

HYDRAULIC REPORT

REGION: 3
DISTRICT: 4
ROUTE: FAI 155 (I-155)
SECTION: (108-B-2)
COUNTY: Tazewell
JOB NUMBER: P-94-022-18
CONTRACT NUMBER: 68E42
EXISTING STRUCTURE NUMBER: 090-0093 & 090-0094
PROPOSED STRUCTURE NUMBER: 090-0184 & 090-0185
LOCATION: I-155 over Indian Creek
R3W T23N



PREPARED BY: Joshua Jochums
IDOT District 4
Joshua.Jochums@illinois.gov
DATE PREPARED: July 2021
PROPOSED LETTING DATE: November 2022

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I. HYDRAULIC REPORT NARRATIVE

Project Description

This report consists of the hydraulic evaluation of the existing structures (S.N. 090-0093 & 090-0094) and the recommended replacement structures (S.N. 090-0184 & 090-0185) carrying I-155 over Indian Creek in Tazewell County. The existing structures were constructed in 1971 and are located approximately 1.75 miles west of Hopedale, IL.

Description of Existing Structure and Floodplain

The structures are 3 span bridges with span lengths of 57'-4" – 58'-2" – 57'-4", back to back abutment lengths of 177'-10", out-to-out widths of 44'-0", and 0° 0' skews. The superstructure consists of an 8" concrete deck supported by PPC I-Beams. The substructure consists of open reinforced concrete abutments supported by PPC piles and solid wall reinforced concrete piers on spread footings.

The drainage area contributing to the runoff at this site is approximately 10.9 square miles. The floodplain consists of both timber and farmland. No USGS gauging stations were identified in the vicinity of this crossing. The existing structure meets the Clearance and Freeboard Policy. The proposed replacement structure is to be located at the same location as the existing bridge with new span/substructure configuration to improve the hydraulic capacity. Scour mitigation in the form of gabion baskets were installed in the channel downstream of structure 0093. The proposed structures will use integral abutments with 2 piers.

Field Observations

Since the original construction of the structures, the slope wall has degraded upstream and downstream of the structures. Slope wall repairs and preventative countermeasures were installed in 1992. However, these countermeasures are no longer effective which has further degraded the slope wall. Large voids are present underneath the remaining slope wall and entire slabs of channel linear concrete are tilting or missing. Because of this, the entire channel and up the side slopes to the proposed abutments should be armored with riprap.

Historical Observations/Record

There were no records or observations of the roadway or bridge overtopping.

Other Studies & Affected Agencies

Indian Creek at I-155 is not known to be in an active drainage district and is part of Zone A in the effective FEMA Flood Insurance Study (FIS).

At the time of this report, no other agencies are known to be affected by this structure.

Sensitive Flood Receptors

There are no sensitive flood receptors along Indian Creek in the vicinity of the structures.

Hydrologic Methodology

Peak flow rates were calculated using Streamstats. Since no other flow rate information was available (gaging stations, etc.), these peak flow rates were used directly. Hydrologic calculations are contained in Attachment C. A map of the watershed and the drainage area boundaries is also contained in Attachment C.

Hydraulic Methodology

HEC-RAS Version 5.0.7 was used to determine the natural, existing, and proposed water surface profiles at the site.

Stream cross sections were generated using elevation data from LIDAR and a hard survey of the creek channel as depicted in Attachment F. The surveyed cross sections were copied and/or interpolated to generate additional cross sections as required to properly model the stream. Interpolated cross sections are denoted in the HEC-RAS output with an asterisk. Manning's "n" values were estimated based on field observations and photographs. The normal depth boundary condition was selected for the downstream end of the reach (R.S. 0.00) with a local slope of 0.003 ft/ft. This slope was given from the 10% and 85% stream slope in the Illinois Streamstats site report. The flood discharges in their entirety were assumed to originate at the upstream end of the reach (R.S. 4512). Ineffective areas were added as required.

Summary of Natural and Existing Hydraulic Analysis

The natural conditions analysis is shown in Attachment J. The natural conditions plan and cross sections are in attachment P. Manning's "n" values were computed based on the stream consisting of mainly soil and the floodplain consisting of both timber and farmland. The natural high-water elevations in the Waterway Information Table were computed for R.S. 2696 for the existing and proposed by interpolating the water surface elevations from HEC-RAS at R.S. 2772 and R.S. 2474.

The existing conditions analysis is shown in Attachment J. The existing conditions plan and cross sections are in attachment P. The existing cross sections were created from the natural condition plan by editing or adding cross sections to depict the in-place physical features. The bridge and roadway cross sections were generated using elevation data from LIDAR. Ineffective flow areas were added upstream and downstream. The existing created heads in the Waterway Information Table were computed using the difference in elevation between the existing water surface elevation and the natural water surface elevation at each respective upstream cross section. The headwater elevations at the upstream cross sections were computed by adding the natural high-water elevations and the created heads. The existing structure does not appear to constrict the natural flow of the waterway. Therefore, this meets IDOT's freeboard and clearance policy.

Proposed Structure Analysis

The proposed conditions analysis results are shown in attachment J. The proposed conditions plan and cross sections are in attachment P. The proposed cross sections were created by editing the existing cross sections at the bridge to reflect the proposed bridge/channel configuration. The ineffective flow areas were adjusted for the proposed structure. The proposed replacement structure is a three-span steel beam/PPC deck superstructure with integral abutments and 2:1 slopes having a back-to-back abutment length of 186'-10". The low beam elevation is 595.74, which is approximately 0.57' higher than the existing structure. The freeboard and clearance still meet IDOT's policy which is discussed in the Freeboard/Clearance section below.

Reconstruction of the existing superstructure was investigated; however, reconstruction was more than 60% of the replacement cost.

Scour Analysis

Scour analysis was performed at the bridges for the existing and proposed conditions utilizing the HEC-RAS Hydraulic Design Functions. The input and results of these analyses are contained in Attachment K. Average grain size for D₅₀ was estimated at 0.2 mm. Scour investigations were executed for the 10, 50, 100, 200, and 500-year flood events. The existing substructure consist of open abutments on PPC piles and spread footing solid wall piers. The existing concrete slope wall appears to be eroded with large voids which has inhibited the scour mitigation efforts. The total scour depths and elevations for each flood frequency are shown in the following table:

Flood Frequency	Existing					Proposed				
	Thalweg Elevation	Contraction Scour	Pier Scour	Total Scour	Scour Elevation	Thalweg Elevation	Contraction Scour	Pier Scour	Total Scour	Scour Elevation
		Ft.	Ft.	Ft.	Ft.		Ft.	Ft.	Ft.	Ft.
10	558.98	8.09	4.02	12.11	546.87	558.98	8.09	4.02	12.11	546.87
50	558.98	12.60	4.57	17.17	541.81	558.98	12.60	4.57	17.17	541.81
100	558.98	14.18	4.76	18.94	540.04	558.98	14.18	4.76	18.94	540.04
200	558.98	14.98	4.85	19.83	539.15	558.98	14.98	4.85	19.83	539.15
500	558.98	17.49	5.13	22.62	536.36	558.98	17.49	5.13	22.62	536.36

Compensatory Storage

No compensatory storage provisions were required for this analysis.

Permit Requirements

These structures are in a rural area with a drainage area greater than 10 square miles. The structure has not been the cause of demonstrable flood damage. The proposed structure roadway profile will remain the same as the existing roadway profile. The proposed waterway will not be straightened or relocated. IDNR-OWR Statewide Permit No. 12 is required.

Freeboard/Clearance

The existing and proposed structures meet IDOT's freeboard and clearance policy based on the 50-year design event taken at R.S. 2696. The existing bridge does not overtop and has a roadway freeboard of 28.4' and a bridge clearance of 25.4'. The proposed bridges do not overtop and have a roadway freeboard of 28.4' and a bridge clearance of 26.0'. IDOT's required freeboard is 3.0' and clearance is 2.0'.

Conclusion

The proposed bridge is a three-span steel beam bridge with open abutments with 2:1 slopes and a back to back abutment length of 186'-10". The low beam elevation is 595.74, which is approximately 0.57' higher than the existing low beam elevation. The proposed bridge meets the freeboard and clearance requirements of IDOT and maintains the waterway opening for all flood years analyzed. It is also recommended that the proposed slopes and channel be lined with riprap to prevent erosion and scour.



Route	Existing SN	Proposed SN	Structure C.L. Sta.
FAI 155	090-0093 & 0094	090-0184 & 0185	745+70

Section Number	County	Waterway
(108-B-2)	Tazewell	Indian Creek

Prepared by	Date	Checked by	Date
Josh Jochums	06/29/21		

				Existing Overtopping Elev. =	N/A	at Sta.	N/A		
Drainage Area	10.9	sq. mi.			Proposed Overtopping Elev. =	N/A	at Sta.	N/A	
Flood Event	Freq. Yr.	Discharge	Waterway Opening (sf)		Natural	Head (ft)		Headwater Elev. (ft)	
		(cfs)	Existing	Proposed	H.W.E. (ft)	Existing	Proposed	Existing	Proposed
Ten-Year	10	1,800	400	400	568.5	1.4	1.4	569.9	569.9
Design	50	2,980	481	481	569.8	1.4	1.4	571.2	571.2
Base	100	3,510	513	513	570.4	1.4	1.4	571.8	571.8
Scour Check	200	3,800	530	530	570.6	1.4	1.4	572.0	572.0
Max Calc	500	4,830	587	587	571.5	1.6	1.6	573.1	573.1

Existing 10 Year Average Velocity (Q/A) =
 ft/s

Proposed 10 Year Average Velocity (Q/A) =
 ft/s

All-Time H.W.E. & Date

Scope of Work

Existing
Bridge

Abutment Type	Open Abutment	
# Spans	3	
Length (ft)	177'-10"	BK-BK
Skew	0	LT-AH
Low E.O.P.	599.63	
Low Beam	595.17	
US Flowline	558.98	
DS Flowline	558.43	

Proposed
Bridge

Abutment Type	Open Abutment	
# Spans	3	
Length (ft)	186'-10"	BK-BK
Skew	0	LT-AH
Low E.O.P.	599.63	
Low Beam	595.74	
US Flowline	558.98	
DS Flowline	558.43	

Note(s)

Proposed structure details are preliminary; subject to refinement in TSL stage.



Route FAI 155 (I-155)
Section (108-B-2)
County Tazewell
Exist SN 090-0093 & 0094
Prop SN 090-0184 & 0185

P or D # P-94-022-18
PTB # N/A

General Information

- 1. Stream name: Indian Creek
2. Structure location: SE 1/4 of the NE 1/4 of Section 29, Township 23N, Range 3W of the 3rd P.M.
3. Hydraulic Report Prepared By: [X] District
4. Hydraulic Report Approval Authority: [X] District - Post PDF of HR to BBS Hydraulics SharePoint Server

Site Design Data

- 5. Drainage Area (sq. mi.): 10.9
6. Highway Classification: [X] Rural, [X] Principal Arterial
7. Design Frequency: [X] 50 Yr.
8. Number of Waterway Information Tables (WIT): 1

Hydrologic & Hydraulic Analysis

- 9. Hydrology Modeling (check all that apply): [X] USGS/Stream Stats
10. Hydraulic Modeling (check all that apply):
a. Method: [X] HEC-RAS
b. Manning's 'n' values determined per IDOT Drainage Manual Chap. 5? [X] Yes
c. Source of Starting WSE: Downstream normal depth method in HEC-RAS
d. Non-IDOT encroachments in Survey? [X] No
e. Does a Tailwater Control exist? [X] No
f. Were the Expansion/Contraction cones properly addressed? [X] Yes

g. What Expansion and Contraction Rates were used?

Expansion: 2 (X:1)
Contraction: 1 (X:1)

IDNR – OWR Floodway Permit

- 11. Is area experiencing urbanization or expected to urbanize within 10 years? Yes No (Rural)
- 12. Are there any sensitive flood receptors located upstream within possible backwater influence? Yes No
If yes, list and describe critical upstream flood damageable properties and their elevations.

- 13. Is there any History of Flooding or Overtopping problems? Yes No
Sources & dates of Observed Highwater:

- 14. Is the structure hydraulically connected to or within the floodway of an IDNR-OWR designated Public Body of Water? No Yes. OWR 3704 Rules apply.
- 15. Required IDNR - OWR Permit type:
 Individual 3700 SWP #2 SWP #12 Floodway 3708
 None Other _____

Proposed Structure Data

- 16. Project Scope (check all that apply):
 - a. Complete Replacement
 - b. Superstructure Replacement
 - c. Superstructure Widening; Length of Pier Extension in the water:
 U/S _____ D/S _____
 - d. Bridge Culvert Three-sided Bridge
 - e. New Alignment
 - f. Work Planned Below Q₁₀₀ HWE? Yes No
 - g. Profile Raise
- 17. If a bridge is proposed, supply:

Flow line elevation (ft):	<u>558.98</u>	Abutment type:	<u>Integral</u>
Preliminary low beam elevation (ft):	<u>595.74</u>	Skew (degrees):	<u>0</u>
Width of deck (ft):	<u>43.67</u>	Number of spans:	<u>3</u>
Total length from face to face of abutment (ft)	<u>177.83</u>		
- 18. If a culvert is proposed, supply:

Type and size:	_____	Length (ft):	_____
Upstream invert elevation (ft):	_____	Entrance type:	_____
Downstream invert elevation (ft):	_____	Skew (degrees):	_____

Note: Upstream and downstream elevations should reflect the elevations before the standard 3" drop (or other embedment) is applied
- 19. If a three-sided structure is proposed, supply:

U/S Flow line elevation (ft):	_____	Skew (degrees):	_____
Span (ft):	_____	Length (ft):	_____
Height (ft):	_____	Number of spans:	_____
- 20. a. Is the IDOT Clearance Policy met? Yes No NA Value (ft): 26.0
 b. Is the IDOT Freeboard Policy met? Yes No NA Value (ft): 28.4
- 21. Type of streambed soil : Clay Silt Sand Loam _____

22. Scour/ Migration Problems: None/Minimal Significant Severe
 Comments: Spread footings experiencing pier scour

Ice Concerns: None/Minimal Significant Severe
 Comments:

Debris Concerns: None/Minimal Significant Severe
 Comments:

Proposed or Identified Countermeasures:

Existing Structure Data

	Structure U/S	Subject Structure	Structure D/S
23. Distance from proposed (subject) structure: (ft.)	N/A	N/A	N/A
24. Type of structure:		PPC I-Beam	
25. Low beam elevation:		595.17	
26. Flow line elevation:		558.98	
27. Maximum known high water elevation:		Unknown	
28. Date of maximum high water:		-	
29. Cause (backwater, headwater, etc.):		-	
30. Does structure carry entire design flood flow?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
If not, state area of additional waterway opening: (ft ²)			
31. Type and size of existing overflow structures:		-	
32. Has adverse scour occurred under or adjacent to the structure?		Yes	
33. Classify type of scour and/or aggradation / degradation:		Pier	

Required Additional Data

34. Deviations from the General Procedures presented in IDOT Drainage Manual CH. 2, CH.6, and CH.7:
 N/A

35. Information regarding high water from other streams, reservoirs, flood control projects, proposed channel changes, or other controls affecting proposed waterway area:
 N/A

36. Site Inspection made by: Nick Jack & Josh Jochums Date: 6-19-2020

Remarks:

37. Prepared by: Josh Jochums Date July 1, 2021

Signed (QA/QC): _____ Date _____

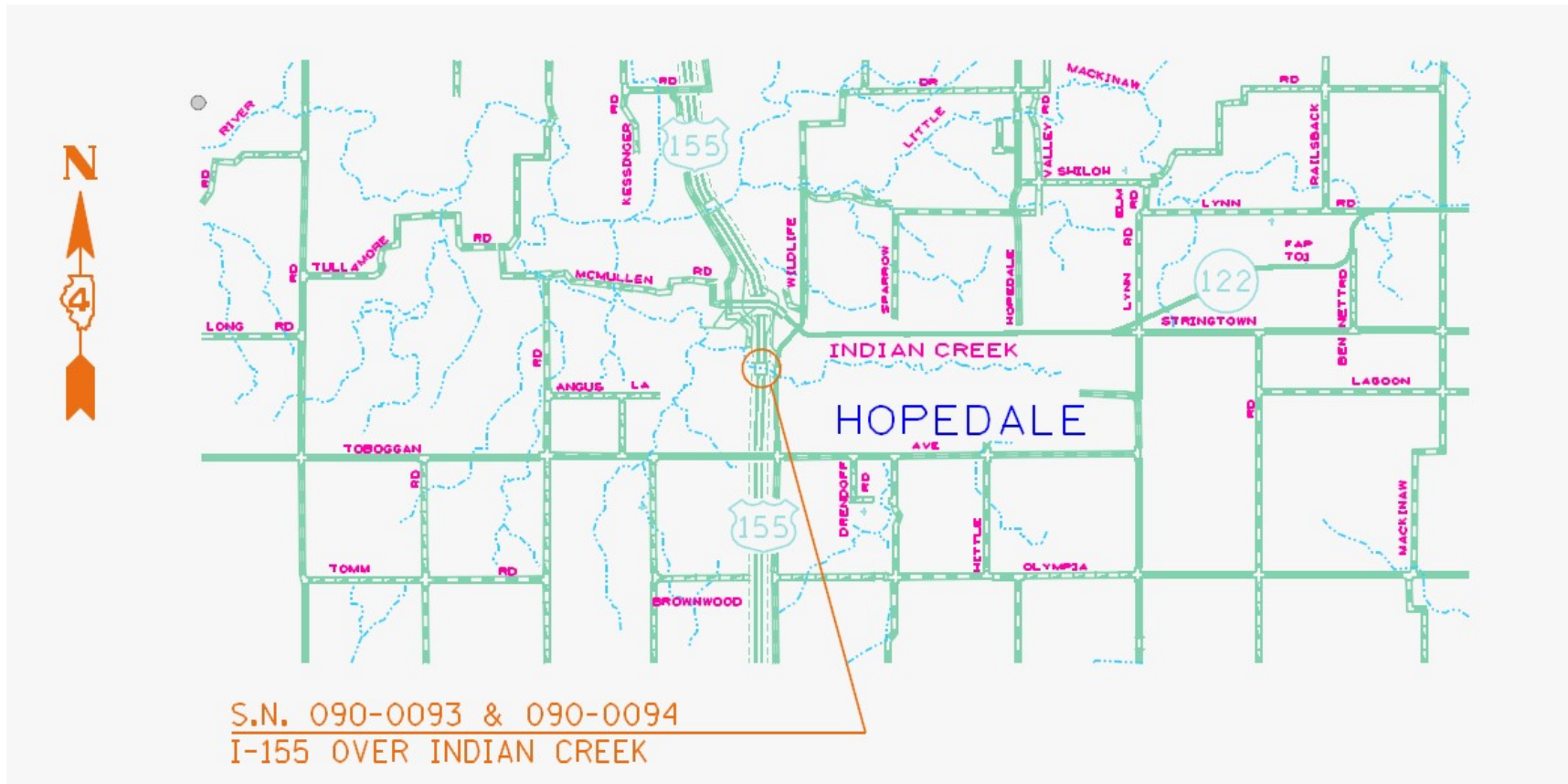
Hydraulic Report Checklist

The District or Consultant should complete the following checklist before submitting the Hydraulic Report for approval.

1. Title Page
2. Table of Contents
3. Narrative - (as outlined in Section 2-601.01 Item #3)
4. Waterway Information Table (WIT) - (as outlined in Section 2-601.01 Item #4)
5. Hydraulic Report Data Sheets
6. Location Map - should show the subject structure along with nearby location defining landmarks (cities, roads, highways, nearby structures over same stream, etc.)
7. USGS Hydrologic Atlas (historical data available on selected streams- District 1 only)
8. Photographs - (Minimum: U/S & D/S structure faces, U/S & D/S channel, U/S & D/S roadway across structure)
9. Hydrology (map, calculations and related exhibits)
10. Streambed Profile
11. Roadway Profile (existing and proposed)
12. Cross Section Plots - with plan layout preferably overlaid upon an aerial photo with the contours
13. Bridge Opening Plots
14. Natural Condition Analysis
15. Existing Condition Analysis
16. Proposed Condition Analysis
17. Scour Analysis – Existing and Proposed Conditions
18. Compensatory Storage Calculations (if required- District 1 only. Include permit summary form and related attachments.)
19. Survey Notes (if available, CADD plot of survey points. No Electronic Point Files)
20. EWSE Data - (per Section 2-402.06)
21. Correspondence Notes
22. CD with Project Files (Include pdf copy of the Hydraulic Report and working files for the hydrology and hydraulic analyses.)

When HEC-RAS modeling is being used, ALL Plans (Natural, Existing, & Proposed) shall be included in ONE Project File.

ATTACHMENT A



Location Map

Tazewell County

ATTACHMENT B

PHOTOGRAPHS



Photo 1
Looking North-0093



Photo 2
Looking South-0093



Photo 3
Looking North-0094



Photo 4
Looking South-0094



Photo 5
Downstream Face-0093



Photo 6
Upstream Face-0093



Photo 7
Downstream Face-0094



Photo 8
Upstream Face-0094



Photo 9
Channel Looking Upstream



Photo 10
Channel Looking Downstream

ATTACHMENT C

HYDROLOGY

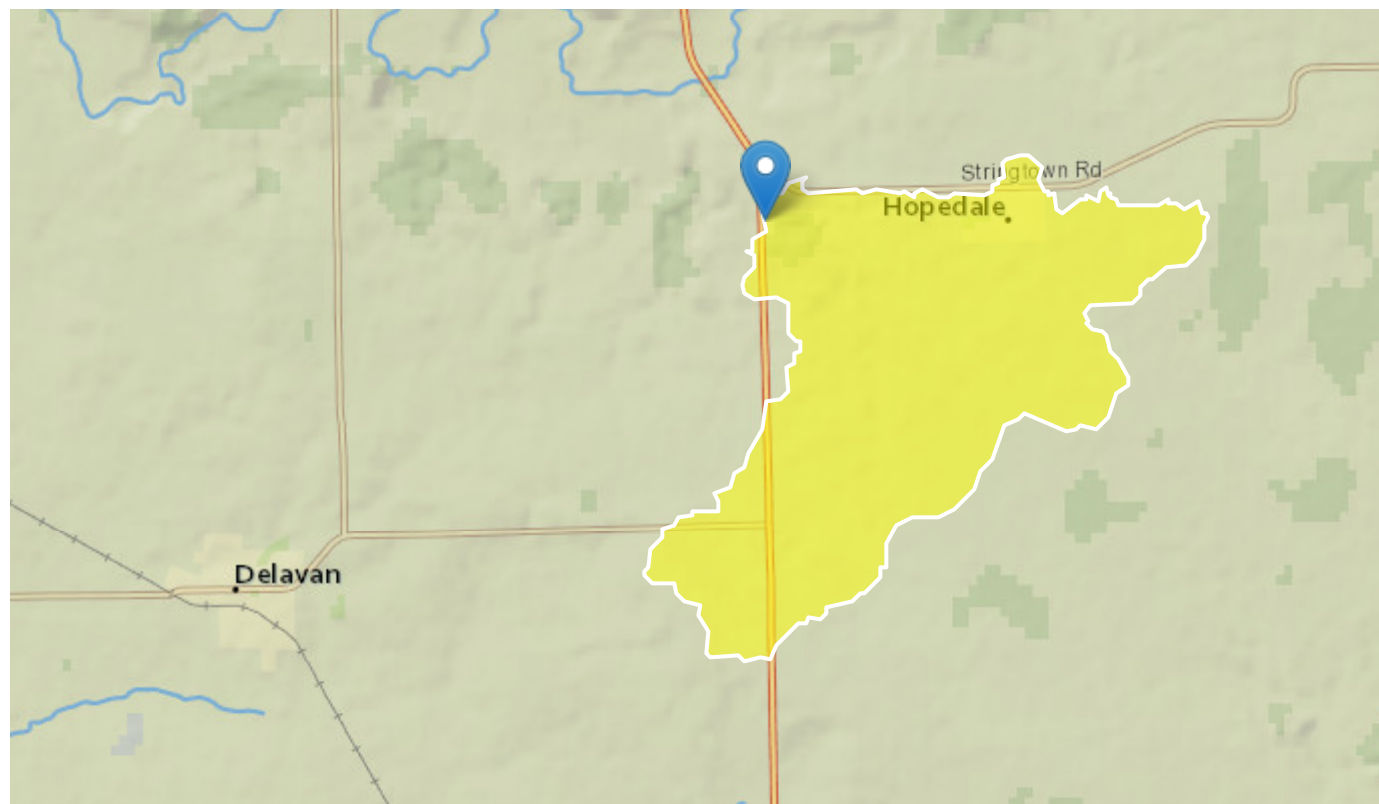
StreamStats Report

Region ID: IL

Workspace ID: IL20200824210604421000

Clicked Point (Latitude, Longitude): 40.42062, -89.45658

Time: 2020-08-24 16:06:26 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	10.87	square miles
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	19.124	feet per mi
SOILPERM	Average Soil Permeability	1.002	inches per hour
ILREG3	Indicator variable for IL region 3, enter 1 if site is in region 3 else 0	1	dimensionless

Parameter Code	Parameter Description	Value	Unit
URBTHE2010	Fraction of drainage area that is in urban classes 7 to 10 from Theobald 2010	0.047	dimensionless

Peak-Flow Statistics Parameters[Region 3 Peak Unadjusted SIR 2004 5103]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	10.87	square miles	0.03	9554
CSL10_85	Stream Slope 10 and 85 Method	19.124	feet per mi	0.81	317
SOILPERM	Average Soil Permeability	1.002	inches per hour	0.3	8
ILREG3	Region 3 Indicator enter 1	1	dimensionless	1	1

Peak-Flow Statistics Parameters[Region 3 Peak Adjusted Using SIR 2016 5050]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	10.87	square miles	0.03	9554
CSL10_85	Stream Slope 10 and 85 Method	19.124	feet per mi	0.81	317
SOILPERM	Average Soil Permeability	1.002	inches per hour	0.3	8
ILREG3	Region 3 Indicator enter 1	1	dimensionless	1	1
URBTHE2010	Fraction_of_Urban_Land_Theobald_2010	0.047	dimensionless	0	1

Peak-Flow Statistics Flow Report[Region 3 Peak Unadjusted SIR 2004 5103]

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

Statistic	Value	Unit	PII	Plu	SE	SEp	Equiv. Yrs.
2 Year Peak Flood	701	ft ³ /s	376	1310	39.5	39.5	2.7
5 Year Peak Flood	1320	ft ³ /s	703	2480	40	40	3.2
10 Year Peak Flood	1800	ft ³ /s	937	3460	41.6	41.6	3.9
25 Year Peak Flood	2460	ft ³ /s	1230	4900	44.2	44.2	4.7

Statistic	Value	Unit	PII	Plu	SE	SEp	Equiv. Yrs.
50 Year Peak Flood	2980	ft ³ /s	1450	6130	46.6	46.6	5.2
100 Year Peak Flood	3510	ft ³ /s	1650	7470	49	49	5.6
500 Year Peak Flood	4830	ft ³ /s	2090	11100	54.9	54.9	6.2

Peak-Flow Statistics Flow Report_[Region 3 Peak Adjusted Using SIR 2016 5050]

Statistic	Value	Unit
Urban 2 Year Peak Flood	739	ft ³ /s
Urban 5 Year Peak Flood	1380	ft ³ /s
Urban 10 Year Peak Flood	1880	ft ³ /s
Urban 25 Year Peak Flood	2550	ft ³ /s
Urban 50 Year Peak Flood	3080	ft ³ /s
Urban 100 Year Peak Flood	3630	ft ³ /s
Urban 500 Year Peak Flood	4990	ft ³ /s

Peak-Flow Statistics Flow Report_[Area-Averaged]

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

Statistic	Value	Unit	PII	Plu	SE	SEp	Equiv. Yrs.
2 Year Peak Flood	701	ft ³ /s	376	1310	39.5	39.5	2.7
5 Year Peak Flood	1320	ft ³ /s	703	2480	40	40	3.2
10 Year Peak Flood	1800	ft ³ /s	937	3460	41.6	41.6	3.9
25 Year Peak Flood	2460	ft ³ /s	1230	4900	44.2	44.2	4.7
50 Year Peak Flood	2980	ft ³ /s	1450	6130	46.6	46.6	5.2
100 Year Peak Flood	3510	ft ³ /s	1650	7470	49	49	5.6
500 Year Peak Flood	4830	ft ³ /s	2090	11100	54.9	54.9	6.2
Urban 2 Year Peak Flood	739	ft ³ /s					
Urban 5 Year Peak Flood	1380	ft ³ /s					
Urban 10 Year Peak Flood	1880	ft ³ /s					
Urban 25 Year Peak Flood	2550	ft ³ /s					
Urban 50 Year Peak Flood	3080	ft ³ /s					
Urban 100 Year Peak Flood	3630	ft ³ /s					

Statistic	Value	Unit	PII	Plu	SE	SEp	Equiv. Yrs.
Urban 500 Year Peak Flood	4990	ft ³ /s					

Peak-Flow Statistics Citations

Soong, D.T., Ishii, A.L., Sharpe, J.B., and Avery, C.F., 2004, Estimating Flood-Peak Discharge Magnitudes and Frequencies for Rural Streams in Illinois, U.S. Geological Survey Scientific Investigations Report 2004-5103. 147 p. (<http://il.water.usgs.gov/pubs/sir2004-5103.pdf>)
Over, T.M. , Saito, R.J., Veilleux, A.G., Sharpe, J.B., Soong, D.T., and Ishii, A.L., 2016, Estimation of peak discharge quantiles for selected annual exceedance probabilities in northeastern Illinois: U.S. Geological Survey Scientific Investigations Report 2016-5050, 50 p. (<http://dx.doi.org/10.3133/sir20165050>)

USGS Data Disclaimer: Unless otherwise stated, all data, metadata and related materials are considered to satisfy the quality standards relative to the purpose for which the data were collected. Although these data and associated metadata have been reviewed for accuracy and completeness and approved for release by the U.S. Geological Survey (USGS), no warranty expressed or implied is made regarding the display or utility of the data for other purposes, nor on all computer systems, nor shall the act of distribution constitute any such warranty.

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USGS Product Names Disclaimer: Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Application Version: 4.4.0

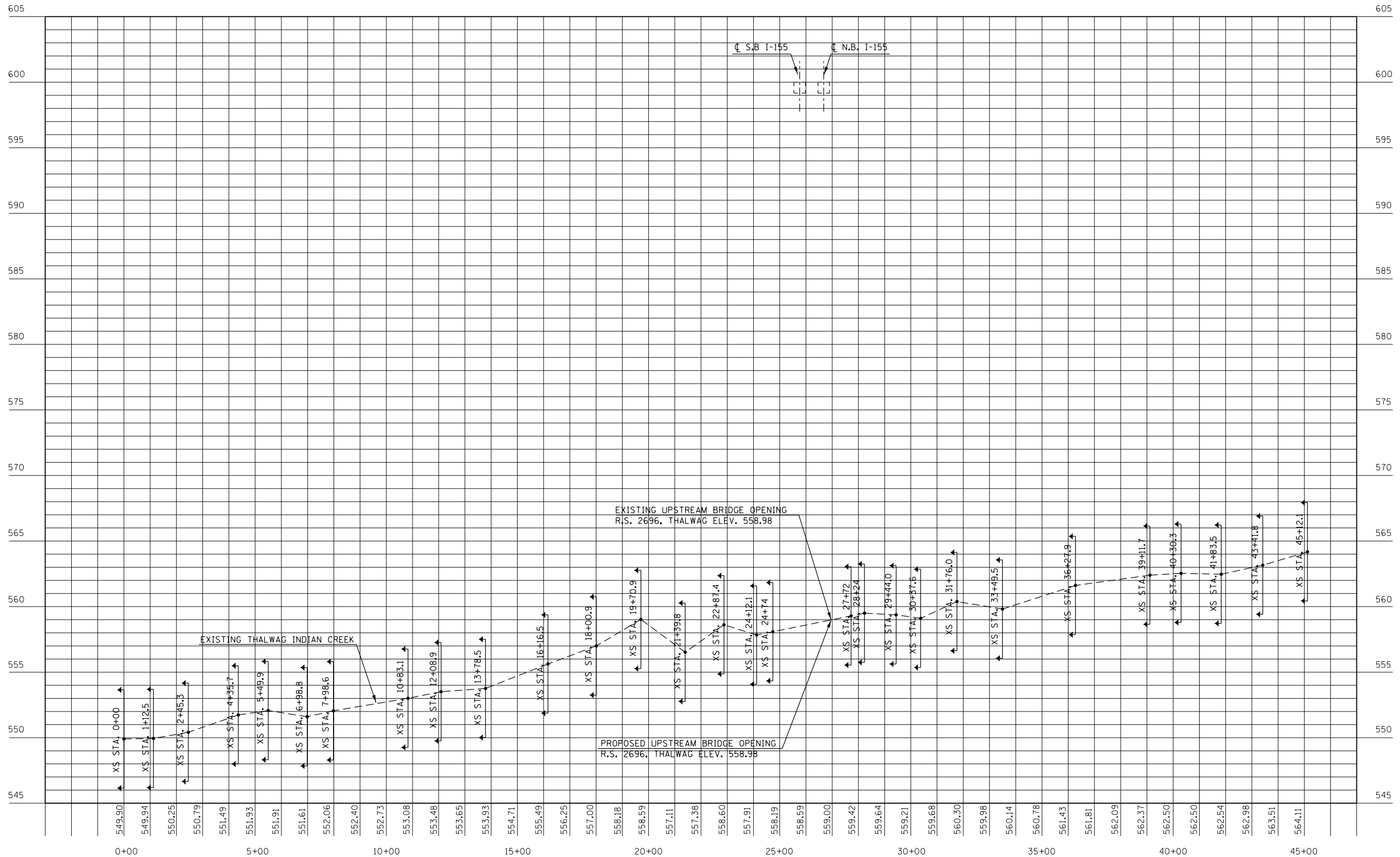
ATTACHMENT D

STREAMBED PROFILE

I-155 over Indian Creek Hydraulic Cross Section



MODEL: streambed_profile.gnd
 FILE NAME: S:\CADD\115_155_067_Indian_Creek\Hydraulic_Report\Attachments\Attachment_D-Streambed_Profile\streambed_profile.dgn



LEGEND	
---	EXISTING THALWAG INDIAN CREEK
—	PROPOSED THALWAG INDIAN CREEK

STREAMBED PROFILE

USER NAME = jochumsjg	DESIGNED -	REVISED -
PLOT SCALE = 0.5906' / mm	DRAWN -	REVISED -
PLOT DATE = 7/7/2021	CHECKED -	REVISED -
	DATE -	REVISED -

STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION

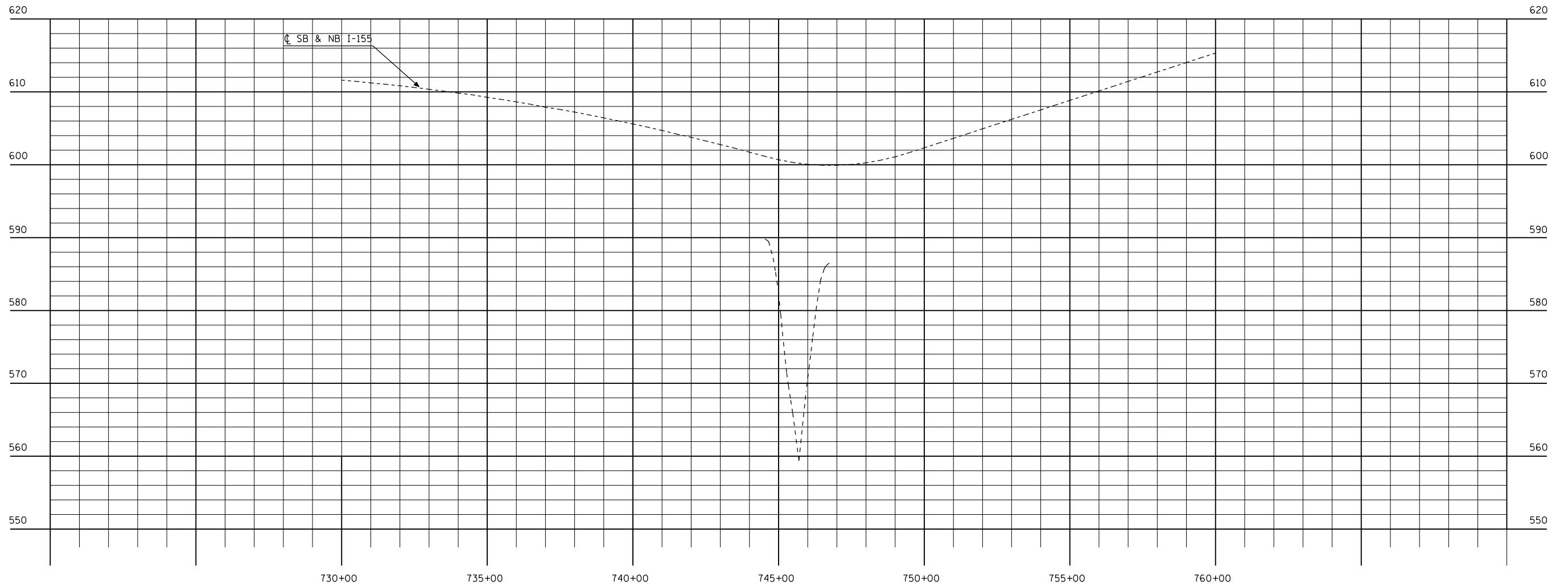
STREAMBED PROFILE EXISTING & PROPOSED				
SCALE:	SHEET	OF SHEETS	STA.	TO STA.

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
155	(108-B-2)	TAZEWELL		
ILLINOIS FED. AID PROJECT			CONTRACT NO. 68E42	

ATTACHMENT E

ROADWAY PROFILE

MODEL: D:\dgn\...
 FILE NAME: S:\CEN\DRAWING\...
 PROJECT: I-155 over Indian Creek
 REPORT: Hydraulic Report
 ATTACHMENT: E-Roadway Profile



ROADWAY PROFILE

SOUTHBOUND I-155 (0093)
 NORTHBOUND I-155 (0094)

NOTE:

PROPOSED PROFILE WILL MATCH EXISTING PROFILE

USER NAME = jochumsjg	DESIGNED -	REVISED -
	DRAWN -	REVISED -
PLOT SCALE = 0.5906' / mm	CHECKED -	REVISED -
PLOT DATE = 1/22/2021	DATE -	REVISED -

**STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION**

**EXISTING ROADWAY PROFILE
 S.N. 090-0093 & 0094**

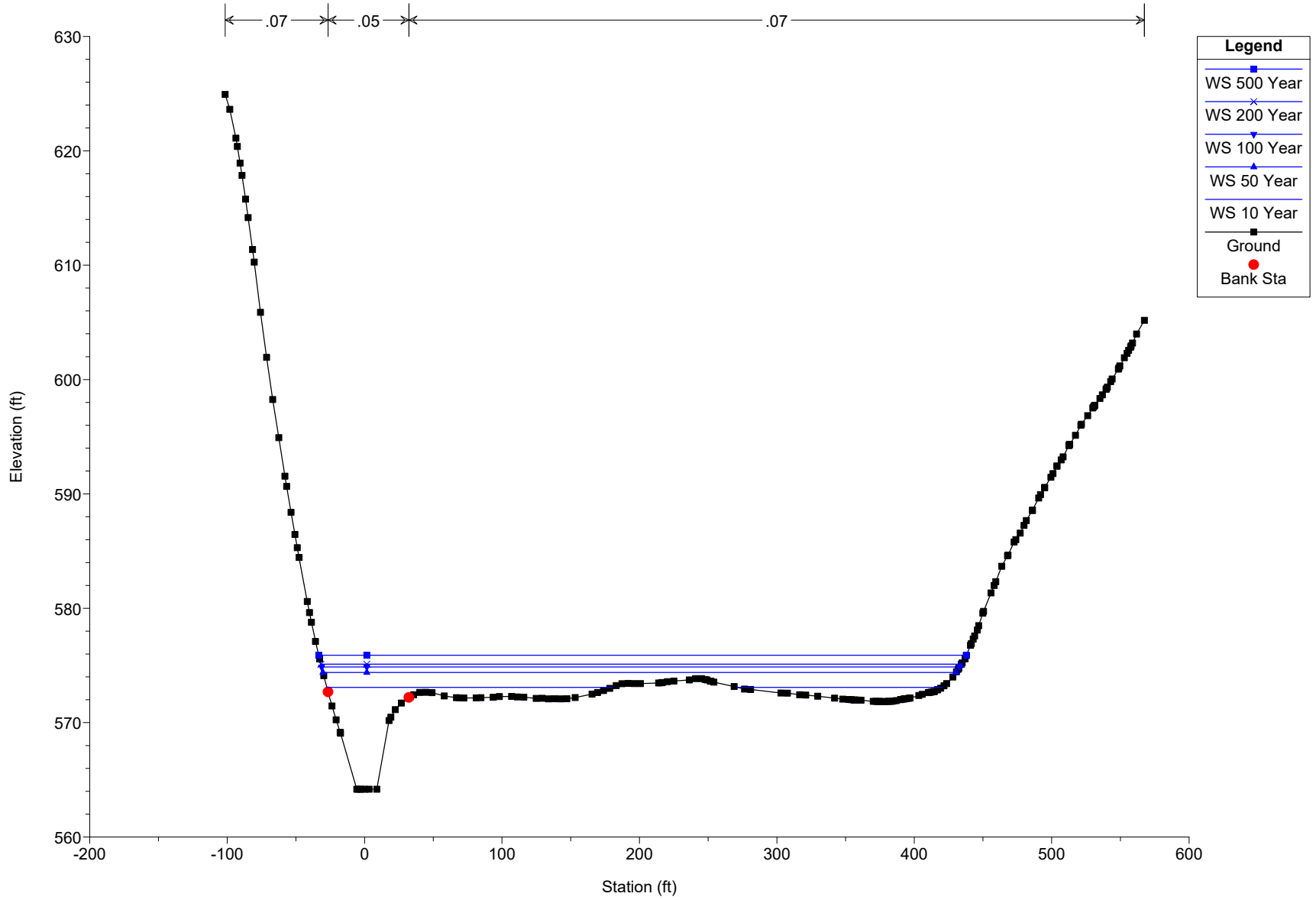
SCALE: SHEET OF SHEETS STA. TO STA.

F.A.J. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
155	(108-B-2)	TAZEWELL		
			CONTRACT NO. 68E42	
		ILLINOIS	FED. AID PROJECT	

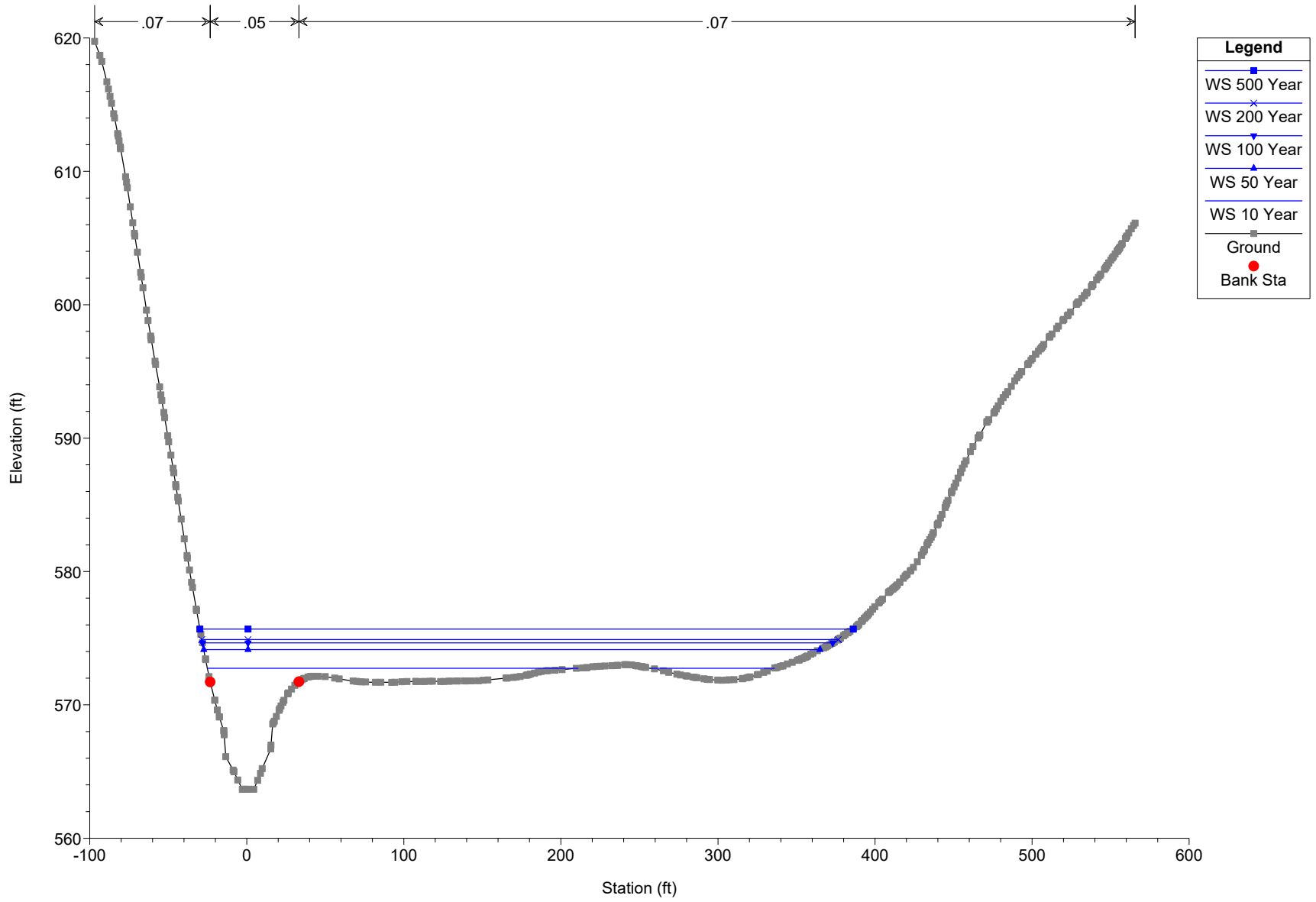
ATTACHMENT F

CROSS SECTION PLOTS

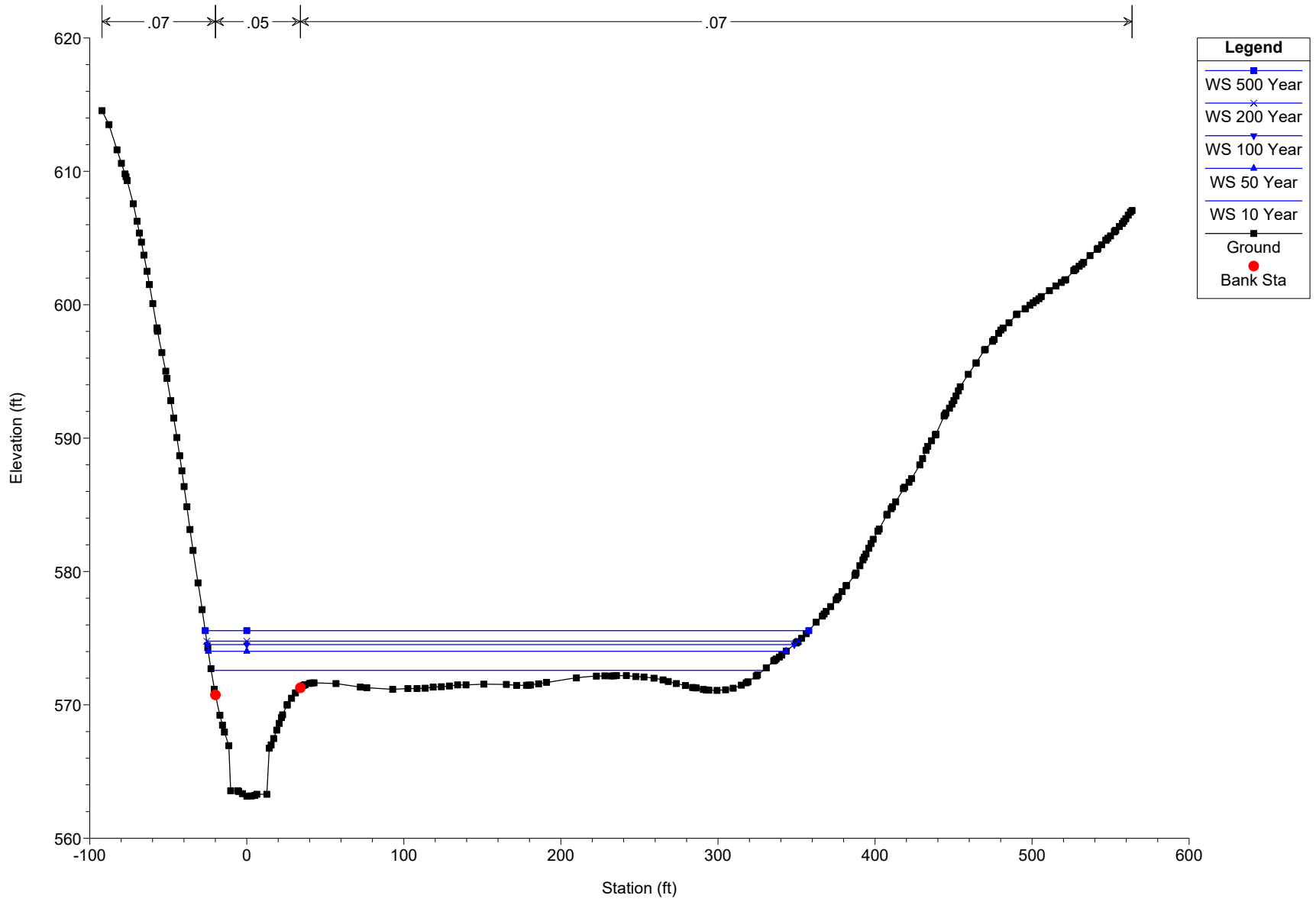
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



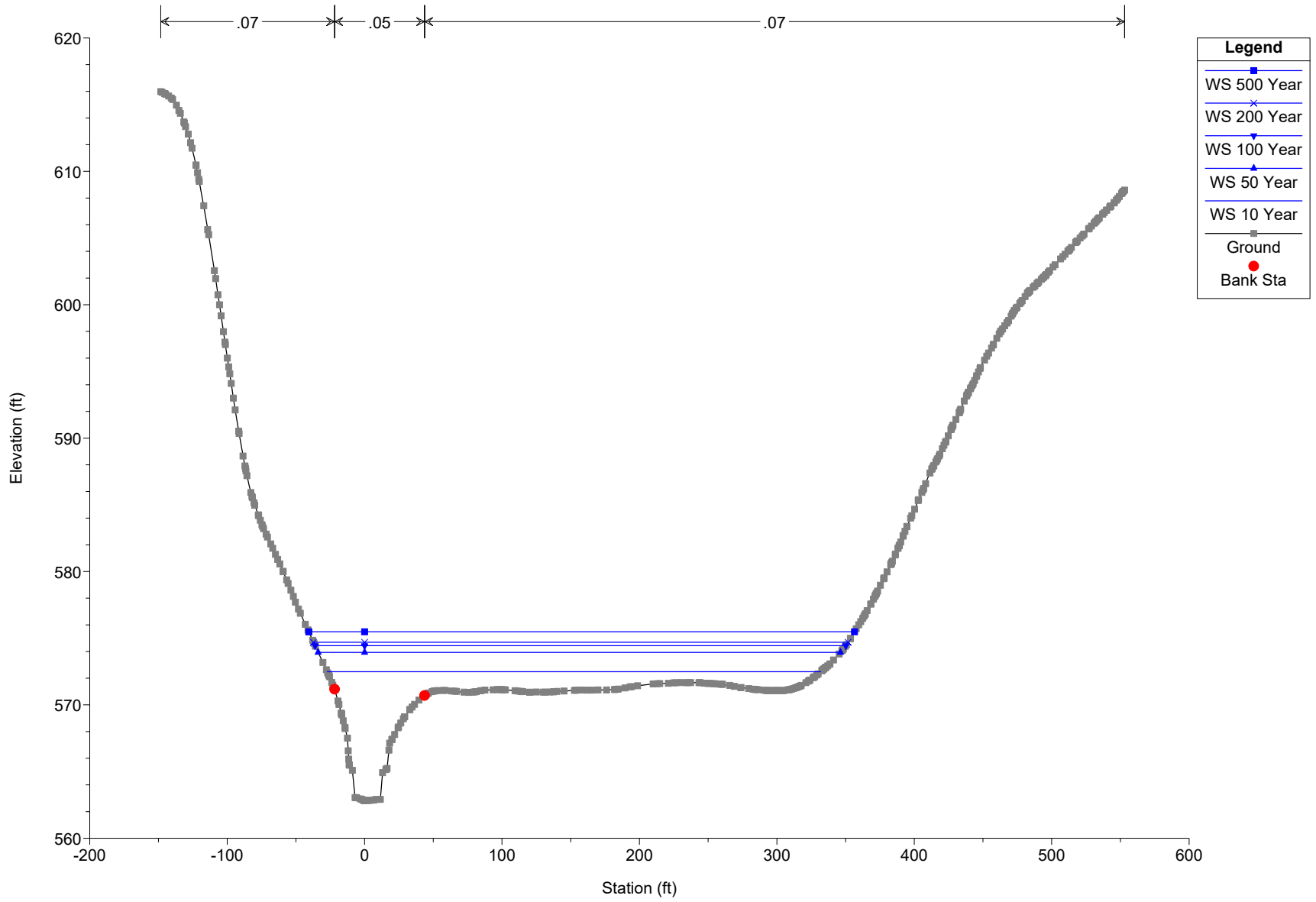
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



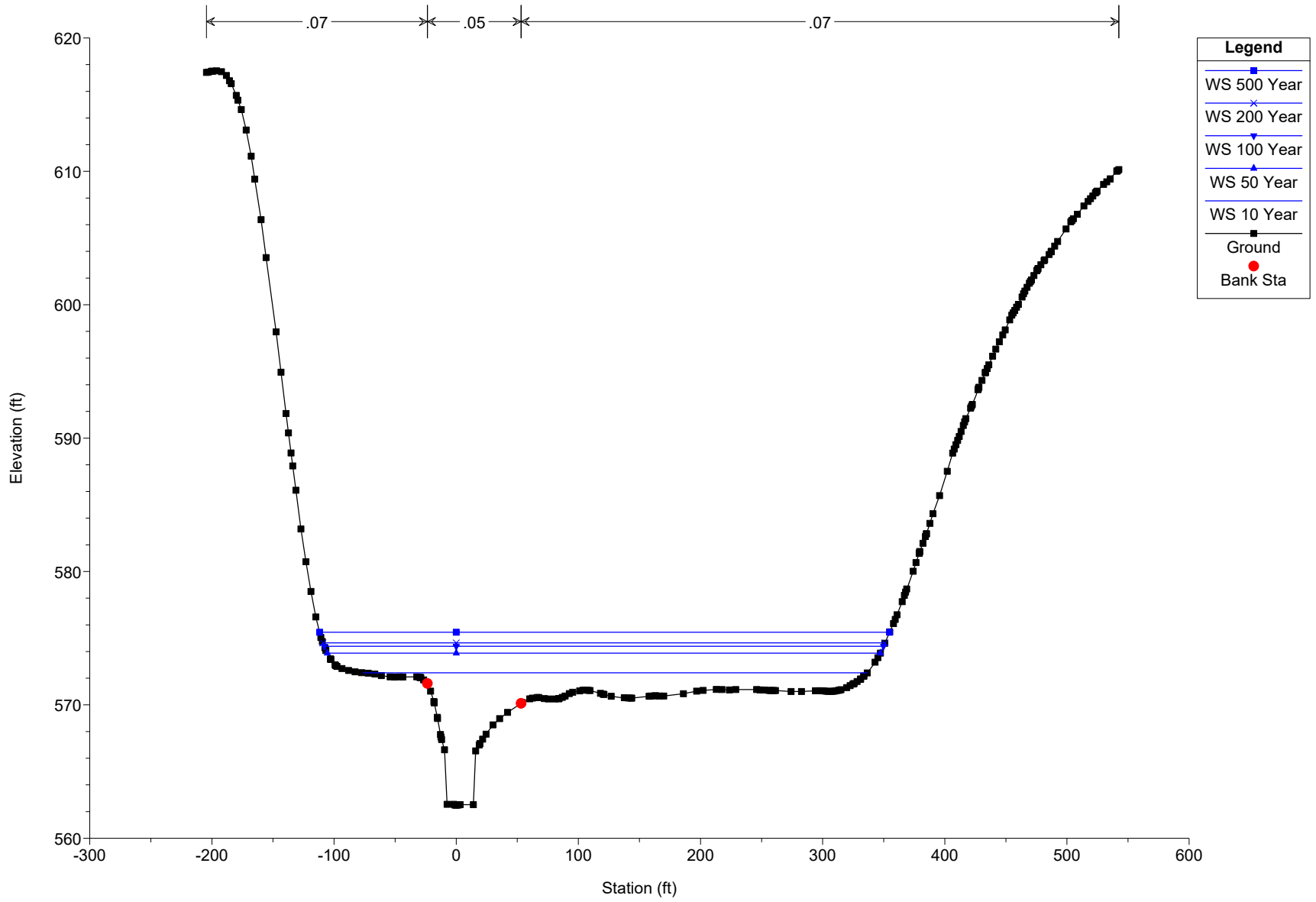
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



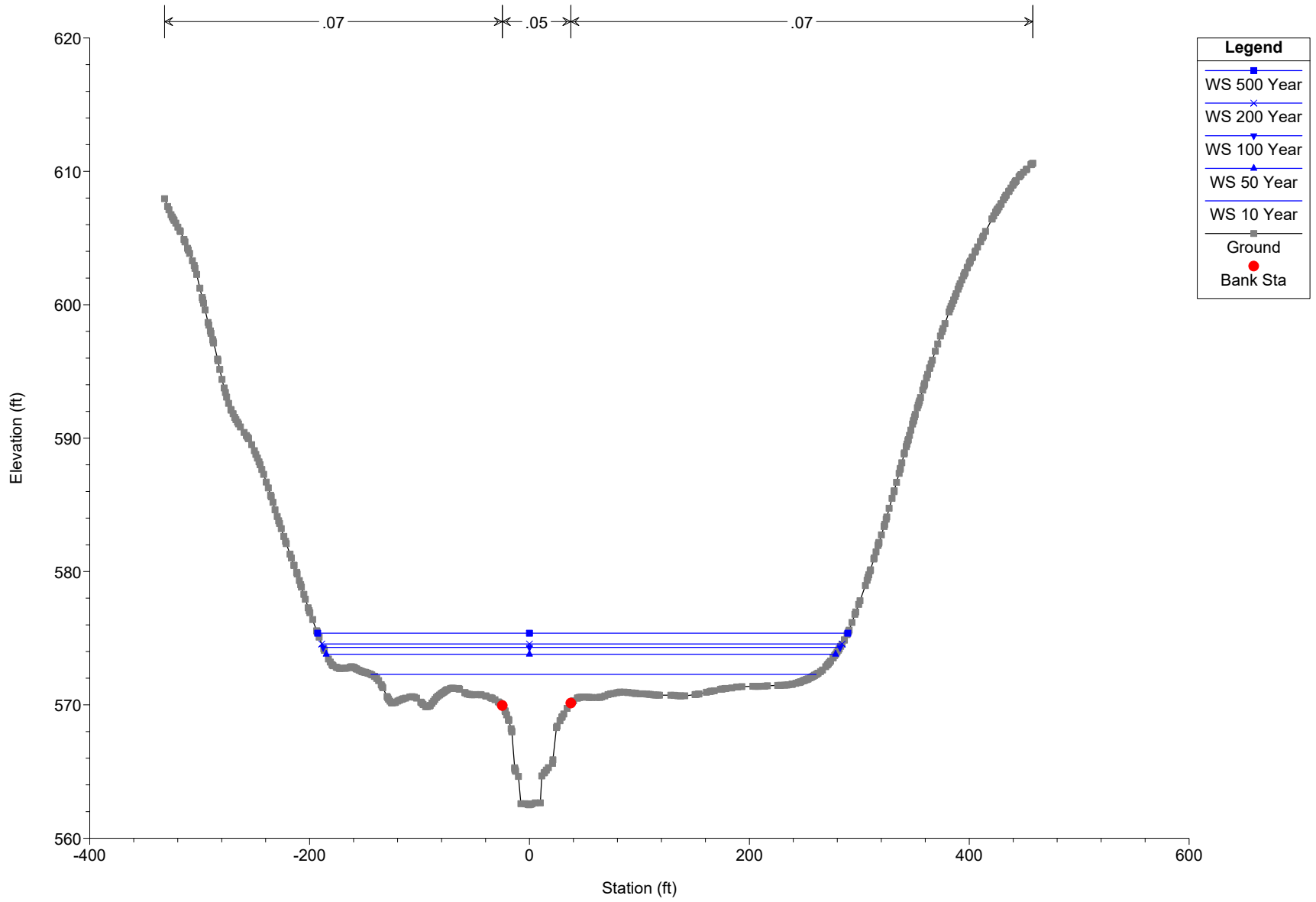
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



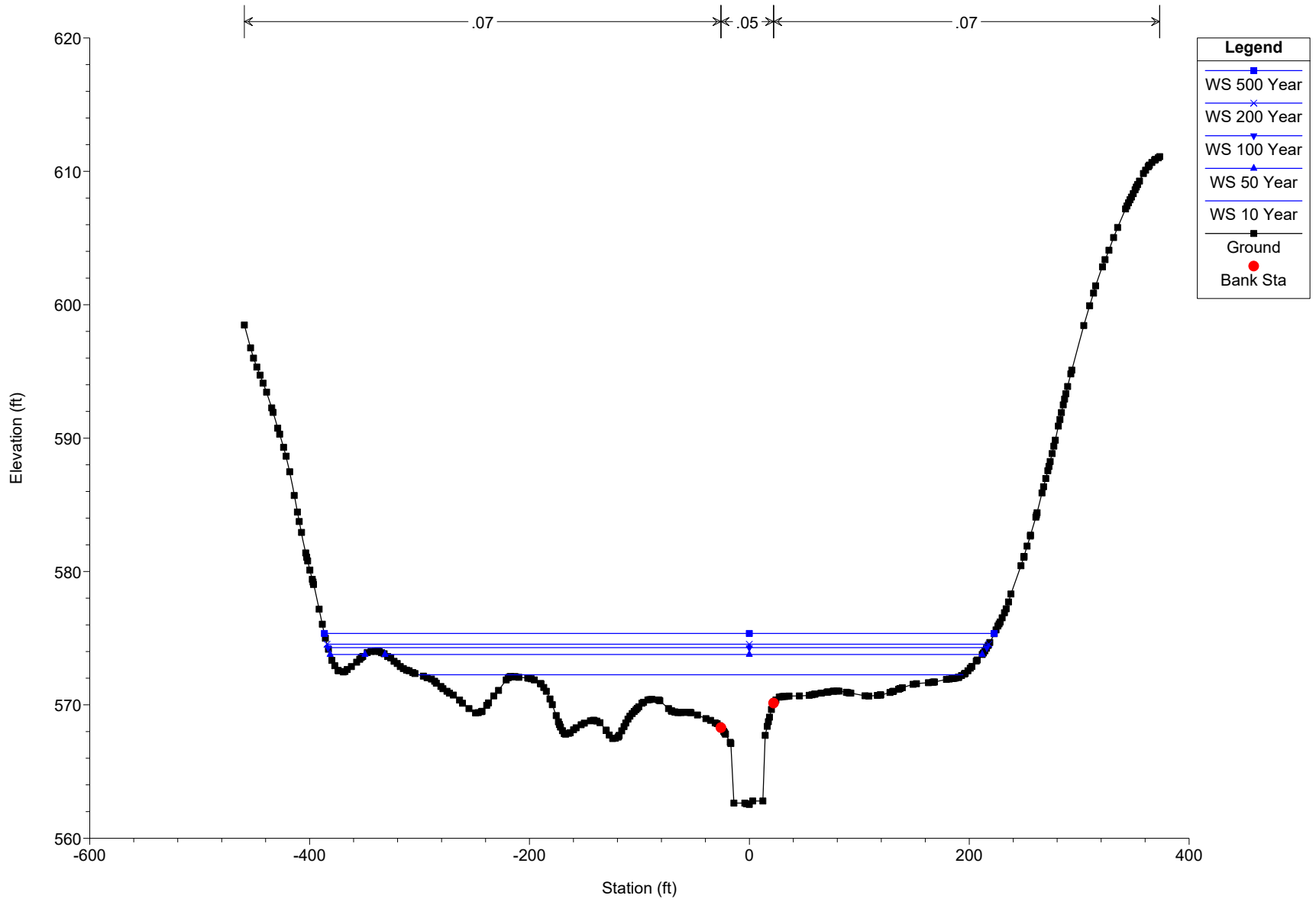
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



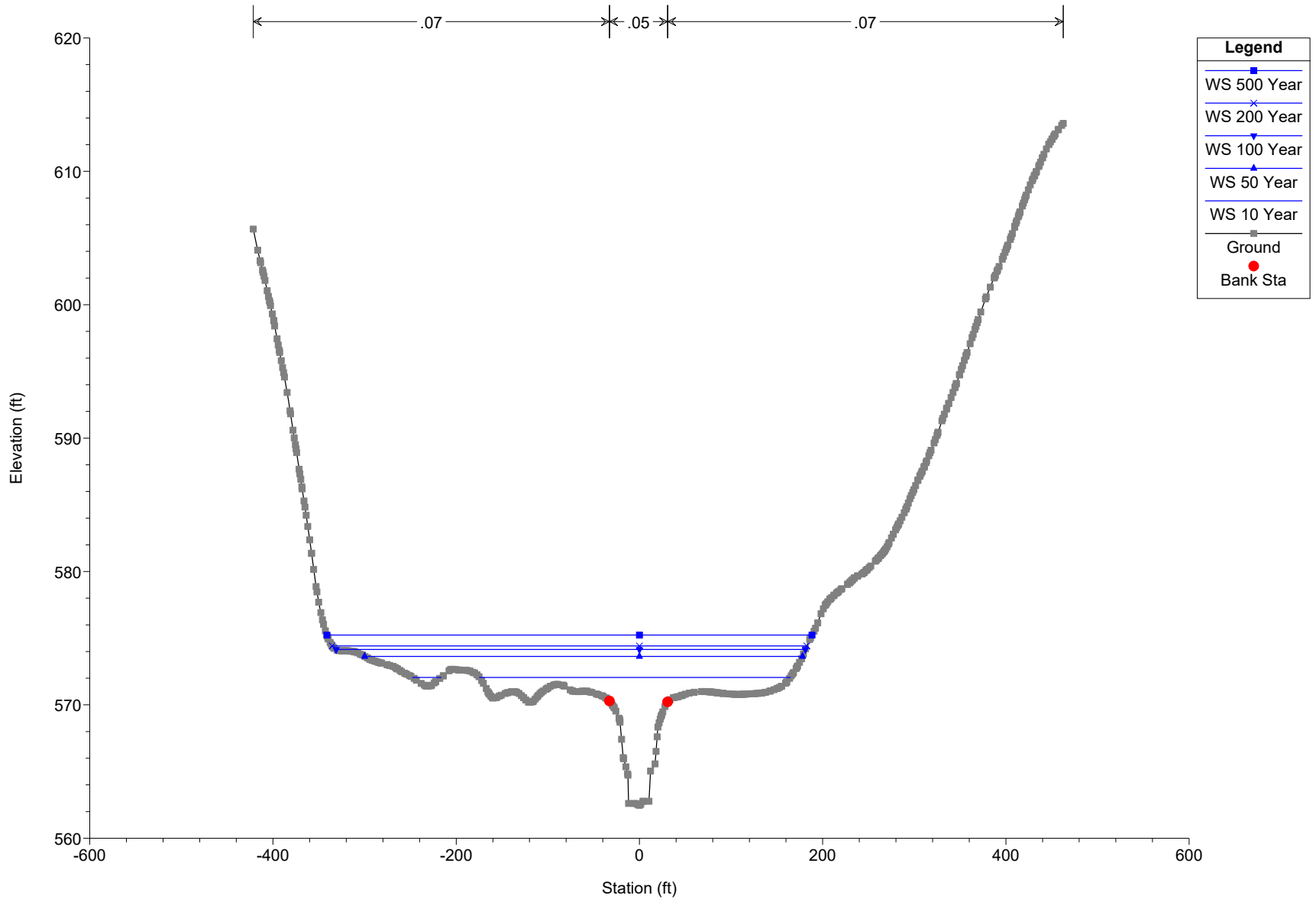
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



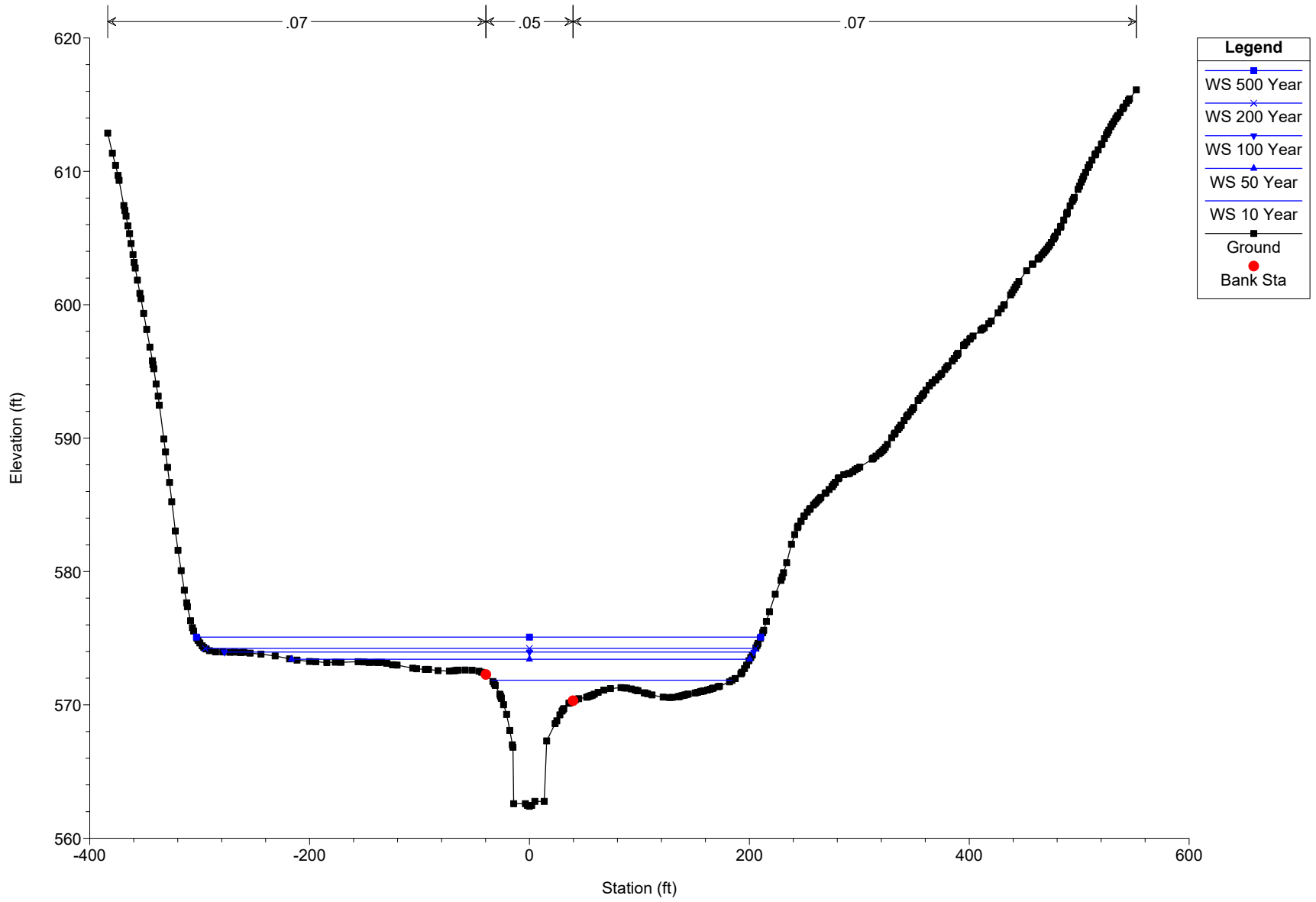
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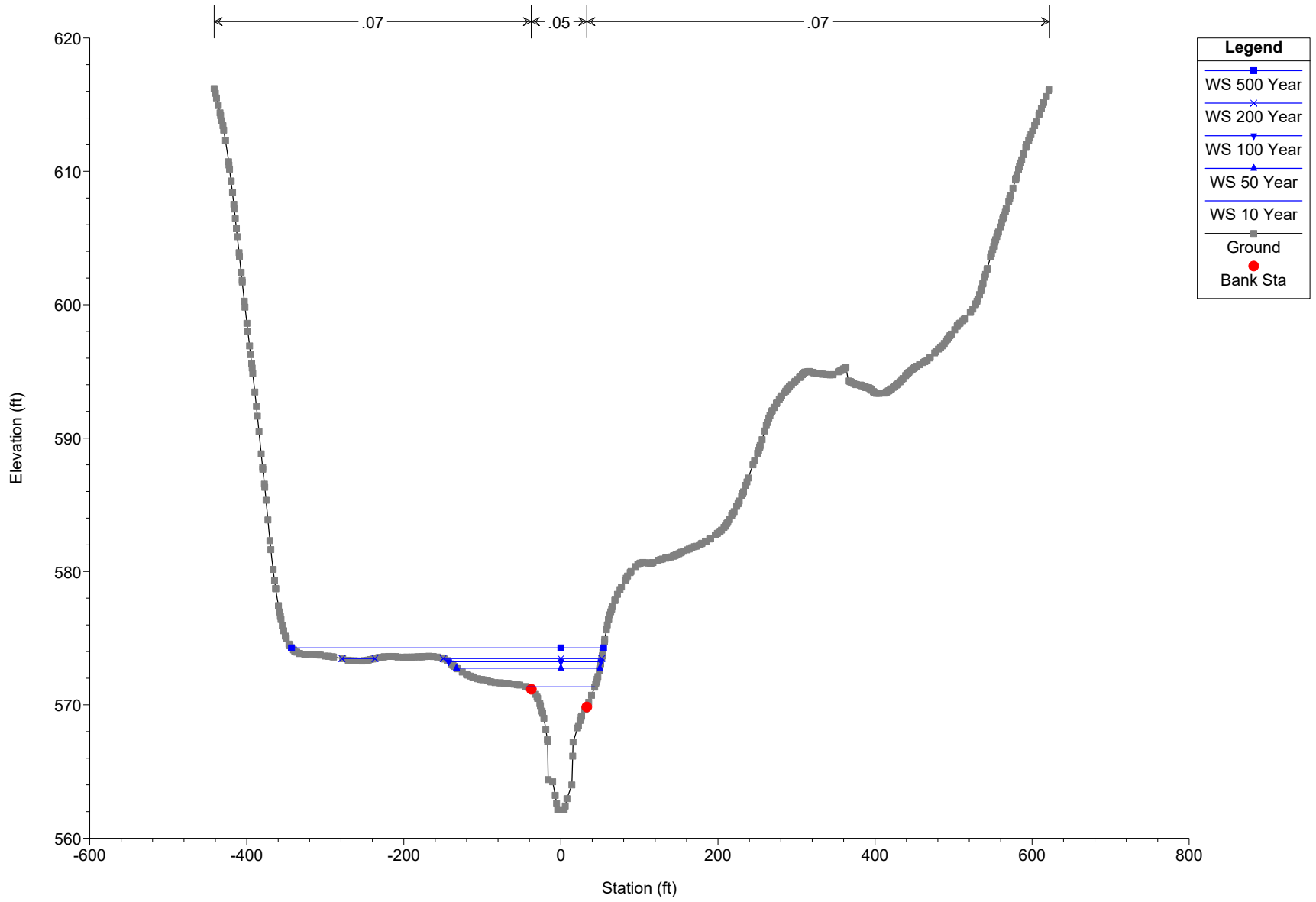
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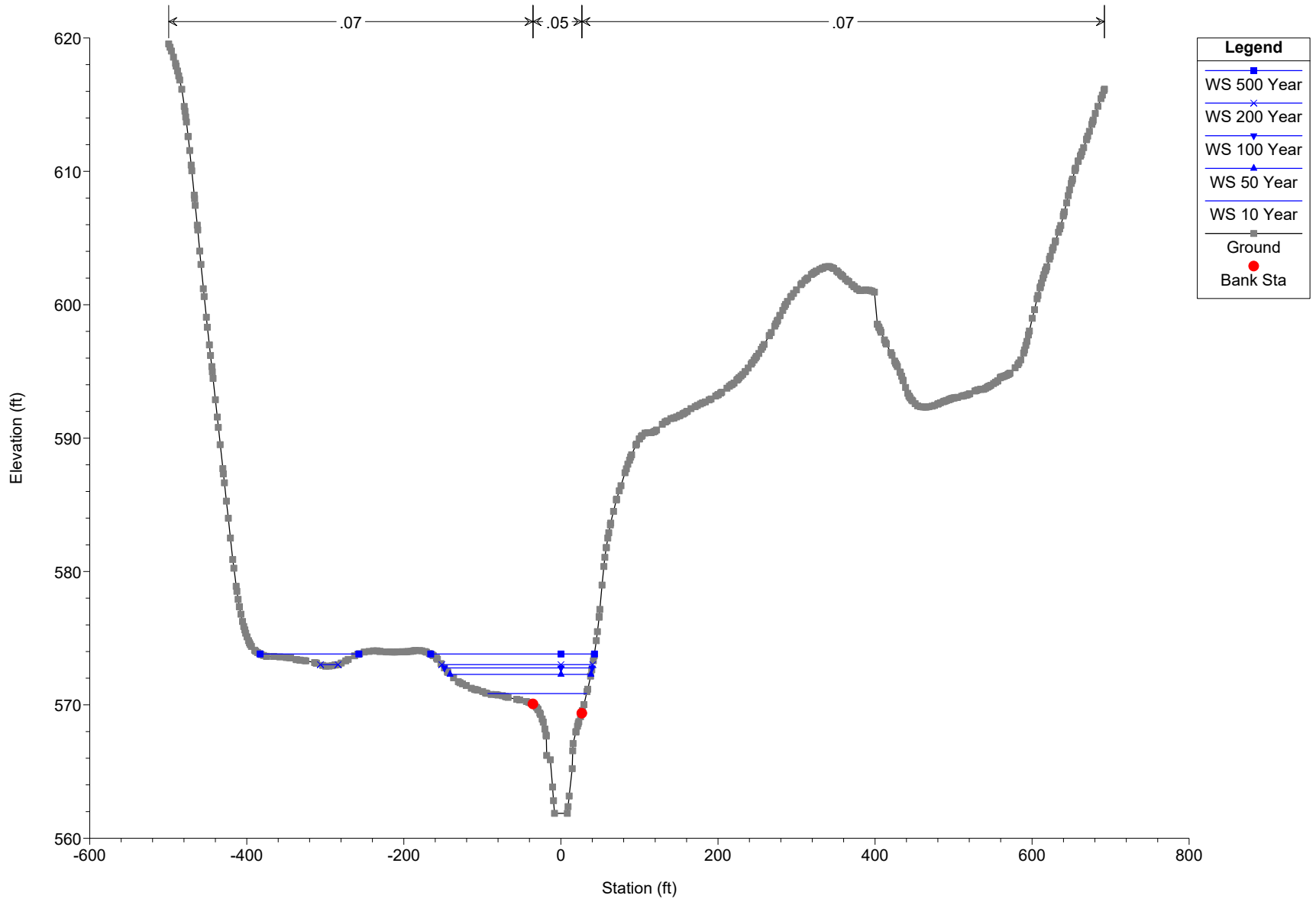
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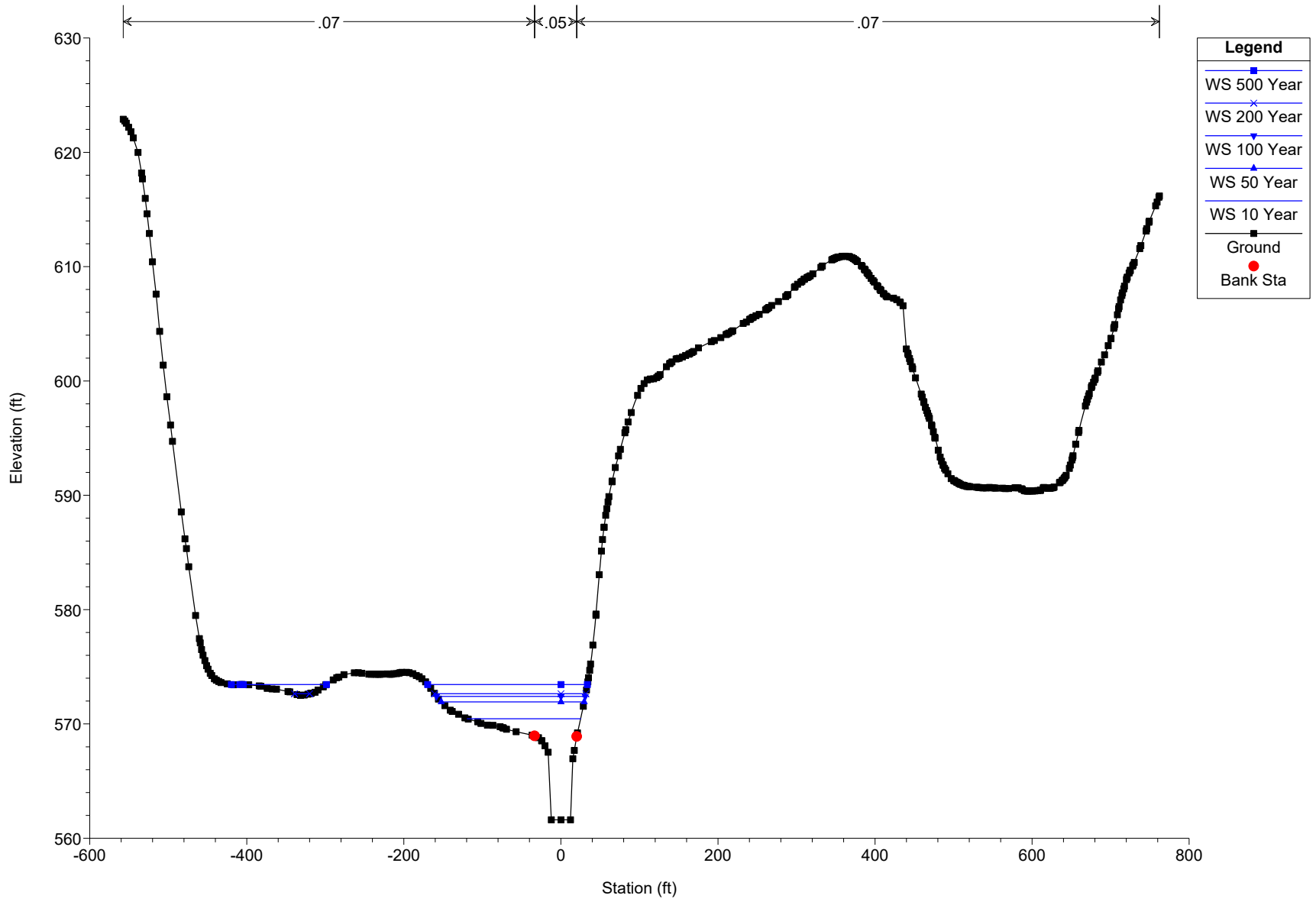
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



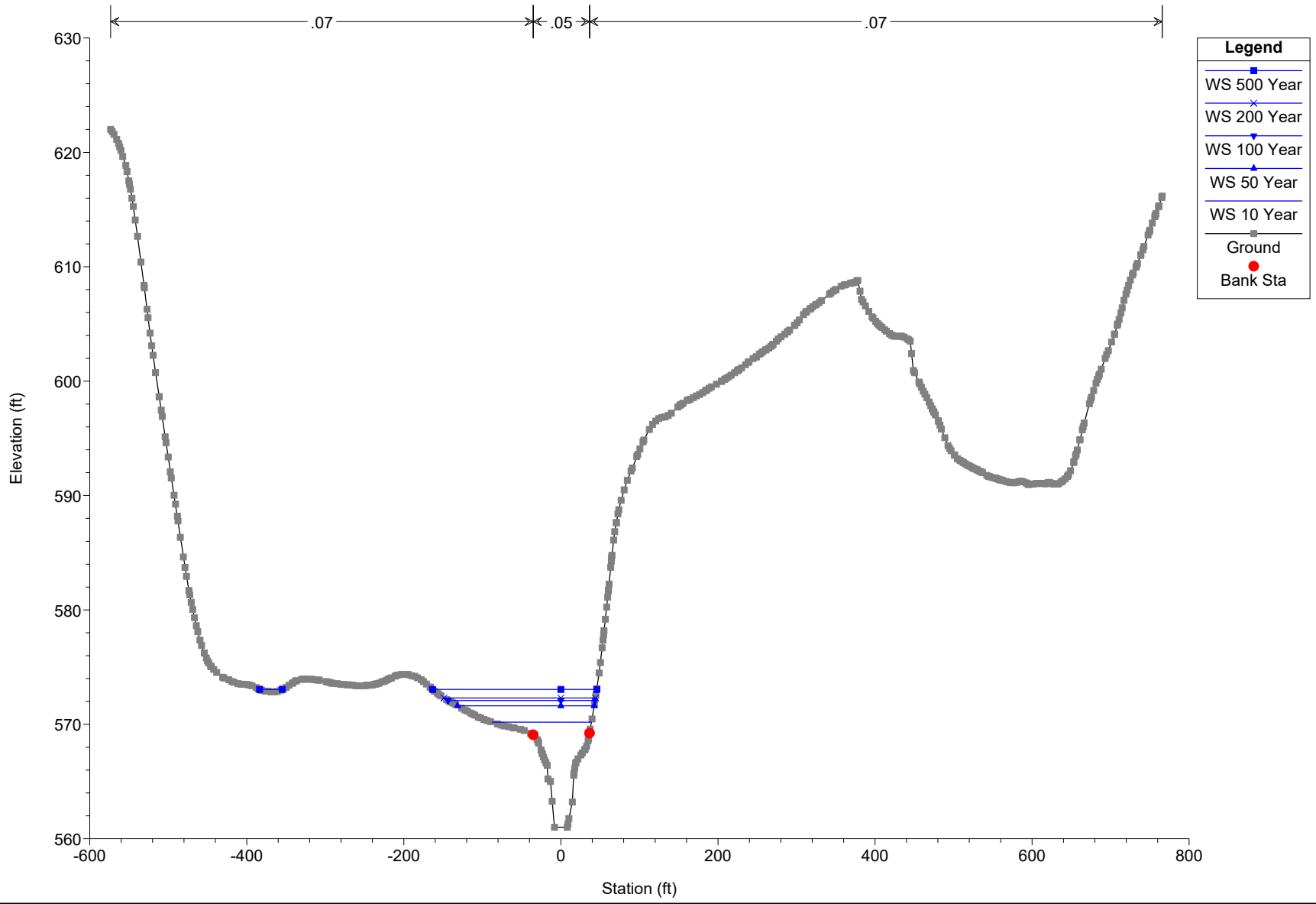
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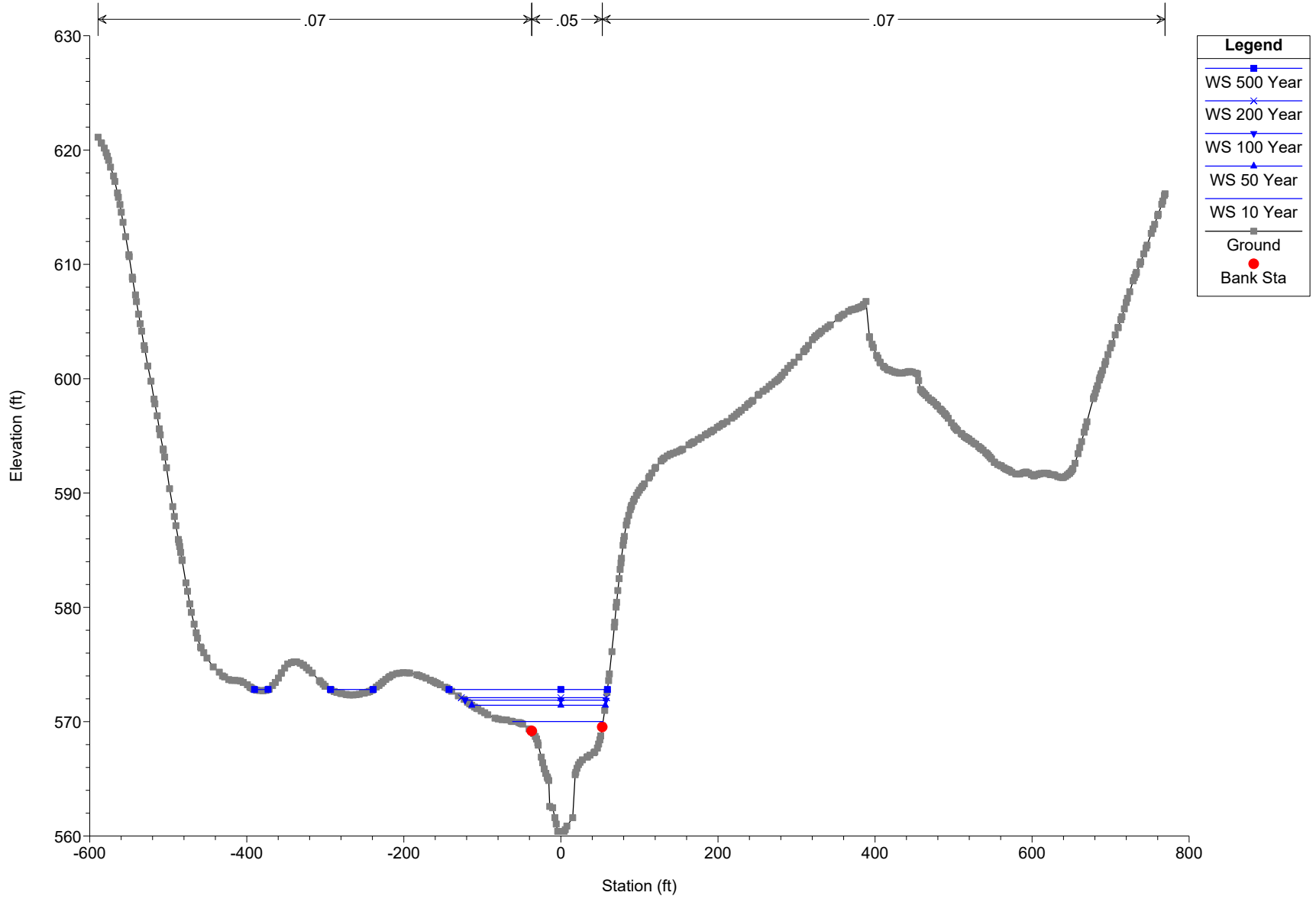
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



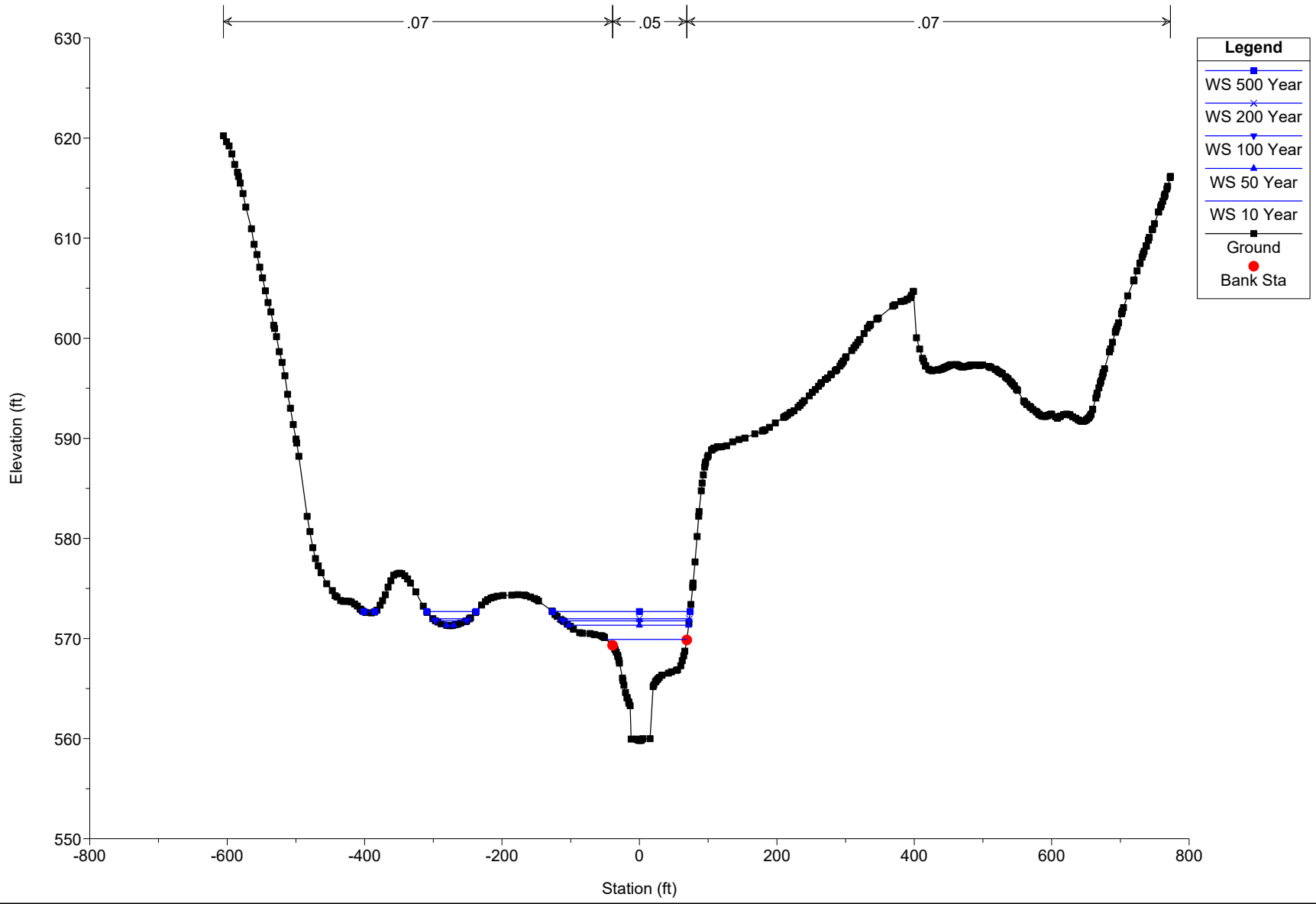
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



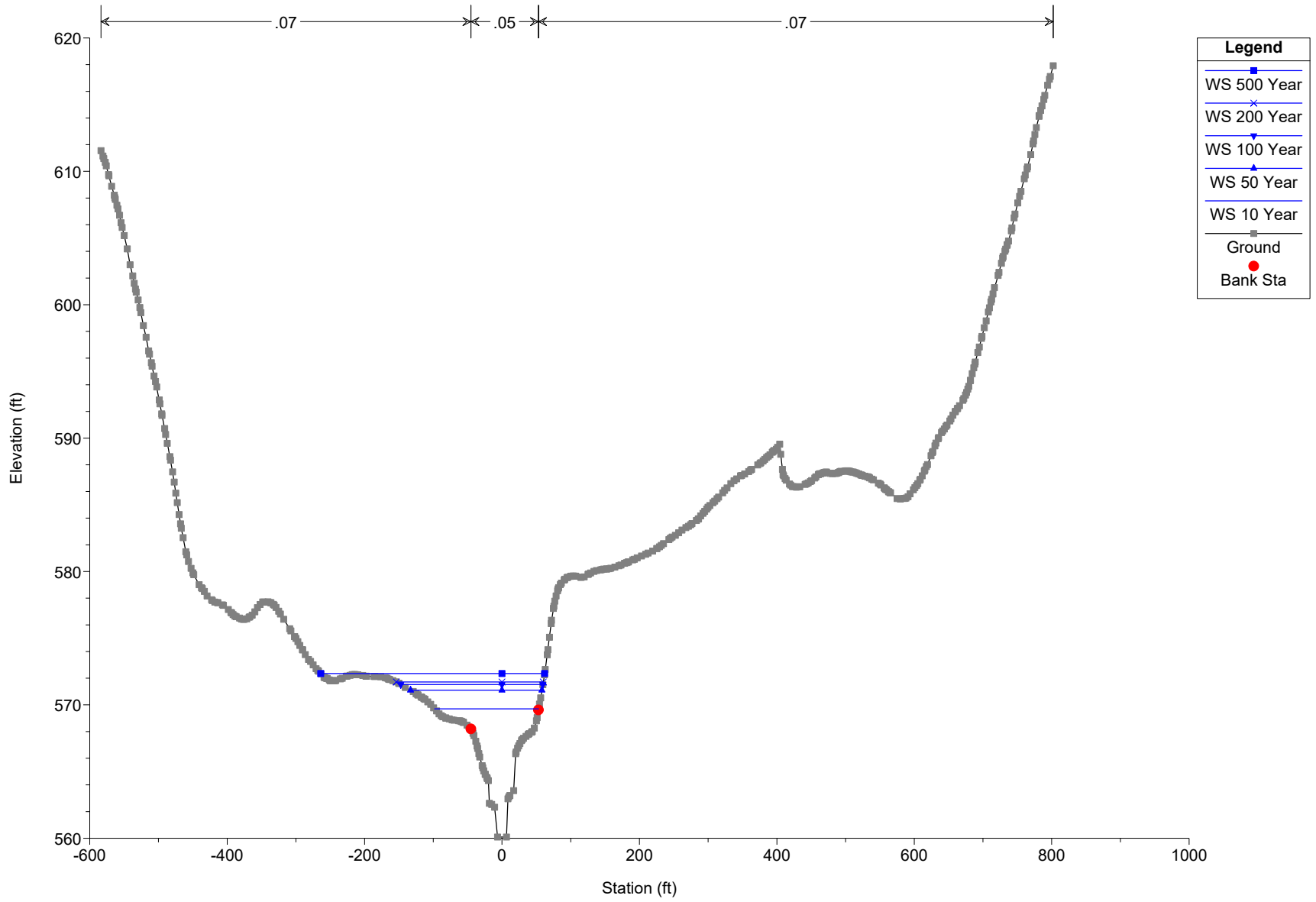
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



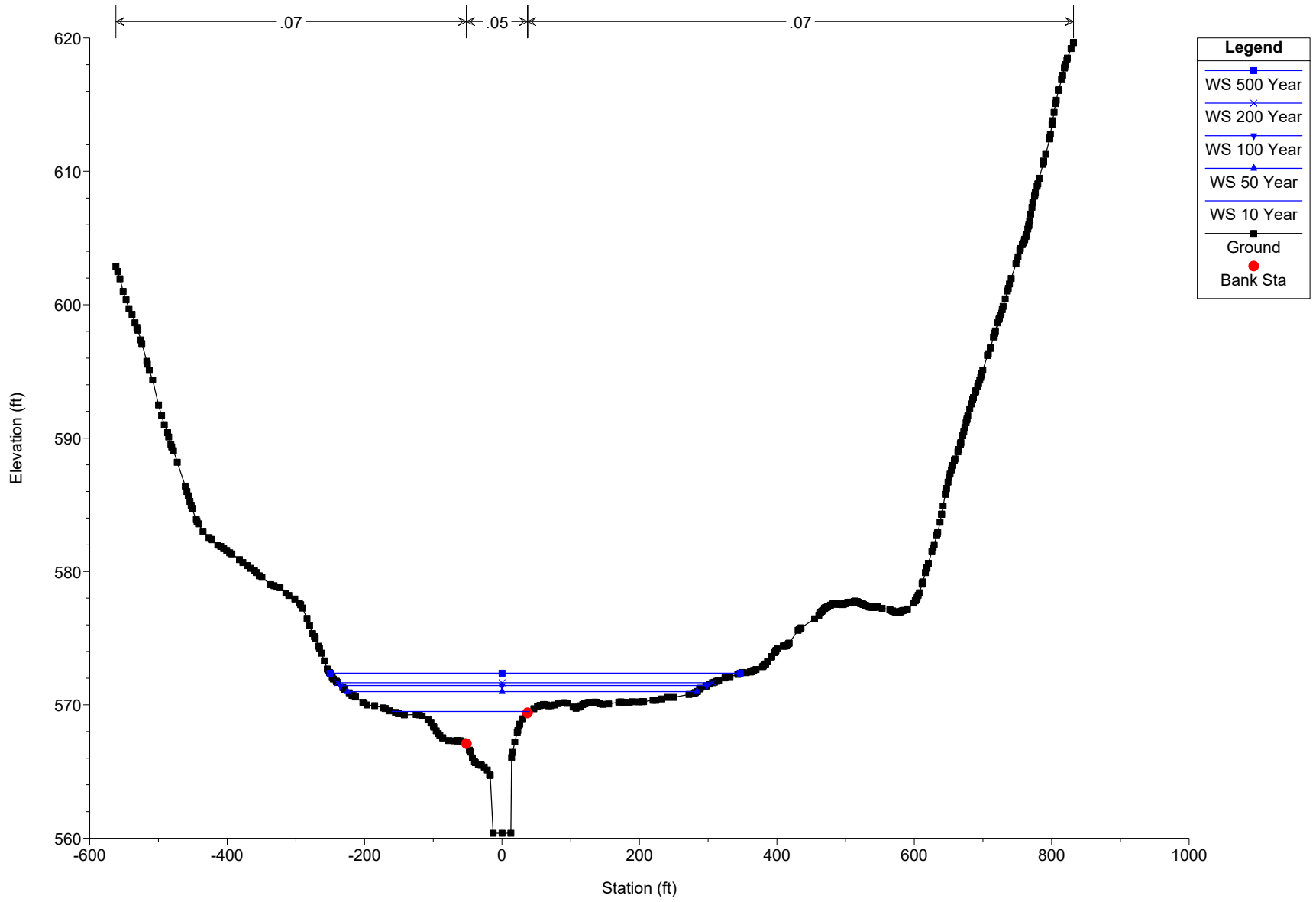
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



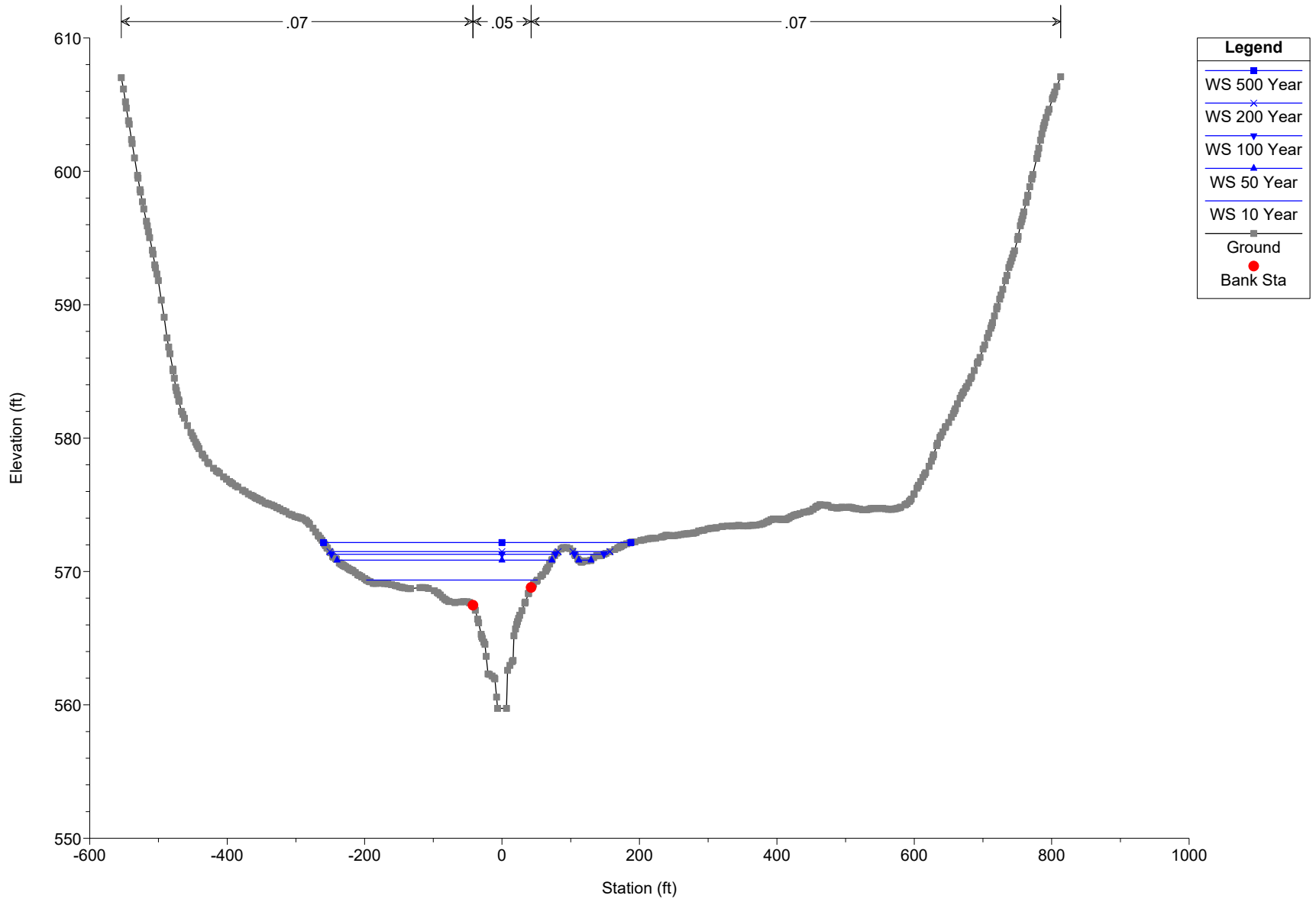
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



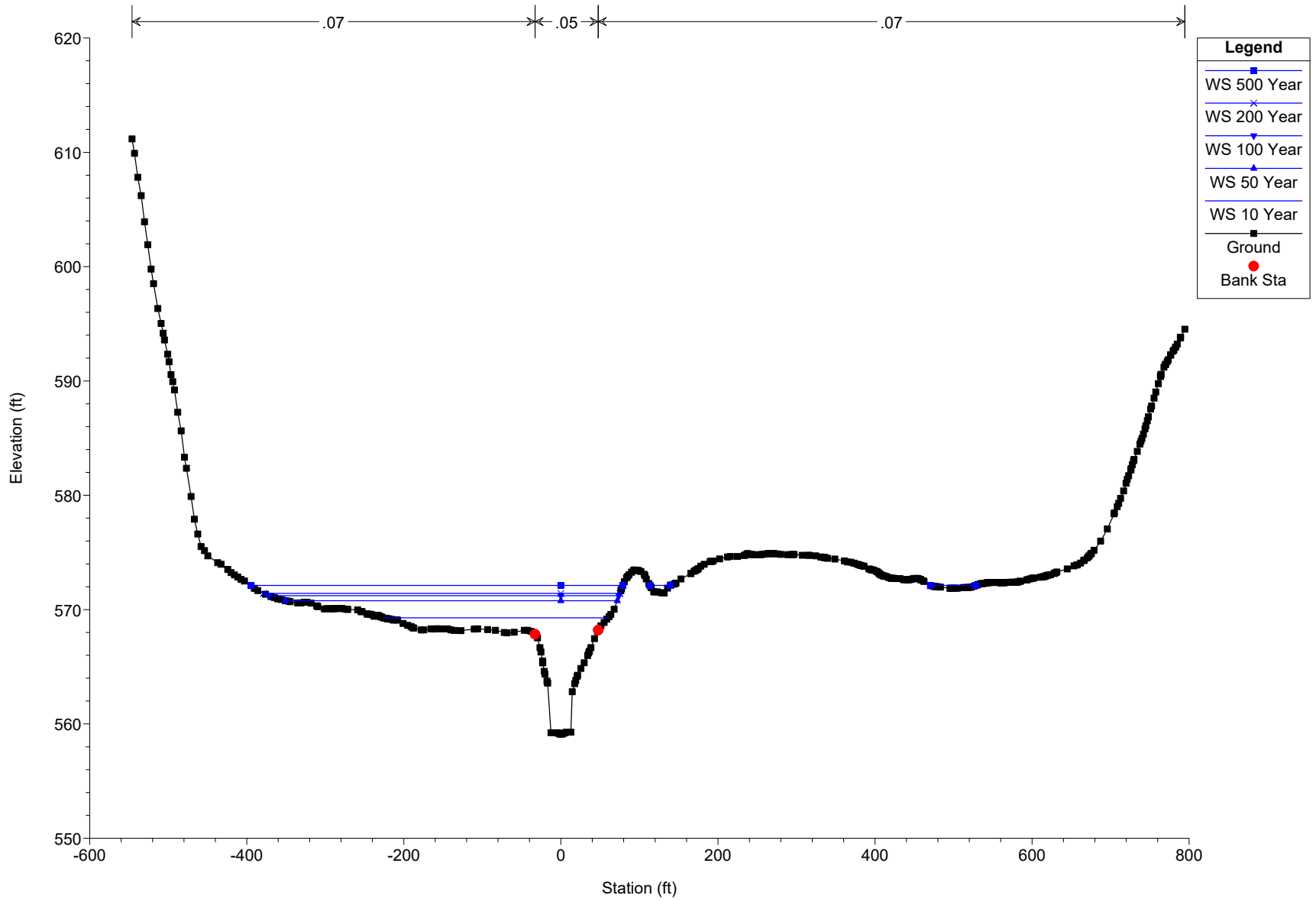
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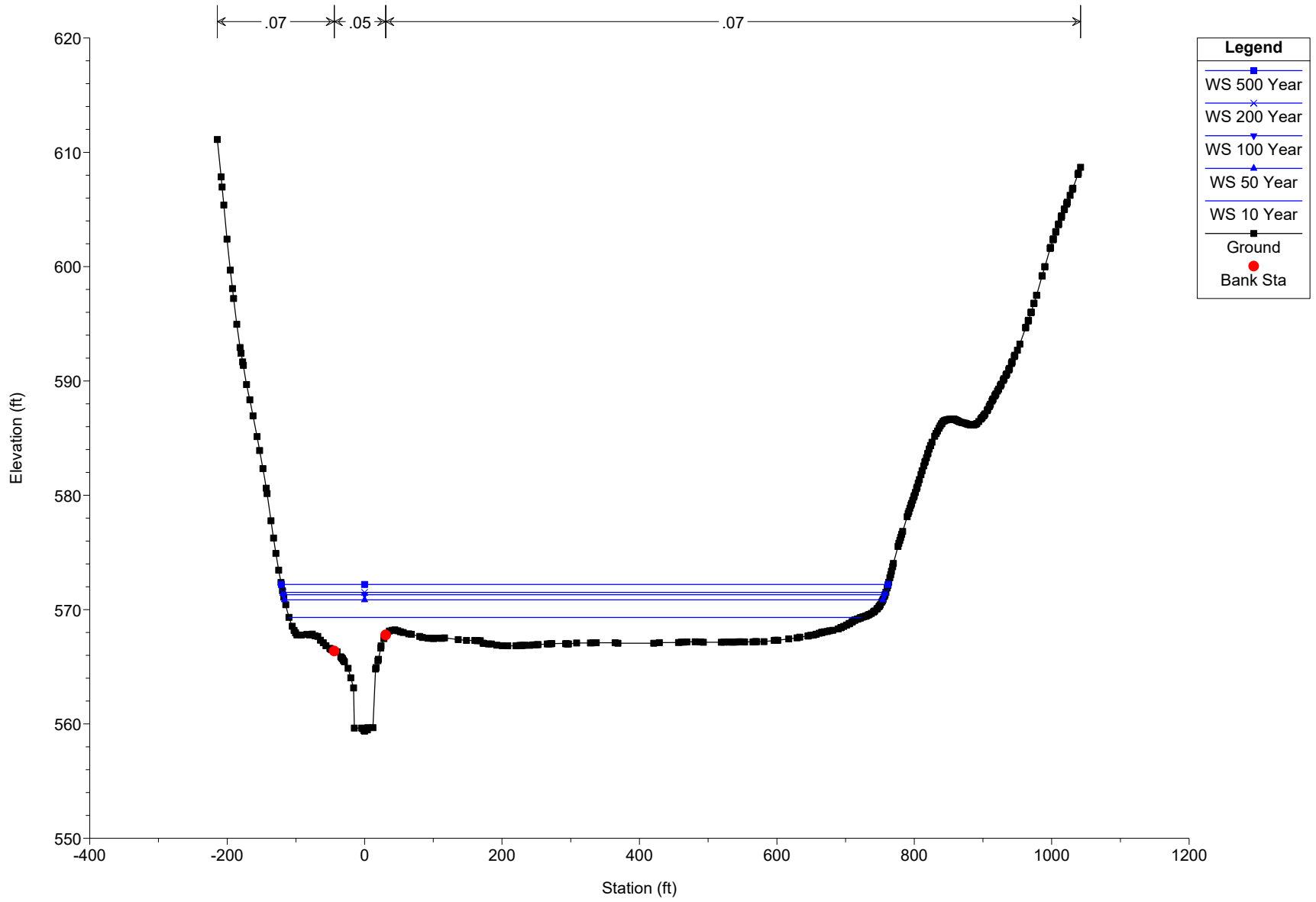
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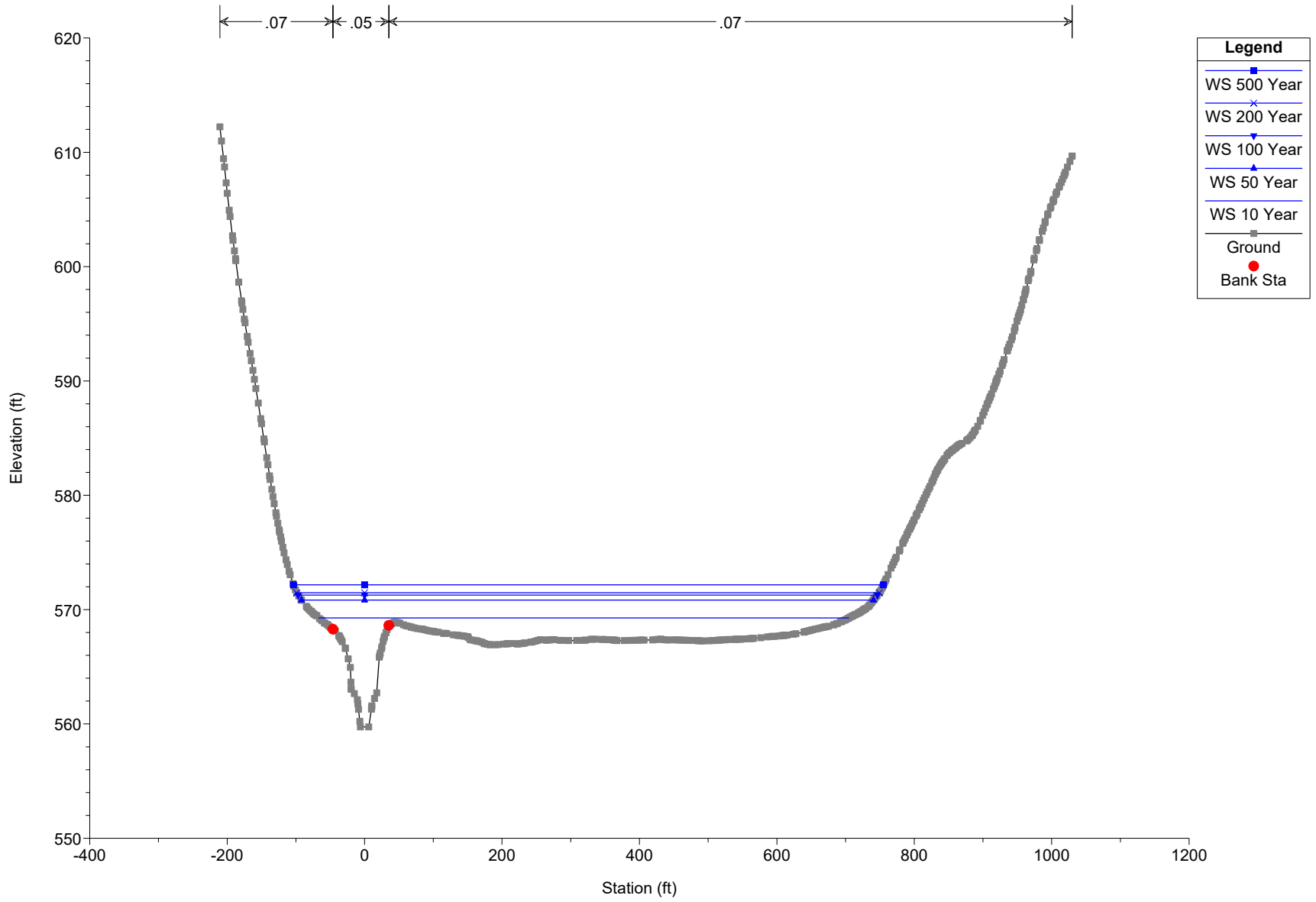
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



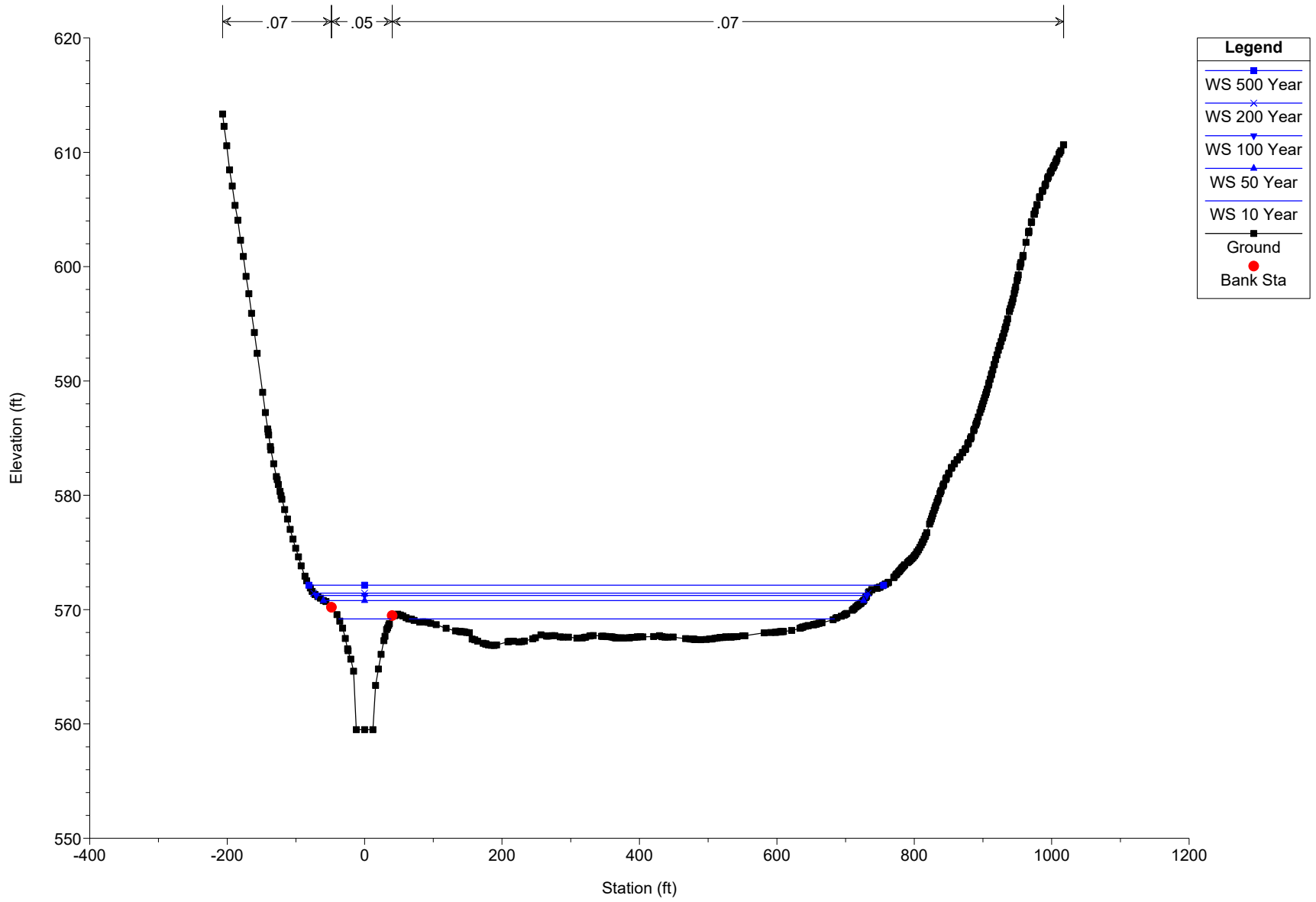
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



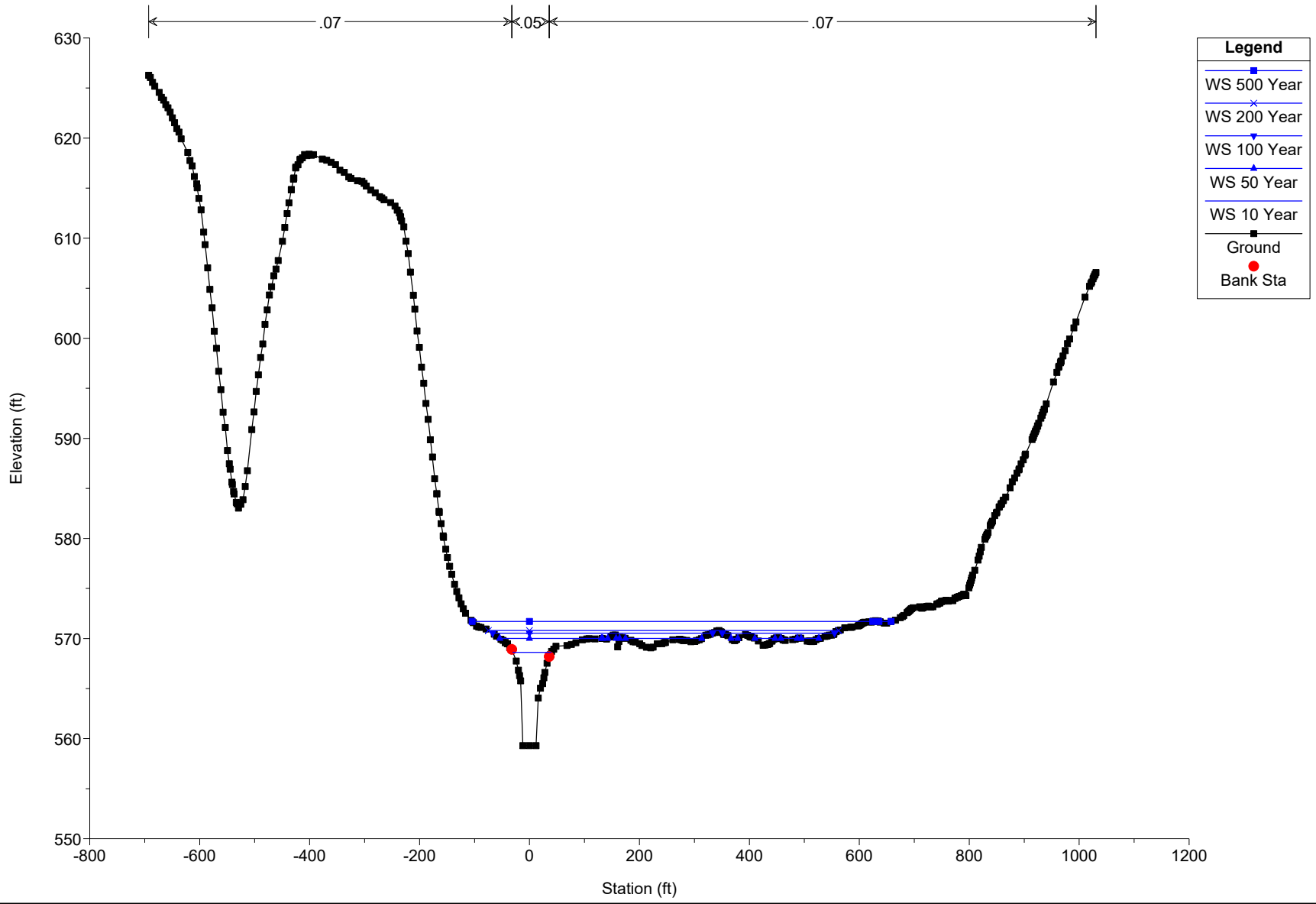
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



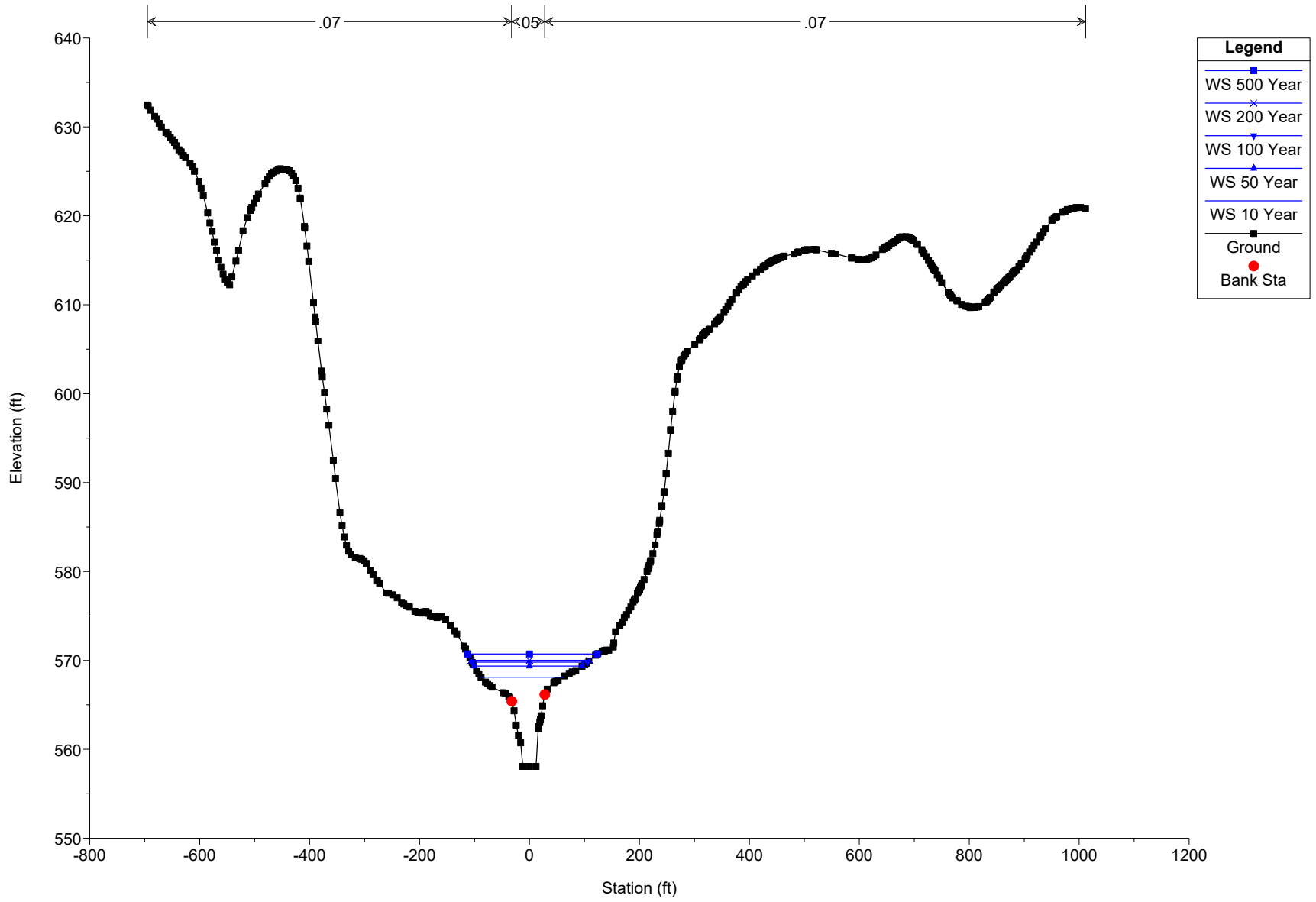
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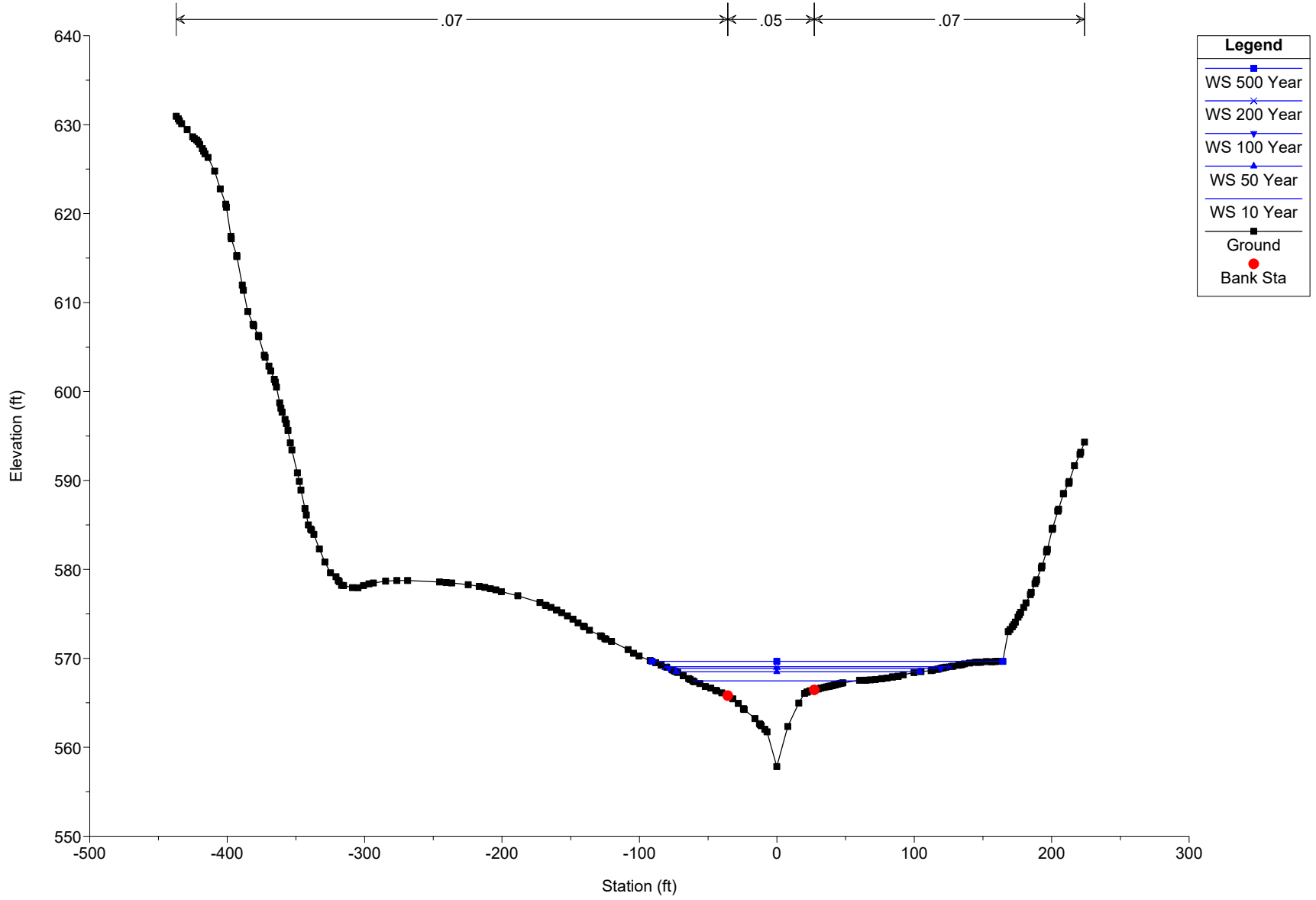
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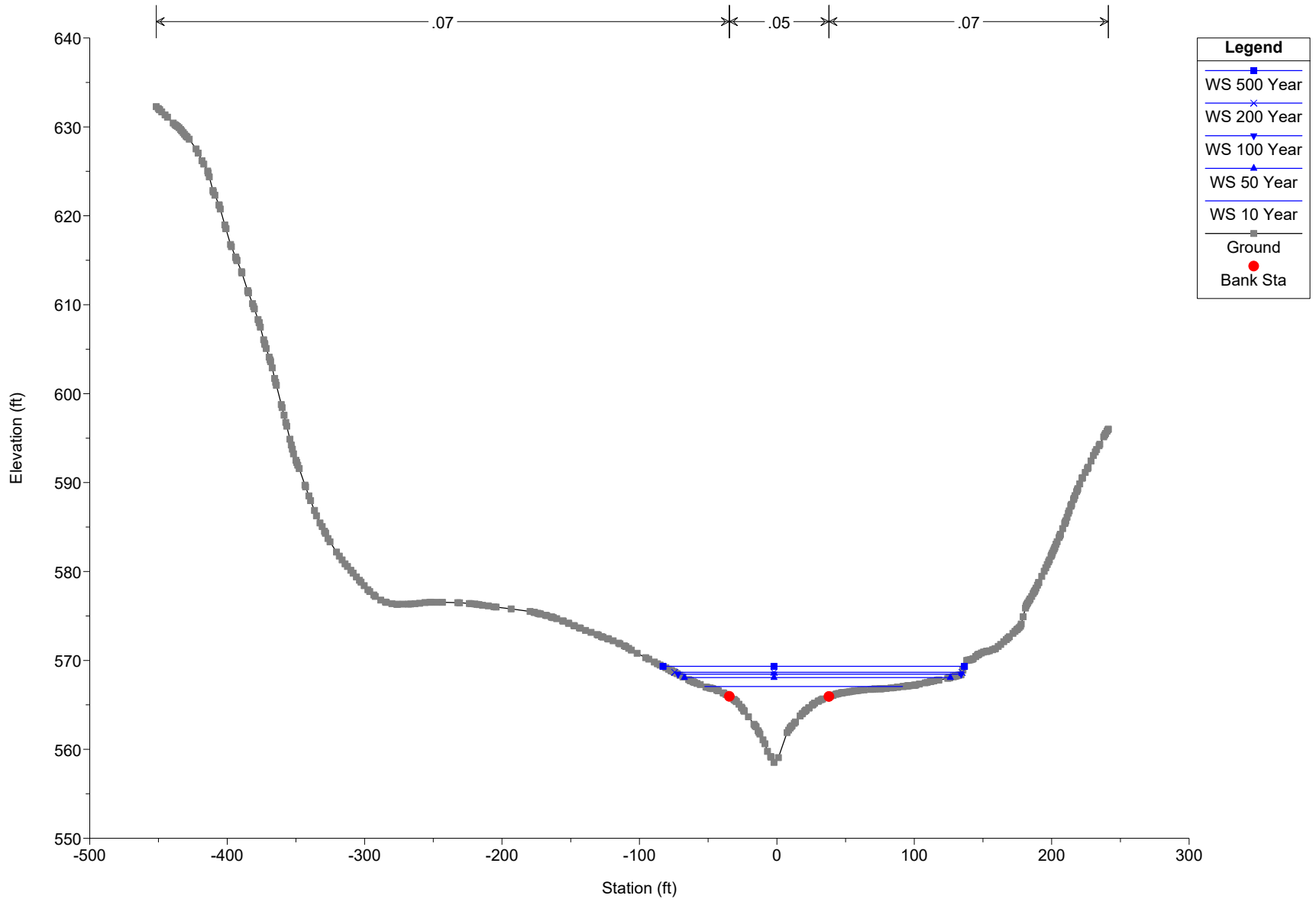
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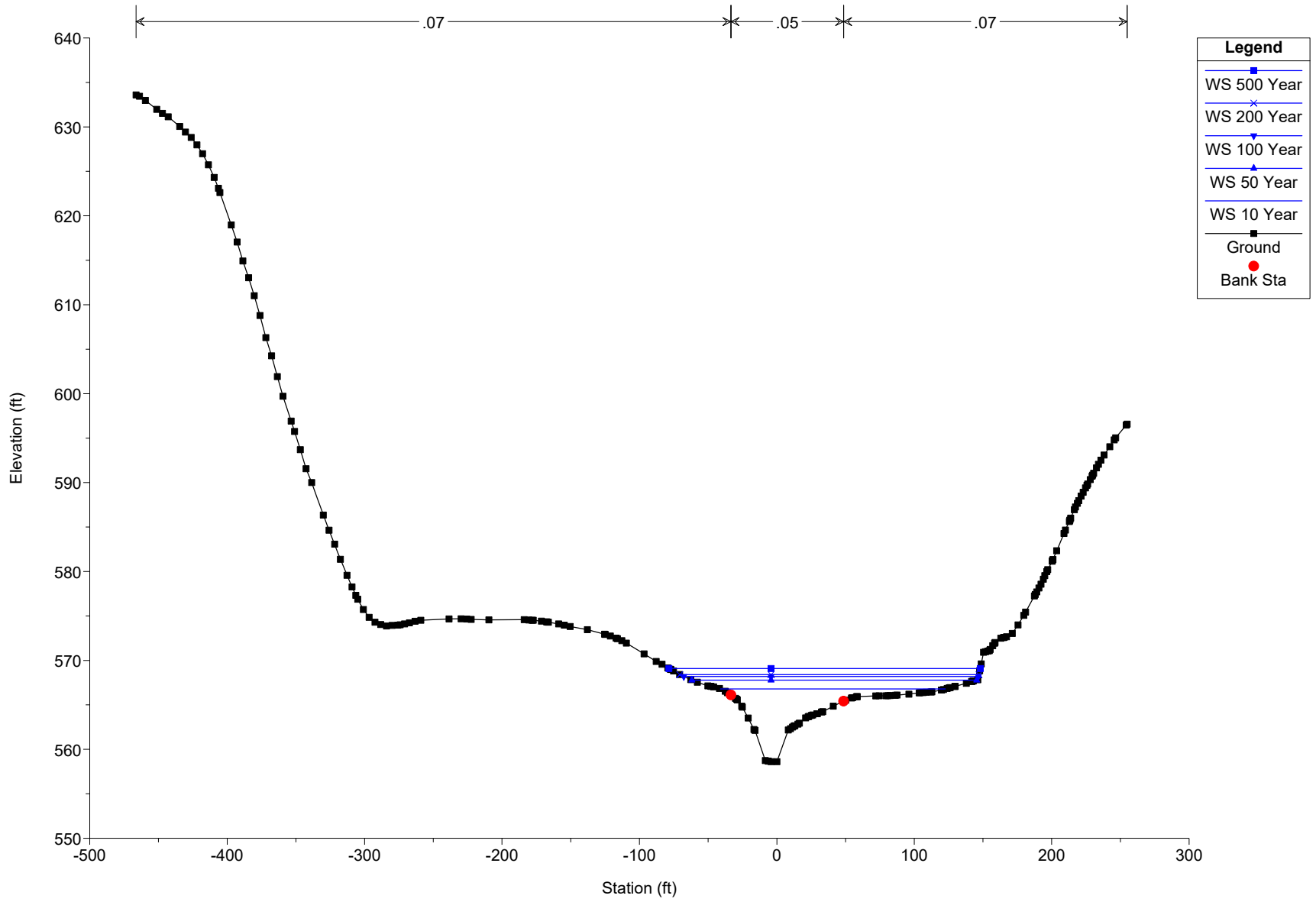
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



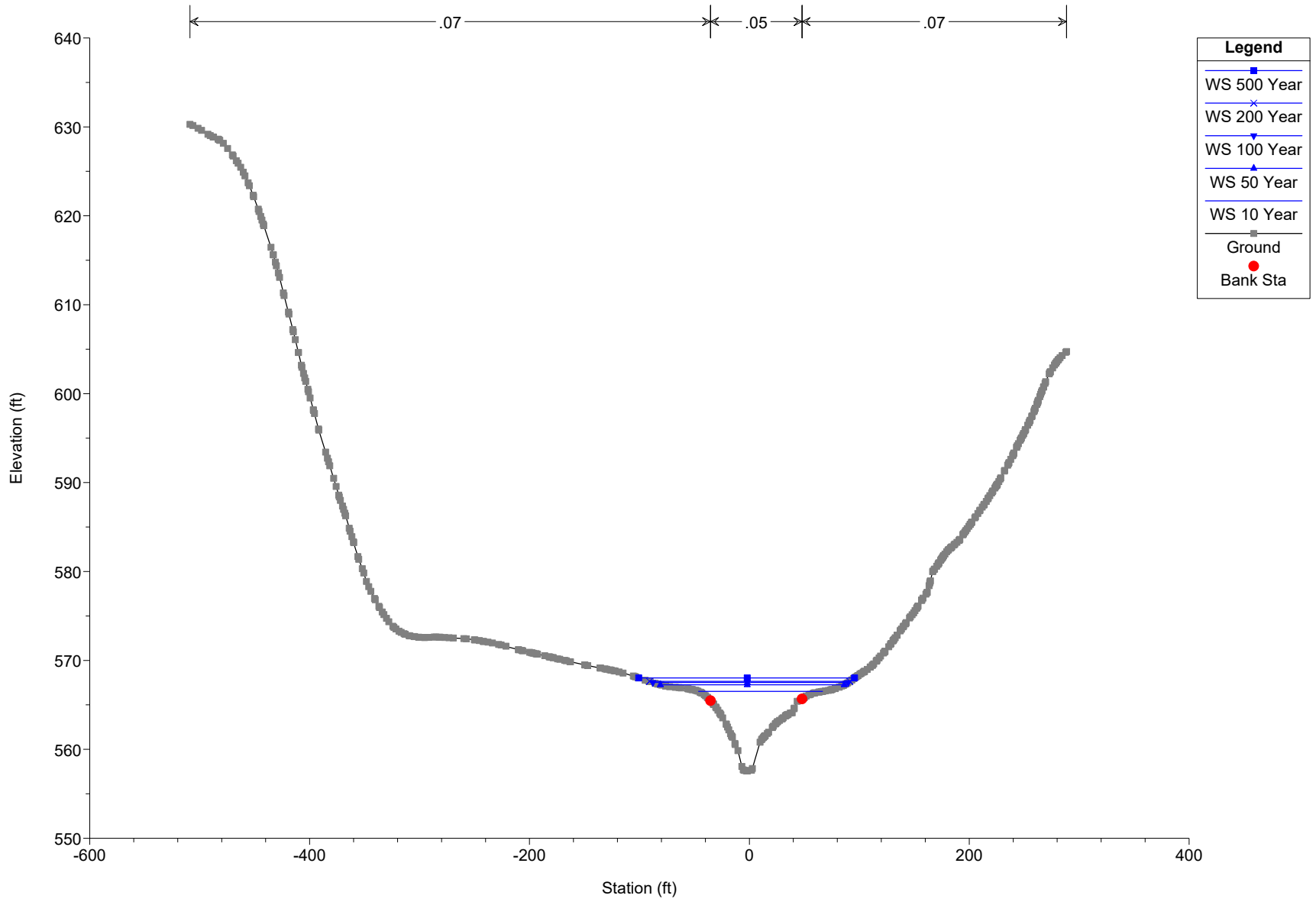
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



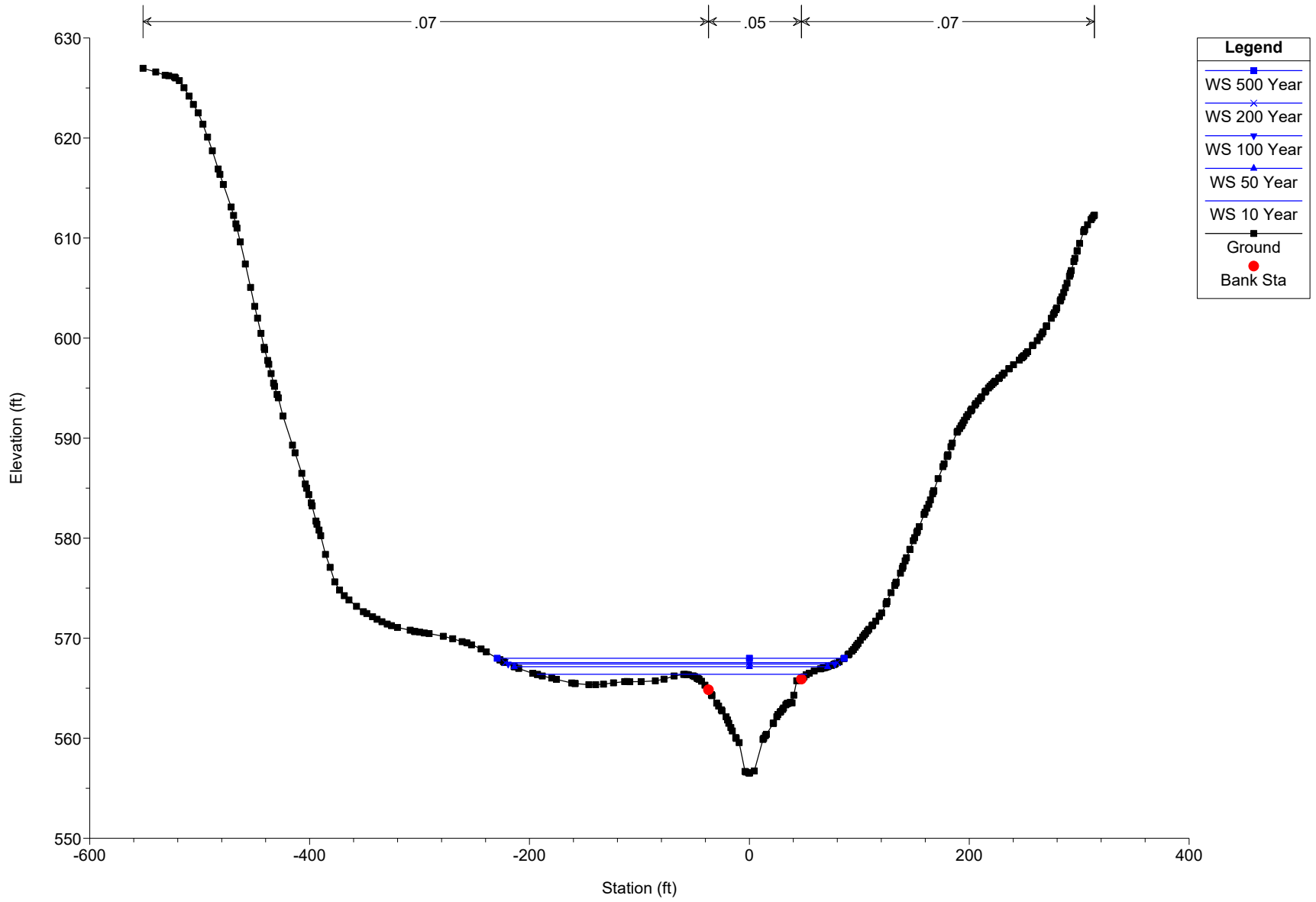
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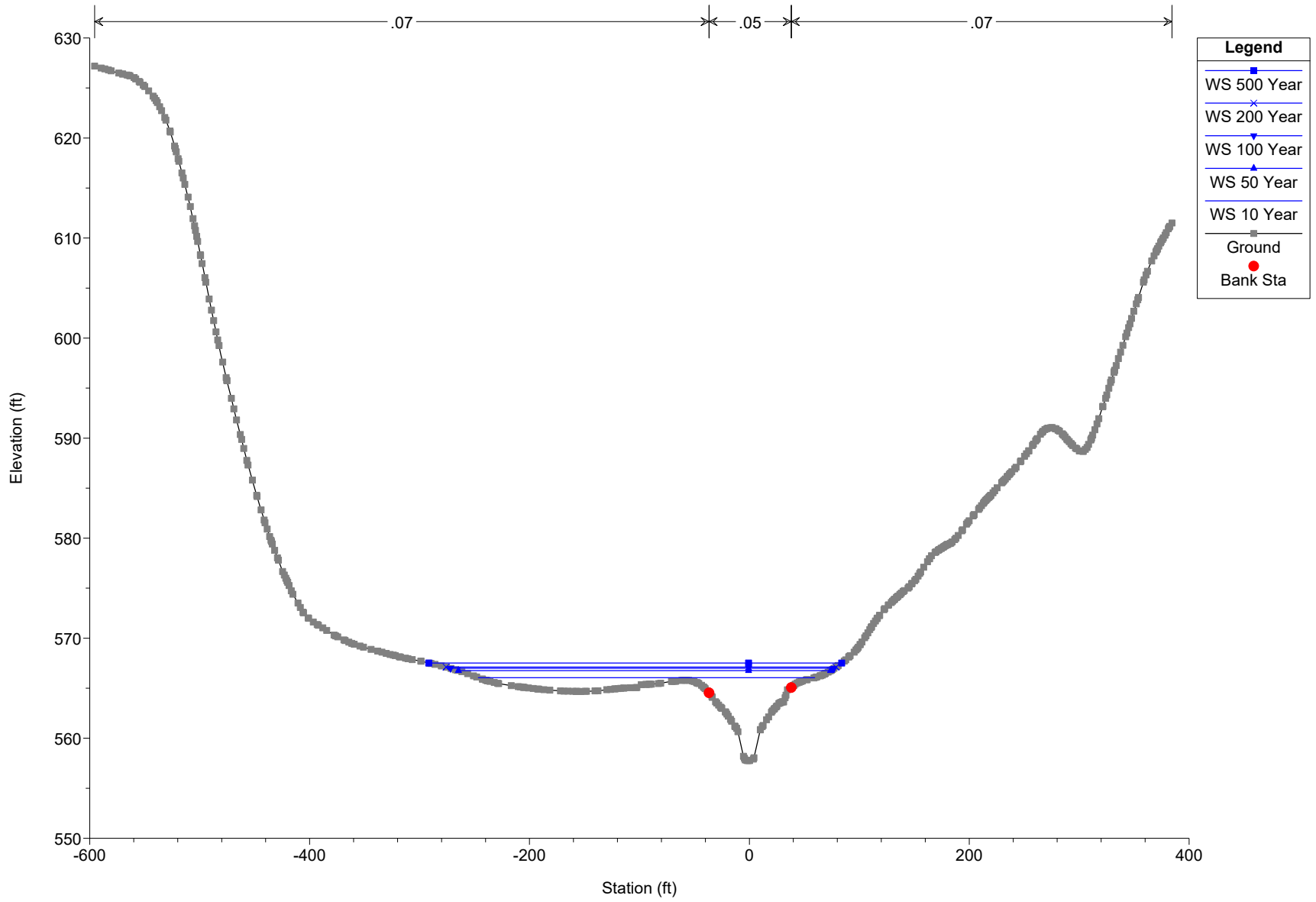
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



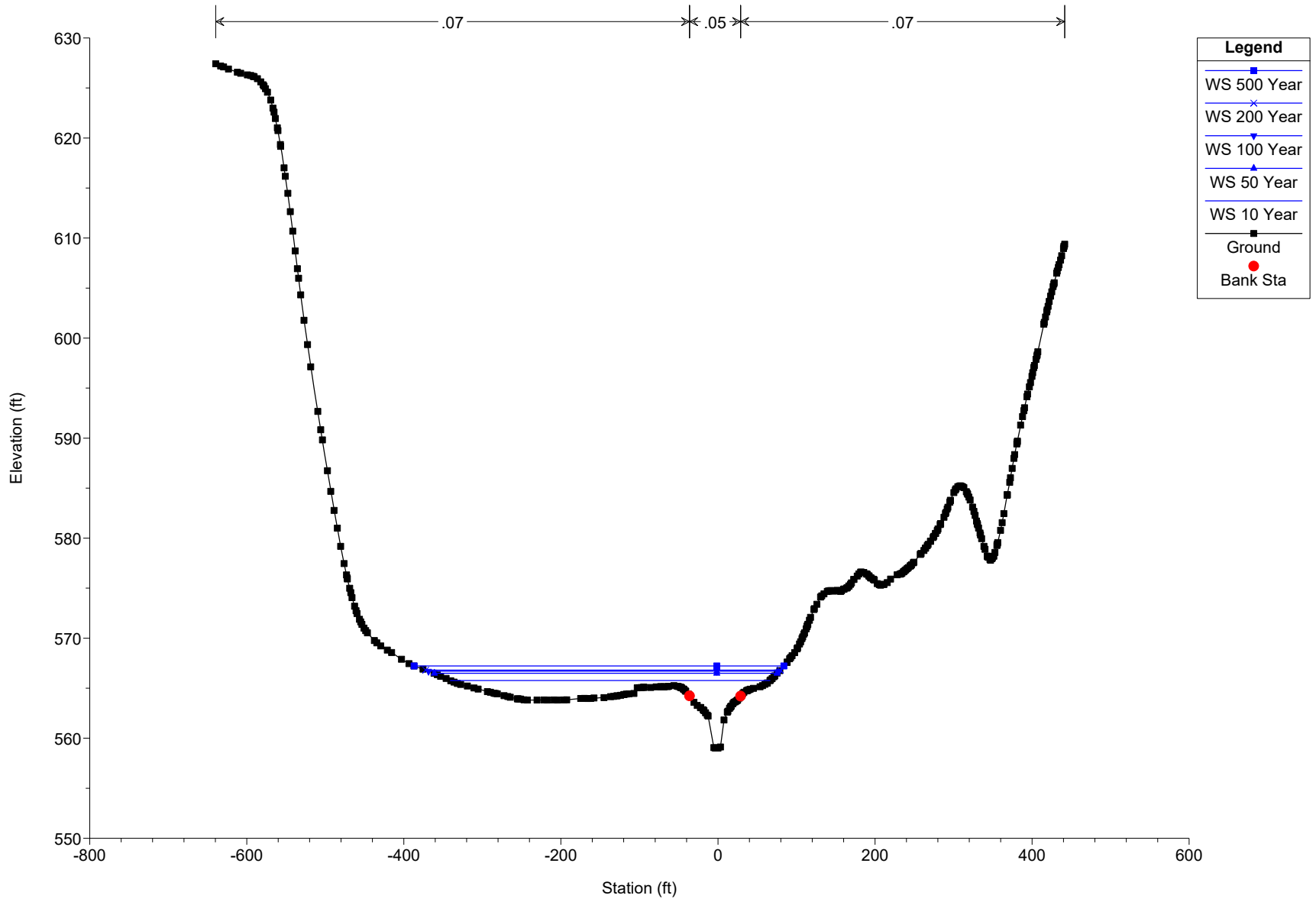
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



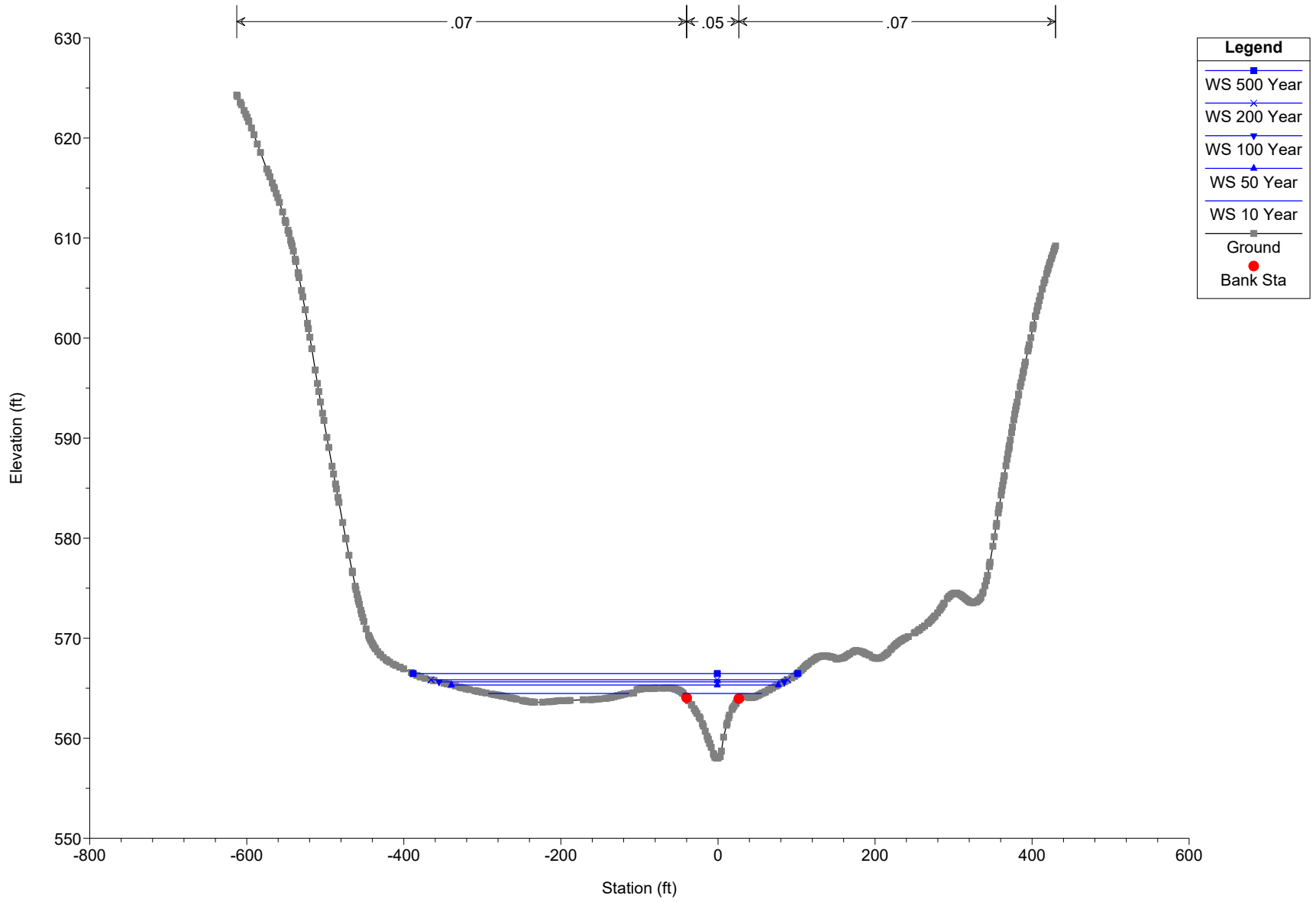
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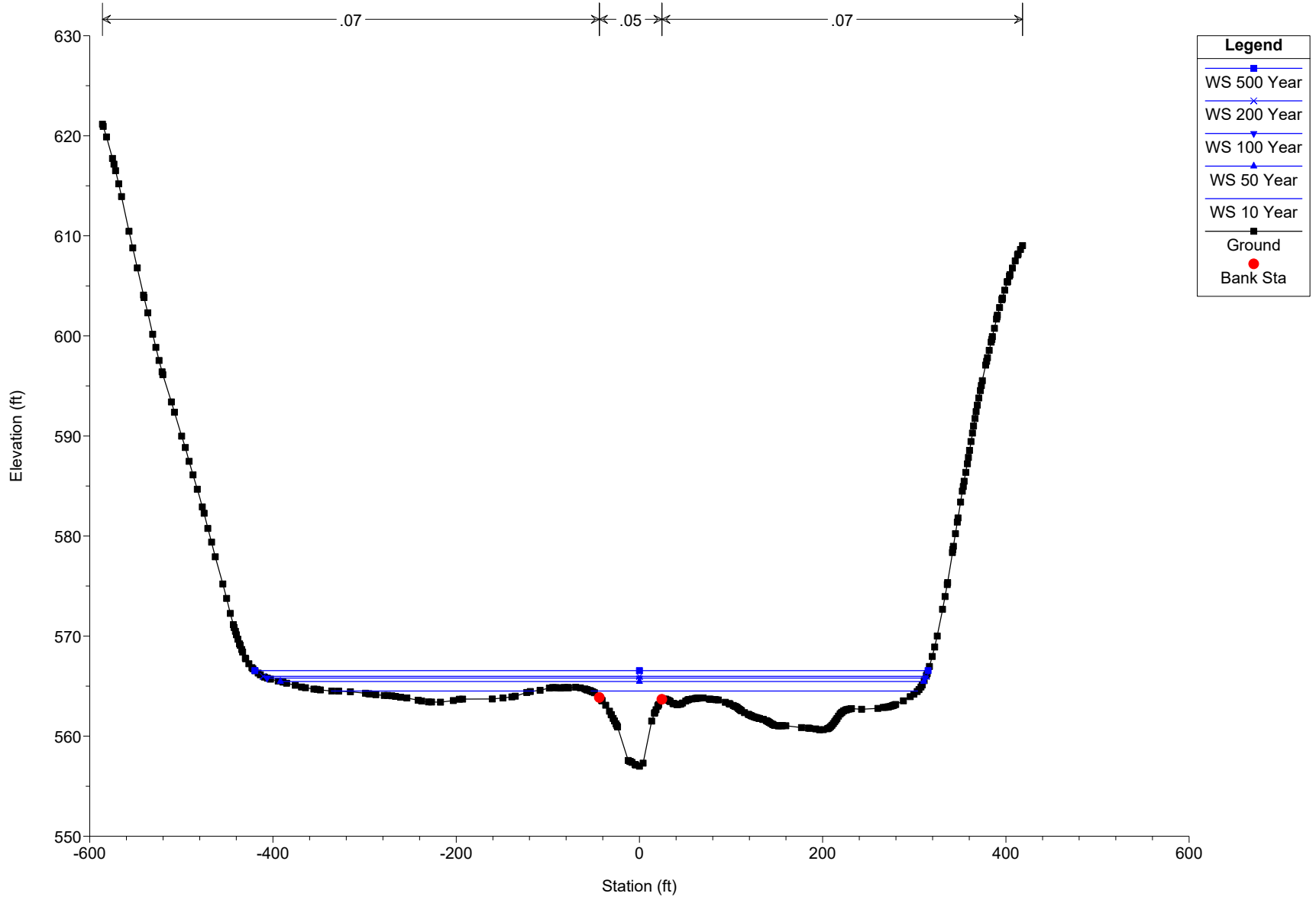
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



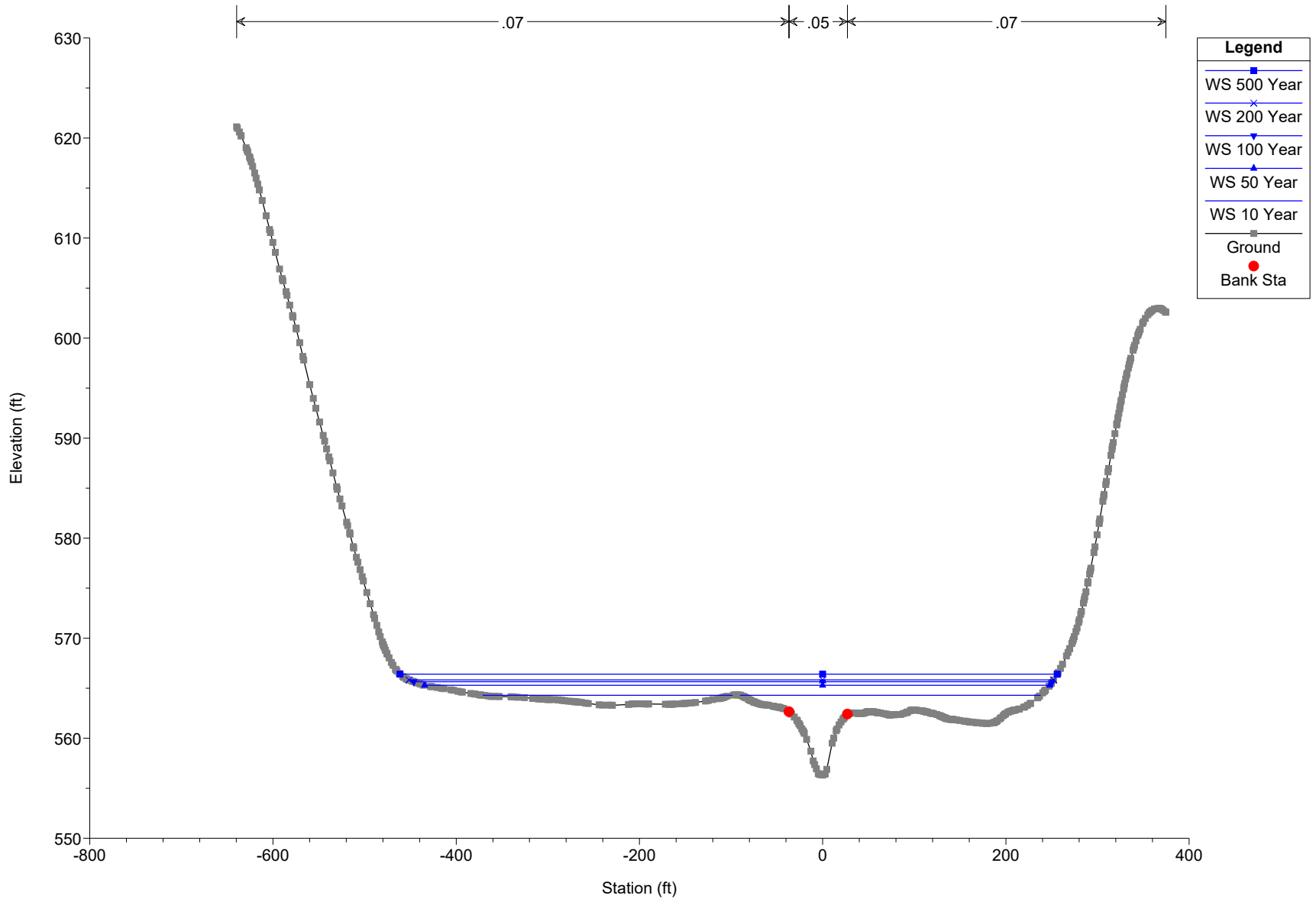
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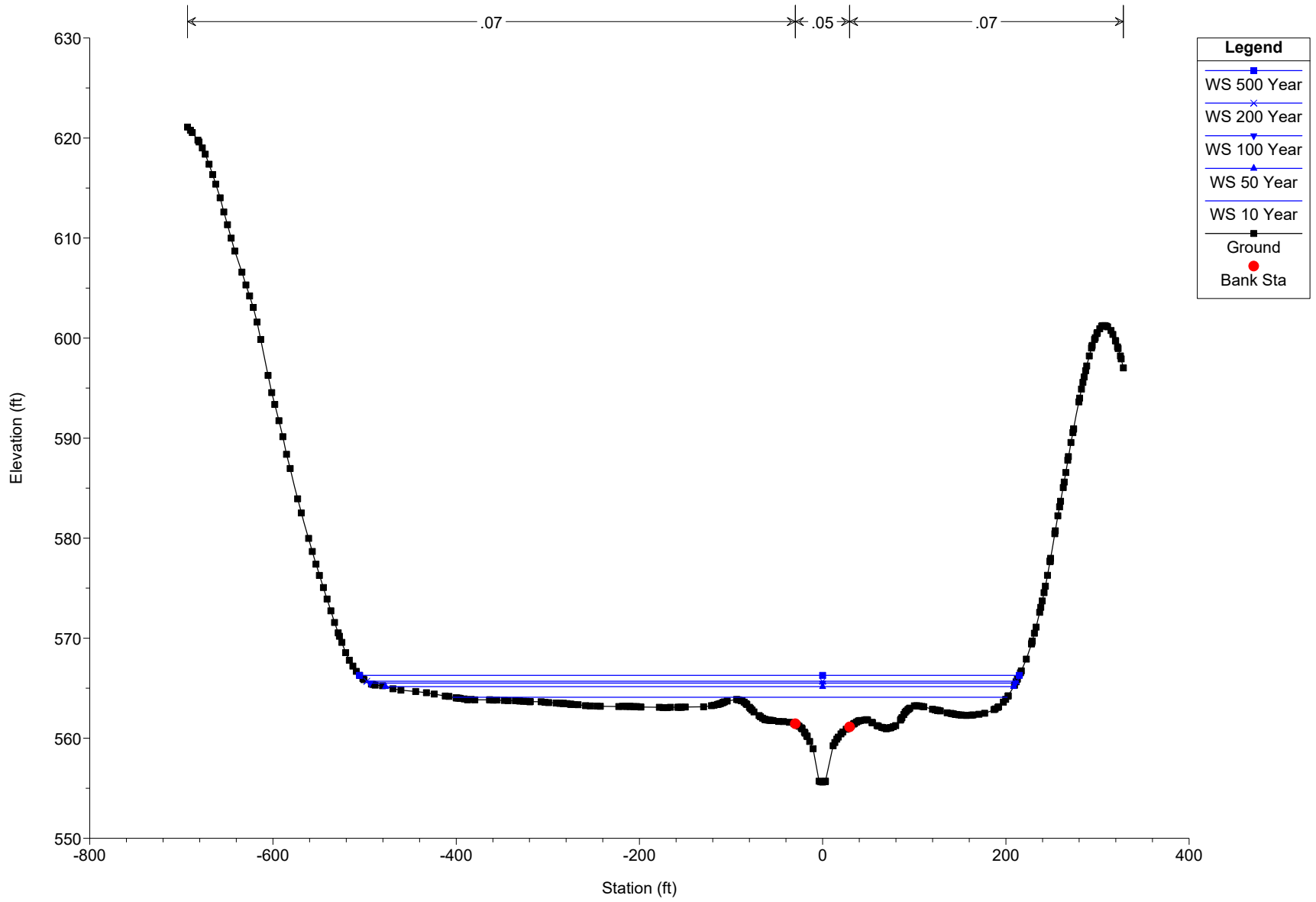
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



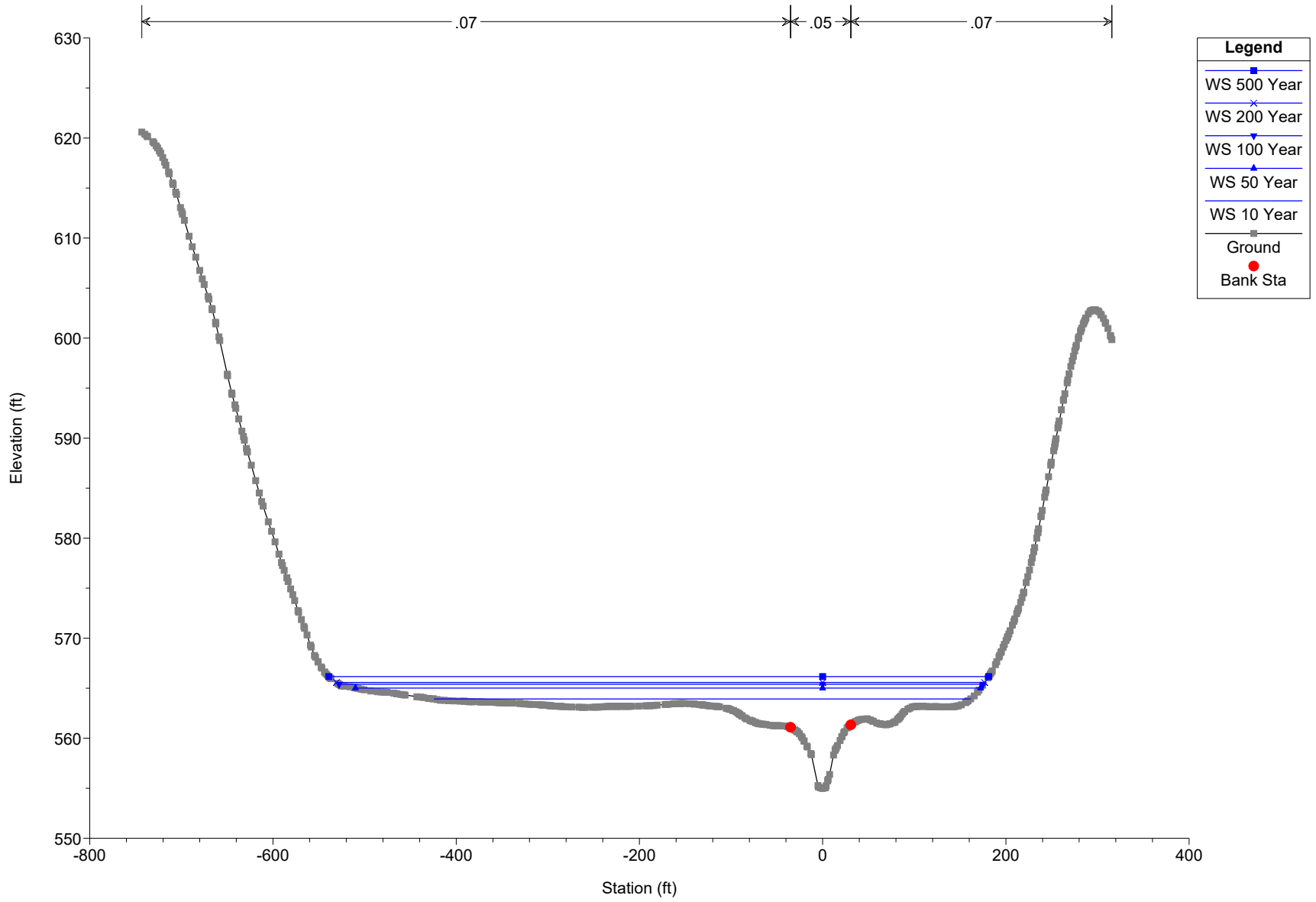
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



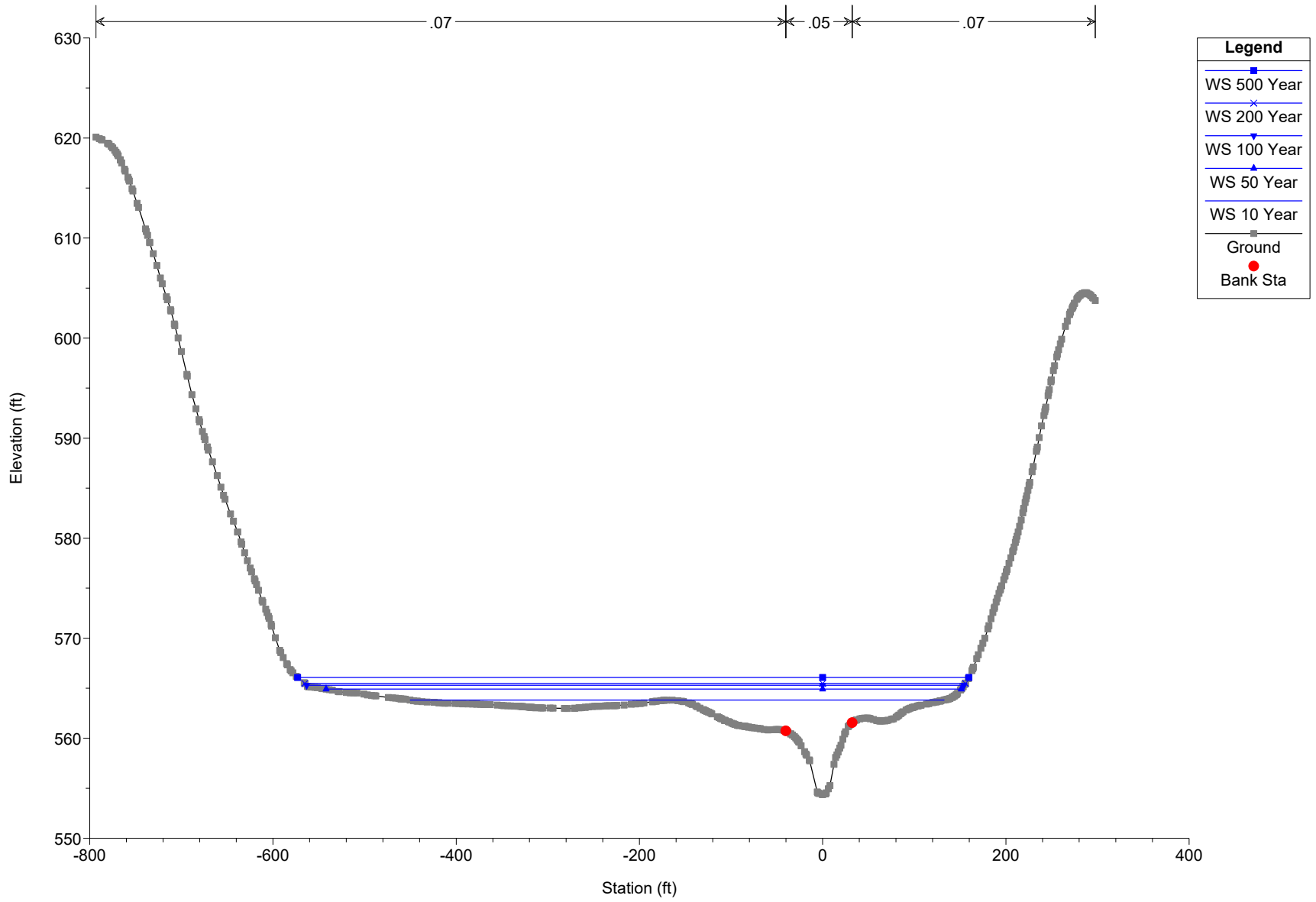
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



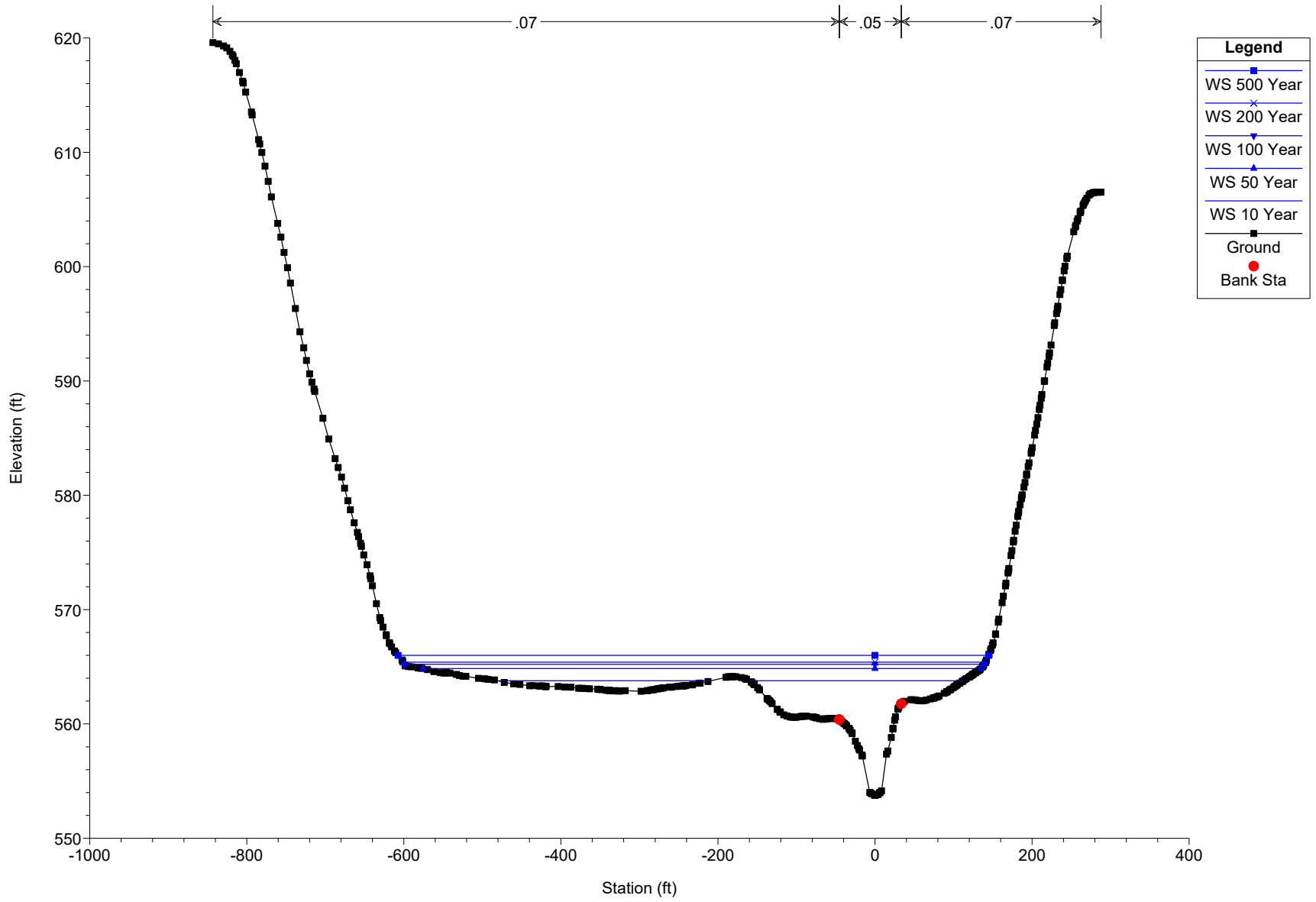
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



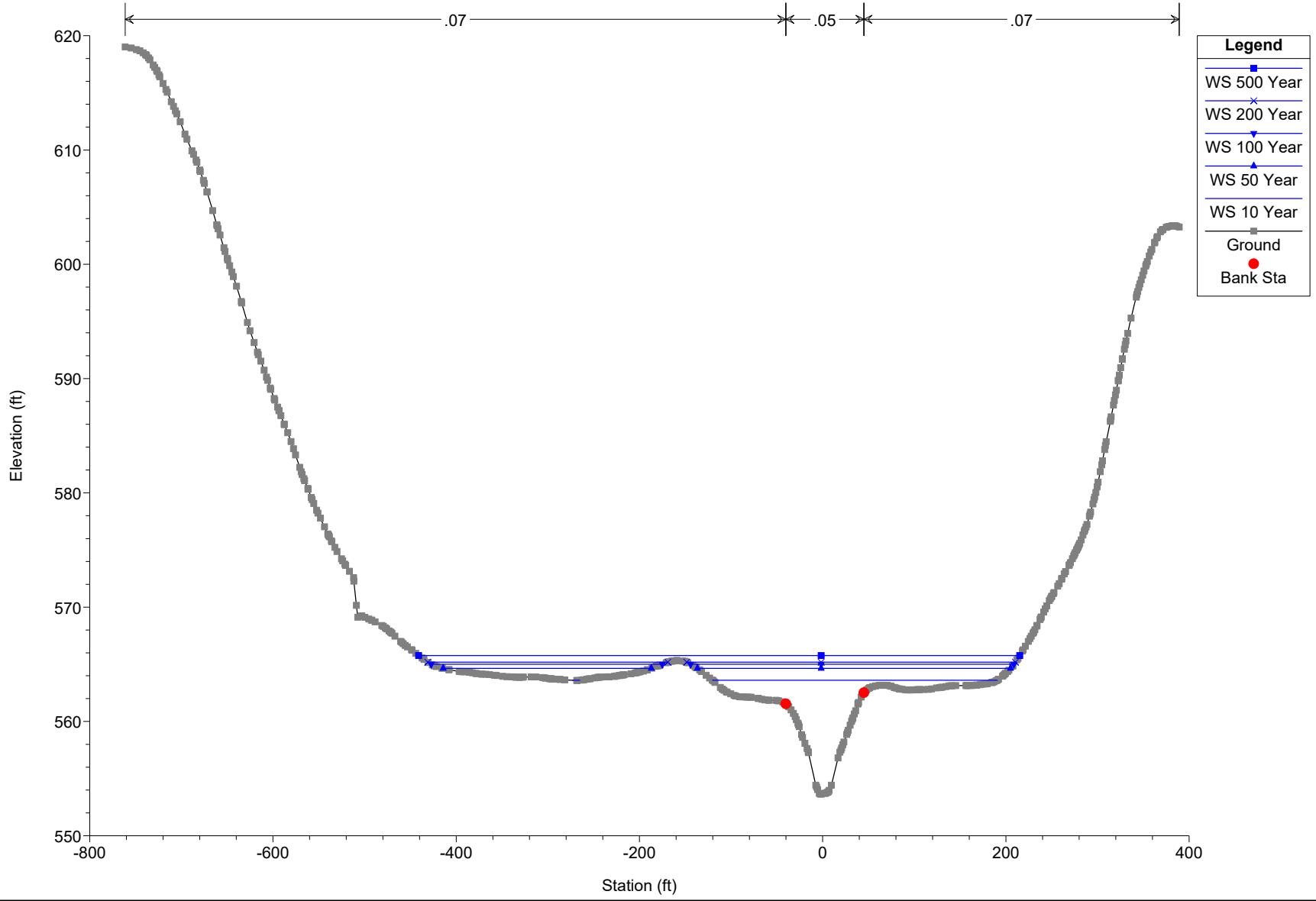
basefile after BO review.06.28.2021 Plan: natural 7/7/2021



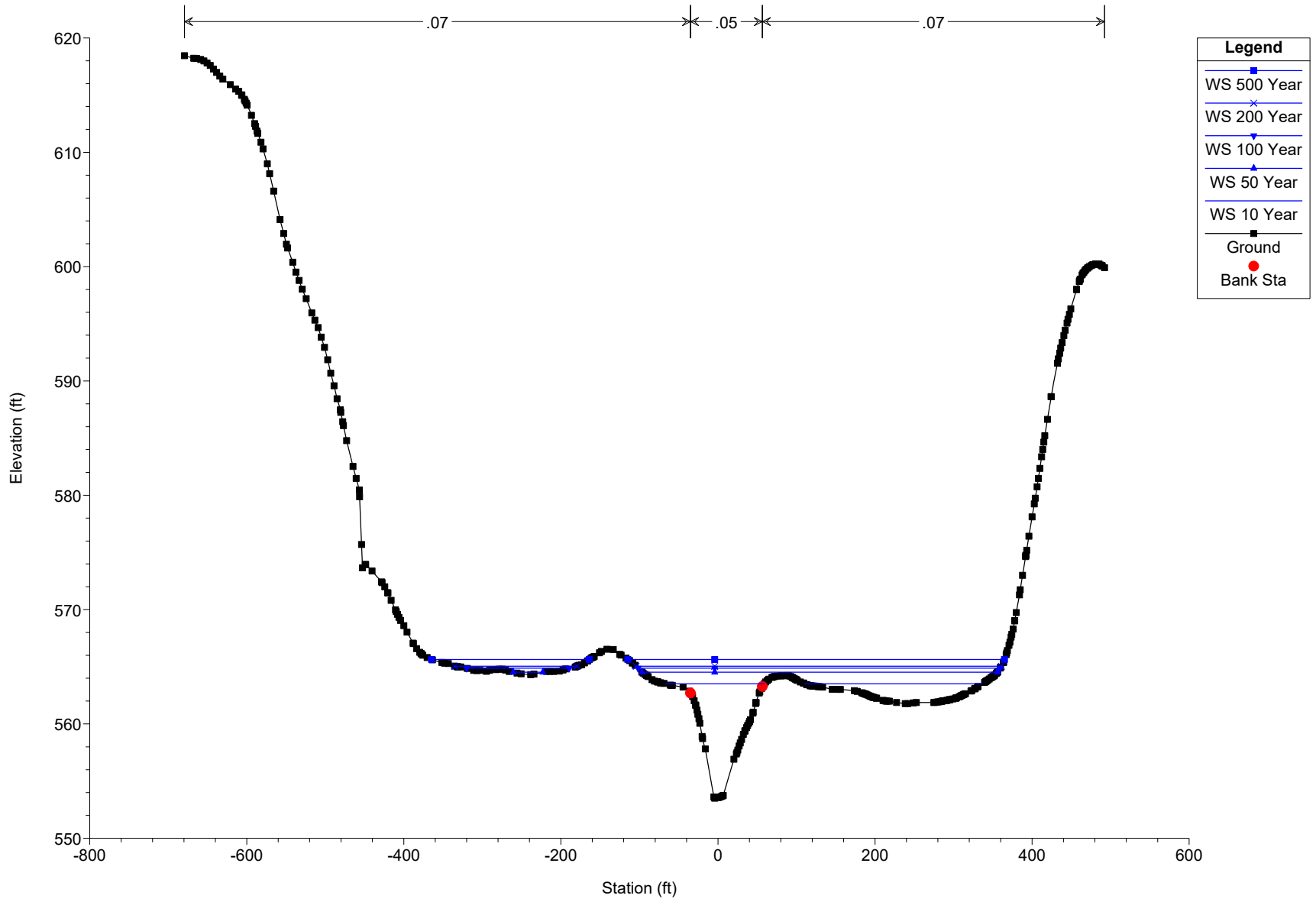
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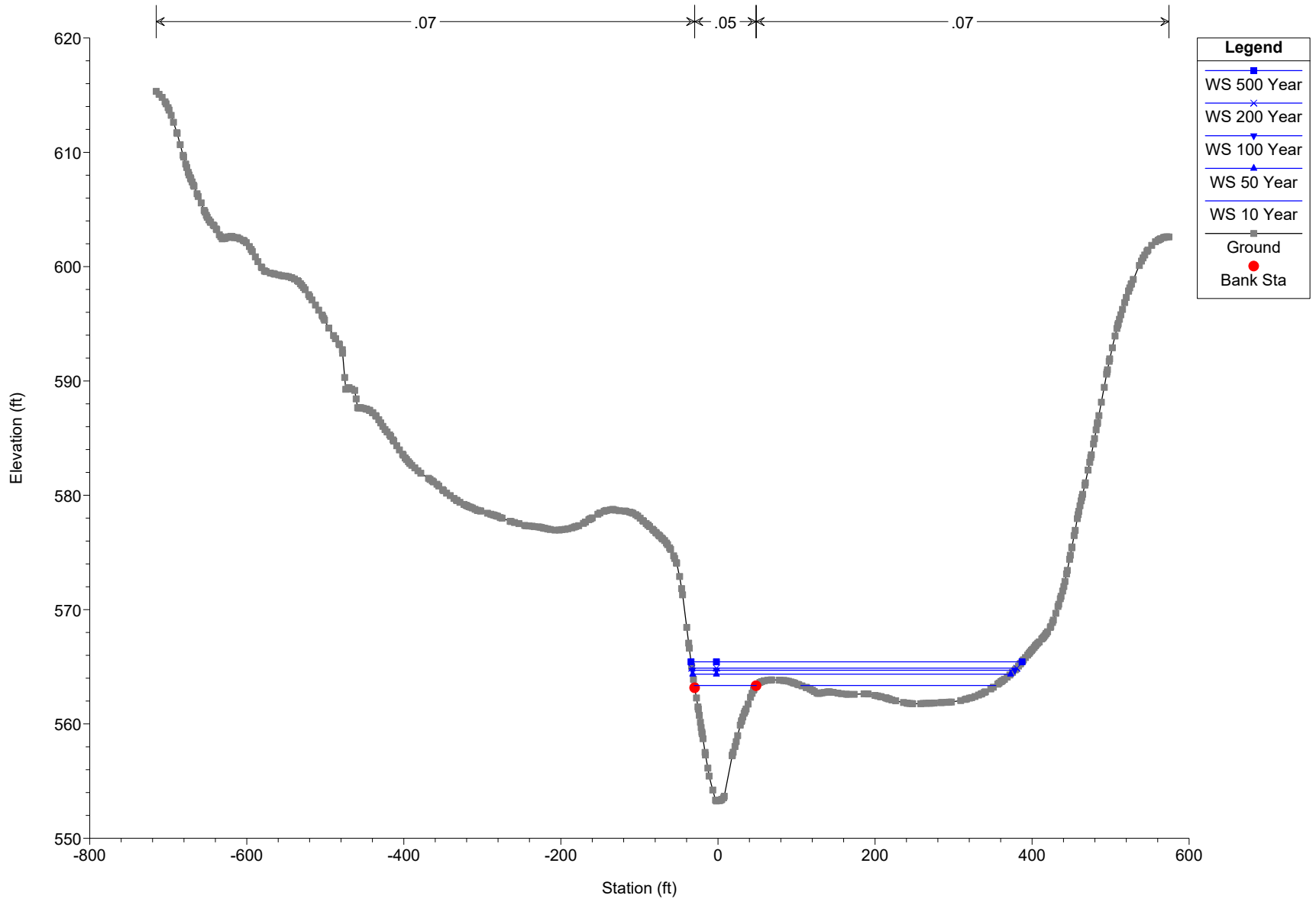
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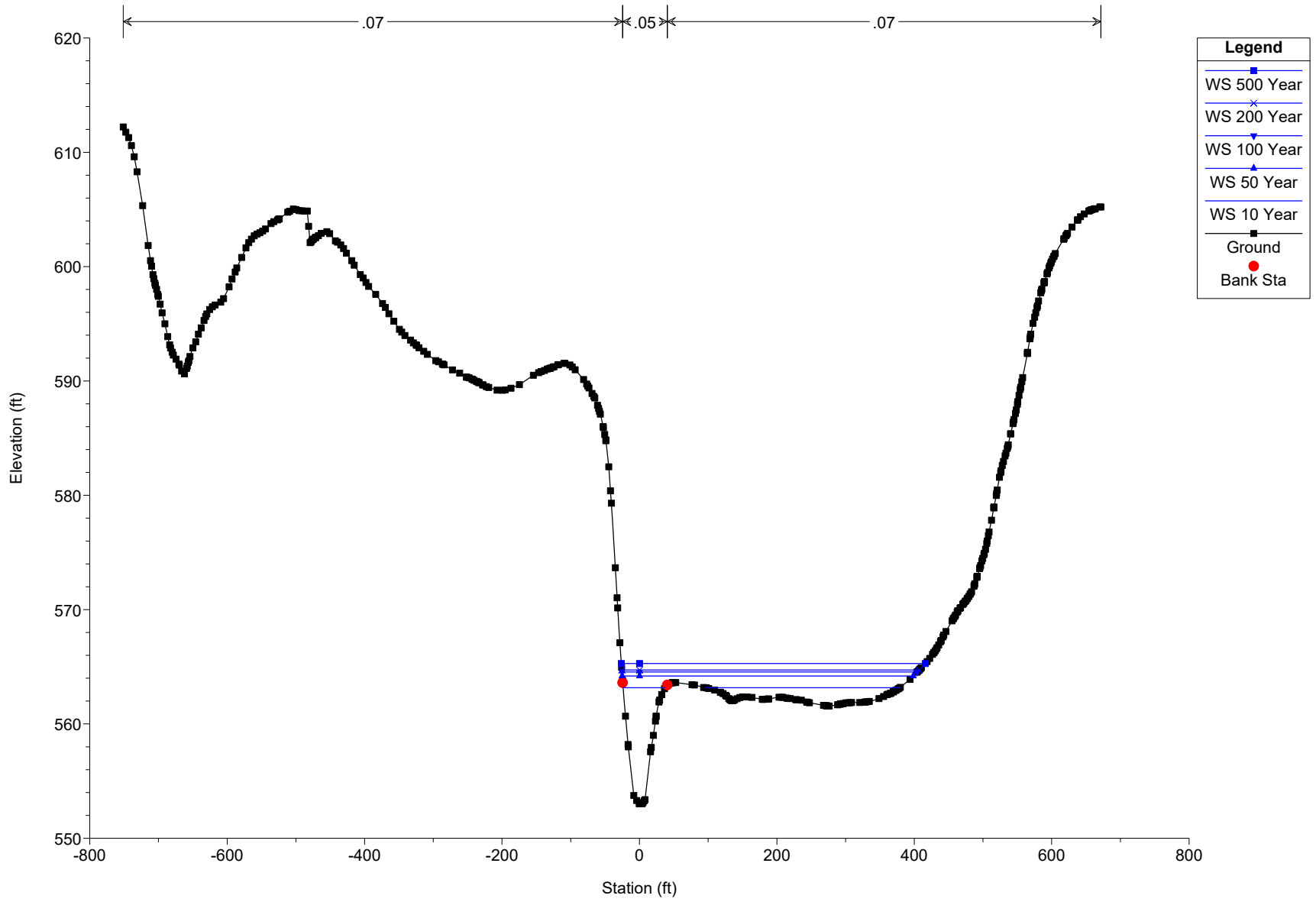
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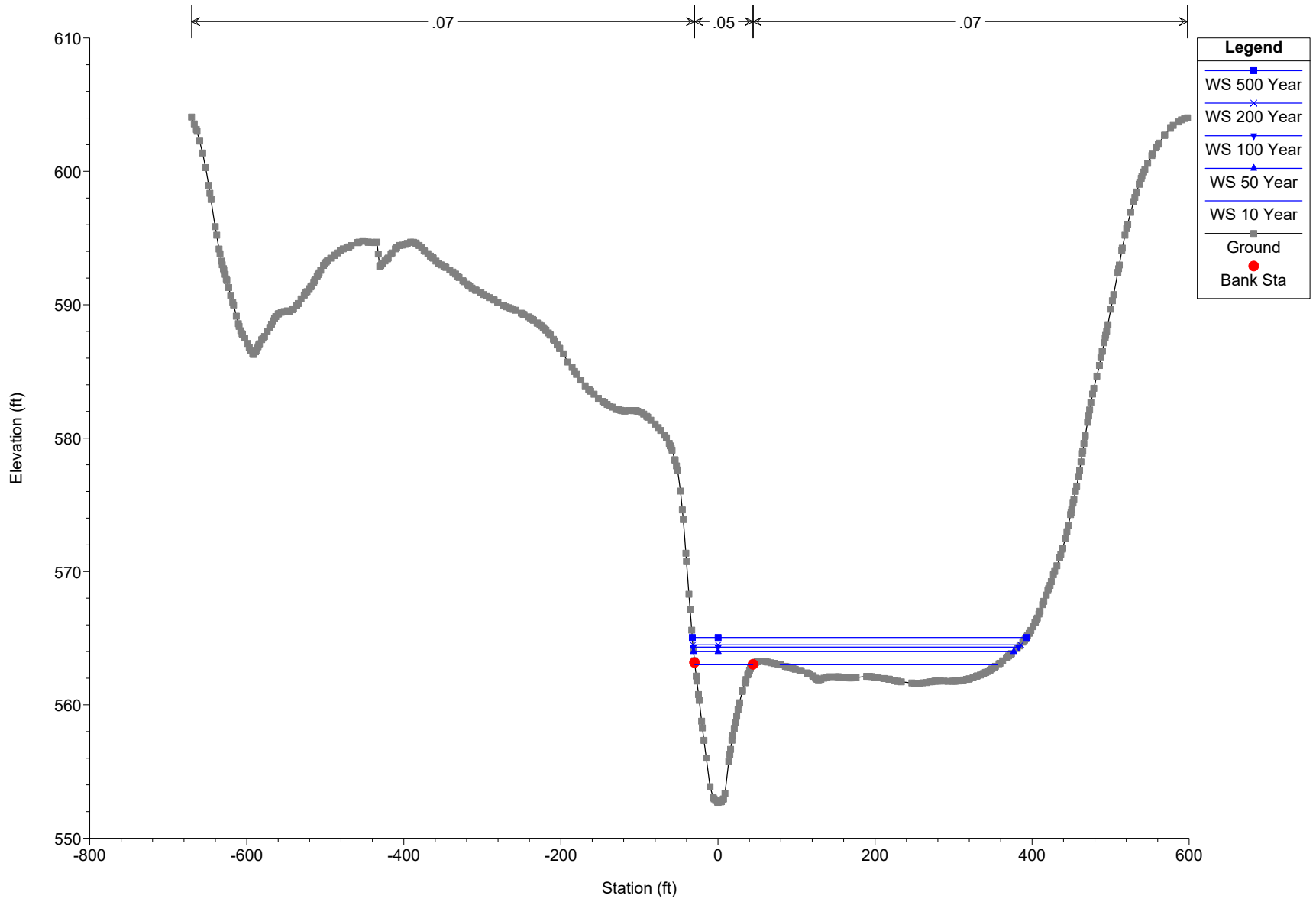
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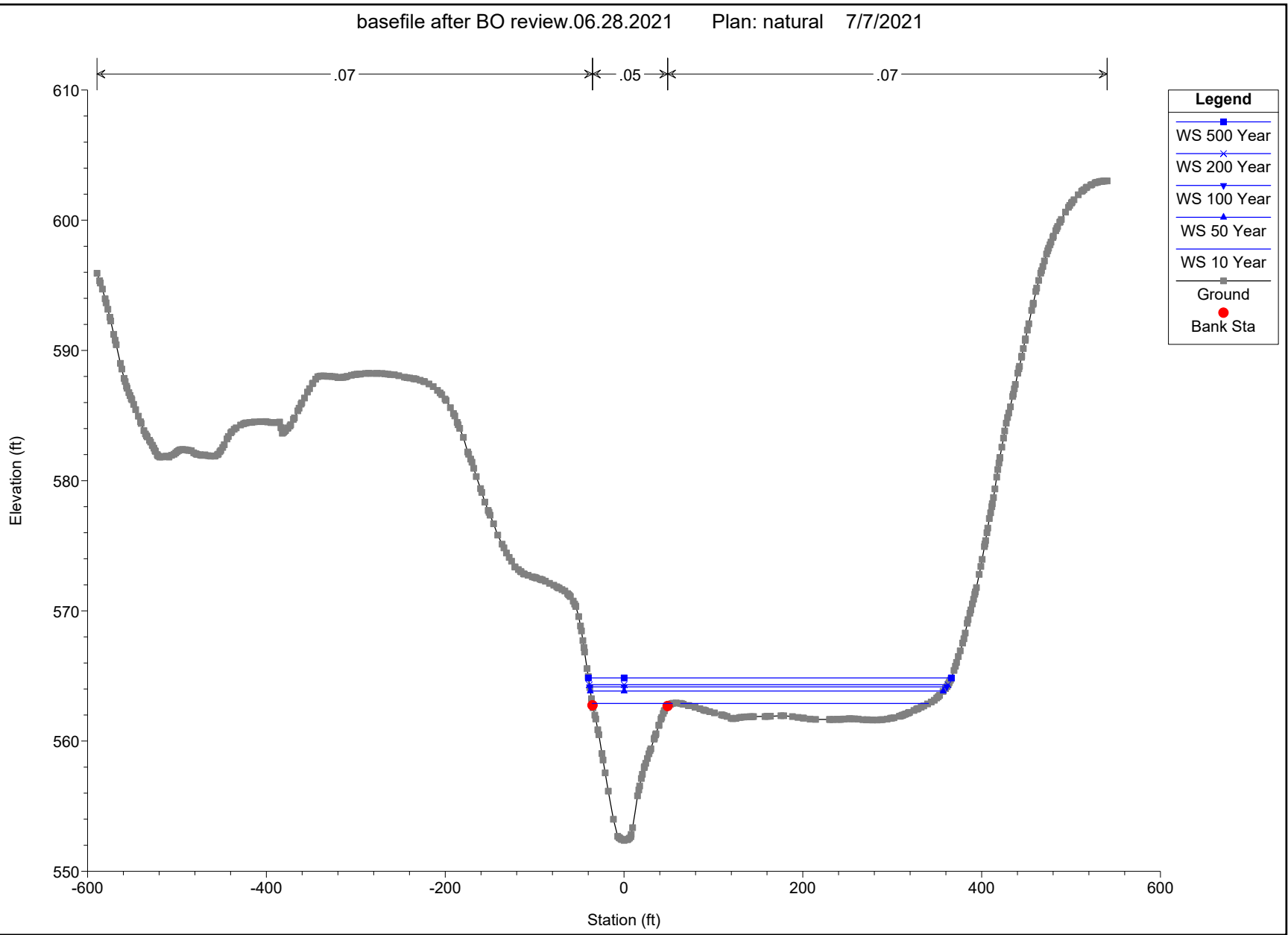
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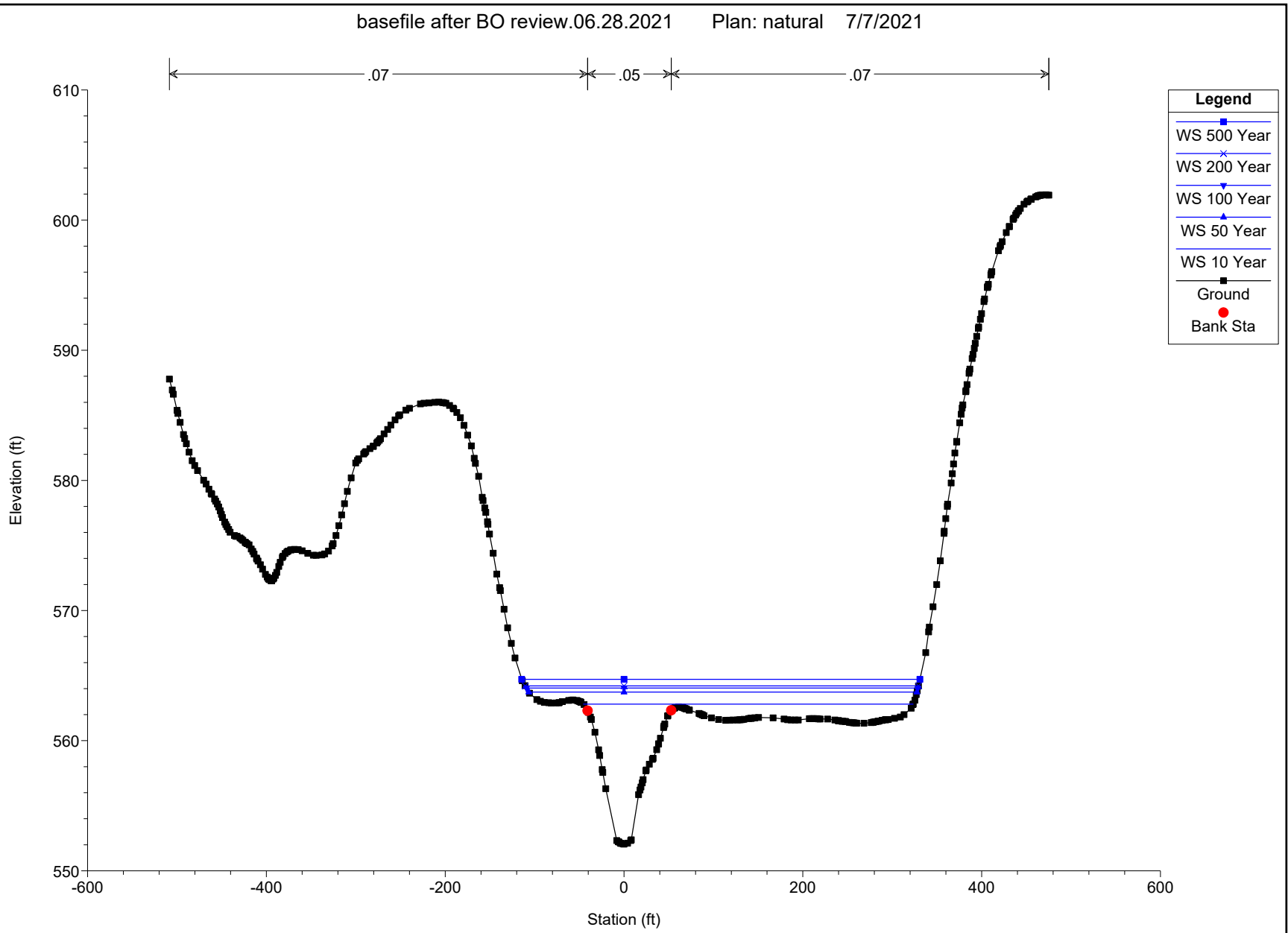
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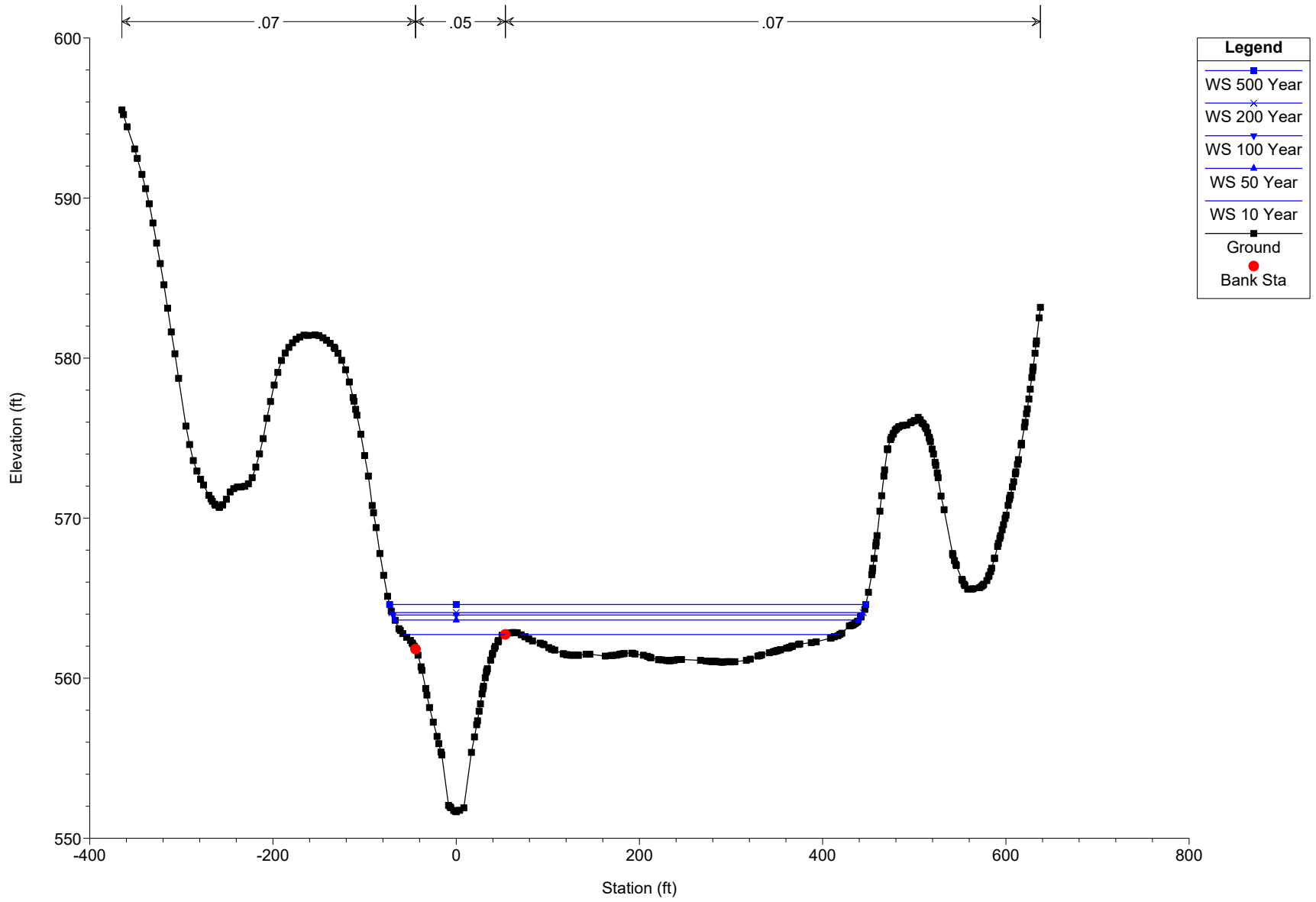
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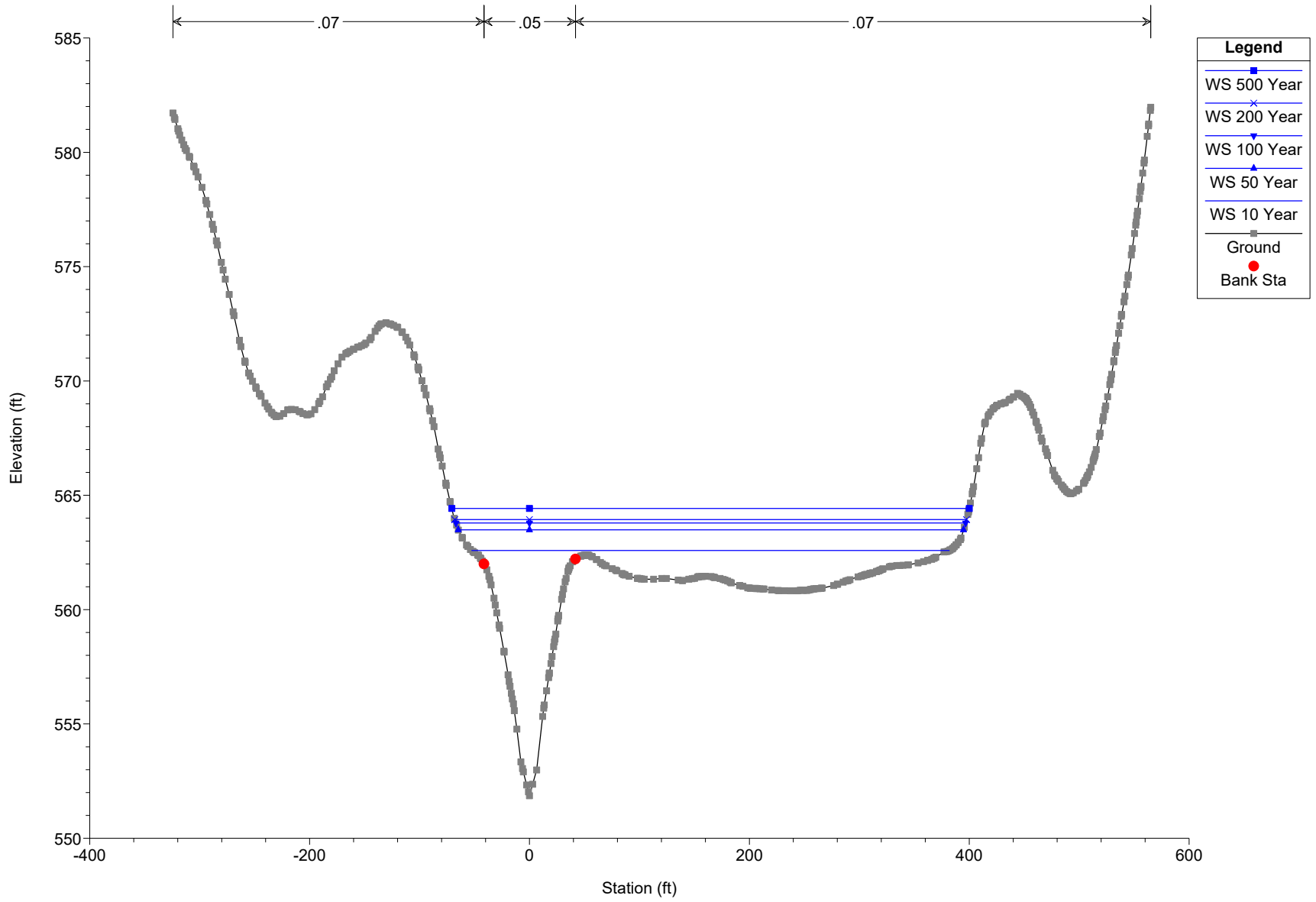
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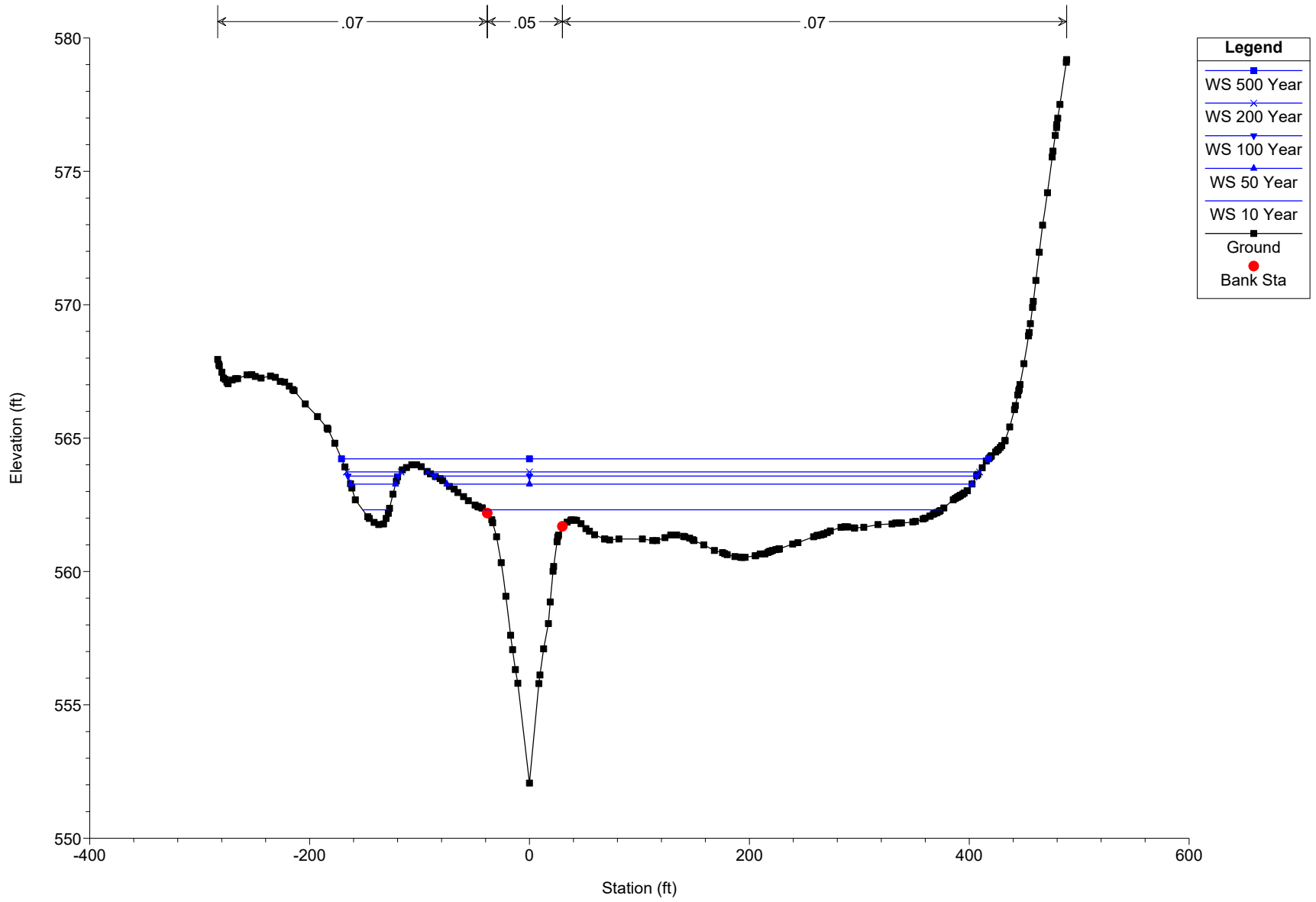
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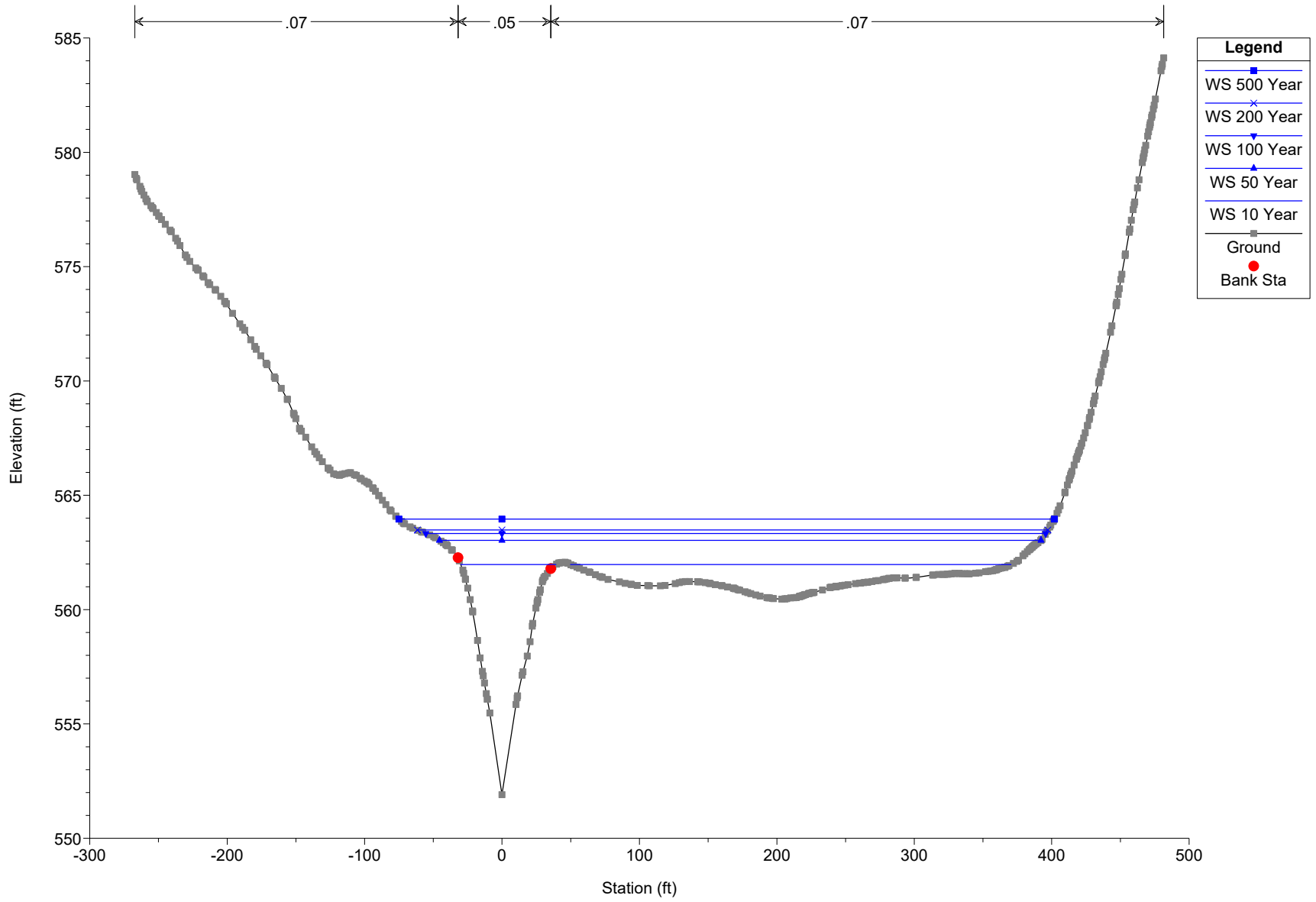
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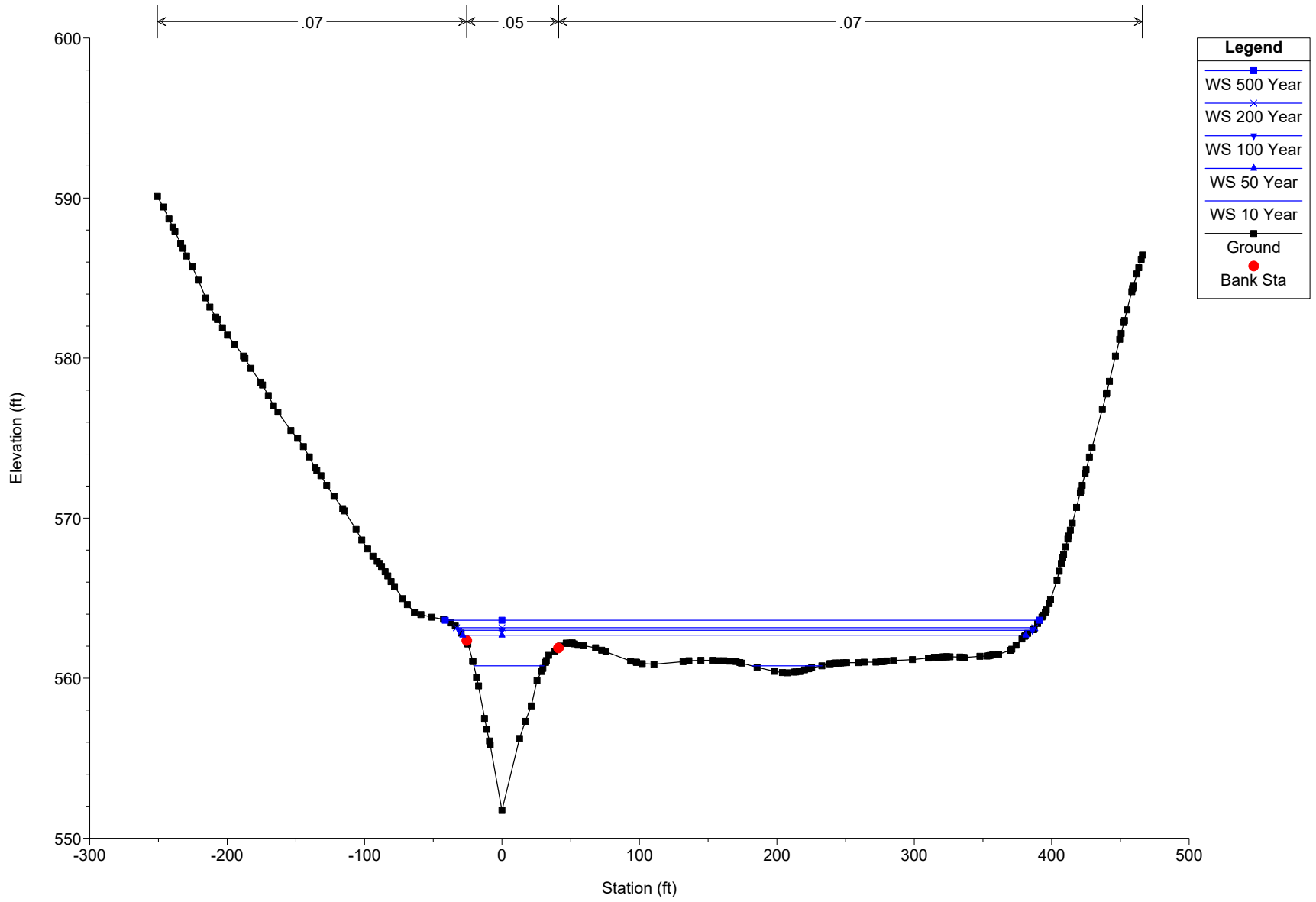
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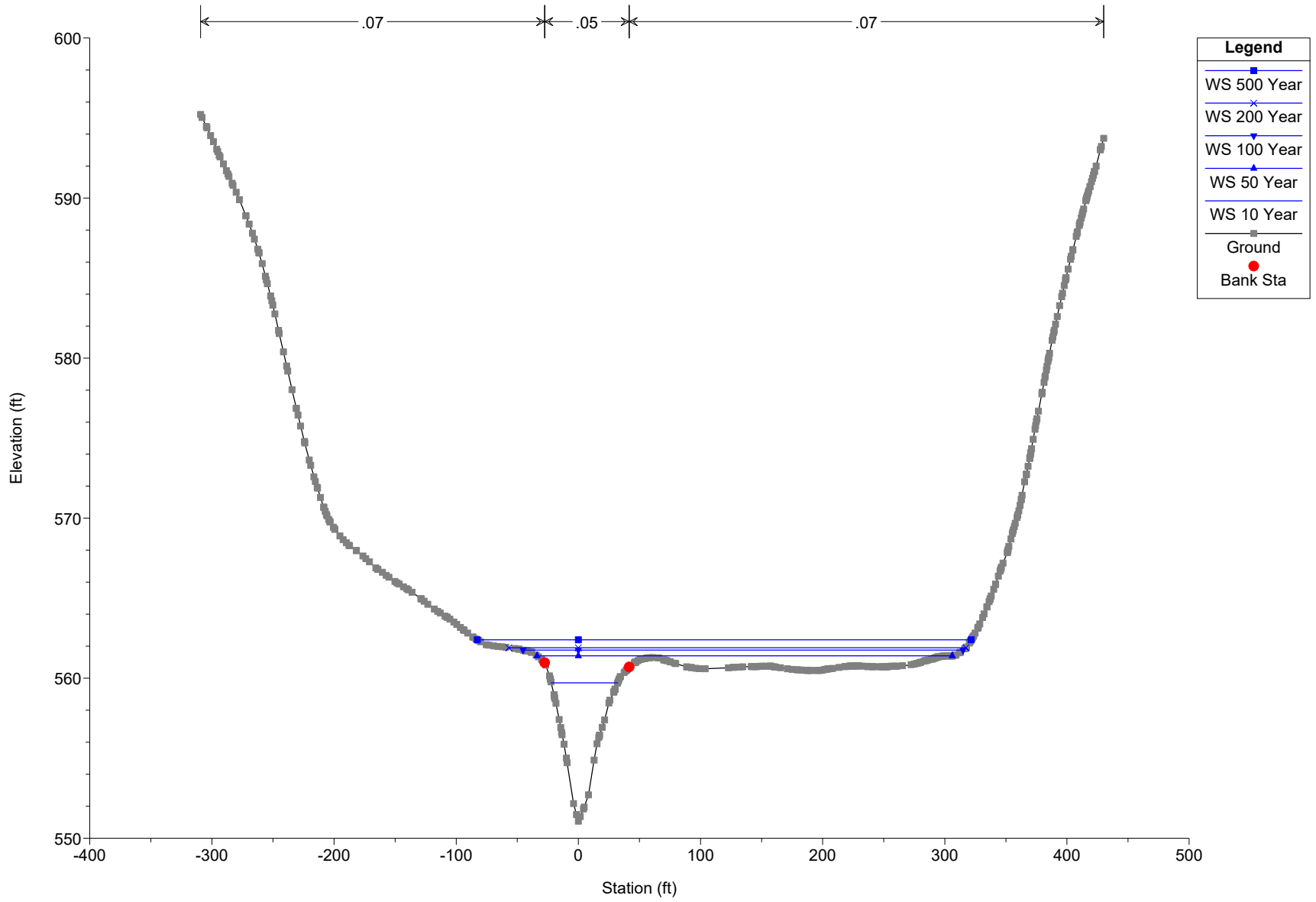
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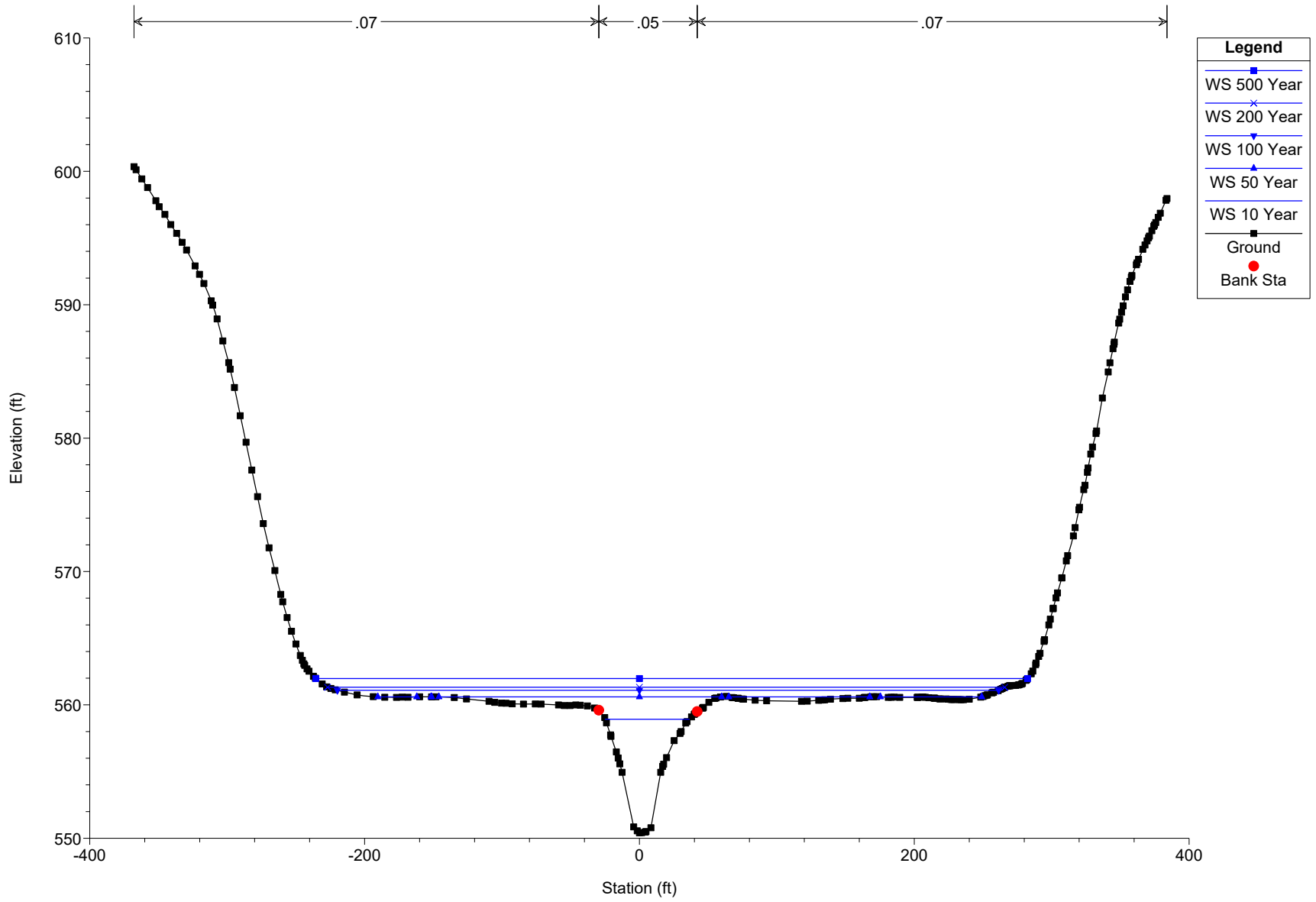
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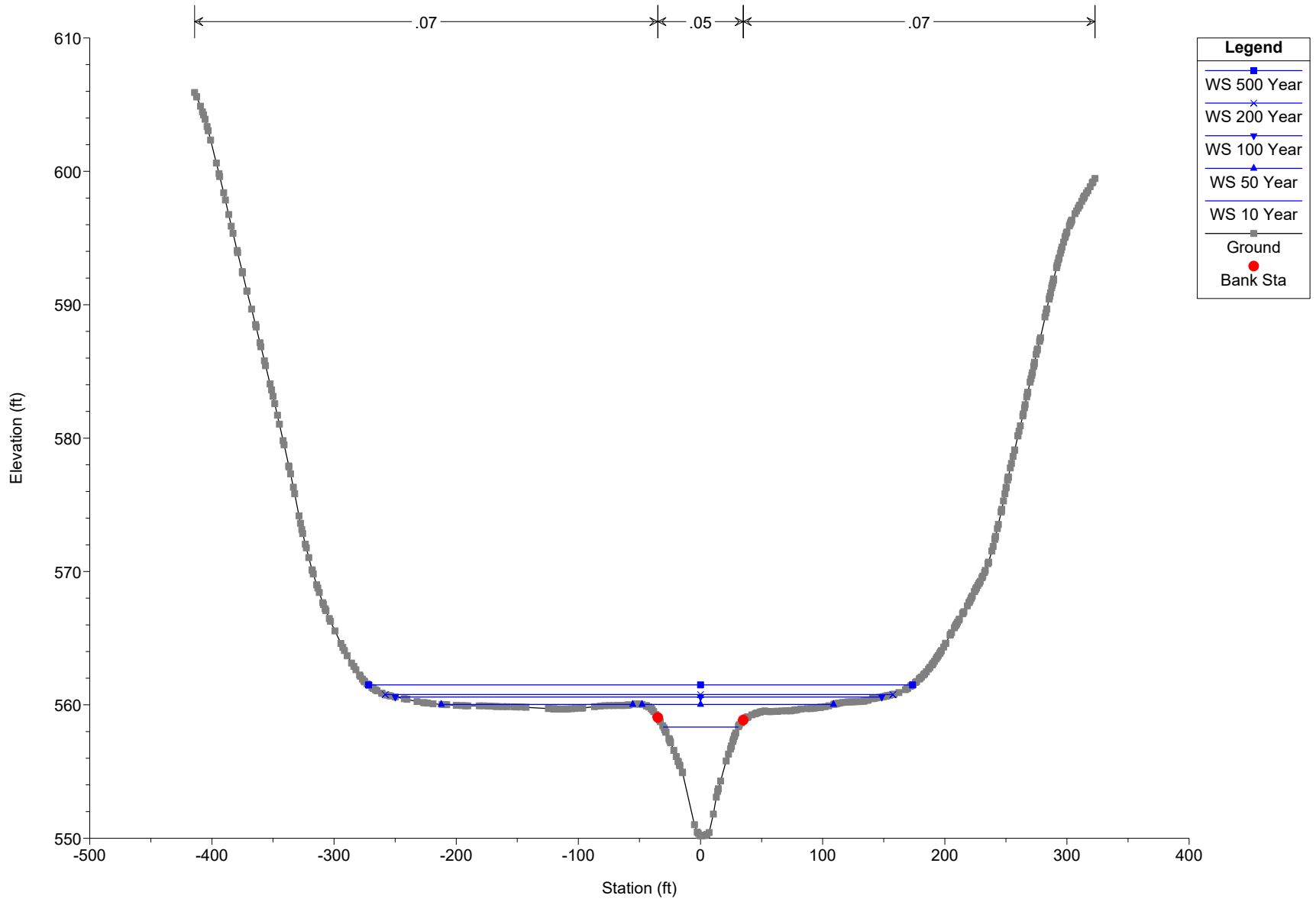
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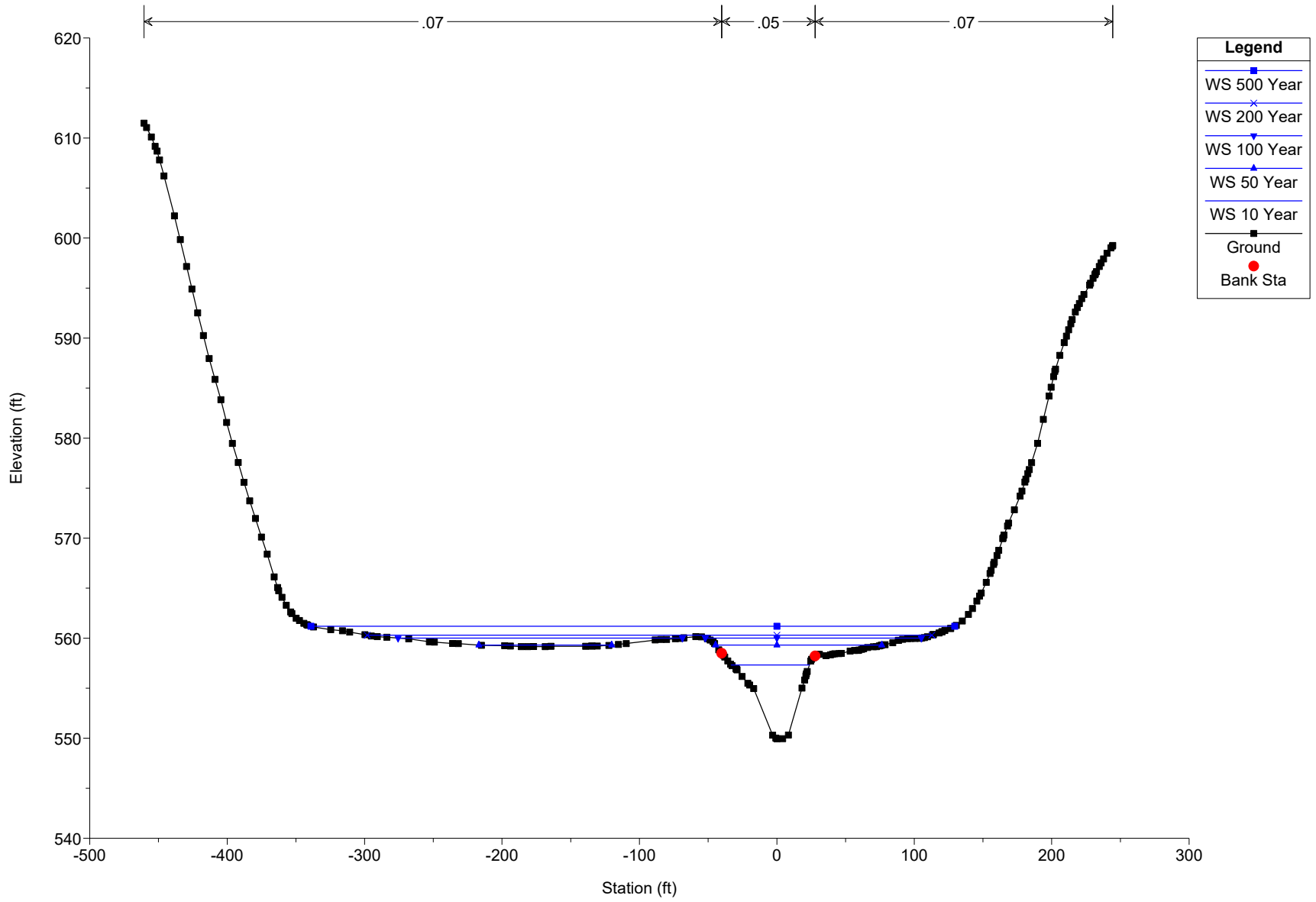
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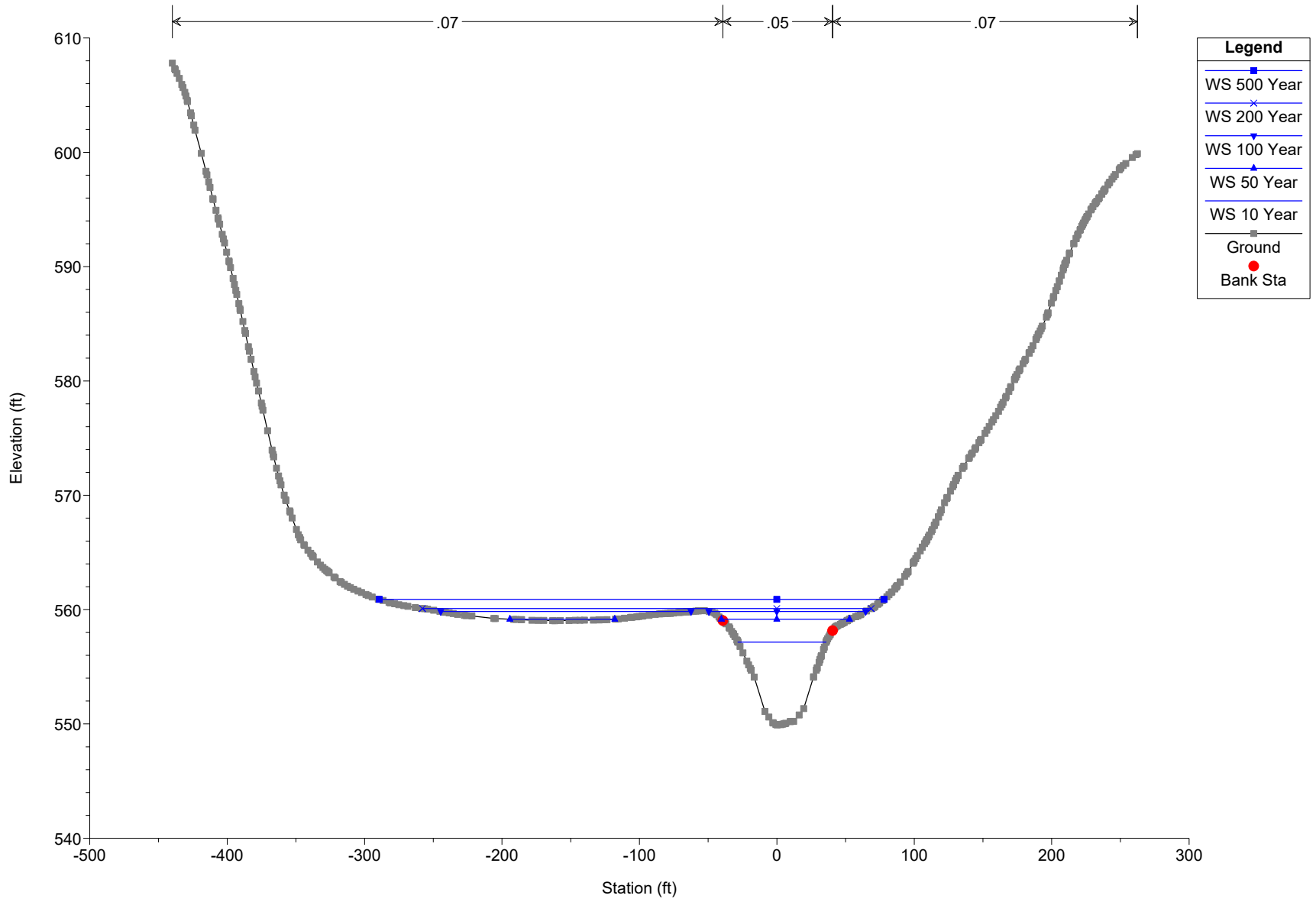
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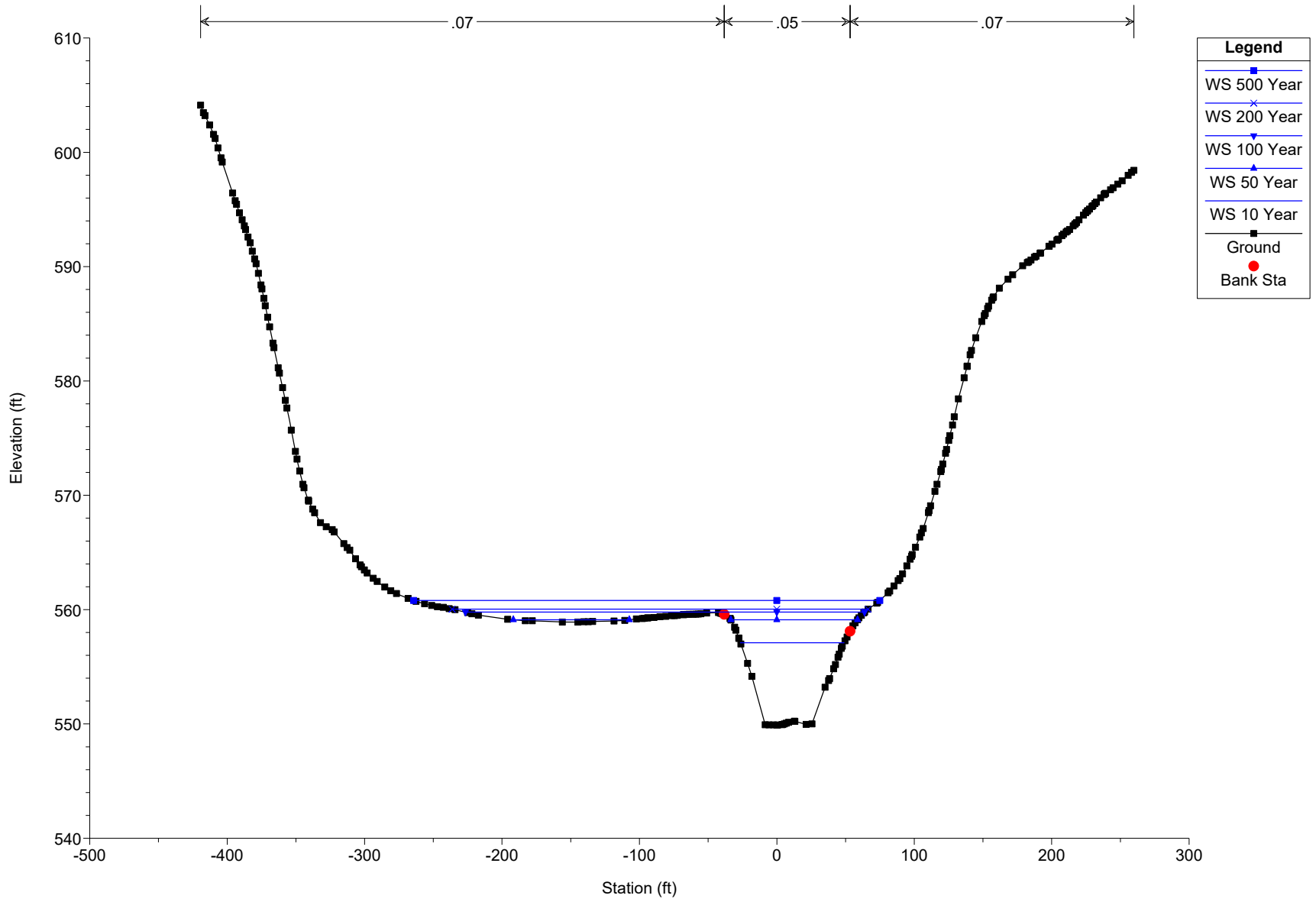
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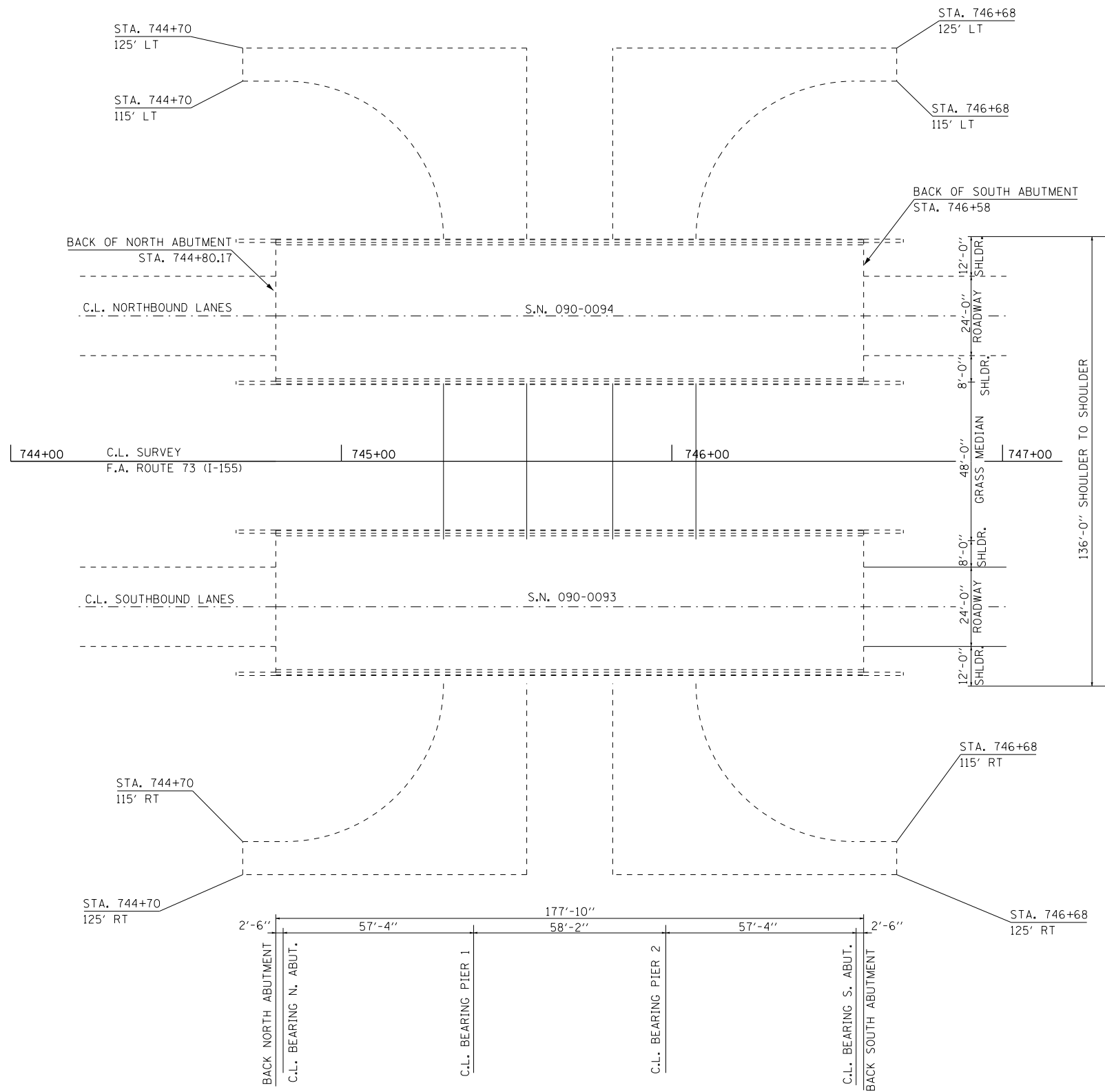


basefile after BO review.06.28.2021 Plan: natural 7/7/2021



ATTACHMENT G

BRIDGE LAYOUT/PLAN DRAWING PLOTS



EXISTING PLAN

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

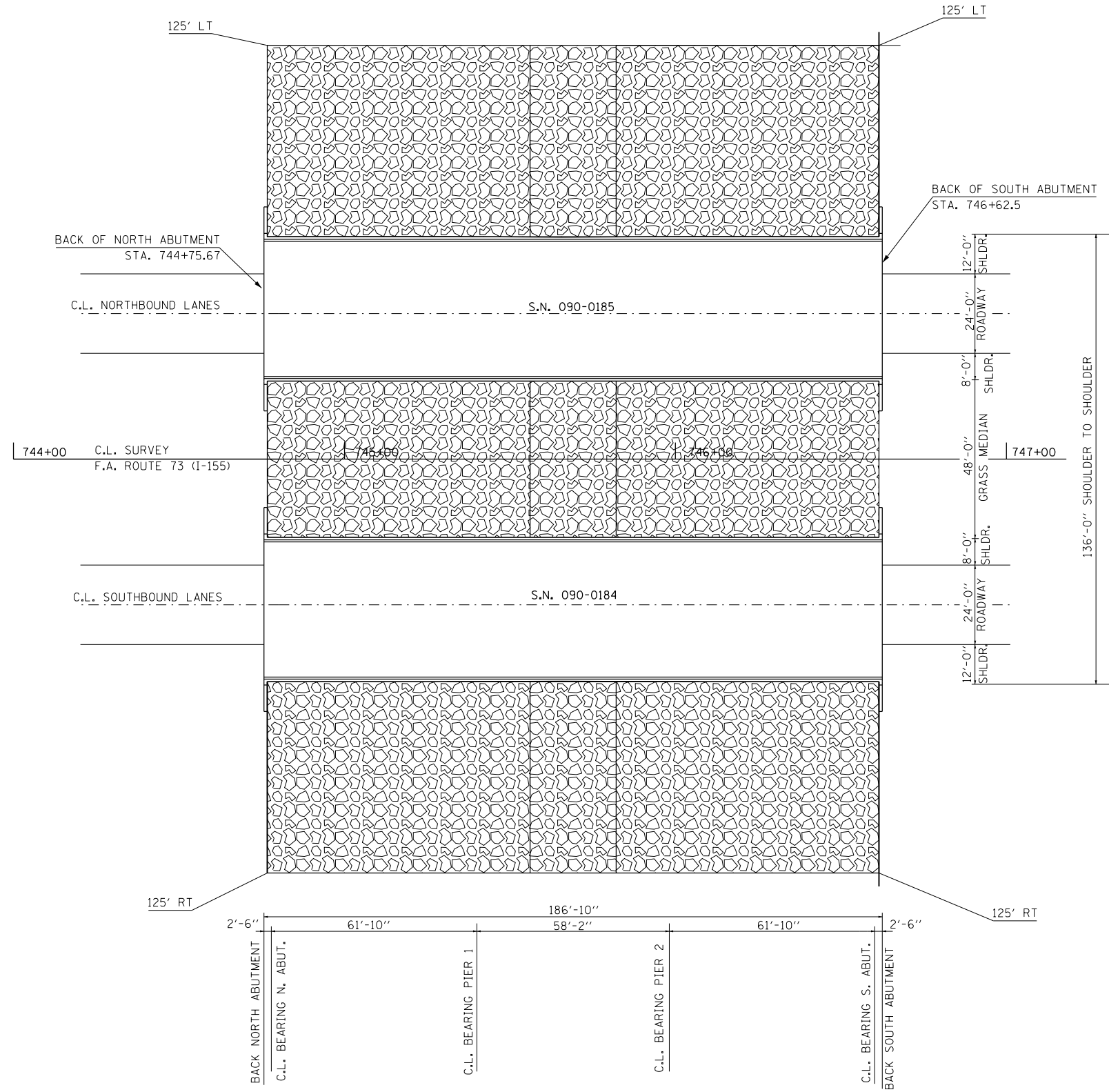
EXISTING PLAN

SCALE: SHEET OF SHEETS STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
CONTRACT NO.				
ILLINOIS FED. AID PROJECT				

MODEL Path: S:\ENGDRAFTM\JACK\MSH\Hydraulic\Report\Manufactured Hydraulic Report\Attachments\Attachment C - Bridge Layout, Plan Drawing, Plans\Electricity and Proposed.dgn
FILE NAME: S:\ENGDRAFTM\JACK\MSH\Hydraulic\Report\Manufactured Hydraulic Report\Attachments\Attachment C - Bridge Layout, Plan Drawing, Plans\Electricity and Proposed.dgn

USER NAME = jochumsjg	DESIGNED -	REVISED -
	DRAWN -	REVISED -
PLOT SCALE = 40.0000 ' / in.	CHECKED -	REVISED -
PLOT DATE = 9/22/2020	DATE -	REVISED -



PROPOSED PLAN

MODEL: Proposed
FILE NAME: S:\CEN\DRFTM_135 over Indian Creek\Hydraulic Report\Manufactured Hydraulic Report\Attachments\Attachment G - Bridge Layout - Plan Drawing\PlanDrawing and Proposed.dgn

USER NAME = jochumsjg	DESIGNED -	REVISED -
	DRAWN -	REVISED -
PLOT SCALE = 1:5748 ' / mm	CHECKED -	REVISED -
PLOT DATE = 7/7/2021	DATE -	REVISED -

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

PROPOSED PLAN

SCALE: SHEET OF SHEETS STA. TO STA.

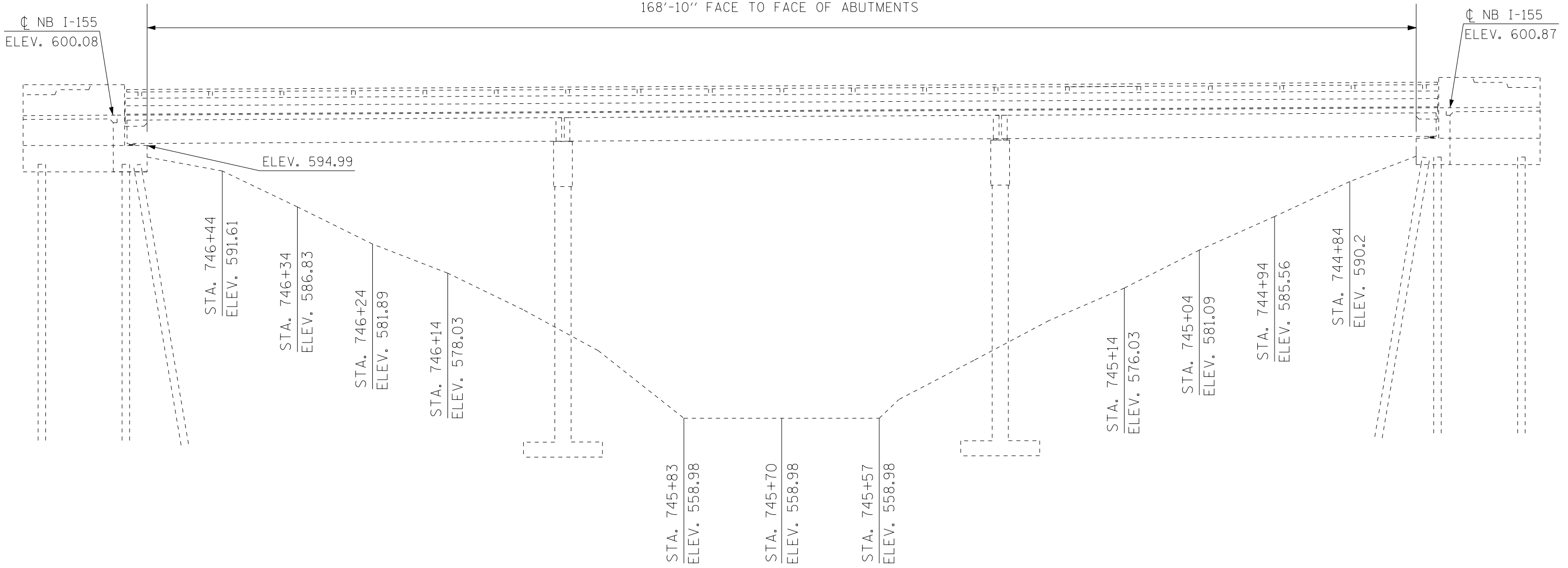
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
CONTRACT NO.				
ILLINOIS FED. AID PROJECT				

ATTACHMENT H

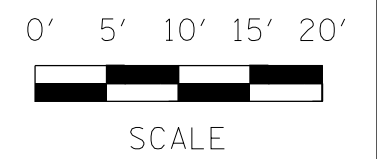
BRIDGE CROSS SECTION PLOTS-EXISTING CONDITIONS



168'-10" FACE TO FACE OF ABUTMENTS



EXISTING BRIDGE OPENING UPSTREAM SECTION
LOOKING DOWNSTREAM



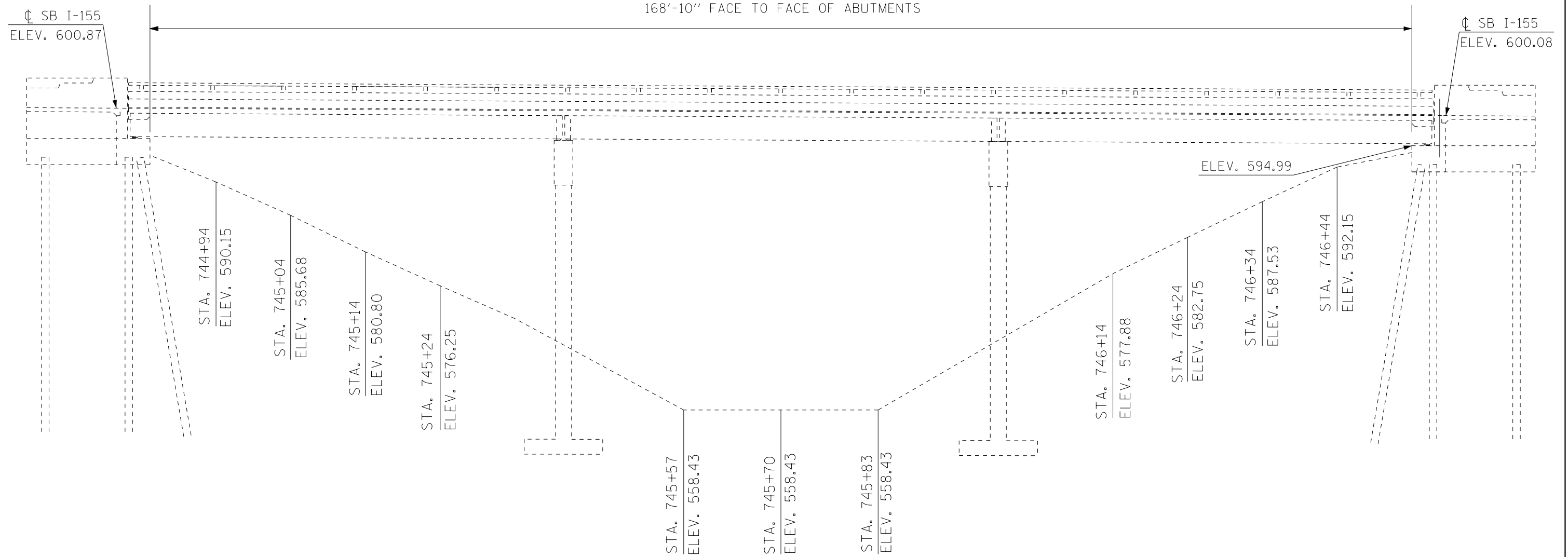
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 FILE NAME: S:\GEN\DRFTM...
 PROJECT: I-155 over Indian Creek Hydraulic Report\Manufactured Hydraulic Report\Attachments\Attachment_HBridge_Cross_Section_Plot\Existing_Condition\Ex_BridgeOpen_Ref From Original.dgn

USER NAME = jochumsjg	DESIGNED -	REVISED -
PLOT SCALE = 1:5748' / mm	DRAWN -	REVISED -
PLOT DATE = 7/7/2021	CHECKED -	REVISED -
	DATE -	REVISED -

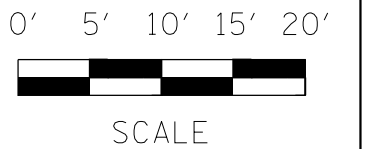
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

EXISTING STRUCTURE			
S.N. 090-0094			
SCALE:	SHEET	OF SHEETS	STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
CONTRACT NO.				
ILLINOIS FED. AID PROJECT				



EXISTING BRIDGE OPENING DOWNSTREAM SECTION
LOOKING UPSTREAM



MODEL: D:\dft\11...
FILE NAME: S:\GEN\DRAWING\...
REPORT MANUFACTURED: Hydraulic ReportAttachments\Attachment_H\Bridge_Cross_Section_Plot\Existing_Condition\Ex_BridgeOpen_Ref From Original.dgn

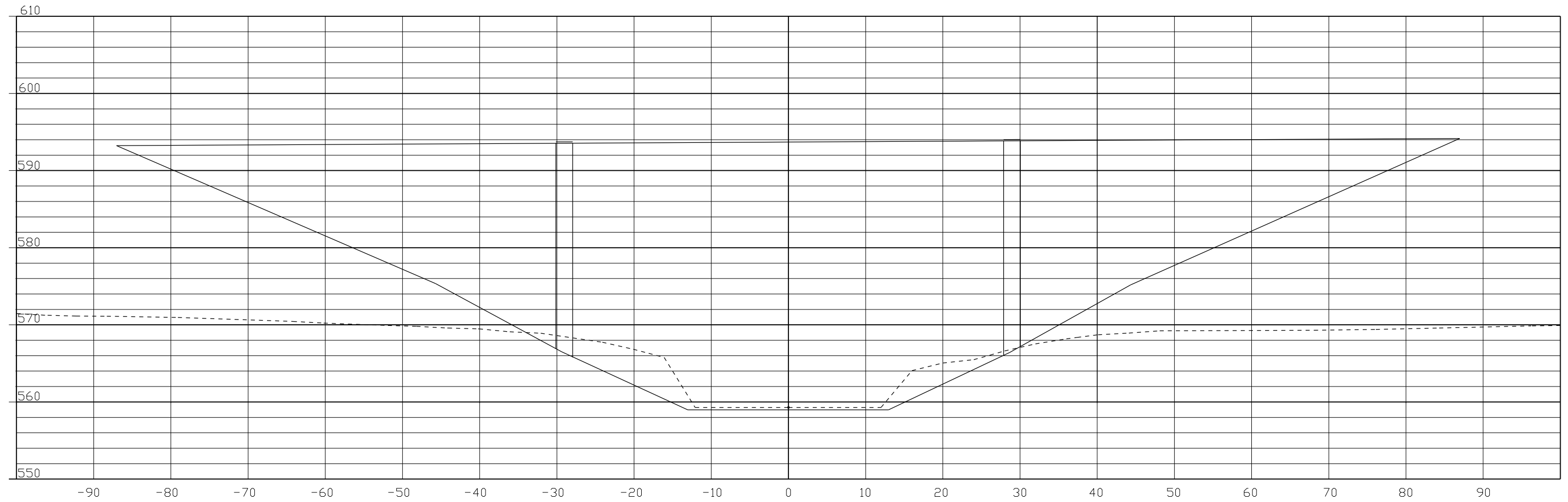
USER NAME = jochumsjg	DESIGNED -	REVISED -
	DRAWN -	REVISED -
PLOT SCALE = 1:5748' / mm	CHECKED -	REVISED -
PLOT DATE = 7/7/2021	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

EXISTING STRUCTURE
S.N. 090-0093

SCALE: SHEET OF SHEETS STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
CONTRACT NO.				
ILLINOIS FED. AID PROJECT				



LOOKING DOWNSTREAM

LEGEND

———— = S.N. 090-0094 UPSTREAM BRIDGE OPENING (HEC-RAS RIVER STATION 2696)

----- = NEXT UPSTREAM CROSS SECTION (HEC-RAS RIVER STATION 2772)

MODEL: Model1
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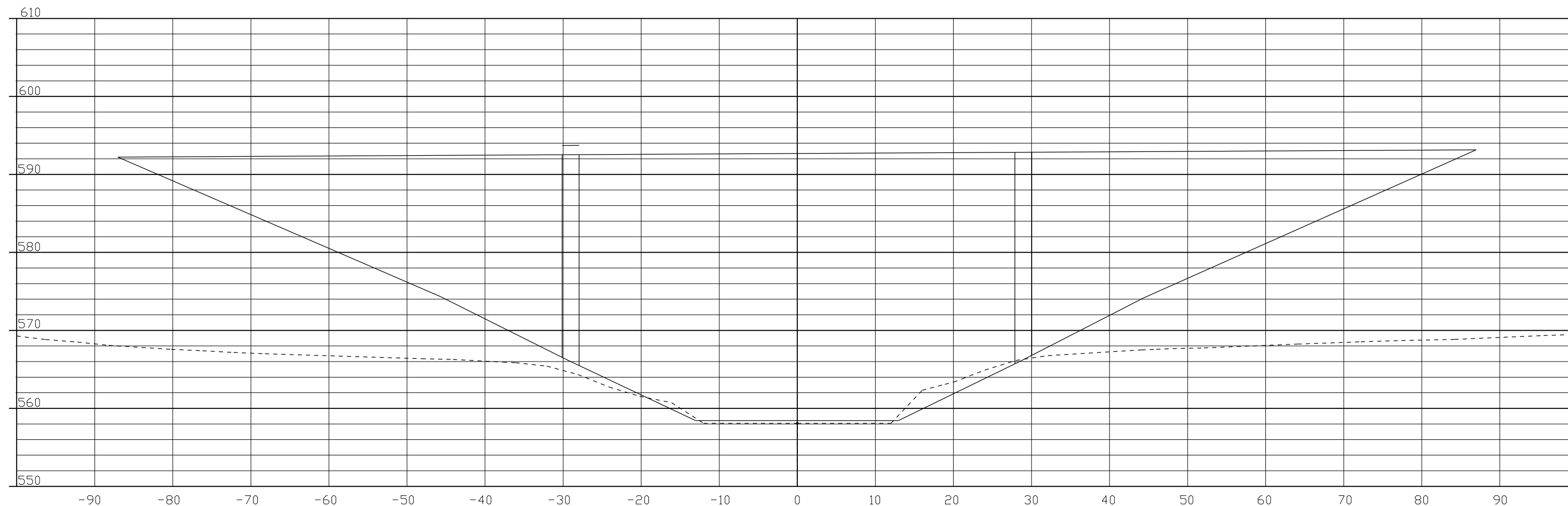
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	DATE -	REVISED -

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**EXISTING U.S. BRIDGE OPENING SUPERIMPOSED
ON NEXT EXISTING U.S. CROSS SECTION**

SCALE: SHEET OF SHEETS STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
CONTRACT NO.				
ILLINOIS FED. AID PROJECT				



LOOKING DOWNSTREAM

LEGEND

- = S.N. 090-0093 DOWNSTREAM BRIDGE OPENING (HEC-RAS RIVER STATION 2560)
- = NEXT DOWNSTREAM CROSS SECTION (HEC-RAS RIVER STATION 2474)

MODEL: Model1
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PLOT SCALE = 0.5167 / mm	DRAWN -	REVISED -
PLOT DATE = 7/7/2021	CHECKED -	REVISED -
	DATE -	REVISED -

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

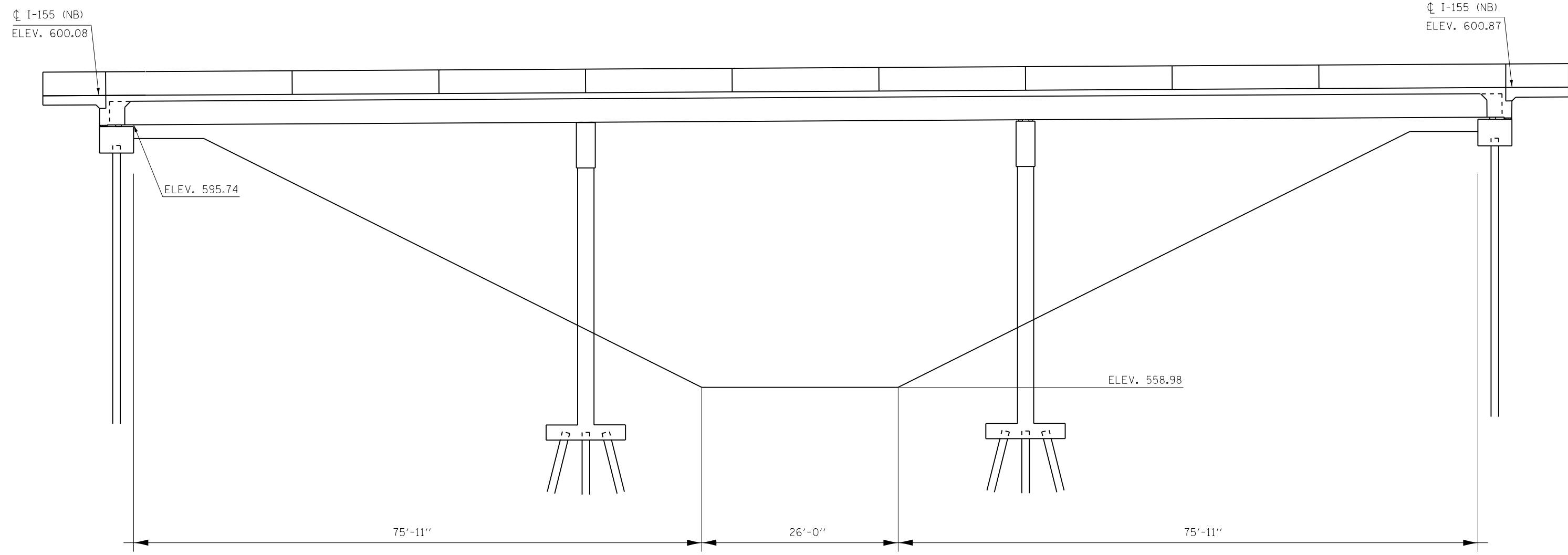
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ON NEXT EXISTING D.S. CROSS SECTION**

SCALE: SHEET OF SHEETS STA. TO STA.

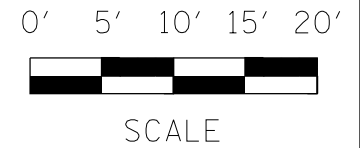
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
CONTRACT NO.				
ILLINOIS FED. AID PROJECT				

ATTACHMENT I

BRIDGE CROSS SECTION PLOTS-PROPOSED CONDITIONS



PROPOSED BRIDGE OPENING ON BRIDGE UPSTREAM SECTION
LOOKING DOWNSTREAM



MODEL: Default
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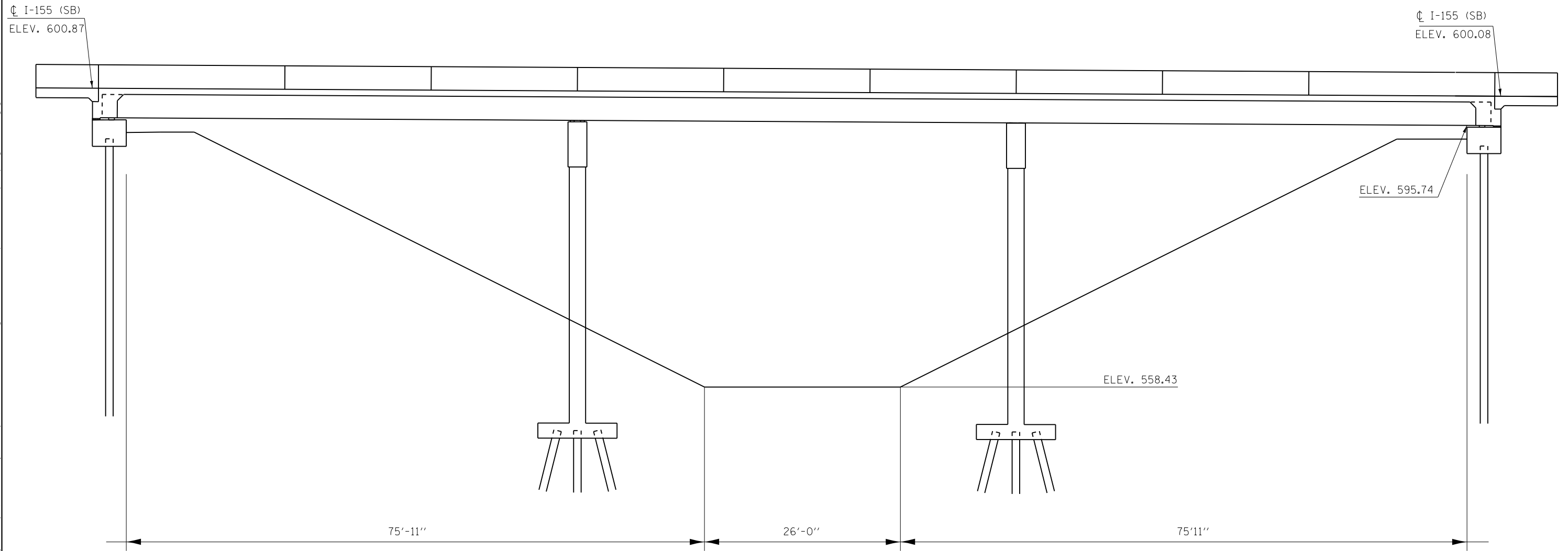
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PLOT DATE = 7/7/2021	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

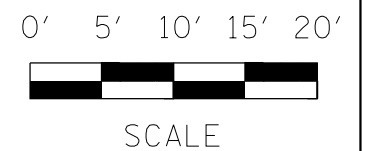
PROPOSED STRUCTURE
S.N. 090-0185

SCALE: SHEET OF SHEETS STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
CONTRACT NO.				
ILLINOIS FED. AID PROJECT				



PROPOSED BRIDGE OPENING ON BRIDGE DOWNSTREAM SECTION
LOOKING UPSTREAM



MODEL: Default
FILE NAME: S:\GEN\DRAWING\JACKSON\68E2-1_155 OVER INDIAN CREEK\Hydraulic_Report\Manufactured_Hydraulic_ReportAttachments\Attachment_Hydraulic_Cross_Section_Plot-Proposed_Conditions\Prop_Br_Opning_Ref_From_Orig.dwg

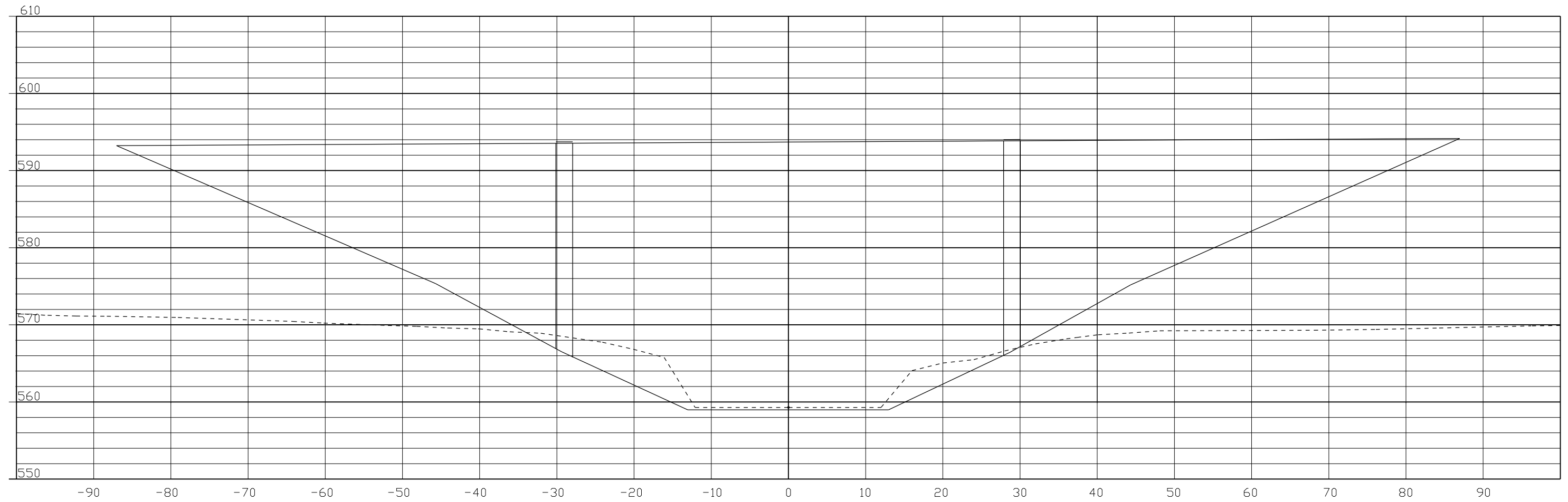
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	DRAWN -	REVISED -
PLOT SCALE = 1:5748 ' / mm	CHECKED -	REVISED -
PLOT DATE = 7/7/2021	DATE -	REVISED -

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**PROPOSED STRUCTURE
S.N. 090-0184**

SCALE: SHEET OF SHEETS STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
CONTRACT NO.				
ILLINOIS FED. AID PROJECT				



LOOKING DOWNSTREAM

LEGEND

- = S.N. 090-0185 UPSTREAM BRIDGE OPENING (HEC-RAS RIVER STATION 2696)
- = NEXT UPSTREAM CROSS SECTION (HEC-RAS RIVER STATION 2772)

MODEL: Model1
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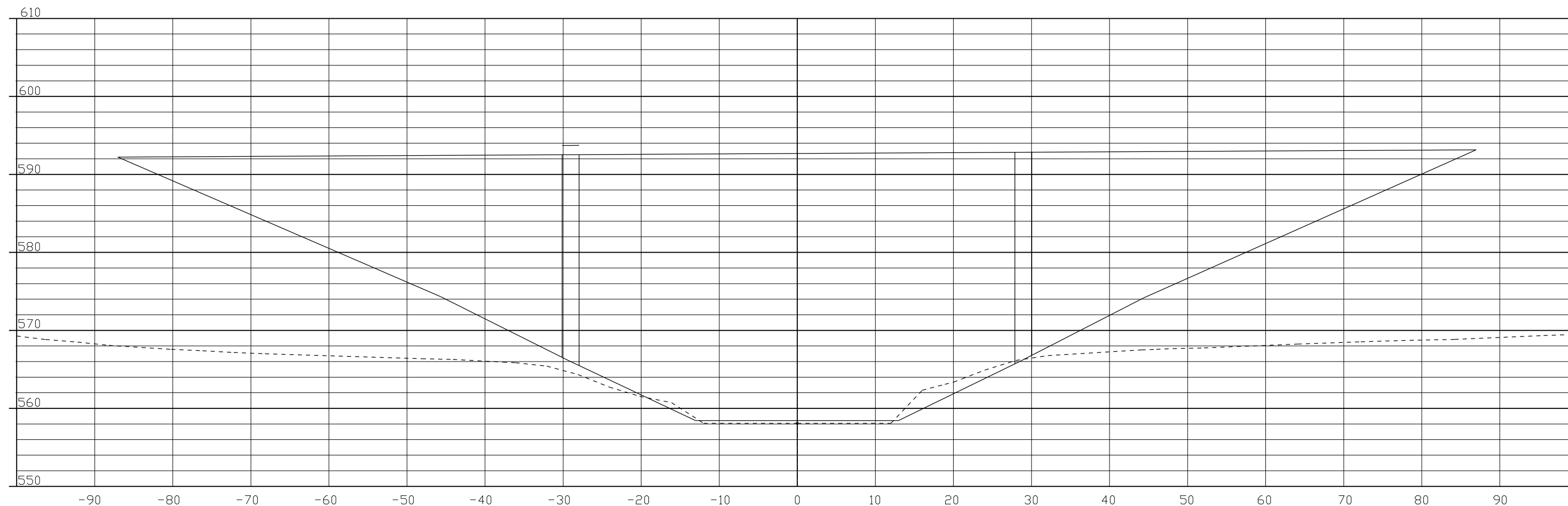
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PLOT DATE = 7/8/2021	DATE -	REVISED -

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

PROPOSED U.S. BRIDGE OPENING SUPERIMPOSED
ON NEXT PROPOSED U.S. CROSS SECTION

SCALE: SHEET OF SHEETS STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
CONTRACT NO.				
ILLINOIS FED. AID PROJECT				



LOOKING DOWNSTREAM

LEGEND

- = S.N. 090-0184 DOWNSTREAM BRIDGE OPENING (HEC-RAS RIVER STATION 2560)
- = NEXT DOWNSTREAM CROSS SECTION (HEC-RAS RIVER STATION 2474)

MODEL: Model1
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PLOT DATE = 7/8/2021	CHECKED -	REVISED -
	DATE -	REVISED -

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

PROPOSED D.S. BRIDGE OPENING SUPERIMPOSED
ON NEXT PROPOSED D.S. CROSS SECTION

SCALE: SHEET OF SHEETS STA. TO STA.

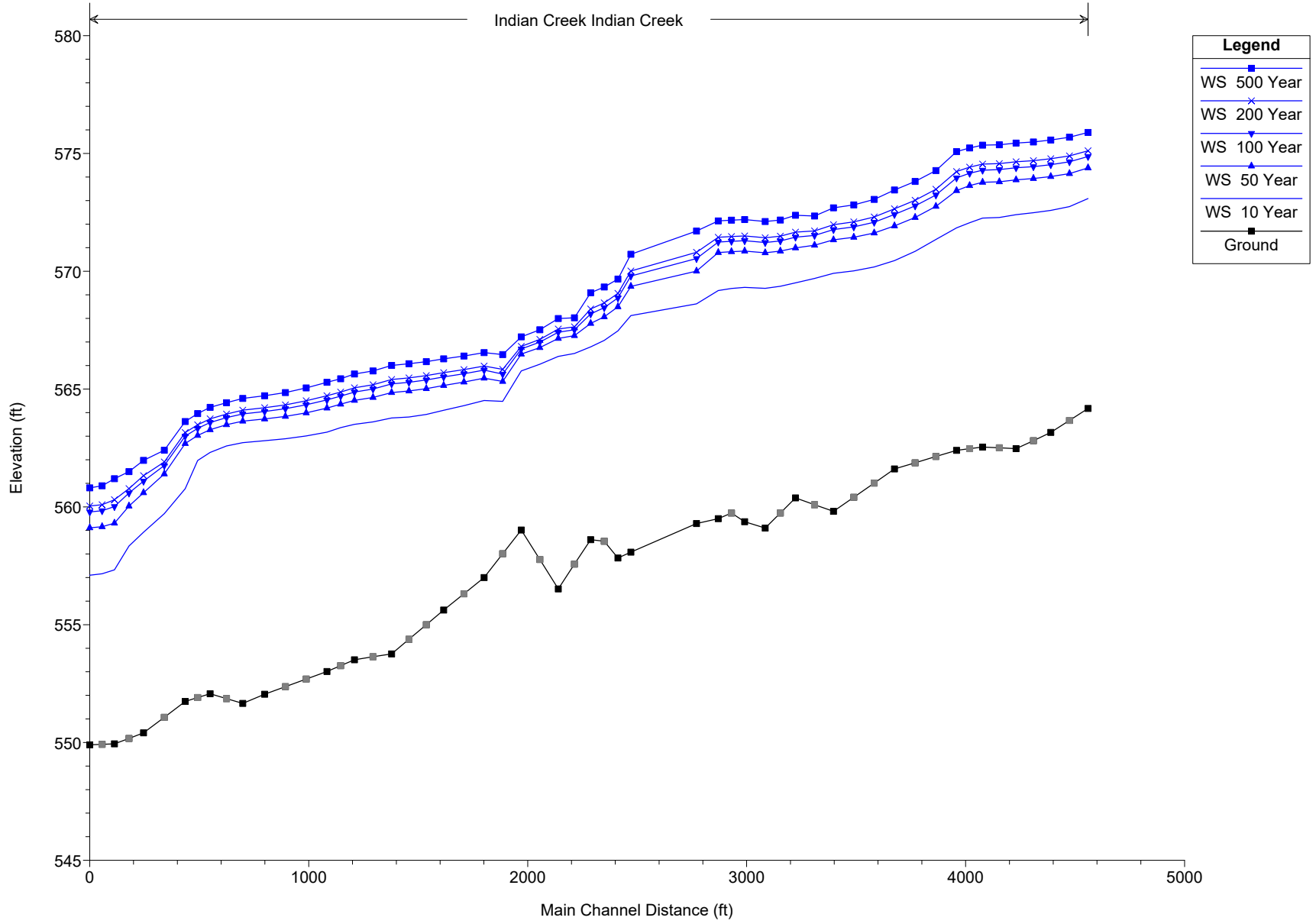
F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
CONTRACT NO.				
ILLINOIS FED. AID PROJECT				

ATTACHMENT J

HYDRAULIC ANALYSIS

basefile after BO review.06.28.2021 Plan: natural 7/7/2021

Indian Creek Indian Creek



HEC-RAS Plan: nat River: Indian Creek Reach: Indian Creek

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Indian Creek	4512	10 Year	1800.00	564.18	573.09		573.45	0.003641	5.14	527.85	356.33	0.40
Indian Creek	4512	50 Year	2980.00	564.18	574.39		574.65	0.002529	4.98	1081.40	460.62	0.35
Indian Creek	4512	100 Year	3510.00	564.18	574.87		575.10	0.002200	4.87	1305.49	464.32	0.33
Indian Creek	4512	200 Year	3800.00	564.18	575.12		575.34	0.002075	4.84	1418.96	466.11	0.32
Indian Creek	4512	500 Year	4830.00	564.18	575.90		576.10	0.001797	4.83	1783.84	471.32	0.30
Indian Creek	4427.00*	10 Year	1800.00	563.67	572.75		573.14	0.003564	5.26	487.66	314.78	0.40
Indian Creek	4427.00*	50 Year	2980.00	563.67	574.14		574.43	0.002500	5.13	1009.14	392.33	0.35
Indian Creek	4427.00*	100 Year	3510.00	563.67	574.65		574.91	0.002252	5.10	1208.15	401.28	0.33
Indian Creek	4427.00*	200 Year	3800.00	563.67	574.90		575.15	0.002157	5.11	1309.14	405.20	0.33
Indian Creek	4427.00*	500 Year	4830.00	563.67	575.69		575.93	0.001946	5.18	1634.51	416.02	0.32
Indian Creek	4342	10 Year	1800.00	563.16	572.58		572.85	0.002402	4.53	624.46	351.39	0.32
Indian Creek	4342	50 Year	2980.00	563.16	574.02		574.23	0.001772	4.48	1141.14	367.90	0.29
Indian Creek	4342	100 Year	3510.00	563.16	574.53		574.73	0.001669	4.54	1327.86	373.74	0.28
Indian Creek	4342	200 Year	3800.00	563.16	574.78		574.98	0.001635	4.58	1421.97	376.78	0.28
Indian Creek	4342	500 Year	4830.00	563.16	575.57		575.77	0.001564	4.77	1723.77	384.35	0.28
Indian Creek	4263.00*	10 Year	1800.00	562.81	572.48		572.67	0.001727	3.80	735.82	359.04	0.28
Indian Creek	4263.00*	50 Year	2980.00	562.81	573.94		574.09	0.001317	3.85	1273.78	380.03	0.25
Indian Creek	4263.00*	100 Year	3510.00	562.81	574.44		574.60	0.001260	3.94	1467.47	386.25	0.25
Indian Creek	4263.00*	200 Year	3800.00	562.81	574.69		574.85	0.001241	4.00	1564.92	388.97	0.25
Indian Creek	4263.00*	500 Year	4830.00	562.81	575.49		575.65	0.001213	4.21	1876.64	397.16	0.25
Indian Creek	4184	10 Year	1800.00	562.47	572.40		572.53	0.001342	3.24	856.30	412.50	0.24
Indian Creek	4184	50 Year	2980.00	562.47	573.88		573.99	0.000975	3.23	1507.97	452.82	0.21
Indian Creek	4184	100 Year	3510.00	562.47	574.39		574.50	0.000922	3.29	1740.29	457.80	0.21
Indian Creek	4184	200 Year	3800.00	562.47	574.65		574.75	0.000906	3.33	1856.46	460.15	0.21
Indian Creek	4184	500 Year	4830.00	562.47	575.44		575.56	0.000878	3.50	2225.96	466.62	0.21
Indian Creek	4107.50*	10 Year	1800.00	562.51	572.28		572.43	0.001252	3.45	859.96	404.88	0.24
Indian Creek	4107.50*	50 Year	2980.00	562.51	573.80		573.91	0.000947	3.46	1529.73	463.34	0.22
Indian Creek	4107.50*	100 Year	3510.00	562.51	574.31		574.43	0.000897	3.51	1770.82	470.14	0.21
Indian Creek	4107.50*	200 Year	3800.00	562.51	574.57		574.68	0.000881	3.55	1891.25	473.26	0.21
Indian Creek	4107.50*	500 Year	4830.00	562.51	575.37		575.49	0.000856	3.71	2274.19	482.13	0.21
Indian Creek	4031	10 Year	1800.00	562.54	572.26		572.34	0.000766	2.87	1190.58	494.77	0.19
Indian Creek	4031	50 Year	2980.00	562.54	573.78		573.84	0.000592	2.86	2009.37	575.01	0.17
Indian Creek	4031	100 Year	3510.00	562.54	574.29		574.36	0.000592	2.97	2313.16	599.32	0.17
Indian Creek	4031	200 Year	3800.00	562.54	574.55		574.61	0.000578	2.99	2467.39	601.95	0.17
Indian Creek	4031	500 Year	4830.00	562.54	575.35		575.42	0.000554	3.09	2955.22	609.33	0.17
Indian Creek	3971.50*	10 Year	1800.00	562.47	572.06		572.26	0.001720	3.89	708.44	370.33	0.28
Indian Creek	3971.50*	50 Year	2980.00	562.47	573.63		573.78	0.001213	3.81	1389.02	477.99	0.24
Indian Creek	3971.50*	100 Year	3510.00	562.47	574.16		574.30	0.001141	3.86	1645.67	512.25	0.24
Indian Creek	3971.50*	200 Year	3800.00	562.47	574.42		574.56	0.001099	3.87	1780.68	518.11	0.23
Indian Creek	3971.50*	500 Year	4830.00	562.47	575.24		575.37	0.001008	3.94	2208.00	529.56	0.23
Indian Creek	3912	10 Year	1800.00	562.40	571.84		572.12	0.002828	4.40	507.11	218.64	0.34
Indian Creek	3912	50 Year	2980.00	562.40	573.43		573.68	0.002220	4.52	960.88	416.94	0.32
Indian Creek	3912	100 Year	3510.00	562.40	573.96		574.21	0.002016	4.55	1196.90	481.66	0.31
Indian Creek	3912	200 Year	3800.00	562.40	574.23		574.47	0.001908	4.54	1331.26	500.61	0.30
Indian Creek	3912	500 Year	4830.00	562.40	575.08		575.29	0.001636	4.53	1759.18	513.35	0.28
Indian Creek	3817.33*	10 Year	1800.00	562.14	571.35		571.78	0.004324	5.29	346.92	86.51	0.43
Indian Creek	3817.33*	50 Year	2980.00	562.14	572.75		573.35	0.004502	6.40	554.81	182.47	0.45
Indian Creek	3817.33*	100 Year	3510.00	562.14	573.24		573.89	0.004544	6.76	646.16	194.11	0.46
Indian Creek	3817.33*	200 Year	3800.00	562.14	573.48		574.16	0.004576	6.95	699.19	243.90	0.47
Indian Creek	3817.33*	500 Year	4830.00	562.14	574.28		575.00	0.004490	7.40	987.67	397.25	0.47
Indian Creek	3722.67*	10 Year	1800.00	561.87	570.85		571.35	0.004690	5.69	336.83	125.77	0.45
Indian Creek	3722.67*	50 Year	2980.00	561.87	572.29		572.92	0.004641	6.69	563.64	179.49	0.46
Indian Creek	3722.67*	100 Year	3510.00	561.87	572.77		573.45	0.004662	7.04	653.57	188.20	0.47
Indian Creek	3722.67*	200 Year	3800.00	561.87	573.02		573.72	0.004688	7.22	700.88	214.52	0.47
Indian Creek	3722.67*	500 Year	4830.00	561.87	573.81		574.56	0.004637	7.70	915.63	334.07	0.48
Indian Creek	3628	10 Year	1800.00	561.61	570.45		570.92	0.004122	5.63	376.08	144.37	0.42
Indian Creek	3628	50 Year	2980.00	561.61	571.93		572.49	0.004056	6.51	620.34	182.09	0.43
Indian Creek	3628	100 Year	3510.00	561.61	572.41		573.01	0.004128	6.86	710.66	189.44	0.44
Indian Creek	3628	200 Year	3800.00	561.61	572.65		573.27	0.004181	7.04	757.73	211.81	0.44
Indian Creek	3628	500 Year	4830.00	561.61	573.45		574.12	0.004196	7.53	963.19	319.87	0.45
Indian Creek	3535.33*	10 Year	1800.00	561.01	570.19		570.55	0.003305	4.87	392.37	126.39	0.38
Indian Creek	3535.33*	50 Year	2980.00	561.01	571.62		572.12	0.003464	5.89	611.42	173.92	0.41
Indian Creek	3535.33*	100 Year	3510.00	561.01	572.08		572.64	0.003636	6.31	694.18	187.20	0.42
Indian Creek	3535.33*	200 Year	3800.00	561.01	572.30		572.90	0.003739	6.53	736.20	192.87	0.43

HEC-RAS Plan: nat River: Indian Creek Reach: Indian Creek (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Indian Creek	3535.33*	500 Year	4830.00	561.01	573.05		573.74	0.003956	7.18	890.54	237.97	0.45
Indian Creek	3442.67*	10 Year	1800.00	560.41	570.02		570.26	0.002255	4.00	456.85	115.23	0.32
Indian Creek	3442.67*	50 Year	2980.00	560.41	571.44		571.81	0.002501	4.98	669.42	170.11	0.35
Indian Creek	3442.67*	100 Year	3510.00	560.41	571.89		572.32	0.002683	5.39	747.43	179.63	0.36
Indian Creek	3442.67*	200 Year	3800.00	560.41	572.10		572.56	0.002798	5.61	785.76	184.62	0.37
Indian Creek	3442.67*	500 Year	4830.00	560.41	572.82		573.38	0.003079	6.28	943.20	273.44	0.40
Indian Creek	3350	10 Year	1800.00	559.81	569.91		570.08	0.001398	3.21	562.46	117.03	0.25
Indian Creek	3350	50 Year	2980.00	559.81	571.33		571.59	0.001657	4.11	774.03	185.45	0.28
Indian Creek	3350	100 Year	3510.00	559.81	571.77		572.08	0.001812	4.49	865.63	229.25	0.30
Indian Creek	3350	200 Year	3800.00	559.81	571.98		572.31	0.001901	4.68	914.43	241.70	0.31
Indian Creek	3350	500 Year	4830.00	559.81	572.69		573.10	0.002108	5.25	1100.44	288.91	0.33
Indian Creek	3263.50*	10 Year	1800.00	560.09	569.70		569.92	0.002204	3.81	505.20	151.41	0.31
Indian Creek	3263.50*	50 Year	2980.00	560.09	571.10		571.42	0.002304	4.63	743.14	191.25	0.33
Indian Creek	3263.50*	100 Year	3510.00	560.09	571.52		571.89	0.002486	5.03	826.43	206.90	0.35
Indian Creek	3263.50*	200 Year	3800.00	560.09	571.72		572.11	0.002602	5.25	867.11	213.90	0.36
Indian Creek	3263.50*	500 Year	4830.00	560.09	572.35		572.87	0.003072	6.05	1034.46	325.82	0.39
Indian Creek	3177	10 Year	1800.00	560.38	569.51		569.72	0.002256	3.86	551.37	199.98	0.31
Indian Creek	3177	50 Year	2980.00	560.38	570.99		571.21	0.001839	4.16	1095.05	508.77	0.29
Indian Creek	3177	100 Year	3510.00	560.38	571.45		571.66	0.001732	4.23	1332.79	532.92	0.29
Indian Creek	3177	200 Year	3800.00	560.38	571.66		571.87	0.001710	4.29	1446.95	545.96	0.29
Indian Creek	3177	500 Year	4830.00	560.38	572.38		572.58	0.001598	4.42	1856.65	596.93	0.28
Indian Creek	3108.00*	10 Year	1800.00	559.74	569.36		569.58	0.001987	3.84	570.95	248.68	0.30
Indian Creek	3108.00*	50 Year	2980.00	559.74	570.86		571.09	0.001721	4.23	995.34	330.70	0.29
Indian Creek	3108.00*	100 Year	3510.00	559.74	571.29		571.54	0.001763	4.47	1146.21	369.22	0.30
Indian Creek	3108.00*	200 Year	3800.00	559.74	571.49		571.75	0.001803	4.60	1221.57	386.19	0.30
Indian Creek	3108.00*	500 Year	4830.00	559.74	572.17		572.46	0.001870	4.98	1508.23	447.28	0.31
Indian Creek	3039	10 Year	1800.00	559.10	569.28		569.45	0.001383	3.48	664.25	285.97	0.25
Indian Creek	3039	50 Year	2980.00	559.10	570.78		570.97	0.001288	3.90	1187.68	422.94	0.25
Indian Creek	3039	100 Year	3510.00	559.10	571.22		571.42	0.001311	4.09	1377.97	446.03	0.26
Indian Creek	3039	200 Year	3800.00	559.10	571.42		571.62	0.001336	4.20	1468.28	453.73	0.26
Indian Creek	3039	500 Year	4830.00	559.10	572.11		572.33	0.001359	4.47	1810.40	557.10	0.27
Indian Creek	2945	10 Year	1800.00	559.37	569.32		569.35	0.000386	1.85	1928.52	833.52	0.13
Indian Creek	2945	50 Year	2980.00	559.37	570.86		570.88	0.000246	1.72	3247.23	870.86	0.11
Indian Creek	2945	100 Year	3510.00	559.37	571.30		571.32	0.000244	1.78	3633.73	875.82	0.11
Indian Creek	2945	200 Year	3800.00	559.37	571.50		571.52	0.000247	1.82	3812.23	877.55	0.11
Indian Creek	2945	500 Year	4830.00	559.37	572.20		572.22	0.000253	1.94	4424.83	883.11	0.11
Indian Creek	2884.50*	10 Year	1800.00	559.74	569.27		569.31	0.000715	2.25	1524.78	771.30	0.18
Indian Creek	2884.50*	50 Year	2980.00	559.74	570.83		570.86	0.000373	1.95	2783.97	832.53	0.13
Indian Creek	2884.50*	100 Year	3510.00	559.74	571.27		571.30	0.000358	2.00	3155.31	843.05	0.13
Indian Creek	2884.50*	200 Year	3800.00	559.74	571.48		571.51	0.000359	2.04	3327.27	847.95	0.13
Indian Creek	2884.50*	500 Year	4830.00	559.74	572.17		572.20	0.000354	2.15	3921.12	858.81	0.13
Indian Creek	2824	10 Year	1800.00	559.50	569.18		569.26	0.001051	2.75	1241.67	694.68	0.21
Indian Creek	2824	50 Year	2980.00	559.50	570.79		570.83	0.000521	2.15	2451.14	786.34	0.15
Indian Creek	2824	100 Year	3510.00	559.50	571.24		571.28	0.000486	2.17	2804.57	801.39	0.15
Indian Creek	2824	200 Year	3800.00	559.50	571.44		571.48	0.000482	2.21	2968.26	807.01	0.15
Indian Creek	2824	500 Year	4830.00	559.50	572.14		572.18	0.000469	2.33	3539.14	836.38	0.15
Indian Creek	2772	10 Year	1800.00	559.29	568.61		569.04	0.003934	5.25	343.76	69.34	0.41
Indian Creek	2772	50 Year	2980.00	559.29	570.01	566.77	570.65	0.004635	6.57	572.76	451.53	0.46
Indian Creek	2772	100 Year	3510.00	559.29	570.54		571.12	0.004066	6.49	863.80	604.58	0.43
Indian Creek	2772	200 Year	3800.00	559.29	570.81		571.33	0.003718	6.37	1028.86	637.23	0.42
Indian Creek	2772	500 Year	4830.00	559.29	571.71		572.06	0.002579	5.74	1649.23	750.71	0.35
Indian Creek	2474	10 Year	1800.00	558.08	568.12		568.34	0.001328	3.91	537.80	149.42	0.25
Indian Creek	2474	50 Year	2980.00	558.08	569.36		569.73	0.001872	5.15	753.91	196.90	0.31
Indian Creek	2474	100 Year	3510.00	558.08	569.80		570.22	0.002074	5.61	842.93	210.02	0.33
Indian Creek	2474	200 Year	3800.00	558.08	570.01		570.47	0.002178	5.84	888.94	215.43	0.34
Indian Creek	2474	500 Year	4830.00	558.08	570.72		571.28	0.002489	6.56	1048.80	235.30	0.37
Indian Creek	2413	10 Year	1800.00	557.83	567.47		568.14	0.007993	6.67	297.35	118.78	0.58
Indian Creek	2413	50 Year	2980.00	557.83	568.49		569.46	0.009138	8.25	453.85	177.54	0.64
Indian Creek	2413	100 Year	3510.00	557.83	568.87	568.24	569.93	0.009392	8.77	525.51	197.71	0.66
Indian Creek	2413	200 Year	3800.00	557.83	569.06	568.42	570.17	0.009519	9.03	563.68	207.00	0.66
Indian Creek	2413	500 Year	4830.00	557.83	569.67	569.07	570.94	0.009982	9.88	700.55	255.25	0.69
Indian Creek	2350.50*	10 Year	1800.00	558.54	567.07		567.64	0.007104	6.16	318.39	143.90	0.55
Indian Creek	2350.50*	50 Year	2980.00	558.54	568.07		568.89	0.007957	7.58	488.96	193.50	0.60

HEC-RAS Plan: nat River: Indian Creek Reach: Indian Creek (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Indian Creek	2350.50*	100 Year	3510.00	558.54	568.45		569.34	0.007996	7.99	566.86	206.06	0.61
Indian Creek	2350.50*	200 Year	3800.00	558.54	568.66		569.57	0.007942	8.16	609.12	209.05	0.61
Indian Creek	2350.50*	500 Year	4830.00	558.54	569.33		570.31	0.007691	8.67	754.00	219.34	0.61
Indian Creek	2288	10 Year	1800.00	558.61	566.79		567.22	0.005276	5.33	377.07	163.60	0.47
Indian Creek	2288	50 Year	2980.00	558.61	567.79		568.40	0.005931	6.56	563.14	207.24	0.52
Indian Creek	2288	100 Year	3510.00	558.61	568.19		568.84	0.005898	6.89	648.35	214.41	0.52
Indian Creek	2288	200 Year	3800.00	558.61	568.40		569.07	0.005873	7.06	693.16	217.64	0.53
Indian Creek	2288	500 Year	4830.00	558.61	569.09		569.83	0.005732	7.53	846.51	226.53	0.53
Indian Creek	2214.00*	10 Year	1800.00	557.57	566.51		566.87	0.003746	4.84	381.07	112.65	0.40
Indian Creek	2214.00*	50 Year	2980.00	557.57	567.27		567.95	0.005868	6.72	487.48	167.29	0.52
Indian Creek	2214.00*	100 Year	3510.00	557.57	567.52		568.36	0.006799	7.47	530.89	177.73	0.56
Indian Creek	2214.00*	200 Year	3800.00	557.57	567.64		568.56	0.007304	7.85	553.13	182.24	0.59
Indian Creek	2214.00*	500 Year	4830.00	557.57	568.03	567.06	569.25	0.009047	9.14	626.39	196.33	0.66
Indian Creek	2140	10 Year	1800.00	556.52	566.39		566.63	0.002198	4.03	527.97	245.36	0.32
Indian Creek	2140	50 Year	2980.00	556.52	567.15		567.55	0.003243	5.37	730.19	285.04	0.39
Indian Creek	2140	100 Year	3510.00	556.52	567.42		567.89	0.003663	5.88	807.41	297.13	0.42
Indian Creek	2140	200 Year	3800.00	556.52	567.55		568.06	0.003877	6.14	847.57	302.08	0.43
Indian Creek	2140	500 Year	4830.00	556.52	567.99		568.61	0.004519	6.94	984.41	315.70	0.47
Indian Creek	2055.50*	10 Year	1800.00	557.77	566.06		566.38	0.003941	4.86	516.06	305.89	0.41
Indian Creek	2055.50*	50 Year	2980.00	557.77	566.76		567.21	0.005033	6.07	742.97	338.46	0.48
Indian Creek	2055.50*	100 Year	3510.00	557.77	566.99		567.50	0.005539	6.56	823.34	348.93	0.51
Indian Creek	2055.50*	200 Year	3800.00	557.77	567.11		567.65	0.005810	6.82	864.28	354.61	0.52
Indian Creek	2055.50*	500 Year	4830.00	557.77	567.52		568.16	0.006483	7.57	1013.84	375.60	0.56
Indian Creek	1971	10 Year	1800.00	559.02	565.77		565.99	0.004629	4.65	658.59	407.07	0.43
Indian Creek	1971	50 Year	2980.00	559.02	566.49		566.74	0.004712	5.30	961.07	436.29	0.45
Indian Creek	1971	100 Year	3510.00	559.02	566.70		566.99	0.005054	5.67	1057.81	446.56	0.47
Indian Creek	1971	200 Year	3800.00	559.02	566.81		567.11	0.005248	5.87	1106.30	451.57	0.48
Indian Creek	1971	500 Year	4830.00	559.02	567.22		567.56	0.005551	6.38	1293.46	470.89	0.50
Indian Creek	1886.00*	10 Year	1800.00	558.01	564.48	564.48	565.29	0.014192	7.59	321.64	279.11	0.75
Indian Creek	1886.00*	50 Year	2980.00	558.01	565.32	565.32	566.09	0.011784	8.08	617.14	416.46	0.71
Indian Creek	1886.00*	100 Year	3510.00	558.01	565.63	565.55	566.34	0.010637	8.07	751.21	439.75	0.68
Indian Creek	1886.00*	200 Year	3800.00	558.01	565.84		566.49	0.009585	7.90	842.38	454.05	0.65
Indian Creek	1886.00*	500 Year	4830.00	558.01	566.46		567.00	0.007422	7.57	1138.50	489.64	0.59
Indian Creek	1801	10 Year	1800.00	557.00	564.51		564.61	0.001756	3.18	985.65	578.72	0.27
Indian Creek	1801	50 Year	2980.00	557.00	565.46		565.55	0.001495	3.36	1612.38	702.26	0.26
Indian Creek	1801	100 Year	3510.00	557.00	565.81		565.90	0.001432	3.44	1856.55	718.57	0.26
Indian Creek	1801	200 Year	3800.00	557.00	565.98		566.07	0.001405	3.48	1982.20	723.67	0.26
Indian Creek	1801	500 Year	4830.00	557.00	566.55		566.64	0.001332	3.61	2396.50	734.86	0.25
Indian Creek	1709.00*	10 Year	1800.00	556.31	564.30		564.43	0.002045	3.64	899.44	599.34	0.30
Indian Creek	1709.00*	50 Year	2980.00	556.31	565.30		565.41	0.001618	3.69	1545.51	682.45	0.28
Indian Creek	1709.00*	100 Year	3510.00	556.31	565.65		565.76	0.001534	3.75	1789.52	697.06	0.27
Indian Creek	1709.00*	200 Year	3800.00	556.31	565.83		565.94	0.001503	3.78	1914.10	703.64	0.27
Indian Creek	1709.00*	500 Year	4830.00	556.31	566.40		566.52	0.001415	3.90	2325.14	717.37	0.27
Indian Creek	1617	10 Year	1800.00	555.62	564.10		564.24	0.001934	3.74	924.57	605.10	0.30
Indian Creek	1617	50 Year	2980.00	555.62	565.16		565.27	0.001466	3.70	1605.90	685.64	0.27
Indian Creek	1617	100 Year	3510.00	555.62	565.52		565.62	0.001396	3.75	1857.28	704.84	0.26
Indian Creek	1617	200 Year	3800.00	555.62	565.70		565.80	0.001365	3.78	1985.44	709.14	0.26
Indian Creek	1617	500 Year	4830.00	555.62	566.28		566.39	0.001289	3.89	2404.34	720.08	0.26
Indian Creek	1537.67*	10 Year	1800.00	555.00	563.92		564.09	0.001824	3.80	859.93	585.33	0.29
Indian Creek	1537.67*	50 Year	2980.00	555.00	565.02		565.15	0.001418	3.80	1556.81	682.36	0.26
Indian Creek	1537.67*	100 Year	3510.00	555.00	565.39		565.51	0.001356	3.85	1812.29	703.09	0.26
Indian Creek	1537.67*	200 Year	3800.00	555.00	565.57		565.70	0.001327	3.88	1942.54	707.37	0.26
Indian Creek	1537.67*	500 Year	4830.00	555.00	566.16		566.29	0.001259	3.99	2366.74	720.48	0.26
Indian Creek	1458.33*	10 Year	1800.00	554.38	563.81		563.96	0.001356	3.44	904.07	582.63	0.25
Indian Creek	1458.33*	50 Year	2980.00	554.38	564.92		565.05	0.001165	3.59	1615.55	693.37	0.24
Indian Creek	1458.33*	100 Year	3510.00	554.38	565.29		565.41	0.001138	3.67	1877.43	717.60	0.24
Indian Creek	1458.33*	200 Year	3800.00	554.38	565.48		565.60	0.001121	3.71	2011.39	721.03	0.24
Indian Creek	1458.33*	500 Year	4830.00	554.38	566.07		566.19	0.001084	3.84	2445.51	732.79	0.24
Indian Creek	1379	10 Year	1800.00	553.76	563.77		563.86	0.000787	2.76	1030.94	544.14	0.20
Indian Creek	1379	50 Year	2980.00	553.76	564.85		564.96	0.000900	3.28	1727.05	710.76	0.21
Indian Creek	1379	100 Year	3510.00	553.76	565.22		565.33	0.000903	3.40	1995.47	738.51	0.22
Indian Creek	1379	200 Year	3800.00	553.76	565.40		565.52	0.000898	3.44	2133.39	741.70	0.22
Indian Creek	1379	500 Year	4830.00	553.76	566.00		566.11	0.000891	3.60	2579.39	752.06	0.22

HEC-RAS Plan: nat River: Indian Creek Reach: Indian Creek (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Indian Creek	1294.00*	10 Year	1800.00	553.64	563.61		563.77	0.001308	3.38	681.77	318.93	0.25
Indian Creek	1294.00*	50 Year	2980.00	553.64	564.65		564.85	0.001523	4.08	1165.96	569.06	0.28
Indian Creek	1294.00*	100 Year	3510.00	553.64	565.00		565.22	0.001569	4.29	1376.20	605.10	0.28
Indian Creek	1294.00*	200 Year	3800.00	553.64	565.18		565.41	0.001584	4.38	1487.66	620.68	0.29
Indian Creek	1294.00*	500 Year	4830.00	553.64	565.77		566.00	0.001627	4.68	1865.69	656.12	0.29
Indian Creek	1209	10 Year	1800.00	553.51	563.51		563.66	0.001325	3.27	732.41	351.45	0.25
Indian Creek	1209	50 Year	2980.00	553.51	564.52		564.72	0.001562	3.98	1150.84	490.44	0.28
Indian Creek	1209	100 Year	3510.00	553.51	564.87		565.08	0.001610	4.19	1342.77	591.53	0.28
Indian Creek	1209	200 Year	3800.00	553.51	565.05		565.27	0.001623	4.28	1452.18	620.61	0.29
Indian Creek	1209	500 Year	4830.00	553.51	565.64		565.86	0.001632	4.53	1834.22	680.57	0.29
Indian Creek	1146.00*	10 Year	1800.00	553.26	563.36		563.56	0.001783	3.75	667.14	327.36	0.29
Indian Creek	1146.00*	50 Year	2980.00	553.26	564.36		564.60	0.002050	4.51	1040.53	404.92	0.31
Indian Creek	1146.00*	100 Year	3510.00	553.26	564.70		564.96	0.002128	4.76	1180.49	410.95	0.32
Indian Creek	1146.00*	200 Year	3800.00	553.26	564.87		565.14	0.002166	4.88	1252.28	413.71	0.33
Indian Creek	1146.00*	500 Year	4830.00	553.26	565.44		565.73	0.002283	5.28	1486.56	421.48	0.34
Indian Creek	1083	10 Year	1800.00	553.01	563.17		563.42	0.002318	4.34	628.05	344.98	0.32
Indian Creek	1083	50 Year	2980.00	553.01	564.19		564.46	0.002511	4.89	1033.97	423.53	0.34
Indian Creek	1083	100 Year	3510.00	553.01	564.54		564.81	0.002526	5.09	1183.30	429.58	0.35
Indian Creek	1083	200 Year	3800.00	553.01	564.72		565.00	0.002539	5.19	1259.49	432.71	0.35
Indian Creek	1083	500 Year	4830.00	553.01	565.28		565.58	0.002592	5.52	1506.90	442.30	0.36
Indian Creek	988.33*	10 Year	1800.00	552.69	563.01		563.21	0.001825	3.85	668.85	351.05	0.29
Indian Creek	988.33*	50 Year	2980.00	552.69	563.99		564.24	0.002068	4.54	1052.74	407.65	0.31
Indian Creek	988.33*	100 Year	3510.00	552.69	564.33		564.59	0.002153	4.80	1191.85	414.46	0.32
Indian Creek	988.33*	200 Year	3800.00	552.69	564.50		564.77	0.002195	4.92	1263.07	417.37	0.33
Indian Creek	988.33*	500 Year	4830.00	552.69	565.05		565.35	0.002332	5.34	1493.44	425.48	0.34
Indian Creek	893.67*	10 Year	1800.00	552.37	562.89		563.05	0.001365	3.39	733.93	366.93	0.25
Indian Creek	893.67*	50 Year	2980.00	552.37	563.84		564.05	0.001653	4.14	1100.88	394.89	0.28
Indian Creek	893.67*	100 Year	3510.00	552.37	564.17		564.40	0.001773	4.43	1229.75	399.53	0.30
Indian Creek	893.67*	200 Year	3800.00	552.37	564.33		564.57	0.001832	4.57	1295.57	401.09	0.30
Indian Creek	893.67*	500 Year	4830.00	552.37	564.85		565.14	0.002026	5.04	1507.21	406.09	0.32
Indian Creek	799	10 Year	1800.00	552.05	562.81		562.93	0.000989	2.95	830.77	368.71	0.22
Indian Creek	799	50 Year	2980.00	552.05	563.73		563.90	0.001262	3.68	1214.98	434.04	0.25
Indian Creek	799	100 Year	3510.00	552.05	564.05		564.24	0.001375	3.96	1352.01	437.87	0.26
Indian Creek	799	200 Year	3800.00	552.05	564.21		564.41	0.001432	4.10	1421.92	439.80	0.27
Indian Creek	799	500 Year	4830.00	552.05	564.72		564.95	0.001615	4.56	1646.89	445.36	0.29
Indian Creek	699	10 Year	1800.00	551.66	562.73		562.83	0.000943	2.80	943.53	458.56	0.21
Indian Creek	699	50 Year	2980.00	551.66	563.64		563.77	0.001145	3.41	1390.30	506.03	0.24
Indian Creek	699	100 Year	3510.00	551.66	563.95		564.10	0.001228	3.64	1547.62	511.71	0.25
Indian Creek	699	200 Year	3800.00	551.66	564.10		564.26	0.001270	3.76	1628.06	514.32	0.25
Indian Creek	699	500 Year	4830.00	551.66	564.60		564.78	0.001404	4.14	1886.99	519.79	0.27
Indian Creek	624.50*	10 Year	1800.00	551.86	562.59		562.74	0.001572	3.42	808.62	434.31	0.27
Indian Creek	624.50*	50 Year	2980.00	551.86	563.49		563.66	0.001733	4.00	1214.29	459.63	0.29
Indian Creek	624.50*	100 Year	3510.00	551.86	563.79		563.98	0.001834	4.25	1352.63	463.53	0.30
Indian Creek	624.50*	200 Year	3800.00	551.86	563.94		564.14	0.001886	4.38	1423.25	465.48	0.30
Indian Creek	624.50*	500 Year	4830.00	551.86	564.42		564.65	0.002060	4.80	1649.60	470.64	0.32
Indian Creek	550	10 Year	1800.00	552.07	562.31		562.56	0.003324	4.52	654.65	439.88	0.38
Indian Creek	550	50 Year	2980.00	552.07	563.27		563.50	0.002811	4.73	1119.07	518.39	0.36
Indian Creek	550	100 Year	3510.00	552.07	563.58		563.81	0.002808	4.90	1280.32	538.88	0.36
Indian Creek	550	200 Year	3800.00	552.07	563.74		563.97	0.002812	4.99	1365.03	551.42	0.36
Indian Creek	550	500 Year	4830.00	552.07	564.23		564.47	0.002853	5.31	1646.05	588.60	0.37
Indian Creek	493.00*	10 Year	1800.00	551.91	561.97	559.67	562.33	0.004648	5.23	535.42	389.75	0.44
Indian Creek	493.00*	50 Year	2980.00	551.91	563.03		563.31	0.003537	5.20	978.02	437.79	0.40
Indian Creek	493.00*	100 Year	3510.00	551.91	563.33		563.62	0.003561	5.41	1111.09	451.06	0.40
Indian Creek	493.00*	200 Year	3800.00	551.91	563.48		563.78	0.003575	5.52	1180.52	458.72	0.41
Indian Creek	493.00*	500 Year	4830.00	551.91	563.96		564.28	0.003681	5.91	1403.47	476.87	0.42
Indian Creek	436	10 Year	1800.00	551.74	560.77	559.62	561.85	0.012638	8.34	227.10	102.24	0.72
Indian Creek	436	50 Year	2980.00	551.74	562.69		563.06	0.004997	5.90	849.13	409.73	0.47
Indian Creek	436	100 Year	3510.00	551.74	563.00		563.38	0.004893	6.08	976.71	417.57	0.47
Indian Creek	436	200 Year	3800.00	551.74	563.15		563.54	0.004849	6.17	1042.28	420.69	0.47
Indian Creek	436	500 Year	4830.00	551.74	563.62		564.03	0.004915	6.56	1241.75	432.44	0.48
Indian Creek	341.00*	10 Year	1800.00	551.07	559.71		560.68	0.011234	7.90	227.78	54.35	0.68
Indian Creek	341.00*	50 Year	2980.00	551.07	561.40	560.17	562.36	0.009797	8.18	494.56	339.95	0.65
Indian Creek	341.00*	100 Year	3510.00	551.07	561.75	561.66	562.69	0.009312	8.36	618.96	360.17	0.65
Indian Creek	341.00*	200 Year	3800.00	551.07	561.91	561.83	562.86	0.009311	8.52	674.59	374.10	0.65

HEC-RAS Plan: nat River: Indian Creek Reach: Indian Creek (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Indian Creek	341.00*	500 Year	4830.00	551.07	562.40	562.23	563.36	0.009080	8.93	869.76	404.41	0.65
Indian Creek	246	10 Year	1800.00	550.41	558.93		559.68	0.008646	6.97	258.07	61.20	0.60
Indian Creek	246	50 Year	2980.00	550.41	560.60	558.89	561.51	0.007919	7.74	462.75	411.13	0.60
Indian Creek	246	100 Year	3510.00	550.41	561.09	559.50	561.90	0.006830	7.63	690.53	481.30	0.56
Indian Creek	246	200 Year	3800.00	550.41	561.32	559.74	562.07	0.006311	7.53	803.04	492.82	0.54
Indian Creek	246	500 Year	4830.00	550.41	561.98		562.61	0.005303	7.40	1134.88	517.97	0.51
Indian Creek	179.50*	10 Year	1800.00	550.17	558.34		559.10	0.008719	7.02	256.34	61.11	0.60
Indian Creek	179.50*	50 Year	2980.00	550.17	560.04	558.35	560.98	0.007891	7.85	437.25	313.55	0.60
Indian Creek	179.50*	100 Year	3510.00	550.17	560.59	558.93	561.45	0.006791	7.78	638.68	398.21	0.57
Indian Creek	179.50*	200 Year	3800.00	550.17	560.77	559.10	561.64	0.006735	7.91	713.36	415.51	0.57
Indian Creek	179.50*	500 Year	4830.00	550.17	561.50		562.23	0.005623	7.79	1026.19	445.39	0.53
Indian Creek	113	10 Year	1800.00	549.94	557.32		558.37	0.013301	8.19	219.66	56.91	0.74
Indian Creek	113	50 Year	2980.00	549.94	559.31	557.98	560.39	0.009570	8.41	389.48	217.52	0.66
Indian Creek	113	100 Year	3510.00	549.94	560.01	558.64	560.96	0.007562	8.15	591.78	364.18	0.60
Indian Creek	113	200 Year	3800.00	549.94	560.31	558.96	561.19	0.006853	8.01	706.73	410.93	0.57
Indian Creek	113	500 Year	4830.00	549.94	561.19		561.86	0.005011	7.50	1097.92	468.47	0.50
Indian Creek	56.50*	10 Year	1800.00	549.92	557.16		557.75	0.005962	6.17	291.93	64.13	0.51
Indian Creek	56.50*	50 Year	2980.00	549.92	559.16		559.87	0.005645	6.80	448.11	169.50	0.51
Indian Creek	56.50*	100 Year	3510.00	549.92	559.84		560.55	0.004978	6.90	607.71	296.18	0.49
Indian Creek	56.50*	200 Year	3800.00	549.92	560.09		560.82	0.004860	7.01	688.85	326.52	0.49
Indian Creek	56.50*	500 Year	4830.00	549.92	560.90		561.59	0.004382	7.20	969.48	367.40	0.47
Indian Creek	0	10 Year	1800.00	549.90	557.10	553.98	557.45	0.003004	4.71	382.46	75.39	0.37
Indian Creek	0	50 Year	2980.00	549.90	559.11	555.36	559.57	0.003005	5.44	560.22	176.60	0.38
Indian Creek	0	100 Year	3510.00	549.90	559.79	555.89	560.27	0.003005	5.63	718.41	290.45	0.39
Indian Creek	0	200 Year	3800.00	549.90	560.04	556.15	560.54	0.003003	5.77	793.38	302.73	0.39
Indian Creek	0	500 Year	4830.00	549.90	560.81	557.03	561.34	0.003003	6.19	1040.76	339.23	0.39

HEC-RAS Plan: nat River: Indian Creek Reach: Indian Creek

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Indian Creek	4512	10 Year	573.45	573.09	0.36	0.31	0.00	0.07	1562.16	237.77	356.33
Indian Creek	4512	50 Year	574.65	574.39	0.26	0.21	0.00	2.84	1894.47	1082.69	460.62
Indian Creek	4512	100 Year	575.10	574.87	0.23	0.19	0.00	5.15	1993.28	1511.57	464.32
Indian Creek	4512	200 Year	575.34	575.12	0.22	0.18	0.00	6.62	2050.62	1742.77	466.11
Indian Creek	4512	500 Year	576.10	575.90	0.20	0.16	0.00	12.83	2264.38	2552.79	471.32
Indian Creek											
Indian Creek	4427.00*	10 Year	573.14	572.75	0.39	0.25	0.04	0.78	1619.63	179.60	314.78
Indian Creek	4427.00*	50 Year	574.43	574.14	0.29	0.18	0.02	5.90	1983.93	990.17	392.33
Indian Creek	4427.00*	100 Year	574.91	574.65	0.26	0.16	0.02	9.07	2118.34	1382.59	401.28
Indian Creek	4427.00*	200 Year	575.15	574.90	0.26	0.16	0.02	10.96	2192.38	1596.66	405.20
Indian Creek	4427.00*	500 Year	575.93	575.69	0.24	0.15	0.01	18.50	2456.48	2355.03	416.02
Indian Creek											
Indian Creek	4342	10 Year	572.85	572.58	0.27	0.16	0.03	2.40	1496.60	301.00	351.39
Indian Creek	4342	50 Year	574.23	574.02	0.21	0.12	0.02	8.84	1827.99	1143.17	367.90
Indian Creek	4342	100 Year	574.73	574.53	0.20	0.11	0.01	12.33	1976.27	1521.39	373.74
Indian Creek	4342	200 Year	574.98	574.78	0.20	0.11	0.01	14.37	2058.22	1727.42	376.78
Indian Creek	4342	500 Year	575.77	575.57	0.20	0.11	0.01	22.21	2343.91	2463.88	384.35
Indian Creek											
Indian Creek	4263.00*	10 Year	572.67	572.48	0.18	0.12	0.02	2.33	1441.17	356.50	359.04
Indian Creek	4263.00*	50 Year	574.09	573.94	0.15	0.09	0.01	15.05	1827.98	1136.97	380.03
Indian Creek	4263.00*	100 Year	574.60	574.44	0.15	0.08	0.01	23.21	2000.20	1486.59	386.25
Indian Creek	4263.00*	200 Year	574.85	574.69	0.16	0.08	0.01	28.17	2093.83	1678.00	388.97
Indian Creek	4263.00*	500 Year	575.65	575.49	0.16	0.08	0.02	48.32	2422.89	2358.79	397.16
Indian Creek											
Indian Creek	4184	10 Year	572.53	572.40	0.13	0.10	0.00	4.45	1375.38	420.17	412.50
Indian Creek	4184	50 Year	573.99	573.88	0.11	0.07	0.00	108.29	1739.92	1131.79	452.82
Indian Creek	4184	100 Year	574.50	574.39	0.11	0.07	0.00	168.62	1902.54	1438.85	457.80
Indian Creek	4184	200 Year	574.75	574.65	0.11	0.07	0.00	202.73	1992.07	1605.20	460.15
Indian Creek	4184	500 Year	575.56	575.44	0.11	0.07	0.00	329.76	2308.05	2192.19	466.62
Indian Creek											
Indian Creek	4107.50*	10 Year	572.43	572.28	0.14	0.07	0.02	189.61	1372.60	237.79	404.88
Indian Creek	4107.50*	50 Year	573.91	573.80	0.12	0.06	0.02	500.29	1702.38	777.33	463.34
Indian Creek	4107.50*	100 Year	574.43	574.31	0.11	0.06	0.01	655.47	1841.32	1013.21	470.14
Indian Creek	4107.50*	200 Year	574.68	574.57	0.11	0.05	0.01	740.09	1918.35	1141.56	473.26
Indian Creek	4107.50*	500 Year	575.49	575.37	0.12	0.05	0.02	1040.05	2191.31	1598.64	482.13
Indian Creek											
Indian Creek	4031	10 Year	572.34	572.26	0.08	0.07	0.01	658.93	1013.09	127.98	494.77
Indian Creek	4031	50 Year	573.84	573.78	0.06	0.05	0.01	1311.29	1217.54	451.17	575.01
Indian Creek	4031	100 Year	574.36	574.29	0.07	0.05	0.01	1563.47	1337.21	609.32	599.32
Indian Creek	4031	200 Year	574.61	574.55	0.06	0.05	0.01	1729.86	1382.09	688.04	601.95
Indian Creek	4031	500 Year	575.42	575.35	0.07	0.04	0.01	2314.72	1546.48	968.81	609.33
Indian Creek											
Indian Creek	3971.50*	10 Year	572.26	572.06	0.20	0.13	0.01	157.45	1497.60	144.96	370.33
Indian Creek	3971.50*	50 Year	573.78	573.63	0.15	0.10	0.01	618.57	1848.04	513.39	477.99
Indian Creek	3971.50*	100 Year	574.30	574.16	0.14	0.09	0.01	835.22	2001.67	673.11	512.25
Indian Creek	3971.50*	200 Year	574.56	574.42	0.14	0.08	0.01	975.68	2070.10	754.22	518.11
Indian Creek	3971.50*	500 Year	575.37	575.24	0.14	0.08	0.01	1485.21	2313.01	1031.78	529.56
Indian Creek											
Indian Creek	3912	10 Year	572.12	571.84	0.28	0.33	0.02		1665.64	134.36	218.64
Indian Creek	3912	50 Year	573.68	573.43	0.25	0.29	0.03	51.74	2273.38	654.88	416.94
Indian Creek	3912	100 Year	574.21	573.96	0.24	0.27	0.04	156.69	2480.53	872.78	481.66
Indian Creek	3912	200 Year	574.47	574.23	0.23	0.27	0.04	242.07	2573.47	984.46	500.61
Indian Creek	3912	500 Year	575.29	575.08	0.21	0.24	0.05	610.35	2868.53	1351.12	513.35
Indian Creek											
Indian Creek	3817.33*	10 Year	571.78	571.35	0.43	0.43	0.01	0.13	1791.25	8.62	86.51
Indian Creek	3817.33*	50 Year	573.35	572.75	0.60	0.43	0.00	123.66	2805.39	50.96	182.47
Indian Creek	3817.33*	100 Year	573.89	573.24	0.65	0.44	0.00	238.86	3195.31	75.83	194.11
Indian Creek	3817.33*	200 Year	574.16	573.48	0.68	0.44	0.00	308.12	3401.67	90.21	243.90
Indian Creek	3817.33*	500 Year	575.00	574.28	0.72	0.43	0.00	643.36	4040.38	146.26	397.25
Indian Creek											
Indian Creek	3722.67*	10 Year	571.35	570.85	0.50	0.42	0.01	13.49	1781.44	5.07	125.77
Indian Creek	3722.67*	50 Year	572.92	572.29	0.63	0.41	0.02	255.64	2692.72	31.63	179.49
Indian Creek	3722.67*	100 Year	573.45	572.77	0.68	0.41	0.02	415.38	3046.58	48.05	188.20
Indian Creek	3722.67*	200 Year	573.72	573.02	0.70	0.42	0.02	508.67	3233.57	57.76	214.52
Indian Creek	3722.67*	500 Year	574.56	573.81	0.75	0.42	0.02	902.11	3831.20	96.69	334.07
Indian Creek											
Indian Creek	3628	10 Year	570.92	570.45	0.47	0.34	0.03	77.01	1718.93	4.07	144.37
Indian Creek	3628	50 Year	572.49	571.93	0.56	0.35	0.02	452.68	2502.71	24.62	182.09
Indian Creek	3628	100 Year	573.01	572.41	0.60	0.36	0.01	656.56	2816.39	37.05	189.44
Indian Creek	3628	200 Year	573.27	572.65	0.63	0.37	0.01	772.95	2982.65	44.39	211.81

HEC-RAS Plan: nat River: Indian Creek Reach: Indian Creek (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Indian Creek	3628	500 Year	574.12	573.45	0.67	0.38	0.00	1244.38	3510.91	74.71	319.87
Indian Creek	3535.33*	10 Year	570.55	570.19	0.36	0.25	0.04	19.83	1779.36	0.82	126.39
Indian Creek	3535.33*	50 Year	572.12	571.62	0.50	0.27	0.04	213.54	2756.82	9.64	173.92
Indian Creek	3535.33*	100 Year	572.64	572.08	0.56	0.29	0.04	330.99	3163.29	15.73	187.20
Indian Creek	3535.33*	200 Year	572.90	572.30	0.60	0.30	0.04	401.59	3378.99	19.43	192.87
Indian Creek	3535.33*	500 Year	573.74	573.05	0.69	0.32	0.04	698.53	4095.91	35.56	237.97
Indian Creek	3442.67*	10 Year	570.26	570.02	0.25	0.16	0.03	3.18	1796.73	0.08	115.23
Indian Creek	3442.67*	50 Year	571.81	571.44	0.37	0.19	0.03	102.97	2873.40	3.63	170.11
Indian Creek	3442.67*	100 Year	572.32	571.89	0.43	0.20	0.04	175.83	3327.61	6.57	179.63
Indian Creek	3442.67*	200 Year	572.56	572.10	0.46	0.21	0.04	218.14	3573.45	8.41	184.62
Indian Creek	3442.67*	500 Year	573.38	572.82	0.56	0.23	0.05	409.62	4403.46	16.92	273.44
Indian Creek	3350	10 Year	570.08	569.91	0.16	0.15	0.01	0.94	1799.06	0.00	117.03
Indian Creek	3350	50 Year	571.59	571.33	0.26	0.17	0.01	48.18	2930.55	1.27	185.45
Indian Creek	3350	100 Year	572.08	571.77	0.30	0.18	0.01	96.98	3410.37	2.66	229.25
Indian Creek	3350	200 Year	572.31	571.98	0.33	0.19	0.01	130.87	3665.56	3.57	241.70
Indian Creek	3350	500 Year	573.10	572.69	0.40	0.22	0.01	306.08	4515.86	8.06	288.91
Indian Creek	3263.50*	10 Year	569.92	569.70	0.22	0.19	0.00	35.35	1764.65	0.00	151.41
Indian Creek	3263.50*	50 Year	571.42	571.10	0.31	0.18	0.03	188.62	2788.26	3.13	191.25
Indian Creek	3263.50*	100 Year	571.89	571.52	0.36	0.18	0.05	270.70	3233.06	6.24	206.90
Indian Creek	3263.50*	200 Year	572.11	571.72	0.39	0.18	0.05	318.79	3472.96	8.25	213.90
Indian Creek	3263.50*	500 Year	572.87	572.35	0.52	0.19	0.09	430.47	4381.61	17.92	325.82
Indian Creek	3177	10 Year	569.72	569.51	0.22	0.15	0.00	125.35	1674.63	0.02	199.98
Indian Creek	3177	50 Year	571.21	570.99	0.22	0.12	0.00	475.39	2354.75	149.86	508.77
Indian Creek	3177	100 Year	571.66	571.45	0.21	0.12	0.00	638.46	2565.89	305.65	532.92
Indian Creek	3177	200 Year	571.87	571.66	0.21	0.12	0.00	724.94	2682.61	392.45	545.96
Indian Creek	3177	500 Year	572.58	572.38	0.21	0.12	0.01	1050.97	3047.81	731.23	596.93
Indian Creek	3108.00*	10 Year	569.58	569.36	0.22	0.11	0.01	107.40	1691.69	0.92	248.68
Indian Creek	3108.00*	50 Year	571.09	570.86	0.23	0.10	0.01	548.51	2399.53	31.95	330.70
Indian Creek	3108.00*	100 Year	571.54	571.29	0.25	0.10	0.01	755.89	2696.71	57.41	369.22
Indian Creek	3108.00*	200 Year	571.75	571.49	0.26	0.11	0.02	870.31	2855.33	74.36	386.19
Indian Creek	3108.00*	500 Year	572.46	572.17	0.28	0.11	0.02	1296.03	3374.21	159.76	447.28
Indian Creek	3039	10 Year	569.45	569.28	0.17	0.06	0.04	135.64	1661.34	3.02	285.97
Indian Creek	3039	50 Year	570.97	570.78	0.19	0.04	0.05	609.02	2336.41	34.57	422.94
Indian Creek	3039	100 Year	571.42	571.22	0.20	0.04	0.05	866.12	2592.19	51.70	446.03
Indian Creek	3039	200 Year	571.62	571.42	0.20	0.05	0.05	1009.67	2729.21	61.12	453.73
Indian Creek	3039	500 Year	572.33	572.11	0.22	0.05	0.06	1568.77	3155.51	105.72	557.10
Indian Creek	2945	10 Year	569.35	569.32	0.03	0.03	0.00	68.78	842.31	888.91	833.52
Indian Creek	2945	50 Year	570.88	570.86	0.02	0.02	0.00	154.24	978.86	1846.90	870.86
Indian Creek	2945	100 Year	571.32	571.30	0.02	0.02	0.00	189.89	1070.67	2249.44	875.82
Indian Creek	2945	200 Year	571.52	571.50	0.02	0.02	0.00	209.25	1123.67	2467.08	877.55
Indian Creek	2945	500 Year	572.22	572.20	0.03	0.02	0.00	280.13	1300.98	3248.89	883.11
Indian Creek	2884.50*	10 Year	569.31	569.27	0.04	0.05	0.00	3.62	918.09	878.29	771.30
Indian Creek	2884.50*	50 Year	570.86	570.83	0.03	0.03	0.00	32.50	1043.44	1904.06	832.53
Indian Creek	2884.50*	100 Year	571.30	571.27	0.03	0.03	0.00	48.31	1140.48	2321.21	843.05
Indian Creek	2884.50*	200 Year	571.51	571.48	0.03	0.02	0.00	57.09	1197.31	2545.60	847.95
Indian Creek	2884.50*	500 Year	572.20	572.17	0.03	0.02	0.00	93.91	1385.65	3350.44	858.81
Indian Creek	2824	10 Year	569.26	569.18	0.07	0.18	0.04		1077.64	722.36	694.68
Indian Creek	2824	50 Year	570.83	570.79	0.04	0.12	0.06	0.55	1132.41	1847.03	786.34
Indian Creek	2824	100 Year	571.28	571.24	0.04	0.11	0.05	2.92	1233.28	2273.81	801.39
Indian Creek	2824	200 Year	571.48	571.44	0.04	0.10	0.05	5.00	1293.09	2501.91	807.01
Indian Creek	2824	500 Year	572.18	572.14	0.04	0.09	0.03	17.52	1507.39	3305.09	836.38
Indian Creek	2772	10 Year	569.04	568.61	0.43	0.64	0.06		1799.67	0.33	69.34
Indian Creek	2772	50 Year	570.65	570.01	0.65	0.84	0.08	9.49	2875.31	95.20	451.53
Indian Creek	2772	100 Year	571.12	570.54	0.58	0.85	0.04	28.75	3076.31	404.94	604.58
Indian Creek	2772	200 Year	571.33	570.81	0.52	0.84	0.02	42.09	3131.69	626.22	637.23
Indian Creek	2772	500 Year	572.06	571.71	0.35	0.76	0.02	114.32	3174.57	1541.11	750.71
Indian Creek	2474	10 Year	568.34	568.12	0.23	0.16	0.04	69.90	1715.06	15.05	149.42
Indian Creek	2474	50 Year	569.73	569.36	0.37	0.21	0.06	239.43	2646.02	94.54	196.90

HEC-RAS Plan: nat River: Indian Creek Reach: Indian Creek (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Indian Creek	2474	100 Year	570.22	569.80	0.43	0.23	0.06	330.13	3026.17	153.70	210.02
Indian Creek	2474	200 Year	570.47	570.01	0.46	0.24	0.06	382.48	3226.60	190.92	215.43
Indian Creek	2474	500 Year	571.28	570.72	0.55	0.26	0.07	580.67	3904.74	344.60	235.30
Indian Creek	2413	10 Year	568.14	567.47	0.67	0.47	0.03	34.83	1749.40	15.76	118.78
Indian Creek	2413	50 Year	569.46	568.49	0.97	0.53	0.04	136.24	2699.21	144.55	177.54
Indian Creek	2413	100 Year	569.93	568.87	1.06	0.54	0.05	193.02	3077.29	239.69	197.71
Indian Creek	2413	200 Year	570.17	569.06	1.11	0.54	0.06	225.57	3275.30	299.13	207.00
Indian Creek	2413	500 Year	570.94	569.67	1.27	0.54	0.09	355.81	3965.81	508.38	255.25
Indian Creek	2350.50*	10 Year	567.64	567.07	0.58	0.38	0.05	9.18	1767.37	23.45	143.90
Indian Creek	2350.50*	50 Year	568.89	568.07	0.82	0.43	0.06	66.31	2723.55	190.14	193.50
Indian Creek	2350.50*	100 Year	569.34	568.45	0.88	0.43	0.07	106.77	3096.26	306.97	206.06
Indian Creek	2350.50*	200 Year	569.57	568.66	0.91	0.42	0.07	131.40	3284.20	384.40	209.05
Indian Creek	2350.50*	500 Year	570.31	569.33	0.97	0.41	0.07	232.31	3914.44	683.26	219.34
Indian Creek	2288	10 Year	567.22	566.79	0.43	0.33	0.02	1.72	1742.94	55.34	163.60
Indian Creek	2288	50 Year	568.40	567.79	0.61	0.44	0.01	28.38	2681.43	270.19	207.24
Indian Creek	2288	100 Year	568.84	568.19	0.65	0.47	0.02	54.61	3044.56	410.84	214.41
Indian Creek	2288	200 Year	569.07	568.40	0.67	0.48	0.02	71.77	3235.76	492.47	217.64
Indian Creek	2288	500 Year	569.83	569.09	0.73	0.52	0.05	149.17	3881.59	799.24	226.53
Indian Creek	2214.00*	10 Year	566.87	566.51	0.36	0.21	0.04	3.59	1793.14	3.27	112.65
Indian Creek	2214.00*	50 Year	567.95	567.27	0.69	0.32	0.09	27.81	2914.02	38.17	167.29
Indian Creek	2214.00*	100 Year	568.36	567.52	0.84	0.36	0.11	52.94	3392.98	64.08	177.73
Indian Creek	2214.00*	200 Year	568.56	567.64	0.92	0.38	0.12	69.27	3650.34	80.39	182.24
Indian Creek	2214.00*	500 Year	569.25	568.03	1.23	0.46	0.18	140.34	4542.33	147.33	196.33
Indian Creek	2140	10 Year	566.63	566.39	0.24	0.24	0.01	71.21	1728.38	0.41	245.36
Indian Creek	2140	50 Year	567.55	567.15	0.40	0.34	0.00	319.81	2651.80	8.38	285.04
Indian Creek	2140	100 Year	567.89	567.42	0.47	0.38	0.00	458.24	3034.52	17.24	297.13
Indian Creek	2140	200 Year	568.06	567.55	0.51	0.40	0.00	539.04	3237.18	23.78	302.08
Indian Creek	2140	500 Year	568.61	567.99	0.62	0.45	0.00	856.70	3918.24	55.06	315.70
Indian Creek	2055.50*	10 Year	566.38	566.06	0.32	0.36	0.03	227.85	1566.74	5.41	305.89
Indian Creek	2055.50*	50 Year	567.21	566.76	0.45	0.41	0.06	665.65	2277.24	37.11	338.46
Indian Creek	2055.50*	100 Year	567.50	566.99	0.51	0.45	0.07	875.33	2577.34	57.32	348.93
Indian Creek	2055.50*	200 Year	567.65	567.11	0.54	0.47	0.07	992.64	2738.02	69.34	354.61
Indian Creek	2055.50*	500 Year	568.16	567.52	0.64	0.51	0.09	1438.82	3269.58	121.60	375.60
Indian Creek	1971	10 Year	565.99	565.77	0.22	0.64	0.06	689.26	1078.24	32.51	407.07
Indian Creek	1971	50 Year	566.74	566.49	0.25	0.60	0.05	1406.67	1475.99	97.34	436.29
Indian Creek	1971	100 Year	566.99	566.70	0.28	0.60	0.04	1721.22	1660.92	127.86	446.56
Indian Creek	1971	200 Year	567.11	566.81	0.30	0.59	0.04	1894.05	1760.66	145.29	451.57
Indian Creek	1971	500 Year	567.56	567.22	0.35	0.54	0.02	2530.22	2083.88	215.91	470.89
Indian Creek	1886.00*	10 Year	565.29	564.48	0.81	0.33	0.22	165.98	1623.19	10.83	279.11
Indian Creek	1886.00*	50 Year	566.09	565.32	0.77	0.28	0.20	709.49	2182.63	87.88	416.46
Indian Creek	1886.00*	100 Year	566.34	565.63	0.71	0.26	0.19	1029.43	2347.55	133.03	439.75
Indian Creek	1886.00*	200 Year	566.49	565.84	0.65	0.25	0.17	1230.64	2404.77	164.58	454.05
Indian Creek	1886.00*	500 Year	567.00	566.46	0.54	0.22	0.13	1929.85	2619.76	280.39	489.64
Indian Creek	1801	10 Year	564.61	564.51	0.09	0.17	0.00	82.23	910.96	806.81	578.72
Indian Creek	1801	50 Year	565.55	565.46	0.09	0.14	0.00	400.61	1180.68	1398.71	702.26
Indian Creek	1801	100 Year	565.90	565.81	0.09	0.14	0.00	580.69	1287.18	1642.14	718.57
Indian Creek	1801	200 Year	566.07	565.98	0.09	0.13	0.00	685.23	1343.27	1771.50	723.67
Indian Creek	1801	500 Year	566.64	566.55	0.10	0.13	0.00	1075.68	1534.00	2220.32	734.86
Indian Creek	1709.00*	10 Year	564.43	564.30	0.13	0.18	0.00	149.92	1059.50	590.58	599.34
Indian Creek	1709.00*	50 Year	565.41	565.30	0.11	0.14	0.00	626.15	1310.79	1043.05	682.45
Indian Creek	1709.00*	100 Year	565.76	565.65	0.11	0.13	0.00	866.07	1414.22	1229.71	697.06
Indian Creek	1709.00*	200 Year	565.94	565.83	0.11	0.13	0.00	999.38	1470.19	1330.43	703.64
Indian Creek	1709.00*	500 Year	566.52	566.40	0.11	0.12	0.00	1493.10	1659.27	1677.63	717.37
Indian Creek	1617	10 Year	564.24	564.10	0.14	0.15	0.00	271.41	1106.17	422.42	605.10
Indian Creek	1617	50 Year	565.27	565.16	0.11	0.11	0.00	870.84	1324.58	784.59	685.64
Indian Creek	1617	100 Year	565.62	565.52	0.11	0.11	0.00	1152.17	1423.84	933.99	704.84
Indian Creek	1617	200 Year	565.80	565.70	0.11	0.11	0.00	1312.53	1474.89	1012.58	709.14
Indian Creek	1617	500 Year	566.39	566.28	0.11	0.10	0.00	1891.59	1652.12	1286.29	720.08

HEC-RAS Plan: nat River: Indian Creek Reach: Indian Creek (Continued)

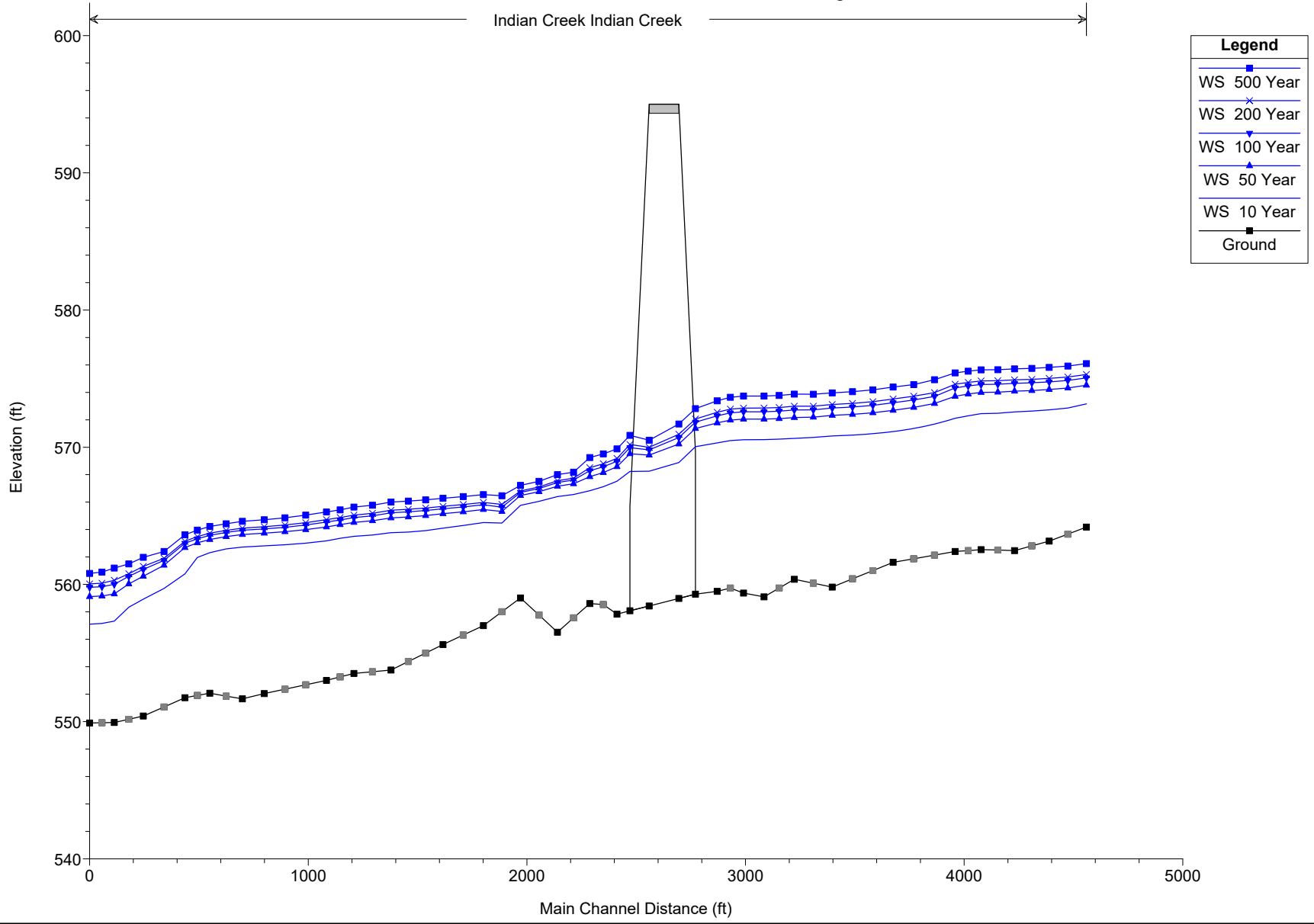
Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Indian Creek	1537.67*	10 Year	564.09	563.92	0.17	0.12	0.01	266.32	1328.84	204.84	585.33
Indian Creek	1537.67*	50 Year	565.15	565.02	0.13	0.10	0.00	912.51	1601.28	466.21	682.36
Indian Creek	1537.67*	100 Year	565.51	565.39	0.13	0.10	0.00	1216.39	1718.47	575.14	703.09
Indian Creek	1537.67*	200 Year	565.70	565.57	0.13	0.10	0.00	1389.90	1777.70	632.40	707.37
Indian Creek	1537.67*	500 Year	566.29	566.16	0.12	0.09	0.00	2011.26	1984.81	833.93	720.48
Indian Creek	1458.33*	10 Year	563.96	563.81	0.15	0.08	0.02	262.74	1421.64	115.62	582.63
Indian Creek	1458.33*	50 Year	565.05	564.92	0.13	0.08	0.00	911.05	1769.90	299.04	693.37
Indian Creek	1458.33*	100 Year	565.41	565.29	0.12	0.08	0.00	1217.93	1910.28	381.79	717.60
Indian Creek	1458.33*	200 Year	565.60	565.48	0.12	0.08	0.00	1396.00	1978.38	425.62	721.03
Indian Creek	1458.33*	500 Year	566.19	566.07	0.12	0.08	0.00	2031.40	2215.52	583.08	732.79
Indian Creek	1379	10 Year	563.86	563.77	0.09	0.08	0.01	383.25	1345.47	71.27	544.14
Indian Creek	1379	50 Year	564.96	564.85	0.11	0.10	0.01	900.63	1881.00	198.37	710.76
Indian Creek	1379	100 Year	565.33	565.22	0.11	0.10	0.01	1204.96	2046.01	259.03	738.51
Indian Creek	1379	200 Year	565.52	565.40	0.11	0.10	0.01	1383.44	2124.32	292.25	741.70
Indian Creek	1379	500 Year	566.11	566.00	0.11	0.10	0.01	2022.44	2392.86	414.70	752.06
Indian Creek	1294.00*	10 Year	563.77	563.61	0.16	0.11	0.00	104.78	1650.90	44.32	318.93
Indian Creek	1294.00*	50 Year	564.85	564.65	0.21	0.13	0.00	362.50	2352.36	265.15	569.06
Indian Creek	1294.00*	100 Year	565.22	565.00	0.22	0.13	0.00	529.97	2601.43	378.60	605.10
Indian Creek	1294.00*	200 Year	565.41	565.18	0.22	0.14	0.00	630.43	2726.65	442.92	620.68
Indian Creek	1294.00*	500 Year	566.00	565.77	0.23	0.14	0.00	1007.37	3143.25	679.38	656.12
Indian Creek	1209	10 Year	563.66	563.51	0.15	0.10	0.00	2.61	1618.38	179.01	351.45
Indian Creek	1209	50 Year	564.72	564.52	0.20	0.11	0.00	49.66	2341.63	588.71	490.44
Indian Creek	1209	100 Year	565.08	564.87	0.21	0.12	0.01	92.98	2599.01	818.01	591.53
Indian Creek	1209	200 Year	565.27	565.05	0.21	0.12	0.01	127.41	2727.07	945.52	620.61
Indian Creek	1209	500 Year	565.86	565.64	0.22	0.12	0.01	296.09	3129.92	1403.99	680.57
Indian Creek	1146.00*	10 Year	563.56	563.36	0.19	0.13	0.01	0.01	1581.05	218.94	327.36
Indian Creek	1146.00*	50 Year	564.60	564.36	0.25	0.14	0.00	0.90	2250.04	729.06	404.92
Indian Creek	1146.00*	100 Year	564.96	564.70	0.26	0.15	0.00	1.82	2501.82	1006.36	410.95
Indian Creek	1146.00*	200 Year	565.14	564.87	0.27	0.15	0.00	2.46	2634.09	1163.45	413.71
Indian Creek	1146.00*	500 Year	565.73	565.44	0.30	0.15	0.00	5.46	3080.78	1743.76	421.48
Indian Creek	1083	10 Year	563.42	563.17	0.25	0.19	0.01		1518.76	281.24	344.98
Indian Creek	1083	50 Year	564.46	564.19	0.27	0.22	0.01	0.07	2032.81	947.12	423.53
Indian Creek	1083	100 Year	564.81	564.54	0.27	0.22	0.00	0.26	2228.40	1281.34	429.58
Indian Creek	1083	200 Year	565.00	564.72	0.28	0.22	0.00	0.42	2332.25	1467.33	432.71
Indian Creek	1083	500 Year	565.58	565.28	0.29	0.23	0.00	1.31	2686.35	2142.34	442.30
Indian Creek	988.33*	10 Year	563.21	563.01	0.20	0.15	0.01		1574.54	225.46	351.05
Indian Creek	988.33*	50 Year	564.24	563.99	0.24	0.17	0.01	0.23	2190.73	789.05	407.65
Indian Creek	988.33*	100 Year	564.59	564.33	0.26	0.18	0.01	0.59	2433.56	1075.84	414.46
Indian Creek	988.33*	200 Year	564.77	564.50	0.27	0.19	0.01	0.87	2560.96	1238.17	417.37
Indian Creek	988.33*	500 Year	565.35	565.05	0.30	0.21	0.00	2.27	2992.95	1834.78	425.48
Indian Creek	893.67*	10 Year	563.05	562.89	0.16	0.11	0.01	0.00	1604.06	195.93	366.93
Indian Creek	893.67*	50 Year	564.05	563.84	0.21	0.14	0.01	0.77	2288.13	691.09	394.89
Indian Creek	893.67*	100 Year	564.40	564.17	0.23	0.15	0.01	1.59	2567.72	940.69	399.53
Indian Creek	893.67*	200 Year	564.57	564.33	0.24	0.15	0.01	2.16	2714.48	1083.35	401.09
Indian Creek	893.67*	500 Year	565.14	564.85	0.28	0.17	0.01	4.80	3215.61	1609.59	406.09
Indian Creek	799	10 Year	562.93	562.81	0.12	0.10	0.01	0.28	1599.18	200.54	368.71
Indian Creek	799	50 Year	563.90	563.73	0.17	0.12	0.01	28.00	2312.56	639.43	434.04
Indian Creek	799	100 Year	564.24	564.05	0.19	0.13	0.01	52.98	2604.69	852.33	437.87
Indian Creek	799	200 Year	564.41	564.21	0.20	0.13	0.01	68.58	2759.01	972.41	439.80
Indian Creek	799	500 Year	564.95	564.72	0.23	0.15	0.02	132.52	3284.02	1413.46	445.36
Indian Creek	699	10 Year	562.83	562.73	0.10	0.09	0.00	1.63	1515.12	283.24	458.56
Indian Creek	699	50 Year	563.77	563.64	0.14	0.10	0.00	15.08	2146.97	817.95	506.03
Indian Creek	699	100 Year	564.10	563.95	0.15	0.11	0.00	23.76	2404.48	1081.76	511.71
Indian Creek	699	200 Year	564.26	564.10	0.16	0.11	0.00	29.04	2540.51	1230.45	514.32
Indian Creek	699	500 Year	564.78	564.60	0.18	0.13	0.01	51.16	3002.02	1776.82	519.79
Indian Creek	624.50*	10 Year	562.74	562.59	0.15	0.16	0.01	0.85	1453.49	345.66	434.31
Indian Creek	624.50*	50 Year	563.66	563.49	0.18	0.16	0.00	14.66	2000.69	964.65	459.63
Indian Creek	624.50*	100 Year	563.98	563.79	0.19	0.17	0.00	24.50	2232.28	1253.22	463.53
Indian Creek	624.50*	200 Year	564.14	563.94	0.20	0.17	0.00	30.49	2355.10	1414.42	465.48

HEC-RAS Plan: nat River: Indian Creek Reach: Indian Creek (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Indian Creek	624.50*	500 Year	564.65	564.42	0.23	0.18	0.00	55.25	2775.97	1998.78	470.64
Indian Creek	550	10 Year	562.56	562.31	0.25	0.22	0.01	5.49	1382.87	411.64	439.88
Indian Creek	550	50 Year	563.50	563.27	0.22	0.18	0.01	61.69	1758.88	1159.43	518.39
Indian Creek	550	100 Year	563.81	563.58	0.23	0.18	0.01	97.10	1925.43	1487.47	538.88
Indian Creek	550	200 Year	563.97	563.74	0.23	0.18	0.01	118.34	2014.34	1667.32	551.42
Indian Creek	550	500 Year	564.47	564.23	0.25	0.18	0.01	210.15	2317.67	2302.19	588.60
Indian Creek	493.00*	10 Year	562.33	561.97	0.36	0.41	0.07		1494.42	305.58	389.75
Indian Creek	493.00*	50 Year	563.31	563.03	0.28	0.24	0.01	2.61	1856.42	1120.97	437.79
Indian Creek	493.00*	100 Year	563.62	563.33	0.29	0.24	0.01	6.91	2042.11	1460.98	451.06
Indian Creek	493.00*	200 Year	563.78	563.48	0.30	0.24	0.01	10.60	2140.10	1649.30	458.72
Indian Creek	493.00*	500 Year	564.28	563.96	0.32	0.24	0.01	33.28	2479.21	2317.51	476.87
Indian Creek	436	10 Year	561.85	560.77	1.07	1.13	0.03		1788.05	11.95	102.24
Indian Creek	436	50 Year	563.06	562.69	0.38	0.65	0.06	0.24	1951.67	1028.10	409.73
Indian Creek	436	100 Year	563.38	563.00	0.38	0.63	0.06	1.30	2135.65	1373.05	417.57
Indian Creek	436	200 Year	563.54	563.15	0.38	0.62	0.06	2.32	2232.29	1565.38	420.69
Indian Creek	436	500 Year	564.03	563.62	0.41	0.62	0.05	7.73	2579.75	2242.52	432.44
Indian Creek	341.00*	10 Year	560.68	559.71	0.97	0.93	0.06		1800.00		54.35
Indian Creek	341.00*	50 Year	562.36	561.40	0.96	0.84	0.02	0.88	2744.01	235.11	339.95
Indian Creek	341.00*	100 Year	562.69	561.75	0.94	0.75	0.04	4.31	3010.36	495.33	360.17
Indian Creek	341.00*	200 Year	562.86	561.91	0.95	0.72	0.06	7.45	3158.01	634.54	374.10
Indian Creek	341.00*	500 Year	563.36	562.40	0.95	0.65	0.10	44.19	3613.53	1172.28	404.41
Indian Creek	246	10 Year	559.68	558.93	0.76	0.58	0.00		1800.00		61.20
Indian Creek	246	50 Year	561.51	560.60	0.91	0.52	0.00	56.33	2898.02	25.66	411.13
Indian Creek	246	100 Year	561.90	561.09	0.81	0.45	0.01	200.14	3126.12	183.75	481.30
Indian Creek	246	200 Year	562.07	561.32	0.75	0.43	0.01	298.21	3209.63	292.16	492.82
Indian Creek	246	500 Year	562.61	561.98	0.63	0.36	0.01	651.85	3498.81	679.34	517.97
Indian Creek	179.50*	10 Year	559.10	558.34	0.77	0.71	0.03		1800.00		61.11
Indian Creek	179.50*	50 Year	560.98	560.04	0.94	0.58	0.01	20.00	2922.58	37.42	313.55
Indian Creek	179.50*	100 Year	561.45	560.59	0.86	0.48	0.01	187.60	3196.66	125.75	398.21
Indian Creek	179.50*	200 Year	561.64	560.77	0.86	0.45	0.00	276.48	3350.87	172.65	415.51
Indian Creek	179.50*	500 Year	562.23	561.50	0.74	0.35	0.02	718.74	3694.00	417.26	445.39
Indian Creek	113	10 Year	558.37	557.32	1.04	0.48	0.14		1800.00		56.91
Indian Creek	113	50 Year	560.39	559.31	1.08	0.41	0.11	6.37	2928.93	44.71	217.52
Indian Creek	113	100 Year	560.96	560.01	0.95	0.34	0.07	156.93	3228.29	124.79	364.18
Indian Creek	113	200 Year	561.19	560.31	0.88	0.32	0.05	285.07	3334.50	180.43	410.93
Indian Creek	113	500 Year	561.86	561.19	0.66	0.26	0.00	863.79	3575.15	391.06	468.47
Indian Creek	56.50*	10 Year	557.75	557.16	0.59	0.23	0.07		1800.00		64.13
Indian Creek	56.50*	50 Year	559.87	559.16	0.72	0.23	0.08	1.58	2973.79	4.63	169.50
Indian Creek	56.50*	100 Year	560.55	559.84	0.72	0.21	0.07	94.74	3393.43	21.83	296.18
Indian Creek	56.50*	200 Year	560.82	560.09	0.72	0.21	0.07	177.03	3589.90	33.07	326.52
Indian Creek	56.50*	500 Year	561.59	560.90	0.70	0.20	0.05	593.10	4149.19	87.71	367.40
Indian Creek	0	10 Year	557.45	557.10	0.34				1800.00		75.39
Indian Creek	0	50 Year	559.57	559.11	0.46			3.17	2975.19	1.64	176.60
Indian Creek	0	100 Year	560.27	559.79	0.48			80.29	3422.46	7.26	290.45
Indian Creek	0	200 Year	560.54	560.04	0.50			148.07	3641.14	10.80	302.73
Indian Creek	0	500 Year	561.34	560.81	0.54			458.79	4341.05	30.15	339.23

basefile after BO review.06.28.2021 Plan: existing 7/8/2021

Indian Creek Indian Creek



HEC-RAS Plan: exist River: Indian Creek Reach: Indian Creek

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Indian Creek	4512	10 Year	1800.00	564.18	573.16		573.49	0.003352	4.98	554.68	361.30	0.38
Indian Creek	4512	50 Year	2980.00	564.18	574.52		574.75	0.002215	4.72	1142.56	461.63	0.32
Indian Creek	4512	100 Year	3510.00	564.18	575.06		575.25	0.001867	4.57	1390.58	466.66	0.30
Indian Creek	4512	200 Year	3800.00	564.18	575.30		575.49	0.001770	4.55	1506.26	467.54	0.30
Indian Creek	4512	500 Year	4830.00	564.18	576.10		576.27	0.001551	4.56	1879.14	472.40	0.28
Indian Creek	4427.00*	10 Year	1800.00	563.67	572.86		573.21	0.003203	5.05	524.08	332.94	0.38
Indian Creek	4427.00*	50 Year	2980.00	563.67	574.31		574.56	0.002154	4.84	1075.28	395.67	0.32
Indian Creek	4427.00*	100 Year	3510.00	563.67	574.87		575.09	0.001884	4.76	1297.27	404.81	0.30
Indian Creek	4427.00*	200 Year	3800.00	563.67	575.12		575.34	0.001815	4.77	1399.85	408.17	0.30
Indian Creek	4427.00*	500 Year	4830.00	563.67	575.92		576.13	0.001664	4.88	1731.44	418.92	0.29
Indian Creek	4342	10 Year	1800.00	563.16	572.73		572.96	0.002085	4.29	673.99	353.04	0.30
Indian Creek	4342	50 Year	2980.00	563.16	574.21		574.39	0.001532	4.23	1209.06	370.03	0.27
Indian Creek	4342	100 Year	3510.00	563.16	574.76		574.94	0.001406	4.25	1417.74	376.66	0.26
Indian Creek	4342	200 Year	3800.00	563.16	575.02		575.19	0.001384	4.30	1513.02	379.28	0.26
Indian Creek	4342	500 Year	4830.00	563.16	575.82		576.00	0.001345	4.50	1819.56	386.49	0.26
Indian Creek	4263.00*	10 Year	1800.00	562.81	572.64		572.80	0.001482	3.58	791.76	361.43	0.26
Indian Creek	4263.00*	50 Year	2980.00	562.81	574.13		574.27	0.001136	3.64	1348.30	382.54	0.24
Indian Creek	4263.00*	100 Year	3510.00	562.81	574.70		574.83	0.001058	3.69	1565.42	388.99	0.23
Indian Creek	4263.00*	200 Year	3800.00	562.81	574.95		575.08	0.001049	3.75	1663.86	391.67	0.23
Indian Creek	4263.00*	500 Year	4830.00	562.81	575.75		575.89	0.001042	3.98	1980.24	399.78	0.23
Indian Creek	4184	10 Year	1800.00	562.47	572.57		572.68	0.001135	3.04	927.13	425.48	0.22
Indian Creek	4184	50 Year	2980.00	562.47	574.09		574.18	0.000833	3.04	1600.76	455.03	0.20
Indian Creek	4184	100 Year	3510.00	562.47	574.65		574.74	0.000768	3.07	1860.62	460.24	0.19
Indian Creek	4184	200 Year	3800.00	562.47	574.91		575.00	0.000760	3.12	1977.51	462.49	0.19
Indian Creek	4184	500 Year	4830.00	562.47	575.71		575.81	0.000751	3.31	2351.06	468.64	0.20
Indian Creek	4107.50*	10 Year	1800.00	562.51	572.47		572.60	0.001056	3.23	937.01	415.58	0.22
Indian Creek	4107.50*	50 Year	2980.00	562.51	574.02		574.12	0.000803	3.25	1631.30	466.39	0.20
Indian Creek	4107.50*	100 Year	3510.00	562.51	574.59		574.69	0.000741	3.26	1901.51	473.51	0.20
Indian Creek	4107.50*	200 Year	3800.00	562.51	574.85		574.94	0.000734	3.31	2022.44	476.50	0.20
Indian Creek	4107.50*	500 Year	4830.00	562.51	575.65		575.75	0.000727	3.49	2409.30	484.86	0.20
Indian Creek	4031	10 Year	1800.00	562.54	572.45		572.52	0.000644	2.68	1287.19	504.32	0.17
Indian Creek	4031	50 Year	2980.00	562.54	574.00		574.05	0.000506	2.69	2137.96	587.92	0.16
Indian Creek	4031	100 Year	3510.00	562.54	574.57		574.63	0.000485	2.74	2482.53	602.19	0.16
Indian Creek	4031	200 Year	3800.00	562.54	574.83		574.88	0.000478	2.77	2636.74	604.64	0.15
Indian Creek	4031	500 Year	4830.00	562.54	575.64		575.70	0.000469	2.89	3127.87	611.80	0.16
Indian Creek	3971.50*	10 Year	1800.00	562.47	572.29		572.45	0.001385	3.58	795.98	386.47	0.25
Indian Creek	3971.50*	50 Year	2980.00	562.47	573.88		574.01	0.000998	3.53	1508.29	486.49	0.22
Indian Creek	3971.50*	100 Year	3510.00	562.47	574.47		574.58	0.000905	3.52	1805.78	518.87	0.21
Indian Creek	3971.50*	200 Year	3800.00	562.47	574.73		574.84	0.000880	3.54	1940.36	522.62	0.21
Indian Creek	3971.50*	500 Year	4830.00	562.47	575.54		575.65	0.000832	3.66	2369.42	533.46	0.21
Indian Creek	3912	10 Year	1800.00	562.40	572.11		572.34	0.002344	4.04	567.28	226.75	0.31
Indian Creek	3912	50 Year	2980.00	562.40	573.72		573.92	0.001758	4.14	1084.62	438.24	0.28
Indian Creek	3912	100 Year	3510.00	562.40	574.32		574.51	0.001519	4.08	1375.48	502.65	0.27
Indian Creek	3912	200 Year	3800.00	562.40	574.59		574.77	0.001451	4.09	1509.16	507.04	0.26
Indian Creek	3912	500 Year	4830.00	562.40	575.42		575.59	0.001294	4.14	1933.48	517.05	0.25
Indian Creek	3817.33*	10 Year	1800.00	562.14	571.69		572.06	0.003405	4.91	382.33	130.84	0.38
Indian Creek	3817.33*	50 Year	2980.00	562.14	573.19		573.67	0.003381	5.80	636.53	192.94	0.40
Indian Creek	3817.33*	100 Year	3510.00	562.14	573.70		574.26	0.003591	6.29	765.65	356.62	0.41
Indian Creek	3817.33*	200 Year	3800.00	562.14	573.98		574.53	0.003456	6.33	871.62	390.77	0.41
Indian Creek	3817.33*	500 Year	4830.00	562.14	574.92		575.38	0.002829	6.20	1245.73	405.31	0.38
Indian Creek	3722.67*	10 Year	1800.00	561.87	571.37		571.75	0.003222	5.03	409.41	152.66	0.38
Indian Creek	3722.67*	50 Year	2980.00	561.87	572.90		573.36	0.003103	5.81	677.17	190.26	0.38
Indian Creek	3722.67*	100 Year	3510.00	561.87	573.44		573.92	0.003063	6.06	803.72	269.56	0.39
Indian Creek	3722.67*	200 Year	3800.00	561.87	573.72		574.20	0.003043	6.19	883.99	323.21	0.39
Indian Creek	3722.67*	500 Year	4830.00	561.87	574.56		575.10	0.003090	6.67	1225.70	440.39	0.40
Indian Creek	3628	10 Year	1800.00	561.61	571.14	566.89	571.46	0.002522	4.75	483.25	166.75	0.33
Indian Creek	3628	50 Year	2980.00	561.61	572.69	569.58	573.07	0.002503	5.47	767.24	216.65	0.34
Indian Creek	3628	100 Year	3510.00	561.61	573.24	570.45	573.64	0.002502	5.72	902.80	277.46	0.35
Indian Creek	3628	200 Year	3800.00	561.61	573.52	570.76	573.92	0.002499	5.84	985.15	332.68	0.35
Indian Creek	3628	500 Year	4830.00	561.61	574.39	571.59	574.80	0.002439	6.15	1306.32	436.15	0.35
Indian Creek	3535.33*	10 Year	1800.00	561.01	570.99	566.89	571.24	0.001899	4.07	507.05	155.94	0.30
Indian Creek	3535.33*	50 Year	2980.00	561.01	572.51	568.77	572.85	0.002033	4.91	777.68	197.91	0.32
Indian Creek	3535.33*	100 Year	3510.00	561.01	573.05	569.32	573.42	0.002085	5.21	891.37	238.30	0.33
Indian Creek	3535.33*	200 Year	3800.00	561.01	573.32	569.58	573.70	0.002108	5.36	957.95	257.84	0.33

HEC-RAS Plan: exist River: Indian Creek Reach: Indian Creek (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #	Chl
Indian Creek	3535.33*	500 Year	4830.00	561.01	574.18	570.72	574.59	0.002124	5.75	1279.40	453.46		0.34
Indian Creek	3442.67*	10 Year	1800.00	560.41	570.88	566.18	571.06	0.001279	3.35	578.74	155.69		0.24
Indian Creek	3442.67*	50 Year	2980.00	560.41	572.40	567.99	572.65	0.001464	4.18	842.70	208.55		0.27
Indian Creek	3442.67*	100 Year	3510.00	560.41	572.93	568.47	573.21	0.001532	4.47	974.67	286.35		0.28
Indian Creek	3442.67*	200 Year	3800.00	560.41	573.19	568.70	573.49	0.001563	4.62	1054.56	314.55		0.28
Indian Creek	3442.67*	500 Year	4830.00	560.41	574.05	569.49	574.38	0.001620	5.02	1364.75	414.51		0.29
Indian Creek	3350	10 Year	1800.00	559.81	570.82	564.97	570.93	0.000808	2.72	686.81	163.71		0.19
Indian Creek	3350	50 Year	2980.00	559.81	572.32	567.16	572.50	0.000973	3.46	1000.87	257.79		0.22
Indian Creek	3350	100 Year	3510.00	559.81	572.85	567.58	573.05	0.001026	3.71	1143.68	301.89		0.23
Indian Creek	3350	200 Year	3800.00	559.81	573.12	567.79	573.33	0.001053	3.84	1219.96	319.47		0.23
Indian Creek	3350	500 Year	4830.00	559.81	573.96	568.52	574.21	0.001133	4.25	1488.76	394.07		0.25
Indian Creek	3263.50*	10 Year	1800.00	560.09	570.71	565.98	570.85	0.001078	3.03	670.74	178.25		0.22
Indian Creek	3263.50*	50 Year	2980.00	560.09	572.19	567.70	572.40	0.001252	3.81	985.33	301.70		0.25
Indian Creek	3263.50*	100 Year	3510.00	560.09	572.72	568.30	572.95	0.001288	4.05	1158.03	333.74		0.26
Indian Creek	3263.50*	200 Year	3800.00	560.09	572.99	568.50	573.22	0.001283	4.14	1249.36	338.62		0.26
Indian Creek	3263.50*	500 Year	4830.00	560.09	573.86	569.36	574.11	0.001270	4.41	1550.35	353.42		0.26
Indian Creek	3177	10 Year	1800.00	560.38	570.64	566.02	570.75	0.000907	2.81	921.49	472.79		0.20
Indian Creek	3177	50 Year	2980.00	560.38	572.17	567.59	572.26	0.000711	2.90	1732.98	583.27		0.19
Indian Creek	3177	100 Year	3510.00	560.38	572.71	568.15	572.80	0.000666	2.94	2062.16	626.76		0.18
Indian Creek	3177	200 Year	3800.00	560.38	572.99	568.38	573.08	0.000641	2.95	2237.58	638.38		0.18
Indian Creek	3177	500 Year	4830.00	560.38	573.87	569.14	573.96	0.000577	2.99	2811.09	658.43		0.17
Indian Creek	3108.00*	10 Year	1800.00	559.74	570.59	565.61	570.69	0.000764	2.75	910.84	304.91		0.19
Indian Creek	3108.00*	50 Year	2980.00	559.74	572.09	567.22	572.20	0.000751	3.13	1470.89	440.86		0.20
Indian Creek	3108.00*	100 Year	3510.00	559.74	572.62	567.92	572.74	0.000748	3.26	1721.81	501.42		0.20
Indian Creek	3108.00*	200 Year	3800.00	559.74	572.90	568.25	573.02	0.000747	3.33	1864.99	550.16		0.20
Indian Creek	3108.00*	500 Year	4830.00	559.74	573.77	569.43	573.90	0.000724	3.50	2398.72	671.93		0.20
Indian Creek	3039	10 Year	1800.00	559.10	570.55	564.58	570.63	0.000534	2.46	1037.43	388.36		0.16
Indian Creek	3039	50 Year	2980.00	559.10	572.05	566.29	572.15	0.000580	2.91	1503.57	548.60		0.17
Indian Creek	3039	100 Year	3510.00	559.10	572.58	566.90	572.69	0.000599	3.07	1731.82	662.14		0.18
Indian Creek	3039	200 Year	3800.00	559.10	572.86	567.19	572.96	0.000605	3.15	1873.59	743.33		0.18
Indian Creek	3039	500 Year	4830.00	559.10	573.73	568.92	573.85	0.000609	3.35	2412.48	868.52		0.18
Indian Creek	2945	10 Year	1800.00	559.37	570.55	564.74	570.57	0.000256	1.71	1725.64	866.84		0.11
Indian Creek	2945	50 Year	2980.00	559.37	572.05	567.52	572.08	0.000267	1.97	2398.47	881.99		0.12
Indian Creek	2945	100 Year	3510.00	559.37	572.58	568.04	572.62	0.000278	2.09	2639.48	885.87		0.12
Indian Creek	2945	200 Year	3800.00	559.37	572.85	568.18	572.89	0.000283	2.15	2762.48	887.89		0.12
Indian Creek	2945	500 Year	4830.00	559.37	573.73	568.61	573.78	0.000303	2.36	3160.10	894.16		0.13
Indian Creek	2884.50*	10 Year	1800.00	559.74	570.48	565.40	570.54	0.000560	2.30	1162.68	823.69		0.16
Indian Creek	2884.50*	50 Year	2980.00	559.74	571.98	567.91	572.05	0.000548	2.63	1683.20	856.18		0.17
Indian Creek	2884.50*	100 Year	3510.00	559.74	572.51	568.45	572.58	0.000559	2.78	1871.85	863.26		0.17
Indian Creek	2884.50*	200 Year	3800.00	559.74	572.78	568.62	572.86	0.000565	2.85	1968.40	866.62		0.17
Indian Creek	2884.50*	500 Year	4830.00	559.74	573.64	569.17	573.74	0.000590	3.11	2281.50	877.53		0.18
Indian Creek	2824	10 Year	1800.00	559.50	570.32	564.79	570.46	0.001350	3.27	682.64	766.95		0.25
Indian Creek	2824	50 Year	2980.00	559.50	571.78	566.79	571.96	0.001347	3.82	1011.22	818.48		0.26
Indian Creek	2824	100 Year	3510.00	559.50	572.29	567.47	572.50	0.001375	4.05	1134.41	842.14		0.26
Indian Creek	2824	200 Year	3800.00	559.50	572.55	567.87	572.77	0.001391	4.16	1197.84	849.85		0.26
Indian Creek	2824	500 Year	4830.00	559.50	573.39	569.53	573.64	0.001448	4.55	1404.28	868.08		0.27
Indian Creek	2772	10 Year	1800.00	559.29	570.04	564.65	570.29	0.001706	4.00	494.48	476.14		0.28
Indian Creek	2772	50 Year	2980.00	559.29	571.36	566.79	571.74	0.002195	5.14	709.57	699.51		0.32
Indian Creek	2772	100 Year	3510.00	559.29	571.82	567.53	572.25	0.002361	5.54	793.09	771.82		0.34
Indian Creek	2772	200 Year	3800.00	559.29	572.06	567.94	572.52	0.002443	5.74	835.50	783.49		0.35
Indian Creek	2772	500 Year	4830.00	559.29	572.81	569.02	573.36	0.002710	6.40	970.76	810.28		0.37
Indian Creek	2628		Bridge										
Indian Creek	2474	10 Year	1800.00	558.08	568.24	563.20	568.45	0.001243	3.82	556.01	153.54		0.25
Indian Creek	2474	50 Year	2980.00	558.08	569.52	564.85	569.86	0.001718	5.00	785.55	202.75		0.30
Indian Creek	2474	100 Year	3510.00	558.08	569.97	565.49	570.36	0.001877	5.40	875.30	214.27		0.31
Indian Creek	2474	200 Year	3800.00	558.08	570.20	565.77	570.61	0.001955	5.60	921.17	220.30		0.32
Indian Creek	2474	500 Year	4830.00	558.08	570.87	566.91	571.38	0.002270	6.32	1055.32	240.24		0.35
Indian Creek	2413	10 Year	1800.00	557.83	567.52	566.12	568.17	0.007610	6.56	304.00	121.82		0.56
Indian Creek	2413	50 Year	2980.00	557.83	568.58	567.72	569.50	0.008557	8.07	469.03	184.03		0.62
Indian Creek	2413	100 Year	3510.00	557.83	568.98	568.26	569.97	0.008635	8.52	547.05	202.32		0.63
Indian Creek	2413	200 Year	3800.00	557.83	569.19	568.42	570.21	0.008869	8.75	589.59	214.58		0.64
Indian Creek	2413	500 Year	4830.00	557.83	569.88	569.17	570.97	0.008413	9.27	750.35	258.91		0.64

HEC-RAS Plan: exist River: Indian Creek Reach: Indian Creek (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Indian Creek	2350.50*	10 Year	1800.00	558.54	567.13	565.68	567.68	0.006712	6.05	327.18	147.61	0.53
Indian Creek	2350.50*	50 Year	2980.00	558.54	568.16	567.12	568.93	0.007360	7.38	507.05	196.94	0.58
Indian Creek	2350.50*	100 Year	3510.00	558.54	568.58	567.64	569.39	0.007234	7.71	592.21	207.85	0.58
Indian Creek	2350.50*	200 Year	3800.00	558.54	568.79	567.85	569.63	0.007132	7.86	637.71	211.07	0.58
Indian Creek	2350.50*	500 Year	4830.00	558.54	569.51	568.59	570.39	0.006783	8.30	793.39	222.34	0.58
Indian Creek	2288	10 Year	1800.00	558.61	566.83	565.10	567.25	0.005059	5.26	384.26	165.16	0.46
Indian Creek	2288	50 Year	2980.00	558.61	567.85	566.42	568.44	0.005612	6.44	576.89	209.15	0.51
Indian Creek	2288	100 Year	3510.00	558.61	568.29	566.92	568.90	0.005463	6.71	669.15	215.92	0.51
Indian Creek	2288	200 Year	3800.00	558.61	568.51	567.16	569.14	0.005387	6.85	717.77	219.04	0.51
Indian Creek	2288	500 Year	4830.00	558.61	569.25	567.88	569.93	0.005143	7.26	882.78	228.50	0.50
Indian Creek	2214.00*	10 Year	1800.00	557.57	566.55	564.15	566.91	0.003636	4.79	385.48	115.01	0.40
Indian Creek	2214.00*	50 Year	2980.00	557.57	567.34	565.40	568.00	0.005572	6.61	499.64	170.67	0.51
Indian Creek	2214.00*	100 Year	3510.00	557.57	567.61	565.88	568.41	0.006376	7.31	547.18	180.97	0.55
Indian Creek	2214.00*	200 Year	3800.00	557.57	567.74	566.10	568.62	0.006799	7.67	572.11	186.58	0.57
Indian Creek	2214.00*	500 Year	4830.00	557.57	568.18	567.07	569.32	0.008170	8.83	656.66	201.32	0.63
Indian Creek	2140	10 Year	1800.00	556.52	566.41	563.12	566.64	0.002167	4.01	532.20	246.37	0.31
Indian Creek	2140	50 Year	2980.00	556.52	567.16	564.48	567.56	0.003212	5.35	733.76	285.77	0.39
Indian Creek	2140	100 Year	3510.00	556.52	567.43	564.95	567.89	0.003634	5.86	810.50	297.50	0.42
Indian Creek	2140	200 Year	3800.00	556.52	567.56	565.17	568.06	0.003848	6.12	850.57	302.46	0.43
Indian Creek	2140	500 Year	4830.00	556.52	568.00	566.61	568.62	0.004488	6.92	987.44	315.95	0.47
Indian Creek	2055.50*	10 Year	1800.00	557.77	566.06	564.22	566.38	0.003941	4.86	516.06	305.89	0.41
Indian Creek	2055.50*	50 Year	2980.00	557.77	566.76	565.94	567.21	0.005033	6.07	742.97	338.46	0.48
Indian Creek	2055.50*	100 Year	3510.00	557.77	566.99	566.25	567.50	0.005539	6.56	823.34	348.93	0.51
Indian Creek	2055.50*	200 Year	3800.00	557.77	567.11	566.39	567.65	0.005810	6.82	864.28	354.61	0.52
Indian Creek	2055.50*	500 Year	4830.00	557.77	567.52	566.80	568.16	0.006483	7.57	1013.84	375.60	0.56
Indian Creek	1971	10 Year	1800.00	559.02	565.77	565.01	565.99	0.004629	4.65	658.59	407.07	0.43
Indian Creek	1971	50 Year	2980.00	559.02	566.49	565.67	566.74	0.004712	5.30	961.07	436.29	0.45
Indian Creek	1971	100 Year	3510.00	559.02	566.70	565.84	566.99	0.005054	5.67	1057.81	446.56	0.47
Indian Creek	1971	200 Year	3800.00	559.02	566.81	565.95	567.11	0.005248	5.87	1106.30	451.57	0.48
Indian Creek	1971	500 Year	4830.00	559.02	567.22	566.24	567.56	0.005551	6.38	1293.46	470.89	0.50
Indian Creek	1886.00*	10 Year	1800.00	558.01	564.48	564.48	565.29	0.014192	7.59	321.64	279.11	0.75
Indian Creek	1886.00*	50 Year	2980.00	558.01	565.32	565.32	566.09	0.011784	8.08	617.14	416.46	0.71
Indian Creek	1886.00*	100 Year	3510.00	558.01	565.63	565.55	566.34	0.010637	8.07	751.21	439.75	0.68
Indian Creek	1886.00*	200 Year	3800.00	558.01	565.84		566.49	0.009585	7.90	842.38	454.05	0.65
Indian Creek	1886.00*	500 Year	4830.00	558.01	566.46		567.00	0.007422	7.57	1138.50	489.64	0.59
Indian Creek	1801	10 Year	1800.00	557.00	564.51		564.61	0.001756	3.18	985.65	578.72	0.27
Indian Creek	1801	50 Year	2980.00	557.00	565.46		565.55	0.001495	3.36	1612.38	702.26	0.26
Indian Creek	1801	100 Year	3510.00	557.00	565.81		565.90	0.001432	3.44	1856.55	718.57	0.26
Indian Creek	1801	200 Year	3800.00	557.00	565.98		566.07	0.001405	3.48	1982.20	723.67	0.26
Indian Creek	1801	500 Year	4830.00	557.00	566.55		566.64	0.001332	3.61	2396.50	734.86	0.25
Indian Creek	1709.00*	10 Year	1800.00	556.31	564.30		564.43	0.002045	3.64	899.44	599.34	0.30
Indian Creek	1709.00*	50 Year	2980.00	556.31	565.30		565.41	0.001618	3.69	1545.51	682.45	0.28
Indian Creek	1709.00*	100 Year	3510.00	556.31	565.65		565.76	0.001534	3.75	1789.52	697.06	0.27
Indian Creek	1709.00*	200 Year	3800.00	556.31	565.83		565.94	0.001503	3.78	1914.10	703.64	0.27
Indian Creek	1709.00*	500 Year	4830.00	556.31	566.40		566.52	0.001415	3.90	2325.14	717.37	0.27
Indian Creek	1617	10 Year	1800.00	555.62	564.10		564.24	0.001934	3.74	924.57	605.10	0.30
Indian Creek	1617	50 Year	2980.00	555.62	565.16		565.27	0.001466	3.70	1605.90	685.64	0.27
Indian Creek	1617	100 Year	3510.00	555.62	565.52		565.62	0.001396	3.75	1857.28	704.84	0.26
Indian Creek	1617	200 Year	3800.00	555.62	565.70		565.80	0.001365	3.78	1985.44	709.14	0.26
Indian Creek	1617	500 Year	4830.00	555.62	566.28		566.39	0.001289	3.89	2404.34	720.08	0.26
Indian Creek	1537.67*	10 Year	1800.00	555.00	563.92		564.09	0.001824	3.80	859.93	585.33	0.29
Indian Creek	1537.67*	50 Year	2980.00	555.00	565.02		565.15	0.001418	3.80	1556.81	682.36	0.26
Indian Creek	1537.67*	100 Year	3510.00	555.00	565.39		565.51	0.001356	3.85	1812.29	703.09	0.26
Indian Creek	1537.67*	200 Year	3800.00	555.00	565.57		565.70	0.001327	3.88	1942.54	707.37	0.26
Indian Creek	1537.67*	500 Year	4830.00	555.00	566.16		566.29	0.001259	3.99	2366.74	720.48	0.26
Indian Creek	1458.33*	10 Year	1800.00	554.38	563.81		563.96	0.001356	3.44	904.07	582.63	0.25
Indian Creek	1458.33*	50 Year	2980.00	554.38	564.92		565.05	0.001165	3.59	1615.55	693.37	0.24
Indian Creek	1458.33*	100 Year	3510.00	554.38	565.29		565.41	0.001138	3.67	1877.43	717.60	0.24
Indian Creek	1458.33*	200 Year	3800.00	554.38	565.48		565.60	0.001121	3.71	2011.39	721.03	0.24
Indian Creek	1458.33*	500 Year	4830.00	554.38	566.07		566.19	0.001084	3.84	2445.51	732.79	0.24
Indian Creek	1379	10 Year	1800.00	553.76	563.77		563.86	0.000787	2.76	1030.94	544.14	0.20
Indian Creek	1379	50 Year	2980.00	553.76	564.85		564.96	0.000900	3.28	1727.05	710.76	0.21
Indian Creek	1379	100 Year	3510.00	553.76	565.22		565.33	0.000903	3.40	1995.47	738.51	0.22
Indian Creek	1379	200 Year	3800.00	553.76	565.40		565.52	0.000898	3.44	2133.39	741.70	0.22

HEC-RAS Plan: exist River: Indian Creek Reach: Indian Creek (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Indian Creek	1379	500 Year	4830.00	553.76	566.00		566.11	0.000891	3.60	2579.39	752.06	0.22
Indian Creek	1294.00*	10 Year	1800.00	553.64	563.61		563.77	0.001308	3.38	681.77	318.93	0.25
Indian Creek	1294.00*	50 Year	2980.00	553.64	564.65		564.85	0.001523	4.08	1165.96	569.06	0.28
Indian Creek	1294.00*	100 Year	3510.00	553.64	565.00		565.22	0.001569	4.29	1376.20	605.10	0.28
Indian Creek	1294.00*	200 Year	3800.00	553.64	565.18		565.41	0.001584	4.38	1487.66	620.68	0.29
Indian Creek	1294.00*	500 Year	4830.00	553.64	565.77		566.00	0.001627	4.68	1865.69	656.12	0.29
Indian Creek	1209	10 Year	1800.00	553.51	563.51		563.66	0.001325	3.27	732.41	351.45	0.25
Indian Creek	1209	50 Year	2980.00	553.51	564.52		564.72	0.001562	3.98	1150.84	490.44	0.28
Indian Creek	1209	100 Year	3510.00	553.51	564.87		565.08	0.001610	4.19	1342.77	591.53	0.28
Indian Creek	1209	200 Year	3800.00	553.51	565.05		565.27	0.001623	4.28	1452.18	620.61	0.29
Indian Creek	1209	500 Year	4830.00	553.51	565.64		565.86	0.001632	4.53	1834.22	680.57	0.29
Indian Creek	1146.00*	10 Year	1800.00	553.26	563.36		563.56	0.001783	3.75	667.14	327.36	0.29
Indian Creek	1146.00*	50 Year	2980.00	553.26	564.36		564.60	0.002050	4.51	1040.53	404.92	0.31
Indian Creek	1146.00*	100 Year	3510.00	553.26	564.70		564.96	0.002128	4.76	1180.49	410.95	0.32
Indian Creek	1146.00*	200 Year	3800.00	553.26	564.87		565.14	0.002166	4.88	1252.28	413.71	0.33
Indian Creek	1146.00*	500 Year	4830.00	553.26	565.44		565.73	0.002283	5.28	1486.56	421.48	0.34
Indian Creek	1083	10 Year	1800.00	553.01	563.17		563.42	0.002318	4.34	628.05	344.98	0.32
Indian Creek	1083	50 Year	2980.00	553.01	564.19		564.46	0.002511	4.89	1033.97	423.53	0.34
Indian Creek	1083	100 Year	3510.00	553.01	564.54		564.81	0.002526	5.09	1183.30	429.58	0.35
Indian Creek	1083	200 Year	3800.00	553.01	564.72		565.00	0.002539	5.19	1259.49	432.71	0.35
Indian Creek	1083	500 Year	4830.00	553.01	565.28		565.58	0.002592	5.52	1506.90	442.30	0.36
Indian Creek	988.33*	10 Year	1800.00	552.69	563.01		563.21	0.001825	3.85	668.85	351.05	0.29
Indian Creek	988.33*	50 Year	2980.00	552.69	563.99		564.24	0.002068	4.54	1052.74	407.65	0.31
Indian Creek	988.33*	100 Year	3510.00	552.69	564.33		564.59	0.002153	4.80	1191.85	414.46	0.32
Indian Creek	988.33*	200 Year	3800.00	552.69	564.50		564.77	0.002195	4.92	1263.07	417.37	0.33
Indian Creek	988.33*	500 Year	4830.00	552.69	565.05		565.35	0.002332	5.34	1493.44	425.48	0.34
Indian Creek	893.67*	10 Year	1800.00	552.37	562.89		563.05	0.001365	3.39	733.93	366.93	0.25
Indian Creek	893.67*	50 Year	2980.00	552.37	563.84		564.05	0.001653	4.14	1100.88	394.89	0.28
Indian Creek	893.67*	100 Year	3510.00	552.37	564.17		564.40	0.001773	4.43	1229.75	399.53	0.30
Indian Creek	893.67*	200 Year	3800.00	552.37	564.33		564.57	0.001832	4.57	1295.57	401.09	0.30
Indian Creek	893.67*	500 Year	4830.00	552.37	564.85		565.14	0.002026	5.04	1507.21	406.09	0.32
Indian Creek	799	10 Year	1800.00	552.05	562.81		562.93	0.000989	2.95	830.77	368.71	0.22
Indian Creek	799	50 Year	2980.00	552.05	563.73		563.90	0.001262	3.68	1214.98	434.04	0.25
Indian Creek	799	100 Year	3510.00	552.05	564.05		564.24	0.001375	3.96	1352.01	437.87	0.26
Indian Creek	799	200 Year	3800.00	552.05	564.21		564.41	0.001432	4.10	1421.92	439.80	0.27
Indian Creek	799	500 Year	4830.00	552.05	564.72		564.95	0.001615	4.56	1646.89	445.36	0.29
Indian Creek	699	10 Year	1800.00	551.66	562.73		562.83	0.000943	2.80	943.53	458.56	0.21
Indian Creek	699	50 Year	2980.00	551.66	563.64		563.77	0.001145	3.41	1390.30	506.03	0.24
Indian Creek	699	100 Year	3510.00	551.66	563.95		564.10	0.001228	3.64	1547.62	511.71	0.25
Indian Creek	699	200 Year	3800.00	551.66	564.10		564.26	0.001270	3.76	1628.06	514.32	0.25
Indian Creek	699	500 Year	4830.00	551.66	564.60		564.78	0.001404	4.14	1886.99	519.79	0.27
Indian Creek	624.50*	10 Year	1800.00	551.86	562.59		562.74	0.001572	3.42	808.62	434.31	0.27
Indian Creek	624.50*	50 Year	2980.00	551.86	563.49		563.66	0.001733	4.00	1214.29	459.63	0.29
Indian Creek	624.50*	100 Year	3510.00	551.86	563.79		563.98	0.001834	4.25	1352.63	463.53	0.30
Indian Creek	624.50*	200 Year	3800.00	551.86	563.94		564.14	0.001886	4.38	1423.25	465.48	0.30
Indian Creek	624.50*	500 Year	4830.00	551.86	564.42		564.65	0.002060	4.80	1649.60	470.64	0.32
Indian Creek	550	10 Year	1800.00	552.07	562.31		562.56	0.003324	4.52	654.65	439.88	0.38
Indian Creek	550	50 Year	2980.00	552.07	563.27		563.50	0.002811	4.73	1119.07	518.39	0.36
Indian Creek	550	100 Year	3510.00	552.07	563.58		563.81	0.002808	4.90	1280.32	538.88	0.36
Indian Creek	550	200 Year	3800.00	552.07	563.74		563.97	0.002812	4.99	1365.03	551.42	0.36
Indian Creek	550	500 Year	4830.00	552.07	564.23		564.47	0.002853	5.31	1646.05	588.60	0.37
Indian Creek	493.00*	10 Year	1800.00	551.91	561.97	559.67	562.33	0.004648	5.23	535.42	389.75	0.44
Indian Creek	493.00*	50 Year	2980.00	551.91	563.03		563.31	0.003537	5.20	978.02	437.79	0.40
Indian Creek	493.00*	100 Year	3510.00	551.91	563.33		563.62	0.003561	5.41	1111.09	451.06	0.40
Indian Creek	493.00*	200 Year	3800.00	551.91	563.48		563.78	0.003575	5.52	1180.52	458.72	0.41
Indian Creek	493.00*	500 Year	4830.00	551.91	563.96		564.28	0.003681	5.91	1403.47	476.87	0.42
Indian Creek	436	10 Year	1800.00	551.74	560.77	559.62	561.85	0.012638	8.34	227.10	102.24	0.72
Indian Creek	436	50 Year	2980.00	551.74	562.69		563.06	0.004997	5.90	849.13	409.73	0.47
Indian Creek	436	100 Year	3510.00	551.74	563.00		563.38	0.004893	6.08	976.71	417.57	0.47
Indian Creek	436	200 Year	3800.00	551.74	563.15		563.54	0.004849	6.17	1042.28	420.69	0.47
Indian Creek	436	500 Year	4830.00	551.74	563.62		564.03	0.004915	6.56	1241.75	432.44	0.48
Indian Creek	341.00*	10 Year	1800.00	551.07	559.71		560.68	0.011234	7.90	227.78	54.35	0.68
Indian Creek	341.00*	50 Year	2980.00	551.07	561.40	560.17	562.36	0.009797	8.18	494.56	339.95	0.65

HEC-RAS Plan: exist River: Indian Creek Reach: Indian Creek (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Indian Creek	341.00*	100 Year	3510.00	551.07	561.75	561.66	562.69	0.009312	8.36	618.96	360.17	0.65
Indian Creek	341.00*	200 Year	3800.00	551.07	561.91	561.83	562.86	0.009311	8.52	674.59	374.10	0.65
Indian Creek	341.00*	500 Year	4830.00	551.07	562.40	562.23	563.36	0.009080	8.93	869.78	404.42	0.65
Indian Creek	246	10 Year	1800.00	550.41	558.93		559.68	0.008646	6.97	258.07	61.20	0.60
Indian Creek	246	50 Year	2980.00	550.41	560.60	558.89	561.51	0.007919	7.74	462.75	411.13	0.60
Indian Creek	246	100 Year	3510.00	550.41	561.09	559.50	561.90	0.006830	7.63	690.53	481.30	0.56
Indian Creek	246	200 Year	3800.00	550.41	561.32	559.74	562.07	0.006311	7.53	803.04	492.82	0.54
Indian Creek	246	500 Year	4830.00	550.41	561.98		562.61	0.005302	7.40	1135.04	517.98	0.51
Indian Creek	179.50*	10 Year	1800.00	550.17	558.34		559.10	0.008719	7.02	256.34	61.11	0.60
Indian Creek	179.50*	50 Year	2980.00	550.17	560.04	558.35	560.98	0.007891	7.85	437.25	313.55	0.60
Indian Creek	179.50*	100 Year	3510.00	550.17	560.59	558.93	561.45	0.006791	7.78	638.68	398.21	0.57
Indian Creek	179.50*	200 Year	3800.00	550.17	560.77	559.10	561.64	0.006735	7.91	713.36	415.51	0.57
Indian Creek	179.50*	500 Year	4830.00	550.17	561.50		562.23	0.005615	7.79	1026.87	445.43	0.53
Indian Creek	113	10 Year	1800.00	549.94	557.32		558.37	0.013301	8.19	219.66	56.91	0.74
Indian Creek	113	50 Year	2980.00	549.94	559.31	557.98	560.39	0.009571	8.41	389.47	217.50	0.66
Indian Creek	113	100 Year	3510.00	549.94	560.01	558.64	560.96	0.007562	8.15	591.78	364.18	0.60
Indian Creek	113	200 Year	3800.00	549.94	560.31	558.96	561.19	0.006853	8.01	706.73	410.93	0.57
Indian Creek	113	500 Year	4830.00	549.94	561.20		561.86	0.005001	7.49	1099.01	468.55	0.50
Indian Creek	56.50*	10 Year	1800.00	549.92	557.16		557.75	0.005962	6.17	291.93	64.13	0.51
Indian Creek	56.50*	50 Year	2980.00	549.92	559.16		559.87	0.005645	6.80	448.10	169.48	0.51
Indian Creek	56.50*	100 Year	3510.00	549.92	559.84		560.55	0.004978	6.90	607.71	296.18	0.49
Indian Creek	56.50*	200 Year	3800.00	549.92	560.09		560.82	0.004860	7.01	688.85	326.52	0.49
Indian Creek	56.50*	500 Year	4830.00	549.92	560.90		561.60	0.004374	7.20	970.44	367.50	0.47
Indian Creek	0	10 Year	1800.00	549.90	557.10	553.98	557.45	0.003004	4.71	382.46	75.39	0.37
Indian Creek	0	50 Year	2980.00	549.90	559.11	555.36	559.57	0.003005	5.44	560.22	176.60	0.38
Indian Creek	0	100 Year	3510.00	549.90	559.79	555.89	560.27	0.003005	5.63	718.41	290.45	0.39
Indian Creek	0	200 Year	3800.00	549.90	560.04	556.15	560.54	0.003003	5.77	793.38	302.73	0.39
Indian Creek	0	500 Year	4830.00	549.90	560.81	557.03	561.34	0.003003	6.19	1040.76	339.23	0.39

HEC-RAS Plan: exist River: Indian Creek Reach: Indian Creek

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Indian Creek	4512	10 Year	573.49	573.16	0.33	0.28	0.00	0.11	1535.35	264.54	361.30
Indian Creek	4512	50 Year	574.75	574.52	0.23	0.19	0.00	3.24	1833.92	1142.83	461.63
Indian Creek	4512	100 Year	575.25	575.06	0.20	0.16	0.00	5.87	1917.75	1586.38	465.66
Indian Creek	4512	200 Year	575.49	575.30	0.19	0.15	0.00	7.43	1976.81	1815.75	467.54
Indian Creek	4512	500 Year	576.27	576.10	0.18	0.14	0.00	14.00	2193.46	2622.54	472.40
Indian Creek	4427.00*	10 Year	573.21	572.86	0.35	0.22	0.04	0.96	1588.40	210.65	332.94
Indian Creek	4427.00*	50 Year	574.56	574.31	0.25	0.15	0.02	6.50	1917.70	1055.80	395.67
Indian Creek	4427.00*	100 Year	575.09	574.87	0.22	0.14	0.02	10.00	2035.58	1464.42	404.81
Indian Creek	4427.00*	200 Year	575.34	575.12	0.22	0.13	0.01	11.97	2110.28	1677.75	408.17
Indian Creek	4427.00*	500 Year	576.13	575.92	0.21	0.13	0.01	19.82	2377.45	2432.73	418.92
Indian Creek	4342	10 Year	572.96	572.73	0.23	0.14	0.02	2.69	1448.31	349.00	353.04
Indian Creek	4342	50 Year	574.39	574.21	0.18	0.10	0.01	9.44	1769.40	1201.16	370.03
Indian Creek	4342	100 Year	574.94	574.76	0.17	0.10	0.01	13.23	1904.38	1592.39	376.66
Indian Creek	4342	200 Year	575.19	575.02	0.17	0.09	0.01	15.33	1986.56	1798.11	379.28
Indian Creek	4342	500 Year	576.00	575.82	0.18	0.09	0.01	23.42	2273.29	2533.29	386.49
Indian Creek	4263.00*	10 Year	572.80	572.64	0.16	0.10	0.01	2.90	1395.48	401.62	361.43
Indian Creek	4263.00*	50 Year	574.27	574.13	0.14	0.08	0.01	16.83	1774.84	1188.33	382.54
Indian Creek	4263.00*	100 Year	574.83	574.70	0.13	0.07	0.01	26.04	1933.72	1550.25	388.99
Indian Creek	4263.00*	200 Year	575.08	574.95	0.13	0.07	0.01	31.29	2028.09	1740.62	391.67
Indian Creek	4263.00*	500 Year	575.89	575.75	0.15	0.07	0.01	52.53	2357.87	2419.60	399.78
Indian Creek	4184	10 Year	572.68	572.57	0.11	0.08	0.00	8.82	1329.59	461.58	425.48
Indian Creek	4184	50 Year	574.18	574.09	0.09	0.06	0.00	122.56	1686.95	1170.49	455.03
Indian Creek	4184	100 Year	574.74	574.65	0.09	0.06	0.00	187.90	1837.93	1484.18	460.24
Indian Creek	4184	200 Year	575.00	574.91	0.09	0.06	0.00	222.40	1928.44	1649.16	462.49
Indian Creek	4184	500 Year	575.81	575.71	0.10	0.06	0.00	351.08	2245.99	2232.93	468.64
Indian Creek	4107.50*	10 Year	572.60	572.47	0.12	0.06	0.02	203.19	1322.68	274.13	415.58
Indian Creek	4107.50*	50 Year	574.12	574.02	0.10	0.05	0.01	525.46	1640.06	814.49	466.39
Indian Creek	4107.50*	100 Year	574.69	574.59	0.10	0.05	0.01	685.86	1766.37	1057.77	473.51
Indian Creek	4107.50*	200 Year	574.94	574.85	0.10	0.04	0.01	769.74	1844.95	1185.31	476.50
Indian Creek	4107.50*	500 Year	575.75	575.65	0.10	0.04	0.01	1068.35	2120.11	1641.55	484.86
Indian Creek	4031	10 Year	572.52	572.45	0.07	0.05	0.01	680.09	969.40	150.51	504.32
Indian Creek	4031	50 Year	574.05	574.00	0.06	0.04	0.01	1330.07	1172.53	477.40	587.92
Indian Creek	4031	100 Year	574.63	574.57	0.05	0.04	0.01	1600.97	1271.04	637.99	602.19
Indian Creek	4031	200 Year	574.88	574.83	0.05	0.04	0.01	1765.41	1318.20	716.39	604.64
Indian Creek	4031	500 Year	575.70	575.64	0.06	0.04	0.01	2346.81	1487.10	996.09	611.80
Indian Creek	3971.50*	10 Year	572.45	572.29	0.16	0.10	0.01	193.86	1430.39	175.75	386.47
Indian Creek	3971.50*	50 Year	574.01	573.88	0.12	0.08	0.01	672.11	1767.35	540.54	486.49
Indian Creek	3971.50*	100 Year	574.58	574.47	0.12	0.07	0.01	913.16	1896.27	700.57	518.87
Indian Creek	3971.50*	200 Year	574.84	574.73	0.11	0.07	0.01	1054.33	1966.43	779.24	522.62
Indian Creek	3971.50*	500 Year	575.65	575.54	0.11	0.06	0.01	1560.82	2217.44	1051.74	533.46
Indian Creek	3912	10 Year	572.34	572.11	0.23	0.26	0.01		1612.64	187.36	226.75
Indian Creek	3912	50 Year	573.92	573.72	0.21	0.22	0.03	97.76	2178.93	703.30	438.24
Indian Creek	3912	100 Year	574.51	574.32	0.19	0.21	0.04	247.30	2343.43	919.28	502.65
Indian Creek	3912	200 Year	574.77	574.59	0.18	0.20	0.04	344.88	2431.88	1023.24	507.04
Indian Creek	3912	500 Year	575.59	575.42	0.17	0.17	0.03	719.16	2734.07	1376.77	517.05
Indian Creek	3817.33*	10 Year	572.06	571.69	0.37	0.31	0.00	2.92	1783.68	13.40	130.84
Indian Creek	3817.33*	50 Year	573.67	573.19	0.48	0.31	0.01	194.55	2722.40	63.05	192.94
Indian Creek	3817.33*	100 Year	574.26	573.70	0.56	0.31	0.02	240.48	3176.91	92.61	356.62
Indian Creek	3817.33*	200 Year	574.53	573.98	0.55	0.31	0.02	369.28	3322.44	108.28	390.77
Indian Creek	3817.33*	500 Year	575.38	574.92	0.46	0.28	0.01	1004.85	3664.16	160.99	405.31
Indian Creek	3722.67*	10 Year	571.75	571.37	0.38	0.27	0.02	52.05	1738.45	9.50	152.66
Indian Creek	3722.67*	50 Year	573.36	572.90	0.46	0.26	0.02	376.68	2560.19	43.13	190.26
Indian Creek	3722.67*	100 Year	573.92	573.44	0.48	0.26	0.03	569.28	2878.17	62.55	269.56
Indian Creek	3722.67*	200 Year	574.20	573.72	0.49	0.26	0.03	684.49	3041.59	73.92	323.21
Indian Creek	3722.67*	500 Year	575.10	574.56	0.53	0.26	0.04	1079.70	3632.16	118.13	440.39
Indian Creek	3628	10 Year	571.46	571.14	0.32	0.20	0.02	164.61	1626.78	8.60	166.75
Indian Creek	3628	50 Year	573.07	572.69	0.38	0.21	0.01	615.14	2329.42	35.44	216.65
Indian Creek	3628	100 Year	573.64	573.24	0.39	0.21	0.01	855.17	2603.93	50.90	277.46
Indian Creek	3628	200 Year	573.92	573.52	0.40	0.21	0.01	995.61	2744.45	59.95	332.68

HEC-RAS Plan: exist River: Indian Creek Reach: Indian Creek (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Indian Creek	2474	10 Year	568.45	568.24	0.22	0.15	0.13	77.18	1704.91	17.91	153.54
Indian Creek	2474	50 Year	569.86	569.52	0.34	0.19	0.17	258.84	2614.31	106.85	202.75
Indian Creek	2474	100 Year	570.36	569.97	0.39	0.21	0.18	359.54	2971.32	179.14	214.27
Indian Creek	2474	200 Year	570.61	570.20	0.41	0.21	0.18	417.23	3159.93	222.84	220.30
Indian Creek	2474	500 Year	571.38	570.87	0.51	0.23	0.17	623.85	3820.99	385.16	240.24
Indian Creek	2413	10 Year	568.17	567.52	0.65	0.45	0.05	37.30	1744.91	17.79	121.82
Indian Creek	2413	50 Year	569.50	568.58	0.92	0.49	0.07	142.45	2682.91	154.63	184.03
Indian Creek	2413	100 Year	569.97	568.98	0.99	0.49	0.09	202.25	3046.47	261.29	202.32
Indian Creek	2413	200 Year	570.21	569.19	1.03	0.49	0.10	234.96	3241.23	323.81	214.58
Indian Creek	2413	500 Year	570.97	569.88	1.09	0.47	0.10	373.25	3840.57	616.18	258.91
Indian Creek	2350.50*	10 Year	567.68	567.13	0.56	0.36	0.07	10.60	1761.84	27.56	147.61
Indian Creek	2350.50*	50 Year	568.93	568.16	0.77	0.40	0.09	71.88	2701.44	206.67	196.94
Indian Creek	2350.50*	100 Year	569.39	568.58	0.82	0.39	0.10	115.57	3058.25	336.19	207.85
Indian Creek	2350.50*	200 Year	569.63	568.79	0.83	0.38	0.10	141.85	3240.43	417.72	211.07
Indian Creek	2350.50*	500 Year	570.39	569.51	0.88	0.37	0.10	248.41	3853.22	728.38	222.34
Indian Creek	2288	10 Year	567.25	566.83	0.42	0.31	0.03	2.01	1738.06	59.93	165.16
Indian Creek	2288	50 Year	568.44	567.85	0.58	0.41	0.02	31.12	2666.28	282.60	209.15
Indian Creek	2288	100 Year	568.90	568.29	0.61	0.43	0.06	60.00	3018.26	431.74	215.92
Indian Creek	2288	200 Year	569.14	568.51	0.63	0.45	0.07	79.23	3203.79	516.97	219.04
Indian Creek	2288	500 Year	569.93	569.25	0.68	0.47	0.14	162.82	3833.62	833.56	228.50
Indian Creek	2214.00*	10 Year	566.91	566.55	0.36	0.20	0.06	3.94	1792.32	3.74	115.01
Indian Creek	2214.00*	50 Year	568.00	567.34	0.66	0.31	0.13	32.32	2905.08	42.61	170.67
Indian Creek	2214.00*	100 Year	568.41	567.61	0.80	0.35	0.17	61.05	3377.41	71.53	180.97
Indian Creek	2214.00*	200 Year	568.62	567.74	0.88	0.37	0.19	79.26	3631.03	89.71	186.58
Indian Creek	2214.00*	500 Year	569.32	568.18	1.14	0.44	0.26	163.13	4501.85	165.03	201.32
Indian Creek	2140	10 Year	566.64	566.41	0.24	0.24	0.02	73.76	1725.79	0.44	246.37
Indian Creek	2140	50 Year	567.56	567.16	0.40	0.34	0.02	323.06	2648.32	8.62	285.77
Indian Creek	2140	100 Year	567.89	567.43	0.47	0.37	0.01	461.35	3031.05	17.60	297.50
Indian Creek	2140	200 Year	568.06	567.56	0.50	0.40	0.01	542.18	3233.65	24.18	302.46
Indian Creek	2140	500 Year	568.62	568.00	0.62	0.45	0.01	860.21	3914.13	55.66	315.95
Indian Creek	2055.50*	10 Year	566.38	566.06	0.32	0.36	0.03	227.85	1566.74	5.41	305.89
Indian Creek	2055.50*	50 Year	567.21	566.76	0.45	0.41	0.06	665.65	2277.24	37.11	338.46
Indian Creek	2055.50*	100 Year	567.50	566.99	0.51	0.45	0.07	875.33	2577.34	57.32	348.93
Indian Creek	2055.50*	200 Year	567.65	567.11	0.54	0.47	0.07	992.64	2738.02	69.34	354.61
Indian Creek	2055.50*	500 Year	568.16	567.52	0.64	0.51	0.09	1438.82	3269.58	121.60	375.60
Indian Creek	1971	10 Year	565.99	565.77	0.22	0.64	0.06	689.26	1078.24	32.51	407.07
Indian Creek	1971	50 Year	566.74	566.49	0.25	0.60	0.05	1406.67	1475.99	97.34	436.29
Indian Creek	1971	100 Year	566.99	566.70	0.28	0.60	0.04	1721.22	1660.92	127.86	446.56
Indian Creek	1971	200 Year	567.11	566.81	0.30	0.59	0.04	1894.05	1760.66	145.29	451.57
Indian Creek	1971	500 Year	567.56	567.22	0.35	0.54	0.02	2530.22	2083.88	215.91	470.89
Indian Creek	1886.00*	10 Year	565.29	564.48	0.81	0.33	0.22	165.98	1623.19	10.83	279.11
Indian Creek	1886.00*	50 Year	566.09	565.32	0.77	0.28	0.20	709.49	2182.63	87.88	416.46
Indian Creek	1886.00*	100 Year	566.34	565.63	0.71	0.26	0.19	1029.43	2347.55	133.03	439.75
Indian Creek	1886.00*	200 Year	566.49	565.84	0.65	0.25	0.17	1230.64	2404.77	164.58	454.05
Indian Creek	1886.00*	500 Year	567.00	566.46	0.54	0.22	0.13	1929.85	2619.76	280.39	489.64
Indian Creek	1801	10 Year	564.61	564.51	0.09	0.17	0.00	82.23	910.96	806.81	578.72
Indian Creek	1801	50 Year	565.55	565.46	0.09	0.14	0.00	400.61	1180.68	1398.71	702.26
Indian Creek	1801	100 Year	565.90	565.81	0.09	0.14	0.00	580.69	1287.18	1642.14	718.57
Indian Creek	1801	200 Year	566.07	565.98	0.09	0.13	0.00	685.23	1343.27	1771.50	723.67
Indian Creek	1801	500 Year	566.64	566.55	0.10	0.13	0.00	1075.68	1534.00	2220.32	734.86
Indian Creek	1709.00*	10 Year	564.43	564.30	0.13	0.18	0.00	149.92	1059.50	590.58	599.34
Indian Creek	1709.00*	50 Year	565.41	565.30	0.11	0.14	0.00	626.15	1310.79	1043.05	682.45
Indian Creek	1709.00*	100 Year	565.76	565.65	0.11	0.13	0.00	866.07	1414.22	1229.71	697.06
Indian Creek	1709.00*	200 Year	565.94	565.83	0.11	0.13	0.00	999.38	1470.19	1330.43	703.64
Indian Creek	1709.00*	500 Year	566.52	566.40	0.11	0.12	0.00	1493.10	1659.27	1677.63	717.37
Indian Creek	1617	10 Year	564.24	564.10	0.14	0.15	0.00	271.41	1106.17	422.42	605.10
Indian Creek	1617	50 Year	565.27	565.16	0.11	0.11	0.00	870.84	1324.58	784.59	685.64
Indian Creek	1617	100 Year	565.62	565.52	0.11	0.11	0.00	1152.17	1423.84	933.99	704.84
Indian Creek	1617	200 Year	565.80	565.70	0.11	0.11	0.00	1312.53	1474.89	1012.58	709.14

HEC-RAS Plan: exist River: Indian Creek Reach: Indian Creek (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Indian Creek	1617	500 Year	566.39	566.28	0.11	0.10	0.00	1891.59	1652.12	1286.29	720.08
Indian Creek	1537.67*	10 Year	564.09	563.92	0.17	0.12	0.01	266.32	1328.84	204.84	585.33
Indian Creek	1537.67*	50 Year	565.15	565.02	0.13	0.10	0.00	912.51	1601.28	466.21	682.36
Indian Creek	1537.67*	100 Year	565.51	565.39	0.13	0.10	0.00	1216.39	1718.47	575.14	703.09
Indian Creek	1537.67*	200 Year	565.70	565.57	0.13	0.10	0.00	1389.90	1777.70	632.40	707.37
Indian Creek	1537.67*	500 Year	566.29	566.16	0.12	0.09	0.00	2011.26	1984.81	833.93	720.48
Indian Creek	1458.33*	10 Year	563.96	563.81	0.15	0.08	0.02	262.74	1421.64	115.62	582.63
Indian Creek	1458.33*	50 Year	565.05	564.92	0.13	0.08	0.00	911.05	1769.90	299.04	693.37
Indian Creek	1458.33*	100 Year	565.41	565.29	0.12	0.08	0.00	1217.93	1910.28	381.79	717.60
Indian Creek	1458.33*	200 Year	565.60	565.48	0.12	0.08	0.00	1396.00	1978.38	425.62	721.03
Indian Creek	1458.33*	500 Year	566.19	566.07	0.12	0.08	0.00	2031.40	2215.52	583.08	732.79
Indian Creek	1379	10 Year	563.86	563.77	0.09	0.08	0.01	383.25	1345.47	71.27	544.14
Indian Creek	1379	50 Year	564.96	564.85	0.11	0.10	0.01	900.63	1881.00	198.37	710.76
Indian Creek	1379	100 Year	565.33	565.22	0.11	0.10	0.01	1204.96	2046.01	259.03	738.51
Indian Creek	1379	200 Year	565.52	565.40	0.11	0.10	0.01	1383.44	2124.32	292.25	741.70
Indian Creek	1379	500 Year	566.11	566.00	0.11	0.10	0.01	2022.44	2392.86	414.70	752.06
Indian Creek	1294.00*	10 Year	563.77	563.61	0.16	0.11	0.00	104.78	1650.90	44.32	318.93
Indian Creek	1294.00*	50 Year	564.85	564.65	0.21	0.13	0.00	362.50	2352.36	265.15	569.06
Indian Creek	1294.00*	100 Year	565.22	565.00	0.22	0.13	0.00	529.97	2601.43	378.60	605.10
Indian Creek	1294.00*	200 Year	565.41	565.18	0.22	0.14	0.00	630.43	2726.65	442.92	620.68
Indian Creek	1294.00*	500 Year	566.00	565.77	0.23	0.14	0.00	1007.37	3143.25	679.38	656.12
Indian Creek	1209	10 Year	563.66	563.51	0.15	0.10	0.00	2.61	1618.38	179.01	351.45
Indian Creek	1209	50 Year	564.72	564.52	0.20	0.11	0.00	49.66	2341.63	588.71	490.44
Indian Creek	1209	100 Year	565.08	564.87	0.21	0.12	0.01	92.98	2599.01	818.01	591.53
Indian Creek	1209	200 Year	565.27	565.05	0.21	0.12	0.01	127.41	2727.07	945.52	620.61
Indian Creek	1209	500 Year	565.86	565.64	0.22	0.12	0.01	296.09	3129.92	1403.99	680.57
Indian Creek	1146.00*	10 Year	563.56	563.36	0.19	0.13	0.01	0.01	1581.05	218.94	327.36
Indian Creek	1146.00*	50 Year	564.60	564.36	0.25	0.14	0.00	0.90	2250.04	729.06	404.92
Indian Creek	1146.00*	100 Year	564.96	564.70	0.26	0.15	0.00	1.82	2501.82	1006.36	410.95
Indian Creek	1146.00*	200 Year	565.14	564.87	0.27	0.15	0.00	2.46	2634.09	1163.45	413.71
Indian Creek	1146.00*	500 Year	565.73	565.44	0.30	0.15	0.00	5.46	3080.78	1743.76	421.48
Indian Creek	1083	10 Year	563.42	563.17	0.25	0.19	0.01		1518.76	281.24	344.98
Indian Creek	1083	50 Year	564.46	564.19	0.27	0.22	0.01	0.07	2032.81	947.12	423.53
Indian Creek	1083	100 Year	564.81	564.54	0.27	0.22	0.00	0.26	2228.40	1281.34	429.58
Indian Creek	1083	200 Year	565.00	564.72	0.28	0.22	0.00	0.42	2332.25	1467.33	432.71
Indian Creek	1083	500 Year	565.58	565.28	0.29	0.23	0.00	1.31	2686.35	2142.34	442.30
Indian Creek	988.33*	10 Year	563.21	563.01	0.20	0.15	0.01		1574.54	225.46	351.05
Indian Creek	988.33*	50 Year	564.24	563.99	0.24	0.17	0.01	0.23	2190.73	789.05	407.65
Indian Creek	988.33*	100 Year	564.59	564.33	0.26	0.18	0.01	0.59	2433.56	1075.84	414.46
Indian Creek	988.33*	200 Year	564.77	564.50	0.27	0.19	0.01	0.87	2560.96	1238.17	417.37
Indian Creek	988.33*	500 Year	565.35	565.05	0.30	0.21	0.00	2.27	2992.95	1834.78	425.48
Indian Creek	893.67*	10 Year	563.05	562.89	0.16	0.11	0.01	0.00	1604.06	195.93	366.93
Indian Creek	893.67*	50 Year	564.05	563.84	0.21	0.14	0.01	0.77	2288.13	691.09	394.89
Indian Creek	893.67*	100 Year	564.40	564.17	0.23	0.15	0.01	1.59	2567.72	940.69	399.53
Indian Creek	893.67*	200 Year	564.57	564.33	0.24	0.15	0.01	2.16	2714.48	1083.35	401.09
Indian Creek	893.67*	500 Year	565.14	564.85	0.28	0.17	0.01	4.80	3215.61	1609.59	406.09
Indian Creek	799	10 Year	562.93	562.81	0.12	0.10	0.01	0.28	1599.18	200.54	368.71
Indian Creek	799	50 Year	563.90	563.73	0.17	0.12	0.01	28.00	2312.56	639.43	434.04
Indian Creek	799	100 Year	564.24	564.05	0.19	0.13	0.01	52.98	2604.69	852.33	437.87
Indian Creek	799	200 Year	564.41	564.21	0.20	0.13	0.01	68.58	2759.01	972.41	439.80
Indian Creek	799	500 Year	564.95	564.72	0.23	0.15	0.02	132.52	3284.02	1413.46	445.36
Indian Creek	699	10 Year	562.83	562.73	0.10	0.09	0.00	1.63	1515.12	283.24	458.56
Indian Creek	699	50 Year	563.77	563.64	0.14	0.10	0.00	15.08	2146.97	817.95	506.03
Indian Creek	699	100 Year	564.10	563.95	0.15	0.11	0.00	23.76	2404.48	1081.76	511.71
Indian Creek	699	200 Year	564.26	564.10	0.16	0.11	0.00	29.04	2540.51	1230.45	514.32
Indian Creek	699	500 Year	564.78	564.60	0.18	0.13	0.01	51.16	3002.02	1776.82	519.79
Indian Creek	624.50*	10 Year	562.74	562.59	0.15	0.16	0.01	0.85	1453.49	345.66	434.31
Indian Creek	624.50*	50 Year	563.66	563.49	0.18	0.16	0.00	14.66	2000.69	964.65	459.63

HEC-RAS Plan: exist River: Indian Creek Reach: Indian Creek (Continued)

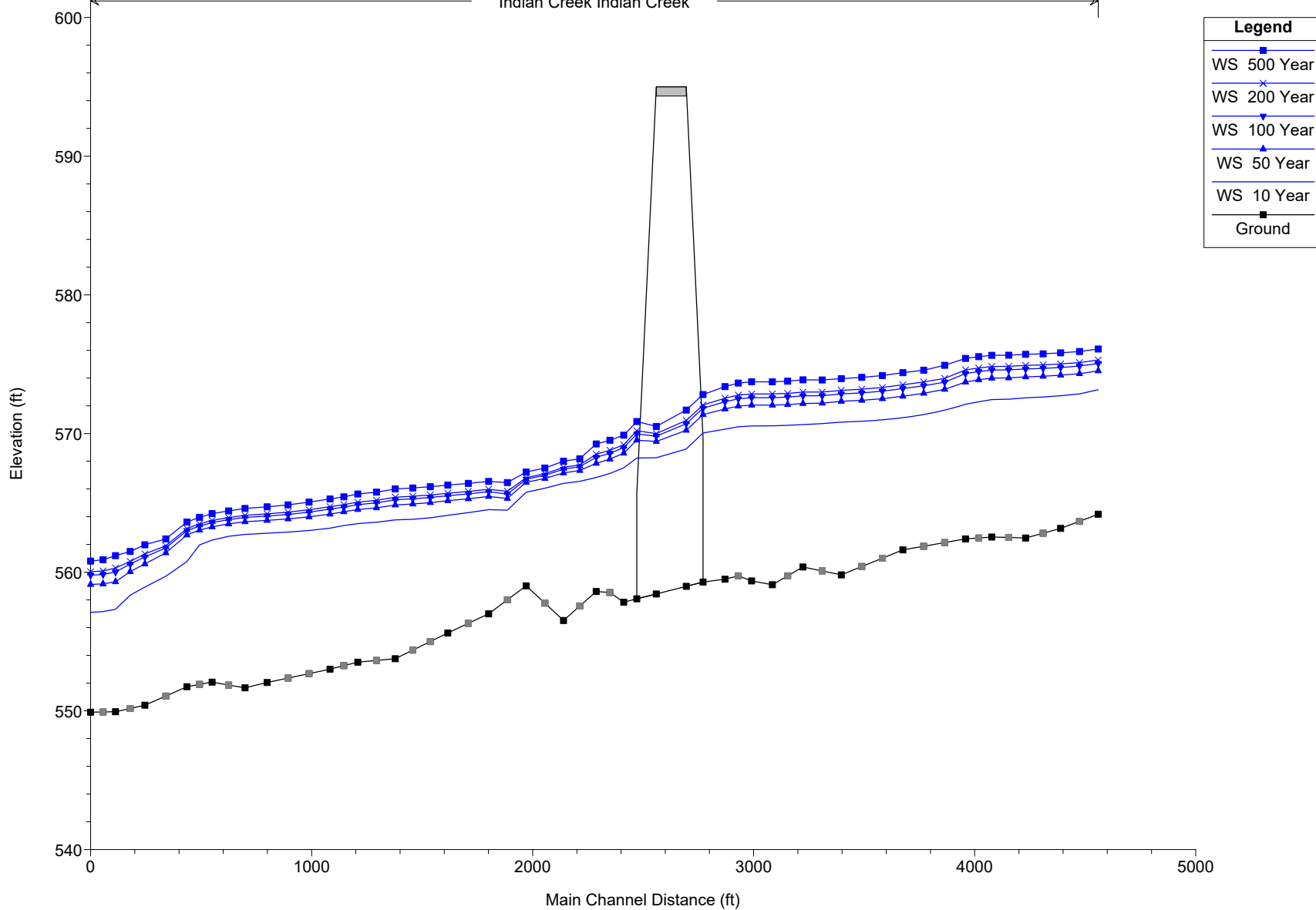
Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Indian Creek	624.50*	100 Year	563.98	563.79	0.19	0.17	0.00	24.50	2232.28	1253.22	463.53
Indian Creek	624.50*	200 Year	564.14	563.94	0.20	0.17	0.00	30.49	2355.10	1414.42	465.48
Indian Creek	624.50*	500 Year	564.65	564.42	0.23	0.18	0.00	55.25	2775.97	1998.78	470.64
Indian Creek	550	10 Year	562.56	562.31	0.25	0.22	0.01	5.49	1382.87	411.64	439.88
Indian Creek	550	50 Year	563.50	563.27	0.22	0.18	0.01	61.69	1758.88	1159.43	518.39
Indian Creek	550	100 Year	563.81	563.58	0.23	0.18	0.01	97.10	1925.43	1487.47	538.88
Indian Creek	550	200 Year	563.97	563.74	0.23	0.18	0.01	118.34	2014.34	1667.32	551.42
Indian Creek	550	500 Year	564.47	564.23	0.25	0.18	0.01	210.15	2317.67	2302.19	588.60
Indian Creek	493.00*	10 Year	562.33	561.97	0.36	0.41	0.07		1494.42	305.58	389.75
Indian Creek	493.00*	50 Year	563.31	563.03	0.28	0.24	0.01	2.61	1856.42	1120.97	437.79
Indian Creek	493.00*	100 Year	563.62	563.33	0.29	0.24	0.01	6.91	2042.11	1460.98	451.06
Indian Creek	493.00*	200 Year	563.78	563.48	0.30	0.24	0.01	10.60	2140.10	1649.30	458.72
Indian Creek	493.00*	500 Year	564.28	563.96	0.32	0.24	0.01	33.28	2479.21	2317.51	476.87
Indian Creek	436	10 Year	561.85	560.77	1.07	1.13	0.03		1788.05	11.95	102.24
Indian Creek	436	50 Year	563.06	562.69	0.38	0.65	0.06	0.24	1951.67	1028.10	409.73
Indian Creek	436	100 Year	563.38	563.00	0.38	0.63	0.06	1.30	2135.65	1373.05	417.57
Indian Creek	436	200 Year	563.54	563.15	0.38	0.62	0.06	2.32	2232.29	1565.38	420.69
Indian Creek	436	500 Year	564.03	563.62	0.41	0.62	0.05	7.73	2579.75	2242.52	432.44
Indian Creek	341.00*	10 Year	560.68	559.71	0.97	0.93	0.06		1800.00		54.35
Indian Creek	341.00*	50 Year	562.36	561.40	0.96	0.84	0.02	0.88	2744.01	235.11	339.95
Indian Creek	341.00*	100 Year	562.69	561.75	0.94	0.75	0.04	4.31	3010.36	495.33	360.17
Indian Creek	341.00*	200 Year	562.86	561.91	0.95	0.72	0.06	7.45	3158.01	634.54	374.10
Indian Creek	341.00*	500 Year	563.36	562.40	0.95	0.65	0.10	44.19	3613.48	1172.32	404.42
Indian Creek	246	10 Year	559.68	558.93	0.76	0.58	0.00		1800.00		61.20
Indian Creek	246	50 Year	561.51	560.60	0.91	0.52	0.00	56.33	2898.02	25.66	411.13
Indian Creek	246	100 Year	561.90	561.09	0.81	0.45	0.01	200.14	3126.12	183.75	481.30
Indian Creek	246	200 Year	562.07	561.32	0.75	0.43	0.01	298.21	3209.63	292.16	492.82
Indian Creek	246	500 Year	562.61	561.98	0.63	0.36	0.01	651.96	3498.57	679.48	517.98
Indian Creek	179.50*	10 Year	559.10	558.34	0.77	0.71	0.03		1800.00		61.11
Indian Creek	179.50*	50 Year	560.98	560.04	0.94	0.58	0.01	20.00	2922.58	37.42	313.55
Indian Creek	179.50*	100 Year	561.45	560.59	0.86	0.48	0.01	187.60	3196.66	125.75	398.21
Indian Creek	179.50*	200 Year	561.64	560.77	0.86	0.45	0.00	276.48	3350.87	172.65	415.51
Indian Creek	179.50*	500 Year	562.23	561.50	0.74	0.35	0.02	719.45	3692.89	417.66	445.43
Indian Creek	113	10 Year	558.37	557.32	1.04	0.48	0.14		1800.00		56.91
Indian Creek	113	50 Year	560.39	559.31	1.08	0.41	0.11	6.36	2928.94	44.70	217.50
Indian Creek	113	100 Year	560.96	560.01	0.95	0.34	0.07	156.93	3228.29	124.79	364.18
Indian Creek	113	200 Year	561.19	560.31	0.88	0.32	0.05	285.07	3334.50	180.43	410.93
Indian Creek	113	500 Year	561.86	561.20	0.66	0.26	0.00	865.06	3573.50	391.44	468.55
Indian Creek	56.50*	10 Year	557.75	557.16	0.59	0.23	0.07		1800.00		64.13
Indian Creek	56.50*	50 Year	559.87	559.16	0.72	0.23	0.08	1.58	2973.79	4.63	169.48
Indian Creek	56.50*	100 Year	560.55	559.84	0.72	0.21	0.07	94.74	3393.43	21.83	296.18
Indian Creek	56.50*	200 Year	560.82	560.09	0.72	0.21	0.07	177.03	3589.90	33.07	326.52
Indian Creek	56.50*	500 Year	561.60	560.90	0.70	0.20	0.05	594.31	4147.81	87.87	367.50
Indian Creek	0	10 Year	557.45	557.10	0.34				1800.00		75.39
Indian Creek	0	50 Year	559.57	559.11	0.46			3.17	2975.19	1.64	176.60
Indian Creek	0	100 Year	560.27	559.79	0.48			80.29	3422.46	7.26	290.45
Indian Creek	0	200 Year	560.54	560.04	0.50			148.07	3641.14	10.80	302.73
Indian Creek	0	500 Year	561.34	560.81	0.54			458.79	4341.05	30.15	339.23

HEC-RAS Plan: exist River: Indian Creek Reach: Indian Creek

Reach	River Sta	Profile	E.G. US. (ft)	Min El Prs (ft)	BR Open Area (sq ft)	Prs O WS (ft)	Q Total (cfs)	Min El Weir Flow (ft)	Q Weir (cfs)	Delta EG (ft)	BR Sluice Coef
Indian Creek	2628	10 Year	570.29	594.34	3249.67		1800.00	600.01		1.83	
Indian Creek	2628	50 Year	571.74	594.34	3249.67		2980.00	600.01		1.87	
Indian Creek	2628	100 Year	572.25	594.34	3249.67		3510.00	600.01		1.89	
Indian Creek	2628	200 Year	572.52	594.34	3249.67		3800.00	600.01		1.90	
Indian Creek	2628	500 Year	573.36	594.34	3249.67		4830.00	600.01		1.98	

basefile after BO review.06.28.2021 Plan: proposed 7/8/2021

Indian Creek Indian Creek



HEC-RAS Plan: prop River: Indian Creek Reach: Indian Creek

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Indian Creek	4512	10 Year	1800.00	564.18	573.16		573.49	0.003352	4.98	554.68	361.30	0.38
Indian Creek	4512	50 Year	2980.00	564.18	574.52		574.75	0.002215	4.72	1142.56	461.63	0.32
Indian Creek	4512	100 Year	3510.00	564.18	575.06		575.25	0.001867	4.57	1390.58	466.66	0.30
Indian Creek	4512	200 Year	3800.00	564.18	575.30		575.49	0.001770	4.55	1506.26	467.54	0.30
Indian Creek	4512	500 Year	4830.00	564.18	576.10		576.27	0.001551	4.56	1879.14	472.40	0.28
Indian Creek	4427.00*	10 Year	1800.00	563.67	572.86		573.21	0.003203	5.05	524.08	332.94	0.38
Indian Creek	4427.00*	50 Year	2980.00	563.67	574.31		574.56	0.002154	4.84	1075.28	395.67	0.32
Indian Creek	4427.00*	100 Year	3510.00	563.67	574.87		575.09	0.001884	4.76	1297.27	404.81	0.30
Indian Creek	4427.00*	200 Year	3800.00	563.67	575.12		575.34	0.001815	4.77	1399.85	408.17	0.30
Indian Creek	4427.00*	500 Year	4830.00	563.67	575.92		576.13	0.001664	4.88	1731.44	418.92	0.29
Indian Creek	4342	10 Year	1800.00	563.16	572.73		572.96	0.002085	4.29	673.99	353.04	0.30
Indian Creek	4342	50 Year	2980.00	563.16	574.21		574.39	0.001532	4.23	1209.06	370.03	0.27
Indian Creek	4342	100 Year	3510.00	563.16	574.76		574.94	0.001406	4.25	1417.74	376.66	0.26
Indian Creek	4342	200 Year	3800.00	563.16	575.02		575.19	0.001384	4.30	1513.02	379.28	0.26
Indian Creek	4342	500 Year	4830.00	563.16	575.82		576.00	0.001345	4.50	1819.56	386.49	0.26
Indian Creek	4263.00*	10 Year	1800.00	562.81	572.64		572.80	0.001482	3.58	791.76	361.43	0.26
Indian Creek	4263.00*	50 Year	2980.00	562.81	574.13		574.27	0.001136	3.64	1348.30	382.54	0.24
Indian Creek	4263.00*	100 Year	3510.00	562.81	574.70		574.83	0.001058	3.69	1565.42	388.99	0.23
Indian Creek	4263.00*	200 Year	3800.00	562.81	574.95		575.08	0.001049	3.75	1663.86	391.67	0.23
Indian Creek	4263.00*	500 Year	4830.00	562.81	575.75		575.89	0.001042	3.98	1980.24	399.78	0.23
Indian Creek	4184	10 Year	1800.00	562.47	572.57		572.68	0.001135	3.04	927.13	425.48	0.22
Indian Creek	4184	50 Year	2980.00	562.47	574.09		574.18	0.000833	3.04	1600.76	455.03	0.20
Indian Creek	4184	100 Year	3510.00	562.47	574.65		574.74	0.000768	3.07	1860.62	460.24	0.19
Indian Creek	4184	200 Year	3800.00	562.47	574.91		575.00	0.000760	3.12	1977.51	462.49	0.19
Indian Creek	4184	500 Year	4830.00	562.47	575.71		575.81	0.000751	3.31	2351.06	468.64	0.20
Indian Creek	4107.50*	10 Year	1800.00	562.51	572.47		572.60	0.001056	3.23	937.01	415.58	0.22
Indian Creek	4107.50*	50 Year	2980.00	562.51	574.02		574.12	0.000803	3.25	1631.30	466.39	0.20
Indian Creek	4107.50*	100 Year	3510.00	562.51	574.59		574.69	0.000741	3.26	1901.51	473.51	0.20
Indian Creek	4107.50*	200 Year	3800.00	562.51	574.85		574.94	0.000734	3.31	2022.44	476.50	0.20
Indian Creek	4107.50*	500 Year	4830.00	562.51	575.65		575.75	0.000727	3.49	2409.30	484.86	0.20
Indian Creek	4031	10 Year	1800.00	562.54	572.45		572.52	0.000644	2.68	1287.19	504.32	0.17
Indian Creek	4031	50 Year	2980.00	562.54	574.00		574.05	0.000506	2.69	2137.96	587.92	0.16
Indian Creek	4031	100 Year	3510.00	562.54	574.57		574.63	0.000485	2.74	2482.53	602.19	0.16
Indian Creek	4031	200 Year	3800.00	562.54	574.83		574.88	0.000478	2.77	2636.74	604.64	0.15
Indian Creek	4031	500 Year	4830.00	562.54	575.64		575.70	0.000469	2.89	3127.87	611.80	0.16
Indian Creek	3971.50*	10 Year	1800.00	562.47	572.29		572.45	0.001385	3.58	795.98	386.47	0.25
Indian Creek	3971.50*	50 Year	2980.00	562.47	573.88		574.01	0.000998	3.53	1508.29	486.49	0.22
Indian Creek	3971.50*	100 Year	3510.00	562.47	574.47		574.58	0.000905	3.52	1805.78	518.87	0.21
Indian Creek	3971.50*	200 Year	3800.00	562.47	574.73		574.84	0.000880	3.54	1940.36	522.62	0.21
Indian Creek	3971.50*	500 Year	4830.00	562.47	575.54		575.65	0.000832	3.66	2369.42	533.46	0.21
Indian Creek	3912	10 Year	1800.00	562.40	572.11		572.34	0.002344	4.04	567.28	226.75	0.31
Indian Creek	3912	50 Year	2980.00	562.40	573.72		573.92	0.001758	4.14	1084.62	438.24	0.28
Indian Creek	3912	100 Year	3510.00	562.40	574.32		574.51	0.001519	4.08	1375.48	502.65	0.27
Indian Creek	3912	200 Year	3800.00	562.40	574.59		574.77	0.001451	4.09	1509.16	507.04	0.26
Indian Creek	3912	500 Year	4830.00	562.40	575.42		575.59	0.001294	4.14	1933.48	517.05	0.25
Indian Creek	3817.33*	10 Year	1800.00	562.14	571.69		572.06	0.003405	4.91	382.33	130.84	0.38
Indian Creek	3817.33*	50 Year	2980.00	562.14	573.19		573.67	0.003381	5.80	636.53	192.94	0.40
Indian Creek	3817.33*	100 Year	3510.00	562.14	573.70		574.26	0.003591	6.29	765.65	356.62	0.41
Indian Creek	3817.33*	200 Year	3800.00	562.14	573.98		574.53	0.003456	6.33	871.62	390.77	0.41
Indian Creek	3817.33*	500 Year	4830.00	562.14	574.92		575.38	0.002829	6.20	1245.73	405.31	0.38
Indian Creek	3722.67*	10 Year	1800.00	561.87	571.37		571.75	0.003222	5.03	409.41	152.66	0.38
Indian Creek	3722.67*	50 Year	2980.00	561.87	572.90		573.36	0.003103	5.81	677.17	190.26	0.38
Indian Creek	3722.67*	100 Year	3510.00	561.87	573.44		573.92	0.003063	6.06	803.72	269.56	0.39
Indian Creek	3722.67*	200 Year	3800.00	561.87	573.72		574.20	0.003043	6.19	883.99	323.21	0.39
Indian Creek	3722.67*	500 Year	4830.00	561.87	574.56		575.10	0.003090	6.67	1225.70	440.39	0.40
Indian Creek	3628	10 Year	1800.00	561.61	571.14	566.89	571.46	0.002522	4.75	483.25	166.75	0.33
Indian Creek	3628	50 Year	2980.00	561.61	572.69	569.58	573.07	0.002503	5.47	767.24	216.65	0.34
Indian Creek	3628	100 Year	3510.00	561.61	573.24	570.45	573.64	0.002502	5.72	902.80	277.46	0.35
Indian Creek	3628	200 Year	3800.00	561.61	573.52	570.76	573.92	0.002499	5.84	985.15	332.68	0.35
Indian Creek	3628	500 Year	4830.00	561.61	574.39	571.59	574.80	0.002439	6.15	1306.32	436.15	0.35
Indian Creek	3535.33*	10 Year	1800.00	561.01	570.99	566.89	571.24	0.001899	4.07	507.05	155.94	0.30
Indian Creek	3535.33*	50 Year	2980.00	561.01	572.51	568.77	572.85	0.002033	4.91	777.68	197.91	0.32
Indian Creek	3535.33*	100 Year	3510.00	561.01	573.05	569.32	573.42	0.002085	5.21	891.37	238.30	0.33
Indian Creek	3535.33*	200 Year	3800.00	561.01	573.32	569.58	573.70	0.002108	5.36	957.95	257.84	0.33

HEC-RAS Plan: prop River: Indian Creek Reach: Indian Creek (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Indian Creek	3535.33*	500 Year	4830.00	561.01	574.18	570.72	574.59	0.002124	5.75	1279.40	453.46	0.34
Indian Creek	3442.67*	10 Year	1800.00	560.41	570.88	566.18	571.06	0.001279	3.35	578.74	155.69	0.24
Indian Creek	3442.67*	50 Year	2980.00	560.41	572.40	567.99	572.65	0.001464	4.18	842.70	208.55	0.27
Indian Creek	3442.67*	100 Year	3510.00	560.41	572.93	568.47	573.21	0.001532	4.47	974.67	286.35	0.28
Indian Creek	3442.67*	200 Year	3800.00	560.41	573.19	568.70	573.49	0.001563	4.62	1054.56	314.55	0.28
Indian Creek	3442.67*	500 Year	4830.00	560.41	574.05	569.49	574.38	0.001620	5.02	1364.75	414.51	0.29
Indian Creek	3350	10 Year	1800.00	559.81	570.82	564.97	570.93	0.000808	2.72	686.81	163.71	0.19
Indian Creek	3350	50 Year	2980.00	559.81	572.32	567.16	572.50	0.000973	3.46	1000.87	257.79	0.22
Indian Creek	3350	100 Year	3510.00	559.81	572.85	567.58	573.05	0.001026	3.71	1143.68	301.89	0.23
Indian Creek	3350	200 Year	3800.00	559.81	573.12	567.79	573.33	0.001053	3.84	1219.96	319.47	0.23
Indian Creek	3350	500 Year	4830.00	559.81	573.96	568.52	574.21	0.001133	4.25	1488.76	394.07	0.25
Indian Creek	3263.50*	10 Year	1800.00	560.09	570.71	565.98	570.85	0.001078	3.03	670.74	178.25	0.22
Indian Creek	3263.50*	50 Year	2980.00	560.09	572.19	567.70	572.40	0.001252	3.81	985.33	301.70	0.25
Indian Creek	3263.50*	100 Year	3510.00	560.09	572.72	568.30	572.95	0.001288	4.05	1158.03	333.74	0.26
Indian Creek	3263.50*	200 Year	3800.00	560.09	572.99	568.50	573.22	0.001283	4.14	1249.36	338.62	0.26
Indian Creek	3263.50*	500 Year	4830.00	560.09	573.86	569.36	574.11	0.001270	4.41	1550.35	353.42	0.26
Indian Creek	3177	10 Year	1800.00	560.38	570.64	566.02	570.75	0.000907	2.81	921.49	472.79	0.20
Indian Creek	3177	50 Year	2980.00	560.38	572.17	567.59	572.26	0.000711	2.90	1732.98	583.27	0.19
Indian Creek	3177	100 Year	3510.00	560.38	572.71	568.15	572.80	0.000666	2.94	2062.16	626.76	0.18
Indian Creek	3177	200 Year	3800.00	560.38	572.99	568.38	573.08	0.000641	2.95	2237.58	638.38	0.18
Indian Creek	3177	500 Year	4830.00	560.38	573.87	569.14	573.96	0.000577	2.99	2811.09	658.43	0.17
Indian Creek	3108.00*	10 Year	1800.00	559.74	570.59	565.61	570.69	0.000764	2.75	910.84	304.91	0.19
Indian Creek	3108.00*	50 Year	2980.00	559.74	572.09	567.22	572.20	0.000751	3.13	1470.89	440.86	0.20
Indian Creek	3108.00*	100 Year	3510.00	559.74	572.62	567.92	572.74	0.000748	3.26	1721.81	501.42	0.20
Indian Creek	3108.00*	200 Year	3800.00	559.74	572.90	568.25	573.02	0.000747	3.33	1864.99	550.16	0.20
Indian Creek	3108.00*	500 Year	4830.00	559.74	573.77	569.43	573.90	0.000724	3.50	2398.72	671.93	0.20
Indian Creek	3039	10 Year	1800.00	559.10	570.55	564.58	570.63	0.000534	2.46	1037.43	388.36	0.16
Indian Creek	3039	50 Year	2980.00	559.10	572.05	566.29	572.15	0.000580	2.91	1503.57	548.60	0.17
Indian Creek	3039	100 Year	3510.00	559.10	572.58	566.90	572.69	0.000599	3.07	1731.82	662.14	0.18
Indian Creek	3039	200 Year	3800.00	559.10	572.86	567.19	572.96	0.000605	3.15	1873.59	743.33	0.18
Indian Creek	3039	500 Year	4830.00	559.10	573.73	568.92	573.85	0.000609	3.35	2412.48	868.52	0.18
Indian Creek	2945	10 Year	1800.00	559.37	570.55	564.74	570.57	0.000256	1.71	1725.64	866.84	0.11
Indian Creek	2945	50 Year	2980.00	559.37	572.05	567.52	572.08	0.000267	1.97	2398.47	881.99	0.12
Indian Creek	2945	100 Year	3510.00	559.37	572.58	568.04	572.62	0.000278	2.09	2639.48	885.87	0.12
Indian Creek	2945	200 Year	3800.00	559.37	572.85	568.18	572.89	0.000283	2.15	2762.48	887.89	0.12
Indian Creek	2945	500 Year	4830.00	559.37	573.73	568.61	573.78	0.000303	2.36	3160.10	894.16	0.13
Indian Creek	2884.50*	10 Year	1800.00	559.74	570.48	565.40	570.54	0.000560	2.30	1162.68	823.69	0.16
Indian Creek	2884.50*	50 Year	2980.00	559.74	571.98	567.91	572.05	0.000548	2.63	1683.20	856.18	0.17
Indian Creek	2884.50*	100 Year	3510.00	559.74	572.51	568.45	572.58	0.000559	2.78	1871.85	863.26	0.17
Indian Creek	2884.50*	200 Year	3800.00	559.74	572.78	568.62	572.86	0.000565	2.85	1968.40	866.62	0.17
Indian Creek	2884.50*	500 Year	4830.00	559.74	573.64	569.17	573.74	0.000590	3.11	2281.50	877.53	0.18
Indian Creek	2824	10 Year	1800.00	559.50	570.32	564.79	570.46	0.001350	3.27	682.64	766.95	0.25
Indian Creek	2824	50 Year	2980.00	559.50	571.78	566.79	571.96	0.001347	3.82	1011.22	818.48	0.26
Indian Creek	2824	100 Year	3510.00	559.50	572.29	567.47	572.50	0.001375	4.05	1134.41	842.14	0.26
Indian Creek	2824	200 Year	3800.00	559.50	572.55	567.87	572.77	0.001391	4.16	1197.84	849.85	0.26
Indian Creek	2824	500 Year	4830.00	559.50	573.39	569.53	573.64	0.001448	4.55	1404.28	868.08	0.27
Indian Creek	2772	10 Year	1800.00	559.29	570.04	564.65	570.29	0.001706	4.00	494.48	476.14	0.28
Indian Creek	2772	50 Year	2980.00	559.29	571.36	566.79	571.74	0.002195	5.14	709.57	699.51	0.32
Indian Creek	2772	100 Year	3510.00	559.29	571.82	567.53	572.25	0.002361	5.54	793.09	771.82	0.34
Indian Creek	2772	200 Year	3800.00	559.29	572.06	567.94	572.52	0.002443	5.74	835.50	783.49	0.35
Indian Creek	2772	500 Year	4830.00	559.29	572.81	569.02	573.36	0.002710	6.40	970.76	810.28	0.37
Indian Creek	2628	Bridge										
Indian Creek	2474	10 Year	1800.00	558.08	568.24	563.20	568.45	0.001243	3.82	556.01	153.54	0.25
Indian Creek	2474	50 Year	2980.00	558.08	569.52	564.85	569.86	0.001718	5.00	785.55	202.75	0.30
Indian Creek	2474	100 Year	3510.00	558.08	569.97	565.49	570.36	0.001877	5.40	875.30	214.27	0.31
Indian Creek	2474	200 Year	3800.00	558.08	570.20	565.77	570.61	0.001955	5.60	921.17	220.30	0.32
Indian Creek	2474	500 Year	4830.00	558.08	570.87	566.91	571.38	0.002270	6.32	1055.32	240.24	0.35
Indian Creek	2413	10 Year	1800.00	557.83	567.52	566.12	568.17	0.007610	6.56	304.00	121.82	0.56
Indian Creek	2413	50 Year	2980.00	557.83	568.58	567.72	569.50	0.008557	8.07	469.03	184.03	0.62
Indian Creek	2413	100 Year	3510.00	557.83	568.98	568.26	569.97	0.008635	8.52	547.05	202.32	0.63
Indian Creek	2413	200 Year	3800.00	557.83	569.19	568.42	570.21	0.008689	8.75	589.59	214.58	0.64
Indian Creek	2413	500 Year	4830.00	557.83	569.88	569.17	570.97	0.008413	9.27	750.35	258.91	0.64

HEC-RAS Plan: prop River: Indian Creek Reach: Indian Creek (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Indian Creek	2350.50*	10 Year	1800.00	558.54	567.13	565.68	567.68	0.006712	6.05	327.18	147.61	0.53
Indian Creek	2350.50*	50 Year	2980.00	558.54	568.16	567.12	568.93	0.007360	7.38	507.05	196.94	0.58
Indian Creek	2350.50*	100 Year	3510.00	558.54	568.58	567.64	569.39	0.007234	7.71	592.21	207.85	0.58
Indian Creek	2350.50*	200 Year	3800.00	558.54	568.79	567.85	569.63	0.007132	7.86	637.71	211.07	0.58
Indian Creek	2350.50*	500 Year	4830.00	558.54	569.51	568.59	570.39	0.006783	8.30	793.39	222.34	0.58
Indian Creek	2288	10 Year	1800.00	558.61	566.83	565.10	567.25	0.005059	5.26	384.26	165.16	0.46
Indian Creek	2288	50 Year	2980.00	558.61	567.85	566.42	568.44	0.005612	6.44	576.89	209.15	0.51
Indian Creek	2288	100 Year	3510.00	558.61	568.29	566.92	568.90	0.005463	6.71	669.15	215.92	0.51
Indian Creek	2288	200 Year	3800.00	558.61	568.51	567.16	569.14	0.005387	6.85	717.77	219.04	0.51
Indian Creek	2288	500 Year	4830.00	558.61	569.25	567.88	569.93	0.005143	7.26	882.78	228.50	0.50
Indian Creek	2214.00*	10 Year	1800.00	557.57	566.55	564.15	566.91	0.003636	4.79	385.48	115.01	0.40
Indian Creek	2214.00*	50 Year	2980.00	557.57	567.34	565.40	568.00	0.005572	6.61	499.64	170.67	0.51
Indian Creek	2214.00*	100 Year	3510.00	557.57	567.61	565.88	568.41	0.006376	7.31	547.18	180.97	0.55
Indian Creek	2214.00*	200 Year	3800.00	557.57	567.74	566.10	568.62	0.006799	7.67	572.11	186.58	0.57
Indian Creek	2214.00*	500 Year	4830.00	557.57	568.18	567.07	569.32	0.008170	8.83	656.66	201.32	0.63
Indian Creek	2140	10 Year	1800.00	556.52	566.41	563.12	566.64	0.002167	4.01	532.20	246.37	0.31
Indian Creek	2140	50 Year	2980.00	556.52	567.16	564.48	567.56	0.003212	5.35	733.76	285.77	0.39
Indian Creek	2140	100 Year	3510.00	556.52	567.43	564.95	567.89	0.003634	5.86	810.50	297.50	0.42
Indian Creek	2140	200 Year	3800.00	556.52	567.56	565.17	568.06	0.003848	6.12	850.57	302.46	0.43
Indian Creek	2140	500 Year	4830.00	556.52	568.00	566.61	568.62	0.004488	6.92	987.44	315.95	0.47
Indian Creek	2055.50*	10 Year	1800.00	557.77	566.06	564.22	566.38	0.003941	4.86	516.06	305.89	0.41
Indian Creek	2055.50*	50 Year	2980.00	557.77	566.76	565.94	567.21	0.005033	6.07	742.97	338.46	0.48
Indian Creek	2055.50*	100 Year	3510.00	557.77	566.99	566.25	567.50	0.005539	6.56	823.34	348.93	0.51
Indian Creek	2055.50*	200 Year	3800.00	557.77	567.11	566.39	567.65	0.005810	6.82	864.28	354.61	0.52
Indian Creek	2055.50*	500 Year	4830.00	557.77	567.52	566.80	568.16	0.006483	7.57	1013.84	375.60	0.56
Indian Creek	1971	10 Year	1800.00	559.02	565.77	565.01	565.99	0.004629	4.65	658.59	407.07	0.43
Indian Creek	1971	50 Year	2980.00	559.02	566.49	565.67	566.74	0.004712	5.30	961.07	436.29	0.45
Indian Creek	1971	100 Year	3510.00	559.02	566.70	565.84	566.99	0.005054	5.67	1057.81	446.56	0.47
Indian Creek	1971	200 Year	3800.00	559.02	566.81	565.95	567.11	0.005248	5.87	1106.30	451.57	0.48
Indian Creek	1971	500 Year	4830.00	559.02	567.22	566.24	567.56	0.005551	6.38	1293.46	470.89	0.50
Indian Creek	1886.00*	10 Year	1800.00	558.01	564.48	564.48	565.29	0.014192	7.59	321.64	279.11	0.75
Indian Creek	1886.00*	50 Year	2980.00	558.01	565.32	565.32	566.09	0.011784	8.08	617.14	416.46	0.71
Indian Creek	1886.00*	100 Year	3510.00	558.01	565.63	565.55	566.34	0.010637	8.07	751.21	439.75	0.68
Indian Creek	1886.00*	200 Year	3800.00	558.01	565.84	565.49	566.49	0.009585	7.90	842.38	454.05	0.65
Indian Creek	1886.00*	500 Year	4830.00	558.01	566.46	566.00	567.00	0.007422	7.57	1138.50	489.64	0.59
Indian Creek	1801	10 Year	1800.00	557.00	564.51	564.51	564.61	0.001756	3.18	985.65	578.72	0.27
Indian Creek	1801	50 Year	2980.00	557.00	565.46	565.46	565.55	0.001495	3.36	1612.38	702.26	0.26
Indian Creek	1801	100 Year	3510.00	557.00	565.81	565.81	565.90	0.001432	3.44	1856.55	718.57	0.26
Indian Creek	1801	200 Year	3800.00	557.00	565.98	565.98	566.07	0.001405	3.48	1982.20	723.67	0.26
Indian Creek	1801	500 Year	4830.00	557.00	566.55	566.55	566.64	0.001332	3.61	2396.50	734.86	0.25
Indian Creek	1709.00*	10 Year	1800.00	556.31	564.30	564.30	564.43	0.002045	3.64	899.44	599.34	0.30
Indian Creek	1709.00*	50 Year	2980.00	556.31	565.30	565.30	565.41	0.001618	3.69	1545.51	682.45	0.28
Indian Creek	1709.00*	100 Year	3510.00	556.31	565.65	565.65	565.76	0.001534	3.75	1789.52	697.06	0.27
Indian Creek	1709.00*	200 Year	3800.00	556.31	565.83	565.83	565.94	0.001503	3.78	1914.10	703.64	0.27
Indian Creek	1709.00*	500 Year	4830.00	556.31	566.40	566.40	566.52	0.001415	3.90	2325.14	717.37	0.27
Indian Creek	1617	10 Year	1800.00	555.62	564.10	564.10	564.24	0.001934	3.74	924.57	605.10	0.30
Indian Creek	1617	50 Year	2980.00	555.62	565.16	565.16	565.27	0.001466	3.70	1605.90	685.64	0.27
Indian Creek	1617	100 Year	3510.00	555.62	565.52	565.52	565.62	0.001396	3.75	1857.28	704.84	0.26
Indian Creek	1617	200 Year	3800.00	555.62	565.70	565.70	565.80	0.001365	3.78	1985.44	709.14	0.26
Indian Creek	1617	500 Year	4830.00	555.62	566.28	566.28	566.39	0.001289	3.89	2404.34	720.08	0.26
Indian Creek	1537.67*	10 Year	1800.00	555.00	563.92	563.92	564.09	0.001824	3.80	859.93	585.33	0.29
Indian Creek	1537.67*	50 Year	2980.00	555.00	565.02	565.02	565.15	0.001418	3.80	1556.81	682.36	0.26
Indian Creek	1537.67*	100 Year	3510.00	555.00	565.39	565.39	565.51	0.001356	3.85	1812.29	703.09	0.26
Indian Creek	1537.67*	200 Year	3800.00	555.00	565.57	565.57	565.70	0.001327	3.88	1942.54	707.37	0.26
Indian Creek	1537.67*	500 Year	4830.00	555.00	566.16	566.16	566.29	0.001259	3.99	2366.74	720.48	0.26
Indian Creek	1458.33*	10 Year	1800.00	554.38	563.81	563.81	563.96	0.001356	3.44	904.07	582.63	0.25
Indian Creek	1458.33*	50 Year	2980.00	554.38	564.92	564.92	565.05	0.001165	3.59	1615.55	693.37	0.24
Indian Creek	1458.33*	100 Year	3510.00	554.38	565.29	565.29	565.41	0.001138	3.67	1877.43	717.60	0.24
Indian Creek	1458.33*	200 Year	3800.00	554.38	565.48	565.48	565.60	0.001121	3.71	2011.39	721.03	0.24
Indian Creek	1458.33*	500 Year	4830.00	554.38	566.07	566.07	566.19	0.001084	3.84	2445.51	732.79	0.24
Indian Creek	1379	10 Year	1800.00	553.76	563.77	563.77	563.86	0.000787	2.76	1030.94	544.14	0.20
Indian Creek	1379	50 Year	2980.00	553.76	564.85	564.85	564.96	0.000900	3.28	1727.05	710.76	0.21
Indian Creek	1379	100 Year	3510.00	553.76	565.22	565.22	565.33	0.000903	3.40	1995.47	738.51	0.22
Indian Creek	1379	200 Year	3800.00	553.76	565.40	565.40	565.52	0.000898	3.44	2133.39	741.70	0.22

HEC-RAS Plan: prop River: Indian Creek Reach: Indian Creek (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Indian Creek	1379	500 Year	4830.00	553.76	566.00		566.11	0.000891	3.60	2579.39	752.06	0.22
Indian Creek	1294.00*	10 Year	1800.00	553.64	563.61		563.77	0.001308	3.38	681.77	318.93	0.25
Indian Creek	1294.00*	50 Year	2980.00	553.64	564.65		564.85	0.001523	4.08	1165.96	569.06	0.28
Indian Creek	1294.00*	100 Year	3510.00	553.64	565.00		565.22	0.001569	4.29	1376.20	605.10	0.28
Indian Creek	1294.00*	200 Year	3800.00	553.64	565.18		565.41	0.001584	4.38	1487.66	620.68	0.29
Indian Creek	1294.00*	500 Year	4830.00	553.64	565.77		566.00	0.001627	4.68	1865.69	656.12	0.29
Indian Creek	1209	10 Year	1800.00	553.51	563.51		563.66	0.001325	3.27	732.41	351.45	0.25
Indian Creek	1209	50 Year	2980.00	553.51	564.52		564.72	0.001562	3.98	1150.84	490.44	0.28
Indian Creek	1209	100 Year	3510.00	553.51	564.87		565.08	0.001610	4.19	1342.77	591.53	0.28
Indian Creek	1209	200 Year	3800.00	553.51	565.05		565.27	0.001623	4.28	1452.18	620.61	0.29
Indian Creek	1209	500 Year	4830.00	553.51	565.64		565.86	0.001632	4.53	1834.22	680.57	0.29
Indian Creek	1146.00*	10 Year	1800.00	553.26	563.36		563.56	0.001783	3.75	667.14	327.36	0.29
Indian Creek	1146.00*	50 Year	2980.00	553.26	564.36		564.60	0.002050	4.51	1040.53	404.92	0.31
Indian Creek	1146.00*	100 Year	3510.00	553.26	564.70		564.96	0.002128	4.76	1180.49	410.95	0.32
Indian Creek	1146.00*	200 Year	3800.00	553.26	564.87		565.14	0.002166	4.88	1252.28	413.71	0.33
Indian Creek	1146.00*	500 Year	4830.00	553.26	565.44		565.73	0.002283	5.28	1486.56	421.48	0.34
Indian Creek	1083	10 Year	1800.00	553.01	563.17		563.42	0.002318	4.34	628.05	344.98	0.32
Indian Creek	1083	50 Year	2980.00	553.01	564.19		564.46	0.002511	4.89	1033.97	423.53	0.34
Indian Creek	1083	100 Year	3510.00	553.01	564.54		564.81	0.002526	5.09	1183.30	429.58	0.35
Indian Creek	1083	200 Year	3800.00	553.01	564.72		565.00	0.002539	5.19	1259.49	432.71	0.35
Indian Creek	1083	500 Year	4830.00	553.01	565.28		565.58	0.002592	5.52	1506.90	442.30	0.36
Indian Creek	988.33*	10 Year	1800.00	552.69	563.01		563.21	0.001825	3.85	668.85	351.05	0.29
Indian Creek	988.33*	50 Year	2980.00	552.69	563.99		564.24	0.002068	4.54	1052.74	407.65	0.31
Indian Creek	988.33*	100 Year	3510.00	552.69	564.33		564.59	0.002153	4.80	1191.85	414.46	0.32
Indian Creek	988.33*	200 Year	3800.00	552.69	564.50		564.77	0.002195	4.92	1263.07	417.37	0.33
Indian Creek	988.33*	500 Year	4830.00	552.69	565.05		565.35	0.002332	5.34	1493.44	425.48	0.34
Indian Creek	893.67*	10 Year	1800.00	552.37	562.89		563.05	0.001365	3.39	733.93	366.93	0.25
Indian Creek	893.67*	50 Year	2980.00	552.37	563.84		564.05	0.001653	4.14	1100.88	394.89	0.28
Indian Creek	893.67*	100 Year	3510.00	552.37	564.17		564.40	0.001773	4.43	1229.75	399.53	0.30
Indian Creek	893.67*	200 Year	3800.00	552.37	564.33		564.57	0.001832	4.57	1295.57	401.09	0.30
Indian Creek	893.67*	500 Year	4830.00	552.37	564.85		565.14	0.002026	5.04	1507.21	406.09	0.32
Indian Creek	799	10 Year	1800.00	552.05	562.81		562.93	0.000989	2.95	830.77	368.71	0.22
Indian Creek	799	50 Year	2980.00	552.05	563.73		563.90	0.001262	3.68	1214.98	434.04	0.25
Indian Creek	799	100 Year	3510.00	552.05	564.05		564.24	0.001375	3.96	1352.01	437.87	0.26
Indian Creek	799	200 Year	3800.00	552.05	564.21		564.41	0.001432	4.10	1421.92	439.80	0.27
Indian Creek	799	500 Year	4830.00	552.05	564.72		564.95	0.001615	4.56	1646.89	445.36	0.29
Indian Creek	699	10 Year	1800.00	551.66	562.73		562.83	0.000943	2.80	943.53	458.56	0.21
Indian Creek	699	50 Year	2980.00	551.66	563.64		563.77	0.001145	3.41	1390.30	506.03	0.24
Indian Creek	699	100 Year	3510.00	551.66	563.95		564.10	0.001228	3.64	1547.62	511.71	0.25
Indian Creek	699	200 Year	3800.00	551.66	564.10		564.26	0.001270	3.76	1628.06	514.32	0.25
Indian Creek	699	500 Year	4830.00	551.66	564.60		564.78	0.001404	4.14	1886.99	519.79	0.27
Indian Creek	624.50*	10 Year	1800.00	551.86	562.59		562.74	0.001572	3.42	808.62	434.31	0.27
Indian Creek	624.50*	50 Year	2980.00	551.86	563.49		563.66	0.001733	4.00	1214.29	459.63	0.29
Indian Creek	624.50*	100 Year	3510.00	551.86	563.79		563.98	0.001834	4.25	1352.63	463.53	0.30
Indian Creek	624.50*	200 Year	3800.00	551.86	563.94		564.14	0.001886	4.38	1423.25	465.48	0.30
Indian Creek	624.50*	500 Year	4830.00	551.86	564.42		564.65	0.002060	4.80	1649.60	470.64	0.32
Indian Creek	550	10 Year	1800.00	552.07	562.31		562.56	0.003324	4.52	654.65	439.88	0.38
Indian Creek	550	50 Year	2980.00	552.07	563.27		563.50	0.002811	4.73	1119.07	518.39	0.36
Indian Creek	550	100 Year	3510.00	552.07	563.58		563.81	0.002808	4.90	1280.32	538.88	0.36
Indian Creek	550	200 Year	3800.00	552.07	563.74		563.97	0.002812	4.99	1365.03	551.42	0.36
Indian Creek	550	500 Year	4830.00	552.07	564.23		564.47	0.002853	5.31	1646.05	588.60	0.37
Indian Creek	493.00*	10 Year	1800.00	551.91	561.97	559.67	562.33	0.004648	5.23	535.42	389.75	0.44
Indian Creek	493.00*	50 Year	2980.00	551.91	563.03		563.31	0.003537	5.20	978.02	437.79	0.40
Indian Creek	493.00*	100 Year	3510.00	551.91	563.33		563.62	0.003561	5.41	1111.09	451.06	0.40
Indian Creek	493.00*	200 Year	3800.00	551.91	563.48		563.78	0.003575	5.52	1180.52	458.72	0.41
Indian Creek	493.00*	500 Year	4830.00	551.91	563.96		564.28	0.003681	5.91	1403.47	476.87	0.42
Indian Creek	436	10 Year	1800.00	551.74	560.77	559.62	561.85	0.012638	8.34	227.10	102.24	0.72
Indian Creek	436	50 Year	2980.00	551.74	562.69		563.06	0.004997	5.90	849.13	409.73	0.47
Indian Creek	436	100 Year	3510.00	551.74	563.00		563.38	0.004893	6.08	976.71	417.57	0.47
Indian Creek	436	200 Year	3800.00	551.74	563.15		563.54	0.004849	6.17	1042.28	420.69	0.47
Indian Creek	436	500 Year	4830.00	551.74	563.62		564.03	0.004915	6.56	1241.75	432.44	0.48
Indian Creek	341.00*	10 Year	1800.00	551.07	559.71		560.68	0.011234	7.90	227.78	54.35	0.68
Indian Creek	341.00*	50 Year	2980.00	551.07	561.40	560.17	562.36	0.009797	8.18	494.56	339.95	0.65

HEC-RAS Plan: prop River: Indian Creek Reach: Indian Creek (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Indian Creek	341.00*	100 Year	3510.00	551.07	561.75	561.66	562.69	0.009312	8.36	618.96	360.17	0.65
Indian Creek	341.00*	200 Year	3800.00	551.07	561.91	561.83	562.86	0.009311	8.52	674.59	374.10	0.65
Indian Creek	341.00*	500 Year	4830.00	551.07	562.40	562.23	563.36	0.009080	8.93	869.78	404.42	0.65
Indian Creek	246	10 Year	1800.00	550.41	558.93		559.68	0.008646	6.97	258.07	61.20	0.60
Indian Creek	246	50 Year	2980.00	550.41	560.60	558.89	561.51	0.007919	7.74	462.75	411.13	0.60
Indian Creek	246	100 Year	3510.00	550.41	561.09	559.50	561.90	0.006830	7.63	690.53	481.30	0.56
Indian Creek	246	200 Year	3800.00	550.41	561.32	559.74	562.07	0.006311	7.53	803.04	492.82	0.54
Indian Creek	246	500 Year	4830.00	550.41	561.98		562.61	0.005302	7.40	1135.04	517.98	0.51
Indian Creek	179.50*	10 Year	1800.00	550.17	558.34		559.10	0.008719	7.02	256.34	61.11	0.60
Indian Creek	179.50*	50 Year	2980.00	550.17	560.04	558.35	560.98	0.007891	7.85	437.25	313.55	0.60
Indian Creek	179.50*	100 Year	3510.00	550.17	560.59	558.93	561.45	0.006791	7.78	638.68	398.21	0.57
Indian Creek	179.50*	200 Year	3800.00	550.17	560.77	559.10	561.64	0.006735	7.91	713.36	415.51	0.57
Indian Creek	179.50*	500 Year	4830.00	550.17	561.50		562.23	0.005615	7.79	1026.87	445.43	0.53
Indian Creek	113	10 Year	1800.00	549.94	557.32		558.37	0.013301	8.19	219.66	56.91	0.74
Indian Creek	113	50 Year	2980.00	549.94	559.31	557.98	560.39	0.009571	8.41	389.47	217.50	0.66
Indian Creek	113	100 Year	3510.00	549.94	560.01	558.64	560.96	0.007562	8.15	591.78	364.18	0.60
Indian Creek	113	200 Year	3800.00	549.94	560.31	558.96	561.19	0.006853	8.01	706.73	410.93	0.57
Indian Creek	113	500 Year	4830.00	549.94	561.20		561.86	0.005001	7.49	1099.01	468.55	0.50
Indian Creek	56.50*	10 Year	1800.00	549.92	557.16		557.75	0.005962	6.17	291.93	64.13	0.51
Indian Creek	56.50*	50 Year	2980.00	549.92	559.16		559.87	0.005645	6.80	448.10	169.48	0.51
Indian Creek	56.50*	100 Year	3510.00	549.92	559.84		560.55	0.004978	6.90	607.71	296.18	0.49
Indian Creek	56.50*	200 Year	3800.00	549.92	560.09		560.82	0.004860	7.01	688.85	326.52	0.49
Indian Creek	56.50*	500 Year	4830.00	549.92	560.90		561.60	0.004374	7.20	970.44	367.50	0.47
Indian Creek	0	10 Year	1800.00	549.90	557.10	553.98	557.45	0.003004	4.71	382.46	75.39	0.37
Indian Creek	0	50 Year	2980.00	549.90	559.11	555.36	559.57	0.003005	5.44	560.22	176.60	0.38
Indian Creek	0	100 Year	3510.00	549.90	559.79	555.89	560.27	0.003005	5.63	718.41	290.45	0.39
Indian Creek	0	200 Year	3800.00	549.90	560.04	556.15	560.54	0.003003	5.77	793.38	302.73	0.39
Indian Creek	0	500 Year	4830.00	549.90	560.81	557.03	561.34	0.003003	6.19	1040.76	339.23	0.39

HEC-RAS Plan: prop River: Indian Creek Reach: Indian Creek

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Indian Creek	4512	10 Year	573.49	573.16	0.33	0.28	0.00	0.11	1535.35	264.54	361.30
Indian Creek	4512	50 Year	574.75	574.52	0.23	0.19	0.00	3.24	1833.92	1142.83	461.63
Indian Creek	4512	100 Year	575.25	575.06	0.20	0.16	0.00	5.87	1917.75	1586.38	465.66
Indian Creek	4512	200 Year	575.49	575.30	0.19	0.15	0.00	7.43	1976.81	1815.75	467.54
Indian Creek	4512	500 Year	576.27	576.10	0.18	0.14	0.00	14.00	2193.46	2622.54	472.40
Indian Creek	4427.00*	10 Year	573.21	572.86	0.35	0.22	0.04	0.96	1588.40	210.65	332.94
Indian Creek	4427.00*	50 Year	574.56	574.31	0.25	0.15	0.02	6.50	1917.70	1055.80	395.67
Indian Creek	4427.00*	100 Year	575.09	574.87	0.22	0.14	0.02	10.00	2035.58	1464.42	404.81
Indian Creek	4427.00*	200 Year	575.34	575.12	0.22	0.13	0.01	11.97	2110.28	1677.75	408.17
Indian Creek	4427.00*	500 Year	576.13	575.92	0.21	0.13	0.01	19.82	2377.45	2432.73	418.92
Indian Creek	4342	10 Year	572.96	572.73	0.23	0.14	0.02	2.69	1448.31	349.00	353.04
Indian Creek	4342	50 Year	574.39	574.21	0.18	0.10	0.01	9.44	1769.40	1201.16	370.03
Indian Creek	4342	100 Year	574.94	574.76	0.17	0.10	0.01	13.23	1904.38	1592.39	376.66
Indian Creek	4342	200 Year	575.19	575.02	0.17	0.09	0.01	15.33	1986.56	1798.11	379.28
Indian Creek	4342	500 Year	576.00	575.82	0.18	0.09	0.01	23.42	2273.29	2533.29	386.49
Indian Creek	4263.00*	10 Year	572.80	572.64	0.16	0.10	0.01	2.90	1395.48	401.62	361.43
Indian Creek	4263.00*	50 Year	574.27	574.13	0.14	0.08	0.01	16.83	1774.84	1188.33	382.54
Indian Creek	4263.00*	100 Year	574.83	574.70	0.13	0.07	0.01	26.04	1933.72	1550.25	388.99
Indian Creek	4263.00*	200 Year	575.08	574.95	0.13	0.07	0.01	31.29	2028.09	1740.62	391.67
Indian Creek	4263.00*	500 Year	575.89	575.75	0.15	0.07	0.01	52.53	2357.87	2419.60	399.78
Indian Creek	4184	10 Year	572.68	572.57	0.11	0.08	0.00	8.82	1329.59	461.58	425.48
Indian Creek	4184	50 Year	574.18	574.09	0.09	0.06	0.00	122.56	1686.95	1170.49	455.03
Indian Creek	4184	100 Year	574.74	574.65	0.09	0.06	0.00	187.90	1837.93	1484.18	460.24
Indian Creek	4184	200 Year	575.00	574.91	0.09	0.06	0.00	222.40	1928.44	1649.16	462.49
Indian Creek	4184	500 Year	575.81	575.71	0.10	0.06	0.00	351.08	2245.99	2232.93	468.64
Indian Creek	4107.50*	10 Year	572.60	572.47	0.12	0.06	0.02	203.19	1322.68	274.13	415.58
Indian Creek	4107.50*	50 Year	574.12	574.02	0.10	0.05	0.01	525.46	1640.06	814.49	466.39
Indian Creek	4107.50*	100 Year	574.69	574.59	0.10	0.05	0.01	685.86	1766.37	1057.77	473.51
Indian Creek	4107.50*	200 Year	574.94	574.85	0.10	0.04	0.01	769.74	1844.95	1185.31	476.50
Indian Creek	4107.50*	500 Year	575.75	575.65	0.10	0.04	0.01	1068.35	2120.11	1641.55	484.86
Indian Creek	4031	10 Year	572.52	572.45	0.07	0.05	0.01	680.09	969.40	150.51	504.32
Indian Creek	4031	50 Year	574.05	574.00	0.06	0.04	0.01	1330.07	1172.53	477.40	587.92
Indian Creek	4031	100 Year	574.63	574.57	0.05	0.04	0.01	1600.97	1271.04	637.99	602.19
Indian Creek	4031	200 Year	574.88	574.83	0.05	0.04	0.01	1765.41	1318.20	716.39	604.64
Indian Creek	4031	500 Year	575.70	575.64	0.06	0.04	0.01	2346.81	1487.10	996.09	611.80
Indian Creek	3971.50*	10 Year	572.45	572.29	0.16	0.10	0.01	193.86	1430.39	175.75	386.47
Indian Creek	3971.50*	50 Year	574.01	573.88	0.12	0.08	0.01	672.11	1767.35	540.54	486.49
Indian Creek	3971.50*	100 Year	574.58	574.47	0.12	0.07	0.01	913.16	1896.27	700.57	518.87
Indian Creek	3971.50*	200 Year	574.84	574.73	0.11	0.07	0.01	1054.33	1966.43	779.24	522.62
Indian Creek	3971.50*	500 Year	575.65	575.54	0.11	0.06	0.01	1560.82	2217.44	1051.74	533.46
Indian Creek	3912	10 Year	572.34	572.11	0.23	0.26	0.01		1612.64	187.36	226.75
Indian Creek	3912	50 Year	573.92	573.72	0.21	0.22	0.03	97.76	2178.93	703.30	438.24
Indian Creek	3912	100 Year	574.51	574.32	0.19	0.21	0.04	247.30	2343.43	919.28	502.65
Indian Creek	3912	200 Year	574.77	574.59	0.18	0.20	0.04	344.88	2431.88	1023.24	507.04
Indian Creek	3912	500 Year	575.59	575.42	0.17	0.17	0.03	719.16	2734.07	1376.77	517.05
Indian Creek	3817.33*	10 Year	572.06	571.69	0.37	0.31	0.00	2.92	1783.68	13.40	130.84
Indian Creek	3817.33*	50 Year	573.67	573.19	0.48	0.31	0.01	194.55	2722.40	63.05	192.94
Indian Creek	3817.33*	100 Year	574.26	573.70	0.56	0.31	0.02	240.48	3176.91	92.61	356.62
Indian Creek	3817.33*	200 Year	574.53	573.98	0.55	0.31	0.02	369.28	3322.44	108.28	390.77
Indian Creek	3817.33*	500 Year	575.38	574.92	0.46	0.28	0.01	1004.85	3664.16	160.99	405.31
Indian Creek	3722.67*	10 Year	571.75	571.37	0.38	0.27	0.02	52.05	1738.45	9.50	152.66
Indian Creek	3722.67*	50 Year	573.36	572.90	0.46	0.26	0.02	376.68	2560.19	43.13	190.26
Indian Creek	3722.67*	100 Year	573.92	573.44	0.48	0.26	0.03	569.28	2878.17	62.55	269.56
Indian Creek	3722.67*	200 Year	574.20	573.72	0.49	0.26	0.03	684.49	3041.59	73.92	323.21
Indian Creek	3722.67*	500 Year	575.10	574.56	0.53	0.26	0.04	1079.70	3632.16	118.13	440.39
Indian Creek	3628	10 Year	571.46	571.14	0.32	0.20	0.02	164.61	1626.78	8.60	166.75
Indian Creek	3628	50 Year	573.07	572.69	0.38	0.21	0.01	615.14	2329.42	35.44	216.65
Indian Creek	3628	100 Year	573.64	573.24	0.39	0.21	0.01	855.17	2603.93	50.90	277.46
Indian Creek	3628	200 Year	573.92	573.52	0.40	0.21	0.01	995.61	2744.45	59.95	332.68

HEC-RAS Plan: prop River: Indian Creek Reach: Indian Creek (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Indian Creek	2474	10 Year	568.45	568.24	0.22	0.15	0.13	77.18	1704.91	17.91	153.54
Indian Creek	2474	50 Year	569.86	569.52	0.34	0.19	0.17	258.84	2614.31	106.85	202.75
Indian Creek	2474	100 Year	570.36	569.97	0.39	0.21	0.18	359.54	2971.32	179.14	214.27
Indian Creek	2474	200 Year	570.61	570.20	0.41	0.21	0.18	417.23	3159.93	222.84	220.30
Indian Creek	2474	500 Year	571.38	570.87	0.51	0.23	0.17	623.85	3820.99	385.16	240.24
Indian Creek	2413	10 Year	568.17	567.52	0.65	0.45	0.05	37.30	1744.91	17.79	121.82
Indian Creek	2413	50 Year	569.50	568.58	0.92	0.49	0.07	142.45	2682.91	154.63	184.03
Indian Creek	2413	100 Year	569.97	568.98	0.99	0.49	0.09	202.25	3046.47	261.29	202.32
Indian Creek	2413	200 Year	570.21	569.19	1.03	0.49	0.10	234.96	3241.23	323.81	214.58
Indian Creek	2413	500 Year	570.97	569.88	1.09	0.47	0.10	373.25	3840.57	616.18	258.91
Indian Creek	2350.50*	10 Year	567.68	567.13	0.56	0.36	0.07	10.60	1761.84	27.56	147.61
Indian Creek	2350.50*	50 Year	568.93	568.16	0.77	0.40	0.09	71.88	2701.44	206.67	196.94
Indian Creek	2350.50*	100 Year	569.39	568.58	0.82	0.39	0.10	115.57	3058.25	336.19	207.85
Indian Creek	2350.50*	200 Year	569.63	568.79	0.83	0.38	0.10	141.85	3240.43	417.72	211.07
Indian Creek	2350.50*	500 Year	570.39	569.51	0.88	0.37	0.10	248.41	3853.22	728.38	222.34
Indian Creek	2288	10 Year	567.25	566.83	0.42	0.31	0.03	2.01	1738.06	59.93	165.16
Indian Creek	2288	50 Year	568.44	567.85	0.58	0.41	0.02	31.12	2666.28	282.60	209.15
Indian Creek	2288	100 Year	568.90	568.29	0.61	0.43	0.06	60.00	3018.26	431.74	215.92
Indian Creek	2288	200 Year	569.14	568.51	0.63	0.45	0.07	79.23	3203.79	516.97	219.04
Indian Creek	2288	500 Year	569.93	569.25	0.68	0.47	0.14	162.82	3833.62	833.56	228.50
Indian Creek	2214.00*	10 Year	566.91	566.55	0.36	0.20	0.06	3.94	1792.32	3.74	115.01
Indian Creek	2214.00*	50 Year	568.00	567.34	0.66	0.31	0.13	32.32	2905.08	42.61	170.67
Indian Creek	2214.00*	100 Year	568.41	567.61	0.80	0.35	0.17	61.05	3377.41	71.53	180.97
Indian Creek	2214.00*	200 Year	568.62	567.74	0.88	0.37	0.19	79.26	3631.03	89.71	186.58
Indian Creek	2214.00*	500 Year	569.32	568.18	1.14	0.44	0.26	163.13	4501.85	165.03	201.32
Indian Creek	2140	10 Year	566.64	566.41	0.24	0.24	0.02	73.76	1725.79	0.44	246.37
Indian Creek	2140	50 Year	567.56	567.16	0.40	0.34	0.02	323.06	2648.32	8.62	285.77
Indian Creek	2140	100 Year	567.89	567.43	0.47	0.37	0.01	461.35	3031.05	17.60	297.50
Indian Creek	2140	200 Year	568.06	567.56	0.50	0.40	0.01	542.18	3233.65	24.18	302.46
Indian Creek	2140	500 Year	568.62	568.00	0.62	0.45	0.01	860.21	3914.13	55.66	315.95
Indian Creek	2055.50*	10 Year	566.38	566.06	0.32	0.36	0.03	227.85	1566.74	5.41	305.89
Indian Creek	2055.50*	50 Year	567.21	566.76	0.45	0.41	0.06	665.65	2277.24	37.11	338.46
Indian Creek	2055.50*	100 Year	567.50	566.99	0.51	0.45	0.07	875.33	2577.34	57.32	348.93
Indian Creek	2055.50*	200 Year	567.65	567.11	0.54	0.47	0.07	992.64	2738.02	69.34	354.61
Indian Creek	2055.50*	500 Year	568.16	567.52	0.64	0.51	0.09	1438.82	3269.58	121.60	375.60
Indian Creek	1971	10 Year	565.99	565.77	0.22	0.64	0.06	689.26	1078.24	32.51	407.07
Indian Creek	1971	50 Year	566.74	566.49	0.25	0.60	0.05	1406.67	1475.99	97.34	436.29
Indian Creek	1971	100 Year	566.99	566.70	0.28	0.60	0.04	1721.22	1660.92	127.86	446.56
Indian Creek	1971	200 Year	567.11	566.81	0.30	0.59	0.04	1894.05	1760.66	145.29	451.57
Indian Creek	1971	500 Year	567.56	567.22	0.35	0.54	0.02	2530.22	2083.88	215.91	470.89
Indian Creek	1886.00*	10 Year	565.29	564.48	0.81	0.33	0.22	165.98	1623.19	10.83	279.11
Indian Creek	1886.00*	50 Year	566.09	565.32	0.77	0.28	0.20	709.49	2182.63	87.88	416.46
Indian Creek	1886.00*	100 Year	566.34	565.63	0.71	0.26	0.19	1029.43	2347.55	133.03	439.75
Indian Creek	1886.00*	200 Year	566.49	565.84	0.65	0.25	0.17	1230.64	2404.77	164.58	454.05
Indian Creek	1886.00*	500 Year	567.00	566.46	0.54	0.22	0.13	1929.85	2619.76	280.39	489.64
Indian Creek	1801	10 Year	564.61	564.51	0.09	0.17	0.00	82.23	910.96	806.81	578.72
Indian Creek	1801	50 Year	565.55	565.46	0.09	0.14	0.00	400.61	1180.68	1398.71	702.26
Indian Creek	1801	100 Year	565.90	565.81	0.09	0.14	0.00	580.69	1287.18	1642.14	718.57
Indian Creek	1801	200 Year	566.07	565.98	0.09	0.13	0.00	685.23	1343.27	1771.50	723.67
Indian Creek	1801	500 Year	566.64	566.55	0.10	0.13	0.00	1075.68	1534.00	2220.32	734.86
Indian Creek	1709.00*	10 Year	564.43	564.30	0.13	0.18	0.00	149.92	1059.50	590.58	599.34
Indian Creek	1709.00*	50 Year	565.41	565.30	0.11	0.14	0.00	626.15	1310.79	1043.05	682.45
Indian Creek	1709.00*	100 Year	565.76	565.65	0.11	0.13	0.00	866.07	1414.22	1229.71	697.06
Indian Creek	1709.00*	200 Year	565.94	565.83	0.11	0.13	0.00	999.38	1470.19	1330.43	703.64
Indian Creek	1709.00*	500 Year	566.52	566.40	0.11	0.12	0.00	1493.10	1659.27	1677.63	717.37
Indian Creek	1617	10 Year	564.24	564.10	0.14	0.15	0.00	271.41	1106.17	422.42	605.10
Indian Creek	1617	50 Year	565.27	565.16	0.11	0.11	0.00	870.84	1324.58	784.59	685.64
Indian Creek	1617	100 Year	565.62	565.52	0.11	0.11	0.00	1152.17	1423.84	933.99	704.84
Indian Creek	1617	200 Year	565.80	565.70	0.11	0.11	0.00	1312.53	1474.89	1012.58	709.14

HEC-RAS Plan: prop River: Indian Creek Reach: Indian Creek (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Indian Creek	1617	500 Year	566.39	566.28	0.11	0.10	0.00	1891.59	1652.12	1286.29	720.08
Indian Creek	1537.67*	10 Year	564.09	563.92	0.17	0.12	0.01	266.32	1328.84	204.84	585.33
Indian Creek	1537.67*	50 Year	565.15	565.02	0.13	0.10	0.00	912.51	1601.28	466.21	682.36
Indian Creek	1537.67*	100 Year	565.51	565.39	0.13	0.10	0.00	1216.39	1718.47	575.14	703.09
Indian Creek	1537.67*	200 Year	565.70	565.57	0.13	0.10	0.00	1389.90	1777.70	632.40	707.37
Indian Creek	1537.67*	500 Year	566.29	566.16	0.12	0.09	0.00	2011.26	1984.81	833.93	720.48
Indian Creek	1458.33*	10 Year	563.96	563.81	0.15	0.08	0.02	262.74	1421.64	115.62	582.63
Indian Creek	1458.33*	50 Year	565.05	564.92	0.13	0.08	0.00	911.05	1769.90	299.04	693.37
Indian Creek	1458.33*	100 Year	565.41	565.29	0.12	0.08	0.00	1217.93	1910.28	381.79	717.60
Indian Creek	1458.33*	200 Year	565.60	565.48	0.12	0.08	0.00	1396.00	1978.38	425.62	721.03
Indian Creek	1458.33*	500 Year	566.19	566.07	0.12	0.08	0.00	2031.40	2215.52	583.08	732.79
Indian Creek	1379	10 Year	563.86	563.77	0.09	0.08	0.01	383.25	1345.47	71.27	544.14
Indian Creek	1379	50 Year	564.96	564.85	0.11	0.10	0.01	900.63	1881.00	198.37	710.76
Indian Creek	1379	100 Year	565.33	565.22	0.11	0.10	0.01	1204.96	2046.01	259.03	738.51
Indian Creek	1379	200 Year	565.52	565.40	0.11	0.10	0.01	1383.44	2124.32	292.25	741.70
Indian Creek	1379	500 Year	566.11	566.00	0.11	0.10	0.01	2022.44	2392.86	414.70	752.06
Indian Creek	1294.00*	10 Year	563.77	563.61	0.16	0.11	0.00	104.78	1650.90	44.32	318.93
Indian Creek	1294.00*	50 Year	564.85	564.65	0.21	0.13	0.00	362.50	2352.36	265.15	569.06
Indian Creek	1294.00*	100 Year	565.22	565.00	0.22	0.13	0.00	529.97	2601.43	378.60	605.10
Indian Creek	1294.00*	200 Year	565.41	565.18	0.22	0.14	0.00	630.43	2726.65	442.92	620.68
Indian Creek	1294.00*	500 Year	566.00	565.77	0.23	0.14	0.00	1007.37	3143.25	679.38	656.12
Indian Creek	1209	10 Year	563.66	563.51	0.15	0.10	0.00	2.61	1618.38	179.01	351.45
Indian Creek	1209	50 Year	564.72	564.52	0.20	0.11	0.00	49.66	2341.63	588.71	490.44
Indian Creek	1209	100 Year	565.08	564.87	0.21	0.12	0.01	92.98	2599.01	818.01	591.53
Indian Creek	1209	200 Year	565.27	565.05	0.21	0.12	0.01	127.41	2727.07	945.52	620.61
Indian Creek	1209	500 Year	565.86	565.64	0.22	0.12	0.01	296.09	3129.92	1403.99	680.57
Indian Creek	1146.00*	10 Year	563.56	563.36	0.19	0.13	0.01	0.01	1581.05	218.94	327.36
Indian Creek	1146.00*	50 Year	564.60	564.36	0.25	0.14	0.00	0.90	2250.04	729.06	404.92
Indian Creek	1146.00*	100 Year	564.96	564.70	0.26	0.15	0.00	1.82	2501.82	1006.36	410.95
Indian Creek	1146.00*	200 Year	565.14	564.87	0.27	0.15	0.00	2.46	2634.09	1163.45	413.71
Indian Creek	1146.00*	500 Year	565.73	565.44	0.30	0.15	0.00	5.46	3080.78	1743.76	421.48
Indian Creek	1083	10 Year	563.42	563.17	0.25	0.19	0.01		1518.76	281.24	344.98
Indian Creek	1083	50 Year	564.46	564.19	0.27	0.22	0.01	0.07	2032.81	947.12	423.53
Indian Creek	1083	100 Year	564.81	564.54	0.27	0.22	0.00	0.26	2228.40	1281.34	429.58
Indian Creek	1083	200 Year	565.00	564.72	0.28	0.22	0.00	0.42	2332.25	1467.33	432.71
Indian Creek	1083	500 Year	565.58	565.28	0.29	0.23	0.00	1.31	2686.35	2142.34	442.30
Indian Creek	988.33*	10 Year	563.21	563.01	0.20	0.15	0.01		1574.54	225.46	351.05
Indian Creek	988.33*	50 Year	564.24	563.99	0.24	0.17	0.01	0.23	2190.73	789.05	407.65
Indian Creek	988.33*	100 Year	564.59	564.33	0.26	0.18	0.01	0.59	2433.56	1075.84	414.46
Indian Creek	988.33*	200 Year	564.77	564.50	0.27	0.19	0.01	0.87	2560.96	1238.17	417.37
Indian Creek	988.33*	500 Year	565.35	565.05	0.30	0.21	0.00	2.27	2992.95	1834.78	425.48
Indian Creek	893.67*	10 Year	563.05	562.89	0.16	0.11	0.01	0.00	1604.06	195.93	366.93
Indian Creek	893.67*	50 Year	564.05	563.84	0.21	0.14	0.01	0.77	2288.13	691.09	394.89
Indian Creek	893.67*	100 Year	564.40	564.17	0.23	0.15	0.01	1.59	2567.72	940.69	399.53
Indian Creek	893.67*	200 Year	564.57	564.33	0.24	0.15	0.01	2.16	2714.48	1083.35	401.09
Indian Creek	893.67*	500 Year	565.14	564.85	0.28	0.17	0.01	4.80	3215.61	1609.59	406.09
Indian Creek	799	10 Year	562.93	562.81	0.12	0.10	0.01	0.28	1599.18	200.54	368.71
Indian Creek	799	50 Year	563.90	563.73	0.17	0.12	0.01	28.00	2312.56	639.43	434.04
Indian Creek	799	100 Year	564.24	564.05	0.19	0.13	0.01	52.98	2604.69	852.33	437.87
Indian Creek	799	200 Year	564.41	564.21	0.20	0.13	0.01	68.58	2759.01	972.41	439.80
Indian Creek	799	500 Year	564.95	564.72	0.23	0.15	0.02	132.52	3284.02	1413.46	445.36
Indian Creek	699	10 Year	562.83	562.73	0.10	0.09	0.00	1.63	1515.12	283.24	458.56
Indian Creek	699	50 Year	563.77	563.64	0.14	0.10	0.00	15.08	2146.97	817.95	506.03
Indian Creek	699	100 Year	564.10	563.95	0.15	0.11	0.00	23.76	2404.48	1081.76	511.71
Indian Creek	699	200 Year	564.26	564.10	0.16	0.11	0.00	29.04	2540.51	1230.45	514.32
Indian Creek	699	500 Year	564.78	564.60	0.18	0.13	0.01	51.16	3002.02	1776.82	519.79
Indian Creek	624.50*	10 Year	562.74	562.59	0.15	0.16	0.01	0.85	1453.49	345.66	434.31
Indian Creek	624.50*	50 Year	563.66	563.49	0.18	0.16	0.00	14.66	2000.69	964.65	459.63

HEC-RAS Plan: prop River: Indian Creek Reach: Indian Creek (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Indian Creek	624.50*	100 Year	563.98	563.79	0.19	0.17	0.00	24.50	2232.28	1253.22	463.53
Indian Creek	624.50*	200 Year	564.14	563.94	0.20	0.17	0.00	30.49	2355.10	1414.42	465.48
Indian Creek	624.50*	500 Year	564.65	564.42	0.23	0.18	0.00	55.25	2775.97	1998.78	470.64
Indian Creek	550	10 Year	562.56	562.31	0.25	0.22	0.01	5.49	1382.87	411.64	439.88
Indian Creek	550	50 Year	563.50	563.27	0.22	0.18	0.01	61.69	1758.88	1159.43	518.39
Indian Creek	550	100 Year	563.81	563.58	0.23	0.18	0.01	97.10	1925.43	1487.47	538.88
Indian Creek	550	200 Year	563.97	563.74	0.23	0.18	0.01	118.34	2014.34	1667.32	551.42
Indian Creek	550	500 Year	564.47	564.23	0.25	0.18	0.01	210.15	2317.67	2302.19	588.60
Indian Creek	493.00*	10 Year	562.33	561.97	0.36	0.41	0.07		1494.42	305.58	389.75
Indian Creek	493.00*	50 Year	563.31	563.03	0.28	0.24	0.01	2.61	1856.42	1120.97	437.79
Indian Creek	493.00*	100 Year	563.62	563.33	0.29	0.24	0.01	6.91	2042.11	1460.98	451.06
Indian Creek	493.00*	200 Year	563.78	563.48	0.30	0.24	0.01	10.60	2140.10	1649.30	458.72
Indian Creek	493.00*	500 Year	564.28	563.96	0.32	0.24	0.01	33.28	2479.21	2317.51	476.87
Indian Creek	436	10 Year	561.85	560.77	1.07	1.13	0.03		1788.05	11.95	102.24
Indian Creek	436	50 Year	563.06	562.69	0.38	0.65	0.06	0.24	1951.67	1028.10	409.73
Indian Creek	436	100 Year	563.38	563.00	0.38	0.63	0.06	1.30	2135.65	1373.05	417.57
Indian Creek	436	200 Year	563.54	563.15	0.38	0.62	0.06	2.32	2232.29	1565.38	420.69
Indian Creek	436	500 Year	564.03	563.62	0.41	0.62	0.05	7.73	2579.75	2242.52	432.44
Indian Creek	341.00*	10 Year	560.68	559.71	0.97	0.93	0.06		1800.00		54.35
Indian Creek	341.00*	50 Year	562.36	561.40	0.96	0.84	0.02	0.88	2744.01	235.11	339.95
Indian Creek	341.00*	100 Year	562.69	561.75	0.94	0.75	0.04	4.31	3010.36	495.33	360.17
Indian Creek	341.00*	200 Year	562.86	561.91	0.95	0.72	0.06	7.45	3158.01	634.54	374.10
Indian Creek	341.00*	500 Year	563.36	562.40	0.95	0.65	0.10	44.19	3613.48	1172.32	404.42
Indian Creek	246	10 Year	559.68	558.93	0.76	0.58	0.00		1800.00		61.20
Indian Creek	246	50 Year	561.51	560.60	0.91	0.52	0.00	56.33	2898.02	25.66	411.13
Indian Creek	246	100 Year	561.90	561.09	0.81	0.45	0.01	200.14	3126.12	183.75	481.30
Indian Creek	246	200 Year	562.07	561.32	0.75	0.43	0.01	298.21	3209.63	292.16	492.82
Indian Creek	246	500 Year	562.61	561.98	0.63	0.36	0.01	651.96	3498.57	679.48	517.98
Indian Creek	179.50*	10 Year	559.10	558.34	0.77	0.71	0.03		1800.00		61.11
Indian Creek	179.50*	50 Year	560.98	560.04	0.94	0.58	0.01	20.00	2922.58	37.42	313.55
Indian Creek	179.50*	100 Year	561.45	560.59	0.86	0.48	0.01	187.60	3196.66	125.75	398.21
Indian Creek	179.50*	200 Year	561.64	560.77	0.86	0.45	0.00	276.48	3350.87	172.65	415.51
Indian Creek	179.50*	500 Year	562.23	561.50	0.74	0.35	0.02	719.45	3692.89	417.66	445.43
Indian Creek	113	10 Year	558.37	557.32	1.04	0.48	0.14		1800.00		56.91
Indian Creek	113	50 Year	560.39	559.31	1.08	0.41	0.11	6.36	2928.94	44.70	217.50
Indian Creek	113	100 Year	560.96	560.01	0.95	0.34	0.07	156.93	3228.29	124.79	364.18
Indian Creek	113	200 Year	561.19	560.31	0.88	0.32	0.05	285.07	3334.50	180.43	410.93
Indian Creek	113	500 Year	561.86	561.20	0.66	0.26	0.00	865.06	3573.50	391.44	468.55
Indian Creek	56.50*	10 Year	557.75	557.16	0.59	0.23	0.07		1800.00		64.13
Indian Creek	56.50*	50 Year	559.87	559.16	0.72	0.23	0.08	1.58	2973.79	4.63	169.48
Indian Creek	56.50*	100 Year	560.55	559.84	0.72	0.21	0.07	94.74	3393.43	21.83	296.18
Indian Creek	56.50*	200 Year	560.82	560.09	0.72	0.21	0.07	177.03	3589.90	33.07	326.52
Indian Creek	56.50*	500 Year	561.60	560.90	0.70	0.20	0.05	594.31	4147.81	87.87	367.50
Indian Creek	0	10 Year	557.45	557.10	0.34				1800.00		75.39
Indian Creek	0	50 Year	559.57	559.11	0.46			3.17	2975.19	1.64	176.60
Indian Creek	0	100 Year	560.27	559.79	0.48			80.29	3422.46	7.26	290.45
Indian Creek	0	200 Year	560.54	560.04	0.50			148.07	3641.14	10.80	302.73
Indian Creek	0	500 Year	561.34	560.81	0.54			458.79	4341.05	30.15	339.23

HEC-RAS Plan: prop River: Indian Creek Reach: Indian Creek

Reach	River Sta	Profile	E.G. US. (ft)	Min El Prs (ft)	BR Open Area (sq ft)	Prs O WS (ft)	Q Total (cfs)	Min El Weir Flow (ft)	Q Weir (cfs)	Delta EG (ft)	BR Sluice Coef
Indian Creek	2628	10 Year	570.29	594.34	3296.49		1800.00	600.01		1.83	
Indian Creek	2628	50 Year	571.74	594.34	3296.49		2980.00	600.01		1.87	
Indian Creek	2628	100 Year	572.25	594.34	3296.49		3510.00	600.01		1.89	
Indian Creek	2628	200 Year	572.52	594.34	3296.49		3800.00	600.01		1.90	
Indian Creek	2628	500 Year	573.36	594.34	3296.49		4830.00	600.01		1.98	

ATTACHMENT K

SCOUR ANALYSIS

Approach Cross Section is 2945

Critical Velocity								
10 YR Existing								
LOB			Channel			ROB		
V_{avg}	0.71		V_{avg}	1.77		V_{avg}	0.75	
y	3.05		y	7.88		y	3.3	
D_{50} (mm)	0.2000		D_{50} (mm)	0.2000		D_{50} (mm)	0.2000	
D_{50} (ft)	0.0007		D_{50} (ft)	0.0007		D_{50} (ft)	0.0007	
V_{cD50}	1.17		V_{cD50}	1.37		V_{cD50}	1.18	
Clear-Water			Live-Bed			Clear-Water		
#DIV/0!			8.09			#DIV/0!		

-								
LOB			Channel			ROB		
<u>Live-Bed</u>			<u>Live-Bed</u>			<u>Live-Bed</u>		
y_1	3.05		y_1	7.88		y_1	3.3	
V_{avg}	0.71		V_{avg}	1.77		V_{avg}	0.75	
y_0	0		y_0	7.38		y_0	0	
Q_2	0		Q_2	1800		Q_2	0	
W_2	0		W_2	57.72		W_2	0	
D_{50} (mm)	0.2		D_{50} (mm)	0.2		D_{50} (mm)	0.2	
Q_1	180.6+8		Q_1	877.16		Q_1	742.16	
W_1	83.3		W_1	62.8		W_1	299.25	
k_1	0.64		k_1	0.69		k_1	0.64	
S_1	0.000254		S_1	0.000254		S_1	0.000254	
V^*	0.16		V^*	0.25		V^*	0.16	
ω	0.0892		ω	0.0892		ω	0.0892	
V^*/ω	1.794		V^*/ω	2.803		V^*/ω	1.794	
y_2/y_1	#VALUE!		y_2/y_1	1.96		y_2/y_1	#DIV/0!	
y_2	#VALUE!		y_2	15.47		y_2	#DIV/0!	
Y_s	#VALUE!		Y_s	8.09		Y_s	#DIV/0!	
<u>Clear-Water</u>			<u>Clear-Water</u>			<u>Clear-Water</u>		
K_u	0.0077		K_u	0.0077		K_u	0.0077	
Q	0		Q	1800		Q	0	
D_{50} (ft)	0.0007		D_{50} (ft)	0.0007		D_{50} (ft)	0.0007	
D_m (ft)	0.001		D_m (ft)	0.001		D_m (ft)	0.001	
W	0		W	57.72		W	0	
y_0	0		y_0	7.38		y_0	0	
y_2	#DIV/0!		y_2	18.18		y_2	#DIV/0!	
Y_s	#DIV/0!		Y_s	10.80		Y_s	#DIV/0!	

Approach Cross Section is 2945

Critical Velocity								
50 YR Existing								
LOB			Channel			ROB		
V_{avg}	0.91		V_{avg}	2.03		V_{avg}	0.99	
y	4.35		y	9.41		y	4.84	
D_{50} (mm)	0.2000		D_{50} (mm)	0.2000		D_{50} (mm)	0.2000	
D_{50} (ft)	0.0007		D_{50} (ft)	0.0007		D_{50} (ft)	0.0007	
V_{cD50}	1.24		V_{cD50}	1.41		V_{cD50}	1.26	
Clear-Water			Live-Bed			Clear-Water		
0.12			12.60			#DIV/0!		

-								
LOB			Channel			ROB		
<u>Live-Bed</u>			<u>Live-Bed</u>			<u>Live-Bed</u>		
y_1	4.35		y_1	9.41		y_1	4.84	
V_{avg}	0.91		V_{avg}	2.03		V_{avg}	0.99	
y_0	0.71		y_0	8.46		y_0	0	
Q_2	2.51		Q_2	2977.49		Q_2	0	
W_2	2.96		W_2	60.39		W_2	0	
D_{50} (mm)	0.2		D_{50} (mm)	0.2		D_{50} (mm)	0.2	
Q_1	353.58		Q_1	1200.58		Q_1	1425.84	
W_1	88.81		W_1	62.8		W_1	299.25	
k_1	0.69		k_1	0.69		k_1	0.69	
S_1	0.000264		S_1	0.000264		S_1	0.000264	
V^*	0.19		V^*	0.28		V^*	0.2	
ω	0.0892		ω	0.0892		ω	0.0892	
V^*/ω	2.13		V^*/ω	3.139		V^*/ω	2.242	
y_2/y_1	0.15		y_2/y_1	2.24		y_2/y_1	#DIV/0!	
y_2	0.65		y_2	21.06		y_2	#DIV/0!	
Y_s	0.00		Y_s	12.60		Y_s	#DIV/0!	
<u>Clear-Water</u>			<u>Clear-Water</u>			<u>Clear-Water</u>		
K_u	0.0077		K_u	0.0077		K_u	0.0077	
Q	2.51		Q	2977.49		Q	0	
D_{50} (ft)	0.0007		D_{50} (ft)	0.0007		D_{50} (ft)	0.0007	
D_m (ft)	0.001		D_m (ft)	0.001		D_m (ft)	0.001	
W	2.96		W	60.39		W	0	
y_0	0.71		y_0	8.46		y_0	0	
y_2	0.83		y_2	26.92		y_2	#DIV/0!	
Y_s	0.12		Y_s	18.46		Y_s	#DIV/0!	

Approach Cross Section is 2945

Critical Velocity								
100 YR Existing								
LOB			Channel			ROB		
V_{avg}	1		V_{avg}	2.15		V_{avg}	1.08	
y	4.81		y	9.96		y	5.38	
D_{50} (mm)	0.2000		D_{50} (mm)	0.2000		D_{50} (mm)	0.2000	
D_{50} (ft)	0.0007		D_{50} (ft)	0.0007		D_{50} (ft)	0.0007	
V_{cD50}	1.26		V_{cD50}	1.42		V_{cD50}	1.28	
Clear-Water			Live-Bed			Clear-Water		
0.43			14.18			#DIV/0!		

-								
LOB			Channel			ROB		
<u>Live-Bed</u>			<u>Live-Bed</u>			<u>Live-Bed</u>		
y_1	4.81		y_1	9.96		y_1	5.38	
V_{avg}	1		V_{avg}	2.15		V_{avg}	1.08	
y_0	0.97		y_0	8.85		y_0	0	
Q_2	6.37		Q_2	3503.63		Q_2	0	
W_2	4.06		W_2	61.35		W_2	0	
D_{50} (mm)	0.2		D_{50} (mm)	0.2		D_{50} (mm)	0.2	
Q_1	433.27		Q_1	1342.43		Q_1	1734.29	
W_1	90.48		W_1	62.8		W_1	299.25	
k_1	0.69		k_1	0.69		k_1	0.69	
S_1	0.000273		S_1	0.000273		S_1	0.000273	
V^*	0.21		V^*	0.30		V^*	0.22	
ω	0.0892		ω	0.0892		ω	0.0892	
V^*/ω	2.354		V^*/ω	3.363		V^*/ω	2.466	
y_2/y_1	0.23		y_2/y_1	2.31		y_2/y_1	#DIV/0!	
y_2	1.10		y_2	23.03		y_2	#DIV/0!	
Y_s	0.13		Y_s	14.18		Y_s	#DIV/0!	
<u>Clear-Water</u>			<u>Clear-Water</u>			<u>Clear-Water</u>		
K_u	0.0077		K_u	0.0077		K_u	0.0077	
Q	6.37		Q	3503.63		Q	0	
D_{50} (ft)	0.0007		D_{50} (ft)	0.0007		D_{50} (ft)	0.0007	
D_m (ft)	0.001		D_m (ft)	0.001		D_m (ft)	0.001	
W	4.06		W	61.35		W	0	
y_0	0.97		y_0	8.85		y_0	0	
y_2	1.4		y_2	30.53		y_2	#DIV/0!	
Y_s	0.43		Y_s	21.68		Y_s	#DIV/0!	

Approach Cross Section is 2945

Critical Velocity								
200 YR Existing								
<u>LOB</u>			<u>Channel</u>			<u>ROB</u>		
V_{avg}	1.04		V_{avg}	2.21		V_{avg}	1.12	
y	5.04		y	10.24		y	5.66	
D_{50} (mm)	0.2000		D_{50} (mm)	0.2000		D_{50} (mm)	0.2000	
D_{50} (ft)	0.0007		D_{50} (ft)	0.0007		D_{50} (ft)	0.0007	
V_{cD50}	1.27		V_{cD50}	1.43		V_{cD50}	1.3	
Clear-Water			Live-Bed			Clear-Water		
0.65			14.98			#DIV/0!		

-								
<u>LOB</u>			<u>Channel</u>			<u>ROB</u>		
<u>Live-Bed</u>			<u>Live-Bed</u>			<u>Live-Bed</u>		
y_1	5.04		y_1	10.24		y_1	5.66	
V_{avg}	1.04		V_{avg}	2.21		V_{avg}	1.12	
y_0	1.1		y_0	9.05		y_0	0	
Q_2	9.42		Q_2	3790.58		Q_2	0	
W_2	4.62		W_2	61.84		W_2	0	
D_{50} (mm)	0.2		D_{50} (mm)	0.2		D_{50} (mm)	0.2	
Q_1	477.37		Q_1	1418.39		Q_1	1904.24	
W_1	91.36		W_1	62.8		W_1	299.25	
k_1	0.69		k_1	0.69		k_1	0.69	
S_1	0.000278		S_1	0.000278		S_1	0.000278	
V^*	0.21		V^*	0.30		V^*	0.23	
ω	0.0892		ω	0.0892		ω	0.0892	
V^*/ω	2.354		V^*/ω	3.363		V^*/ω	2.578	
y_2/y_1	0.27		y_2/y_1	2.35		y_2/y_1	#DIV/0!	
y_2	1.37		y_2	24.03		y_2	#DIV/0!	
Y_s	0.27		Y_s	14.98		Y_s	#DIV/0!	
<u>Clear-Water</u>			<u>Clear-Water</u>			<u>Clear-Water</u>		
K_u	0.0077		K_u	0.0077		K_u	0.0077	
Q	9.42		Q	3790.58		Q	0	
D_{50} (ft)	0.0007		D_{50} (ft)	0.0007		D_{50} (ft)	0.0007	
D_m (ft)	0.001		D_m (ft)	0.001		D_m (ft)	0.001	
W	4.62		W	61.84		W	0	
y_0	1.1		y_0	9.05		y_0	0	
y_2	1.75		y_2	32.44		y_2	#DIV/0!	
Y_s	0.65		Y_s	23.39		Y_s	#DIV/0!	

Approach Cross Section is 2945

Critical Velocity								
500 YR Existing								
LOB			Channel			ROB		
V_{avg}	1.17		V_{avg}	2.41		V_{avg}	1.28	
y	5.78		y	11.13		y	6.55	
D_{50} (mm)	0.2000		D_{50} (mm)	0.2000		D_{50} (mm)	0.2000	
D_{50} (ft)	0.0007		D_{50} (ft)	0.0007		D_{50} (ft)	0.0007	
V_{cD50}	1.30		V_{cD50}	1.45		V_{cD50}	1.33	
Clear-Water			Live-Bed			Clear-Water		
1.59			17.49			#DIV/0!		

-								
LOB			Channel			ROB		
<u>Live-Bed</u>			<u>Live-Bed</u>			<u>Live-Bed</u>		
y_1	5.78		y_1	11.13		y_1	6.55	
V_{avg}	1.17		V_{avg}	2.41		V_{avg}	1.28	
y_0	1.53		y_0	9.67		y_0	0	
Q_2	25.64		Q_2	4804.36		Q_2	0	
W_2	6.42		W_2	63.41		W_2	0	
D_{50} (mm)	0.2		D_{50} (mm)	0.2		D_{50} (mm)	0.2	
Q_1	636.41		Q_1	1683.52		Q_1	2510.08	
W_1	94.02		W_1	62.8		W_1	299.25	
k_1	0.69		k_1	0.69		k_1	0.69	
S_1	0.000296		S_1	0.000296		S_1	0.000296	
V^*	0.23		V^*	0.33		V^*	0.25	
ω	0.0892		ω	0.0892		ω	0.0892	
V^*/ω	2.578		V^*/ω	3.7		V^*/ω	2.803	
y_2/y_1	0.41		y_2/y_1	2.44		y_2/y_1	#DIV/0!	
y_2	2.35		y_2	27.16		y_2	#DIV/0!	
Y_s	0.82		Y_s	17.49		Y_s	#DIV/0!	
<u>Clear-Water</u>			<u>Clear-Water</u>			<u>Clear-Water</u>		
K_u	0.0077		K_u	0.0077		K_u	0.0077	
Q	25.64		Q	4804.36		Q	0	
D_{50} (ft)	0.0007		D_{50} (ft)	0.0007		D_{50} (ft)	0.0007	
D_m (ft)	0.001		D_m (ft)	0.001		D_m (ft)	0.001	
W	6.42		W	63.41		W	0	
y_0	1.53		y_0	9.67		y_0	0	
y_2	3.12		y_2	38.91		y_2	#DIV/0!	
Y_s	1.59		Y_s	29.24		Y_s	#DIV/0!	

Approach Cross Section is 2945

Critical Velocity								
10 YR Proposed								
LOB			Channel			ROB		
V_{avg}	0.71		V_{avg}	1.77		V_{avg}	0.75	
y	3.05		y	7.88		y	3.3	
D_{50} (mm)	0.2000		D_{50} (mm)	0.2000		D_{50} (mm)	0.2000	
D_{50} (ft)	0.0007		D_{50} (ft)	0.0007		D_{50} (ft)	0.0007	
V_{cD50}	1.17		V_{cD50}	1.37		V_{cD50}	1.18	
Clear-Water			Live-Bed			Clear-Water		
#DIV/0!			8.09			#DIV/0!		

-								
LOB			Channel			ROB		
<u>Live-Bed</u>			<u>Live-Bed</u>			<u>Live-Bed</u>		
y_1	3.05		y_1	7.88		y_1	3.3	
V_{avg}	0.71		V_{avg}	1.77		V_{avg}	0.75	
y_0	0		y_0	7.38		y_0	0	
Q_2	0		Q_2	1800		Q_2	0	
W_2	0		W_2	57.72		W_2	0	
D_{50} (mm)	0.2		D_{50} (mm)	0.2		D_{50} (mm)	0.2	
Q_1	180.68		Q_1	877.16		Q_1	742.16	
W_1	83.3		W_1	62.8		W_1	299.25	
k_1	0.64		k_1	0.69		k_1	0.64	
S_1	0.000254		S_1	0.000254		S_1	0.000254	
V^*	0.16		V^*	0.25		V^*	0.16	
ω	0.0892		ω	0.0892		ω	0.0892	
V^*/ω	1.794		V^*/ω	2.803		V^*/ω	1.794	
y_2/y_1	#DIV/0!		y_2/y_1	1.96		y_2/y_1	#DIV/0!	
y_2	#DIV/0!		y_2	15.47		y_2	#DIV/0!	
Y_s	#DIV/0!		Y_s	8.09		Y_s	#DIV/0!	
<u>Clear-Water</u>			<u>Clear-Water</u>			<u>Clear-Water</u>		
K_u	0.0077		K_u	0.0077		K_u	0.0077	
Q	0		Q	1800		Q	0	
D_{50} (ft)	0.0007		D_{50} (ft)	0.0007		D_{50} (ft)	0.0007	
D_m (ft)	0.001		D_m (ft)	0.001		D_m (ft)	0.001	
W	0		W	57.72		W	0	
y_0	0		y_0	7.38		y_0	0	
y_2	#DIV/0!		y_2	18.18		y_2	#DIV/0!	
Y_s	#DIV/0!		Y_s	10.80		Y_s	#DIV/0!	

Approach Cross Section is 2945

Critical Velocity								
50 YR Proposed								
LOB			Channel			ROB		
V_{avg}	0.91		V_{avg}	2.03		V_{avg}	0.99	
y	4.35		y	9.41		y	4.84	
D_{50} (mm)	0.2000		D_{50} (mm)	0.2000		D_{50} (mm)	0.2000	
D_{50} (ft)	0.0007		D_{50} (ft)	0.0007		D_{50} (ft)	0.0007	
V_{cD50}	1.24		V_{cD50}	1.41		V_{cD50}	1.26	
Clear-Water			Live-Bed			Clear-Water		
0.12			12.60			#DIV/0!		

-								
LOB			Channel			ROB		
<u>Live-Bed</u>			<u>Live-Bed</u>			<u>Live-Bed</u>		
y_1	4.35		y_1	9.41		y_1	4.84	
V_{avg}	0.91		V_{avg}	2.03		V_{avg}	0.99	
y_0	0.71		y_0	8.46		y_0	0	
Q_2	2.51		Q_2	2977.49		Q_2	0	
W_2	2.96		W_2	60.39		W_2	0	
D_{50} (mm)	0.2		D_{50} (mm)	0.2		D_{50} (mm)	0.2	
Q_1	353.58		Q_1	1200.58		Q_1	1425.84	
W_1	88.81		W_1	62.8		W_1	299.25	
k_1	0.69		k_1	0.69		k_1	0.69	
S_1	0.00264		S_1	0.00264		S_1	0.00264	
V^*	0.61		V^*	0.89		V^*	0.64	
ω	0.0892		ω	0.0892		ω	0.0892	
V^*/ω	6.839		V^*/ω	9.978		V^*/ω	7.175	
y_2/y_1	0.15		y_2/y_1	2.24		y_2/y_1	#DIV/0!	
y_2	0.65		y_2	21.06		y_2	#DIV/0!	
Y_s	0.00		Y_s	12.60		Y_s	#DIV/0!	
<u>Clear-Water</u>			<u>Clear-Water</u>			<u>Clear-Water</u>		
K_u	0.0077		K_u	0.0077		K_u	0.0077	
Q	2.51		Q	2977.49		Q	0	
D_{50} (ft)	0.0007		D_{50} (ft)	0.0007		D_{50} (ft)	0.0007	
D_m (ft)	0.001		D_m (ft)	0.001		D_m (ft)	0.001	
W	2.96		W	60.39		W	0	
y_0	0.71		y_0	8.46		y_0	0	
y_2	0.83		y_2	26.92		y_2	#DIV/0!	
Y_s	0.12		Y_s	18.46		Y_s	#DIV/0!	

Approach Cross Section is 2945

Critical Velocity								
100 YR Proposed								
LOB			Channel			ROB		
V_{avg}	1		V_{avg}	2.15		V_{avg}	1.08	
y	4.81		y	9.96		y	5.38	
D_{50} (mm)	0.2000		D_{50} (mm)	0.2000		D_{50} (mm)	0.2000	
D_{50} (ft)	0.0007		D_{50} (ft)	0.0007		D_{50} (ft)	0.0007	
V_{cD50}	1.26		V_{cD50}	1.42		V_{cD50}	1.28	
Clear-Water			Live-Bed			Clear-Water		
0.43			14.18			#DIV/0!		

-								
LOB			Channel			ROB		
<u>Live-Bed</u>			<u>Live-Bed</u>			<u>Live-Bed</u>		
y_1	4.81		y_1	9.96		y_1	5.38	
V_{avg}	1		V_{avg}	2.15		V_{avg}	1.08	
y_0	0.97		y_0	8.85		y_0	0	
Q_2	6.37		Q_2	3503.63		Q_2	0	
W_2	4.06		W_2	61.35		W_2	0	
D_{50} (mm)	0.2		D_{50} (mm)	0.2		D_{50} (mm)	0.2	
Q_1	433.27		Q_1	1342.43		Q_1	1734.29	
W_1	90.48		W_1	62.8		W_1	299.25	
k_1	0.69		k_1	0.69		k_1	0.69	
S_1	0.000273		S_1	0.000273		S_1	0.000273	
V^*	0.21		V^*	0.30		V^*	0.22	
ω	0.0892		ω	0.0892		ω	0.0892	
V^*/ω	2.354		V^*/ω	3.363		V^*/ω	2.466	
y_2/y_1	0.23		y_2/y_1	2.31		y_2/y_1	#DIV/0!	
y_2	1.10		y_2	23.03		y_2	#DIV/0!	
Y_s	0.13		Y_s	14.18		Y_s	#DIV/0!	
<u>Clear-Water</u>			<u>Clear-Water</u>			<u>Clear-Water</u>		
K_u	0.0077		K_u	0.0077		K_u	0.0077	
Q	6.37		Q	3503.63		Q	0	
D_{50} (ft)	0.0007		D_{50} (ft)	0.0007		D_{50} (ft)	0.0007	
D_m (ft)	0.001		D_m (ft)	0.001		D_m (ft)	0.001	
W	4.06		W	61.35		W	0	
y_0	0.97		y_0	8.85		y_0	0	
y_2	1.4		y_2	30.53		y_2	#DIV/0!	
Y_s	0.43		Y_s	21.68		Y_s	#DIV/0!	

Approach Cross Section is 2945

Critical Velocity								
200 YR Proposed								
LOB			Channel			ROB		
V_{avg}	1.04		V_{avg}	2.21		V_{avg}	1.12	
y	5.04		y	10.24		y	5.66	
D_{50} (mm)	0.2000		D_{50} (mm)	0.2000		D_{50} (mm)	0.2000	
D_{50} (ft)	0.0007		D_{50} (ft)	0.0007		D_{50} (ft)	0.0007	
V_{cD50}	1.27		V_{cD50}	1.43		V_{cD50}	1.3	
Clear-Water			Live-Bed			Clear-Water		
0.65			14.98			#DIV/0!		

-								
LOB			Channel			ROB		
<u>Live-Bed</u>			<u>Live-Bed</u>			<u>Live-Bed</u>		
y_1	5.04		y_1	10.24		y_1	5.66	
V_{avg}	1.04		V_{avg}	2.21		V_{avg}	1.12	
y_0	1.1		y_0	9.05		y_0	0	
Q_2	9.42		Q_2	3790.58		Q_2	0	
W_2	4.62		W_2	61.84		W_2	0	
D_{50} (mm)	0.2		D_{50} (mm)	0.2		D_{50} (mm)	0.2	
Q_1	477.37		Q_1	1418.39		Q_1	1904.24	
W_1	91.36		W_1	62.8		W_1	299.25	
k_1	0.69		k_1	0.69		k_1	0.69	
S_1	0.000278		S_1	0.000278		S_1	0.000278	
V^*	0.21		V^*	0.30		V^*	0.23	
ω	0.0892		ω	0.0892		ω	0.0892	
V^*/ω	2.354		V^*/ω	3.363		V^*/ω	2.578	
y_2/y_1	0.27		y_2/y_1	2.35		y_2/y_1	#DIV/0!	
y_2	1.37		y_2	24.03		y_2	#DIV/0!	
Y_s	0.27		Y_s	14.98		Y_s	#DIV/0!	
<u>Clear-Water</u>			<u>Clear-Water</u>			<u>Clear-Water</u>		
K_u	0.0077		K_u	0.0077		K_u	0.0077	
Q	9.42		Q	3790.58		Q	0	
D_{50} (ft)	0.0007		D_{50} (ft)	0.0007		D_{50} (ft)	0.0007	
D_m (ft)	0.001		D_m (ft)	0.001		D_m (ft)	0.001	
W	4.62		W	61.84		W	0	
y_0	1.1		y_0	9.05		y_0	0	
y_2	1.75		y_2	32.44		y_2	#DIV/0!	
Y_s	0.65		Y_s	23.39		Y_s	#DIV/0!	

Approach Cross Section is 2945

Critical Velocity								
500 YR Proposed								
LOB			Channel			ROB		
V_{avg}	1.17		V_{avg}	2.41		V_{avg}	1.28	
y	5.78		y	11.13		y	6.55	
D_{50} (mm)	0.2000		D_{50} (mm)	0.2000		D_{50} (mm)	0.2000	
D_{50} (ft)	0.0007		D_{50} (ft)	0.0007		D_{50} (ft)	0.0007	
V_{cD50}	1.30		V_{cD50}	1.45		V_{cD50}	1.33	
Clear-Water			Live-Bed			Clear-Water		
1.59			17.49			#DIV/0!		

-								
LOB			Channel			ROB		
<u>Live-Bed</u>			<u>Live-Bed</u>			<u>Live-Bed</u>		
y_1	5.78		y_1	11.13		y_1	6.55	
V_{avg}	1.17		V_{avg}	2.41		V_{avg}	1.28	
y_0	1.53		y_0	9.67		y_0	0	
Q_2	25.64		Q_2	4804.36		Q_2	0	
W_2	6.42		W_2	63.41		W_2	0	
D_{50} (mm)	0.2		D_{50} (mm)	0.2		D_{50} (mm)	0.2	
Q_1	636.41		Q_1	1683.52		Q_1	2510.08	
W_1	94.02		W_1	62.8		W_1	299.25	
k_1	0.69		k_1	0.69		k_1	0.69	
S_1	0.000296		S_1	0.000296		S_1	0.000296	
V^*	0.23		V^*	0.33		V^*	0.25	
ω	0.0892		ω	0.0892		ω	0.0892	
V^*/ω	2.578		V^*/ω	3.7		V^*/ω	2.803	
y_2/y_1	0.41		y_2/y_1	2.44		y_2/y_1	#DIV/0!	
y_2	2.35		y_2	27.16		y_2	#DIV/0!	
Y_s	0.82		Y_s	17.49		Y_s	#DIV/0!	
<u>Clear-Water</u>			<u>Clear-Water</u>			<u>Clear-Water</u>		
K_u	0.0077		K_u	0.0077		K_u	0.0077	
Q	25.64		Q	4804.36		Q	0	
D_{50} (ft)	0.0007		D_{50} (ft)	0.0007		D_{50} (ft)	0.0007	
D_m (ft)	0.001		D_m (ft)	0.001		D_m (ft)	0.001	
W	6.42		W	63.41		W	0	
y_0	1.53		y_0	9.67		y_0	0	
y_2	3.12		y_2	38.91		y_2	#DIV/0!	
Y_s	1.59		Y_s	29.24		Y_s	#DIV/0!	

Existing

10YR	
Pier	
<u>Local Pier Scour</u>	
Pier Shape	Round
K1	1.0
L _{pier}	136.0
a _{pier}	2.2
L/a	12.0
θ	0.0
K2	1.0
K3	1.1
D ₅₀ (mm)	0.200
D ₅₀ (ft)	0.0006
y ₁	6.52
V ₁	3.96
Fr	0.27
y _s /y ₁	0.62
Y _s	4.02

50YR	
Pier	
<u>Local Pier Scour</u>	
Pier Shape	Round
K1	1.0
L _{pier}	136.0
a _{pier}	2.2
L/a	12.0
θ	0.0
K2	1.0
K3	1.1
D ₅₀ (mm)	0.200
D ₅₀ (ft)	0.0006
y ₁	7.87
V ₁	5.05
Fr	0.32
y _s /y ₁	0.58
Y _s	4.57

100YR	
Pier	
<u>Local Pier Scour</u>	
Pier Shape	Round
K1	1.0
L _{pier}	136.0
a _{pier}	2.2
L/a	12.0
θ	0.0
K2	1.0
K3	1.1
D ₅₀ (mm)	0.200
D ₅₀ (ft)	0.0006
y ₁	8.35
V ₁	5.43
Fr	0.33
y _s /y ₁	0.57
Y _s	4.76

200YR	
Pier	
<u>Local Pier Scour</u>	
Pier Shape	Round
K1	1.0
L _{pier}	136.0
a _{pier}	2.2
L/a	12.0
θ	0.0
K2	1.0
K3	1.1
D ₅₀ (mm)	0.200
D ₅₀ (ft)	0.0006
y ₁	8.60
V ₁	5.62
Fr	0.34
y _s /y ₁	0.56
Y _s	4.85

500YR	
Pier	
<u>Local Pier Scour</u>	
Pier Shape	Round
K1	1.0
L _{pier}	136.0
a _{pier}	2.2
L/a	12.0
θ	0.0
K2	1.0
K3	1.1
D ₅₀ (mm)	0.200
D ₅₀ (ft)	0.0006
y ₁	9.38
V ₁	6.24
Fr	0.36
y _s /y ₁	0.55
Y _s	5.13

Maximum scour: (for round nosed piers aligned with the flow)

$Y_s \leq 2.4$ times the pier width (a) for $Fr \leq 0.8$

$Y_s \leq 3.0$ times the pier width (a) for $Fr > 0.8$

Maximum scour is controlled by $2.4 \cdot a = 5.21$ feet

Proposed

10YR	
Pier	
<u>Local Pier Scour</u>	
Pier Shape	Round
K1	1.0
L _{pier}	136.0
a _{pier}	2.2
L/a	12.0
θ	0.0
K2	1.0
K3	1.1
D ₅₀ (mm)	0.200
D ₅₀ (ft)	0.0006
y ₁	6.52
V ₁	3.96
Fr	0.27
y _s /y ₁	0.62
Y _s	4.02

50YR	
Pier	
<u>Local Pier Scour</u>	
Pier Shape	Round
K1	1.0
L _{pier}	136.0
a _{pier}	2.2
L/a	12.0
θ	0.0
K2	1.0
K3	1.1
D ₅₀ (mm)	0.200
D ₅₀ (ft)	0.0006
y ₁	7.87
V ₁	5.05
Fr	0.32
y _s /y ₁	0.58
Y _s	4.57

100YR	
Pier	
<u>Local Pier Scour</u>	
Pier Shape	Round
K1	1.0
L _{pier}	136.0
a _{pier}	2.2
L/a	12.0
θ	0.0
K2	1.0
K3	1.1
D ₅₀ (mm)	0.200
D ₅₀ (ft)	0.0006
y ₁	8.35
V ₁	5.43
Fr	0.33
y _s /y ₁	0.57
Y _s	4.76

200YR	
Pier	
<u>Local Pier Scour</u>	
Pier Shape	Round
K1	1.0
L _{pier}	136.0
a _{pier}	2.2
L/a	12.0
θ	0.0
K2	1.0
K3	1.1
D ₅₀ (mm)	0.200
D ₅₀ (ft)	0.0006
y ₁	8.60
V ₁	5.62
Fr	0.34
y _s /y ₁	0.56
Y _s	4.85

500YR	
Pier	
<u>Local Pier Scour</u>	
Pier Shape	Round
K1	1.0
L _{pier}	136.0
a _{pier}	2.2
L/a	12.0
θ	0.0
K2	1.0
K3	1.1
D ₅₀ (mm)	0.200
D ₅₀ (ft)	0.0006
y ₁	9.38
V ₁	6.24
Fr	0.36
y _s /y ₁	0.55
Y _s	5.13

Maximum scour: (for round nosed piers aligned with the flow)

$Y_s \leq 2.4$ times the pier width (a) for $Fr \leq 0.8$

$Y_s \leq 3.0$ times the pier width (a) for $Fr > 0.8$

Maximum scour is controlled by $2.4 \cdot a = 5.21$ feet

ATTACHMENT L

RIPRAP SIZING

IDOT Drainage Manual

Chapter 11 - Scour Countermeasures

Section 11-102.031 Rock Riprap at Piers and Abutments

output

input by user

Sizing Rock Riprap at Piers

Determine the local velocity at the pier, V_{des}

$$12.78 \quad V_{des} = K_1 V_{max}$$

V_{des} = Design velocity on pier, ft/sec

1.5 K_1 = Shape factor equal to 1.5 for round-nose piers or 1.7 for square-faced piers

8.52 V_{max} = Maximum velocity in the active channel, ft/sec

Determine d_{50}

$$1.06 \quad d_{50} = \frac{0.692 (v_{des})^2}{(S_g - 1)2g}$$

d_{50} = Median stone diameter, ft.

12.78 V_{des} = Design velocity on pier, ft/sec

2.65 S_g = Specific gravity of riprap (normally 2.65)

32.2 g = 32.2 ft/sec²

Sizing Rock Riprap at Abutments

0.40 Froude Number

For Froude Numbers ($V/(gy)^{1/2}$) less than or equal to 0.80, the recommended design equation for sizing rock riprap for spill-through and vertical wall abutments is in the form of the Isbash relationship:

$$\frac{D_{50}}{y} = \frac{K}{(S_s - 1)} * \frac{V^2}{gy}$$

0.83 D_{50} = Median stone diameter, ft

7.06 V = Characteristic average velocity in the contracted section, ft/sec (see *** below for explanation)

2.65 S_s = Specific gravity of rock riprap

32.2 g = gravitational acceleration, (32.2 ft/sec²)

8.12 y = depth of flow in the contracted bridge opening, ft

0.89 K = 0.89 for a spill-through abutment and 1.02 for a vertical wall abutment

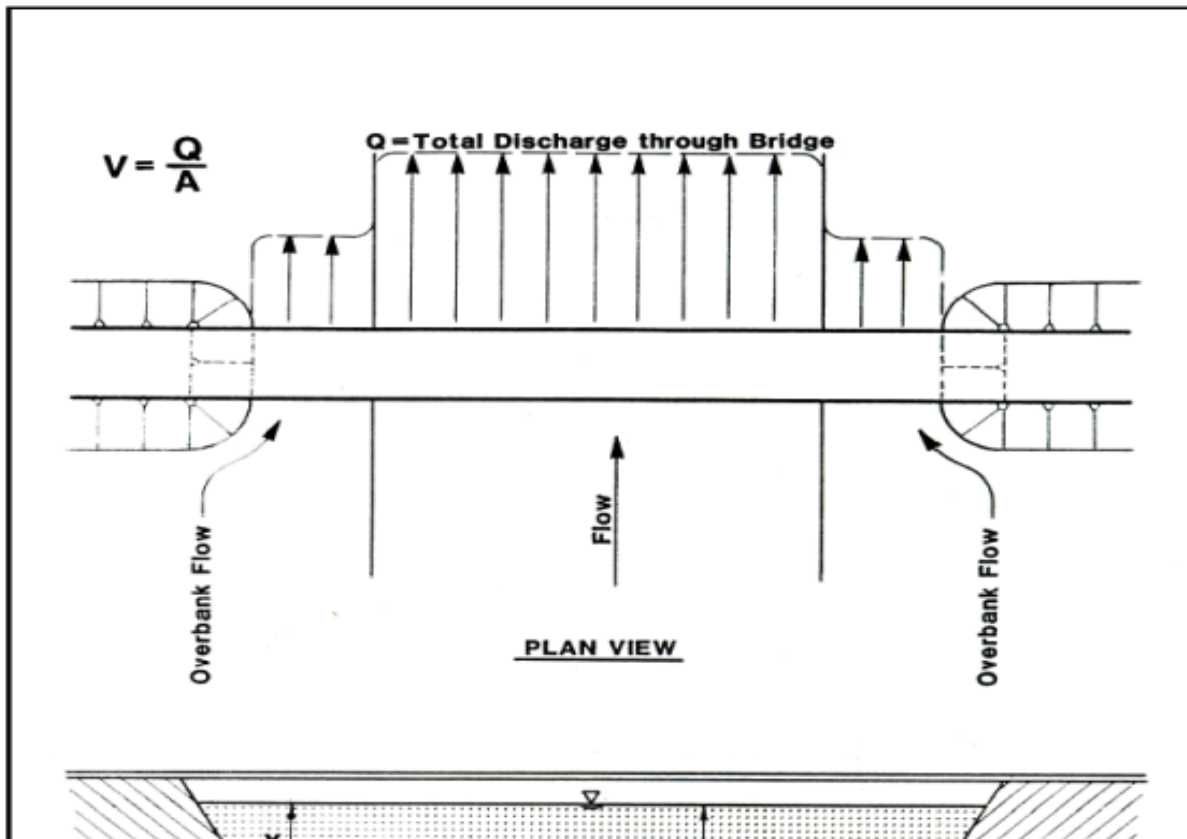
For Froude Numbers greater than 0.80:

$$NA \frac{D_{50}}{y} = \frac{K}{(S_s-1)} * \frac{(V^2 / gy)^{0.14}}$$

NA K = 0.61 for spill-through abutments and 0.69 for vertical wall abutments

A recommended procedure for selecting the characteristic average velocity is as follows:

1. Determine the set-back ratio (SBR) of each abutment. SBR is the ratio of the set-back length to average channel flow depth. The set-back length is the distance from the near edge of the main channel to the toe of abutment.
 - a) If SBR is less than 5 for both abutments ([Figure 11-102.031b](#)), compute a characteristic average velocity, Q/A , based on the entire contracted area through the bridge opening. This includes the total upstream flow, exclusive of that which overtops the roadway. The [HEC-RAS BR Open Velocity](#) located in the Bridge Output table is also appropriate for this step.



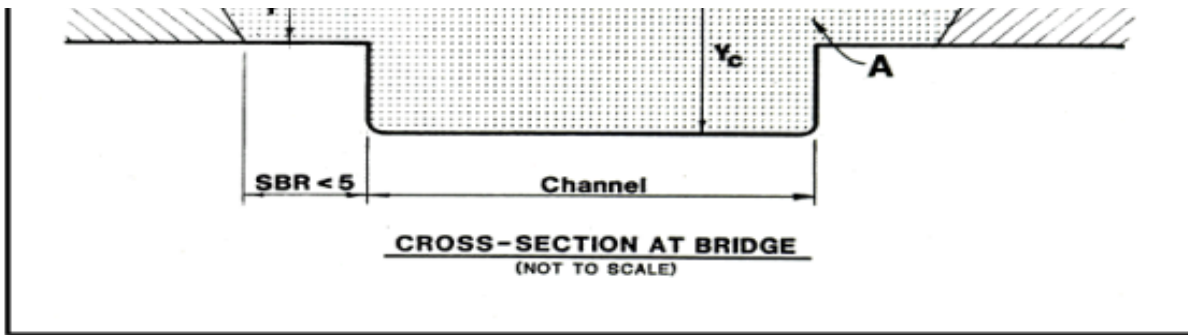


Figure 11-102.031b¹
Characteristic average velocity for SBR < 5

- b) If SBR is greater than 5 for an abutment (Figure 11-102.031c), compute a characteristic average velocity, Q/A , for the respective overbank flow only. Assume that the entire respective overbank flow stays in the overbank section through the bridge opening. This overbank velocity can be found in the cross section output table in HEC-RAS.

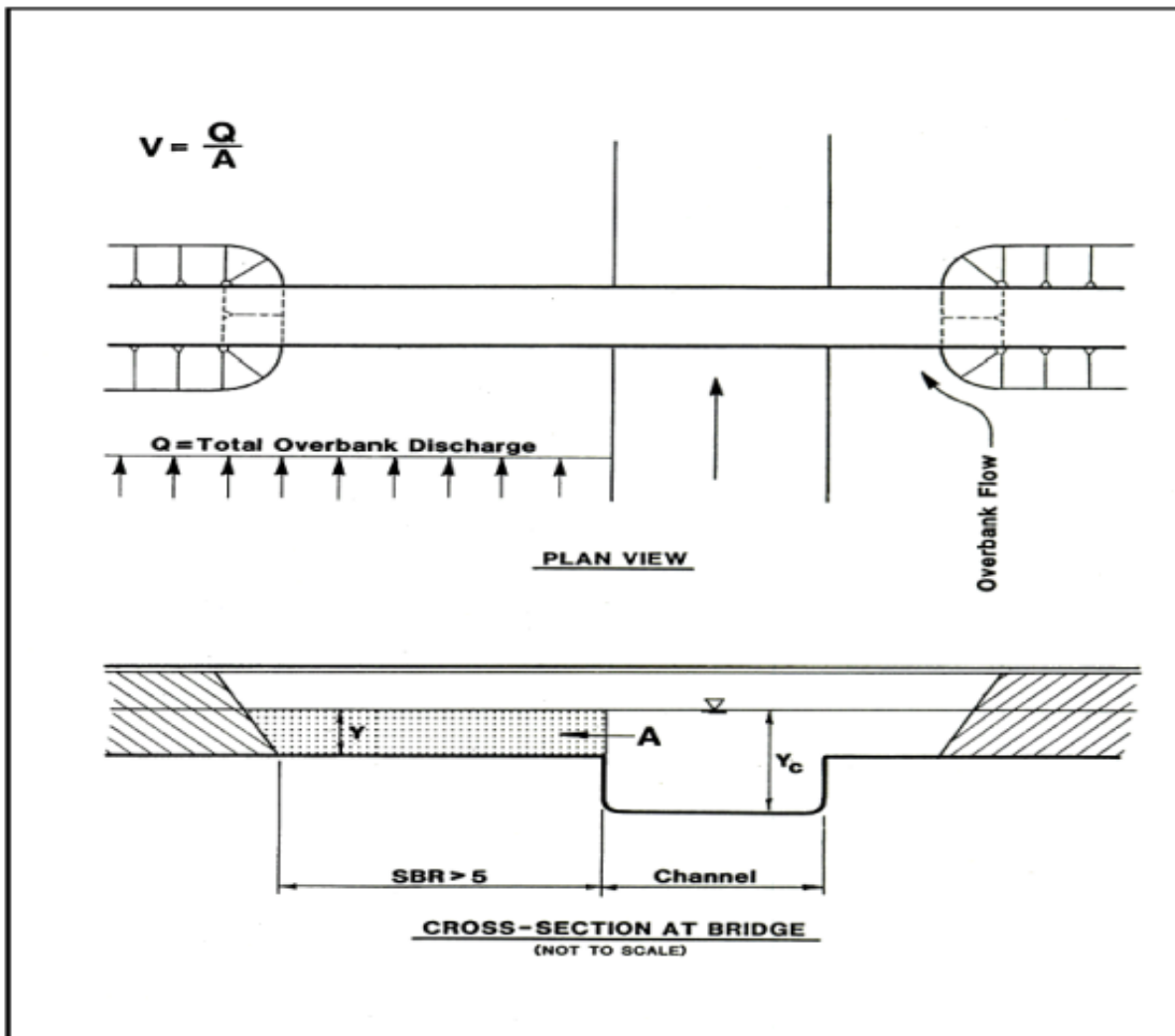


Figure 11-102.031c'
Characteristic average velocity for $SBR > 5$

- c) If SBR for an abutment is less than 5 and SBR for the other abutment at the same site is more than 5 (Figure 11-102.031d), a characteristic average velocity determined from Step 1a for the abutment with SBR less than 5 may be uncharacteristically low. This would, of course, depend upon the opposite overbank discharge as well as how far the other abutment is set back. For this case, the characteristic average velocity for the abutment with SBR less than 5 should be based on the flow area limited by the boundary of that abutment and an imaginary wall and the outer edge of the floodplain associated with that abutment.

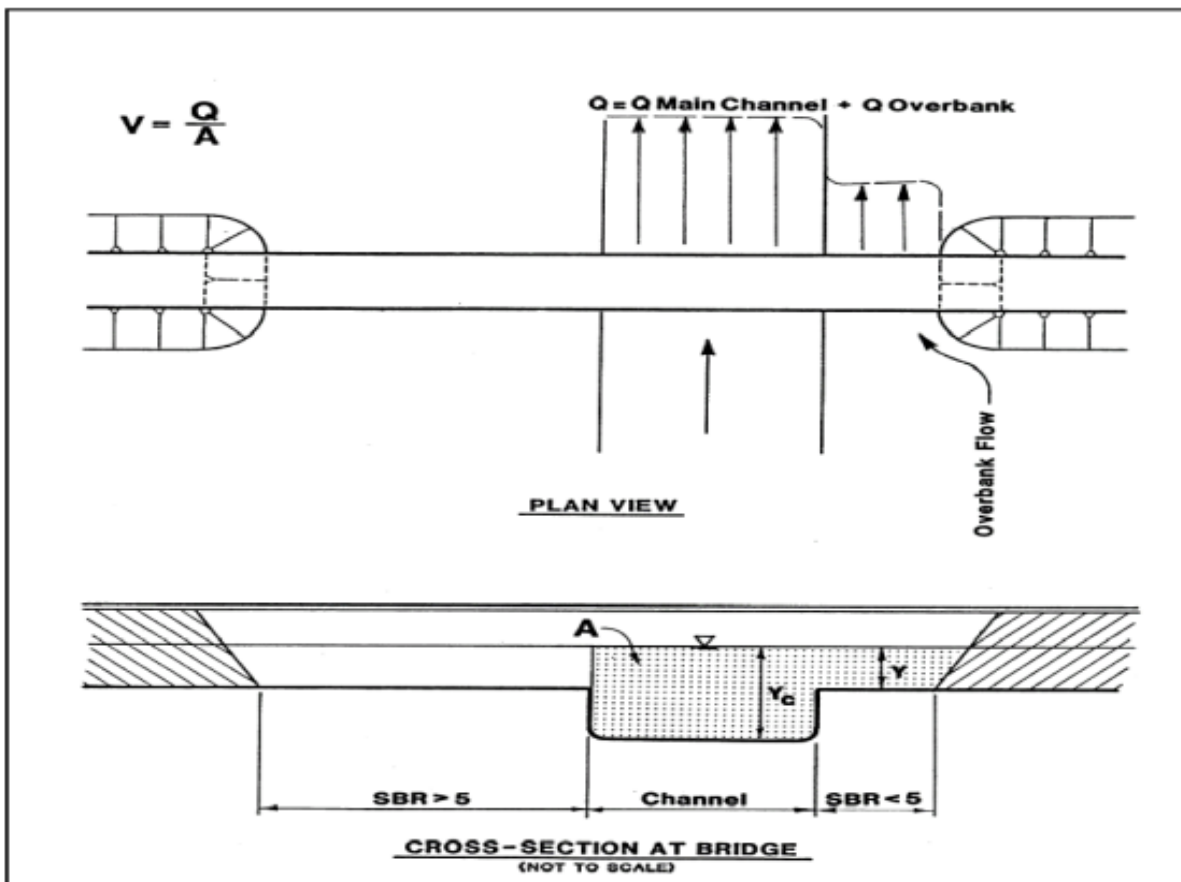


Figure 11-102.031d'
Characteristic average velocity for $SBR > 5$ and $SBR < 5$

2. Select characteristic average velocity when applying the SBR method using the following additional criteria.
 - a) Whenever the SBR is less than 5, the average velocity in the bridge opening provides a good estimate for the velocity at the abutment.
 - b) When the SBR is greater than 5, the recommended adjustment is to compare the velocity from the SBR method to the maximum velocity in the channel within the bridge opening and select the lower velocity.

velocity.

- c) The SBR method is well suited for estimating velocity at an abutment if the estimated velocity does not exceed the maximum velocity in the channel.

The equivalent weight of the stone particle based on the diameter is defined by the following relationship

$$W = 0.85(\gamma_s d^3)$$

W = Weight of stone, lb

γ_s = Density of stone, lb/ft³

d = Diameter of stone, ft (Choose the larger of the stone diameter from the pier and abutment calculation)

Select Grade per Article 1005.01

Grade	50% passing (lb)
RR3	10
RR4	40
RR5	90
RR6	170
RR7	3000

x

This size riprap would roughly be equivalent to a Grade 5 stone. Use Grade 5 riprap at a minimum.

All variable based on the Q₁₀₀ event

ATTACHMENT M

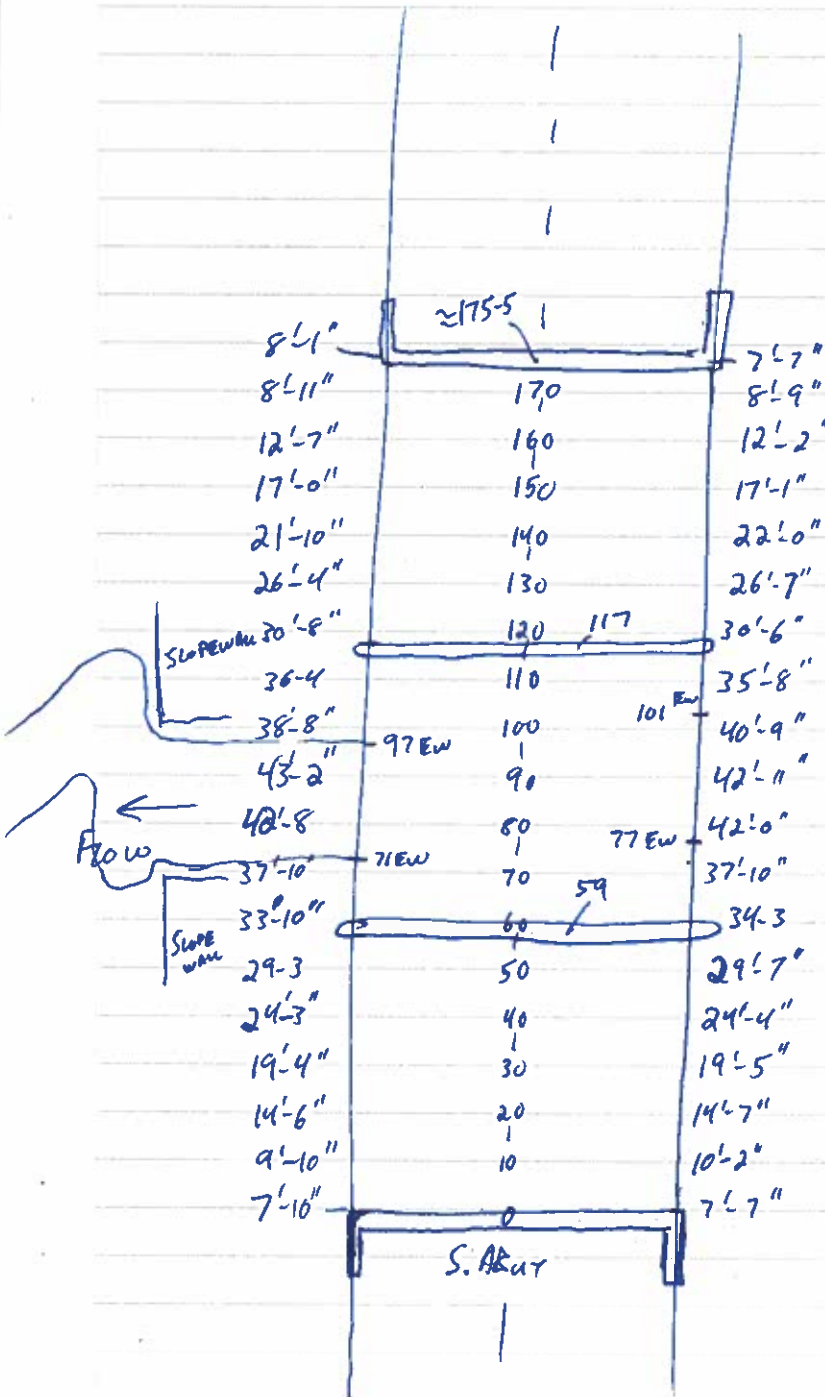
SURVEY NOTES

1/19/2021

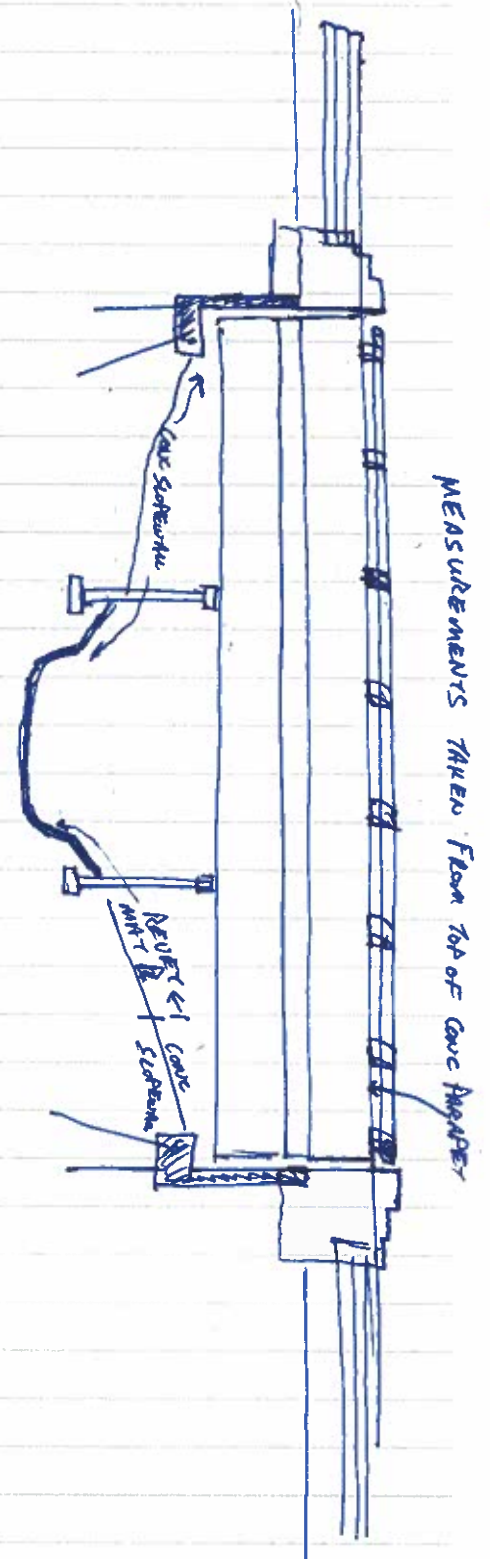
Description	BS	HI	FS	Elev.
0094 SE Bearing Seat	2.21	597.21		595.00
TP #1			23.70	573.51
TP #1	0.37	573.88		573.51
RS 2696 (US Face 0094)			14.90	558.98
RS 2715			14.82	559.06
RS 2740			14.72	559.16
RS 2765			14.62	559.26
RS 2790			14.60	559.28
RS 2815			14.50	559.38
RS 2840			14.40	559.48
RS 2865			14.30	559.58
RS 2890			14.20	559.68
RS 2915			13.65	560.23
RS 2940			14.22	559.66
RS 2560 (DS Face 0093)			15.45	558.43
RS 2529			15.58	558.30
RS 2504			15.68	558.20
RS 2479			15.78	558.10
RS 2454			15.88	558.00
RS 2429			15.98	557.90
RS 2404			16.50	557.38
RS 2379			16.05	557.83
RS 2354			16.50	557.38
RS 2329			16.71	557.17
RS 2304			16.65	557.23
RS 2279			16.49	557.39
RS 2254			16.39	557.49

93C4 - Inspection Remarks

4-23-15
TL + MA 50°



40'-10" @ 80



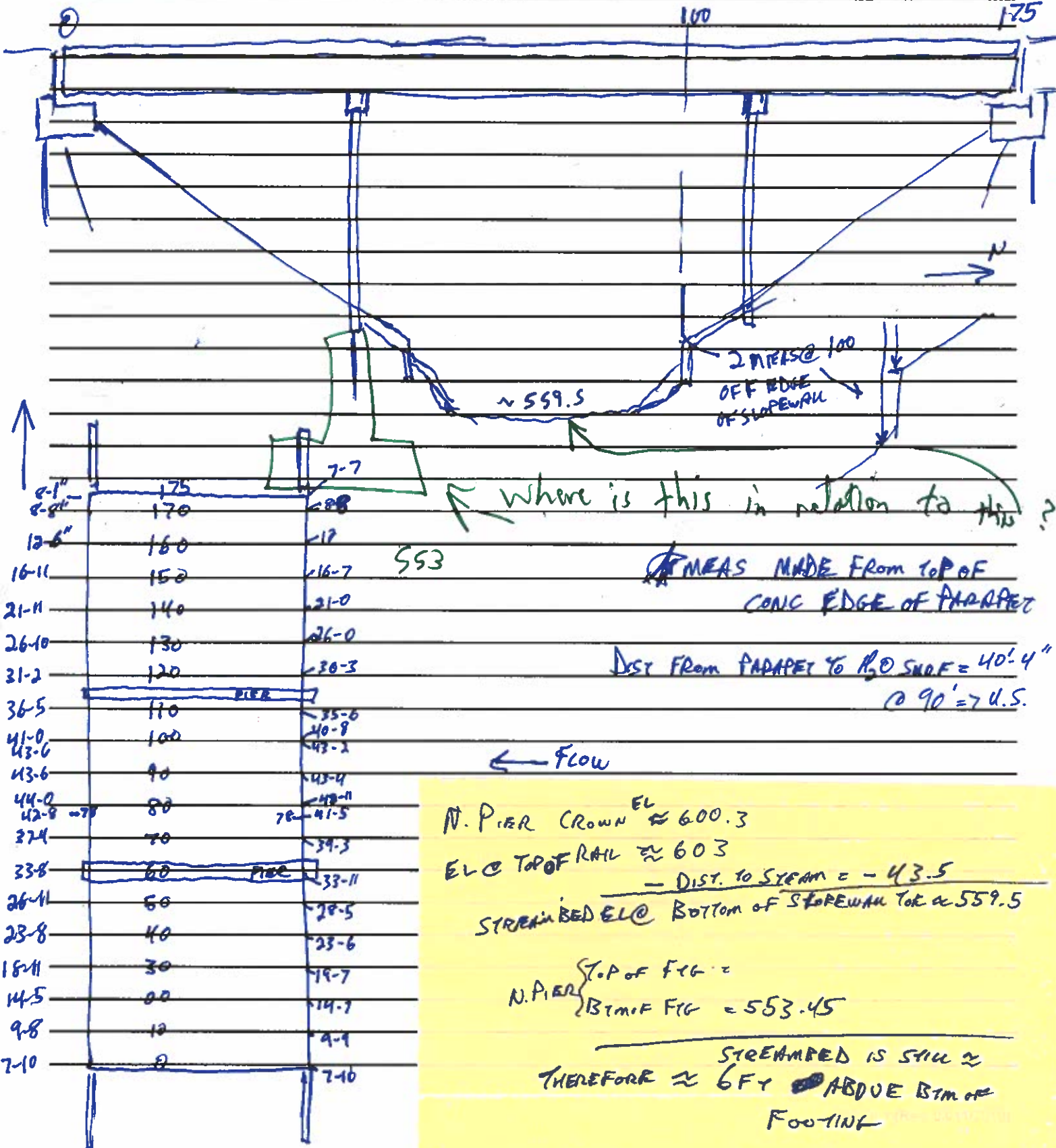
H₂O TO TOP OF (COND) PARAPET = 40'-10" @ 80 DS.
= 40'-6" @ 86 US

6-26-19
TL
86°

Special Inspection Report

Structure Number: 0900094

93C4 - Special Inspection Remarks Continued:



ATTACHMENT N

EWSE DATA

The EWSE (Estimated Water Surface Elevation) is an estimate of flow depth that is anticipated during construction. Per Section 2-402.06 of IDOT's Drainage Manual, the following data was surveyed in September of 2020:

- Water Surface Elevation: 560.80
- Date of Survey: September 17, 2020
- Top of Bank Elevation: 590.50

ATTACHMENT O

MANNING'S "n" CALCULATION

For Stable Channel

$$n = (n_b + n_1 + n_2 + n_3 + n_4)m$$

n_b = a base value of n for a straight uniform, smooth channel in natural materials

n_1 = a value added to correct for the effect of surface irregularities

n_2 = a value for variations in shape and size of the channel cross section

n_3 = a value for obstructions

n_4 = a value for vegetation and flow conditions

m = a correction for meandering of the channel

$$n_b = 0.025 \text{ (Firm Soil)}$$

$$n_1 = 0.005 \text{ (Minor)}$$

$$n_2 = 0.005 \text{ (Alternating occasionally)}$$

$$n_3 = 0.005 \text{ (Minor)}$$

$$n_4 = 0.01 \text{ (Medium)}$$

$$m = 1.00 \text{ (Minor)}$$

$$n = (0.025 + 0.005 + 0.005 + 0.005 + 0.01) * 1.00$$

$$n = \mathbf{0.05}$$

For Floodplain

$$n = (n_b + n_1 + n_2 + n_3 + n_4)m$$

n_b = a base value of n for the floodplain's natural bare soil surface, with nothing on the surface

n_1 = a value to correct for the effect of surface irregularities on the floodplain

n_2 = a value for variations in shape and size of the floodplain cross section assumed to equal 0

n_3 = a value for obstructions on the floodplain

n_4 = a value for vegetation on the floodplain

m = a correction for sinuosity of the floodplain, equal to 1.0

$$n_b = 0.025 \text{ (Firm Soil)}$$

$$n_1 = 0.003 \text{ (Minor)}$$

$$n_2 = 0.000 \text{ (N/A)}$$

$$n_3 = 0.017 \text{ (Minor)}$$

$$n_4 = 0.025 \text{ (Large)}$$

$$m = 1.00 \text{ (Minor)}$$

$$n = (0.025 + 0.003 + 0.000 + 0.017 + 0.025) * 1.00$$

$$n = \mathbf{0.07}$$

ATTACHMENT P

CD WITH PROJECT FILES