466.78
 4487.98   466.3 4493.09  466.12    4496     466  4506.4     468  4559.1     474
  4582.9     476  4650.9     476  4662.6     476  4833.3     474  4836.3     474
  4840.3     473  4852.3     473  4894.3     459  4974.8     458 4977.34  456.34
 4977.57   456.2 4978.16  455.82 4978.91  455.06 4982.06   451.5  4983.2  450.39
 4988.23  450.18    5000  449.16 5008.98  450.17 5013.37   450.1 5013.79  450.15
 5017.95   450.7 5018.46  450.76 5019.12  451.01 5022.44  451.74  5023.5  452.19
 5024.86  453.12 5026.92  454.85 5028.54  455.89  5030.6  457.11 5031.41  457.55
  5032.2     458  5069.2     459    5116     474  5194.1     475  5556.1     477

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
    4058     .05  4836.3    .045  4974.8    .045  5032.2    .045
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        4974.8  5032.2               28      28      28             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    4058  4582.9     476       T

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.16

INPUT
Description: 4.16
This is a REPEATED section.
Station Elevation Data    num=      85
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    4127     476 4323.02  469.13 4393.75  467.52 4398.17  467.52 4398.81  467.51
 4399.67  467.49 4402.58  467.44 4403.86  467.41 4405.58   467.4 4406.99  467.39
 4408.91  467.37  4411.4  467.34  4411.5  467.34 4413.97  467.31 4415.81  467.29
 4417.41  467.26 4419.02  467.24 4420.22  467.22 4423.33  467.21 4424.07   467.2
 4424.63  467.19 4428.44  467.14 4429.04  467.13 4429.24  467.13 4433.45  467.11
 4434.18  467.11 4435.16  467.12 4437.86  467.14 4439.23  467.15 4441.07  467.14
 4442.27  467.12 4444.28  467.11 4446.68  467.08 4446.99  467.08 4449.34  467.05
 4451.09  467.03  4452.9  467.03 4454.39  467.02  4455.5  467.01 4458.82  466.97
 4459.44  466.97 4459.91  466.96 4463.09  466.93 4464.32  466.91  4464.5   466.9
 4464.74   466.9 4468.73   466.8 4469.55  466.78 4470.65  466.74 4473.14  466.67
  4474.6  466.62 4476.57  466.58 4477.55  466.57 4479.65  466.52 4481.96  466.46
 4482.48  466.45 4484.71   466.4 4486.37  466.35  4488.4  466.26 4489.76  466.22
 4490.78  466.17 4494.31  465.98 4494.81  465.96  4506.5     466  4566.6     472
  4619.6     474  4675.7     476  4691.5     476  4831.5     473  4843.5     473
  4885.5     459  4970.3     458  4980.3     452 4984.77  450.63    5000  449.16
 5015.12  450.27 5016.38  450.38 5019.24  450.84 5020.15  450.94 5020.87  452.12
  5024.5     458  5067.2     459    5114     474  5174.3     475  5508.6     476

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
    4127    .075  4506.5    .045  4970.3    .045  5024.5    .045
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        4970.3  5024.5               14      14      14             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    4127  4675.7     476       T

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.157

INPUT
Description: 4.157
 LADUE FIS 21947  D.S. FACE OF ROCK HILL RD.
Station Elevation Data    num=     128
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    4136     476 4330.08  469.18 4332.56   469.1 4332.64   469.1 4335.13  469.02
 4337.05  469.01 4338.48  468.96 4340.19  468.94 4341.46  468.96 4344.39  468.93
 4345.24  468.94 4345.87  468.92 4350.18  468.86 4350.28  468.87 4350.29  468.86
 4350.31  468.86 4354.69  468.98 4355.34  468.97 4356.23  468.92  4359.1   468.8
  4360.4  468.74 4362.14  468.69 4363.51  468.66 4365.45   468.6 4367.92  468.51
 4368.06  468.51  4370.5  468.41 4372.33  468.35 4373.97  468.27 4375.56  468.22
 4376.74  468.11 4379.89   467.9 4380.61  467.84 4381.15  467.83 4384.84  467.77
 4385.56  467.78  4385.8  467.78 4389.97  467.68 4390.71  467.67 4391.72  467.63
 4394.38  467.55 4395.77  467.49 4397.63  467.53 4398.79  467.58 4400.82   467.6
  4403.2  467.64 4403.55  467.63 4405.87  467.65 4407.61  467.63 4409.46  467.57
 4410.93  467.54 4412.02  467.51 4415.38  467.51 4415.98  467.49 4416.43  467.48
 4419.49  467.44 4420.84  467.43 4426.08  467.43 4427.21  467.42 4429.65  467.44
 4431.14  467.43 4434.06  467.43 4436.19  467.41 4438.47  467.29 4439.04  467.27
 4441.24  467.15 4442.88  467.14 4444.96  467.07  4446.3  467.04 4447.29  467.04
 4450.87     467 4451.35  466.99  4451.7     467 4454.15  467.01 4456.11  467.06
 4456.79  467.06 4460.52  467.12 4461.45  467.12  4462.7  467.13 4464.93  467.18
 4466.51  467.18 4468.62  467.07 4469.34  467.03 4471.56  466.93 4473.75  466.83
 4474.53  466.79 4476.61   466.7 4478.16  466.61 4480.45   466.5 4481.67  466.43
 4482.57  466.35 4486.36  466.09 4486.72  466.06 4486.98  466.04  4488.8  465.95
  4506.2     466  4566.1     472  4634.9     474  4671.5     476  4690.6     476
```

```
  4780.6     474  4830.6     473  4842.6     473  4884.6     459  4975.1     458
 4975.34  457.67 4976.65  455.09 4976.82  454.84 4977.02  454.68 4981.14  451.03
 4981.85  450.48 4982.77  450.41    5000  449.16 5017.23  450.22 5021.52  451.59
 5022.15  452.13 5022.97  452.78    5026  455.47 5026.73  456.04 5027.19   456.4
 5028.73  457.61  5029.2     458  5069.5     459  5112.2     473  5116.8     474
    5164     475  5207.6     476  5507.6     476

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
    4136    .075  4506.2    .045  4975.1    .045  5029.2    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        4975.1  5029.2               43      43      43             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    4136  4671.5     476       T

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.148

INPUT
Description: 4.148
Station Elevation Data    num=      78
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    4145     476 4339.54  470.25 4359.13     470 4359.75  469.99 4369.86  469.82
 4370.96  469.76 4373.44  469.62 4374.91  469.54 4376.88  469.41 4377.85  469.34
 4379.96   469.2 4382.26  469.06 4382.79  469.03 4385.02   468.9 4430.12   469.5
 4430.49   469.5  4440.6  469.17 4441.95  469.05    4444  468.86 4445.65  468.72
 4447.86  468.47 4448.41  468.41  4450.7  468.16 4452.82  467.99 4453.78  467.94
 4455.76   467.8 4457.23  467.77 4459.69  467.74 4460.81  467.71 4461.64   467.7
 4465.61  467.55 4465.86  467.54 4466.05  467.52 4467.34  467.34 4470.46  466.92
 4514.56  464.63 4516.39  464.56 4518.85  464.61 4518.97  464.61 4521.44  464.66
 4523.38  464.71 4524.76  464.76  4526.5  464.81 4527.79  464.78 4530.68  464.68
 4531.55  464.66  4532.2  464.65 4536.59  464.58 4536.65  464.58 4541.02  464.42
    4553     468  4572.2     474    4585     475    4610     475  4637.4     476
```

```
  4652.3     476    4736     475  4823.9     474  4826.9     473  4838.9     473
  4883.9     458  4975.5     457 4976.16  456.55 4977.87  454.65  4979.7  452.37
 4981.19  450.68    5000     448  5021.5  450.52 5022.73  451.24 5025.68  452.71
 5026.54  453.19 5027.19  453.97    5029     457  5063.8     458  5108.9     473
  5134.6     474  5137.8     475  5408.9     476

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
    4145    .075 4541.02    .045  4975.5    .045    5029    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        4975.5    5029              300     308     255             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    4145    4585     475       T

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.080

INPUT
Description: 4.080
Station Elevation Data    num=      79
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  476.85  473.04  479.13  472.95  479.58  472.93  481.85  472.84  484.09  472.72
  484.62   472.7  486.85  472.59  489.05   472.5  489.66  472.48  491.85  472.39
  494.02  472.31   494.7  472.29  496.85  472.21  498.98  472.09   523.8     471
  548.61  469.96  550.11   469.9  551.86  469.85  553.58   469.8  608.17   468.1
  610.56   468.1  611.86  468.09  613.14  468.05   615.6  467.98  616.86  467.94
   618.1  467.91  620.63  467.86  621.86  467.83  623.06   467.8  625.67  467.74
  626.86  467.71  659.42  466.81  661.18  466.79  661.88  466.79  662.42   466.7
  666.34  465.78  666.86  465.65  666.93  465.64  667.02  465.63   671.3  464.95
  671.98  464.95  672.87  465.04  675.74  465.59   679.9     468   694.1     472
   700.7   473.5   709.2     473   734.4     472   742.7   472.3   748.3     474
   852.3     474   855.3     473   867.3     473   912.3     458     973     457
  973.17  456.98  974.77  456.06  976.87  454.43  977.61  453.82  979.82  452.13
```

```
  982.05  451.13  982.72  450.81  984.12  450.17  984.86  449.84    1000  447.15
 1015.14  449.67 1017.57  450.72 1017.79  450.82 1020.19  451.86 1022.01  452.75
 1023.64  453.47 1025.23  454.23 1026.45  455.06 1029.49  456.99  1058.5     458
  1107.1     474  1111.1     474  1301.1     474  1379.7     476

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
  476.85    .075   679.9    .045  973.17    .045 1029.49    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        973.17 1029.49               80      92     105             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  476.85   700.7   473.5       T

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.073

INPUT
Description: 4.073
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   525.7     475   723.7     464   732.3     468   764.6     468   917.6     466
   927.7     464   934.5     462   943.6     460   986.9     450    1000   446.9
  1024.1     450  1066.4     465  1070.2     466  1192.5     467  1287.3     467
  1300.3     472  1330.2     473  1460.3     476

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   525.7    .075   943.6    .045  1066.4    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         943.6  1066.4               18      18      40             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
```

```
   525.7   732.3     468       T

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.069

INPUT
Description: 4.069
This is a REPEATED section.
Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   456.7     480   537.9     476   582.3     474   639.9     472   700.8     470
     765     468     842     466     943   461.1     944   461.1     981   460.3
     984     448    1003   447.5    1022   447.5    1025   456.6    1026   456.6
    1056   459.3    1057   459.4    1206   466.7    1430     468  1555.6     470
  1683.8     472  1863.4     474

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   456.7    .075     981    .045    1025    .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           981    1025               64      64      64             .3       .5

BRIDGE


RIVER: RIVER-1
REACH: Reach-1            RS: 4.060

INPUT
Description: S. McKnight Road Bridge
Distance from Upstream XS =      .5
Deck/Roadway Width        =      63
Weir Coefficient          =     2.4
Upstream  Deck/Roadway Coordinates
```

num= 24

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
350	486	486	400	483	483	460	480	480
525	477	477	595	474	474	690	471	471
765	468	468	842	466	466	943	465.7	461.1
944	465.7	464	1003	465.5	463.8	1056	465.2	463.7
1057	465.2	459.3	1206	466.7	466.7	1430	468	468
1780	468	468	1880	468	468	1935	471	471
2050	471	471	2080	474	474	2100	477	477
2110	480	480	2125	483	483	2150	486	486

Upstream Bridge Cross Section Data

Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
456.7	480	537.9	476	582.3	474	639.9	472	700.8	470
765	468	842	466	943	461.1	944	461.1	981	460.3
984	448	1003	447.5	1022	447.5	1025	456.6	1026	456.6
1056	459.3	1057	459.4	1206	466.7	1430	468	1555.6	470
1683.8	472	1863.4	474						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
456.7	.075	981	.045	1025	.075

Bank Sta: Left	Right	Coeff Contr.	Expan.
981	1025	.3	.5

Downstream Deck/Roadway Coordinates

num= 24

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
350	486	486	400	483	483	460	480	480
525	477	477	595	474	474	690	471	471
765	468	468	842	466	466	943	465.7	461.1
944	465.7	464	1003	465.5	463.8	1056	465.2	463.7
1057	465.2	459.3	1206	466.7	466.7	1430	468	468
1780	468	468	1880	468	468	1935	471	471
2050	471	471	2080	474	474	2100	477	477
2110	480	480	2125	483	483	2150	486	486

```
Downstream Bridge Cross Section Data
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     350     486     400     483   462.5     480   497.4     476   572.5     474
     634     472   715.9     470     765     468     842     466     943   461.1
     944   461.1     981   460.3     984     448    1003   447.5    1022   447.5
    1025   456.6    1026   456.6    1056   459.3    1057   459.4    1206   466.7
    1430     468  1604.7     470  1708.8     472    1905     474

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     350    .075     981    .045    1025    .075

Bank Sta: Left   Right    Coeff Contr.   Expan.
           981    1025             .3       .5

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =   465.2
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=    1003    Downstream=    1003
Upstream     num=       2
    Width   Elev    Width   Elev
       6   447.5       6   464.8
Downstream     num=       2
    Width   Elev    Width   Elev
       6   447.5       6   464.8

Number of Bridge Coefficient Sets =  1
```

```
Low Flow Methods and Data
       Yarnell                KVal =    1.25
Selected Low Flow Methods = Yarnell

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =.6726728
           Max Low Cord                =   464.8

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: RIVER-1
REACH: Reach-1            RS: 4.057

INPUT
Description: 4.057
 LADUE FIS 21422  D.S. FACE OF MCKNIGHT RD. - ROCK HILL
             CORPORATE LIMITS
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     350     486     400     483   462.5     480   497.4     476   572.5     474
     634     472   715.9     470     765     468     842     466     943   461.1
     944   461.1     981   460.3     984     448    1003   447.5    1022   447.5
    1025   456.6    1026   456.6    1056   459.3    1057   459.4    1206   466.7
    1430     468  1604.7     470  1708.8     472    1905     474

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     350    .075     981    .045    1025    .075
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           981    1025               43      43      43             .3       .5

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.049

INPUT
Description: 4.049
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   459.1     480   514.5     476     552     474   613.4     472   654.5     470
     950     465     965     460     977     455     985   446.8    1015   446.8
    1030     455    1050     460    1070     465  1605.4     470  1707.3     472
  1903.2     474

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   459.1     .07     950     .04    1070     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           950    1070              100      70      20             .1       .3

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 4.036

INPUT
Description: 4.036
 BRENTWOOD FIS =4.15
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     731     480   794.1     474   819.8     472   853.5     470     867     465
```

```
     963     460     973     455     985   445.9    1015   445.9    1055     465
  1268.9     468  1583.4     470  1703.1     472  1880.4     474

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     731     .07     963     .04    1055     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           963    1055                0       0       0             .1       .3
```

SUMMARY OF MANNING'S N VALUES

River:RIVER-1

Reach	River Sta.	n1	n2	n3	n4
Reach-1	4.743	.08	.04	.1	
Reach-1	4.625	.1	.04	.1	
Reach-1	4.612	.1	.04	.1	
Reach-1	4.563	.1	.04	.1	
Reach-1	4.464	.075	.045	.03	
Reach-1	4.419	.05	.075	.045	.05
Reach-1	4.365	.05	.075	.045	.05
Reach-1	4.259	.05	.045	.045	.045
Reach-1	4.165	.05	.045	.045	.045
Reach-1	4.16	.075	.045	.045	.045
Reach-1	4.157	.075	.045	.045	.045
Reach-1	4.148	.075	.045	.045	.045
Reach-1	4.080	.075	.045	.045	.045
Reach-1	4.073	.075	.045	.075	
Reach-1	4.069	.075	.045	.075	
Reach-1	4.060	Bridge			
Reach-1	4.057	.075	.045	.075	
Reach-1	4.049	.07	.04	.06	
Reach-1	4.036	.07	.04	.06	

SUMMARY OF REACH LENGTHS

River: RIVER-1

Reach	River Sta.	Left	Channel	Right
Reach-1	4.743	680	766	771
Reach-1	4.625	110	105	64
Reach-1	4.612	270	255	240
Reach-1	4.563	480	522.5	525
Reach-1	4.464	218	238	238
Reach-1	4.419	261	285	286
Reach-1	4.365	580	560	520
Reach-1	4.259	480	500	530
Reach-1	4.165	28	28	28
Reach-1	4.16	14	14	14
Reach-1	4.157	43	43	43
Reach-1	4.148	300	308	255
Reach-1	4.080	80	92	105
Reach-1	4.073	18	18	40
Reach-1	4.069	64	64	64
Reach-1	4.060	Bridge		
Reach-1	4.057	43	43	43
Reach-1	4.049	100	70	20
Reach-1	4.036	0	0	0

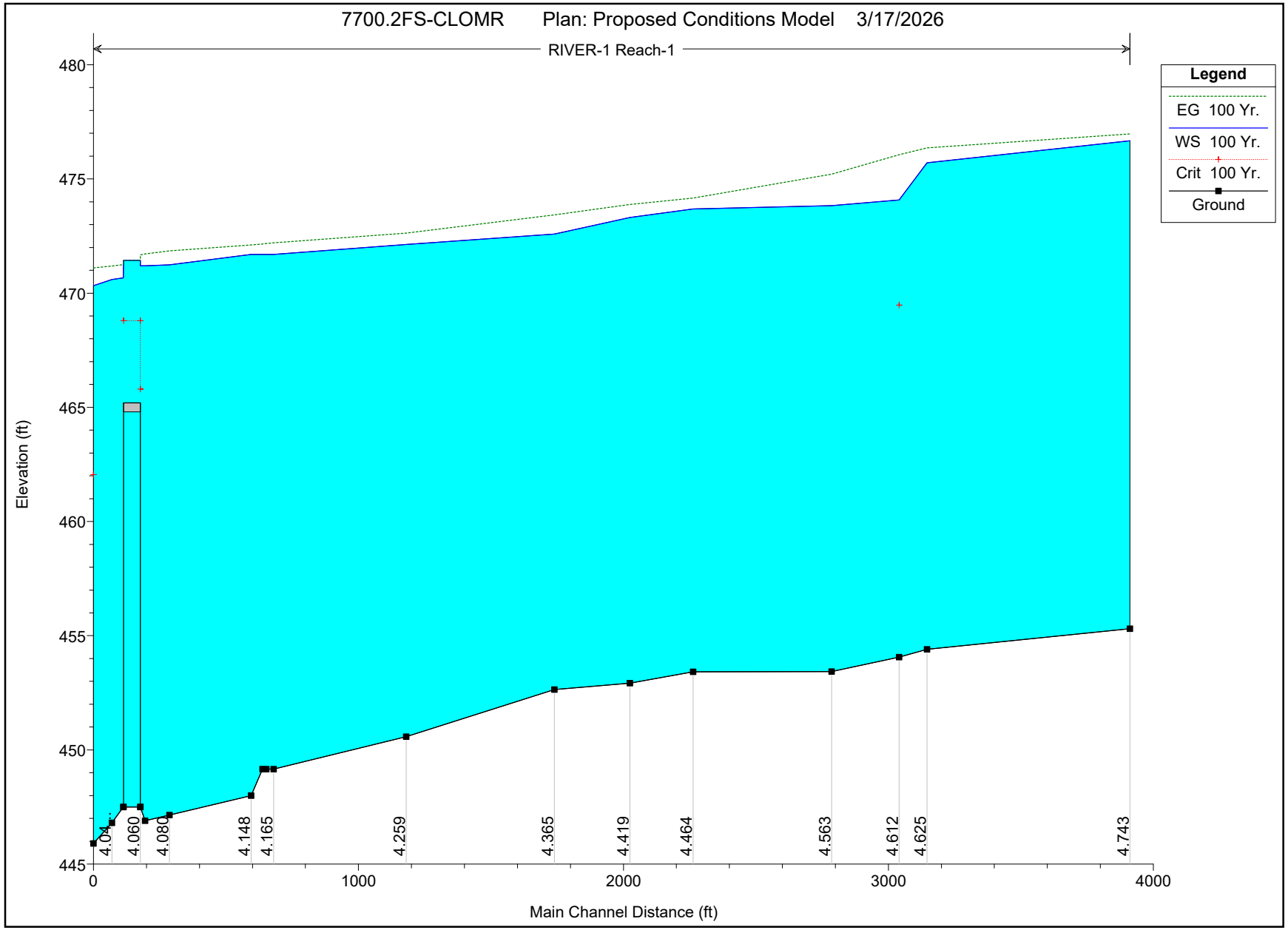
SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: RIVER-1

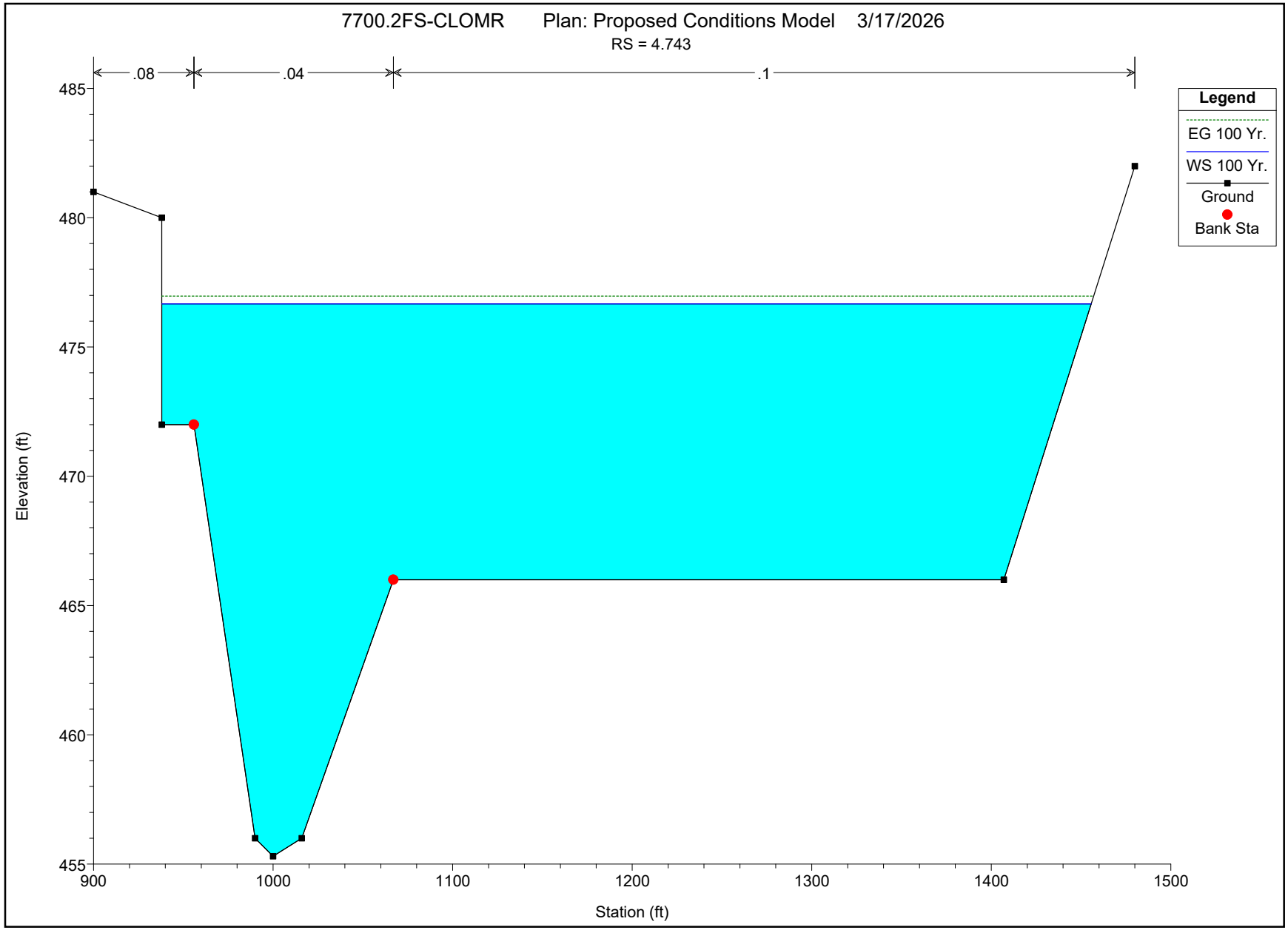
Reach	River Sta.	Contr.	Expan.

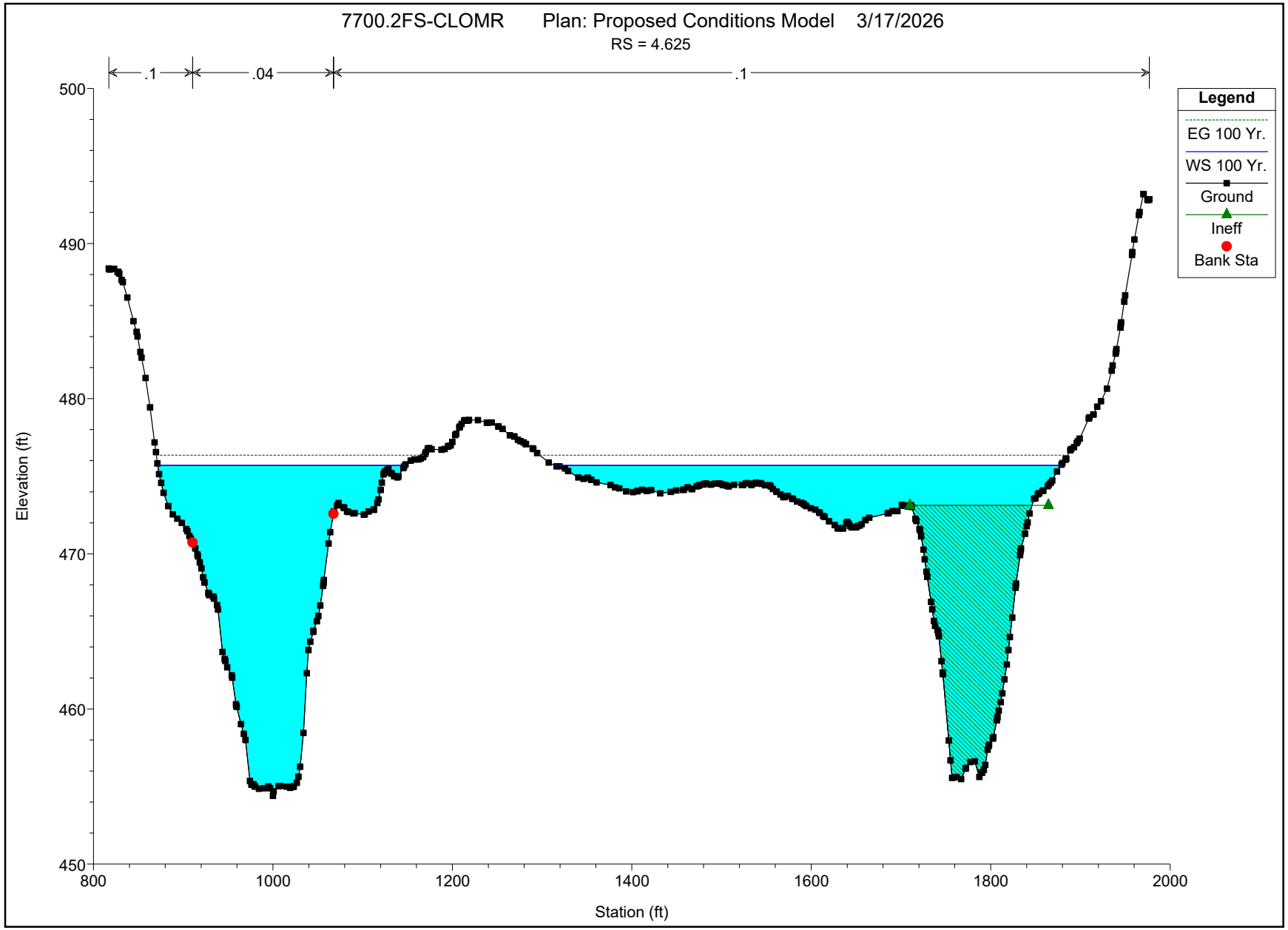
Reach-1	4.743		.1	.3
Reach-1	4.625		.1	.3
Reach-1	4.612		.1	.3
Reach-1	4.563		.1	.3
Reach-1	4.464		.1	.3
Reach-1	4.419		.1	.3
Reach-1	4.365		.1	.3
Reach-1	4.259		.1	.3
Reach-1	4.165		.1	.3
Reach-1	4.16		.1	.3
Reach-1	4.157		.1	.3
Reach-1	4.148		.1	.3
Reach-1	4.080		.3	.5
Reach-1	4.073		.3	.5
Reach-1	4.069		.3	.5
Reach-1	4.060	Bridge		
Reach-1	4.057		.3	.5
Reach-1	4.049		.1	.3
Reach-1	4.036		.1	.3

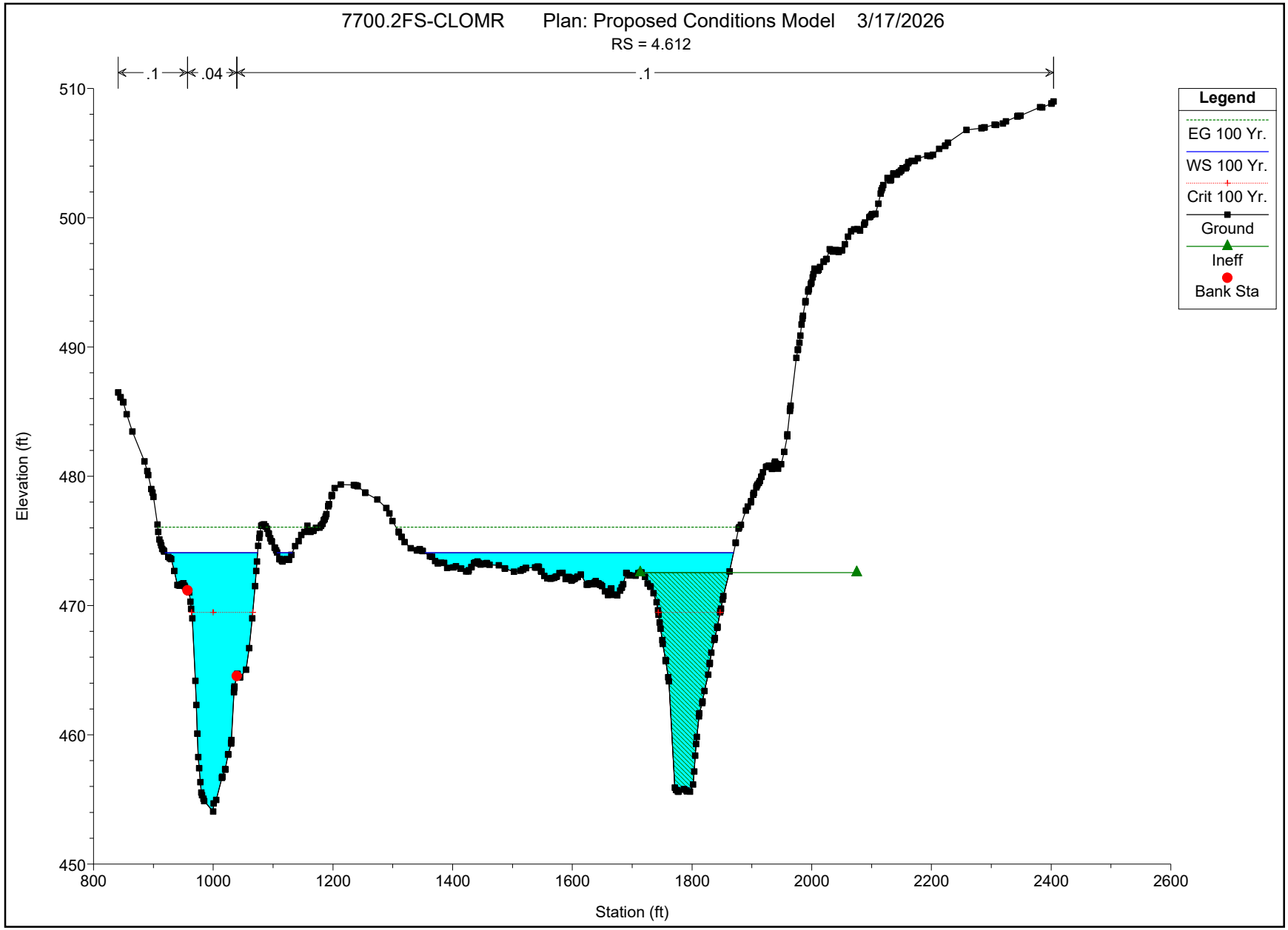
HEC-RAS Plan: PrCond River: RIVER-1 Reach: Reach-1

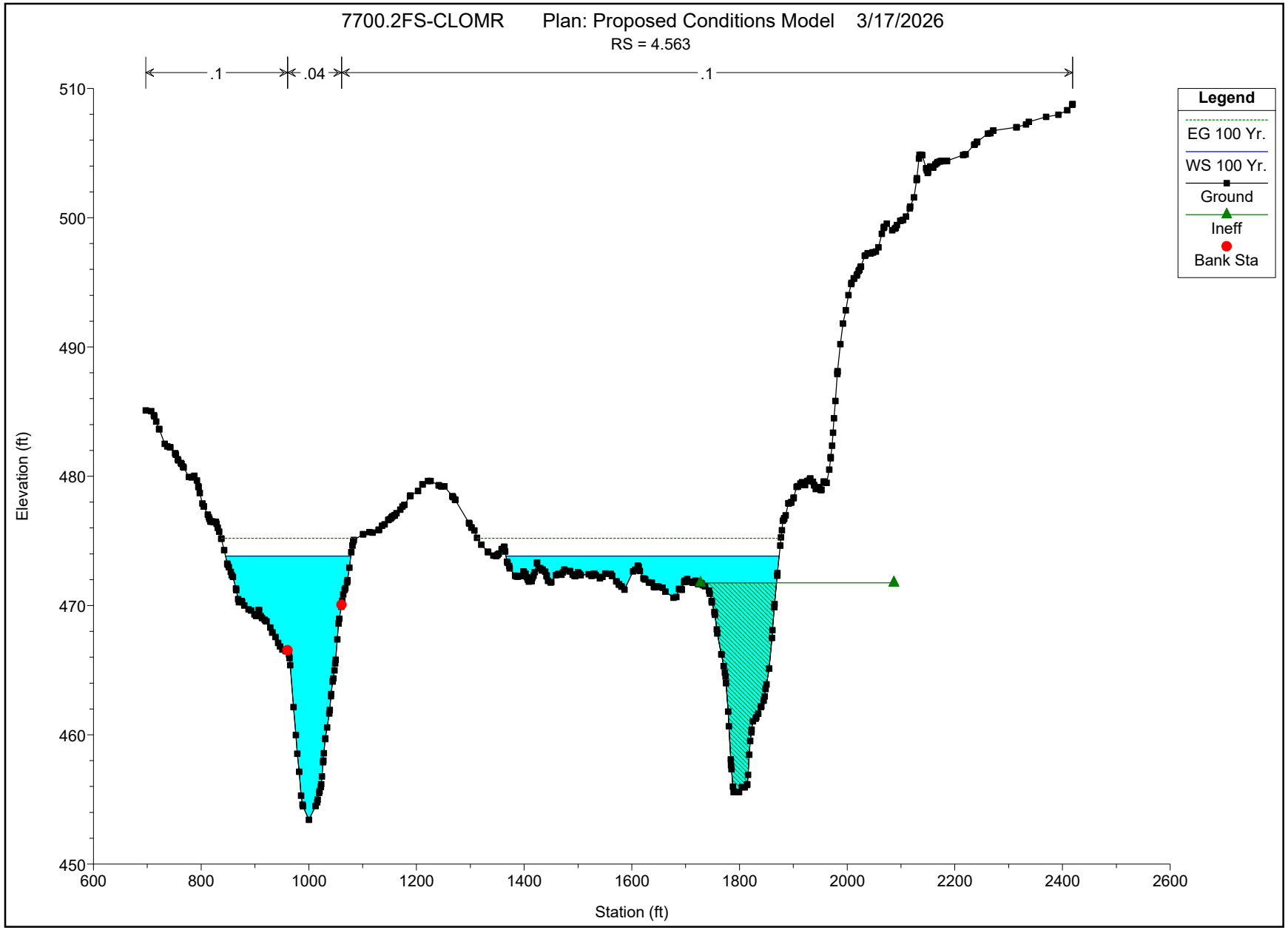
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	4.743	15 Yr.	11300.00	455.30	474.30		474.53	0.000536	4.77	4531.51	506.85	0.23
Reach-1	4.743	100 Yr.	16358.00	455.30	476.67		476.97	0.000580	5.53	5747.01	517.67	0.24
Reach-1	4.625	15 Yr.	11300.00	454.40	473.43		473.97	0.000948	5.87	2146.25	501.54	0.30
Reach-1	4.625	100 Yr.	16358.00	454.40	475.71		476.36	0.000990	6.73	3711.32	840.04	0.31
Reach-1	4.612	15 Yr.	11300.00	454.06	472.22		473.72	0.002668	10.02	1336.28	384.43	0.49
Reach-1	4.612	100 Yr.	16358.00	454.06	474.08	469.48	476.07	0.003155	11.90	2344.39	695.15	0.54
Reach-1	4.563	15 Yr.	11300.00	453.43	471.86		473.01	0.002093	8.76	1613.67	465.56	0.44
Reach-1	4.563	100 Yr.	16358.00	453.43	473.83		475.21	0.002249	10.02	2909.75	740.73	0.47
Reach-1	4.464	15 Yr.	11300.00	453.42	471.62		472.06	0.001042	6.67	2702.42	791.82	0.30
Reach-1	4.464	100 Yr.	16358.00	453.42	473.68		474.17	0.001078	7.37	3772.06	849.89	0.31
Reach-1	4.419	15 Yr.	11300.00	452.92	471.46		471.81	0.000895	5.65	2741.92	505.40	0.26
Reach-1	4.419	100 Yr.	16358.00	452.92	473.32		473.88	0.001317	7.22	3159.28	547.11	0.32
Reach-1	4.365	15 Yr.	11770.00	452.64	471.00		471.51	0.001226	6.64	2392.23	341.80	0.30
Reach-1	4.365	100 Yr.	17157.00	452.64	472.58		473.43	0.001820	8.61	2705.79	369.82	0.37
Reach-1	4.259	15 Yr.	11770.00	450.58	470.69		470.99	0.000583	5.02	2803.05	475.57	0.22
Reach-1	4.259	100 Yr.	17157.00	450.58	472.13		472.63	0.000883	6.53	3152.96	518.28	0.27
Reach-1	4.165	15 Yr.	11770.00	449.16	470.41		470.70	0.000545	5.15	2880.30	473.46	0.21
Reach-1	4.165	100 Yr.	17157.00	449.16	471.70		472.20	0.000856	6.75	3200.78	529.24	0.27
Reach-1	4.16	15 Yr.	11770.00	449.16	470.41		470.68	0.000528	5.05	2949.92	515.56	0.20
Reach-1	4.16	100 Yr.	17157.00	449.16	471.70		472.17	0.000828	6.61	3278.99	573.11	0.26
Reach-1	4.157	15 Yr.	11770.00	449.16	470.41		470.67	0.000506	4.98	2997.79	508.86	0.20
Reach-1	4.157	100 Yr.	17157.00	449.16	471.69		472.15	0.000795	6.52	3329.71	566.14	0.25
Reach-1	4.148	15 Yr.	11770.00	448.00	470.41		470.65	0.000424	4.69	3169.29	480.88	0.18
Reach-1	4.148	100 Yr.	17157.00	448.00	471.69		472.11	0.000677	6.17	3501.86	536.30	0.24
Reach-1	4.080	15 Yr.	11770.00	447.15	470.15		470.49	0.000587	5.53	2684.21	362.85	0.22
Reach-1	4.080	100 Yr.	17157.00	447.15	471.24		471.85	0.000977	7.40	2927.99	399.18	0.29
Reach-1	4.073	15 Yr.	11770.00	446.90	470.09		470.43	0.000596	5.05	3684.81	681.30	0.22
Reach-1	4.073	100 Yr.	17157.00	446.90	471.20		471.72	0.000889	6.44	4450.77	704.08	0.27
Reach-1	4.069	15 Yr.	11770.00	447.50	470.06	463.17	470.41	0.000955	6.44	4440.01	860.14	0.24
Reach-1	4.069	100 Yr.	17157.00	447.50	471.20	465.80	471.67	0.001328	7.85	5481.48	967.87	0.29
Reach-1	4.060		Bridge									
Reach-1	4.057	15 Yr.	11750.00	447.50	467.51		468.48	0.002435	9.46	2574.02	562.74	0.38
Reach-1	4.057	100 Yr.	17035.00	447.50	470.67		471.25	0.001588	8.45	5042.88	951.20	0.32
Reach-1	4.049	15 Yr.	11750.00	446.80	467.50		468.33	0.001532	7.47	2018.24	535.80	0.37
Reach-1	4.049	100 Yr.	17035.00	446.80	470.60		471.19	0.000998	6.99	4458.53	993.80	0.31
Reach-1	4.036	15 Yr.	11750.00	445.90	467.45	459.01	468.22	0.001149	7.39	2127.30	369.30	0.33
Reach-1	4.036	100 Yr.	17035.00	445.90	470.33	462.06	471.10	0.001044	7.89	3726.53	755.21	0.32

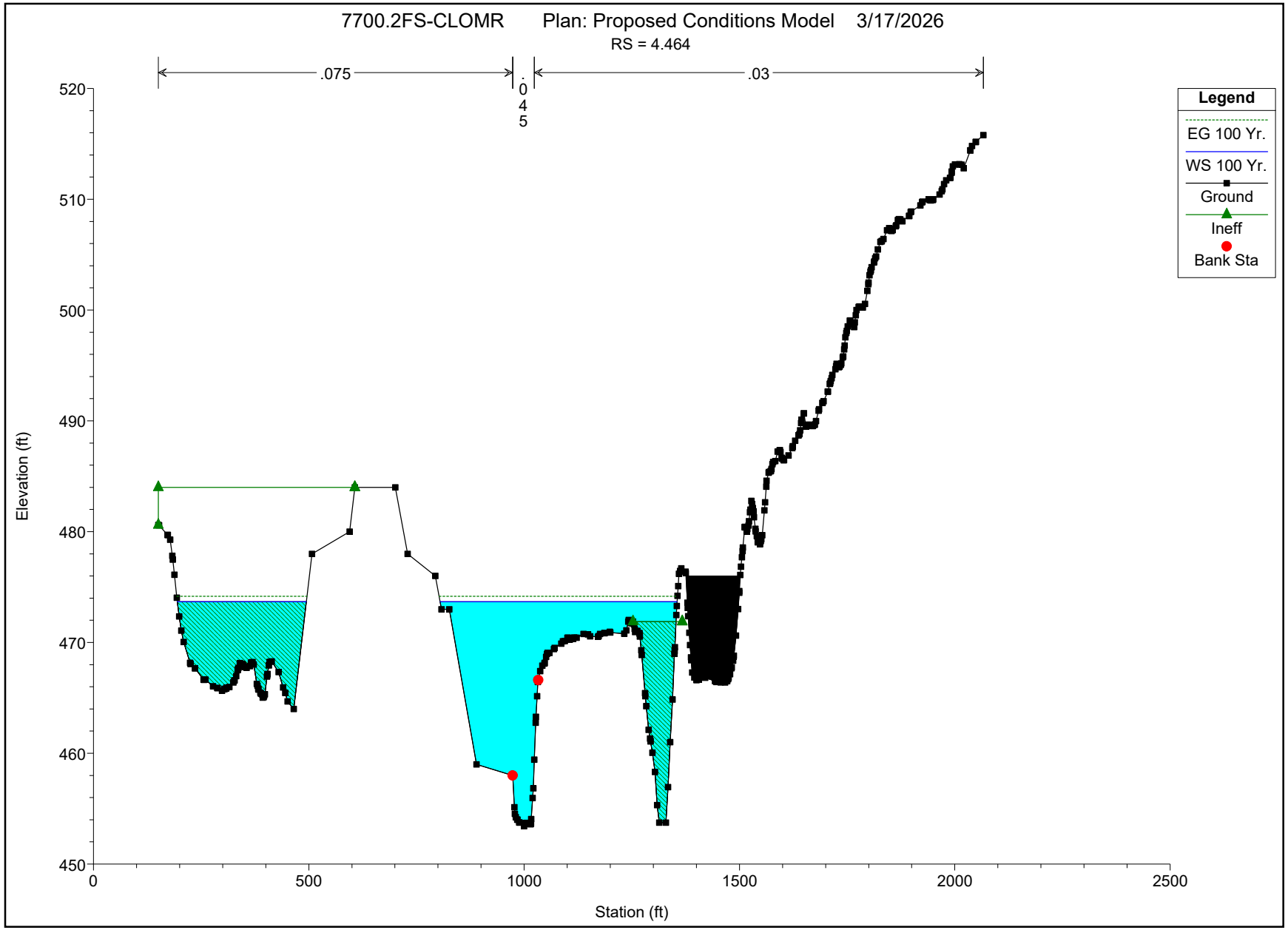

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RIVER-1 Reach-1
Legend
EG 100 Yr.
WS 100 Yr.
Crit 100 Yr.
Ground
Elevation (ft)
480
475
470
465
460
455
450
445
0
1000
2000
3000
4000
Main Channel Distance (ft)
4.04
4.060
4.080
4.148
4.165
4.259
4.365
4.419
4.464
4.563
4.612
4.625
4.743

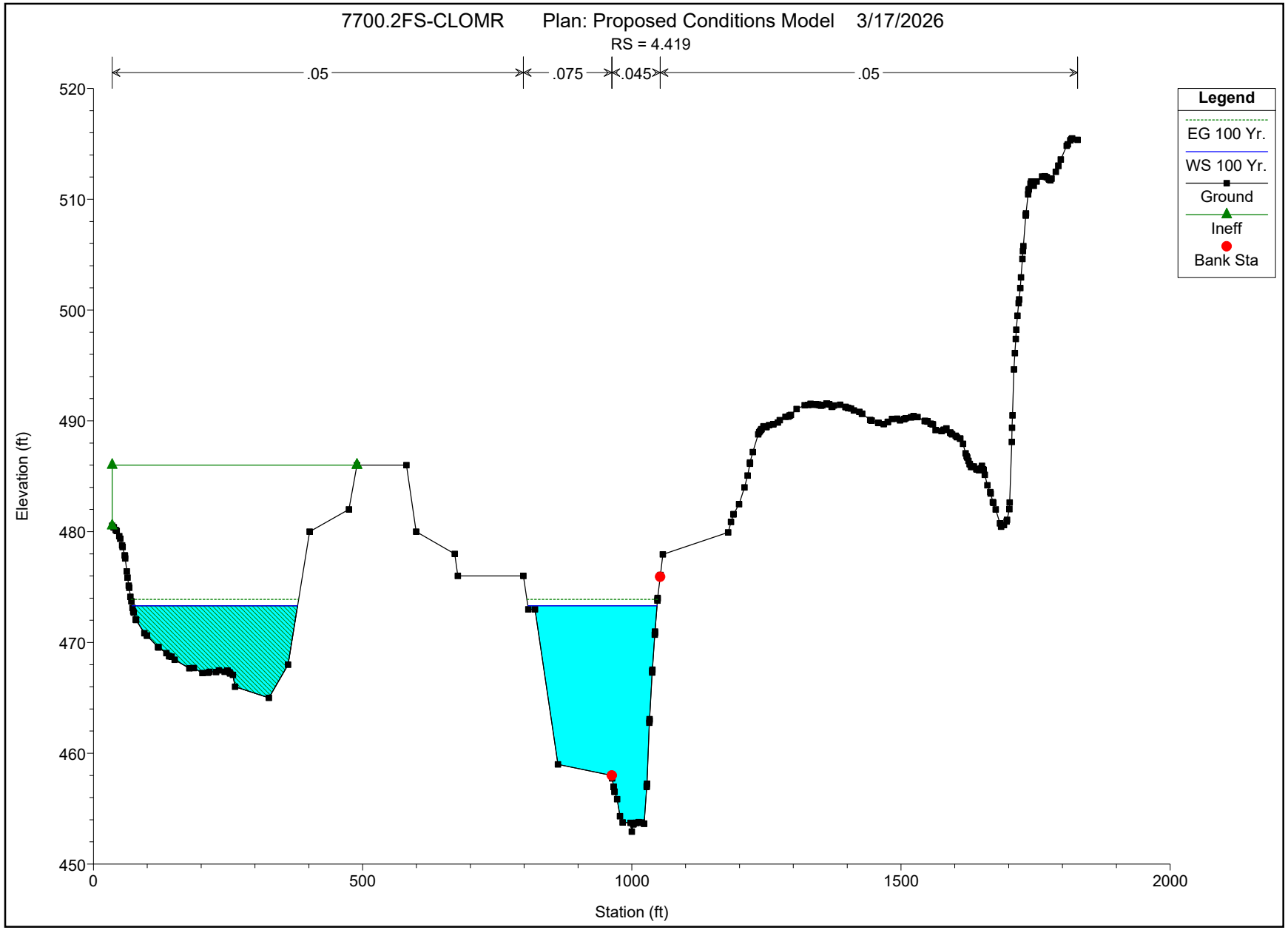

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.743
.08
.04
.1
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Bank Sta
Elevation (ft)
Station (ft)
485
480
475
470
465
460
455
900
1000
1100
1200
1300
1400
1500

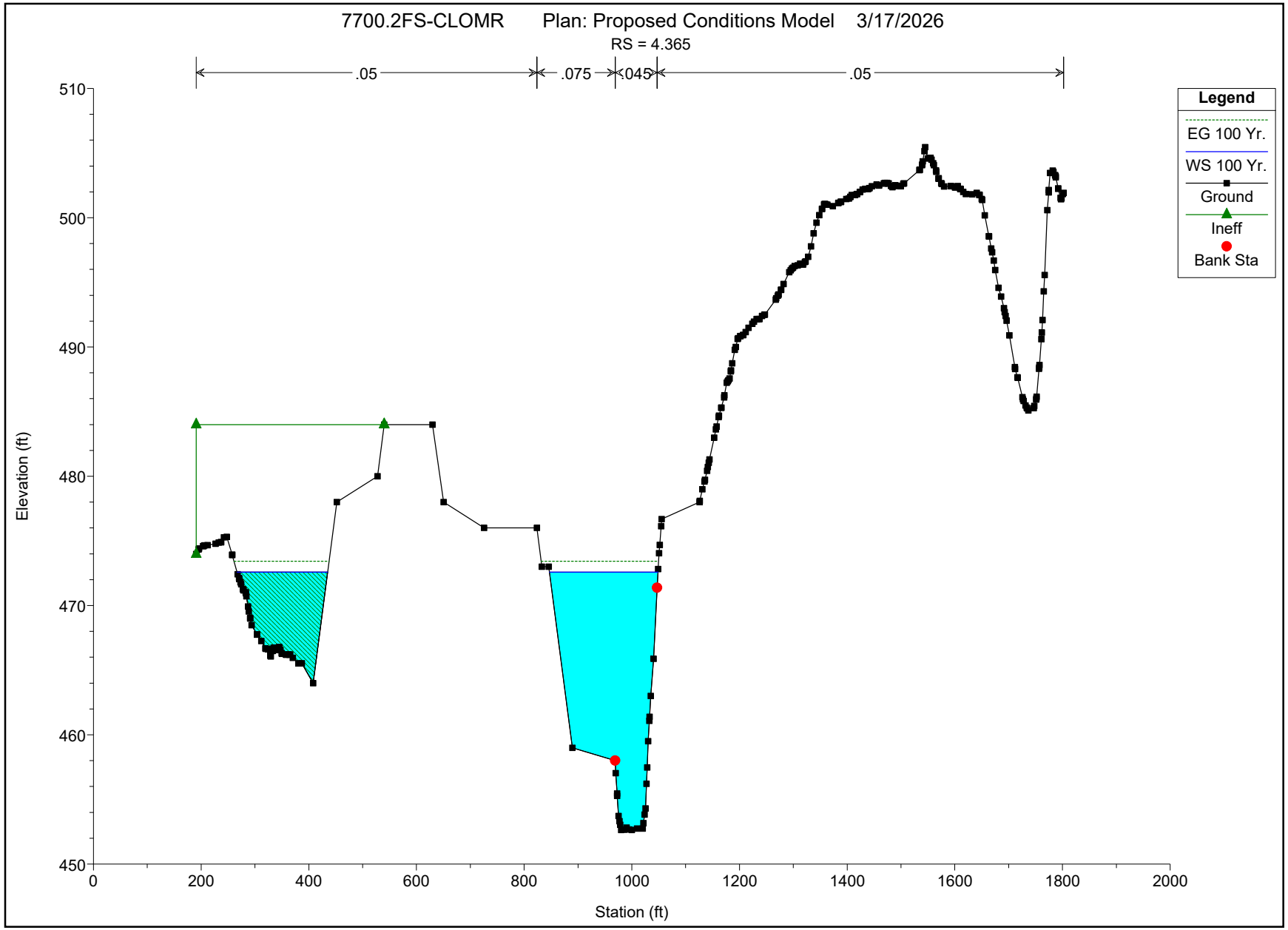

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.625
.1
.04
.1
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
500
490
480
470
460
450
800
1000
1200
1400
1600
1800
2000

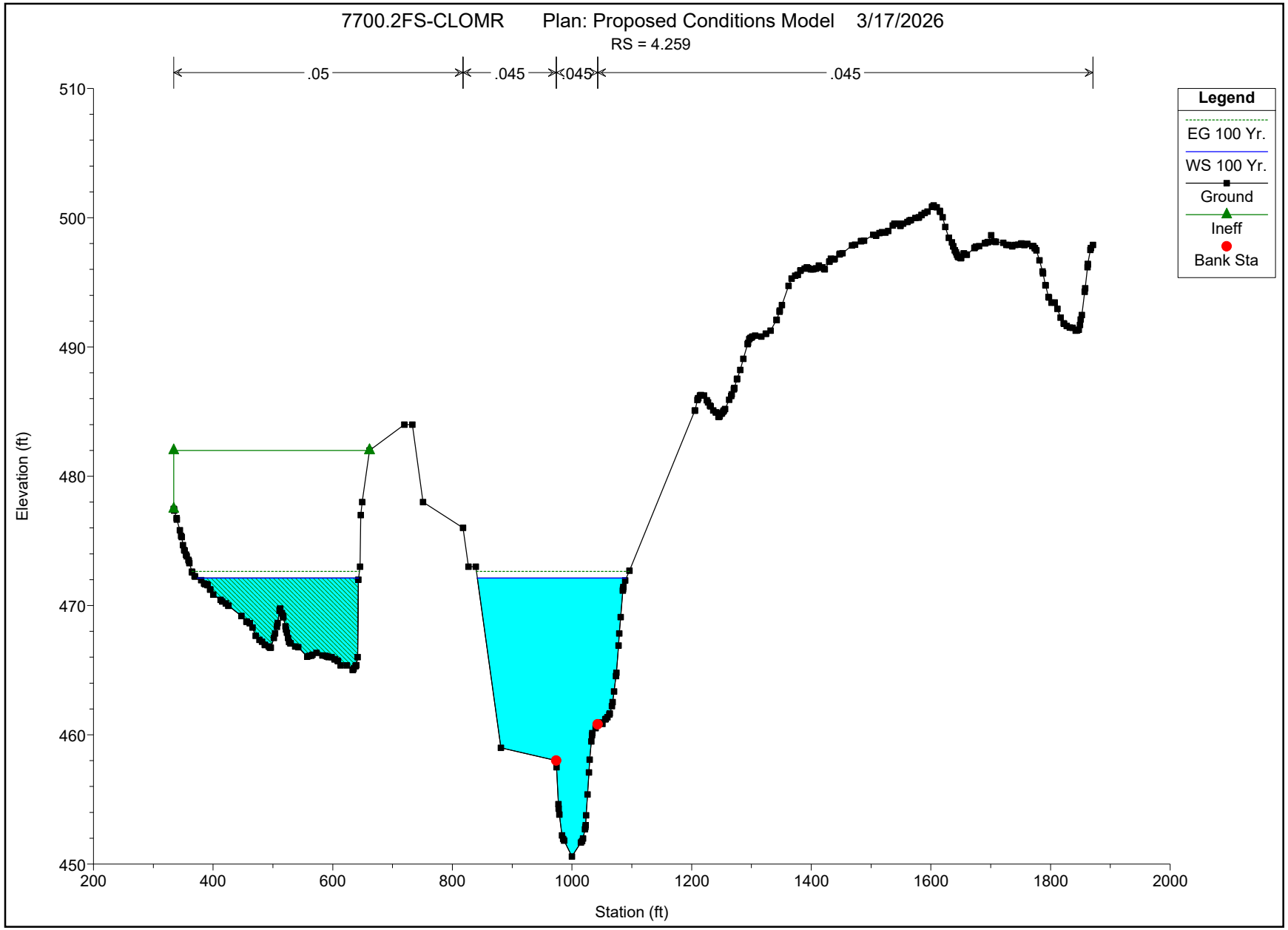

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.612
.1
.04
.1
Legend
EG 100 Yr.
WS 100 Yr.
Crit 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
510
500
490
480
470
460
450
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
Station (ft)

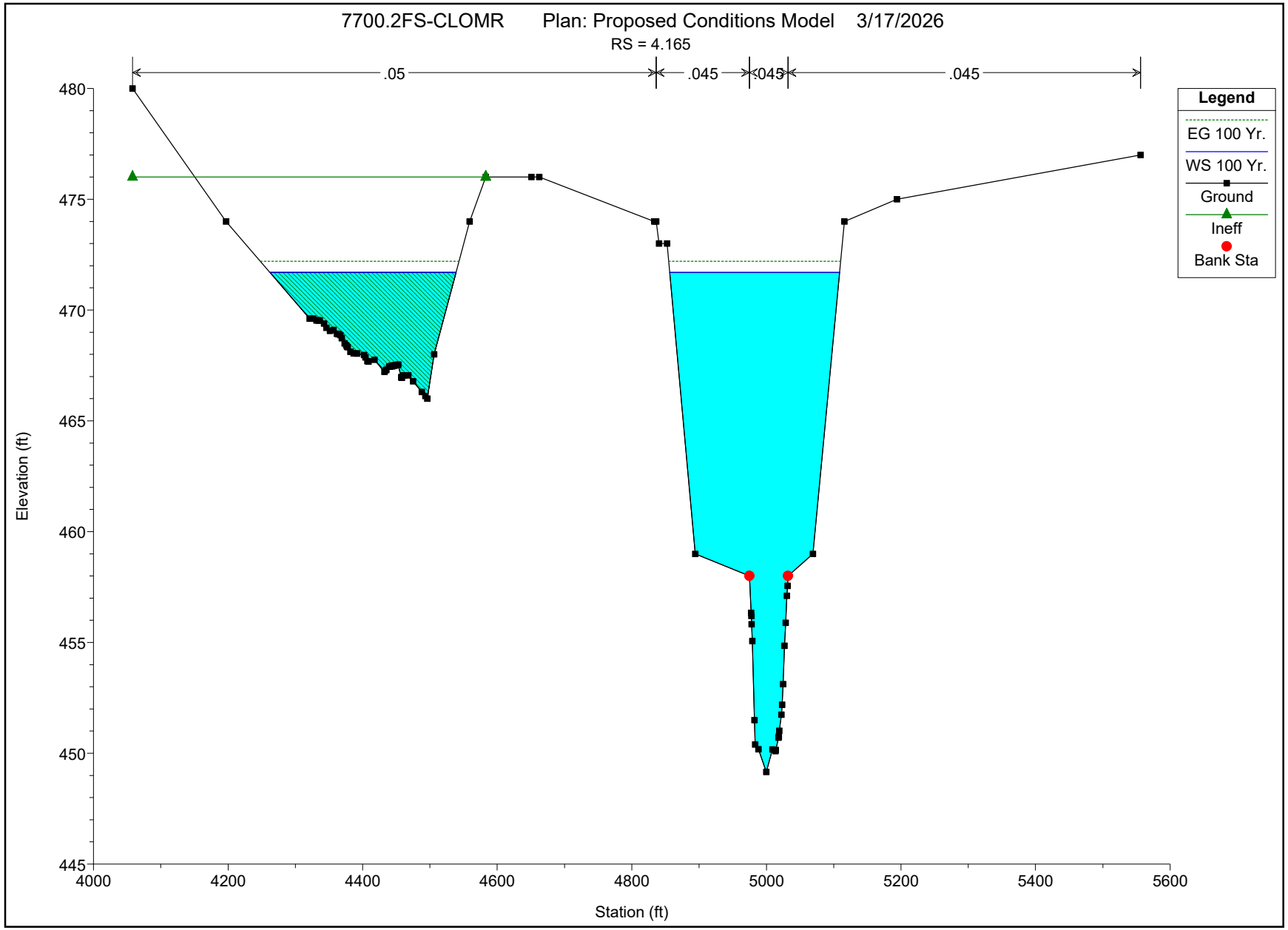

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.563
.1
.04
.1
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
510
500
490
480
470
460
450
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600

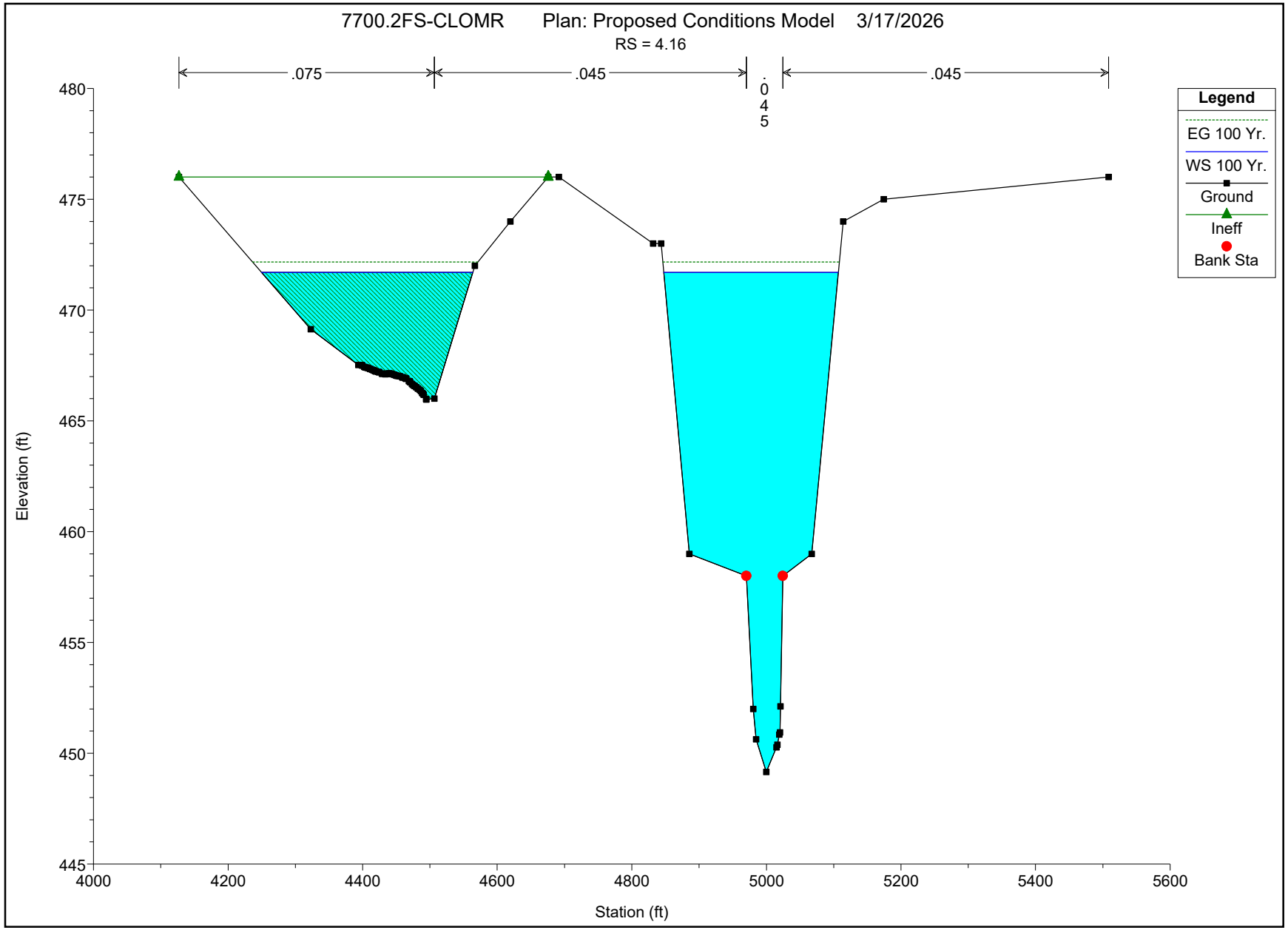

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.464
.075
.045
.03
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
520
510
500
490
480
470
460
450
0
500
1000
1500
2000
2500

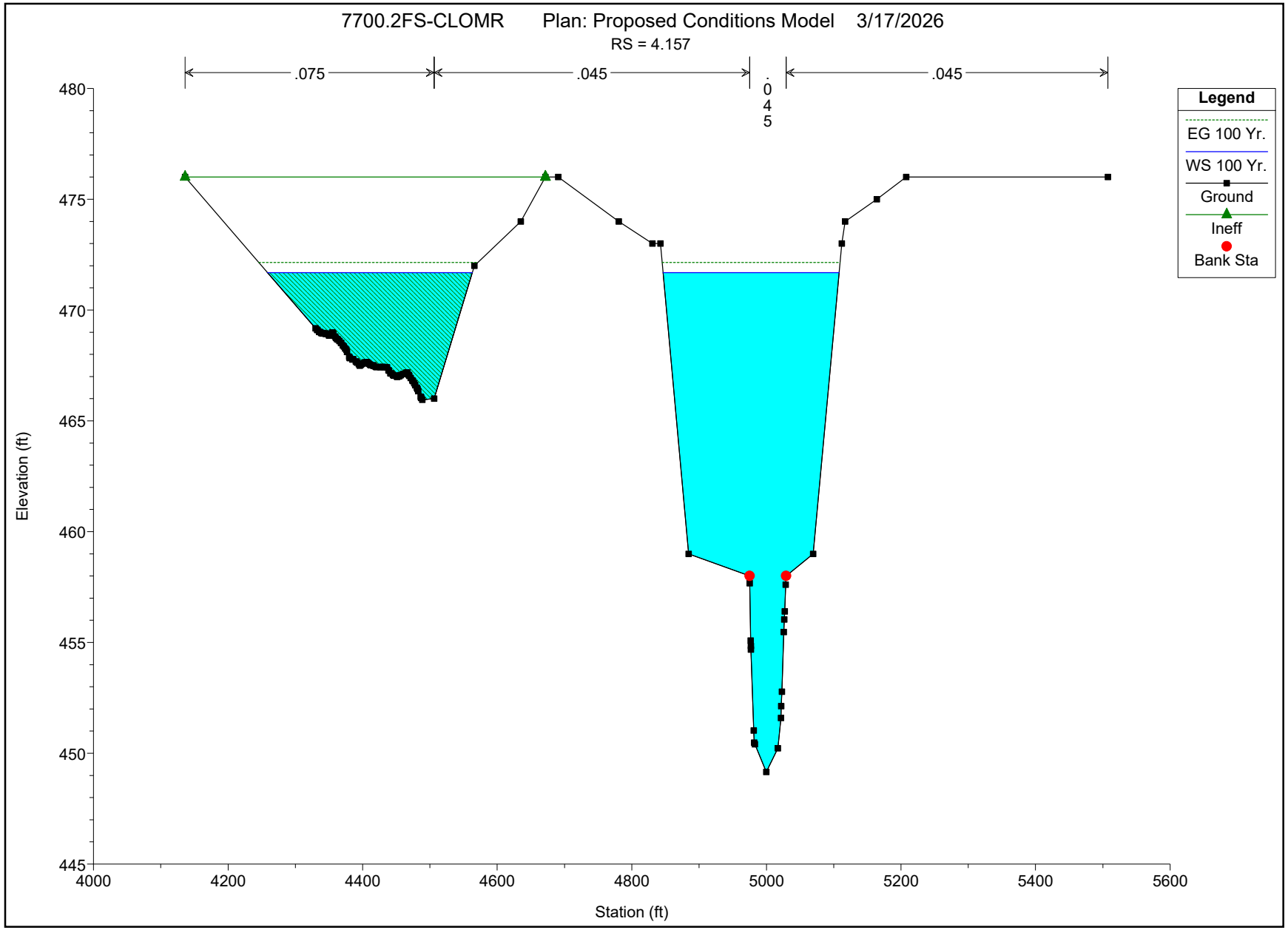

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.419
.05
.075
.045
.05
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
520
510
500
490
480
470
460
450
0
500
1000
1500
2000
Station (ft)

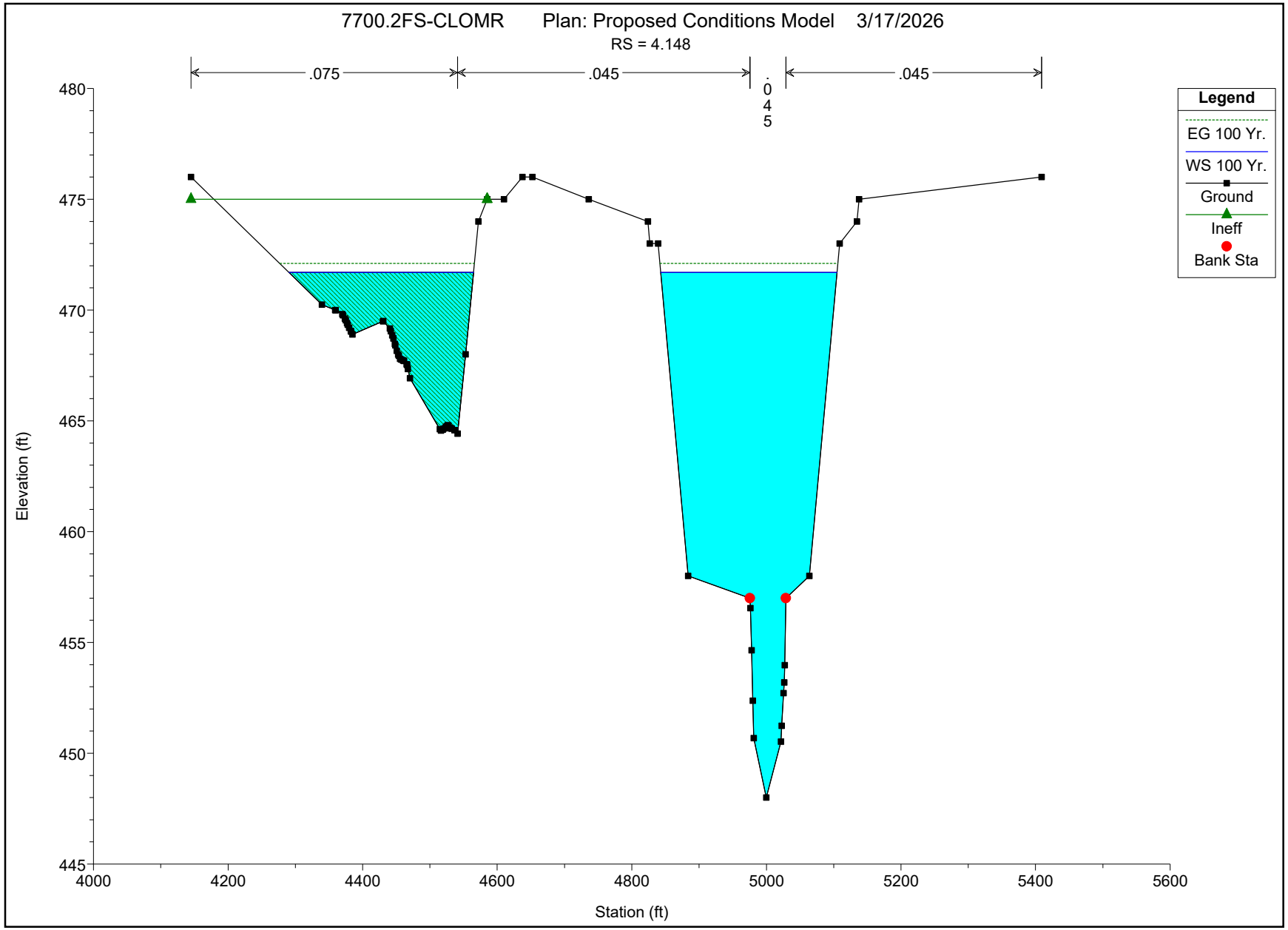

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.365
.05
.075
.045
.05
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
510
500
490
480
470
460
450
0
200
400
600
800
1000
1200
1400
1600
1800
2000

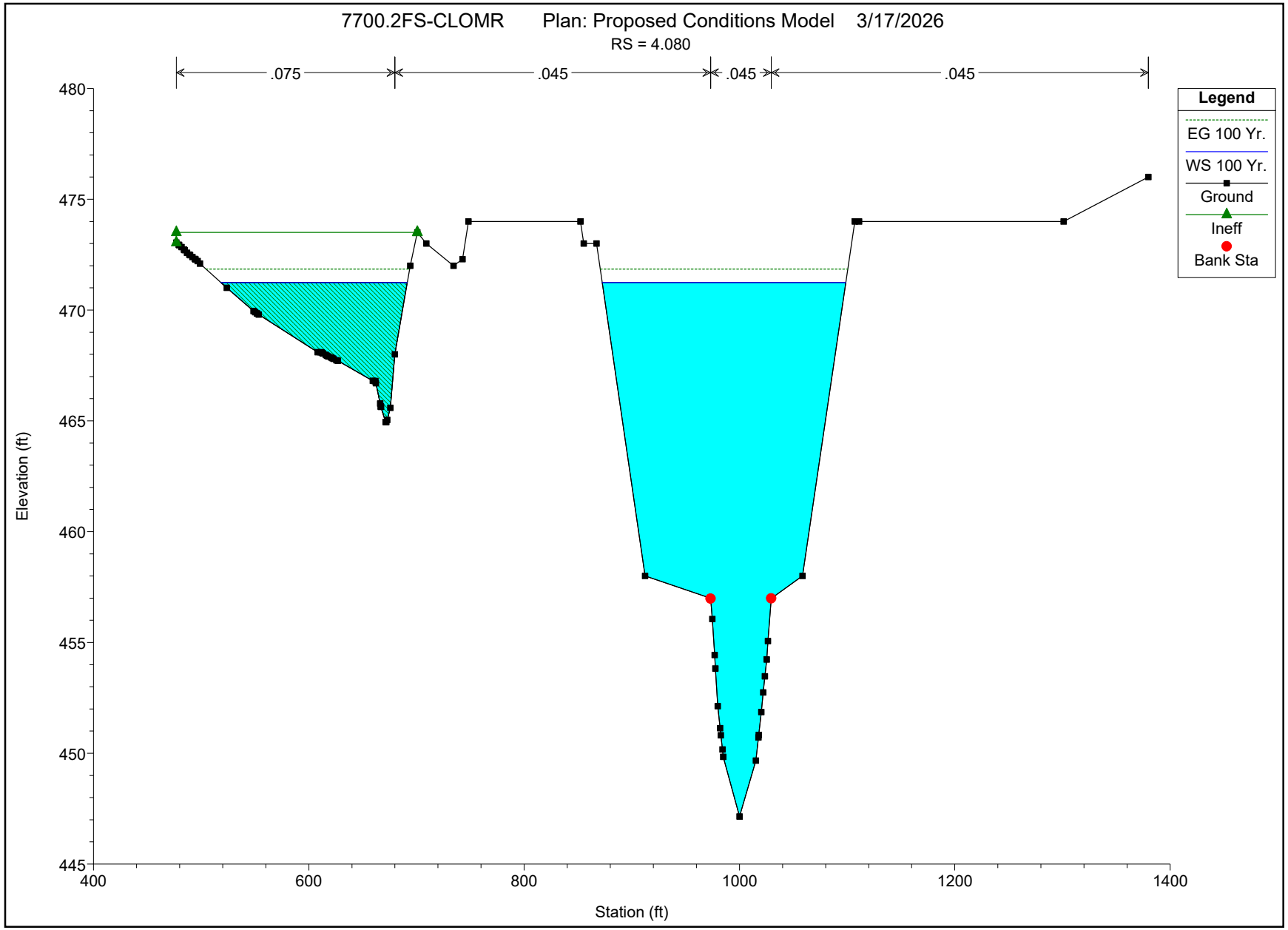

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.259
.05
.045
.045
.045
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
510
500
490
480
470
460
450
200
400
600
800
1000
1200
1400
1600
1800
2000

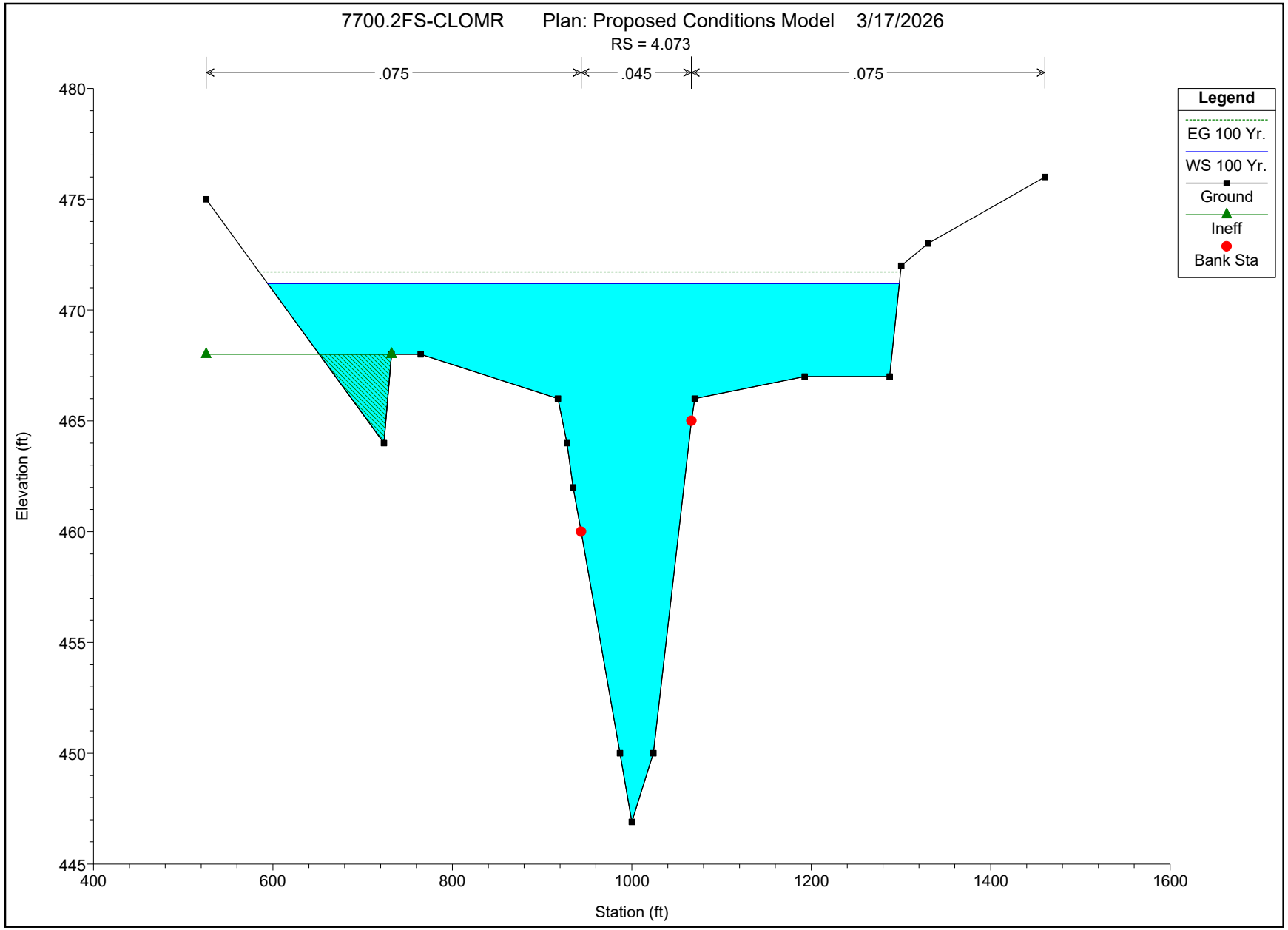

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.165
.05
.045
.045
.045
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
480
475
470
465
460
455
450
445
4000
4200
4400
4600
4800
5000
5200
5400
5600
Station (ft)

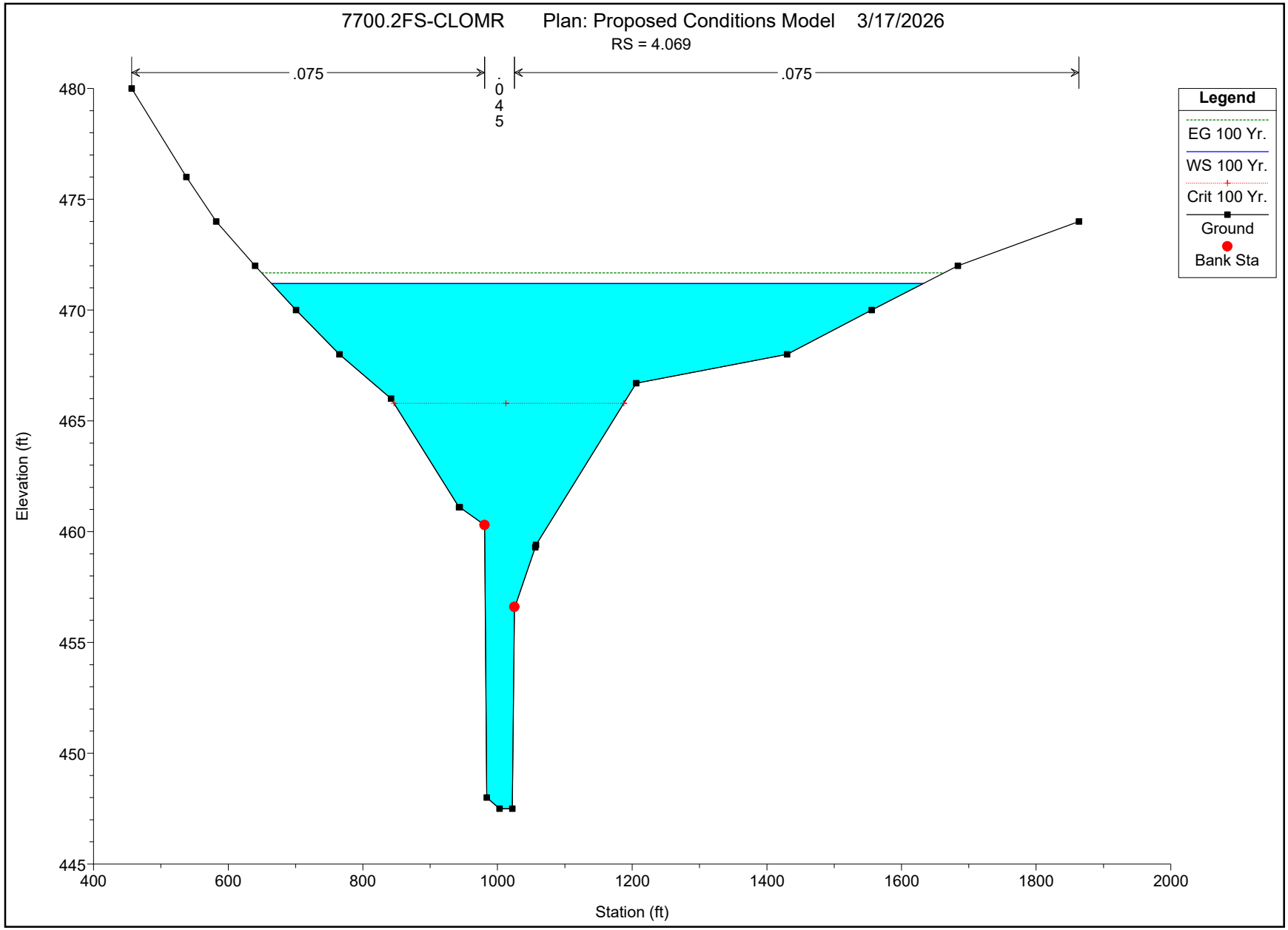

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.16
.075
.045
.045
.045
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
480
475
470
465
460
455
450
445
4000
4200
4400
4600
4800
5000
5200
5400
5600

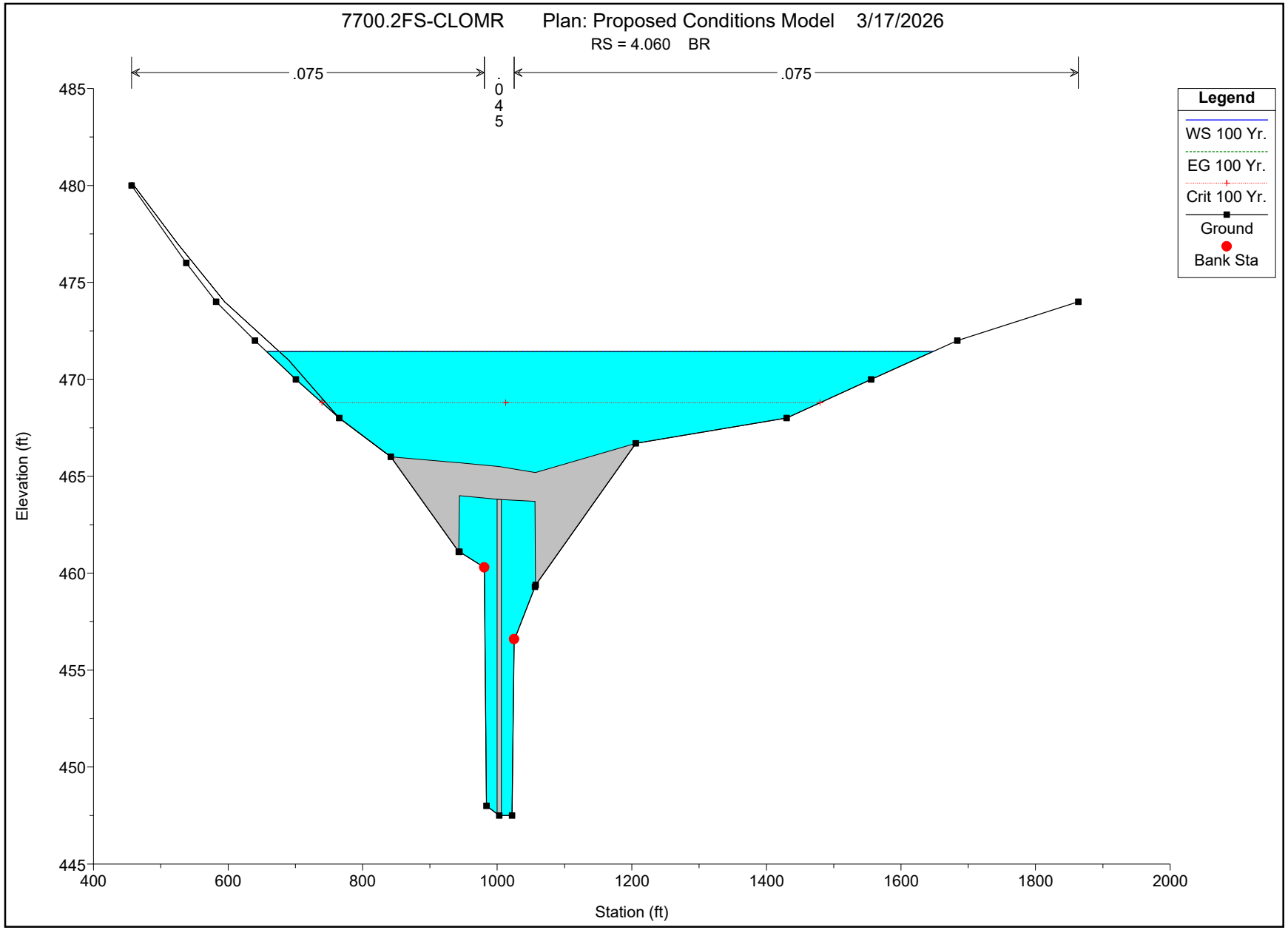

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.157
.075
.045
.045
.045
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
480
475
470
465
460
455
450
445
4000
4200
4400
4600
4800
5000
5200
5400
5600

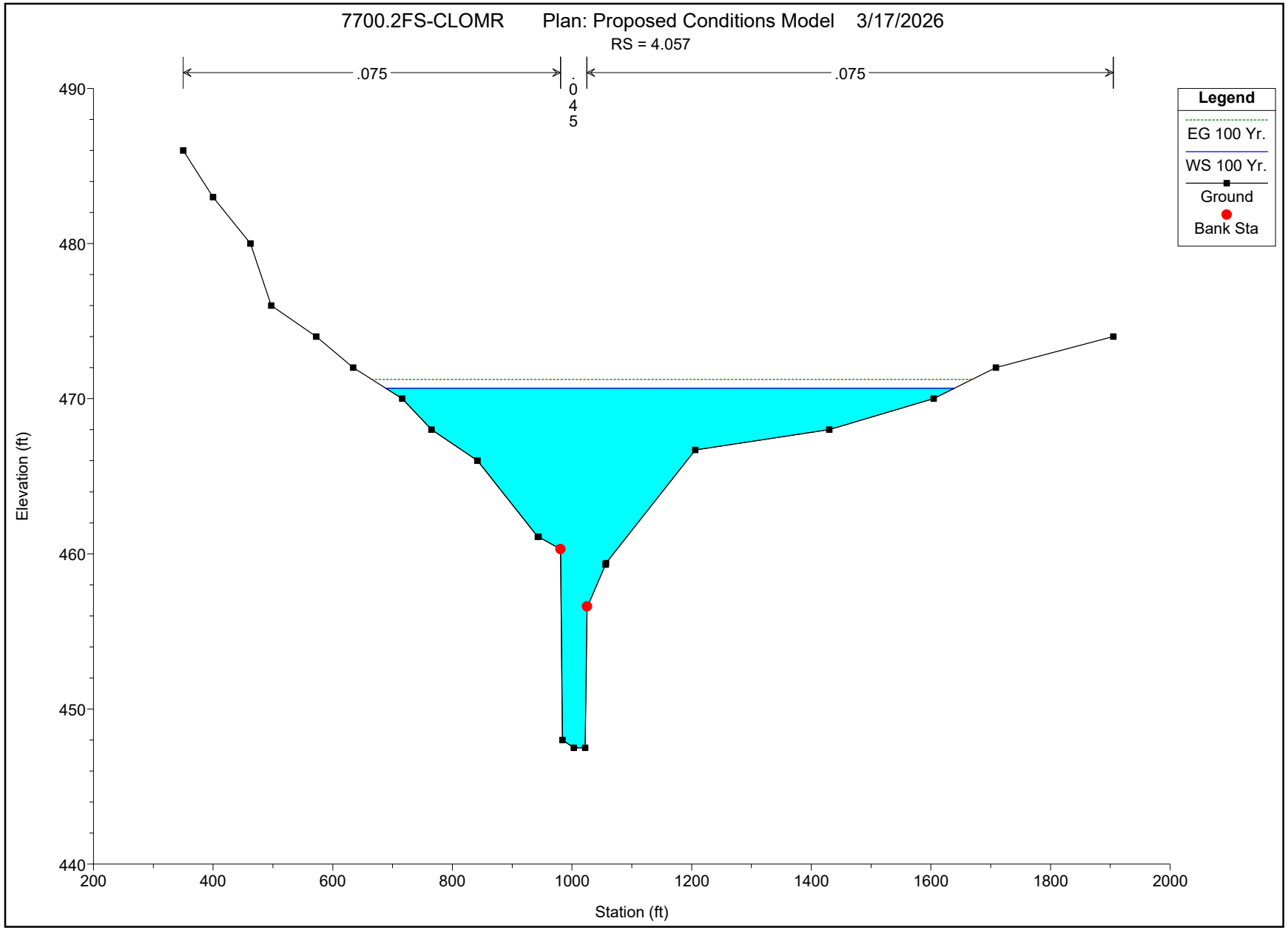

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.148
.075
.045
.045
.045
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
480
475
470
465
460
455
450
445
4000
4200
4400
4600
4800
5000
5200
5400
5600

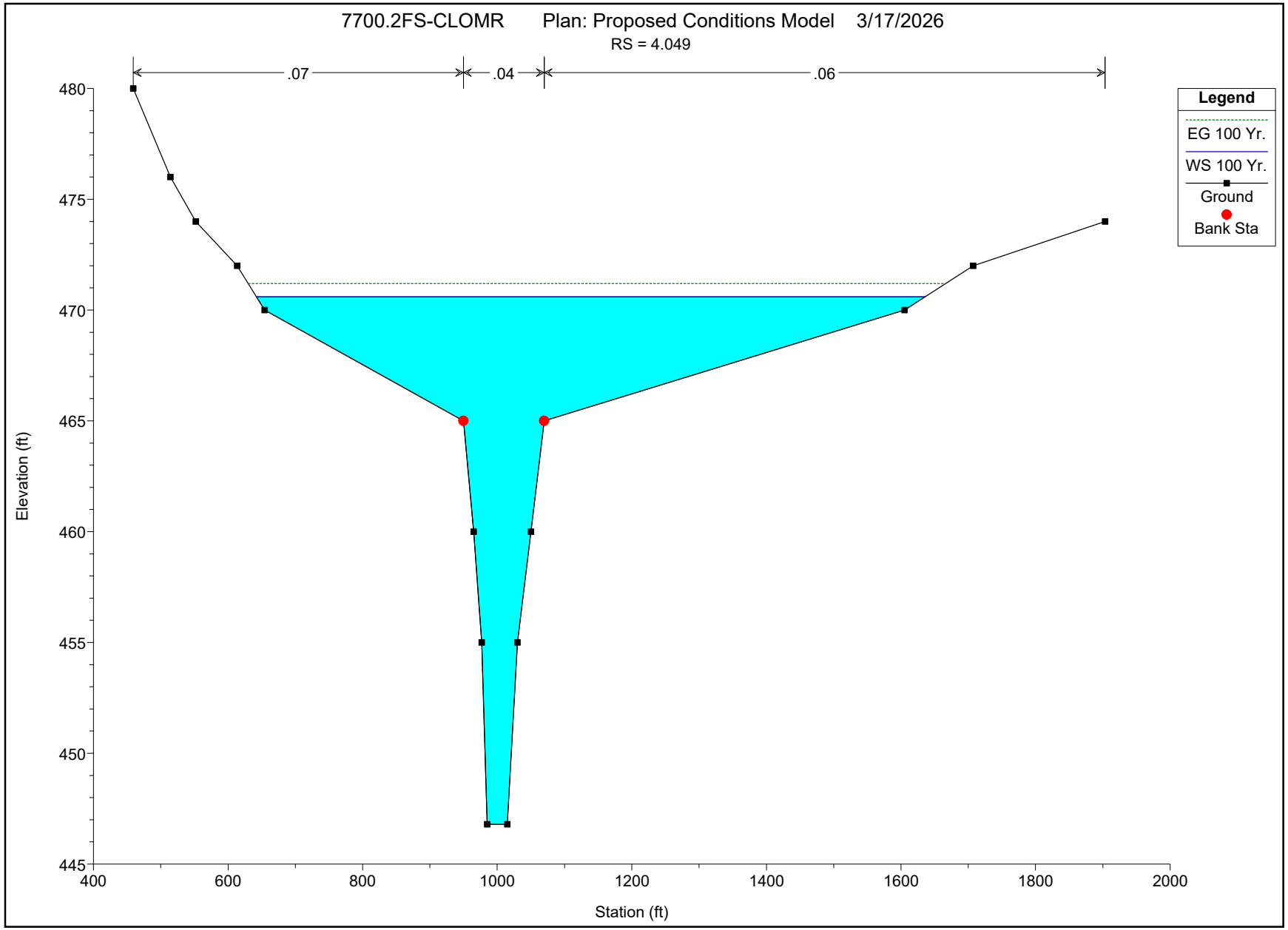

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.080
.075
.045
.045
.045
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
480
475
470
465
460
455
450
445
400
600
800
1000
1200
1400

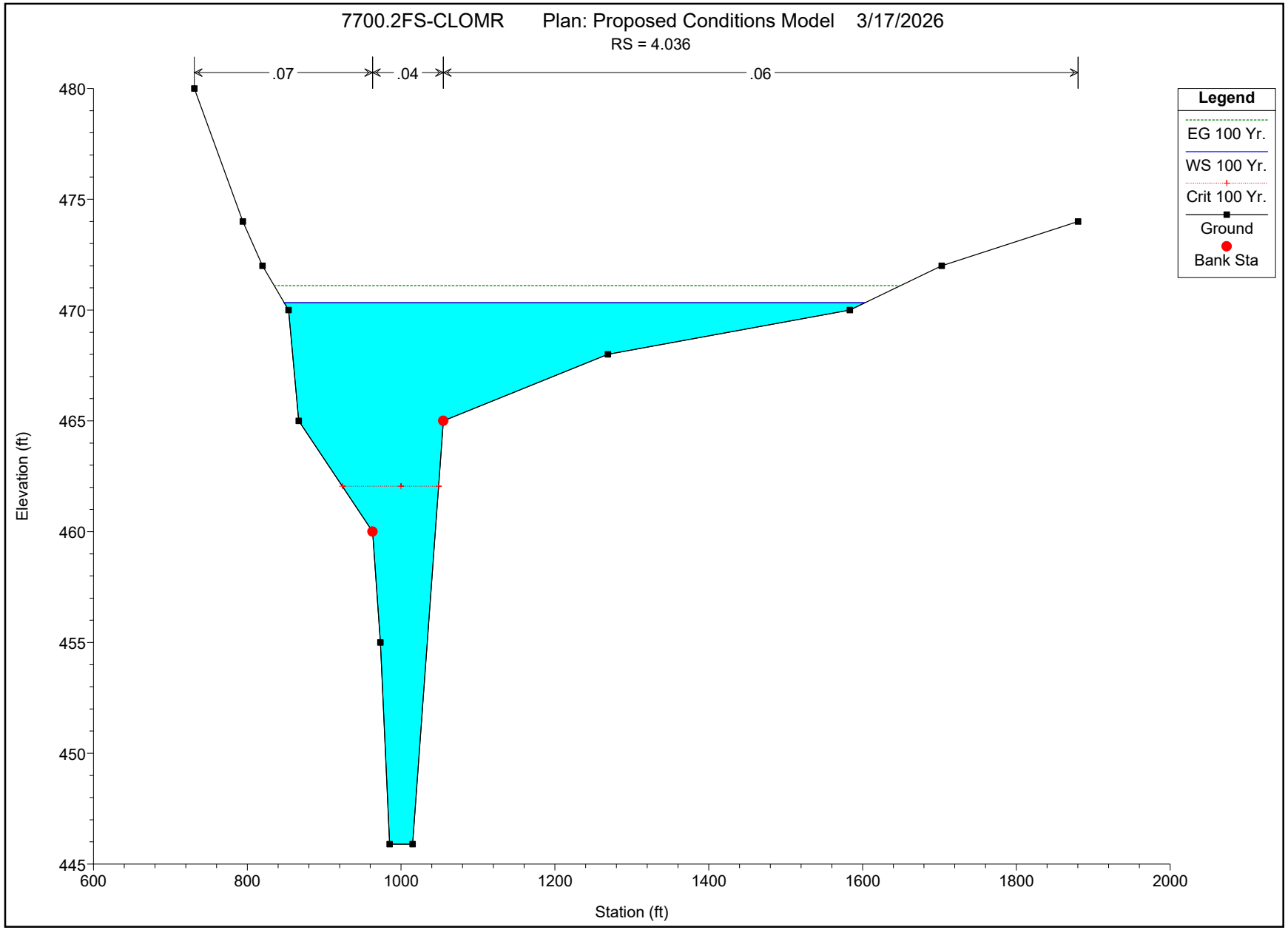

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.073
.075
.045
.075
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Elevation (ft)
480
475
470
465
460
455
450
445
400
600
800
1000
1200
1400
1600
Station (ft)


7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.069
.075
.045
.075
Legend
EG 100 Yr.
WS 100 Yr.
Crit 100 Yr.
Ground
Bank Sta
Elevation (ft)
480
475
470
465
460
455
450
445
400
600
800
1000
1200
1400
1600
1800
2000
Station (ft)


7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.060 BR
.075
.045
.075
Legend
WS 100 Yr.
EG 100 Yr.
Crit 100 Yr.
Ground
Bank Sta
Elevation (ft)
485
480
475
470
465
460
455
450
445
400
600
800
1000
1200
1400
1600
1800
2000
Station (ft)


7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.057
.075
.045
.075
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Bank Sta
Elevation (ft)
Station (ft)
490
480
470
460
450
440
200
400
600
800
1000
1200
1400
1600
1800
2000


7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.049
.07
.04
.06
Legend
EG 100 Yr.
WS 100 Yr.
Ground
Bank Sta
Elevation (ft)
480
475
470
465
460
455
450
445
400
600
800
1000
1200
1400
1600
1800
2000
Station (ft)

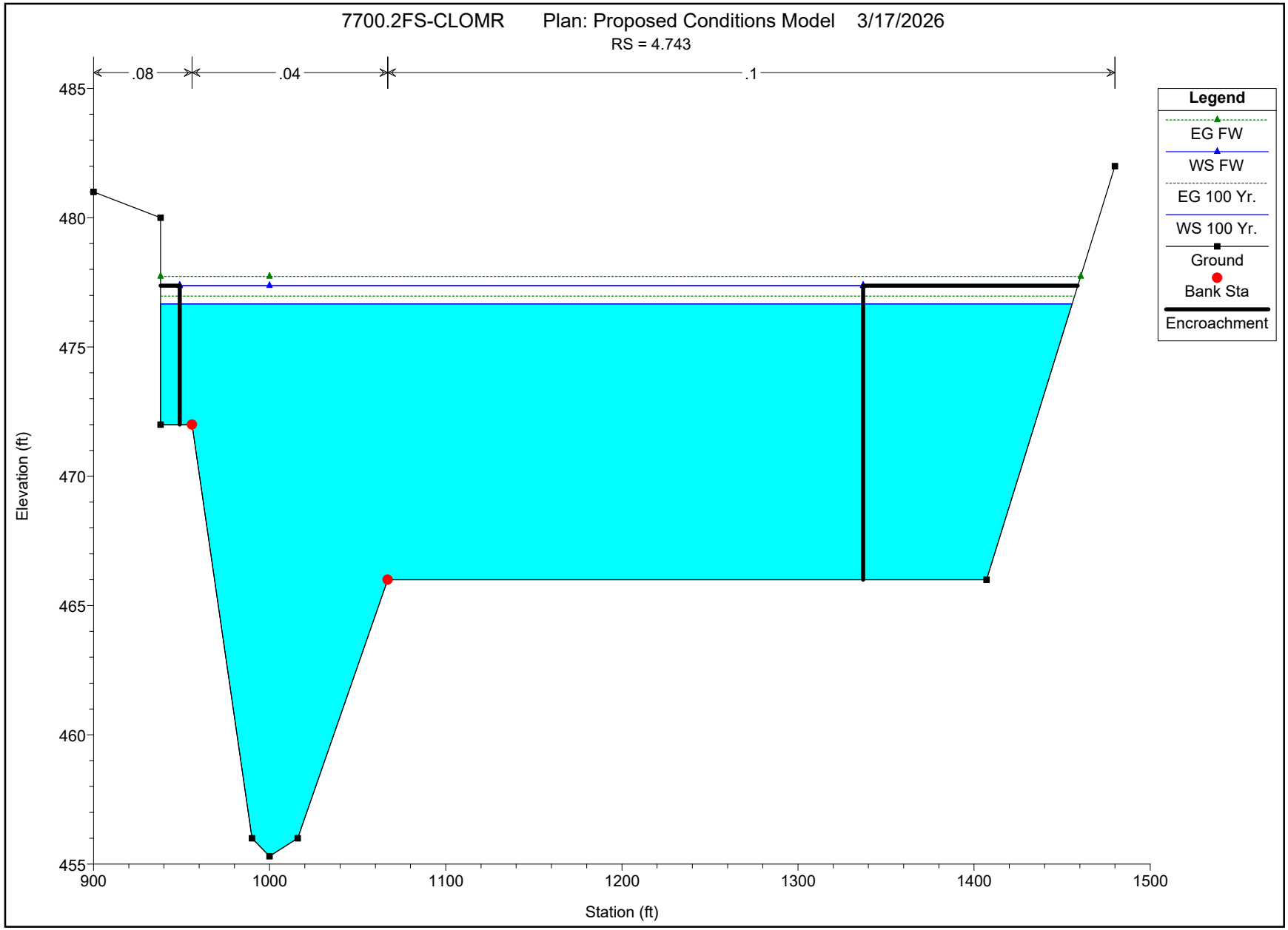

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.036
.07
.04
.06
Legend
EG 100 Yr.
WS 100 Yr.
Crit 100 Yr.
Ground
Bank Sta
Elevation (ft)
480
475
470
465
460
455
450
445
600
800
1000
1200
1400
1600
1800
2000
Station (ft)

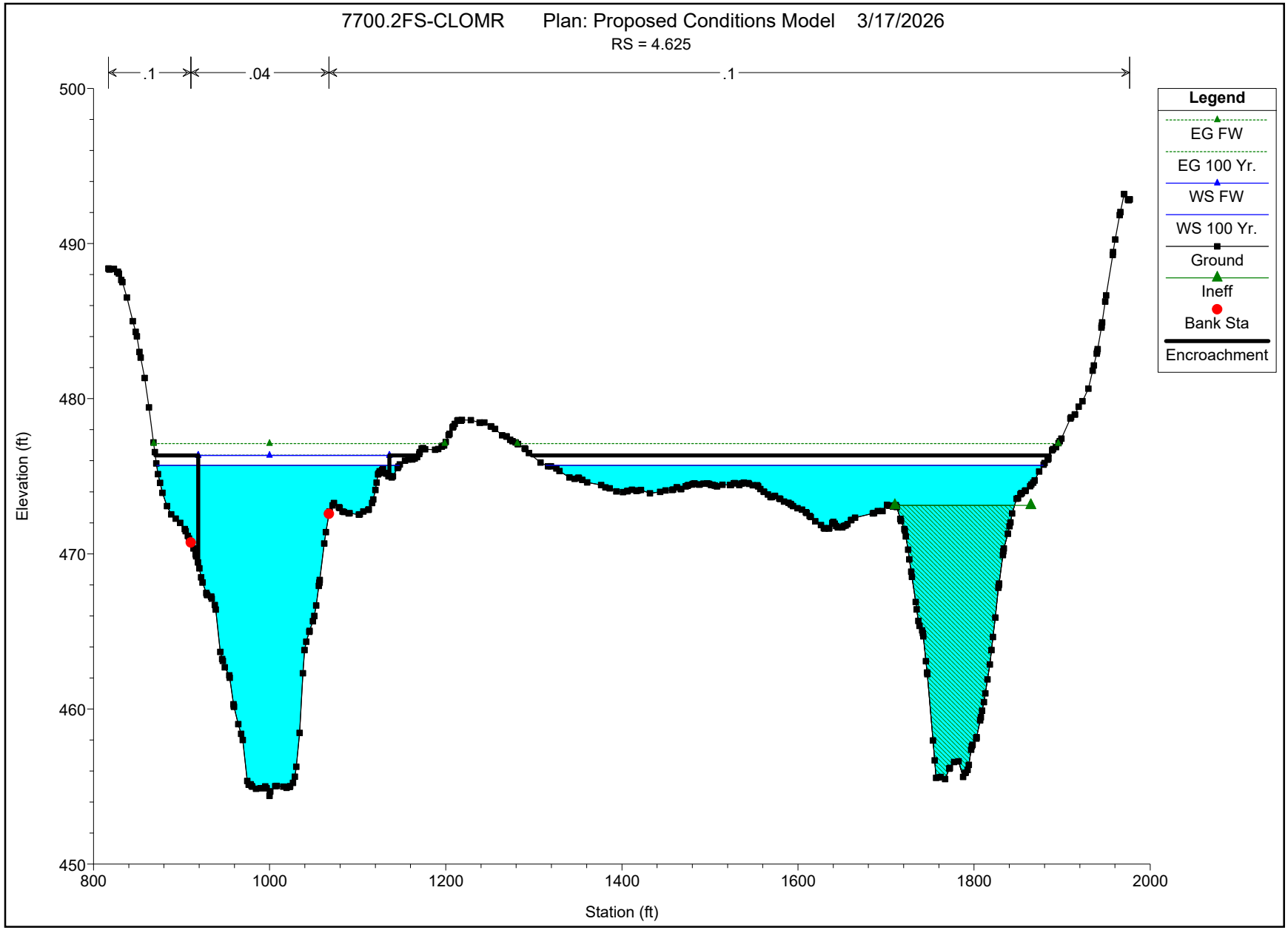
V. HEC-RAS Output – Deer Creek Proposed Conditions Model with Floodway

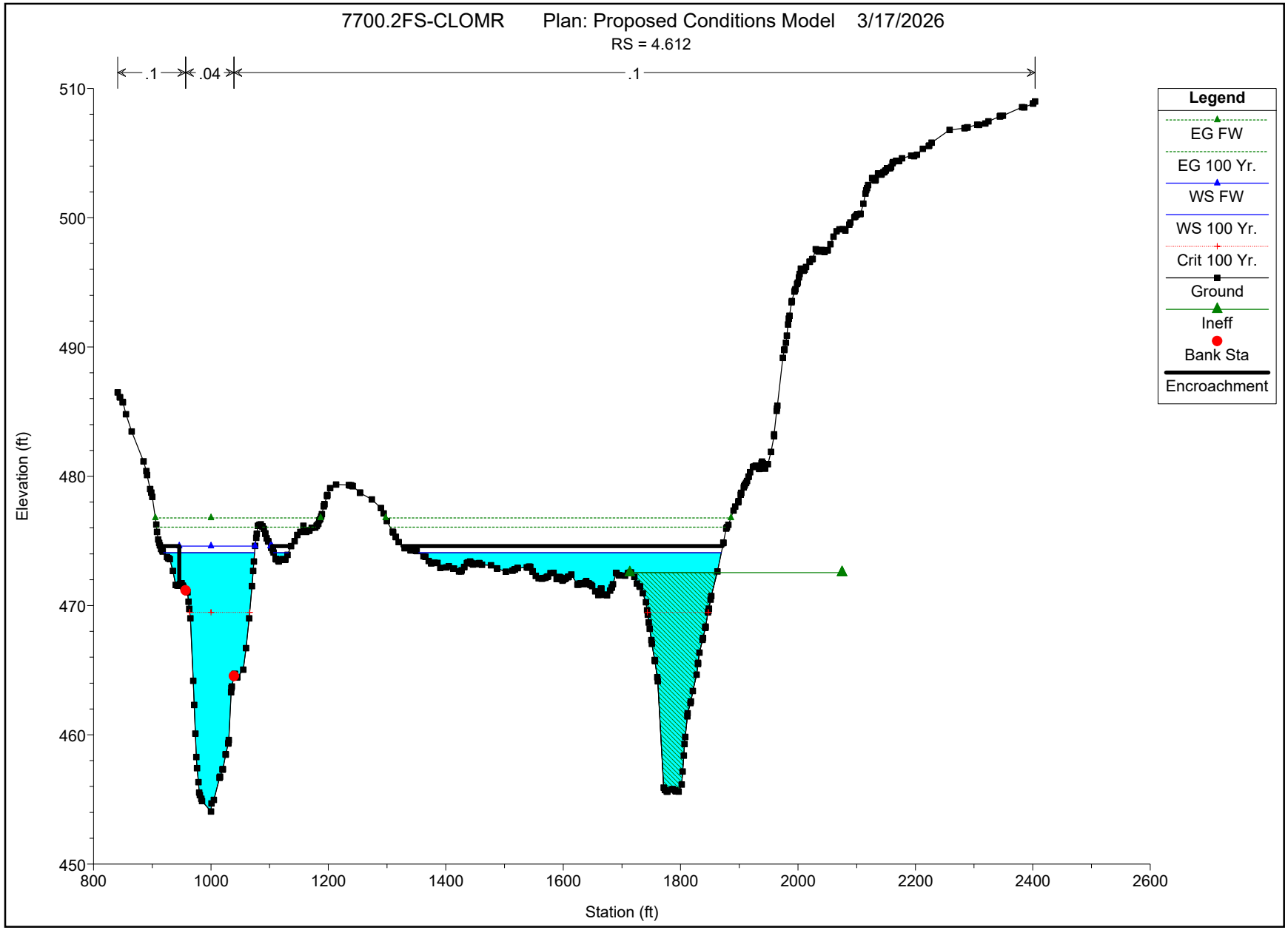
- 100 Yr. and Floodway-Flood Profile Table
- Cross Sections Showing 100 yr and Floodway Water Surface Elevation

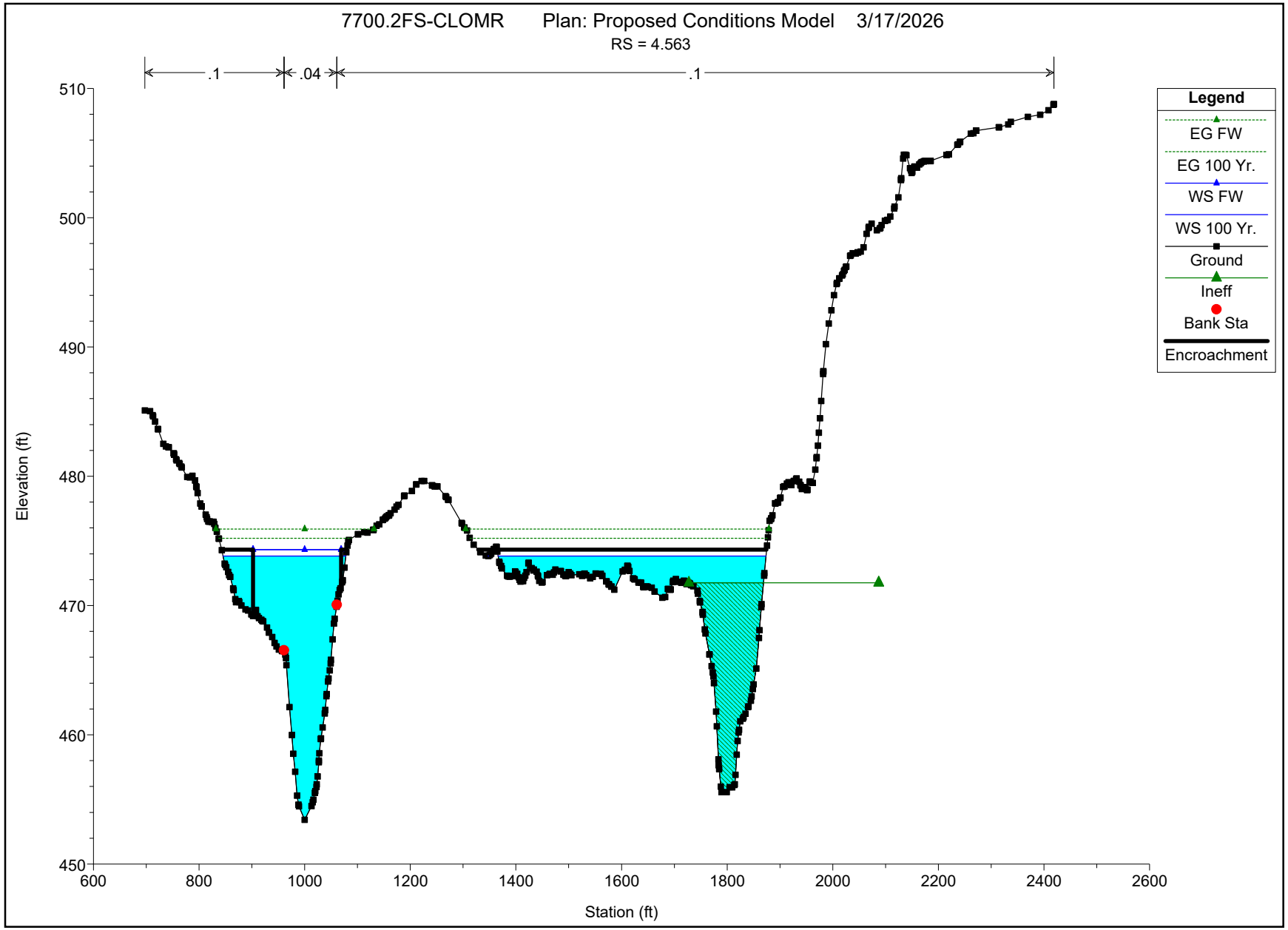
HEC-RAS Plan: PrCond River: RIVER-1 Reach: Reach-1

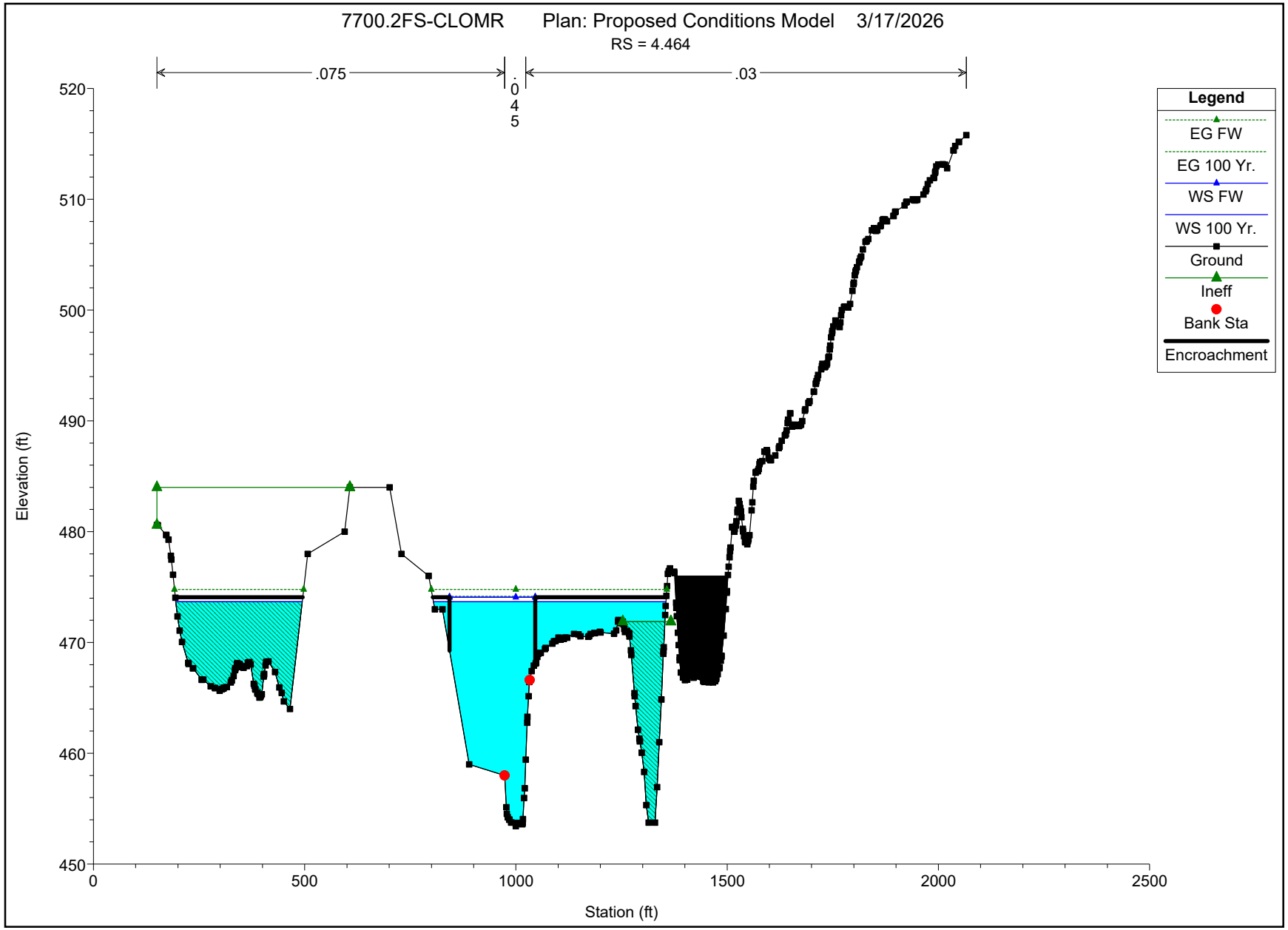
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	4.743	100 Yr.	16358.00	455.30	476.67		476.97	0.000580	5.53	5747.01	517.67	0.24
Reach-1	4.743	FW	16358.00	455.30	477.37		477.73	0.000607	5.82	4960.95	388.00	0.25
Reach-1	4.625	100 Yr.	16358.00	454.40	475.71		476.36	0.000990	6.73	3711.32	840.04	0.31
Reach-1	4.625	FW	16358.00	454.40	476.35		477.10	0.001024	6.99	2516.74	217.00	0.31
Reach-1	4.612	100 Yr.	16358.00	454.06	474.08	469.48	476.07	0.003155	11.90	2344.39	695.15	0.54
Reach-1	4.612	FW	16358.00	454.06	474.60		476.78	0.003143	12.15	1572.82	131.63	0.54
Reach-1	4.563	100 Yr.	16358.00	453.43	473.83		475.21	0.002249	10.02	2909.75	740.73	0.47
Reach-1	4.563	FW	16358.00	453.43	474.33		475.92	0.002322	10.41	1885.12	167.00	0.48
Reach-1	4.464	100 Yr.	16358.00	453.42	473.68		474.17	0.001078	7.37	3772.06	849.89	0.31
Reach-1	4.464	FW	16358.00	453.42	474.09		474.78	0.001303	8.22	2945.33	203.00	0.34
Reach-1	4.419	100 Yr.	16358.00	452.92	473.32		473.88	0.001317	7.22	3159.28	547.11	0.32
Reach-1	4.419	FW	16358.00	452.92	473.95		474.45	0.001086	6.74	3267.39	214.00	0.29
Reach-1	4.365	100 Yr.	17157.00	452.64	472.58		473.43	0.001820	8.61	2705.79	369.82	0.37
Reach-1	4.365	FW	17157.00	452.64	473.25		474.05	0.001670	8.43	2756.64	182.00	0.34
Reach-1	4.259	100 Yr.	17157.00	450.58	472.13		472.63	0.000883	6.53	3152.96	518.28	0.27
Reach-1	4.259	FW	17157.00	450.58	472.89		473.34	0.000731	6.11	3292.40	228.00	0.25
Reach-1	4.165	100 Yr.	17157.00	449.16	471.70		472.20	0.000856	6.75	3200.78	529.24	0.27
Reach-1	4.165	FW	17157.00	449.16	472.55		472.99	0.000695	6.25	3374.69	236.00	0.24
Reach-1	4.16	100 Yr.	17157.00	449.16	471.70		472.17	0.000828	6.61	3278.99	573.11	0.26
Reach-1	4.16	FW	17157.00	449.16	472.55		472.96	0.000671	6.11	3459.76	243.00	0.23
Reach-1	4.157	100 Yr.	17157.00	449.16	471.69		472.15	0.000795	6.52	3329.71	566.14	0.25
Reach-1	4.157	FW	17157.00	449.16	472.54		472.95	0.000644	6.03	3512.69	245.00	0.23
Reach-1	4.148	100 Yr.	17157.00	448.00	471.69		472.11	0.000677	6.17	3501.86	536.30	0.24
Reach-1	4.148	FW	17157.00	448.00	472.55		472.91	0.000553	5.73	3686.85	246.00	0.21
Reach-1	4.080	100 Yr.	17157.00	447.15	471.24		471.85	0.000977	7.40	2927.99	399.18	0.29
Reach-1	4.080	FW	17157.00	447.15	472.17		472.70	0.000784	6.82	3109.73	213.00	0.26
Reach-1	4.073	100 Yr.	17157.00	446.90	471.20		471.72	0.000889	6.44	4450.77	704.08	0.27
Reach-1	4.073	FW	17157.00	446.90	471.82		472.55	0.001048	7.16	2874.32	229.00	0.30
Reach-1	4.069	100 Yr.	17157.00	447.50	471.20	465.80	471.67	0.001328	7.85	5481.48	967.87	0.29
Reach-1	4.069	FW	17157.00	447.50	471.77	465.58	472.52	0.001651	8.90	3216.99	256.00	0.32
Reach-1	4.060		Bridge									
Reach-1	4.057	100 Yr.	17035.00	447.50	470.67		471.25	0.001588	8.45	5042.88	951.20	0.32
Reach-1	4.057	FW	17035.00	447.50	470.94		471.59	0.001589	8.52	3602.75	344.00	0.32
Reach-1	4.049	100 Yr.	17035.00	446.80	470.60		471.19	0.000998	6.99	4458.53	993.80	0.31
Reach-1	4.049	FW	17035.00	446.80	470.69		471.48	0.001201	7.70	3066.13	376.00	0.34
Reach-1	4.036	100 Yr.	17035.00	445.90	470.33	462.06	471.10	0.001044	7.89	3726.53	755.21	0.32
Reach-1	4.036	FW	17035.00	445.90	470.52	462.06	471.39	0.001109	8.19	2935.26	293.26	0.33

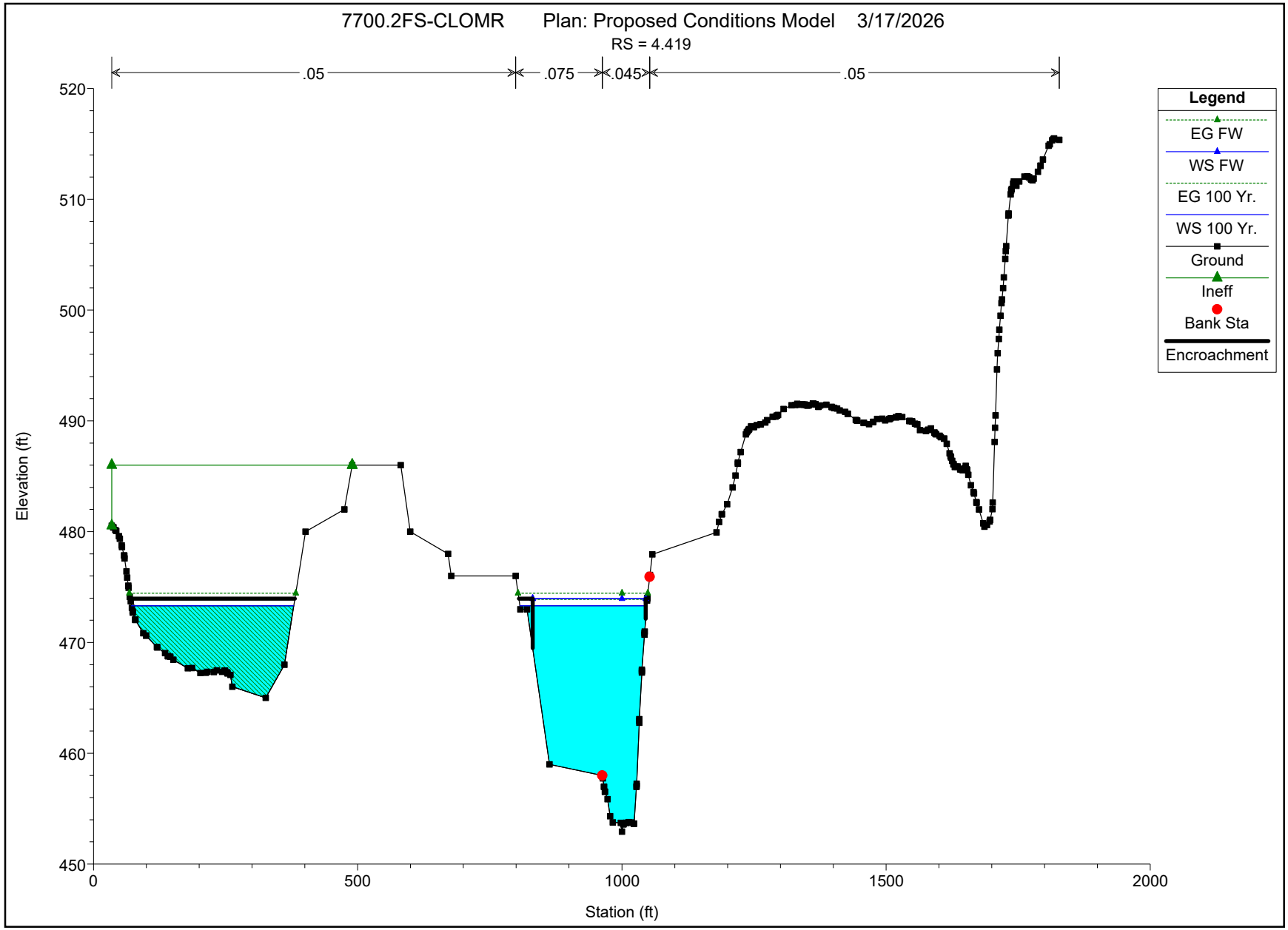

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.743
.08
.04
.1
Legend
EG FW
WS FW
EG 100 Yr.
WS 100 Yr.
Ground
Bank Sta
Encroachment
Elevation (ft)
485
480
475
470
465
460
455
900
1000
1100
1200
1300
1400
1500
Station (ft)

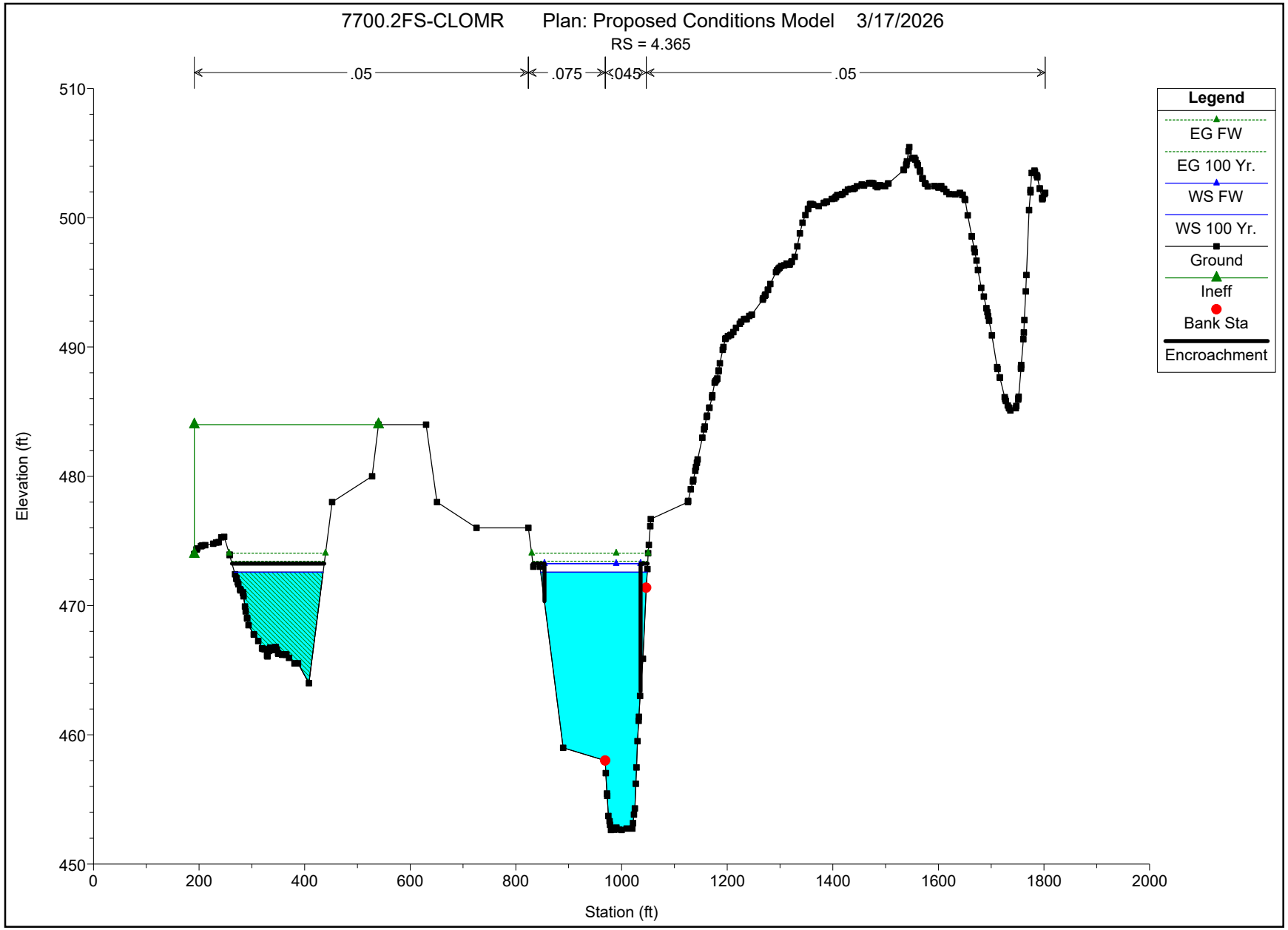

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.625
.1
.04
.1
Legend
EG FW
EG 100 Yr.
WS FW
WS 100 Yr.
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
500
490
480
470
460
450
800
1000
1200
1400
1600
1800
2000
Station (ft)

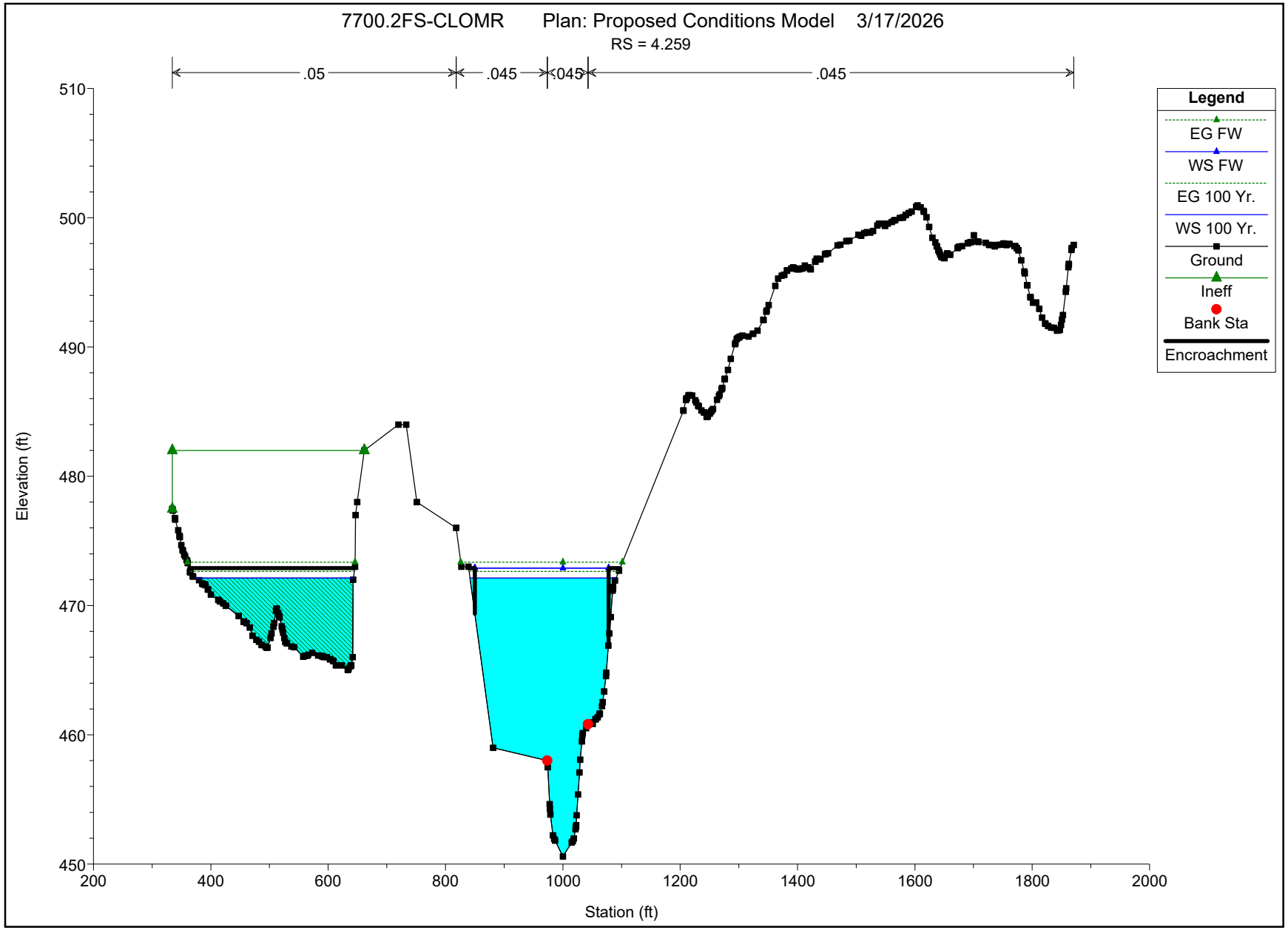

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.612
.1
.04
.1
Legend
EG FW
EG 100 Yr.
WS FW
WS 100 Yr.
Crit 100 Yr.
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
510
500
490
480
470
460
450
800
1000
1200
1400
1600
1800
2000
2200
2400
2600

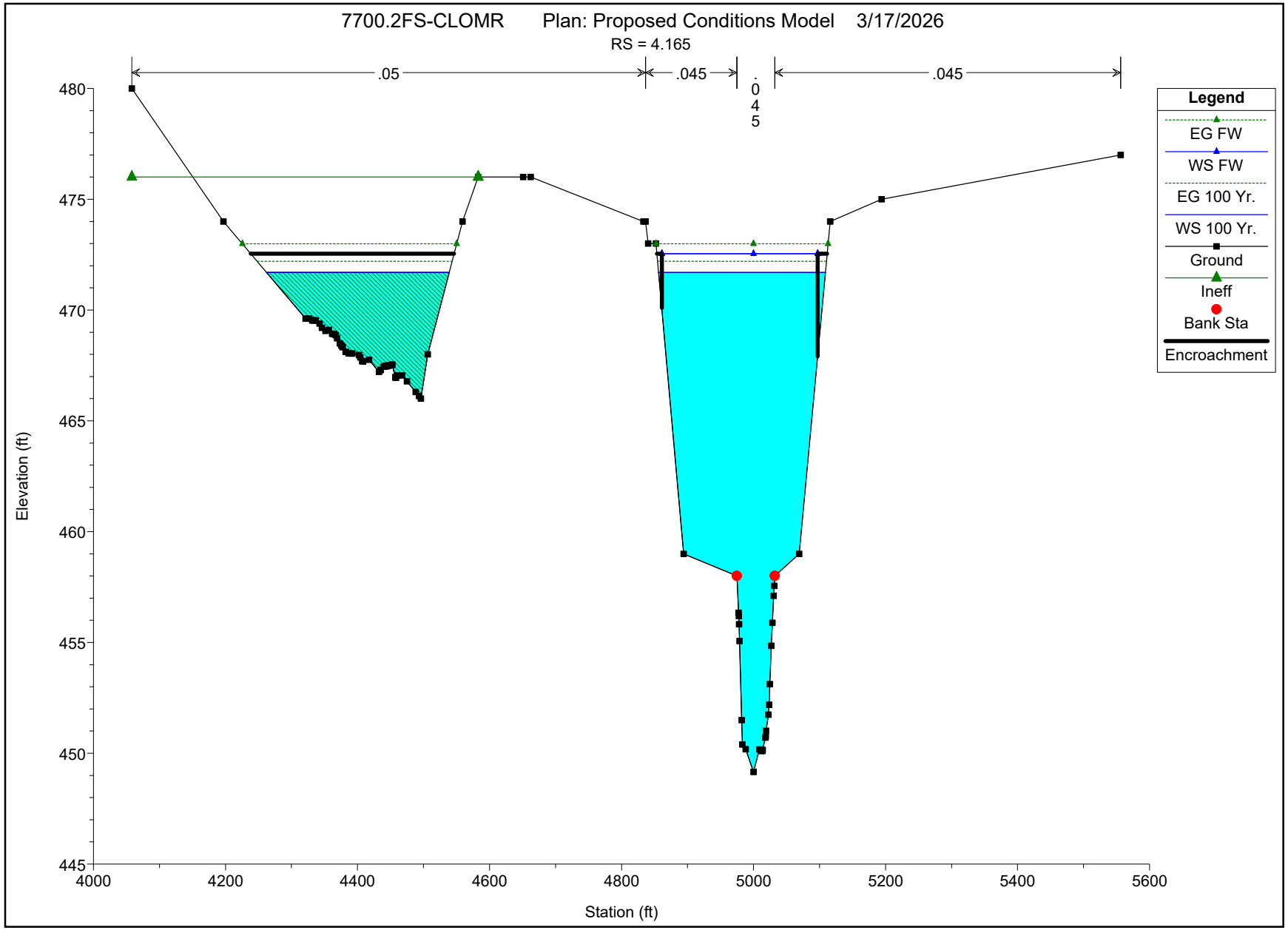

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.563
.1
.04
.1
Legend
EG FW
EG 100 Yr.
WS FW
WS 100 Yr.
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
510
500
490
480
470
460
450
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600

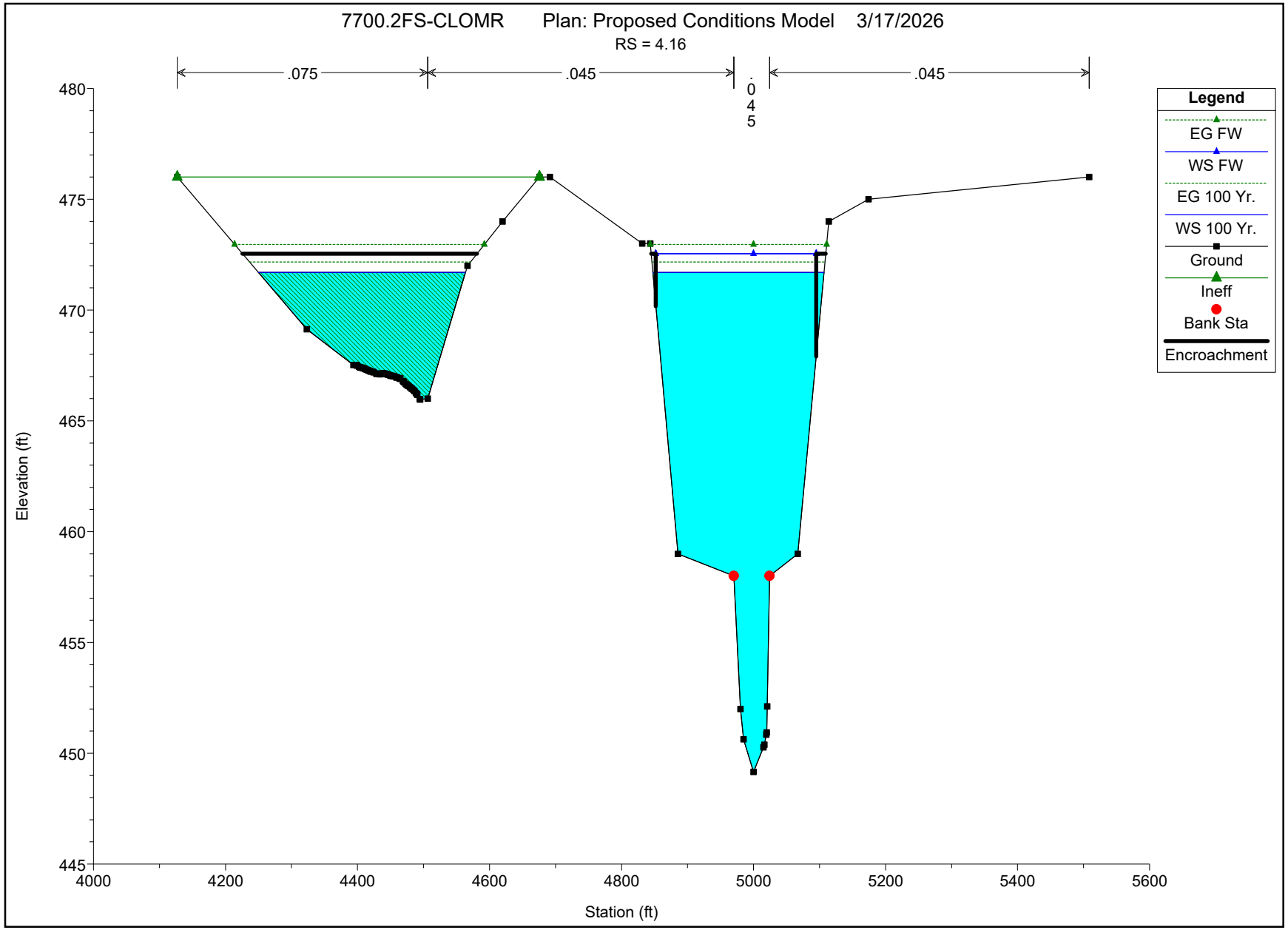

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.464
.075
.045
.03
Legend
EG FW
EG 100 Yr.
WS FW
WS 100 Yr.
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
520
510
500
490
480
470
460
450
0
500
1000
1500
2000
2500

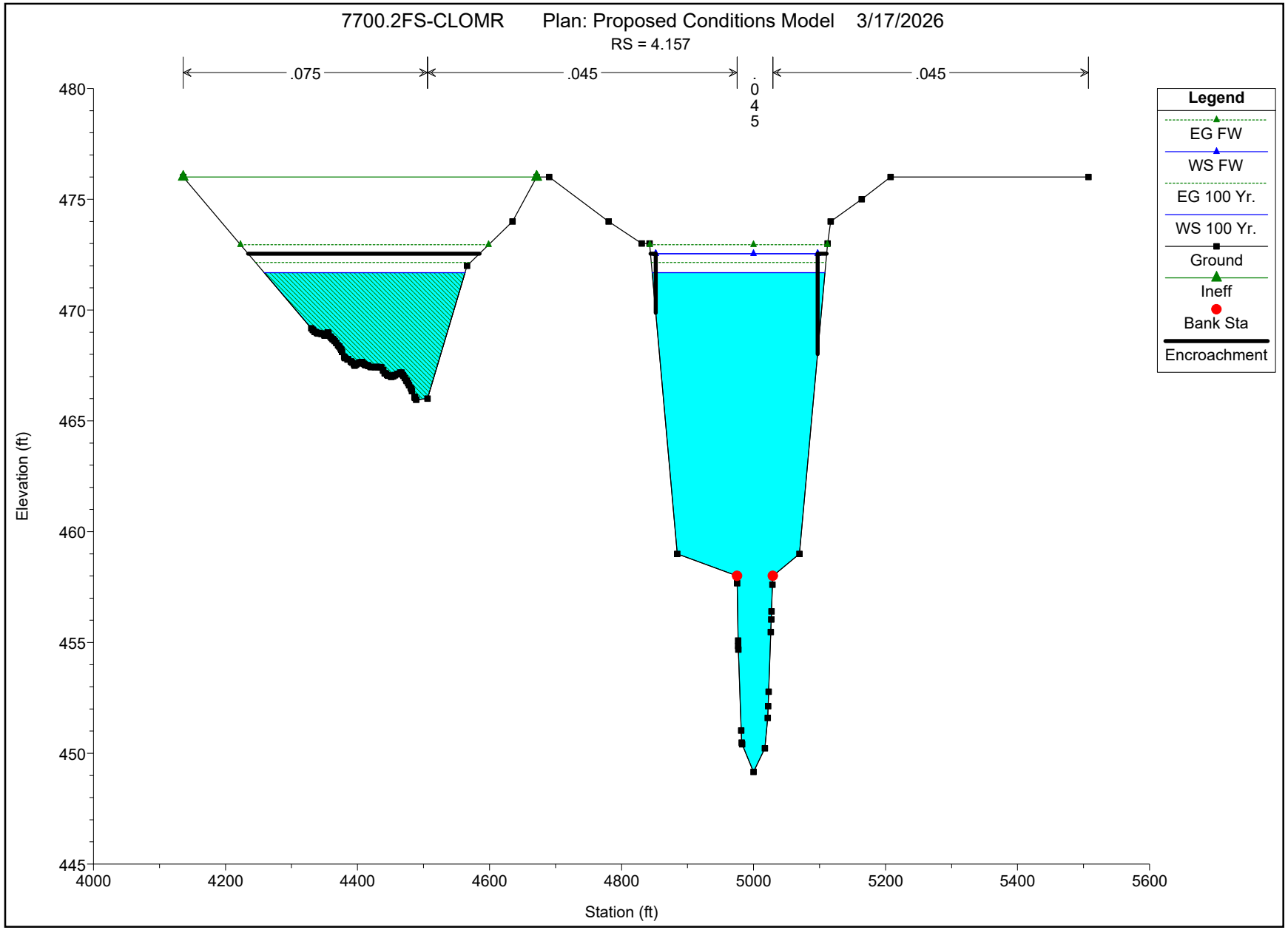

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.419
.05
.075
.045
.05
Legend
EG FW
WS FW
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
520
510
500
490
480
470
460
450
0
500
1000
1500
2000
Station (ft)

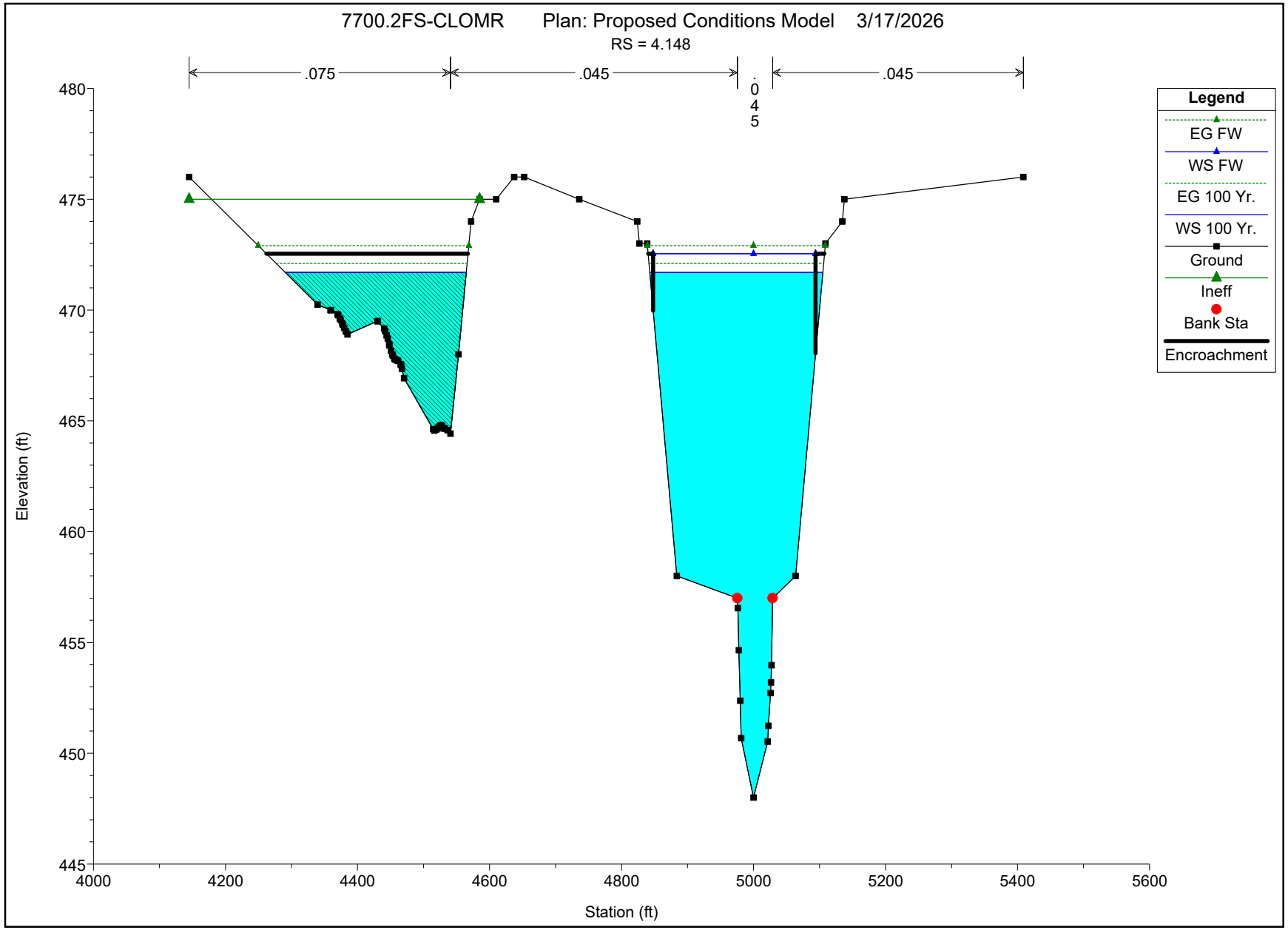

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.365
.05
.075
.045
.05
Legend
EG FW
EG 100 Yr.
WS FW
WS 100 Yr.
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
510
500
490
480
470
460
450
0
200
400
600
800
1000
1200
1400
1600
1800
2000

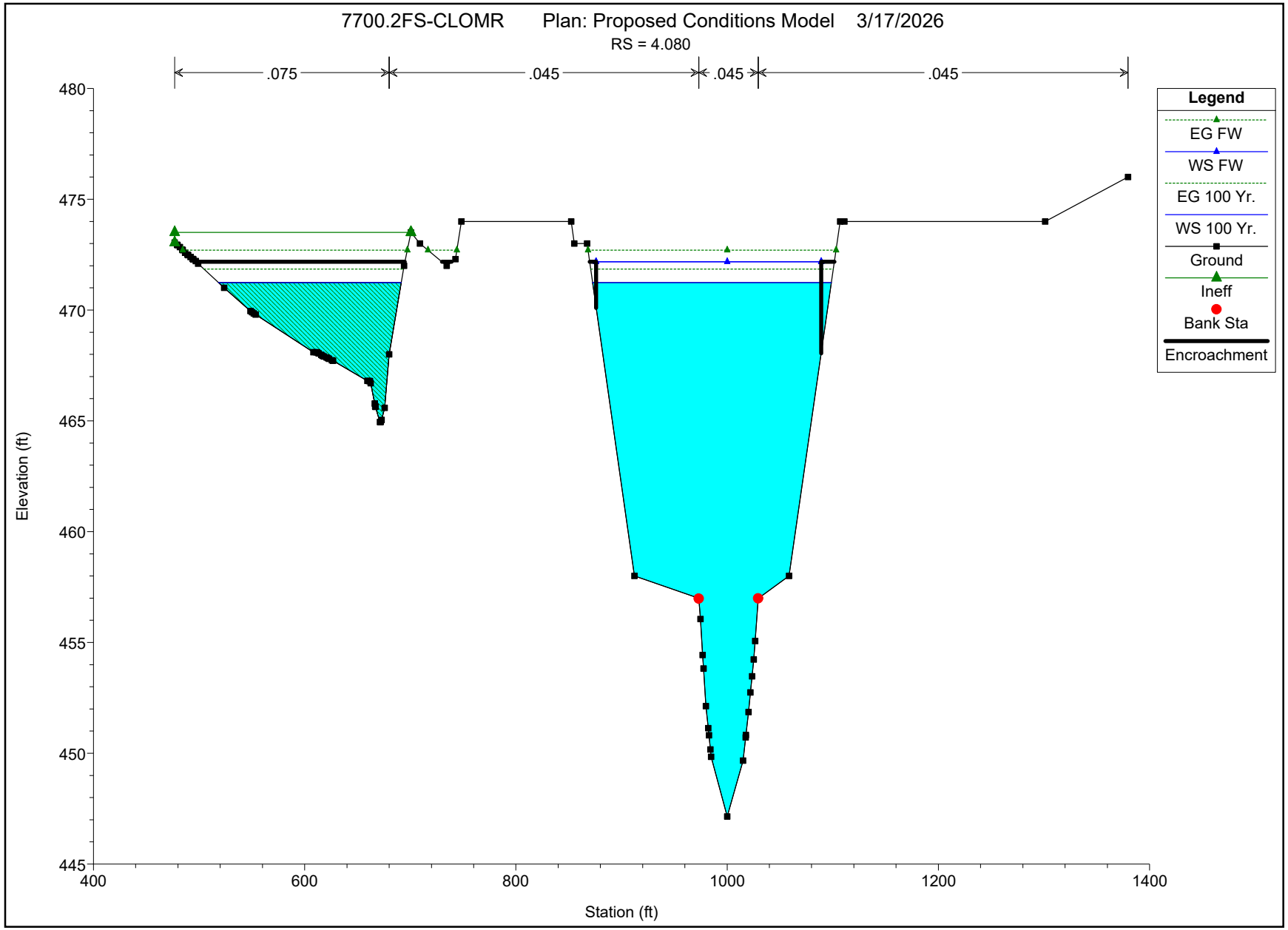

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.259
.05
.045
.045
.045
Legend
EG FW
WS FW
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
510
500
490
480
470
460
450
200
400
600
800
1000
1200
1400
1600
1800
2000

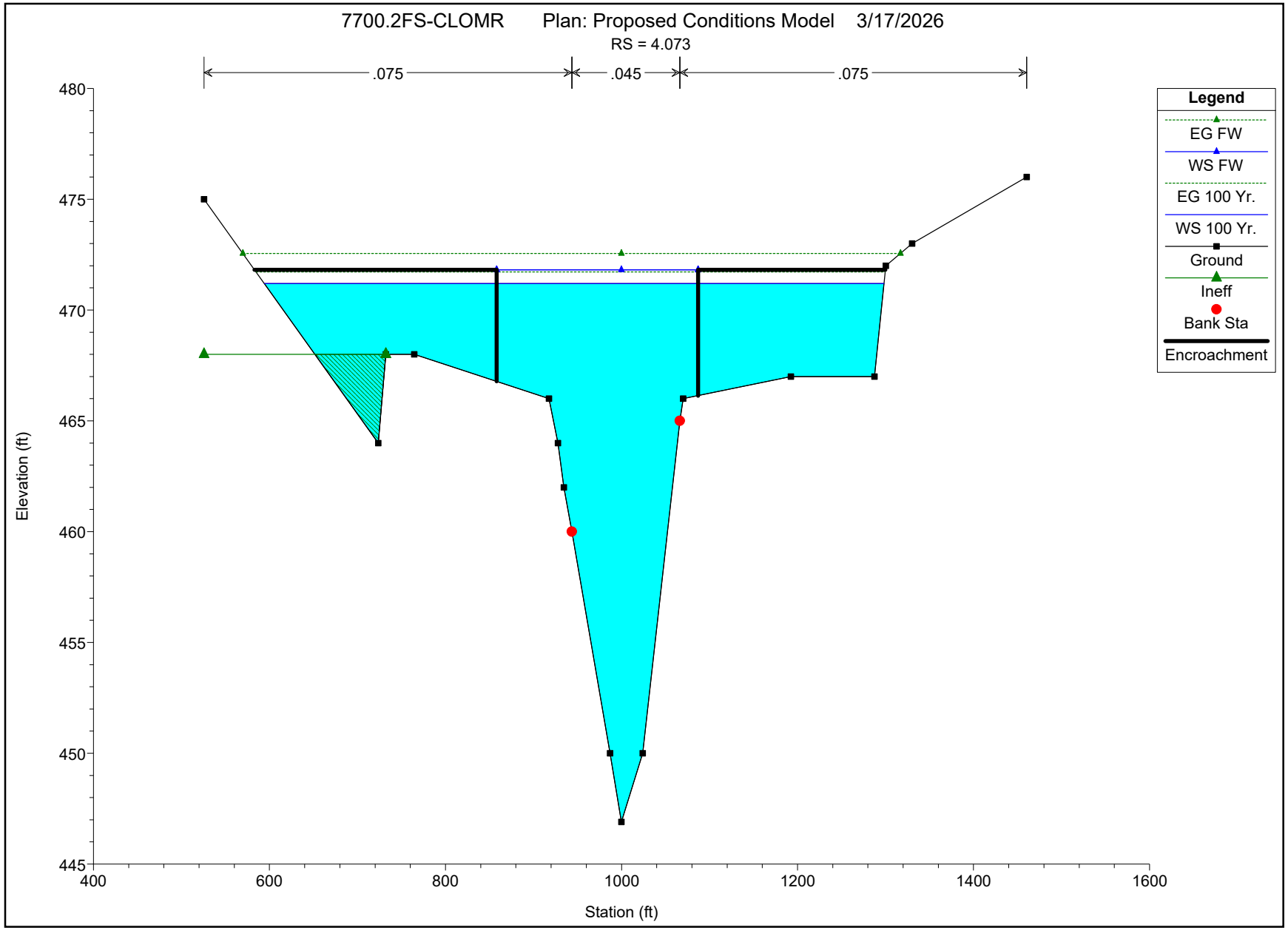

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.165
.05
.045
.045
.045
Legend
EG FW
WS FW
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
480
475
470
465
460
455
450
445
4000
4200
4400
4600
4800
5000
5200
5400
5600
Station (ft)

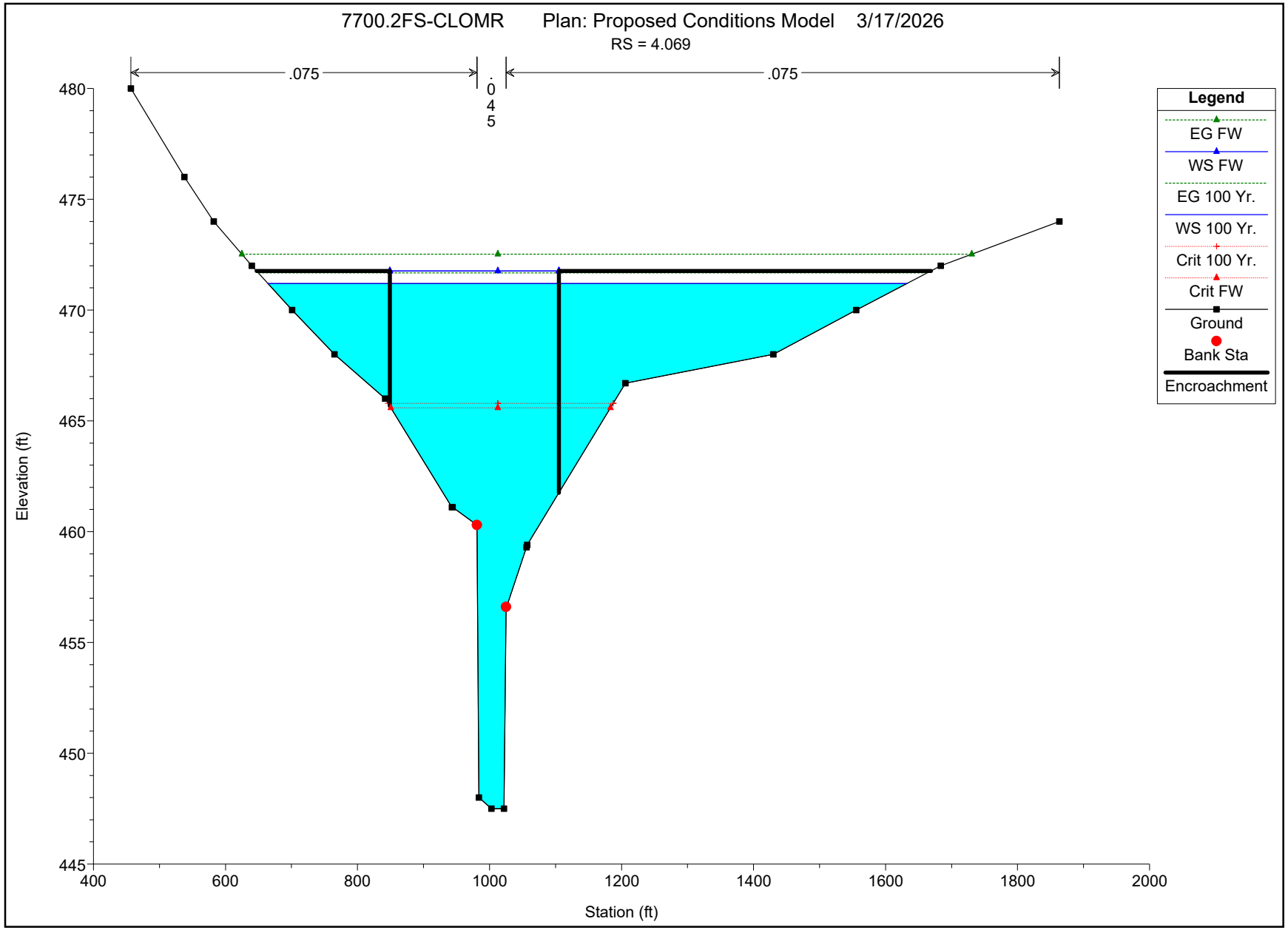

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.16
.075
.045
.045
.045
Legend
EG FW
WS FW
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
480
475
470
465
460
455
450
445
4000
4200
4400
4600
4800
5000
5200
5400
5600
Station (ft)

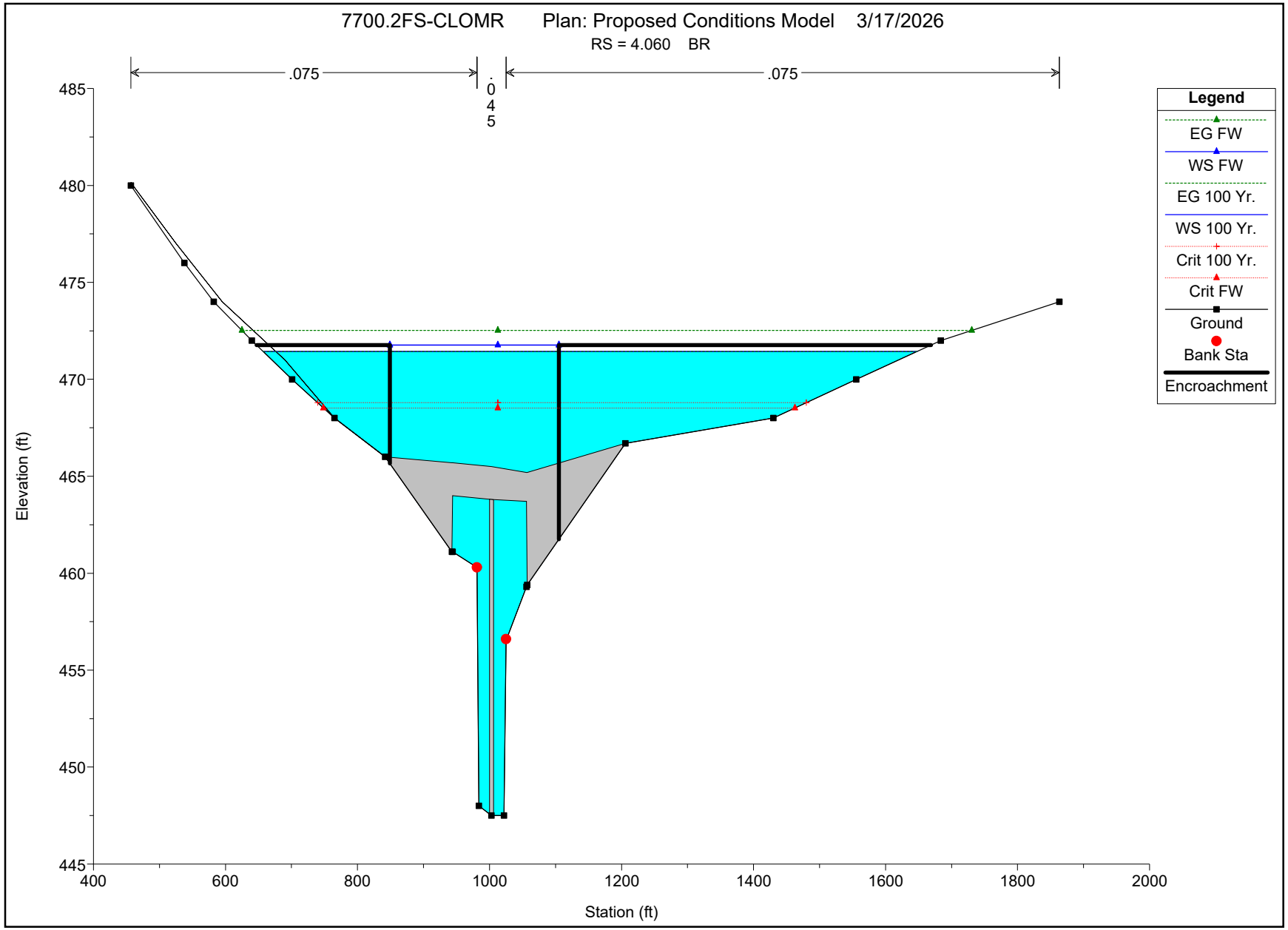

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.157
.075
.045
.045
.045
Legend
EG FW
WS FW
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
480
475
470
465
460
455
450
445
4000
4200
4400
4600
4800
5000
5200
5400
5600
Station (ft)

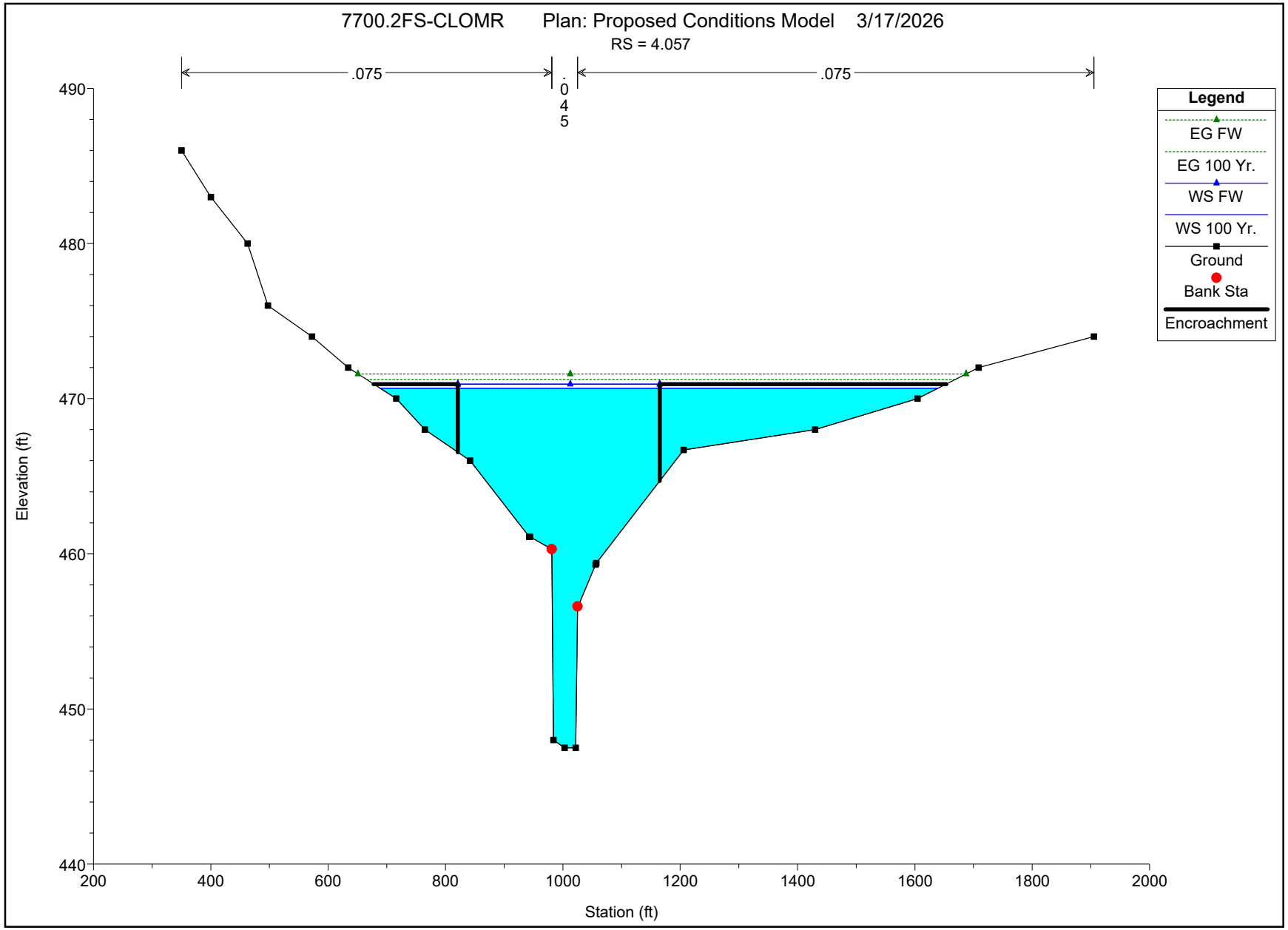

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.148
.075
.045
.045
.045
Legend
EG FW
WS FW
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
480
475
470
465
460
455
450
445
4000
4200
4400
4600
4800
5000
5200
5400
5600
Station (ft)

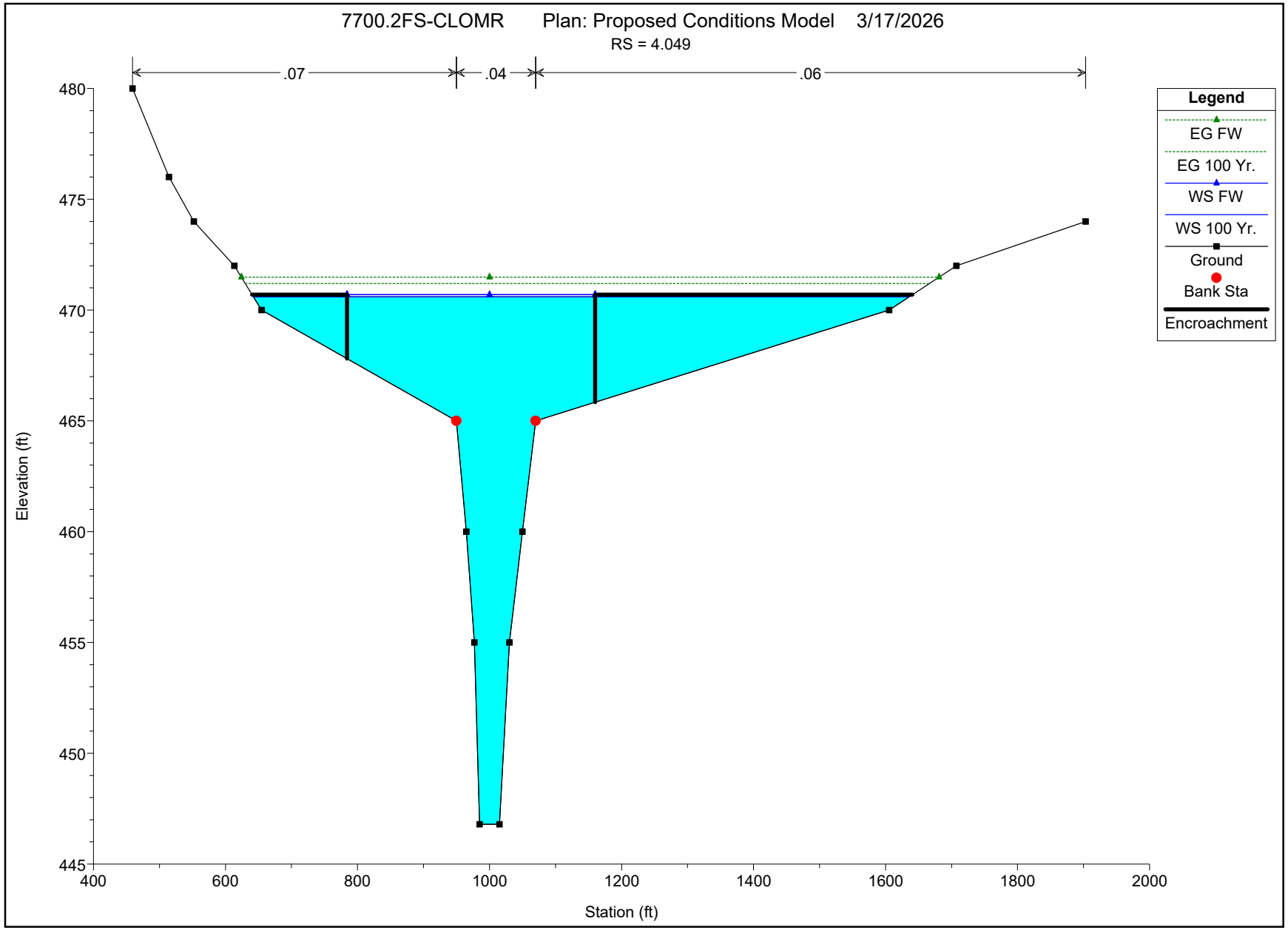

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.080
.075
.045
.045
.045
Legend
EG FW
WS FW
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
480
475
470
465
460
455
450
445
400
600
800
1000
1200
1400
Station (ft)

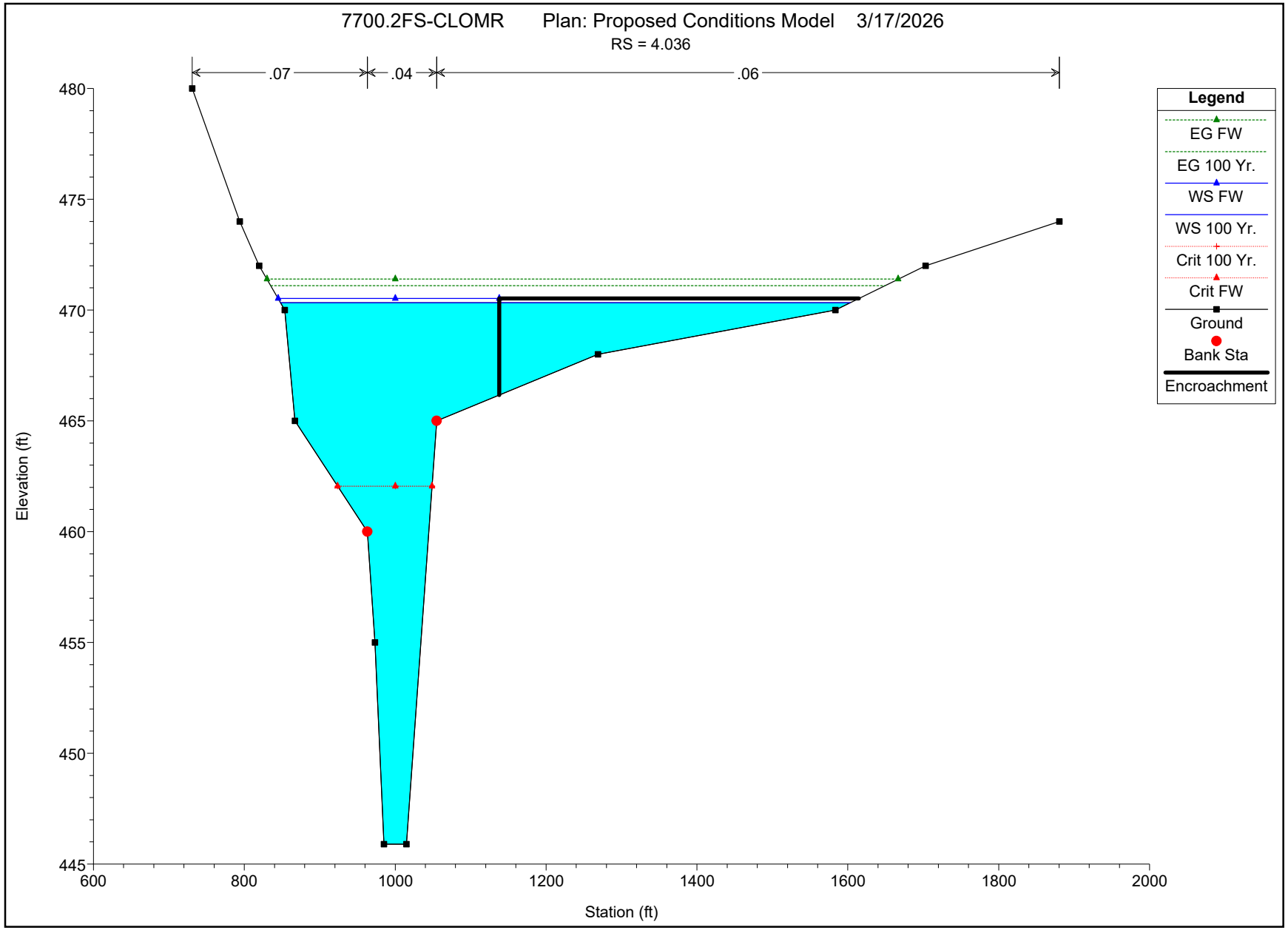

7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.073
.075
.045
.075
Legend
EG FW
WS FW
EG 100 Yr.
WS 100 Yr.
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
480
475
470
465
460
455
450
445
400
600
800
1000
1200
1400
1600
Station (ft)


7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.069
.075
.045
.075
Legend
EG FW
WS FW
EG 100 Yr.
WS 100 Yr.
Crit 100 Yr.
Crit FW
Ground
Bank Sta
Encroachment
Elevation (ft)
480
475
470
465
460
455
450
445
400
600
800
1000
1200
1400
1600
1800
2000
Station (ft)


7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.060 BR
.075
.045
.075
Legend
EG FW
WS FW
EG 100 Yr.
WS 100 Yr.
Crit 100 Yr.
Crit FW
Ground
Bank Sta
Encroachment
Elevation (ft)
485
480
475
470
465
460
455
450
445
400
600
800
1000
1200
1400
1600
1800
2000
Station (ft)


7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.057
.075
.045
.075
Legend
EG FW
EG 100 Yr.
WS FW
WS 100 Yr.
Ground
Bank Sta
Encroachment
Elevation (ft)
490
480
470
460
450
440
200
400
600
800
1000
1200
1400
1600
1800
2000
Station (ft)


7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.049
.07
.04
.06
Legend
EG FW
EG 100 Yr.
WS FW
WS 100 Yr.
Ground
Bank Sta
Encroachment
Elevation (ft)
480
475
470
465
460
455
450
445
400
600
800
1000
1200
1400
1600
1800
2000
Station (ft)


7700.2FS-CLOMR Plan: Proposed Conditions Model 3/17/2026
RS = 4.036
.07
.04
.06
Legend
EG FW
EG 100 Yr.
WS FW
WS 100 Yr.
Crit 100 Yr.
Crit FW
Ground
Bank Sta
Encroachment
Elevation (ft)
480
475
470
465
460
455
450
445
600
800
1000
1200
1400
1600
1800
2000
Station (ft)

VI. APPENDIX I

LOMR 23-07-0790P

Federal Emergency Management Agency

Washington, D.C. 20472

June 5, 2024

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable Edward Mahan
Mayor, City of Rock Hill
827 North Rock Hill Road
Rock Hill, MO 63119

IN REPLY REFER TO:
Case No.: 23-07-0790P
Community Name: City of Rock Hill, MO
Community No.: 290382
Effective Date of
This Revision: **May 20, 2024**

Dear Mayor Mahan:

The Flood Insurance Study Report and Flood Insurance Rate Map for your community have been revised by this Letter of Map Revision (LOMR). Please use the enclosed annotated map panel revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals issued in your community.

Additional documents are enclosed which provide information regarding this LOMR. Please see the List of Enclosures below to determine which documents are included. Other attachments specific to this request may be included as referenced in the Determination Document. If you have any questions regarding floodplain management regulations for your community or the National Flood Insurance Program (NFIP) in general, please contact the Consultation Coordination Officer for your community. If you have any technical questions regarding this LOMR, please contact the Director, Mitigation Division of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) in Kansas City, Missouri, at (816) 283-7003, or the FEMA Mapping and Insurance eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our website at https://www.fema.gov/flood-insurance.

Sincerely,

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

List of Enclosures:

Letter of Map Revision Determination Document
Annotated Flood Insurance Rate Map
Annotated Flood Insurance Study Report

cc: The Honorable Nancy Spewak
Mayor, City of Ladue

Garrett Schlett
City Administrator
City of Rock Hill

Roger Stewart
Floodplain Administrator
City of Ladue

Karen McHugh, CFM
State NFIP Coordinator
Missouri State Emergency Management Agency

George Stock, P.E.
President
Stock and Associates Consulting Engineers, Inc.

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	City of Rock Hill St. Louis County Missouri	NO PROJECT	1D HYDRAULIC ANALYSIS FLOODWAY UPDATED TOPOGRAPHIC DATA
	COMMUNITY NO.: 290382		
IDENTIFIER	1200 N. Rock Hill Road	APPROXIMATE LATITUDE & LONGITUDE: 38.617, -90.364 SOURCE: OTHER DATUM: NAD 83	

ANNOTATED MAPPING ENCLOSURES	ANNOTATED STUDY ENCLOSURES
TYPE: FIRM* NO.: 29189C0326K DATE: February 4, 2015	DATE OF EFFECTIVE FLOOD INSURANCE STUDY: February 4, 2015 PROFILE: 66P, 67P, AND 214P FLOODWAY DATA TABLES: 12

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

Deer Creek - from approximately 130 feet downstream of the McKnight Road to approximately 1,300 feet upstream of Litzsinger Road

SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Deer Creek	BFEs*	BFEs	YES	YES
	Zone AE	Zone AE	YES	YES
	Zone X (shaded)	Zone X (shaded)	YES	YES
	Floodway	Floodway	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 our 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)

Twomile Creek - from the confluence with Deer Creek to approximately 1,500 feet above the confluence with Deer Creek
Sebago drainage - from the confluence with Deer Creek to approximately 1,500 feet above the confluence with Deer Creek

SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Twomile Creek	Zone X (shaded)	Zone X (shaded)	YES	YES
	Zone AE	Zone AE	YES	YES
Sebago drainage	Zone X (shaded)	Zone X (shaded)	YES	YES
	Zone AE	Zone AE	YES	YES
	BFEs	BFEs	YES	NO

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 our 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 COMMUNITIES AFFECTED BY THIS REVISION

CID Number: 290363 **Name:** City of Ladue, Missouri

AFFECTED MAP PANELS	AFFECTED PORTIONS OF THE FLOOD INSURANCE STUDY REPORT
TYPE: FIRM NO.: 29189C0194K DATE: February 4, 2015 TYPE: FIRM NO.: 29189C0307K DATE: February 4, 2015	DATE OF EFFECTIVE FLOOD INSURANCE STUDY: February 4, 2015 PROFILES: 66P, 67P AND 214P FLOODWAY DATA TABLES: 12

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 our 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)

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.

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 our 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)

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:

Catherine Sanders
Director, Mitigation Division
Federal Emergency Management Agency, Region VII
9221 Ward Parkway, Suite 300
Kansas City, MO 64114-3323
(816) 283-7003

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 panel(s) 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 our 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)

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 Legal Ledger*

Dates: January 12, 2024 and January 19, 2024

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 our website at https://www.fema.gov/flood-insurance.

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

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Deer Creek (continued)								
AB	17,376	507	2,536	6.7	459.1	459.1	460.0	0.9
AC	17,534	560	2,453	7.0	460.3	460.3	460.6	0.3
AD	18,064	570	2,579	6.6	461.6	461.6	462.0	0.4
AE	19,020	645	2,262	7.5	464.1	464.1	465.0	0.9
AF	20,100	520	2,434	7.0	466.4	466.4	467.0	0.6
AG	20,435	200	1,923	8.9	466.8	466.8	467.5	0.7
AH	20,770	240	1,756	9.7	467.7	467.7	468.3	0.6
AI	21,129	548	5,401	3.2	471.2	471.2	471.8	0.6
AJ	21,538	616	5,497	3.5	471.6	471.6	472.2	0.6
AK	22,134	555	4,494	4.4	472.2	472.2	472.9	0.7
AL	22,696	659	2,943	5.8	472.8	472.8	473.4	0.6
AM	23,746	763	4,677	4.4	474.3	474.3	474.9	0.6
AN	24,001	740	3,662	6.4	474.3	474.3	474.6	0.3
AO	25,487	718	7,126	1.6	477.1	477.1	477.6	0.5
AP	26,340	385	2,791	4.0	477.2	477.2	477.6	0.4
AQ	27,640	454	4,338	2.6	478.1	478.1	478.6	0.5
AR	28,546	400	2,492	4.5	479.9	479.9	480.7	0.8
AS	29,596	250	1,990	5.6	482.8	482.8	483.5	0.7
AT	30,834	338	2,709	4.2	487.9	487.9	488.6	0.7
AU	31,586	218	1,766	6.4	489.8	489.8	490.2	0.4
AV	32,456	175	1,300	8.7	493.6	493.6	494.0	0.4
AW	33,436	175	1,456	7.3	499.0	499.0	499.5	0.5
AX	34,220	275	1,965	5.4	503.8	503.8	503.9	0.1
AY	35,310	175	1,754	5.6	506.0	506.0	506.8	0.8
AZ	37,000	275	1,724	5.7	510.2	510.2	511.0	0.8
BA	37,480	313	1,691	5.8	511.3	511.3	512.2	0.9

REVISED DATA

[1]Feet above confluence with River Des Peres

TABLE 12

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. LOUIS COUNTY, MO AND INCORPORATED AREAS

FLOODWAY DATA

REVISED TO REFLECT LOMR EFFECTIVE: May 20, 2024

DEER CREEK (continued)

FLOODING SOURCE		FLOODWAY			1-PERCENT ANNUAL CHANCE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Sebago Drainage								
A	410	111	863	3.7	473.8[4]	469.3[2]	470.1	0.8
B	620	112	959	3.3	473.8[4]	469.7[2]	470.4	0.7
C	1,215	126	710	4.5	473.8[4]	470.3[2]	471.0	0.7
D	1,820	103	627	5.1	473.8[4]	471.7	472.6	0.9
E	2,440	113	855	4.5	479.3	479.3	479.8	0.5
F	2,930	119	604	6.4	481.6	481.6	482.5	0.9
G	3,170	100	453	8.5	483.8	483.8	484.5	0.7
H	3,250	109	769	4.2	487.8	487.8	488.8	1.0
I	3,655	N/A[3]	N/A[3]	N/A[3]	489.7	489.7	490.1	0.4
J	4,270	N/A[3]	N/A[3]	N/A[3]	496.5	496.5	496.6	0.1
K	4,895	46	286	11.2	502.8	502.8	503.8	1.0
L	5,285	N/A[3]	N/A[3]	N/A[3]	507.5	507.5	508.3	0.8
M	5,410	142	942	2.4	517.0	517.0	518.0	1.0
N	6,455	N/A[3]	N/A[3]	N/A[3]	527.1	527.1	527.8	0.7

REVISED DATA

[1]Feet above confluence with Deer Creek
[2]Elevations computed without considering overflow effects from Deer Creek
[3]Data unavailable
[4]Elevation computed with considering overflow from Deer Creek → REVISED DATA

TABLE 12

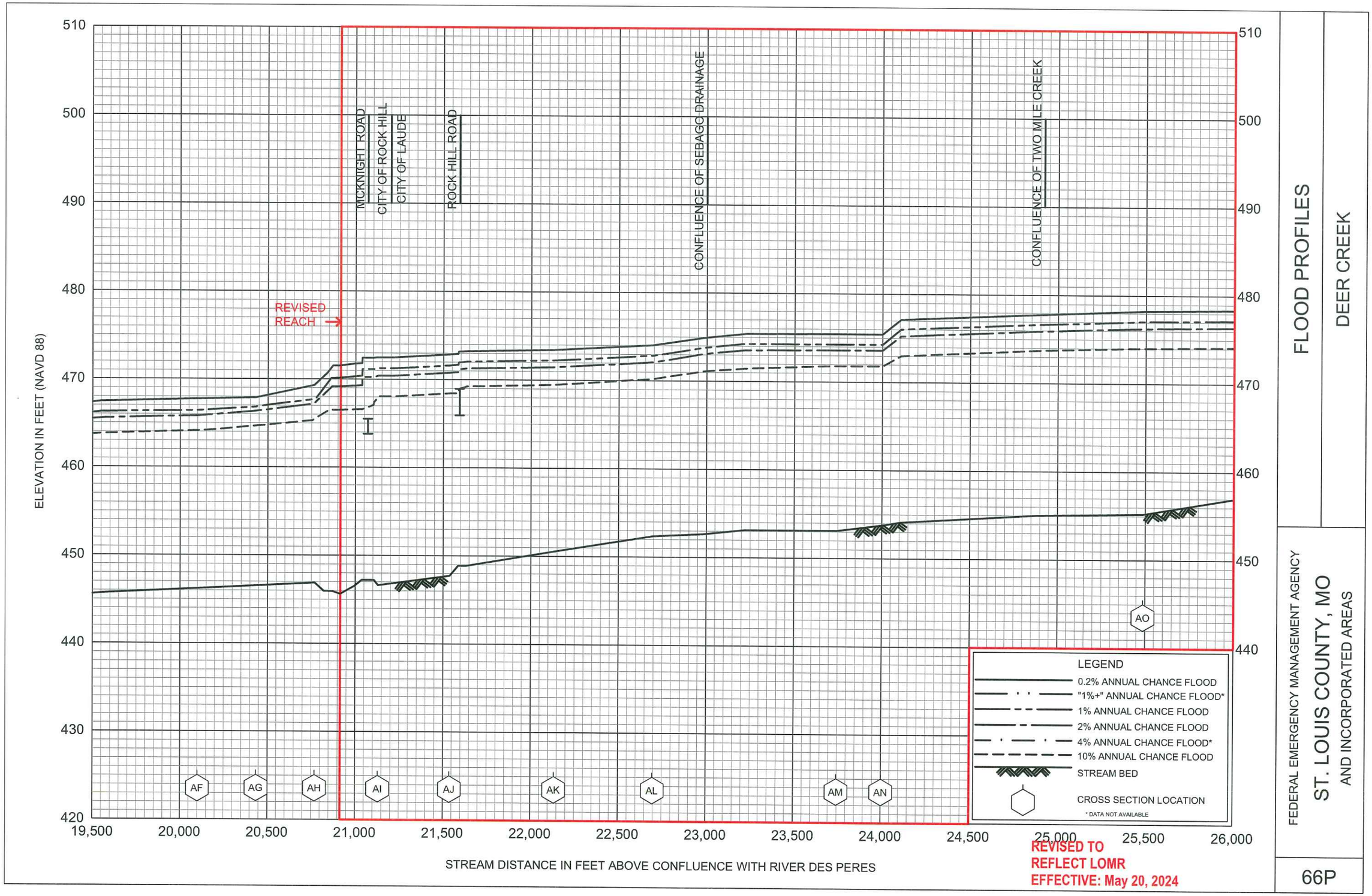
FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. LOUIS COUNTY, MO AND INCORPORATED AREAS

FLOODWAY DATA

REVISED TO REFLECT LOMR EFFECTIVE: May 20, 2024

SEBAGO DRAINAGE



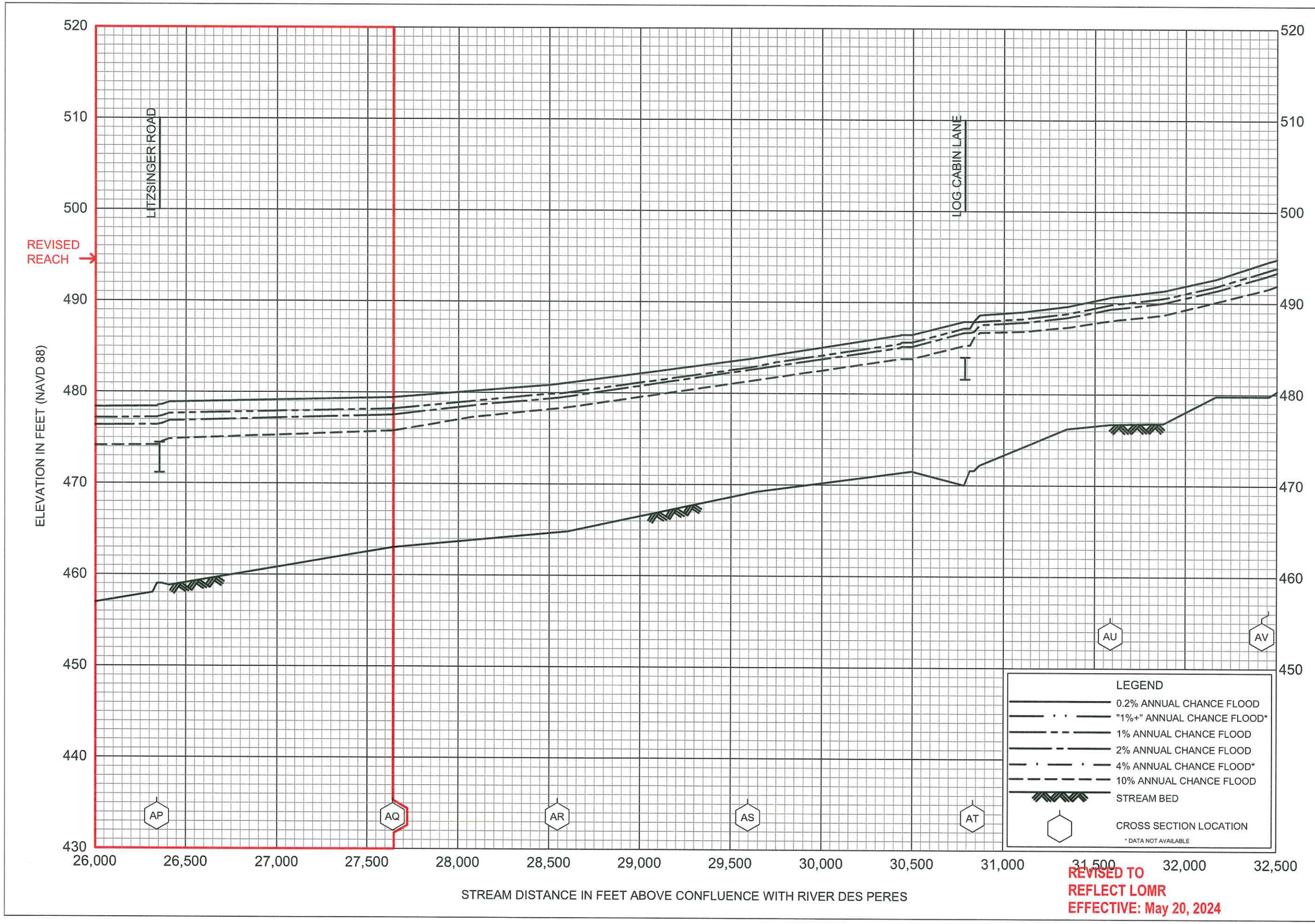
FLOOD PROFILES

DEER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. LOUIS COUNTY, MO
AND INCORPORATED AREAS

REVISED TO
REFLECT LOMR
EFFECTIVE: May 20, 2024



FLOOD PROFILES

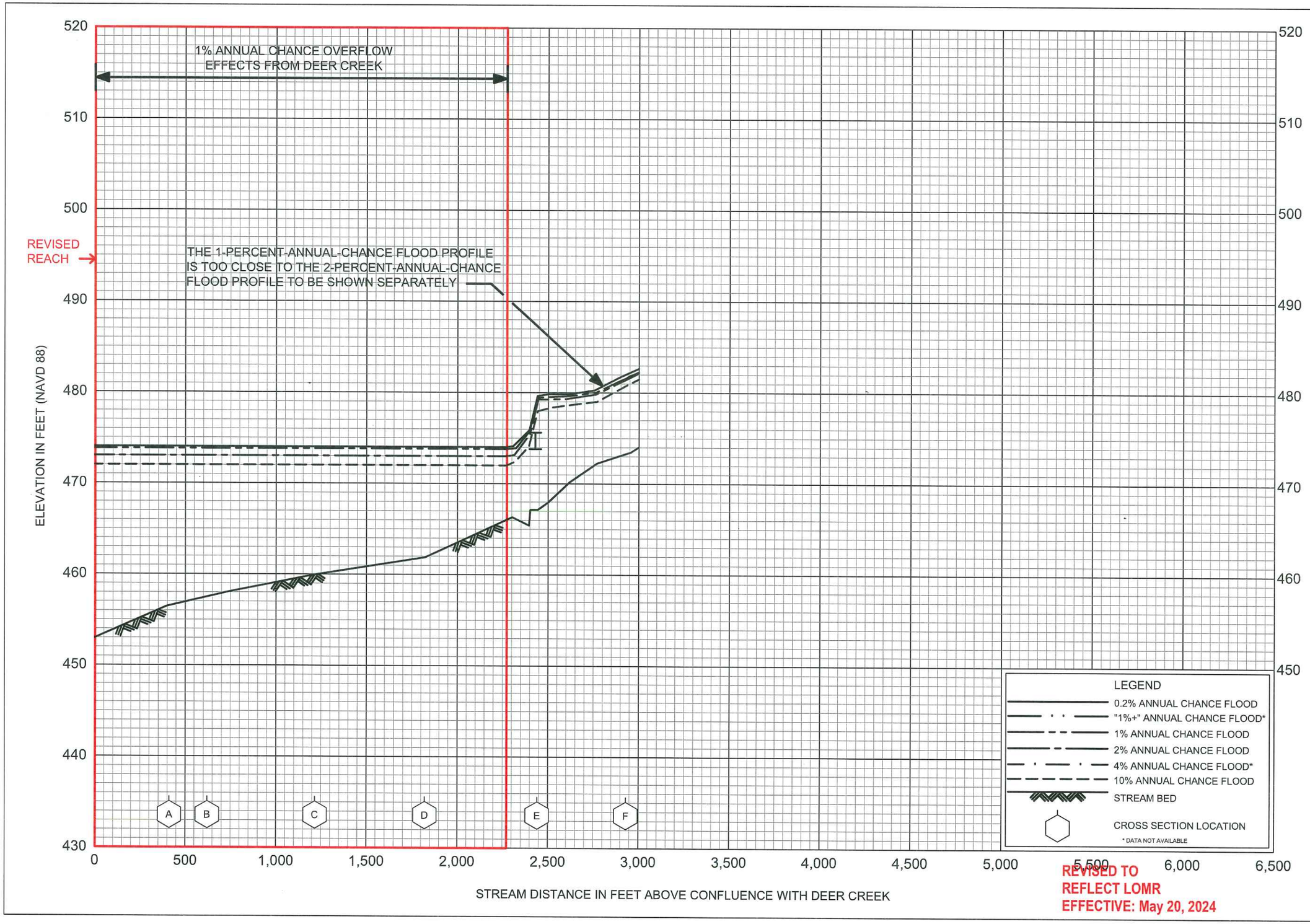
DEER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. LOUIS COUNTY, MO
AND INCORPORATED AREAS

REVISED TO
REFLECT LOMR
EFFECTIVE: May 20, 2024

67P



REVISED TO REFLECT LOMR EFFECTIVE: May 20, 2024

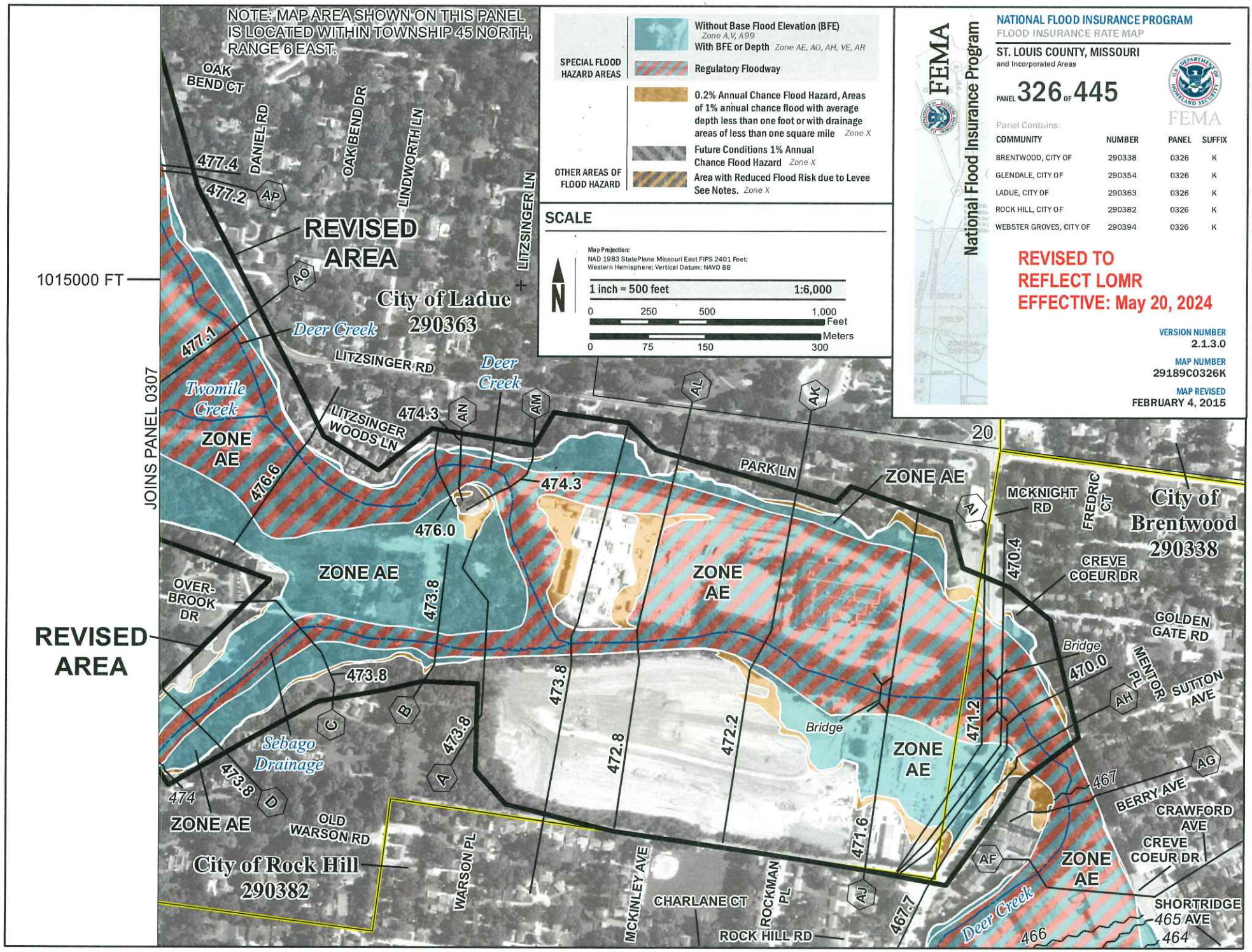
FLOOD PROFILES

SEBAGO DRAINAGE

FEDERAL EMERGENCY MANAGEMENT AGENCY

ST. LOUIS COUNTY, MO AND INCORPORATED AREAS

214P


NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 45 NORTH, RANGE 6 EAST.
1015000 FT
JOINS PANEL 0307
REVISED AREA
REVISED AREA
OAK BEND CT
DANIEL RD
OAK BEND DR
LINDWORTH LN
LITZSINGER LN
477.4
477.2
AP
AO
AL
AK
AM
AN
477.1
Deer Creek
LITZSINGER RD
Twomile Creek
LITZSINGER WOODS LN
474.3
476.6
476.0
474.3
PARK LN
ZONE AE
City of Ladue
290363
ZONE AE
ZONE AE
ZONE AE
ZONE AE
OVER-BROOK DR
473.8
473.8
473.8
473.8
473.8
472.8
472.2
471.2
Bridge
Sebago Drainage
474
ZONE AE
OLD WARSON RD
City of Rock Hill
290382
WARSON PL
MCKINLEY AVE
CHARLANE CT
ROCKMAN PL
ROCK HILL RD
AJ
471.6
467.7
AF
ZONE AE
Deer Creek
466
SHORTRIDGE
465 AVE
464
AG
467
BERRY AVE
CRAWFORD AVE
CREVE COEUR DR
AH
MENTOR PL
SUTTON AVE
Bridge
470.0
GOLDEN GATE RD
CREVE COEUR DR
470.4
AI
MCKNIGHT RD
FREDRIC CT
City of Brentwood
290338
20
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 Missouri East FIPS 2401 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
ST. LOUIS COUNTY, MISSOURI
and Incorporated Areas
PANEL 326 OF 445
Panel Contains:
COMMUNITY NUMBER PANEL SUFFIX
BRENTWOOD, CITY OF 290338 0326 K
GLENDALE, CITY OF 290354 0326 K
LADUE, CITY OF 290363 0326 K
ROCK HILL, CITY OF 290382 0326 K
WEBSTER GROVES, CITY OF 290394 0326 K
REVISED TO REFLECT LOMR EFFECTIVE: May 20, 2024
VERSION NUMBER
2.1.3.0
MAP NUMBER
29189C0326K
MAP REVISED
FEBRUARY 4, 2015

VII. APPENDIX II

15 yr. Flow Projections (for MSD requirements)
15 yr. Estimated Starting Water Surface Elevation (for MSD requirements)

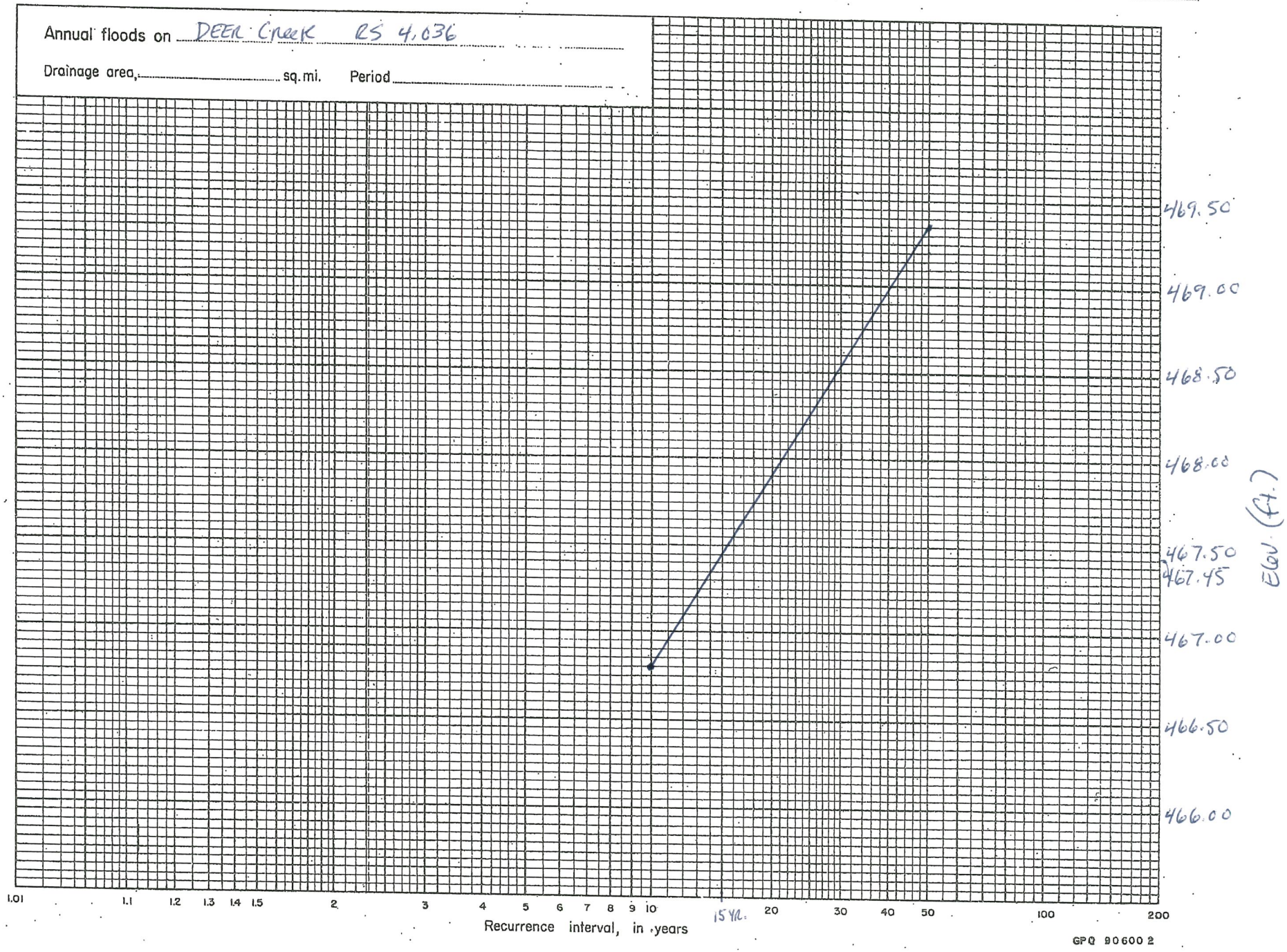
9–179a
Flood data plot
(March 1949)

UNITED STATES DEPARTMENT OF THE INTERIOR — GEOLOGICAL SURVEY — WATER RESOURCES DIVISION

File Number _____

Annual floods on DEER Creek RS 4.036

Drainage area, _____ sq. mi. Period _____



GPO 90600 2

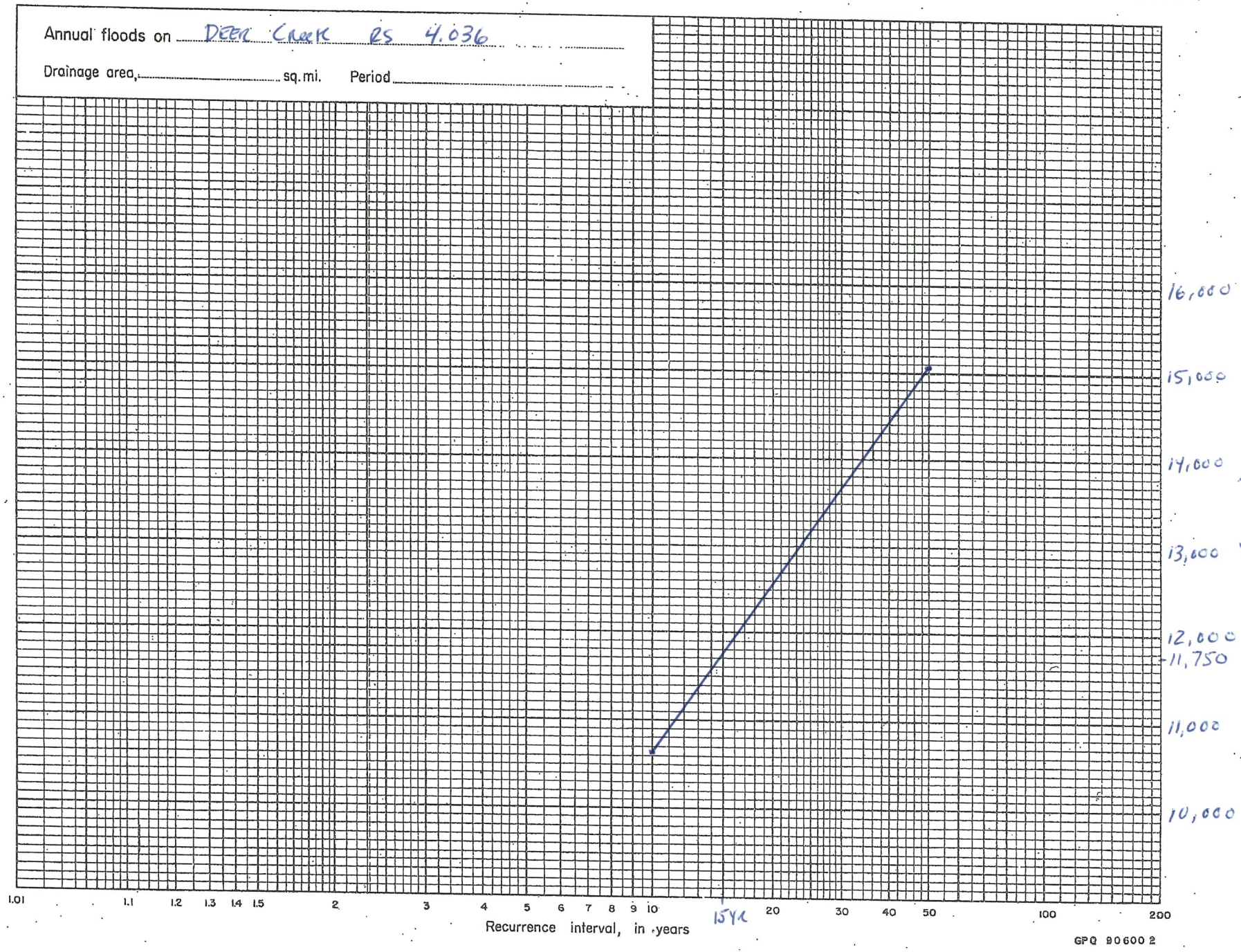
9–179a
Flood data plot
(March 1949)

UNITED STATES DEPARTMENT OF THE INTERIOR — GEOLOGICAL SURVEY — WATER RESOURCES DIVISION

File Number _____

Annual floods on DEER CREEK RS 4.036

Drainage area, _____ sq. mi. Period _____



GPO 90600 2

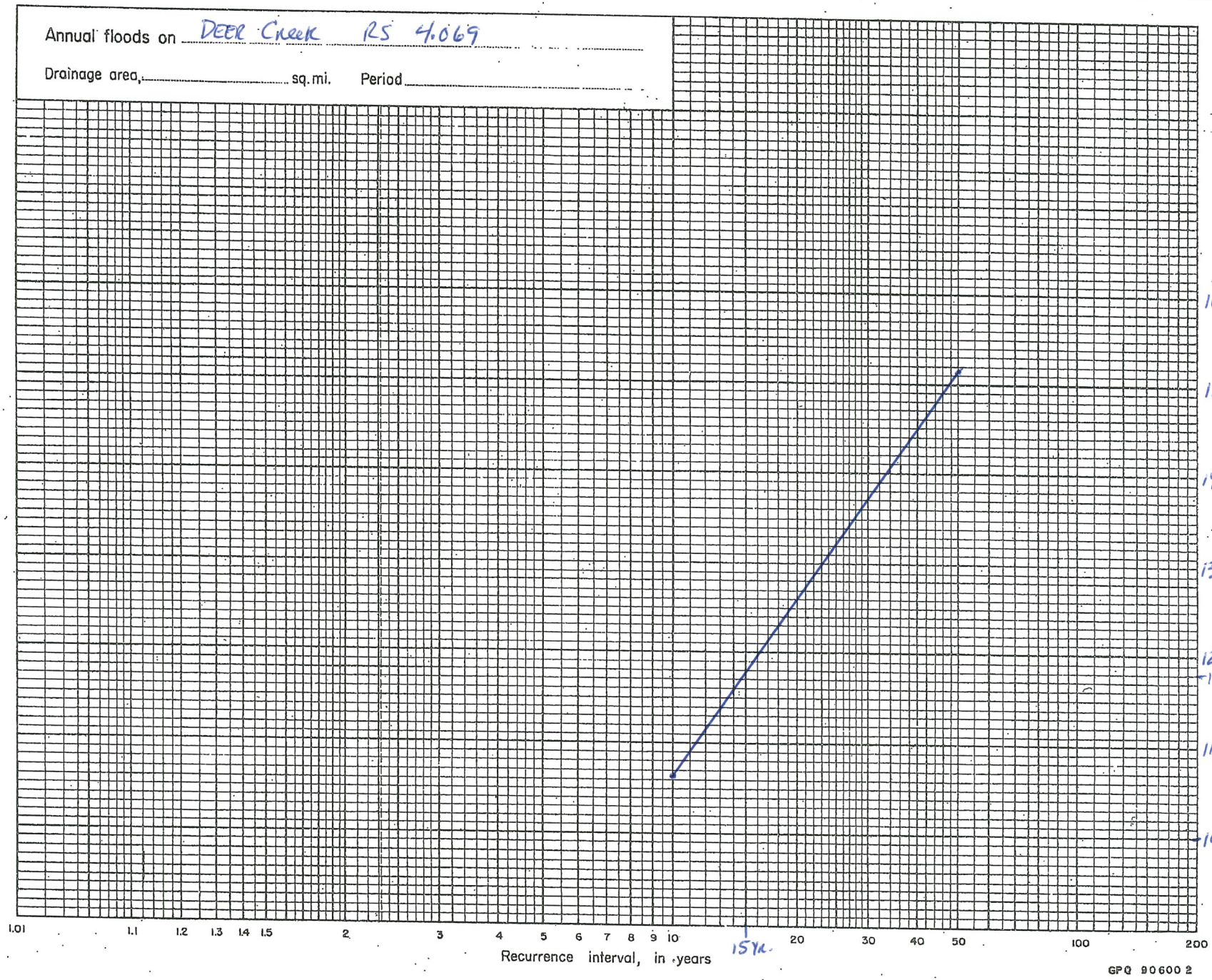
9–179a
Flood data plot
(March 1949)

UNITED STATES DEPARTMENT OF THE INTERIOR — GEOLOGICAL SURVEY — WATER RESOURCES DIVISION

File Number .....

Annual floods on DEER Creek RS 4.069

Drainage area, ... sq. mi. Period .....



GPO 90600 2

VIII. APPENDIX III

Preliminary FIRM Map 29189C0326 L



FLOOD HAZARD INFORMATION

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

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT HTTPS://MSC.FEMA.GOV

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*
- 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
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available effective flood hazard information for your community, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Mapping and Insurance eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website https://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be downloaded from the website. Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be acquired directly from the Flood Map Service Center at the website listed above.

For community and countywide map dates refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Basemap information shown on this FIRM was provided in digital format by the United States Geological Survey (USGS). The basemap shown is the USGS National Map: Orthoimagery. Last refreshed October, 2020.

Note: Some Special Flood Hazard Areas with elevations may not appear with elevation labels if the Base Flood Elevation or Cross-section line which communicates the elevation for the location appears on the adjacent panel. Please see the Panel Locator Diagram on this map panel to determine the adjacent panel and find the elevation feature there, or alternatively use the Flood Insurance Study report for detailed elevations by flood source.

SCALE

N

1 inch = 500 feet 1:6,000

0 250 500 1,000 1,500 2,000 feet

0 50 100 200 300 400 meters

Map Projection:
NAD 1983 StatePlane Missouri East FIPS 2401 Feet
Vertical Datum: NAVD88

PANEL LOCATOR

*PANEL NOT PRINTED

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

ST. LOUIS COUNTY MISSOURI AND INCORPORATED AREAS

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
CITY OF LADUE	290363	0326	L
CITY OF ROCK HILL	290382	0326	L
CITY OF WEBSTER GROVES	290394	0326	L
CITY OF BRENTWOOD	290338	0326	L
CITY OF GLENDALE	290354	0326	L

MAP NUMBER
29189C0326L
EFFECTIVE DATE
Prelim Issue Date: 01/29/2026

IX. APPENDIX IV

City of Ladue Ordinance 2103 “Floodplain Management Ordinance” Article 4, Section F: Additional Requirement - Velocity regulations
The Metropolitan St. Louis Sewer District, Rules and Regulations, February 1, 2018 – 5.010.07.8
City of Ladue Approved Variance for Increased Flow Velocity, dated February 6, 2019

2. The community shall prohibit any encroachments, including fill, new construction, substantial-improvements, and other development within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in **any** increase in flood levels within the community during the occurrence of the base flood discharge.

3. If Article 4, Section D(2) is satisfied, all new construction and substantial improvements shall comply with all applicable flood hazard reduction provisions of Article 4.

4. In unnumbered A zones, the community shall obtain, review, and reasonably utilize any base flood elevation or floodway data currently available from Federal, State, or other sources as set forth in Article 4, Section A(2).

SECTION E. RECREATIONAL VEHICLES

1. Require that recreational vehicles placed on sites within all unnumbered and numbered A zones and AE zones on the community's FIRM either:

   a. be on the site for fewer than 180 consecutive days,

   b. be fully licensed and ready for highway use; **or**

   c. meet the permitting, elevation, and the anchoring requirements for manufactured homes of this ordinance.

SECTION F. ADDITIONAL REQUIREMENTS

1. Any owner or developer desiring to do any construction in the flood plain, including the floodway and floodway fringe areas thereof, or to for any other work of any kind or description which makes any changes in said areas must do such work in a manner that will result in no increase in water surface elevation (equal to or less than 0.00 feet) and no increase in mean flow velocity (equal to or less than 0.00 feet per second). The following methods of determining compliance are applicable:
   a. The preliminary review method:
      i. Plans sufficient to describe the project and enable evaluation thereof must be filed with the City.
      ii. The local administrator shall review the proposed work on a "best judgment" basis for the purpose of determining whether a probability exists that the proposed work will not cause a result which violates the requirements of Article 4 Section F (1).
      iii. If the local administrator reports his opinion that the work is not likely to cause a violation of said requirements, then a permit may be issued. If the local administrator reports otherwise, then the procedure set out in Part b herein shall be followed.
      iv. The procedure set out in this Part a and its subparts are intended to eliminate unnecessary hardship. The preliminary review required herein is necessarily limited so as to limit cost to residents. Neither the local administrator providing the opinion nor the City shall not be liable to anyone because of errors arising in connection with such opinion.
   b. Unless excused by the preliminary review method described in Part a, the owner or developer must do the following:
      i. The owner or developer shall deposit with the City $1,500.00 to be applied towards the cost of the engineering review described herein. If said cost exceeds the amount

4. Cross sections shall show the following items:

   a. 100-year water surface elevation.

   b. Manning's "n" values

   c. Top of bank locations

   d. Horizontal stationing, vertical elevations

   e. Existing and proposed ground lines

   f. Existing and proposed sewers

   g. Cross section identification as it relates to the site plan and hydraulic study

   h. Existing or proposed structures

   i. Floodway limits

5. Crossroad culverts in the flood plain shall be designed on a 100-year storm frequency and provide a minimum of two (2) feet of freeboard at the road shoulder line.

6. Basement elevations, with the exception of walkouts, must be one (1) foot above the 100-year flood elevation. Basements outside the flood plain limits may be below the 100-year flood elevation if a sanitary pump is installed in the basement with the outgoing plumbing located above the 100-year elevation.

7. The lowest finished floor elevation of all new or redevelopment structures, including slab on grade, shall be minimum of one (1) foot above the 100-year flood elevation. . The low sill of all structures in or adjacent to the floodplain shall be a minimum of two (2) feet above the 100-year flood elevation.

8. Channel and overbank (flood plain) velocities should generally not increase by more than fifty percent (50%) over pre-developed conditions. Velocities in excess of five (5) feet per second (fps) in channels shall require erosion protection.

5216

CITY OF LADUE

Building Department

February 6, 2019

George M. Stock, P.E., President
Stock & Associates Consulting Engineers, Inc.
257 Chesterfield Business Pkwy.
St, Louis MO 63005

RECEIVED
FEB 0 8 2019
Stock & Associates
Consulting Engineers, Inc.

MSD
P#
18FLPLS-00031

Re: Floodplain approval Rock Hill Quarries Project phase one

Dear George,

The Floodplain Management Board has granted a variance for the increased flow velocity under the Flood study for phase one. This will allow the City of Ladue to issue a Floodplain Development permit and Building permit for the project upon receiving verification of the MSD approval, 404 and 401 approvals and zoning requirements.

I hope this suffices for the letter request for the other entities.

Sincerely,

Roger Stewart, CBO
City of Ladue
9345 Clayton Rd.
St. Louis, MO 63124

Cc: file

X. APPENDIX V

Rock Hill Quarries Plat 2
C1: Site Existing Conditions Plan
C2: Site Proposed Conditions Plan

ROCK HILL QUARRIES PLAT 2

A SUBDIVISION OF ROCK HILL QUARRIES PER PLAT RECORDED IN PLAT BOOK 371, PAGE 25 AND PART OF LOT 10 AND LOTS 11 THROUGH 16 OF EICKERMANN'S SUBDIVISION OF THE CHARLEVILLE TRACT, PER PLAT BOOK 9 PAGE 106 OF THE CITY (FORMERLY COUNTY) OF ST. LOUIS RECORDS, AND PART OF LOT 9 OF CHARLEVILLE TRACT LOCATED IN U.S. SURVEY 1930, TOWNSHIP 45 NORTH, RANGE 6 EAST OF THE 5TH PRINCIPAL MERIDIAN, CITY OF LADUE AND ROCK HILL, ST. LOUIS COUNTY, MISSOURI

576

2025092900193
BK: 373 PGS: 576 - 576
FILED FOR RECORD
09/29/2025 09:29:08 AM
Number of Pages: 2
RECORDER OF DEEDS
ST. LOUIS COUNTY, MO
Witness my hand and official seal on the day and year aforesaid.
Gerald E. Solly

193

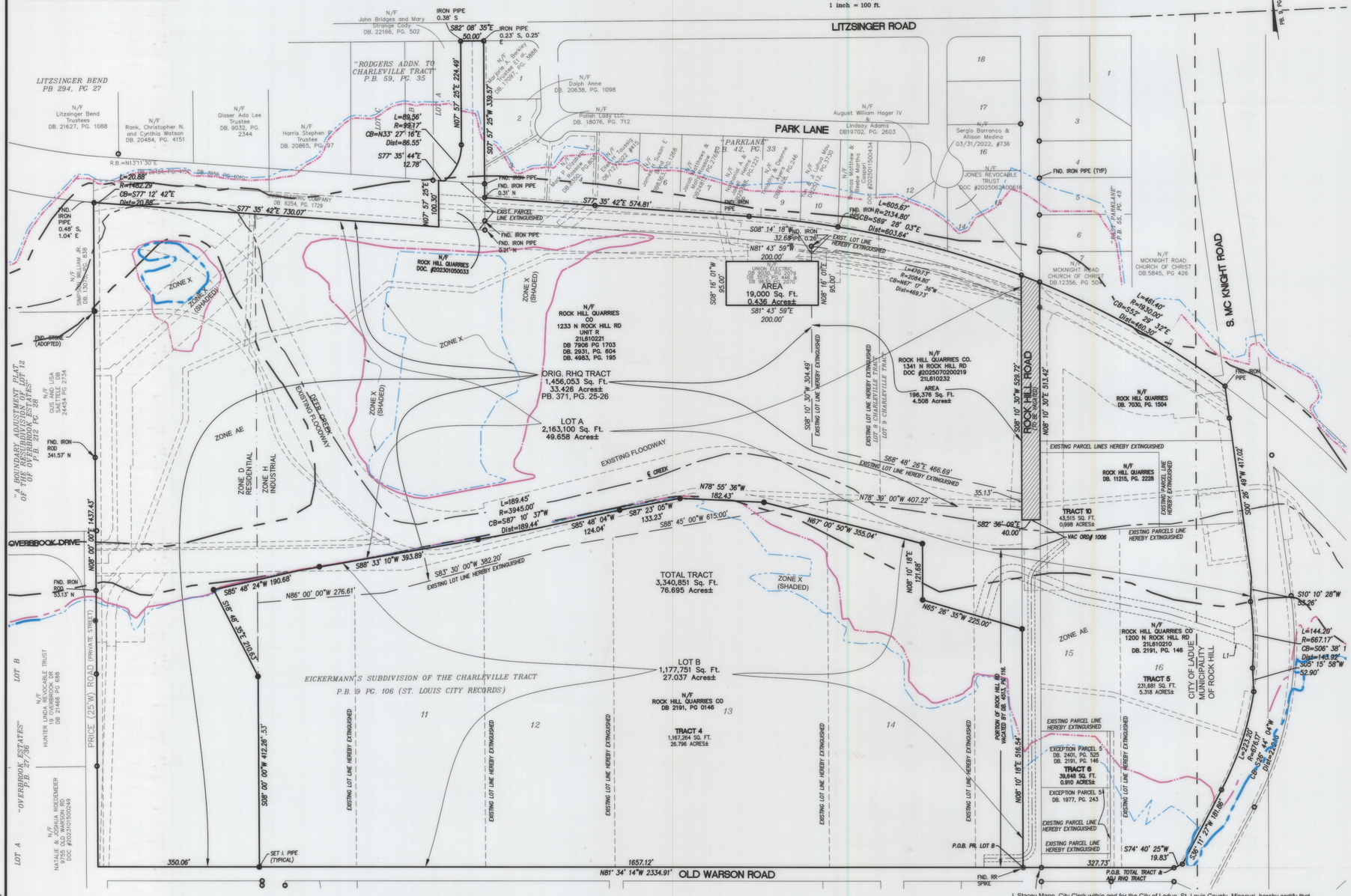
LOCATION MAP
(NOT TO SCALE)

LINE TYPE LEGEND
- EX CONT MJR
- EX CONT MNR
- TREE LINE
- FEMA ELEV
- FEMA LIMIT
- PAVEMENT
- WALL
- GUARD RAIL
- CHAINLINK/WIRE FENCE
- WOOD/VINYL FENCE
- GAS
- UNDER GROUND ELEC
- OVERHEAD ELEC
- TELEPHONE LINE
- FIBER OPTIC LINE
- WATERLINE
- 100 YR FIRM
- 500 YR FIRM
- FLOODWAY EX FIRM

LEGEND
- BENCH MARK
- FOUND IRON ROD
- FOUND IRON PIPE
- RIGHT OF WAY MARKER

ABBREVIATIONS
- DB. – DEED BOOK
- FT. – FEET
- FND. – FOUND
- N/F – NOW OR FORMERLY
- PB. – PLAT BOOK
- PG. – PAGE
- SQ. – SQUARE
- (86'W) – RIGHT-OF-WAY WIDTH

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.



TOTAL TRACT

A tract of land being all of Rock Hill Quarries Plat , a boundary adjustment plat as recorded in Plat Book 371, Page 25 and part of Lot 10 and Lots 11 Through 16 Of Eickermann's Subdivision of The Charleville Tract, a subdivision according to the plat thereof as recorded in Plat Book 9 Page 106 Of The City (Formerly County) of St. Louis Records, and Part of Lot 9 Of Charleville Tract located in U.S. Survey 1930, Township 45 North, Range 6 East, St. Louis County, City of Ladue, Missouri, and being more particularly described as:

Beginning at the intersection of north right of way line of Old Warson Road, 40 feet wide and the west right of way line of South McKnight Road, variable width, thence along said north right-of-way line, North 81 degrees 34 minutes 14 seconds West, 2,334.91 feet to the east right of way line of Price Road, 25 feet wide; thence North 08 degrees 00 minutes 00 seconds East, along said east right of way line and its northerly extension, 1,437.43 feet to the southwest corner of a tract of land as conveyed to Union Electric by Deed Book 5254 Page 1729, of the St. Louis County records, said point being located on a curve to the left having a radius of 1,482.29 feet; thence along said curve an arc distance of 20.88 feet, and a chord which bears South 77 degrees 12 minutes 42 seconds East, 20.88 feet; thence South 77 degrees 35 minutes 42 seconds East, 730.07 feet to the southwest corner of a tract of land as conveyed to Rock Hill Quarries by Document Number 202301050033 of above said records; thence along the west line of said Rock Hill Quarries tract, North 07 degrees 57 minutes 25 seconds East, 100.30 feet to the south line of Lot A of Rodgers Add to Charleville Tract, as recorded in Plat Book 59 Page 35, of said records; thence along the south and east lines of said Lot A the following courses and distance: South 77 degrees 35 minutes 42 seconds East, 12.79 feet, to a curve to the left having a radius of 100.00 feet; along said curve an arc distance of 89.50 feet, and a chord which bears North 33 degrees 27 minutes 16 seconds East, 86.55 feet and North 07 degrees 57 minutes 25 seconds East, 224.49 feet to the South right of way line of Litzinger Road, variable width, thence South 82 degrees 08 minutes 35 seconds East along the south line of said Litzsinger Road, 50.00 feet, to the west line of Lot 1 of Parklane as recorded in Plat Book 42 Page 33; thence along the west line of Parkland Subdivision South 07 degrees 57 minutes 25 seconds West, 339.57 feet to the southwest corner of said Parklane Subdivision; thence along the south line of said Parklane Subdivision following courses and distances: South 77 degrees 35 minutes 42 seconds East, 574.81 feet to the beginning of a curve to the right having a radius of 2,134.80 feet and along said curve to the right an arc distance of 605.67 feet, and a chord which bears South 69 degrees 28 minutes 03 seconds East, 603.64 feet, to the southeast corner of Lot 14 of said Parklane Subdivision, said point also being located on the western right of way line of Rock Hill Road, 40 feet wide; thence South 08 degrees 10 minutes 31 seconds West, along the west right of way line of said Rock Hill Road, South 08 degrees 10 minutes 30 seconds East, 529.72 feet to the north line of that part of Rock Hill Road was vacated by Ordinance Number 1006; thence along the north line of said vacated Rock Hill Road, South 82 degrees 36 minutes 09 seconds East, 40.00 feet, to the east right-of-way of said Rock Hill Road, thence along said right-of-way line, North 08 degrees 10 minutes 30 seconds East, 513.42 feet to the north line of a tract of land as conveyed to Rock Hill Quarries by instrument recorded in Book 7030, Page 1504 of above said records, said point also being located on a curve to the right having a radius of 1,930.00 feet; thence along said curve an arc length of 461.40 feet and a chord which bears South 52 degrees 29 minutes 32 seconds East, 460.30 feet to its intersection with the west right-of-way line of S. McKnight Road, variable width; thence along said right-of-way line the following: South 00 degrees 26 minutes 49 seconds West, 417.02 feet; South 10 degrees 10 minutes 28 seconds West, 53.26 feet to the beginning of a non-tangent curve to the right having a radius of 667.17 feet and a chord which bears South 06 degrees 38 minutes 17 seconds West, 143.92 feet; South 05 degrees 15 minutes 58 seconds West, 52.90 feet to the beginning of a non-tangent curve to the right having a radius of 676.17 feet; along said curve with an arc length of 223.20 feet and a chord which bears South 26 degrees 44 minutes 04 seconds West, 222.18 feet; South 36 degrees 11 minutes 27 seconds West, 181.86 feet and South 74 degrees 40 minutes 25 seconds West, 19.83 feet to the POINT OF BEGINNING.

Less and Excepting therefrom a tract of land as convey to Union Electric Company by instruments recorded in Book 9030, Page 2079, Book 3575, Page 446 and Book 9630, Page 2070 being 19,000 square feet or 0.436 acres, more or less.

Containing 3,340,851 square feet or 76.695 acres, more or less

LOT A

A tract of land being part of U.S. Survey 1930, Township 45 North, Range 6 East, St. Louis County, City of Ladue, Missouri, and being more particularly described as:

Beginning at the intersections of north right of way line of Old Warson Road, 40 feet wide and the west right of way line of South McKnight Road, variable width, thence along said north right-of-way line, North 81 degrees 34 minutes 14 seconds West, 327.73 feet to its intersection with the west line of that part of Rock Hill Road, as vacated by instrument recorded in Book 4513, Page 116 of above said records; thence along said west vacated right -of-way line, North 08 degrees 10 minutes 18 seconds East, 516.54 feet; thence departing last described line the following courses and distances: North 65 degrees 26 minutes 35 seconds West, 225.00 feet; North 08 degrees 10 minutes 18 seconds East, 121.68 feet; North 67 degrees 00 minutes 50 seconds West, 355.04 feet; North 78 degrees 55 minutes 36 seconds West, 182.43 feet; South 87 degrees 23 minutes 05 seconds West, 133.23 feet; South 85 degrees 48 minutes 04 seconds West, 124.04 feet to the beginning of a curve to the right having a radius of 3,945.00 feet; along said curve with an arc length of 189.45 feet and a chord which bears South 87 degrees 10 minutes 37 seconds West, 189.44 feet, South 88 degrees 33 minutes 10 seconds West, 393.89 feet; South 85 degrees 48 minutes 24 seconds West, 190.68 feet and South 18 degrees 48 minutes 35 seconds East, 210.63 feet to its intersection with the east line of RHQ Tract as established by the Boundary Adjustment plat recorded in Plat Book 371, Page 25 of the St. Louis County records; thence along said east line, South 08 degrees 00 minutes 00 seconds West, 412.26 feet to the north right-of-way line of above said Old Warson Road; thence along said right-of-way line, North 81 degrees 34 minutes 14 seconds West, 350.06 feet to the east right of way line of Price Road, 25 feet wide; thence North 08 degrees 00 minutes 00 seconds East, along said east right of way line and its northerly extension, 1,437.43 feet to the southwest corner of a tract of land as conveyed to Union Electric by Deed Book 5254 Page 1729, of the St. Louis County records, said point being located on a curve to the left having a radius of 1,482.29 feet; thence along said curve an arc distance of 20.88 feet, and a chord which bears South 77 degrees 12 minutes 42 seconds East, 20.88 feet; thence South 77 degrees 35 minutes 42 seconds East, 730.07 feet to the southwest corner of a tract of land as conveyed to Rock Hill Quarries by Document Number 202301050033 of above said records; thence along the west line of said Rock Hill Quarries tract, North 07 degrees 57 minutes 25 seconds East, 100.30 feet to the south line of Lot A of Rodgers Add to Charleville Tract, as recorded in Plat Book 59 Page 35, of said records; thence along the south and east lines of said Lot A the following courses and distance: South 77 degrees 35 minutes 42 seconds East, 12.79 feet, to a curve to the left having a radius of 100.00 feet; along said curve an arc distance of 89.50 feet, and a chord which bears North 33 degrees 27 minutes 16 seconds East, 86.55 feet and North 07 degrees 57 minutes 25 seconds East, 224.49 feet to the South right of way line of Litzinger Road, variable width, thence South 82 degrees 08 minutes 35 seconds East along the south line of said Litzsinger Road, 50.00 feet, to the west line of Lot 1 of Parklane as recorded in Plat Book 42 Page 33; thence along the west line of Parkland Subdivision South 07 degrees 57 minutes 25 seconds West, 339.57 feet to the southwest corner of said Parklane Subdivision; thence along the south line of said Parklane Subdivision following courses and distances: South 77 degrees 35 minutes 42 seconds East, 574.81 feet to the beginning of a curve to the right having a radius of 2,134.80 feet and along said curve to the right an arc distance of 605.67 feet, and a chord which bears South 69 degrees 28 minutes 03 seconds East, 603.64 feet, to the southeast corner of Lot 14 of said Parklane Subdivision, said point also being located on the western right of way line of Rock Hill Road, 40 feet wide; thence along said right-of-way line South 08 degrees 10 minutes 30 seconds West, 529.72 feet to the north line of that part of Rock Hill Road as vacated by Ordinance Number 1006; thence along the north line of said vacated Rock Hill Road, South 82 degrees 36 minutes 09 seconds East, 40.00 feet, to the east right-of-way of said Rock Hill Road, thence along said right-of-way line, North 08 degrees 10 minutes 30 seconds East, 513.42 feet t the north line of a tract of land as conveyed to Rock Hill Quarries by instrument recorded in Book 7030, Page 1504 of above said records, said point also being located on a curve to the right having a radius of 1,930.00 feet; thence along said curve an arc length of 461.40 feet and a chord which bears South 52 degrees 29 minutes 32 seconds East, 460.30 feet to its intersection with the west right-of-way line of S. McKnight Road, variable width; thence along said right-of-way line the following: South 00 degrees 26 minutes 49 seconds West, 417.02 feet; South 10 degrees 10 minutes 28 seconds West, 53.26 feet to the beginning of a non-tangent curve to the right having a radius of 667.17 feet and a chord which bears South 06 degrees 38 minutes 17 seconds West, 143.92 feet; South 05 degrees 15 minutes 58 seconds West, 52.90 feet to the beginning of a non-tangent curve to the right having a radius of 676.17 feet; along said curve with an arc length of 223.20 feet and a chord which bears South 26 degrees 44 minutes 04 seconds West, 222.18 feet: South 36 degrees 11 minutes 27 seconds West, 181.86 feet and South 74 degrees 40 minutes 25 seconds West, 19.83 feet to the POINT OF BEGINNING.

Less and Excepting therefrom a tract of land as convey to Union Electric Company by instruments recorded in Book 9030, Page 2079, Book 3575, Page 446 and Book 9630, Page 2070 being 19,000 square feet or 0.436 acres, more or less.

Containing 2,163,100 square feet or 49.658 acres, more or less.

LOT B

A tract of land being part of lots 10, 11, 12, 13 14, and 15 of Eickermann's Subdivision of The Charleville Tract, a subdivision according to the plat thereof as recorded in Plat Book 9, Page 106 of the St. Louis County records, located in U.S. Survey 1930, Township 45 North, Range 6 East of the Fifth Principal Meridian, City of Ladue, St. Louis County, Missouri being more particularly described as follows:

Beginning at the intersection of the west line of that part of Rock Hill Road, as vacated by instrument recorded in Book 4513, Page 116 of above said records with the north right-of-way line of Old Warson Road, 40 feet wide; thence along said north right-of-way line, North 81 degrees 34 minutes 14 seconds West, 1,657.12 feet; thence departing said right-of-way line the following courses and distances: North 08 degrees 00 minutes 00 seconds East, 412.26 feet; North 18 degrees 48 minutes 35 seconds West, 210.63 feet; North 85 degrees 48 minutes 24 seconds East, 190.68 feet; North 88 degrees 33 minutes 10 seconds East, 393.89 feet to a point of curvature to the to the left having a radius of 3,945.00 feet, an arc length of 189.45 feet and a chord which bears North 87 degrees 10 minutes 37 seconds East, 189.44 feet to a point of tangency; North 85 degrees 48 minutes 04 seconds East, 124.04 feet; North 87 degrees 23 minutes 05 seconds East, 133.23 feet; South 78 degrees 55 minutes 36 seconds East, 182.43 feet; South 67 degrees 00 minutes 50 seconds East, 355.04 feet; South 08 degrees 10 minutes 18 seconds West, 121.68 feet and South 65 degrees 26 minutes 35 seconds East, 225.00 feet to the west line of above said vacated Rock Hill Road, thence along said west line, South 08 degrees 10 minutes 18 seconds West, 516.54 feet to the POINT OF BEGINNING.

Containing 1,177,751 square feet or 27.037 acres, more or less according to calculations performed by Stock & Associates Consulting Engineers, Inc. on December 16, 2024

OWNER'S CERTIFICATION

The undersigned, owner of the tract of land herein platted and further described in the surveyor's certificate set forth below, has caused the same to be surveyed and adjusted in the manner shown on this plat, which subdivision shall be known as:

"ROCK HILL QUARRIES PLAT 2"

It is not hereby certified that all existing easements are shown on this plat as of the time and date of recording of this plat.

Two (2) permanent monuments for each block created, and semi-permanent monuments at all lot corners will be set within twelve (12) months after the recording of this SUBDIVISION PLAT, in accordance with 20 CSR 2030-16 of the Department of Insurance, Financial Institutions and Professional Registration. In addition, other survey monuments indicated on this consolidation plat, will be set.

IN WITNESS THEREOF, I have hereunto set my hand this 18 day of Sept, 2025

Rock Hill Quarries Plat 2

By: [signature]

Print Name: William McCarthy Print Title President

PREPARED FOR:
ROCK HILL QUARRIES COMPANY
1341 N. ROCK HILL RD
ST. LOUIS, MO 63124

STATE OF MISSOURI)
) SS
COUNTY OF ST. LOUIS)

On this 18 day of Sept in the year 2025 before me, Daniel Stock a Notary Public in and for said state, personally appeared Tom McCarthy the President of Rock Hill Quarries known to me to be the person who executed the foregoing instrument in behalf of said Company and acknowledged to me that he executed the same for the purposes therein stated

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my notarial seal the day and year last above written.

[signature]
Notary Public

My commission expires: 3/17/29

DANIEL JOSEPH STOCK
NOTARY PUBLIC - NOTARY SEAL
STATE OF MISSOURI
MY COMMISSION EXPIRES MARCH 17, 2029
ST. LOUIS COUNTY
COMMISSION #13486125

I, Stacey Mann, City Clerk within and for the City of Ladue, St. Louis County, Missouri, hereby certify that this Plat being Rock Hill Quarries Plat Two, was approved by the City Council of the City of Ladue, St. Louis County, Missouri by Ordinance No. 2393 approved this 18th day of August, 2025

CITY OF LADUE

[signature]
Stacey Mann, City Clerk

[signature] 9/24/25
Andrea Sukanek, City Planner

CITY OF LADUE SAINT LOUIS COUNTY, MISSOURI SEAL

This subdivision plat has been reviewed and has been approved by the Department of Planning. The purpose of this plat is to consolidate several adjacent parcels into two overall Lots. No other lots shall be created.

[signature]
Edward Mahan
Mayor, City of Rock Hill Date

I, Amy Perrin, Assistant City Administrator / City Clerk of the City of Rock Hill, Missouri, do hereby certify this Subdivision plat was reviewed and approved by the City Of Rock Hill, St. Louis County, Missouri by Ordinance No. 2086 approved this 16th day of September, 2025

[signature]
Amy Perrin,
Assistant City Administrator / City Clerk

CITY OF ROCK HILL CORPORATE SEAL ST. LOUIS COUNTY, MO

SURVEYOR'S CERTIFICATION

This is to certify that Stock and Associates Consulting Engineers, Inc. have, during January 2025, by order of and for the use of Rock Hill Quarries Company, executed a Property Boundary Survey and SUBDIVISION Plat of a tract of lands located in U.S. Survey 1930, Township 45 North, Range 6 East of the 5th Principal Meridian, City of Ladue, St. Louis County, Missouri, and that the results of said survey and Subdivision Plat are shown hereon. We further certify that the above plat was prepared from an actual survey, according to the records available and recorded, and said survey meets or exceeds the current standards for Property Boundary Surveys for "Class Urban Property" as defined in Chapter 16, Division 2030 Missouri Standards for Property Boundary Surveys as adopted by the Missouri Board for Architects, Professional Engineers, Professional Land Surveyors, and Landscape Architects.

STOCK AND ASSOCIATES CONSULTING ENGINEERS, INC.
LC NO. 222-D
By: [signature]
Walter J. Pfleger, Missouri P.L.S. No. 2008-000728

PREPARED BY:
STOCK & ASSOCIATES
Consulting Engineers, Inc.
257 Chesterfield Business Parkway
St. Louis, MO 63005 PH: (636) 530-9100 FAX: (636) 530-9130
e-mail: general@stockassoc.com
Web: www.stockassoc.com

SUBDIVISION PLAT

ROCK HILL QUARRIES CO.

1200 N. ROCK HILL ROAD
CITY OF LADUE, MISSOURI

MISSOURI PROFESSIONAL ENGINEER WALTER JOSEPH PFLEGER NUMBER PE-2008000728 9/18/25

WALTER J. PFLEGER,P.L.S.
MO P.L.S. # 2008-000728
CERTIFICATE OF AUTHORITY
LC-222-D

REVISIONS:
1. 7/31/2025 - Revised per City of Ladue comments Dated 7/29/2025
2. 8/04/2025 - Revised per City of Ladue Comments (email Dated 8/04/2025)
3. 9/16/25 - Revised per Ladue Ordinance

DRAWN BY: J.K.	CHECKED BY: W.J.P.
DATE: 5/23/25	JOB NO: 213-5216
M.S.D. P. #	BASE MAP #
S.L.C. H&T # -	H&T S.U.P. # -
M.D.N.R. #	

SHEET TITLE:
SUBDIVISION PLAT

SHEET NO.:
1 OF 2

577

ROCK HILL QUARRIES PLAT 2

A SUBDIVISION OF ROCK HILL QUARRIES PER PLAT RECORDED IN PLAT BOOK 371, PAGE 25
AND PART OF LOT 10 AND LOTS 11 THROUGH 16 OF EICKERMANN'S SUBDIVISION OF THE CHARLEVILLE TRACT, PER PLAT BOOK 9 PAGE 106
OF THE CITY (FORMERLY COUNTY) OF ST. LOUIS RECORDS, AND PART OF LOT 9 OF CHARLEVILLE TRACT
LOCATED IN U.S. SURVEY 1930, TOWNSHIP 45 NORTH, RANGE 6 EAST OF THE 5TH PRINCIPAL MERIDIAN,
CITY OF LADUE AND ROCK HILL, ST. LOUIS COUNTY, MISSOURI



LOCATION MAP
(NOT TO SCALE)

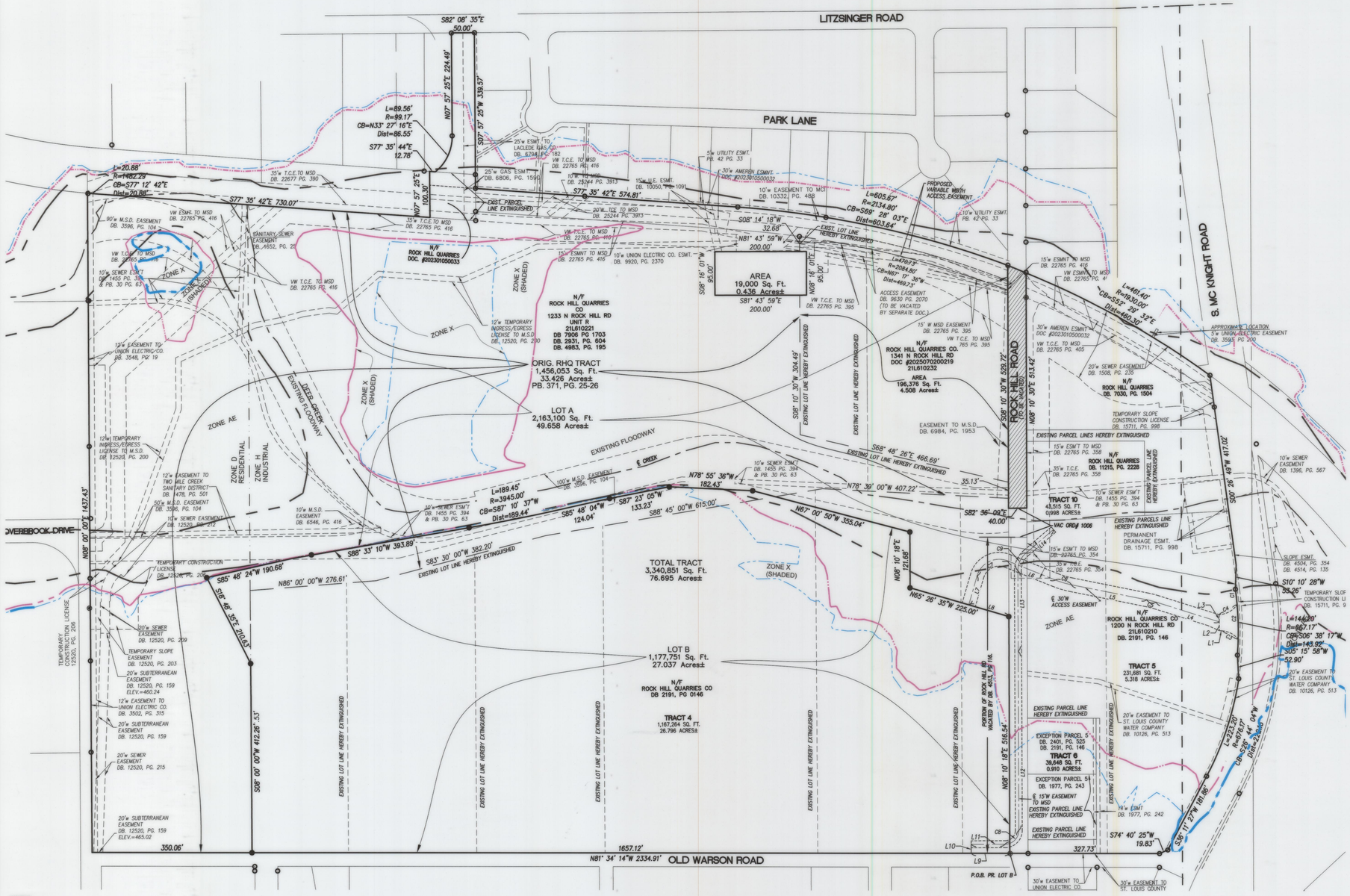
LINE TYPE LEGEND
- EX CONT MJR
- EX CONT MNR
- TREE LINE
- FEMA ELEV
- FEMA LIMIT
- PAVEMENT
- WALL
- GUARD RAIL
- CHAINLINK/WIRE FENCE
- WOOD/VINYL FENCE
- GAS
- UNDER GROUND ELEC
- OVERHEAD ELEC
- TELEPHONE LINE
- FIBER OPTIC LINE
- WATERLINE
- 100 YR FIRM
- 500 YR FIRM
- FLOODWAY EX FIRM

PB. 9, PG. 106

LEGEND
- BENCH MARK
- FOUND IRON ROD
- FOUND IRON PIPE
- RIGHT OF WAY MARKER

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

ABBREVIATIONS
- DB. – DEED BOOK
- FT – FEET
- FND. – FOUND
- N/F – NOW OR FORMERLY
- PB. – PLAT BOOK
- PG. – PAGE
- SQ. – SQUARE
- (86'W) – RIGHT-OF-WAY WIDTH



NOTES:
1) Subject property lies within Flood Zone "AE" and Flood Zone "X" (areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood) and Flood Zone "X" (areas determined to be outside 500-year floodplain) per the National Flood Insurance Program, Flood Insurance Rate Map for St. Louis County, Missouri and Incorporated Areas. This map is identified as Map No. 29189C0326KH with an effective date of February 4,
By graphically plotting. (LOMR Case NO. 22-07-0954P Under Review FEMA 2022)

2) Zoning
Present Zoning:
"H" (Light Industrial District), City of Ladue
Building Setback Requirements
(a) Front Yard - Fifty (50) Feet
(b) Side Yard - Twenty (20) Feet
(c) Rear Yard - Thirty (30) Feet
"D" Residential
(a) Front Yard - Forty (40) Feet
(b) Side Yard - Fifteen (15) Feet per note 2.
(c) Rear Yard - Thirty (30) Feet
Stream buffer and setbacks from Deer Creek - Sec. 110-124 - Applicability
50 foot buffer
25 foot setback (in addition to the 50 feet buffer)
Note: The above zoning was provided by the City of Ladue, Missouri and to verify, the client should obtain a zoning endorsement from their title company.

3) Basis of Bearings: Bearing system adopted from Plat Book 9, Page 106 of the St. Louis County Records.

Present Zoning:
Rock Hill Zoning E (Industrial)
Building Setback Requirements
Front yard. not less than thirty (30) feet

Where a lot is located at the intersection of two (2) streets, the front yard on the side street side of the lot shall be not less than ten (10) feet.

Side yard. The side yard regulations for dwellings are the same as those in the "B" Residence District. Where a lot is used for any of the other purposes permitted in this district, a side yard is not required except on the side of a lot abutting on a dwelling district, in which case there shall be a side yard of not less than five (5) feet. If a side yard is provided where not required, it shall be not less than five (5) feet in width.

Rear yard. Except as otherwise provided in this Chapter:
a. For lots having a depth of two hundred (200) feet or less, there shall be a rear yard having a depth of not less than twenty-five (25) feet.
b For lots having a depth of more than two hundred (200) feet, there shall be a rear yard having a depth equivalent to twelve and one-half percent (12.5%) of the average depth of the lot but need not exceed fifty (50) feet and at no point shall the rear yard be less than twenty-five (25) feet.

ACCESS EASEMENT LINE & CURVE TABLES

Parcel Line Table		
Line #	Length	Direction
L1	7.25	N76° 58' 11"W
L2	19.21	S07° 40' 52"W
L3	15.77	S07° 40' 52"W
L4	144.18	N64° 19' 13"W
L5	167.69	N70° 25' 19"W
L6	112.93	N59° 55' 13"W
L7	65.96	S24° 33' 25"W
L8	91.40	N65° 26' 35"W

Curve Table				
Curve #	Length	Radius	Chord Direction	Chord Length
C1	34.01	665.05	N1° 54' 17"E	34.01
C2	75.15	667.17	N6° 35' 41"E	75.11
C3	39.64	49.58	N53° 43' 41"W	38.60
C4	46.44	51.51	N69° 49' 58"E	44.88
C5	21.30	200.00	N67° 22' 16"W	21.29
C6	36.66	200.00	S65° 10' 16"E	36.61
C7	83.36	50.00	S72° 19' 06"W	74.04

MSD EASEMENT LINE & CURVE TABLES

Parcel Line Table		
Line #	Length	Direction
L9	84.59	S81° 34' 14"E
L10	19.94	S08° 25' 46"W
L11	74.50	N81° 49' 30"W
L12	390.13	S08° 10' 32"W
L13	176.08	N08° 10' 26"E
L14	79.33	S58° 01' 16"W

Curve Table				
Curve #	Length	Radius	Chord Direction	Chord Length
C8	47.12	30.00	N53° 10' 30"E	42.43
C9	43.50	50.00	S33° 05' 53"W	42.14

ORIGINAL PROPERTY DESCRIPTIONS

Tract 4:

Lot 10 (Except the West 69.5 feet), all of Lots 11, 12, 13 and 14, and all that part of Lot 15 lying West of Rock Hill Road, 40 feet wide, of Eickermann's Subdivision of the Charleville Tract, according to the plat thereof recorded in Plat Book 9 page 106 of the St. Louis City, (formerly county), Missouri, Recorder's Office.

Tract 5:
Lot 16 and that part of Lot 15 lying East of Rock Hill Road, 40 feet wide, together with that part of said Rock Hill Road as vacated by Ordinance of the City of Ladue, of Eickermann's Subdivision of Charleville Tract, according to the plat thereof recorded in Plat Book 9 page 106 of the City (formerly county) of St. Louis, Missouri, Recorder's Office.

EXCEPTING THEREFROM that part conveyed to Missouri Permi-Tac Co. by instrument recorded in Book 1977 page 243.

ALSO EXCEPTING THEREFROM that part conveyed to John Yacovelli and Fannie Yacovelli, his wife, by instrument recorded in Book 2401 page 325.

ALSO EXCEPTING THEREFROM that part conveyed to City of Rock Hill, by instrument recorded in Book 16164 page 483.

ALSO EXCEPTING THEREFROM that part conveyed to the City of Ladue by instrument recorded in Book 6513 page 1329.

ALSO EXCEPTING THEREFROM that part conveyed to St. Louis County, Missouri, by instrument recorded in Book 4504 page 348.

Tract 6:
Part of Lot 15 of Eickermann's Subdivision of the Charleville Tract in Township 45 North, Range 6 East, St.. Louis County, Missouri, as shown by plat recorded in Plat Book 9 page 106 of the St. Louis City Records, and described as follows:

Beginning at a point in the East line of Rock Hill Road, 40 feet wide, at its intersection with the North line of the 30 foot road laid out along the South line of said Lot 15 and shown on said subdivision plat; thence along the East line of Rock Hill Road North 8 degrees 7-1/2 minutes East 295 feet to a cross on top of sewer manhole; thence South 81 degrees 35 minutes East 150.68 feet to the center line between rails of a railroad switch; thence along said center line South 8 degrees 7-1/2 minutes West 295 feet to a point in the North line of said 30 foot road above referred to; thence along said North line North 81 degrees 35 minutes West 150.68 feet to the place of beginning.

Tract 10
Part of Lot 9 of the Charleville Tract in U.S. Survey 1930, Township 45 North, Range 6 East, St. Louis County, Missouri, and being:

A plot of ground fronting on the East side of Rock Hill Road and beginning at a point 25 feet South of the Southwest corner of property heretofore deeded by Frederick H. Semple to Aluma Kraft Manufacturing Company; thence along the East line of Rock Hill Road South to the South end of property now owned by Frederick H. Semple, bounded by the center line of a creek; thence in a general Easterly direction to a point where this line meets a line parallel with the East line of Rock Hill Road. The North boundary line shall be a line parallel with the South line of property heretofore deeded to Aluma Kraft Manufacturing Company and 25 feet distant therefrom, running from the point of beginning to the line parallel with Rock Hill Road.m

ORIGINAL RHQ TRACT

A tract of land being part of U.S. Survey 1930, Township 45 North, Range 6 East, St. Louis County, City of Ladue, Missouri, and being more particularly described as:

Commencing at intersections of north right of way line of Old Warson Road, 40 feet wide and the west right of way line of South Mcknight Road, variable width; thence North 81 degrees 34 minutes 14 seconds West along the north right of way line of said Old Warson Road, 1,984.90 feet TO THE POINT OF BEGINNING of herein described tract: thence continuing along said right of way line, North 81 degrees 34 minutes 14 seconds West, 350.01 feet to the east right of way line of Price Road, 25 feet wide; thence North 08 degrees 00 minutes 00 seconds East, along the east right of way line of said Price Road and its northerly extension, 1,437.43 feet to the southwest corner of a tract of land conveyed to Union Electric by Deed Book 5254 Page 1729, of the St. Louis County records, said point being located on a curve to the left having a radius of 1482.29 feet; thence along said curve an arc distance of 20.88 feet, and a chord which bears South 77 degrees 12 minutes 42 seconds East, 20.88 feet; and South 77 degrees 35 minutes 42 seconds East, 730.07 feet; thence leaving said south line, North 07 degrees 57 minutes 25 seconds East, 100.30 feet to the south line of Lot A of Rodgers Add to Charleville Tract, as recorded in Plat Book 59 Page 35, of said records; thence the following courses and distance along the south and east lines of said Lot A: South 77 degrees 35 minutes 42 seconds East, 12.79 feet, to a curve to the left having a radius of 100.00 feet; along said curve an arc distance of 89.50 feet, and a chord which bears North 33 degrees 27 minutes 16 seconds East, 86.55 feet; and North 07 degrees 57 minutes 25 seconds East, 224.49 feet to the South right of way line of Litzinger Road, width varies, thence South 82 degrees 08 minutes 35 seconds East along the south line of said Litzsinger Road, 50.00 feet, to the west line of Lot 1 of Parklane as recorded in Plat Book 42 Page 33; thence South 07 degrees 57 minutes 25 seconds West, along the west line of Parkland Subdivision, 339.57 feet to the southwest corner of said Parklane Subdivision; thence the following courses and distances along the south line of said Parklane Subdivision: South 77 degrees 35 minutes 42 seconds East, 574.81 feet to the beginning of a curve to the right having a radius of 2134.80 feet and along said curve to the right an arc distance of 605.67 feet, and a chord which bears South 69 degrees 28 minutes 03 seconds East, 603.64 feet, to the southeast corner of Lot 14 of said Parklane Subdivision, said point also being located on the western right of way line of Rock Hill Road, 40 feet wide; thence South 08 degrees 10 minutes 31 seconds West, along the west right of way line of said Rock Hill Road 53.47 feet to a curve to the left having a radius of 2,084.80 feet, being the northeast corner of a tract of land conveyed to 1864 Properties LLC as recorded in Deed Book 24398 Page 3674 of said records; thence along the north and west line of said 1864 Properties, with said curve an arc distance of 470.73 feet and a chord which bears North 67 degrees 17 minutes 36 seconds West, 469.73 feet, and South 08 degrees 14 minutes 18 seconds West, 32.68 feet, to the north line of a tract of land conveyed to Union Electric; thence the following courses and distances along the north, west, and south line of said Union Electric tract: North 81 degrees 43 minutes 59 seconds West, 185.23 feet; South 08 degrees 16 minutes 01 second West, 95.00 feet; and South 81 degrees 43 minutes 59 seconds East, 185.42 feet, to the west line of said 1864 Properties LLC tract; thence along the west and south lines of said 1864 Properties LLC tract, South 08 degrees 10 minutes 30 seconds West, 304.49 feet and South 68 degrees 48 minutes 26 seconds East, 466.69 feet, to the west right of way line of said Rock Hill Road; thence South 08 degrees 10 minutes 30 seconds West, along said west right of way line, 35.13 feet to the north line of line of Eickermann's Subdivision of the Charleville Tract, according to the plat thereof recorded in Plat Book 9 page 106 of the CITY (formerly county) records; thence following courses along the north line of said Subdivision: North 78 degrees 39 minutes 00 seconds West, 407.22 feet; South 88 degrees 45 minutes 00 seconds West, 615.00 feet; South 83 degrees 30 minutes 00 seconds West, 382.20 feet; and North 86 degrees 00 minutes 00 seconds West, 276.61 feet to a point 69.50 feet east of the west line of Lot 10 of said Eickermann's Subdivision; thence South 08 degrees 00 minutes 00 seconds West, along a line 69.50 feet east of the west line of said Lot 10, 571.53 feet to the POINT OF BEGINNING Containing 1,456,040 square feet or 33.426 acres.

1864 ROCK HILL QUARRIES CO TRACT DESCRIPTION

A tract of land being part of Lots 8 and 9 of "Charleville Tract" in U.S. Survey 1930, Township 45 North, Range 6 East, St. Louis County, Missouri, and being more particularly described as:

Beginning at the intersection of the West line of Rock Hill Road, 40 feet wide, with the South line of Missouri Pacific Railroad right-of-way (Laclede and Creve Coeur Lake Branch), 50 feet wide; thence South 08 degrees 08 minutes 00 seconds West 419.43 feet to the North line of property now or formerly of Rock Hill Quarries Corporation; thence North 68 degrees 50 minutes 56 seconds West 466.69 feet along the North line of said Rock Hill Quarries Corporation property to an East line of said Rock Hill Quarries Corporation property; thence North 08 degrees 08 minutes 00 seconds East 301.40 feet along said East line of Rock Hill Quarries Corporation property to the South line of property conveyed to Union Electric Company of Missouri by deed recorded in Book 3541 Page 446 of the St. Louis County Records; thence South 81 degrees 52 minutes 00 seconds East 15.28 feet along said South line of Union Electric Company property to the Southeast corner thereof; thence North 08 degrees 08 minutes 00 seconds East 74.94 feet along the East line of said Union Electric Company property to the Northwest corner thereof; thence North 81 degrees 52 minutes 00 seconds West 15.28 feet along the North line of said Union Electric Company property to a point; thence North 08 degrees 08 minutes 00 seconds East 56.00 feet to the South right-of-way line of Missouri Pacific Railroad right-of-way (Laclede and Creve Coeur Lake Branch); thence along a curve to the right whose radius point bears South 16 degrees 13 minutes 01 seconds West 2,084.80 feet from the last mentioned point, a distance of 470.76 feet along said South right-of-line of said Missouri Pacific Railroad right-of-way to the Point of Beginning, according to a survey by Volz Engineering & Surveying, Inc., on February 13, 1987. EXCEPTING THEREFROM that part conveyed to Union Electric Company by deed recorded in Book 9630 Page 2070.

AS 9/24/25
SM 9/24/25

PREPARED FOR:
ROCK HILL QUARRIES COMPANY
1341 N. ROCK HILL RD
ST. LOUIS, MO 63124

PREPARED BY:
STOCK & ASSOCIATES Consulting Engineers, Inc.
257 Chesterfield Business Parkway
St. Louis, MO 63005-1276
636-530-9100 FAX (636) 530-9011
e-mail: general@stockassoc.com
Web: www.stockassoc.com

SUBDIVISION PLAT
ROCK HILL QUARRIES CO.
1200 N. ROCK HILL ROAD
CITY OF LADUE, MISSOURI

STATE OF MISSOURI
WALTER JOSEPH PFEGER
2008-009728
NUMBER
PROFESSIONAL LAND SURVEYOR
WALTER J. PFEGER P.L.S.
MO. P.L.S. # 2008-009728
CERTIFICATE OF AUTHORITY
LC-222-D

REVISIONS:
1. 7/31/2025 - Revised per City of Ladue comments Dated: 7/29/2025
2. 8/04/2025 - Revised per City of Ladue Comments (email Dated 8/04/2025)
3. 9/16/25 - Revised per Ladue Ordinance

DRAWN BY: J.K.	CHECKED BY: W.J.P.
DATE: 5/23/25	JOB NO: 213-5216
M.S.D. P. #	BASE MAP #:
S.L.C. H&T #:	H&T S.U.P. #:
M.D.N.R. #:	

SHEET TITLE: SUBDIVISON PLAT

SHEET NO.: 2 OF 2

LEGEND

EXIST. 100 YR. FLOODPLAIN

EXIST. FLOODWAY

CENTERLINE EXISTING CREEK

SCALE: 1" = 100'

LITZINGER WOODS

LITZINGER ROAD

PARK LANE

ROCK HILL ROAD

OVERBROOK DRIVE

KORTWRIGHT AVENUE

WARSON TL AVE

MC CRUEY AVENUE

ROCKMAN COURT

S. MC KNIGHT ROAD

SECTION 4,743, ELEV. 476.67

SECTION 4,625, ELEV. 475.71

SECTION 4,612, ELEV. 474.08

SECTION 4,563, ELEV. 473.88

SECTION 4,365, ELEV. 472.58

SECTION 4,258, ELEV. 472.26

SECTION 4,195, ELEV. 472.20

SECTION 4,169, ELEV. 472.05

SECTION 4,157, ELEV. 471.98

SECTION 4,148, ELEV. 471.69

SECTION 4,090, ELEV. 471.84

SECTION 4,073, ELEV. 471.80

SECTION 4,069, ELEV. 471.20

SECTION 4,057, ELEV. 470.67

SECTION 4,049, ELEV. 470.60

SECTION 4,036, ELEV. 470.35

SECTION 4,464, ELEV. 473.88

SECTION 4,419, ELEV. 473.60

SANITARY M.H. TOP=459.78

PROPOSED EASEMENT

SANITARY M.H. TOP=467.37 FL=

INLET NOT LOCATED

2" GAS MAIN

GRATE INLET TOP=466.70 FL=463.

STORM INLET TOP=468.93 FL=463.75

AREA INLET TOP=464.59 FL=460.38

STORM INLET TOP=469.14 FL=459.14

AREA INLET TOP=464.47 FL=458.89

AREA INLET TOP=482.94 FL=457.08

STORM INLET TOP=465.19

STORM INLET TOP=465.36 FL=

STORM INLET TOP=465.50 FL=461.45

GRATE INLET TOP=464.88 FL=460.78

STORM INLET TOP=466.13 FL=460.53

GRATE INLET TOP=468.61 FL=

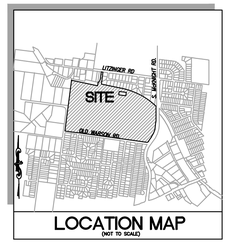
APPROXIMATE LOCATION BURIED TELEPHONE CABLE

SITE BENCHMARK

APPROXIMATE LOCATION 2" GAS MAIN

APPROXIMATE LOCATION 2" GAS MAIN

PREPARED FOR:
T-V Acquisition LLC
12647 Olive Blvd | Suite 510
St. Louis, MO 63141



LOCATION MAP
(NOT TO SCALE)

ST. LOUIS COUNTY BENCHMARK

BENCHMARK# NAVD88 Elev = 492.74
"L" on the northeast corner at the north end of a retaining wall at the Church of Christ; 50' west of the centerline of McKnight Road and 200' south of the centerline of Litzsinger Road.

SITE BENCHMARK

ELEV.=483.91
FND. RAILROAD SPIKE AT THE N.W. CORNER OF ROCK HILL RD. AND OLD WARSON RD. AS SHOWN HEREON.

PREPARED BY:
STOCK & ASSOCIATES
Consulting Engineers, Inc.
257 Chesterfield Business Parkway
St. Louis, MO. 63005 PH. (636) 530-9100 FAX (636) 530-9130
e-mail: general@stockassoc.com
Web: www.stockassoc.com

FLOODSTUDY FOR:

ROCK HILL QUARRIES

1200 N. ROCK HILL ROAD
LADUE, MISSOURI 63124

DATE: 03/17/2026

STATE OF MISSOURI
GEORGE MICHAEL STOCK
NUMBER PE-25116
PROFESSIONAL ENGINEER

GEORGE M. STOCK E-25116
CIVIL ENGINEER
CERTIFICATE OF AUTHORITY
NUMBER: 000996

REVISIONS:

1.

DRAWN BY: E.A.F.	CHECKED BY: G.M.S.
DATE: 3/17/2026	JOB NO: 224--7700.2
M.S.D. P. #: 26FLPLS--	BASE MAP #: 21L
S.L.C. H&T #: --	H&T S.U.P. #: --
M.D.N.R. #:	

SHEET TITLE:

SITE EXISTING CONDITIONS PLAN

SHEET NO.:

C1.0

DRAWING FILE: C:\STOCK\PROJECTS\7700\ACAD\PLOTTED STE\Rock_LAYOUT_C1.0 SITE EXISTING CONDITIONS PLAN PLOTTED: Mar 17, 2026 - 3:05pm PLOTTED BY: Eric Fischer

ROCK HILL QUARRIES

FLOODSTUDY FOR:

1200 N. ROCK HILL ROAD
LADUE, MISSOURI 63124

PREPARED BY:

STOCK & ASSOCIATES
Consulting Engineers, Inc.
257 Chesterfield Business Parkway
St. Louis, MO 63005 PH. (636) 530-9100 FAX (636) 530-9130
e-mail: general@stockassoc.com
Web: www.stockassoc.com

DATE: 03/17/2026

STATE OF MISSOURI
GEORGE MICHAEL STOCK
NUMBER PE-2011
PROFESSIONAL ENGINEER

PROJECT MANAGER: G.M.S.
CIVIL DESIGNER: E.J.F.
PROJECT AUTHORITY NUMBER: 000896

E - 25116

REVISIONS:

1.

DRAWN BY: E.J.F.
CHECKED BY: G.M.S.
DATE: 03/17/2026
JOB NO. 224-7700.2
M.E.S.D. P.E. –
BASE MAP #
S.L.C. HAT. #
HAT. SURV. #
M.S.D.K. #

SHEET TITLE:
SITE PROPOSED CONDITIONS PLAN

SHEET NO:
C2.0

SCALE: 1" = 100'

LEGEND

- PROPOSED FLOODWAY
- PROPOSED 100 YR. FLOODPLAIN
- EXIST. 100 YR. FLOODPLAIN
- EXIST. FLOODWAY
- CENTERLINE EXISTING CREEK

ST. LOUIS COUNTY BENCHMARK

BENCHMARK NAD88 Elev. = 492.74
"L" on the northeast corner at the north end of a retaining wall on the west side of Rock Hill Road, the centerline of Midnight Road and 200' south of the centerline of Litzinger Road.

SITE BENCHMARK

ELEV.=483.91
PK NAIL AND WASHER SET IN SPIKE AT THE N.W. CORNER OF ROCK HILL RD. AND OLD WASSON RD. AS SHOWN HEREON.

SECTION 4,036, ELEV. 470.63
SECTION 4,049, ELEV. 470.60
SECTION 4,057, ELEV. 470.67
SECTION 4,069, ELEV. 471.20
SECTION 4,073, ELEV. 471.20
SECTION 4,080, ELEV. 471.24
SECTION 4,148, ELEV. 471.69
SECTION 4,157, ELEV. 471.69
SECTION 4,160, ELEV. 471.70
SECTION 4,165, ELEV. 471.70
SECTION 4,259, ELEV. 472.13
SECTION 4,365, ELEV. 472.56
SECTION 4,449, ELEV. 476.67
SECTION 4,464, ELEV. 473.68
SECTION 4,482, ELEV. 473.32
SECTION 4,562, ELEV. 473.83
SECTION 4,612, ELEV. 474.08
SECTION 4,625, ELEV. 475.71

ROCK HILL ROAD
LITZINGER ROAD
PARK LANE
LITZINGER WOODS
OVERBROOK DRIVE
S. MC KNIGHT ROAD
KORTWRIGHT AVENUE
WASSON PLACE
MC KINLEY AVENUE
HODGMAN COURT

STORM INLET TOP=468.83 FL=460.83
STORM INLET TOP=468.43 FL=460.43
AREA INLET TOP=468.34 FL=457.08
STORM INLET TOP=465.36 FL=
STORM INLET TOP=466.13 FL=460.53
STORM INLET TOP=466.78 FL=460.78
STORM INLET TOP=466.61 FL=460.45
GRATE INLET TOP=468.61 FL=
APPROXIMATE LOCATION BURIED TELEPHONE CABLE
F.F.=476.50 ± 60.00' @ 5.56.5%
SANITARY MH TOP=459.78
PROPOSED EASEMENT
HOT LOAD MIX ASPHALT
CONCRETE
RETAINING WALL
SITE BENCHMARK

DRAWING FILE: C:\Drawings\7000\2026\7000x026-PROPOSED CONDITIONS PLAN.PLOTTED: Mar 17, 2026 - 1:53pm PLOTTED BY: Joe Maher